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QIKIQ15 BAFFIN REGION DEW LINE SITE MONITORING

2017 DYE-M Monitoring Report

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Executive Summary

Golder Associates Ltd. (Golder) has been contracted by Public Services and Procurement Canada (PSPC), on behalf of the Department of National Defence (DND), to complete the 2015-2018 Distant Early Warning (DEW) Line Sites Landfill Monitoring Program in the Baffin Region of Nunavut. The three DEW Line sites that were monitored in 2017 as part of the QIKIQ15 contract are DYE-M, CAM-5 and FOX-M. These sites are all now in the Post-Construction Monitoring Phase of their remedial program.

This monitoring report presents the 2017 post-construction inspection and monitoring results for 13 landfills at DYE-M:

- Lower Site North Warning System Landfill
- Lower Site Tier II Disposal Facility
- Lower Site Crossroads Landfill
- Lower Site Foundation Landfill
- Lower Site Powerhouse Landfill
- Lower Site Non-Hazardous Waste Landfill
- Upper Site Tier II Disposal Facility
- Upper Site West Landfill
- Upper Site Pallet Line Landfill
- Upper Site Non-Hazardous Waste Landfill
- Upper Site North Warning System Landfill
- Upper Site South Landfill West
- Upper Site Helipad Landfill

Remediation of DYE-M was completed in 2013 and the 2017 monitoring event was Year 4 for DYE-M. DYE-M has been monitored annually from 2014 to 2017. The 2017 monitoring event at DYE-M was completed from August 2nd through 6th.

It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Lower Site North Warning System (NWS) Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site NWS Landfill. No new features were observed in this landfill in 2017. All observed features are minor and were unchanged since 2016, with the exception of more extensive establishment of vegetation on the cover surface. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium, PHC or PCB were noted in any of the soil samples in 2017. The concentrations of metals were marginally highest overall at the sample location DM-07, located upgradient of the northwest side of the landfill. Whereas concentrations of most metals at downgradient sample location DM-10 were slightly higher than in 2016, the results are overall largely unchanged from previous years. Slight increases in the trend of lead and zinc concentrations are noted at DM-07; however, fewer than seven samples have been collected for trend confirmation. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality. No modifications to the ongoing monitoring program at this landfill are recommended for this landfill.

Lower Site Tier II Disposal Facility

No settlement, exposed waste or indications of slope instability were observed at the Lower Site Tier II Disposal Facility during the 2017 visual inspection. Self-armouring erosion, cracking, wet areas, minor sloughing, tire tracks and vegetation features were observed during the recent inspection, but they have not changed significantly since the last inspection and do not appear to be negatively impacting stability of the landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium, PHC or PCB were noted in any of the soil samples collected adjacent to this landfill in 2017. The concentrations of metals were highest overall at the deep sample location MW05-15, located downgradient of the northwest side of the landfill; however, similar elevated metal concentrations were also observed upgradient at MW05-16. In general, the concentrations observed in the 2017 soil samples were similar to 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

In 2017, groundwater samples were collected from two of four monitoring wells adjacent to the landfill. No groundwater samples could be collected at MW05-15 and MW05-16 as the groundwater in the well was frozen. No detectable concentrations of arsenic, cadmium, chromium, lead or PHC were noted in either of the groundwater samples collected in 2017. The concentrations of metals detected at these locations were similar to previous years. None of the reported groundwater values exceeded their respective baseline mean concentrations plus 3σ.

Based on the monitoring results, there does not appear to be significant impact to soil or groundwater quality from the landfill. No modifications to the ongoing monitoring program at this landfill are recommended.

Lower Site Crossroads Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site Crossroads Landfill. No new features were observed in this landfill in 2017. All observed features are minor and were unchanged since 2016, with the exception of vegetation on the cover surface which has expanded. The observed features do not appear to be having a negative impact on landfill stability. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals were largely similar at all three sampled locations. Overall, the observed results are similar to their respective baseline mean concentrations and are within their respective expected ranges.

PHC were detected in both the shallow and deep sample at upgradient location DM-01, with modified TPH concentrations of 71 mg/kg and 52 mg/kg, respectively. The modified TPH concentration in the shallow sample was slightly less than those reported in 2015 and 2016, whereas PHC were detected in the deep sample at DM-01 for the first time. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality. No modifications to the ongoing monitoring program at this landfill are recommended.

Lower Site Foundation Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site Foundation Landfill. No new features were observed in this landfill in 2017. Some minor tension cracks, self-armouring erosion and an area of minor differential settlement were observed. All observed features are minor and were unchanged since 2016, with the exception of vegetation on the cover surface south crest and east slope of the landfill which has expanded. The observed features do not appear to be having a negative impact on landfill stability. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. Concentrations of metals were highest overall at the shallow sample location DM-06, located downgradient of the west side of the landfill. Overall, the concentrations of metals at these locations were similar to those observed in previous years. The concentration of lead (8.7 mg/kg) at downgradient location DM-05 (shallow) was substantially less than in 2016 (131 mg/kg), suggesting the earlier result was anomalous. At DM-06 (shallow), the concentrations of the metals were similar to or moderately greater than previous years but remained less than the baseline mean concentrations plus 3σ. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

At DM-04, located upgradient of the south side of the landfill, and DM-05 (both shallow), the presence of PHC was noted, at modified TPH concentrations of 108 mg/kg and 76 mg/kg, respectively. The modified TPH concentration at DM-05 was greater than those in previous years, whereas the concentration at DM-05 was well below the concentration reported in 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality. No modifications to the ongoing monitoring program at this landfill are recommended.

Lower Site Powerhouse Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Lower Site Powerhouse Landfill. The overall stability performance of this landfill was assessed as Acceptable.

No arsenic or cadmium were noted in any of the soil samples in 2017. Concentrations of metals were highest overall at the deep sample location MW05-07, located downgradient of the east side of the landfill. Overall, the concentrations of most metals similar to those reported in previous years. The lead concentration at both the downgradient sample location MW05-06 (shallow) and upgradient sample location MW05-08 (shallow) exceeded the baseline mean concentration plus 3σ. As noted above, this standard is the same as the baseline mean and the concentrations at these locations remained below their respective historical maxima. Given this, and the slight nature of the exceedances, these 2017 results are not considered of concern.

PHC were detected at all four soil sampling locations in 2017, at modified TPH concentrations between 26 mg/kg and 1940 mg/kg. The highest PHC concentrations were reported in the deep MW05-06 sample, the modified TPH concentration exceeded the baseline mean concentration plus 3σ but was less than the concentration reported in 2014. None of the other reported parameter concentrations exceeded their respective baseline mean concentrations plus 3σ.

The PCB concentration reported at the deep MW05-06 location remains below the baseline mean concentration; no detectable concentrations of PCB were noted in any of the remaining samples in 2017.

In 2017, groundwater samples were collected from two of the four locations surrounding the landfill. No groundwater samples could be collected at MW05-06 and MW05-07 as the groundwater in the well was frozen. The concentrations of most metals were similar to the concentrations reported in previous years. At both MW05-05, located downgradient of the northwest side of the landfill, and MW05-08, the nickel concentrations exceeded the baseline mean concentration plus 3σ but remained below the concentrations reported in 2015. The baseline mean concentration for nickel is the same as the baseline mean concentrations plus 3σ; the 2015 and 2017 results may represent natural variation. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality. No modifications to the ongoing monitoring program at this landfill are recommended. The O-ring on the cap at MW-08 is damaged and should be replaced in 2018.

Lower Site Non-Hazardous Waste Landfill (NHWL)

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site Non-Hazardous Waste Landfill. Some new self-armouring erosion, tension cracking and ponding of water along the toe of the landfill were observed in 2017. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals in soil were slightly higher overall at the deep sample location MW05-12, located downgradient of the northeast side of the landfill. At the deep MW05-12 location, the concentrations of metals were greater than those reported in previous years, including lead and nickel, which exceeded their baseline mean concentration plus 3σ. The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for lead; given this, the result is not considered significant. At the remaining sampling locations, metals concentrations were less than or similar to those observed in previous years.

PHC were detected at downgradient sample locations MW05-09, MW05-12, MW09-27 and MW09-28 at modified TPH concentrations of 22 mg/kg and 46 mg/kg, respectively. At all locations, the PHC concentrations remained well below the baseline mean concentration plus 3σ.

In 2017, groundwater samples were collected from two of five monitoring wells adjacent to the landfill. Samples could not be collected at the remaining locations as the wells were either dry/plugged (MW05-09), frozen (MW05-12) or filled with sand (MW09-28). No detectable concentrations of arsenic, chromium, lead or PHC were noted in either of the groundwater samples in 2017. Overall, the results in 2017 are similar to those in 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in any of the groundwater samples in 2017.

Based on the monitoring results, there does not appear to be significant impact to groundwater quality or soil quality from the landfill. No modifications to the ongoing monitoring program at this landfill are recommended. It is recommended that an attempt be made in 2018 to flush both MW05-09 and MW09-28.

Upper Site Tier II Disposal Facility

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site Tier II Disposal Facility. Some self-armouring erosion along the slopes of the landfill, rough areas on the crest, a minor tension crack and ponded water features were observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium, PHC or PCB were noted in any of the soil samples in 2017. The concentrations of the metals were highest overall at the deep sample location MW08-25, located downgradient of the northwest side of the landfill. At the deep MW08-25 location, the concentrations of most metals were greater than those observed in 2014, including cobalt, which exceeded the baseline mean concentration plus 3σ. The chromium concentration also exceeded the baseline mean concentration plus 3σ but remains below the concentration reported in 2014. At the remaining sampling locations, most metal concentrations were similar to or greater than those observed in previous years. Exceedances of the baseline mean concentration plus 3σ were reported for nickel at the shallow MW07-23 location, arsenic at the deep MW07-23 location and chromium at the shallow MW08-25 location, all of which are located downgradient of the landfill.

In 2017, a groundwater sample was only collected from MW08-24, as the rest of the locations were frozen. At MW08-24, the concentrations of all metals were less than the respective baseline mean concentration. No cadmium or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

The results at MW08-25 suggest potential impact from the landfill; however, fewer than seven samples have been collected for trend confirmation. No modifications to the ongoing monitoring program at this landfill are recommended. It is noted that the hasp on the casing at MW12-02 is broken, it is recommended an attempt be made to repair this in 2018.

Upper Site West Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site West Landfill (West, Centre, Centre Lobe A and East Lobes). Some self-armouring erosion, minor tension cracks, tire tracks and rough cover surface areas were observed. The overall stability performance of the Upper Site West Landfill areas was assessed as Acceptable.

No cadmium was detected in any of the samples in 2017. The concentrations of metals were highest overall at the sample location DM-48, located downgradient of the East Lobe of the landfill. At DM-48, the concentrations of many metals were greater than those reported in previous years and the concentrations of arsenic, cobalt, chromium and nickel exceeded their baseline mean concentrations plus 3σ. Exceedances of the baseline mean concentrations plus 3σ were also observed at upgradient sample locations DM-40 (copper), DM-47 (PCB) and DM-52 (nickel) and downgradient sample locations DM-38 (lead) andDM-44 (copper). At the majority of the other sampling locations, the concentrations of most metals were less than or similar to those reported in previous years.

Detectable concentrations of PHC were noted at a number of locations (upgradient locations DM-40, DM-47, and DM-50, DM-51 and DM-52 and downgradient locations DM-36, DM-37, DM-38, DM-44, DM-46, DM-48 and DM-49) at modified TPH concentrations ranging from 15 mg/kg to 3,025 mg/kg. It is also noted that hydrocarbon odours were present at DM-40, DM-47, DM-51 and DM-53. The concentrations of modified TPH were highest in the deep sample at DM-51; the modified TPH concentration of 3,025 mg/kg was greater than the concentration reported in 2014 and exceeds the baseline mean concentration plus 3σ (826 mg/kg). None of the remaining PHC concentrations exceeded the baseline concentration plus 3σ. PCB were detected at the shallow DM-47 location

for the first time; the PCB concentration of 0.11 mg/kg exceeded the baseline mean concentration plus 3σ. No detectable concentrations of PHC or PCB were noted in any of the other samples in 2017.

With the exception of the lead exceedance at DM-38, the results from samples in the vicinity of the West Lobe are less than the baseline mean concentration plus 3σ. Exceedances are noted both upgradient and downgradient of the Centre and East lobes, notably as observed at DM-48, where concentrations in several parameters (arsenic, cobalt and nickel represent new historical maxima. Given that elevated concentrations have been observed at this location in the past, they could represent impacts present at the time of landfill completion and additional data are required to determine if impacts are increasing. The elevated PHC at locations upgradient of the West landfill may represent impacts from the Pallet Line landfill; however, these elevated concentrations have been detected since 2014 (i.e., the first post-construction samples). Additional data is required to assess if the elevated concentrations relate to impact from the landfill or reflect impacts associated with soils outside of the landfill.

Upper Site Pallet Line Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site Pallet Line Landfill. Some minor settlement (including two small sinkholes), self-armouring erosion, minor tension cracks and ponding of water along (less water compared to previous inspection) the toe of the landfill were observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals were highest overall at the deep sample location DM-50, located downgradient of Lobe 1. At the deep DM-50 location, the concentrations of most metals were greater than those reported in previous years, including arsenic, chromium and copper, which exceeded their baseline mean concentrations plus 3σ. Chromium and copper also exceeded the baseline mean concentration plus 3σ at the shallow DM-50 location. At the majority of the remaining sampling locations, the concentrations of most metals were generally similar to those reported in previous years, and remained below the baseline mean concentration plus 3σ, with the exception of chromium at the deep DM-53 sample location, located downgradient of Lobe 1.

Hydrocarbon odours were detected at some locations. Detectable concentrations of PHC were reported at downgradient locations DM-50, DM-51, DM-53 and DM-59, at modified TPH concentrations between 58 mg/kg and 3,104 mg/kg. PHC concentrations were highest at the deep DM-59 location; the modified TPH concentration was greater than the concentration reported in 2014 and exceeds the baseline mean concentration plus 3σ. Modified TPH concentrations greater than the baseline mean concentration plus 3σ were also reported at the deep DM-51 and shallow DM-59 locations.

Overall, it was noted that concentrations of metals at the lobes making up the Pallet Line Landfill were highest to the north towards the West Landfill. It is further noted that the observed exceedances were not consistent for one parameter or a group of parameters, suggesting that pre-existing conditions may be responsible for the observed variation. Collection of a larger dataset of results is required to assess changes to soil quality in this area resulting from the landfills. No additional modifications to the ongoing monitoring program at this landfill are recommended.

Upper Site NHWL

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site NHWL. Some areas with cover material segregation and an isolated crack on the cover surface the landfill were observed. The overall stability performance of this landfill was assessed as Acceptable.

No arsenic, cadmium or PCB were detected in any of the soil samples in 2017. The concentrations of most metals were similar to their respective baseline mean concentrations and are within their respective expected ranges. The lead concentration at upgradient sample location MW06-18 slightly exceeded the baseline mean concentration plus 3σ; however as noted above, this criteria for lead is the same as the baseline mean and is most likely within expected natural variation.

PHC were detected at MW06-18; the modified TPH concentration (212 mg/kg) was greater than the concentration reported in 2016 (42 mg/kg). No detectable concentrations of PHC in any of the remaining soil samples in 2017.

In 2017, a groundwater sample was collected only from downgradient sample location MW06-19, as the rest of the locations were frozen. At MW06-19, concentrations of copper and lead increased slightly, whereas the concentration of zinc was less than the concentration reported in 2015. No arsenic, cadmium, chromium, cobalt, nickel PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Based on the results, there does not appear to be significant impact to soil quality or groundwater quality from the landfill. No modifications to the ongoing monitoring program at this landfill are recommended.

Upper Site NWS Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Upper Site NWS Landfill. Some areas of self-armouring erosion, an isolated crack and partially buried steel cable were observed along the south and west slopes of the landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium, arsenic, PCB or PHC were noted in any of the samples collected adjacent to this landfill in 2017. The concentrations of metals were similar at all locations. Slight increases in some of metals concentrations were noted; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. Metals concentrations at all locations remain well below the baseline mean concentrations plus 3σ were reported in 2017.

There is no evident ongoing impact of the NWS landfill on soil quality. No modifications to the ongoing monitoring program at this landfill are recommended.

Upper Site South Landfill West

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site South Landfill West. Some minor self-armouring erosion, sparse vegetation on the cover surface, and running water with orange stained soil at the south toe were observed during the inspection. The overall stability performance of this landfill was assessed as Acceptable.

The concentrations of metals were highest overall at the shallow sample location DM-24 and the deep sample location DM-26, located downgradient of the south side of the landfill. At DM-24, concentrations of most metals were greater than those reported in previous years; however, these results are similar to their respective baseline

mean concentrations and are within their respective expected ranges. At the deep DM-26 sample location, the concentrations of most detected metals were less than those reported in 2014, whereas the concentrations of chromium, cobalt and nickel increased. The nickel concentration of 220 mg/kg exceeded the baseline mean concentration plus 3σ (94.5 mg/kg). At the remaining sampling locations, the concentrations of most metals were less than or similar those reported in previous years. An area of running water flowing over orange stained soil was noted near downgradient sample location DM-25. This area is downslope of where the landfill cover material exhibited staining, with no sheen. It appears that the staining may be related to the cover material, based on the areal extent (as opposed to point source) of the discoloration. For the shallow sample at this location, the concentrations of most metals were similar to those reported in previous years. No detectable concentrations of cadmium, arsenic, PCB or PHC were noted in any of the samples in 2017.

Overall, the results of the monitoring at this landfill do not indicate ongoing impact. Continued close scrutiny of downgradient results, notably DM-25 and DM-26, should be undertaken. No modifications to the ongoing monitoring program at this landfill are recommended.

Upper Site Helipad Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Upper Site Helipad Landfill. Some minor settlement, rough grading and tire tracks were observed in this landfill. A new settlement area and a hydrocarbon stain were observed in 2017. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic or cadmium were noted in 2017 at any sampling locations at this landfill. Concentrations of the most metals were highest at downgradient sampling locations DM-14 (notably chromium and nickel) and DM-17 (notably copper). At DM-14, chromium in both the shallow and deep samples exceeded the baseline mean concentration plus 3σ and both chromium and nickel concentrations represent historical high values. At DM-17, the copper concentration exceeded the baseline mean concentration plus 3σ and represents a new historical maximum. The copper concentration at the deep DM-17 location exceeded the baseline mean concentration plus 3σ, but remains less than the historical maximum reported in 2015.

PHC were detected at downgradient sample locations DM-12 and DM-13, at modified TPH concentrations ranging from 25 mg/kg to 87 mg/kg. PHC concentrations were highest at the deep DM-12 location; the modified TPH concentration of 87 mg/kg was greater than the concentration reported in 2015 (81 mg/kg) but remains below the historical maximum of 150 mg/kg reported in 2014. Detectable concentrations of PCB are noted at DM-12, at values less than those reported in 2014 and 2015. No detectable concentrations of PCB or PHC were noted in 2017 at any other sampling locations at this landfill. It is noted that exceedances of the baseline mean concentration plus 3σ for PCB were noted at many of the downgradient locations in previous years; however, none were observed in 2017. This may reflect a decreasing trend in PCB concentrations but is more likely reflective of natural variability in the sampling results; fewer than seven samples have been collected for trend confirmation.

Overall, the results indicate that most locations exhibit soil concentrations similar to earlier sampling. Increasing concentrations of chromium and nickel at DM-14 should be closely monitored to assess if this represents impact from the landfill. No modifications to the ongoing monitoring program at this landfill are recommended.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been contracted by Public Services and Procurement Canada (PSPC), on behalf of the Department of National Defence (DND), to complete the 2015-2018 Distant Early Warning (DEW) Line Sites Landfill Monitoring Program in the Baffin Region of Nunavut (hereafter referred to as the "Project"). The contract number with PSPC is W6837-151002/001/NCS. The DND file number for the Project is QIKIQ15. The contracted scope of work is in accordance with the project Terms of Reference (TOR) dated April 2015, Golder Proposal P1530908 dated June 16, 2015 ("Golder Proposal") and the May 24, 2017 kick-off meeting minutes.

The three DEW Line sites that were monitored in 2017 as part of the QIKIQ15 contract are DYE-M, CAM-5 and FOX-M. These sites are all now in the Post-Construction Monitoring Phase of their remedial program. Post-Construction Monitoring was carried out in accordance with the TOR and implemented as per Golder's Logistics and Work Plan (LWP) dated July 7, 2017. Monitoring activities included geotechnical visual inspection, thermal monitoring, soil sampling and groundwater sampling. Deviations from the TOR are noted throughout this report, where applicable.

This monitoring report presents the 2017 post-construction inspection and monitoring results for DYE-M (the Site). Remediation of DYE-M was completed in 2013 and the 2017 monitoring event was Year 4. DYE-M has been monitored annually from 2014 to 2017. The first year of post-construction monitoring was completed in 2014 by the Environmental Service Group (ESG). Golder has completed the annual monitoring from 2015 to 2017.

Appendix A is a summary of the report limitations and forms part of the report.

1.1 Objective of the Study

The objective of the landfill monitoring program is to collect sufficient information to assess the performance, integrity, and stability of the landfills from a geotechnical and environmental perspective for the protection of human health and the environment. The monitoring program is designed to monitor landfill integrity and to determine, in the event of any evident deterioration or impacts identified from sampling results, if remedial measures are required.

1.2 Scope of Work

The scope of work for this project includes the following:

1) Project management including liaison with DND, project team coordination, scope management, cost management, schedule management and resource coordination;

2) Preparation of a site-specific Health Safety and Environment Plan (HASEP) and procurement of safety equipment and supplies (e.g., personal protective equipment, first aid kits and satellite phones);

3) Development of a Logistics and Work Plan (LWP) for each field season that outlines the field schedule, travel plans, accommodation, hiring of local Inuit contract workers, all-terrain vehicle (ATV) and charter aircraft rental;

4) Completion of field work consisting of visual inspection, photographic documentation, thermistor data collection and soil and water sample collection;

5) Preparation of a Field Work Progress Report that summarizes field work activities completed each year (submitted under separate cover);

6) Preparation of a Consultant's Inuit Participation Plan (CIPP) and Report (CIPR), that contains the Inuit employment and subcontracting content (submitted under separate cover); and,

7) Preparation of draft and final monitoring reports for each site with visual inspection results, photographic log, thermistor data collection, figures of inspection features and photograph locations, soil and groundwater quality monitoring results, Quality Analysis / Quality Control (QA/QC) and data interpretation.

2.0 BACKGROUND

2.1 Site Description

DYE-M is a former Distant Early Warning Line (DEW Line) site, located at Cape Dyer, Nunavut, on the Cumberland Peninsula at the easternmost point of Baffin Island. It is bordered by Davis Strait and Coronation Gulf, at 66° 40' N, 61° 21' W. The DYE-M station is currently operated by Canada's Department of National Defence (DND) as a North Warning System (NWS) long-range radar (LRR) site.

The elevation across the site varies from less than 300 m to over 500 m above sea level. The station is about 15 km inland from the shore of Sunneshine Fjord. The site is divided into three areas connected by a road: Upper Site, Middle Site and Lower Site. The main site facilities (the Upper Site-Station Area) are located at the top of a summit, approximately 16 km east-northeast of the Lower Site-Airstrip and Camp Area. At the Middle Site, there is only a switchback in the road, a benchmark and a small lake. At the lower site, there is currently a large hangar and the airstrip, plus six landfills. In the past, petroleum, oil and lubricant (POL) storage facilities and vehicle maintenance facilities were located at the Lower Site. The Beach Area was formerly used for POL storage and open storage areas.

This former DEW Line site was comprised of communications, accommodations and maintenance facilities. In 1993, the site was upgraded to an unmanned LRR site as part of the NWS. Much of the station infrastructure was no longer required, and most buildings were subsequently decommissioned. Only those structures required to support the NWS site and house the remotely operated communications systems are still present.

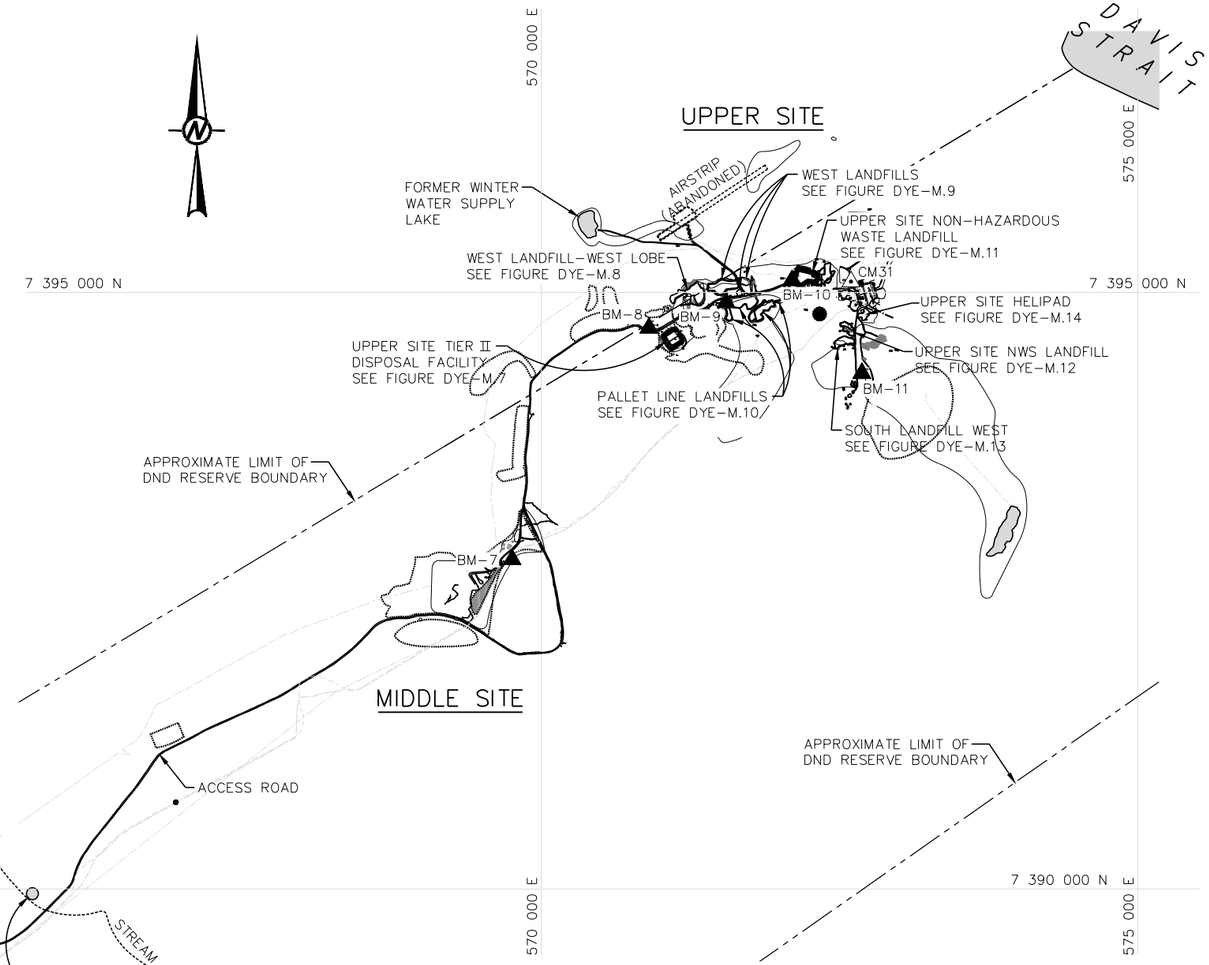
The Site clean-up included the remediation of existing landfills and the construction of new landfills for the disposal of non-hazardous wastes generated from demolition and collection of site debris and the construction of new Tier II Disposal Facilities for the disposal of Tier II contaminated soil. The landfills included in the long-term monitoring program are shown on the overall site plan, Figure DYE-M.1, and are listed below:

- Lower Site North Warning System Landfill
- Lower Site Tier II Disposal Facility
- Lower Site Crossroads Landfill
- Lower Site Foundation Landfill
- Lower Site Powerhouse Landfill
- Lower Site Non-Hazardous Waste Landfill
- Upper Site Tier II Disposal Facility
- Upper Site West Landfills
- Upper Site Pallet Line Landfill
- Upper Site Non-Hazardous Waste Landfill
- Upper Site North Warning System Landfill
- Upper Site South Landfill West
- Upper Site Helipad Landfill



LOCATION OF CAPE DYER WITHIN NUNAVUT TERRITORY

SCALE: NTS



LEGEND:

- APPROXIMATE LIMIT OF DND RESERVE BOUNDARY
- CM1 — SURVEY CONTROL MONUMENT (2)
- BM-1 — PERMANENT BENCHMARK LOCATION (11)
- ARCHAEOLOGICAL FEATURES
- BODY OF WATER

NOTE
GRID PROJECTION IS NAD83 ZONE 20N.
ELEVATIONS ARE GEODETIC.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 1,000 2,000
1:50,000 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
OVERALL SITE PLAN

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\99_PRO\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0012.dwg

2.2 Site Geology, Hydrogeology and Hydrology

The site is on the northeastern edge of the Precambrian (Canadian) Shield. Most Precambrian bedrock has been metamorphosed (altered by intense heat and pressure) into granite. Surficial soils have been formed by the erosive forces of glaciation and deposited by retreating glaciers. Glacial retreat has deposited glacial till moraine, boulders and talus slopes over the landscape. The landscape is dominated by bedrock outcrops and boulder fields; tundra vegetation is generally limited to valleys.

The groundwater flow processes at the site are expected to be significantly influenced by the presence of continuous permafrost. Annual active thaw layers are typically limited to a few metres below ground surface, depending on ground cover, soil materials and surface water features. Shallow groundwater representing meltwater (both surficial and within the active layer) and infiltration from precipitation during the summer thaw is perched within the active layer during the short summer season. Movement of the groundwater is dictated by soil type, presence of shallow permafrost and hydraulic pressures resulting from topographic differences and distribution (elevation) of the water within the soils. Water elevations are only measured at some wells, and therefore the use of terms upgradient or downgradient may not be truly reflective of the actual flow direction. Nevertheless, for the purposes of this report, upgradient and downgradient are used to maintain consistency with the identification of monitoring locations in previous annual reports.

The landscape at DYE-M varies from a shallow marine beach to the southwest, broad glacial U-shaped valleys, broad rounded hills, boulder covered uplands, to sheer cliff walls along the eastern coast. Rugged topography and the presence of permafrost at the site have created many small, shallow perched lakes and seasonal streams from drainage of melting snow. Smaller, shallow surface water features typically freeze solid during the winter months. Some of the larger, deeper lakes may not freeze solid, which may therefore support fish populations.

2.3 Land-Use Description

In the 1950s, DEW Line sites were constructed across a number of locations in the northern parts of Alaska, Canada and Greenland, between latitudes 65 and 70 degrees to maintain surveillance of the North American Airspace. In 1963, improvements in surveillance technology led to the closure of most of the DEW Line sites and their replacement with the NWS. Since the 1990s, investigations, decommissioning, and clean-up activities have been undertaken at the DEW Line sites. Clean-up and decommissioning activities involved the demolition of surplus buildings and structures, excavation of contaminated soils, and the regrading of existing landfills. New engineered landfills were also constructed for the disposal of excavated soils and building materials.

Landfills at DEW Line sites can be categorized as follows:

- **Regraded:** Existing landfills that were regraded and capped with gravel;
- **Leachate Contained:** Existing landfills that were capped with gravel and provided with an impermeable membrane keyed into the permafrost (either only on the sides or over the surface) to contain leachate;
- **New NH:** New non-hazardous waste landfills; and,
- **New Tier II:** New Tier II disposal facilities (used for the disposal of Tier II soils as described by the DEW Line Cleanup Criteria) with an impermeable liner underneath and on top of the contaminated soil to encapsulate the contents (leachate contained). Tier II landfills have a saturated granular perimeter berm keyed into the permafrost and sufficient cover of granular material to promote permafrost aggradation into the landfilled materials.

Gravel airstrips are maintained at some of the DEW Line sites for the purpose of ongoing site operations, maintenance and monitoring.

2.4 Field Program Staff and Schedule

Table 2-1 presents a list of field personal, roles, responsibilities and dates for the DYE-M 2017 monitoring program.

Table 2-1: Field Personnel and Roles

Name (Affiliation)	Role / Responsibility	Site	Date
Paul Dewaele (Golder)	Environmental Lead/ Soil and Water Sampling	DYE-M	August 2-6
Reza Moghaddam (Golder)	Field Geotechnical Lead	DYE-M	August 2-6
Jamie Bonany (Golder)	Environmental Lead/ Soil and Water Sampling	DYE-M	August 2-6
Jonah Audlakiak (Inuit Subcontractor)	Wildlife Monitor	DYE-M	August 2-6
Uriah Newkingnak (Inuit Subcontractor)	Wildlife Monitor	DYE-M	August 2-6
Ricky Nookiguak (Inuit Subcontractor)	Environmental Assistant / Sampling	DYE-M	August 2-6
Tony Atsanik (Inuit Subcontractor)	Environmental Assistant / Sampling	DYE-M	August 2-6

2.5 Weather Conditions

Table 2-2 presents a summary of weather conditions on each day of the DYE-M 2017 monitoring program.

Table 2-2: Summary of Weather Conditions

Date	Weather
August 2	Clear with some clouds, 3°C to 9°C
August 3	Clear with some clouds, 3°C to 9°C
August 4	Clear with some clouds, 3°C to 9°C
August 5	Clear with some clouds, 3°C to 9°C
August 6	Clear with some clouds, 3°C to 9°C

2.6 Project References

Canadian Council of Ministers of the Environment (CCME, 2016a), “Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume I Guidance Manual”.

Canadian Council of Ministers of the Environment (CCME, 2016b), “Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume III Suggested Operating Procedures”.

Canadian Council of Ministers of the Environment (CCME, 2016c), “Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume IV Analytical Methods”.

Department of National Defence (DND, 2015), “Terms of Reference, DEW Line Monitoring Program CAM-5, FOX-M, 2, 3, 4, 5, DYE-M”, QIKIQ15 Contract, April 2015.

Environmental Sciences Group (ESG 2002a), “DYE-Main, Cape Dyer, Nunavut: Lower Site Investigation, 1997-2001”, Royal Military College of Canada, Kingston, Ontario.

Environmental Sciences Group (ESG 2002b), “DYE-Main, Cape Dyer, Nunavut: Upper Site Investigation, 1997-2001”, Royal Military College of Canada, Kingston, Ontario.

Environmental Sciences Group (ESG 2015), “DYE-M Cape Dyer, Nunavut Baseline and First Year Environmental Monitoring Report 2014”, Royal Military College, Kingston, Ontario.

Golder Associates Ltd. (Golder, 2015a), “Solicitation No. W6837-151002/A Baffin Region Dew Line Sites Monitoring Program”, Report P1530908, dated June 16, 2015.

Golder Associates Ltd. (Golder, 2016a), “*2015 DYE-M Monitoring Report*”, Report 1530908-1600-Rev2, dated March 2016.

Golder Associates Ltd. (Golder, 2016b). “*Baffin Region DEW Line Site Monitoring Health Safety and Environment Plan*”, Report 1530908-2000-V2, dated July 25, 2016.

Golder Associates Ltd. (Golder, 2016c), “*2016 Landfill Monitoring Program for QIKIQ15 Contract: Logistics and Work Plan*”, Report 1530908-2000-R1-V2, dated July 25, 2016.

Golder Associates Ltd. (Golder, 2016d). “*2016 Baffin Region DEW Line Site Landfill Monitoring Field Work Progress Report*”, Report 1530908-2000-R2-V2, dated October 7, 2016.

Golder Associates Ltd. (Golder, 2017a), “*2016 DYE-M Monitoring Report*”, Report 1530908-2000-R5-V2, dated March, 2017.

Golder Associates Ltd. (Golder, 2017b), “*Baffin Region DEW Line Site Monitoring Health Safety and Environment Plan*”, Report 1530908-3000, dated July 7, 2017.

Golder Associates Ltd. (Golder, 2017c), “*2017 Landfill Monitoring for DEW Line Sites: Logistics and Work Plan*”, Report 1530908-3000-R1, dated July 7, 2017.

2.7 Report Structure

This report describes the monitoring program carried out in August 2017 at DYE-M. Results from soil and groundwater sampling, thermal monitoring and visual inspection activities are presented in Section 4 in accordance with the TOR.

Each of the landfills is described in separate sub-sections (Sections 4.1 to 4.13). Each section contains the following 2017 monitoring information for that landfill:

- Scope deviations summary;
- Visual Inspection Checklist;
- Preliminary Stability Assessment Table;
- Table of visual inspection photographs;
- Landfill plan with photograph locations and observed features;
- Summary of thermal monitoring (if applicable for landfill);
- Summary of soil sampling analytical results;
- Summary of groundwater sampling analytical results (if applicable for landfill); and,
- Discussion of overall landfill performance based on available monitoring data.

The methodology for the monitoring program is described in Section 3. Information on the development of Background and Baseline data used for comparison of soil and groundwater samples described herein is provided at the beginning of Section 4. The Quality Analysis / Quality Control (QA/QC) data interpretation is contained in Section 5.

Appendix A provides a Limitation of Responsibilities and forms part of the report. Thermal, soil and groundwater monitoring field record sheets are included in Appendix B. Laboratory certificates of analysis, historical landfill monitoring results and QA/QC reports are included in Appendix C. The photographic log is included in Appendix D.

An electronic version of the report, tables, figures, photos and laboratory certificates of analysis are saved on a DVD-ROM, which is appended to the hardcopy of the report.

3.0 APPROACH & METHODOLOGY (GENERAL)

3.1 Summary of Work

3.1.1 Health and Safety

Golder developed a Health, Safety and Environment Plan (Golder, 2017b) for the QIKIQ15 field program that described potential hazards, risks and proposed mitigation measures. Unique health and safety risks included the potential for wildlife encounters, long distances to the nearest emergency health care facilities and variable weather conditions. In addition, Golder developed a Logistics and Work Plan (Golder, 2017c) for the field program that outlined travel plans, contact information, accommodation details, transportation, communications, field equipment and sampling protocols.

3.1.2 Field Program

Table 3-1 provides a summary of the monitoring schedule for the seven DEW Line sites that are part of the QIKIQ15 Project. DYE-M was monitored in 2017 (Year 4) and will be monitored again in 2018 (Year 5). The field monitoring program consisted of the following activities:

- Visual inspection including photographic documentation of observed conditions;
- Thermal monitoring (i.e., datalogger downloading at landfills with thermistors);
- Soil sampling; and,
- Groundwater sampling (at landfills with monitoring wells).

The field methodology is detailed in the following sections, and any deviations from the TOR are noted in italics.

Table 3-2 provides a summary of monitoring activities by landfill.

Table 3-1: Summary of QIKIQ15 Project Monitoring Schedule

DEW Line Site	Year			
	2015	2016	2017	2018
CAM-5 Mackar Inlet	Year 5		Year 7	
FOX-M Hall Beach			Year 10	
FOX-2 Longstaff Bluff	Year 4	Year 5		Year 7
FOX-3 Dewar Lakes	Year 4[(a)]	Year 5[(a)]		Year 7
FOX-4 Cape Hooper		Year 18		Year 20
FOX-5 Broughton Island		Year 10		
DYE-M Cape Dyer	Year 2	Year 3	Year 4	Year 5

Legend	
	Phase I Monitoring
	Phase II Monitoring

Note:

a) At FOX-3 in 2015 and 2016 (Years 4 and 5) – Complete a geotechnical inspection of the thermokarst regrade.

Table 3-2: Summary of Monitoring Requirements by Landfill

Landfill Designation	Type of Landfill	Visual Inspection	Soil Sampling[(a)]	Groundwater Sampling	Thermal Monitoring
		✓ = yes	# of Locations	# of Monitoring Wells	# of Thermistors
DYE-M					
Lower Site NWS	Regraded	✓	4 x 2		
Lower Site Tier II Disposal Facility	New Tier II	✓	4 x 2	4	4 + 1 (background)
Lower Site Crossroads Landfill	Regraded	✓	3 x 2		
Lower Site Foundation Landfill	Regraded	✓	3 x 2		
Lower Site Powerhouse Landfill	Leachate contained	✓	4 x 2	4	3
Lower Site NHWL	New NH	✓	5 x 2	5	
Upper Site Tier II Disposal Facility	New Tier II	✓	5 x 2	5	5 + 1 (background)
Upper Site West Landfill – West Lobe	Regraded	✓	9 x 2		
Upper Site West Landfill – Centre Lobe and East Lobe	Regraded	✓	13 x 2		
Upper Site Pallet Line Landfill – Lobes 1 to 5, and Abandoned Lobe	Regraded	✓	10 x 2		
Upper Site – NHWL	New NH	✓	4 x 2	4	
Upper Site NWS Landfill	Regraded	✓	5 x 2		
Upper Site South Landfill West	Regraded	✓	8 x 2		
Upper Site Helipad Area Landfill	Regraded	✓	7 x 2		
	TOTAL	**14**	**168**	**22**	**14**

Notes:

a) (# x #) Indicates approximate number of sampling points at each landfill and requirement to collect samples from 2 depths at each sampling point; from 0-15 cm and from 40-50 cm (or at refusal).

3.1.3 Visual Inspection

At each of the landfill locations mentioned above, a visual inspection was conducted to observe whether there were any visual signs of erosion, cracking, seepage, ponded water, stressed vegetation (potentially caused by the landfill) and for physical stability. Photographic records of the landfill were taken to document the observed condition of the landfill and other notable features that were observed. Coordinates of all photographs and feature locations were collected using a Garmin GLO GPS connected by Bluetooth to a field tablet. The claimed accuracy of this unit is *3 m, less accurate than the 0.5 to 1 m accuracy specified in the TOR*. *The dimensions of all features were measured (e.g., smaller features by measuring tape and larger features by counting 1 m steps) and recorded on the field tablet. Noteworthy features (i.e., relevant to landfill performance) larger than 10 m in length were photographed at 10 m intervals and GPS coordinates were recorded to dimension the feature.* Depths of features were measured with a measuring tape. Areas with the same minor feature (e.g., minor self-armouring erosion, vegetation or vehicle tracks) have generally been assigned a single feature letter where they are located on the same side/section/area of the landfill and/or when previous inspections have reported the area as a single feature. Where extensive minor erosion was observed, the reported feature dimensions refer to the area of minor erosion (i.e., not a single erosion channel). The statement 'no significant change' indicates that no significant or noteworthy

change in the condition of a feature was observed during the 2017 inspection compared to previously reported observations and photographs of the feature.

In general, for all of the DEW Line sites that form part of this contract, many of the acceptable features observed during the inspections do not appear to be related to landfill performance. For example, shallow depressions that appear to be unchanged since construction of the landfill (i.e., as-built condition) or minor hydrocarbon staining from post-construction anthropogenic activities (e.g., ATV use). These acceptable features that do not appear to be related to landfill performance have been reported as “not a concern”. Where observed, self-armouring erosion, minor water ponding and seepage without staining have also been reported as “not a concern” when they are not indicative of deteriorating landfill performance and/or when they are suspected as being weather related. In addition, when minor cracking appears to be related to slope creep and does not indicate slope instability, it is not considered to be a concern at the present time. Features that are related to landfill performance have been photographed and described in detail.

Visual inspection information was used to complete a Preliminary Stability Assessment for each landfill. Each observed feature was assigned a Severity Rating (Acceptable, Marginal, Significant or Unacceptable) and Extent (Isolated, Occasional, Numerous or Extensive) and then the landfill was assigned an overall Performance Rating (Acceptable, Marginal, Significant or Unacceptable). If a type of feature was not observed during the inspection, then the Severity Rating was reported as “Not Observed” in the Preliminary Stability Assessment. Definitions of these terms are as follows:

Feature Severity Rating / Landfill Performance Rating	Description
Not Observed	This type of feature was not observed at the landfill during the inspection.
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of landfill is compromised to the extent that ability to contain waste materials is compromised. Examples may include: ■ Debris exposed in erosion channels or areas of differential settlement. ■ Liner exposed. ■ Slope failure.

Extent	Description
Isolated	Singular feature
Occasional	Features of note occurring at irregular intervals/locations
Numerous	Many features of note, impacting less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

3.1.4 Thermal Monitoring

The landfills that require leachate containment (e.g., Tier II disposal facilities) and rely on permafrost aggradation incorporate ground temperature monitoring systems with vertical thermistor strings that measure temperature at various depths and automated data loggers that allow for data collection. The data recorded on the data loggers was downloaded using a laptop computer and Prolog software from Lakewood Systems Ltd. Thermistor inspection and data downloading details were recorded on field record sheets included in Appendix B.

3.1.5 Soil Sampling

Soil samples were collected in accordance with the TOR, the Golder Proposal, Logistics and Work Plan and Canadian Council of Ministers of the Environment (CCME) Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume I Guidance Manual (CCME, 2016a). Soil sampling procedures of note are as follows (deviations from the TOR are noted *in italics*):

- Soil samples were collected within 2 to 4 metres of monitoring wells (where applicable). Where there was no corresponding monitoring well soil samples were collected within 2 to 4 metres of previous sample locations. Previous consultants left pins and tags in the ground to indicate where they sampled soil. Golder sampled away from those locations and did not leave pins in the ground.
- Coordinates of the 2017 soil sampling locations were recorded using a field tablet equipped with a Garmin GPS and confirmed to be consistent with previous/required sampling locations prior to sampling.
- Test pits were dug with a shovel that was washed between sample locations. The shovel was decontaminated with soap and water, methyl hydrate and rinsed with distilled water before each use. Soil samples were collected by hand using a single-use disposable nitrile glove and placed into new/clean glass sample jars provided by the laboratory that were labelled with the sample location ID and depth.
- Soil samples were generally collected at 0 to 15 centimetres (cm) depth and at 40 to 50 cm depth at the locations in accordance with the TOR. *At some locations, the sample collection depth was adjusted where refusal on rock was encountered. Where refusal on a large rock(s) was encountered near surface, the sampling location was moved slightly to avoid the large rock(s). When rocks were encountered prior to reaching the target sampling depth, the test pit was enlarged and the rock(s) were excavated if possible. If the specified sampling depth could not be reached after expending reasonable effort to enlarge the hole in an attempt to remove rock(s), a sample was collected at or near the zone of refusal (in accordance with the TOR). If refusal was encountered after the shallow soil sample depth and even with additional effort it was not possible to remove the rock(s) causing refusal, then only one soil sample was collected at that location (noted as "refusal" in summary tables below).*

- Soil samples were not analyzed for mercury during the 2017 monitoring program in accordance with Environmental Working Group (EWG) recommendations.
- Field duplicates were collected for at least 10% of the total soil samples collected. The field duplicates were collected from relatively homogenous soil material in the test pit, such that the composition of the samples was the same and to minimize escape of volatile compounds.
- In order to assess the effectiveness of decontamination of the shovel used for soil sampling, an equipment rinsate (equipment blank) sample was completed following a typical decontamination procedure at each Site.

3.1.6 Groundwater Sampling

Groundwater samples were collected in accordance with the TOR, the Golder Proposal, Logistics and Work Plan and CCME (2016a and b). Groundwater sampling procedures of note are as follows (*deviations in italics*):

- Water levels in the wells were measured with an interface probe that was decontaminated with soap and water, methyl hydrate and rinsed with deionized water before each use.
- At monitoring well locations where there was snow on the ground surrounding the well and no measurable water level or water that could be pumped with the peristaltic pump, water samples were not collected (noted as “frozen” in the summary tables below).
- *At monitoring well locations that had no measurable water level or water that could be pumped with the peristaltic pump, water samples were not collected (noted as “dry” in summary tables below).*
- *In wells with limited water depth and/or slow recharge, purging was only carried out to obtain a set of the field parameters* and then sampling was commenced in the priority order outlined in the TOR*. The number of water sample bottles collected and parameters that could not be analyzed are listed in footnotes following the respective summary tables below.*
- Purging and sampling was carried out using a peristaltic pump and a low-flow purge rate of less than 100 mL/min was maintained. Peristaltic pump flexible tubing and nylon tubing extending down the well was single-use and disposed after use at each well (i.e., not reused). Sample tubing was removed from the wells after completion of the sampling event and disposed off-site.
- Based on experience gained in the 2015 sampling program, the purging and sampling protocols were changed to maximize sample collection for the wells, which typically have low recovery. For wells with less than 20 cm of standing water, an initial sample for analysis of field parameters was collected, followed by sampling and, where enough water remained, a final sample for analysis of field parameters was collected. For wells with more than 20 cm of standing water, a second sample for field analysis was collected, followed by sampling and a final sample for analysis of field parameters was collected. Where it was evident that the sample recovery was slowing, the second field analysis was not undertaken. The total purging volumes for this technique were 250 ml and 500 ml, equivalent to one or two containers of the Horiba field meter.
- *The potential impact of collecting groundwater samples before the field parameters have stabilized is offset in the case of this project by the requirement to obtain sufficient sample volume for the analyses and thus make interpretations of potential changes in groundwater quality, given the difficulty in accessing the sites and the short period over which active zone water is available for sampling. We consider that the approach taken to well purging for this project is a reasonable balance between prioritizing the objectives of having adequate sample volume and achieving stability of the field parameters to the extent possible.*

- A Horiba U-52 meter was used to monitor groundwater physio-chemical field parameters during purging. The instrument was calibrated before the 2017 sampling program by Pine Environmental, the calibration record is provided in Appendix B. In addition, the Horiba U-52 meter was field calibrated prior to each site using a pH of 4.01, conductivity of 4.49 mS/cm and turbidity of 0 NTU solution. Probes were rinsed with deionized water and patted dry between each calibration buffer solution.
- Groundwater samples were pumped directly from the well into analysis-specific bottles provided by the laboratory that were labelled with the sample location ID. Groundwater samples were not field filtered and were not field-acidified or preserved (in accordance with the TOR).
- Where groundwater was insufficient, sampling was prioritized in the following order:
  - Petroleum hydrocarbons: F1 fraction;
  - Inorganic elements – total concentrations: arsenic, cadmium, chromium, cobalt, copper, lead, nickel and zinc. Samples were not filtered (which is why low turbidity is so important) or preserved; and,
  - Petroleum hydrocarbons: F2, F3 and F4 fractions.
- Groundwater samples were not analyzed for mercury or PCBs (polychlorinated biphenyls – Total Aroclor analysis) during the 2017 monitoring program, in accordance with Environmental Working Group (EWG) recommendations.
- The petroleum hydrocarbon F1 fraction groundwater samples were preserved using sodium bisulphate.
- Field duplicates were collected for 10% of the total groundwater samples collected.
- A travel blank of laboratory prepared water accompanied the sampling containers for each site, and analyzed for the entire suite of parameters.
- In order to assess the effectiveness of decontamination of the groundwater level / interface probe, and the shovel used to dig the test pits, equipment rinsate (equipment blank) samples of the probe and shovel were completed following a typical decontamination procedure at each site.
- No equipment blanks were required for the sample collection tubing, as new tubing was used at each sampling location.
- *Lab analyses were completed as dissolved metals instead of total metals in 2017. This is noted on the historic data and trend charts. Golder is conducting an overall trend comparison on the impact of results based on total versus dissolved metals and is preparing a separate memo to discuss the comparison.*

3.2 Field Notes and Data

Visual inspection photographs, features, UTM coordinates, dimension measurements and other notes were recorded in the field with a tablet computer equipped with a camera and Global Positioning System (GPS). The tablet's GPS accuracy was enhanced by connecting it to a Garmin GLO, which allows it to also receive information from the GLONASS satellites. *The GPS manufacturer's specified accuracy is 3 m* (typical of handheld GPS units), which is less accurate than the TOR requirement of 0.5 to 1 m (typical of survey quality GPS instruments). Field data, UTM coordinates and photographs from the field tablet were uploaded to an online Geographic Information System (GIS) database that was used to generate the photograph log and figures presented in this report. Scale items (e.g., people, ATV, glove, handheld radio, etc.) were included in *most* feature photographs. For difficult to identify features, scale items have been placed beside or on the feature and annotation arrows have been drawn in the photo log to help locate features in the visual inspection photographs.

Thermistor inspection and monitoring data were recorded on field record sheets included in Appendix B. Photographs and UTM coordinates of the thermistor locations were recorded with the field tablet.

Soil sampling locations were photographed before test pit excavation, at the maximum depth of the test pit excavation and after backfilling. Soil sampling locations were recorded with either the field tablet or a hand-held GPS.

Groundwater monitoring data was recorded on field record sheets included in Appendix B. Monitoring well locations were recorded with either the field tablet or a hand-held GPS.

Aerial photographs of most of the landfills at DYE-M were taken during approaches and leaving DYE-M (Photographs 777 through 784 in Appendix D).

3.3 QA/QC

Quality Assurance (QA) is the system of validation checks performed to measure quality in order to determine if the quality objectives have been met. Quality Control (QC) is the set of procedures which are incorporated into the project's standard operating procedures to ensure that it achieves its quality objectives.

The QC procedures incorporated into the monitoring program carried out at DYE-M included:

- Using only ISO 17025 certified environmental labs to perform the soil and groundwater analyses. Golder used Paracel Laboratories Ltd. (Paracel) of Ottawa for all chemical analyses.
- Paracel performed its own internal QA/QC procedures on the analyses performed including testing of matrix spikes, method blanks and lab duplicates. Golder reviewed the quality control reports with each certificate of analysis and has commented on the accuracy of lab results as indicated with these procedures. Golder also reviewed the method detection limits (MDL) achieved by Paracel, and has commented on them in Section 5.
- The field sampling for soil and groundwater was completed by a two-person team, which helped to ensure that all of the sampling and field identification procedures were followed. To minimize the possibility of mislabelling sample containers, they were labelled at the sample location, and with identification, date and time.
- Duplicate soil samples were collected from relatively homogenous soil material in the test pit, such that the composition of the samples was the same and to minimize escape of petroleum hydrocarbon (F1 fraction) compounds;

- Duplicate groundwater samples were prepared by alternately filling bottles for the original and the duplicate, for each parameter type; the yield of the wells in some cases prevented filling the whole suite of sample bottles;
- To minimize the possibility of cross contamination, soil samples were collected directly from the test pits with nitrile gloved hands, at the designated depth intervals, and placed into lab-supplied sample jars leaving no headspace. New gloves were used for each sample. The shovel used to open the test pit was cleaned manually then rinsed with methyl-hydrate and distilled water;
- To minimize the risk of cross-contamination, groundwater samples were pumped from the monitoring wells using dedicated tubing inserted into the well and another dedicated length of tubing between the rollers in the peristaltic pump. Staff holding the sample bottles wore nitrile gloves. Samples were labelled at the monitoring well with identification, time and date;
- Equipment blanks were taken by running lab-supplied deionized water over the sterilized shovel and groundwater probe once per site for testing to confirm that the effectiveness of the cleaning procedure in limiting cross-contamination.
- Groundwater samples for were neither filtered nor preserved in the field, with the exception of the petroleum hydrocarbon F1 fraction, which was preserved using a $NaHSO_4$ tablet. The low-flow sampling technique was employed to minimize the presence of sediment in the water sample.
- Soil samples were not preserved in the field;
- Samples were stored in coolers until the sampling program at DYE-M was complete. The frozen ice packs were replaced each evening during the program to keep the samples cool. All of the sample coolers were shipped from the staging location (Qikiqtarjuaq) to Ottawa in a single shipment as soon as the sampling program for DYE-M was complete.
- Golder sent coolers to Ottawa via First Air under cold storage labelling. Golder picked the coolers up on the day of arrival and took them to Golder's office in Ottawa, where they were checked for breakage, legibility of the labels and accuracy and the chain of custody was filled out. After being checked at Golder, the samples were dispatched to Paracel Labs. The maximum allowable hold times for samples were largely met, with the exception of PHC-F1 in soil, which has an unpreserved hold time of 48 hours.

QA was measured by the duplicate analysis and review of the QA/QC data contained in each laboratory certificate of results. In addition to the duplicate analyses, a trip blank consisting of bottles filled with deionized water and sealed at the laboratory was brought uniquely to DYE-M and not opened, then submitted to Paracel for analysis of all specified parameters. There was no field blank prepared at DYE-M.

The soil samples and groundwater samples were collected with dedicated single-use equipment. The water sampling tubing was single-use from the well to sample bottle, and soil samples were collected from the test pits into sample jars using single-use gloves. This was possible because the texture of the soil samples was generally loose sandy soil. Nevertheless, equipment blanks were prepared for each type of sampling performed at DYE-M. For groundwater sampling, the equipment blank was a sample of deionized water poured over the water level probe after it had been sterilized, and for soil sampling the equipment blank was a sample of deionized water that had been poured over the shovel after it had been washed between samples. No equipment blank was required for the sample collection tubing, as new tubing was used at each sampling location.

A discussion of the QA/QC results is provided in Section 5.

4.0 2017 MONITORING PROGRAM RESULTS

Photographs 1 through 776 (in Appendix D) document the observed conditions during the visual inspection including features on the cover/toe of the landfills, the groundwater monitoring wells, soil sample locations before excavation, after excavation and after backfilling as well as the condition of thermistors. The photographs taken at each of the landfill sites to document the observed conditions are organized as follows:

- **Lower Site NWS Landfill** – Photographs 1 through 28;
- **Lower Site Tier II Disposal Facility** – Photographs 29 through 109;
- **Lower Site Crossroads Landfill** – Photographs 110 through 131;
- **Lower Site Foundation Landfill** – Photographs 132 through 157;
- **Lower Site Powerhouse Landfill** – Photographs 158 through 190;
- **Lower Site Non-Hazardous Waste Landfill** – Photographs 191 through 258;
- **Upper Site Tier II Disposal Facility** – Photographs 259 through 311;
- **Upper Site West Landfills (West Lobe)** – Photographs 312 through 372;
- **Upper Site West Landfills (Centre and East Lobes)** – Photographs 373 through 458;
- **Upper Site Pallet Line Landfill –** Photographs 459 through 590;
- **Upper Site Non-Hazardous Waste Landfill** – Photographs 591 through 632;
- **Upper Site NWS Landfill** – Photographs 633 through 675;
- **Upper Site South Landfill West** – Photographs 676 through 736;
- **Upper Site Helipad Landfill** – Photographs 737 through 776; and,
- **Aerial Photographs** – Photographs 777 through 784.

A complete log of all photographs is included in Appendix D. Copies of all digital photograph files are included on a DVD attached to this report. Visual inspection photographs taken with the field tablet are identified by a "DYEM_Photo Number" in the file name which are noted in brackets in the visual inspection photograph log tables.

The monitoring program results are listed for each landfill in the sections below. In the tables contained within the text and Appendix C, data which exceed the arithmetic mean background data and baseline arithmetic mean data are identified by underlined and **bold** fonts, respectively. The background arithmetic mean limits for each landfill have been previously established using the arithmetic mean concentrations for soil samples collected outside the landfill areas in 1989 and 2003. The baseline arithmetic mean limits were calculated based on the concentrations for soil samples collected at each of the current soil sampling locations adjacent to the landfills, between 1997 and 2013. The arithmetic mean baseline and the baseline concentrations plus 3σ are the same for a number of parameters at many of the sites, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits. Soil and groundwater quality data are also compared to the baseline mean concentration plus three standard deviations (3σ); exceedances of this standard are shaded. This limit is based on the "three-sigma rule of thumb", wherein it is expected that nearly all values not influenced by changes in impact lie within three standard deviations of the arithmetic mean. As noted in the results section, at a number of the landfill sites, there was no standard deviation for a number of the metals parameters and PCB, and as a result the baseline mean concentration plus three standard deviations (3σ) is the same as the baseline

mean concentration. Small exceedances of this standard should not necessarily be viewed as significant in terms of evident changes in quality.

A modified total petroleum hydrocarbons (TPH) value, calculated as the sum of the PHC F1, F2 and F3 fractions, is discussed throughout this report to allow for comparison to TPH baseline data.

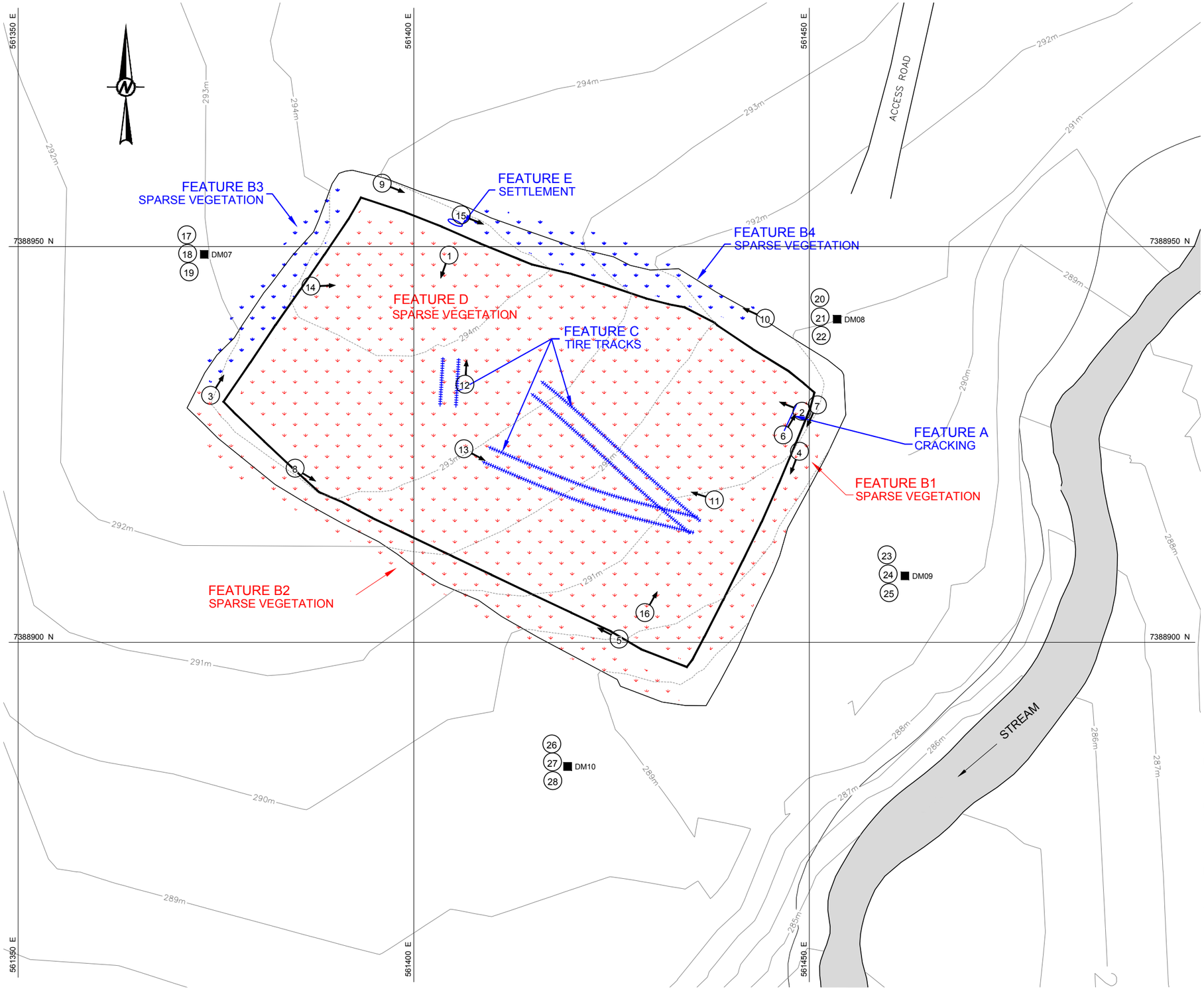
Historical soil and groundwater results and charts are included in Appendix C. It is recommended that seven data points be used as a minimum to identify a soil or groundwater quality trend for these landfills. As of the end of 2017, the maximum of four sample results is less than the seven-year standard and there is therefore insufficient information available to establish a reliable trend. Discussion of the 2017 data in this report focused on identifying data results for locations where concentrations significantly different (typically greater) than previous years are observed, or locations where concentrations exceeded the baseline mean concentration plus 3σ.

Duplicate soil samples were collected at a total of fifteen locations at DYE-M. This included the shallow DM-06 (0-15 cm), deep DM-07 (30-40 cm), deep DM-12 (30-40 cm), shallow DM-14 (0-15 cm), shallow DM-21 (0-15 cm), shallow DM-25 (0-15 cm), shallow DM-33 (0-15 cm), deep DM-40 (40-50 cm), deep DM-48 (40-50 cm), shallow DM-52 (0-15 cm), shallow DM-59 (0-15 cm), shallow MW05-06 (0-15 cm), deep MW08-25 (40-50 cm) and deep MW12-01 (40-50 cm) sample locations. A single duplicate groundwater sample was also collected at monitoring wells MW09-26. For these duplicate sample locations, the average of the two concentrations are presented in the tables and used to discuss in the results in Section 4. The reproducibility of the duplicate sample results is discussed in Section 5.

4.1 Lower Site North Warning System Landfill

4.1.1 Landfill Description

The Lower Site North Warning System (NWS) Landfill was created during DEW Line operations. The landfill is located approximately 1.5 km northwest of the lower camp facilities, 100 m west of the lower camp road. The landfill area is approximately 3,300 m^2. The overall gradient of the surrounding area slopes towards the south and locally east, in the direction of the river located to the immediate east of the landfill, and to Exeter Bay. The landfill and the disturbed area immediately around the landfill are covered in sparse vegetation (less than 20% of the surface). The landfill is underlain by sand and gravel, to boulders and bedrock at varying depths. The remediation of this landfill was completed in 2008 and consisted of regrading the surface with clean fill. The Lower Site NWS Landfill, its features and sampling locations are provided in Figure DYE-M.2.



LEGEND:

- SETTLEMENT
- VEGETATION
- TIRE TRACKS
- CRACKING
- SOIL SAMPLING LOCATION
- PHOTOGRAPH LOCATION
- BODY OF WATER
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

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1:500 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
LOWER SITE
NWS LANDFILL

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
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4.1.2 Visual Inspection

The Lower Site NWS Landfill exhibits minor settlement, minor cracking, tire tracks and extensive sparse vegetation features. Table 4-1 presents a summary of observed visual inspection features and Table 4-2 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance as all observed features were assessed as “Acceptable.” Table 4-3 is a log of photographs taken during the 2017 visual inspection.

A previously observed tension crack (Feature A) was unchanged in 2017. Tire tracks were noted on the surface of the landfill (Feature C), unchanged from previous observations. There are extensive areas of sparse vegetation on the side slopes of the landfill (Features B1, B2, B3 and B4) and top cover surface (Feature D). The small area of previously observed minor settlement (Feature E) remained unchanged.

Table 4-1: Visual Inspection Checklist – Lower Site NWS Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site NWS Landfill
DATE OF INSPECTION: August 5, 2017
DATE OF PREVIOUS INSPECTION: August 13, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-1: Visual Inspection Checklist – Lower Site NWS Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	Y	E	Northeast slope	561,406	7,388,954	1	0.5	0.01-0.02	0.02%	Minor settlement (Acceptable)	Unchanged since previous observation	15
Erosion	N	-	-	-	-	-	-	-	-	-	-	-
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	A	Cover surface	561,450	738,893	2	0.1	-	<0.01%	Tension cracking 1 m above crest of southeast slope. (Acceptable)	Unchanged since previous observation	6
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	B1	Southeast slope	561,451	7,388,930	40	3	-	3.64%	Sparse vegetation	Expanded area	7
	Y	B2	Southwest slope	561,385	7,388,922	70	5	-	10.61%	Sparse vegetation	Expanded area	5, 8
	Y	B3	Northwest slope	561,378	7,388,931	29	5	-	4.4%	Sparse vegetation	Unchanged since previous observation	3
	Y	B4	Northeast slope	561,444	7,388,941	37	5	-	5.6%	Sparse vegetation	Unchanged since previous observation	9,10
	Y	D	Cover surface	561,429	7,388,904	65	35	-	68.94%	Sparse vegetation	Expanded area – Entire cover surface	14, 16

Table 4-1: Visual Inspection Checklist – Lower Site NWS Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	-	-	-	-	-	-	-	-	-	-	-
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	Y	C	Cover surface	561,438	7,388,918	50	2	-	3.0%	Tire tracks (Acceptable)	Unchanged since previous observation	11, 12, 13

Landfill Area = 3,300 m^2.

Table 4-2: Preliminary Stability Assessment – Lower Site NWS Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Not Observed	-
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Isolated
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Extensive
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other (Tire Tracks)	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Table 4-3: Summary Table of Photographic Log – Lower Site NWS Landfill

Photo	Easting	Northing	Date
Photo 1:	561,405	7,388,949	Aug. 5, 2017
Photo 2:	561,449	7,388,929	Aug. 5, 2017
Photo 3:	561,378	7,388,931	Aug. 5, 2017
Photo 4:	561,449	7,388,924	Aug. 5, 2017
Photo 5:	561,426	7,388,900	Aug. 5, 2017
Photo 6:	561,447	7,388,926	Aug. 5, 2017
Photo 7:	561,451	7,388,930	Aug. 5, 2017
Photo 8:	561,385	7,388,922	Aug. 5, 2017
Photo 9:	561,396	7,388,958	Aug. 5, 2017
Photo 10:	561,444	7,388,941	Aug. 5, 2017
Photo 11:	561,438	7,388,918	Aug. 5, 2017
Photo 12:	561,407	7,388,933	Aug. 5, 2017
Photo 13:	561,406	7,388,924	Aug. 5, 2017
Photo 14:	561,387	7,388,945	Aug. 5, 2017
Photo 15:	561,406	7,388,954	Aug. 5, 2017
Photo 16:	561,429	7,388,904	Aug. 5, 2017
Photo 17:	561,374	7,388,949	Aug. 5, 2017
Photo 18:	561,374	7,388,949	Aug. 5, 2017
Photo 19:	561,374	7,388,949	Aug. 5, 2017
Photo 20:	561,454	7,388,941	Aug. 5, 2017
Photo 21:	561,454	7,388,941	Aug. 5, 2017
Photo 22:	561,454	7,388,941	Aug. 5, 2017

Table 4-3: Summary Table of Photographic Log – Lower Site NWS Landfill

Photo	Easting	Northing	Date
Photo 23:	561,462	7,388,908	Aug. 5, 2017
Photo 24:	561,462	7,388,908	Aug. 5, 2017
Photo 25:	561,462	7,388,908	Aug. 5, 2017
Photo 26:	561,420	7,388,884	Aug. 5, 2017
Photo 27:	561,420	7,388,884	Aug. 5, 2017
Photo 28:	561,420	7,388,884	Aug. 5, 2017

4.1.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at DM-08 and DM-10 could not be collected due to refusal on rock.

4.1.4 Soil Sampling

Table 4-4 presents a summary of analytical results for soil samples collected at the Lower Site NWS Landfill. DM-07 represents an upgradient sampling location, whereas DM-08, DM-09 and DM-10 represent downgradient sampling locations. These latter locations are within approximately 30 m of a stream leading southwest to Exeter Bay.

Table 4-4 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus three-sigma (baseline plus 3σ) limits. At the Lower Site NWS Landfill, the background arithmetic means for chromium, copper, nickel and zinc are greater than the baseline arithmetic means. The background arithmetic mean for zinc is also greater than the baseline mean plus 3σ. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site NWS Landfill in 2017. There were no detections of PHC or PCB at any location at this landfill in 2017.

DM-07

Sampling location DM-07 is located upgradient of the landfill, approximately 8 m northwest of the toe. The estimated elevation of this sampling point is 293 masl. As shown in Photo 17, the area consists of sand and gravel with some boulders and established vegetation. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-07 (0-15 cm), the concentrations of most metals were slightly greater than those observed in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-07 (30-40 cm duplicate location), metals concentrations were similar to those observed in the shallow sample. The concentrations of most metals were slightly greater than those observed in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-08

Sampling location DM-08 is located downgradient of the landfill, approximately 7 m northeast of the toe. The estimated elevation of this sampling point is 291 masl. As shown in Photo 20, the area is largely covered with sand and gravel and is sparsely vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-08 (0-15 cm), the concentrations all metals were similar to or less than in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-09

Sampling location DM-09 is located downgradient of the landfill, approximately 17 m southeast of the toe. The estimated elevation of this sampling point is 289 masl. As shown in Photos 23, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of brown sand with some gravel.

For the shallow sample at DM-09 (0-15 cm), the concentrations all metals were similar to previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-09 (20-30 cm), metals concentrations were similar to those observed in the shallow sample. The metals concentrations were all less than those reported in 2014. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-10

Sampling location DM-10 is located downgradient of the landfill, approximately 7 m southwest of the toe. The estimated elevation of this sampling point is 289 masl. As shown in Photo 26, the area consists of sand, gravel and rocks and is not vegetated. The soils consisted of brown sand, gravel and stone.

For the shallow sample at DM-10 (0-15 cm), the concentrations of metals were similar to those observed in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-4: Soil Chemical Analysis Results – Lower Site NWS Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**64.5**	**12.4**	**26.0**	**10.0**	**34.4**	**49.2**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	126.5	23.3	47.7	10.0	64.4	81.8	0.10	NA	NA	NA	NA
Upgradient														
DM-07 Shallow	0-15	<1.0	<0.5	**74.0**	11.2	**29.2**	6.4	**41.0**	46.4	<0.05	<7	<4	<8	<6
DM-07 Deep	30-40	<1.0	<0.5	**64.6**	10.0	26.0	4.7	**36.7**	41.5	<0.05	<7	<4	<8	<6
DM-97 Deep (Duplicate)	30-40	<1.0	<0.5	**79.3**	12.1	**32.4**	6.8	**44.2**	48.3	<0.05	<7	<4	<8	<6
DM-07 Deep (Dup Avg)	30-40	<1.0	<0.5	**72.0**	11.1	**29.2**	5.8	**40.5**	44.9	<0.05	<7	<4	<8	<6
Downgradient														
DM-08 Shallow	0-15	<1.0	<0.5	44.8	7.9	20.9	8.8	27.8	40.7	<0.05	<7	<4	<8	<6
DM-08 Deep[1]														
DM-09 Shallow	0-15	<1.0	<0.5	62.2	9.4	**30.8**	6.1	**37.5**	44.4	<0.05	<7	<4	<8	<6
DM-09 Deep	20-30	<1.0	<0.5	**64.9**	8.9	**31.0**	5.1	**36.9**	40.2	<0.05	<7	<4	<8	<6
DM-10 Shallow	0-15	<1.0	<0.5	**71.9**	11.1	**32.3**	9.0	**39.0**	**53.5**	<0.05	<7	<4	<8	<6
DM-10 Deep[1]														

Notes:

NA: Not available

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil samples at DM-08 and DM-10 could not be collected due to refusal on rock.

4.1.5 Conclusions and Overall Performance of the Lower Site NWS Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site NWS Landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium, PHC or PCB were noted in any of the soil samples in 2017. The concentrations of metals were marginally highest overall at the sample location DM-07, located upgradient of the northwest side of the landfill. Whereas concentrations of most metals at downgradient sample location DM-10 were slightly higher than in 2016, the results are overall largely unchanged from previous years. Slight increases in the trend of lead and zinc concentrations are noted at DM-07; however, fewer than seven samples have been collected for trend confirmation. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality.

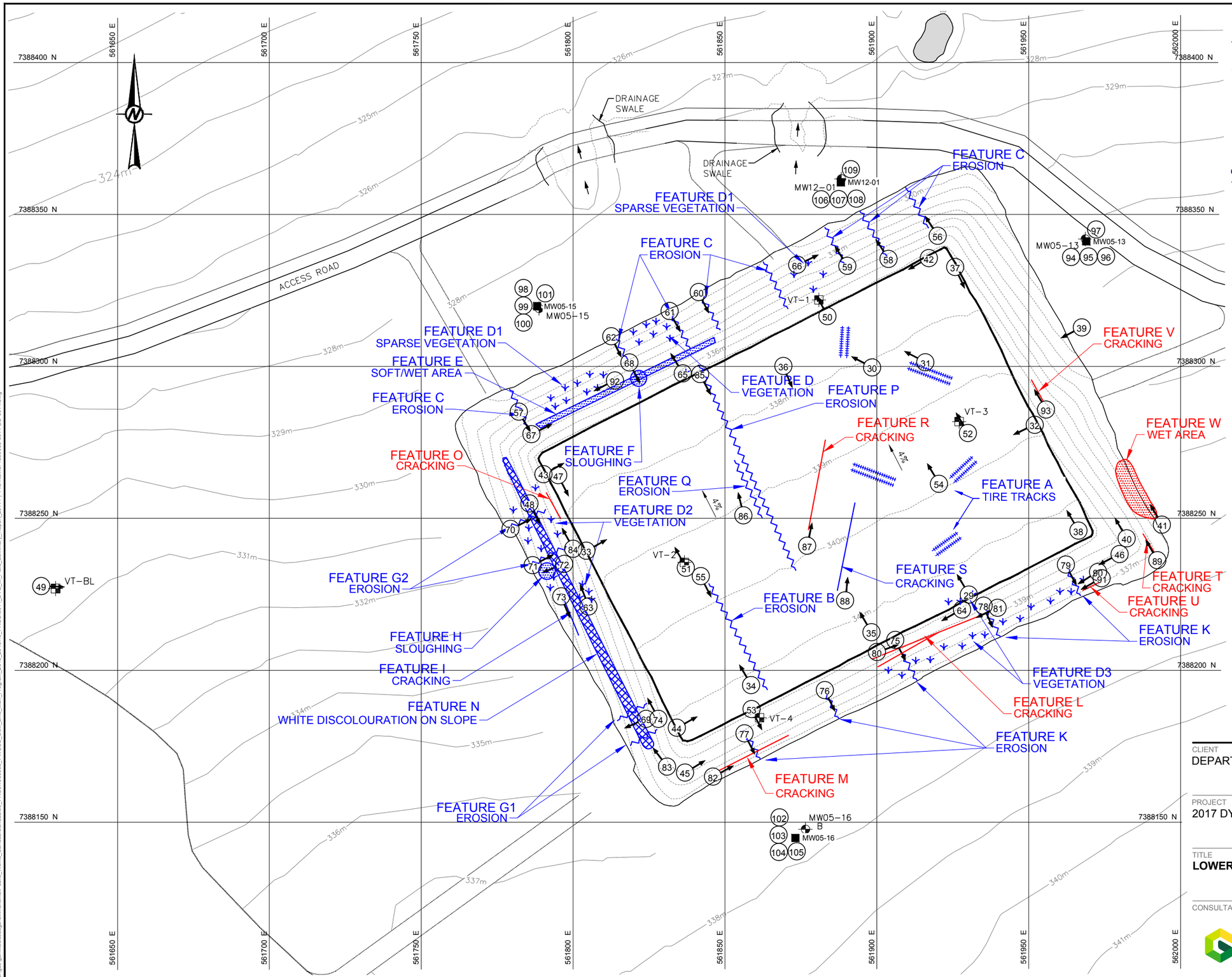
4.1.6 Recommendations for Lower Site NWS Landfill

No modifications to the ongoing monitoring program at this landfill are recommended for this landfill.

4.2 Lower Site Tier II Disposal Facility

4.2.1 Landfill Description

The Lower Site Tier II Disposal Facility is located northwest of the crossroad area, beside the road to the Lower Site NWS Landfill. The facility was designed to contain contaminated soil exceeding Tier II criteria excavated from the Lower Site and has an area of approximately 29,100 m^2. The design of this facility was based on the characteristics of the contaminants in the soil, the geothermal properties of the area and the local permafrost regime. Permafrost provides the primary containment barrier: both the Tier II-contaminated soil in the facility and the silty gravel perimeter berms were designed to be continuously frozen. The monitoring program at the Tier II Disposal Facility consists of visual inspection of physical features, soil and groundwater sampling, as well as collection of thermal data. The Lower Site Tier II Disposal Facility, it features, soil sampling locations, the four monitoring wells and four thermistors are shown in Figure DYE-M.3.



LEGEND:

- CRACKING
- EROSION
- STAINING
- WET/SOFT/SLOUGHING
- VEGETATION
- TIRE TRACKS
- SOIL SAMPLING LOCATION
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION BACKGROUND
- VERTICAL GROUND TEMPERATURE CABLE LOCATION
- GROUND SURFACE CONTOUR
- DRAINAGE

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,250 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
LOWER SITE TIER II DISPOSAL FACILITY

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25 mm

Path: \\golder.gds\gal\Mississauga\S\M\Clients\Public_Works_Canada\Canada\99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0014.dwg

4.2.2 Visual Inspection

The Lower Site Tier II Disposal Facility exhibits multiple locations with observed erosion, cracking, sloughing and wet areas as well as sparse vegetation. Table 4-5 presents a summary of observed visual inspection features and Table 4-6 presents the Preliminary Stability Assessment results. This landfill was assessed to have an "Acceptable" overall performance because all of the features were assessed as "Acceptable." Table 4-7 is a log of photographs taken during the 2017 visual inspection.

In 2015, the physical performance of this landfill appeared to be deteriorating based on an observed increase in the amount of self-armouring erosion. However, during the 2016 and 2017 inspections, previously observed self-armouring erosion (Features B, C, G, K, P and Q) was largely unchanged. Feature C is an area with self-armouring erosion on the north slope that is weathering and becoming stabilized over time (see Photos 56-62 in Appendix D). Feature G is an area with self-armouring erosion on the west slope that is weathering and becoming stabilized over time (see Photos 69-71 in Appendix D). Feature K is an area with self-armouring erosion on the south slope that is weathering and becoming stabilized over time (see Photos 75-79 in Appendix D). These areas of stabilizing self-armouring erosion on the slopes are not considered a concern.

There is some previously observed minor cracking on the slopes and cover surface (Features I, J, L, M, O, R and S); four crack features (L, M, O and R) were observed to have increased slightly in length or width. Three new tension cracks (Features T, U and V) were observed on the northeast and southeast slopes during the 2017 inspection. Two of the previously observed minor cracks on the southwest slope (Feature I) and crest (Feature S) were unchanged while one previously observed crack (Feature J) was not observed in 2017.

The previously observed wet/soft area (Feature E) on the northwest slope was observed again in 2017, as well as minor sloughing on the north and west slopes (Features F and H). The areas of sloughing observed in 2016 were drier in 2017 and no signs of seepage were present. These features have not resulted in slope instability or exposure of waste. A new wet area (Feature W) along the northeast toe does not appear to be having a negative impact on landfill stability. The wet areas (Features E and W) observed in 2017 appear to be caused by the seasonal melting of ice and snow.

The previously observed white discolouration feature was observed again along the southwest slope (Feature N), which may be related to landfill construction materials and moisture, but is not accompanied by evidence of deterioration in this area. Areas of sparse vegetation were observed to be slightly expanded on the slopes (Feature D). Previously observed tire tracks on the cover surface of landfill were observed to be unchanged during the 2017 inspection (Feature A).

All monitoring wells and thermistors were intact and functional except VT-4 (see Section 4.2.3 below).

Table 4-5: Visual Inspection Checklist – Lower Site Tier II Disposal Facility

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site Tier II Disposal Facility
DATE OF INSPECTION: August 5, 2017
DATE OF PREVIOUS INSPECTION: August 12, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-5: Visual Inspection Checklist – Lower Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	B	Cover surface	561,842	7,388,231	45	0.15	0.05	0.02%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	55
	Y	C	North slope	561,920	7,388,343	150	20	0.1	10.3%	Self-armouring erosion area with 0.3-0.4 m wide channels (Acceptable)	Unchanged since previous observation, weathered and stabilized	56-62
	Y	G1	West slope	561,824	7,388,184	10	15	0.1	1.3%	Self-armouring erosion area with 0.3-0.4 m wide channels (Acceptable)	Unchanged since previous observation, weathered and stabilized	69
	Y	G2	West slope	561,779	7,388,247	15	15	0.1	1.3%	Self-armouring erosion area with 0.3-0.4 m wide channels (Acceptable)	Unchanged since previous observation, weathered and stabilized	70,71
	Y	K	South slope	561,906	7,388,210	120	15	0.1	7.7%	Self-armouring erosion area with 0.3-0.4 m wide channels (Acceptable)	Unchanged since previous observation, weathered and stabilized	75-79
	Y	P	Cover surface/north slope	561,842	7,388,297	75	0.3	0.1	0.07%	Self-armouring erosion channel (Acceptable)	Unchanged since previous observation	85
	Y	Q	Cover surface	561,856	7,388,251	20	2	0.1	0.14%	Self-armouring erosion channel (Acceptable)	Unchanged since previous observation	86

Table 4-5: Visual Inspection Checklist – Lower Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	Y	F	North slope	561,821	7,388,297	2	1	0.2	0.01%	Minor sloughing (Acceptable)	Unchanged since previous observation, not wet in 2017	68
	Y	H	West slope	561,797	7,388,235	2	2	0.3	0.01%	Minor sloughing (Acceptable)	Unchanged since previous observation, not wet in 2017	72
Cracking	Y	I	Along west slope near toe	561,802	7,388,212	14	0.02	-	<0.01%	Minor crack (Acceptable)	Unchanged since previous observation	73
	N	J	Near crest on west slope	-	-	-	-	-	-	Minor crack	Not observed in 2017, probably covered with fines	74
	Y	L	South slope near crest	561,900	7,388,206	40	0.05	-	~0.01%	Minor crack with thin parallel crack at west end (Acceptable)	Extended in length, new parallel crack at west end	80, 81
	Y	M	South slope	561,846	7,388,165	25	0.02	-	-	Minor tension crack on slope (Acceptable)	Extended in length	82
	Y	O	West slope	561,800	7,388,240	10	0.1	-	<0.01%	Minor tension crack on slope (Acceptable)	Extended in length	84

Table 4-5: Visual Inspection Checklist – Lower Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
	Y	R	Cover surface	561,877	7,388,241	30	0.2	-	0.01%	Cracking on cover surface (Acceptable)	Slightly wider	87
Cracking (cont'd)	Y	S	Cover surface	561,890	7,388,223	30	0.1	-	0.01%	Cracking on cover surface (Acceptable)	Unchanged since previous observation (orientation corrected on figure in 2017)	88
	Y	T	East slope	561,992	7,388,236	7	0.01		<0.01%	Tension crack near toe (Acceptable)	New	89
	Y	U	South slope	561,974	7,388,231	6	0.01		<0.01%	Tension crack near toe (Acceptable)	New	91
	Y	V	East slope	561,956	7,388,286	8	0.02		<0.01%	Tension crack near crest (Acceptable)	New	93
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	D1	North slope	561,836	7,388,298	40	5	-	0.69%	Sparse vegetation	Slightly more vegetation	65, 66, 92
	Y	D2	West slope	561,805	7,388,221	40	5	-	0.69%	Sparse vegetation	Slightly more vegetation	63
	Y	D3	South slope	561,928	7,388,220	70	5	-	1.0%	Sparse vegetation	Slightly more vegetation	64, 90

Table 4-5: Visual Inspection Checklist – Lower Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Staining	Y	N	West slope	561,831	7,388,168	100	1	-	0.34%	Band of white discolouration along entire west slope (Acceptable)	Unchanged since previous observation	83
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	Y	E	West side of north slope	561,786	7,388,278	65	2	-	0.48%	Wet and soft area (Acceptable)	Unchanged since previous observation	65, 67
	Y	W	East toe	561,994	7,388,248	20	5	-	0.34%	Wet area (Acceptable)	New	41
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	Y	MW12-01, MW05-13, 15, 16 VT-1, 2, 3, 4, BL	-	-	-	-	-	-	-	Monitoring wells intact and functional Thermistors intact and functional (except VT-4)	-	97, 101, 105, 109 49-53
Features of Note / Other Observations	Y	A	Cover surface	-	-	100	60	-	20.6%	Tire tracks on east half of landfill crest surface (Acceptable)	Unchanged since previous observation	30, 31, 54

Landfill Area = 29,100 m^2.

Table 4-6: Preliminary Stability Assessment – Lower Site Tier II Disposal Facility

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Acceptable	Occasional
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Occasional
Staining	Acceptable	Isolated
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Occasional
Debris and/or Liner Exposure	Not Observed	-
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Table 4-7: Summary Table of Photographic Log – Lower Site Tier II Disposal Facility

Photo	Easting	Northing	Date
Photo 29:	561,930	7,388,225	Aug. 5, 2017
Photo 30:	561,898	7,388,300	Aug. 5, 2017
Photo 31:	561,916	7,388,301	Aug. 5, 2017
Photo 32:	561,952	7,388,281	Aug. 5, 2017
Photo 33:	561,804	7,388,239	Aug. 5, 2017
Photo 34:	561,859	7,388,195	Aug. 5, 2017
Photo 35:	561,898	7,388,213	Aug. 5, 2017
Photo 36:	561,869	7,388,300	Aug. 5, 2017
Photo 37:	561,926	7,388,333	Aug. 5, 2017
Photo 38:	561,966	7,388,246	Aug. 5, 2017
Photo 39:	561,967	7,388,313	Aug. 5, 2017
Photo 40:	561,982	7,388,243	Aug. 5, 2017
Photo 41:	561,994	7,388,248	Aug. 5, 2017
Photo 42:	561,917	7,388,336	Aug. 5, 2017
Photo 43:	561,790	7,388,265	Aug. 5, 2017
Photo 44:	561,834	7,388,181	Aug. 5, 2017
Photo 45:	561,837	7,388,166	Aug. 5, 2017
Photo 46:	561,980	7,388,238	Aug. 5, 2017
Photo 47:	561,795	7,388,264	Aug. 5, 2017

Table 4-7: Summary Table of Photographic Log – Lower Site Tier II Disposal Facility

Photo	Easting	Northing	Date
Photo 48:	561,786	7,388,255	Aug. 5, 2017
Photo 49:	561,625	7,388,228	Aug. 5, 2017
Photo 50:	561,884	7,388,317	Aug. 5, 2017
Photo 51:	561,837	7,388,234	Aug. 5, 2017
Photo 52:	561,930	7,388,278	Aug. 5, 2017
Photo 53:	561,859	7,388,187	Aug. 5, 2017
Photo 54:	561,920	7,388,261	Aug. 5, 2017
Photo 55:	561,842	7,388,231	Aug. 5, 2017
Photo 56:	561,920	7,388,343	Aug. 5, 2017
Photo 57:	561,782	7,388,285	Aug. 5, 2017
Photo 58:	561,904	7,388,335	Aug. 5, 2017
Photo 59:	561,890	7,388,333	Aug. 5, 2017
Photo 60:	561,841	7,388,325	Aug. 5, 2017
Photo 61:	561,832	7,388,318	Aug. 5, 2017
Photo 62:	561,813	7,388,310	Aug. 5, 2017
Photo 63:	561,805	7,388,221	Aug. 5, 2017
Photo 64:	561,928	7,388,220	Aug. 5, 2017
Photo 65:	561,836	7,388,298	Aug. 5, 2017
Photo 66:	561,874	7,388,333	Aug. 5, 2017
Photo 67:	561,786	7,388,278	Aug. 5, 2017
Photo 68:	561,821	7,388,297	Aug. 5, 2017
Photo 69:	561,824	7,388,184	Aug. 5, 2017
Photo 70:	561,779	7,388,247	Aug. 5, 2017
Photo 71:	561,787	7,388,235	Aug. 5, 2017
Photo 72:	561,797	7,388,235	Aug. 5, 2017
Photo 73:	561,802	7,388,212	Aug. 5, 2017
Photo 74:	561,828	7,388,184	Aug. 5, 2017
Photo 75:	561,906	7,388,210	Aug. 5, 2017
Photo 76:	561,883	7,388,194	Aug. 5, 2017
Photo 77:	561,856	7,388,179	Aug. 5, 2017
Photo 78:	561,935	7,388,221	Aug. 5, 2017
Photo 79:	561,962	7,388,235	Aug. 5, 2017
Photo 80:	561,900	7,388,206	Aug. 5, 2017
Photo 81:	561,938	7,388,222	Aug. 5, 2017
Photo 82:	561,846	7,388,165	Aug. 5, 2017
Photo 83:	561,831	7,388,168	Aug. 5, 2017

Table 4-7: Summary Table of Photographic Log – Lower Site Tier II Disposal Facility

Photo	Easting	Northing	Date
Photo 84:	561,800	7,388,240	Aug. 5, 2017
Photo 85:	561,842	7,388,298	Aug. 5, 2017
Photo 86:	561,856	7,388,251	Aug. 5, 2017
Photo 87:	561,877	7,388,241	Aug. 5, 2017
Photo 88:	561,890	7,388,223	Aug. 5, 2017
Photo 89:	561,992	7,388,236	Aug. 5, 2017
Photo 90:	561,973	7,388,232	Aug. 5, 2017
Photo 91:	561,974	7,388,231	Aug. 5, 2017
Photo 92:	561,814	7,388,295	Aug. 5, 2017
Photo 93:	561,956	7,388,286	Aug. 5, 2017

4.2.3 Thermal Monitoring

Thermistor dataloggers VT-1, VT-2, VT-3 and VT-BL located at the Lower Site Tier II Disposal Facility were downloaded. The VT-4 datalogger was not communicating with the field computer, most likely due to a lack of battery power. The data logger, wires and casing were intact and in good condition. *Replacement lithium batteries were not brought to DYE-M during the 2017 site visit.* The failure of the datalogger batteries was unexpected as they had been observed in recent (i.e., 2015 and 2016) monitoring events to be strong; it appears that the logger batteries at VT-4 failed prematurely. Golder will be returning to DYE M in 2018 (for Year 5 monitoring) and we will replace the logger batteries and troubleshoot the datalogger at that time. If an extra thermistor datalogger is available, the datalogger will be brought to DYE-M in 2018 to replace the existing unit, in the event that the problem cannot be solved by replacing the batteries. Thermistor inspection and data downloading details were recorded on field record sheets included in Appendix B.

4.2.4 Summary of Sampling Deviations

The field work was conducted as per the TOR, with the following exceptions:

- No groundwater samples could be collected at MW05-15 and MW05-16 as the groundwater in the well was frozen.

4.2.5 Soil Sampling

Table 4-8 presents a summary of analytical results for soil samples collected at the Lower Site Tier II Disposal Facility. MW05-16 represents an upgradient sampling location, whereas MW05-13, MW05-15 and MW12-01 represent downgradient sampling locations.

Table 4-8 also lists the arithmetic mean background and baseline values for the soil samples at this landfill, in addition to the baseline plus 3σ limits. At the Lower Site Tier II Disposal Facility, the background arithmetic means for chromium, cobalt, copper and zinc are greater than the baseline arithmetic means. The background arithmetic mean for zinc is also greater than the baseline mean plus 3σ. Additionally, the arithmetic mean baseline and the baseline concentration plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site Tier II Disposal Facility in 2017. There were no detections of PHC or PCB at any location at this landfill in 2017.

MW05-16

Sampling location MW05-16 is located upgradient of the landfill, approximately 20 m south of the toe. The estimated elevation of this sampling point is 337.5 masl. As shown in Photo 102, the area consists of sand and gravel with some rocks with some vegetation. The soils consisted of brown sand with some gravel.

For the shallow sample at MW05-16 (0-15 cm), metals concentrations were similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that a modified TPH concentration of 40 mg/kg was reported in 2016.

For the deep sample at MW05-16 (40-50 cm), metals concentrations were slightly less than those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW05-13

Sampling location MW05-13 is located downgradient of the landfill, approximately 17 m east of the toe. The estimated elevation of this sampling point is 331 masl. As shown in Photo 94, the area consists of sand and gravel with some rocks and boulders and is sparsely vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at MW05-13 (0-15 cm), the concentrations of most metals were similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that a modified TPH concentration of 47 mg/kg was reported in 2016.

For the deep sample at MW05-13 (20-30 cm), metals concentrations were similar to those in the shallow sample. The concentrations of metals were slightly less than those reported in 2016. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW05-15

Sampling location MW05-15 is located downgradient of the landfill, approximately 17 m north of the toe. The estimated elevation of this sampling point is 328.5 masl. MW05-15 is located downgradient of where a soft/wet area and sloughing are observed on the northern slope of the landfill (Photo 67). As shown in Photo 98, the area consists of sand and gravel with some rocks with some vegetation. The soils consisted of brown sand with some gravel.

For the shallow sample at MW05-15 (0-15 cm), the concentrations of metals were similar to or slightly less than previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that a modified TPH concentration of 65 mg/kg was reported in 2016.

For the deep sample at MW05-15 (40-50 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of copper, nickel and zinc were slightly greater than those reported in previous years and a slight increasing trend of nickel is noted, which will require additional data to confirm reliability. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW12-01

Sampling location MW12-01 is located downgradient of the landfill, approximately 7 m north of the toe. The estimated elevation of this sampling point is 328.5 masl. As shown in Photo 106, the area is largely covered with sand and gravel, with some boulders and some vegetation. The soils consisted of brown sand with stone.

For the shallow sample at MW12-01 (0-15 cm), the concentrations of most metals were slightly greater than those observed in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW12-01 (40-50 cm, duplicate location), metals concentrations were similar to those in the shallow sample. The concentrations of the metals were similar to previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-8: Soil Chemical Analysis Results – Lower Site Tier II Disposal Facility

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**71.9**	**11.7**	**27.7**	**10.0**	**38.4**	**47.4**	**0.05**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	120.2	20.2	52.2	10.0	64.0	78.6	0.05	NA	NA	NA	NA
Upgradient														
MW05-16 Shallow	0-15	<1.0	<0.5	**85.0**	10.9	**31.9**	5.3	**41.3**	**50.9**	<0.05	<7	<4	<8	<6
MW05-16 Deep	40-50	<1.0	<0.5	71.2	9.7	**28.1**	5.1	35.2	44.2	<0.05	<7	<4	<8	<6
Downgradient														
MW05-13 Shallow	0-15	<1.0	<0.5	47.3	7.1	21.8	5.2	27.4	33.5	<0.05	<7	<4	<8	<6
MW05-13 Deep	20-30	<1.0	<0.5	45.3	6.5	18.6	3.2	26.1	31.3	<0.05	<7	<4	<8	<6
MW05-15 Shallow	0-15	<1.0	<0.5	**79.3**	11.5	**37.7**	6.0	**44.3**	**51.3**	<0.05	<7	<4	<8	<6
MW05-15 Deep	40-50	<1.0	<0.5	**87.9**	**12.5**	**40.2**	6.0	**46.3**	**55.8**	<0.05	<7	<4	<8	<6
MW12-01 Shallow	0-15	<1.0	<0.5	**72.0**	9.5	**29.3**	5.3	35.0	42.8	<0.05	<7	<4	<8	<6
MW12-01 Deep	40-50	<1.0	<0.5	64.9	9.4	**28.2**	5.4	35.2	43.4	<0.05	<7	<4	<8	<6
MW12-901 Deep (Duplicate)	40-50	<1.0	<0.5	61.7	8.5	25.2	4.5	31.5	39.6	<0.05	<7	<4	<8	<6
MW12-01 Deep (Dup Avg)	40-50	<1.0	<0.5	63.3	9.0	26.7	5.0	33.4	41.5	<0.05	<7	<4	<8	<6

Notes:
NA: Not available; ID: Soil sample location ID
Underlined values: Results exceed Background arithmetic mean.
Bold Values: Results exceed Baseline arithmetic mean.
Shaded Values: Results exceed the Baseline arithmetic mean plus 3σ.

4.2.6 Groundwater Sampling

Groundwater sampling and monitoring well inspection field records are included in Appendix B. Table 4-9 presents a summary of groundwater levels and analytical results for groundwater samples collected at the Lower Site Tier II Disposal Facility. No groundwater samples could be collected at MW05-15 and MW05-16 as the groundwater in the wells was frozen.

The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for arsenic, cadmium and lead, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic, cadmium, chromium or lead detected in the groundwater samples collected adjacent to this landfill in 2017. There were no detections of PHC in either of the samples collected from the wells at this location in 2017.

MW05-13

The depth to groundwater measured at MW05-13 in 2017 was 1.14 m below grade. Overall, the concentrations of the detected metals in 2017 was similar to earlier results. The concentration of nickel was slightly less than in 2016, but similar to the 2014 result, whereas copper and lead was largely unchanged. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW12-01

The depth to groundwater measured at MW12-01 in 2017 was 0.85 m below grade. Overall, the concentrations of the detected metals in 2017 (cobalt, nickel and zinc) were similar to earlier results. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-9: Monitoring Well Groundwater Levels and Groundwater Chemical Analysis Results – Lower Site Tier II Disposal Facility

ID	GW Depth BGS (m)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 (mg/L)	F2 (mg/L)	F3 (mg/L)	F4 (mg/L)
Baseline Mean		**0.003**	**0.001**	**0.30**	**0.017**	**0.07**	**0.010**	**0.19**	**3.1**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		0.003	0.001	0.94	0.057	0.23	0.010	0.52	14.6	NA	NA	NA	NA
Upgradient													
MW05-16[1]	-												
Downgradient													
MW05-13	1.14	<0.001	<0.0001	<0.001	<0.0005	0.0013	<0.0001	0.003	2.36	<0.025	<0.1	<0.1	<0.1
MW05-15[1]	-												
MW12-01	0.85	<0.001	<0.0001	<0.001	0.0007	<0.0005	<0.0001	0.007	0.007	<0.025	<0.1	<0.1	<0.1

Notes:
ID: Monitoring well location ID.
GW: Groundwater.
BGS: Below ground surface.
NA: Not Available.
Bold Values: Results exceed Baseline arithmetic mean.
Groundwater metals analyses were for dissolved metals.
1: No groundwater sample could be collected at MW05-15 and MW05-16 as the groundwater in the wells was frozen.

4.2.7 Conclusions and Overall Performance of the Lower Site Tier II Disposal Facility

No settlement, exposed waste or indications of slope instability were observed at the Lower Site Tier II Disposal Facility during the 2017 visual inspection. Self-armouring erosion, cracking, wet areas, minor sloughing, tire tracks and vegetation features were observed during the recent inspection, but they have not changed significantly since the last inspection and do not appear to be negatively impacting stability of the landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium, PHC or PCB were noted in any of the soil samples in 2017. The concentrations of metals were highest overall at the deep sample location MW05-15, located downgradient of the northwest side of the landfill; however, similar elevated metal concentrations were also observed upgradient at MW05-16. In general, the concentrations observed in the 2017 soil samples were similar to 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

In 2017, groundwater samples were collected from two of four monitoring wells adjacent to the landfill. No groundwater samples could be collected at MW05-15 and MW05-16 as the groundwater in the well was frozen. No detectable concentrations of arsenic, cadmium, chromium, lead or PHC were noted in either of the groundwater samples collected in 2017. The concentrations of metals detected at these locations were similar to previous years. None of the reported groundwater values exceeded their respective baseline mean concentrations plus 3σ. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Comparison of groundwater elevations based on estimated grade elevation and the measured water depth in the wells indicates that groundwater was higher at MW05-13, and lower towards the west at MW12-01, which follows the topography in the area.

Based on the monitoring results, there does not appear to be significant impact to soil or groundwater quality from the landfill.

4.2.8 Recommendations for Lower Site Tier II Disposal Facility

No modifications to the ongoing monitoring program at this landfill are recommended.

4.3 Lower Site Crossroads Landfill

4.3.1 Landfill Description

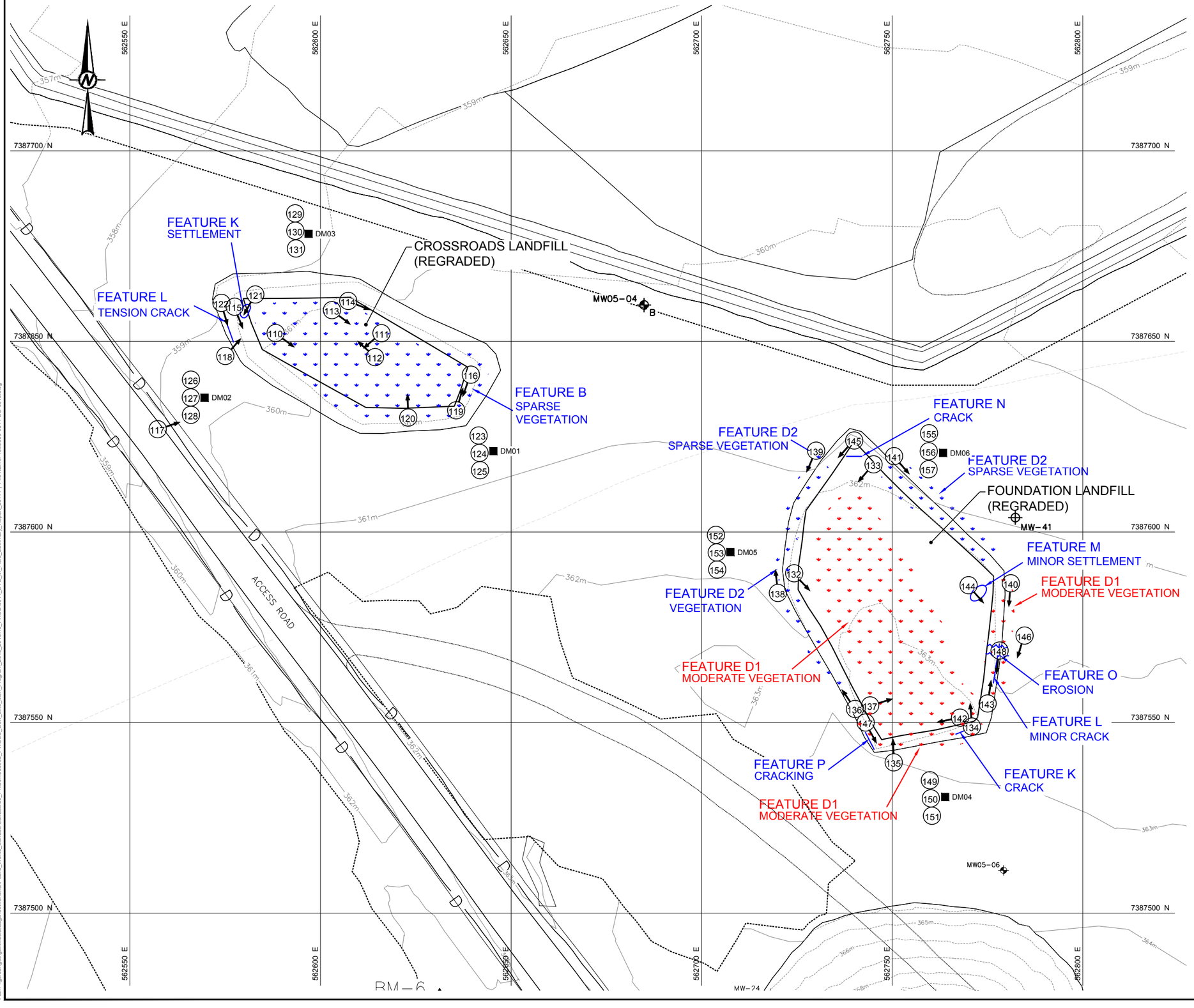
The Lower Site Crossroads Landfill was created during DEW Line operations. The landfill is located northwest of the lower camp hangar, southeast of the former landfarm and east of the Lower Site access road. The Crossroads Landfill is located approximately 85 metres northwest and downslope of the Foundation Landfill.

The tundra surrounding the landfill has moderate (<50%) vegetation cover (ESG 2015). The area is underlain by sand and gravel to frozen ground (ESG 2002a). The landfill was regraded in 2007 as part of the DEW Line remediation program. It is a small landfill and covers an area of about 2,140 m^2. The Lower Site Crossroads landfill, its features and approximate soil sampling locations are provided on the left side of Figure DYE-M.4.

4.3.2 Visual Inspection

The Lower Site Crossroads Landfill has cracking, minor settlement and sparse vegetation features. Table 4-10 presents a summary of observed visual inspection features and Table 4-11 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-12 is a log of photographs taken during the 2017 visual inspection.

A previously observed minor tension crack (Feature L) and minor settlement area (Feature K) both appeared to be unchanged in 2017. Previously observed sparse vegetation (Feature B) has expanded on the landfill surface. Previously observed ponded water (Feature F), tension cracks (Features G, H and I) and tire tracks (Feature J) were not observed in 2017. The observed features do not appear to be having a negative impact on landfill stability. Note that feature letters A, C, D and E have not been assigned to the Lower Site Crossroads Landfill.



LEGEND:

- CRACKING
- SETTLEMENT
- VEGETATION
- EROSION
- SOIL SAMPLING LOCATION
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION BACKGROUND
- MONITORING WELL LOCATION
- TYPE 1 GRANULAR A
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

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CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
CROSSROADS AND FOUNDATION LANDFILLS

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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Table 4-10: Visual Inspection Checklist – Lower Site Crossroads Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site Crossroads Landfill
DATE OF INSPECTION: August 5, 2017
DATE OF PREVIOUS INSPECTION: August 12, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-10: Visual Inspection Checklist – Lower Site Crossroads Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	Y	K	Cover surface	562,583	7,387,662	0.5	0.5	0.3	0.01%	Area of minor settlement (Acceptable)	Unchanged since previous observation	121
Erosion	N	-	-	-	-	-	-	-	-	-	-	-
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	L	West slope	562,574	7,387,660	5.0	0.02	-	<0.01%	Tension crack (Acceptable)	Unchanged since previous observation	122
	N	G, H and I	-	-	-	-	-	-	-	Tension cracks	Not observed	-
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	B	Slopes and crest surface	562,623	7,387,630	60	25	-	70%	Sparse grass	Slightly expanded area	110, 111, 112, 120
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	F	-	-	-	-	-	-	-	Ponded water	Not observed	-
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-10: Visual Inspection Checklist – Lower Site Crossroads Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	N	J	-	-	-	-	-	-	-	Tire tracks	Not observed	-
	N	A, C, D and E	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 2,140 m^2.

Table 4-11: Preliminary Stability Assessment – Lower Site Crossroads Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Not Observed	-
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Isolated
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Extensive
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-12: Summary Table of Photographic Log – Lower Site Crossroads Landfill

Photo	Easting	Northing	Date
Photo 110:	562,582	7,387,649	Aug. 5, 2017
Photo 111:	562,616	7,387,652	Aug. 5, 2017
Photo 112:	562,614	7,387,646	Aug. 5, 2017
Photo 113:	562,603	7,387,658	Aug. 5, 2017
Photo 114:	562,607	7,387,661	Aug. 5, 2017
Photo 115:	562,578	7,387,659	Aug. 5, 2017
Photo 116:	562,639	7,387,641	Aug. 5, 2017
Photo 117:	562,557	7,387,627	Aug. 5, 2017
Photo 118:	562,575	7,387,646	Aug. 5, 2017
Photo 119:	562,636	7,387,632	Aug. 5, 2017
Photo 120:	562,623	7,387,630	Aug. 5, 2017
Photo 121:	562,583	7,387,662	Aug. 5, 2017
Photo 122:	562,574	7,387,660	Aug. 5, 2017

4.3.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exception:

- The deep soil sample at DM-02 could not be collected due to refusal on rock.

4.3.4 Soil Sampling

Table 4-13 presents a summary of analytical results for soil samples collected at the Lower Site Crossroads Landfill. DM-01 represents an upgradient sampling location, whereas DM-02 and DM-03 represent downgradient sampling locations.

Table 4-13 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Lower Site Crossroads Landfill, the background arithmetic means for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means. The background arithmetic mean for zinc is also greater than the baseline means plus 3σ. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site Crossroads Landfill in 2017. There were no detections of PCB at any location at this landfill in 2017.

DM-01

Sampling location DM-01 is located upgradient of the landfill, immediately south of the toe. The estimated elevation of this sampling point is 361 masl. As shown in Photo 123, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-01 (0-15 cm), the concentrations of the detected metals were similar to or slightly greater than those reported in previous years and are similar to their respective baseline mean concentrations. The modified TPH concentration of 71 mg/kg was slightly less than those reported in 2015 and 2016 (79 mg/kg and 84 mg/kg, respectively). Both F3 (65 mg/kg) and F4 (7 mg/kg) were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-01 (20-30 cm), detected metals concentrations were slightly lower than those in the shallow sample. The concentrations of the detected metals were similar to or greater than those reported in previous years but similar to their respective baseline mean concentrations. PHC was detected at this location for the first time; a modified TPH concentration of 52 mg/kg was reported in 2017. The concentration of the PHC F3 fraction in 2017 was 46 mg/kg. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-02

Sampling location DM-02 is located downgradient of the landfill, approximately 8 m southwest of the toe. The estimated elevation of this sampling point is 359.5 masl. As shown in Photo 126, the area consists of sand and gravel with some rocks and some vegetation. The soils consisted of grey sand with some gravel.

For the shallow sample at DM-02 (0-15 cm), the concentrations of most metals were slightly greater than those observed in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that modified TPH concentrations of 41 mg/kg and 67 mg/kg were reported in 2015 and 2016, respectively.

DM-03

Sampling location DM-03 is located downgradient of the landfill, approximately 7 m north of the toe. The estimated elevation of this sampling point is 359 masl. As shown in Photo 129, the area consists of sand and gravel with some rocks and some vegetation. The soils consisted of grey sand, gravel and stone.

For the shallow sample at DM-03 (0-15 cm), the concentrations metals were largely similar to those in previous years; nickel was slightly greater but similar to the background arithmetic mean concentration. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-03 (40-50 cm), metals concentrations were similar to those in the shallow sample. The concentrations of the metals were largely similar to those observed in previous years; nickel was slightly greater but similar to the background arithmetic mean concentration. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-13: Soil Chemical Analysis Results – Lower Site Crossroads Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**69.0**	**11.1**	**29.9**	**10.0**	**37.6**	**47.0**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	106.5	18.5	52.1	10.0	61.1	71.1	0.10	NA	NA	NA	NA
Upgradient														
DM-01 Shallow	0-15	<1.0	<0.5	**69.4**	10.1	**37.2**	9.3	**40.3**	**48.8**	<0.05	<7	<4	65	7
DM-01 Deep	20-30	<1.0	<0.5	64.7	8.9	**31.2**	7.4	36.1	41.7	<0.05	<7	<4	46	<6
Downgradient														
DM-02 Shallow	0-15	<1.0	<0.5	**70.9**	10.4	**35.5**	6.3	**41.4**	45.3	<0.05	<7	<4	<8	<6
DM-02 Deep[1]														
DM-03 Shallow	0-15	<1.0	<0.5	56.1	8.6	**31.9**	4.6	**40.3**	33.8	<0.05	<7	<4	<8	<6
DM-03 Deep	40-50	<1.0	<0.5	52.9	8.2	**30.0**	4.0	37.1	33.7	<0.05	<7	<4	<8	<6

Notes:
NA: Not available
Underlined values: Results exceed Background arithmetic mean.
Bold Values: Results exceed Baseline arithmetic mean.
1: The deep soil sample at DM-02 could not be collected due to refusal on rock.

4.3.5 Conclusions and Overall Performance of the Lower Site Crossroads Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site Crossroads Landfill. The minor tension crack on the western slope and minor settlement on the cover surface do not appear to be negatively impacting the stability of the landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals were largely similar at all three sampled locations. Overall, the observed results are similar to their respective baseline mean concentrations and are within their respective expected ranges.

PHC were detected in both the shallow and deep sample at upgradient location DM-01, with modified TPH concentrations of 71 mg/kg and 52 mg/kg, respectively. The modified TPH concentration in the shallow sample was slightly less than those reported in 2015 and 2016, whereas PHC were detected in the deep sample at DM-01 for the first time. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality.

4.3.6 Recommendations for Lower Site Crossroads Landfill

No modifications to the ongoing monitoring program at this landfill are recommended.

4.4 Lower Site Foundation Landfill

4.4.1 Landfill Description

The Lower Site Foundation Landfill was created during DEW Line operations and covers an area of approximately 3,340 m^2. The Foundation Landfill is located approximately 85 metres southeast and upslope of the Crossroads Landfill and approximately 45 metres north and downslope of the Powerhouse Landfill.

The tundra surrounding the landfill has a moderate amount of vegetation (50 to 60%) with poorly defined drainage (ESG 2015). The area is underlain by sand and gravel to frozen ground (ESG 2002a). The remediation of this landfill was completed in 2008 and consisted of regrading the surface of the landfill and placement of clean cover material. The Lower Site Foundation Landfill, its features and soil sampling locations are provided on the right side of Figure DYE-M.4.

4.4.2 Visual Inspection

The Lower Site Foundation Landfill has locations with observed minor settlement, self-armouring erosion, cracking and sparse vegetation. Table 4-14 presents a summary of observed visual inspection features and Table 4-15 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-16 is a log of photographs taken during the 2017 visual inspection.

In general, observed features remained consistent with the 2016 visual inspection. The previously observed self-armouring erosion (Feature O) and minor tension cracks (Features K, L N and P) were unchanged since the previous inspection. An isolated area of minor settlement (Feature M) was previously observed on the cover surface in 2015 and remained unchanged in 2017. Previously observed sparse vegetation (Feature D2) was unchanged on the northeast and northwest slopes in 2017, whereas increased vegetation is noted on the cover surface south crest and east slope (Feature D1) in 2017. The observed features do not appear to be having a negative impact on landfill stability. Previously observed exposed debris (Feature E) and a minor crack on the northwest crest (Feature C) were not observed in 2017. Note that feature letters A, B, F, G, H, I and J have not been assigned to the Lower Site Foundation Landfill.

Table 4-14: Visual Inspection Checklist – Lower Site Foundation Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site Foundation Landfill
DATE OF INSPECTION: August 2, 2017
DATE OF PREVIOUS INSPECTION: August 12, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-14: Visual Inspection Checklist – Lower Site Foundation Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	Y	M	Cover surface	562,770	7,387,586	3	2	0.1	0.18%	Minor settlement depression (Acceptable)	Unchanged since previous observation	144
Erosion	Y	O	East Slope	562,785	7,387,573	5.0	1.0	0.1	0.15%	Area of self-armouring erosion, accumulation of fines at toe of slope. (Acceptable)	Unchanged since previous observation	146
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	K	South crest	562,770	7,387,550	4	0.02	-	<0.01%	Minor thaw crack (Acceptable)	Unchanged since previous observation	142
	Y	L	Southeast slope	562,775	7,387,555	10	0.02	-	<0.01%	Minor thaw crack (Acceptable)	Unchanged since previous observation	143, 148
	Y	N	North crest corner	562,740	7,387,624	4	0.02	-	<0.01%	Minor thaw crack (Acceptable)	Unchanged since previous observation	145
	Y	P	Southwest slope	562,743	7,387,550	3	0.02	-	<0.01%	Minor thaw crack (Acceptable)	Unchanged since previous observation	147
	N	C	-	-	-	-	-	-	-	Minor crack	Not observed	-
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-14: Visual Inspection Checklist – Lower Site Foundation Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Vegetation	Y	D1	Cover, crest at south end and east slope	562,743	7,387,554	70	30	-	63%	Moderately vegetated (Acceptable)	Expanded Area	137, 135, 140
	Y	D2	Northwest, northeast and west slopes	562,720	7,387,584	50	5	-	7.5%	Moderate grass vegetation	Unchanged since previous observation	138, 139, 141
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	-	-	-	-	-	-	-	-	-	-	-
Debris and/or Liner Exposed	N	E	-	-	-	-	-	-	-	Debris	Not observed	-
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	N	A, B, F, G, H, I and J	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 3,340 m^2.

Table 4-15: Preliminary Stability Assessment – Lower Site Foundation Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Extensive
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-16: Summary Table of Photographic Log – Lower Site Foundation Landfill

Photo	Easting	Northing	Date
Photo 132:	562,724	7,387,589	Aug.2, 2017
Photo 133:	562,745	7,387,618	Aug.2, 2017
Photo 134:	562,770	7,387,549	Aug.2, 2017
Photo 135:	562,750	7,387,540	Aug.2, 2017
Photo 136:	562,740	7,387,554	Aug.2, 2017
Photo 137:	562,743	7,387,554	Aug.2, 2017
Photo 138:	562,720	7,387,584	Aug.2, 2017
Photo 139:	562,730	7,387,621	Aug.2, 2017
Photo 140:	562,781	7,387,587	Aug.2, 2017
Photo 141:	562,751	7,387,620	Aug.2, 2017
Photo 142:	562,770	7,387,550	Aug.2, 2017
Photo 143:	562,775	7,387,555	Aug.2, 2017
Photo 144:	562,770	7,387,586	Aug.2, 2017
Photo 145:	562,740	7,387,624	Aug.2, 2017
Photo 146:	562,785	7,387,573	Aug.2, 2017
Photo 147:	562,743	7,387,550	Aug.2, 2017
Photo 148:	562,778	7,387,569	Aug.2, 2017

4.4.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exception:

- The deep soil sample at DM-04 could not be collected due to refusal on rock.

4.4.4 Soil Sampling

Table 4-17 presents a summary of analytical results for soil samples collected at the Lower Site Foundation Landfill. DM-04 represents an upgradient sampling location, whereas DM-05 and DM-06 represent downgradient sampling locations.

Table 4-17 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Lower Site Foundation Landfill, the background arithmetic mean for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means; the background arithmetic mean for copper is also slightly greater than baseline concentration plus 3σ. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site Foundation Landfill in 2017. There were no detections of PCB at any location at this landfill in 2017.

DM-04

Sampling location DM-04 is located upgradient of the landfill, approximately 9 m south of the toe. The estimated elevation of this sampling point is 363 masl. As shown in Photo 149, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-04 (0-15 cm), the concentrations of most metals are similar to those reported in previous years; concentrations of metals that are slightly greater (i.e., copper, lead, nickel and zinc) are within their respective expected ranges. The modified TPH concentration of 108 mg/kg is greater than the concentration of 44 mg/kg reported in 2015; no PHC were detected in 2016. Both F3 (102 mg/kg) and F4 (15 mg/kg) fraction were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-05

Sampling location DM-05 is located downgradient of the landfill, approximately 9 m west of the toe. The estimated elevation of this sampling point is 362 masl. As shown in Photo 152, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-05 (0-15 cm), the concentrations of all metals were less than or similar to those observed in previous years. The concentration of lead (8.7 mg/kg) was substantially less than in 2016 (131 mg/kg), suggesting the earlier result was anomalous. The modified TPH concentration of 76 mg/kg was well below the concentration of 450 mg/kg reported in 2016. Both F3 (70 mg/kg) and F4 (8 mg/kg) fraction were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-05 (30-40 cm), metals concentrations were slightly less than those in the shallow sample. The concentrations of all metals were less than or similar to those observed in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-06

Sampling location DM-06 is located downgradient of the landfill, approximately 8 m northeast of the toe. The estimated elevation of this sampling point is 361 masl. As shown in Photos 155, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-06 (0-15 cm, duplicate location), the concentrations of the metals were similar to or moderately greater than previous years but remained less than the baseline mean concentrations plus 3σ. No PHC were detected at this location in 2017. It is noted that a modified TPH concentration of 31 mg/kg was reported in 2016. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-06 (30-40 cm), metals concentrations were less than those in the shallow sample. The concentrations of most metals were similar to those observed in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-17: Soil Chemical Analysis Results – Lower Site Foundation Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**66.8**	**10.7**	**26.7**	**14.7**	**34.9**	**62.8**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	98.0	18.0	40.9	58.7	52.8	187.2	0.10	NA	NA	NA	NA
Upgradient														
DM-04 Shallow	0-15	<1.0	<0.5	62.1	8.6	**28.1**	12.9	33.3	45.8	<0.05	<7	<4	102	15
DM-04 Deep[1]														
Downgradient														
DM-05 Shallow	0-15	<1.0	<0.5	50.3	7.6	26.2	8.7	29.1	35.1	<0.05	<7	<4	70	8
DM-05 Deep	30-40	<1.0	<0.5	45.4	6.4	23.2	3.8	27.5	30.0	<0.05	<7	<4	<8	<6
DM-06 Shallow	0-15	<1.0	<0.5	**69.6**	9.8	**32.1**	4.6	**39.3**	44.8	<0.05	<7	<4	<8	<6
DM-906 Shallow (Duplicate)	0-15	<1.0	<0.5	**76.4**	10.4	**31.7**	5.2	**40.4**	47.2	<0.05	<7	<4	<8	<6
DM-06 Shallow (Dup Avg)	0-15	<1.0	<0.5	**73.0**	10.1	**31.9**	4.9	**39.9**	46.0	<0.05	<7	<4	<8	<6
DM-06 Deep	30-40	<1.0	<0.5	56.9	7.9	25.8	4.2	32.9	37.6	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

Shaded Values: Results exceed the Baseline arithmetic mean plus 3σ.

1: The deep soil sample at DM-04 could not be collected due to refusal on rock.

4.4.5 Conclusions and Overall Performance of the Lower Site Foundation Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site Foundation Landfill. Some minor tension cracks, self-armouring erosion and a minor differential settlement area were observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. Concentrations of metals were highest overall at the shallow sample location DM-06, located downgradient of the west side of the landfill. Overall, the concentrations of metals at these locations were similar to those observed in previous years. The concentration of lead (8.7 mg/kg) at downgradient location DM-05 (shallow) was substantially less than in 2016 (131 mg/kg), suggesting the earlier result was anomalous. At DM-06 (shallow), the concentrations of the metals were similar to or moderately greater than previous years but remained less than the baseline mean concentrations plus 3σ. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

At DM-04 (upgradient) and DM-05 (downgradient), the presence of PHC was noted, at modified TPH concentrations of 108 mg/kg and 76 mg/kg, respectively. The modified TPH concentration at DM-05 was greater than those in previous years, whereas the concentration at DM-05 was well below the concentration reported in 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in 2017.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality.

4.4.6 Recommendations for Lower Site Foundation Landfill

No modifications to the ongoing monitoring program at this landfill are recommended.

4.5 Lower Site Powerhouse Landfill

4.5.1 Landfill Description

The Lower Site Powerhouse Landfill was created during DEW Line operations. It is located northwest of the lower camp hangar and approximately 45 metres south and upslope of the Foundation Landfill.

Soils in the landfill area consist of sand and gravel over frozen ground (ESG 2002a). The remediation of the Powerhouse Landfill consisted of the installation of a leachate containment liner system and capping of the surface with clean granular material. The landfill has an area of approximately 7,000 m^2, including side slopes. The Lower Site Powerhouse Landfill, its features, and soil and groundwater sampling locations are provided on Figure DYE-M.5.

4.5.2 Visual Inspection

The Lower Site Powerhouse Landfill had only one observed feature in 2017 (Feature C, self-armouring erosion). The minor erosion was observed at the crest edge at the northwest corner, adjacent to boulder erosion protection on the landfill slope and is not considered a concern. Previously observed steel debris (Feature A) and ponded water (Feature B) were not observed in 2017. Table 4-18 presents a summary of observed visual inspection features and Table 4-19 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because the observed feature was assessed as “Acceptable.” Table 4-20 is a log of photographs taken during the 2017 visual inspection. All thermistors were intact and functional.

562650 E
562700 E
562750 E
562800 E
562850 E
7387500 N
7387450 N
7387400 N
7387350 N
363m
364m
365m
366m
367m
368m
369m
MW05-06 (Pb,TPH)
MW05-05 (Ni)
MW05-08 (Pb)
MW05-08 (Ni)
MW05-07
FEATURE C EROSION
ACCESS ROAD
VT-5
VT-6
VT-7
B

LEGEND:

- EROSION
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- VERTICAL GROUND TEMPERATURE CABLE LOCATION
- TYPE 1 GRANULAR A
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 12.5 25
1:750 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
POWERHOUSE LANDFILL

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\99_PRO\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0016.dwg

Table 4-18: Visual Inspection Checklist – Lower Site Powerhouse Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site Powerhouse Landfill
DATE OF INSPECTION: August 5, 2017
DATE OF PREVIOUS INSPECTION: August 12, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-18: Visual Inspection Checklist – Lower Site Powerhouse Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	C	West slope	562,722	7,387,461	1	1	0.3	0.01%	Self-armouring erosion at crest edge between rip-rap rocks	Unchanged since previous observation	174
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	N	-	-	-	-	-	-	-	-	-	-	-
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	B	-	-	-	-	-	-	-	Ponded water	Not observed	-
Debris and/or Liner Exposed	N	A	-	-	-	-	-	-	-	Debris	Not observed	-
Presence / Condition of Monitoring Instruments	Y	VT-5, -6, -7, MW05-05, -06, -07, -08	-	-	-	-	-	-	-	Thermistors and wells intact and functional (see Appendix B)	-	171,172, 173,178, 182,186, 190
Features of Note / Other Observations	N	-	-	-	-	-	-	-	-	-	-	-

Landfill Area = 7,000 m^2.

Table 4-19: Preliminary Stability Assessment – Lower Site Powerhouse Landfill

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Not Observed	-
Animal Burrows	Not Observed	-
Vegetation Establishment	Not Observed	-
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-20: Summary Table of Photographic Log – Lower Site Powerhouse Landfill

Photo	Easting	Northing	Date
Photo 158:	562,742	7,387,445	Aug.5, 2017
Photo 159:	562,732	7,387,454	Aug.5, 2017
Photo 160:	562,756	7,387,427	Aug.5, 2017
Photo 161:	562,780	7,387,456	Aug.5, 2017
Photo 162:	562,751	7,387,478	Aug.5, 2017
Photo 163:	562,729	7,387,464	Aug.5, 2017
Photo 164:	562,784	7,387,442	Aug.5, 2017
Photo 165:	562,779	7,387,478	Aug.5, 2017
Photo 166:	562,710	7,387,506	Aug.5, 2017
Photo 167:	562,757	7,387,378	Aug.5, 2017
Photo 168:	562,779	7,387,435	Aug.5, 2017
Photo 169:	562,724	7,387,459	Aug.5, 2017
Photo 170:	562,703	7,387,456	Aug.5, 2017
Photo 171:	562,757	7,387,479	Aug.5, 2017
Photo 172:	562,754	7,387,456	Aug.5, 2017
Photo 173:	562,788	7,387,451	Aug.5, 2017
Photo 174:	562,722	7,387,461	Aug.5, 2017

4.5.3 Thermal Monitoring

Thermistor dataloggers VT-5, VT-6 and VT-7 located at the Lower Site Powerhouse Landfill were downloaded using Lakewood Systems Ltd. Prolog software and a laptop computer. Thermistor inspection and data downloading details were recorded on field record sheets included in Appendix B.

4.5.4 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at MW05-05 and MW05-08 could not be collected due to refusal on rock; and,
- The groundwater samples at MW05-06 and MW05-07 could not be collected because the groundwater in the well was frozen.

4.5.5 Soil Sampling

Table 4-21 presents a summary of analytical results for soil samples collected at the Lower Site Powerhouse Landfill. MW05-08 represents an upgradient sampling location, whereas MW05-05, MW05-06 and MW05-07 represent downgradient sampling locations.

Table 4-21 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Lower Site Powerhouse Landfill, the background arithmetic means for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site Powerhouse Landfill in 2017. With the exception of MW05-06 (shallow), there were no detections of PCB at any location in 2017.

MW05-08

Sampling location MW05-08 is located upgradient of the landfill, approximately 9 m south of the toe. The estimated elevation of this sampling point is 365.5 masl. As shown in Photo 187, the area consists of sand and gravel with some rocks and boulders and sparse vegetation. The soils consisted of brown sand with stone.

For shallow sample at MW05-08 (0-15 cm), the concentrations of all metals were similar to those reported in previous years. The lead concentration of 10.2 mg/kg marginally exceeded the baseline mean concentration plus 3σ (10.0 mg/kg) but remained below the historical maximum concentration of 17.0 mg/kg reported in 2015. As noted above, the baseline mean concentration for lead is the same as the baseline mean concentrations plus 3σ; given this and the slight nature of the exceedance, this result is not considered of concern. The modified TPH concentration of 102 mg/kg was less than concentrations reported in 2015 and 2016 (115 mg/kg and 106 mg/kg, respectively). The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 7 mg/kg, 91 mg/kg and 21 mg/kg, respectively. None of the reported PHC values exceeded their respective baseline mean concentrations plus 3σ. It is noted that 2017 was the first year that no PCB was detected at this location.

MW05-05

Sampling location MW05-05 is located downgradient of the landfill, approximately 6 m northwest of the toe. The estimated elevation of this sampling point is 364 masl. As shown in Photo 175, the area consists of sand and gravel with some rocks and boulders and is sparsely vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at MW05-05 (0-15 cm), the concentrations of all metals were similar to those reported in 2017 and in some cases, less than those in previous years. PHC was detected at this location in 2017 for the first time; a modified TPH concentration of 48 mg/kg was reported in 2017. Both F3 (42 mg/kg) and F4 (13 mg/kg) fractions were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW05-06

Sampling location MW05-06 is located downgradient of the landfill, approximately 12 m north of the toe. The estimated elevation of this sampling point is 363.5 masl. As shown in Photo 179, the area consists of sand and gravel with some rocks and boulders and is sparsely vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at MW05-06 (0-15 cm, duplicate location), the concentrations of most metals similar to those reported in recent years. The lead concentration of 14.3 mg/kg exceeded the baseline mean concentration plus 3σ (10.0 mg/kg) but remained below the historical maximum concentration of 29.0 mg/kg reported in 2014. As noted above, the baseline mean concentration for lead is the same as the baseline mean concentrations plus 3σ; given this and the slight nature of the exceedance, this 2017 result is not considered of concern. The modified TPH concentration (1,021 mg/kg) was greater than those reported in previous years but remained below the baseline mean concentration plus 3σ (1,040 mg/kg). The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 765 mg/kg, 252 mg/kg and 40 mg/kg, respectively. The PCB concentration of 0.11 mg/kg represents a new historical maximum concentration, but remains below the baseline mean concentration.

For the deep sample at MW05-06 (40-50 cm), metals concentrations were slightly less than those in the shallow sample. The concentrations of most metals were less than or similar to those reported in previous years. The modified TPH concentration (1,940 mg/kg) exceeded the baseline mean concentration plus 3σ (1,040 mg/kg) but was less than the concentration of 2064 mg/kg reported in 2014. The concentrations of the PHC F1, F2 and F3 fractions in 2017 were 40 mg/kg, 1810 mg/kg and 90 mg/kg, respectively.

MW05-07

Sampling location MW05-07 is located downgradient of the landfill, approximately 8 m east of the toe. The estimated elevation of this sampling point is 364.5 masl. As shown in Photo 183, the area largely consists of sand and is sparsely vegetated. The soils consisted of wet brown sand with some gravel and stone.

For the shallow sample at MW05-07 (0-15 cm), the concentrations of all metals were largely similar to those reported in previous years. The modified TPH concentration of 26 mg/kg was less than concentrations reported in 2015 (107 mg/kg); no PHC were detected in 2016. Both F3 (20 mg/kg) and F4 (11 mg/kg) fractions were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW05-07 (30-40 cm), metals concentrations were typically greater than those in the shallow sample. The concentrations of all detected metals were greater than those observed in previous years. The results are similar to, although in some cases slightly higher than, their respective baseline mean concentrations and are within their respective expected ranges. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-21: Soil Chemical Analysis Results – Lower Site Powerhouse Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.24**	**1.00**	**64.1**	**10.4**	**26.7**	**10.0**	**34.4**	**54.6**	**0.175**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		3.64	1.00	102.6	18.9	54.7	10.0	61.6	131.9	0.175	NA	NA	NA	NA
Upgradient														
MW05-08 Shallow	0-15	<1.0	<0.5	53	8.3	24.9	**10.2**	31.7	40.8	<0.05	<7	7	91	21
MW05-08 Deep[1]														
Downgradient														
MW05-05 Shallow	0-15	<1.0	<0.5	59.6	8.2	26.5	9.5	32.1	43.3	<0.05	<7	<4	42	13
MW05-05 Deep[1]														
MW05-06 Shallow	0-15	<1.0	<0.5	61.7	7.9	24.8	**13.4**	30.9	45.0	0.10	<7	653	293	56
MW05-906 Shallow (Duplicate)	0-15	<1.0	<0.5	57.9	7.0	**33.1**	**15.2**	28.1	45.2	0.11	<7	877	211	24
MW05-06 Shallow (Dup Avg)	0-15	<1.0	<0.5	59.8	7.5	**29.0**	**14.3**	29.5	45.1	0.11	<7	765	252	40
MW05-06 Deep	40-50	<1.0	<0.5	46.7	7.0	18.1	4.1	27.0	31.6	<0.05	40	1810	90	<6
MW05-07 Shallow	0-15	<1.0	<0.5	56.1	8.4	26.6	9.2	32.9	45.6	<0.05	<7	<4	20	11
MW05-07 Deep	30-40	<1.0	<0.5	**71.3**	**10.5**	**32.2**	5.7	**41.2**	47.5	<0.05	<7	<4	<8	<6

Notes:
NA: Not available; ID: Soil sample location ID.
Underlined values: Results exceed Background arithmetic mean.
Bold Values: Results exceed Baseline arithmetic mean.
Shaded Values: Results exceed the Baseline arithmetic mean plus 3σ.
1: The deep soil samples at MW05-05 and MW05-08 could not be collected due to refusal on rock.

4.5.6 Groundwater Sampling

Groundwater sampling and monitoring well inspection field records are included in Appendix B. Table 4-22 presents a summary of groundwater levels and analytical results for groundwater samples collected at the Lower Site Powerhouse Landfill. No groundwater samples could be collected at MW05-06 and MW05-07, as the groundwater in the well was frozen.

The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for cadmium, cobalt, copper, lead and nickel, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits. There was no arsenic or chromium in the groundwater samples collected adjacent to this landfill in 2017. There were no detections of PHC in either of the samples collected from the wells at this location in 2017.

MW05-08

The depth to groundwater measured at MW05-08 in 2017 was 1.19 m below grade. The concentrations of metals were similar to those reported in 2015; copper was detected at this location for the first time. The nickel concentration of 0.015 mg/L exceeded the baseline mean concentration plus 3σ (0.005 mg/L) but remains below the concentration reported in 2015 (0.016 mg/L). As noted above, the baseline mean concentration for nickel is the same as the baseline mean concentrations plus 3σ; the 2015 and 2017 results may represent natural variation.

The O-ring on the cap at MW-08 was noted to be damaged and should be replaced in 2018.

MW05-05

The depth to groundwater measured at MW05-05 in 2017 was 1.29 m below grade. The concentrations of all detected metals were less than those reported in previous years. The nickel concentration of 0.009 mg/L exceeded the baseline mean concentration plus 3σ (0.005 mg/L) but remains below the concentration reported in 2015 (0.0135 mg/L). As noted above, the baseline mean concentration for nickel is the same as the baseline mean concentrations plus 3σ; the 2015 and 2017 results may represent natural variation.

Table 4-22: Monitoring Well Groundwater Levels and Groundwater Chemical Analysis Results – Lower Site Powerhouse Landfill

ID	GW Depth BGS (m)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 (mg/L)	F2 (mg/L)	F3 (mg/L)	F4 (mg/L)
Baseline Mean		**0.0034**	**0.001**	**0.0914**	**0.003**	**0.005**	**0.010**	**0.005**	**4.92**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		0.0096	0.001	0.1765	0.003	0.005	0.010	0.005	17.22	NA	NA	NA	NA
Upgradient													
MW05-08	1.19	<0.001	0.0003	<0.001	0.0011	0.0015	<0.0001	**0.015**	**7.86**	<0.025	<0.1	<0.1	<0.1
Downgradient													
MW05-05	1.29	<0.001	0.0001	<0.001	0.0007	0.001	0.0003	**0.009**	1.03	<0.025	<0.2	<0.2	<0.2
MW05-06[1]	-												
MW05-07[1]	-												

Notes:

ID: Monitoring well location ID.

GW: Groundwater.

BGS: Below ground surface.

NA: Not Available.

Bold Values: Results exceed Baseline arithmetic mean.

Groundwater metals analyses were for dissolved metals.

1: No groundwater sample could be collected at MW05-06 and MW05-07 as the groundwater in the well was frozen.

4.5.7 Conclusions and Overall Performance of the Lower Site Powerhouse Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Lower Site Powerhouse Landfill. The overall stability performance of this landfill was assessed as Acceptable.

No arsenic or cadmium were noted in any of the soil samples in 2017. Concentrations of metals were highest overall at the deep sample location MW05-07, located downgradient of the east side of the landfill. Overall, the concentrations of most metals similar to those reported in previous years. The lead concentration at both the downgradient sample location MW05-06 (shallow) and upgradient sample location MW05-08 (shallow) exceeded the baseline mean concentration plus 3σ. As noted above, this standard is the same as the baseline mean and the concentrations at these locations remained below their respective historical maxima. Given this, and the slight nature of the exceedances, these 2017 results are not considered of concern.

PHC were detected at all four soil sampling locations in 2017, at modified TPH concentrations between 26 mg/kg and 1940 mg/kg. The highest PHC concentrations were reported in the deep MW05-06 sample, the modified TPH concentration exceeded the baseline mean concentration plus 3σ but was less than the concentration reported in 2014. None of the other reported parameter concentrations exceeded their respective baseline mean concentrations plus 3σ.

The PCB concentration reported at the deep MW05-06 location remains below the baseline mean concentration; no detectable concentrations of PCB were noted in any of the remaining samples in 2017.

In 2017, groundwater samples were collected from two of the four locations surrounding the landfill. No groundwater samples could be collected at MW05-06 and MW05-07, as the groundwater in the well was frozen. The concentrations of most metals were similar to the concentrations reported in previous years. At both MW05-05, located downgradient of the northwest side of the landfill, and MW05-08, the nickel concentrations exceeded the baseline mean concentration plus 3σ but remained below the concentrations reported in 2015. The baseline mean concentration for nickel is the same as the baseline mean concentrations plus 3σ; the 2015 and 2017 results may represent natural variation. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Overall, based on the results of the 2017 sampling program, there is no evident ongoing impact of the landfill on soil quality.

4.5.8 Recommendations for Lower Site Powerhouse Landfill

No modifications to the ongoing monitoring program at this landfill are recommended. The O-ring on the cap at MW-08 is damaged and should be replaced in 2018.

4.6 Lower Site Non-Hazardous Waste Landfill

4.6.1 Landfill Description

The Lower Site Non-Hazardous Waste Landfill (NHWL) was constructed as part of the DEW Line remediation program. The facility was constructed to contain non-hazardous waste generated during decommissioning of the DEW Line installations. The landfill has an area of approximately 23,200 m^2. The Lower Site NHWL is located in the southern portion of the Lower Site area, immediately east of the airstrip and approximately 500 metres south of the Powerhouse Landfill. The Lower Site NHWL, its features soil and groundwater sampling locations are provided in Figure DYE-M.6.

4.6.2 Visual Inspection

The Lower Site NHWL has locations with observed minor erosion, cracking, sparse vegetation and ponded water features. Table 4-23 presents a summary of observed visual inspection features and Table 4-24 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-25 is a log of photographs taken during the 2017 visual inspection.

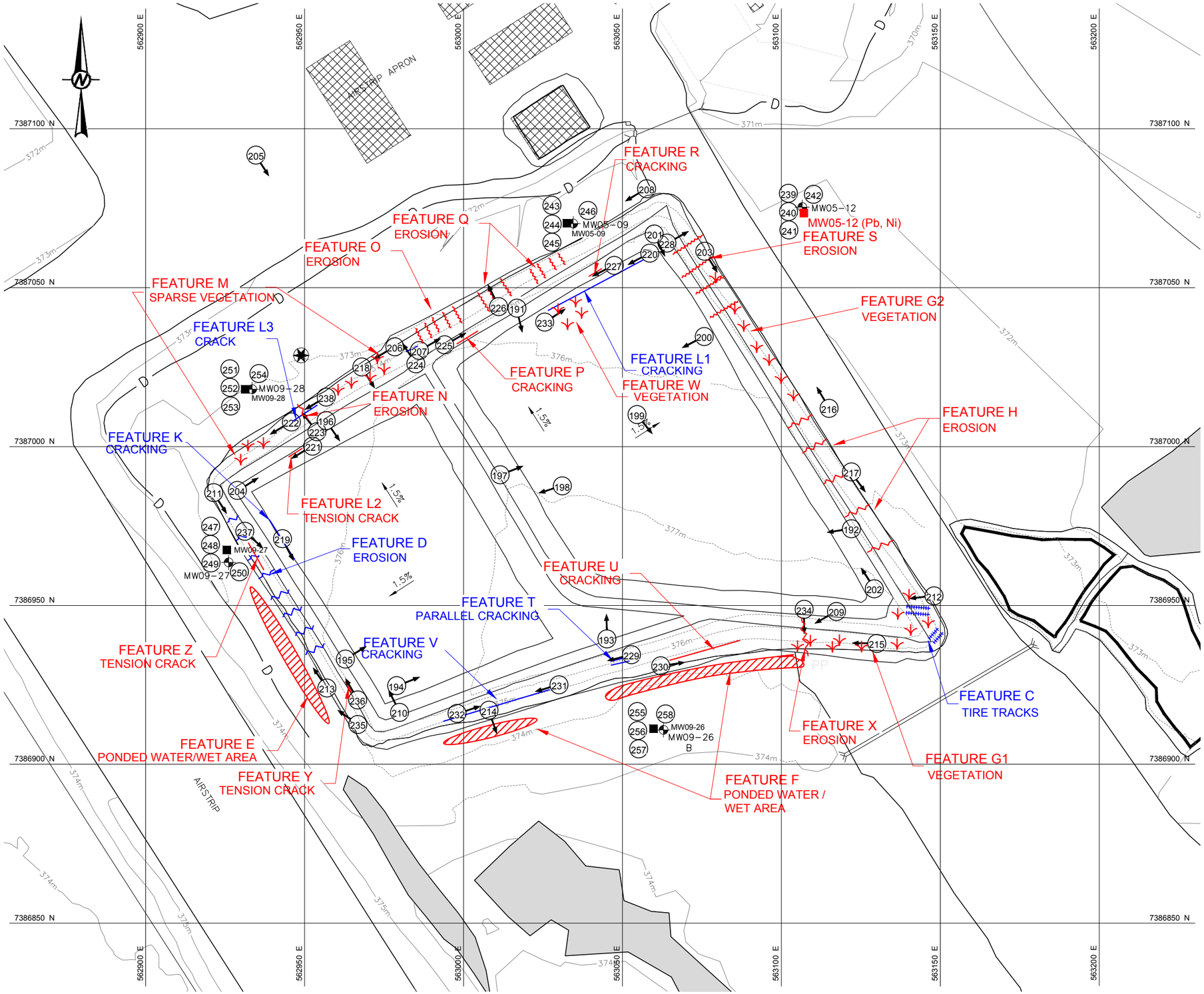
Based on the 2017 inspection, previously observed self-armouring erosion (Feature D) on the southwest slope has not changed significantly. Whereas the extent of some self-armouring erosion was observed to have increased (Features H, N, O, Q and S). The previously observed self-armouring erosion areas are weathering with less defined channels and appear to have stabilized. An area of new self-armouring erosion (Feature X) was observed in 2017.

There are several slope locations with minor tension cracking that appear to be thaw related slope creep. Several previously observed minor cracking features (K, L1, L3 and V) were observed to have no significant change. There is some parallel tension cracking on the slopes (same area as previously observed Features P and T) and the length of some tension cracks has increased (Features R and U). Three new tension cracks (Features L2, Y and Z) were observed in 2017.

The area of previously observed ponded water along the south toe (Feature F) was slightly larger than observed during the last inspection. A previously observed ponded water and wet area on the west toe of the landfill was present in 2017 (Feature E), whereas no ponded water was observed on the east toe of the landfill (Feature I) in 2017. The ponded water and wet areas along the toe observed in 2017 (Features E and F) appear to be caused by the seasonal melting of ice and snow. The sparse vegetation areas on the slopes (Feature G and M) appeared to cover a larger area than the previous inspection. Some new sparse vegetation (Feature W) was observed on the cover surface in 2017.

Previously observed tire tracks on the southeast slope (Feature C) were unchanged in 2017. Previously reported tire tracks on the north slope appear to be an as-built condition and therefore have not been reported as a feature in 2017 (Feature J).

The observed features do not appear to be impacting landfill stability. There was no evidence of significant settlement or slope instability of the landfill. Features A and B have not been assigned to this landfill.



LEGEND:

- CRACKING
- EROSION
- SETTLEMENT
- VEGETATION
- PONDED WATER / WET AREA
- TIRE TRACKS
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION BACKGROUND
- APPROXIMATE LOCATION OF COMMEMORATIVE PLAQUE
- DEMOLISHED BUILDING
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,250 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
LOWER SITE
NON-HAZARDOUS WASTE LANDFILL

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\99_PRO\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\

Table 4-23: Visual Inspection Checklist – Lower Site Non-Hazardous Waste Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Lower Site Non-Hazardous Waste Landfill
DATE OF INSPECTION: August 2, 2017
DATE OF PREVIOUS INSPECTION: August 12, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-23: Visual Inspection Checklist – Lower Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	D	West slope	562,957	7,386,924	45	5	0.1	1.0%	Area of minor self-armouring erosion with fines washing down slope (Acceptable)	Unchanged since previous observation, weathered and becoming stabilized	213
	Y	H	East slope	563,122	7,386,992	45	10	0.1	0.9%	Area of minor self-armouring erosion with fines washing down slope (Acceptable)	Expanded area, weathered and becoming stabilized	217
	Y	N	North slope	562,952	7,387,008	5	3	0.3	<0.01%	Area of minor self-armouring erosion on slope (Acceptable)	Previous settlement has weathered and was not visible in 2017. Erosion has expanded slightly and is becoming stabilized.	223
	Y	O	North slope	562,985	7,387,026	15	10	0.1	0.86%	Area of minor self-armouring erosion with fines washing down slope (Acceptable)	Expanded area, weathered and becoming stabilized	224, 207
	Y	Q	North slope	563,011	7,387,044	30	10	0.1	0.86%	Area of minor self-armouring erosion with fines washing down slope (Acceptable)	Expanded area, weathered and becoming stabilized	226

Table 4-23: Visual Inspection Checklist – Lower Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Erosion (cont'd)	Y	S	East slope	563,064	7,387,064	25	10	0.1	0.86%	Area of minor self-armouring erosion with fines washing down slope (Acceptable)	Expanded area, weathered and becoming stabilized	203, 228
	Y	X	South slope	563,107	7,386,949	8	0.3	0.1	0.01%	Minor self-armouring erosion (Acceptable)	New	234
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	K	West crest	562,943	7,386,971	15	0.01	-	<0.01%	Weathered minor crack (Acceptable)	Unchanged since previous observation	219
	Y	L1	North crest	563,053	7,387,060	35	0.005	-	<0.01%	Minor thaw cracking (Acceptable)	Unchanged since previous observation	220
	Y	L2	North crest	562,945	7,387,009	1	0.01	-	<0.01%	Minor thaw cracking (Acceptable)	New	221
	Y	L3	North slope	562,951	7,387,010	10	0.02	-	<0.01%	Minor thaw cracking (Acceptable)	Unchanged since previous observation	238
	Y	P	North slope	562,994	7,387,032	7	0.0	-	-	Parallel tension cracking on slope (Acceptable)	Same area, a parallel crack has occurred upslope of previous Feature P.	225
	Y	R	North slope	563,047	7,387,057	3	0.1	-	<0.01%	Weathered crack (Acceptable)	Extended in length	227
	Y	T	South slope	563,053	7,386,934	5	0.01	-	<0.01%	Parallel tension cracking on slope (Acceptable)	Unchanged since previous observation	229

Table 4-23: Visual Inspection Checklist – Lower Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Cracking (cont'd)	Y	U	South slope	563,062	7,386,931	25	0.01	-	<0.01%	Tension cracking near toe of slope (Acceptable)	Extended in length	230
	Y	V	South slope	563,030	7,386,925	35	0.01	-	0.02%	Tension cracking (Acceptable)	Unchanged since previous observation	231, 232
	Y	Y	West slope	562,967	7,386,920	4	0.02	-	<0.01%	Tension cracking (Acceptable)	New	236
	Y	Z	West slope	562,931	7,386,973	10	0.01	-	<0.01%	Tension cracking (Acceptable)	New	237
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	G1	South slope	563,130	7,386,938	40	5	-	0.86%	Sparse grass	Vegetation over larger area	215
	Y	G2	East slope	563,115	7,387,012	40	0.5	-	1.29%	Sparse grass	Vegetation over larger area	216
	Y	W	Cover surface	563,026	7,387,039	5	3	-	0.065%	Sparse vegetation	New	233
	Y	M	North slope	562,950	7,387,009	50	2	-	0.02%	Sparse vegetation	Vegetation over larger area	218, 222
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	Y	E	West Slope	562,967	7,386,913	50	4	0.1	0.86%	Wet area with ponded water (Acceptable)	Observed in 2015 but not in 2016	235
	Y	F	South toe	563,008	7,386,917	90	5	0.3	1.25%	Ponded water/wet area (Acceptable)	Expanded area	214
	N	I	East toe	-	-	-	-	-	-	Ponded water	Not observed in 2016 or 2017	-

Table 4-23: Visual Inspection Checklist – Lower Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	Y	MW05-09, -12, and MW09-26, -27, -28	-	-	-	-	-	-	-	All 5 monitoring wells intact, 3 functional and 2 non-functional (see Sect 4.6.5 and Appendix B for details)	-	-
Features of Note / Other Observations	Y	C	East slope	563,148	7,386,953	10	4	-	0.2%	Previously noted tire tracks (Acceptable)	Unchanged since previous observation	212
	N	J	North slope	-	-	-	-	-	-	Previously noted tire tracks are from construction equipment	Not reported as a feature in 2017	218
	N	A and B	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 23,200 m^2.

Table 4-24: Preliminary Stability Assessment – Lower Site Non-Hazardous Waste Landfill

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Occasional
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Occasional
Debris and/or Liner Exposure	Not Observed	-
Other	Acceptable	Isolated
Overall Landfill Performance	**Acceptable**	

Table 4-25: Summary Table of Photographic Log – Lower Site Non-Hazardous Waste Landfill

Photo	Easting	Northing	Date
Photo 191:	563,017	7,387,044	Aug. 2, 2017
Photo 192:	563,122	7,386,974	Aug. 2, 2017
Photo 193:	563,045	7,386,940	Aug. 2, 2017
Photo 194:	562,979	7,386,925	Aug. 2, 2017
Photo 195:	562,963	7,386,933	Aug. 2, 2017
Photo 196:	562,957	7,387,008	Aug. 2, 2017
Photo 197:	563,012	7,386,991	Aug. 2, 2017
Photo 198:	563,031	7,386,988	Aug. 2, 2017
Photo 199:	563,055	7,387,010	Aug. 2, 2017
Photo 200:	563,076	7,387,035	Aug. 2, 2017
Photo 201:	563,060	7,387,067	Aug. 2, 2017
Photo 202:	563,129	7,386,955	Aug. 2, 2017
Photo 203:	563,076	7,387,061	Aug. 2, 2017
Photo 204:	562,929	7,386,986	Aug. 2, 2017
Photo 205:	562,935	7,387,092	Aug. 2, 2017
Photo 206:	562,978	7,387,031	Aug. 2, 2017
Photo 207:	562,986	7,387,030	Aug. 2, 2017
Photo 208:	563,058	7,387,081	Aug. 2, 2017
Photo 209:	563,117	7,386,948	Aug. 2, 2017
Photo 210:	562,980	7,386,916	Aug. 2, 2017

Table 4-25: Summary Table of Photographic Log – Lower Site Non-Hazardous Waste Landfill

Photo	Easting	Northing	Date
Photo 211:	562,921	7,386,986	Aug. 2, 2017
Photo 212:	563,148	7,386,953	Aug. 2, 2017
Photo 213:	562,957	7,386,924	Aug. 2, 2017
Photo 214:	563,008	7,386,917	Aug. 2, 2017
Photo 215:	563,130	7,386,938	Aug. 2, 2017
Photo 216:	563,115	7,387,012	Aug. 2, 2017
Photo 217:	563,122	7,386,992	Aug. 2, 2017
Photo 218:	562,968	7,387,025	Aug. 2, 2017
Photo 219:	562,943	7,386,971	Aug. 2, 2017
Photo 220:	563,053	7,387,060	Aug. 2, 2017
Photo 221:	562,945	7,387,010	Aug. 2, 2017
Photo 222:	562,950	7,387,009	Aug. 2, 2017
Photo 223:	562,952	7,387,008	Aug. 2, 2017
Photo 224:	562,985	7,387,026	Aug. 2, 2017
Photo 225:	562,994	7,387,032	Aug. 2, 2017
Photo 226:	563,011	7,387,044	Aug. 2, 2017
Photo 227:	563,047	7,387,057	Aug. 2, 2017
Photo 228:	563,064	7,387,064	Aug. 2, 2017
Photo 229:	563,053	7,386,935	Aug. 2, 2017
Photo 230:	563,062	7,386,931	Aug. 2, 2017
Photo 231:	563,030	7,386,925	Aug. 2, 2017
Photo 232:	562,998	7,386,916	Aug. 2, 2017
Photo 233:	563,026	7,387,039	Aug. 2, 2017
Photo 234:	563,107	7,386,949	Aug. 2, 2017
Photo 235:	562,967	7,386,913	Aug. 2, 2017
Photo 236:	562,967	7,386,920	Aug. 2, 2017
Photo 237:	562,931	7,386,973	Aug. 2, 2017
Photo 238:	562,951	7,387,010	Aug. 2, 2017

4.6.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The groundwater sample at MW05-09 could not be collected because the well was dry. There was evidence of bentonite on the probe and therefore the well screen may be plugged;
- The groundwater sample at MW05-12 could not be collected because the groundwater in the well was frozen; and,
- The groundwater sample at MW09-28 could not be collected because the well was filled with sand.

4.6.4 Soil Sampling

Table 4-26 presents a summary of analytical results for soil samples collected at the Lower Site NHWL. MW09-26 represents an upgradient sampling location, whereas MW05-09, MW05-12, MW09-27 and MW09-28 represent downgradient sampling locations.

Table 4-26 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Lower Site NHWL, the background arithmetic means for chromium, cobalt, copper, nickel, and zinc are greater than the baseline arithmetic mean. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Lower Site NHWL in 2017. There were no detections of PCB at any location at this landfill in 2017.

MW09-26

Sampling location MW09-26 is located upgradient of the landfill, approximately 20 m south of the toe. The estimated elevation of this sampling point is 374 masl. As shown in Photo 255, the area consists of sand and gravel with some rocks and sparse vegetation. The soils consisted of wet yellow-brown sand with some gravel. Ponding of water is observed along the toe of the landfill in the area of the sampling location.

For the shallow sample at MW09-26 (0-15 cm), the concentrations of all detected metals were less than those reported in previous years and historical trends for some metals indicate longer term declines (e.g., chromium, nickel, zinc); additional data points are required to confirm reliability. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW09-26 (40-50 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all detected metals were less than previous years and historical trends for some metals indicate longer term declines (e.g., chromium, nickel, zinc); additional data points are required to confirm reliability. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW05-09

Sampling location MW05-09 is located downgradient of the landfill, approximately 5 m north of the toe. The estimated elevation of this sampling point is 372.5 masl. As shown in Photo 243, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of brown sand with some gravel.

For the shallow sample at MW05-09 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. The lead concentration declined to below the baseline mean concentration plus 3σ. The modified TPH concentration of 46 mg/kg was less than those reported in 2015 and 2016 (58 mg/kg and 65 mg/kg, respectively). Both F3 (40 mg/kg) and F4 (14 mg/kg) fractions were detected in 2017. It is noted that a PCB concentration of 0.07 mg/kg (exceeding baseline mean concentration plus 3σ) was reported in 2016. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW05-09 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. The lead concentration declined to below the baseline mean concentration plus 3σ exceedance noted in 2015. The modified TPH concentration of 37 mg/kg was less than the concentration reported in 2015 (48 mg/kg). The concentration

of the PHC F3 fraction in 2017 was 31 mg/kg. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that a PCB concentration of 0.09 mg/kg (exceeding baseline mean concentration plus 3σ) was reported in 2015.

MW05-12

Sampling location MW05-12 is located downgradient of the landfill, approximately 25 m northeast of the toe. The estimated elevation of this sampling point is 372 masl. As shown in Photo 239, the area is largely covered with sand and gravel and is sparsely vegetated. The soil in the area of the sample location consisted of brown sand, gravel and stone.

For the shallow sample at MW05-12 (0-15 cm), the concentrations of metals were similar to those reported in previous years. The concentration of lead (11.0 mg/kg) marginally exceeded the baseline mean concentration plus 3σ (10.0 mg/kg) but remains well below the historical maximum reported in 2014 (53.0 mg/kg). The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for lead; given this, the result is not considered significant. No PHC were detected at this location in 2017.

For the deep sample at MW05-12 (20-30 cm), metals concentrations were greater than those in the shallow sample. The concentrations of metals were greater than those reported in previous years, including lead and nickel, which exceeded their baseline mean concentration plus 3σ. The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for lead; given this, the result for this parameter is not considered significant. PHC were detected at this location for the first time; a modified TPH concentration of 25 mg/kg was reported in 2017. The concentration of the PHC F3 fraction in 2017 was 19 mg/kg.

MW09-27

Sampling location MW09-27 is located downgradient of the landfill, approximately 5 m west of the toe. The estimated elevation of this sampling point is 373.5 masl. As shown in Photo 247, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand and gravel. It is noted that two samples were labelled MW09-27 Deep and no samples were labelled as MW09-27 Shallow. Historically, metals results are slightly greater in the shallow sample, and therefore the lab results from sample no. 1732457-87 were assigned to the shallow sample.

For the shallow sample at MW09-27 (0-15 cm), the concentrations of metals were similar to those reported in previous years; however, it is noted that the 2017 concentration of lead declined to less the baseline mean concentration plus 3σ. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW09-27 (30-40 cm), most metals concentrations were less than those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. The modified TPH concentration of 22 mg/kg was less than the concentration reported in 2015 (34 mg/kg); no PHC were detected in 2016. Both F3 (16 mg/kg) and F4 (19 mg/kg) fractions were detected in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW09-28

Sampling location MW09-28 is located downgradient of the landfill, approximately 12 m northwest of the toe. The estimated elevation of this sampling point is 373 masl. As shown in Photo 251, the area consists of sand and gravel with some rocks and is not vegetated. The soil in the area of the sample location consisted of brown sand with some gravel and stone.

For the shallow sample at MW09-28 (0-15 cm), the concentrations of detected metals were less than those reported in previous years. PHC were detected at this location for the first time; a modified TPH concentration of 40 mg/kg was reported in 2017. The concentration of the PHC F3 fraction in 2017 was 34 mg/kg. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW09-28 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all detected metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-26: Soil Chemical Analysis Results – Lower Site Non-Hazardous Waste Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005	NA	NA	NA	NA
Baseline Mean		**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.13	1.00	105.0	16.6	49.2	10.0	49.9	134.9	0.067	NA	NA	NA	NA
Upgradient														
MW09-26 Shallow	0-15	<1.0	<0.5	43.9	5.6	14.5	3.6	22.3	28.7	<0.05	<7	<4	<8	<6
MW09-26 Deep	40-50	<1.0	<0.5	46.8	5.5	15.2	3.6	22.8	28.4	<0.05	<7	<4	<8	<6
Downgradient														
MW05-09 Shallow	0-15	<1.0	<0.5	49.8	7.7	**34.9**	6.9	31.0	37.2	<0.05	<7	<4	40	14
MW05-09 Deep	30-40	<1.0	<0.5	53.0	7.8	**28.3**	8.0	31.6	42.7	<0.05	<7	<4	31	<6
MW05-12 Shallow	0-15	<1.0	<0.5	**73.5**	10.2	**31.1**	**11.0**	**40.3**	**55.4**	<0.05	<7	<4	<8	<6
MW05-12 Deep	20-30	<1.0	<0.5	**93.0**	**13.2**	**41.3**	**14.6**	**51.8**	**76.8**	<0.05	<7	<4	19	<6
MW09-27 Shallow	0-15	<1.0	<0.5	**75.2**	**10.7**	**33.2**	6.4	**42.9**	48.9	<0.05	<7	<4	<8	<6
MW09-27 Deep	30-40	<1.0	<0.5	62.0	8.4	26.6	7.0	32.8	38.5	<0.05	<7	<4	16	10
MW09-28 Shallow	0-15	<1.0	<0.5	60.4	9.2	26.1	6.2	34.7	41.3	<0.05	<7	<4	34	<6
MW09-28 Deep	30-40	<1.0	<0.5	62.5	8.4	25.1	5.5	33.6	39.0	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean. The lab results from sample No. 1732457-87 were assigned to the shallow sample of MW09-27.

4.6.5 Groundwater Sampling

Groundwater sampling and monitoring well inspection field records are included in Appendix B. Table 4-27 presents a summary of groundwater levels and analytical results for groundwater samples collected at the Lower Site NHWL. The groundwater sample at MW05-09 could not be collected because the well was dry. There was evidence of bentonite on the probe and therefore the well screen may be plugged. The groundwater sample at MW05-12 could not be collected because the groundwater in the well was frozen. The groundwater sample at MW09-28 could not be collected because the well was infilled with sand. It is recommended that an attempt be made in 2018 to flush both MW05-09 and MW09-28 in 2018.

The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for arsenic, cadmium and lead, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic, chromium or lead in the groundwater samples collected adjacent to these landfills in 2017. There were no detections of PHC in either of the samples collected from the wells at this location in 2017.

MW09-26

The depth to groundwater measured at MW09-26 (duplicate location) in 2017 was 0.08 m below grade. The concentrations of all detected metals were less than or similar to previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW09-27

The depth to groundwater measured at MW09-27 in 2017 was 0.19 m below grade. The concentrations of most detected metals were less than or similar to previous years. Whereas the concentration of zinc is the highest recorded to date, this result is less than the baseline mean concentrations and is within the expected range. No cadmium was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-27: Monitoring Well Groundwater Levels and Groundwater Chemical Analysis Results – Lower Site Non-Hazardous Waste Landfill

ID	GW Depth BGS (m)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 (mg/L)	F2 (mg/L)	F3 (mg/L)	F4 (mg/L)
Baseline Mean		**0.003**	**0.001**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		0.003	0.001	0.5738	0.0127	0.0523	0.0124	0.2726	21.24	NA	NA	NA	NA
Upgradient													
MW09-26	0.08	<0.001	0.0001	<0.001	0.0014	0.0008	<0.0001	0.069	2.73	<0.025	<0.1	<0.1	<0.1
MW909-26 (Duplicate)	0.08	<0.001	0.0001	<0.001	0.0014	0.001	<0.0001	0.069	2.81	<0.025	<0.1	<0.1	<0.1
MW09-26 (Dup Avg)	0.08	<0.001	0.0001	<0.001	0.0014	0.0009	<0.0001	0.069	2.77	<0.025	<0.1	<0.1	<0.1
Downgradient													
MW05-09[1]													
MW05-12[2]													
MW09-27	0.19	<0.001	<0.0001	<0.001	0.001	0.0038	<0.0001	0.015	1.64	<0.025	<0.1	<0.1	<0.1
MW09-28[3]													

Notes:

ID: Monitoring well location ID.

GW: Groundwater.

BGS: Below ground surface.

NA: Not available

Bold Values: Results exceed Baseline arithmetic mean.

Groundwater metals analyses were for dissolved metals.

1: The groundwater sample at MW05-09 could not be collected because it was dry.

2: The groundwater sample at MW05-12 could not be collected because the groundwater in the well was frozen.

3: The groundwater sample at MW09-28 could not be collected because the well was infilled with sand.

4.6.6 Conclusions and Overall Performance of the Lower Site NHWL

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Lower Site NHWL. Some self-armouring erosion, tension cracking and ponding of water along the toe of the landfill was observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic, cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals in soil were slightly higher overall at the deep sample location MW05-12, located downgradient of the northeast side of the landfill. At the deep MW05-12 location, the concentrations of metals were greater than those reported in previous years, including lead and nickel, which exceeded their baseline mean concentration plus 3σ. The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for lead; given this, the result is not considered significant. At the remaining sampling locations, metals concentrations were less than or similar to those observed in previous years.

PHC were detected at downgradient sample locations MW05-09, MW05-12, MW09-27 and MW09-28 at modified TPH concentrations of 22 mg/kg and 46 mg/kg, respectively. At all locations, the PHC concentrations remained well below the baseline mean concentration plus 3σ.

In 2017, groundwater samples were collected from two of five monitoring wells adjacent to the landfill. Samples could not be collected at the remaining locations as the wells were either dry/plugged (MW05-09), frozen (MW05-12) or filled with sand (MW09-28). No detectable concentrations of arsenic, chromium, lead or PHC were noted in either of the groundwater samples in 2017. Overall, the results in 2017 are similar to those in 2016. No exceedances of the baseline mean concentrations plus 3σ were reported in any of the groundwater samples in 2017. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Based on the monitoring results, there does not appear to be significant impact to groundwater quality or soil quality from the landfill.

4.6.7 Recommendations for Lower Site NHWL

No modifications to the ongoing monitoring program at this landfill are recommended. It is recommended that an attempt be made in 2018 to flush both MW05-09 and MW09-28 in 2018.

4.7 Upper Site Tier II Disposal Facility

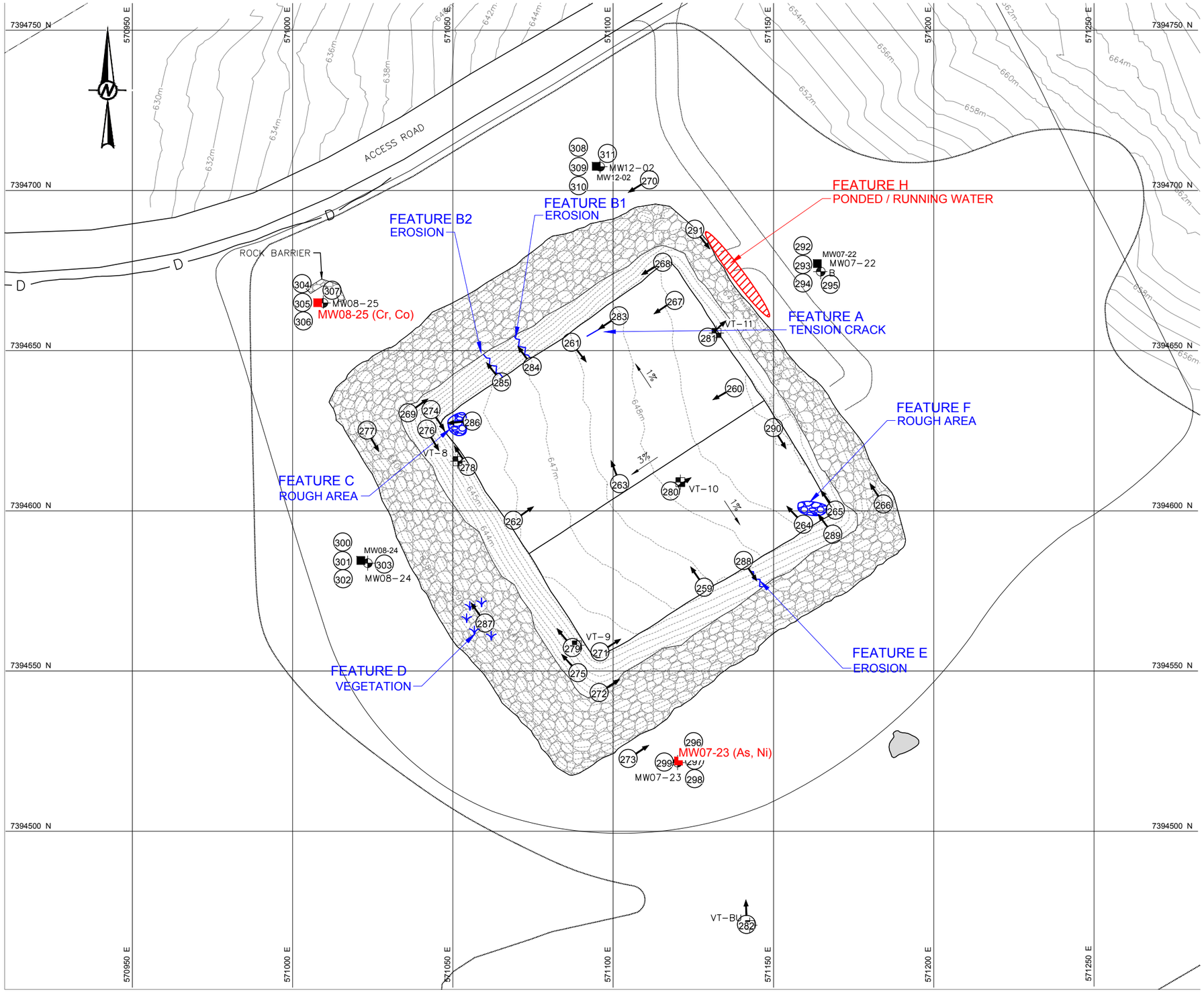
4.7.1 Landfill Description

The Upper Site (US) Tier II Disposal Facility is located on the south side of the road to the Upper Site, approximately 600 m west of the Pallet Line Landfill (ESG 2002b). The facility was designed to contain contaminated soil exceeding Tier II criteria excavated from the Upper Site. The design of this facility was based on the characteristics of the contaminants in the soil, the geothermal properties of the area, and the local permafrost regime. Permafrost provides the primary containment barrier: both the Tier II-contaminated soil in the facility and the silty gravel perimeter berms were designed to be continuously frozen. The landfill has an area of approximately 18,600 m^2. The Upper Site Tier II Disposal Facility, its features, thermistors and soil and groundwater sampling locations are provided in Figure DYE-M.7.

4.7.2 Visual Inspection

The Upper Site Tier II Disposal Facility has some observed erosion, cracking and sparse vegetation features. Table 4-28 presents a summary of observed visual inspection features and Table 4-29 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-30 is a log of photographs taken during the 2017 visual inspection.

No significant changes were noted in 2017. A previously observed tension crack on the northwest crest (Feature A) was unchanged in 2017. A tension crack along the northeast crest first observed in 2016 (Feature G) was not observed in 2017. The erosion channels on the northwest and southeast slopes (Features B1, B2 and E) and rough areas on the cover surface (Features C and F) were unchanged since the previous inspection. Previously observed vegetation (Feature D) was observed to be unchanged in 2017. A new ponded water area with running water (Feature H) was observed in 2017. All thermistors were intact and functional. The observed features are not having a negative impact on landfill stability.



LEGEND:

- EROSION
- ROUGH AREA
- VEGETATION
- PONDED WATER
- CRACKING
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION BACKGROUND
- VERTICAL GROUND TEMPERATURE CABLE LOCATION
- TYPE 1 GRANULAR A
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,250 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER SITE
TIER II DISPOSAL FACILITY

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\00\14_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0018.dwg

Table 4-28: Visual Inspection Checklist – Upper Site Tier II Disposal Facility

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site Tier II Disposal Facility
DATE OF INSPECTION: August 3, 2017
DATE OF PREVIOUS INSPECTION: August 11, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-28: Visual Inspection Checklist – Upper Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	B1	Northwest slope	571,069	7,394,653	10	3	0.03	0.4%	Self-armouring erosion (two 0.5m wide channels) (Acceptable)	Previously observed, unchanged	284
	Y	B2	Northwest slope	571,060	7,394,648	10	3	0.03	0.4%	Self-armouring erosion (two 0.5m wide channels) (Acceptable)	Previously observed, unchanged	285
	Y	C	West crest corner	571,056	7,394,628	5	5	0.15	0.1%	Rough area (Acceptable)	Previously observed, unchanged	286
	Y	E	Southeast slope	571,149	7,394,574	5	0.1	0.05	<0.01%	Self-armouring erosion and accumulation of fines (Acceptable)	Previously observed, unchanged	288
	Y	F	East crest corner	571,156	7,394,604	10	5	0.15	0.3%	Rough area (Acceptable)	Previously observed, unchanged	289
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-28: Visual Inspection Checklist – Upper Site Tier II Disposal Facility

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Cracking	Y	A	Northwest crest	571,093	7,394,658	1.5	0.1	0.02	<0.01%	Tension crack (Acceptable)	Previously observed, unchanged	283
	N	G	Northeast crest	-	-	-	-	-	-	Tension crack	Not observed in 2017	-
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	D	Southwest slope	571,060	7,394,565	0.3	0.3	-	<0.01%	Sparse vegetation	Previously observed, unchanged	287
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	Y	H	East toe	571,125	7,394,688	30	3	0.2	0.48%	Ponded and running water (Acceptable)	New	291
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	Y	MW07-22, 23, MW08-24, 25, MW12-02 VT-8, 9, 10, 11 and BU	-	-	-	-	-	-	-	Monitoring wells and thermistors intact and functional	-	278-282, 295, 299, 303, 307, 311
Features of Note / Other Observations	N	-	-	-	-	-	-	-	-	-	-	-

Landfill Area = 18,600 m^2.

Table 4-29: Preliminary Stability Assessment – Upper Site Tier II Disposal Facility

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Isolated
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Isolated
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Isolated
Debris and/or Liner Exposure	Not Observed	-
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-30: Summary Table of Photographic Log – Upper Site Tier II Disposal Facility

Photo	Easting	Northing	Date
Photo 259:	571,128	7,394,576	Aug. 3, 2017
Photo 260:	571,138	7,394,638	Aug. 3, 2017
Photo 261:	571,087	7,394,653	Aug. 3, 2017
Photo 262:	571,069	7,394,597	Aug. 3, 2017
Photo 263:	571,102	7,394,609	Aug. 3, 2017
Photo 264:	571,159	7,394,596	Aug. 3, 2017
Photo 265:	571,169	7,394,600	Aug. 3, 2017
Photo 266:	571,184	7,394,602	Aug. 3, 2017
Photo 267:	571,119	7,394,666	Aug. 3, 2017
Photo 268:	571,115	7,394,678	Aug. 3, 2017
Photo 269:	571,036	7,394,631	Aug. 3, 2017
Photo 270:	571,111	7,394,703	Aug. 3, 2017
Photo 271:	571,096	7,394,556	Aug. 3, 2017
Photo 272:	571,096	7,394,543	Aug. 3, 2017
Photo 273:	571,105	7,394,523	Aug. 3, 2017
Photo 274:	571,046	7,394,627	Aug. 3, 2017
Photo 275:	571,089	7,394,550	Aug. 3, 2017
Photo 276:	571,042	7,394,626	Aug. 3, 2017
Photo 277:	571,023	7,394,625	Aug. 3, 2017
Photo 278:	571,055	7,394,614	Aug. 3, 2017

Table 4-30: Summary Table of Photographic Log – Upper Site Tier II Disposal Facility

Photo	Easting	Northing	Date
Photo 279:	571,087	7,394,557	Aug. 3, 2017
Photo 280:	571,118	7,394,606	Aug. 3, 2017
Photo 281:	571,130	7,394,654	Aug. 3, 2017
Photo 282:	571,142	7,394,471	Aug. 3, 2017
Photo 283:	571,093	7,394,658	Aug. 3, 2017
Photo 284:	571,069	7,394,653	Aug. 3, 2017
Photo 285:	571,060	7,394,648	Aug. 3, 2017
Photo 286:	571,056	7,394,628	Aug. 3, 2017
Photo 287:	571,060	7,394,565	Aug. 3, 2017
Photo 288:	571,149	7,394,574	Aug. 3, 2017
Photo 289:	571,156	7,394,604	Aug. 3, 2017
Photo 290:	571,150	7,394,626	Aug. 3, 2017
Photo 291:	571,125	7,394,688	Aug. 3, 2017

4.7.3 Thermal Monitoring

Thermistor dataloggers VT-8, VT-9, VT-10, VT-11 and VT-BU located at the Upper Site Tier II Disposal Facility were downloaded using Lakewood Systems Ltd. Prolog software and a laptop computer. Thermistor inspection and data downloading details were recorded on field record sheets included in Appendix B.

4.7.4 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil sample at MW12-02 could not be collected due to refusal on rock; and,
- Groundwater samples at MW07-22, MW07-23, MW08-25 and MW12-02 could not be collected because the groundwater in the wells was frozen.

4.7.5 Soil Sampling

Table 4-31 presents a summary of analytical results for soil samples collected at the Upper Site Tier II Disposal Facility. MW07-22 and MW12-02 represent upgradient sampling locations, whereas MW07-23, MW08-24 and MW08-25 represent downgradient sampling locations.

Table 4-31 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site Tier II Disposal Facility, the background arithmetic means for cobalt, copper and nickel are greater than the baseline arithmetic mean. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for cadmium and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no cadmium detected in the soil samples at the Upper Site Tier II Disposal Facility in 2017. With the exception of MW07-23 (deep), there were no detections of arsenic at any location in 2017. There were no detections of PHC or PCB at any location at this landfill in 2017.

MW07-22

Sampling location MW07-22 is located upgradient of the landfill, approximately 20 m northeast of the toe. The estimated elevation of this sampling point is 648.5 masl. As shown in Photo 292, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of brown sand, gravel and stone.

For the shallow sample at MW07-22 (0-15 cm), the concentrations of most detected metals were similar to or slightly greater than those reported in previous years. Longer term trends for chromium, copper and lead suggest increasing concentrations; however, additional data are required for confirmation. No arsenic, cadmium, PHC or PCB were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW07-22 (20-30 cm), most metals concentrations were less than those in the shallow sample. The concentrations of most detected metals were similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW12-02

Sampling location MW12-02 is located upgradient of the landfill, approximately 15 m north of the toe. The estimated elevation of this sampling point is 642.5 masl. As shown in Photo 308, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of grey sand with gravel and stone.

For the shallow sample at MW12-02 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW07-23

Sampling location MW07-23 is located downgradient of the landfill, approximately 12 m south of the toe. The estimated elevation of this sampling point is 638 masl. As shown in Photo 296, the area consists of sand, gravel and rock and is not vegetated. The soils consisted of grey sand with stone.

For the shallow sample at MW07-23 (0-15 cm), the concentrations of most detected metals were greater than those observed in previous years, including the concentration of nickel (352 mg/kg), which exceeded the baseline mean concentration plus 3σ (304 mg/kg). The concentration of arsenic declined from the exceedance of the baseline concentration plus 3σ reported for 2016.

For the deep sample at MW07-23 (40-50 cm), most metals concentrations were less than those in the shallow sample. The concentrations of all detected metals were greater than those observed in 2014. This includes the concentration of arsenic (20.4 mg/kg), which exceeded the baseline concentration plus 3σ (12.6 mg/kg).

MW08-24

Sampling location MW08-24 is located downgradient of the landfill, approximately 10 m west of the toe. The estimated elevation of this sampling point is 636 masl. As shown in Photo 300, the area consists of sand, gravel and rock and is not vegetated. The soils consisted of grey sand with gravel and stone.

For the shallow sample at MW08-24 (0-15 cm), the concentrations of most metals were similar to those observed in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW08-24 (30-40 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of most metals were similar to but slightly greater than those observed in 2014. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW08-25

Sampling location MW08-25 is located downgradient of the landfill, approximately 22 m north of the toe. The estimated elevation of this sampling point is 635 masl. As shown in Photo 304, the area consists of sand and gravel with rocks and boulders and is not vegetated. The soils consisted of grey sand with gravel and stone.

For the shallow sample at MW08-25 (0-15 cm), the concentrations of most metals were similar to those reported in previous years, whereas the concentrations of chromium, cobalt and nickel represent new historical maxima. The concentration of chromium (474 mg/kg) exceeded the baseline mean concentration plus 3σ (281 mg/kg).

For the deep sample at MW08-25 (40-50 cm, duplicate location), all detected metals concentrations were greater than those in the shallow sample. The concentrations of most detected metals were greater than those observed in 2014, with the exception of chromium. This includes cobalt (50.9 mg/kg), which exceeded the baseline mean concentration plus 3σ (40.0 mg/kg). The chromium concentration of 616 mg/kg also exceeded the baseline mean concentration plus 3σ (281 mg/kg) but remains below the concentration of 710 mg/kg reported in 2014.

Table 4-31: Soil Chemical Analysis Results – Upper Site Tier II Disposal Facility

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		12.6	1.00	280.9	40.0	130.1	57.2	303.8	214.1	0.050	NA	NA	NA	NA
Upgradient														
MW07-22 Shallow	0-15	<1.0	<0.5	**146.0**	**19.0**	**103.0**	14.7	78.9	**134.0**	<0.05	<7	<4	<8	<6
MW07-22 Deep	20-30	<1.0	<0.5	**114.0**	14.0	**58.0**	**19.7**	66.3	**88.2**	<0.05	<7	<4	<8	<6
MW12-02 Shallow	0-15	<1.0	<0.5	51.1	12.6	14.2	**17.1**	33.2	65.4	<0.05	<7	<4	<8	<6
MW12-02 Deep[1]														
Downgradient														
MW07-23 Shallow	0-15	<1.0	<0.5	**129.0**	**27.2**	**62.3**	9.4	**352.0**	54.2	<0.05	<7	<4	<8	<6
MW07-23 Deep	40-50	**20.4**	<0.5	**111.0**	**24.4**	**111.0**	8.6	**178.0**	51.6	<0.05	<7	<4	<8	<6
MW08-24 Shallow	0-15	<1.0	<0.5	73.8	12.2	26.1	15.0	51.4	54.9	<0.05	<7	<4	<8	<6
MW08-24 Deep	30-40	<1.0	<0.5	68.0	12.3	24.4	13.3	50.3	50.3	<0.05	<7	<4	<8	<6
MW08-25 Shallow	0-15	<1.0	<0.5	**474.0**	**36.5**	**62.6**	**23.5**	**132.0**	74.6	<0.05	<7	<4	<8	<6
MW08-25 Deep	40-50	<1.0	<0.5	**530.0**	**39.1**	**73.4**	**24.1**	**145.0**	74.4	<0.05	<7	<4	<8	<6
MW08-925 Deep (Duplicate)	40-50	<1.0	<0.5	**702.0**	**62.6**	**131.0**	**29.3**	**257.0**	**89.2**	<0.05	<7	<4	<8	<6
MW08-25 Deep (Dup Avg)	40-50	<1.0	<0.5	**616.0**	**50.9**	**102.2**	**26.7**	**201.0**	**81.8**	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil sample MW12-02 could not be collected due to refusal on rock.

4.7.6 Groundwater Sampling

Groundwater sampling and monitoring well inspection field records are included in Appendix B. Table 4-32 presents a summary of groundwater levels and analytical results for groundwater samples collected at the Upper Site Tier II Disposal Facility. The groundwater samples at MW07-22, MW07-23, MW08-25 and MW12-02 could not be collected because the groundwater in the wells was frozen. It is noted that the hasp on the casing at MW12-02 is broken; it is recommended an attempt be made to repair this in 2018.

The baseline arithmetic mean and the baseline concentrations plus 3σ are the same for arsenic and cadmium, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

MW08-24

The depth to groundwater measured at MW08-24 in 2017 was 0.84 m below grade. The concentrations of all metals were less than or similar to all previous years. No cadmium or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ and all results were less than the respective baseline mean concentrations.

Table 4-32: Monitoring Well Groundwater Levels and Groundwater Chemical Analysis Results – Upper Site Tier II Disposal Facility

ID	GW Depth BGS (m)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 (mg/L)	F2 (mg/L)	F3 (mg/L)	F4 (mg/L)
Baseline Mean		**0.003**	**0.001**	**0.3429**	**0.0121**	**0.0835**	**0.0127**	**0.2143**	**0.783**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		0.003	0.001	1.06	0.0231	0.2126	0.0354	0.7392	6.57	NA	NA	NA	NA
Upgradient													
MW07-22[1]													
MW12-02[1]													
Downgradient													
MW07-23[1]													
MW08-24	0.84	0.001	<0.0001	0.003	0.0007	0.0097	0.0007	0.012	0.051	<0.025	<0.2	<0.2	<0.2
MW08-25[1]													

Notes:
ID: Monitoring well location ID.
GW: Groundwater.
BGS: Below ground surface.
NA: Not available.
Bold Values: Results exceed Baseline arithmetic mean.
Groundwater metals analyses were for dissolved metals.
1: The groundwater samples at MW07-22, MW07-23, MW08-25 and MW12-02 could not be collected because the groundwater in the wells was frozen.

4.7.7 Conclusions and Overall Performance of the Upper Site Tier II Disposal Facility

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site Tier II Disposal Facility. Some self-armouring erosion along the slopes of the landfill, rough areas on the crest, a minor tension crack and ponded water features were observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium, PHC or PCB were noted in any of the soil samples in 2017. The concentrations of the metals were highest overall at the deep sample location MW08-25, located downgradient of the northwest side of the landfill. At the deep MW08-25 location, the concentrations of most metals were greater than those observed in 2014, including cobalt, which exceeded the baseline mean concentration plus 3σ. The chromium concentration also exceeded the baseline mean concentration plus 3σ but remains below the concentration reported in 2014. At the remaining sampling locations, most metal concentrations were similar to or greater than those observed in previous years. Exceedances of the baseline mean concentration plus 3σ were reported for nickel at the shallow MW07-23 location, arsenic at the deep MW07-23 location and chromium at the shallow MW08-25 location, all of which are located downgradient of the landfill.

In 2017, a groundwater sample was only collected from MW08-24, as the rest of the locations were frozen. At MW08-24, the concentrations of all metals were less than the respective baseline mean concentration. No cadmium or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

The results at MW08-25 suggest potential impact from the landfill; however, fewer than seven samples have been collected for trend confirmation.

4.7.8 Recommendations for Upper Site Tier II Disposal Facility

No modifications to the ongoing monitoring program at this landfill are recommended. It is noted that the hasp on the casing at MW12-02 is broken; it is recommended an attempt be made to repair this in 2018.

4.8 Upper Site West Landfill – West Lobe, Centre Lobe and East Lobe

4.8.1 Landfill Description

The Upper Site West Landfill is located 800 m west of the Station Area on the north side of the access road. The Upper Site West Landfill was created during DEW Line operations. The surface of the landfill was covered with additional sand and gravel cover material. Vegetative cover on the surface and in the surrounding area is sparse (ESG 2002b). The remediation of this landfill consisted of the complete excavation of certain areas and the regrading of the remainder of the landfill between 2008 and 2012. Additional work was also completed in 2013. The area of the West lobe is approximately 29,000 m^2 and the area of the Centre and East Lobes are about 32,000 m^2. The Upper Site West Landfill, West Lobe, its features and soil sampling locations are provided in Figure DYE-M.8 (West Lobe) and Figure DYE-M.9 provides the features, and soil sampling locations for the Centre and East Lobes. There are no monitoring wells or thermistors at the Upper Site West Landfill.

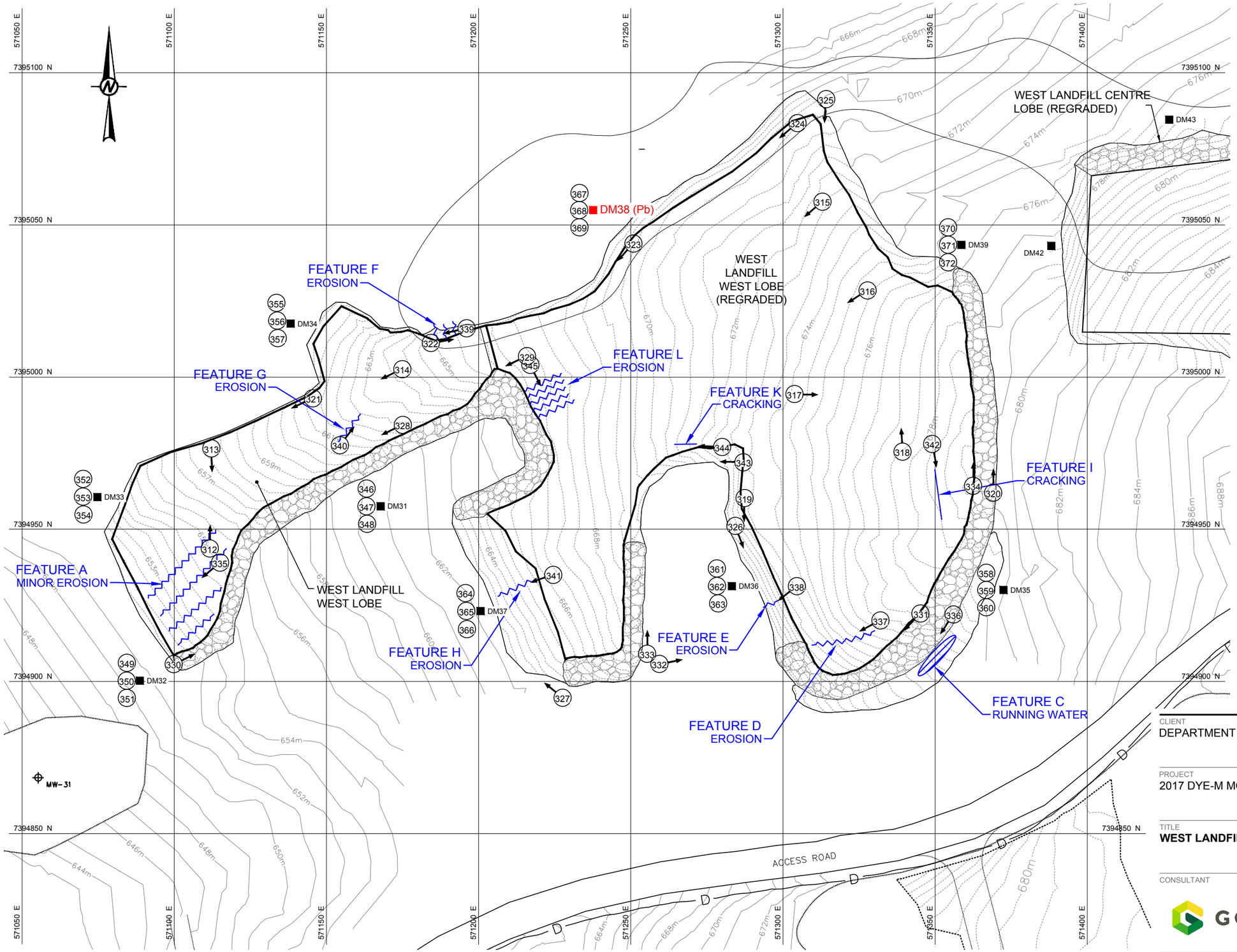
Soil monitoring locations DM-50 and DM-51 overlap between the Upper Site West Landfill and the Upper Site Pallet Line Landfill. Results from these monitoring locations were used in the evaluation of both landfills. Given the number of lobes associated with this area, particular focus is given to results which exceed the three standard deviations from baseline means; interpretation of trends is considered in light of the need to collect seven samples prior to confirmation.

4.8.2 Visual Inspection

The Upper Site West Landfill (West, Centre and East Lobes) exhibited erosion, cracking and ponded water features. Table 4-33 (West Lobe) and Table 4-34 (Centre and East Lobes) present a summary of observed visual inspection features and Table 4-35 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-36 is a log of photographs taken during the 2017 visual inspection.

Visual inspection of the West Lobe in 2017 observed previously reported erosion features (Features A, D, E, F, G, H and L on Figure DYE.M-8) that were unchanged from the previous inspection in 2016. The previously observed running water and erosion feature along the southwest toe beyond the West Lobe riprap had no significant change although it was partly covered with snow in 2017 (Feature C). A previously observed minor tension crack on the south slope (Feature J) was not observed in 2017. The other previously observed minor tension cracks were unchanged in 2017 (Features I and K). The observed features do not appear to be impacting the stability of the Upper Site West Landfill (West Lobe). Feature B has not been assigned to this landfill.

Previously observed minor tension cracking was observed to be unchanged along the north edge of the East Lobe (Feature B on Figure DYE.M-9) and southwest end of the Centre Lobe (Feature I). No new tension cracks were observed on the East or Centre Lobe in 2017. New self-armouring erosion on the south slope of the Centre Lobe (Feature N) was observed in 2017. The previously observed self-armouring erosion on the cover surface and slopes of the Centre Lobe (Features E, F, G, H, J and K) was unchanged since 2016. Previously observed self-armouring erosion on the cover surface of the East Lobe (Feature D) unchanged since 2016. New tire tracks (Feature M) were observed on the Centre Lobe A cover in 2017. A rough surface area (Feature L) which was previously observed is unchanged but has been more precisely circumscribed. The observed features do not appear to be impacting the stability of the Upper Site West Landfill (Centre and East Lobes). Damage to the south toe of Central Lobe A from snow clearing activities along the access road (previously observed in 2014) was not observed during the 2017 visual inspection (see Photo 406 in Appendix D). Note that Features A and C have not been assigned to this landfill.



LEGEND:

- EROSION
- PONDING/RUNNING WATER
- CRACKING
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- MONITORING WELL LOCATION
- REGRADED RIP RAP
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,250 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
WEST LANDFILL - WEST LOBE

CONSULTANT
GOLDER

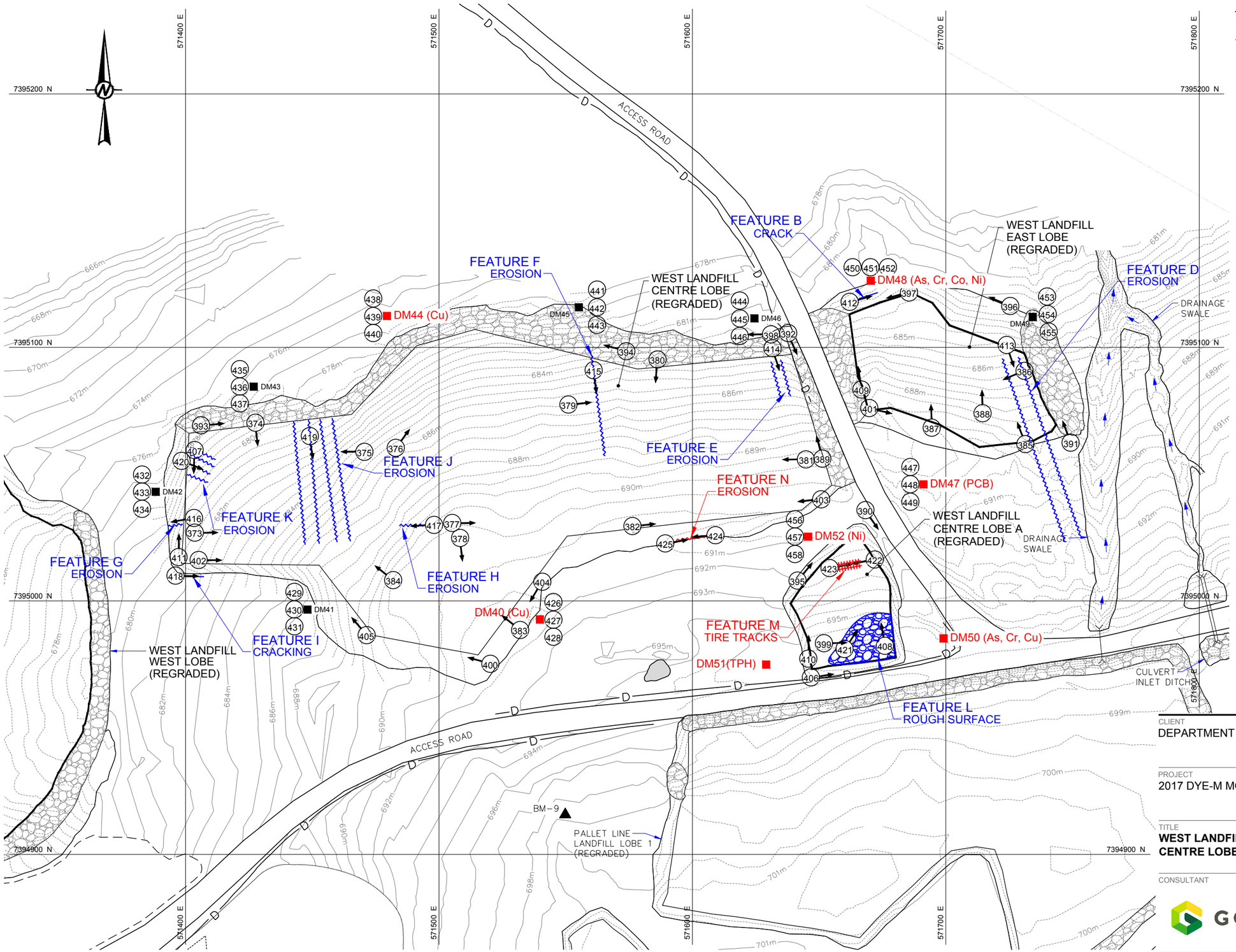
YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.8

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

0 25 mm

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public - Works_Canada\Canada\99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0019.dwg



LEGEND:

- CRACKING
- EROSION
- ROUGH SURFACE
- TIRE TRACKS
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION
- PERMANENT BENCHMARK LOCATION
- REGRADED RIP RAP
- GROUND SURFACE CONTOUR
- DRAINAGE

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,500 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
WEST LANDFILL
CENTRE LOBE, CENTRE LOBE A AND EAST LOBE

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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Table 4-33: Visual Inspection Checklist – Upper Site West Landfill (West Lobe)

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site West Landfill (West Lobe)
DATE OF INSPECTION: August 3, 2016
DATE OF PREVIOUS INSPECTION: August 11, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-33: Visual Inspection Checklist – Upper Site West Landfill (West Lobe)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	A	Cover surface west end	571,115	7,394,939	15-25	10-20	0.1	1.0%	Minor self-armouring erosion area with 0.5m wide channels (Acceptable)	Unchanged since previous observation	335
	Y	D	Cover surface near southwest slope	571,332	7,394,920	20	5	0.1-0.2	0.35%	Self-armouring erosion (Acceptable)	Unchanged since previous observation	337
	Y	E	Southwest slope	571,300	7,394,928	6	0.3	0.2	0.01%	Small erosion channel (Acceptable)	Unchanged since previous observation	338
	Y	F	North toe	571,196	7,395,016	5	5	0.1-0.2	0.09%	Some erosion at toe (Acceptable)	Unchanged since previous observation	339
	Y	G	Cover surface	571,159	7,394,987	12	0.3	0.1-0.2	0.01%	Some minor self-armouring erosion (Acceptable)	Unchanged since previous observation	340
	Y	H	Southwest slope	571,203	7,394,926	16	2.5	0.1-0.2	0.14%	Self-armouring erosion (Acceptable)	Unchanged since previous observation	341
	Y	L	Cover surface	571,217	7,395,004	15	10	0.1	0.05%	Minor self-armouring erosion area with 0.5m wide channels (Acceptable)	Unchanged since previous observation	345

Table 4-33: Visual Inspection Checklist – Upper Site West Landfill (West Lobe)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	I	Cover surface	571,349	7,394,978	15.0	0.1	-	<0.01%	Cracking on surface of landfill (Acceptable)	Unchanged since previous observation	342
	N	J	South slope	-	-	-	-	-	-	Tension cracking	Not observed in 2017	343
	Y	K	Crest of south slope	571,280	7,394,977	4.0	0.1	-	<0.01	Weathered tension cracking (Acceptable)	Unchanged since previous observation	344
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	Y	C	Southwest toe	571,356	7,394,922	15	0.2	-	0.01%	Previously observed running water and minor erosion along toe beyond riprap (Acceptable)	No significant change from previous observation, although partly snow covered in 2017	336
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-33: Visual Inspection Checklist – Upper Site West Landfill (West Lobe)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	N	B	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 29,000 m^2.

Table 4-34: Visual Inspection Checklist – Upper Site West Landfill (Centre and East Lobes)

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site West Landfill (Centre and East Lobes)
DATE OF INSPECTION: August 3, 2017
DATE OF PREVIOUS INSPECTION: August 11, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-34: Visual Inspection Checklist – Upper Site West Landfill (Centre and East Lobes)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	D	East slope and off landfill to road	571,724	7,395,101	75	10	0.1	1.6%	Self-armouring erosion area with fines washing out downslope to road (Acceptable)	Unchanged since previous observation	413
	Y	E	North slope	571,632	7,395,088	15	5	0.1	0.2%	Self-armouring erosion area with two 0.3m wide channels (Acceptable)	Unchanged since previous observation	414
	Y	F	North slope	571,561	7,395,091	40	0.5	0.05	0.1%	Self-armouring erosion transporting fines down slope (Acceptable)	Unchanged since previous observation	415
	Y	G	West slope	571,399	7,395,033	6	5	0.05	0.2%	Self-armouring erosion (Acceptable)	Unchanged since previous observation	416
	Y	H	Cover surface	571,498	7,395,030	10	3	0.1	0.1%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	417
	Y	J	Cover surface	571,449	7,395,065	50.0	20.0	0.05	3.1%	Self-armouring erosion area, with transport of fines down slope (Acceptable)	Unchanged since previous observation	375, 419
	Y	K	Cover surface	571,402	7,395,054	10.0	5.0	0.05	0.15%	Self-armouring erosion area, with transport of fines down slope (Acceptable)	Unchanged since previous observation	407, 420

Table 4-34: Visual Inspection Checklist – Upper Site West Landfill (Centre and East Lobes)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Erosion (cont'd)	Y	N	Centre Lobe	571,609	7,395,026	17	4	0.05	0.25%	Self-armouring erosion transporting fines down slope (Acceptable)	New	424, 425
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	B	North slope	571,662	7,395,118	10	0.1	0.05	<0.01%	Tension crack (Acceptable)	Unchanged since previous observation	412
	Y	I	Southwest corner	571,396	7,395,010	2	0.1	0.05	<0.01%	Thaw creep cracks (Acceptable)	Unchanged since previous observation	418
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	-	-	-	-	-	-	-	-	-	-	-
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-34: Visual Inspection Checklist – Upper Site West Landfill (Centre and East Lobes)

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Features of Note / Other Observations	Y	L	Centre Lobe A	571,660	7,394,981	25	15	-	1.88%	Rough, uneven surface. (Acceptable)	Unchanged since previous observation (modified area)	399 421
	Y	M	Centre Lobe A	571,670	7,395,016	17	3	-	0.16%	Tire tracks (Acceptable)	New	422, 423
	N	A and C	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 32,000 m^2.

Table 4-35: Preliminary Stability Assessment – Upper Site West Landfill (West, Centre and East Lobes)

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	-
Vegetation Establishment	Not Observed	-
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Isolated
Debris and/or Liner Exposure	Not Observed	-
Other	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Table 4-36: Summary Table of Photographic Log – Upper Site West Landfill (West, Centre and East Lobes)

Photo	Easting	Northing	Date
Photo 312:	571,112	7,394,944	Aug. 3, 2017
Photo 313:	571,112	7,394,977	Aug. 3, 2017
Photo 314:	571,175	7,395,003	Aug. 3, 2017
Photo 315:	571,313	7,395,058	Aug. 3, 2017
Photo 316:	571,328	7,395,029	Aug. 3, 2017
Photo 317:	571,304	7,394,994	Aug. 3, 2017
Photo 318:	571,339	7,394,976	Aug. 3, 2017
Photo 319:	571,287	7,394,960	Aug. 3, 2017
Photo 320:	571,369	7,394,962	Aug. 3, 2017
Photo 321:	571,146	7,394,993	Aug. 3, 2017
Photo 322:	571,184	7,395,011	Aug. 3, 2017
Photo 323:	571,251	7,395,044	Aug. 3, 2017
Photo 324:	571,305	7,395,083	Aug. 3, 2017
Photo 325:	571,313	7,395,079	Aug. 3, 2017
Photo 326:	571,284	7,394,951	Aug. 3, 2017
Photo 327:	571,228	7,394,895	Aug. 3, 2017
Photo 328:	571,175	7,394,984	Aug. 3, 2017
Photo 329:	571,216	7,395,007	Aug. 3, 2017
Photo 330:	571,100	7,394,906	Aug. 3, 2017
Photo 331:	571,345	7,394,922	Aug. 3, 2017
Photo 332:	571,259	7,394,906	Aug. 3, 2017

Table 4-36: Summary Table of Photographic Log – Upper Site West Landfill (West, Centre and East Lobes)

Photo	Easting	Northing	Date
Photo 333:	571,255	7,394,909	Aug. 3, 2017
Photo 334:	571,362	7,394,964	Aug. 3, 2017
Photo 335:	571,115	7,394,939	Aug. 3, 2017
Photo 336:	571,356	7,394,922	Aug. 3, 2017
Photo 337:	571,332	7,394,920	Aug. 3, 2017
Photo 338:	571,300	7,394,928	Aug. 3, 2017
Photo 339:	571,196	7,395,016	Aug. 3, 2017
Photo 340:	571,154	7,394,978	Aug. 3, 2017
Photo 341:	571,203	7,394,926	Aug. 3, 2017
Photo 342:	571,349	7,394,978	Aug. 3, 2017
Photo 343:	571,287	7,394,972	Aug. 3, 2017
Photo 344:	571,280	7,394,977	Aug. 3, 2017
Photo 345:	571,217	7,395,004	Aug. 3, 2017
Photo 373:	571,404	7,395,027	Aug. 3, 2017
Photo 374:	571,428	7,395,070	Aug. 3, 2017
Photo 375:	571,471	7,395,059	Aug. 3, 2017
Photo 376:	571,483	7,395,060	Aug. 3, 2017
Photo 377:	571,504	7,395,030	Aug. 3, 2017
Photo 378:	571,508	7,395,025	Aug. 3, 2017
Photo 379:	571,551	7,395,078	Aug. 3, 2017
Photo 380:	571,586	7,395,095	Aug. 3, 2017
Photo 381:	571,646	7,395,056	Aug. 3, 2017
Photo 382:	571,576	7,395,030	Aug. 3, 2017
Photo 383:	571,532	7,394,989	Aug. 3, 2017
Photo 384:	571,482	7,395,008	Aug. 3, 2017
Photo 385:	571,731	7,395,062	Aug. 3, 2017
Photo 386:	571,731	7,395,091	Aug. 3, 2017
Photo 387:	571,694	7,395,068	Aug. 3, 2017
Photo 388:	571,714	7,395,074	Aug. 3, 2017
Photo 389:	571,651	7,395,056	Aug. 3, 2017
Photo 390:	571,668	7,395,036	Aug. 3, 2017
Photo 391:	571,749	7,395,062	Aug. 3, 2017
Photo 392:	571,638	7,395,106	Aug. 3, 2017
Photo 393:	571,406	7,395,069	Aug. 3, 2017
Photo 394:	571,574	7,395,099	Aug. 3, 2017
Photo 395:	571,642	7,395,008	Aug. 3, 2017
Photo 396:	571,725	7,395,116	Aug. 3, 2017
Photo 397:	571,686	7,395,124	Aug. 3, 2017
Photo 398:	571,631	7,395,105	Aug. 3, 2017
Photo 399:	571,647	7,394,979	Aug. 3, 2017
Photo 400:	571,520	7,394,975	Aug. 3, 2017
Photo 401:	571,670	7,395,076	Aug. 3, 2017

Table 4-36: Summary Table of Photographic Log – Upper Site West Landfill (West, Centre and East Lobes)

Photo	Easting	Northing	Date
Photo 402:	571,405	7,395,016	Aug. 3, 2017
Photo 403:	571,651	7,395,040	Aug. 3, 2017
Photo 404:	571,541	7,395,008	Aug. 3, 2017
Photo 405:	571,471	7,394,987	Aug. 3, 2017
Photo 406:	571,647	7,394,970	Aug. 3, 2017
Photo 407:	571,404	7,395,060	Aug. 3, 2017
Photo 408:	571,676	7,394,982	Aug. 3, 2017
Photo 409:	571,667	7,395,083	Aug. 3, 2017
Photo 410:	571,646	7,394,977	Aug. 3, 2017
Photo 411:	571,397	7,395,017	Aug. 3, 2017
Photo 412:	571,662	7,395,118	Aug. 3, 2017
Photo 413:	571,724	7,395,101	Aug. 3, 2017
Photo 414:	571,632	7,395,100	Aug. 3, 2017
Photo 415:	571,561	7,395,091	Aug. 3, 2017
Photo 416:	571,399	7,395,033	Aug. 3, 2017
Photo 417:	571,498	7,395,030	Aug. 3, 2017
Photo 418:	571,396	7,395,010	Aug. 3, 2017
Photo 419:	571,449	7,395,065	Aug. 3, 2017
Photo 420:	571,402	7,395,054	Aug. 3, 2017
Photo 421:	571,660	7,394,981	Aug. 3, 2017
Photo 422:	571,670	7,395,016	Aug. 3, 2017
Photo 423:	571,654	7,395,013	Aug. 3, 2017
Photo 424:	571,609	7,395,026	Aug. 3, 2017
Photo 425:	571,589	7,395,023	Aug. 3, 2017

4.8.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at DM-34, DM-35 and DM-38 could not be collected due to refusal on rock.

4.8.4 Soil Sampling

Table 4-37 presents a summary of analytical results for soil samples collected at the Upper Site West Landfill. DM-35, DM-39, DM-40, DM-47, DM-50, DM-51 and DM-52 represent upgradient sampling locations, whereas DM-31, DM-32, DM-33, DM-34, DM-36, DM-37, DM-38, DM-41, DM-42, DM-43, DM-44, DM-45, DM-46, DM-48, and DM-49 represent downgradient sampling locations. It should be noted that while sampling locations DM-50 and DM-51 are considered to be located upgradient of the Upper Site West Landfill, they are also located downgradient of the nearby Upper Site Pallet Line Landfill.

Table 4-37 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site West Landfill, the background arithmetic means for cobalt and nickel are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for cadmium and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no cadmium detected in the soil samples at the Upper Site West Landfill in 2017. With the exception of DM-47 (shallow), there were no detections of PCB at any location in 2017. Arsenic was only detected at DM-44, DM-48 and DM-50

DM-35

Sampling location DM-35 is located upgradient of the West Lobe of the landfill, immediately east of the toe, and downgradient of the Centre Lobe. The estimated elevation of this sampling point is 678 masl. As shown in Photo 358, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-35 (0-15 cm), the concentrations of most metals were similar to previous years, whereas the concentrations of cobalt, copper and nickel represent new historical maxima. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-39

Sampling location DM-39 is located upgradient of the West Lobe of the landfill, approximately 6 m northeast of the toe, and downgradient of the Centre Lobe. The estimated elevation of this sampling point is 675.5 masl. As shown in Photo 370, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand, gravel and stone.

For the shallow sample at DM-39 (0-15 cm), the concentrations of most metals were similar to previous years. Whereas the concentrations of a number of metals were slightly greater than in 2016, they are similar to their respective baseline mean concentrations and are within their respective expected ranges. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-39 (40-50 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of most metals were similar to previous years; the concentration of copper was slightly greater. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-40

Sampling location DM-40 is located upgradient of the Centre Lobe of the landfill, immediately south of the toe. It is also cross-gradient of the West Landfill Centre Lobe A. The estimated elevation of this sampling point is 691 masl. As shown in Photo 426, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of grey sand with gravel and stone. As shown in Photo 427, iron staining was noted in both the shallow and deep soils excavated at this location.

For the shallow sample at DM-40 (0-15 cm), the concentrations of most metals were similar to previous years. Slight increases in concentrations are observed for some parameters compared to the 2016 results. PHC were detected at this location for the first time; a modified TPH concentration of 56 mg/kg was reported in 2017. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 24 mg/kg, 28 mg/kg and 6 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-40 (40-50 cm, duplicate location), most metals concentrations were similar to those in the shallow sample, other than copper, which was greater. The concentrations of chromium and cobalt were less than those reported in 2014, whereas the concentrations of copper (notably), as well as lead, nickel and zinc were greater. The copper concentration of 244 mg/kg exceeded the baseline mean concentration plus 3σ (159 mg/kg). No arsenic or PHC were detected at this location in 2017.

DM-47

Sampling location DM-47 is located upgradient of the East Lobe of the landfill, approximately 13 m south of the toe. The estimated elevation of this sampling point is 690.5 masl. As shown in Photo 447, the area consists of sand and gravel and is not vegetated. The soils consisted of grey sand with some gravel and stone. A hydrocarbon odour was noted in both the shallow and deep soils excavated from this location.

For the shallow sample at DM-47 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. The modified TPH concentration of 137 mg/kg was well below those reported in previous years. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 52 mg/kg, 81 mg/kg and 17 mg/kg, respectively. PCB were detected at this location for the first time; the PCB concentration of 0.11 mg/kg marginally exceeded the baseline mean concentration plus 3σ (0.10 mg/kg). No arsenic was detected at this location in 2017. The baseline mean concentration plus 3σ is the same as the background arithmetic mean, and the reported exceedance is not considered significant.

For the deep sample at DM-47 (40-50 cm), most metals concentrations were slightly greater than those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. The modified TPH concentration of 54 mg/kg was well below those reported in previous years. The concentrations of the PHC F2 and F3 fractions in 2017 were 34 mg/kg and 16 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-50

Sampling location DM-50 is located upgradient of Centre Lobe A of the landfill, approximately 12 m east of the toe. This location is also in the area of the Pallet Line landfill. The estimated elevation of this sampling point is 695 masl. As shown in Photo 555, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-50 (0-15 cm), the concentrations of all metals were similar to those reported in previous years; concentrations of the detected metals in 2017 were slightly higher than in 2016. PHC were detected at this location for the first time; a modified TPH concentration of 58 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 7 mg/kg and 47 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-50 (30-40 cm), most metals concentrations were greater than those in the shallow sample. The concentrations of most metals were also slightly greater than those reported in previous years. PHC were detected at this location for the first time; a modified TPH concentration of 212 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 179 mg/kg and 29 mg/kg, respectively. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-51

Sampling location DM-51 is located upgradient of Centre Lobe A of the landfill, approximately 20 m west of the toe. This location is also in the area of the Pallet Line landfill. The estimated elevation of this sampling point is 695 masl. As shown in Photo 558, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of grey sand with some gravel and stone. A diesel odour was noted in both the shallow and deep soils excavated from this location.

For the shallow sample at DM-51 (0-15 cm), the concentrations of all metals were less than or similar to previous years. The modified TPH concentration of 430 mg/kg was greater than the concentration reported in 2016 (215 mg/kg) and represents a new historical maximum. The concentration of the PHC F1, F2, F3 and F4 fractions in 2017 were 9 mg/kg, 313 mg/kg, 108 mg/kg and 20 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-51 (30-40 cm), all detected metal concentrations were slightly greater than those in the shallow sample. Most metals concentrations, with the exception of cobalt, were less than those reported at this location in 2014. The modified TPH concentration of 3,025 mg/kg was greater than the concentration reported in 2014 (1,909 mg/kg) and exceeds the baseline mean concentration plus 3σ (826 mg/kg). The concentration of the PHC F1, F2, F3 and F4 fractions in 2017 were 98 mg/kg, 2,320 mg/kg, 607 mg/kg and 94 mg/kg, respectively. No arsenic was detected at this location in 2017.

DM-52

Sampling location DM-52 is located upgradient of Centre Lobe of the landfill, approximately 10 m south of the toe and 10 m north of the toe of Centre Lobe A. This location is downgradient of Centre Lobe A. The estimated elevation of this sampling point is 691 masl. As shown in Photo 456, the area is largely covered with sand, gravel and rocks is not vegetated. The soils consisted of grey sand with some gravel and stone.

For the shallow sample at DM-52 (0-15 cm, duplicate location), the concentrations of all metals were less than or similar to previous years. The nickel concentration of 228 mg/kg exceeded the baseline mean concentration plus 3σ (224 mg/kg) but remains less than the historical maximum concentration of 290 mg/kg reported in 2014. The modified TPH concentration of 17 mg/kg was less than the concentration reported in 2016 (81 mg/kg). The concentration of the PHC F3 fraction in 2017 was 11 mg/kg. No arsenic was detected at this location in 2017.

For the deep sample at DM-52 (20-30 cm), all detected metal concentrations were similar to those in the shallow sample. The concentrations of most metals were similar to those reported in 2014. The nickel concentration of 241 mg/kg exceeded the baseline mean concentration plus 3σ (224 mg/kg) and represents a new historical maximum concentration. No arsenic or PHC were detected at this location in 2017.

DM-31

Sampling location DM-31 is located downgradient of the West Lobe of the landfill, approximately 10 m south of the toe. The estimated elevation of this sampling point is 660.5 masl. As shown in Photo 346, the area is largely covered with sand, gravel and some rock and is not vegetated. The soils consisted of brown sand and gravel.

For the shallow sample at DM-31 (0-15 cm), the concentrations of all metals were less than or similar to previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-31 (40-50 cm), most detected metals concentrations were similar to those in the shallow sample. The concentrations of most metals were also similar to previous years. Whereas the concentrations of copper, lead and nickel are slightly higher than earlier results, they are less than their respective baseline mean concentrations and are within their respective expected ranges. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-32

Sampling location DM-32 is located downgradient of the West Lobe of the landfill, approximately 8 m southwest of the toe. The estimated elevation of this sampling point is 651 masl. As shown in Photo 349, the area is covered with sand, gravel and some rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-32 (0-15 cm), the concentrations of all metals were similar to those reported in previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-32 (40-50 cm), most detected metals concentrations were slightly greater those in the shallow sample. The concentrations of most metals were similar to previous years. Whereas the concentrations of nickel and zinc is slightly higher than in previous years, these results are similar to their respective baseline mean concentrations. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-33

Sampling location DM-33 is located downgradient of the West Lobe of the landfill, approximately 10 m west of the toe. The estimated elevation of this sampling point is 652 masl. As shown in Photo 352, the area is covered with gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-33 (0-15 cm, duplicate location), the concentrations of most detected metals were slightly greater than those reported in previous years; however, these results are less than their respective baseline mean concentrations and are within their respective expected ranges. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-33 (30-40 cm), all detected metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were slightly greater than those in previous years and, in some cases, represent historical highs; however, these results are less than their respective baseline mean concentrations and are within their respective expected ranges. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-34

Sampling location DM-34 is located downgradient of the West Lobe of the landfill, approximately 6 m north of the toe. The estimated elevation of this sampling point is 660 masl. As shown in Photo 355, the area is largely covered with sand, rock and boulders is not vegetated. The soils consisted of reddish-brown sand with some gravel and stone.

For the shallow sample at DM-34 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-36

Sampling location DM-36 is located downgradient of the West Lobe of the landfill, approximately 6 m west of the southerly part of the toe. The estimated elevation of this sampling point is 669 masl. As shown in Photo 361, the area consists of sand and gravel and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-36 (0-15 cm), the concentrations of all metals were similar to those reported in previous years. PHC were detected at this location for the first time; a modified TPH concentration of 37 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 25 mg/kg and 8 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-36 (20-30 cm), all detected metals concentrations were greater than those in the shallow sample. The concentrations of all detected metals were greater than those in 2014. The modified TPH concentration of 253 mg/kg was greater than the concentration of 29 mg/kg reported in 2014. The concentration of the PHC F2 fraction 2017 was 245 mg/kg. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-37

Sampling location DM-37 is located downgradient of the West Lobe of the landfill, immediately west of the southerly part of the toe. The estimated elevation of this sampling point is 662 masl. As shown in Photo 364, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-37 (0-15 cm), the concentrations of most metals were less than or similar to previous years. Whereas the concentrations of lead and zinc increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. PHC were detected at this location for the first time; a modified TPH concentration of 34 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 17 mg/kg and 13 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-37 (20-30 cm), all detected metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were slightly greater than those reported in previous years; however, these results are less than their respective baseline mean concentrations and are within their respective expected ranges. PHC were detected at this location for the first time; a modified TPH concentration of 64 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 50 mg/kg and 10 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-38

Sampling location DM-38 is located downgradient of the north part of the West Lobe of the landfill, approximately 6 m north of the toe. The estimated elevation of this sampling point is 662 masl. As shown in Photo 367, the area is largely covered with sand, rock and boulders is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-38 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. The lead concentration of 95.6 mg/kg exceeded the baseline mean concentration plus 3σ (55.4 mg/kg) but remains below the historical maximum concentration of 124 mg/kg reported in 2015. The modified TPH concentration of 34 mg/kg was less than the concentrations reported in 2015 and 2016 (89 mg/kg and 34 mg/kg, respectively). The concentrations of the PHC F3 and F4 fractions in 2017 were 27 mg/kg and 21 mg/kg, respectively. No arsenic was detected at this location in 2017.

DM-41

Sampling location DM-41 is located downgradient of the Centre Lobe of the landfill, approximately 8 m southwest of the toe. The estimated elevation of this sampling point is 686 masl. As shown in Photo 429, the area is covered with sand, gravel and rock and is not vegetated. The soils consisted of grey sand with some stone.

For the shallow sample at DM-41 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-41 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of metals, with the exception of copper which was marginally higher, were less than those reported in 2014. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-42

Sampling location DM-42 is located downgradient of the Centre Lobe of the landfill, approximately 3 m west of the toe. The estimated elevation of this sampling point is 676.5 masl. As shown in Photo 432, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-42 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-42 (20-30 cm), most detected metals concentrations were similar to those in the shallow sample. The concentrations of metals were less than or similar to those reported in previous years. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-43

Sampling location DM-43 is located downgradient of the Centre Lobe of the landfill, approximately 6 m north of the toe. The estimated elevation of this sampling point is 676 masl. As shown in Photo 435, the area is covered with sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-43 (0-15 cm) the concentrations of most detected metals were slightly greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected range. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-43 (40-50 cm), all detected metals concentrations were less than those in the shallow sample. The concentrations of most detected metals were greater than those reported in previous years; however, these results are less than their respective baseline mean concentrations and are within their respective expected ranges. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-44

Sampling location DM-44 is located downgradient of the Centre Lobe of the landfill, approximately 3 m north of the toe. The estimated elevation of this sampling point is 676.5 masl. As shown in Photo 438, the area is covered with sand, gravel and rock and is not vegetated. The soils consisted of grey sand with gravel and stone.

For the shallow sample at DM-44 (0-15 cm), the concentrations of all metals were similar to those reported in previous years. PHC were detected at this location for the first time; a modified TPH concentration of 15 mg/kg was reported in 2017. The concentrations of the PHC F3 fraction in 2017 was 9 mg/kg. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-44 (30-40 cm), most detected metals concentrations were slightly greater than those in the shallow sample. The concentrations of all detected metals, with the exception of lead and zinc which were slightly higher, were less than those reported in 2014. Copper (162 mg/kg) marginally exceeded the baseline mean concentrations plus 3σ (159 mg/kg). No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-45

Sampling location DM-45 is located downgradient of the Centre Lobe of the landfill, immediately north of the toe. The estimated elevation of this sampling point is 678 masl. As shown in Photo 441, the area consists of sand, gravel and rocks and is not vegetated. The soils consisted of brown sand with some gravel.

For the shallow sample at DM-45 (0-15 cm), the concentrations of most detected metals were less than or similar to those reported in previous years, whereas the concentrations of lead and zinc increased slightly and represent new historical maxima. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-45 (30-40 cm), most detected metals concentrations were less than those in the shallow sample. The concentrations of the detected metals were similar to those reported in 2014. No arsenic or PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-46

Sampling location DM-46 is located downgradient of the Centre Lobe of the landfill, approximately 8 m north of the toe. The estimated elevation of this sampling point is 681.5 masl. As shown in Photo 444, the area is covered with sand, gravel and rock and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-46 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years. The concentrations of chromium, cobalt and lead increased slightly and represent new historical maxima; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. The modified TPH concentration of 248 mg/kg represents a new historical maximum; a modified TPH concentration of 97 mg/kg was reported in 2016. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 48 mg/kg, 196 mg/kg and 24 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that the exceedance of the baseline mean concentration plus 3σ for PCB reported in 2016 was not repeated in 2017.

For the deep sample at DM-46 (40-50 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of most metals were less than or similar to those reported in previous years.

The concentrations of cobalt, lead and nickel increased slightly and represent new historical maxima; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. PHC were detected at this location for the first time; a modified TPH concentration of 104 mg/kg was reported in 2017. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 24 mg/kg, 76 mg/kg and 11 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-48

Sampling location DM-48 is located downgradient of the East Lobe of the landfill, immediately northeast of the toe at the northwest corner. The estimated elevation of this sampling point is 681.5 masl. As shown in Photo 450, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-48 (0-15 cm), the concentrations of most detected metals were less than or similar to those reported in previous years, but in some cases represent an increase over the 2016 results. The concentrations of arsenic, cobalt and nickel represent new historical maxima and exceeded their baseline mean concentrations plus 3σ. The chromium concentration of 486 mg/kg also exceeded the baseline concentration plus 3σ (313 mg/kg). The modified TPH concentration of 35 mg/kg was less than the concentration of 124 mg/kg reported in 2015; no PHC were detected in 2016. The concentration of the PHC F3 fraction in 2017 was 29 mg/kg.

For the deep sample at DM-48 (40-50 cm, duplicate location), most metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were greater than those reported in previous years, including arsenic, cobalt, chromium and nickel, which exceeded their baseline mean concentrations plus 3σ. No PHC were detected at this location in 2017.

DM-49

Sampling location DM-49 is located downgradient of the East Lobe of the landfill, immediately north of the toe. The estimated elevation of this sampling point is 682 masl. As shown in Photo 453, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-49 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years, whereas the concentration of lead was marginally greater. The modified TPH concentration of 114 mg/kg was less than the concentration of 143 mg/kg was reported in 2015; no PHC were detected in 2016. The concentrations of the PHC F2 and F3 fractions in 2017 were 72 mg/kg and 38 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-49 (30-40 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of most metals were similar to those reported in previous years, although it is noted that the concentrations of chromium, lead and zinc were slightly greater or equal to earlier results. The modified TPH concentration of 170 mg/kg represents a new historical maximum; a modified TPH concentration of 131 mg/kg was reported in 2015. The concentrations of the PHC F2 and F3 fractions in 2017 were 119 mg/kg and 47 mg/kg, respectively. No arsenic was detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-37: Soil Chemical Analysis Results – Upper Site West Landfill (West, Centre and East Lobes)

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.1**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		8.47	1.00	313.1	38.3	159.0	55.4	223.6	235.6	0.1	NA	NA	NA	NA
Upgradient														
DM-35 Shallow	0-15	<1.0	<0.5	52.2	**30.0**	**75.0**	7.3	**198**	48.1	<0.05	<7	<4	<8	<6
DM-35 Deep[1]														
DM-39 Shallow	0-15	<1.0	<0.5	**161**	12.4	**86.6**	10.7	39.3	**148**	<0.05	<7	<4	<8	<6
DM-39 Deep	40-50	<1.0	<0.5	**172**	11.1	**131**	10.7	34.3	**138**	<0.05	<7	<4	<8	<6
DM-40 Shallow	0-15	<1.0	<0.5	**173**	13.0	**107**	**15.0**	57.5	**146**	<0.05	<7	24	28	6
DM-40 Deep	40-50	<1.0	<0.5	**148**	6.8	**225**	**16.1**	45.6	**185**	<0.05	<7	<4	<8	<6
DM-940 Deep (Duplicate)	40-50	<1.0	<0.5	**198**	6.7	**263**	**22.0**	55.0	**217**	<0.05	<7	<4	<8	6
DM-40 Deep (Dup Avg)	40-50	<1.0	<0.5	**173**	6.8	**244**	**19.1**	50.3	**201**	<0.05	<7	<4	<8	6
DM-47 Shallow	0-15	<1.0	<0.5	**184**	15.2	**70.6**	11.8	57.5	**136**	**0.11**	<7	52	81	17
DM-47 Deep	40-50	<1.0	<0.5	**218**	**17.1**	**82.6**	11.3	63.4	**150**	<0.05	<7	34	16	<6
DM-50 Shallow	0-15	<1.0	<0.5	**205**	13.7	**94.4**	**21.0**	**73.7**	74.0	<0.05	<7	7	47	<6
DM-50 Deep	30-40	**4.6**	<0.5	**273**	15.7	**137**	**15.1**	**80.8**	88.1	<0.05	<7	179	29	<6
DM-51 Shallow	0-15	<1.0	<0.5	95.1	10.8	39.4	**16.6**	52.3	71.6	<0.05	9	313	108	20
DM-51 Deep	30-40	<1.0	<0.5	107.0	12.2	46.0	**21.0**	52.8	84.2	<0.05	98	2320	607	94
DM-52 Shallow	0-15	<1.0	<0.5	45.3	**37.9**	62.0	6.6	**226**	42.3	<0.05	<7	<4	11	<6
DM-952 Shallow (Duplicate)	0-15	<1.0	<0.5	42.1	**32.7**	63.2	5.8	**229**	42.9	<0.05	<7	<4	11	<6
DM-52 Shallow (Dup Avg)	0-15	<1.0	<0.5	43.7	**35.3**	62.6	6.2	**228**	42.6	<0.05	<7	<4	11	<6
DM-52 Deep	20-30	<1.0	<0.5	44.0	**34.0**	64.8	5.0	**241**	40.4	<0.05	<7	<4	<8	<6

Table 4-37: Soil Chemical Analysis Results – Upper Site West Landfill (West, Centre and East Lobes)

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.1**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		8.47	1.00	313.1	38.3	159.0	55.4	223.6	235.6	0.1	NA	NA	NA	NA
Downgradient														
DM-31 Shallow	0-15	<1.0	<0.5	133	9.0	56.0	10.4	29.1	**114**	<0.05	<7	<4	<8	<6
DM-31 Deep	40-50	<1.0	<0.5	126	9.8	67.4	9.6	36.2	**121**	<0.05	<7	<4	<8	<6
DM-32 Shallow	0-15	<1.0	<0.5	**183**	11.9	**89.6**	12.7	42.4	**122**	<0.05	<7	<4	<8	<6
DM-32 Deep	40-50	<1.0	<0.5	**190**	11.4	**89.2**	9.5	38.7	**125**	<0.05	<7	<4	<8	<6
DM-33 Shallow	0-15	<1.0	<0.5	89.1	13.3	47.7	8.3	54.9	78.3	<0.05	<7	<4	<8	<6
DM-933 Shallow (Duplicate)	0-15	<1.0	<0.5	79.4	12.5	40.2	7.7	56.0	71.4	<0.05	<7	<4	<8	<6
DM-33 Shallow (Dup Avg)	0-15	<1.0	<0.5	84.3	12.9	44.0	8.0	55.5	74.9	<0.05	<7	<4	<8	<6
DM-33 Deep	30-40	<1.0	<0.5	78.8	11.1	43.0	7.4	45.5	67.8	<0.05	<7	<4	<8	<6
DM-34 Shallow	0-15	<1.0	<0.5	31.1	11.0	16.8	7.2	49.2	41.7	<0.05	<7	<4	<8	<6
DM-34 Deep[1]														
DM-36 Shallow	0-15	<1.0	<0.5	**150**	11.5	**96.8**	**13.8**	42.8	113	<0.05	<7	25	8	<6
DM-36 Deep	20-30	<1.0	<0.5	**183**	12.1	**136**	**17.4**	44.6	**150**	<0.05	<7	245	<8	<6
DM-37 Shallow	0-15	<1.0	<0.5	132	10.2	62.3	**13.8**	34.1	111	<0.05	<7	17	13	<6
DM-37 Deep	30-40	<1.0	<0.5	126	9.8	52.8	8.7	31.8	107	<0.05	<7	50	10	<6
DM-38 Shallow	0-15	<1.0	<0.5	78.4	11.8	**77.6**	**95.6**	51.5	**229**	<0.05	<7	<4	27	21
DM-38 Deep[1]														
DM-41 Shallow	0-15	<1.0	<0.5	116	10.8	**70.0**	11.3	41.9	**118**	<0.05	<7	<4	<8	<6
DM-41 Deep	30-40	<1.0	<0.5	124	10.8	**79.7**	12.1	38.2	**123**	<0.05	<7	<4	<8	<6
DM-42 Shallow	0-15	<1.0	<0.5	132	14.7	48.2	7.2	51.1	104	<0.05	<7	<4	<8	<6
DM-42 Deep	20-30	<1.0	<0.5	**156**	14.1	**81.3**	8.6	46.0	**125**	<0.05	<7	<4	<8	<6
DM-43 Shallow	0-15	<1.0	<0.5	**135**	14.6	61.1	7.4	45.5	81.5	<0.05	<7	<4	<8	<6

Table 4-37: Soil Chemical Analysis Results – Upper Site West Landfill (West, Centre and East Lobes)

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.1**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		8.47	1.00	313.1	38.3	159.0	55.4	223.6	235.6	0.1	NA	NA	NA	NA
DM-43 Deep	40-50	<1.0	<0.5	121	13.6	53.8	6.4	42.6	71.1	<0.05	<7	<4	<8	<6
DM-44 Shallow	0-15	**3.4**	<0.5	**159**	10.6	**145.0**	**13.6**	44.9	**147**	<0.05	<7	<4	9	<6
DM-44 Deep	30-40	**4.4**	<0.5	**175**	10.5	**162**	**13.2**	40.6	**179**	<0.05	<7	<4	<8	<6
DM-45 Shallow	0-15	<1.0	<0.5	**173**	15.8	**131**	**20.1**	**105**	**179**	<0.05	<7	<4	<8	<6
DM-45 Deep	40-50	<1.0	<0.5	**163**	14.7	**92.4**	**12.9**	**84.1**	**208**	<0.05	<7	<4	<8	<6
DM-46 Shallow	0-15	<1.0	<0.5	**163**	14.8	**85.2**	**26.8**	**71**	**120**	<0.05	<7	48	196	24
DM-46 Deep	40-50	<1.0	<0.5	**149**	14.1	**107**	**20.5**	61.3	**126**	<0.05	<7	24	76	11
DM-48 Shallow	0-15	**25.2**	<0.5	**486**	**54.8**	**95.0**	9.5	**609**	105	<0.05	<7	<4	29	<6
DM-48 Deep	40-50	**13.5**	<0.5	**503**	**46.8**	**94.8**	9.4	**399**	**119**	<0.05	<7	<4	<8	<6
DM-948 Deep (Duplicate)	40-50	**17.2**	<0.5	**600**	**53.9**	**109**	10.0	**472**	**135**	<0.05	<7	<4	<8	<6
DM-48 Deep (Dup Avg)	40-50	**15.4**	<0.5	**552**	**50.4**	**102**	9.7	**436**	**127**	<0.05	<7	<4	<8	<6
DM-49 Shallow	0-15	<1.0	<0.5	**210**	15.6	**117**	**16.7**	**76.1**	**150**	<0.05	<7	72	38	<6
DM-49 Deep	30-40	<1.0	<0.5	**222**	**16.9**	**117**	**16.8**	**86.0**	**151**	<0.05	<7	119	47	<6

Notes:

NA: Not available; ID: Soil sample location ID

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

Shaded Values: Results exceed the Baseline arithmetic mean plus 3σ.

1: The deep soil samples at DM-34, DM-35 and DM-38 could not be collected due to refusal on rock.

4.8.5 Conclusions and Overall Performance of the Upper Site West Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site West Landfill (West, Centre, Centre Lobe A and East Lobes). Some self-armouring erosion, minor tension cracks, tire tracks and rough cover surface areas were observed. The overall stability performance of the Upper Site West Landfill areas was assessed as Acceptable.

No cadmium was detected in any of the samples in 2017. The concentrations of metals were highest overall at the sample location DM-48, located downgradient of the East Lobe of the landfill. At DM-48, the concentrations of many metals were greater than those reported in previous years and the concentrations of arsenic, cobalt, chromium and nickel exceeded their baseline mean concentrations plus 3σ. Exceedances of the baseline mean concentration plus 3σ were also observed at upgradient sample locations DM-40 (copper), DM-47 (PCB) and DM-52 (nickel) and downgradient sample locations DM-38 (lead) and DM-44 (copper). At the majority of the other sampling locations, the concentrations of most metals were less than or similar to those reported in previous years.

Detectable concentrations of PHC were noted at a number of locations: upgradient locations DM-40, DM-47, and DM-50, DM-51 and DM-52 and downgradient locations DM-36, DM-37, DM-38, DM-44, DM-46, DM-48 and DM-49) at modified TPH concentrations ranging from 15 mg/kg to 3,025 mg/kg. It is also noted that hydrocarbon odours were present at DM-40, DM-47, DM-51 and DM-53. The concentrations of modified TPH were highest in the deep sample at DM-51; the modified TPH concentration of 3,025 mg/kg was greater than the concentration reported in 2014 and exceeds the baseline mean concentration plus 3σ (826 mg/kg). None of the remaining PHC concentrations exceeded the baseline concentration plus 3σ. PCB were detected at the shallow DM-47 location for the first time; the PCB concentration of 0.11 mg/kg exceeded the baseline mean concentration plus 3σ. No detectable concentrations of PHC or PCB were noted in any of the other samples in 2017.

With the exception of the lead exceedance at DM-38, the results from samples in the vicinity of the West Lobe are less than the baseline mean concentration plus 3σ. Exceedances are noted both upgradient and downgradient of the Centre and East lobes, notably as observed at DM-48, where concentrations in several parameters (arsenic, cobalt and nickel represent new historical maxima. Given that elevated concentrations have been observed at this location in the past, they could represent impacts present at the time of landfill completion and additional data are required to determine if impacts are increasing. The elevated PHC at locations upgradient of the West landfill may represent impacts from the Pallet Line landfill; however, these elevated concentrations have been detected since 2014 (i.e., the first post-construction samples). Additional data is required to assess if the elevated concentrations relate to impact from the landfill or reflect impacts associated with soils outside of the landfill.

4.8.6 Recommendations for Upper Site West Landfill

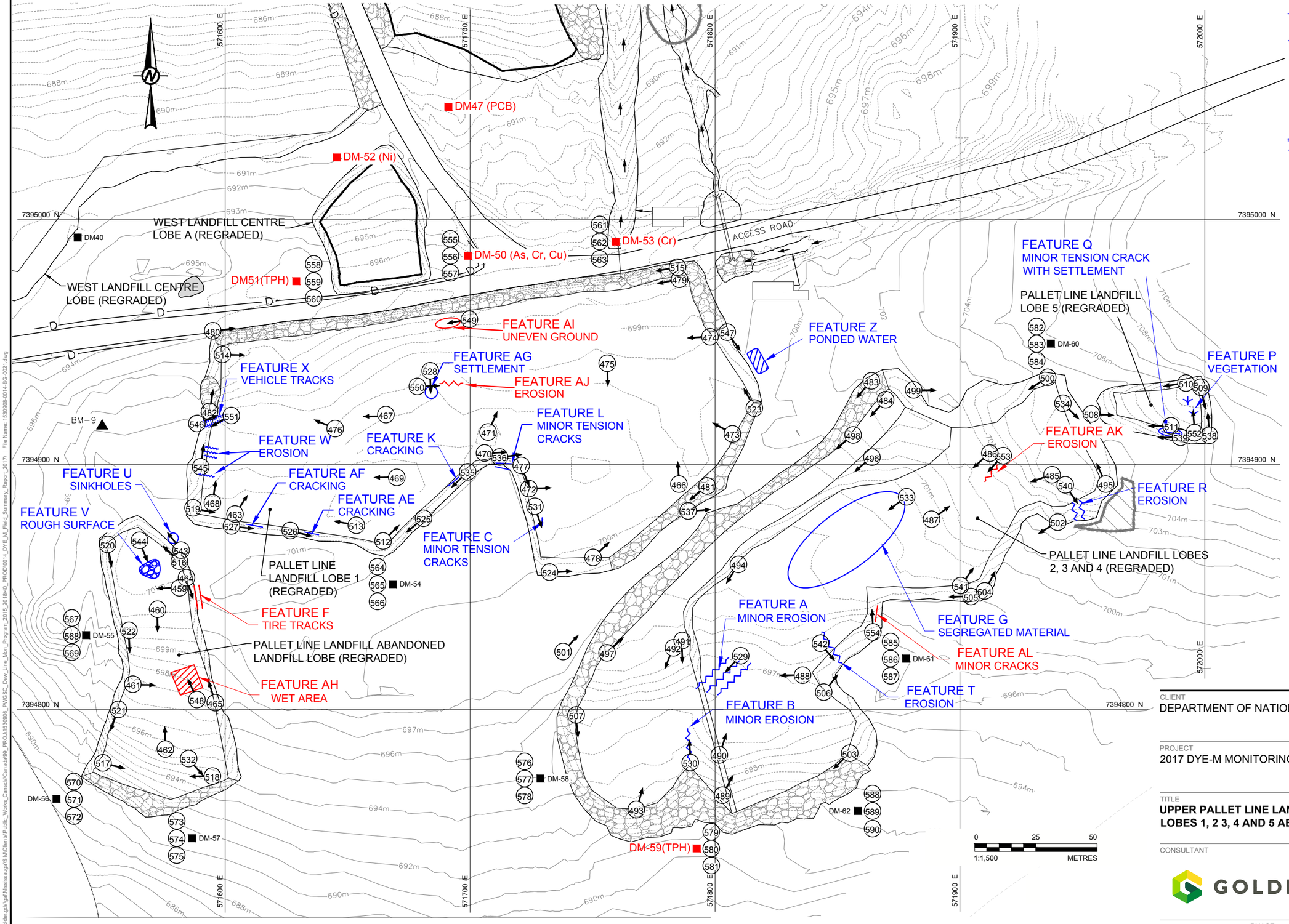
No modifications to the ongoing monitoring program at this landfill are currently recommended.

4.9 Upper Site Pallet Line Landfill

4.9.1 Landfill Description

The Upper Site Pallet Line Landfill is located approximately 800 m west of the Station Area and on the southern side of the road from the West Landfill and from west to east is composed of the Abandoned Landfill Lobe, Lobe 1, Lobes, 2, 3 and 4 (agglomerated together) and Lobe 5. The north end of Lobe 1 is located in the immediate vicinity (approximately 75 metres or less) and upgradient (upslope) of the Centre, Centre A and East Lobes of the West Landfill. The Upper Site Pallet Line Landfill was created during DEW Line operations. The area was a flat sand and gravel pad (ESG 2002b). The multiple lobes of the Upper Site Pallet Line Landfill were regraded with clean fill in 2008 and 2009 during the remediation of DYE-M. The monitoring program consists of 10 soil monitoring locations around the lobes, with the exception of Lobe 5, which is upslope of the remainder of the lobes and has no soil sampling points. There are no monitoring wells and no thermistors at this series of landfills. These regraded landfills cover a total area of approximately 44,000 m^2. The Upper Site Pallet Line Landfill, its features and soil sampling locations are provided in Figure DYE-M.10.

It is noted that monitoring locations DM-50 and DM-51 overlap between the Upper Site Pallet Line Landfill and the West Landfill. Results from these two monitoring locations are considered in the evaluation of both landfills. Given the number of lobes associated with this area, particular focus should be given only to results which exceed the three standard deviations from baseline mean.



LEGEND:

- CRACKING
- EROSION
- SEEPAGE / PONDING
- SETTLEMENT
- VEGETATION
- VEHICLE TRACKS
- ROUGH AREA
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- BODY OF WATER
- MONITORING WELL LOCATION
- PERMANENT BENCHMARK LOCATION
- REGRADED RIP RAP
- DRAINAGE
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER PALLET LINE LANDFILL
LOBES 1, 2 3, 4 AND 5 ABANDONED LANDFILL LOBE

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25 mm

0

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2016\40_PROD\0014_DYE_M_Field_Summary_Report_2017 | File Name: 1530908-0014-BG-0021.dwg

4.9.2 Visual Inspection

The Upper Site Pallet Line Landfill exhibited minor settlement, erosion, cracking, vegetation and ponded water features. Table 4-38 presents a summary of observed visual inspection features and Table 4-39 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-40 is a log of photographs taken during the 2017 visual inspection.

Lobe 1

Some of the previously observed tension cracks and erosion on the southern slopes and cover surface of Lobe 1 (Features Y, AA, AB, AC and AD) were not observed in 2017. Some previously observed cracks were observed to be filled with fines from self-armouring erosion (Features AE and AF) during the 2017 inspection. Previously observed tension cracks near the south crest of Lobe 1 (Features C, L and K) have weathered, but appeared to be otherwise unchanged since the previous inspection. Previously observed self-armouring erosion on Lobe 1 (Feature W) and previously observed minor settlement (Feature AG) appeared to be unchanged in 2017. Previously observed ponded water around the toe (Features M and N) was not present in 2017. Previously observed tire tracks on the west slope of Lobe 1 appeared to be unchanged in 2017. Previously observed ponded water east of Lobe 1 (Feature Z) was observed again in 2017; there were no signs of seepage indicating it is likely water from snow melt. A sheen had been previously observed on the surface of the water associated with Feature Z; no sheen was observed in 2017. A new area of uneven ground (Feature AI) was observed near the north crest of Lobe 1 and a new self-armouring erosion feature AJ was observed. Although these features (e.g., erosion, settlement, cracking and ponding) can be indicative of deteriorating landfill performance, there were no observations of slope instability or exposed waste at the Upper Site Pallet Line Landfill during the 2017 visual inspection.

Lobes 2, 3 and 4

Previously observed self-armouring erosion on the cover surface and south slope of Lobes 2, 3 and 4 (Features A, B, R and T) was observed again in 2017. Cracking had been previously associated with Feature T but was not observed in 2017. Previously reported uneven ground (Feature S) appears to be an as-built condition and is unchanged; therefore, it has been removed as a feature in 2017. A previously observed area of rough and segregated cover material (Feature G) and tire tracks (Feature E) on Lobes 2, 3 and 4 are not considered to be a concern. New self-armouring erosion on the cover surface at the east end (Feature AK) was observed in 2017. A new tension crack (Feature AL) was observed on the southeast slope. The observed features are not indicative of deteriorating landfill performance.

Abandoned Landfill Lobe

Previously observed settlement, in the form of two small sinkholes at the northeast toe of the Abandoned Landfill Lobe (Feature U) was observed to be weathered but unchanged in 2017. The settlement may be related to thaw of frozen fill. A previously observed rough area (Feature V) appeared to be unchanged in 2017. Previously observed tire tracks on the top surface at the south end of the Abandoned Landfill Lobe were not observed in 2017, but new tracks were observed along the east toe (Feature F). A new wet area on the cover surface was observed in 2017 (Feature AH). These features are not considered to be indicative of deteriorating landfill performance.

Lobe 5

Previously observed vegetation (Feature P) at Lobe 5 was observed to be unchanged in 2017. Previously observed ponded water around the toe of Lobe 5 (Features I and O) was not present in 2017. Previously observed isolated sparse vegetation (Feature P) on Lobe 5 appeared to be unchanged in 2017. A previously observed minor tension crack and settlement area on Lobe 5 (Feature Q) appeared to be unchanged since the previous inspection.

Features D, H and J have not been assigned to the Upper Site Pallet Line Landfill.

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site Pallet Line Landfill
DATE OF INSPECTION: August 4, 2017
DATE OF PREVIOUS INSPECTION: August 10, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	S	Lobes 2, 3 and 4 – southeast slope	571,913	7,394,862	-	-	-	-	Previously reported uneven ground (Acceptable)	Unchanged, appears to be an as-built condition	541
	Y	U	Abandoned Lobe – toe of northeast slope	571,582	7,394,865	0.3	0.3	0.3	0.0019%	Two small sinkholes at toe of slope (Acceptable)	Weathered but unchanged since previous observation	543
	Y	V	Abandoned Lobe – cover surface	571,565	7,394,869	10	10	0.1	2.08%	Uneven ground, potential settlement, some self-armouring erosion (Acceptable)	Unchanged since previous observation	544
	Y	AG	Lobe 1 – cover surface	571,683	7,394,933	1	0.5	0.05	<0.001%	Minor settlement (Acceptable)	Unchanged since previous observation	528
	Y	AI	Lobe 1 – north crest	571,700	7,394,959	7	5	0.15	0.17%	Uneven ground, potential settlement (Acceptable)	New	549

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Erosion	Y	A	Lobes 2, 3 and 4 – internal slope	571,810	7,394,822	20	10	0.1	0.91%	Minor self-armouring erosion area (Acceptable)	Unchanged since previous observation	529
	Y	B	Lobes 2, 3 and 4 – internal slope	571,790	7,394,778	12	0.5	0.1	0.03%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	530
	Y	R	Lobes 2, 3 and 4 – southeast slope	571,954	7,394,879	8	5	0.1	0.23%	Minor self-armouring erosion into boulders (Acceptable)	Unchanged since previous observation	540
	Y	T	Lobes 2, 3 and 4 – southeast slope	571,843	7,394,827	15	0.5	0.05	0.03%	Self-armouring erosion (Acceptable)	Unchanged since previous observation, previously observed cracking was not observed in 2017	542
	Y	W	Lobe 1 – west slope	571,590	7,394,899	10	3	0.05	0.14%	Minor self-armouring erosion area (Acceptable)	Unchanged since previous observation	545
	N	Y	Lobe 1 – cover surface	-	-	-	-	-	-	Self-armouring erosion, multiple channels	Not observed in 2017	-
	Y	AJ	Lobe 1 – cover surface	571,678	7,394,932	10	0.25	0.15	0.01%	Self-armouring erosion channel (Acceptable)	New	550
	Y	AK	Lobes 2, 3 and 4 – cover surface	571,916	7,394,904	7	0.3	0.1	0.01%	Self-armouring (Acceptable)	New	553

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	C	Lobe 1 – west slope of the south side extension	571,729	7,394,866	3	0.03	0.02	<0.01%	Minor weathered crack (Acceptable)	Unchanged but weathered since last inspection	531
	Y	K	Lobe 1 – south slope	571,699	7,394,897	1	0.1	0.05	<0.01%	Minor weathered crack (Acceptable)	Unchanged but weathered and difficult to locate	535
	Y	L	Lobe 1 – south slope	571,712	7,394,903	2	2	-	0.02%	Series of minor weathered cracks (Acceptable)	Unchanged but weathered since last inspection	536
	Y	Q	Lobe 5 – south slope	571,991	7,394,911	3	0.1	0.05	0.03%	Minor tension crack and settlement (Acceptable)	Unchanged since previous observation	539
	N	AA	Lobe 1 – east slope	-	-	-	-	-	-	Minor crack	Not observed in 2017. Probably covered with fines.	-
	N	AB	Lobe 1 – east slope	-	-	-	-	-	-	Series of parallel tension cracks on slope	Not observed in 2017. Probably covered with fines due to self-armouring erosion.	523
	N	AC	Lobe 1 – south slope	-	-	-	-	-	-	Tension crack near toe of slope	Not observed in 2017. Probably covered with fines due to self-armouring erosion.	524

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Cracking (cont'd)	N	AD	Lobe 1 – south slope	-	-	-	-	-	-	Tension crack on slope	Not observed in 2017. Probably covered with fines due to self-armouring erosion.	525
	Y	AE	Lobe 1 – south slope	571,648	7,394,869	10.0	0.1	0.02	<0.01%	Tension crack on slope (Acceptable)	Unchanged since previous observation – slightly covered with fines.	526
	Y	AF	Lobe 1 – south slope	571,625	7,394,873	10.0	0.1	0.02	<0.01%	Tension crack at crest of slope (Acceptable)	Unchanged since previous observation – slightly covered with fines.	527
	Y	AL	Lobes 2,3 and 4 – southeast slope	571,864	7,394,832	2	0.01	-	<0.01%	Series of minor tension cracks	New	554
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	P	Lobe 5 – east slope	572,001	7,394,912	2	2	-	0.43%	Sparse grass on slope	Unchanged since previous observation	552
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Seepage or Ponded Water	N	I	Between Lobes 2,3 and 4 and Lobe 5	-	-	-	-	-	-	Ponded water	Not observed in 2017	534
	N	M	Between Lobe 1 and Lobes 2, 3 and 4	-	-	-	-	-	-	Ponded water	Not observed in 2017	537
	N	N	Lobe 1 toe	-	-	-	-	-	-	Ponded water	Not observed in 2017	-
	N	O	Lobe 5 – east toe	-	-	-	-	-	-	Ponded water	Not observed in 2017	538
	Y	Z	East toe of Lobe 1	571,805	7,394,954	10	5	0.1	0.01%	Ponded water (Acceptable)	Less water and no sheen in 2017	547
	Y	AH	Abandoned Lobe – cover surface	571,588	7,394,804	10	10	-	2.08%	Wet area (Acceptable)	New	548
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-38: Visual Inspection Checklist – Upper Site Pallet Line Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Features of Note / Other Observations	N	E	Lobes 2, 3 and 4 – cover surface	-	-	-	-	-	-	Tire tracks	Not observed in 2017	-
	Y	F	Abandoned Lobe crest surface	571,584	7,394,854	10	2	-	0.41%	Tire tracks (Acceptable)	Tracks observed at new location in 2017 (photo 464). Previously observed tracks at south end (Photo 532) were not observed in 2017	464
	Y	G	Lobes 2, 3 and 4 – cover surface	571,878	7,394,887	60	20	-	5.45%	Rough / segregated material (Acceptable)	Unchanged since previous observation	533
	Y	X	Lobe 1 – cover surface	571,592	7,394,914	20	5	-	0.473%	Tire tracks (Acceptable)	Unchanged since previous observation	546
	N	D, H and J	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area:

Pallet Line – Lobe 1 = 21,160 m^2; Pallet Line – Lobes 2,3 and 4 = 21,950 m^2; Pallet Line – Lobe 5 = 940 m^2 Pallet Line – Abandoned Lobe = 4,840 m^2

Table 4-39: Preliminary Stability Assessment – Upper Site Pallet Line Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Occasional
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Isolated
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Occasional
Debris and/or Liner Exposure	Not Observed	-
Other	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Table 4-40: Summary Table of Photographic Log – Upper Site Pallet Line Landfill

Photo	Easting	Northing	Date
Photo 459:	571,581	7,394,850	Aug. 4, 2017
Photo 460:	571,572	7,394,841	Aug. 4, 2017
Photo 461:	571,562	7,394,810	Aug. 4, 2017
Photo 462:	571,576	7,394,784	Aug. 4, 2017
Photo 463:	571,606	7,394,878	Aug. 4, 2017
Photo 464:	571,584	7,394,854	Aug. 4, 2017
Photo 465:	571,596	7,394,803	Aug. 4, 2017
Photo 466:	571,785	7,394,892	Aug. 4, 2017
Photo 467:	571,666	7,394,920	Aug. 4, 2017
Photo 468:	571,595	7,394,881	Aug. 4, 2017
Photo 469:	571,670	7,394,895	Aug. 4, 2017
Photo 470:	571,706	7,394,905	Aug. 4, 2017
Photo 471:	571,707	7,394,913	Aug. 4, 2017
Photo 472:	571,724	7,394,890	Aug. 4, 2017
Photo 473:	571,807	7,394,913	Aug. 4, 2017
Photo 474:	571,798	7,394,952	Aug. 4, 2017
Photo 475:	571,756	7,394,941	Aug. 4, 2017
Photo 476:	571,645	7,394,915	Aug. 4, 2017
Photo 477:	571,721	7,394,900	Aug. 4, 2017
Photo 478:	571,750	7,394,862	Aug. 4, 2017

Table 4-40: Summary Table of Photographic Log – Upper Site Pallet Line Landfill

Photo	Easting	Northing	Date
Photo 479:	571,786	7,394,976	Aug. 4, 2017
Photo 480:	571,595	7,394,955	Aug. 4, 2017
Photo 481:	571,797	7,394,891	Aug. 4, 2017
Photo 482:	571,593	7,394,919	Aug. 4, 2017
Photo 483:	571,864	7,394,934	Aug. 4, 2017
Photo 484:	571,870	7,394,926	Aug. 4, 2017
Photo 485:	571,938	7,394,896	Aug. 4, 2017
Photo 486:	571,912	7,394,905	Aug. 4, 2017
Photo 487:	571,888	7,394,878	Aug. 4, 2017
Photo 488:	571,836	7,394,814	Aug. 4, 2017
Photo 489:	571,803	7,394,765	Aug. 4, 2017
Photo 490:	571,802	7,394,781	Aug. 4, 2017
Photo 491:	571,787	7,394,828	Aug. 4, 2017
Photo 492:	571,783	7,394,825	Aug. 4, 2017
Photo 493:	571,768	7,394,759	Aug. 4, 2017
Photo 494:	571,810	7,394,859	Aug. 4, 2017
Photo 495:	571,960	7,394,892	Aug. 4, 2017
Photo 496:	571,864	7,394,903	Aug. 4, 2017
Photo 497:	571,756	7,394,823	Aug. 4, 2017
Photo 498:	571,856	7,394,912	Aug. 4, 2017
Photo 499:	571,881	7,394,930	Aug. 4, 2017
Photo 500:	571,936	7,394,936	Aug. 4, 2017
Photo 501:	571,738	7,394,824	Aug. 4, 2017
Photo 502:	571,940	7,394,876	Aug. 4, 2017
Photo 503:	571,859	7,394,779	Aug. 4, 2017
Photo 504:	571,910	7,394,848	Aug. 4, 2017
Photo 505:	571,905	7,394,846	Aug. 4, 2017
Photo 506:	571,844	7,394,807	Aug. 4, 2017
Photo 507:	571,743	7,394,798	Aug. 4, 2017
Photo 508:	571,954	7,394,921	Aug. 4, 2017
Photo 509:	571,998	7,394,932	Aug. 4, 2017
Photo 510:	571,995	7,394,933	Aug. 4, 2017
Photo 511:	571,986	7,394,916	Aug. 4, 2017
Photo 512:	571,665	7,394,869	Aug. 4, 2017
Photo 513:	571,654	7,394,875	Aug. 4, 2017
Photo 514:	571,599	7,394,945	Aug. 4, 2017
Photo 515:	571,785	7,394,981	Aug. 4, 2017
Photo 516:	571,581	7,394,861	Aug. 4, 2017

Table 4-40: Summary Table of Photographic Log – Upper Site Pallet Line Landfill

Photo	Easting	Northing	Date
Photo 517:	571,550	7,394,778	Aug. 4, 2017
Photo 518:	571,595	7,394,773	Aug. 4, 2017
Photo 519:	571,587	7,394,882	Aug. 4, 2017
Photo 520:	571,552	7,394,867	Aug. 4, 2017
Photo 521:	571,556	7,394,800	Aug. 4, 2017
Photo 522:	571,561	7,394,832	Aug. 4, 2017
Photo 523:	571,816	7,394,923	Aug. 4, 2017
Photo 524:	571,732	7,394,856	Aug. 4, 2017
Photo 525:	571,681	7,394,878	Aug. 4, 2017
Photo 526:	571,648	7,394,869	Aug. 4, 2017
Photo 527:	571,625	7,394,873	Aug. 4, 2017
Photo 528:	571,684	7,394,933	Aug. 4, 2017
Photo 529:	571,811	7,394,822	Aug. 4, 2017
Photo 530:	571,790	7,394,778	Aug. 4, 2017
Photo 531:	571,729	7,394,866	Aug. 4, 2017
Photo 532:	571,585	7,394,780	Aug. 4, 2017
Photo 533:	571,878	7,394,887	Aug. 4, 2017
Photo 534:	571,942	7,394,925	Aug. 4, 2017
Photo 535:	571,699	7,394,897	Aug. 4, 2017
Photo 536:	571,712	7,394,903	Aug. 4, 2017
Photo 537:	571,789	7,394,881	Aug. 4, 2017
Photo 538:	572,001	7,394,912	Aug. 4, 2017
Photo 539:	571,991	7,394,911	Aug. 4, 2017
Photo 540:	571,954	7,394,879	Aug. 4, 2017
Photo 541:	571,900	7,394,851	Aug. 4, 2017
Photo 542:	571,843	7,394,827	Aug. 4, 2017
Photo 543:	571,582	7,394,865	Aug. 4, 2017
Photo 544:	571,565	7,394,869	Aug. 4, 2017
Photo 545:	571,590	7,394,899	Aug. 4, 2017
Photo 546:	571,588	7,394,917	Aug. 4, 2017
Photo 547:	571,805	7,394,954	Aug. 4, 2017
Photo 548:	571,588	7,394,804	Aug. 4, 2017
Photo 549:	571,700	7,394,959	Aug. 4, 2017
Photo 550:	571,678	7,394,932	Aug. 4, 2017
Photo 551:	571,603	7,394,920	Aug. 4, 2017
Photo 552:	571,995	7,394,913	Aug. 4, 2017
Photo 553:	571,916	7,394,904	Aug. 4, 2017
Photo 554:	571,864	7,394,832	Aug. 4, 2017

4.9.3 Summary of Sampling Deviations

The field work was conducted as per the TOR, with the following exceptions:

- The deep soil samples at DM-56 and DM-60 could not be collected due to refusal on rock.

4.9.4 Soil Sampling

Table 4-41 presents a summary of analytical results for soil samples collected at the Upper Site Pallet Landfill. DM-60 represents an upgradient sampling location, whereas DM-50, DM-51, DM-53, DM-54, DM-55, DM-56, DM-57, DM-58, DM-59, DM-61 and DM-62 represent downgradient sampling locations.

Table 4-41 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site Pallet Landfill, the background arithmetic means for chromium, cobalt, copper and nickel are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no cadmium detected in the soil samples at the Upper Site Pallet in 2017. With the exception of DM-50 (deep), there were no detections of arsenic at any location in 2017. There were no detections of PCB at any location at this landfill in 2017.

DM-60

Sampling location DM-60 is located upgradient of the landfill, approximately 15 m north of the toe. The estimated elevation of this sampling point is 706 masl. As shown in Photo 582, the area is largely covered with sand and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-60 (0-15 cm), the concentrations of most metals were less than previous years; the concentration lead was marginally greater. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-50

Sampling location DM-50 is located downgradient of Lobe 1 of the landfill, approximately 15 m north of the toe and north of the access road. The estimated elevation of this sampling point is 695 masl. As shown in Photo 555, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-50 (0-15 cm), the concentrations of all metals were similar to those reported in previous years; concentrations of detected metals in 2017 were slightly higher than in 2016. The concentrations of chromium and copper exceeded their baseline mean concentrations plus 3σ but remained less than their historical maximum concentrations reported in 2014. PHC were detected at this location for the first time; a modified TPH concentration of 58 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 7 mg/kg and 47 mg/kg, respectively.

For the deep sample at DM-50 (30-40 cm), most metals concentrations were greater than those in the shallow sample. The concentrations of most metals were also slightly greater than those reported in previous years, including the concentrations of arsenic, chromium and copper which exceeded their baseline mean concentrations plus 3σ. PHC were detected at this location for the first time; a modified TPH concentration of 212 mg/kg was reported in 2017. The concentrations of the PHC F2 and F3 fractions in 2017 were 179 mg/kg and 29 mg/kg, respectively.

DM-51

Sampling location DM-51 is located downgradient of Lobe 1 of the landfill, approximately 15 m north of the toe and north of the access road. The estimated elevation of this sampling point is 695 masl. As shown in Photo 558, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of grey sand with some gravel and stone. A diesel odour was noted at both sampling depths for this location.

For the shallow sample at DM-51 (0-15 cm), the concentrations of all metals were less than or similar to previous years. The modified TPH concentration of 430 mg/kg was greater than the concentration reported in 2016 (215 mg/kg) and represents a new historical maximum. The concentrations of the PHC F1, F2, F3 and F4 fractions in 2017 were 9 mg/kg, 313 mg/kg, 108 mg/kg and 20 mg/kg, respectively. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-51 (30-40 cm), all detected metal concentrations were slightly greater than those in the shallow sample. The concentrations of most metals were less than those reported in 2014. The modified TPH concentration of 3,025 mg/kg was greater than the concentration reported in 2014 (1909 mg/kg) and exceeds the baseline mean concentration plus 3σ (1,597 mg/kg). The concentrations of the PHC F1, F2, F3 and F4 fractions in 2017 were 98 mg/kg, 2320 mg/kg, 607 mg/kg and 94 mg/kg, respectively.

DM-53

Sampling location DM-53 is located downgradient of Lobe 1 of the landfill, approximately 15 m north of the toe and north of the access road. The estimated elevation of this sampling point is 694 masl. As shown in Photo 561, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with gravel and stone. A slight hydrocarbon odour was noted at this location.

For the shallow sample at DM-53 (0-15 cm), the concentrations of most metals were greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. PHC were detected at this location for the first time; a modified TPH concentration of 73 mg/kg was reported in 2017. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 8 mg/kg, 61 mg/kg and 14 mg/kg, respectively. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-53 (40-50 cm), all detected metal concentrations were greater than those in the shallow sample. The concentrations of all metals were greater than those reported in previous years, including chromium (207 mg/kg), which exceeded the baseline mean concentration plus 3σ (179.2 mg/kg). The modified TPH concentration of 163 mg/kg was greater than the concentration reported in 2015 (99 mg/kg) and represents a new historical maximum. The concentrations of the PHC F2, F3 and F4 fractions in 2017 were 28 mg/kg, 131 mg/kg and 18 mg/kg, respectively.

DM-54

Sampling location DM-54 is located downgradient of Lobe 1 of the landfill, approximately 10 m south of the toe. The estimated elevation of this sampling point is 699.5 masl. As shown in Photo 564, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-54 (0-15 cm), the concentrations of most metals were similar to previous years, whereas the concentrations of lead and zinc were slightly greater. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-54 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all detected metals were similar to those reported in 2014. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-55

Sampling location DM-55 is located downgradient of the Abandoned Landfill Lobe of the landfill, approximately 10 m west of the toe. The estimated elevation of this sampling point is 697 masl. As shown in Photo 567, the area consists of sand, rock and boulders and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-55 (0-15 cm), the concentrations of most detected metals were similar to or slightly greater than previous years; however, most of these are within their respective expected ranges. Lead concentrations have increased slightly but consistently in recent years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-55 (20-30 cm), all detected metals concentrations were slightly less than those in the shallow sample. The concentrations of most metals were similar to those reported in previous years. Lead concentrations have increased slightly in recent years but are within the respective expected range. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-56

Sampling location DM-56 is located downgradient of the Abandoned Landfill Lobe of the landfill, approximately 8 m southwest of the toe. The estimated elevation of this sampling point is 689 masl. As shown in Photo 570, the area is largely covered with gravel, rock and boulders and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-56 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-57

Sampling location DM-57 is located downgradient of the Abandoned Landfill Lobe of the landfill, approximately 8 m south of the toe. The estimated elevation of this sampling point is 691 masl. As shown in Photo 573, the area consists of sand and gravel with some rocks and boulders and is not vegetated. The soils consisted of brown sand with some stone.

For the shallow sample at DM-57 (0-15 cm), the concentrations of all detected metals were greater than previous years; however, these results are generally similar to their respective baseline mean concentrations and are within their respective expected ranges. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-57 (30-40 cm), all detected metals concentrations were less than those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-58

Sampling location DM-58 is located downgradient of Lobes 2, 3 and 4 of the landfill, approximately 6 m west of the toe. The estimated elevation of this sampling point is 695 masl. As shown in Photo 576, the area is largely covered with gravel with some rocks and is not vegetated. The soils consisted of brown sand, gravel and stone.

For the shallow sample at DM-58 (0-15 cm), the concentrations of all metals were less than or similar to previous years. Zinc concentrations were notably less in 2017 than in 2016, when they exceeded the baseline mean concentration plus 3σ. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-58 (40-50 cm), most metals concentrations were slightly greater than those in the shallow sample. The concentrations of most metals were similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-59

Sampling location DM-59 is located downgradient of Lobes 2, 3 and 4 of the landfill, at the south of the toe. The estimated elevation of this sampling point is 692 masl. As shown in Photo 579, the area consists of sand and gravel with some rock and is not vegetated. The soils consisted of a brown sand with some gravel and stone. A hydrocarbon odour was noted at this location.

For the shallow sample at DM-59 (0-15 cm, duplicate location), the concentrations of most metals were less than or similar to previous years. Whereas the concentrations of lead and zinc represent new historical maxima, these results are less than their respective baseline mean concentrations and are within their respective expected ranges. The modified TPH concentration of 3,010 mg/kg was greater than the concentration reported in 2016 (937 mg/kg) and exceeds the baseline mean concentration plus 3σ (1,597 mg/kg). The concentrations of the PHC F1, F2 and F3 fractions in 2017 were 149 mg/kg, 2,670 mg/kg and 191 mg/kg, respectively.

For the deep sample at DM-59 (40-50 cm), most metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were greater than those reported in 2014; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. The modified TPH concentration of 3,104 mg/kg was greater than the concentration reported in 2014 (777 mg/kg) and exceeds the baseline mean concentration plus 3σ (1,597 mg/kg). The concentrations of the PHC F2 and F3 fractions in 2017 were 2,950 mg/kg and 150 mg/kg, respectively.

DM-61

Sampling location DM-61 is located downgradient of Lobes 2, 3 and 4 of the landfill, at the east toe. The estimated elevation of this sampling point is 700 masl. As shown in Photo 585, the area is largely covered with sand, gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-61 (0-15 cm), the concentrations of most metals were less than or similar to previous years; the concentration of zinc was slightly greater. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-61 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-62

Sampling location DM-62 is located downgradient of Lobes 2, 3 and 4 of the landfill, approximately 6 m southeast of the toe. The estimated elevation of this sampling point is 693 masl. As shown in Photo 588, the area is largely covered with sand, gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-62 (0-15 cm), the concentrations of most metals were similar to previous years; the concentrations of copper, lead and zinc increased slightly and represent new historical maxima. These results are similar to their respective baseline mean concentrations and are within their respective expected ranges. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-62 (40-50 cm, duplicate location), metals concentrations were similar to those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-41: Soil Chemical Analysis Results – Upper Site Pallet Line Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**71.8**	**16.5**	**36.7**	**21.1**	**74.6**	**75.3**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	179.2	35.4	88.1	93.5	150.5	174.6	0.10	NA	NA	NA	NA
Upgradient														
DM-60 Shallow	0-15	<1.0	<0.5	42.0	16.3	20.9	9.3	**90.9**	50.1	<0.05	<7	<4	<8	<6
DM-60 Deep[1]														
Downgradient														
DM-50 Shallow	0-15	<1.0	<0.5	**205**	13.7	**94.4**	21.0	73.7	74.0	<0.05	<7	7	47	<6
DM-50 Deep	30-40	**4.6**	<0.5	**273**	15.7	**137**	15.1	**80.8**	**88.1**	<0.05	<7	179	29	<6
DM-51 Shallow	0-15	<1.0	<0.5	**95.1**	10.8	**39.4**	16.6	52.3	71.6	<0.05	9	313	108	20
DM-51 Deep	30-40	<1.0	<0.5	**107**	12.2	**46.0**	21.0	52.8	**84.2**	<0.05	98	2320	607	94
DM-53 Shallow	0-15	<1.0	<0.5	**104**	11.0	**44.5**	13.8	54.6	**86.9**	<0.05	<7	8	61	14
DM-53 Deep	40-50	<1.0	<0.5	**207**	13.5	**67.2**	19.8	64.9	**121**	<0.05	<7	28	131	18
DM-54 Shallow	0-15	<1.0	<0.5	69.5	16.2	**43.8**	**39.1**	**78.7**	**79.3**	<0.05	<7	<4	<8	<6
DM-54 Deep	30-40	<1.0	<0.5	62.9	15.7	**36.8**	**30.5**	**82.6**	69.9	<0.05	<7	<4	<8	<6
DM-55 Shallow	0-15	<1.0	<0.5	70.4	**16.9**	35.9	**44.3**	**88.1**	**76.9**	<0.05	<7	<4	<8	<6
DM-55 Deep	20-30	<1.0	<0.5	61.3	15.4	30.3	**38.3**	**76.8**	72.4	<0.05	<7	<4	<8	<6
DM-56 Shallow	0-15	<1.0	<0.5	48.0	12.9	28.6	16.1	57.8	59.3	<0.05	<7	<4	<8	<6
DM-56 Deep[1]														
DM-57 Shallow	0-15	<1.0	<0.5	**76.9**	**19.9**	**47.4**	19.0	**96.0**	**79.3**	<0.05	<7	<4	<8	<6
DM-57 Deep	30-40	<1.0	<0.5	57.8	14.6	31.0	10.1	**93.2**	54.6	<0.05	<7	<4	<8	<6
DM-58 Shallow	0-15	<1.0	<0.5	64.5	**16.9**	33.6	12.3	**97.8**	65.7	<0.05	<7	<4	<8	<6
DM-58 Deep	40-50	<1.0	<0.5	**72.5**	**18.3**	**42.9**	18.5	**81.4**	**79.2**	<0.05	<7	<4	<8	<6
DM-59 Shallow	0-15	<1.0	<0.5	52.3	14.2	33.5	17.3	**80.7**	56.9	<0.05	90	2430	216	<6
DM-959 Shallow (Duplicate)	0-15	<1.0	<0.5	46.4	15.2	**39.2**	17.8	74.4	64.3	<0.05	208	2910	166	<6
DM-59 Shallow (Dup Avg)	0-15	<1.0	<0.5	49.4	14.7	36.4	17.6	**77.6**	60.6	<0.05	149	2670	191	<6
DM-59 Deep	40-50	<1.0	<0.5	48.3	15.8	**41.9**	15.5	68.9	70.0	<0.05	<7	2950	150	<6

Table 4-41: Soil Chemical Analysis Results – Upper Site Pallet Line Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**71.8**	**16.5**	**36.7**	**21.1**	**74.6**	**75.3**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	179.2	35.4	88.1	93.5	150.5	174.6	0.10	NA	NA	NA	NA
DM-61 Shallow	0-15	<1.0	<0.5	55.3	16.0	**42.8**	7.8	68.2	69.4	<0.05	<7	<4	<8	<6
DM-61 Deep	30-40	<1.0	<0.5	49.9	15.9	**39.0**	8.1	72.5	66.1	<0.05	<7	<4	<8	<6
DM-62 Shallow	0-15	<1.0	<0.5	49.6	15.0	**55.8**	15.0	66.9	65.0	<0.05	<7	<4	<8	<6
DM-62 Deep	40-50	<1.0	<0.5	52.1	14.7	**58.4**	16.8	67.4	68.0	<0.05	<7	<4	<8	<6
DM-962 Deep (Duplicate)	40-50	<1.0	<0.5	41.5	12.8	**58.0**	15.9	54.2	65.4	<0.05	<7	<4	<8	<6
DM-62 Deep (Dup Avg)	40-50	<1.0	<0.5	46.8	13.8	**58.2**	16.4	60.8	66.7	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

Shaded Values: Results exceed the Baseline arithmetic mean plus 3σ.

1: The deep soil samples at DM-56 and DM-60 could not be collected due to refusal on rock.

4.9.5 Conclusions and Overall Performance of the Upper Site Pallet Line Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site Pallet Line Landfill. Some minor settlement (including two small sinkholes), self-armouring erosion, minor tension cracks and ponding of water along the toe of the landfill were observed. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium or PCB were noted in any of the soil samples in 2017. The concentrations of metals were highest overall at the deep sample location DM-50, located downgradient of Lobe 1. At the deep DM-50 location, the concentrations of most metals were greater than those reported in previous years, including arsenic, chromium and copper, which exceeded their baseline mean concentrations plus 3σ. Chromium and copper also exceeded the baseline mean concentration plus 3σ at the shallow DM-50 location. At the majority of the remaining sampling locations, the concentrations of most metals were generally similar to those reported in previous years, and remained below the baseline mean concentration plus 3σ, with the exception of chromium at the deep DM-53 sample location, located downgradient of Lobe 1.

Hydrocarbon odours were detected at some locations. Detectable concentrations of PHC were reported at downgradient locations DM-50, DM-51, DM-53 and DM-59, at modified TPH concentrations between 58 mg/kg and 3,104 mg/kg. PHC concentrations were highest at the deep DM-59 location; the modified TPH concentration was greater than the concentration reported in 2014 and exceeds the baseline mean concentration plus 3σ. Modified TPH concentrations greater than the baseline mean concentration plus 3σ were also reported at the deep DM-51 and shallow DM-59 locations.

Overall, it was noted that concentrations of metals at the lobes making up the Pallet Line Landfill were highest to the north towards the West Landfill. It is further noted that the observed exceedances were not consistent for one parameter or a group of parameters, suggesting that pre-existing conditions may be responsible for the observed variation. Collection of a larger dataset of results is required to assess changes to soil quality in this area resulting from the landfills.

4.9.6 Recommendations for Upper Site Pallet Line Landfill

No additional modifications to the ongoing monitoring program at this landfill are recommended.

4.10 Upper Site Non-Hazardous Waste Landfill

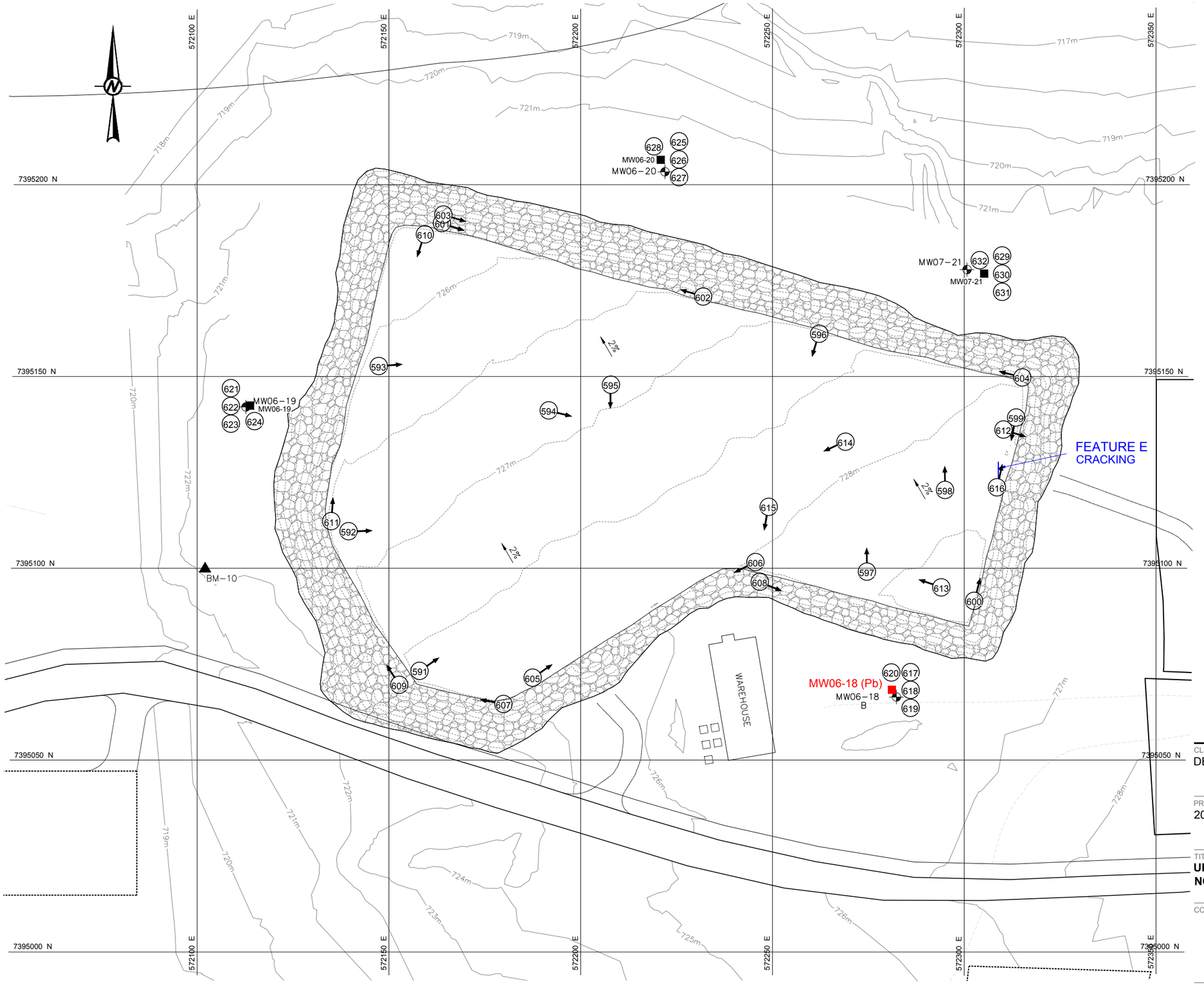
4.10.1 Landfill Description

The Upper Site Non-Hazardous Waste Landfill (NHWL) is located on the north side of the road leading to the Upper Site, adjacent to the NWS warehouse. The NHWL was built for the disposal of non-hazardous demolition materials and wastes generated during the cleanup operations at the Upper Site. The landfill covers an area of approximately 21,100 m^2. The Upper Site NHWL, its features and soil and groundwater sampling locations are provided in Figure DYE-M.11.

4.10.2 Visual Inspection

The Upper Site Non-Hazardous Waste Landfill exhibited one minor cracking feature. Table 4-41 presents a summary of observed visual inspection features and Table 4-42 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-43 is a log of photographs taken during the 2017 visual inspection.

Previously observed minor tension cracking on the crest of the eastern slope (Feature E) was observed to be unchanged in 2017 and is not considered a concern. Previously observed areas with segregated cover material (Feature B) were unchanged in 2017, indicating that they are likely as-built conditions (i.e., not erosion) and will no longer reported as a feature. Previously observed ponded water (Features C and D) was not observed in 2017. Previously observed tire tracks near the east crest (Feature A) have not deteriorated (i.e., caused erosion) and will no longer be reported as a feature.



LEGEND:

- CRACKING
- SETTLEMENT
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- 614 PHOTOGRAPH LOCATION
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION BACKGROUND B
- PERMANENT BENCHMARK
- RIP RAP
- 730m GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. *FEATURES DRAWN IN RED ARE EITHER* NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 25 50
1:1,000 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER SITE
NON-HAZARDOUS WASTE LANDFILL

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25 mm

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\9g_PRO\1530908_PWGSC_Dev_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0022.dwg

Table 4-42: Visual Inspection Checklist – Upper Site Non-Hazardous Waste Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site Non-Hazardous Waste Landfill
DATE OF INSPECTION: August 4, 2017
DATE OF PREVIOUS INSPECTION: August 11, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-42: Visual Inspection Checklist – Upper Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	N	B1	Southeast corner of crest	572,294	7,395,095	-	-	-	-	Previous area of segregation	Unchanged as-built condition, not a feature	613
	N	B2	Cover surface	572,269	7,395,133	-	-	-	-	Previous area of segregation	Unchanged as-built condition, not a feature	614
	N	B3	Near warehouse	572,249	7,395,116	-	-	-	-	Previous area of segregation	Unchanged as-built condition, not a feature	615
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	E	Cover surface, along east crest	572,310	7,395,134	4	0.1		<0.01%	Minor tension cracking (Acceptable)	Unchanged since previous observation	616
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	C and D	-	-	-	-	-	-	-	Ponded water	Not observed in 2016 or 2017	-
Presence / Condition of Monitoring Instruments	Y	MW06-18, 19, 20 and MW07-21	-	-	-	-	-	-	-	Monitoring wells intact	--	620, 624, 628, 632

Table 4-42: Visual Inspection Checklist – Upper Site Non-Hazardous Waste Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Features of Note / Other Observations	N	A	East slope	572,314	7,395,139	-	-	-	-	Previously observed tire tracks (Acceptable)	Unchanged, not reported as a feature in 2017	599

Landfill Area = 21,100 m^2.

Table 4-43: Preliminary Stability Assessment – Upper Site Non-Hazardous Waste Landfill

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Not Observed	-
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Isolated
Animal Burrows	Not Observed	-
Vegetation Establishment	Not Observed	-
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other (Tire Tracks)	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-44: Summary Table of Photographic Log – Upper Site Non-Hazardous Waste Landfill

Photo	Easting	Northing	Date
Photo 591:	572,158	7,395,073	Aug. 4, 2017
Photo 592:	572,139	7,395,110	Aug. 4, 2017
Photo 593:	572,147	7,395,153	Aug. 4, 2017
Photo 594:	572,192	7,395,141	Aug. 4, 2017
Photo 595:	572,208	7,395,148	Aug. 4, 2017
Photo 596:	572,262	7,395,161	Aug. 4, 2017
Photo 597:	572,275	7,395,099	Aug. 4, 2017
Photo 598:	572,295	7,395,120	Aug. 4, 2017
Photo 599:	572,314	7,395,139	Aug. 4, 2017
Photo 600:	572,303	7,395,092	Aug. 4, 2017
Photo 601:	572,164	7,395,190	Aug. 4, 2017
Photo 602:	572,232	7,395,171	Aug. 4, 2017
Photo 603:	572,164	7,395,192	Aug. 4, 2017
Photo 604:	572,315	7,395,150	Aug. 4, 2017
Photo 605:	572,187	7,395,072	Aug. 4, 2017
Photo 606:	572,246	7,395,102	Aug. 4, 2017
Photo 607:	572,180	7,395,065	Aug. 4, 2017
Photo 608:	572,247	7,395,097	Aug. 4, 2017
Photo 609:	572,153	7,395,070	Aug. 4, 2017
Photo 610:	572,159	7,395,187	Aug. 4, 2017

Table 4-44: Summary Table of Photographic Log – Upper Site Non-Hazardous Waste Landfill

Photo	Easting	Northing	Date
Photo 611:	572,135	7,395,112	Aug. 4, 2017
Photo 612:	572,311	7,395,136	Aug. 4, 2017
Photo 613:	572,294	7,395,095	Aug. 4, 2017
Photo 614:	572,269	7,395,133	Aug. 4, 2017
Photo 615:	572,249	7,395,116	Aug. 4, 2017
Photo 616:	572,310	7,395,134	Aug. 4, 2017
Photo 600:	572,303	7,395,092	Aug. 4, 2017
Photo 601:	572,164	7,395,190	Aug. 4, 2017
Photo 602:	572,232	7,395,171	Aug. 4, 2017
Photo 603:	572,164	7,395,192	Aug. 4, 2017
Photo 604:	572,315	7,395,150	Aug. 4, 2017

4.10.3 Summary of Sampling Deviations

The field work was conducted as per the TOR, with the following exceptions:

- The deep soil samples at MW06-18, MW06-19 and MW06-20 could not be collected due to refusal on rock; and,
- The groundwater sample at MW06-18, MW06-20 and MW07-21 could not be collected because the groundwater in the wells was frozen.

4.10.4 Soil Sampling

Table 4-45 presents a summary of analytical results for soil samples collected at the Upper Site NHWL. MW06-18 represents an upgradient sampling location, whereas MW06-19, MW06-20 and MW07-21 represent downgradient sampling locations.

Table 4-45 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site NHWL, the background arithmetic means for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic, cadmium or PCB detected in the soil samples at the Upper Site NHWL in 2017. With the exception of MW06-18 (shallow), there were no detections of PHC at any location in 2017.

MW06-18

Sampling location MW06-18 is located upgradient of the landfill, approximately 15 m south of the toe. The estimated elevation of this sampling point is 726.5 masl. As shown in Photo 617, the area is largely covered with sand, gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone. Ponding of water was observed near the soil sampling location but the soil sample was not taken in the wet area. This area was noted as having seasonal ponded water in the as-built construction record (see Figure DYE-M.11). It met refusal on rocks after the shallow sample.

For the shallow sample at MW06-18 (0-15 cm), the concentrations of most metals were less than or similar to previous years. The concentrations of chromium, lead and zinc are slightly higher and represent new historical maxima; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. The lead concentration of 16.3 mg/kg slightly exceeded the baseline mean concentration plus 3σ (10.0 mg/kg); however as noted above, this criteria for lead is the same as the baseline mean and is most likely within expected natural variation. The modified TPH concentration (212 mg/kg) was greater than the concentration reported in 2016 (42 mg/kg). The concentrations of the PHC F2 and F3 fractions in 2017 were 163 mg/kg and 53 mg/kg, respectively. None of the reported PHC values exceeded their respective baseline mean concentrations plus 3σ.

MW06-19

Sampling location MW06-19 is located downgradient of the landfill, approximately 10 m west of the toe. The estimated elevation of this sampling point is 723 masl. As shown in Photo 621, the area is largely covered with sand, gravel, rocks and boulders and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at MW06-19 (0-15 cm), the concentrations most metals were similar to previous years; slight increases in the concentrations of chromium and zinc represent new historical maxima. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW06-20

Sampling location MW06-20 is located downgradient of the landfill, approximately 15 m north of the toe. The estimated elevation of this sampling point is 722 masl. As shown in Photo 625, the area is largely covered with sand, gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at MW06-20 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

MW07-21

Sampling location MW07-21 is located downgradient of the landfill, approximately 15 m north of the toe. The estimated elevation of this sampling point is 722 masl. As shown in Photo 629, the area is largely covered with sand, gravel, rocks and boulders and is not vegetated. The soils consisted of brown sand with some gravel.

For the shallow sample at MW07-21 (0-15 cm), the concentrations of metals were similar to those reported in previous years, although slightly greater than in 2016. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at MW07-21 (40-50 cm), metals concentrations were similar to those in the shallow sample. The concentrations of the detected metals were greater than those reported in previous years, but similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-45: Soil Chemical Analysis Results – Upper Site Non-Hazardous Waste Landfill

ID	Depth (cm)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**41.2**	**14.2**	**26.6**	**10.0**	**59.4**	**57.1**	**0.20**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	114.5	31.5	74.2	10.0	131.2	148.2	0.20	NA	NA	NA	NA
Upgradient														
MW06-18 Shallow	0-15	<1.0	<0.5	40.9	8.9	**28.2**	**16.3**	49.7	50.0	<0.05	<7	163	53	<6
MW06-18 Deep[1]														
Downgradient														
MW06-19 Shallow	0-15	<1.0	<0.5	**42.1**	12.8	19.5	8.4	**73.4**	45.0	<0.05	<7	<4	<8	<6
MW06-19 Deep[1]														
MW06-20 Shallow	0-15	<1.0	<0.5	25.7	11.6	26.3	5.5	55.3	48.2	<0.05	<7	<4	<8	<6
MW06-20 Deep[1]														
MW07-21 Shallow	0-15	<1.0	<0.5	30.2	13.1	25.0	6.8	**75.1**	42.0	<0.05	<7	<4	<8	<6
MW07-21 Deep	40-50	<1.0	<0.5	30.2	12.1	24.3	6.6	**71.1**	43.6	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil samples at MW06-18, MW06-19 and MW06-20 could not be collected due to refusal on rock.

4.10.5 Groundwater Sampling

Groundwater sampling and monitoring well inspection field records are included in Appendix B. Table 4-46 presents a summary of groundwater levels and analytical results for groundwater samples collected at the Upper Site NHWL. The groundwater samples at MW06-18, MW06-20 and MW07-21 could not be collected because the groundwater in the wells was frozen.

MW06-19

The depth to groundwater measured at MW06-19 was 0.77 m below grade. Concentrations of copper and lead increased slightly and represent new historical maxima, whereas the concentration of zinc was less than the concentration reported in 2015; no zinc was detected in 2016. No arsenic, cadmium, chromium, cobalt, nickel PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-46: Monitoring Well Groundwater Levels and Groundwater Chemical Analysis Results – Upper Site Non-Hazardous Waste Landfill

ID	GW Depth BGS (m)	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 (mg/L)	F2 (mg/L)	F3 (mg/L)	F4 (mg/L)
Baseline Mean		**0.0092**	**0.0016**	**0.2654**	**0.0654**	**0.2481**	**0.0815**	**0.2200**	**3.95**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		0.0387	0.0054	0.7904	0.1940	0.7610	0.3523	0.5929	20.96	NA	NA	NA	NA
Upgradient													
MW06-18[1]													
Downgradient													
MW06-19	0.77	<0.001	<0.0001	<0.001	<0.0005	0.0059	0.0005	<0.001	0.075	<0.025	<0.1	<0.1	<0.1
MW06-20[1]													
MW07-21[1]													

Notes:
ID: Monitoring well location ID.
GW: Groundwater.
BGS: Below ground surface.
NA: Not available
Bold Values: Results exceed Baseline arithmetic mean.
Groundwater metals analyses were for dissolved metals.
1: The groundwater sample at MW06-18, MW06-20 and MW07-21 could not be collected because the groundwater in the wells was frozen.

4.10.6 Conclusions and Overall Performance of the Upper Site Non-Hazardous Waste Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site NHWL. Some areas with cover material segregation and an isolated crack on the cover surface the landfill were observed. The overall stability performance of this landfill was assessed as Acceptable.

No arsenic, cadmium or PCB were detected in any of the soil samples in 2017. The concentrations of most metals were similar to their respective baseline mean concentrations and are within their respective expected ranges. The lead concentration at upgradient sample location MW06-18 slightly exceeded the baseline mean concentration plus 3σ; however as noted above, this criteria for lead is the same as the baseline mean and is most likely within expected natural variation.

PHC were detected at MW06-18; the modified TPH concentration (212 mg/kg) was greater than the concentration reported in 2016 (42 mg/kg). No detectable concentrations of PHC in any of the remaining soil samples in 2017.

In 2017, a groundwater sample was collected only from downgradient sample location MW06-19, as the rest of the locations were frozen. At MW06-19, concentrations of copper and lead increased slightly, whereas the concentration of zinc was less than the concentration reported in 2015. No arsenic, cadmium, chromium, cobalt, nickel PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted that the groundwater samples collected in 2017 were filtered in the lab, and therefore the results represent dissolved metals instead of total metals. An overall trend comparison on the impact of results based on total versus dissolved metals will be prepared in 2018.

Based on the results, there does not appear to be significant impact to soil quality or groundwater quality from the landfill.

4.10.7 Recommendations for Upper Site Non-Hazardous Waste Landfill

No modifications to the ongoing monitoring program at this landfill are recommended.

4.11 Upper Site North Warning System Landfill

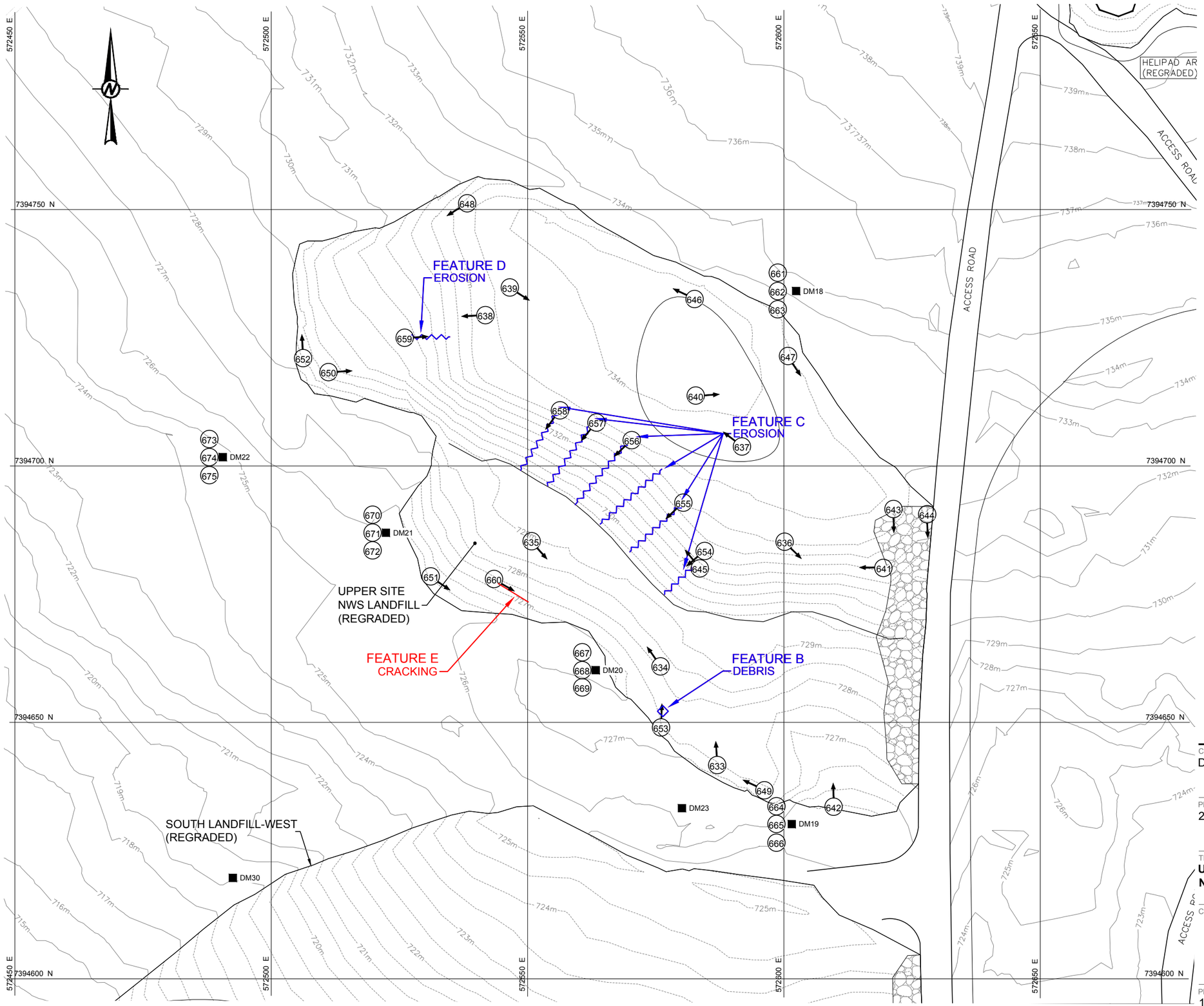
4.11.1 Landfill Description

The Upper Site NWS Landfill is located southwest of the Station Area, on the west side of the road. The Upper Site NWS Landfill was initially created during DEW Line operations. The area around the landfill has very little vegetative cover (<20%) (ESG 2002b). The Upper Site NWS Landfill was regraded and covered with clean fill in 2008 during the remediation of DYE-M. The landfill area is approximately 9,100 m^2. The Upper Site NWS Landfill, its features and soil sampling locations are provided in Figure DYE-M.12.

4.11.2 Visual Inspection

The Upper Site NWS Landfill exhibited some minor erosion and a new isolated tension crack during the 2017 visual inspection. Table 4-47 presents a summary of observed visual inspection features and Table 4-48 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-49 is a log of photographs taken during the 2017 visual inspection.

Previously observed areas of minor self-armouring erosion on the south slope (Feature C) and west end of the landfill (Feature D) were unchanged in 2017. There is a previously observed partially buried steel cable at the south toe of the landfill (Feature B) likely remaining from landfill construction. A new tension crack (Feature E) was observed on the south slope of the landfill near the toe. The observed features do not appear to be having a negative impact on the stability of the landfill. Feature A has not been assigned to this landfill.



LEGEND:

- DEBRIS
- EROSION
- CRACKING
- SOIL SAMPLING LOCATION
- PHOTOGRAPH LOCATION
- REGRADED RIP RAP
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 12.5 25
1:750 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER SITE
NWS LANDFILL

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO.	PHASE	REV.	FIGURE
1530908	3000	A	DYE-M.12

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada\99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\0014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0023.dwg | Last Saved by: tdr on Mar 28, 2018 - 2:01pm | Last Plotted by: tdr on Mar 28, 2018 - 2:01pm

Table 4-47: Visual Inspection Checklist – Upper Site NWS Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site NWS Landfill
DATE OF INSPECTION: August 4, 2017
DATE OF PREVIOUS INSPECTION: August 10, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-47: Visual Inspection Checklist – Upper Site NWS Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	C	South slope area	572,583	7,394,682	40	15	0.02	6.6%	Area of minor self-armouring erosion (Acceptable)	Unchanged since previous observation	654-658
	Y	D	West end of cover surface	572,526	7,394,725	9	0.2	0.02	0.02%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	659
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	Y	E	South slope	572,543	7,394,678	7	0.03	-	<0.01%	Minor tension crack (Acceptable)	New	660
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	-	-	-	-	-	-	-	-	-	-	-
Debris and/or Liner Exposed	Y	B	Lower south slope	572,576	7,394,649	1	-	-	-	Partially buried steel cable (Acceptable)	Previously observed	653

Table 4-47: Visual Inspection Checklist – Upper Site NWS Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	N	A	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 9,100 m^2.

Table 4-48: Preliminary Stability Assessment – Upper Site NWS Landfill

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Acceptable	Isolated
Animal Burrows	Not Observed	-
Vegetation Establishment	Not Observed	-
Staining	Not Observed	-
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Acceptable	Isolated
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-49: Summary Table of Photographic Log – Upper Site NWS Landfill

Photo	Easting	Northing	Date
Photo 633:	572,587	7,394,642	Aug. 4, 2017
Photo 634:	572,576	7,394,661	Aug. 4, 2017
Photo 635:	572,551	7,394,685	Aug. 4, 2017
Photo 636:	572,600	7,394,685	Aug. 4, 2017
Photo 637:	572,592	7,394,704	Aug. 4, 2017
Photo 638:	572,542	7,394,729	Aug. 4, 2017
Photo 639:	572,547	7,394,735	Aug. 4, 2017
Photo 640:	572,583	7,394,714	Aug. 4, 2017
Photo 641:	572,619	7,394,680	Aug. 4, 2017
Photo 642:	572,610	7,394,634	Aug. 4, 2017
Photo 643:	572,621	7,394,692	Aug. 4, 2017
Photo 644:	572,628	7,394,691	Aug. 4, 2017
Photo 645:	572,584	7,394,680	Aug. 4, 2017
Photo 646:	572,583	7,394,733	Aug. 4, 2017
Photo 647:	572,601	7,394,721	Aug. 4, 2017
Photo 648:	572,538	7,394,751	Aug. 4, 2017
Photo 649:	572,596	7,394,637	Aug. 4, 2017
Photo 650:	572,511	7,394,718	Aug. 4, 2017
Photo 651:	572,531	7,394,679	Aug. 4, 2017
Photo 652:	572,506	7,394,721	Aug. 4, 2017

Table 4-49: Summary Table of Photographic Log – Upper Site NWS Landfill

Photo	Easting	Northing	Date
Photo 653:	572,576	7,394,649	Aug. 4, 2017
Photo 654:	572,583	7,394,682	Aug. 4, 2017
Photo 655:	572,580	7,394,693	Aug. 4, 2017
Photo 656:	572,570	7,394,705	Aug. 4, 2017
Photo 657:	572,563	7,394,709	Aug. 4, 2017
Photo 658:	572,556	7,394,711	Aug. 4, 2017
Photo 659:	572,526	7,394,725	Aug. 4, 2017
Photo 660:	572,543	7,394,678	Aug. 4, 2017

4.11.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at DM-19 and DM-20 could not be collected due to refusal on rock.

4.11.4 Soil Sampling

Table 4-50 presents a summary of analytical results for soil samples collected at the Upper Site NWS Landfill. DM-18 represents an upgradient sampling location, whereas DM-19, DM-20, DM-21, DM-22 and DM-23 represent downgradient sampling locations.

Table 4-50 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site NWS Landfill, the background arithmetic means for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Upper Site NWS in 2017. There were no detections of PCB or PHC at any location at this landfill in 2017.

DM-18

Sampling location DM-18 is located upgradient of the landfill, immediately north of the toe. The estimated elevation of this sampling point is 733.5 masl. As shown in Photo 661, the area consists of sand and gravel with some rocks and is sparsely vegetated. The soils consisted of grey sand with some gravel.

For the shallow sample at DM-18 (0-15 cm), the concentrations of all metals were less than or similar to previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-18 (20-30 cm), the concentrations of all detected metals were less than those in the shallow sample. The concentrations of most metals were less than or similar to those reported in 2014. Whereas the concentrations of chromium and nickel increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-19

Sampling location DM-19 is located downgradient of the landfill, approximately 7 m south of the toe. The estimated elevation of this sampling point is 725.5 masl. As shown in Photo 664, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel.

For shallow sample at DM-19 (0-15 cm), the concentrations of all detected metals were greater than previous years; however, the concentrations are not substantially above the baseline mean. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-20

Sampling location DM-20 is located downgradient of the landfill, immediately west of the toe. The estimated elevation of this sampling point is 727 masl. As shown in Photo 667, the area consists of gravel and rock with boulders and is not vegetated. The soils consisted of a brown sand with some gravel and stone.

For the shallow sample at DM-20 (0-15 cm), the concentration of zinc was slightly greater than those reported in previous years however the concentration is not above the baseline mean; the concentrations of all other metals were less than or similar to previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-21

Sampling location DM-21 is located downgradient of the landfill, approximately 6 m west of the toe. The estimated elevation of this sampling point is 726 masl. As shown in Photo 670, the area consists of gravel and rock with boulders and is not vegetated. The soils consisted of a grey sand with some gravel and stone.

For the shallow sample at DM-21 (0-15 cm, duplicate location), the concentrations of most metals were slightly greater than those reported in previous years; however, most results were similar to their respective baseline mean concentrations and within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-21 (20-30 cm), the concentrations of all detected metals were less than those in the shallow sample. The concentrations of most metals were less than or similar to those reported in 2014. Whereas the slightly increased concentrations of chromium and nickel represent new historical maxima, these results are less than their respective baseline mean concentrations and are within their respective ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-22

Sampling location DM-22 is located downgradient of the landfill, approximately 13 m southwest of the toe. The estimated elevation of this sampling point is 725.5 masl. As shown in Photo 673, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of grey brown sand with some gravel.

For the shallow sample at DM-22 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years. Whereas the concentrations of copper and lead represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-22 (20-30 cm), metals concentrations were similar to those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-23

Sampling location DM-23 is located downgradient of the landfill, approximately 13 m south of the toe. The estimated elevation of this sampling point is 726 masl. As shown in Photo 713, the area consists of sand, gravel and rock with boulders and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-23 (0-15 cm), the concentrations of a number of the metals were less than or similar to those reported in previous years. Whereas the slightly increased concentrations of cobalt and nickel represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-23 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were greater than those reported in 2014; these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-50: Soil Chemical Analysis Results – Upper Site NWS Landfill

ID	Depth (m)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	142.1	23.0	70.2	35.3	181.0	154.6	0.10	NA	NA	NA	NA
Upgradient														
DM-18 Shallow	0-15	<1.0	<0.5	**72.7**	**12.2**	**36.0**	**14.4**	**67.2**	48.0	<0.05	<7	<4	<8	<6
DM-18 Deep	20-30	<1.0	<0.5	24.2	8.1	20.6	**10.8**	38.4	44.9	<0.05	<7	<4	<8	<6
Downgradient														
DM-19 Shallow	0-15	<1.0	<0.5	30.0	9.7	**25.8**	**10.4**	41.9	60.0	<0.05	<7	<4	<8	<6
DM-19 Deep[1]														
DM-20 Shallow	0-15	<1.0	<0.5	19.2	7.3	**30.1**	**14.5**	27.1	56.9	<0.05	<7	<4	<8	<6
DM-20 Deep[1]														
DM-21 Shallow	0-15	<1.0	<0.5	15.5	9.0	18.0	**13.5**	23.3	**99.2**	<0.05	<7	<4	<8	<6
DM-921 Shallow (Duplicate)	0-15	<1.0	<0.5	18.3	10.3	20.7	**15.4**	25.6	**110**	<0.05	<7	<4	<8	<6
DM-21 Shallow (Dup Avg)	0-15	<1.0	<0.5	16.9	9.7	19.4	**14.5**	24.5	**105**	<0.05	<7	<4	<8	<6
DM-21 Deep	20-30	<1.0	<0.5	15.3	9.0	16.7	**13.1**	22.0	**98.6**	<0.05	<7	<4	<8	<6
DM-22 Shallow	0-15	<1.0	<0.5	19.8	**13.9**	**40.7**	**13.6**	35.1	51.5	<0.05	<7	<4	<8	<6
DM-22 Deep	20-30	<1.0	<0.5	18.2	**14.4**	**42.7**	8.8	30.9	44.6	<0.05	<7	<4	<8	<6
DM-23 Shallow	0-15	<1.0	<0.5	36.0	**11.1**	22.4	9.0	**66.9**	42.0	<0.05	<7	<4	<8	<6
DM-23 Deep	30-40	<1.0	<0.5	33.7	**11.4**	23.3	8.0	**72.9**	40.8	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil samples at DM-19 and DM-20 could not be collected due to refusal on rock.

4.11.5 Conclusions and Overall Performance of the Upper Site NWS Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Upper Site NWS Landfill. Some areas of self-armouring erosion, an isolated crack and partially buried steel cable were observed along the south and west slopes of the landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of cadmium, arsenic, PCB or PHC were noted in any of the samples in 2017. The concentrations of metals were similar at all locations. Slight increases in some of metals concentrations were noted; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. Metals concentrations at all locations remain well below the baseline mean concentrations plus 3σ were reported in 2017.

There is no evident ongoing impact of the NWS landfill on soil quality.

4.11.6 Recommendations for Upper Site NWS Landfill

No modifications to the ongoing monitoring program at this landfill are recommended.

4.12 Upper Site South Landfill West

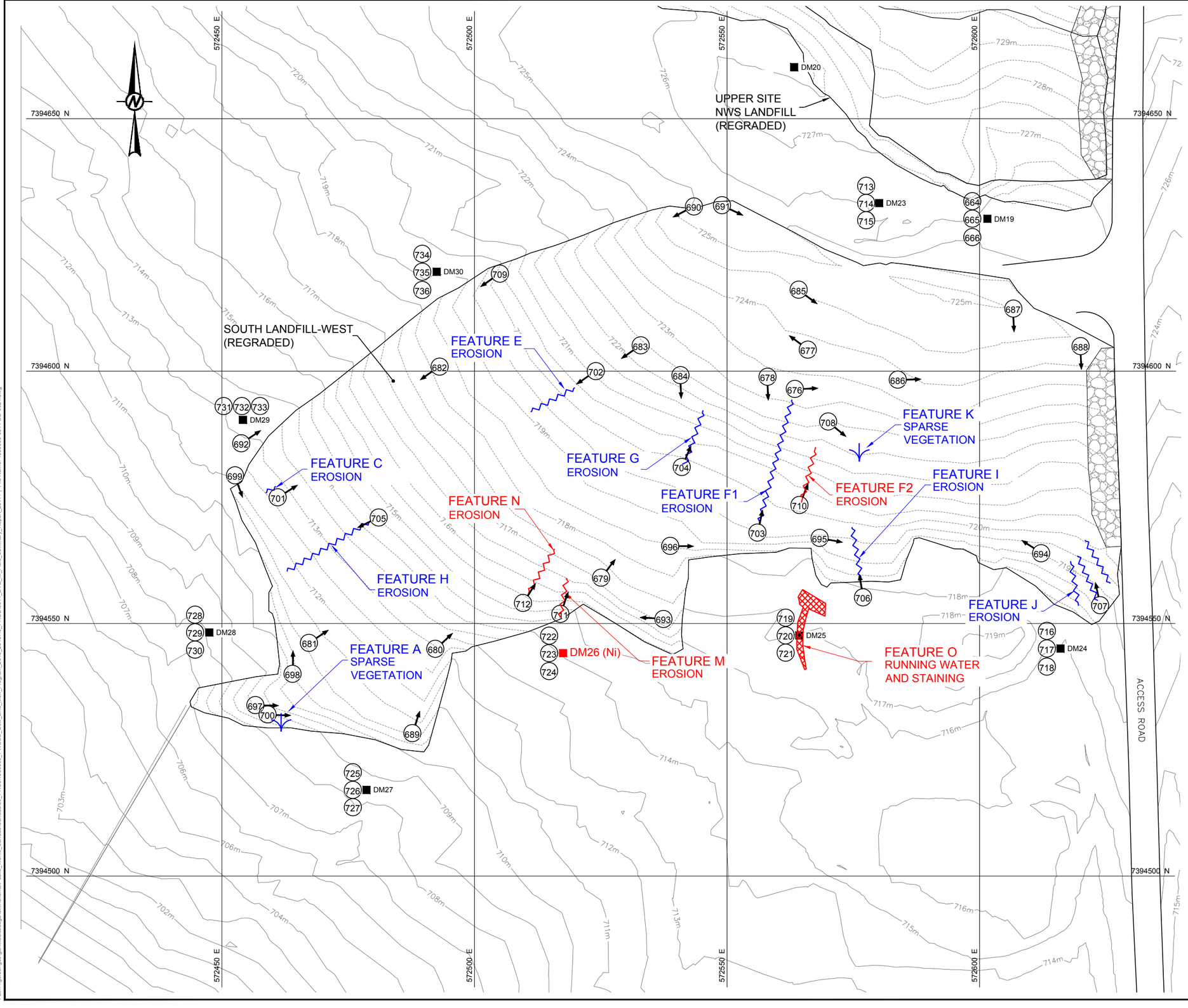
4.12.1 Landfill Description

The Upper Site South Landfill West is located approximately 25 metres south and downgradient of the Upper Site NWS Landfill. The Upper Site South Landfill West was initially created during DEW Line operations. The landfill was regraded and covered with clean fill in 2008 during the remediation of DYE-M. The landfill covers an area of approximately 11,700 m^2. There are nine soil sampling locations for this landfill, no monitoring wells and no thermistors. The Upper Site South Landfill West, its features and soil sampling locations are provided in Figure DYE-M.13.

4.12.2 Visual Inspection

The Upper Site South Landfill West exhibited areas of minor erosion, ponded and running water, and sparse vegetation. Table 4-51 presents a summary of observed visual inspection features and Table 4-52 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all of the observed features were assessed as “Acceptable.” Table 4-53 is a log of photographs taken during the 2017 visual inspection.

Most of the previously observed self-armouring erosion (Features C, E, F1, G, H, I and J) appeared to be unchanged in 2017 compared to the last inspection and is stabilizing over time. An area of new self-armouring erosion was observed on the south-central cover (Feature F2), parallel to Feature F1. In addition, two new erosion channels were observed on the south slope in 2017 (Features M and N). Previously observed sparse vegetation (Features A and K) was unchanged in 2017. A previously observed minor crack (Feature L) was not observed in 2017. The south toe of the landfill (near soil sampling location DM-25) was wet with melting snow, running water and orange coloured soil (Feature O - Photo 719). The observed features do not appear to be negatively impacting the stability of the landfill. Features B and D have not been assigned to the Upper Site South Landfill West.



LEGEND:

- EROSION
- CRACKING
- VEGETATION
- RUNNING WATER AND STAINING
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- REGRADED RIP RAP
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

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1:750 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER SITE
SOUTH LANDFILL WEST

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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Table 4-51: Visual Inspection Checklist – Upper Site South Landfill West

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site South Landfill West
DATE OF INSPECTION: August 4, 2017
DATE OF PREVIOUS INSPECTION: August 10, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 4
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-51: Visual Inspection Checklist – Upper Site South Landfill West

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	N	-	-	-	-	-	-	-	-	-	-	-
Erosion	Y	C	Cover surface	572,461	7,394,575	1	0.3	0.1	<0.01%	Minor self-armouring erosion with accumulation of fines in a low area from erosion above (Acceptable)	Unchanged since previous observation	701
	Y	E	Cover surface	572,524	7,394,600	10	0.3	0.05	0.03%	Minor self-armouring erosion with accumulation of fines below (Acceptable)	Unchanged since previous observation	702
	Y	F1	Cover surface	572,556	7,394,568	20	0.2	0.03	0.03%	Minor self-armouring erosion channel from the middle of landfill towards south (Acceptable)	Unchanged since previous observation	703
	Y	F2	Cover surface	572,564	7,394,573	10	2	0.1	0.04%	Minor self-armouring erosion (Acceptable)	New	710
	Y	G	Cover surface	572,541	7,394,581	14	0.2	0.02	0.02%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	704
	Y	H	Cover surface	572,481	7,394,571	19	0.2	0.02	0.03%	Minor self-armouring erosion channel (Acceptable)	Unchanged since previous observation	705
	Y	I	Cover surface	572,574	7,394,568	10	0.1	0.02	0.01%	Minor self-armouring erosion (Acceptable)	Unchanged since previous observation	706
	Y	J	Cover surface	572,609	7,394,567	10	8	0.02	0.64%	Area of self-armouring erosion with 0.5-1m wide channels (Acceptable)	Unchanged since previous observation, appears to be stabilizing with time	707
	Y	M	South slope	572,517	7,394,552	7	0.3	0.1	0.02%	Minor self-armouring erosion (Acceptable)	New	711
	Y	N	South slope	572,510	7,394,554	10	2	0.1	0.17%	Minor self-armouring erosion (Acceptable)	New	712

Table 4-51: Visual Inspection Checklist – Upper Site South Landfill West

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	N	L	North crest	-	-	-	-	-	-	Minor tension cracking (Acceptable)	Not observed in 2017	709
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	Y	A	South slope	572,459	7,394,532	1	1	-	<0.01%	Sparse vegetation (Acceptable)	Unchanged since previous observation	700
	Y	K	Cover surface	572,570	7,394,590	1	1	-	<0.01%	Sparse vegetation (Acceptable)	Unchanged since previous observation	708
Staining	Y	O	South toe	572,564	7,394,548	17	2-5	-	0.26%	Wet area with melting snow, running water and orange staining (Acceptable)	New	719
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	Y	O	South toe	572,564	7,394,548	15	2	0.1	0.26%	Wet area with melting snow and running water (Acceptable)	New	719
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	N	B and D	-	-	-	-	-	-	-	Not assigned	Not assigned	-

Landfill Area = 11,700 m^2.

Table 4-52: Preliminary Stability Assessment – Upper Site South Landfill West

Feature	Severity Rating	Extent
Settlement	Not Observed	-
Erosion	Acceptable	Occasional
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Not Observed	-
Animal Burrows	Not Observed	-
Vegetation Establishment	Acceptable	Occasional
Staining	Acceptable	Isolated
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Acceptable	Isolated
Debris and/or Liner Exposure	Not Observed	-
Other	Not Observed	-
Overall Landfill Performance	**Acceptable**	

Table 4-53: Summary Table of Photographic Log – Upper Site South Landfill West

Photo	Easting	Northing	Date
Photo 676:	572,563	7,394,596	Aug. 4, 2017
Photo 677:	572,566	7,394,604	Aug. 4, 2017
Photo 678:	572,558	7,394,599	Aug. 4, 2017
Photo 679:	572,525	7,394,559	Aug. 4, 2017
Photo 680:	572,492	7,394,545	Aug. 4, 2017
Photo 681:	572,467	7,394,546	Aug. 4, 2017
Photo 682:	572,493	7,394,601	Aug. 4, 2017
Photo 683:	572,533	7,394,605	Aug. 4, 2017
Photo 684:	572,541	7,394,599	Aug. 4, 2017
Photo 685:	572,564	7,394,616	Aug. 4, 2017
Photo 686:	572,584	7,394,598	Aug. 4, 2017
Photo 687:	572,607	7,394,612	Aug. 4, 2017
Photo 688:	572,620	7,394,605	Aug. 4, 2017
Photo 689:	572,488	7,394,528	Aug. 4, 2017
Photo 690:	572,543	7,394,633	Aug. 4, 2017
Photo 691:	572,549	7,394,633	Aug. 4, 2017
Photo 692:	572,454	7,394,586	Aug. 4, 2017
Photo 693:	572,537	7,394,551	Aug. 4, 2017
Photo 694:	572,612	7,394,564	Aug. 4, 2017
Photo 695:	572,568	7,394,567	Aug. 4, 2017

Table 4-53: Summary Table of Photographic Log – Upper Site South Landfill West

Photo	Easting	Northing	Date
Photo 696:	572,539	7,394,565	Aug. 4, 2017
Photo 697:	572,457	7,394,534	Aug. 4, 2017
Photo 698:	572,464	7,394,540	Aug. 4, 2017
Photo 699:	572,453	7,394,579	Aug. 4, 2017
Photo 700:	572,459	7,394,532	Aug. 4, 2017
Photo 701:	572,461	7,394,575	Aug. 4, 2017
Photo 702:	572,524	7,394,600	Aug. 4, 2017
Photo 703:	572,556	7,394,568	Aug. 4, 2017
Photo 704:	572,541	7,394,581	Aug. 4, 2017
Photo 705:	572,481	7,394,571	Aug. 4, 2017
Photo 706:	572,574	7,394,568	Aug. 4, 2017
Photo 707:	572,609	7,394,567	Aug. 4, 2017
Photo 708:	572,570	7,394,590	Aug. 4, 2017
Photo 709:	572,505	7,394,619	Aug. 4, 2017
Photo 710:	572,564	7,394,574	Aug. 4, 2017
Photo 711:	572,517	7,394,552	Aug. 4, 2017
Photo 712:	572,510	7,394,554	Aug. 4, 2017
Photo 719:	572,564	7,394,548	Aug. 4, 2017

4.12.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at DM-19, DM-24, DM-25 and DM-27 could not be collected due to refusal on rock (assumed boulder).

4.12.4 Soil Sampling

Table 4-54 presents a summary of analytical results for soil samples collected at the Upper Site South Landfill West. DM-19 and DM-23 represent upgradient sampling locations, whereas DM-24, DM-25, DM-26, DM-27, DM-28, DM-29 and DM-30 represent downgradient sampling locations. It should be noted that whereas sampling locations DM-19 and DM-23 are considered to be located upgradient of the Upper Site South Landfill West, they are also located downgradient of the nearby Upper Site NWS Landfill.

Table 4-54 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site South Landfill West, the background arithmetic means for chromium, cobalt, copper and nickel are greater than the baseline arithmetic means and the background arithmetic mean for nickel is also greater than the baseline concentrations plus 3σ. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for arsenic, cadmium, lead and PCB, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Upper Site South Landfill in 2017. There were no detections of PCB or PHC at any location at this landfill in 2017.

DM-19

Sampling location DM-19 is located upgradient of the landfill, approximately 7 m south of the toe of the nearby NWS landfill. The estimated elevation of this sampling point is 725.5 masl. As shown in Photo 664, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel.

For shallow sample at DM-19 (0-15 cm), the concentrations of all detected metals were greater than previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-23

Sampling location DM-23 is located upgradient of the landfill, approximately 4 m north of the toe. The estimated elevation of this sampling point is 726 masl. As shown in Photo 713, the area consists of sand, gravel and rock with boulders and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-23 (0-15 cm), the concentrations of a number of the metals were less than or similar to those reported in previous years. Whereas the slightly increased concentrations of cobalt and nickel represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-23 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were greater than those reported in 2014; these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-24

Sampling location DM-24 is located downgradient of the landfill, approximately 6 m south of the toe. The estimated elevation of this sampling point is 717 masl. As shown in Photo 716, the area is largely covered with gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone. At the time of sampling, snow was located along the toe of the landfill near the sample location.

For the shallow sample at DM-24 (0-5 cm), the concentrations of most metals were greater than those reported in previous years, notably chromium and nickel. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-25

Sampling location DM-25 is located downgradient of the landfill, approximately 13 m south of the toe. The estimated elevation of this sampling point is 717 masl. As shown in Photo 719, the area is largely covered with sand and gravel with some rock and is not vegetated. The soils consisted of grey sand with gravel and stone. This soil sampling location is located adjacent to a wet area with running water on orange coloured soil downslope of the landfill.

For the shallow sample at DM-25 (0-15 cm, duplicate location), the concentrations of most metals were similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-26

Sampling location DM-26 is located downgradient of the landfill, approximately 6 m south of the toe. The estimated elevation of this sampling point is 714 masl. As shown in Photo 722, the area is largely covered with sand and gravel with some rock and is not vegetated. The soils consisted of brown sand and some gravel.

For the shallow sample at DM-26 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years. Whereas the concentrations of cobalt and nickel increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-26 (30-40 cm), most metals concentrations were greater than those in the shallow sample. The concentrations of a number of detected metals were less than those reported in 2014; the concentrations of chromium, cobalt and nickel increased slightly and represent new historical maxima. The nickel concentration of 220 mg/kg exceeded the baseline mean concentration plus 3σ (94.5 mg/kg).

DM-27

Sampling location DM-27 is located downgradient of the landfill, approximately 15 m south of the toe. The estimated elevation of this sampling point is 708 masl. As shown in Photo 725, the area is largely covered with sand and some gravel and rock and is not vegetated. The soils consisted of brown sand with some gravel.

For the shallow sample at DM-27 (0-15 cm), the concentrations of most metals were similar to those reported in previous years. Whereas the concentrations of copper and lead increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-28

Sampling location DM-28 is located downgradient of the landfill, approximately 12 m west of the toe. The estimated elevation of this sampling point is 708.5 masl. As shown in Photo 728, the area is largely covered with gravel, rocks and boulders and is not vegetated. The soils consisted of grey sand, gravel and stone.

For the shallow sample at DM-28 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-28 (40-50 cm), metals concentrations were greater than those in the shallow sample. The concentrations of most detected metals were slightly greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-29

Sampling location DM-29 is located downgradient of the landfill, approximately 10 m north of the toe. The estimated elevation of this sampling point is 714 masl. As shown in Photo 731, the area is largely covered with gravel and rock and is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-29 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-29 (30-40 cm), metals concentrations were similar to those in the shallow sample. The concentrations of most detected metals were less than or similar to those reported in previous years. Whereas the concentrations of chromium and zinc increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-30

Sampling location DM-30 is located cross-gradient of the landfill, approximately 7 m north of the toe. The estimated elevation of this sampling point is 720 masl. As shown in Photo 734, the area is largely covered with sand and gravel is not vegetated. The soils consisted of brown sand with gravel and stone.

For the shallow sample at DM-30 (0-15 cm), the concentrations of most metals were similar to those reported in previous years; the concentrations of lead and zinc were marginally greater. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-30 (40-50 cm), metals concentrations were greater than those in the shallow sample. The concentrations of most detected metals were marginally greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

Table 4-54: Soil Chemical Analysis Results – Upper Site South Landfill West

ID	Depth (m)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	177.7	24.1	71.8	14.8	94.5	232.1	0.10	NA	NA	NA	NA
Upgradient														
DM-19 Shallow	0-15	<1.0	<0.5	30.0	9.7	**25.8**	10.4	**41.9**	60.0	<0.05	<7	<4	<8	<6
DM-19 Deep[1]														
DM-23 Shallow	0-15	<1.0	<0.5	36.0	11.1	22.4	9.0	**66.9**	42.0	<0.05	<7	<4	<8	<6
DM-23 Deep	30-40	<1.0	<0.5	33.7	**11.4**	23.3	8.0	**72.9**	40.8	<0.05	<7	<4	<8	<6
Downgradient														
DM-24 Shallow	0-5	<1.0	<0.5	**142**	**15.5**	**41.7**	8.0	**74.5**	83.2	<0.05	<7	<4	<8	<6
DM-24 Deep[1]														
DM-25 Shallow	0-15	<1.0	<0.5	32.6	**14.0**	**27.0**	11.7	**67.9**	81.9	<0.05	<7	<4	<8	<6
DM-925 Shallow (Duplicate)	0-15	<1.0	<0.5	37.4	**14.7**	**29.1**	9.6	**71.2**	81.2	<0.05	<7	<4	<8	<6
DM-25 Shallow (Dup Avg)	0-15	<1.0	<0.5	35.0	**14.4**	**28.1**	10.7	**69.6**	81.6	<0.05	<7	<4	<8	<6
DM-25 Deep[1]														
DM-26 Shallow	0-15	<1.0	<0.5	**68.3**	**12.8**	**27.1**	8.0	**62.9**	65.2	<0.05	<7	<4	<8	<6
DM-26 Deep	30-40	<1.0	<0.5	**139**	**15.2**	17.4	7.5	**220**	82.0	<0.05	<7	<4	<8	<6
DM-27 Shallow	0-15	<1.0	<0.5	28.3	10.2	**35.1**	10.9	26.7	73.1	<0.05	<7	<4	<8	<6
DM-27 Deep[1]														
DM-28 Shallow	0-15	<1.0	<0.5	29.1	10.8	15.4	7.9	26.5	73.8	<0.05	<7	<4	<8	<6
DM-28 Deep	40-50	<1.0	<0.5	39.5	**13.2**	21.6	8.1	**44.9**	78.3	<0.05	<7	<4	<8	<6
DM-29 Shallow	0-15	<1.0	<0.5	24.6	9.1	19.2	9.4	**47.9**	40.7	<0.05	<7	<4	<8	<6
DM-29 Deep	30-40	<1.0	<0.5	31.5	8.8	20.3	7.3	**47.9**	42.3	<0.05	<7	<4	<8	<6

Table 4-54: Soil Chemical Analysis Results – Upper Site South Landfill West

ID	Depth (m)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		1.00	1.00	177.7	24.1	71.8	14.8	94.5	232.1	0.10	NA	NA	NA	NA
DM-30 Shallow	0-15	<1.0	<0.5	29.2	8.7	22.7	7.8	33.9	53.7	<0.05	<7	<4	<8	<6
DM-30 Deep	40-50	<1.0	<0.5	37.7	10.5	**28.4**	9.9	37.6	63.9	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil samples at DM-19, DM-23, DM-24, DM-25, DM-26, DM-27, DM-28 and DM-29 could not be collected due to refusal on rock.

4.12.5 Conclusions and Overall Performance of the Upper Site South Landfill West

Based on the visual inspection, there does not appear to be any significant erosion, settlement, exposed waste or indications of instability at the Upper Site South Landfill West. Some minor self-armouring erosion, sparse vegetation on the cover surface, and running water with orange stained soil at the south toe were observed during the inspection. The overall stability performance of this landfill was assessed as Acceptable.

The concentrations of metals were highest overall at the shallow sample location DM-24 and the deep sample location DM-26, located downgradient of the south side of the landfill. At DM-24, concentrations of most metals were greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. At the deep DM-26 sample location, the concentrations of most detected metals were less than those reported in 2014, whereas the concentrations of chromium, cobalt and nickel increased. The nickel concentration of 220 mg/kg exceeded the baseline mean concentration plus 3σ (94.5 mg/kg). At the remaining sampling locations, the concentrations of most metals were less than or similar those reported in previous years. An area of running water flowing over orange stained soil was noted near downgradient sample location DM-25. This area is downslope of where the landfill cover material exhibited staining, with no sheen. It appears that the staining may be related to the cover material, based on the areal extent (as opposed to point source) of the discoloration. For the shallow sample at this location, the concentrations of most metals were similar to those reported in previous years. No detectable concentrations of cadmium, arsenic, PCB or PHC were noted in any of the samples in 2017.

Overall, the results of the monitoring at this landfill do not indicate ongoing impact. Continued close scrutiny of downgradient results, notably DM-25 and DM-26, should be undertaken.

4.12.6 Recommendations for Upper Site South Landfill West

No modifications to the ongoing monitoring program at this landfill are recommended.

4.13 Upper Site Helipad Landfill

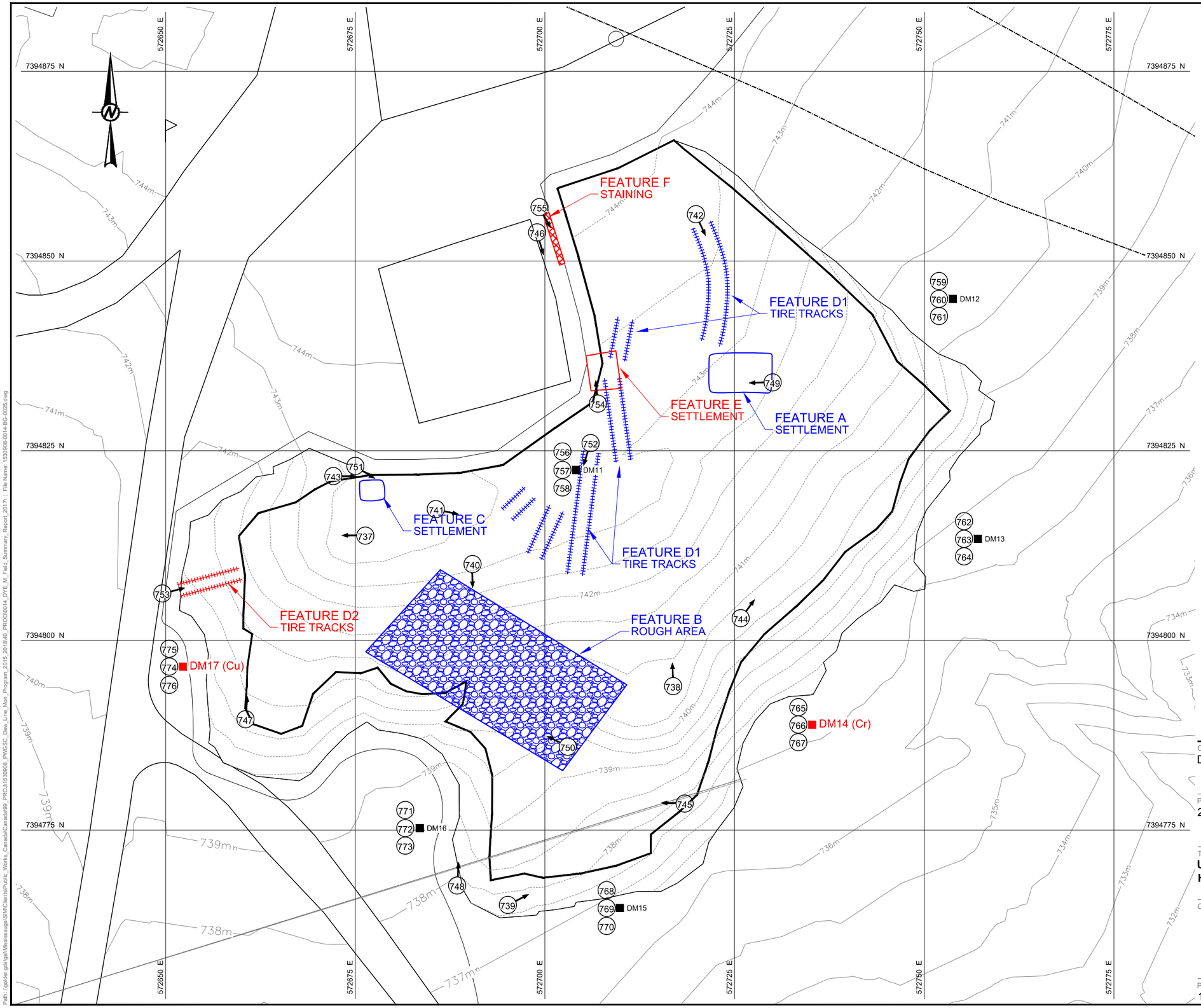
4.13.1 Landfill Description

The Upper Site Helipad Landfill is located between the existing helipad and the south side of the station. It is a former landfill that was created during DEW Line operations. The Upper Site Helipad Landfill was regraded and covered with clean fill in 2008 during the remediation of DYE-M. The area of the regraded landfill is approximately 5,600 m^2. There is one soil sampling location on the landfill and six surrounding it. There are no monitoring wells or thermistors at this landfill. It is a small landfill and for that reason was not formally monitored in 2014; this is why this is only its third monitoring event for this landfill, whereas for the other landfills it is the fourth. The Upper Site Helipad Landfill, its features and soil sampling locations are provided in Figure DYE-M.14.

4.13.2 Visual Inspection

The Upper Site Helipad Landfill exhibited some minor settlement, rough grading, staining and tire tracks. Table 4-55 presents a summary of observed visual inspection features and Table 4-56 presents the Preliminary Stability Assessment results. This landfill was assessed to have an “Acceptable” overall performance because all observed features were assessed as “Acceptable.” Table 4-57 is a log of photographs taken during the 2017 visual inspection.

Previously observed minor settlement areas on the cover surface (Features A and C) were unchanged in 2017. A new settlement area was observed at the northwest end of the landfill (Feature E). The previously observed area of rough grading at the southwest end of the landfill (Feature B) was unchanged in 2017. Previously observed tire tracks on the cover surface (Feature D1) were observed to be unchanged. There were some new tire tracks on the west slope (Feature D2). A new hydrocarbon stain (Feature F) was observed along the northwest toe of the landfill. The observed features do not appear to be impacting the stability of the landfill.



LEGEND:

- SETTLEMENT
- ROUGH AREAS
- TIRE TRACKS
- STAINING
- SOIL SAMPLING LOCATION
- SOIL SAMPLING LOCATION WITH EXCEEDANCE OF BASELINE MEAN PLUS 3σ
- PHOTOGRAPH LOCATION
- GROUND SURFACE CONTOUR

NOTES

1. GRID PROJECTION IS NAD83 ZONE 20N. ELEVATIONS ARE GEODETIC.
2. *LOCATIONS AND SCALE OF FEATURES ARE APPROXIMATE AND SHOWN FOR ILLUSTRATIVE PURPOSES ONLY.*
3. FEATURES DRAWN IN RED ARE EITHER NEW OR EXPANDED.

REFERENCE

ORIGINAL INSPECTION FIGURE PROVIDED BY AECOM, PROJECT NO. 60323208 (0171-LANDFILL MONITORING), DATED MARCH 2015.

0 10 20
1:500 METRES

CLIENT
DEPARTMENT OF NATIONAL DEFENCE CANADA

PROJECT
2017 DYE-M MONITORING REPORT

TITLE
UPPER SITE
HELIPAD

CONSULTANT
GOLDER

YYYY-MM-DD	2018-03-28
DESIGNED	RM
PREPARED	TDR
REVIEWED	DCJ
APPROVED	DP

PROJECT NO. 1530908 | PHASE 3000 | REV. A | FIGURE DYE-M.14

Path: \\golder.gds\gal\Mississauga\SIM\Clients\Public_Works_Canada\Canada99_PROJ\1530908_PWGSC_Dew_Line_Mon_Program_2015_2018\40_PROD\00014_DYE_M_Field_Summary_Report_2017\ | File Name: 1530908-0014-BG-0025.dwg
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
0 25 mm

Table 4-55: Visual Inspection Checklist – Upper Site Helipad Landfill

SITE NAME: DYE-M Cape Dyer
LANDFILL DESIGNATION: Upper Site Helipad Landfill
DATE OF INSPECTION: August 4, 2017
DATE OF PREVIOUS INSPECTION: August 10, 2016
INSPECTED BY: Reza Moghaddam
REPORT PREPARED BY: Reza Moghaddam
MONITORING EVENT NUMBER: 3
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Table 4-55: Visual Inspection Checklist – Upper Site Helipad Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Settlement	Y	A	Cover surface	572,730	7,394,834	8	6	0.3	0.86%	Minor settlement (Acceptable)	Unchanged since previous observation	749
	Y	C	Cover surface	572,675	7,394,823	3	3	0.3	0.16%	Minor settlement (Acceptable)	Unchanged since previous observation	751
	Y	E	Cover surface	572,707	7,394,831	5	4	0.2	0.36%	Minor settlement (Acceptable)	New	754
Erosion	Y	B	South slope	572,703	7,394,786	27	15	0.1	7.2%	Rough area (Acceptable)	Unchanged since previous observation	750
Lateral Movement	N	-	-	-	-	-	-	-	-	-	-	-
Frost Action	N	-	-	-	-	-	-	-	-	-	-	-
Sloughing	N	-	-	-	-	-	-	-	-	-	-	-
Cracking	N	-	-	-	-	-	-	-	-	-	-	-
Animal Burrows	N	-	-	-	-	-	-	-	-	-	-	-
Vegetation	N	-	-	-	-	-	-	-	-	-	-	-
Staining	Y	F	Northwest toe	572,699	7,394,857	7	0.2	-	0.03%	Hydrocarbon stain (Acceptable)	New	755
Vegetation Stress	N	-	-	-	-	-	-	-	-	-	-	-
Seepage or Ponded Water	N	-	-	-	-	-	-	-	-	-	-	-
Debris and/or Liner Exposed	N	-	-	-	-	-	-	-	-	-	-	-

Table 4-55: Visual Inspection Checklist – Upper Site Helipad Landfill

Checklist Item	Present (Y/N)	Feature ID (A, B, etc.)	Location Description	Easting	Northing	Length (m)	Width (m)	Depth (m)	Extent of Landfill Area (%)	Description (Severity Rating)	Comparison to Historical Observations	Photos
Presence / Condition of Monitoring Instruments	N	-	-	-	-	-	-	-	-	-	-	-
Features of Note / Other Observations	Y	D1	Cover surface	572,706	7,394,826	100	2	0.2	4%	Tire tracks (Acceptable)	Previously observed, no change	742, 752
	Y	D2	West slope	572,650	7,394,806	10	2	0.2		Tire tracks (Acceptable)	New	753

Landfill Area = 5,600 m^2.

Table 4-56: Preliminary Stability Assessment – Upper Site Helipad Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Lateral Movement	Not Observed	-
Frost Action	Not Observed	-
Sloughing	Not Observed	-
Cracking	Not Observed	-
Animal Burrows	Not Observed	-
Vegetation Establishment	Not Observed	-
Staining	Acceptable	Isolated
Vegetation Stress	Not Observed	-
Seepage/Ponded Water	Not Observed	-
Debris and/or Liner Exposure	Not Observed	-
Other	Acceptable	Occasional
Overall Landfill Performance	**Acceptable**	

Table 4-57: Summary Table of Photographic Log – Upper Site Helipad Landfill

Photo	Easting	Northing	Date
Photo 737:	572,676	7,394,814	Aug. 4, 2017
Photo 738:	572,717	7,394,794	Aug. 4, 2017
Photo 739:	572,695	7,394,765	Aug. 4, 2017
Photo 740:	572,690	7,394,810	Aug. 4, 2017
Photo 741:	572,686	7,394,817	Aug. 4, 2017
Photo 742:	572,720	7,394,856	Aug. 4, 2017
Photo 743:	572,672	7,394,822	Aug. 4, 2017
Photo 744:	572,726	7,394,803	Aug. 4, 2017
Photo 745:	572,718	7,394,779	Aug. 4, 2017
Photo 746:	572,699	7,394,854	Aug. 4, 2017
Photo 747:	572,661	7,394,790	Aug. 4, 2017
Photo 748:	572,688	7,394,768	Aug. 4, 2017
Photo 749:	572,730	7,394,834	Aug. 4, 2017
Photo 750:	572,703	7,394,786	Aug. 4, 2017
Photo 751:	572,675	7,394,823	Aug. 4, 2017
Photo 752:	572,706	7,394,826	Aug. 4, 2017
Photo 753:	572,650	7,394,806	Aug. 4, 2017
Photo 754:	572,707	7,394,831	Aug. 4, 2017
Photo 755:	572,699	7,394,857	Aug. 4, 2017

4.13.3 Summary of Sampling Deviations

The field work was conducted as per the TOR with the following exceptions:

- The deep soil samples at DM-11, DM-15 and DM-16 could not be collected due to refusal on rock.

4.13.4 Soil Sampling

Table 4-58 presents a summary of analytical results for soil samples collected at the Upper Site Helipad Landfill. DM-11 is a sampling location within the landfill footprint (cover), whereas DM-12, DM-13, DM-14, DM-15, DM-16 and DM-17 represent downgradient sampling locations. The deep soil samples at DM-11, DM-15 and DM-16 could not be collected due to refusal.

Table 4-58 also lists the arithmetic mean background and baseline values for the landfill, in addition to the baseline plus 3σ limits. At the Upper Site Helipad Landfill, the background arithmetic means for chromium, cobalt, copper, nickel and zinc are greater than the baseline arithmetic means. Additionally, the arithmetic mean baseline and the baseline concentrations plus 3σ are the same for cadmium, which reflects the fact that baseline concentrations of these parameters were primarily at or below laboratory detection limits.

There was no arsenic or cadmium detected in the soil samples at the Upper Site Helipad Landfill in 2017. With the exception of DM-12 (deep) and DM-13 (shallow), there were no detections of PCB at any location in 2017.

DM-11

Sampling location DM-11 is located within the landfill footprint (cover), immediately in an area with tire tracks as shown in Photo 756. The estimated elevation of this sampling point is 743 masl. As shown in Photo 756, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-11 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-12

Sampling location DM-12 is located downgradient of the landfill, approximately 6 m northeast of the toe. The estimated elevation of this sampling point is 741 masl. As shown in Photo 759, the area is largely covered with sand and gravel and is not vegetated. The soils consisted of brown sand with some gravel.

For the shallow sample at DM-12 (0-15 cm), the concentrations of all metals were less than or similar to those reported in previous years. A modified TPH concentration of 31 mg/kg was reported in 2017, which was less than the concentration reported in 2016 (52 mg/kg). A PHC F3 fraction concentration of 25 mg/kg was reported in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ. It is noted a PCB concentration of 1.17 mg/kg was reported in 2016, which exceeded the baseline mean plus 3σ.

For the deep sample at DM-12 (30-40 cm, duplicate location), metals concentrations were similar to those in the shallow sample. The concentrations of all metals were similar to those reported in previous years but slightly greater than observed in 2016. A modified TPH concentration of 87 mg/kg was reported in 2017, which is slightly greater than the concentration reported in 2015 (81 mg/kg) but remains below the historical maximum of 150 mg/kg reported in 2014. The concentrations of PHC F3 and F4 fractions in 2017 were 81 mg/kg and 18 mg/kg, respectively. The PCB concentration of 0.30 mg/kg was less than those reported in 2014 and 2015 (0.76 mg/kg and 0.35 mg/kg, respectively). None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-13

Sampling location DM-13 is located downgradient of the landfill, approximately 6 m south of the toe. The estimated elevation of this sampling point is 737 masl. As shown in Photo 762, the area consists of sand and gravel with some rocks and is not vegetated. The soils consisted of grey sand with some gravel and stone.

For the shallow sample at DM-13 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years. Whereas the concentrations of chromium, cobalt and nickel increased slightly and represent new historical maxima, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. The modified TPH concentration of 25 mg/kg was less than the concentrations reported in 2015 and 2016 (61 mg/kg and 98 mg/kg, respectively). A PHC F3 fraction concentration of 19 mg/kg was reported in 2017. The PCB concentration of 0.08 mg/kg was less than the concentration reported in 2016 (0.32 mg/kg). None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

For the deep sample at DM-13 (40-50 cm), metals concentrations were less than those in the shallow sample. The concentrations of most metals were less than or similar to those reported in previous years. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-14

Sampling location DM-14 is located downgradient of the landfill, immediately south of the toe. The estimated elevation of this sampling point is 736.5 masl. As shown in Photo 765, the area is largely covered with sand and gravel with some rocks and is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-14 (0-15 cm, duplicate location), the concentrations of most metals were similar to those reported in previous years. The concentrations of chromium and nickel, and to a lesser extent cobalt increased and represent new historical maxima. The concentration of chromium (927 mg/kg) is well in excess of the baseline mean concentration plus 3σ (138 mg/kg). No PHC were detected at this location in 2017. It is noted a PCB concentration of 1.14 mg/kg was reported in 2016, which exceeded the baseline mean plus 3σ.

For the deep sample at DM-14 (40-50 cm), metals concentrations were greater than those in the shallow sample. The concentrations of most detected metals were greater than those reported in previous years, including chromium (1,020 mg/kg) which exceeded the baseline mean concentration plus 3σ (138 mg/kg) and nickel. No PHC were detected at this location in 2017.

DM-15

Sampling location DM-15 is located downgradient of the landfill, approximately 5 m south of the toe. The estimated elevation of this sampling point is 736 masl. As shown in Photo 768, the area is largely covered with sand, rock and boulders is not vegetated. The soils consisted of brown sand with some gravel and stone.

For the shallow sample at DM-15 (0-15 cm), the concentrations of most metals were less or similar to those reported in previous years. Whereas the concentration of zinc increased and represents a new historical maximum, this result is similar to the respective baseline mean concentration and is within the expected range. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-16

Sampling location DM-16 is located downgradient of the landfill, approximately 7 m south of the toe. The estimated elevation of this sampling point is 738.5 masl. As shown in Photo 771, the area consists of sand and gravel with some rocks and boulders and is not vegetated. The soils consisted of grey sand with some gravel and stone.

For the shallow sample at DM-16 (0-15 cm), the concentrations of most detected metals (notably nickel) were greater than those reported in previous years; however, these results are similar to their respective baseline mean concentrations and are within their respective expected ranges. No PHC were detected at this location in 2017. None of the reported values exceeded their respective baseline mean concentrations plus 3σ.

DM-17

Sampling location DM-17 is located downgradient of the landfill, immediately west of the toe. The estimated elevation of this sampling point is 740.5 masl. As shown in Photo 774, the area consists of sand and gravel with rocks and boulders and is not vegetated. The soils consisted of grey sand with some gravel and stone.

For the shallow sample at DM-17 (0-15 cm), the concentrations of most metals were less than or similar to those reported in previous years; the copper concentration of 140 mg/kg is higher than historical data and exceeded the baseline mean concentration plus 3σ (76.7 mg/kg). No PHC were detected at this location in 2017.

For the deep sample at DM-17 (0-15 cm), most metals concentrations were slightly less than those in the shallow sample. The concentrations of all metals were less than or similar to those reported in previous years. The copper concentration of 121 mg/kg exceeded the baseline mean concentration plus 3σ (76.7 mg/kg) but is less than the historical maximum of 180 mg/kg reported in 2015. No PHC were detected at this location in 2017.

Table 4-58: Soil Chemical Analysis Results – Upper Site Helipad Landfill

ID	Depth (m)	As (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 (mg/kg)	F2 (mg/kg)	F3 (mg/kg)	F4 (mg/kg)
Background Mean		1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005	NA	NA	NA	NA
Baseline Mean		**1.31**	**1.00**	**57.6**	**13.8**	**34.6**	**10.8**	**72.3**	**68.1**	**0.11**	**NA**	**NA**	**NA**	**NA**
Baseline + 3σ		3.77	1.00	137.8	31.1	76.7	32.6	214.1	125.5	0.51	NA	NA	NA	NA
Landfill Cover														
DM-11 Shallow	0-15	<1.0	<0.5	**63.7**	**14.7**	**51.3**	**12.0**	66.9	54.4	<0.05	<7	<4	<8	<6
DM-11 Deep[1]														
Downgradient														
DM-12 Shallow	0-15	<1.0	<0.5	**91.1**	13.5	**45.6**	**19.5**	**82.5**	**83.1**	<0.05	<7	<4	25	<6
DM-12 Deep	30-40	<1.0	<0.5	**80.8**	13.5	**44.7**	**23.8**	**89.1**	**76.1**	**0.22**	<7	<4	52	11
DM-912 Deep (Duplicate)	30-40	<1.0	<0.5	**80.5**	12.4	**42.8**	**20.5**	**84.9**	**70.3**	**0.38**	<7	<4	110	25
DM-12 Deep (Dup Avg)	30-40	<1.0	<0.5	**80.7**	13.0	**43.8**	**22.2**	**87.0**	**73.2**	**0.30**	<7	<4	81	18
DM-13 Shallow	0-15	<1.0	<0.5	57.1	12.3	34.6	**20.9**	70.0	**79.0**	0.08	<7	<4	19	<6
DM-13 Deep	40-50	<1.0	<0.5	31.6	9.0	24.1	**14.6**	38.1	65.9	<0.05	<7	<4	<8	<6
DM-14 Shallow	0-15	<1.0	<0.5	**1100**	**19.5**	11.0	4.6	**215**	41.4	<0.05	<7	<4	<8	<6
DM-914 Shallow (Duplicate)	0-15	<1.0	<0.5	**754**	**15.7**	10.4	3.8	**157**	35.0	<0.05	<7	<4	<8	<6
DM-14 Shallow (Dup Avg)	0-15	<1.0	<0.5	**927**	**17.6**	10.7	4.2	**186**	38.2	<0.05	<7	<4	<8	<6
DM-14 Deep	40-50	<1.0	<0.5	**1020**	**20.1**	12.3	8.3	**193**	64.8	<0.05	<7	<4	<8	<6
DM-15 Shallow	0-15	<1.0	<0.5	46.5	10.6	28.9	**14.5**	57.6	**90.2**	<0.05	<7	<4	<8	<6
DM-15 Deep[1]														
DM-16 Shallow	0-15	<1.0	<0.5	44.8	**15.4**	**40.2**	**15.9**	**91.8**	65.7	<0.05	<7	<4	<8	<6
DM-16 Deep[1]														
DM-17 Shallow	0-15	<1.0	<0.5	19.8	13.2	**140**	**10.9**	43.5	**97.3**	<0.05	<7	<4	<8	<6
DM-17 Deep	30-40	<1.0	<0.5	11.7	11.8	**121**	7.6	32.8	**97.8**	<0.05	<7	<4	<8	<6

Notes:

NA: Not available; ID: Soil sample location ID.

Underlined values: Results exceed Background arithmetic mean.

Bold Values: Results exceed Baseline arithmetic mean.

1: The deep soil samples at DM-11, DM-15 and DM-16 could not be collected due to refusal on rock.

4.13.5 Conclusions and Overall Performance of the Upper Site Helipad Landfill

Based on the visual inspection, there does not appear to be any significant erosion, settlement, cracking, exposed waste or indications of instability at the Upper Site Helipad Landfill. Some minor settlement, staining, rough grading and tire tracks were observed in this landfill. The overall stability performance of this landfill was assessed as Acceptable.

No detectable concentrations of arsenic or cadmium were noted in 2017 at any sampling locations at this landfill. Concentrations of the most metals were highest at downgradient sampling locations DM-14 (notably chromium and nickel) and DM-17 (notably copper). At DM-14, chromium in both the shallow and deep samples exceeded the baseline mean concentration plus 3σ and both chromium and nickel concentrations represent historical high values. At DM-17, the copper concentration exceeded the baseline mean concentration plus 3σ and represents a new historical maximum. The copper concentration at the deep DM-17 location exceeded the baseline mean concentration plus 3σ, but remains less than the historical maximum reported in 2015.

PHC were detected at downgradient sample locations DM-12 and DM-13, at modified TPH concentrations ranging from 25 mg/kg to 87 mg/kg. PHC concentrations were highest at the deep DM-12 location; the modified TPH concentration of 87 mg/kg was greater than the concentration reported in 2015 (81 mg/kg) but remains below the historical maximum of 150 mg/kg reported in 2014. Detectable concentrations of PCB are noted at DM-12, at values less than those reported in 2014 and 2015. No detectable concentrations of PCB or PHC were noted in 2017 at any other sampling locations at this landfill. It is noted that exceedances of the baseline mean concentration plus 3σ for PCB were noted at many of the downgradient locations in previous years; however, none were observed in 2017. This may reflect a decreasing trend in PCB concentrations but is more likely reflective of natural variability in the sampling results; fewer than seven samples have been collected for trend confirmation.

Overall, the results indicate that most locations exhibit soil concentrations similar to earlier sampling. Increasing concentrations of chromium and nickel at DM-14 should be closely monitored to assess if this represents impact from the landfill.

4.13.6 Recommendations for Upper Site Helipad Landfill

No modifications to the ongoing monitoring program at this landfill are recommended.

5.0 QA/QC RESULTS

The results of the QA/QC program described in Section 3.3 are discussed herein. The results are described in terms of accuracy (lab blanks, spikes and duplicate analysis), reliability (blank analysis) and reproducibility (duplicate analysis).

The three DEW Line sites monitored in 2017 were performed as a single deployment of people and equipment, in which the standard operating procedures were consistent for all sites in the field program. The QA/QC analysis below contains both program-level (applicable to all three sites) and a site-level discussion which focuses on the DYE-M site. The laboratory reports related to the site-level QA/QC discussion are contained in Appendix C.

5.1 Sample Hold Times

The generally accepted hold times for the parameters analyzed in this program are:

- Metals in soil: 180 days, metals in water: 60 days;
- PCB in soil: 365 days,
- PHC-F1 in soil: 48 hours (unpreserved), PHC-F1 in water (preserved): 14 days
- PHC F2-F4 in soil: 14 days, PHC F2-F4 in water (preserved): 14 days

At DYE-M, the soil sampling was carried out on August 2-6, 2017 and the samples were all received at Paracel on August 11, 2017, five to nine days later, thus all of the field samples, with the exception of PHC-F1 in soil, met their respective hold times. The maximum hold time was exceeded for PHC-F1 in soil due to its very short hold time of 48 hours for unpreserved samples. The very short hold time for unpreserved PHC F1 in soil is a known issue but it has been decided to not preserve this parameter in order to maintain consistency with earlier years (i.e., for comparison to previous monitoring data in the program) and because PHC-F1 preservation would require methanol, which might cause the sample shipment to be delayed due to the fact that it is a dangerous good.

The sample date on the DYE-M trip blank corresponds to the date it was prepared at the lab (July 13, 2017), thus it is shown as over its hold time for PHC in water; however, this was intended, because it had to be carried over the duration of the entire travel from the lab to DYE-M and back.

As of 2017, groundwater samples for PHC analysis are now being preserved, resulting in a 14-day hold time. None of the groundwater samples collected at DYE-M exceeded their hold times in 2017.

The samples were packed in coolers with ice and sent with instructions “Keep Cold” on First Air. They were stored in a walk-in refrigerator at First Air cargo upon arrival in Ottawa until Golder picked them up. The temperature recorded by Paracel upon reception of the batch of DYE-M samples was 20.8^{o}C; however, we have confirmed with Paracel that the temperature is measured once per batch with a handheld infra-red temperature reader pointed into a single cooler. The sample jars or bottles comprising each soil or groundwater sample were repacked together in plastic Ziploc® bags. Based on our review of procedures, we expect that the exterior temperature of the Ziploc® bag is what was read by the IR temperature reader and was not representative of the interior temperature of the soil or water contained within.

5.2 Accuracy

Accuracy is a measure of how close a measured value is to the true value. The accuracy of the laboratory data is generally evaluated by the laboratory through the use of matrix spikes or surrogate recoveries. For the DYE-M soil samples, Paracel divided the soil samples into three lots and performed a blank, duplicate and spike analysis on each lot. The lab blanks were all non-detect. The lab duplicates for soil had a maximum RPD of 14.6%; most were under 10%. The spike recoveries were all within the acceptable range, with the exception of a single spike recovery for chromium, which was slightly below the acceptable range. The laboratory qualified the soil results as follows: (i) the soil samples for PHC-F1 analysis were not preserved as is now required as per CCME 2016 methods; and (ii) for the soil sample MW05-09, shallow peaks in the chromatogram were not typical of petroleum hydrocarbon distillates, but may have been from non-mineral compounds not completely removed by clean-up method. Concentrations of 40 and 14 mg/kg were reported for PHC F3, F4 respectively for that sample and are therefore open to doubt.

The groundwater was analyzed as a single lot. The lab blank results were all non-detect. The lab duplicate was of a sample with no detection of metals and the duplicate had an identical result, and as a result, RPDs were not calculated. The spike recoveries were all within the acceptable range of 60-140% for hydrocarbons and 80-120% for metals.

The laboratory qualified the groundwater results as follows:

i) the trip blank was over its hold time (discussed above);

ii) samples were received unfiltered and unpreserved for metals (all groundwater samples) and were filtered and preserved by Paracel, and

iii) Samples from MW08-24 and MW05-05 had insufficient volume in the PHC F2-F4 bottle, which resulted in elevated reporting limits.

5.3 Reliability

Reliability is a measure of certainty that the concentrations reported by the laboratories are reliable indicators of field conditions and have not been affected other sources of contamination such as ambient air or cross-contamination from other samples while in transport. The analysis of blanks provides a measure of reliability. A set of bottles of deionized water prepared at Paracel Lab accompanied the team to DYE-M as a Trip Blank. These bottles were not opened at the site. The analytical reports from Paracel indicate that zinc was detected (0.045 mg/L) in the Trip Blank at nine times the detection level.

Two Equipment Blanks were prepared at DYE-M: one to test the decontamination procedure of the groundwater probe, and the other to test the decontamination procedure of the shovel used to dig test pits. The Shovel Blank and the Probe Blank were non-detect for every parameter except zinc which was detected in both blanks at concentrations of less than twice the detection limit.

Given that zinc was detected at similar concentrations in the Field, Shovel, Probe and Trip blanks at all other sites in the 2017 program (FOX-M and CAM-5) and it was prepared from the same deionized water, it was likely present in the water and not introduced in the field. Also, given the minute concentrations of zinc detected in the equipment blanks and the minimal contact between the equipment and the sampled material, it is concluded that the sampling probe and shovel are not influencing the results of the collected samples.

The Trip Blank and two Equipment Blank sample results for DYE-M are summarized in the table below.

Trip and Equipment Blank Sample Results (mg/L)

ID	As	Cd	Cr	Co	Cu	Pb	Ni	Zn	F1	F2	F3	F4
DLs	<0.001	<0.0001	<0.001	<0.0005	<0.0005	<0.0001	<0.001	<0.005	<0.025	<0.1	<0.1	<0.1
Shovel Blank	<0.001	<0.0001	<0.001	<0.0005	<0.0005	<0.0001	<0.001	**0.009**	<0.025	<0.1	<0.1	<0.1
Probe Blank	<0.001	<0.0001	<0.001	<0.0005	<0.0005	<0.0001	<0.001	**0.006**	<0.025	<0.1	<0.1	<0.1
Trip Blank	<0.001	<0.0001	<0.001	<0.0005	<0.0005	<0.0001	<0.001	**0.045**	<0.025	<0.1	<0.1	<0.1

Note: **bold** indicates detection in a blank sample.

DLs = Detection Levels.

5.4 Reproducibility (Duplicate Analysis)

The reproducibility of lab results was measured through the comparative analysis of field duplicate samples. Duplicate soil samples were prepared in the field, in the test pit being sampled, by taking portions of soil and alternately filling the sample jars for the original and duplicate samples. Duplicate groundwater samples were prepared by alternately filling the bottles for each parameter type for the original and duplicate samples for each parameter type. Unlike previous years, the duplicate samples were analyzed at the same lab as the rest of the samples: Paracel Labs in Ottawa.

The total number of original soil samples collected for the 2017 QIKIQ program was 254, for which 26 duplicate soil samples were prepared and analyzed, providing a duplicate ratio of over 10%. A total of 24 groundwater samples were collected and three duplicates were analyzed, which is a duplicate ratio of over 10% for each site and for the program. The distribution of duplicate soil and groundwater samples over the three sites is provided in the table below. Fifteen soil duplicates and one groundwater duplicate were prepared at DYE-M.

Soil Samples and Duplicates

	DEW Line Site			Totals
	CAM-5	DYE-M	FOX-M	
Soil Samples Collected	25	145	84	254
Duplicate Soil Samples	3	15	8	26
Percent	12%	10%	10%	10%

Groundwater Samples and Duplicates

	DEW Line Site			Totals
	CAM-5	DYE-M	FOX-M	
Monitoring Well Sampled	6	8	10	24
Duplicate Groundwater Samples	1	1	1	3
Percent	17%	13%	10%	13%

To determine the reproducibility of the original and duplicate sample results, the RPD was calculated according to the following equation:

$$RPD = \frac{|x_2 - x_1|}{\left(\frac{x_1 + x_2}{2}\right)} \times 100\%$$

Where, x_1 and x_2 are the original and duplicate concentrations of a given parameter in a pair. RPD can only be calculated if concentrations of given parameters are greater than the analytical method detection limits (MDL) in both the duplicate and original samples of the pair. Additionally, the RPD calculation is less meaningful when the reported concentrations are less than five (5) times the MDL. The RPD have been calculated wherever the concentrations of a parameter were five (5) times greater than the MDL in both the original and duplicate samples. Sample RPD were calculated by taking the average of the parameter RPD for a given sample-duplicate pair, and a program-level RPD was calculated by taking the average of all sample RPD to arrive at a program-wide indication of repeatability.

The TOR sets a data quality objective (DQO) for the RPD in soil and groundwater between a sample and its blind field duplicate of 30%. A discussion or the RPD for the program and at DYE-M is provided below.

5.4.1 Soil Samples

Organics and PCB

Program Level Interpretation

At the 2017 program level, there were only two duplicated samples where PCB was detected and in both cases the original and duplicate PCB results were below five times the MDL, which is internally consistent; RPDs were not calculated due to the low concentrations.

From the 26 soil duplicates, there were only three samples in the 2017 program where one or more PHC fraction was detected. From those three samples there were six PHC parameter pairs with concentrations over five times the MDL for RPD analysis (all were at DYE-M), and three of them had RPDs over 30%; however, the concentrations were still within the same order of magnitude. When PHC is present, the variability in the duplicate results was greater than 30%, in half of the cases.

Site Level Interpretation

Of the fifteen soil sample duplicates from DYE-M there were 45 potential individual PHC F1, F2, F3 parameter pairs for RPD analysis. Thirty-eight of them were non-detect for both results in the pair and the remaining seven pairs had detection in both the original and duplicate components of the pair. Six of the seven parameter pairs with detection had both results over five times the detection limit, thus six RPDs for PHC fractions were calculated. Three of the RPDs were over the data quality objective of 30% for parameter pairs and three were under 30%. The RPD calculations for PHC in soil at DYE-M are shown below.

Relative Percent Difference Analysis of Petroleum Hydrocarbons in Soil Data at DYE-M

Sample ID	Parameter Concentrations (mg//kg)			Sample Average RPD for PHC	Any Over 30%?
	PHC-F1	PHC-F2	PHC-F3		
MDL	7	4	8		
DM-59-Shallow	**90**	**2430**	**216**	41%	Yes F1
DM-959-Shallow	**208**	**2910**	**166**		
RPD	79%	18%	26%		
MW05-06-Shallow	<7	**653**	**293**	32%	Yes F3
MW05-906-Shallow	<7	**877**	**211**		
RPD	n/a	29%	33%		
DM-12-Deep	<7	<4	**52**	72%	Yes F3
DM-912 Deep	<7	<4	**110**		
RPD	n/a	n/a	72%		

Note: Parameters with concentrations greater than 5 x MDL are **bold and highlighted yellow**.

Although there is perfect repeatability in the duplicate samples when PHC fractions are not detected, PHC fraction results appear to have a higher degree of variability than metals, when they are present.

Metals

Program Level Interpretation

Cadmium was below detection limits for all 26 pairs of duplicate soil samples in the program. Mercury in soil has been removed from the analytical program as of the 2017 monitoring year. RPD calculations were undertaken on the seven remaining metals (arsenic, chromium, cobalt, copper, lead nickel and zinc) for the 26 duplicate soil samples, where both sample results were over five times the MDL.

Nine parameter pairs had RPDs exceeding 30% (individual DQO). Only two of the 26 soil duplicates had a sample average RPD of over 30%, one at DYE-M and one FOX-M. The most frequent metals to have a parameter pair RPD over 30% were: lead (three instances), nickel (two instances), and chromium (two instances). Copper and cobalt had one RPD over 30%. The program-level average RPD for the inorganic soil sample duplicate analysis was 14%, which meets the overall DQO.

Site Level Interpretation

From the fifteen soil sample duplicates taken at DYE-M and seven metals with concentrations over the detection limit, there were 105 potential parameter pairs for RPD analysis (7 metals x 15 samples).

Of those 105 metals parameter pairs, only 18 pairs had to be excluded from RPD analysis due to one or both members in the pair being less than five times the MDL, thus 87 parameter RPDs were calculated. All but six of the 87 parameter pairs had RPDs which met the DQO of 30%. The RPDs ranged from 0% to 56%. Zinc generally had the lowest RPDs. Copper and nickel had the highest parameter RPD at DYE-M with 56% for both metals in the same sample (MW08-25-Deep). This sample had an average RPD of 37%. It was described as sand and gravel with occasional stones, and the coarse nature of the material may have contributed to the variability in the soil metals results.

The DYE-M average RPD for the metals in soil sample duplicate analysis was 14%, which meets the DQO of 30%. The reproducibility of the soil sample results at DYE-M was thus acceptable.

Relative Percent Difference Analysis of Metals in Soil Data at DYE-M

Sample ID	Parameter Concentrations (mg/kg)							Sample Average RPD	Any Over 30%?
	Arsenic	Chromium	Cobalt	Copper	Lead	Nickel	Zinc		
MDL	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**		
DM-62-Deep	<1.0	**52.1**	**14.7**	**58.4**	**16.8**	**67.4**	**68**		
DM-962-Deep	<1.0	**41.5**	**12.8**	**58.0**	**15.9**	**54.2**	**65.4**		
RPD		23%	14%	1%	6%	22%	4%	11%	No
DM-59-Shallow	<1.0	**52.3**	**14.2**	**33.5**	**17.3**	**80.7**	**56.9**		
DM-959-Shallow	<1.0	**46.4**	**15.2**	**39.2**	**17.8**	**74.4**	**64.3**		
RPD		12%	7%	16%	3%	8%	12%	10%	No
DM-06-Shallow	<1.0	**69.6**	**9.8**	**32.1**	4.6	**39.3**	**44.8**		
DM-906-Shallow	<1.0	**76.4**	**10.4**	**31.7**	5.2	**40.4**	**47.2**		
RPD		9%	6%	1%		3%	5%	5%	No
MW12-01-Deep	<1.0	**64.9**	**9.4**	**28.2**	5.4	**35.2**	**43.4**		
MW12-901-Deep	<1.0	**61.7**	**8.5**	**25.2**	4.5	**31.5**	**39.6**		
RPD		5%	10%	11%		11%	9%	9%	No
DM-7-Deep	<1.0	**64.6**	**10.0**	**26.0**	4.7	**36.7**	**41.5**		
DM-97-Deep	<1.0	**79.3**	**12.1**	**32.4**	6.8	**44.2**	**48.3**		
RPD		20%	19%	22%		19%	15%	19%	No
MW08-25-Deep	<1.0	**530**	**39.1**	**73.4**	**24.1**	**145**	**74.4**		
MW08-925-Deep	<1.0	**702**	**62.6**	**131**	**29.3**	**257**	**89.2**		
RPD		28%	46%	56%	19%	56%	18%	37%	Yes Co, Cu, Ni
DM-48-Deep	**13.5**	**503**	**46.8**	**94.8**	**9.4**	**399**	**119**		
DM-948-Deep	**17.2**	**600**	**53.9**	**109**	**10.0**	**472**	**135**		
RPD	24%	18%	14%	14%	6%	17%	13%	15%	No
DM-52-Shallow	<1.0	**45.3**	**37.9**	**62.0**	**6.6**	**226**	**42.3**		
DM-952-Shallow	<1.0	**42.1**	**32.7**	**63.2**	**5.8**	**229**	**42.9**		
RPD		7%	15%	2%	13%	1%	1%	7%	No
MW05-06-Shallow	<1.0	**61.7**	**7.9**	**24.8**	**13.4**	**30.9**	**45.0**		
MW05-906-Shallow	<1.0	**57.9**	**7.0**	**33.1**	**15.2**	**28.1**	**45.2**		
RPD		6%	12%	29%	13%	9%	0%	12%	No
DM-33-Shallow	<1.0	**89.1**	**13.3**	**47.7**	**8.3**	**54.9**	**78.3**		
DM-933-Shallow	<1.0	**79.4**	**12.5**	**40.2**	**7.7**	**56.0**	**71.4**		
RPD		12%	6%	17%	8%	2%	9%	9%	No
DM-40-Deep	<1.0	**148**	**6.8**	**225**	**16.1**	**45.6**	**185**		
DM-940-Deep	<1.0	**198**	**6.7**	**263**	**22.0**	**55.0**	**217**		
RPD		29%	1%	16%	31%	19%	16%	19%	Pb
DM-25-Shallow	<1.0	**32.6**	**14.0**	**27.0**	**11.7**	**67.9**	**81.9**		
DM-925-Shallow	<1.0	**37.4**	**14.7**	**29.1**	**9.6**	**71.2**	**81.2**		

Relative Percent Difference Analysis of Metals in Soil Data at DYE-M

Sample ID	Parameter Concentrations (mg/kg)							Sample Average RPD	Any Over 30%?
	Arsenic	Chromium	Cobalt	Copper	Lead	Nickel	Zinc		
MDL	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**	**<1**		
RPD		14%	5%	7%	20%	5%	1%	9%	No
DM-21-Shallow	<1.0	**15.5**	**9.0**	**18.0**	**13.5**	**23.3**	**99.2**		
DM-921-Shallow	<1.0	**18.3**	**10.3**	**20.7**	**15.4**	**25.6**	**110**		
RPD		17%	13%	14%	13%	9%	10%	13%	No
DM-12-Deep	<1.0	**80.8**	**13.5**	**44.7**	**23.8**	**89.1**	**76.1**		
DM-912-Deep	<1.0	**80.5**	**12.4**	**42.8**	**20.5**	**84.9**	**70.3**		
RPD		0%	8%	4%	15%	5%	8%	7%	No
DM-14-Shallow	<1.0	**1100**	**19.5**	**11**	4.6	**215**	**41.4**		
DM-914-Shallow	<1.0	**754**	**15.7**	**10.4**	3.8	**157**	**35.0**		
RPD		37%	22%	6%		31%	17%	22%	Yes Cr, Ni
DYE-M Site Average RPD								14%	1 each (Cr, Co, Cu, Pb) 2 x Nii

Note: Parameter concentrations greater than 5 x MDL are **bold and highlighted yellow**.

5.4.2 Groundwater Samples

Organics and PCB

Program Level and Site Level Interpretation

All three of the groundwater duplicate analyses in the 2017 program had PHC F1, F2 and F3 results that were below the detection limit in the original and duplicate samples, therefore the precision of these results is not a concern. PCB testing in groundwater has been removed from the analytical program as of the 2017 monitoring year.

Metals

Program Level Interpretation

Given the three groundwater duplicate pairs and eight metals analyzed, there were 24 potential parameters pairs for duplicate analysis of metals via RPD calculation (8 metals times 3 samples). Mercury in groundwater has been removed from the analytical program as of the 2017 monitoring year. The metals concentrations were very low; in fact, only 10 of these parameter pairs had both parameters detected above the MDL, and only four had both parameters greater than five times the MDL and were therefore eligible for RPD analysis. In addition to analyzing the QC by RPD analysis the following points are made regarding repeatability. Of the 24 parameter pairs, there were:

- 14 parameter pairs where both concentrations were non-detect in the parameter pair (good repeatability);
- 6 parameter pairs where both concentrations were detected and less than five times the MDL (good repeatability);

- 4 parameter pairs where concentrations were greater than five times the MDL, so an RPD could be calculated. Of those:
  - All were under 30% (very good repeatability)
- No parameter pairs where the results were greater than five times the MDL and the RPD was over 30% (good result).

The program-level average RPD for water analysis of metals (where both parameters were over five times the MDL) was 8%, which meets the program DQO of 30%.

Site Level Interpretation

At DYE-M, the duplicate groundwater samples was collected at MW09-26. Arsenic, chromium and lead were non-detect in the original and the duplicate sample, therefore they were excluded from the RPD calculations. Cadmium, cobalt and copper were detected, but at concentrations less than five times the MDL; therefore, they too were excluded from the RPD calculations. Only nickel and zinc had concentrations in the original and duplicate which were over five times the MDL; thus, only two RPDs were calculated for the groundwater duplicate at DYE-M. The sample average RPD is 1.5% which meets the field data quality objective of 30%. The table below shows the metals results and RPD calculations in groundwater data for DYE-M.

Relative Percent Difference Analysis of Groundwater Data at DYE-M

Sample ID	Parameter Concentrations (mg/L)								Average RPD	Any Over 30%?
	As	Cd	Cr	Co	Cu	Pb	Ni	Zn		
MDL	<0.001	<0.0001	<0.001	<0.0005	<0.0005	<0.0001	<0.001	<0.005		
MW09-26	<0.001	0.0001	<0.001	0.0014	0.0008	<0.0001	**0.069**	**2.73**	1.5%	No
MW909-26 (Duplicate)	<0.001	0.0001	<0.001	0.0014	0.001	<0.0001	**0.069**	**2.81**		
RPD							0%	3%	1.5%	

Note: Parameters with concentrations greater than 5 x MDL are **bold and highlighted yellow**.

5.4.3 Overall Lab Data Reproducibility

Based on a QIKIQ15 overall program average of the field RPDs of 16% for soil and considering that only nine metals parameter pairs and three PHC parameter pairs of the 338 total soil parameter pairs (26 duplicate samples x 13 parameters) exhibited an RPD over the DQO of 30%, it is concluded that that the lab data reproducibility for soil is acceptable.

For groundwater, the program average RPD was 8% and none of the 36 parameter pairs (3 duplicate samples x 12 parameters) had an RPD over the DQO of 30%, so it is concluded that the groundwater data reproducibility is acceptable as well.

5.5 QA/QC Conclusions

The QA/QC analysis has shown that:

- Achieving maximum hold times of PHC-F1 in soil is often not possible if the sample is not preserved, given the logistics of transport from the remote site location;
- Preserving the PHC water samples enabled meeting the maximum hold time for PHC-F1;
- Zinc was detected in the Trip Blank (0.045 mg/L), Shovel Blank (0.009 mg/L) and Probe Blank (0.006 mg/L) for DYE-M. Given that zinc was detected at similar concentrations in the Field, Shovel, Probe and Trip blanks at all other sites in the 2017 program (FOX-M and CAM-5) and it was prepared from the same deionized water, it was likely present in the water and not introduced in the field. Given the minute concentrations of zinc detected in the equipment blanks and the minimal contact between the equipment and the sampled material it is concluded that the sampling probe and shovel are not influencing the results of the collected samples.
- The duplicate analyses for soil at DYE-M met the program field data quality objectives; and,
- The duplicate analyses for groundwater at DYE-M met the program field data quality objectives.

Report Signature Page

We trust that this Monitoring Report meets the project requirements of DND. Please direct any questions to the undersigned.

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APPENDIX A

Report Limitations

REPORT LIMITATIONS

This report has been prepared as an assessment of the environmental condition of the subject site. The monitoring program described in this report was conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practising under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

The assessment of environmental conditions at this Site has been made using the results of chemical analysis of soil and groundwater from a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at sampling locations. Subsurface conditions may vary from those encountered at the sample locations. Additional study, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a Site may be contaminated and remain undetected. Visual inspection comments are based on observed conditions at the time of the inspection and may change with time.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibility of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on the information contained in this report.

The content of this report is based on information collected during our monitoring program, our present understanding of the Site conditions, and our professional judgement in light of such information at the time of writing this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

APPENDIX B

Field Records

Thermistor Inspection Record Sheets

Monitoring Well Sampling Logs

Soil Sampling Record Sheets

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW12-01		Tier II
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (all)		
Date of Sampling Event:	5 August 2017		Time: 10:15am
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): Cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			60
Static water level (cm) from top of pipe:			145
Static water level (cm) (below ground surface) calculated:			85
Measured well refusal depth (cm) (measured after sampling from top of pipe):			188
Thickness of water column (cm):	43	Static Volume of water in well (mL):	540
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	~ 100 mL/min
Volume Purged (L) (note multiple purging events):	~ 500 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	6.71	6.62	6.59	
Conductivity (mS/cm)	0.445	0.381	0.301	
Turbidity (NTU)	11.5	8.6	1.1	
Temperature (degC)	9.17	11.17	7.74	

Visual/olfactory observations:
Clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Upper Site
Monitoring Well ID:	MW12-02		Tier II
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	3 August 2017		Time: 10:10am
Weather	Clear, sunny, 10°C, 15 kts wind		
Names of Samplers	JEB, PJD		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, lid lock hasp broken and needs to be replaced, no ponding

Lock (condition, presence, model, manufacturer): Present, okay condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			65
Static water level (cm) from top of pipe:			frozen @123
Static water level (cm) (below ground surface) calculated:			frozen @58
Measured well refusal depth (cm) (measured after sampling from top of pipe):			frozen @123
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW05-05		Powerhouse
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (40% full F2-F4 bottle)		
Date of Sampling Event:	5 August 2017		Time: 1:20pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): Present & good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			41
Static water level (cm) from top of pipe:			170
Static water level (cm) (below ground surface) calculated:			129
Measured well refusal depth (cm) (measured after sampling from top of pipe):			181
Thickness of water column (cm):	11	Static Volume of water in well (mL):	138
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	< 100 mL/min
Volume Purged (L) (note multiple purging events):	~ 250 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	7.15	-	-	low volume, sampled after
Conductivity (mS/cm)	0.194	-	-	initial readings
Turbidity (NTU)	136	-	-	
Temperature (degC)	11.8	-	-	

Visual/olfactory observations:
Slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site Powerhouse
Monitoring Well ID:	MW05-06		
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	5 August 2017	Time:	12:50pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surfacecasing solid, good condition, water inside surface casing, no ponding on ground

Lock (condition, presence, model, manufacturer): Seized, cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe):			33
Static water level (cm) from top of pipe:			frozen @147
Static water level (cm) (below ground surface) calculated:			frozen @114
Measured well refusal depth (cm) (measured after sampling from top of pipe):			frozen @147
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW05-07		Powerhouse
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	5 August 2017		Time: 12:20pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, water inside surface casing

Lock (condition, presence, model, manufacturer): Damaged, replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe):			32
Static water level (cm) from top of pipe:			frozen @128
Static water level (cm) (below ground surface) calculated:			frozen @96
Measured well refusal depth (cm) (measured after sampling from top of pipe):			frozen @128
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW05-08		Powerhouse
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (all)		
Date of Sampling Event:	5 August 2017		Time: 12:00pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, standing water in casing (below well pipe), o-ring on cap torn

Lock (condition, presence, model, manufacturer): Lock seized, cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe):			36
Static water level (cm) from top of pipe:			155
Static water level (cm) (below ground surface) calculated:			119
Measured well refusal depth (cm) (measured after sampling from top of pipe):			178
Thickness of water column (cm):	23	Static Volume of water in well (mL):	289
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	~ 100 mL/min
Volume Purged (L) (note multiple purging events):	~ 500 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	6.84	7.06	7.01	
Conductivity (mS/cm)	0.957	0.901	1.02	
Turbidity (NTU)	13	9.5	8.5	
Temperature (degC)	13	9.48	8.8	

Visual/olfactory observations:
Clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW05-09		NHWL
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	5 August 2017		Time: 1:50pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface probe		
Well pipe height above ground (cm) (to top of pipe):			29
Static water level (cm) from top of pipe:			dry @140
Static water level (cm) (below ground surface) calculated:			dry @111
Measured well refusal depth (cm) (measured after sampling from top of pipe):			dry @140
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	bentonite in well

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Evidence of bentonite within well pipe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Lower Site
Monitoring Well ID: MW05-12 | NHWL
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 5 August 2017 Time: 1:30pm
Weather Clear, sunny, 15°C, 5 kts wind
Names of Samplers PJD, RN
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding
Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface probe
Well pipe height above ground (cm) (to top of pipe): 38
Static water level (cm) from top of pipe: frozen @189
Static water level (cm) (below ground surface) calculated: frozen @151
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @189
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW05-13		Tier II
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (all)		
Date of Sampling Event:	5 August 2017		Time: 9:30am
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing dented but solid, water inside surface casing

Lock (condition, presence, model, manufacturer): Lock seized, cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			33
Static water level (cm) from top of pipe:			147
Static water level (cm) (below ground surface) calculated:			114
Measured well refusal depth (cm) (measured after sampling from top of pipe):			172
Thickness of water column (cm):	25	Static Volume of water in well (mL):	314
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	< 100 mL/min
Volume Purged (L) (note multiple purging events):	~ 250 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	6.61	-	6.19	dry at end
Conductivity (mS/cm)	0.218	-	0.165	
Turbidity (NTU)	23.2	-	23.2	
Temperature (degC)	10.4	-	11.5	

Visual/olfactory observations:
Clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Lower Site
Monitoring Well ID: MW05-15 | Tier II
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 5 August 2017 Time: 10:40am
Weather Clear, sunny, 15°C, 5 kts wind
Names of Samplers PJD, RN
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding
Lock (condition, presence, model, manufacturer): Seized, replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface probe
Well pipe height above ground (cm) (to top of pipe): 62
Static water level (cm) from top of pipe: frozen @168
Static water level (cm) (below ground surface) calculated: frozen @106
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @168
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Lower Site
Monitoring Well ID: MW05-16 | Tier II
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 5 August 2017 Time: 11:00am
Weather Clear, sunny, 15°C, 5 kts wind
Names of Samplers PJD, RN
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding
Lock (condition, presence, model, manufacturer): Cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface probe
Well pipe height above ground (cm) (to top of pipe): 56
Static water level (cm) from top of pipe: frozen @158
Static water level (cm) (below ground surface) calculated: frozen @102
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @158
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Upper Site
Monitoring Well ID: MW06-18 | NHWL
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 4 August 2017 Time: 11:40am
Weather Sunny, clear, 15°C, 10 kts wind
Names of Samplers JEB, PJD
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, standing water in casing + bentonite
Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface Probe
Well pipe height above ground (cm) (to top of pipe): 87
Static water level (cm) from top of pipe: frozen @105
Static water level (cm) (below ground surface) calculated: frozen @18
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @105
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Upper Site
Monitoring Well ID: MW06-19 | NHWL
Sample Number(s) include dups.: 1
Bottles filled (by parameter type) 4 (all)
Date of Sampling Event: 4 August 2017 Time: 2:00pm
Weather Sunny, clear, 15°C, 10 kts wind
Names of Samplers JEB, PJD
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, some water in surface casing
Lock (condition, presence, model, manufacturer): Present, rusty, replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface Probe
Well pipe height above ground (cm) (to top of pipe): 73
Static water level (cm) from top of pipe: 150
Static water level (cm) (below ground surface) calculated: 77
Measured well refusal depth (cm) (measured after sampling from top of pipe): 166
Thickness of water column (cm): 16 | Static Volume of water in well (mL): 201
Free product thickness (mm): N/A | Evidence of Sludge or siltation: none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N): Y | Recharge Rate: ~ 100 mL/min
Volume Purged (L) (note multiple purging events): ~ 250 mL | Purge Rate: ~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	6.6	-	5.0	low volume, therefore did not
Conductivity (mS/cm)	0.051	-	0.025	let parameters stabilize before
Turbidity (NTU)	24.9	-	9.4	sampling
Temperature (degC)	14.1	-	14.8	

Visual/olfactory observations:
Slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Upper Site
Monitoring Well ID: MW06-20 | NHWL
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 4 August 2017 Time: 1:00pm
Weather Sunny, clear, 15°C, 10 kts wind
Names of Samplers JEB, PJD
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, water inside surface casing
Lock (condition, presence, model, manufacturer): Rusted, seized, replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface Probe
Well pipe height above ground (cm) (to top of pipe): 67
Static water level (cm) from top of pipe: frozen @118
Static water level (cm) (below ground surface) calculated: frozen @51
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @118
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Upper Site
Monitoring Well ID: MW07-21 | NHWL
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 4 August 2017 Time: 12:00pm
Weather Sunny, clear, 15°C, 10 kts wind
Names of Samplers JEB, PJD
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable and good condition, no ponding
Lock (condition, presence, model, manufacturer): Rusted, replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface Probe
Well pipe height above ground (cm) (to top of pipe): 70
Static water level (cm) from top of pipe: frozen @129
Static water level (cm) (below ground surface) calculated: frozen @59
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @129
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Upper Site
Monitoring Well ID:	MW07-22		Tier II
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	3 August 2017		Time: 8:20am
Weather	Sunny, clear, 10°C, 15 kts wind		
Names of Samplers	JEB, PJD		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, standing water inside surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			75
Static water level (cm) from top of pipe:			frozen @258
Static water level (cm) (below ground surface) calculated:			frozen @183
Measured well refusal depth (cm) (measured after sampling from top of pipe):			frozen @258
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Upper Site
Monitoring Well ID:	MW07-23		Tier II
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	3 August 2017		Time: 8:50am
Weather	Sunny, clear, 10°C, 15 kts wind		
Names of Samplers	JEB, PJD		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, standing water inside surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			59
Static water level (cm) from top of pipe:			frozen @106
Static water level (cm) (below ground surface) calculated:			frozen @47
Measured well refusal depth (cm) (measured after sampling from top of pipe):			frozen @106
Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N/A	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	-	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Upper Site
Monitoring Well ID:	MW08-24		Tier II
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (PHC F2-F4 bottle 40% full)		
Date of Sampling Event:	3 August 2017		Time: 10:40am
Weather	Sunny, clear, 10°C, 20 kts wind		
Names of Samplers	JEB, PJD		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, standing water inside surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			55
Static water level (cm) from top of pipe:			139
Static water level (cm) (below ground surface) calculated:			84
Measured well refusal depth (cm) (measured after sampling from top of pipe):			150
Thickness of water column (cm):	11	Static Volume of water in well (mL):	138
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	<100 mL/min
Volume Purged (L) (note multiple purging events):	~ 250 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	8.45	-	-	Limited volume, sampled after
Conductivity (mS/cm)	0.248	-	-	initial readings
Turbidity (NTU)	49.1	-	-	
Temperature (degC)	11.1	-	-	

Visual/olfactory observations:
Slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name: DYE-M | Landfill Name: Upper Site
Monitoring Well ID: MW08-25 | Tier II
Sample Number(s) include dups.: -
Bottles filled (by parameter type) -
Date of Sampling Event: 3 August 2017 Time: 9:40am
Weather Sunny, clear, 10°C, 20 kts wind
Names of Samplers JEB, PJD
Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing solid, good condition, standing water inside surface casing
Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm): | Diameter of well (cm): 4
Depth to top of screen (cm): | Length of screened section (cm):

Field Measurements

Measurement method (interface probe, tape, etc): Interface Probe
Well pipe height above ground (cm) (to top of pipe): 58
Static water level (cm) from top of pipe: frozen @155
Static water level (cm) (below ground surface) calculated: frozen @97
Measured well refusal depth (cm) (measured after sampling from top of pipe): frozen @155
Thickness of water column (cm): - | Static Volume of water in well (mL): N/A
Free product thickness (mm): N/A | Evidence of Sludge or siltation: N/A

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N): N/A | Recharge Rate: N/A
Volume Purged (L) (note multiple purging events): - | Purge Rate: N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:
Ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid(s): Methyl hydrate, soap, water
Number of washes: 1 | Number of rinses: 1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW09-26		NHWL
Sample Number(s) include dups.:	2 (duplicate)		
Bottles filled (by parameter type)	4 (all)		
Date of Sampling Event:	5 August 2017		Time: 1:00pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing loose, good condition, water in surface casing

Lock (condition, presence, model, manufacturer): Cut & replaced

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			53
Static water level (cm) from top of pipe:			61
Static water level (cm) (below ground surface) calculated:			8
Measured well refusal depth (cm) (measured after sampling from top of pipe):			140
Thickness of water column (cm):	79	Static Volume of water in well (mL):	993
Free product thickness (mm):	-	Evidence of Sludge or siltation:	-

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	<100 mL/min
Volume Purged (L) (note multiple purging events):	~ 500 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	6.74	7.29	-	went dry, no final readings taken
Conductivity (mS/cm)	1.4	1.48	-	
Turbidity (NTU)	47.9	47.0	-	
Temperature (degC)	11.39	11.07	-	

Visual/olfactory observations:
Slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments: not recharging

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW09-27		NHWL
Sample Number(s) include dups.:	1		
Bottles filled (by parameter type)	4 (all)		
Date of Sampling Event:	5 August 2017		Time: 2:45pm
Weather	Clear, sunny, 15°C, 5 kts wind		
Names of Samplers	PJD, RN		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing loose, water in surface casing above top of pipe (removed)

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe		
Well pipe height above ground (cm) (to top of pipe):			30
Static water level (cm) from top of pipe:			49
Static water level (cm) (below ground surface) calculated:			19
Measured well refusal depth (cm) (measured after sampling from top of pipe):			164
Thickness of water column (cm):	115	Static Volume of water in well (mL):	1445
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	none

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
Low flow peristaltic pump

Well purged (Y/N):	Y	Recharge Rate:	<100 mL/min
Volume Purged (L) (note multiple purging events):	~ 500 mL	Purge Rate:	~ 100 mL/min

Parameter	Initial	Stablized	Final	Notes
pH	7.12	7.05	6.65	
Conductivity (mS/cm)	0.422	0.460	0.477	
Turbidity (NTU)	18.1	18.6	9.3	
Temperature (degC)	10.98	9.19	6.41	

Visual/olfactory observations:
Clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments:

Annex J: Monitoring Wells Sampling Log

Site Name:	DYE-M	Landfill Name:	Lower Site
Monitoring Well ID:	MW09-28		NHWL
Sample Number(s) include dups.:	-		
Bottles filled (by parameter type)	-		
Date of Sampling Event:	5 August 2017		Time: 2:00pm
Weather	Sunny, clear, 15°C, 5 kts wind		
Names of Samplers	JEB, PJD		

Description of well condition and surrounding ground conditions (note ponding of water):
Surface casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (from water well record log)

Depth of well installation (cm):		Diameter of well (cm):	4
Depth to top of screen (cm):		Length of screened section (cm):	

Field Measurements

Measurement method (interface probe, tape, etc):	Interface Probe
Well pipe height above ground (cm) (to top of pipe):	40
Static water level (cm) from top of pipe:	dry @104
Static water level (cm) (below ground surface) calculated:	dry @64
Measured well refusal depth (cm) (measured after sampling from top of pipe):	dry @104

Thickness of water column (cm):	-	Static Volume of water in well (mL):	N/A
Free product thickness (mm):	N/A	Evidence of Sludge or siltation:	siltation

Purge Information Summary

Purging/sampling equipment, sampling technique and equipment calibration information:
-

Well purged (Y/N):	N	Recharge Rate:	N/A
Volume Purged (L) (note multiple purging events):	N/A	Purge Rate:	N/A

Parameter	Initial	Stablized	Final	Notes
pH	-			
Conductivity (mS/cm)	-			
Turbidity (NTU)	-			
Temperature (degC)	-			

Visual/olfactory observations:

Decontamination of sampling equipment

Type of decontamination fluid(s):	Methyl hydrate, soap, water		
Number of washes:	1	Number of rinses:	1

Other relevant comments: Well infilled with sand

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Lower Sites Tier II Disposal Facility**		
Thermistor Number:	**VT-1**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**14-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7388321.9**	E **561880.9**	Elev	**336.3 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110005**	Nodal Points	**13**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-08**		
Battery Levels	Main 11.34	Aux 13.75	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	0.9990	1.8800
2	0.9362	-0.2100
3	0.9095	-1.1050
4	0.8846	-1.9430
5	0.8651	-2.6010
6	0.8455	-3.2690
7	0.8341	-3.6580
8	0.8230	-4.0400

Bead	ohms	Degrees C
9	0.8157	-4.3150
10	0.8097	-4.5000
11	0.8049	-4.6660
12	0.8006	-4.8170
13	0.7985	-4.8890

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

Memory (setting) - Wrapped around

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Lower Sites Tier II Disposal Facility**		
Thermistor Number:	**VT-2**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**14-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7388235.5**	E **561836.6**	Elev	**339.4 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110052**	Nodal Points	**8**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	☐	☐	No lock

Battery Installation Date: **2012-09-08**

Battery Levels: Main 11.34 Aux 13.87

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2154	8.9540
2	1.1842	7.9200
3	1.0830	4.6100
4	0.9982	1.8300
5	0.9365	-0.2060
6	0.9090	-1.1230
7	0.8863	-1.8800
8	0.8536	-2.9900

Bead	ohms	Degrees C

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

New lock replaced.

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Lower Sites Tier II Disposal Facility**		
Thermistor Number:	**VT-3**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**14-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7388281.8**	E **561927.1**	Elev	**339.4 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110053**	Nodal Points	**7**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	☐	☐	no lock

Battery Installation Date: **2012-09-08**

Battery Levels: Main 11.34 Aux 13.87

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2048	8.0
2	1.1104	5.9
3	1.0263	3.3
4	0.9519	0.4
5	0.9193	-0.8
6	0.8972	-1.7
7	0.8729	-2.6

Bead	ohms	Degrees C

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

New lock replaced.

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Lower Sites Tier II Disposal Facility**		
Thermistor Number:	**VT-4**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**14-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7388184.4**	E **561861.4**	Elev	**340.4 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110054**	Nodal Points	**12**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	☐	X	?
Cable	☐	X	?
Beads	☐	X	?
Lock condition	X	☐	
Battery Installation Date	**2012-09-08**		
Battery Levels	Main		Aux

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	N/A	N/A	9	N/A	N/A
2	N/A	N/A	10	N/A	N/A
3	N/A	N/A	11	N/A	N/A
4	N/A	N/A	12	N/A	N/A
5	N/A	N/A			
6	N/A	N/A			
7	N/A	N/A			
8	N/A	N/A			

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

The datalogger was not communicating with the computer. No data was downloaded. The data logger might require a new set of batteries?

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Lower Sites Tier II Disposal Facility**		
Thermistor Number:	**VT-BL**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**14-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7388226.9**	E **561629.6**	Elev	**330.4 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110027**	Nodal Points	**14**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	☐	☐	no lock
Battery Installation Date	**2012-09-08**		
Battery Levels	Main 11.34	Aux 13.63	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.4663	17.50
2	1.4250	16.00
3	Off	
4	1.2954	11.61
5	Off	
6	1.1135	5.61
7	0.9890	1.53
8	0.8381	-3.52

Bead	ohms	Degrees C
9	0.8412	-3.41
10	0.8097	-4.50
11	0.7920	-5.11
12	0.7759	-5.67
13	0.7723	-5.80
14	0.7691	-5.91

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

NA

Observations and Proposed Maintenance

New lock replaced.

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Power House**		
Thermistor Number:	**VT-5**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**12-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7387478.1**	E **562757.9**	Elev	**368.0 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110024**	Nodal Points	**11**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	☐	X	
Battery Installation Date	**2012-09-08**		
Battery Levels	Main 11.34	Aux 13.99	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.4907	18.40
2	1.4772	17.90
3	1.3449	13.29
4	1.1670	7.36
5	1.0286	2.83
6	0.9374	-0.17
7	0.9090	-1.12
8	0.8863	-2.08

Bead	ohms	Degrees C
9	0.8609	-2.74
10	0.8293	-3.82
11	0.8108	-4.46

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

New lock replaced.

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Power House**		
Thermistor Number:	**VT-6**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**12-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7387454.4**	E **562755.9**	Elev	**369.5 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110025**	Nodal Points	**10**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-08**		
Battery Levels	Main 11.34	Aux 13.36	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	Off	-
2	1.2079	8.70
3	1.1032	5.27
4	1.0006	1.19
5	0.9317	-0.36
6	0.9030	-1.32
7	0.8798	-2.11
8	0.8581	-2.84

Bead	ohms	Degrees C
9	0.8278	-3.87
10	0.8132	-4.38

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 5 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Power House**		
Thermistor Number:	**VT-7**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**12-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7387448.9**	E **562789.8**	Elev	**367.6 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110026**	Nodal Points	**10**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-08**		
Battery Levels	Main 11.34	Aux 14.11	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1342	6.28
2	0.9851	1.43
3	0.9297	-0.43
4	0.9022	-1.36
5	0.7855	-6.34
6	0.8621	-2.76
7	0.8528	-3.02
8	0.8390	-3.11

Bead	ohms	Degrees C
9	0.8293	-3.82
10	0.8254	-3.95

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 3 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Upper Site Tier II Disposal Facility**		
Thermistor Number:	**VT-8**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**13-Aug-14**	Last Date Event	**11-Aug-16**
*Coordinates and Elevation		N **7394615.5**	E **571051.5**	Elev	**645.4 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110057**	Nodal Points	**15**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-10**		
Battery Levels	Main 11.34	Aux 12.53	

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	1.1337	6.27	9	0.8046	-4.67
2	1.1171	5.72	10	0.7876	-5.27
3	1.1121	5.55	11	0.7706	-5.86
4	1.0047	2.05	12	0.7605	-6.22
5	0.9273	-0.51	13	0.7508	-6.58
6	0.8846	-1.94	14	0.7443	-6.80
7	-0.8531	-3.00	15	0.7375	-7.04
8	-0.8249	-3.97			

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

Memory (setting) - Wrapped around

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 3 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Upper Site Tier II Disposal Facility**		
Thermistor Number:	**VT-9**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**13-Aug-14**	Last Date Event	**11-Aug-16**
*Coordinates and Elevation		N **7394558.0**	E **571088.7**	Elev	**645.5 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110058**	Nodal Points	**16**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-10**		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	1.1700	7.46	9	0.8156	-4.30
2	1.1514	6.85	10	0.7980	-4.91
3	1.1628	7.72	11	0.7823	-5.46
4	1.0604	3.87	12	0.7717	-5.83
5	0.9519	0.30	13	0.7605	-6.22
6	0.8375	-1.59	14	0.7528	-6.49
7	0.8669	-2.54	15	0.7488	-6.64
8	0.8366	-3.57	16	0.7393	-6.98

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

Memory (setting) - Wrapped around

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 3 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Upper Site Tier II Disposal Facility**		
Thermistor Number:	**VT-10**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**13-Aug-14**	Last Date Event	**11-Aug-16**
*Coordinates and Elevation		N **7394609**	E **571121**	Elev	**648.2 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110059**	Nodal Points	**10**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-10**		
Battery Levels	Main 11.34	Aux 13.26	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1375	6.23
2	1.1299	6.14
3	1.0154	2.40
4	0.9268	-0.52
5	0.8851	-1.92
6	0.8522	-3.04
7	0.8293	-3.82
8	-0.8061	-4.61

Bead	ohms	Degrees C
9	0.7883	-5.21
10	0.7691	-5.91

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 3 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Upper Site Tier II Disposal Facility**		
Thermistor Number:	**VT-11**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**13-Aug-14**	Last Date Event	**11-Aug-16**
*Coordinates and Elevation		N **7394655.5**	E **571132.2**	Elev	**648.9 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110051**	Nodal Points	**12**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-10**		
Battery Levels	Main 11.34	Aux 13.75	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1866	8.00
2	1.2031	8.55
3	1.2439	6.60
4	1.1397	6.46
5	1.0676	4.11
6	0.9567	0.45
7	0.9059	-1.22
8	0.8760	-2.23

Bead	ohms	Degrees C
9	0.8479	-3.19
10	0.8201	-4.14
11	0.8000	-4.83
12	0.7881	-5.31

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	August 3 , 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name:	**DYE-M**	Landfill:	**Upper Site Tier II Disposal Facility**		
Thermistor Number:	**VT-BU**	Inclination:	**Vertical**		
Datalogger model no:	**RX-16**	Datalogger cable download model:		USB	
*Install Date:	**Unknown**	First Date Event	**13-Aug-14**	Last Date Event	**12-Aug-16**
*Coordinates and Elevation		N **7394470.7**	E **571142.6**	Elev	**636.90 m**
Length of Cable (m)		Cable Lead Above Ground (m)			
Datalogger Serial #	**7110028**	Nodal Points	**14**		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Lock condition	X	☐	
Battery Installation Date	**2012-09-10**		
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2391	9.74
2	1.2262	9.31
3	1.2106	8.79
4	1.0847	4.67
5	0.9901	1.56
6	0.9138	-0.96
7	0.8792	-2.12
8	0.8293	-3.82

Bead	ohms	Degrees C
9	0.7903	-5.17
10	0.7649	-6.06
11	0.7503	-6.58
12	0.7437	-6.82
13	0.7413	-6.90
14	0.7420	-6.88

Battery Information

Batteries changed ? Yes [ ] No [x] Monitoring Year: 2017

Battery model number installed: Existing ULB1 and ULB15

Expected battery life (years): 2020

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE M Landfill Name: Lower Site Tier II

Monitoring Well ID: MW12-01

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): all

Date of Sampling Event: 5/8/2017 Time: 1075

Weather: Clear, sunny, ~15°C, 5 kts wind

Names of Samplers: Paul Dewaele, Ricky Nookigak

Description of Well Condition and Surrounding ground conditions (note ponding of water):

casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): ~~cut~~ cut & replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe.

Well pipe height above ground (cm) (to top of pipe)= 60

Static water level (cm) from top of pipe = 145

Static water level (cm) (below ground surface) calculated = 85

Measured well refusal depth (cm) (measure after sampling)= 188

Thickness of water column (cm)= 43 Static volume of water in well (mL)= 540

Free product thickness (mm)= 0 Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: ~100mL/min

Volume Purged (L) (note multiple purging events if applicable): ~500mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	8.71	6.62	6.59	
Conductivity (uS/cm)	0.445	0.381	0.301	
Turbidity (NTU)	11.5	8.6	1.1	
Temperature (degC)	9.17	11.17	7.74	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site Tier II

Monitoring Well ID: MW12-02

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 3/8/2017 Time: 1010

Weather: Clear, Sunny -10°C 15 kts wind

Names of Samplers: Jamie Bonany, Paul Demeple

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing Solid, lid lock hasp broken (cannot be locked) needs to be replaced, no ponding

Lock (condition, presence, model, manufacturer): Present, ok condition.

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 65

Static water level (cm) from top of pipe = frozen @ 123

Static water level (cm) (below ground surface) calculated = frozen @ 123

Measured well refusal depth (cm) (measure after sampling)= frozen @ 123

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: NA

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Powerhouse

Monitoring Well ID: MW5-05

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): 4 (40% full F2-F4 bottle)

Date of Sampling Event: 5/08/2017 Time: 1:20pm

Weather: clear, sunny, ~15°C, 5kts wind

Names of Samplers: Paul Dewaele, Ricky Nookigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe.

Well pipe height above ground (cm) (to top of pipe)= 41

Static water level (cm) from top of pipe = 170

Static water level (cm) (below ground surface) calculated = 129

Measured well refusal depth (cm) (measure after sampling)= 181

Thickness of water column (cm)= 11 Static volume of water in well (mL)= 138

Free product thickness (mm)= ∅ Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): N Recharge Rate: < 100mL/min

Volume Purged (L) (note multiple purging events if applicable): ~250mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	7.65			low volume
Conductivity (uS/cm)	0.194			sampled after
Turbidity (NTU)	136			initial
Temperature (degC)	11.8			readings

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Powerhouse

Monitoring Well ID: MW05-06

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 05/08/2017 Time: 1250

Weather: Clear, Sunny ~15°C 5 kts

Names of Samplers: Pat Dewaele Ricky Norcigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing Solid, good condition. Water inside Surface Casing, no ponding on ground

Lock (condition, presence, model, manufacturer): Seized, cut

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 33

Static water level (cm) from top of pipe = frozen @ 147

Static water level (cm) (below ground surface) calculated = frozen @ 114

Measured well refusal depth (cm) (measure after sampling)= frozen @ 147

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: _____

Well purged (Y/N): N/A Recharge Rate: NA

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: _____

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-5 Landfill Name: Lower Site Powerhouse

Monitoring Well ID: MW05-07

Sample Number(s) include dups.: 6

Bottles filled (by parameter type): 0

Date of Sampling Event: 5/8/2017 Time: 12:20pm

Weather: clear, sunny, ~15°C, 5 kts wind

Names of Samplers: PAUL DEWATLE, RICKY NOOKIGAK

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing solid, in good condition, water inside surface cash

Lock (condition, presence, model, manufacturer): damaged, replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 52

Static water level (cm) from top of pipe = frozen @ 128

Static water level (cm) (below ground surface) calculated = frozen @ 96

Measured well refusal depth (cm) (measure after sampling)= frozen @ 128

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: _____

Well purged (Y/N): N/A Recharge Rate: NA

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe.

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: _____

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Powerhouse landfill

Monitoring Well ID: MW05-08

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): all

Date of Sampling Event: 5/8/2017 Time: 1200

Weather: Clear Sunny, ~15°C 5 kts

Names of Samplers: Dan DeWaele, Ricky Moorigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing Solid, Standing water in Casing (below well pipe). O-ring on cap worn

Lock (condition, presence, model, manufacturer): lock seized, cut replaced.

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 36

Static water level (cm) from top of pipe = 155

Static water level (cm) (below ground surface) calculated = 119

Measured well refusal depth (cm) (measure after sampling)= 178

Thickness of water column (cm)= 23 Static volume of water in well (mL)= 289

Free product thickness (mm)= Ø Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: ~100 mL/min

Volume Purged (L) (note multiple purging events if applicable): ~600mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	6.84	7.06	7.01	
Conductivity (uS/cm)	0.957	0.901	1.02	
Turbidity (NTU)	13	9.5	8.5	
Temperature (degC)	13	9.48	8.8	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: _____

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site NTHWL

Monitoring Well ID: MW05-09

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 5/08/2017 Time: 1350

Weather: clear, sunny, ~15°C, 5 kts wind

Names of Samplers: Paul DeWaele, Ricky Nookigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing Stable, Good Condition, no ponding

Lock (condition, presence, model, manufacturer): present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 29

Static water level (cm) from top of pipe = dry @ 140 bentonite on top.

Static water level (cm) (below ground surface) calculated = dry @ 111

Measured well refusal depth (cm) (measure after sampling)= dry @ 140

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: bentonite in well

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): evidence of bentonite within well pipe.

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Upper

Monitoring Well ID: MW05-12

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 5/08/2017 Time: 1330

Weather: Clear, sunny, ~15°C, Slts wind

Names of Samplers: Paul DeWaele, Ricky Nookigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 38

Static water level (cm) from top of pipe = ~~frozen~~ @ 189

Static water level (cm) (below ground surface) calculated = frozen @ 159

Measured well refusal depth (cm) (measure after sampling)= 189

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water.

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Tier II

Monitoring Well ID: MW05-13

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): all

Date of Sampling Event: 5/8/2017 Time: 930

Weather: Clear, Sunny ~15°C 5 kts wind.

Names of Samplers: Ian DeWaele Ricky Nookigaks

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing dented but Solid. Water Inside surface casing

Lock (condition, presence, model, manufacturer): Lock Seized, cut and replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= 172 Diameter of well (cm)= 4

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): probe, tape

Well pipe height above ground (cm) (to top of pipe)= 33

Static water level (cm) from top of pipe = 147

Static water level (cm) (below ground surface) calculated = 114

Measured well refusal depth (cm) (measure after sampling)= 172

Thickness of water column (cm)= 25 Static volume of water in well (mL)= 314

Free product thickness (mm)= Ø Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: < 100 ml/min dry @ end

Volume Purged (L) (note multiple purging events if applicable): ~2.50mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	16.61	/	6.59	
Conductivity (uS/cm)	0.218	/	0.165	
Turbidity (NTU)	23.2	/	25.2	
Temperature (degC)	10.4	/	11.3	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Tier II

Monitoring Well ID: MW05-15

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 5/8/2017 Time: 10:40

Weather: clear, sunny, ~15°C, 5kts wind

Names of Samplers: Paul DeWaele, Ricky Nookiguk

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing stickup, good condition, no ponding

Lock (condition, presence, model, manufacturer): screw, replaced.

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 62

Static water level (cm) from top of pipe = frozen @ 168

Static water level (cm) (below ground surface) calculated = frozen @ 106

Measured well refusal depth (cm) (measure after sampling)= frozen @ 168

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: _____

Well purged (Y/N): N/A Recharge Rate: NA

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: _____

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site Tier II

Monitoring Well ID: MW05-16

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): ~~0~~ 0

Date of Sampling Event: 5/8/2017 Time: 1100

Weather: clear, sunny, ~15°C, 5kts wind

Names of Samplers: Paul Dewaele, Ricky Asokigak

Description of Well Condition and Surrounding ground conditions (note ponding of water):

casing stable, good condition, no ponding

Lock (condition, presence, model, manufacturer): cut & replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 56

Static water level (cm) from top of pipe = frozen@158

Static water level (cm) (below ground surface) calculated = frozen@102

Measured well refusal depth (cm) (measure after sampling)= frozen@158

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site NHWL

Monitoring Well ID: MW06-18

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 4/8/2017 Time: 1140

Weather: Sunny, clear -15°C 10 kts wind

Names of Samplers: Jamie Bancay, Paul Demuele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing stable, good condition. Standing water in casing + bentonite.

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 87

Static water level (cm) from top of pipe = 105 frozen

Static water level (cm) (below ground surface) calculated = 18 frozen

Measured well refusal depth (cm) (measure after sampling)= 105 frozen

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site NHWL

Monitoring Well ID: MW06-19

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): 4 (all)

Date of Sampling Event: Aug 4, 2017 Time: 2:00pm

Weather: clear, sunny ~15°C, 10 kts wind

Names of Samplers: Jamie Bonany, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing solid, good condition some water in surface casing

Lock (condition, presence, model, manufacturer): present, rusty, replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= ~~166~~ Diameter of well (cm)= 4

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 73

Static water level (cm) from top of pipe = 150

Static water level (cm) (below ground surface) calculated = 77

Measured well refusal depth (cm) (measure after sampling)= 166

166

Thickness of water column (cm)= 16 Static volume of water in well (mL)= 201

Free product thickness (mm)= Ø Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: ~100mL/min

Volume Purged (L) (note multiple purging events if applicable): ~250mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	6.6	/	5.0	-low volume,
Conductivity (uS/cm)	0.051	/	0.025	∴ did not
Turbidity (NTU)	24.9	/	9.4	let parameters
Temperature (degC)	14.1	/	14.8	stabilize

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): slightly silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site NTNL

Monitoring Well ID: MW06-20

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 4/8/2017 Time: 1:00pm

Weather: Clear, Sunny, -15°C 10 Kts - 15kts

Names of Samplers: Jamie Bonary, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing solid, good condition. Water inside surface casing

Lock (condition, presence, model, manufacturer): rusted, seized, replaced.

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 67

Static water level (cm) from top of pipe = frozen @ 118

Static water level (cm) (below ground surface) calculated = 51, frozen

Measured well refusal depth (cm) (measure after sampling)= 118, frozen

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DRE-M Landfill Name: Upper Site NHWL

Monitoring Well ID: MW07-21

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 4/8/2017 Time: 1200 pm

Weather: Clear, sunny 15°C 10 kts wind

Names of Samplers: Jamie Swaney, Paul Demmelo

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing stable dirt yard condition, no ponding

Lock (condition, presence, model, manufacturer): rusted, replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 70

Static water level (cm) from top of pipe = frozen @ 129

Static water level (cm) (below ground surface) calculated = frozen @ 59

Measured well refusal depth (cm) (measure after sampling)= frozen @ 129

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: _____

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: _____

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site Tier II

Monitoring Well ID: MW 07-22

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 3/8/2017 AVG Time: 8:20

Weather: Clear, sunny ~ 10°C ~15 KTS windspeed.

Names of Samplers: Jamie Banany, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing solid, good condition. Standing water inside surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= ~~250~~ Diameter of well (cm)= 4

*Depth to top of screen (cm)= Length screened section (cm)=

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): Tape, probe

Well pipe height above ground (cm) (to top of pipe)= 75 cm

Static water level (cm) from top of pipe = Frozen @ 258 cm

Static water level (cm) (below ground surface) calculated = Frozen @ 183

Measured well refusal depth (cm) (measure after sampling)= Frozen @ 258 cm

Thickness of water column (cm)= 0 Static volume of water in well (mL)= N/A

Free product thickness (mm)= 0 Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: Dye-M Landfill Name: Upper Site Tier II

Monitoring Well ID: MW07-23

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 3/8/2017 Time: 0850

Weather: Clear, sunny ~10°C, 15 kts wind speed

Names of Samplers: Jamie Benard, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing solid, good condition. Standing water in surface casing

Lock (condition, presence, model, manufacturer): good condition, present

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 59 cm

Static water level (cm) from top of pipe = Frozen @ 106

Static water level (cm) (below ground surface) calculated = Frozen @ 47

Measured well refusal depth (cm) (measure after sampling)= Frozen @ 106

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): NA Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Site Tier II

Monitoring Well ID: MW08-24

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): 4 (PHC bottle F_2-F_4 40% full)

Date of Sampling Event: 3/8/2017 Time: 0940

Weather: Sunny, Clear ~ 10° C 20 kts

Names of Samplers: Jamie Banany, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing solid, good condition. Standing water in surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): probe, tape

Well pipe height above ground (cm) (to top of pipe)= 55

Static water level (cm) from top of pipe = 139

Static water level (cm) (below ground surface) calculated = 84

Measured well refusal depth (cm) (measure after sampling)= 150 frozen @

Thickness of water column (cm)= 11 Static volume of water in well (mL)= 138

Free product thickness (mm)= ϕ Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: ~100 ml/min ran dry

Volume Purged (L) (note multiple purging events if applicable): ~250ML

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	8.45			limited
Conductivity (uS/cm)	0.248			Volume,
Turbidity (NTU)	49.1			Sampled
Temperature (degC)	11.1			after initial readings

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): slighty silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, Soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Upper Sike Tier II

Monitoring Well ID: MW08-25

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 3/8/2017 Time: 0940

Weather: Clear, Sunny ~10°C 20 kts +

Names of Samplers: Jamie Bonany, Paul Dewaele

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing solid, good condition. Standing water in surface casing

Lock (condition, presence, model, manufacturer): Present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): probe, tape

Well pipe height above ground (cm) (to top of pipe)= 58

Static water level (cm) from top of pipe = frozen @ 155

Static water level (cm) (below ground surface) calculated = frozen @ 97

Measured well refusal depth (cm) (measure after sampling)= frozen @ 155

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: N/A

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information:

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): ice on tip of probe

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: PYE-M Landfill Name: Lower Site NHWL

Monitoring Well ID: MW09-26

Sample Number(s) include dups.: 2 sets, duplicate

Bottles filled (by parameter type): 2 sets, duplicate

Date of Sampling Event: 5/08/2017 Time: 1300

Weather: clear, sunny, ~ 15°C, 5 kts wind

Names of Samplers: Paul DeWaele, Ricky Nootrigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing loose, good condition. Water in Surface Casing

Lock (condition, presence, model, manufacturer): cut & replaced

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 53

Static water level (cm) from top of pipe = 61

Static water level (cm) (below ground surface) calculated = 18

Measured well refusal depth (cm) (measure after sampling)= 140

Thickness of water column (cm)= 79 Static volume of water in well (mL)= 993

Free product thickness (mm)= 0 Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: <400 ml/min

Volume Purged (L) (note multiple purging events if applicable): ~500mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	6.74	6.86		went dry,
Conductivity (uS/cm)	1.40	1.32		no final
Turbidity (NTU)	47.9	47.0		readings
Temperature (degC)	11.39	11.07		taken

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): slighty silty, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: not recharging

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site NHWL

Monitoring Well ID: MW09-27

Sample Number(s) include dups.: 1

Bottles filled (by parameter type): 4

Date of Sampling Event: 5/08/2017 Time: 1445

Weather: Sunny, Clear 15°C ~5 kts

Names of Samplers: Paul DONAELE, RICKY NOOKIGAK

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface casing loose, water in surface casing above top of pipe (removed)

Lock (condition, presence, model, manufacturer): present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe.

Well pipe height above ground (cm) (to top of pipe)= 30

Static water level (cm) from top of pipe = 49

Static water level (cm) (below ground surface) calculated = 19

Measured well refusal depth (cm) (measure after sampling)= 164

Thickness of water column (cm)= 115 Static volume of water in well (mL)= 1445

Free product thickness (mm)= Ø Evidence of sludge or siltation: none

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: low flow peristaltic pump

Well purged (Y/N): Y Recharge Rate: ~100 ml/min.

Volume Purged (L) (note multiple purging events if applicable): ~500mL

Parameter	Initial	Stabilized	Final	Notes (if not stabilized)
pH	7.12	7.05	6.65	
Conductivity (uS/cm)	0.422	0.460	0.477	
Turbidity (NTU)	18.1	18.6	9.3	
Temperature (degC)	10.98	9.19	6.41	

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation...): Clear, no sheen, no odour

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments:

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

ANNEX J: Monitoring Well Sampling Log (Complete All Fields)

Site Name: DYE-M Landfill Name: Lower Site NHWL

Monitoring Well ID: MW09-28

Sample Number(s) include dups.: 0

Bottles filled (by parameter type): 0

Date of Sampling Event: 5/08/2017 Time: 1400

Weather: Clear, Sunny, ~15°C 5 kts wind

Names of Samplers: Paul Dewaele, Ricky Nookigak

Description of Well Condition and Surrounding ground conditions (note ponding of water): Surface Casing Stubbe, Good Condition, no ponding

Lock (condition, presence, model, manufacturer): present, good condition

Pre-Measured Data (From Water Well Record Log)

*Depth of well installation (cm)= _____ Diameter of well (cm)= 4

*Depth to top of screen (cm)= _____ Length screened section (cm)= _____

*note: *depths are from ground surface*

Field Measurements

Measurement method (interface probe, tape, etc): tape, probe

Well pipe height above ground (cm) (to top of pipe)= 40

Static water level (cm) from top of pipe = dry@104 (infilled w Sand

Static water level (cm) (below ground surface) calculated = dry@64

Measured well refusal depth (cm) (measure after sampling)= 104

Thickness of water column (cm)= Ø Static volume of water in well (mL)= N/A

Free product thickness (mm)= Ø Evidence of sludge or siltation: siltation (sand)

Purging Information Summary*

Purging/sampling equipment, sampling technique and equipment calibration information: _____

Well purged (Y/N): N/A Recharge Rate: N/A

Volume Purged (L) (note multiple purging events if applicable): N/A

Parameter	Initial	Stabilized	Final	*Notes (if not stabilized)*
pH				
Conductivity (uS/cm)				
Turbidity (NTU)				
Temperature (degC)				

Visual/olfactory observations (incl. colour, odour, presence of free product/sheen/globules, siltation…): _____

Decontamination of sampling equipment

Type of decontamination fluid (s): methyl hydrate, soap, water

Number washes: 1 Number rinses: 1

Other Relevant Comments: infilled with sand

* Complete field notes including full suite of water quality indicator parameters VS time as per EPA low flow sampling procedures should be apended to this summary.

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER NAME: Aug 2, 2017 PSD / JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
lower Site foundation landfill	DM-04-shallow	0-15	dry grey sand with gravel & cobble, trace organics -refusal @ 20cm				3	Y
lower Site foundation Landfill	DM-06-shallow	0-15	dry grey sand with some gravel & cobble.	- Dup Taken DM-906-Shallow			3	Y
lower Site foundation landfill	DM-06-deep	30-40	dry grey sand with some gravel & cobble -refusal @ 40cm				3	Y
lower Site foundation landfill	DM-05-shallow	0-15	dry grey sand with gravel & cobble				3	Y
lower Site foundation landfill	DM-05-deep	30-40	dry grey sand with gravel & cobble -refusal @ 40 cm				3	Y
lower Site Crossroads landfill	DM-01-Shallow	0-15	moist brown sand with gravel and stone				3	Y
lower site Crossroads landfill	DM-01-Deep	20-30	moist brown sand w gravel and stone refusal 30 cm				3	Y
lower site Crossroads landfill	DM-02-Shallow	0-15	moist gray silty Sand w gravel and stone refusal 30 cm				3	Y
lower site Crossroads landfill	DM-02-Deep	N/S	Refusal 20 cm				-	-
lower site Crossroads landfill	DM-03-Shallow	0-15	moist brown fine Sand w stone				3	Y

SITE NAME: OYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 2, 2017
SAMPLER NAME: PJD / JER

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
lower site Crossroads landfill	DM-03 deep	40-50	moist brown fine sand w Stone				3	Y

SITE NAME: DYE-M

3/8/2017

RECORD OF SOIL SAMPLING

SAMPLER: Aug 3, 2017 PSD / JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site Tier II	MW07-22 Shallow	0-15	Dry Brown f-m sand w some gravel				3	Y
Upper Site Tier II	MW07-22 deep	20-30 refusal @ 30	Dry Brown f-m sand w some gravel.				3	Y
Upper Site Tier II	MW07-23 shallow	0-15	Moist-wet brown Sand and gravel w some pebble + stone				3	Y
Upper Site Tier II	MW07-23 deep	40-50	Moist-wet brown sand and gravel w some pebble + stone				3	Y
Upper Site Tier II	MW08-24 Shallow	0-15	Moist brown f sand w some f grl + stone wet near surface				3	Y
Upper Site Tier II	MW08-24 deep	30-40	Moist brown f. sand w some f grl + stone				3	Y
Upper Site Tier II	MW08-25 shallow	0-15	Wet brown sand + gravel w occasional stone				3	Y
Upper Site Tier II	MW08-25 deep	40-50	wet brown sand + gravel w occasional stone water seeping @ base				3	Y
Upper Site Tier II	MW08-925 deep	40-50	wet brown sand + gravel w occasional stone water seeping @ base				3	Y
Upper Site Tier II	MW12-02 shallow	0-15	dry yellow coarse sand, gravel + stone refusal @ 20 cm				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 3, 2017
SAMPLER NAME: PSD / JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site West Landfill West Lobe	DM-32 Shallow	0-15	Wet Brown Sand + Gravel w occasional Stone				3	Y
Upper Site West Landfill West Lobe	DM-32 Deep	40-50	Wet Brown Sand + gravel w occasional Stone				3	Y
Upper Site West Landf.ill West lobe	DM-32 Shallow	0-15	moist brown sand + gravel w occasional stone				3	Y
upper site west landfill west lobe	DM-31 Deep	40-50	moist brown sand + gravel w occasional stone				3	Y
upper site west landfill west lobe	DM-37 shallow	0-15	dry brown sand w stone				3	Y
upper site west landfill west lobe	DM-37 deep	30-40	dry brown sand w stone				3	Y
upper site west landfill west lobe	DM-36	0-15	dry brown sand w gravel & stone				3	Y
upper site west landfill west lobe	DM-36	20-30	dry brown sand w gravel & stone.				3	Y
upper site west landfill west lobe	DM-33	0-15	dry brown sand w some gravel				3	Y
upper site west landfill west lobe	DM-933	0-15	dry brown sand w some gravel				3	Y

SITE NAME: UYE-M

RECORD OF SOIL SAMPLING

SAMPLER NAME: Aug 3, 2017 PJD / JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper site West Landfill West Lobe	DM-33 deep	30-40	dry brown sand w some gravel rock refusal on at 40				3	Y
Upper Site West Landfill West Lobe	DM-34 Shallow	0-15	dry yellow-brown sand, gravel and stone. refusal on rock @ 20				3	Y
Upper site west landfill west lobe	DM-38 shallow	0-15	dry brown sand w pbl + stone. refusal on rock @ 25				3	Y
Upper site west landfill west lobe	DM-39 Shallow	0-15	moist dark brown sand w some gravel and stone				3	Y
Upper site west landfill west lobe	DM-39 deep	40-50	moist dark brown sand w some gravel and stone				3	Y
Upper site west landfill centre/east lobe	DM-42 shallow	0-15	moist yellow-brown sand w trace gravel and stone				3	Y
Upper site west landfill centre east lobe	DM-42 deep	20-30	moist yellow brown sand w some gravel and stone. refusal @ 35				3	Y
Upper Site west landfill Centre east lobe	DM-43 Shallow	0-15	moist brown sand, gravel and stone				3	Y
Upper Site west landfill Centre east lobe	DM-43 deep	40-50	moist brown sand w gravel and stone				3	Y
Upper site West landfill Centre east lobe	DM-44 shallow	0-15	moist brown-yellow sand w gravel and stone				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 3, 2017
SAMPLER NAME: PSD / JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
upper site west landfill Centre east lobe	DM-44 deep	30-40	moist brown-yellow sand w gravel and stone. Refusal on rock @ 40				3	Y
upper site west landfill Centre east lobe	DM-45 shallow	0-15	moist yellow-brown sand, trace gravel				3	Y
upper site west landfill Centre east lobe	DM-45 deep	40-50	moist yellow-brown sand trace gravel				3	Y
upper site west landfill Centre east lobe	DM-46 shallow	0-15	moist yellow-brown sand w gravel and some stone				3	Y
upper site west landfill Centre east lobe	DM-46 deep	40-15	moist yellow-brown sand w gravel and some stone				3	Y
upper site west landfill Centre lobe	DM-48 shallow	0-15	moist brown sand with gravel and some stone				3	Y
upper site west landfill Centre lobe	DM-48 deep	40-50	moist brown sand with gravel and some stone				3	Y
upper site west landfill Centre lobe	DM-948 deep	40-50	moist brown sand with gravel and some stone				3	Y
upper site west landfill the lobe	DM-49	0-15	moist brown fine sand and gravel w some stone				3	Y
upper site west landfill Centre lobe	DM-49	30-40	Brown fine sand and gravel w some stone refusal at 40 on rock				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER NAME: Aug 3, 2017 PSD/JSB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
upper site west landfill centre lobe	DM-47 shallow	0-15	moist fine brown sand w stone hydrocarbon odour				3	Y
upper site west landfill centre lobe	DM-47 deep	40-50	moist fine brown sand w, stone hydrocarbon odour				3	Y
upper site West landfill Centre lobe	DM-52 shallow	0-15	Dry brown sand and stone				3	Y
upper site west landfill Centre lobe	DM-952 shallow	0-15	dry brown sand and stone w rock				3	Y
upper site west landfill Centre lobe	DM-52 deep	20-30	dry brown sand and stone w rock Refusal @ 30 on rock				3	Y
upper site west landfill Centre lobe	DM-40 shallow	0-15	moist medium brown sand, trace gravel iron staining				3	Y
upper site west landfill centre lobe	DM-40 deep	40-50	moist medium brown sand, trace gravel iron staining				3	Y
upper site west landfill centre lobe	DM-940 deep	40-50	moist medium brown sand trace gravel iron staining.				3	Y
upper site west landfill Centre lobe	DM-41 shallow	0-15	dry brown sand and gravel with stone				3	Y
upper site west landfill centre lobe	DM-41 deep	30-40	dry brown sand and gravel with stone				3	Y

SITE NAME: OYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 3, 2017
SAMPLER NAME: PSJDJSEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper site west landfill west lobe	DM-35 Shallow	0-.15	dry Brown fine-m Sand, with rock -refusal on 20cm				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER N: JEB/PSD

: Aug 4, 2017

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site Pallet Line Landfill	DM 60 Shallow	0-15	moist brown Sand, gravel and stone				3	Y
Upper Site Pallet Line Landfill	DM-61 Shallow	0-15	moist brown silty sand with some gravel				3	Y
Upper Site Pallet Line Landfill	DM-61 Deep	30-40	moist brown silty sand w some gravel Bedrock rock 40 cm				3	Y
Upper Site Pallet Line Landfill	DM-62 Shallow	0-15	moist brown clayey sand/sandy clay clasts				3	Y
Upper Site Pallet Line Landfill	DM-62 deep	40-50	moist brown silty sand some gravel + stone				3	Y
Upper Site Pallet Line Landfill	DM-962 deep	40-50	moist brown silty sand some gravel + stone				3	Y
Upper Site Pallet Line Landfill	DM 59 Shallow	0-15	dry brown Sand and gravel PHC odour				3	Y
Upper Site Pallet Line Landfill	DM 59 deep	40-50	dry brown Sand and gravel + stone PHC odour				3	Y
Upper Site Pallet Line Landfill	DM959 deep	40-50	dry brown Sand and gravel + stone PHC odour				3	Y
Upper Site Pallet Line Landfill	DM 58 Shallow	0-15	dry brown sand and gravel some stone				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 4, 2017
SAMPLER NAME: JEB / PJD

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site Pallet Line Landfill	DM-58 deep	40-50	Dry brown Sand and gravel, Some Stone.				3	Y
Upper Site Pallet Line Landfill	DM-54 Shallow	0-15	moist brown f-m Sand w gravel & Stone				3	Y
Upper Site Pallet Line Landfill	DM-54 Deep	30-40	moist brown f-m sand w gravel & Stone Refusal on rock @ 40				3	Y
Upper Site Pallet Line Landfill	DM-57 Shallow	0-15	dry brown m-f Sand + gravel & Stone.				3	Y
Upper Site Pallet Line Landfill	DM-57 Deep	30-40	dry brown m-f sand + gravel & Stone Refusal on rock @ 40				3	Y
Upper Site Pallet Line Landfill	DM-56 Shallow	0-15	dry brown Sand w Some f gravel, Stone Refusal @ 20				3	Y
Upper Site Pallet Line Landfill	DM-55 Shallow	0-15	moist brown Sand w trace gravel + rock				3	Y
Upper Site Pallet Line Landfill	DM-55 deep	20-30	moist brown Sand w trace gravel + rock refusal @ 30				3	Y
Upper Site Pallet Line Landfill	DM-50 Shallow	0-15	Dry brown Sand, gravel and Stone				3	Y
Upper Site Pallet Line Landfill	DM-50 deep	30-40	Dry brown Sand, gravel and Stone Refusal @ 40				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER N. Aug 4, 2017 JEB/PJD

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site Pallet Site Landfill	DM-S1 Shallow	0-15	moist brown Sand w some gravel, trace stone. Diesel odor				3	Y
Upper Site Pallet Site Landfill	DM-S1 Deep	30-40	moist brown Sand w some gravel, stone Diesel Odour Refusal @ 40 stone				3	Y
Upper Site NHWL	MW06-18 Shallow	0-15	Stone, gravel and Sand. Moist				3	Y
Upper Site NHWL	MW06-18 Deep	N/S	Stone, gravel and Sand wet -refusal on ice @ 20cm				3	Y
Upper Site NHWL	MW07-21 Shallow	0-15	moist brown m-c Sand with gravel and stone				3	Y
Upper Site NHWL	MW07-21 Deep	40-50	moist brown m-c Sand w gravel and stone.				3	Y
Upper Site NHWL	MW06-20 Shallow	0-15	moist gravel, Stone and Sand Refusal @ 20, rock				3	Y
Upper Site NHWL	MW06-19 shallow	0-15	dry brown sand w gravel and stone Refusal @ 15, rock				3	Y
Upper Site helipad landfill	DM-17 Shallow	0-15	moist brown sand with some gravel				3	Y
Upper Site helipad landfill	DM-17 Deep	30-40	moist brown sand with some gravel refusal @ 40cm				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 4, 2017
SAMPLER NAME: JEB | PSO

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site South landfill west	DM-24 Shallow	0-5	-wet brown sand with some gravel & stone refusal @5cm (frozen)				3	Y
Upper Site South landfill west	DM-25 Shallow	0-15	wet brown sand w some gravel and stone refusal @15cm (frozen)				3	Y
Upper Site South landfill west	DM-925 Shallow	0-15	wet brown sand w some gravel and stone refusal @15cm (frozen)				3	Y
Upper Site South landfill west	DM26 Shallow	0-15	moist black-brown sand (+biotite) w stone				3	Y
Upper Site South landfill west	DM-26 deep	30-40	moist black-brown sand (+biotite) w stone Refusal on rock @ 40				3	Y
Upper Site South landfill west	DM-27 shallow	0-15	Brown Sand, trace gravel Refusal @ 20 on ice				3	Y
Upper Site South landfill west	DM-28 Shallow	0-15	dry brown sand occasional stone				3	Y
Upper Site South landfill west	DM-28 deep	40-50	dry brown sand occasional stone				3	Y
Upper Site South landfill west	DM-29 Shallow	0-15	dry brown sand with gravel & stone				3	Y
Upper Site South landfill west	DM-29 Deep	30-40	dry brown sand with gravel & stone refusal on rock @ 40cm				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER N Aug 4, 2017 JEB/RJD

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper site South landfill west	DM-30 Shallow	0-15	dry brown sand with some gravel & stone				3	Y
Upper Site south landfill west	DM-30 Deep	40-50	dry brown sand, with some gravel & stone				3	Y
Upper site South landfill west	DM-23 shallow	0-15	moist brown sand, some gravel. occasional stone				3	Y
Upper site South landfill west	DM-23 deep	30-40	moist brow sand, some gravel, occasional stone				3	Y
Upper site NWS landfill	DM-19 shallow	0-15	dry brown sand, gravel & stone refusal on rock @ 20cm				3	Y
Upper Site NWS landfill	DM-20 shallow	0-15	dry brown Sand fine gravel, stone Refusal @ 20 rock				3	Y
upper site NWS landfill	DM21 shallow	0-15	dry brown sand some gravel				3	Y
~~Upper~~ site NWS landfill	DM21 shallow	0-15	dry brown Sand some gravel				3	Y
Upper Site NWS landfill	DM 21 deep	20-30	dry brown Sand Some gravel Refusal on rock @ 30				3	Y
Upper site NWS landfill	DM 22 new shallow	0-15	dry brown - black sand, fine gravel				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 4, 2017
SAMPLER NAME: JEBJ PSD

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper Site NWS Landfill	DM22 new deep	20-30	dry brown - black sand, trace gravel Refusal @ 30 on rock.				3	Y
Upper Site NWS Landfill	DM18 shallow	0-15	wet coarse sand, gravel, stone				3	Y
Upper Site NWS Landfill	DM18 deep	20-30	wet coarse sand, gravel and stone. Wet @ 30 Refusal @ 30				3	Y

SITE NAME: DYE-M

RECORD OIL SAMPLING

SAMPLER N: Aug 9, 2017 PJD/JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
lower site Tier II	MW05-13 Shallow	0-15	wet brown sand with some gravel & stone				3	Y
lower site Tier II	MW05-13 deep	20-30	wet brown sand with some gravel & stone			- refusal @ 30 cm	3	Y
lower site Tier II	MW12-01 Shallow	0-15	wet brown sand with trace gravel & stone				3	Y
lower Site Tier II	MW12-01 Deep	40-50	wet brown sand with trace gravel & stone				3	Y
lower Site Tier II	MW12-901 Deep	40-50	wet brown sand with trace gravel & stone				3	Y
lower Site Tier II	MW05-15 shallow	0-15	moist brown sand, trace gravel & stone				3	Y
lower Site Tier II	MW05-15 Deep	40-50	moist brown sand, trace gravel & stone				3	Y
lower Site Tier II	MW05-16 shallow	0-15	moist brown sand, trace gravel & stone				3	Y
lower site Tier II	MW05-16 deep	40-50	moist brown sand trace gravel & stone				3	Y
lower site powerhouse	MW05-08 shallow	0-15	moist brown sand with some gravel & stone refusal @ 20cm on rock				3	Y

SITE NAME: OYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 5, 2017
SAMPLER NAME: PSD/JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
lower Site Powerhouse Landfill	MW05-07 Shallow	0-15	brown sand (loam) with some gravel, stone & trace organics				3	Y
lower Site Powerhouse Landfill	MW05-07 Deep	30-40	brown sand (loam) with gravel & stone -refusal on rock				3	Y
lower Site powerhouse Landfill	MW05-06 Shallow	0-15	brown sand (loam), trace gravel, stone & organics				3	Y
lower site powerhouse Landfill	MW05-906 Shallow	0-15	brown sand (loam) trace gravel, stone & organics				3	Y
lower site powerhouse landfill	MW05-06 Deep	40-50	brown sand (loam) trace gravel, & stone				3	Y
lower site powerhouse landfill	MW05-05 Shallow	0-15	brown sand (loam) with some gravel & stone -refusal on rocks @ 15cm				3	Y
lower site NHWL	MW09-26 Shallow	0-15	wet brown sand with trace gravel & stone				3	Y
lower site NHWL	MW09-26 Deep	40-50	wet brown sand with trace gravel & stone *water entered hole				3	Y
lower site NHWL	MW05-12 Shallow	0-15	dry brown sand, trace gravel & stone				3	Y
lower site NHWL	MW05-12 Deep	20-30	dry brown sand, trace gravel & stone, refusal on rock @ 30cm				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

SAMPLER N: Aug 5, 2017 PJD/JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
lower site NHWL	MW05-09 Shallow	0-15	moist brown sand with some gravel and stone				3	Y
lower site NHWL	MW05-09 Deep	30-40	moist brown sand with some gravel & stone -refusal on rock @ 40cm				3	Y
lower site NHWL	MW09-28 Shallow	0-15	moist brown sand with some gravel & stone				3	Y
lower site NHWL	MW09-28 Deep	30-40	moist brown sand with some gravel & stone -refusal on rock @ 40cm				3	Y
lower site NHWL	MW09-27 Shallow	0-15	wet brown sand with some gravel & stone				3	Y
lower site NHWL	MW09-27 Deep	30-40	wet brown sand w some gravel & f. stone				3	Y
Lower Site NWS Landfill	DM-8 Shallow	0-15	dry brown sand w gravel & stone/rock Refusal on stone @ 25				3	Y
Lower Site NWS Landfill	DM-9 shallow	0-15.	moist brown sand w trace gravel and rock				3	Y
Lower Site NWS Landfill	DM-9 deep	20-30	moist brown sand w trace gravel and rock Refusal@35 on stone				3	Y
Lower Site NWS Landfill	DM-10 Shallow	0-15	dry grey silt and sand w stone and rock Refusal@20 on rock.				3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 5 2017
SAMPLER NAME: PJD/JED

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Lower Site NWS Landfill	DM-7 shallow	0-15	moist brown fine sand trace gravel, stone and rock				3	Y
Lower Site NWS Landfill	DM-7 deep	30-40	moist brown fine sand, trace gravel, stone and rock Refusal on rock @ 40				3	Y
Lower Site NWS landfill	DM-97 deep	30-40	moist brown fine sand, trace gravel, stone & rock				3	Y
Upper Site Pallet LINE Landfill	DM-53 shallow	0-15	moist brown sand w fine gravel and stone slight PHC odor				3	Y
Upper Site Pallet Line Landfill	DM-53 deep.	40-50	moist brown sand w fine gravel and stone Slight PHC odor				3	Y

SITE NAME: UYE-14

RECORD OF SOIL SAMPLING

SAMPLER NAME: Aug 6, 2017 PSD, JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
upper site helipad landfill	DM-12 shallow	0-45	dry brown sand with some gravel & stone				3	Y
upper site helipad landfill	DM-12 Deep	30-40	dry brown sand with some gravel & stone				3	Y
upper site helipad landfill	DM-912 Deep	30-40	dry brown sand with some gravel & stone.	-refusal	on rock @ 40cm		3	Y
upper site helipad landfill	DM-13 Shallow	0-15	dry brown sand with some gravel & stone				3	Y
upper site helipad landfill	DM-13 Deep	40-50	dry brown sand with some gravel & stone				3	Y
upper site helipad landfill	DM-14 shallow	0-15	dry brown sand with some gravel & stone (biotite)				3	Y
upper site hel. pad landfill	DM-914 shallow	0-15	dry brown sand with some gravel & stone (biotite)				3	Y
upper site helipad landfill	DM-14 Deep	40-50	dry brown sand with some gravel & stone (biotite)				3	Y
upper site helipad landfill	DM-15 shallow	0-15	dry brown sand with some gravel & stone	-refusal @ 20cm on rock			3	Y
upper site helipad landfill	DM-16 Shallow	0-15	dry brown sand with rock and stone	-refusal @ 20cm on rock			3	Y

SITE NAME: DYE-M

RECORD OF SOIL SAMPLING

DATE: Aug 6, 2017
SAMPLER NAME: PJ/JEB

LANDFILL NAME	SOIL SAMPLE ID	DEPTH (m)	SOIL DESCRIPTION	GPS Northing	GPS Easting	GPS Elevation	Photographs	Backfilled (Y/N)
Upper site helipad landfill	OM-11 Shallow	0-15	dry sand with gravel and stone, @15cm dense, refusal on rock (dense rolled gravel)				3	Y

DYE-M
VT-1

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Mojtabedian	Inspection Date: Aug 6, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DYE-M		Landfill:	Lower Site Tier II
Thermistor Number:	VT-1	Inclination:	Vertical
Datalogger model no:	R-12	Datalogger cable download model:	USB
*Install Date:		First Date Event: 2014	Last Date Event: 2017
*Coordinates and Elevation	N 7393321	E 561820.9	Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial #	711005	Nodal Points	13

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.75	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	0.999	1.88
2	0.9362	-0.21
3	0.9096	-1.105
4	0.8846	-1.943
5	0.8651	-2.601
6	0.8455	-3.269
7	0.8341	-3.658
8	0.8230	-4.04

Bead	ohms	Degrees C
9	0.8157	-4.315
10	0.8097	-4.500
11	0.8049	-4.666
12	0.8006	-4.817
13	0.7985	-4.889

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed; beads and frequency)

Memory wrapped around.

Observations and Proposed Maintenance

N/A

DYE-M
VT 2

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	Aug 5, 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name:	DYE-	Landfill:	Lower site Tier II
Thermistor Number:	VT-2	Inclination:	Vertical
Datalogger model no:	CR-	Datalogger cable download model:	USB
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7388236. E 561836.6		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial #	71005 2	Nodal Points	9

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☐	☑	not locked
Battery Installation Date			
Battery Levels	Main 4.34	Aux 13.87	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2154	8.954
2	1.1942	7.92
3	1.0830	1.41
4	0.9982	1.853
5	0.9365	-0.206
6	0.9090	-1.123
7	0.8863	-1.8
9	0.8536	-2.99

Bead	ohms	Degrees C

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DEM
VT-3

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Moghadam	Inspection Date: Aug 5, 2014
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DVE-F		Landfill: Lovell Site Trail II	
Thermistor Number: VT-3		Inclination: Vertical	
Datalogger model no: RX [redacted]		Datalogger cable download model: VS [redacted]	
*Install Date:		First Date Event	Last Date Event 2014
*Coordinates and Elevation	N 7392281 E 561927		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 711005 3		Nodal Points 7	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☐	☐	
Lock condition	☐	☑	No lock
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.87	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2048	8.6
2	1.1104	5.5
3	1.0263	2.7
4	0.9519	0.3
5	0.9193	-0.7
6	0.8972	-1.52
7	0.8729	-2.33

Bead	ohms	Degrees C

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: 2017

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DVE-M
VT-M

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Moghaddam	Inspection Date: Aug 5, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermister logs)

Site Name: DVE-M		Landfill: Lower Sable Terrell	
Thermistor Number: VT-M		Inclination: Vertical	
Datalogger model no: DR16		Datalogger cable download model:	
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7382124E 561261.4		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 710054		Nodal Points N/A	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☐	☐	?
Cable	☐	☐	?
Beads	☐	☐	?
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main		Aux

Manual Ground Temperature Readings

Bead	ohms	Degrees C
N/A		

Bead	ohms	Degrees C
N/A		

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed; bands and frequency)

N/A

Observations and Proposed Maintenance

The datalogger was not communicating with the computer. No data were downloaded. The datalogger might require a new set of batteries?

DYE-M
VT-BL

ANNEX M: Thermistor Inspection Template

Inspector Name: Robert Naghshineh	Inspection Date: Aug 6, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DYE-M		Landfill: Final Lower Site	
Thermistor Number: VT-BL		Inclination: Vertical	
Datalogger model no: RX-16		Datalogger cable download model: USB	
*Install Date:	First Date Event	Last Date Event	2017
*Coordinates and Elevation	N 7382226 E 561629.5	Elev	
Length of Cable (m)	Cable Lead Above Ground (m)		
Datalogger Serial # 711027	Nodal Points 14		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☐	☐	No lock
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.63	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.4663	17.5
2	1.4250	16.0
out	—	—
4	1.2964	11.61
out	—	—
6	1.1135	5.61
7	0.9890	1.53
8	0.9391	-3.52

Bead	ohms	Degrees C
9	0.8412	-3.41
10	0.8097	-4.5
11	0.7920	-5.11
12	0.7859	-5.67
13	0.7723	-5.80
14	0.7691	-5.91

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DVE-M
VT-5

ANNEX M: Thermistor Inspection Template

Inspector Name:	Reza Moghaddam	Inspection Date:	Aug 8, 2017
Inspector Signature / Prepared By:			

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name:	DVE-M	Landfill:	Power Water
Thermistor Number:	VT-5	Inclination:	Vertical
Datalogger model no:	RX-16	Datalogger cable download model:	USB
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7367478 E 582754.9 Elev		
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial #	711024	Nodal Points	11

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	New cover is required
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.99	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.4907	18.4
2	1.4772	17.9
3	1.3444	13.29
4	1.1670	7.36
5	1.0286	2.83
6	0.9374	-0.17
7	0.9090	-1.12
8	0.8863	-2.08

Bead	ohms	Degrees C
9	0.8609	-2.74
10	0.8493	-3.82
11	0.8288	-4.46

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DYE-M
T-6

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Naghdam	Inspection Date: Aug 5, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DYE-M		Landfill:	Power house
Thermistor Number:		Inclination:	Vertical
Datalogger model no:		Datalogger cable download model:	USB
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7331 MSM E 562755.9		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 741002		Nodal Points 10	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☑	New lock
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.36	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	Out.	—
2	1.2079	9.7
3	1.1032	5.21
4	1.0006	1.91
5	0.9337	-0.36
6	0.9030	-1.32
7	0.8978	-2.05
8	0.8961	-2.34

Bead	ohms	Degrees C
9	0.8278	-3.87
10	0.8132	-4.38

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DYE-M
VT-7

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Moghaddam	Inspection Date: Aug 5, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name:		Landfill:	Lower Hacke
Thermistor Number:	VT-7	Inclination:	Vertical
Datalogger model no:		Datalogger cable download model:	USB
*Install Date:		First Date Event	Last Date Event Aug 17
*Coordinates and Elevation	N 7387454 E 562755		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial #	711002	Nodal Points	10

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☐ ✓	☐	
Cover	☐ ✓	☐	
Data Logger	☐ ✓	☐	
Cable	☐ ✓	☐	
Beads	☐ ✓	☐	
Lock condition	☐	☐ ✓	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 14.11	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1342	6.28
2	0.9851	1.43
3	0.9247	-0.438
4	0.9022	-1.351
5	0.7855	-6.34
6	0.8621	-2.76
7	0.8528	-3.02
8	0.8390	-3.49

Bead	ohms	Degrees C
9	0.8293	-3.82
10	0.8254	-3.95

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed; beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DYE-M
VT-8

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Moghaddam	Inspection Date: Aug 3, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DyE-7		Landfill: Upper Site Tier II	
Thermistor Number: [redacted]		Inclination: Vertical	
Datalogger model no: [redacted]		Datalogger cable download model: [redacted]	
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7344615E 571051 S		Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 711057		Nodal Points 15	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 12.53	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1337	6.17
2	1.1171	5.72
3	1.1121	5.55
4	1.0041	2.04
5	0.9773	-0.51
6	0.8946	-1.94
7	0.8539	-3.00
8	0.8449	-3.17

Bead	ohms	Degrees C
9	0.8046	-4.67
10	0.7871	-5.27
11	0.7706	-5.86
12	0.7605	-6.22
13	0.7568	-6.58
14	0.7443	-6.80
15	0.7375	-7.04
16		

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed; beads and frequency)

[redacted] Memory — wrapped around.

Observations and Proposed Maintenance

N/A

ANNEX M
VT-9

ANNEX M: Thermistor Inspection Template

Inspector Name: Dessa Muftahaun	Inspection Date: Aug 3, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some Information can be pre-populated from thermistor logs)

Site Name: [redacted]	Landfill: Tunnel Ridge Upper Site
Thermistor Number: [redacted]	Inclination: Vertical
Datalogger model no: RX-16	Datalogger cable download model: USB
*Install Date:	First Date Event / Last Date Event 2017
*Coordinates and Elevation	N 7394338 E 571588.7 Elev
Length of Cable (m)	Cable Lead Above Ground (m)
Datalogger Serial # 7110058	Nodal Points 16

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main 11.74	Aux 13.78	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1708	7.46
2	1.1514	6.87
3	1.1628	7.72
4	1.0604	3.89
5	0.9519	0.32
6	0.8375	-1.578
7	0.9669	-2.1
8	0.8366	-3.57

Bead	ohms	Degrees C
9	0.8156	-4.24
10	0.7980	-4.883
11	0.7823	-5.457 / -5.83
12	0.7717	-6.22
13	0.7605	-6.619
14	0.7528	-
15	0.7487	-6.64
16	0.7393	-6.98

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed: beads and frequency)

Requery, wrapped around.

Observations and Proposed Maintenance

N/A

DYE-M
VT-10

ANNEX M: Thermistor Inspection Template

Inspector Name: Perri McGlade	Inspection Date: Aug 3, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DYE-M		Landfill: Upper S. Fe, Tier II	
Thermistor Number: VT-10		Inclination: Vertical	
Datalogger model no: R-10		Datalogger cable download model: US[redacted]	
*Install Date:	First Date Event		Last Date Event 2017
*Coordinates and Elevation	N	E	Elev
Length of Cable (m)	Cable Lead Above Ground (m)		
Datalogger Serial # 71 10059	Nodal Points 10		

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.26	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1371	6.27
2	1.1299	6.14
3	1.0154	1.41
4	0.9268	-0.52
5	0.8851	-1.92
6	0.8527	-3.01
7	0.8293	-3.82
8	0.8065	-4.61

Bead	ohms	Degrees C
9	0.7883	-5.24
10	0.7691	-5.91

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DYE-M

VT-11

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Moghaddam	Inspection Date: Aug 3, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DYE-[redacted]		Landfill: Upper Tier II	
Thermistor Number: [redacted]		Inclination: Vertical	
Datalogger model no: [redacted]6		Datalogger cable download model: USB	
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N 7394635E	371527	Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 711035		Nodal Points 12	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	☑	☐	
Cover	☑	☐	
Data Logger	☑	☐	
Cable	☑	☐	
Beads	☑	☐	
Lock condition	☑	☐	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.75	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.1866	8.00
2	1.2031	8.55
3	1.1439	6.66
4	1.1397	6.46
5	1.0676	4.11
6	0.4562	0.41
7	0.9059	-0.27
8	0.8760	-2.23

Bead	ohms	Degrees C
9	0.8479	-3.18
10	0.8201	-4.14
11	0.8000	-4.83
12	0.7965	-5.31

Battery Information

Batteries changed ? Yes ☐ No ☑ Monitoring Year: _____

Battery model number installed: _____

Expected battery life (years): _____

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

DVE-M

√ T-BU

ANNEX M: Thermistor Inspection Template

Inspector Name: Reza Hajhaddan	Inspection Date: Aug 3, 2017
Inspector Signature / Prepared By:	

Thermistor Information (*Some information can be pre-populated from thermistor logs)

Site Name: DVE-M		Landfill: Tier II Upper Site	
Thermistor Number: VT-BU		Inclination: Vertical	
Datalogger model no: RV-16		Datalogger cable download model: USB	
*Install Date:		First Date Event	Last Date Event 2017
*Coordinates and Elevation	N	E	Elev
Length of Cable (m)		Cable Lead Above Ground (m)	
Datalogger Serial # 711002 8		Nodal Points 14	

Thermistor Inspection

	Good	Needs Maintenance	Description
Casing	√	☐	
Cover	√	☐	
Data Logger	√	☐	
Cable	√	☐	
Beads	√	☐	
Lock condition	√	☐	
Battery Installation Date			
Battery Levels	Main 11.34	Aux 13.38	

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	1.2342	9.74
2	1.2262	9.31
3	1.2106	8.79
4	1.0847	4.67
5	0.9901	1.56
6	0.9139	-0.96
7	0.8792	-2.12
8	0.8293	-3.82

Bead	ohms	Degrees C
9	0.7953	-5.17
10	0.7649	-6.06
11	0.7503	-6.58
12	0.7437	-6.82
13	0.7413	-6.91
14	0.7420	-6.88

Battery Information

Batteries changed ? Yes ☐ No ☒ Monitoring Year:

Battery model number installed:

Expected battery life (years):

Datalogger Programming (Describe programming completed: beads and frequency)

N/A

Observations and Proposed Maintenance

N/A

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

159 Colonnade Road
Unit 3
Ottawa, Ontario K2E 7L9

Pine Environmental Services, Inc.

Instrument ID 25326
Description Horiba U-52 Sonde 2m Cable
Calibrated 7/12/2017 10:38:04AM

Manufacturer Horiba
Model Number U-5000
Serial Number/ Lot Number TBKUUMSS
Location Ottawa
Department

State Certified
Status Pass
Temp °C 21.6
Humidity % 56

Calibration Specifications

Group # 1
Group Name PH
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
7.01 / 7.01	PH	7.01	PH	6.83	7.01	0.00%	Pass
4.01 / 4.01	PH	4.01	PH	3.82	4.01	0.00%	Pass

Group # 2
Group Name Turbidity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	NTU	0.00	NTU	1.70	0.00	0.00%	Pass
800.00 / 800.00	NTU	800.00	NTU	813.00	800.00	0.00%	Pass

Group # 3
Group Name Conductivity
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.000

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.718 / 0.718	ms/cm	0.718	ms/cm	0.700	0.718	0.00%	Pass
5.000 / 5.000	ms/cm	5.000	ms/cm	5.140	5.000	0.00%	Pass
80.000 / 80.000	ms/cm	80.000	ms/cm	84.600	80.000	0.00%	Pass

Group # 4
Group Name Redox (ORP)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
240.00 / 240.00	mv	240.00	mv	249.00	240.00	0.00%	Pass

Group # 5
Group Name Disolved Oxygen Zero
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

159 Colonnade Road
Unit 3
Ottawa, Ontario K2E 7L9

Pine Environmental Services, Inc.

Instrument ID 25326
Description Horiba U-52 Sonde 2m Cable
Calibrated 7/12/2017 10:38:04AM

Group # 5 | **Range Acc %** 0.0000
Group Name Disolved Oxygen Zero | **Reading Acc %** 3.0000
Stated Accy Pct of Reading | **Plus/Minus** 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	mg/L	0.00	mg/L	0.52	0.00	0.00%	Pass

Group # 6 | **Range Acc %** 0.0000
Group Name Temperature DO Span | **Reading Acc %** 0.0000
Stated Accy Plus / Minus | **Plus/Minus** 3.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
19.20 / 20.50	degrees C	8.68	mg/L	7.16	8.68	0.00%	Pass

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Shawn Neely

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

APPENDIX C

Laboratory Data

DYE-M Lower Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**64.5**	**12.4**	**25.98**	**10.0**	**34.4**	**49.2**	**0.10**				**51.0**
Baseline Data - Standard Deviation						0.00	0.00	20.6	3.6	7.2	0.0	10.0	10.9	0.00				108.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**126.5**	**23.3**	**47.7**	**10.0**	**64.4**	**81.8**	**0.10**				**377.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-07 surface																	
14-8444	DM-07	2014	Year 1	Phase I	5-10	**1.3**	<1.0	47.0	6.0	21.0	<10	29.0	35.0	<0.010	<10	<10	<10	15.0
DM-07 (0-15)	DM-07	2015	Year 2	Phase I	0-15	**1.2**	<0.50	**68.3**	11.3	23.5	3.8	**37.0**	39.5	<0.050	<7.0	<4.0	<8.0	9.5
DM-07b	DM-07	2016	Year 3	Phase I	0-15	1.0	<0.50	63.2	10.4	**27.3**	5.1	**37.1**	42.0	<0.050	<6.0	<7.0	<29	21.0
DM-07 Shallow	DM-07	2017	Year 4	Phase I	0-15	<1.0	<0.5	**74.0**	11.2	**29.2**	6.4	**41.0**	46.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-07 depth																	
14-8445	DM-07	2014	Year 1	Phase I	40-45	**1.1**	<1.0	58.0	7.0	25.0	<10	33.0	39.0	<0.010	<10	<10	<10	15.0
DM-07 (40-50)	DM-07	2015	Year 2	Phase I	40-50	<1.0	<0.50	**67.0**	11.2	23.8	4.9	**37.6**	38.7	<0.050	<7.0	<4.0	<8.0	9.5
DM-07a	DM-07	2016	Year 3	Phase I	40-50	<1.0	<0.50	**69.5**	10.1	**26.0**	5.6	33.9	36.6	<0.050	<7.0	<4.0	<8.0	9.5
DM-07 Deep (Dup Avg)	DM-07	2017	Year 4	Phase I	30-40	<1.0	<0.5	**72.0**	11.1	**29.2**	5.8	**40.5**	44.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Lower Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**64.5**	**12.4**	**25.98**	**10.0**	**34.4**	**49.2**	**0.10**				**51.0**
Baseline Data - Standard Deviation						0.00	0.00	20.6	3.6	7.2	0.0	10.0	10.9	0.00				108.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**126.5**	**23.3**	**47.7**	**10.0**	**64.4**	**81.8**	**0.10**				**377.0**
Downgradient																		
	DM-08 surface																	
14-8453	DM-08	2014	Year 1	Phase I	5-10	**1.3**	<1.0	54.0	6.9	18.0	**11.0**	32.0	49.0	0.010	<10	<10	<10	15.0
DM-08 (0-15) (Dup Avg)	DM-08	2015	Year 2	Phase I	0-15	**1.2**	<0.50	55.2	9.3	23.3	**10.8**	30.3	**50.1**	<0.050	<6.0	<4.0	11.0	16.0
DM-08a	DM-08	2016	Year 3	Phase I	0-15	<1.0	<0.50	56.3	8.9	25.6	**10.8**	28.5	43.3	<0.050	<7.0	<4.0	<8.0	9.5
DM-08 Shallow	DM-08	2017	Year 4	Phase I	0-15	<1.0	<0.5	44.8	7.9	20.9	8.8	27.8	40.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-08 depth																	
14-8454	DM-08	2014	Year 1	Phase I	45-50	**1.1**	<1.0	50.0	6.3	15.0	<10	29.0	40.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	DM-08	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-08	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-08	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Lower Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**64.5**	**12.4**	**25.98**	**10.0**	**34.4**	**49.2**	**0.10**				**51.0**
Baseline Data - Standard Deviation						0.00	0.00	20.6	3.6	7.2	0.0	10.0	10.9	0.00				108.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**126.5**	**23.3**	**47.7**	**10.0**	**64.4**	**81.8**	**0.10**				**377.0**
	DM-09 surface																	
14-8450/51	DM-09	2014	Year 1	Phase I	5-10	**2.0**	<1.0	**130.0**	**16.0**	**40.0**	<10	**74.0**	**91.0**	<0.010	<10	<10	<10	15.0
DM-09 (0-15)	DM-09	2015	Year 2	Phase I	0-15	**1.8**	<0.50	**107.0**	**19.0**	**40.5**	9.7	**53.7**	**70.1**	<0.050	<7.0	<4.0	<8.0	9.5
DM-09a	DM-09	2016	Year 3	Phase I	0-15	<1.0	<0.50	63.9	9.6	**27.2**	5.2	31.9	36.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-09 Shallow	DM-09	2017	Year 4	Phase I	0-15	<1.0	<0.5	62.2	9.4	**30.8**	6.1	**37.5**	44.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-09 depth																	
14-8452	DM-09	2014	Year 1	Phase I	40-45	**1.8**	<1.0	**120.0**	**15.0**	**38.0**	<10	**71.0**	**87.0**	<0.010	<10	<10	<10	15.0
Not sampled, refusal	DM-09	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-09	2016	Year 3	Phase I														#N/A
DM-09 Deep	DM-09	2017	Year 4	Phase I	20-30	<1.0	<0.5	**64.9**	8.9	**31.0**	5.1	**36.9**	40.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Lower Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**64.5**	**12.4**	**25.98**	**10.0**	**34.4**	**49.2**	**0.10**				**51.0**
Baseline Data - Standard Deviation						0.00	0.00	20.6	3.6	7.2	0.0	10.0	10.9	0.00				108.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**126.5**	**23.3**	**47.7**	**10.0**	**64.4**	**81.8**	**0.10**				**377.0**
	DM-10 surface																	
14-8447*	DM-10	2014	Year 1	Phase I	5-10	**1.1**	<1.0	**77.0**	8.4	21.0	<10	**40.0**	48.0	<0.010	<10	<10	<10	15.0
DM-10 (0-15)	DM-10	2015	Year 2	Phase I	0-15	**1.7**	<0.50	**74.7**	**14.5**	**30.8**	8.9	**39.2**	**55.7**	<0.050	<7.0	<4.0	<8.0	9.5
DM-10a	DM-10	2016	Year 3	Phase I	0-15	<1.0	<0.50	**64.7**	10.0	**28.7**	6.3	31.5	41.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-10 Shallow	DM-10	2017	Year 4	Phase I	0-15	<1.0	<0.5	**71.9**	11.1	**32.3**	9.0	**39.0**	**53.5**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-10 depth																	
14-8448	DM-10	2014	Year 1	Phase I	30-35	0.8	<1.0	58.0	6.5	18.0	<10	31.0	37.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	DM-10	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-10	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-10	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

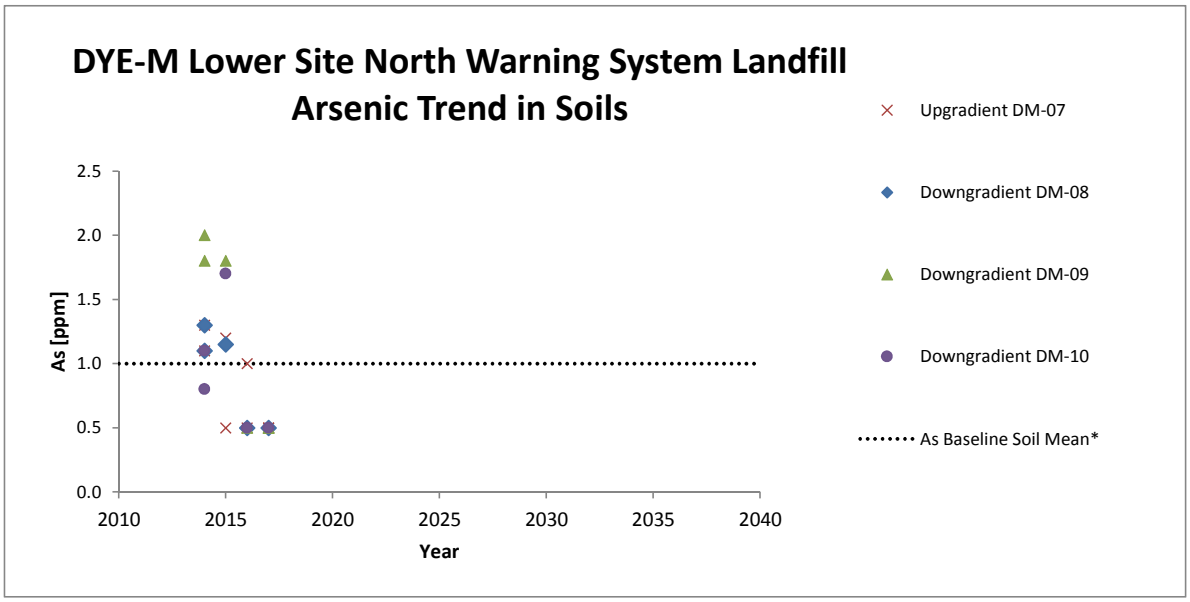
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Lower Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH

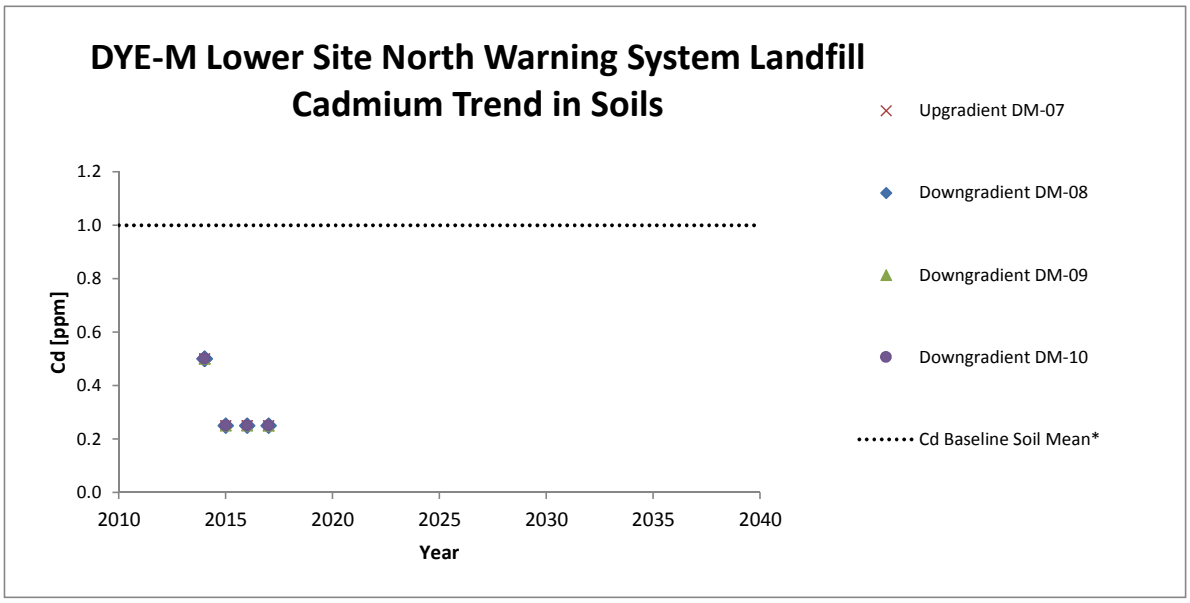
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

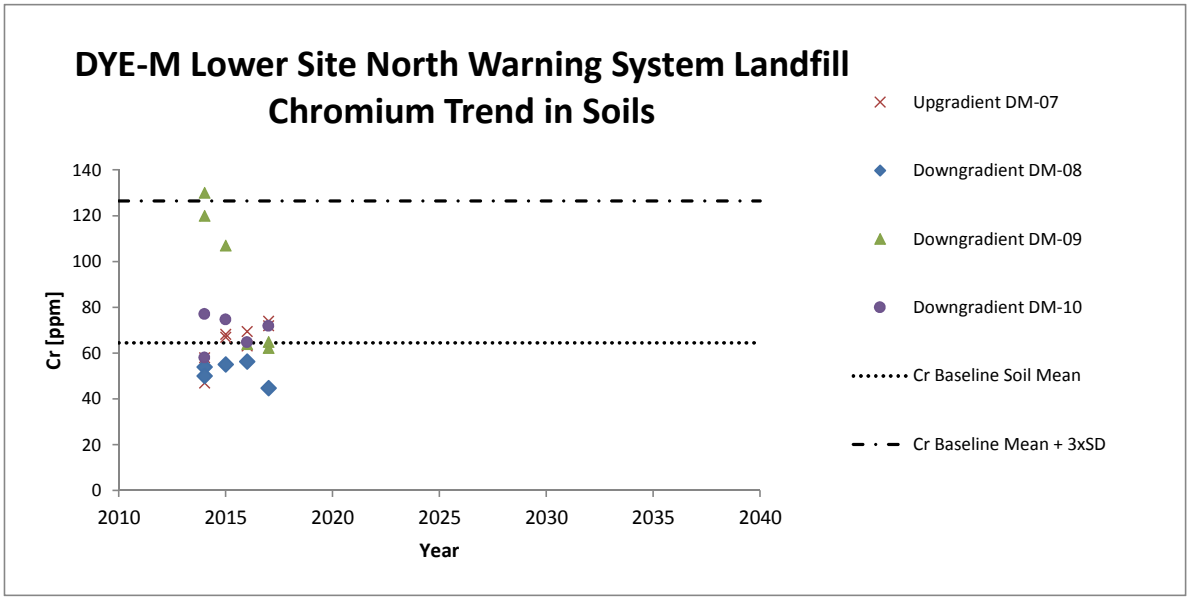


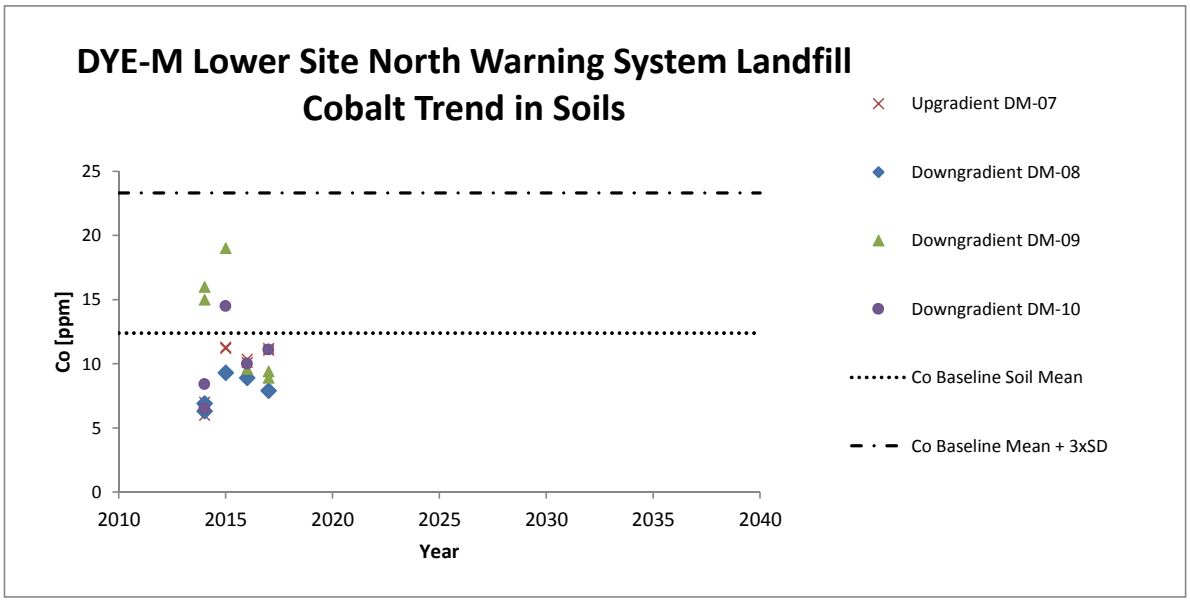
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



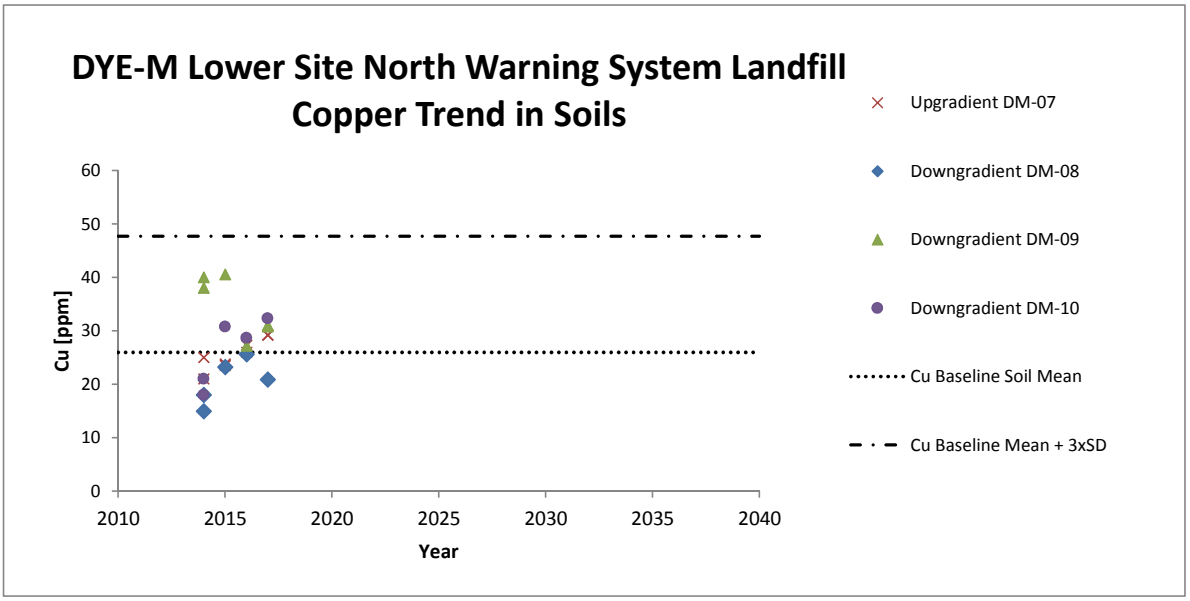
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

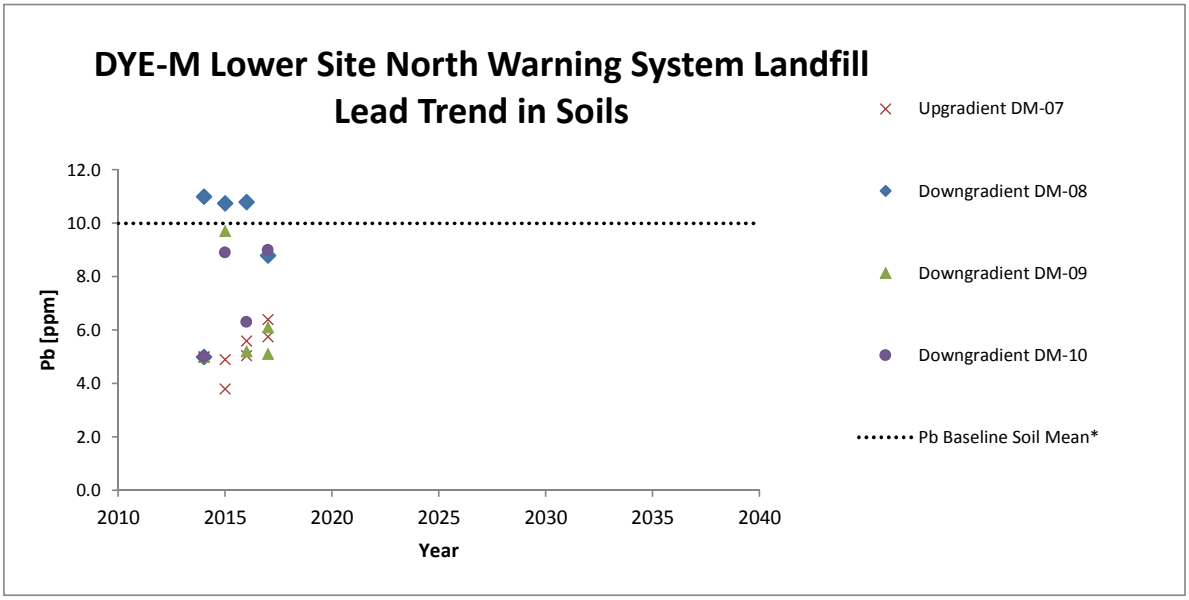
DYE-M Lower Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH





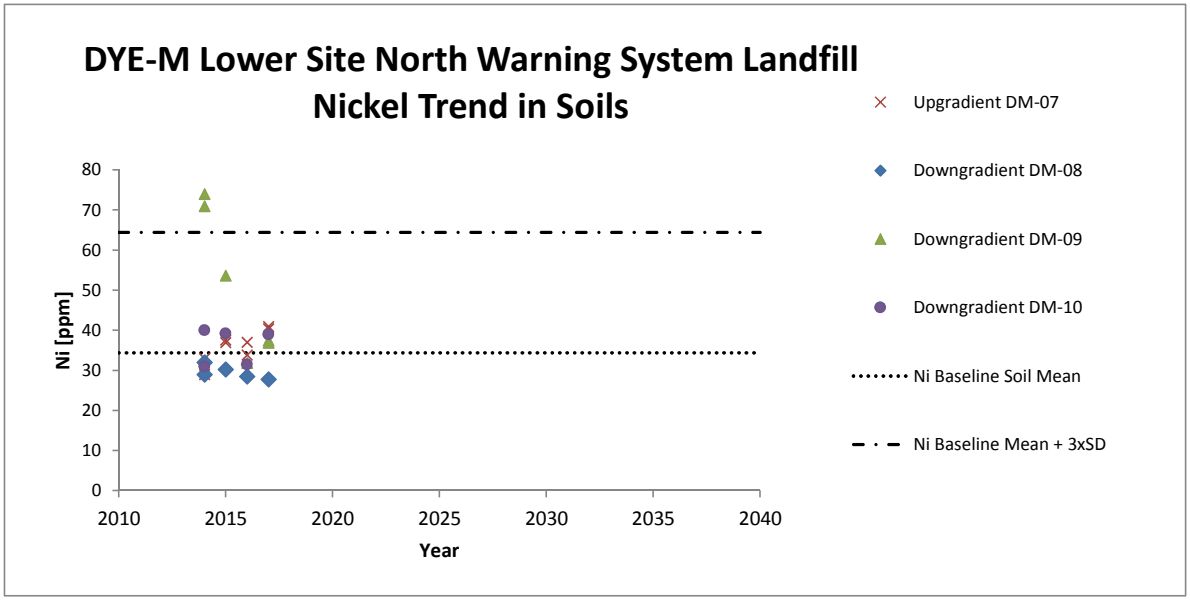
DYE-M Lower Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH

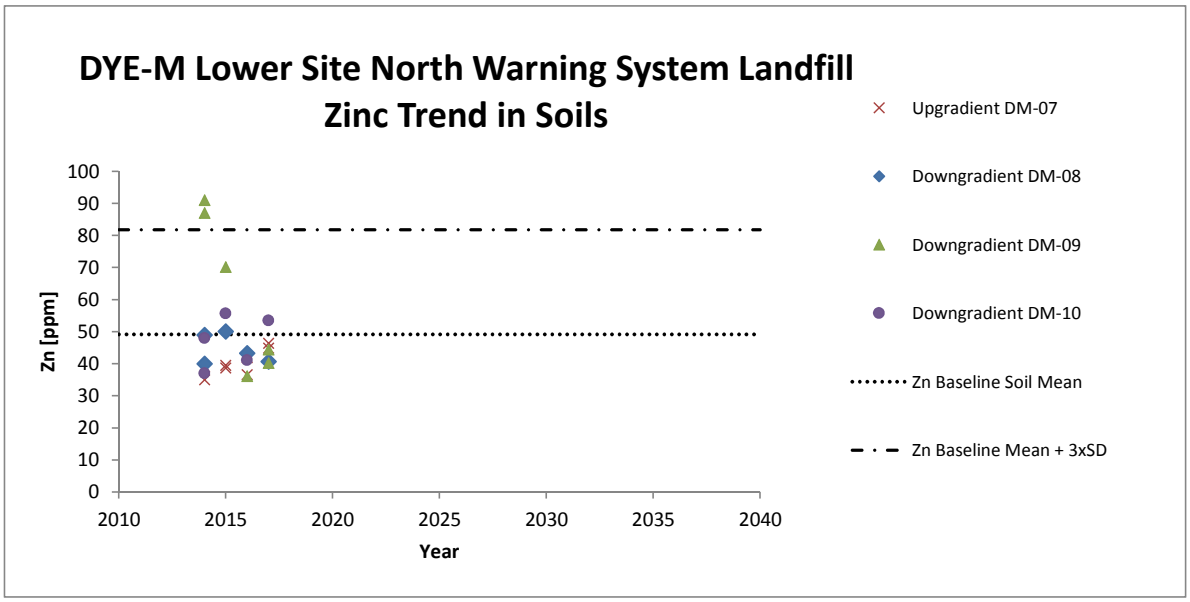




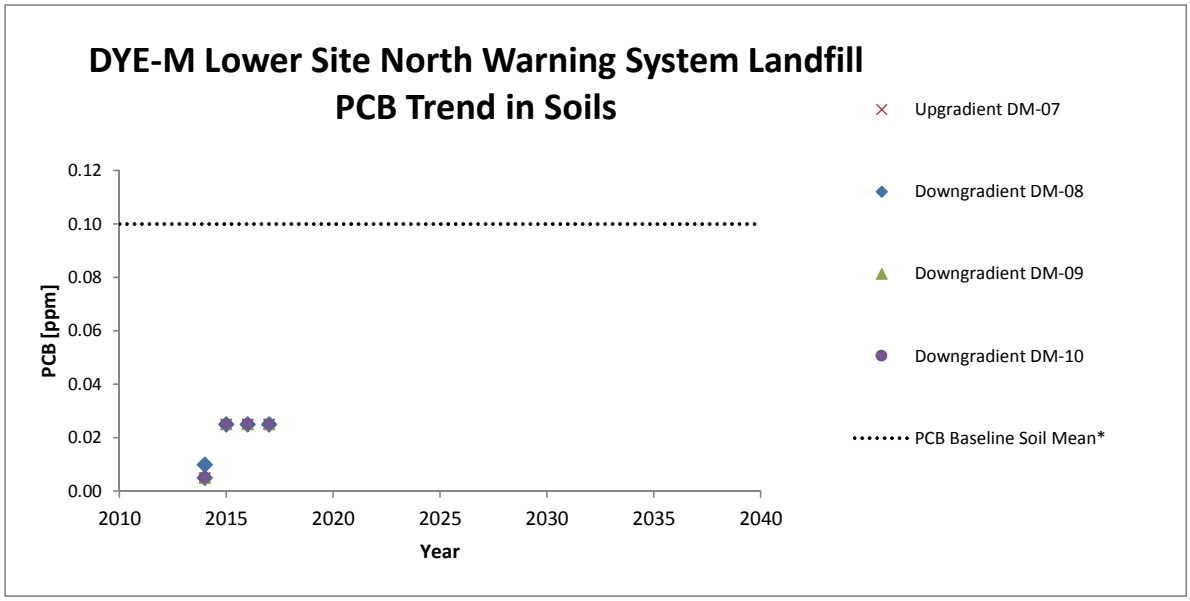
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH

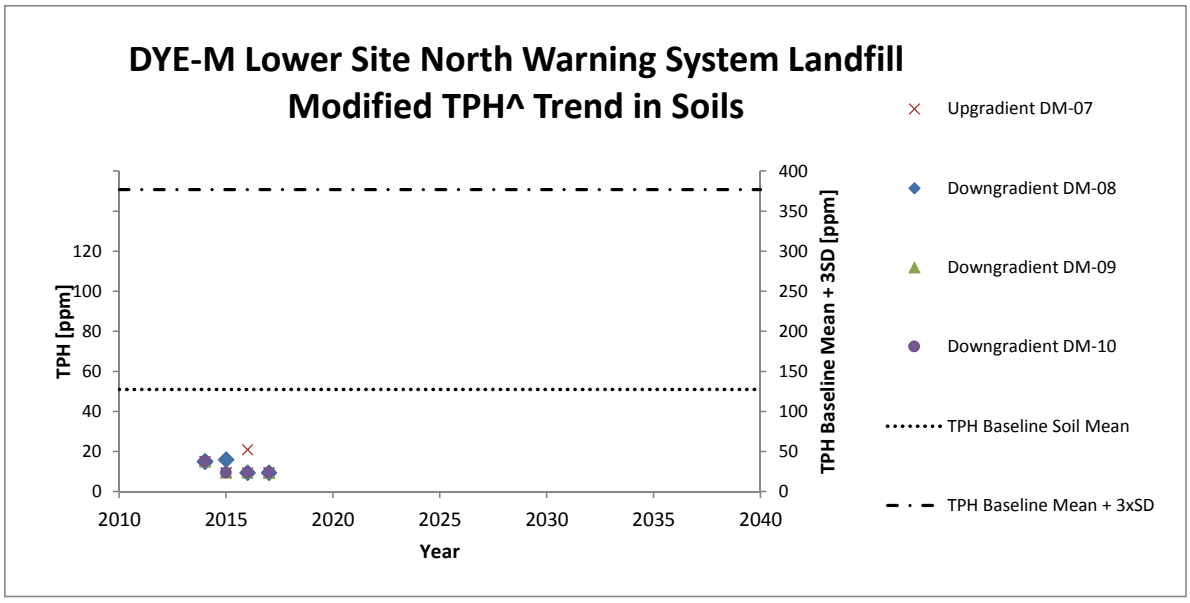




DYE-M Lower Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2017 are an indication of changing detection limits; all results at or below detection limits



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.9**	**11.7**	**27.66**	**10.0**	**38.4**	**47.4**	**0.05**				**24.7**
Baseline Data - Standard Deviation						0.00	0.00	16.1	2.8	8.2	0.0	8.5	10.4	0.00				13.4
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**120.2**	**20.2**	**52.2**	**10.0**	**64.0**	**78.6**	**0.05**				**64.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data															**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient																		
	MW05-16 surface																	
14-8455	MW05-16	2014	Year 1	Phase I	5-10	1.0	<1.0	**86.0**	9.8	24.0	<10	**44.0**	**51.0**	<0.010	<10	<10	<10	15.0
MW 05-16 (0-15)	MW05-16	2015	Year 2	Phase I	0-15	**1.6**	<0.50	**88.1**	**12.4**	**34.6**	5.5	**41.5**	**51.0**	<0.050	<7.0	<4.0	<8.0	9.5
MW05-16b	MW05-16	2016	Year 3	Phase I	0-15	<1.0	<0.50	**88.1**	11.5	**40.4**	6.4	**41.7**	**47.9**	<0.050	<7.0	<4.0	34.0	**39.5**
MW05-16 Shallow	MW05-16	2017	Year 4	Phase I	0-15	<1.0	<0.5	**85.0**	10.9	**31.9**	5.3	**41.3**	**50.9**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-16 depth																	
14-8457	MW05-16	2014	Year 1	Phase I	45-50	**1.7**	<1.0	**95.0**	11.0	**33.0**	<10	**52.0**	**69.0**	<0.010	<10	<10	<10	15.0
MW 05-16 (40-50)	MW05-16	2015	Year 2	Phase I	40-50	**1.4**	<0.50	**90.7**	**13.2**	**33.1**	5.4	**41.3**	**52.0**	<0.050	<7.0	<4.0	<8.0	9.5
MW05-16a	MW05-16	2016	Year 3	Phase I	30-40	<1.0	<0.50	68.8	9.3	**29.7**	6.2	33.7	40.2	<0.050	<7.0	<4.0	<8.0	9.5
MW05-17 Deep	MW05-16	2017	Year 4	Phase I	40-50	<1.0	<0.5	71.2	9.7	**28.1**	5.1	35.2	44.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.9**	**11.7**	**27.66**	**10.0**	**38.4**	**47.4**	**0.05**				**24.7**
Baseline Data - Standard Deviation						0.00	0.00	16.1	2.8	8.2	0.0	8.5	10.4	0.00				13.4
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**120.2**	**20.2**	**52.2**	**10.0**	**64.0**	**78.6**	**0.05**				**64.9**
Downgradient																		
	MW05-13 surface																	
14-8464	MW05-13	2014	Year 1	Phase I	5-10	0.9	<1.0	49.0	5.4	14.0	<10	26.0	30.0	<0.010	<10	<10	<10	15.0
MW 05-13 (0-15)	MW05-13	2015	Year 2	Phase I	0-15	**1.3**	<0.50	60.4	8.9	21.8	3.7	33.7	35.9	<0.050	<7.0	<4.0	<8.0	9.5
MW05-13a	MW05-13	2016	Year 3	Phase I	0-15	<1.0	<0.50	47.1	6.9	18.9	3.7	24.8	26.9	<0.050	<7.0	<4.0	41.0	**46.5**
MW05-13 Shallow	MW05-13	2017	Year 4	Phase I	0-15	<1.0	<0.5	47.3	7.1	21.8	5.2	27.4	33.5	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-13 depth																	
14-8465	MW05-13	2014	Year 1	Phase I	45-50	0.9	<1.0	54.0	6.6	15.0	<10	30.0	36.0	<0.010	<10	<10	<10	15.0
MW 05-13 (20-30)	MW05-13	2015	Year 2	Phase I	20-30	<1.0	<0.50	56.3	8.6	20.8	3.5	30.7	33.6	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW05-13	2016	Year 3	Phase I														#N/A
MW05-13 Deep	MW05-13	2017	Year 4	Phase I	20-30	<1.0	<0.5	45.3	6.5	18.6	3.2	26.1	31.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.9**	**11.7**	**27.66**	**10.0**	**38.4**	**47.4**	**0.05**				**24.7**
Baseline Data - Standard Deviation						0.00	0.00	16.1	2.8	8.2	0.0	8.5	10.4	0.00				13.4
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**120.2**	**20.2**	**52.2**	**10.0**	**64.0**	**78.6**	**0.05**				**64.9**
	MW05-15 surface																	
14-8458	MW05-15	2014	Year 1	Phase I	5-10	**1.5**	<1.0	**91.0**	9.8	25.0	<10	**44.0**	**55.0**	<0.010	<10	<10	<10	15.0
MW05-15 (0-15) (Dup Avg)	MW05-15	2015	Year 2	Phase I	0-15	**1.4**	<0.50	**93.4**	**13.9**	**39.3**	5.0	**47.9**	**60.6**	<0.050	<6.0	<4.0	<8.0	9.0
MW05-15b	MW05-15	2016	Year 3	Phase I	0-15	<1.0	<0.50	**91.3**	**13.0**	**45.9**	7.4	**44.1**	**50.6**	<0.050	<7.0	<4.0	59.0	**64.5**
MW05-15 Shallow	MW05-15	2017	Year 4	Phase I	0-15	<1.0	<0.5	**79.3**	11.5	**37.7**	6.0	**44.3**	**51.3**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-15 depth																	
14-8460/61	MW05-15	2014	Year 1	Phase I	45-50	**1.7**	<1.0	**76.0**	9.1	25.0	<10	**41.0**	**49.0**	<0.010	<10	<10	<10	15.0
MW05-15 (30-40)	MW05-15	2015	Year 2	Phase I	30-40	**1.6**	<0.50	**88.9**	**13.2**	**34.1**	5.2	**42.5**	**53.3**	<0.050	<7.0	<4.0	<8.0	9.5
MW05-15a	MW05-15	2016	Year 3	Phase I	40-50	<1.0	<0.50	71.0	11.3	**36.6**	6.8	**38.5**	45.4	<0.050	<7.0	<4.0	<8.0	9.5
MW05-15 Deep	MW05-15	2017	Year 4	Phase I	40-50	<1.0	<0.5	**87.9**	**12.5**	**40.2**	6.0	**46.3**	**55.8**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.9**	**11.7**	**27.66**	**10.0**	**38.4**	**47.4**	**0.05**				**24.7**
Baseline Data - Standard Deviation						0.00	0.00	16.1	2.8	8.2	0.0	8.5	10.4	0.00				13.4
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**120.2**	**20.2**	**52.2**	**10.0**	**64.0**	**78.6**	**0.05**				**64.9**
	MW12-01 surface																	
14-8462	MW12-01	2014	Year 1	Phase I	5-10	0.8	<1.0	51.0	5.7	14.0	<10	24.0	33.0	<0.010	<10	<10	<10	15.0
MW 12-01 (0-15)	MW12-01	2015	Year 2	Phase I	0-15	**1.5**	<0.50	69.0	9.6	**27.7**	4.4	32.8	42.0	<0.050	<7.0	<4.0	<8.0	9.5
MW12-01a	MW12-01	2016	Year 3	Phase I	0-15	<1.0	<0.50	64.0	8.4	27.1	5.1	29.6	36.4	<0.050	<7.0	<4.0	<8.0	9.5
MW12-01 Shallow	MW12-01	2017	Year 4	Phase I	0-15	<1.0	<0.5	**72.0**	9.5	**29.3**	5.3	35.0	42.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
	MW12-01 depth																	
14-8463	MW12-01	2014	Year 1	Phase I	40-45	**1.2**	<1.0	69.0	8.1	25.0	<10	**39.0**	47.0	<0.010	<10	<10	<10	15.0
MW 12-01 (20-30)	MW12-01	2015	Year 2	Phase I	20-30	1.0	<0.50	70.5	10.0	27.5	4.7	32.3	42.0	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW12-01	2016	Year 3	Phase I														#N/A
MW12-01 Deep (Dup Avg)	MW12-01	2017	Year 4	Phase I	40-50	<1.0	<0.5	63.3	9.0	26.7	5.0	33.4	41.5	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

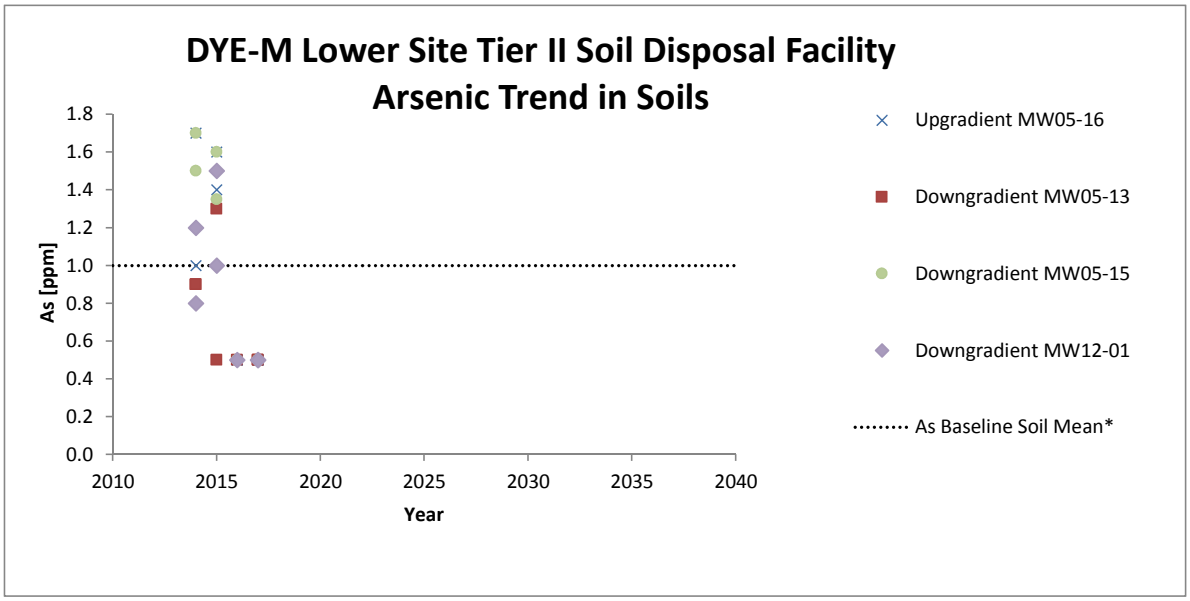
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Lower Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH

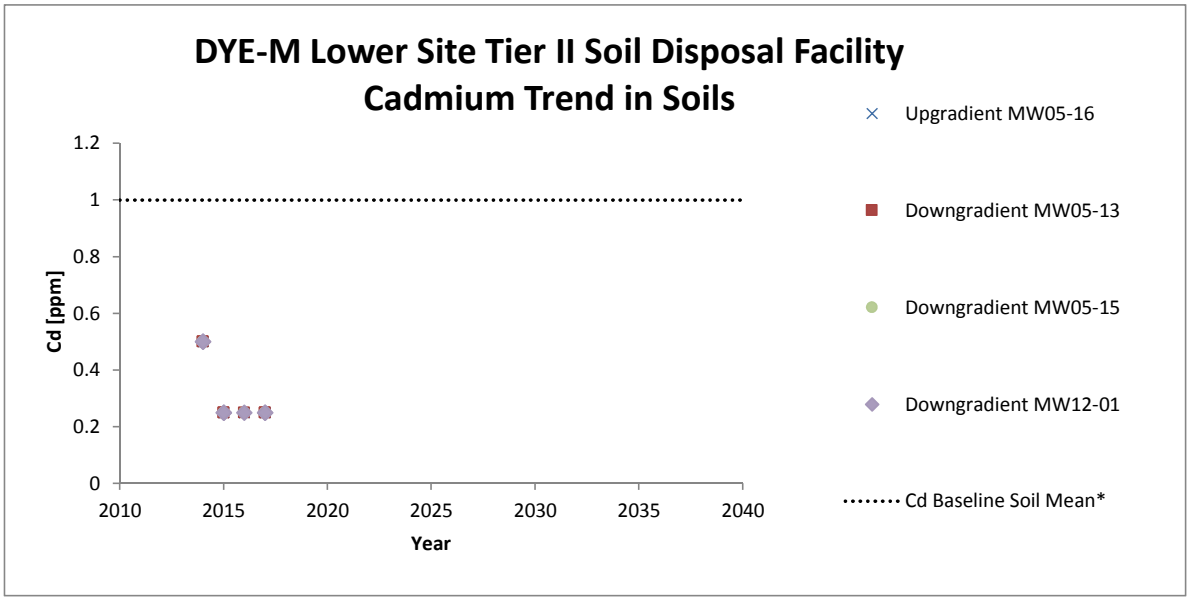
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

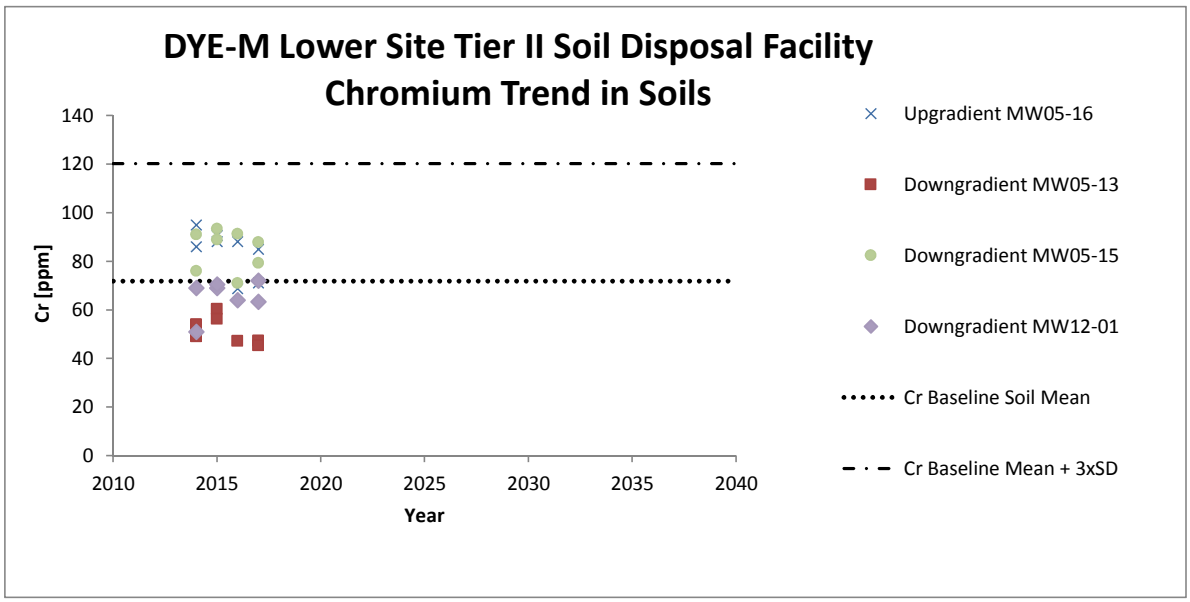


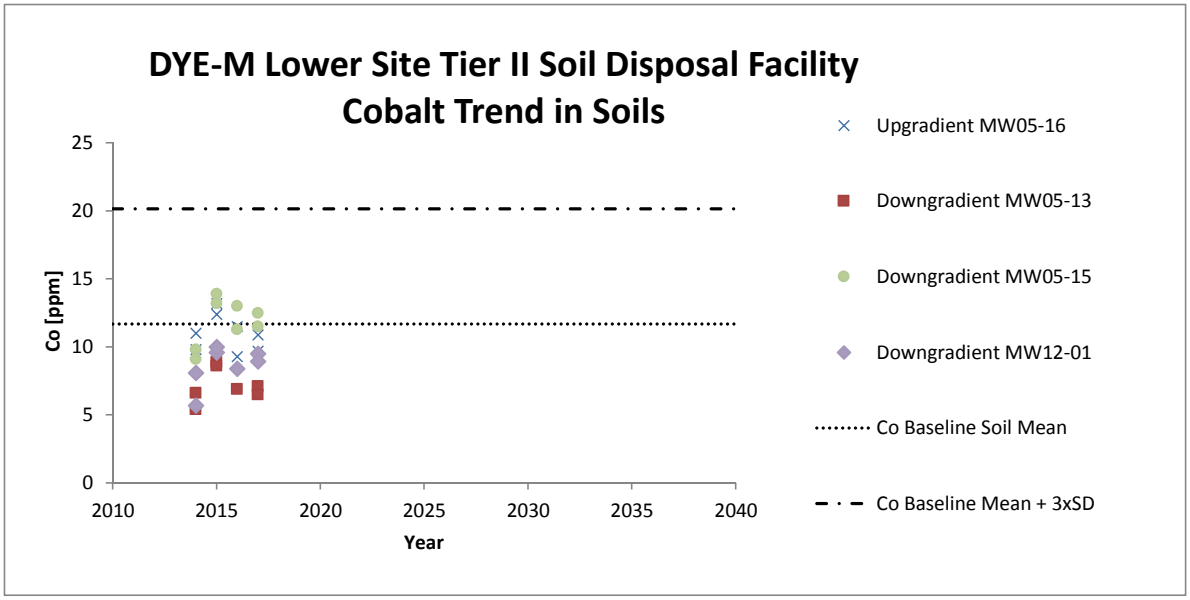
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



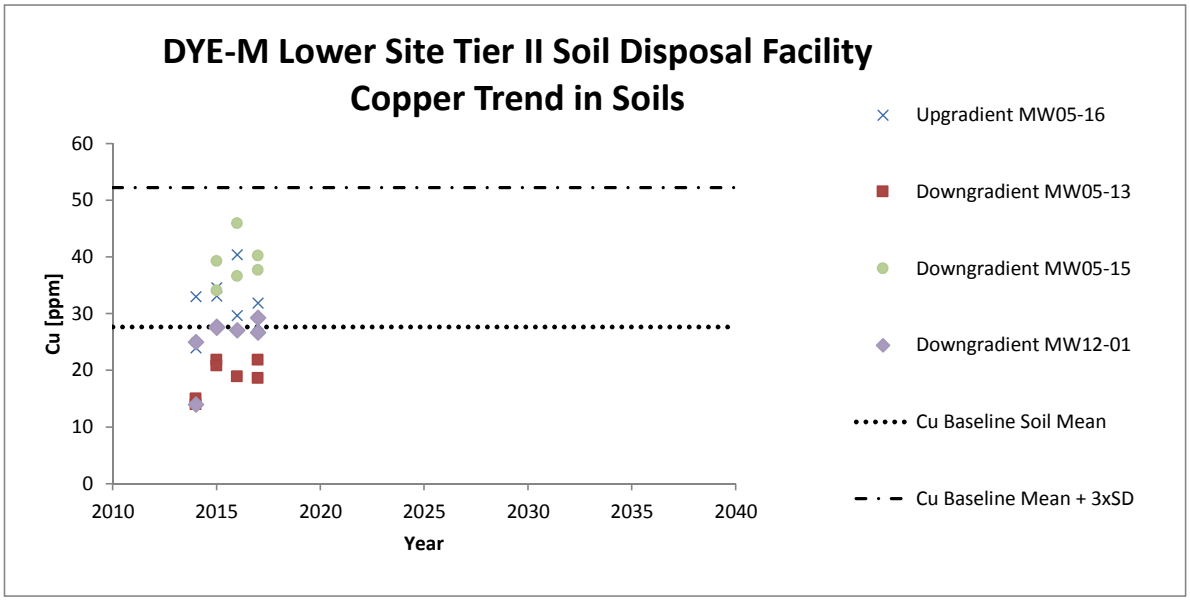
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

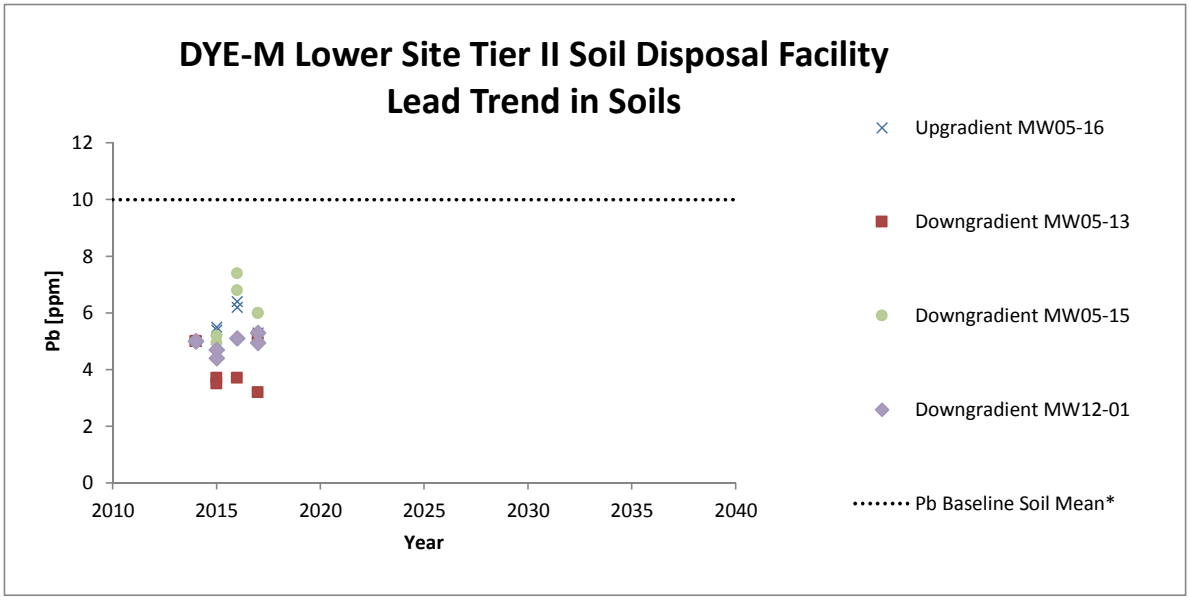
DYE-M Lower Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH





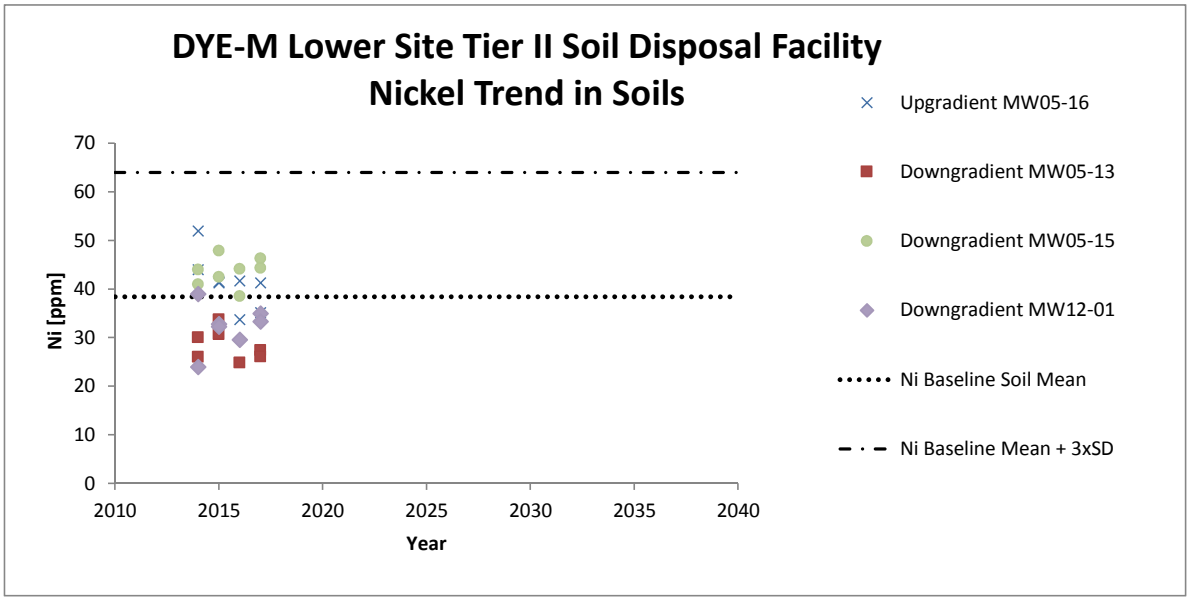
DYE-M Lower Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH

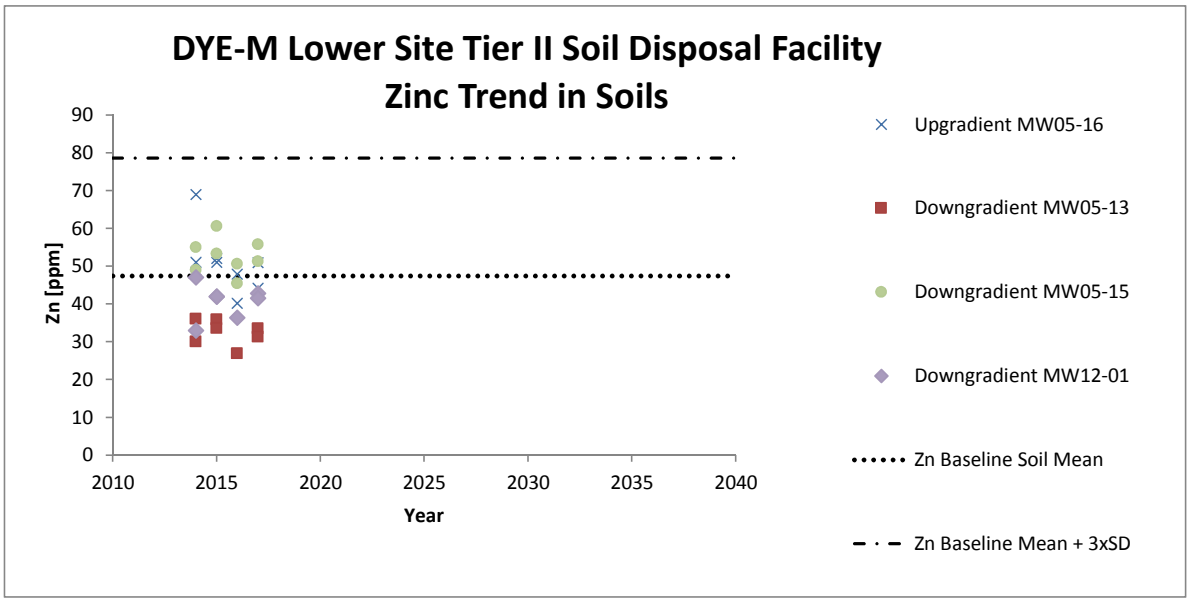




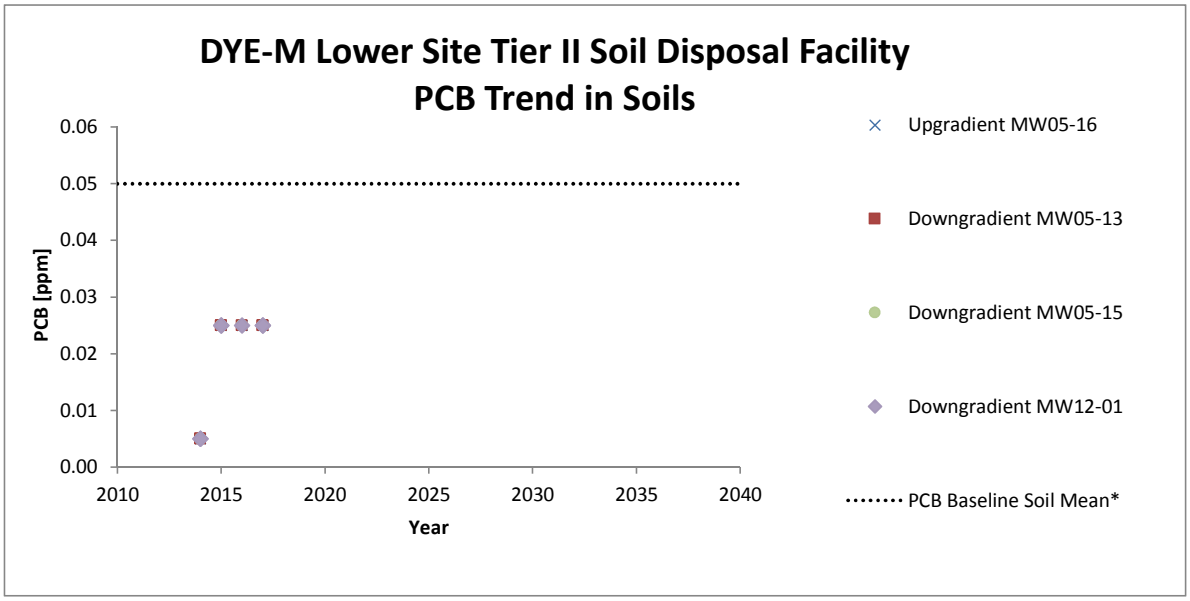
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH

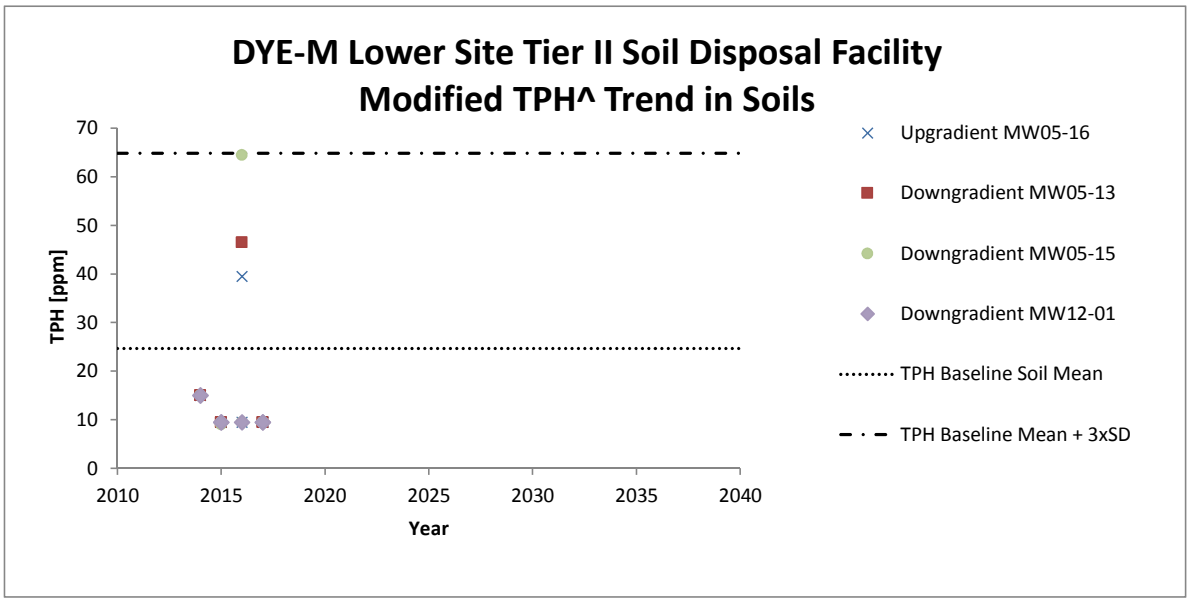




DYE-M Lower Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2017 are an indication of changing detection limits; all results below detection limits



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
07-30674	MW05-16	2007			<0.0030	<0.0010	0.103	0.0042	0.024	<0.010	0.0730	0.88	<0.050	<0.50	<1.0	0.78
08-9734	MW05-16	2008			0.004	<0.0010	0.540	0.041	0.180	0.013	0.3100	1.4	<0.050	<0.50	<1.0	0.78
11-12205	MW05-16	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.0102*	10.0	<0.050	<0.50	<1.0	0.78
12-34983	MW05-16	2012			0.0020	*<0.0010*	0.120	*<0.0030*	*<0.0050*	*<0.0050*	*0.0070*	14.0	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
07-30670/71	MW05-13	2007			<0.0030	<0.0010	0.051	0.004	0.016	<0.010	0.048	0.93	<0.050	<0.50	<1.0	0.78
07-30673	MW05-14	2007			<0.0030	<0.0010	0.30	0.011	0.043	<0.010	0.23	2.6	<0.050	<0.50	<1.0	0.78
07-30672	MW05-15	2007			0.0030	<0.0010	0.190	0.0240	0.100	<0.010	0.14	0.88	<0.050	<0.50	<1.0	0.78
08-9733	MW05-13	2008			<0.0030	<0.0010	0.410	0.021	0.090	0.021	0.23	0.40	<0.050	<0.50	<1.0	0.78
08-9732	MW05-14	2008			<0.0030	<0.0010	0.350	0.0050	0.020	<0.010	0.19	3.6	<0.050	<0.50	<1.0	0.78
08-9731	MW05-15	2008			<0.0030	<0.0010	0.800	0.020	0.065	<0.010	0.36	0.48	<0.050	<0.50	<1.0	0.78
09-21563	MW05-13	2009			<0.0030	<0.0010	0.088	0.0065	0.028	<0.010	0.060	2.5	<0.050	<0.50	<1.0	0.78
09-21562	MW05-15	2009			<0.0030	0.0014	0.530	0.035	0.120	0.015	0.29	0.58	<0.050	<0.50	<1.0	0.78
11-12204	MW05-13	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	2.3	<0.050	<0.50	<1.0	0.78
11-12203	MW05-15	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	6.6	<0.050	<0.50	<1.0	0.78
12-34979	MW05-13	2012			0.0020	*<0.0010*	0.170	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	1.4	<0.050	<0.50	<1.0	0.78
12-34980/81	MW05-15	2012			0.0045	*<0.0010*	0.190	*<0.0030*	*<0.0050*	*<0.0050*	*0.011*	4.8	<0.050	<0.50	<1.0	0.78
12-34982	MW12-01	2012			0.0030	*<0.0010*	0.370	*<0.0030*	*<0.0050*	*<0.0050*	*0.0110*	0.050	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			17	10	14	10	10	10	10	17				17
Baseline Data - Arithmetic Mean					0.0020	0.0006	0.3009	0.0172	0.0686	0.0084	0.1931	3.14				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3009**	**0.0172**	**0.0686**	**0.0100**	**0.1931**	**3.14**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2147	0.0134	0.0536	0.0000	0.1104	3.82				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.9449**	**0.0573**	**0.2296**	**0.0100**	**0.5242**	**14.59**				**1.00**
Dissolved metals results (italicized) have not been included in the calculation of N value, baseline arithmetic mean or standard deviation. Total metals results (i.e., those used in calculations) are not italicized.																
**** If baseline arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																
Monitoring Data													**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient - MW05-16																
Not sampled - well dry/frozen	MW05-16	2014	Year 1	Phase I												#N/A
MW05-16	MW05-16	2015	Year 2	Phase I	<0.0010	<0.00010	<0.0010	<0.00050	0.0013	0.0020	0.0020	**4.96**	<0.025	<0.10	<0.10	0.11
Not sampled - well dry	MW05-16	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW05-16	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
07-30674	MW05-16	2007			<0.0030	<0.0010	0.103	0.0042	0.024	<0.010	0.0730	0.88	<0.050	<0.50	<1.0	0.78
08-9734	MW05-16	2008			0.004	<0.0010	0.540	0.041	0.180	0.013	0.3100	1.4	<0.050	<0.50	<1.0	0.78
11-12205	MW05-16	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.0102*	10.0	<0.050	<0.50	<1.0	0.78
12-34983	MW05-16	2012			0.0020	*<0.0010*	0.120	*<0.0030*	*<0.0050*	*<0.0050*	*0.0070*	14.0	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
07-30670/71	MW05-13	2007			<0.0030	<0.0010	0.051	0.004	0.016	<0.010	0.048	0.93	<0.050	<0.50	<1.0	0.78
07-30673	MW05-14	2007			<0.0030	<0.0010	0.30	0.011	0.043	<0.010	0.23	2.6	<0.050	<0.50	<1.0	0.78
07-30672	MW05-15	2007			0.0030	<0.0010	0.190	0.0240	0.100	<0.010	0.14	0.88	<0.050	<0.50	<1.0	0.78
08-9733	MW05-13	2008			<0.0030	<0.0010	0.410	0.021	0.090	0.021	0.23	0.40	<0.050	<0.50	<1.0	0.78
08-9732	MW05-14	2008			<0.0030	<0.0010	0.350	0.0050	0.020	<0.010	0.19	3.6	<0.050	<0.50	<1.0	0.78
08-9731	MW05-15	2008			<0.0030	<0.0010	0.800	0.020	0.065	<0.010	0.36	0.48	<0.050	<0.50	<1.0	0.78
09-21563	MW05-13	2009			<0.0030	<0.0010	0.088	0.0065	0.028	<0.010	0.060	2.5	<0.050	<0.50	<1.0	0.78
09-21562	MW05-15	2009			<0.0030	0.0014	0.530	0.035	0.120	0.015	0.29	0.58	<0.050	<0.50	<1.0	0.78
11-12204	MW05-13	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	2.3	<0.050	<0.50	<1.0	0.78
11-12203	MW05-15	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	6.6	<0.050	<0.50	<1.0	0.78
12-34979	MW05-13	2012			0.0020	*<0.0010*	0.170	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	1.4	<0.050	<0.50	<1.0	0.78
12-34980/81	MW05-15	2012			0.0045	*<0.0010*	0.190	*<0.0030*	*<0.0050*	*<0.0050*	*0.011*	4.8	<0.050	<0.50	<1.0	0.78
12-34982	MW12-01	2012			0.0030	*<0.0010*	0.370	*<0.0030*	*<0.0050*	*<0.0050*	*0.0110*	0.050	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			17	10	14	10	10	10	10	17				17
Baseline Data - Arithmetic Mean					0.0020	0.0006	0.3009	0.0172	0.0686	0.0084	0.1931	3.14				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3009**	**0.0172**	**0.0686**	**0.0100**	**0.1931**	**3.14**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2147	0.0134	0.0536	0.0000	0.1104	3.82				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.9449**	**0.0573**	**0.2296**	**0.0100**	**0.5242**	**14.59**				**1.00**
Downgradient - MW05-13																
Not sampled - well dry/frozen	MW05-13	2014	Year 1	Phase I												#N/A
MW05-13 (Dup Avg)	MW05-13	2015	Year 2	Phase I	<0.0010	0.0010	0.0020	<0.0010	0.0010	0.0010	0.0025	2.87	<0.025	<0.10	<0.10	0.11
MW05-13	MW05-13	2016	Year 3	Phase I	<0.0010	<0.00010	<0.0010	0.00060	0.0010	<0.00010	0.015	2.38	<0.025			#N/A
MW05-13 (*dissolved metals*)	MW05-13	2017	Year 4	Phase I	*<0.001*	*<0.0001*	*<0.001*	*<0.0005*	*0.0013*	*<0.0001*	*0.003*	*2.36*	<0.025	<0.1	<0.1	0.1
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
07-30674	MW05-16	2007			<0.0030	<0.0010	0.103	0.0042	0.024	<0.010	0.0730	0.88	<0.050	<0.50	<1.0	0.78
08-9734	MW05-16	2008			0.004	<0.0010	0.540	0.041	0.180	0.013	0.3100	1.4	<0.050	<0.50	<1.0	0.78
11-12205	MW05-16	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.0102*	10.0	<0.050	<0.50	<1.0	0.78
12-34983	MW05-16	2012			0.0020	*<0.0010*	0.120	*<0.0030*	*<0.0050*	*<0.0050*	*0.0070*	14.0	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
07-30670/71	MW05-13	2007			<0.0030	<0.0010	0.051	0.004	0.016	<0.010	0.048	0.93	<0.050	<0.50	<1.0	0.78
07-30673	MW05-14	2007			<0.0030	<0.0010	0.30	0.011	0.043	<0.010	0.23	2.6	<0.050	<0.50	<1.0	0.78
07-30672	MW05-15	2007			0.0030	<0.0010	0.190	0.0240	0.100	<0.010	0.14	0.88	<0.050	<0.50	<1.0	0.78
08-9733	MW05-13	2008			<0.0030	<0.0010	0.410	0.021	0.090	0.021	0.23	0.40	<0.050	<0.50	<1.0	0.78
08-9732	MW05-14	2008			<0.0030	<0.0010	0.350	0.0050	0.020	<0.010	0.19	3.6	<0.050	<0.50	<1.0	0.78
08-9731	MW05-15	2008			<0.0030	<0.0010	0.800	0.020	0.065	<0.010	0.36	0.48	<0.050	<0.50	<1.0	0.78
09-21563	MW05-13	2009			<0.0030	<0.0010	0.088	0.0065	0.028	<0.010	0.060	2.5	<0.050	<0.50	<1.0	0.78
09-21562	MW05-15	2009			<0.0030	0.0014	0.530	0.035	0.120	0.015	0.29	0.58	<0.050	<0.50	<1.0	0.78
11-12204	MW05-13	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	2.3	<0.050	<0.50	<1.0	0.78
11-12203	MW05-15	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	6.6	<0.050	<0.50	<1.0	0.78
12-34979	MW05-13	2012			0.0020	*<0.0010*	0.170	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	1.4	<0.050	<0.50	<1.0	0.78
12-34980/81	MW05-15	2012			0.0045	*<0.0010*	0.190	*<0.0030*	*<0.0050*	*<0.0050*	*0.011*	4.8	<0.050	<0.50	<1.0	0.78
12-34982	MW12-01	2012			0.0030	*<0.0010*	0.370	*<0.0030*	*<0.0050*	*<0.0050*	*0.0110*	0.050	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			17	10	14	10	10	10	10	17				17
Baseline Data - Arithmetic Mean					0.0020	0.0006	0.3009	0.0172	0.0686	0.0084	0.1931	3.14				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3009**	**0.0172**	**0.0686**	**0.0100**	**0.1931**	**3.14**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2147	0.0134	0.0536	0.0000	0.1104	3.82				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.9449**	**0.0573**	**0.2296**	**0.0100**	**0.5242**	**14.59**				**1.00**
Downgradient - MW05-15																
Not sampled - well dry/frozen	MW05-15	2014	Year 1	Phase I												#N/A
MW05-15	MW05-15	2015	Year 2	Phase I	<0.0010	0.00010	<0.0010	0.0012	0.0017	0.0022	0.010	**18.7**	<0.025	<0.10	<0.10	0.11
MW05-15	MW05-15	2016	Year 3	Phase I	<0.0010	<0.00010	<0.0010	<0.00050	<0.00050	<0.00010	0.0070	2.52	<0.025	<0.10	<0.10	0.11
Not sampled - frozen	MW05-15	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Lower Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb* (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
07-30674	MW05-16	2007			<0.0030	<0.0010	0.103	0.0042	0.024	<0.010	0.0730	0.88	<0.050	<0.50	<1.0	0.78
08-9734	MW05-16	2008			0.004	<0.0010	0.540	0.041	0.180	0.013	0.3100	1.4	<0.050	<0.50	<1.0	0.78
11-12205	MW05-16	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.0102*	10.0	<0.050	<0.50	<1.0	0.78
12-34983	MW05-16	2012			0.0020	*<0.0010*	0.120	*<0.0030*	*<0.0050*	*<0.0050*	*0.0070*	14.0	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
07-30670/71	MW05-13	2007			<0.0030	<0.0010	0.051	0.004	0.016	<0.010	0.048	0.93	<0.050	<0.50	<1.0	0.78
07-30673	MW05-14	2007			<0.0030	<0.0010	0.30	0.011	0.043	<0.010	0.23	2.6	<0.050	<0.50	<1.0	0.78
07-30672	MW05-15	2007			0.0030	<0.0010	0.190	0.0240	0.100	<0.010	0.14	0.88	<0.050	<0.50	<1.0	0.78
08-9733	MW05-13	2008			<0.0030	<0.0010	0.410	0.021	0.090	0.021	0.23	0.40	<0.050	<0.50	<1.0	0.78
08-9732	MW05-14	2008			<0.0030	<0.0010	0.350	0.0050	0.020	<0.010	0.19	3.6	<0.050	<0.50	<1.0	0.78
08-9731	MW05-15	2008			<0.0030	<0.0010	0.800	0.020	0.065	<0.010	0.36	0.48	<0.050	<0.50	<1.0	0.78
09-21563	MW05-13	2009			<0.0030	<0.0010	0.088	0.0065	0.028	<0.010	0.060	2.5	<0.050	<0.50	<1.0	0.78
09-21562	MW05-15	2009			<0.0030	0.0014	0.530	0.035	0.120	0.015	0.29	0.58	<0.050	<0.50	<1.0	0.78
11-12204	MW05-13	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	2.3	<0.050	<0.50	<1.0	0.78
11-12203	MW05-15	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	6.6	<0.050	<0.50	<1.0	0.78
12-34979	MW05-13	2012			0.0020	*<0.0010*	0.170	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	1.4	<0.050	<0.50	<1.0	0.78
12-34980/81	MW05-15	2012			0.0045	*<0.0010*	0.190	*<0.0030*	*<0.0050*	*<0.0050*	*0.011*	4.8	<0.050	<0.50	<1.0	0.78
12-34982	MW12-01	2012			0.0030	*<0.0010*	0.370	*<0.0030*	*<0.0050*	*<0.0050*	*0.0110*	0.050	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			17	10	14	10	10	10	10	17				17
Baseline Data - Arithmetic Mean					0.0020	0.0006	0.3009	0.0172	0.0686	0.0084	0.1931	3.14				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3009**	**0.0172**	**0.0686**	**0.0100**	**0.1931**	**3.14**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2147	0.0134	0.0536	0.0000	0.1104	3.82				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.9449**	**0.0573**	**0.2296**	**0.0100**	**0.5242**	**14.59**				**1.00**
Downgradient - MW12-01 (Baseline well MW-14 was damaged in 2009; replaced in 2012 by MW12-01)																
14-8185	MW12-01	2014	Year 1	Phase I	*<0.0010*	*<0.000090*	*<0.00050*	*0.00037*	*<0.0010*	*<0.00050*	*0.013*	*<0.0030*	<0.025	<0.10	<0.25	0.19
MW12-01	MW12-01	2015	Year 2	Phase I	<0.0010	<0.00010	<0.0010	0.0018	0.00050	<0.00010	0.020	0.018	<0.025	<0.10	<0.10	0.11
MW12-01 (Dup Avg)	MW12-01	2016	Year 3	Phase I	<0.0010	<0.00010	0.0020	0.00060	<0.0030	0.00020	0.050	<0.0050	<0.025	<0.10	<0.10	0.11
MW12-01	MW12-01	2017	Year 4	Phase I	*<0.001*	*<0.0001*	*<0.001*	*0.0007*	*<0.0005*	*<0.0001*	*0.007*	*0.007*	<0.025	<0.1	<0.1	0.1
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

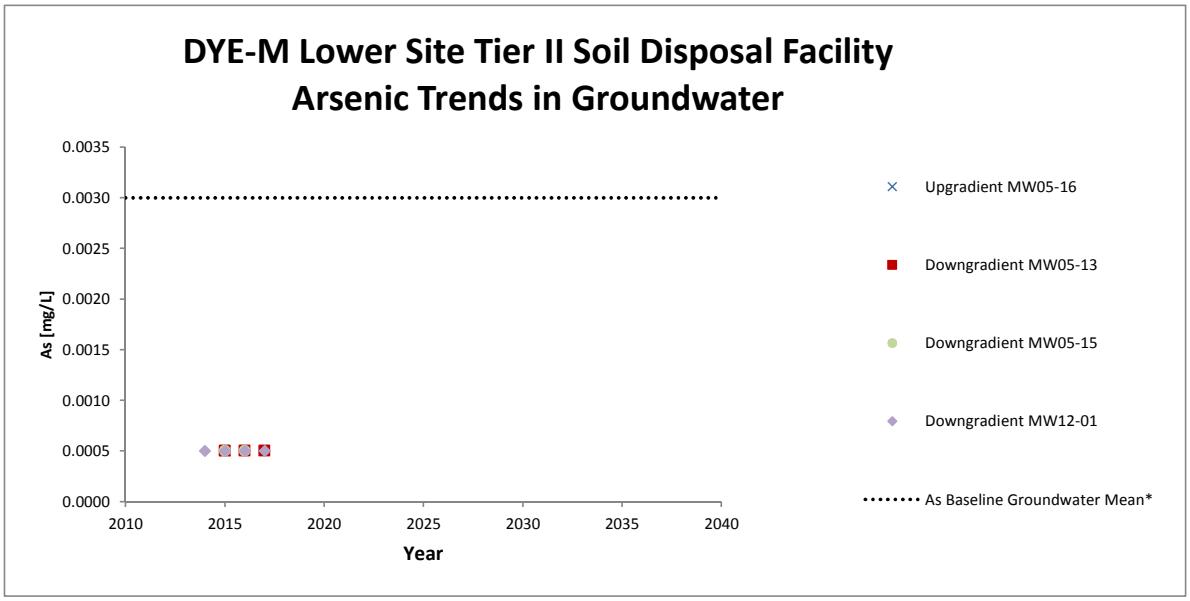
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**
XX	**Dissolved metals results**

DYE-M Lower Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH

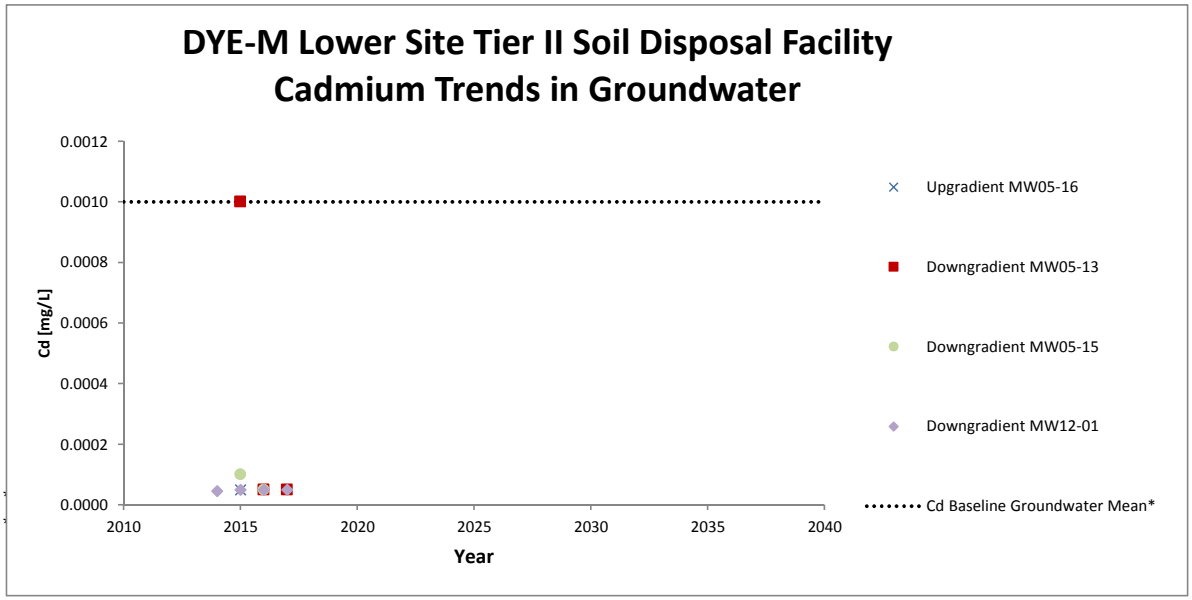
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

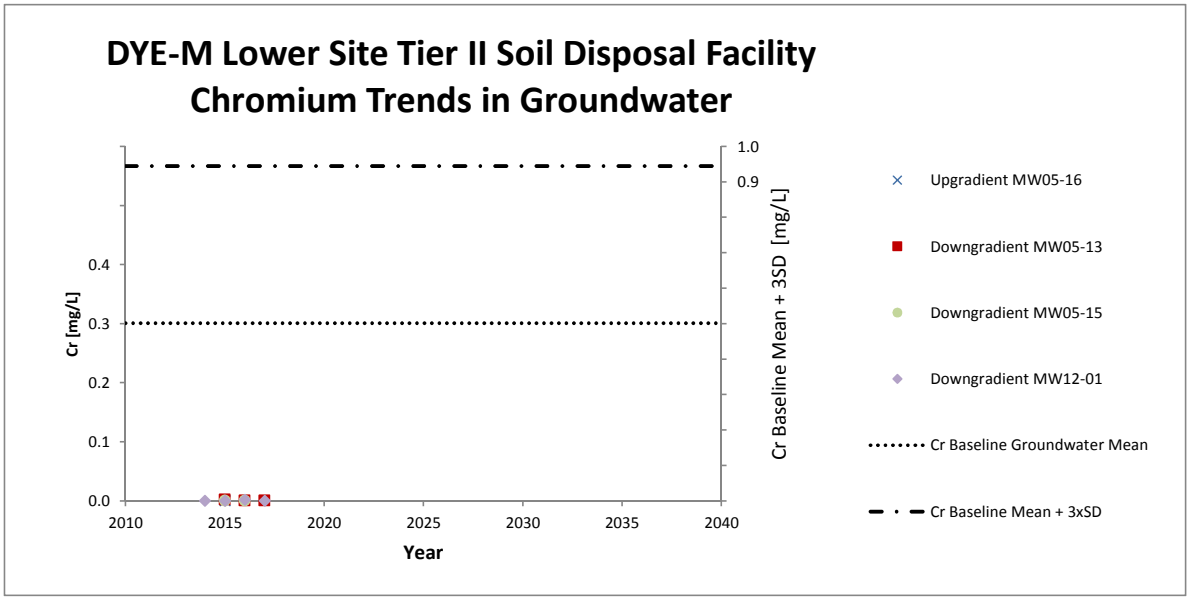


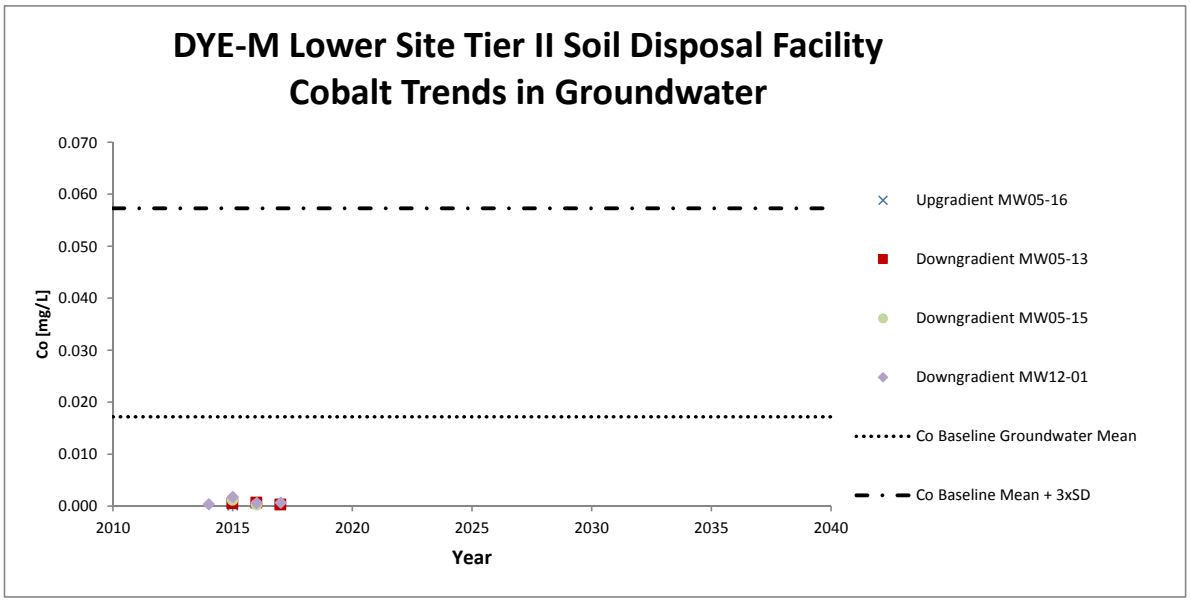
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



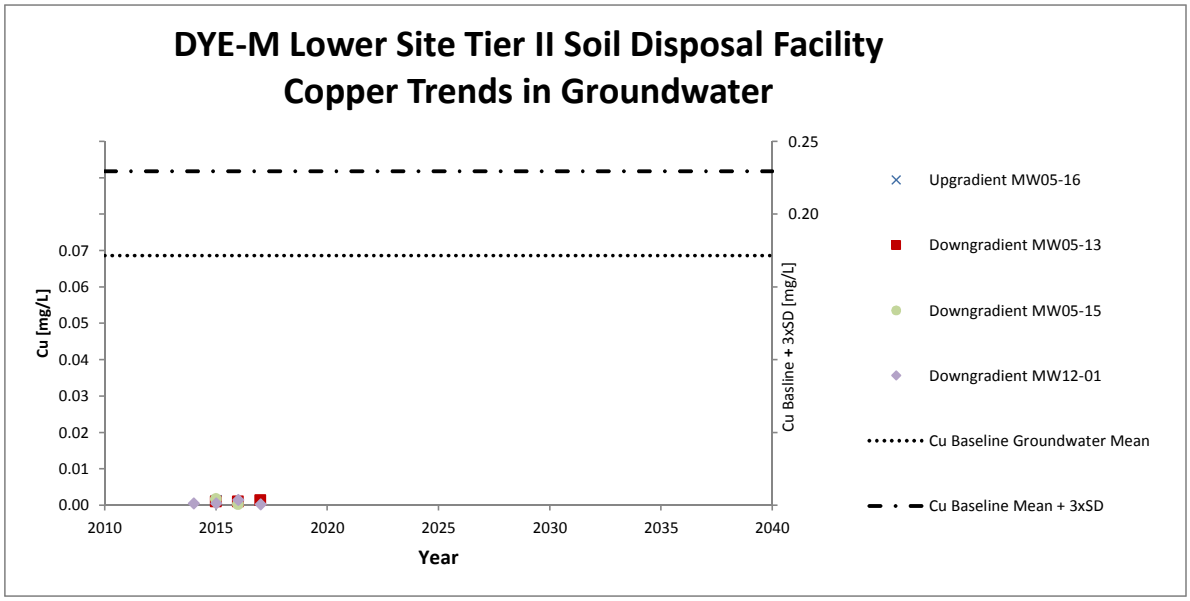
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

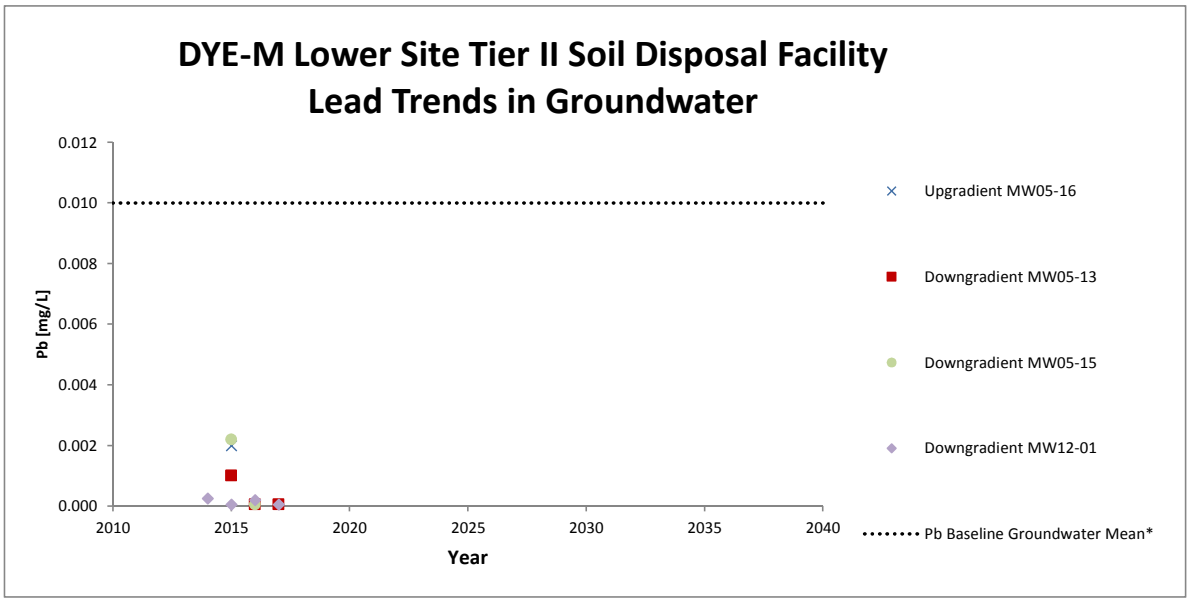
DYE-M Lower Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH





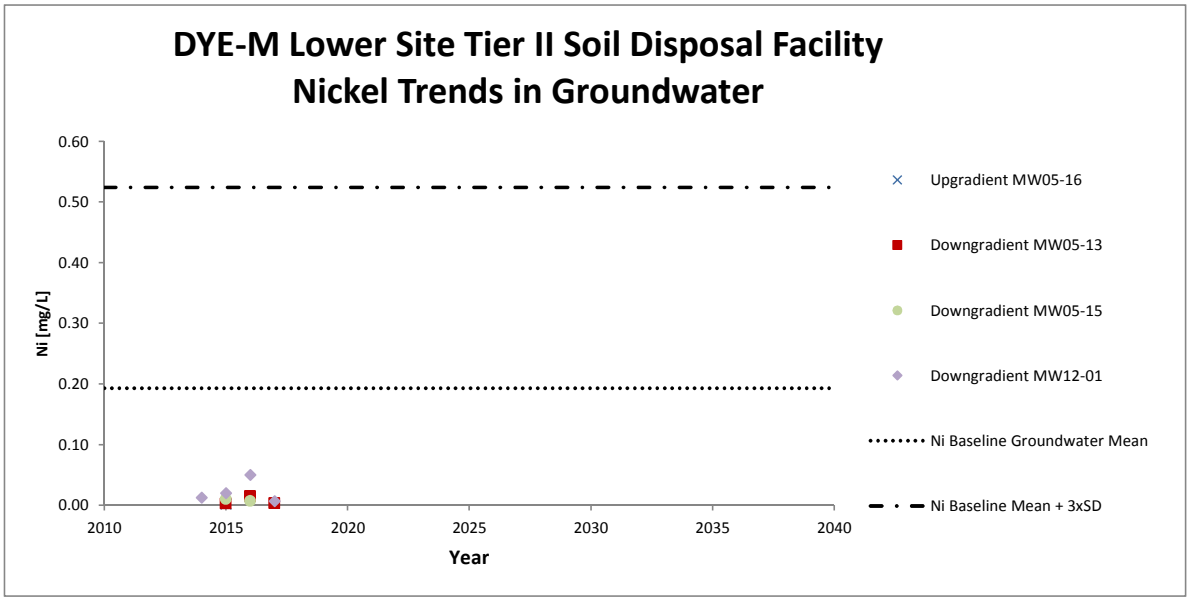
DYE-M Lower Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH

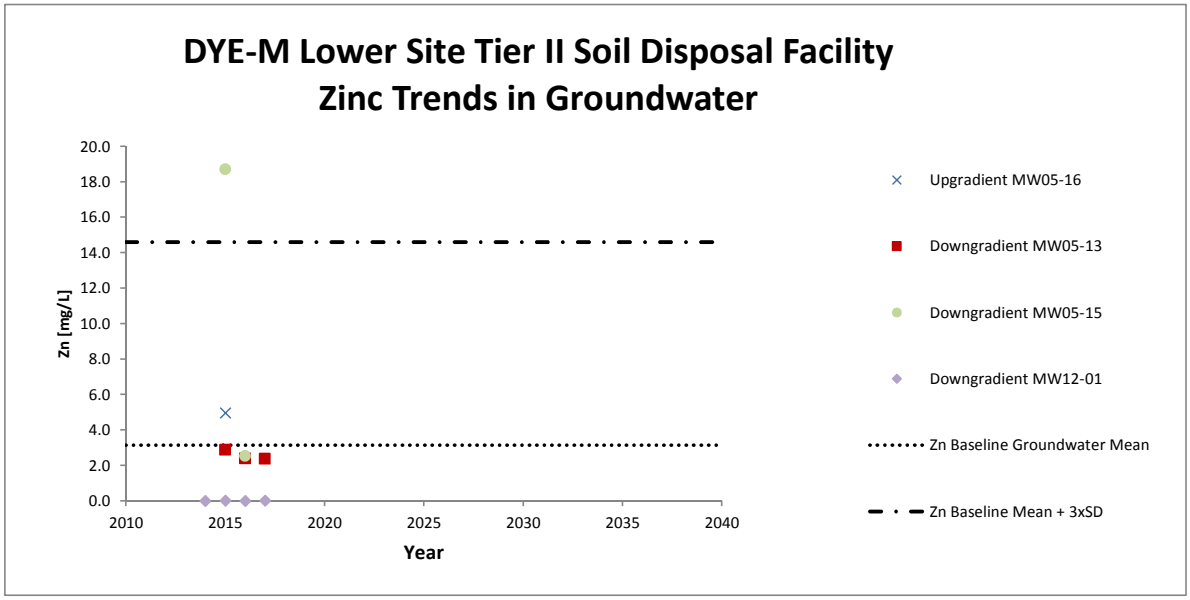




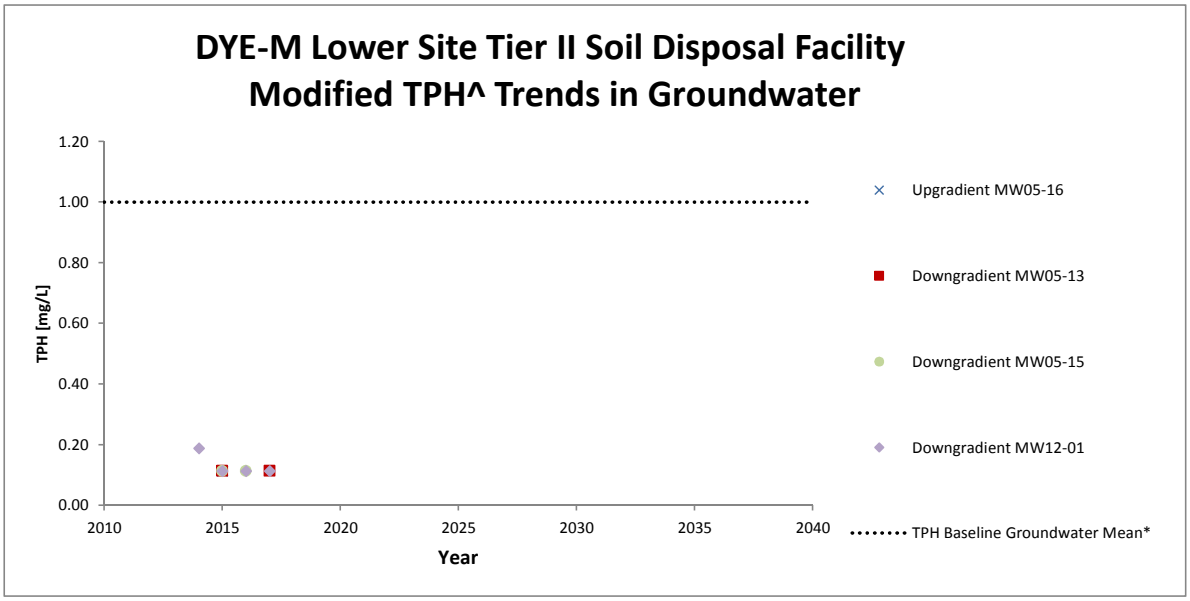
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH





DYE-M Lower Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH



* TPH baseline arithmetic mean is equal to the baseline detection limit
* TPH baseline standard deviation = 0
^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Crossroads Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**69.0**	**11.1**	**29.9**	**10.0**	**37.6**	**47.0**	**0.10**				**36.4**
Baseline Data - Standard Deviation						0.00	0.00	12.5	2.5	7.4	0.0	7.8	8.0	0.00				30.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**106.5**	**18.5**	**52.1**	**10.0**	**61.1**	**71.1**	**0.10**				**128.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-01 surface																	
14-8330/31	DM-01	2014	Year 1	Phase I	5-10	**1.2**	<1.0	66.0	8.0	26.0	<10	36.0	39.0	<0.010	<10	<10	<10	15.0
DM-01 (0-15)	DM-01	2015	Year 2	Phase I	0-15	**1.2**	<0.50	53.7	8.2	24.2	5.1	30.1	32.2	<0.050	<7.0	65.0	10.0	**78.5**
DM-01a	DM-01	2016	Year 3	Phase I	0-15	<1.0	<0.50	**70.3**	8.6	**30.7**	9.2	32.0	37.9	<0.050	<7.0	<4.0	78.0	**83.5**
DM-01 Shallow	DM-01	2017	Year 4	Phase I	0-15	<1.0	<0.5	**69.4**	10.1	**37.2**	9.3	**40.3**	**48.8**	<0.05	<7	<4	65	**70.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-01 depth																	
14-8332	DM-01	2014	Year 1	Phase I	45-50	**3.3**	<1.0	61.0	7.8	23.0	<10	36.0	34.0	<0.010	<10	<10	<10	15.0
DM-01 (40-50)	DM-01	2015	Year 2	Phase I	40-50	**1.3**	<0.50	51.1	7.9	20.9	4.2	29.5	28.9	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-01	2016	Year 3	Phase I														#N/A
DM-01 Deep	DM-01	2017	Year 4	Phase I	20-30	<1.0	<0.5	64.7	8.9	**31.2**	7.4	36.1	41.7	<0.05	<7	<4	46	**51.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Crossroads Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**69.0**	**11.1**	**29.9**	**10.0**	**37.6**	**47.0**	**0.10**				**36.4**
Baseline Data - Standard Deviation						0.00	0.00	12.5	2.5	7.4	0.0	7.8	8.0	0.00				30.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**106.5**	**18.5**	**52.1**	**10.0**	**61.1**	**71.1**	**0.10**				**128.4**
Downgradient																		
	DM-02 surface																	
14-8333	DM-02	2014	Year 1	Phase I	5-10	**1.6**	<1.0	**80.0**	9.6	**33.0**	<10	**41.0**	**49.0**	<0.010	<10	<10	<10	15.0
DM-02 (0-15)	DM-02	2015	Year 2	Phase I	0-15	**1.4**	<0.50	67.5	9.9	**31.7**	8.1	35.8	43.8	<0.050	<7.0	<4.0	35.0	**40.5**
DM-02a (Dup Avg)	DM-02	2016	Year 3	Phase I	0-15	**2.0**	<0.50	57.7	8.2	**31.9**	5.9	35.4	38.7	<0.050	<6.0	17.0	47.0	**67.0**
DM-02 Shallow	DM-02	2017	Year 4	Phase I	0-15	<1.0	<0.5	**70.9**	10.4	**35.5**	6.3	**41.4**	45.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-02 depth																	
14-8334	DM-02	2014	Year 1	Phase I	45-50	**1.6**	<1.0	**94.0**	11.0	**42.0**	**11.0**	**45.0**	**54.0**	<0.010	<10	56.0	<10	**66.0**
DM-02 (15-30)	DM-02	2015	Year 2	Phase I	15-30	**1.3**	<0.50	64.7	9.1	**31.3**	6.1	34.1	40.0	<0.050	<7.0	39.0	57.0	**99.5**
Not sampled - refusal	DM-02	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-02	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Crossroads Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**69.0**	**11.1**	**29.9**	**10.0**	**37.6**	**47.0**	**0.10**				**36.4**
Baseline Data - Standard Deviation						0.00	0.00	12.5	2.5	7.4	0.0	7.8	8.0	0.00				30.7
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**106.5**	**18.5**	**52.1**	**10.0**	**61.1**	**71.1**	**0.10**				**128.4**
	DM-03 surface																	
14-8335	DM-03	2014	Year 1	Phase I	5-10	**1.4**	<1.0	68.0	8.6	28.0	<10	35.0	41.0	<0.010	<10	<10	<10	15.0
DM-03 (0-15)	DM-03	2015	Year 2	Phase I	0-15	**1.2**	<0.50	47.8	7.7	26.6	3.1	27.7	29.4	<0.050	<7.0	<4.0	41.0	**46.5**
DM-03a	DM-03	2016	Year 3	Phase I	0-15	<1.0	<0.50	52.3	7.7	28.1	5.6	28.8	29.5	<0.050	<7.0	<4.0	<8.0	9.5
DM-03 Shallow	DM-03	2017	Year 4	Phase I	0-15	<1.0	<0.5	56.1	8.6	**31.9**	4.6	**40.3**	33.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-03 depth																	
14-8337	DM-03	2014	Year 1	Phase I	45-50	0.9	<1.0	59.0	7.2	21.0	<10	28.0	31.0	<0.010	<10	<10	<10	15.0
DM-03 (40-50) (Dup Avg)	DM-03	2015	Year 2	Phase I	40-50	**1.2**	<0.50	49.6	7.9	28.5	3.5	29.0	32.5	<0.050	<6.0	<4.0	18.0	23.0
Not sampled - refusal	DM-03	2016	Year 3	Phase I														#N/A
DM-03 Deep	DM-03	2017	Year 4	Phase I	40-50	<1.0	<0.5	52.9	8.2	**30.0**	4.0	37.1	33.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

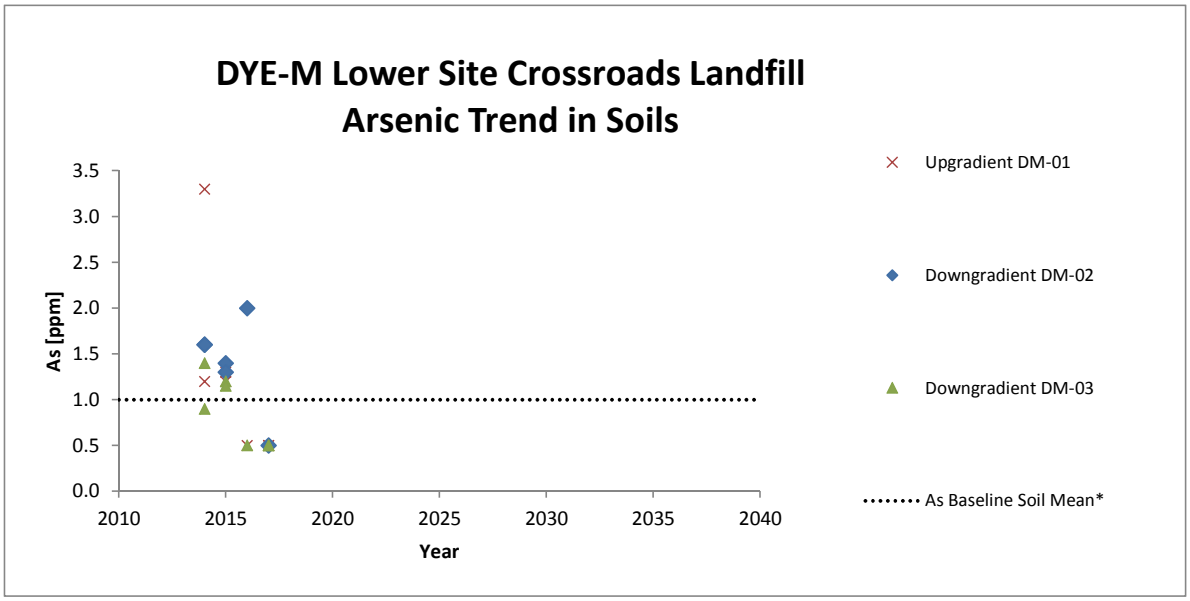
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Lower Site Crossroads Landfill Trends in Soil Inorganics, PCBs and Modified TPH

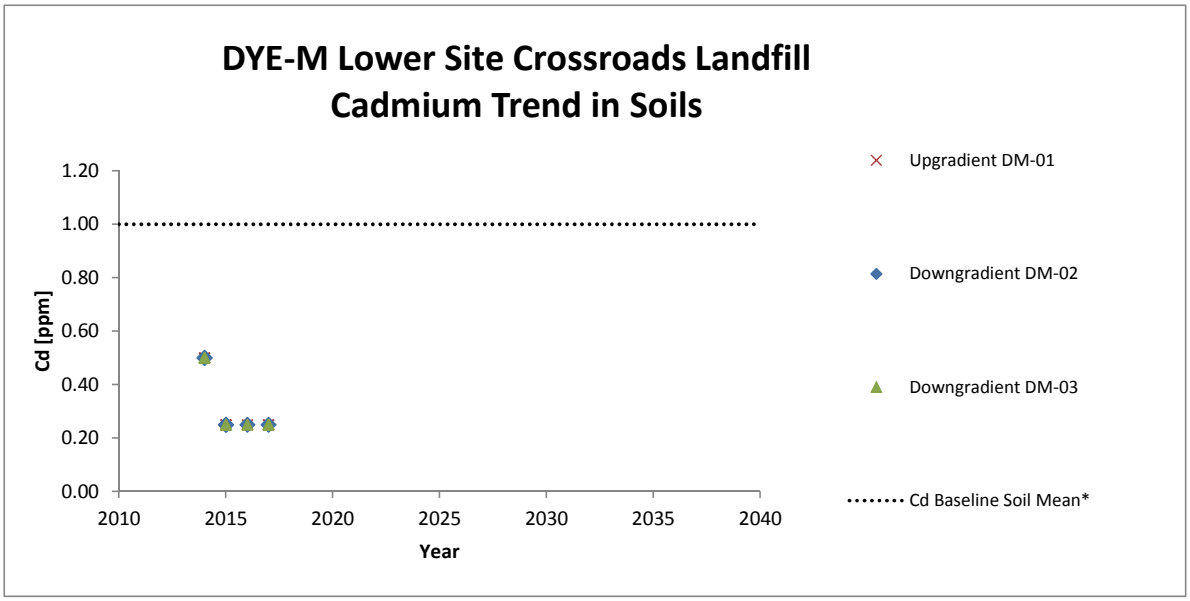
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

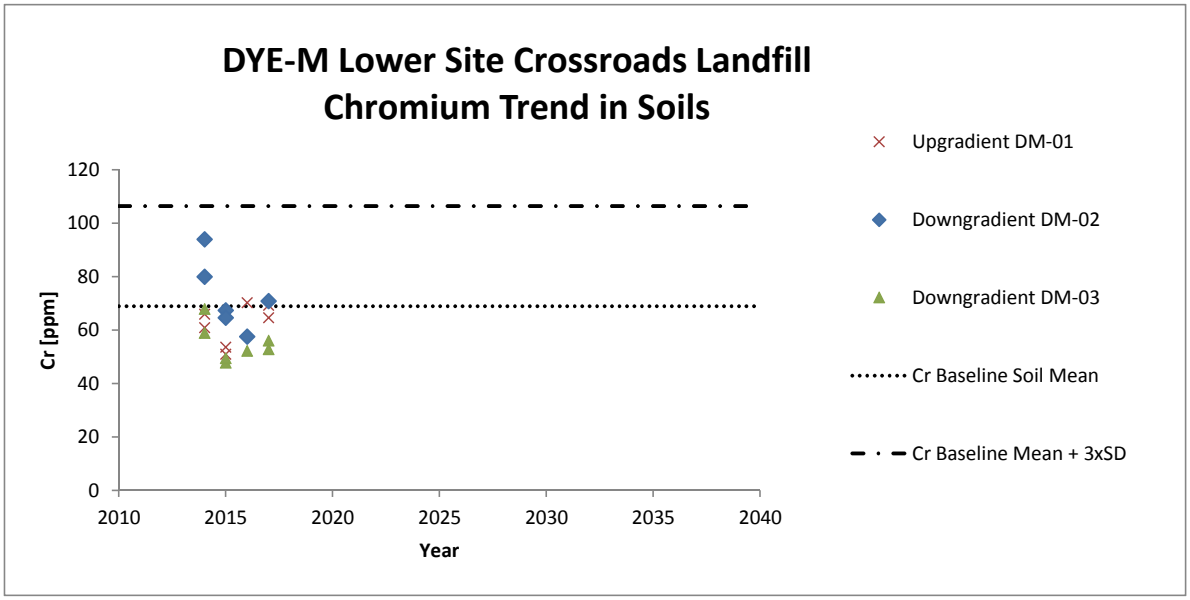


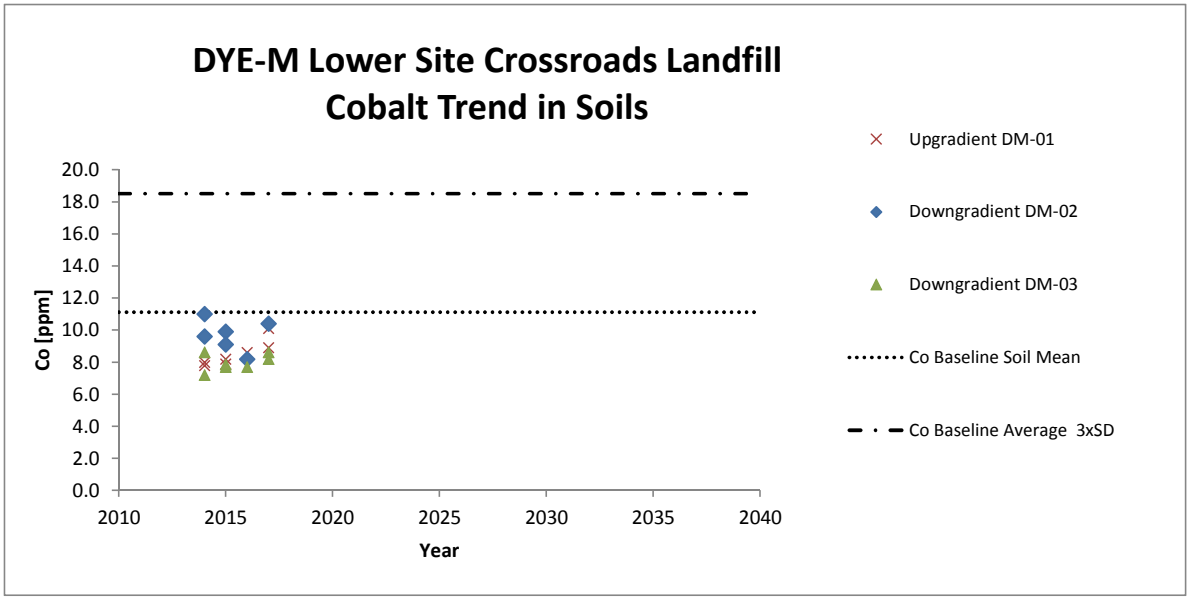
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



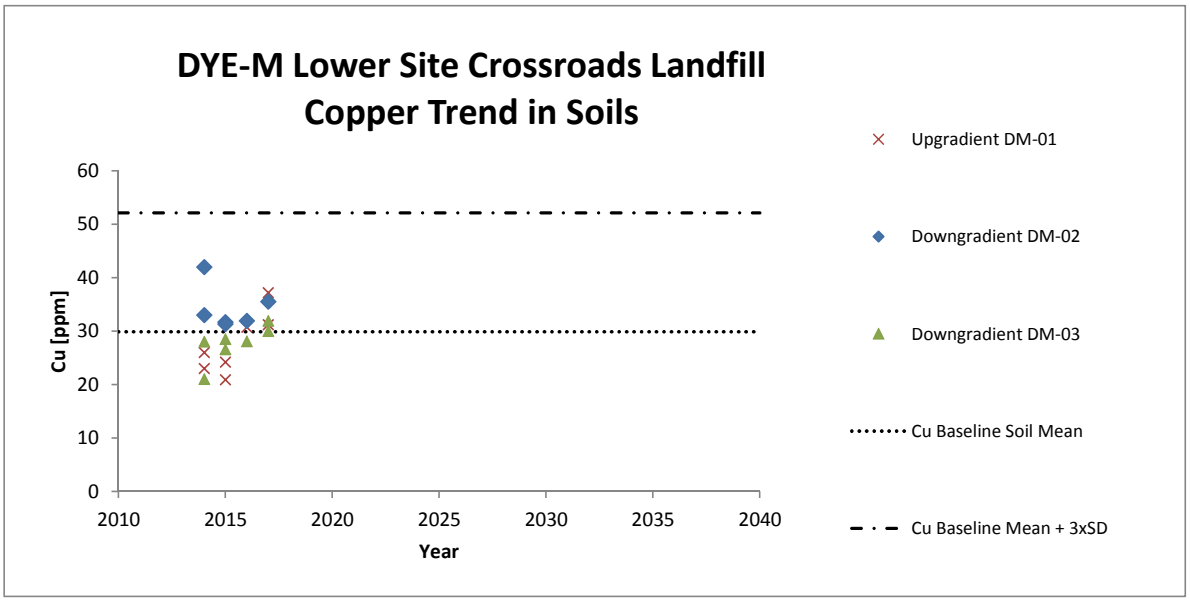
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

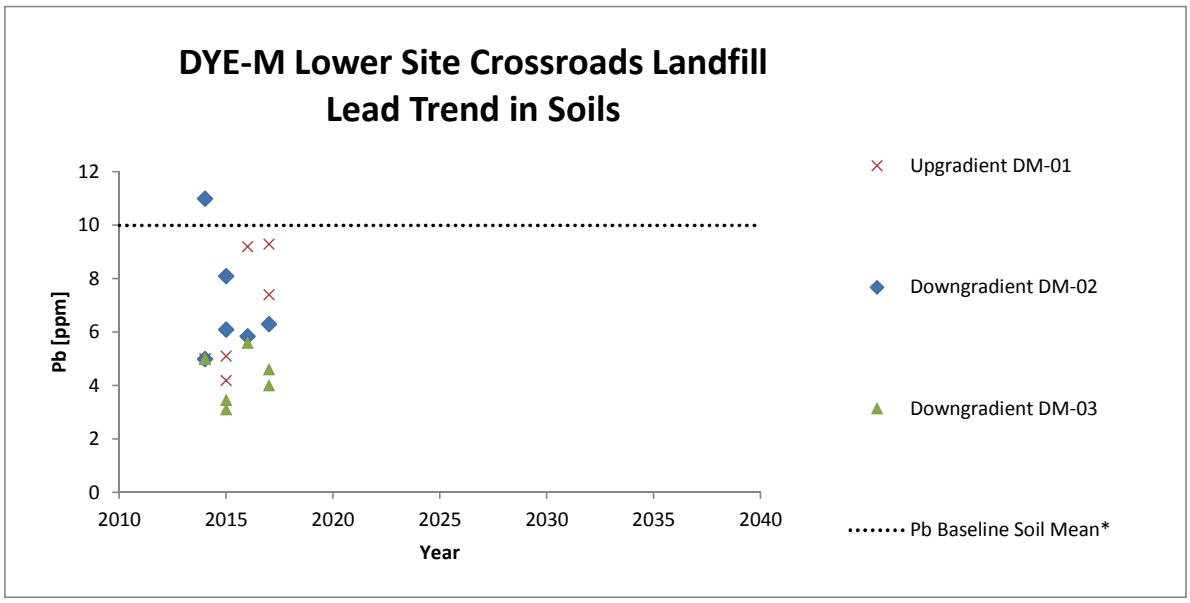
DYE-M Lower Site Crossroads Landfill Trends in Soil Inorganics, PCBs and Modified TPH





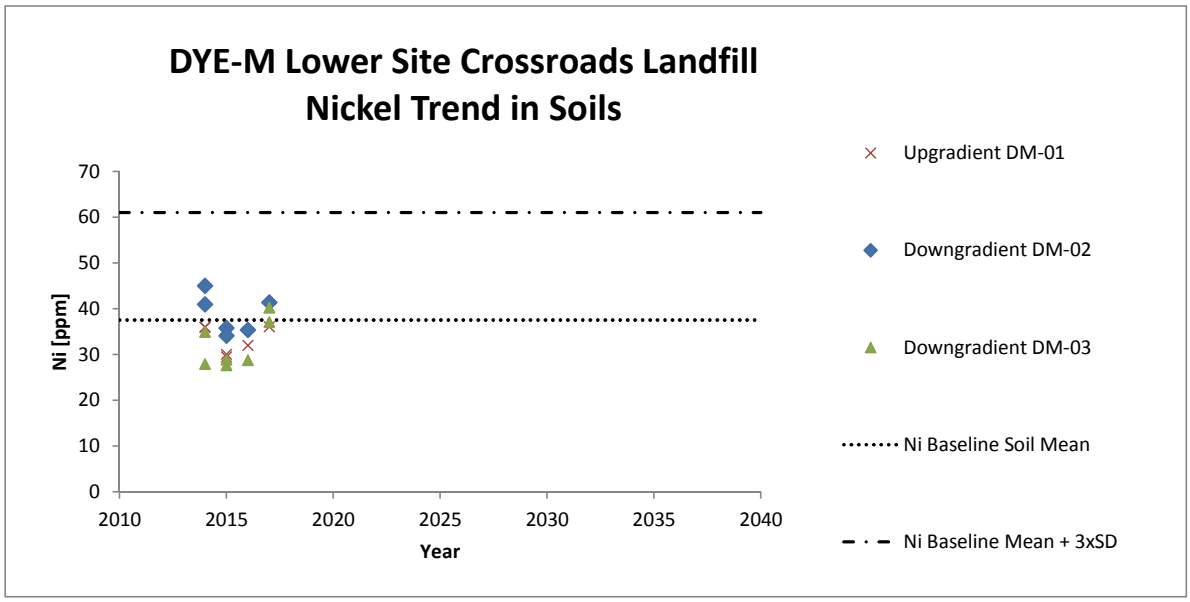
DYE-M Lower Site Crossroads Landfill Trends in Soil Inorganics, PCBs and Modified TPH

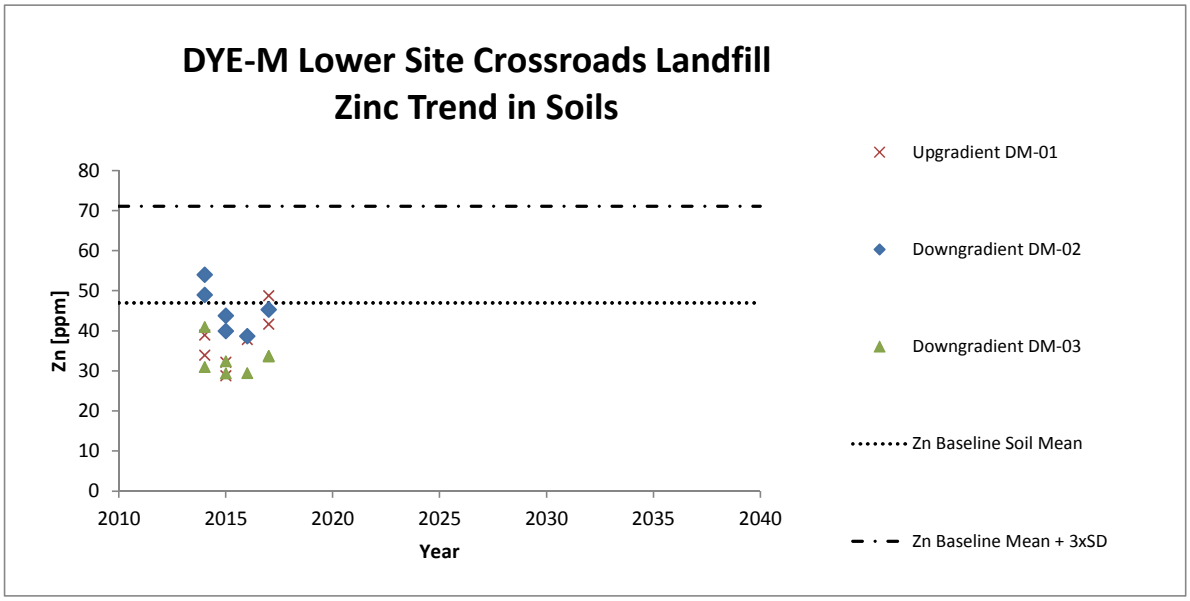




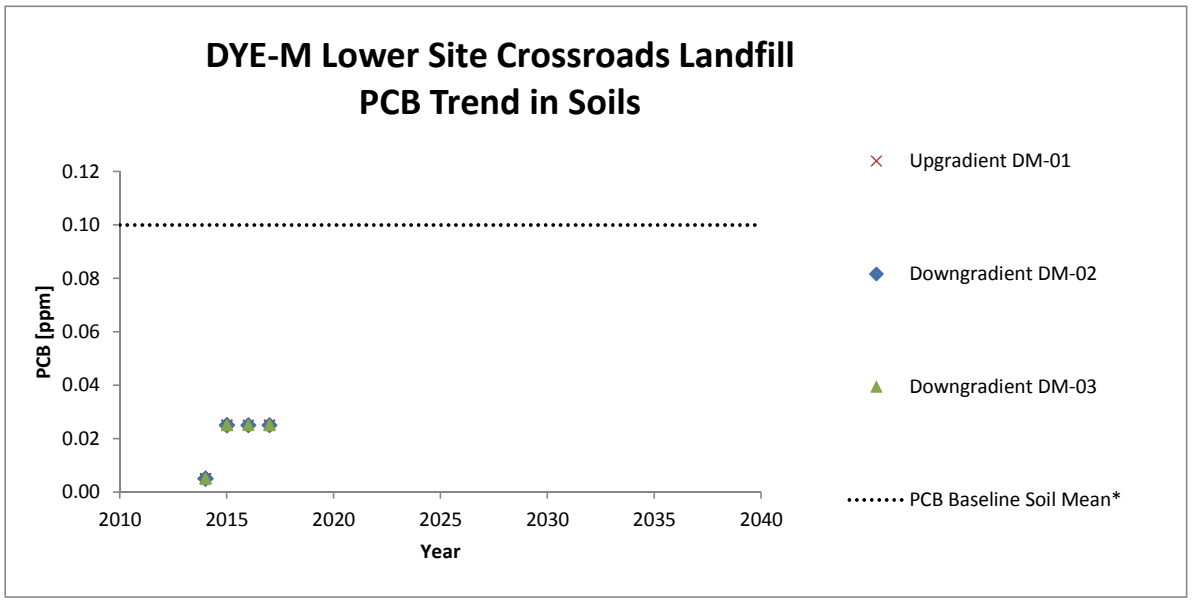
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site Crossroads Landfill Trends in Soil Inorganics, PCBs and Modified TPH

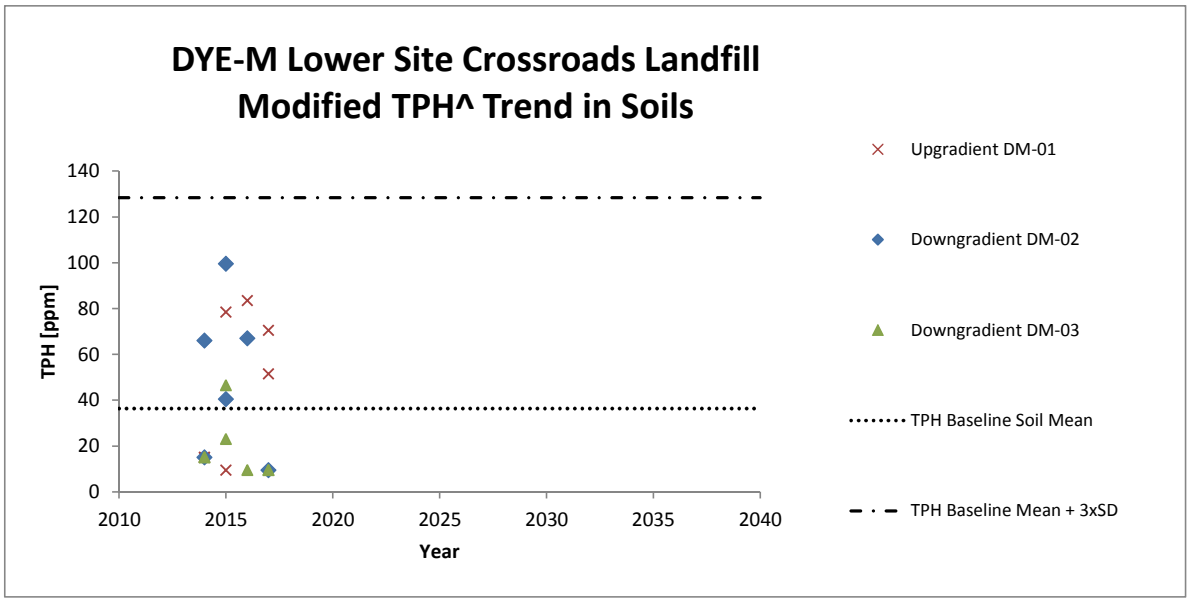




DYE-M Lower Site Crossroads Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2017 are an indication of changing detection limits; all results below detection limits



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Foundation Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**66.8**	**10.7**	**26.7**	**14.7**	**34.9**	**62.8**	**0.10**				**105.4**
Baseline Data - Standard Deviation						0.00	0.00	10.4	2.4	4.7	14.7	6.0	41.5	0.00				161.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**98.0**	**18.0**	**40.9**	**58.7**	**52.8**	**187.2**	**0.10**				**589.4**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-04 surface																	
14-8322	DM-04	2014	Year 1	Phase I	0-10	1.0	<1.0	**68.0**	7.7	26.0	<10	32.0	42.0	0.0270	<10	<10	<10	15.0
DM-04 (0-15)	DM-04	2015	Year 2	Phase I	0-15	**1.2**	<0.50	61.3	9.3	25.3	9.1	31.2	41.6	0.0900	<7.0	<4.0	38.0	43.5
DM-04b	DM-04	2016	Year 3	Phase I	0-15	<1.0	<0.50	57.0	9.1	26.7	5.6	33.1	36.3	<0.050	<7.0	<4.0	<8.0	9.5
DM-04 Shallow	DM-04	2017	Year 4	Phase I	0-15	<1.0	<0.5	62.1	8.6	**28.1**	12.9	33.3	45.8	<0.05	<7	<4	102	**107.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-04 depth																	
14-8323	DM-04	2014	Year 1	Phase I	40-45	1.0	<1.0	59.0	7.2	20.0	<10	29.0	35.0	0.0140	<10	<10	<10	15.0
DM-04 (40-50)	DM-04	2015	Year 2	Phase I	40-50	<1.0	<0.50	49.3	7.4	18.5	6.8	24.8	31.4	<0.050	<7.0	<4.0	28.0	33.5
DM-04a	DM-04	2016	Year 3	Phase I	30-40	<1.0	<0.50	66.8	10.2	**30.7**	6.5	**37.3**	40.5	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-04	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Foundation Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**66.8**	**10.7**	**26.7**	**14.7**	**34.9**	**62.8**	**0.10**				**105.4**
Baseline Data - Standard Deviation						0.00	0.00	10.4	2.4	4.7	14.7	6.0	41.5	0.00				161.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**98.0**	**18.0**	**40.9**	**58.7**	**52.8**	**187.2**	**0.10**				**589.4**
Downgradient																		
	DM-05 surface																	
14-8324	DM-05	2014	Year 1	Phase I	0-10	**1.3**	<1.0	**75.0**	8.4	26.0	**19.0**	**35.0**	49.0	0.0520	<10	<10	170.0	**180.0**
DM-05 (0-15)	DM-05	2015	Year 2	Phase I	0-15	**2.1**	<0.50	**67.0**	9.9	**27.8**	3.6	34.2	38.5	<0.050	<7.0	<4.0	<8.0	9.5
DM-05a	DM-05	2016	Year 3	Phase I	0-15	<1.0	<0.50	63.1	9.1	**35.2**	**131.0**	**44.5**	44.6	<0.050	<7.0	15.0	431.0	**449.5**
DM-05 Shallow	DM-05	2017	Year 4	Phase I	0-15	<1.0	<0.5	50.3	7.6	26.2	8.7	29.1	35.1	<0.05	<7	<4	70	75.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-05 depth																	
14-8325	DM-05	2014	Year 1	Phase I	40-45	**1.3**	<1.0	**75.0**	9.5	**30.0**	<10	**38.0**	45.0	<0.010	<10	<10	<10	15.0
DM-05 (40-50)	DM-05	2015	Year 2	Phase I	40-50	<1.0	<0.50	45.0	6.9	17.4	2.4	23.6	24.8	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-05	2016	Year 3	Phase I														#N/A
DM-05 Deep	DM-05	2017	Year 4	Phase I	30-40	<1.0	<0.5	45.4	6.4	23.2	3.8	27.5	30.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Foundation Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**66.8**	**10.7**	**26.7**	**14.7**	**34.9**	**62.8**	**0.10**				**105.4**
Baseline Data - Standard Deviation						0.00	0.00	10.4	2.4	4.7	14.7	6.0	41.5	0.00				161.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**98.0**	**18.0**	**40.9**	**58.7**	**52.8**	**187.2**	**0.10**				**589.4**
	DM-06 surface																	
14-8327	DM-06	2014	Year 1	Phase I	0-10	**1.6**	<1.0	**76.0**	9.3	**31.0**	<10	**38.0**	46.0	<0.010	<10	<10	<10	15.0
DM-06 (0-15)	DM-06	2015	Year 2	Phase I	0-15	**2.2**	<0.50	**71.8**	**11.1**	**29.7**	4.6	**36.3**	42.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-06a	DM-06	2016	Year 3	Phase I	0-15	<1.0	<0.50	51.6	7.1	24.1	5.4	27.5	33.1	<0.050	<7.0	<4.0	25.0	30.5
DM-06 Shallow (Dup Avg)	DM-06	2017	Year 4	Phase I	0-15	<1.0	<0.5	**73.0**	10.1	**31.9**	4.9	**39.9**	46.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-06 depth																	
14-8328	DM-06	2014	Year 1	Phase I	40-45	**1.3**	<1.0	**86.0**	**11.0**	**30.0**	<10	**43.0**	49.0	<0.010	<10	<10	<10	15.0
DM-06 (40-50)	DM-06	2015	Year 2	Phase I	40-50	**1.7**	<0.50	59.3	8.9	**27.8**	3.4	30.8	38.3	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-06	2016	Year 3	Phase I														#N/A
DM-06 Deep	DM-06	2017	Year 4	Phase I	30-40	<1.0	<0.5	56.9	7.9	25.8	4.2	32.9	37.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

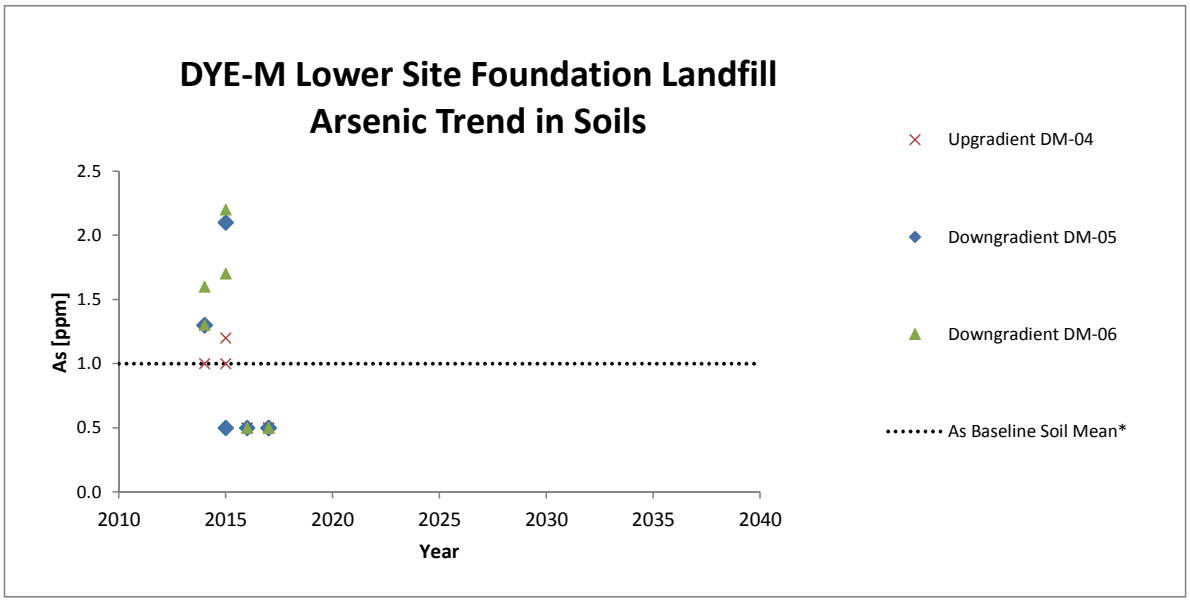
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Lower Site Foundation Landfill Trends in Soil Inorganics, PCBs and Modified TPH

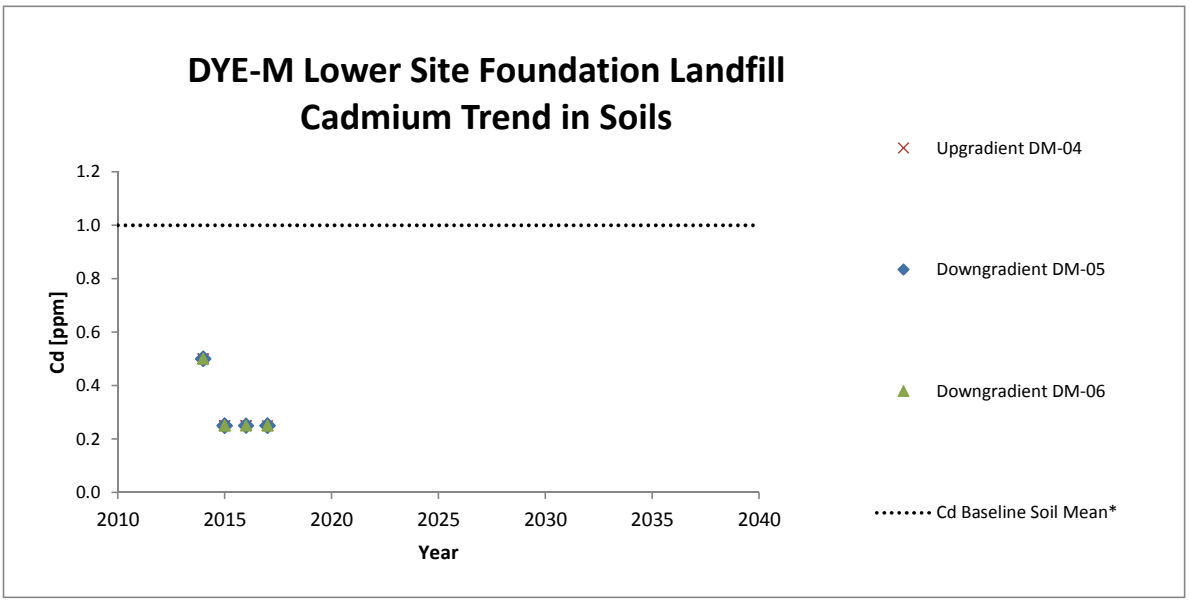
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

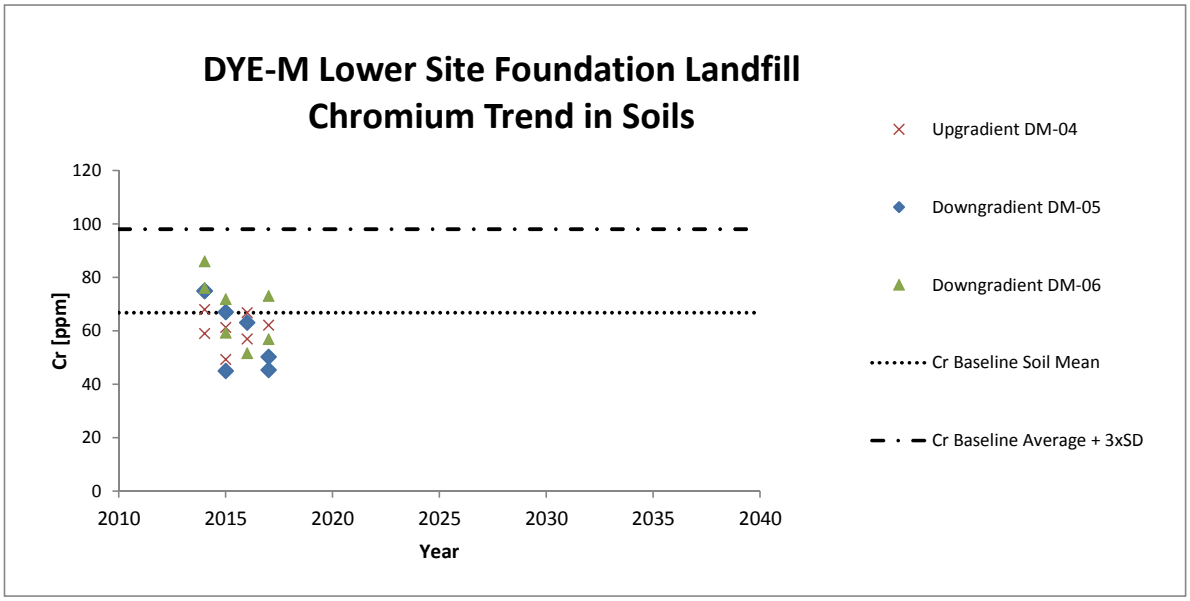


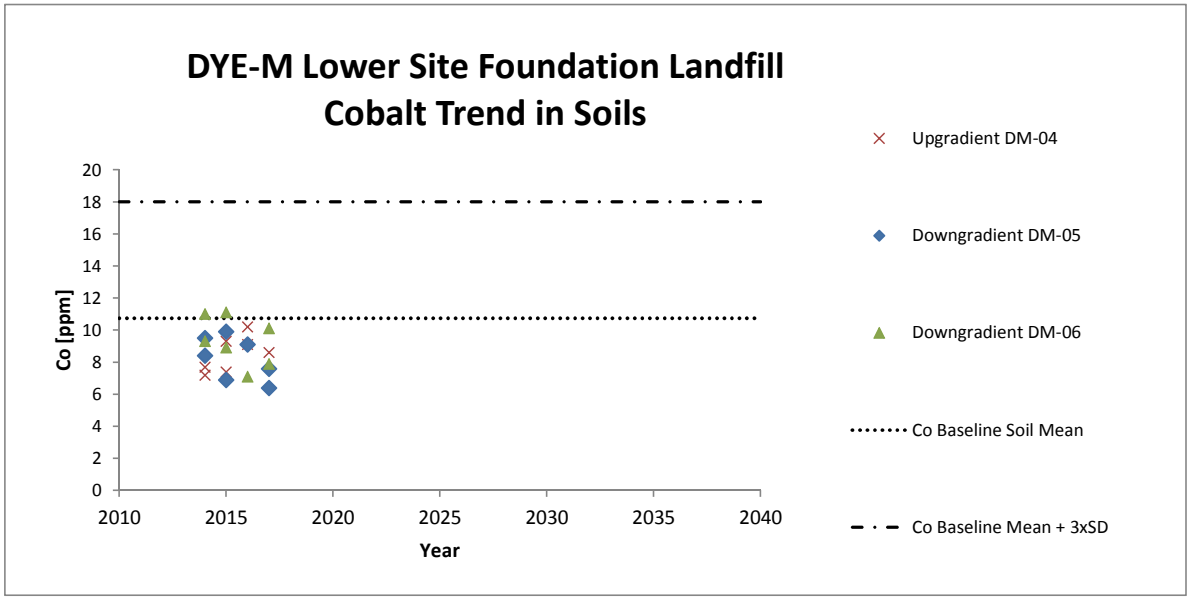
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



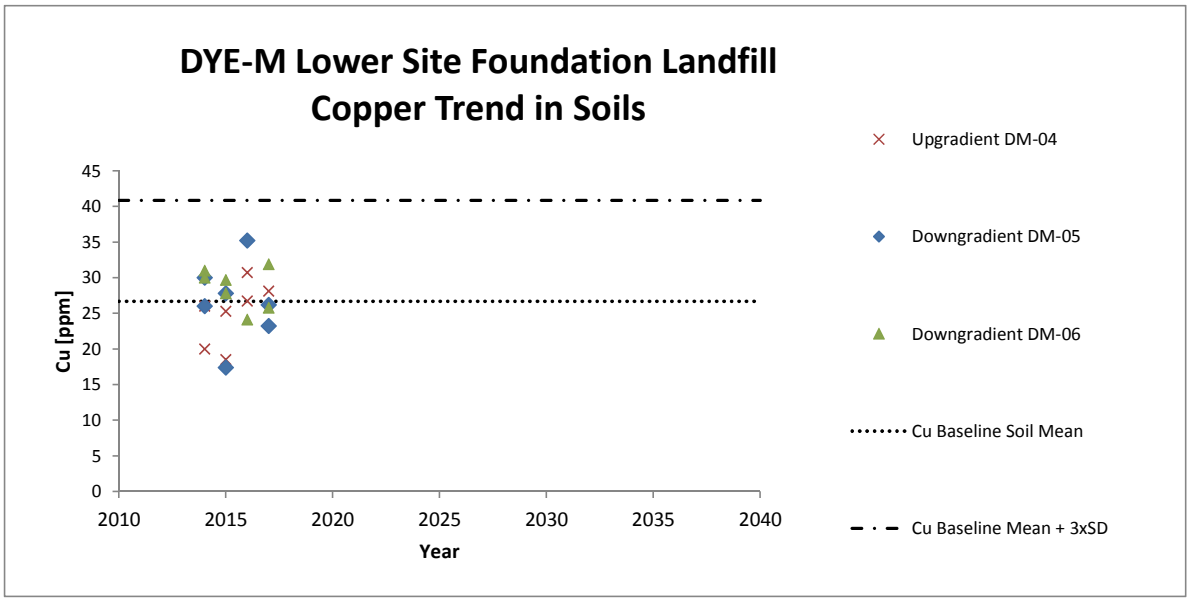
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

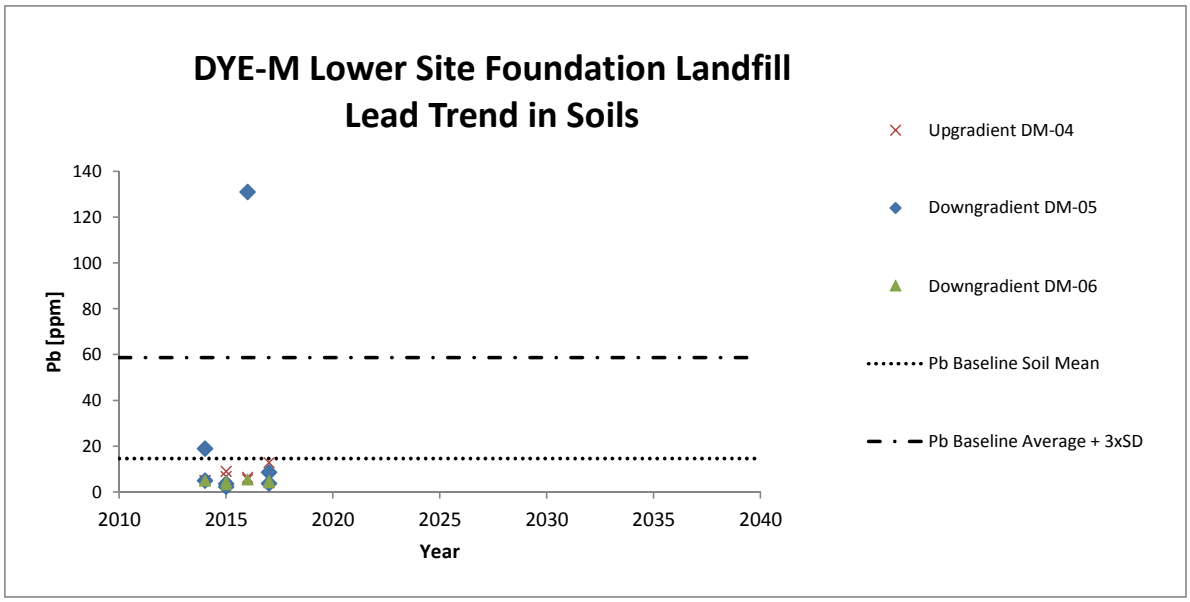
DYE-M Lower Site Foundation Landfill Trends in Soil Inorganics, PCBs and Modified TPH



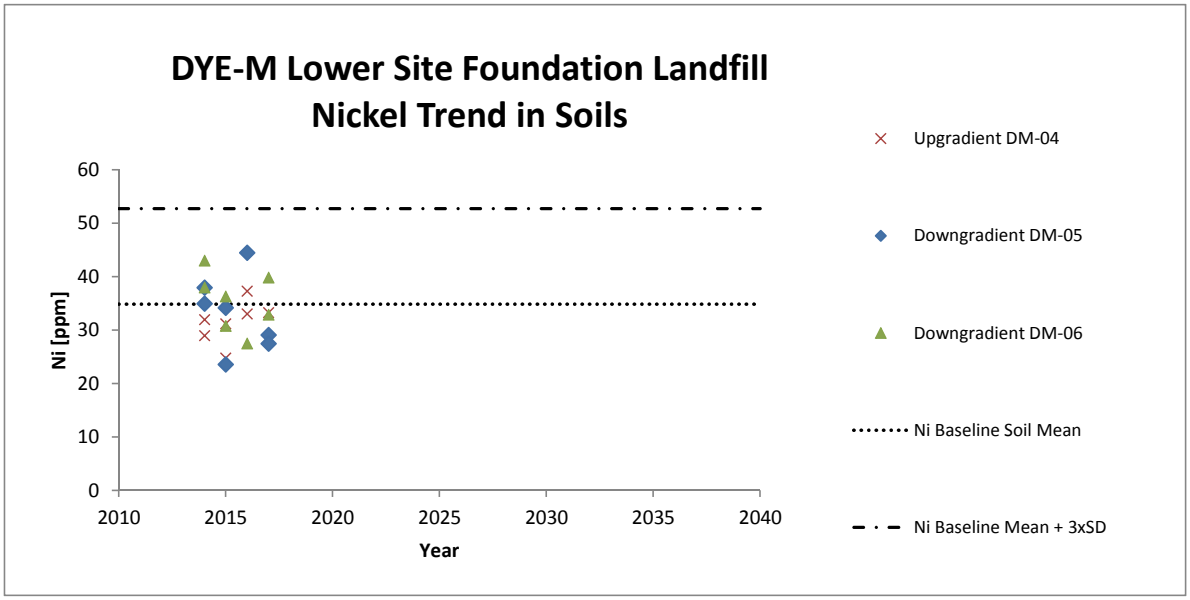


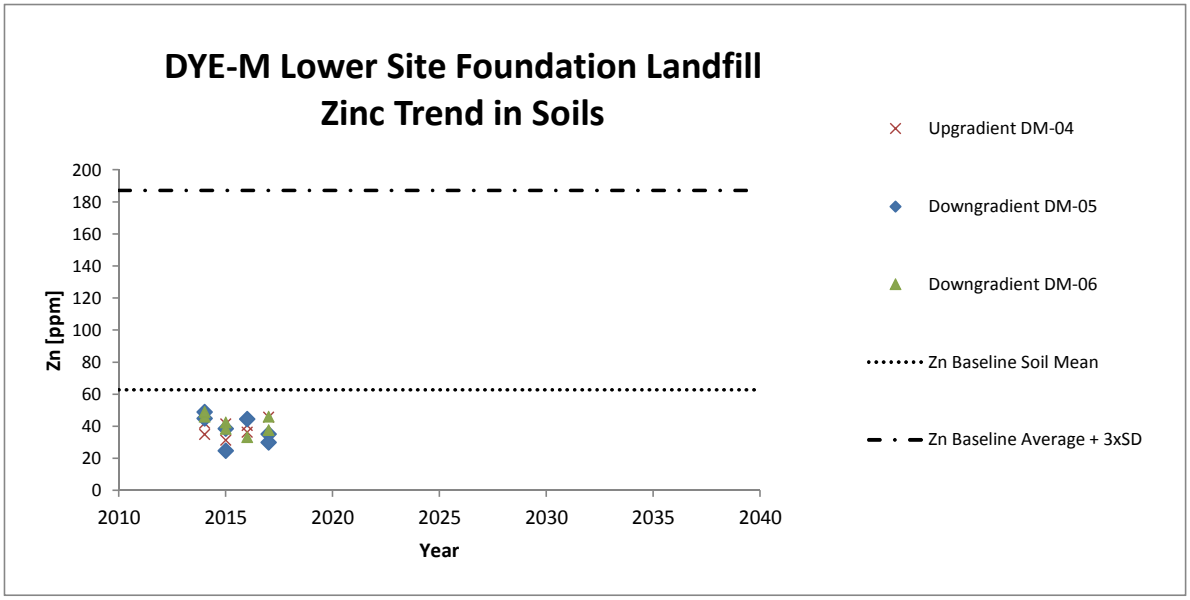
DYE-M Lower Site Foundation Landfill Trends in Soil Inorganics, PCBs and Modified TPH



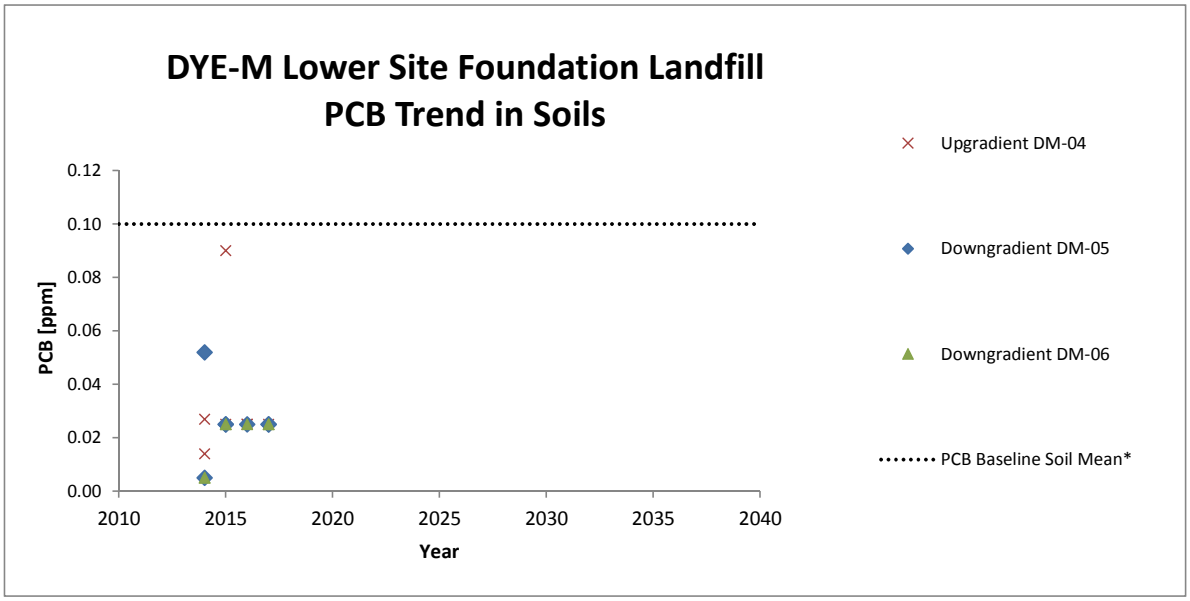


DYE-M Lower Site Foundation Landfill Trends in Soil Inorganics, PCBs and Modified TPH

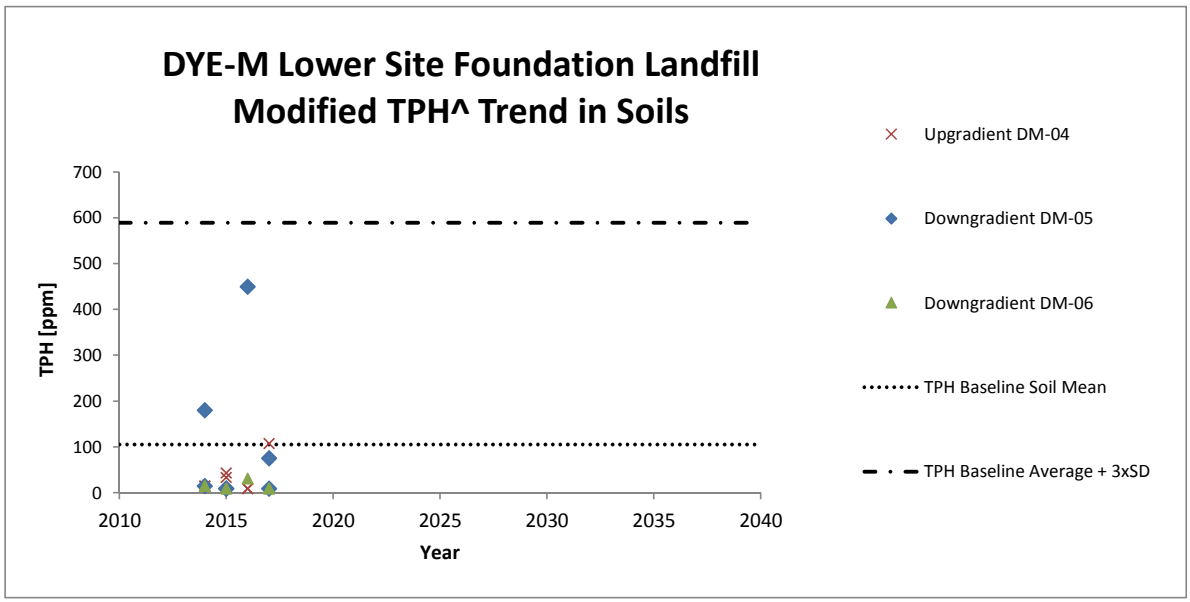




DYE-M Lower Site Foundation Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Powerhouse Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.24**	**1.00**	**64.1**	**10.4**	**26.7**	**10.0**	**34.4**	**54.6**	**0.175**				**167.4**
Baseline Data - Standard Deviation						0.80	0.00	12.8	2.8	9.3	0.0	9.1	25.8	0.000				290.9
Baseline Data Mean + 3xStandard Deviation						**3.64**	**1.00**	**102.6**	**18.9**	**54.7**	**10.0**	**61.6**	**131.9**	**0.175**				**1040.0**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	MW05-08 surface																	
14-8475	MW05-08	2014	Year 1	Phase I	5-10	1.2	<1.0	56.0	7.8	24.0	<10	31.0	48.0	**0.460**	<10	<10	21.0	31.0
MW05-08 (0-15)	MW05-08	2015	Year 2	Phase I	0-15	**1.8**	<0.50	**68.2**	9.3	**32.9**	**17.0**	**34.5**	53.9	**0.240**	<7.0	<4.0	109.0	114.5
MW05-08a	MW05-08	2016	Year 3	Phase I	0-15	<1.0	<0.50	49.3	7.9	24.7	9.2	27.9	34.8	0.060	<7.0	<4.0	100.0	105.5
MW05-08 Shallow	MW05-08	2017	Year 4	Phase I	0-15	<1.0	<0.5	53	8.3	24.9	**10.2**	31.7	40.8	<0.05	<7	7	91	101.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-08 depth																	
14-8477	MW05-08	2014	Year 1	Phase I	40-45	0.8	<1.0	52.0	7.1	18.0	<10	29.0	33.0	<0.010	<10	<10	<10	15.0
DM MW05-08 (40-50)	MW05-08	2015	Year 2	Phase I	40-50	<1.0	<0.50	57.3	8.6	25.3	8.7	30.7	39.1	<0.050	<7.0	<4.0	59.0	64.5
Not sampled - refusal	MW05-08	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW05-08	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Powerhouse Landfill - Summary of Soil Monitoring Analytical Data

Link to: Table of Contents

Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.24**	**1.00**	**64.1**	**10.4**	**26.7**	**10.0**	**34.4**	**54.6**	**0.175**				**167.4**
Baseline Data - Standard Deviation						0.80	0.00	12.8	2.8	9.3	0.0	9.1	25.8	0.000				290.9
Baseline Data Mean + 3xStandard Deviation						**3.64**	**1.00**	**102.6**	**18.9**	**54.7**	**10.0**	**61.6**	**131.9**	**0.175**				**1040.0**
Downgradient																		
	MW05-05 surface																	
14-8467	MW05-05	2014	Year 1	Phase I	5-10	**4.3**	<1.0	**130.0**	**22.0**	**69.0**	<10	**99.0**	**140.0**	<0.010	<10	<10	<10	15.0
DM MW05-05 (0-15)	MW05-05	2015	Year 2	Phase I	0-15	1.0	<0.50	**69.0**	9.4	**31.2**	**27.9**	34.2	53.9	0.090	<7.0	<4.0	<8.0	9.5
MW05-05a	MW05-05	2016	Year 3	Phase I	0-15	<1.0	<0.50	48.1	6.7	21.4	4.4	24.7	27.5	<0.050	<7.0	<4.0	<8.0	9.5
MW05-05 Shallow	MW05-05	2017	Year 4	Phase I	0-15	<1.0	<0.5	59.6	8.2	26.5	9.5	32.1	43.3	<0.05	<7	<4	42	47.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-05 depth																	
14-8468	MW05-05	2014	Year 1	Phase I	40-45	**1.3**	<1.0	**83.0**	8.1	21.0	<10	**39.0**	50.0	0.013	<10	<10	<10	15.0
DM MW05-05 (40-50)	MW05-05	2015	Year 2	Phase I	40-50	1.2	<0.50	62.0	8.4	**27.2**	**14.4**	31.1	43.4	0.110	<7.0	43.0	63.0	109.5
Not sampled - refusal	MW05-05	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW05-05	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Powerhouse Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.24**	**1.00**	**64.1**	**10.4**	**26.7**	**10.0**	**34.4**	**54.6**	**0.175**				**167.4**
Baseline Data - Standard Deviation						0.80	0.00	12.8	2.8	9.3	0.0	9.1	25.8	0.000				290.9
Baseline Data Mean + 3xStandard Deviation						**3.64**	**1.00**	**102.6**	**18.9**	**54.7**	**10.0**	**61.6**	**131.9**	**0.175**				**1040.0**
	MW05-06 surface																	
14-8470/71	MW05-06	2014	Year 1	Phase I	5-10	**1.6**	<1.0	**76.0**	7.2	24.0	**29.0**	**36.0**	52.0	0.068	<10	<10	14.0	24.0
DM MW05-06 (0-15)	MW05-06	2015	Year 2	Phase I	0-15	<1.0	<0.50	38.5	5.7	15.4	3.0	20.4	23.4	<0.050	<7.0	<4.0	<8.0	9.5
MW05-06a	MW05-06	2016	Year 3	Phase I	0-15	<1.0	<0.50	49.6	7.0	22.1	8.8	25.6	31.0	<0.050	<7.0	458.0	243.0	**704.5**
MW05-06 Shallow (Dup Avg)	MW05-06	2017	Year 4	Phase I	0-15	<1.0	<0.5	59.8	7.5	**29.0**	**14.3**	29.5	45.1	0.11	<7	765	252	**1020.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-06 depth																	
14-8472	MW05-06	2014	Year 1	Phase I	35-40	1.2	<1.0	**72.0**	7.6	25.0	<10	**40.0**	52.0	<0.010	14.0	2000.0	50.0	**2064.0**
DM MW05-06 (40-50)	MW05-06	2015	Year 2	Phase I	40-50	<1.0	<0.50	38.9	6.0	15.5	3.0	21.7	24.2	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW05-06	2016	Year 3	Phase I														#N/A
MW05-06 Deep	MW05-06	2017	Year 4	Phase I	40-50	<1.0	<0.5	46.7	7.0	18.1	4.1	27.0	31.6	<0.05	40	1810	90	**1940.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Powerhouse Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.24**	**1.00**	**64.1**	**10.4**	**26.7**	**10.0**	**34.4**	**54.6**	**0.175**				**167.4**
Baseline Data - Standard Deviation						0.80	0.00	12.8	2.8	9.3	0.0	9.1	25.8	0.000				290.9
Baseline Data Mean + 3xStandard Deviation						**3.64**	**1.00**	**102.6**	**18.9**	**54.7**	**10.0**	**61.6**	**131.9**	**0.175**				**1040.0**
	MW05-07 surface																	
14-8473	MW05-07	2014	Year 1	Phase I	5-10	1.1	<1.0	53.0	7.2	19.0	<10	28.0	40.0	<0.010	<10	<10	<10	15.0
DM MW05-07 (0-15)	MW05-07	2015	Year 2	Phase I	0-15	**2.3**	<0.50	64.0	9.2	**29.8**	**14.8**	33.1	48.8	0.100	<7.0	<4.0	101.0	106.5
MW05-07a	MW05-07	2016	Year 3	Phase I	0-15	<1.0	<0.50	56.6	8.1	26.1	5.9	29.3	33.5	<0.050	<7.0	<4.0	<8.0	9.5
MW05-07 Shallow	MW05-07	2017	Year 4	Phase I	0-15	<1.0	<0.5	56.1	8.4	26.6	9.2	32.9	45.6	<0.05	<7	<4	20	25.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-07 depth																	
14-8474	MW05-07	2014	Year 1	Phase I	45-50	1.2	<1.0	55.0	7.3	19.0	<10	30.0	37.0	<0.010	51.0	2800.0	130.0	**2981.0**
DM MW05-07 (15-30)	MW05-07	2015	Year 2	Phase I	15-30	<1.0	<0.50	34.8	5.1	12.9	4.3	18.6	22.6	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW05-07	2016	Year 3	Phase I														#N/A
MW05-07 Deep	MW05-07	2017	Year 4	Phase I	30-40	<1.0	<0.5	**71.3**	**10.5**	**32.2**	5.7	**41.2**	47.5	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

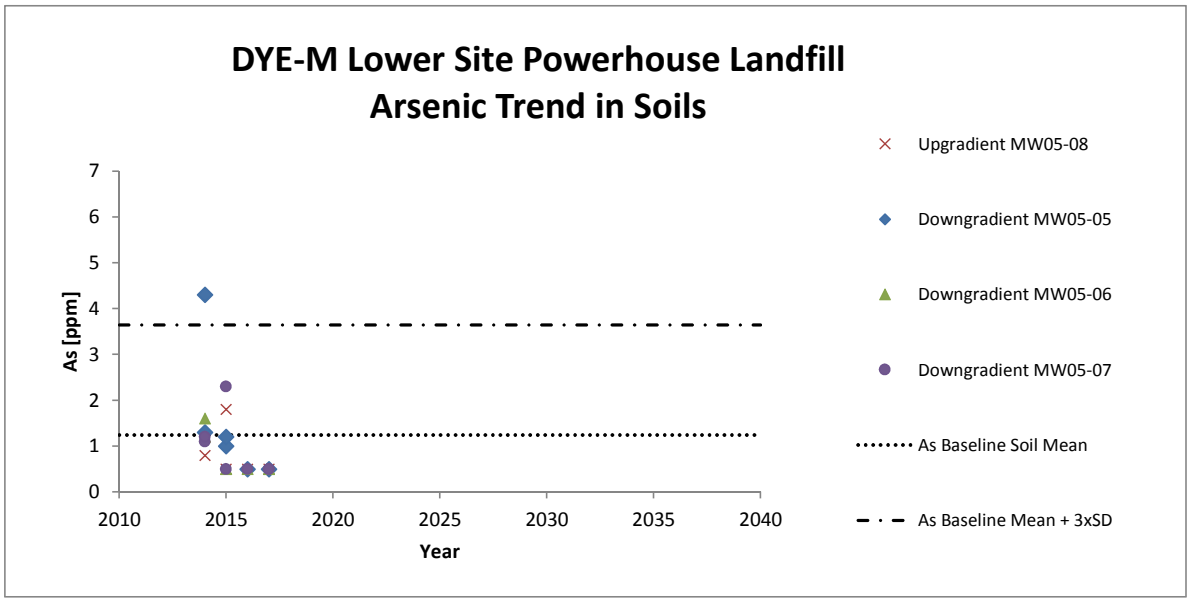
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

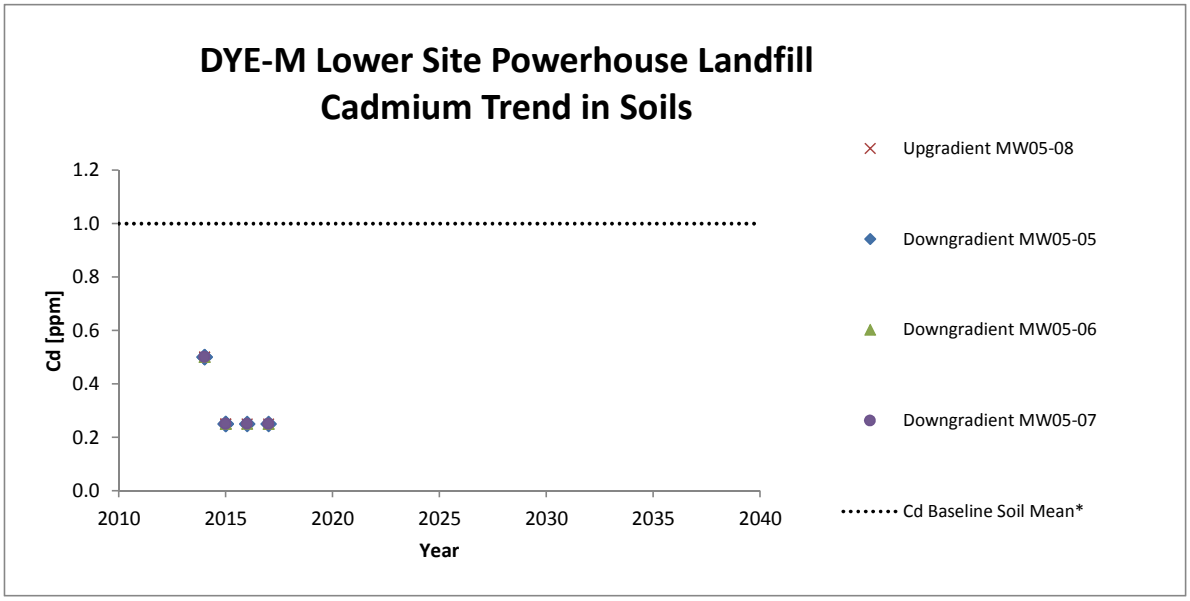
DYE-M Lower Site Powerhouse Landfill Trends in Soil Inorganics, PCBs and Modified TPH

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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

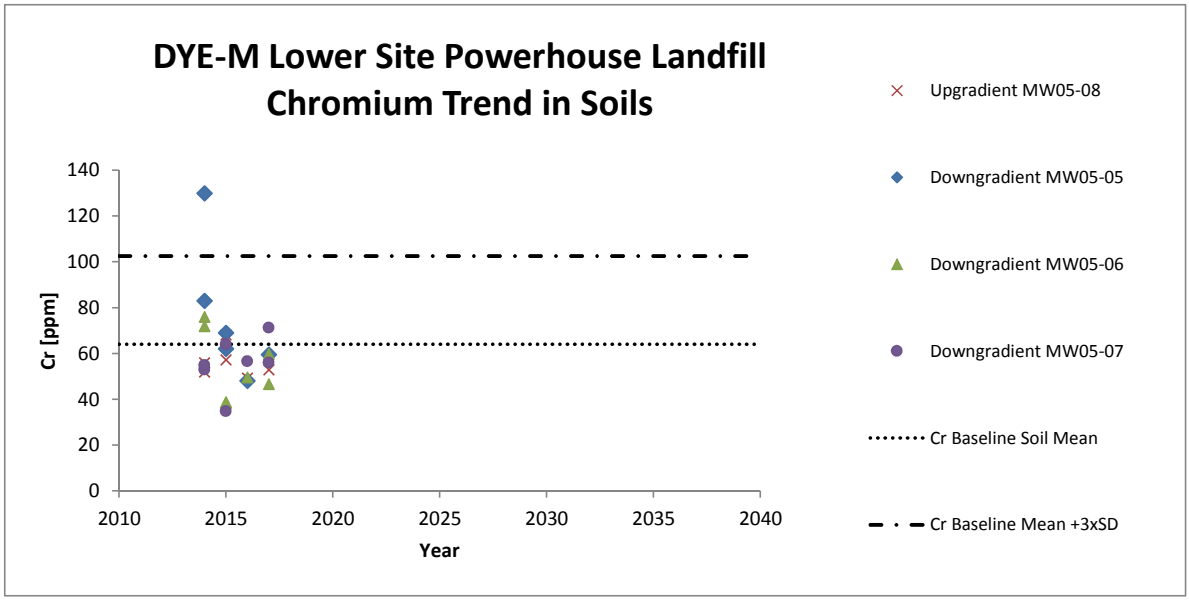
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

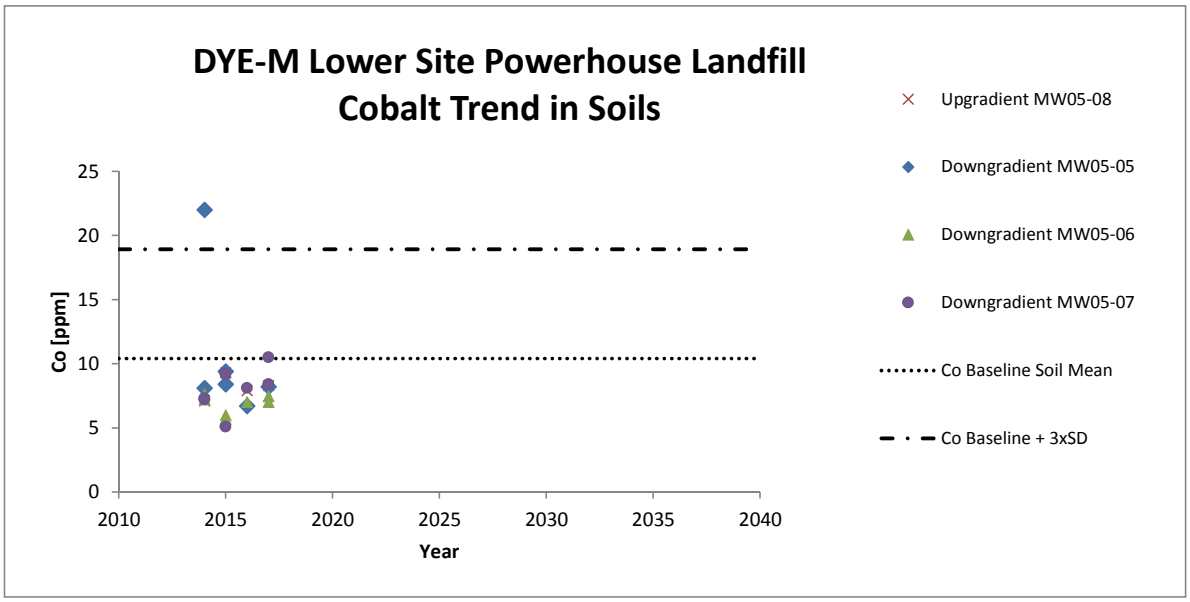




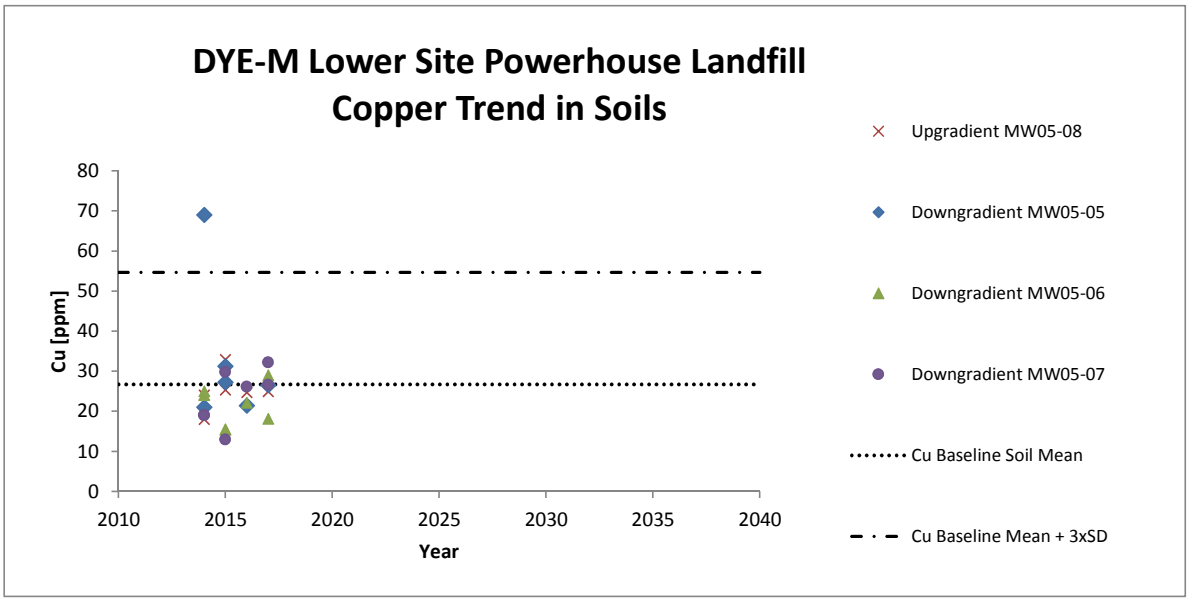
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

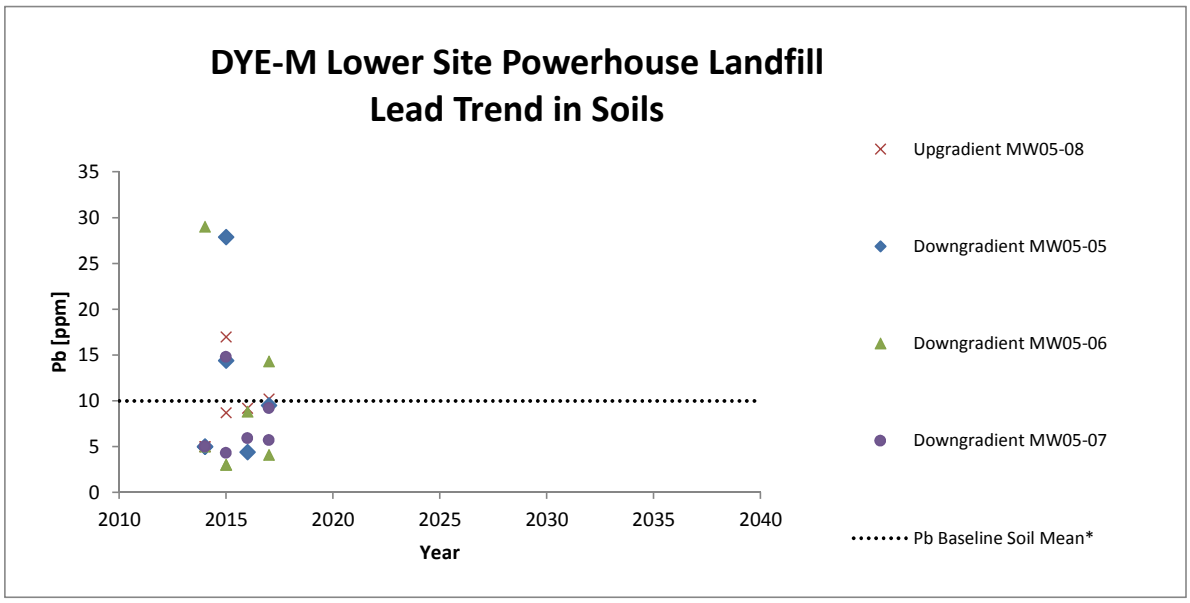
DYE-M Lower Site Powerhouse Landfill Trends in Soil Inorganics, PCBs and Modified TPH





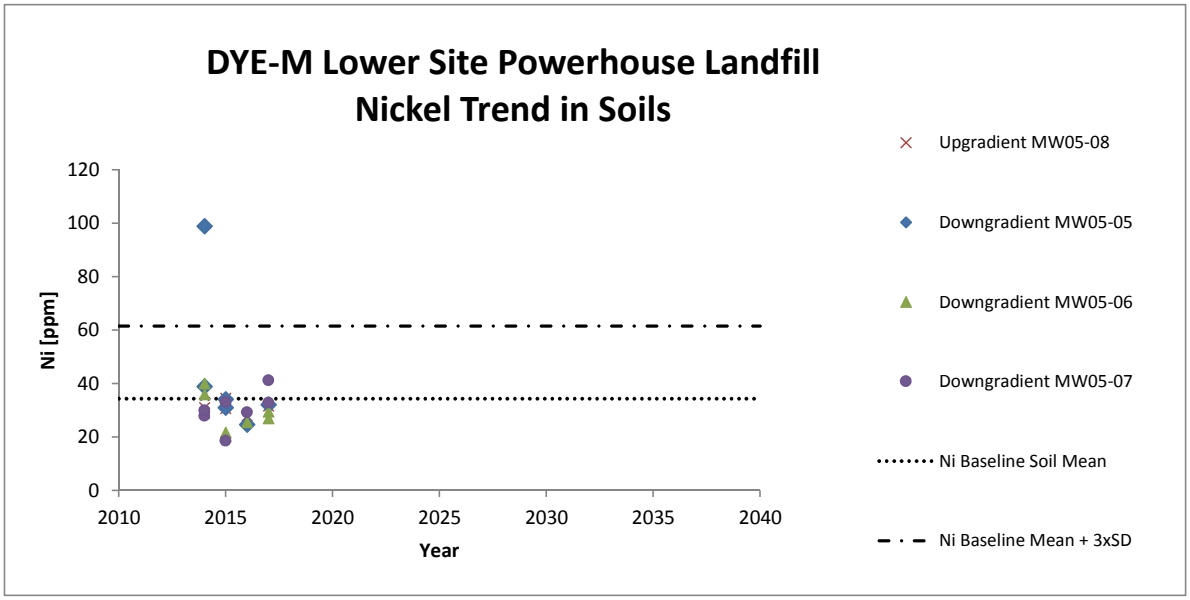
DYE-M Lower Site Powerhouse Landfill Trends in Soil Inorganics, PCBs and Modified TPH

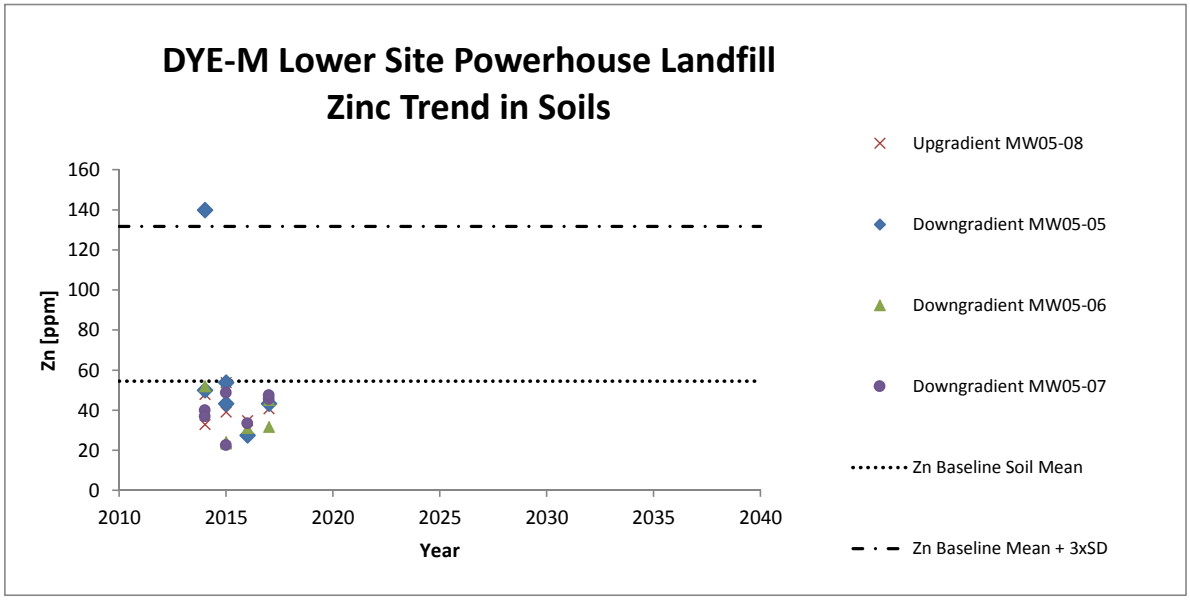




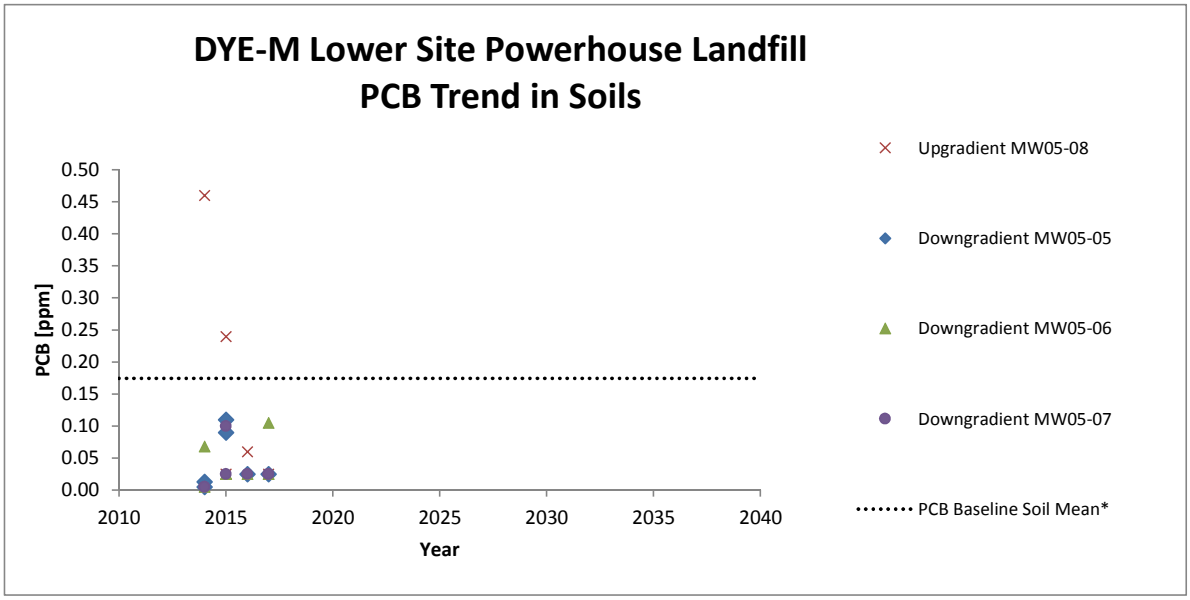
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site Powerhouse Landfill Trends in Soil Inorganics, PCBs and Modified TPH

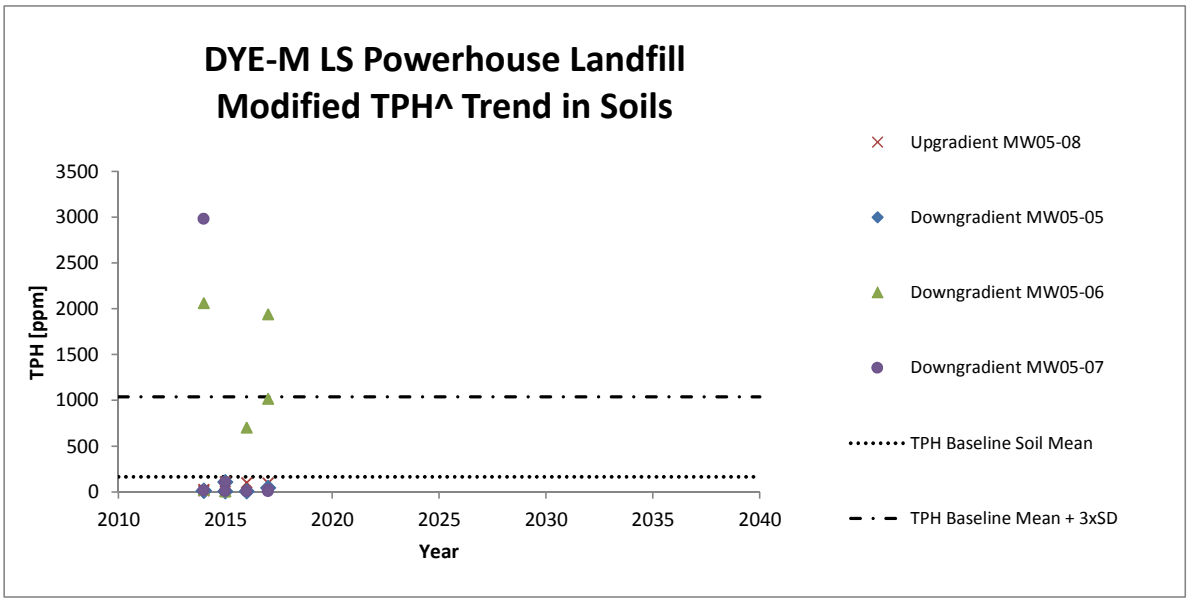




DYE-M Lower Site Powerhouse Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline standard deviation = 0



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Powerhouse Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu* (mg/L)	Pb* (mg/L)	Ni* (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
11-12214	MW05-08	2011			0.0034	*<0.0010*	*<0.0050*	*<0.0030*	*0.0059*	*<0.010*	*0.0061*	11.8	<0.050	<0.50	<1.0	0.78
12-34995	MW05-08	2012			0.0037	*<0.0010*	0.099	*<0.0030*	*<0.0050*	*<0.0050*	*0.0089*	5.3	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
12-34998	MW05-05	2012			0.0063	*<0.0010*	0.12	*<0.0030*	*0.0050*	*<0.0050*	*0.0090*	1.4	<0.050	<0.50	<1.0	0.78
12-34997	MW05-06	2012			0.0033	*<0.0010*	0.094	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	3.5	<0.050	<0.50	<1.0	0.78
12-34996	MW05-07	2012			<0.0010	*<0.0010*	0.052	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	2.6	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			5	0	4	0	0	0	0	5				5
Baseline Data - Arithmetic Mean					0.0034	N/A	0.0914	N/A	N/A	N/A	N/A	4.92				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0034**	**0.0010**	**0.0914**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**4.92**				**1.00**
Baseline Data - Standard Deviation					0.0020	0.0000	0.0284	0.0000	0.0000	0.0000	0.0000	4.10				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0096**	**0.0010**	**0.1765**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**17.22**				**1.00**
**** If baseline arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																
Dissolved metals results (italicized) have not been included in the calculation of N value, baseline arithmetic mean or standard deviation. Total metals results (i.e., those used in calculations) are not italicized.																
Where only dissolved metals results are available, the baseline arithmetic mean has been set to the detection limit of the dissolved metals results (highlighted in green).																
Monitoring Data													**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient - MW05-08																
Not sampled - well dry	MW05-08	2014	Year 1	Phase I												#N/A
MW05-08	MW05-08	2015	Year 2	Phase I	<0.0010	0.0005	0.001	0.0011	<0.00050	0.0006	**0.016**	**12.10**	<0.025	<0.10	<0.10	0.11
Not sampled - well dry	MW05-08	2016	Year 3	Phase I												#N/A
MW05-08 (*dissolved metals*)	MW05-08	2017	Year 4	Phase I	*<0.001*	*0.0003*	*<0.001*	*0.0011*	*0.0015*	*<0.0001*	***0.015***	***7.86***	<0.025	<0.1	<0.1	0.11
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A
																#N/A
																#N/A

DYE-M Lower Site Powerhouse Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu* (mg/L)	Pb* (mg/L)	Ni* (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
11-12214	MW05-08	2011			0.0034	*<0.0010*	*<0.0050*	*<0.0030*	*0.0059*	*<0.010*	*0.0061*	11.8	<0.050	<0.50	<1.0	0.78
12-34995	MW05-08	2012			0.0037	*<0.0010*	0.099	*<0.0030*	*<0.0050*	*<0.0050*	*0.0089*	5.3	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
12-34998	MW05-05	2012			0.0063	*<0.0010*	0.12	*<0.0030*	*0.0050*	*<0.0050*	*0.0090*	1.4	<0.050	<0.50	<1.0	0.78
12-34997	MW05-06	2012			0.0033	*<0.0010*	0.094	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	3.5	<0.050	<0.50	<1.0	0.78
12-34996	MW05-07	2012			<0.0010	*<0.0010*	0.052	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	2.6	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			5	0	4	0	0	0	0	5				5
Baseline Data - Arithmetic Mean					0.0034	N/A	0.0914	N/A	N/A	N/A	N/A	4.92				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0034**	**0.0010**	**0.0914**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**4.92**				**1.00**
Baseline Data - Standard Deviation					0.0020	0.0000	0.0284	0.0000	0.0000	0.0000	0.0000	4.10				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0096**	**0.0010**	**0.1765**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**17.22**				**1.00**
Downgradient - MW05-05																
Not sampled - well dry	MW05-05	2014	Year 1	Phase I												#N/A
MW0505 (Dup Avg)	MW05-05	2015	Year 2	Phase I	<0.0030	0.0004	<0.0040	0.0018	0.00455	**0.02925**	**0.0135**	4.42	<0.025	<0.10	<0.10	0.11
Not sampled - frozen	MW05-05	2016	Year 3	Phase I												#N/A
MW05-05 (*dissolved metals*)	MW05-05	2017	Year 4	Phase I	*<0.001*	*0.0001*	*<0.001*	*0.0007*	*0.001*	*0.0003*	***0.009***	*1.03*	<0.025	<0.2	<0.2	0.21
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A
																#N/A
																#N/A
Downgradient - MW05-06																
Not sampled - well dry	MW05-06	2014	Year 1	Phase I												#N/A
MW0506	MW05-06	2015	Year 2	Phase I	<0.0050	<0.00050	<0.0050	<0.0025	**0.0097**	<0.00050	**0.009**	**15.10**	<0.025	<0.10	<0.10	0.11
Not sampled - frozen	MW05-06	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW05-06	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
																#N/A
																#N/A
																#N/A

DYE-M Lower Site Powerhouse Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	As (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co* (mg/L)	Cu* (mg/L)	Pb* (mg/L)	Ni* (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
11-12214	MW05-08	2011			0.0034	*<0.0010*	*<0.0050*	*<0.0030*	*0.0059*	*<0.010*	*0.0061*	11.8	<0.050	<0.50	<1.0	0.78
12-34995	MW05-08	2012			0.0037	*<0.0010*	0.099	*<0.0030*	*<0.0050*	*<0.0050*	*0.0089*	5.3	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
Downgradient																
12-34998	MW05-05	2012			0.0063	*<0.0010*	0.12	*<0.0030*	*0.0050*	*<0.0050*	*0.0090*	1.4	<0.050	<0.50	<1.0	0.78
12-34997	MW05-06	2012			0.0033	*<0.0010*	0.094	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	3.5	<0.050	<0.50	<1.0	0.78
12-34996	MW05-07	2012			<0.0010	*<0.0010*	0.052	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	2.6	<0.050	<0.50	<1.0	0.78
All wells were dry in 2013		2013														
		N value			5	0	4	0	0	0	0	5				5
Baseline Data - Arithmetic Mean					0.0034	N/A	0.0914	N/A	N/A	N/A	N/A	4.92				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0034**	**0.0010**	**0.0914**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**4.92**				**1.00**
Baseline Data - Standard Deviation					0.0020	0.0000	0.0284	0.0000	0.0000	0.0000	0.0000	4.10				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0096**	**0.0010**	**0.1765**	**0.0030**	**0.0050**	**0.0100**	**0.0050**	**17.22**				**1.00**
Downgradient - MW05-07																
Not sampled - well dry	MW05-07	2014	Year 1	Phase I												#N/A
Not sampled - well dry	MW05-07	2015	Year 2	Phase I												#N/A
Not sampled - well dry	MW05-07	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW05-07	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A
																#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

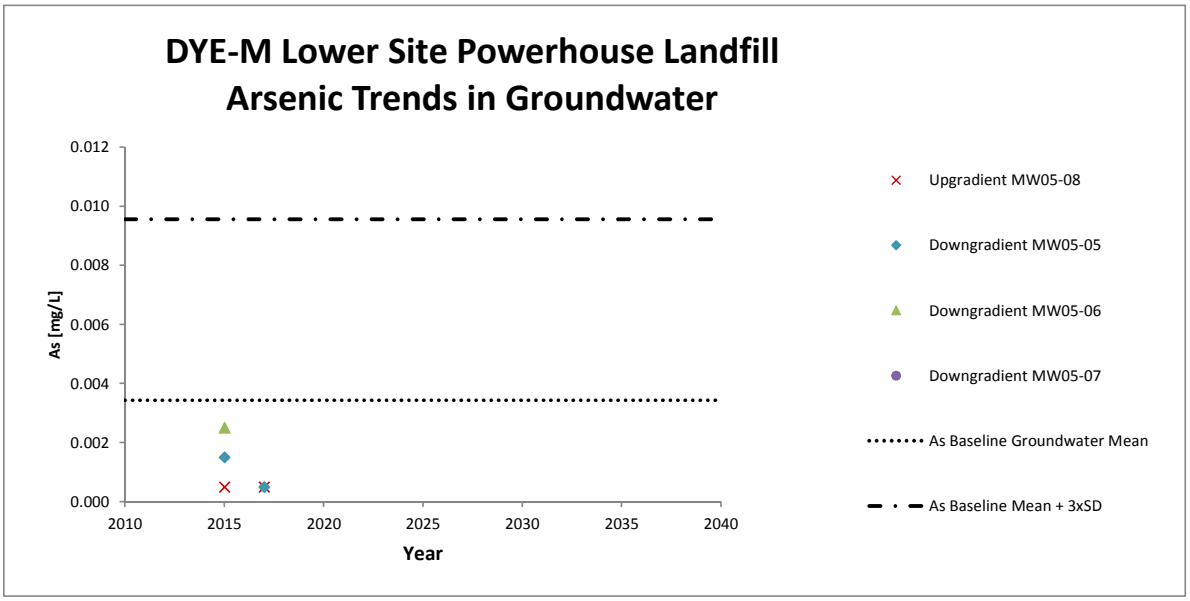
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**
XX	**Dissolved metals results**

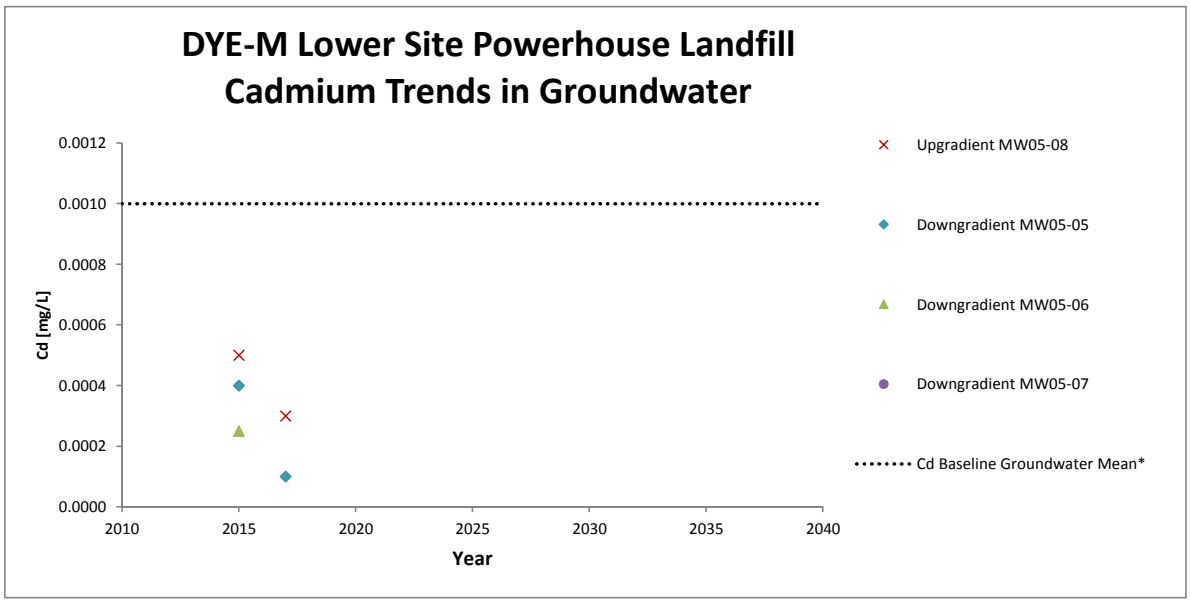
DYE-M Lower Site Powerhouse Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH

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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

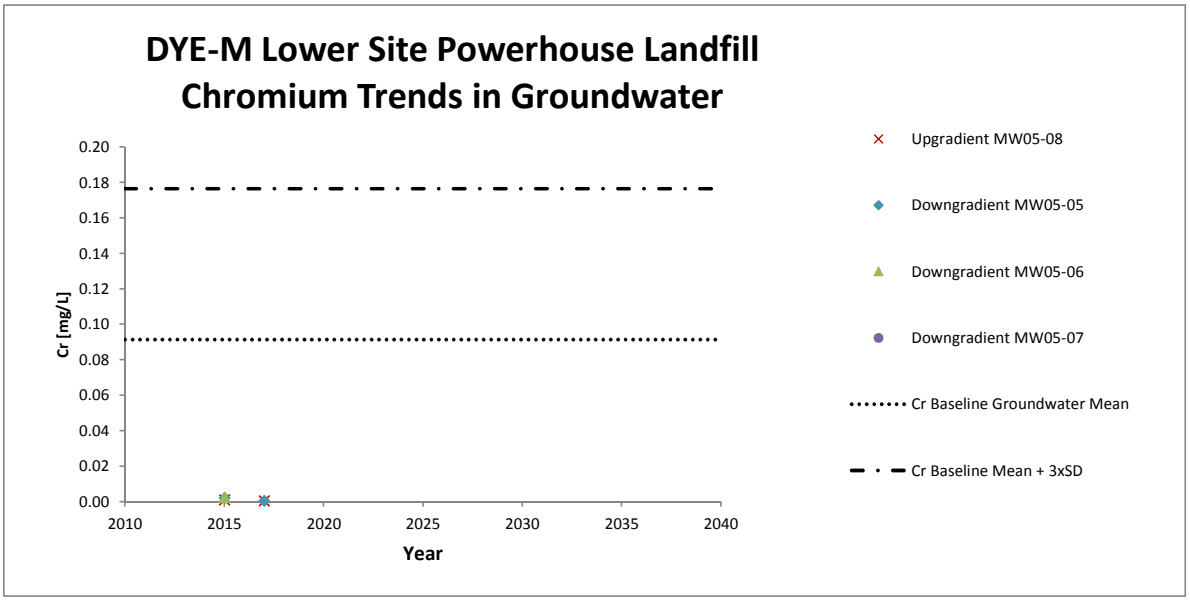
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

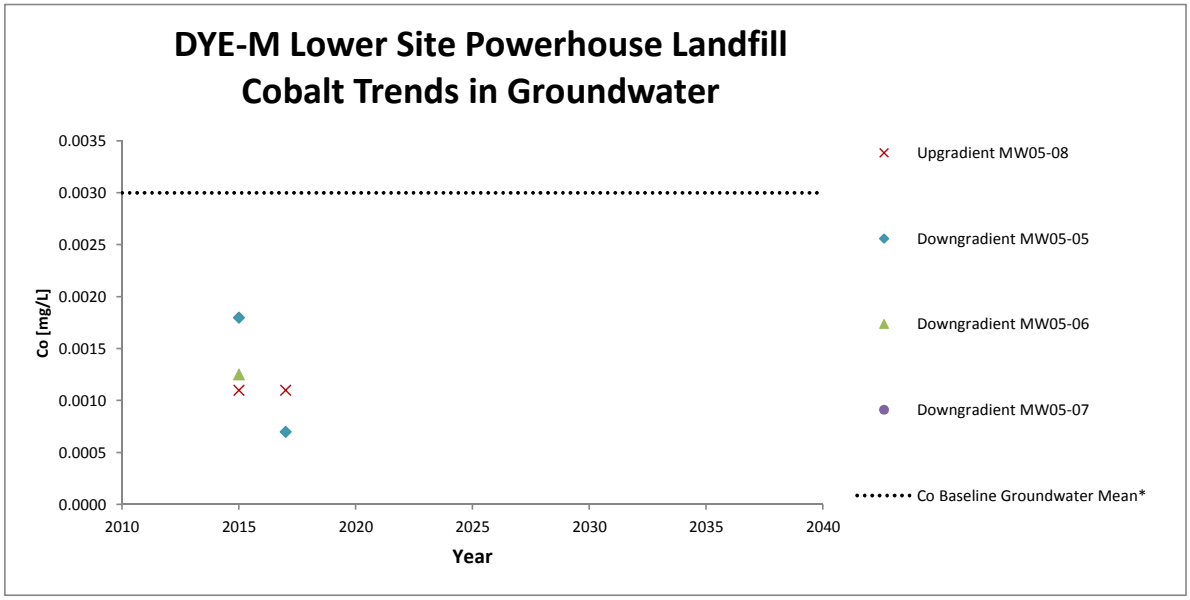




* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

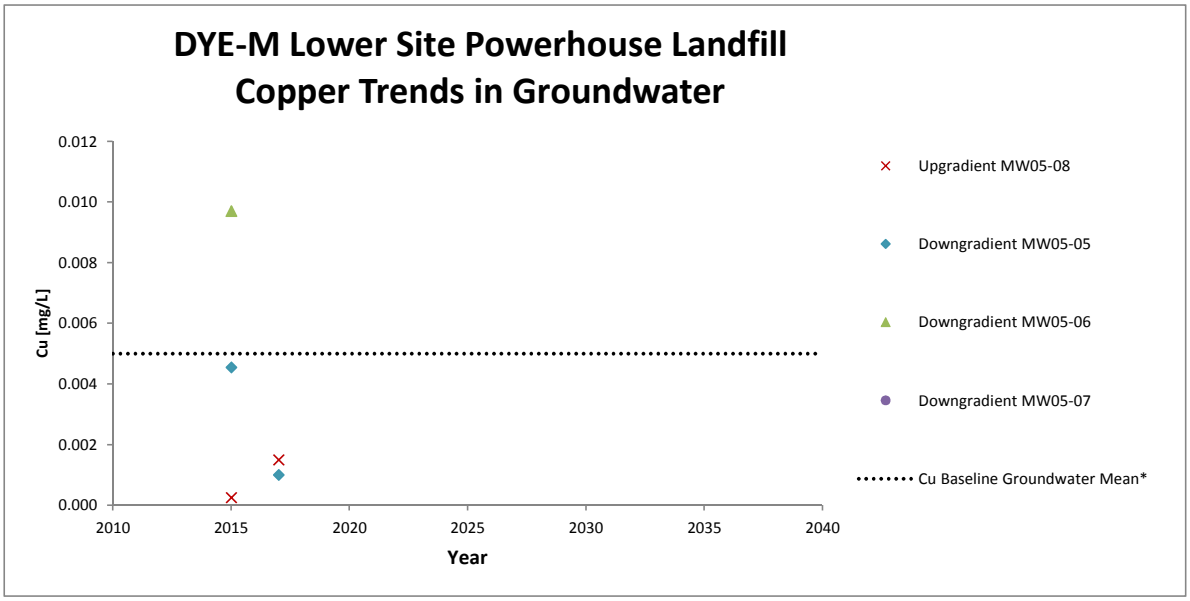
DYE-M Lower Site Powerhouse Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



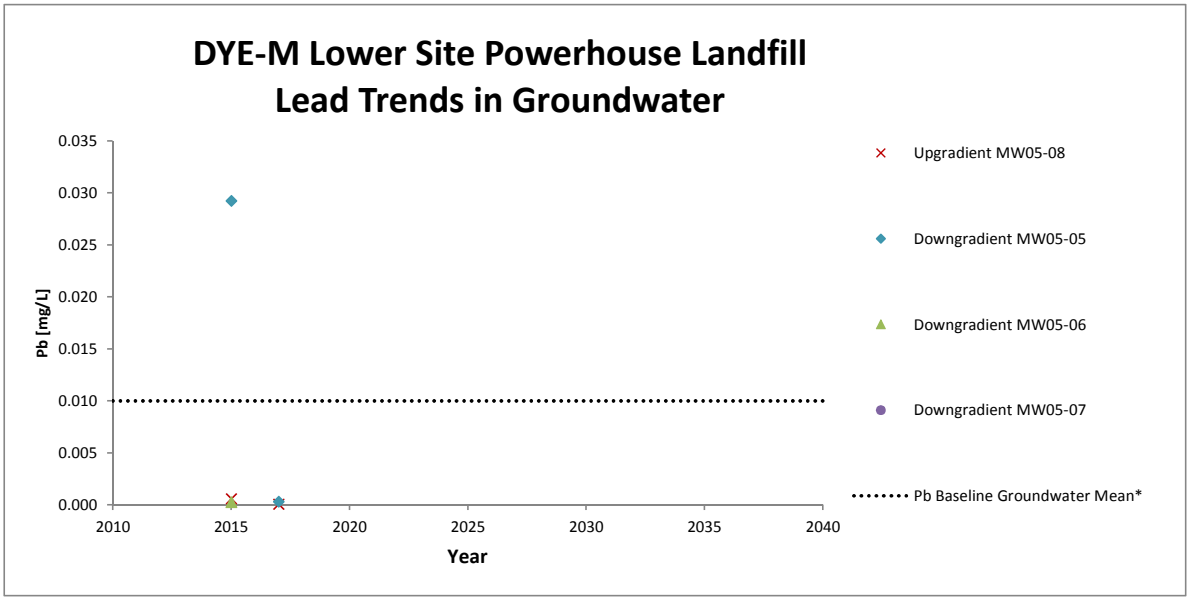


* Co baseline arithmetic mean is equal to the baseline detection limit
* Co baseline standard deviation = 0

DYE-M Lower Site Powerhouse Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH

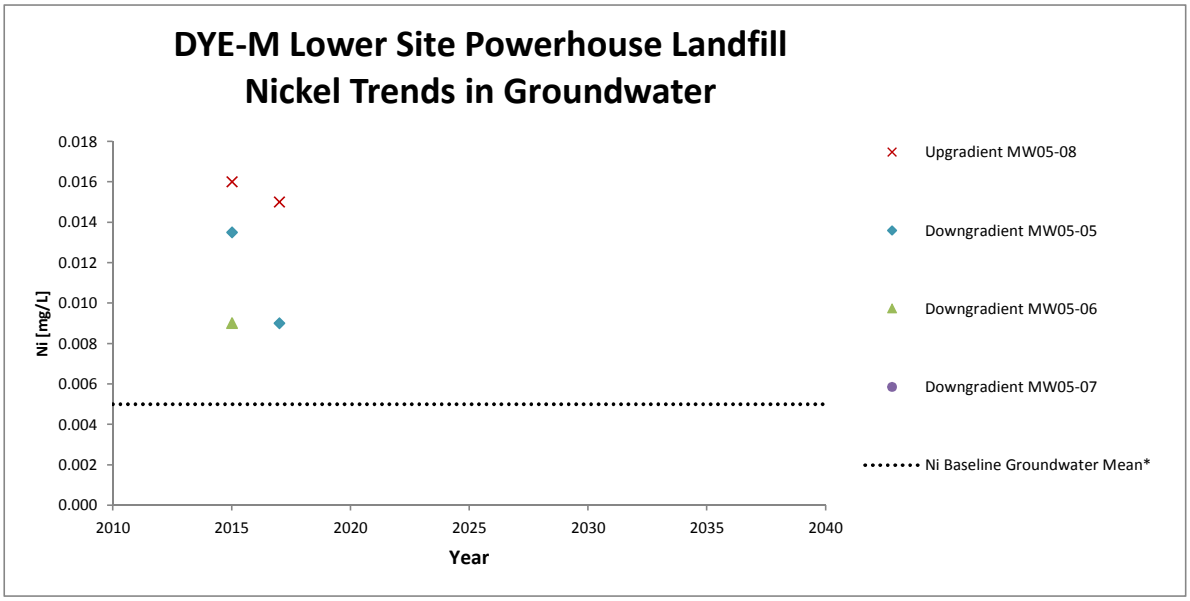


* Cu baseline arithmetic mean is equal to the baseline detection limit
* Cu baseline standard deviation = 0

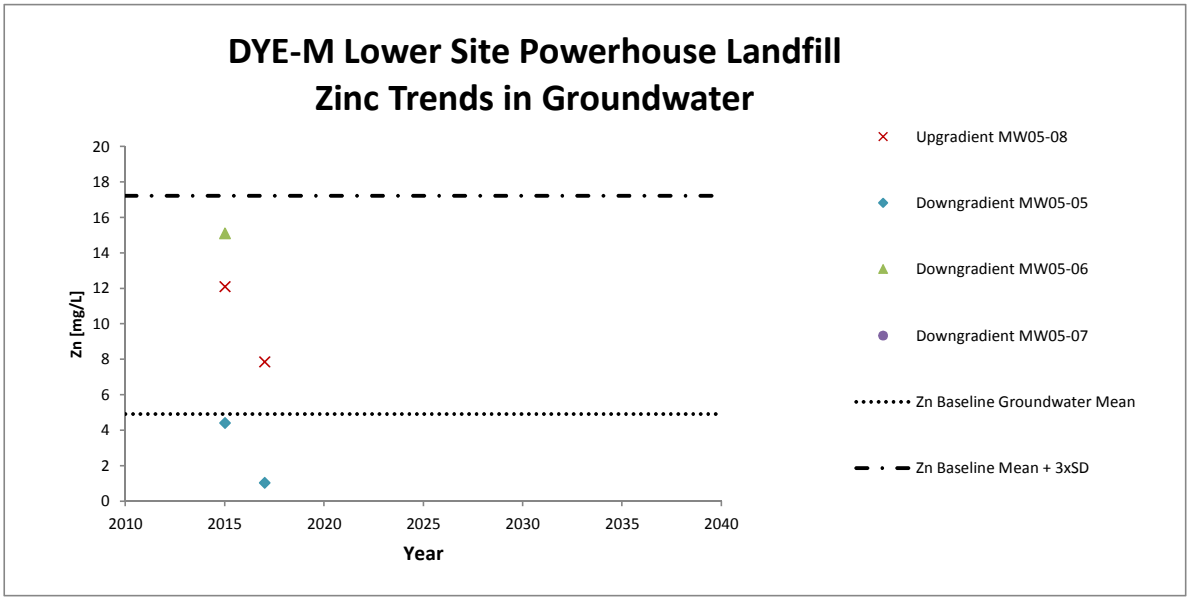


* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

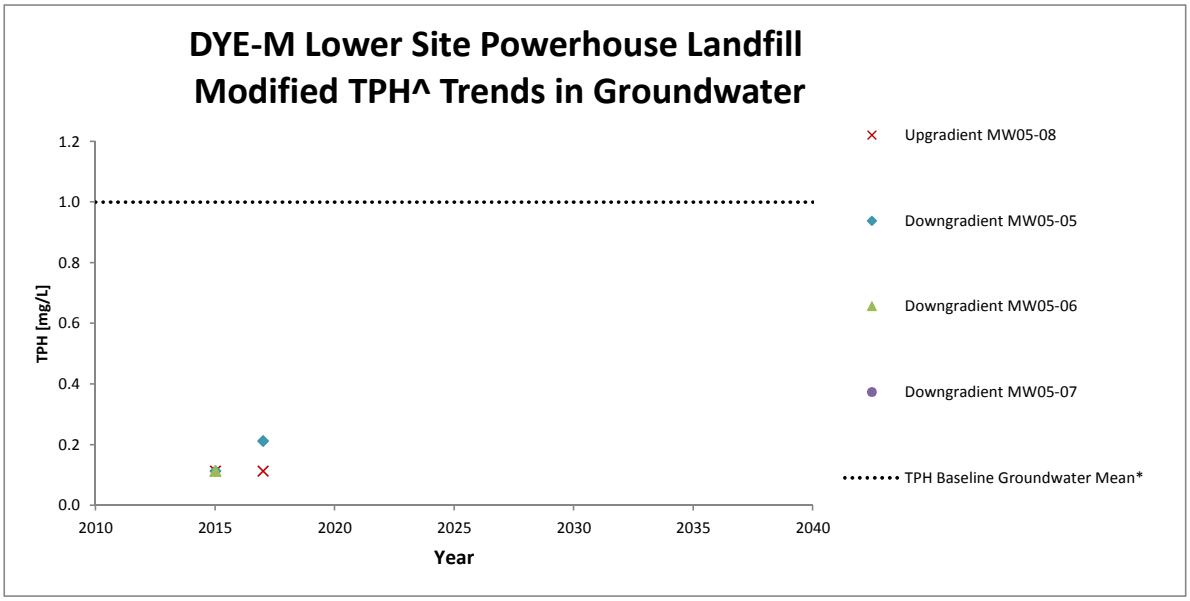
DYE-M Lower Site Powerhouse Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



* Ni baseline arithmetic mean is equal to the baseline detection limit
* Ni baseline standard deviation = 0



DYE-M Lower Site Powerhouse Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



* TPH baseline arithmetic mean is equal to the baseline detection limit
* TPH baseline standard deviation = 0
^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**				**58.9**
Baseline Data - Standard Deviation						0.00	0.00	12.1	2.1	7.5	0.0	5.0	26.8	0.000				115.7
Baseline Data Mean + 3xStandard Deviation						**1.13**	**1.00**	**105.0**	**16.6**	**49.2**	**10.0**	**49.9**	**134.9**	**0.067**				**406.1**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data															**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient																		
	MW09-26 surface																	
14-8252	MW09-26	2014	Year 1	Phase I	5-10	**1.2**	<1.0	**75.0**	9.5	25.0	<10	**41.0**	46.0	<0.010	<10	<10	<10	15.0
DM MW09-26 (0-20)	MW09-26	2015	Year 2	Phase I	0-20	**1.4**	<0.50	67.2	9.8	24.8	4.9	34.8	40.7	<0.050	<7.0	<4.0	<8.0	9.5
MW09-26b	MW09-26	2016	Year 3	Phase I	0-15	<1.0	<0.50	59.4	8.4	23.5	5.5	30.0	34.5	<0.050	<7.0	<4.0	<8.0	9.5
MW09-26 Shallow	MW09-26	2017	Year 4	Phase I	0-15	<1.0	<0.5	43.9	5.6	14.5	3.6	22.3	28.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW09-26 depth																	
14-8253	MW09-26	2014	Year 1	Phase I	45-50	0.9	<1.0	63.0	8.0	21.0	<10	34.0	42.0	<0.010	<10	11.0	<10	21.0
Not sampled, refusal	MW09-26	2015	Year 2	Phase I														#N/A
MW09-26a	MW09-26	2016	Year 3	Phase I	40-50	<1.0	<0.50	60.2	7.8	21.1	5.3	27.7	33.0	<0.050	<7.0	<4.0	<8.0	9.5
MW09-26 Deep	MW09-26	2017	Year 4	Phase I	40-50	<1.0	<0.5	46.8	5.5	15.2	3.6	22.8	28.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**				**58.9**
Baseline Data - Standard Deviation						0.00	0.00	12.1	2.1	7.5	0.0	5.0	26.8	0.000				115.7
Baseline Data Mean + 3xStandard Deviation						**1.13**	**1.00**	**105.0**	**16.6**	**49.2**	**10.0**	**49.9**	**134.9**	**0.067**				**406.1**
Downgradient																		
	MW05-09 surface																	
14-8243	MW05-09	2014	Year 1	Phase I	5-10	**2.4**	<1.0	**92.0**	**11.0**	**44.0**	**15.0**	**50.0**	**72.0**	0.018	<10	<10	<10	15.0
DM MW05-09 (0-15)	MW05-09	2015	Year 2	Phase I	0-15	**1.4**	<0.50	62.1	7.6	**38.3**	**12.5**	34.4	48.9	<0.050	<7.0	<4.0	52.0	57.5
MW05-09a	MW05-09	2016	Year 3	Phase I	0-15	<1.0	<0.50	**72.9**	8.9	**39.7**	**17.2**	33.8	54.1	**0.070**	<7.0	<4.0	59.0	**64.5**
MW05-09 Shallow	MW05-09	2017	Year 4	Phase I	0-15	<1.0	<0.5	49.8	7.7	**34.9**	6.9	31.0	37.2	<0.05	<7	<4	40	45.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-09 depth																	
14-8244	MW05-09	2014	Year 1	Phase I	45-50	**1.4**	<1.0	**75.0**	9.4	**27.0**	<10	**38.0**	47.0	0.018	<10	<10	<10	15.0
DM MW05-09 (40-50)	MW05-09	2015	Year 2	Phase I	40-50	1.0	<0.50	58.7	8.7	**31.0**	**23.7**	32.0	52.3	**0.090**	<7.0	<4.0	42.0	47.5
Not sampled - refusal	MW05-09	2016	Year 3	Phase I														#N/A
MW05-09 Deep	MW05-09	2017	Year 4	Phase I	30-40	<1.0	<0.5	53.0	7.8	**28.3**	8.0	31.6	42.7	<0.05	<7	<4	31	36.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**				**58.9**
Baseline Data - Standard Deviation						0.00	0.00	12.1	2.1	7.5	0.0	5.0	26.8	0.000				115.7
Baseline Data Mean + 3xStandard Deviation						**1.13**	**1.00**	**105.0**	**16.6**	**49.2**	**10.0**	**49.9**	**134.9**	**0.067**				**406.1**
	MW05-12 surface																	
14-8240/41	MW05-12	2014	Year 1	Phase I	5-10	**1.5**	<1.0	**89.0**	**12.0**	**44.0**	**53.0**	**47.0**	**81.0**	**0.300**	<10	<10	<10	15.0
DM MW05-12 (0-15)	MW05-12	2015	Year 2	Phase I	0-15	1.0	<0.50	**77.2**	**11.2**	**31.3**	6.8	**40.1**	50.6	<0.050	<7.0	<4.0	<8.0	9.5
MW05-12a	MW05-12	2016	Year 3	Phase I	0-15	<1.0	<0.50	**82.0**	**10.7**	**33.4**	7.2	**39.3**	46.8	<0.050	<7.0	<4.0	<8.0	9.5
MW05-12 Shallow	MW05-12	2017	Year 4	Phase I	0-15	<1.0	<0.5	**73.5**	10.2	**31.1**	**11.0**	**40.3**	**55.4**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW05-12 depth																	
14-8242	MW05-12	2014	Year 1	Phase I	35-45	**3.2**	<1.0	**84.0**	**11.0**	**35.0**	**13.0**	**45.0**	**71.0**	**0.120**	<10	<10	<10	15.0
DM MW05-12 (40-50)	MW05-12	2015	Year 2	Phase I	40-50	**1.2**	<0.50	**75.0**	**10.8**	**30.8**	8.0	**39.6**	51.3	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW05-12	2016	Year 3	Phase I														#N/A
MW05-12 Deep	MW05-12	2017	Year 4	Phase I	20-30	<1.0	<0.5	**93.0**	**13.2**	**41.3**	**14.6**	**51.8**	**76.8**	<0.05	<7	<4	19	24.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**				**58.9**
Baseline Data - Standard Deviation						0.00	0.00	12.1	2.1	7.5	0.0	5.0	26.8	0.000				115.7
Baseline Data Mean + 3xStandard Deviation						**1.13**	**1.00**	**105.0**	**16.6**	**49.2**	**10.0**	**49.9**	**134.9**	**0.067**				**406.1**
	MW09-27 surface																	
14-8248	MW09-27	2014	Year 1	Phase I	5-10	**2.0**	<1.0	**82.0**	**11.0**	**34.0**	<10	**45.0**	**60.0**	0.040	<10	<10	<10	15.0
DM MW09-27 (0-15)	MW09-27	2015	Year 2	Phase I	0-15	**2.0**	<0.50	65.6	9.3	**28.9**	7.5	34.3	43.2	<0.050	<7.0	<4.0	<8.0	9.5
MW09-27b	MW09-27	2016	Year 3	Phase I	0-15	<1.0	<0.50	**81.9**	9.7	**45.3**	**11.4**	**39.2**	51.3	<0.050	<7.0	<4.0	25.0	30.5
MW09-27 Shallow~	MW09-27	2017	Year 4	Phase I	0-15	<1.0	<0.5	**75.2**	**10.7**	**33.2**	6.4	**42.9**	48.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
	MW09-27 depth																	
14-8250/51	MW09-27	2014	Year 1	Phase I	45-50	0.7	<1.0	54.0	7.0	20.0	<10	31.0	35.0	<0.010	<10	<10	<10	15.0
DM MW09-27 (30-40)	MW09-27	2015	Year 2	Phase I	30-40	**1.4**	<0.50	63.6	9.1	**27.1**	6.1	32.9	40.4	<0.050	<7.0	<4.0	30.0	35.5
MW09-27a	MW09-27	2016	Year 3	Phase I	40-50	<1.0	<0.50	**75.6**	9.7	**32.4**	9.8	34.9	44.6	<0.050	<7.0	<4.0	<8.0	9.5
MW09-27 Deep	MW09-27	2017	Year 4	Phase I	30-40	<1.0	<0.5	62.0	8.4	26.6	7.0	32.8	38.5	<0.05	<7	<4	16	21.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	93.8	12.1	42.6	10.0	37.8	83.6	0.005				N/A
Baseline Data - Arithmetic Mean						**1.13**	**1.00**	**68.8**	**10.4**	**26.7**	**10.0**	**35.0**	**54.5**	**0.067**				**58.9**
Baseline Data - Standard Deviation						0.00	0.00	12.1	2.1	7.5	0.0	5.0	26.8	0.000				115.7
Baseline Data Mean + 3xStandard Deviation						**1.13**	**1.00**	**105.0**	**16.6**	**49.2**	**10.0**	**49.9**	**134.9**	**0.067**				**406.1**
	MW09-28 surface																	
14-8245	MW09-28	2014	Year 1	Phase I	5-10	**1.6**	<1.0	**86.0**	**11.0**	**43.0**	**14.0**	**43.0**	**64.0**	**0.160**	<10	<10	<10	15.0
MW09-28 (0-15)	MW09-28	2015	Year 2	Phase I	0-15	**1.9**	<0.50	**76.0**	**10.9**	**36.9**	**14.7**	**38.6**	54.4	<0.050	<7.0	<4.0	<8.0	9.5
MW09-28a	MW09-28	2016	Year 3	Phase I	0-15	<1.0	<0.50	**89.9**	**11.0**	**44.1**	**16.9**	**37.8**	**56.6**	<0.050	<7.0	<4.0	<8.0	9.5
MW09-28 Shallow	MW09-28	2017	Year 4	Phase I	0-15	<1.0	<0.5	60.4	9.2	26.1	6.2	34.7	41.3	<0.05	<7	<4	34	39.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
	MW09-28 depth																	
14-8247	MW09-28	2014	Year 1	Phase I	45-50	**2.1**	<1.0	**81.0**	10.0	**42.0**	**15.0**	**42.0**	**64.0**	0.032	<10	<10	<10	15.0
DM MW09-28 (40-50)	MW09-28	2015	Year 2	Phase I	40-50	<1.0	<0.50	**69.4**	9.5	**33.6**	**11.8**	32.8	48.3	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW09-28	2016	Year 3	Phase I														#N/A
MW09-28 Deep	MW09-28	2017	Year 4	Phase I	30-40	<1.0	<0.5	62.5	8.4	25.1	5.5	33.6	39.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

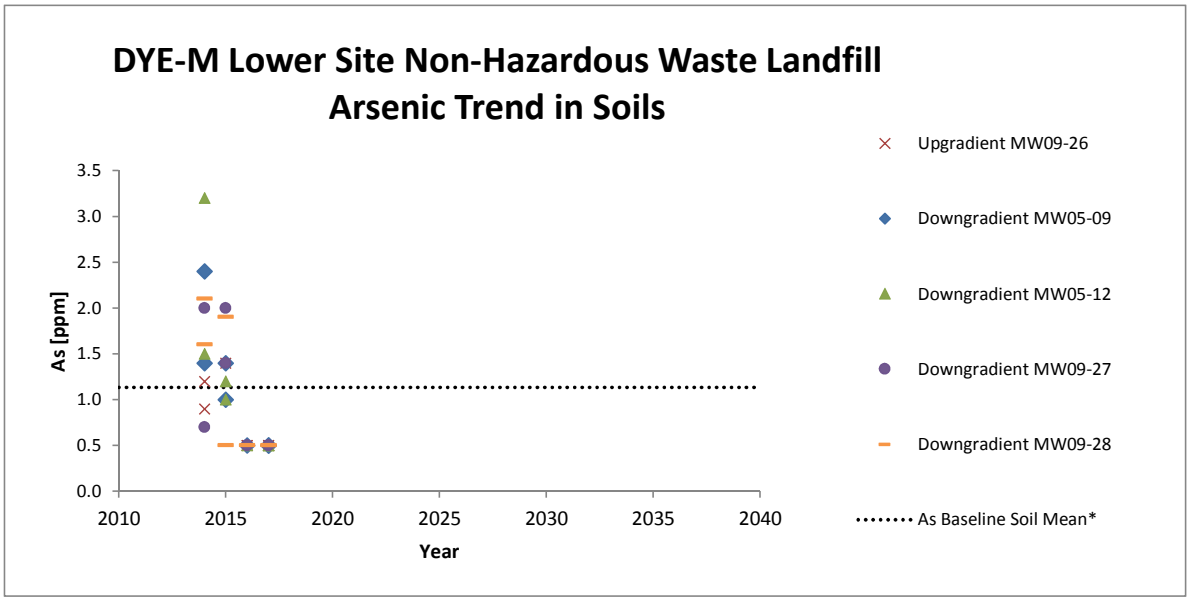
~ Two samples were labelled MW09-27 Deep. Historically, metals results have been slightly greater in the shallow sample, so the results from sample no. 1732457-87 were assigned to the shallow location.

DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

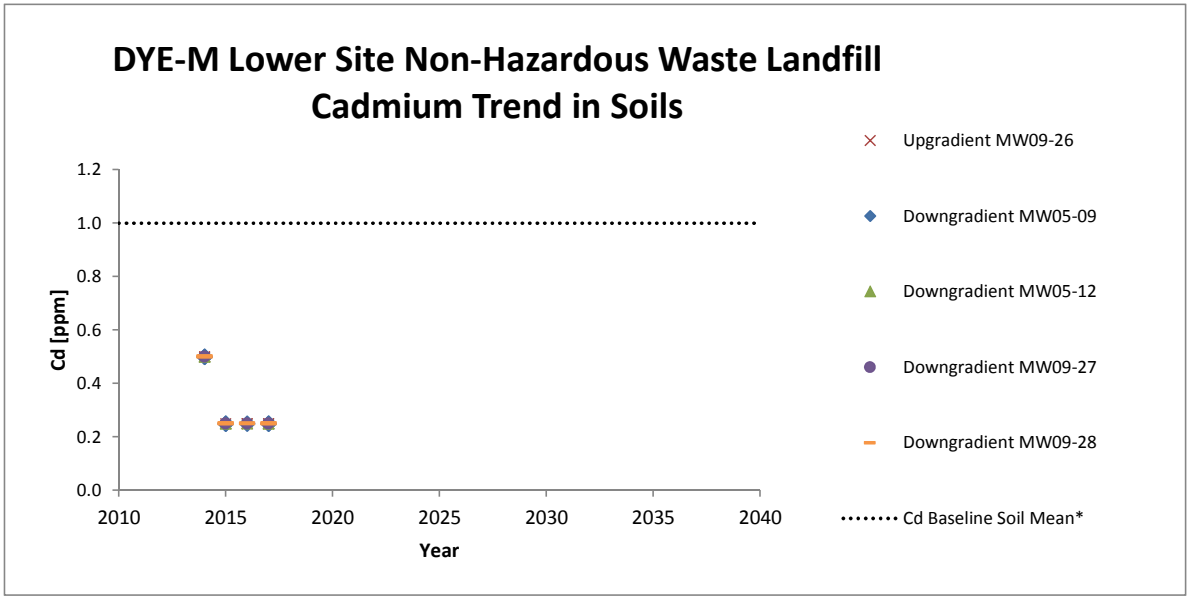
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

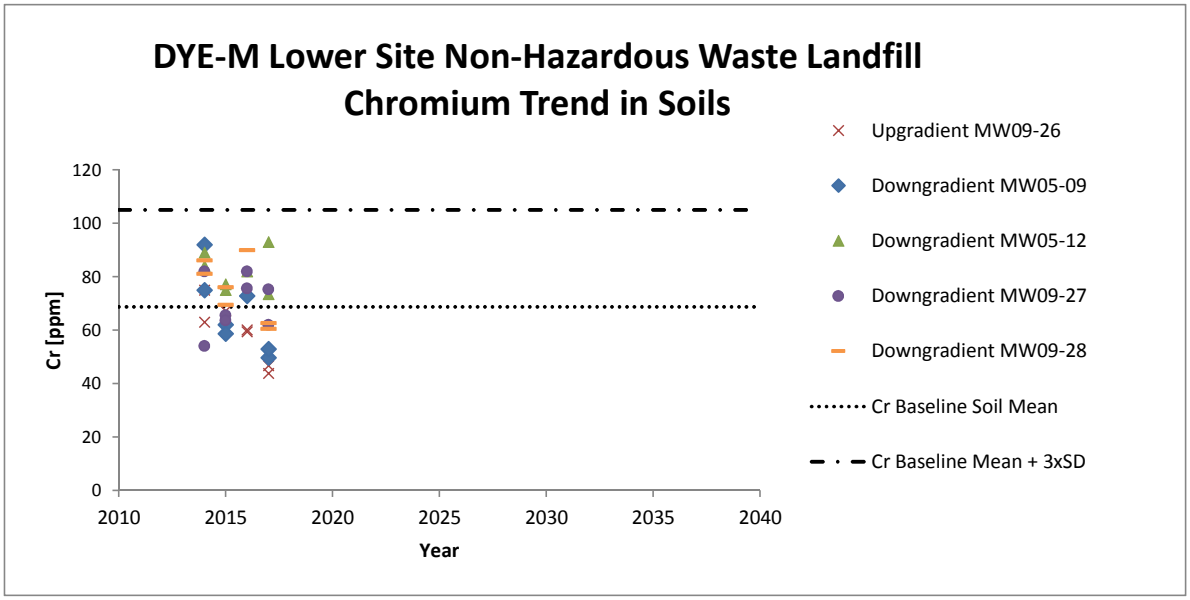


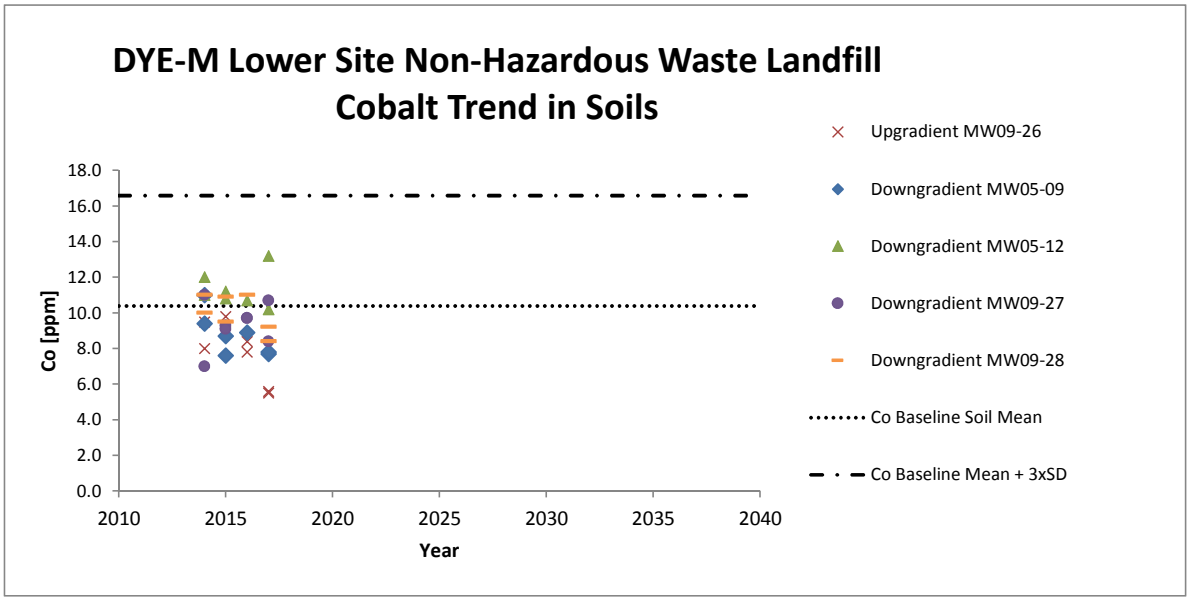
* As baseline standard deviation = 0



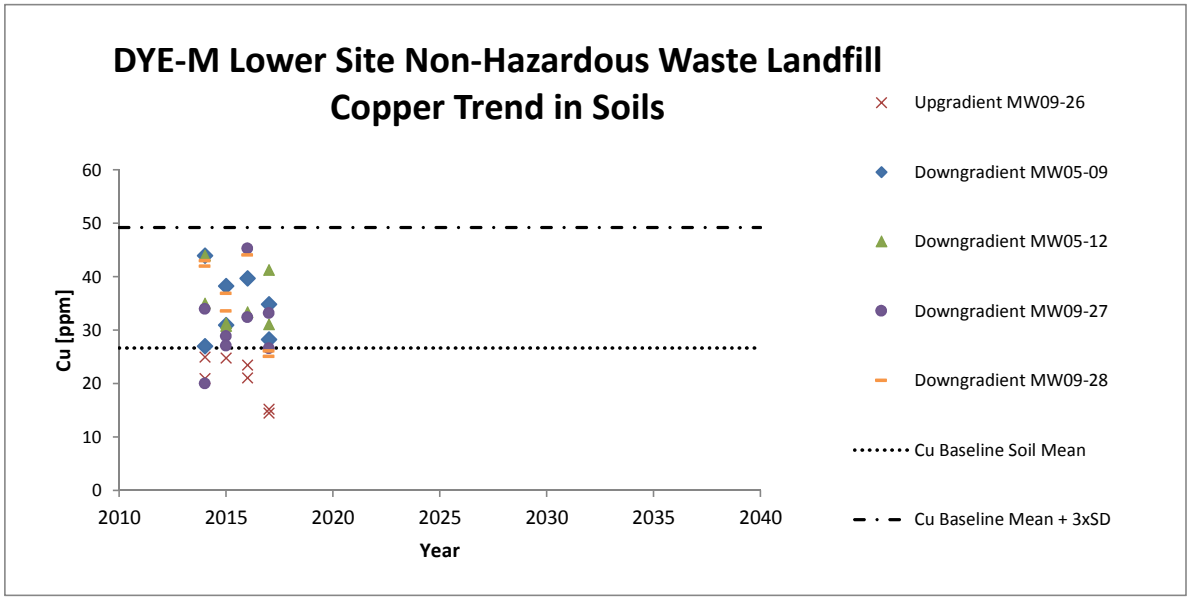
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

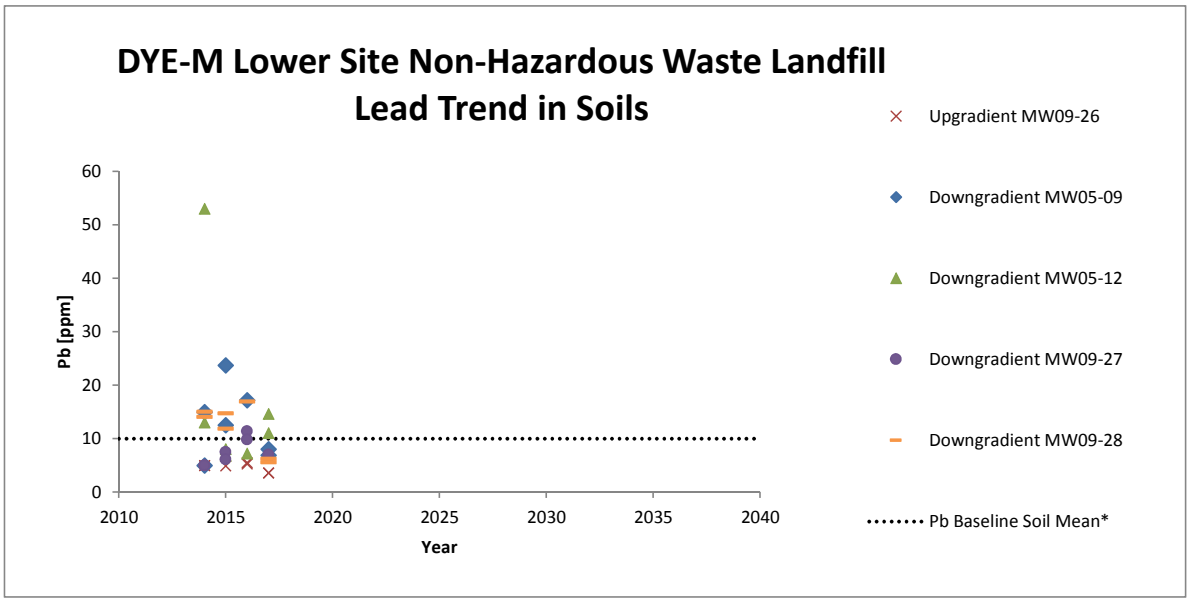
DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH





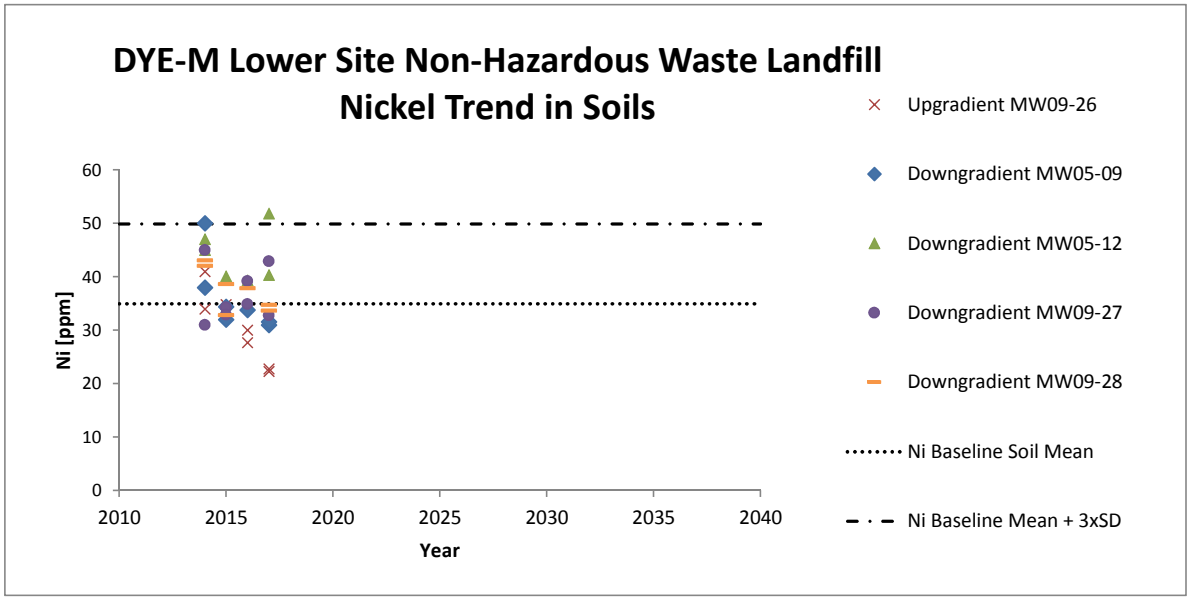
DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

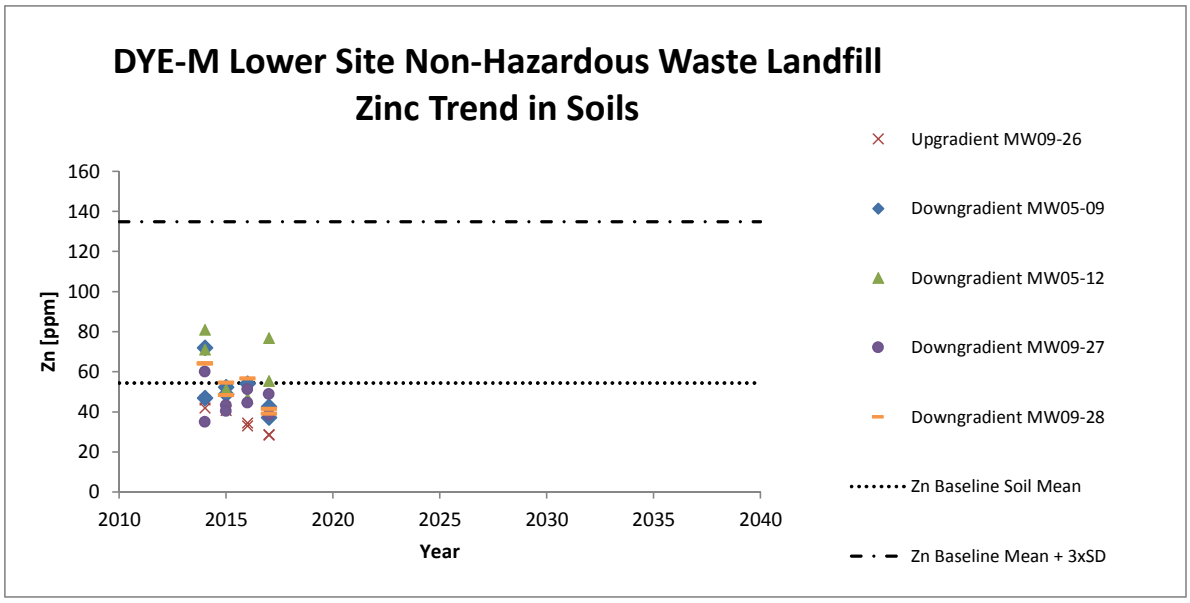




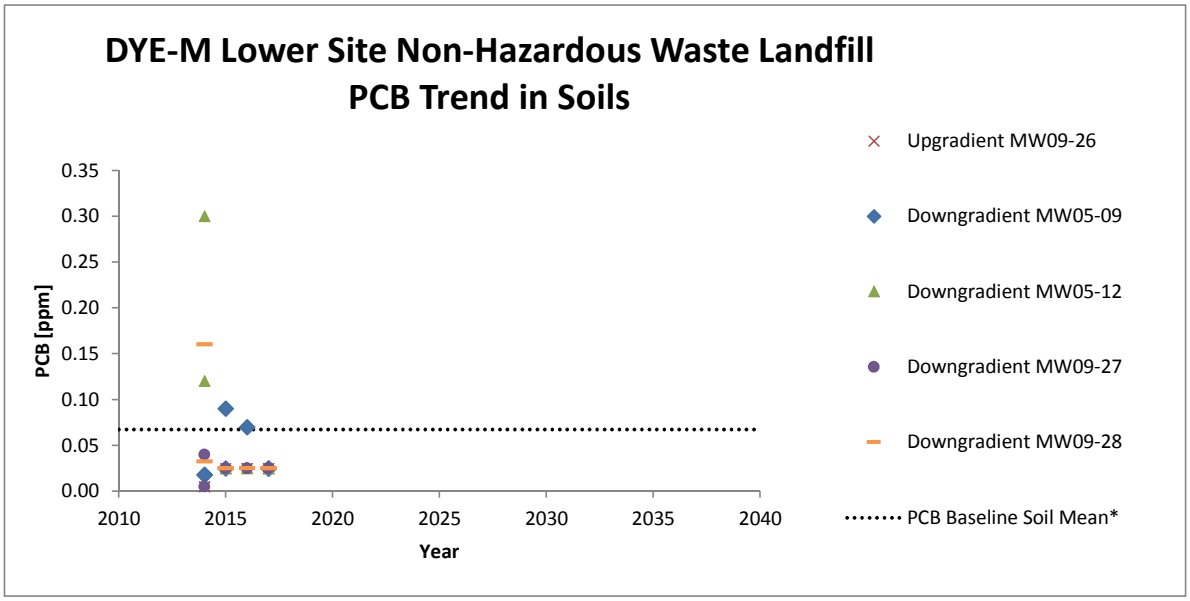
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

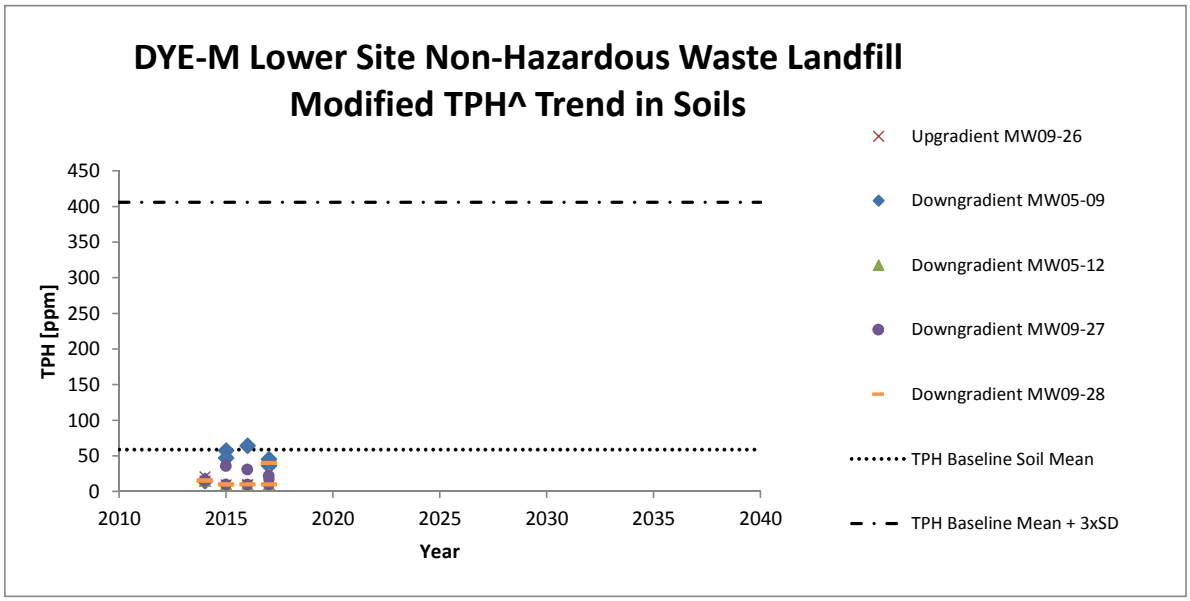




DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline standard deviation = 0



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
**** If baseline arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																
Dissolved metals results (italicized) have not been included in the calculation of N value, baseline arithmetic mean or standard deviation. Total metals results (i.e., those used in calculations) are not italicized.																

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
Monitoring Data													**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient MW09-26																
14-8188	MW09-26	2014	Year 1	Phase I	<0.0010	0.000244	<0.00050	0.00135	0.0029	<0.00050	0.10	0.55	<0.025	<0.10	<0.25	0.19
Not sampled - dry	MW09-26	2015	Year 2	Phase I												#N/A
MW09-26	MW09-26	2016	Year 3	Phase I	<0.0010	0.0002	0.01	0.0029	0.0027	<0.00010	**0.18**	**4.69**	<0.025	<0.10	<0.10	0.11
MW09-26 (Dup Avg; *dissolved metals*)	MW09-26	2017	Year 4	Phase I	*<0.001*	*0.0001*	*<0.001*	*0.0014*	*0.0009*	*<0.0001*	*0.069*	*2.77*	<0.025	<0.1	<0.1	0.11
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
Downgradient MW05-09																
Not sampled - dry	MW05-09	2014	Year 1	Phase I												#N/A
Not sampled - dry	MW05-09	2015	Year 2	Phase I												#N/A
Not sampled - dry	MW05-09	2016	Year 3	Phase I												#N/A
Not sampled - bentonite in well	MW05-09	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
Downgradient MW05-12																
Not sampled - dry	MW05-12	2014	Year 1	Phase I												#N/A
Not sampled - dry	MW05-12	2015	Year 2	Phase I												#N/A
Not sampled - dry	MW05-12	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW05-12	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
Downgradient MW09-27																
14-8186	MW09-27	2014	Year 1	Phase I	<0.0010	<0.000090	<0.00050	0.00034	<0.0010	<0.00050	0.02	0.005	<0.025	<0.10	<0.25	0.19
14-8187‡	MW09-27	2014	Year 1	Phase I	0.003	<0.0010	**1.8**	**0.013**	**0.086**	0.005	**0.18**	0.47	<0.050	<0.50	<1.0	0.78
Not sampled - dry	MW09-27	2015	Year 2	Phase I												#N/A
MW09-27	MW09-27	2016	Year 3	Phase I	<0.0010	<0.00010	0.005	<0.00050	0.0044	<0.00010	0.02	0.53	<0.025	<0.10	<0.10	0.11
MW09-27 (*dissolved metals*)	MW09-27	2017	Year 4	Phase I	*<0.001*	*<0.0001*	*<0.001*	*0.001*	*0.0038*	*<0.0001*	*0.015*	*1.64*	<0.025	<0.1	<0.1	0.11
			Year 5	Phase II												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A

DYE-M Lower Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient - BMW- 09-26																
07-30666	MW 05-11	2007			<0.0030	<0.0010	0.12	<0.0030	0.010	<0.010	0.080	0.66	<0.050	<0.50	<1.0	0.78
08-9735	MW 05-11	2008			<0.0030	<0.0010	0.37	0.0044	0.023	<0.010	0.21	0.39	<0.050	<0.50	<1.0	0.78
11-12194	MW09-26	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0069*	*<0.010*	*<0.0050*	3.2	<0.050	<0.50	<1.0	0.78
12-34993	MW09-26	2012			0.0020	*<0.0010*	0.24	*<0.0030*	*0.016*	*<0.0050*	*0.0160*	11.0	<0.050	<0.50	<1.0	0.78
13-29582	MW09-26	2013			0.0011	*<0.0010*	0.10	*<0.0030*	*0.010*	*<0.0050*	*0.0805*	3.9	<0.050	<0.50	<1.0	0.78
Downgradient																
07-30668	MW 05-09	2007			<0.0030	<0.0010	0.22	0.0051	0.026	0.021	0.14	2.9	<0.050	<0.50	<1.0	0.78
07-30667	MW 05-10	2007			<0.0030	<0.0010	0.30	<0.0030	0.012	<0.010	0.14	0.05	<0.050	<0.50	<1.0	0.78
07-30669	MW 05-12	2007			<0.0030	<0.0010	0.088	0.0039	0.016	<0.010	0.057	2.0	<0.050	<0.50	<1.0	0.78
08-9738	MW 05-09	2008			<0.0030	<0.0010	0.16	<0.0030	0.012	<0.010	0.089	1.6	<0.050	<0.50	<1.0	0.78
08-9736/37	MW 05-10	2008			<0.0030	<0.0010	0.26	0.0050	0.031	<0.010	0.140	0.1	<0.050	<0.50	<1.0	0.78
09-21641	MW 05-09	2009			<0.0030	<0.0010	0.10	0.010	0.039	0.048	0.056	1.0	<0.050	<0.50	<1.0	0.78
11-12188	MW05-09	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.042*	14.7	<0.050	<0.50	<1.0	0.78
11-12193	MW05-12	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*0.007*	6.4	<0.050	<0.50	<1.0	0.78
11-12210/11	MW09-27	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.50	<0.050	<0.50	<1.0	0.78
11-12206	MW09-28	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.024*	*<0.010*	*0.0074*	1.1	<0.050	<0.50	<1.0	0.78
12-34989	MW05-09	2012			0.001	*<0.0010*	0.086	*<0.0030*	*<0.0050*	*<0.0050*	*0.0140*	7.2	<0.050	<0.50	<1.0	0.78
12-34988	MW05-12	2012			0.003	*<0.0010*	0.18	*<0.0030*	*<0.0050*	*<0.0050*	*0.0060*	8.5	<0.050	<0.50	<1.0	0.78
12-34991/92	MW09-27	2012			0.0080	*<0.0010*	0.45	*<0.0030*	*<0.0050*	*<0.0050*	*0.0240*	1.1	<0.050	<0.50	<1.0	0.78
12-34990	MW09-28	2012			0.0050	*<0.0010*	0.42	*<0.0030*	*<0.0050*	*<0.0050*	*0.034*	0.53	<0.050	<0.50	<1.0	0.78
13-29584	MW05-09	2013			0.0014	*<0.0010*	0.032	*<0.0030*	*<0.0050*	*<0.0050*	*0.042*	22.7	<0.050	<0.50	<1.0	0.78
13-29580/81	MW09-27	2013			0.004	*<0.0010*	0.210	*<0.0030*	*<0.0050*	*<0.0050*	*0.026*	1.8	<0.050	<0.50	<1.0	0.78
13-29583	MW09-28	2013			0.0015	*<0.0010*	0.11	*<0.0030*	*0.0085*	*<0.0050*	*0.0299*	0.55	<0.050	<0.50	<1.0	0.78
		N value			22	8	17	8	8	8	8	22				22
Baseline Data - Arithmetic Mean					0.0021	0.0005	0.2027	0.0041	0.0211	0.0124	0.1144	4.17				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.2027**	**0.0041**	**0.0211**	**0.0124**	**0.1144**	**4.17**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.1237	0.0029	0.0104	0.0000	0.0527	5.69				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**0.5738**	**0.0127**	**0.0523**	**0.0124**	**0.2726**	**21.24**				**1.00**
Downgradient MW09-28																
Not sampled - dry	MW09-28	2014	Year 1	Phase I												#N/A
MW09-28	MW09-28	2015	Year 2	Phase I	<0.0010	<0.00010	0.015	0.0009	**0.0292**	0.003	0.02	1.34	<0.025			#N/A
Not sampled - dry	MW09-28	2016	Year 3	Phase I												#N/A
Not sampled - infilled with sand	MW09-28	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

ǂ Sample analyzed for total metals as an interlab sample.

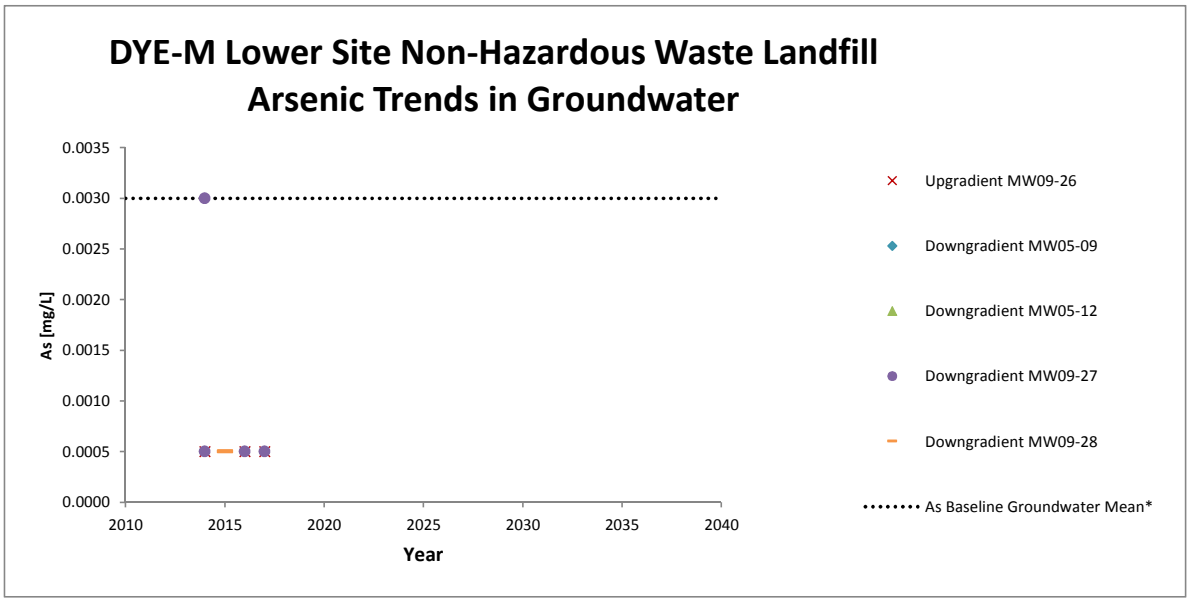
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**
XX	**Dissolved metals results**

DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH

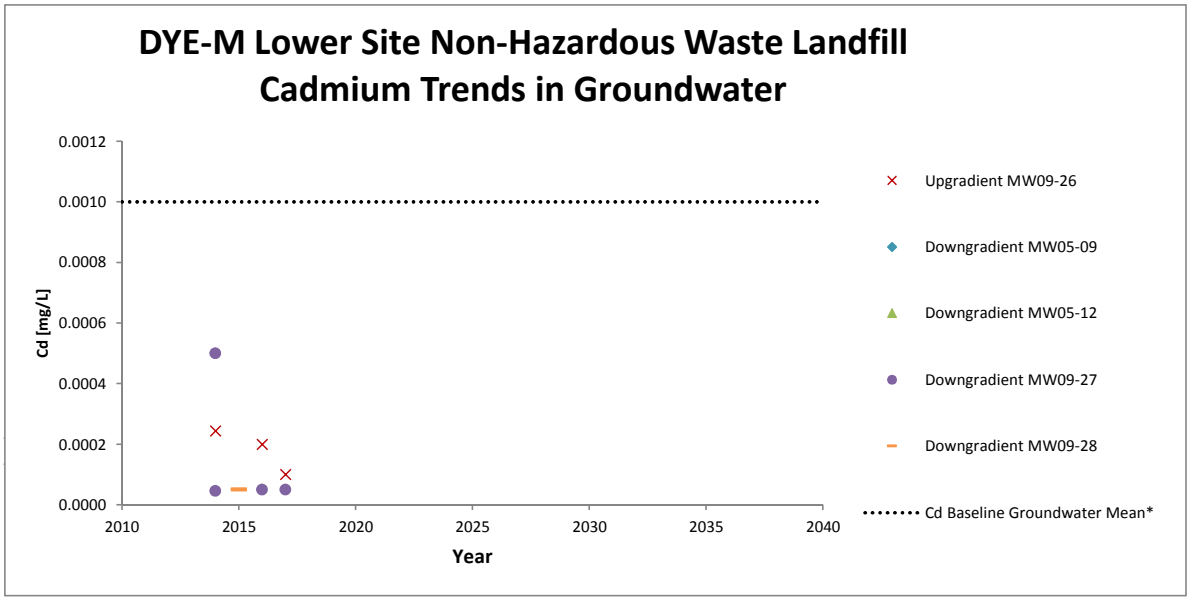
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

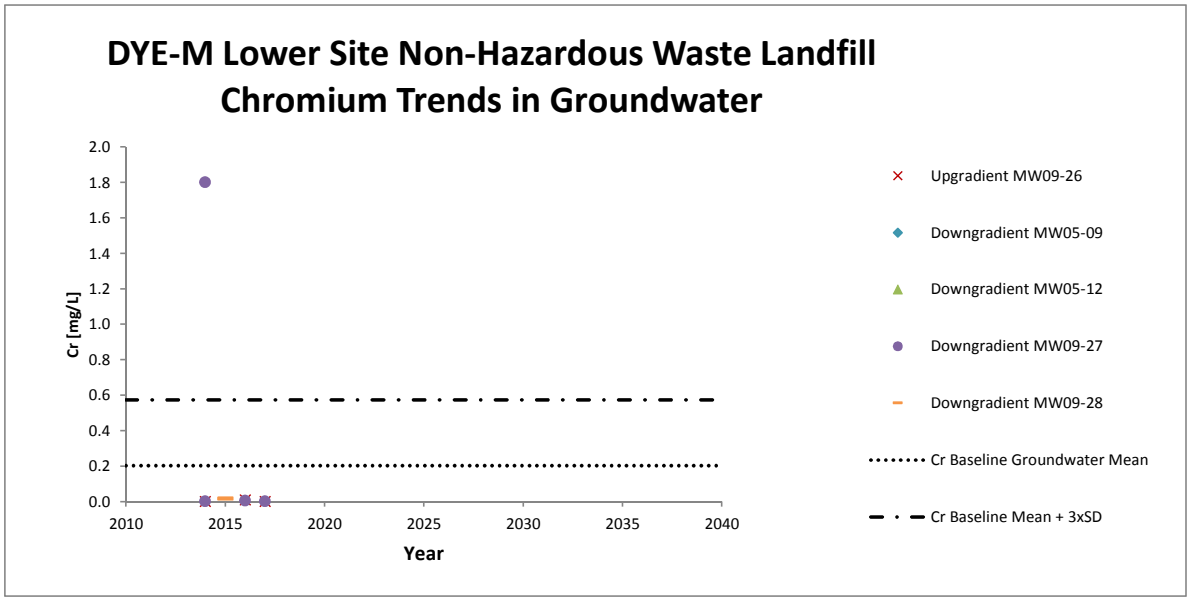


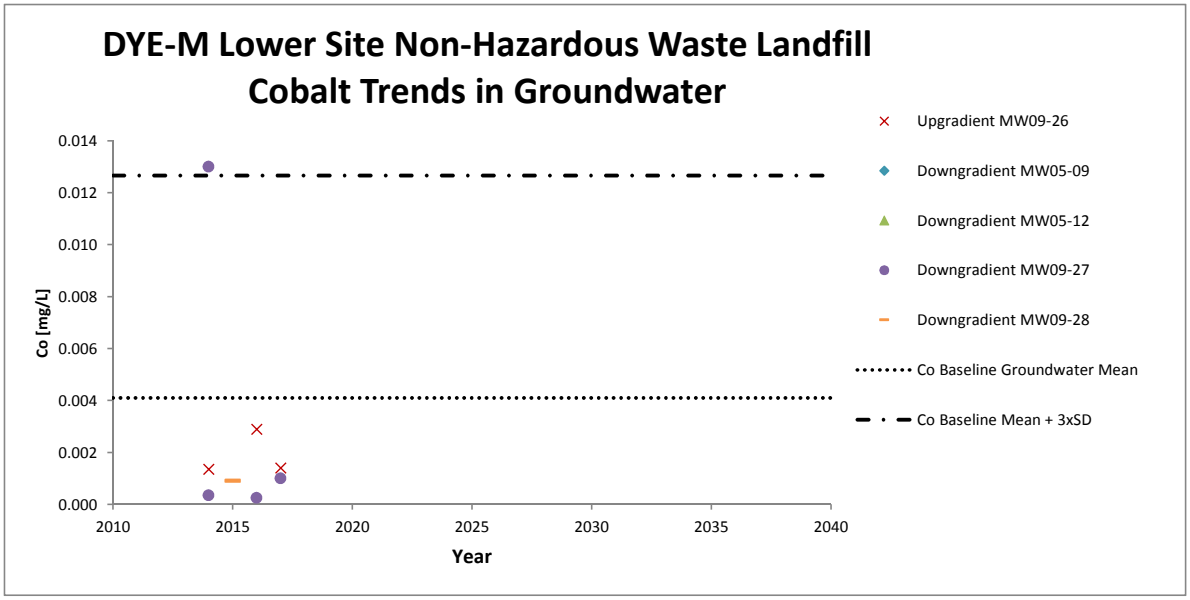
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



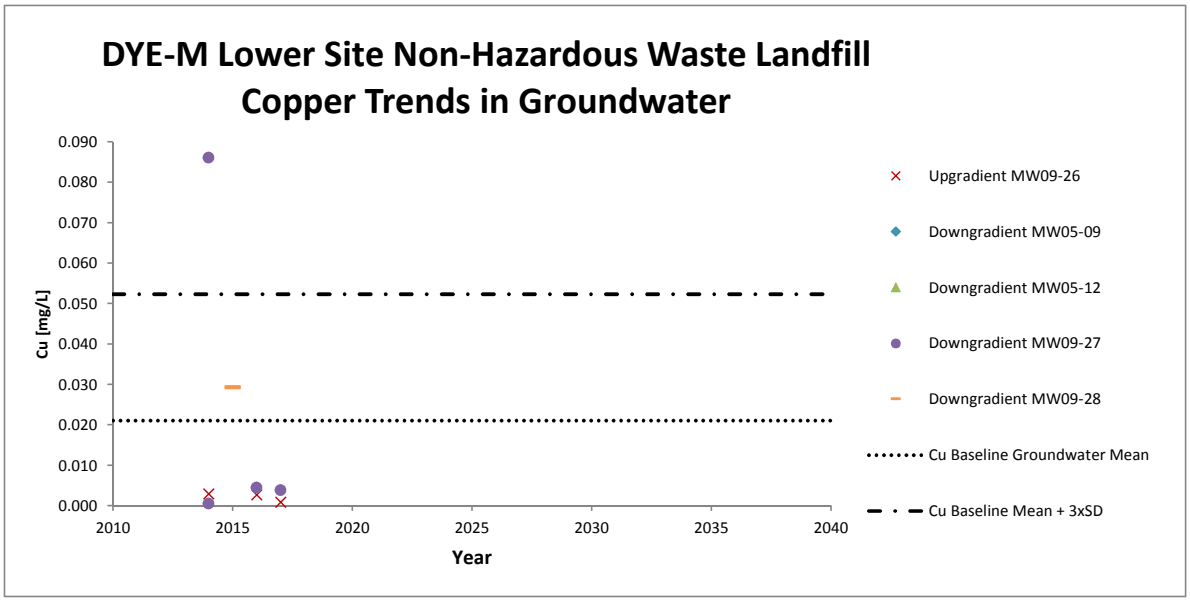
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

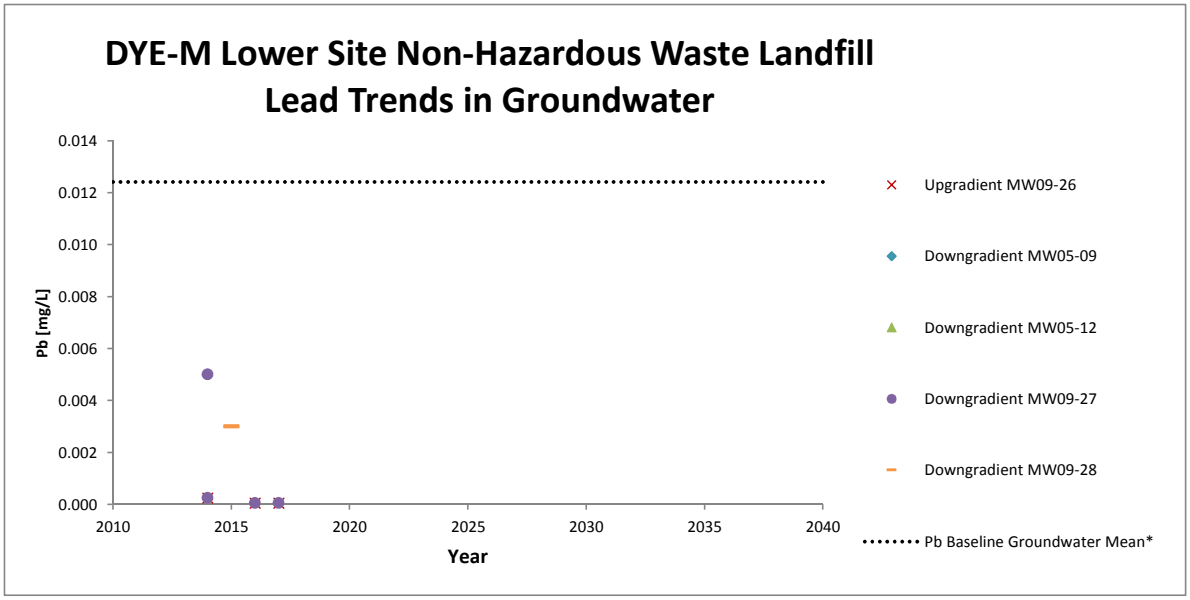
DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH





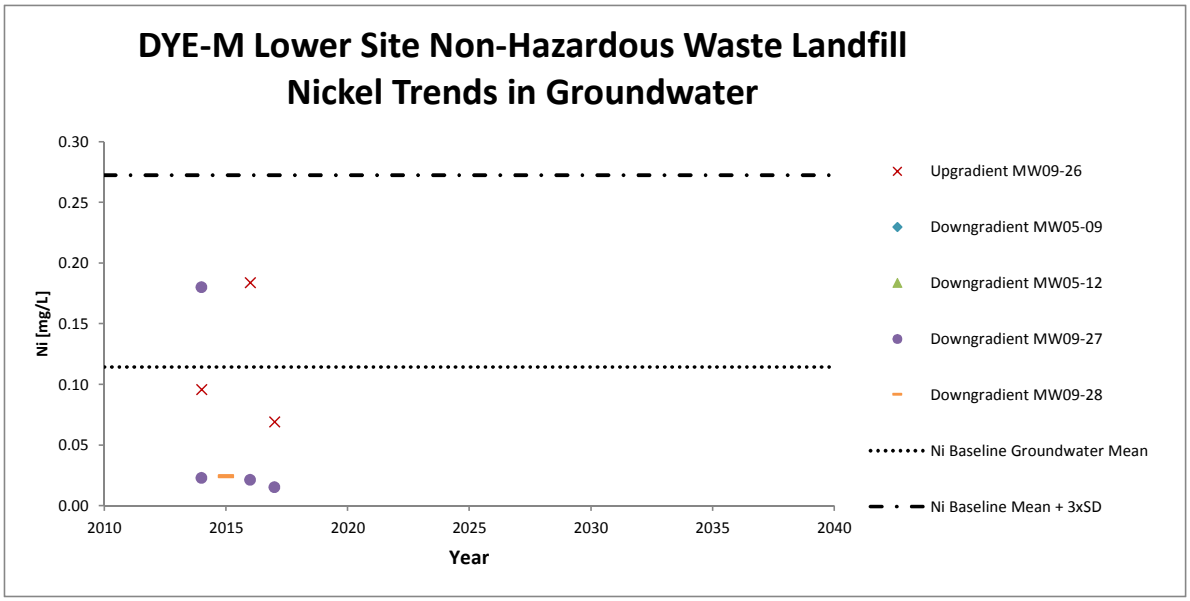
DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH

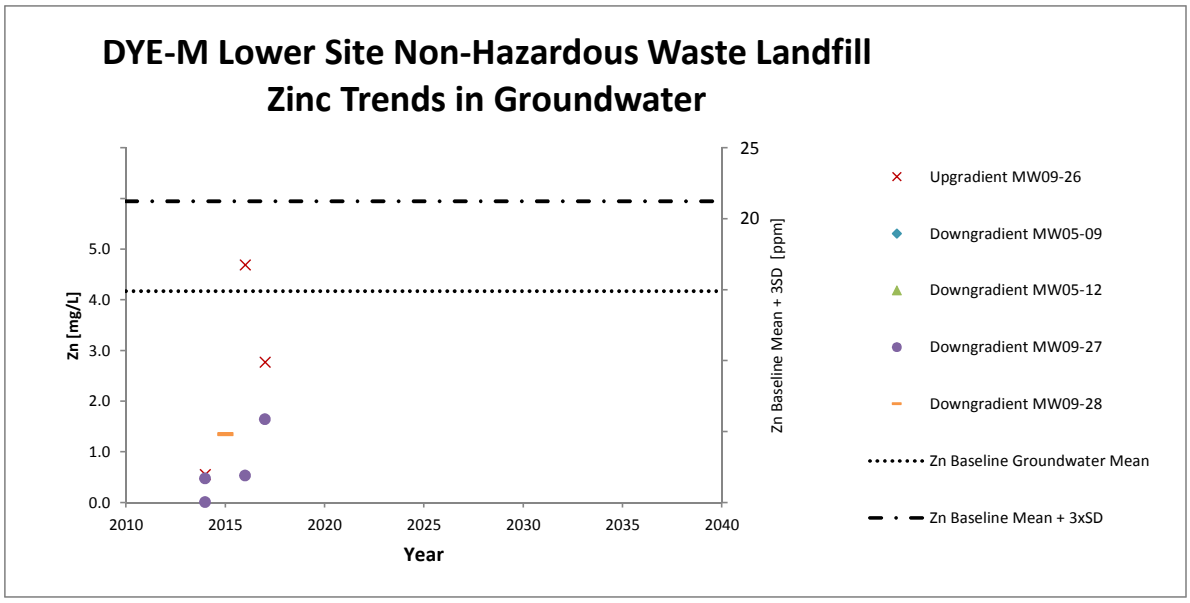




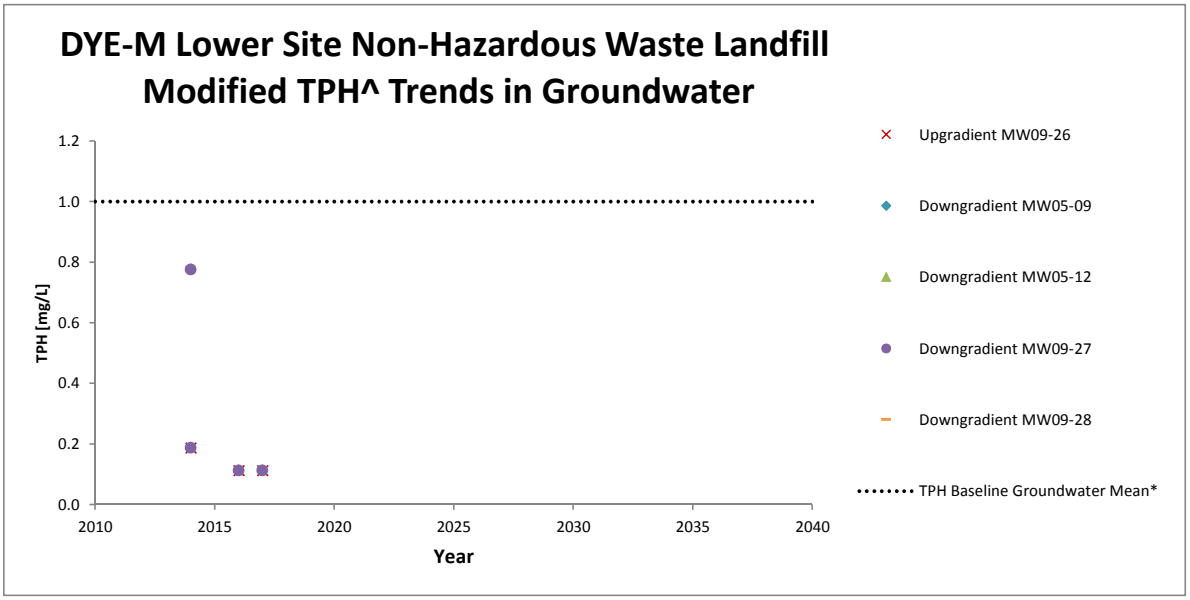
* Pb baseline standard deviation = 0

DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH





DYE-M Lower Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



* TPH baseline arithmetic mean is equal to the baseline detection limit
* TPH baseline standard deviation = 0
^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**				**17.8**
Baseline Data - Standard Deviation						2.97	0.00	59.4	7.1	29.0	13.9	73.5	45.7	0.000				7.5
Baseline Data Mean + 3xStandard Deviation						**12.6**	**1.00**	**280.9**	**40.0**	**130.1**	**57.2**	**303.8**	**214.1**	**0.050**				**40.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data															**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient																		
	MW12-02 surface																	
14-8413	MW12-02	2014	Year 1	Phase I	5-10	**11.0**	<1.0	**150.0**	15.0	**82.0**	11.0	76.0	**110.0**	<0.010	<10	<10	<10	15.0
Not sampled, frozen	MW12-02	2015	Year 2	Phase I														#N/A
MW12-02a	MW12-02	2016	Year 3	Phase I	0-15	<1.0	<0.50	70.4	12.2	20.5	**29.3**	33.3	63.4	<0.050	<7.0	<4.0	<8.0	9.5
MW12-02 Shallow	MW12-02	2017	Year 4	Phase I	0-15	<1.0	<0.5	51.1	12.6	14.2	**17.1**	33.2	65.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW12-02 depth																	
14-8414	MW12-02	2014	Year 1	Phase I	30-35	**7.0**	<1.0	**160.0**	17.0	**70.0**	13.0	**90.0**	**100.0**	<0.010	<10	<10	<10	15.0
Not sampled, frozen	MW12-02	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW12-02	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW12-02	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**				**17.8**
Baseline Data - Standard Deviation						2.97	0.00	59.4	7.1	29.0	13.9	73.5	45.7	0.000				7.5
Baseline Data Mean + 3xStandard Deviation						**12.6**	**1.00**	**280.9**	**40.0**	**130.1**	**57.2**	**303.8**	**214.1**	**0.050**				**40.2**
	MW07-22 surface																	
14-8424	MW07-22	2014	Year 1	Phase I	5-10	1.6	<1.0	26.0	11.0	13.0	**19.0**	25.0	52.0	<0.010	<10	<10	<10	15.0
MW 07-22 (0-15)	MW07-22	2015	Year 2	Phase I	0-15	3.5	<0.50	**112.0**	14.4	**71.6**	10.6	57.8	**98.3**	<0.050	<7.0	<4.0	<8.0	9.5
MW07-22a	MW07-22	2016	Year 3	Phase I	0-15	<1.0	<0.50	**147.0**	18.5	**99.4**	13.2	**97.6**	**102.0**	<0.050	<7.0	<4.0	<8.0	9.5
MW07-22 Shallow	MW07-22	2017	Year 4	Phase I	0-15	<1.0	<0.5	**146.0**	**19.0**	**103.0**	14.7	78.9	**134.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW07-22 depth																	
14-8425	MW07-22	2014	Year 1	Phase I	45-50	1.8	<1.0	29.0	13.0	10.0	**30.0**	36.0	60.0	<0.010	<10	<10	<10	15.0
MW 07-22 (15-30)	MW07-22	2015	Year 2	Phase I	15-30	**3.9**	<0.50	**142.0**	15.9	**59.2**	**18.4**	76.0	**89.6**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW07-22	2016	Year 3	Phase I														#N/A
MW07-22 Deep	MW07-22	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**				**17.8**
Baseline Data - Standard Deviation						2.97	0.00	59.4	7.1	29.0	13.9	73.5	45.7	0.000				7.5
Baseline Data Mean + 3xStandard Deviation						**12.6**	**1.00**	**280.9**	**40.0**	**130.1**	**57.2**	**303.8**	**214.1**	**0.050**				**40.2**
Downgradient																		
	MW07-23 surface																	
14-8415	MW07-23	2014	Year 1	Phase I	5-10	**17.0**	<1.0	100.0	**21.0**	**76.0**	<10	**180.0**	44.0	<0.010	<10	<10	<10	15.0
MW 07-23 (0-25)	MW07-23	2015	Year 2	Phase I	0-25	3.3	<0.50	49.1	15.9	**71.9**	7.4	**86.0**	37.8	<0.050	<7.0	<4.0	<8.0	9.5
MW07-23a	MW07-23	2016	Year 3	Phase I	0-15	**17.3**	<0.50	63.2	15.1	**52.5**	6.2	**125.0**	27.9	<0.050	<7.0	<4.0	<8.0	9.5
MW07-23 Shallow	MW07-23	2017	Year 4	Phase I	0-15	<1.0	<0.5	**129.0**	**27.2**	**62.3**	9.4	**352.0**	54.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW07-23 depth																	
14-8417	MW07-23	2014	Year 1	Phase I	45-50	**12.0**	<1.0	87.0	**19.0**	**72.0**	<10	**130.0**	40.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	MW07-23	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW07-23	2016	Year 3	Phase I														#N/A
MW07-23 Deep	MW07-23	2017	Year 4	Phase I	40-50	**20.4**	<0.5	**111.0**	**24.4**	**111.0**	8.6	**178.0**	51.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**				**17.8**
Baseline Data - Standard Deviation						2.97	0.00	59.4	7.1	29.0	13.9	73.5	45.7	0.000				7.5
Baseline Data Mean + 3xStandard Deviation						**12.6**	**1.00**	**280.9**	**40.0**	**130.1**	**57.2**	**303.8**	**214.1**	**0.050**				**40.2**
	MW08-24 surface																	
14-8418	MW08-24	2014	Year 1	Phase I	5-10	1.4	<1.0	66.0	10.0	27.0	<10	47.0	40.0	<0.010	<10	<10	<10	15.0
MW08-24 (0-15) (Dup Avg)	MW08-24	2015	Year 2	Phase I	0-15	1.1	0.5	76.9	13.5	30.5	13.8	53.5	61.1	<0.10	21.0	<7.0	<29	**39.0**
MW08-24a	MW08-24	2016	Year 3	Phase I	0-15	<1.0	<0.50	57.6	10.9	30.1	10.1	38.9	37.7	<0.050	<7.0	<4.0	<8.0	9.5
MW08-24 Shallow	MW08-24	2017	Year 4	Phase I	0-15	<1.0	<0.5	73.8	12.2	26.1	15.0	51.4	54.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	MW08-24 depth																	
14-8420/21	MW08-24	2014	Year 1	Phase I	30-35	1.1	<1.0	63.0	11.0	27.0	10.0	45.0	40.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	MW08-24	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW08-24	2016	Year 3	Phase I														#N/A
MW08-24 Deep	MW08-24	2017	Year 4	Phase I	30-40	<1.0	<0.5	68.0	12.3	24.4	13.3	50.3	50.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**3.72**	**1.00**	**102.8**	**18.7**	**43.2**	**15.6**	**83.2**	**76.9**	**0.050**				**17.8**
Baseline Data - Standard Deviation						2.97	0.00	59.4	7.1	29.0	13.9	73.5	45.7	0.000				7.5
Baseline Data Mean + 3xStandard Deviation						**12.6**	**1.00**	**280.9**	**40.0**	**130.1**	**57.2**	**303.8**	**214.1**	**0.050**				**40.2**
	MW08-25 surface																	
14-8422	MW08-25	2014	Year 1	Phase I	5-10	1.2	<1.0	**150.0**	16.0	31.0	**18.0**	77.0	50.0	<0.010	<10	<10	<10	15.0
MW 08-25 (0-15)	MW08-25	2015	Year 2	Phase I	0-15	2.9	<0.50	**176.0**	**22.0**	**65.2**	**41.3**	82.7	**133.0**	<0.050	<7.0	<4.0	<8.0	9.5
MW08-25a	MW08-25	2016	Year 3	Phase I	0-15	<1.0	<0.50	**260.0**	**27.9**	**58.6**	**42.2**	**99.5**	**111.0**	<0.050	<7.0	<4.0	<8.0	9.5
MW08-25 Shallow	MW08-25	2017	Year 4	Phase I	0-15	<1.0	<0.5	**474.0**	**36.5**	**62.6**	**23.5**	**132.0**	74.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
	MW08-25 depth																	
14-8423	MW08-25	2014	Year 1	Phase I	40-45	2.2	<1.0	**710.0**	**43.0**	**84.0**	**17.0**	**200.0**	66.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	MW08-25	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW08-25	2016	Year 3	Phase I														#N/A
MW08-25 Deep (Dup Avg)	MW08-25	2017	Year 4	Phase I	40-50	<1.0	<0.5	**616.0**	**50.9**	**102.2**	**26.7**	**201.0**	**81.8**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

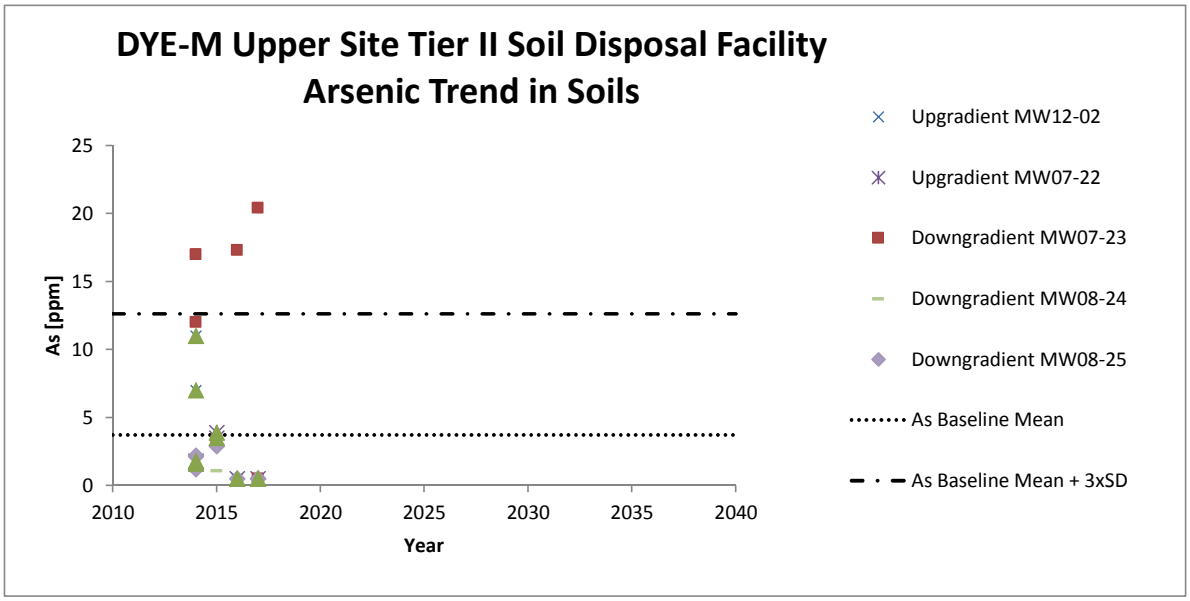
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

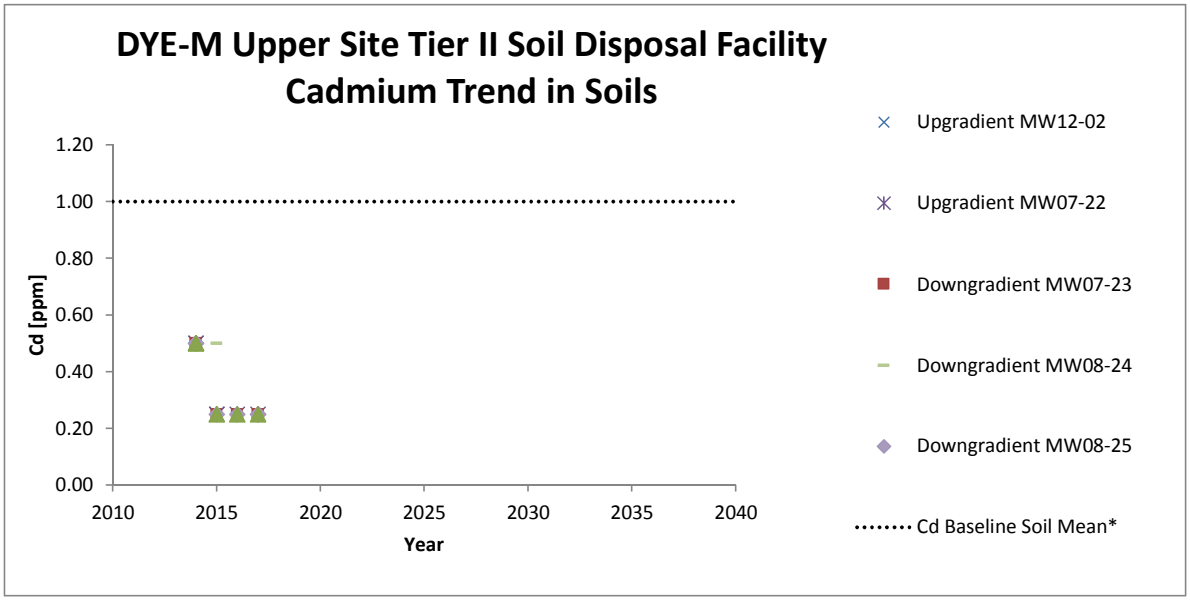
DYE-M Upper Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH

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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

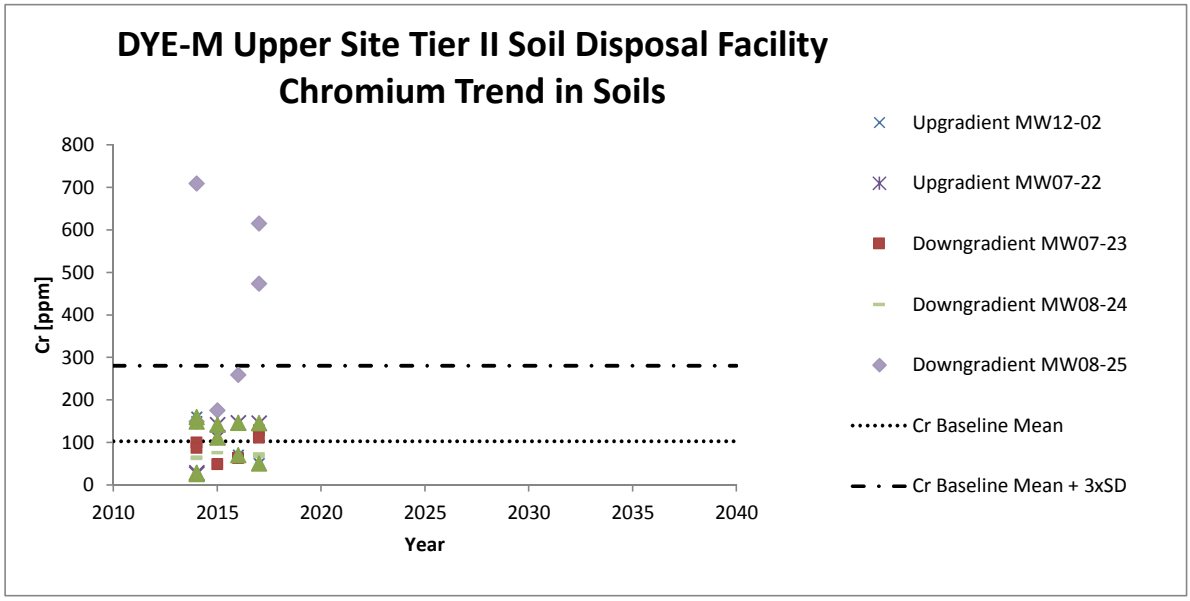
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

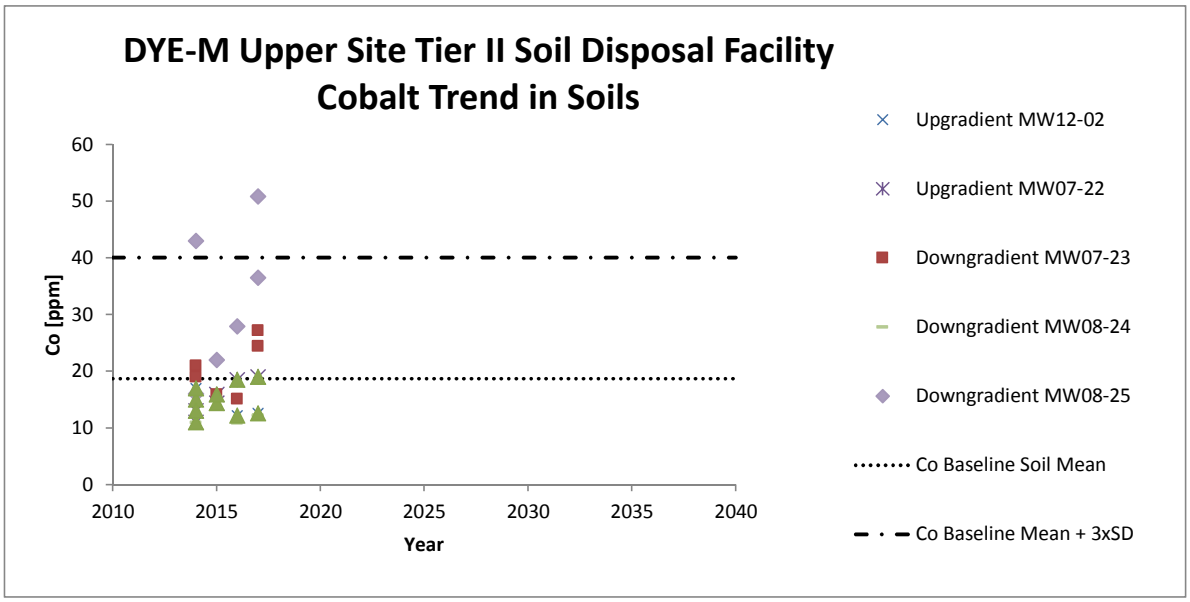




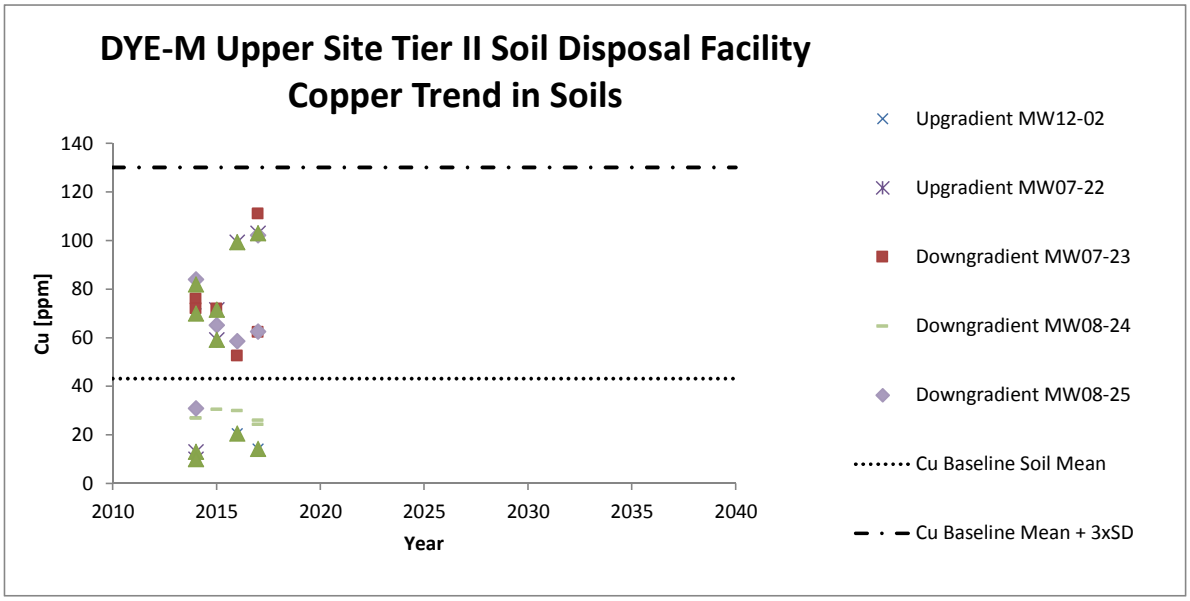
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

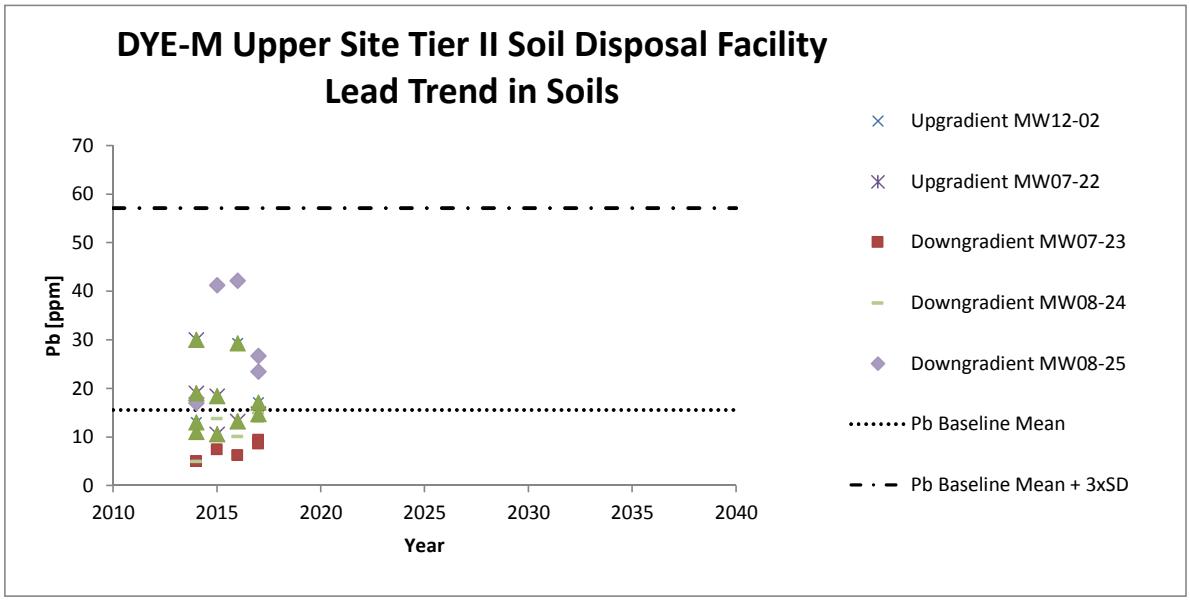
DYE-M Upper Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH



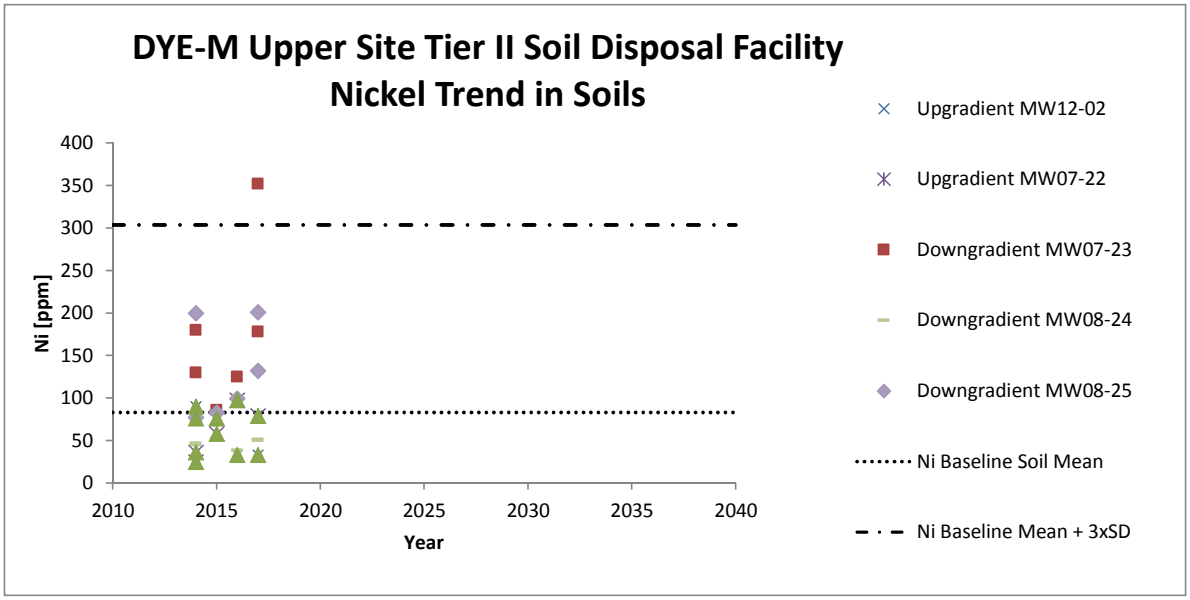


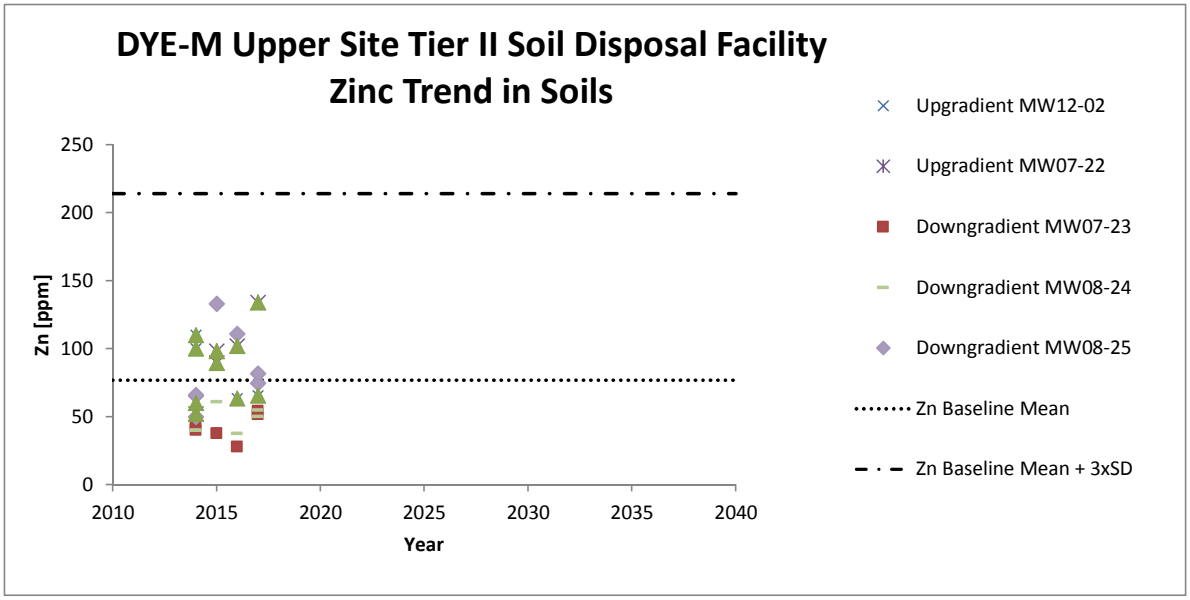
DYE-M Upper Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH



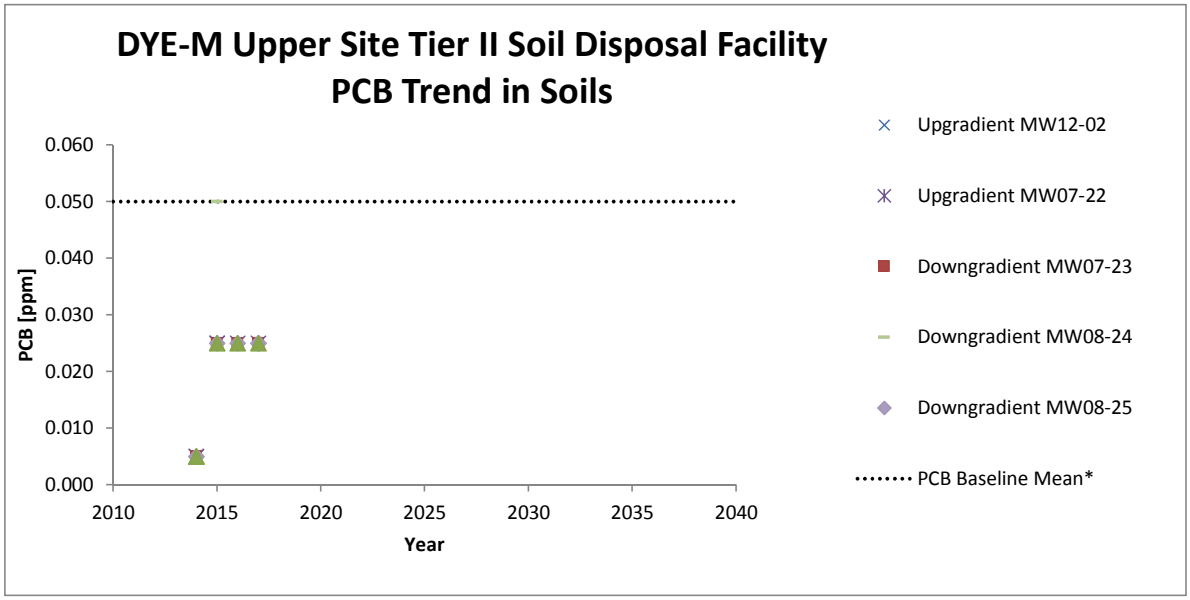


DYE-M Upper Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH

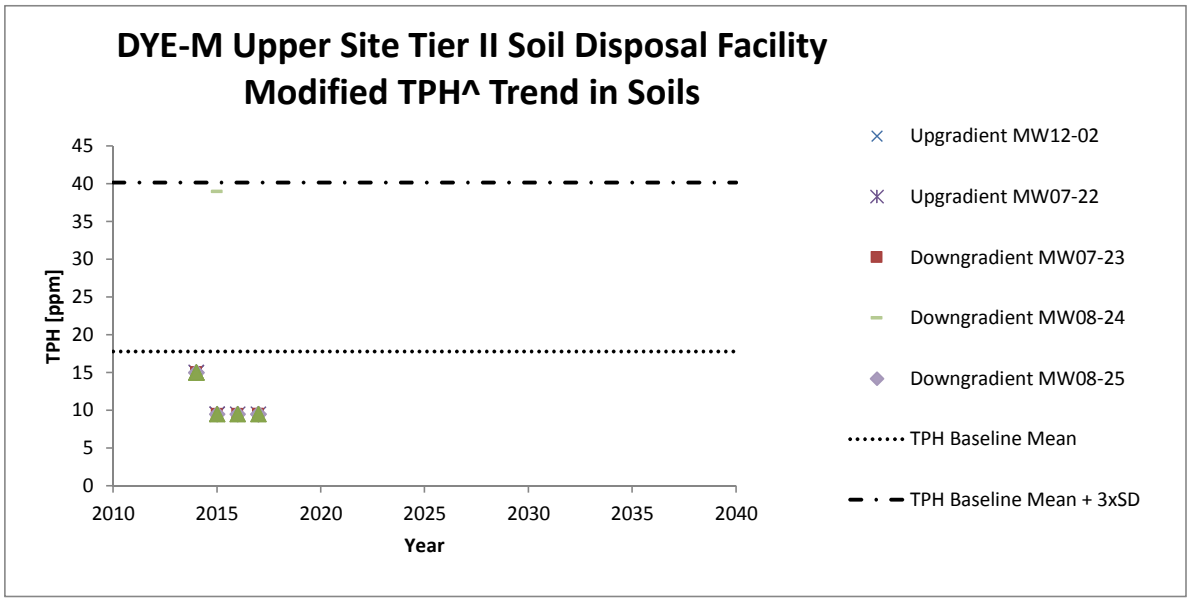




DYE-M Upper Site Tier II Soil Disposal Facility Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2017 are an indication of changing detection limits; all results below detection limits



^ Modified TPH is Sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
12-34978	MW12-02	2012			<0.0010	*<0.0010*	0.76	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.011	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9742	MW07-23	2008			<0.0030	<0.0010	0.30	0.0080	0.036	<0.010	0.16	0.025	<0.050	<0.50	<1.0	0.78
09-21499	MW07-23	2009			<0.0030	<0.0010	0.080	0.015	0.094	0.013	0.073	0.11	<0.050	<0.50	<1.0	0.78
09-21572	MW08-24	2009			<0.0030	<0.0010	0.52	0.0135	0.12	0.020	0.41	0.049	<0.050	<0.50	<1.0	0.78
11-12190/91	MW07-23	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	5.92	<0.050	<0.50	<1.0	0.78
11-12192	MW08-24	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0068*	*<0.010*	*<0.0050*	0.29	<0.050	<0.50	<1.0	0.78
12-34966	MW07-23	2012			0.0057	*<0.0010*	0.16	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.25	<0.050	<0.50	<1.0	0.78
12-34967	MW08-24	2012			0.0070	*<0.0010*	0.41	*<0.0030*	*<0.0050*	*<0.0050*	*0.0100*	0.23	<0.050	<0.50	<1.0	0.78
13-29589	MW08-24	2013			0.0019	*<0.0010*	0.17	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.16	<0.050	<0.50	<1.0	0.78
		N value			9	3	7	3	3	3	3	9				9
Baseline Data - Arithmetic Mean					0.0025	0.0005	0.3429	0.0121	0.0835	0.0127	0.2143	0.783				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3429**	**0.0121**	**0.0835**	**0.0127**	**0.2143**	**0.783**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2395	0.0036	0.0431	0.0076	0.1749	1.929				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**1.06**	**0.0231**	**0.2126**	**0.0354**	**0.7392**	**6.57**				**1.00**
**** If baseline arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																
Dissolved metals results (italicized) have not been included in the calculation of N value, baseline arithmetic mean or standard deviation. Total metals results (i.e., those used in calculations) are not italicized.																
Monitoring Data													**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient MW12-02																
Not sampled	MW12-02	2014	Year 1	Phase I												#N/A
Not sampled, buried	MW12-02	2015	Year 2	Phase I												#N/A
Not sampled - frozen	MW12-02	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW12-02	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
12-34978	MW12-02	2012			<0.0010	*<0.0010*	0.76	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.011	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9742	MW07-23	2008			<0.0030	<0.0010	0.30	0.0080	0.036	<0.010	0.16	0.025	<0.050	<0.50	<1.0	0.78
09-21499	MW07-23	2009			<0.0030	<0.0010	0.080	0.015	0.094	0.013	0.073	0.11	<0.050	<0.50	<1.0	0.78
09-21572	MW08-24	2009			<0.0030	<0.0010	0.52	0.0135	0.12	0.020	0.41	0.049	<0.050	<0.50	<1.0	0.78
11-12190/91	MW07-23	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	5.92	<0.050	<0.50	<1.0	0.78
11-12192	MW08-24	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0068*	*<0.010*	*<0.0050*	0.29	<0.050	<0.50	<1.0	0.78
12-34966	MW07-23	2012			0.0057	*<0.0010*	0.16	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.25	<0.050	<0.50	<1.0	0.78
12-34967	MW08-24	2012			0.0070	*<0.0010*	0.41	*<0.0030*	*<0.0050*	*<0.0050*	*0.0100*	0.23	<0.050	<0.50	<1.0	0.78
13-29589	MW08-24	2013			0.0019	*<0.0010*	0.17	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.16	<0.050	<0.50	<1.0	0.78
		N value			9	3	7	3	3	3	3	9				9
Baseline Data - Arithmetic Mean					0.0025	0.0005	0.3429	0.0121	0.0835	0.0127	0.2143	0.783				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3429**	**0.0121**	**0.0835**	**0.0127**	**0.2143**	**0.783**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2395	0.0036	0.0431	0.0076	0.1749	1.929				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**1.06**	**0.0231**	**0.2126**	**0.0354**	**0.7392**	**6.57**				**1.00**
Upgradient MW07-22																
Not sampled	MW07-22	2014	Year 1	Phase I												#N/A
MW07-22	MW07-22	2015	Year 2	Phase I	0.0010	<0.00010	0.0040	0.0009	0.0062	0.0052	0.0040	0.0720	<0.025	<0.10	<0.10	0.1125
Not sampled - dry	MW07-22	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW07-22	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
Downgradient MW07-23																
14-8183	MW07-23	2014	Year 1	Phase I	*<0.0010*	*<0.000090*	*<0.00050*	*<0.00030*	*<0.0010*	*<0.00050*	*0.0025*	*0.0226*	<0.025	<0.10	<0.25	0.1875
Not sampled, frozen	MW07-23	2015	Year 2	Phase I												#N/A
MW07-23	MW07-23	2016	Year 3	Phase I	<0.0010	<0.00010	<0.0010	<0.00050	<0.00050	<0.00010	<0.0010	0.4070	<0.025	<0.10	<0.10	0.1125
Not sampled - frozen	MW07-23	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A

DYE-M Upper Site Tier II Soil Disposal Facility - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As* (mg/L)	Cd* (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
12-34978	MW12-02	2012			<0.0010	*<0.0010*	0.76	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.011	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9742	MW07-23	2008			<0.0030	<0.0010	0.30	0.0080	0.036	<0.010	0.16	0.025	<0.050	<0.50	<1.0	0.78
09-21499	MW07-23	2009			<0.0030	<0.0010	0.080	0.015	0.094	0.013	0.073	0.11	<0.050	<0.50	<1.0	0.78
09-21572	MW08-24	2009			<0.0030	<0.0010	0.52	0.0135	0.12	0.020	0.41	0.049	<0.050	<0.50	<1.0	0.78
11-12190/91	MW07-23	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	5.92	<0.050	<0.50	<1.0	0.78
11-12192	MW08-24	2011			<0.0030	*<0.0010*	*<0.0050*	*<0.0030*	*0.0068*	*<0.010*	*<0.0050*	0.29	<0.050	<0.50	<1.0	0.78
12-34966	MW07-23	2012			0.0057	*<0.0010*	0.16	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.25	<0.050	<0.50	<1.0	0.78
12-34967	MW08-24	2012			0.0070	*<0.0010*	0.41	*<0.0030*	*<0.0050*	*<0.0050*	*0.0100*	0.23	<0.050	<0.50	<1.0	0.78
13-29589	MW08-24	2013			0.0019	*<0.0010*	0.17	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.16	<0.050	<0.50	<1.0	0.78
		N value			9	3	7	3	3	3	3	9				9
Baseline Data - Arithmetic Mean					0.0025	0.0005	0.3429	0.0121	0.0835	0.0127	0.2143	0.783				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0030**	**0.0010**	**0.3429**	**0.0121**	**0.0835**	**0.0127**	**0.2143**	**0.783**				**1.00**
Baseline Data - Standard Deviation					0.0000	0.0000	0.2395	0.0036	0.0431	0.0076	0.1749	1.929				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0030**	**0.0010**	**1.06**	**0.0231**	**0.2126**	**0.0354**	**0.7392**	**6.57**				**1.00**
Downgradient MW08-24																
14-8184	MW08-24	2014	Year 1	Phase I	*0.0020*	*<0.000090*	*0.0009*	*<0.00030*	*0.0036*	*<0.00050*	*0.0040*	*<0.0030*	<0.025	<0.10	<0.25	0.1875
MW08-24	MW08-24	2015	Year 2	Phase I	<0.0010	<0.00010	0.0120	0.0023	0.0242	0.0024	0.0310	0.3790	<0.025	<0.177	<0.177	0.1895
MW08-24	MW08-24	2016	Year 3	Phase I	<0.0010	<0.00010	0.0070	0.0023	0.0166	0.0011	0.0400	0.1430	<0.025	N/A	N/A	0.0125
MW08-24 (*dissolved metals*)	MW08-24	2017	Year 4	Phase I	*0.001*	*<0.0001*	*0.003*	*0.0007*	*0.0097*	*0.0007*	*0.012*	*0.051*	<0.025	<0.2	<0.2	0.2125
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
Downgradient MW08-25																
Not sampled	MW08-25	2014	Year 1	Phase I												#N/A
MW08-25	MW08-25	2015	Year 2	Phase I	<0.0010	<0.00010	0.0100	0.0023	0.0121	0.0034	0.0270	**0.9390**	<0.025	<0.286	<0.286	0.2985
Not sampled - frozen	MW08-25	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW08-25	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

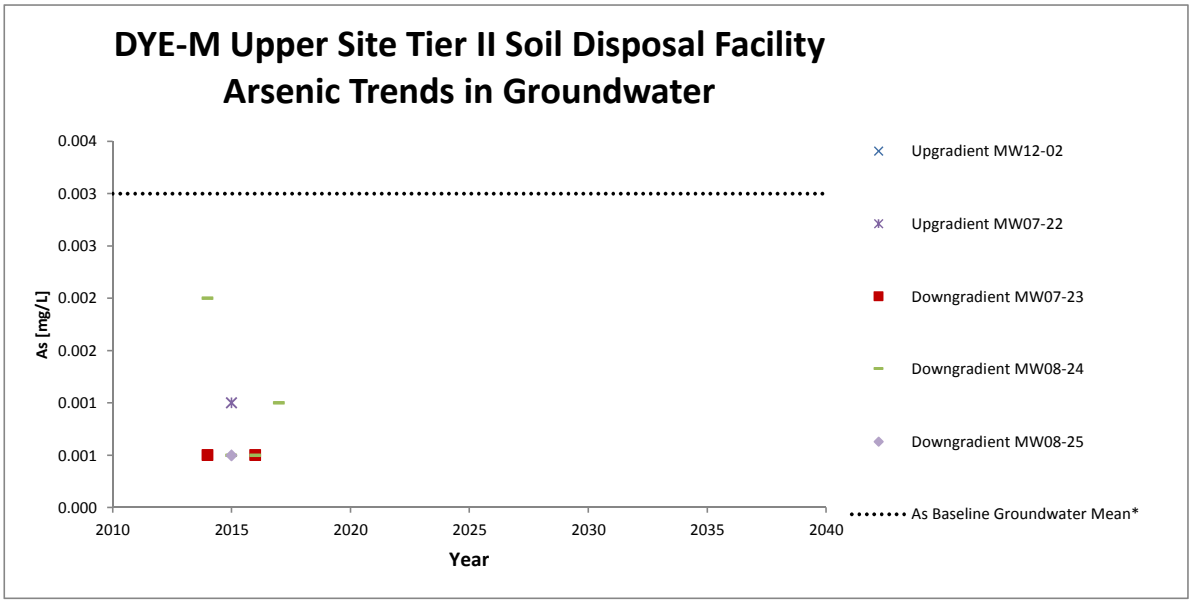
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**
XX	**Dissolved metals results**

DYE-M Upper Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH

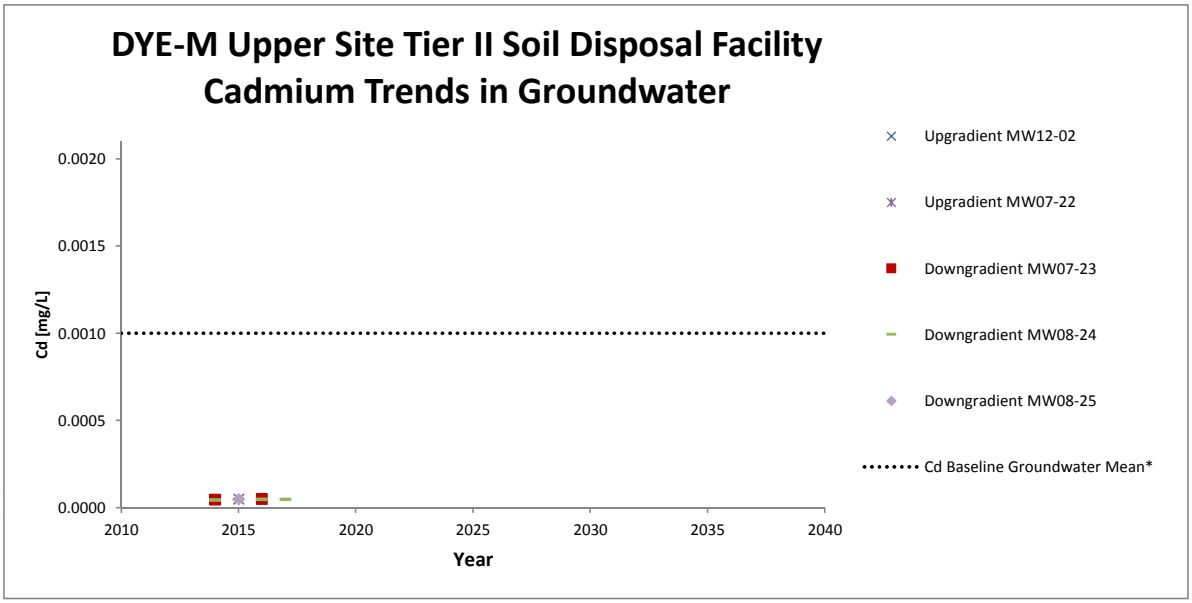
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

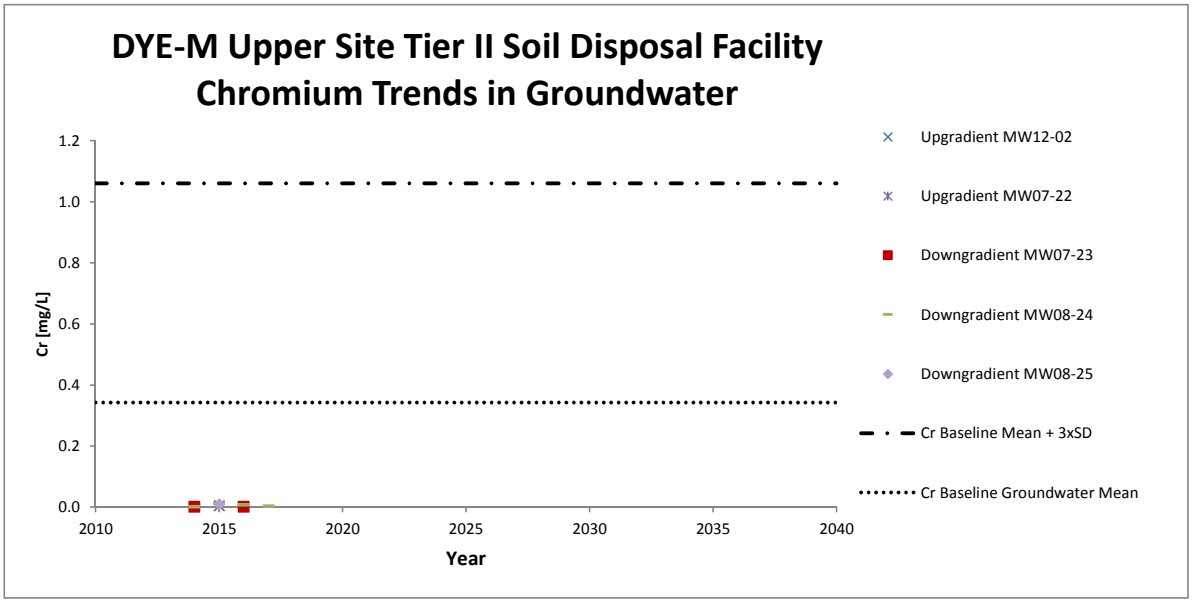


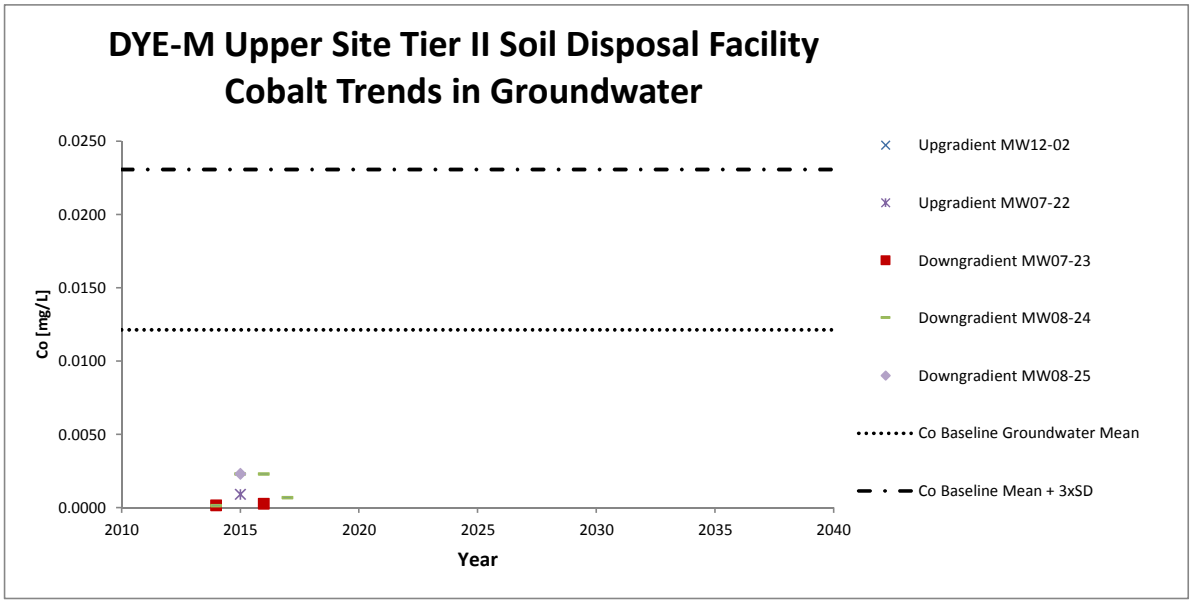
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



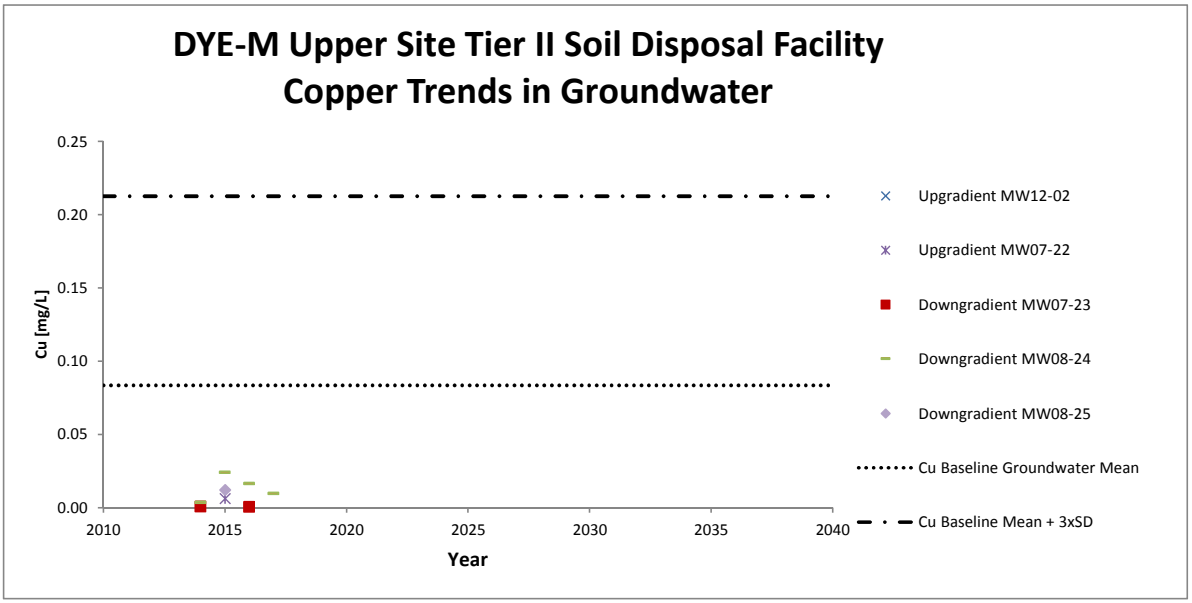
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

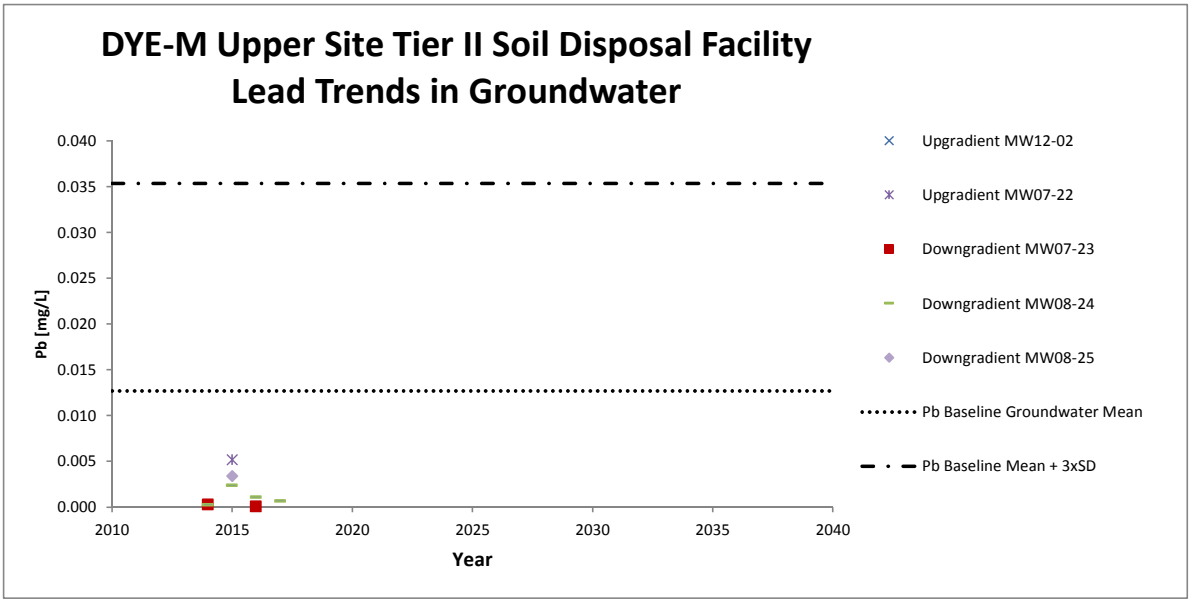
DYE-M Upper Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH



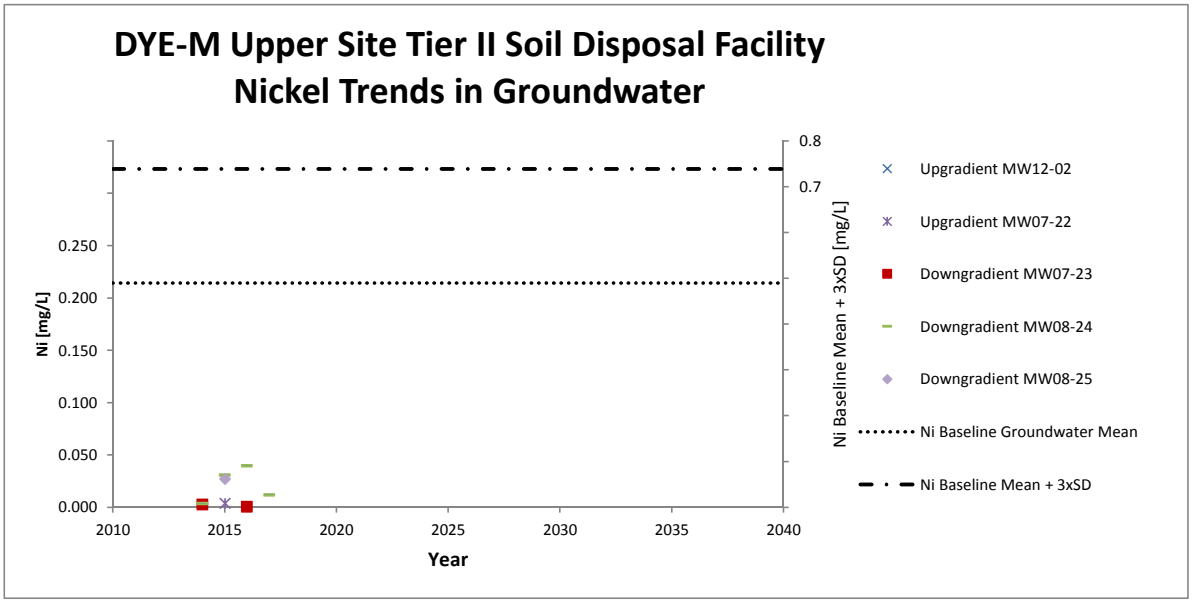


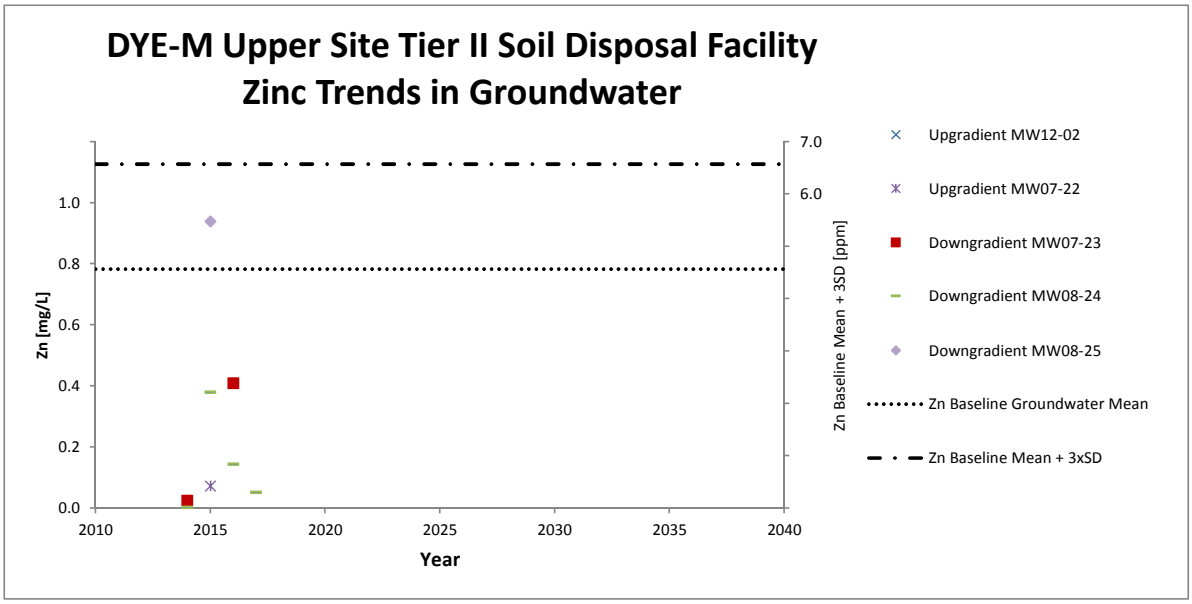
DYE-M Upper Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH



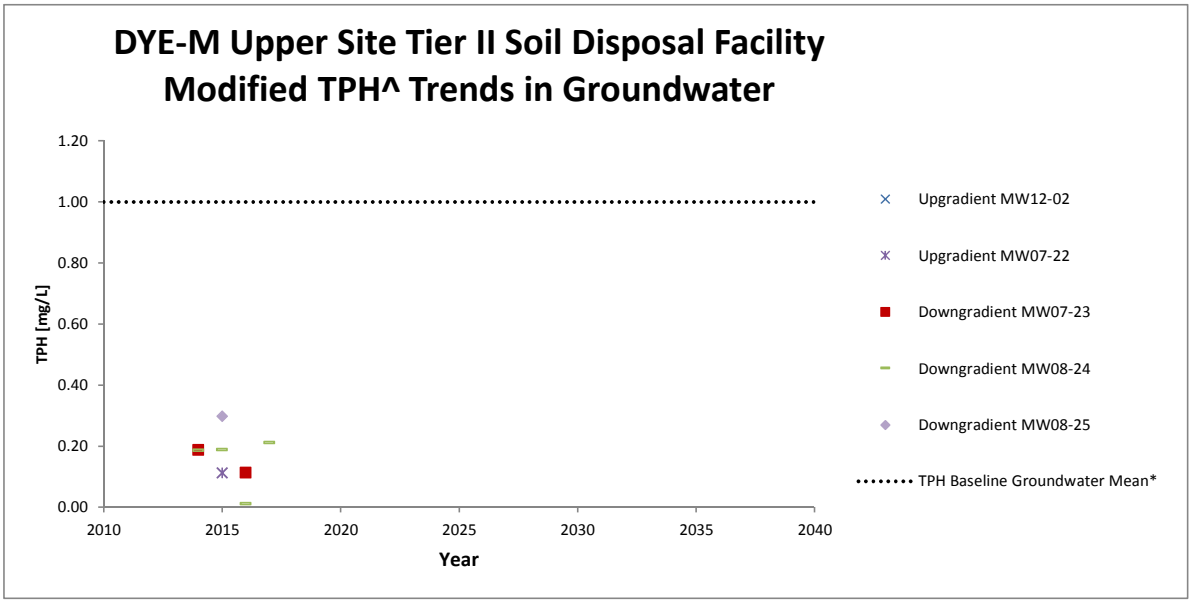


DYE-M Upper Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH





DYE-M Upper Site Tier II Soil Disposal Facility Trends in Groundwater Inorganics, PCBs and Modified TPH



* TPH baseline arithmetic mean is equal to the baseline detection limit
* TPH baseline standard deviation = 0
^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site West Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-35 surface																	
14-8438	DM-35	2014	Year 1	Phase I	5-10	0.6	<1.0	53.0	**23.0**	50.0	<10	**150.0**	44.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-35	2015	Year 2	Phase I														#N/A
DM-35a	DM-35	2016	Year 3	Phase I	0-15	<1.0	<0.50	48.0	14.2	29.4	**14.2**	**75.1**	55.6	<0.050	<7.0	<4.0	<8.0	9.5
DM-35 Shallow	DM-35	2017	Year 4	Phase I	0-15	<1.0	<0.5	52.2	**30.0**	**75.0**	7.3	**198.0**	48.1	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-35 depth																	
14-8440/41	DM-35	2014	Year 1	Phase I	45-50	1.0	<1.0	41.0	12.0	25.0	11.0	**76.0**	45.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-35	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-35	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-35	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site West Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-40 surface																	
14-8367	DM-40	2014	Year 1	Phase I	5-10	**2.7**	<1.0	**200.0**	11.0	**96.5**	11.0	51.0	**158.0**	<0.010	<10	<10	<10	15.0
DM-40 (0-15) (Dup Avg)	DM-40	2015	Year 2	Phase I	0-15	**4.6**	<0.50	**602.0**	10.0	**166.0**	10.9	40.4	**225.0**	<0.050	<6.0	9.0	<8.0	16.0
DM-40a	DM-40	2016	Year 3	Phase I	0-15	<1.0	<0.50	**153.0**	**18.2**	**91.7**	12.3	**79.1**	113.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-40 Shallow	DM-40	2017	Year 4	Phase I	0-15	<1.0	<0.5	**173.0**	13.0	**107.0**	**15.0**	57.5	**146.0**	<0.05	<7	24	28	55.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-40 depth																	#N/A
14-8368	DM-40	2014	Year 1	Phase I	45-50	**2.5**	<1.0	**300.0**	11.0	**100.0**	<10	48.0	**180.0**	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-40	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-40	2016	Year 3	Phase I														#N/A
DM-40 Deep (Dup Avg)	DM-40	2017	Year 4	Phase I	40-50	<1.0	<0.5	**173.0**	6.8	**244.0**	**19.1**	50.3	**201.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site West Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-47 surface																	#N/A
14-8342	DM-47	2014	Year 1	Phase I	5-10	**3.2**	<1.0	**290.0**	**22.0**	**93.0**	11.0	**98.0**	**190.0**	<0.010	15.0	2100.0	39.0	**2154.0**
DM-47 (0-15)	DM-47	2015	Year 2	Phase I	0-15	**4.1**	<0.50	**193.0**	**17.6**	**111.0**	**14.8**	**80.8**	**139.0**	<0.050	187.0	3000.0	129.0	**3316.0**
DM-47a	DM-47	2016	Year 3	Phase I	0-15	<1.0	<0.50	**173.0**	**16.9**	**87.1**	**18.3**	**71.6**	**123.0**	<0.050	<7.0	100.0	234.0	**337.5**
DM-47 Shallow	DM-47	2017	Year 4	Phase I	0-15	<1.0	<0.5	**184.0**	15.2	**70.6**	11.8	57.5	**136.0**	**0.11**	<7	52	81	**136.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-47 depth																	#N/A
14-8343	DM-47	2014	Year 1	Phase I	45-50	**2.9**	<1.0	**210.0**	**17.0**	**83.0**	**14.0**	**110.0**	**140.0**	0.0590	<10	600.0	12.0	**617.0**
DM-47 (40-50)	DM-47	2015	Year 2	Phase I	40-50	**4.0**	<0.50	**255.0**	**21.0**	**95.8**	12.4	**66.2**	**163.0**	<0.050	<7.0	79.0	<8.0	86.5
Not sampled - refusal	DM-47	2016	Year 3	Phase I														#N/A
DM-47 Deep	DM-47	2017	Year 4	Phase I	40-50	<1.0	<0.5	**218.0**	**17.1**	**82.6**	11.3	63.4	**150.0**	<0.05	<7	34	16	53.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-50 surface (also downgradient of Upper Site Pallet Line Landfill)																	#N/A
14-8338	DM-50	2014	Year 1	Phase I	5-10	**3.3**	<1.0	**260.0**	14.0	**100.0**	**24.0**	**79.0**	82.0	<0.010	<10	<10	<10	15.0
DM-50 (0-15)	DM-50	2015	Year 2	Phase I	0-15	**2.6**	<0.50	**154.0**	11.5	**89.9**	12.2	51.5	82.3	<0.050	<7.0	<4.0	<8.0	9.5
DM-50a	DM-50	2016	Year 3	Phase I	0-15	<1.0	<0.50	**186.0**	14.4	**82.6**	**16.9**	**68.0**	80.9	<0.050	<7.0	<4.0	<8.0	9.5
DM-50 Shallow	DM-50	2017	Year 4	Phase I	0-15	<1.0	<0.5	**205.0**	13.7	**94.4**	**21.0**	**73.7**	74.0	<0.05	<7	7	47	57.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-50 depth (also downgradient of Upper Site Pallet Line Landfill)																	#N/A
14-8340/41	DM-50	2014	Year 1	Phase I	35-40	**4.3**	<1.0	**260.0**	15.0	**120.0**	10.0	**74.0**	99.0	<0.010	<10	<10	<10	15.0
DM-50 (30-40)	DM-50	2015	Year 2	Phase I	30-40	**4.2**	<0.50	**186.0**	13.2	**118.0**	**13.8**	55.6	92.9	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-50	2016	Year 3	Phase I														#N/A
DM-50 Deep	DM-50	2017	Year 4	Phase I	30-40	**4.6**	<0.5	**273.0**	15.7	**137.0**	**15.1**	**80.8**	88.1	<0.05	<7	179	29	**211.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-51 surface (also downgradient of Upper Site Pallet Line Landfill)																	#N/A
14-8362	DM-51	2014	Year 1	Phase I	5-10	**2.0**	<1.0	110.0	13.0	46.0	**13.0**	62.0	86.0	0.0180	<10	<10	<10	15.0
DM-51 (0-15)	DM-51	2015	Year 2	Phase I	0-15	**1.9**	<0.50	104.0	11.9	48.3	**25.6**	60.6	107.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-51a	DM-51	2016	Year 3	Phase I	0-15	<1.0	<0.50	112.0	12.3	52.2	**23.4**	56.0	84.8	<0.050	<7.0	<4.0	209.0	**214.5**
DM-51 Shallow	DM-51	2017	Year 4	Phase I	0-15	<1.0	<0.5	95.1	10.8	39.4	**16.6**	52.3	71.6	<0.05	9	313	108	**430.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-51 depth (also downgradient of Upper Site Pallet Line Landfill)																	#N/A
14-8363	DM-51	2014	Year 1	Phase I	30-35	**1.7**	<1.0	130.0	11.0	56.0	**23.0**	54.0	100.0	0.0660	19.0	1500.0	390.0	**1909.0**
Not sampled - refusal	DM-51	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-51	2016	Year 3	Phase I														#N/A
DM-51 Deep	DM-51	2017	Year 4	Phase I	30-40	<1.0	<0.5	107.0	12.2	46.0	**21.0**	52.8	84.2	<0.05	98	2320	607	**3025.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
Downgradient																		#N/A
	DM-31 surface																	#N/A
14-8433	DM-31	2014	Year 1	Phase I	5-10	1.0	<1.0	130.0	9.1	57.0	**27.0**	30.0	**118.0**	<0.010	<10	<10	<10	15.0
DM-31 (0-15)	DM-31	2015	Year 2	Phase I	0-15	1.0	<0.50	**170.0**	11.3	**76.4**	8.1	28.8	**150.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-31a	DM-31	2016	Year 3	Phase I	0-15	<1.0	<0.50	**149.0**	11.9	64.7	11.2	35.0	**124.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-31 Shallow	DM-31	2017	Year 4	Phase I	0-15	<1.0	<0.5	133.0	9.0	56.0	10.4	29.1	**114.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-31 depth																	#N/A
14-8434	DM-31	2014	Year 1	Phase I	45-50	0.7	<1.0	100.0	7.3	49.0	<10	30.0	97.0	<0.010	<10	<10	<10	15.0
DM-31 (30-40)	DM-31	2015	Year 2	Phase I	30-40	1.1	<0.50	**165.0**	12.3	61.5	8.5	32.9	**138.0**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-31	2016	Year 3	Phase I														#N/A
DM-31 Deep	DM-31	2017	Year 4	Phase I	40-50	<1.0	<0.5	126.0	9.8	67.4	9.6	36.2	**121.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-32 surface																	#N/A
14-8430/31	DM-32	2014	Year 1	Phase I	5-10	**2.8**	<1.0	**150.0**	9.9	66.0	<10	33.0	**115.0**	<0.010	<10	<10	<10	15.0
DM-32 (0-15)	DM-32	2015	Year 2	Phase I	0-15	**3.1**	<0.50	**282.0**	15.0	**152.0**	**50.8**	46.9	**138.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-32a	DM-32	2016	Year 3	Phase I	0-15	<1.0	<0.50	**172.0**	11.8	**85.3**	11.1	39.5	105.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-32 Shallow	DM-32	2017	Year 4	Phase I	0-15	<1.0	<0.5	**183.0**	11.9	**89.6**	12.7	42.4	**122.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-32 depth																	#N/A
14-8432	DM-32	2014	Year 1	Phase I	45-50	**5.3**	<1.0	**150.0**	8.4	**90.0**	<10	30.0	108.0	<0.010	<10	<10	<10	15.0
DM-32 (20-30)	DM-32	2015	Year 2	Phase I	20-30	**2.3**	<0.50	**223.0**	11.6	**120.0**	**26.2**	36.0	**117.0**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-32	2016	Year 3	Phase I														#N/A
DM-32 Deep	DM-32	2017	Year 4	Phase I	40-50	<1.0	<0.5	**190.0**	11.4	**89.2**	9.5	38.7	**125.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-33 surface																	#N/A
14-8375	DM-33	2014	Year 1	Phase I	5-10	0.6	<1.0	56.0	11.0	24.0	<10	45.0	60.0	<0.010	<10	<10	<10	15.0
DM-33 (0-15)	DM-33	2015	Year 2	Phase I	0-15	**1.5**	<0.50	70.9	12.3	35.4	5.7	47.8	57.3	<0.050	<7.0	<4.0	<8.0	9.5
DM-33a (Dup Avg)	DM-33	2016	Year 3	Phase I	0-15	<1.0	<0.50	50.9	13.3	19.0	3.5	**65.6**	42.5	<0.050	<6.0	<7.0	<29	21.0
DM-33 Shallow (Dup Avg)	DM-33	2017	Year 4	Phase I	0-15	<1.0	<0.5	84.3	12.9	44.0	8.0	55.5	74.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-33 depth																	#N/A
14-8377	DM-33	2014	Year 1	Phase I	45-50	0.8	<1.0	60.0	11.0	27.0	<10	63.0	60.0	<0.010	<10	<10	<10	15.0
DM-33 (20-30)	DM-33	2015	Year 2	Phase I	20-30	<1.0	<0.50	67.3	10.2	36.1	4.7	33.0	54.9	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-33	2016	Year 3	Phase I														#N/A
DM-33 Deep	DM-33	2017	Year 4	Phase I	30-40	<1.0	<0.5	78.8	11.1	43.0	7.4	45.5	67.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-34 surface																	#N/A
14-8378	DM-34	2014	Year 1	Phase I	5-10	1.1	<1.0	42.0	16.0	30.0	<10	55.0	65.0	<0.010	<10	<10	<10	15.0
DM-34 (0-15) (Dup Avg)	DM-34	2015	Year 2	Phase I	0-15	<1.0	<0.50	28.2	9.5	14.8	5.1	52.9	35.9	<0.10	<6.0	<4.0	<8.0	9.0
DM-34a	DM-34	2016	Year 3	Phase I	0-15	<1.0	<0.50	46.5	12.0	21.3	8.5	**63.8**	44.8	<0.050	<7.0	<4.0	<8.0	9.5
DM-34 Shallow	DM-34	2017	Year 4	Phase I	0-15	<1.0	<0.5	31.1	11.0	16.8	7.2	49.2	41.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-34 depth																	#N/A
14-8380/81	DM-34	2014	Year 1	Phase I	45-50	0.9	<1.0	37.0	16.0	25.0	<10	**65.0**	58.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-34	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-34	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-34	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-36 surface																	#N/A
14-8442	DM-36	2014	Year 1	Phase I	5-10	1.2	<1.0	**180.0**	13.0	**98.0**	**13.0**	48.0	**135.0**	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-36	2015	Year 2	Phase I														#N/A
DM-36a	DM-36	2016	Year 3	Phase I	0-15	<1.0	<0.50	**139.0**	13.6	**76.1**	**13.0**	50.7	91.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-36 Shallow	DM-36	2017	Year 4	Phase I	0-15	<1.0	<0.5	**150.0**	11.5	**96.8**	**13.8**	42.8	113.0	<0.05	<7	25	8	36.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-36 depth																	#N/A
14-8443	DM-36	2014	Year 1	Phase I	45-50	**2.9**	<1.0	**140.0**	10.0	**93.0**	12.0	38.0	106.0	<0.010	<10	19.0	<10	29.0
Not sampled - frozen	DM-36	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-36	2016	Year 3	Phase I														#N/A
DM-36 Deep	DM-36	2017	Year 4	Phase I	20-30	<1.0	<0.5	**183.0**	12.1	**136.0**	**17.4**	44.6	**150.0**	<0.05	<7	245	<8	**252.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-37 surface																	#N/A
14-8435	DM-37	2014	Year 1	Phase I	5-10	**1.4**	<1.0	130.0	10.1	53.0	<10	37.0	106.0	<0.010	<10	<10	<10	15.0
DM-37 (0-15)	DM-37	2015	Year 2	Phase I	0-15	**1.9**	<0.50	**137.0**	12.3	55.0	8.5	35.3	103.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-37a	DM-37	2016	Year 3	Phase I	0-15	<1.0	<0.50	122.0	12.0	63.9	8.4	38.0	108.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-37 Shallow	DM-37	2017	Year 4	Phase I	0-15	<1.0	<0.5	132.0	10.2	62.3	**13.8**	34.1	111.0	<0.05	<7	17	13	33.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-37 depth																	#N/A
14-8437	DM-37	2014	Year 1	Phase I	45-50	1.1	<1.0	100.0	7.6	37.0	<10	32.0	84.0	<0.010	<10	<10	<10	15.0
DM-37 (30-40)	DM-37	2015	Year 2	Phase I	30-40	<1.0	<0.50	125.0	12.7	31.6	5.1	39.8	93.0	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-37	2016	Year 3	Phase I														#N/A
DM-37 Deep	DM-37	2017	Year 4	Phase I	30-40	<1.0	<0.5	126.0	9.8	52.8	8.7	31.8	107.0	<0.05	<7	50	10	63.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-38 surface																	#N/A
14-8382	DM-38	2014	Year 1	Phase I	5-10	**1.7**	<1.0	84.0	15.0	58.0	**94.0**	61.0	**284.0**	<0.010	<10	<10	<10	15.0
DM-38 (0-15)	DM-38	2015	Year 2	Phase I	0-15	**1.5**	<0.50	91.9	14.6	**92.3**	**124.0**	47.9	**308.0**	<0.050	<7.0	<4.0	83.0	88.5
DM-38a	DM-38	2016	Year 3	Phase I	0-15	<1.0	<0.50	81.9	13.0	**89.9**	**58.2**	47.1	**129.0**	<0.050	<7.0	<4.0	28.0	33.5
DM-38 Shallow	DM-38	2017	Year 4	Phase I	0-15	<1.0	<0.5	78.4	11.8	**77.6**	**95.6**	51.5	**229.0**	<0.05	<7	<4	27	32.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-38 depth																	#N/A
14-8383	DM-38	2014	Year 1	Phase I	45-50	**1.6**	<1.0	76.0	13.0	64.0	**100.0**	63.0	**265.0**	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-38	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-38	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-38	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-39 surface (downgradient of West Landfill Centre Lobe; upgradient of West Landfill West Lobe)																	#N/A
14-8427	DM-39	2014	Year 1	Phase I	5-10	**1.6**	<1.0	**160.0**	11.0	**95.0**	<10	37.0	**147.0**	<0.010	<10	<10	<10	15.0
DM-39 (0-15)	DM-39	2015	Year 2	Phase I	0-15	**1.9**	<0.50	**187.0**	11.3	**169.0**	10.7	29.3	**153.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-39a	DM-39	2016	Year 3	Phase I	0-15	<1.0	<0.50	133.0	11.5	**73.5**	**23.3**	36.2	**136.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-39 Shallow	DM-39	2017	Year 4	Phase I	0-15	<1.0	<0.5	**161.0**	12.4	**86.6**	10.7	39.3	**148.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-39 depth (downgradient of West Landfill Centre Lobe; upgradient of West Landfill West Lobe)																	#N/A
14-8428	DM-39	2014	Year 1	Phase I	45-50	**2.0**	<1.0	**170.0**	11.0	**110.0**	<10	37.0	**154.0**	<0.010	<10	<10	<10	15.0
DM-39 (40-50)	DM-39	2015	Year 2	Phase I	40-50	**1.9**	<0.50	**172.0**	13.0	**111.0**	8.4	35.0	**126.0**	<0.050	<7.0	48.0	<8.0	55.5
Not sampled - refusal	DM-39	2016	Year 3	Phase I														#N/A
DM-39 Deep	DM-39	2017	Year 4	Phase I	40-50	<1.0	<0.5	**172.0**	11.1	**131.0**	10.7	34.3	**138.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-41 surface																	#N/A
14-8370/71	DM-41	2014	Year 1	Phase I	5-10	1.3	<1.0	125.0	11.0	**69.0**	**34.0**	44.0	**155.0**	<0.010	<10	<10	<10	15.0
DM-41 (0-15)	DM-41	2015	Year 2	Phase I	0-15	**1.4**	<0.50	**178.0**	15.1	**171.0**	**27.5**	51.8	**351.0**	<0.050	<7.0	<4.0	43.0	48.5
DM-41a	DM-41	2016	Year 3	Phase I	0-15	<1.0	<0.50	**135.0**	10.8	64.9	**17.1**	39.4	111.0	<0.050	<7.0	54.0	295.0	**352.5**
DM-41 Shallow	DM-41	2017	Year 4	Phase I	0-15	<1.0	<0.5	116.0	10.8	**70.0**	11.3	41.9	**118.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-41 depth																	#N/A
14-8372	DM-41	2014	Year 1	Phase I	35-40	**1.6**	<1.0	**180.0**	16.0	**76.0**	**15.0**	**73.0**	**170.0**	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-41	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-41	2016	Year 3	Phase I														#N/A
DM-41 Deep	DM-41	2017	Year 4	Phase I	30-40	<1.0	<0.5	124.0	10.8	**79.7**	12.1	38.2	**123.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-42 surface																	#N/A
14-8373	DM-42	2014	Year 1	Phase I	5-10	**3.8**	<1.0	120.0	**41.0**	**84.0**	<10	**150.0**	**180.0**	<0.010	<10	<10	<10	15.0
DM-42 (0-15)	DM-42	2015	Year 2	Phase I	0-15	**3.2**	0.6	**151.0**	**43.7**	**95.0**	10.5	**118.0**	**173.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-42a	DM-42	2016	Year 3	Phase I	0-15	<1.0	<0.50	**150.0**	**16.9**	60.1	8.1	53.5	110.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-42 Shallow	DM-42	2017	Year 4	Phase I	0-15	<1.0	<0.5	132.0	14.7	48.2	7.2	51.1	104.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-42 depth																	#N/A
14-8374	DM-42	2014	Year 1	Phase I	50-55	**1.5**	<1.0	**140.0**	12.0	**69.0**	<10	42.0	**130.0**	<0.010	<10	<10	<10	15.0
DM-42 (40-50)	DM-42	2015	Year 2	Phase I	40-50	**1.8**	<0.50	**191.0**	**18.5**	**98.7**	8.5	50.5	**152.0**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-42	2016	Year 3	Phase I														#N/A
DM-42 Deep	DM-42	2017	Year 4	Phase I	20-30	<1.0	<0.5	**156.0**	14.1	**81.3**	8.6	46.0	**125.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-43 surface																	#N/A
14-8350/51	DM-43	2014	Year 1	Phase I	5-10	1.1	<1.0	110.0	12.0	40.0	<10	45.0	73.0	<0.010	<10	<10	<10	15.0
DM-43 (0-15)	DM-43	2015	Year 2	Phase I	0-15	1.0	<0.50	127.0	15.4	48.9	5.9	44.4	79.8	<0.050	<7.0	<4.0	<8.0	9.5
DM-43a	DM-43	2016	Year 3	Phase I	0-15	<1.0	<0.50	122.0	14.9	54.7	7.0	44.3	70.9	<0.050	<7.0	<4.0	<8.0	9.5
DM-43 Shallow	DM-43	2017	Year 4	Phase I	0-15	<1.0	<0.5	**135.0**	14.6	61.1	7.4	45.5	81.5	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-43 depth																	#N/A
14-8352	DM-43	2014	Year 1	Phase I	45-50	0.9	<1.0	110.0	12.0	38.0	<10	48.0	79.0	<0.010	<10	<10	<10	15.0
DM-43 (20-30) (Dup Avg)	DM-43	2015	Year 2	Phase I	20-30	1.1	<0.50	112.0	12.4	38.4	4.1	36.1	72.2	<0.050	<6.0	<4.0	<8.0	9.0
Not sampled - refusal	DM-43	2016	Year 3	Phase I														#N/A
DM-43 Deep	DM-43	2017	Year 4	Phase I	40-50	<1.0	<0.5	121.0	13.6	53.8	6.4	42.6	71.1	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-44 surface																	#N/A
14-8353	DM-44	2014	Year 1	Phase I	5-10	**3.7**	<1.0	**190.0**	13.0	**110.0**	<10	41.0	**180.0**	<0.010	<10	<10	<10	15.0
DM-44 (0-15)	DM-44	2015	Year 2	Phase I	0-15	**7.0**	0.6	**239.0**	10.1	**244.0**	**13.3**	26.4	**222.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-44a	DM-44	2016	Year 3	Phase I	0-15	<1.0	<0.50	**161.0**	14.7	**79.8**	8.5	52.7	**125.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-44 Shallow	DM-44	2017	Year 4	Phase I	0-15	**3.4**	<0.5	**159.0**	10.6	**145.0**	**13.6**	44.9	**147.0**	<0.05	<7	<4	9	14.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-44 depth																	#N/A
14-8354	DM-44	2014	Year 1	Phase I	45-50	**4.9**	<1.0	**180.0**	11.0	**190.0**	11.0	51.0	**170.0**	<0.010	<10	<10	15.0	25.0
Not sampled - refusal	DM-44	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-44	2016	Year 3	Phase I														#N/A
DM-44 Deep	DM-44	2017	Year 4	Phase I	30-40	**4.4**	<0.5	**175.0**	10.5	**162.0**	**13.2**	40.6	**179.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-45 surface																	#N/A
14-8355	DM-45	2014	Year 1	Phase I	5-10	**2.2**	<1.0	**170.0**	**21.0**	**110.0**	10.0	**98.0**	**160.0**	<0.010	<10	<10	<10	15.0
DM-45 (0-15)	DM-45	2015	Year 2	Phase I	0-15	**1.7**	<0.50	**178.0**	**26.5**	**141.0**	11.5	**103.0**	**158.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-45a	DM-45	2016	Year 3	Phase I	0-15	<1.0	<0.50	**187.0**	**37.1**	**157.0**	12.6	**129.0**	**166.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-45 Shallow	DM-45	2017	Year 4	Phase I	0-15	<1.0	<0.5	**173.0**	15.8	**131.0**	**20.1**	**105**	**179.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-45 depth																	#N/A
14-8357	DM-45	2014	Year 1	Phase I	45-50	**1.8**	<1.0	**190.0**	**17.0**	**100.0**	11.0	**100.0**	**160.0**	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-45	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-45	2016	Year 3	Phase I														#N/A
DM-45 Deep	DM-45	2017	Year 4	Phase I	40-50	<1.0	<0.5	**163.0**	14.7	**92.4**	**12.9**	**84.1**	**208.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-46 surface																	#N/A
14-8358	DM-46	2014	Year 1	Phase I	5-10	**3.9**	<1.0	**150.0**	14.0	**70.0**	**18.0**	**81.0**	100.0	<0.010	<10	<10	13.0	23.0
DM-46 (0-15) (Dup Avg)	DM-46	2015	Year 2	Phase I	0-15	**5.1**	<0.50	**160.5**	14.0	**122.0**	11.2	53.7	**143.5**	<0.050	<6.0	<4.0	<8.0	9.0
DM-46a	DM-46	2016	Year 3	Phase I	0-15	<1.0	<0.50	**147.0**	11.6	**112.0**	**16.7**	49.4	109.0	**0.4500**	<7.0	<4.0	91.0	96.5
DM-46 Shallow	DM-46	2017	Year 4	Phase I	0-15	<1.0	<0.5	**163.0**	14.8	**85.2**	**26.8**	**71.0**	**120.0**	<0.05	<7	48	196	**247.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-46 depth																	#N/A
14-8360/61	DM-46	2014	Year 1	Phase I	45-50	**11.0**	<1.0	**160.0**	7.9	**160.0**	11.0	46.0	**160.0**	<0.010	<10	<10	<10	15.0
DM-46 (40-50)	DM-46	2015	Year 2	Phase I	40-50	**7.5**	<0.50	**158.0**	11.5	**139.0**	12.4	44.3	**128.0**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-46	2016	Year 3	Phase I														#N/A
DM-46 Deep	DM-46	2017	Year 4	Phase I	40-50	<1.0	<0.5	**149.0**	14.1	**107.0**	**20.5**	61.3	**126.0**	<0.05	<7	24	76	**103.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-48 surface																	#N/A
14-8347	DM-48	2014	Year 1	Phase I	5-10	**15.0**	<1.0	**450.0**	**36.0**	**130.0**	**16.0**	**320.0**	**140.0**	<0.010	<10	<10	16.0	26.0
DM-48 (0-15) (Dup Avg)	DM-48	2015	Year 2	Phase I	0-15	**20.0**	<0.50	**486.5**	**50.9**	**114.0**	**27.9**	**356.5**	**140.0**	0.0500	<6.0	13.0	108.0	**124.0**
DM-48a	DM-48	2016	Year 3	Phase I	0-15	**11.9**	<0.50	**301.0**	**27.1**	**96.6**	11.3	**223.0**	**131.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-48 Shallow	DM-48	2017	Year 4	Phase II	0-15	**25.2**	<0.5	**486.0**	**54.8**	**95.0**	9.5	**609.0**	105.0	<0.05	<7	<4	29	34.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-48 depth																	#N/A
14-8348	DM-48	2014	Year 1	Phase I	45-50	**12.0**	<1.0	**280.0**	**24.0**	**130.0**	12.0	**190.0**	**130.0**	<0.010	<10	<10	<10	15.0
DM-48 (40-50)	DM-48	2015	Year 2	Phase I	40-50	**14.8**	<0.50	**311.0**	**39.3**	**152.0**	**16.8**	**221.0**	**131.0**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-48	2016	Year 3	Phase I														#N/A
DM-48 Deep (Dup Avg)	DM-48	2017	Year 4	Phase II	40-50	**15.4**	<0.5	**551.5**	**50.4**	**101.9**	9.7	**435.5**	**127.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-49 surface																	#N/A
14-8344	DM-49	2014	Year 1	Phase I	5-10	1.0	<1.0	**220.0**	9.0	**120.0**	<10	37.0	**150.0**	<0.010	14.0	230.0	<10	**249.0**
DM-49 (0-15)(Dup Avg)	DM-49	2015	Year 2	Phase I	0-15	**2.8**	<0.50	**219.5**	**17.6**	**107.0**	**14.4**	**82.0**	**147.0**	<0.10	<6.0	76.5	63.0	**142.5**
DM-49b (Dup Avg)	DM-49	2016	Year 3	Phase I	0-15	**2.0**	<0.50	**208.0**	16.0	**113.5**	**13.0**	**73.9**	**144.0**	<0.050	<6.0	<7.0	<29	21.0
DM-49 Shallow	DM-49	2017	Year 4	Phase I	0-15	<1.0	<0.5	**210.0**	15.6	**117.0**	**16.7**	**76.1**	**150.0**	<0.05	<7	72	38	**113.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-49 depth																	#N/A
14-8345	DM-49	2014	Year 1	Phase I	45-50	0.9	<1.0	**200.0**	8.3	**130.0**	<10	31.0	**150.0**	<0.010	<10	<10	<10	15.0
DM-49 (40-50)	DM-49	2015	Year 2	Phase I	40-50	**1.4**	<0.50	**174.0**	**20.5**	**90.6**	11.9	**87.6**	**114.0**	<0.050	<7.0	90.0	37.0	**130.5**
DM-49a	DM-49	2016	Year 3	Phase I	30-40	<1.0	<0.50	**172.0**	16.0	**100.0**	11.8	**70.7**	108.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-49 Deep	DM-49	2017	Year 4	Phase I	30-40	<1.0	<0.5	**222.0**	**16.9**	**117.0**	**16.8**	**86.0**	**151.0**	<0.05	<7	119	47	**169.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.34**	**1.00**	**133.4**	**16.5**	**67.9**	**12.8**	**63.6**	**113.7**	**0.100**				**101.2**
Baseline Data - Standard Deviation						2.38	0.00	59.9	7.3	30.4	14.2	53.3	40.6	0.000				241.5
Baseline Data Mean + 3xStandard Deviation						**8.47**	**1.00**	**313.1**	**38.3**	**159.0**	**55.4**	**223.6**	**235.6**	**0.100**				**825.6**
	DM-52 surface (downgradient of West Landfill Centre Lobe A; upgradient of West Landfill Centre Lobe)																	#N/A
14-8364	DM-52	2014	Year 1	Phase I	5-10	0.6	<1.0	75.0	**43.0**	**87.0**	<10	**290.0**	61.0	<0.010	<10	<10	<10	15.0
DM-52 (0-15)	DM-52	2015	Year 2	Phase I	0-15	<1.0	<0.50	44.2	**28.2**	56.8	5.6	**116.0**	42.9	<0.050	<7.0	<4.0	<8.0	9.5
DM-52a	DM-52	2016	Year 3	Phase I	0-15	<1.0	<0.50	43.6	**34.3**	**70.0**	7.9	**209.0**	44.6	<0.050	<7.0	<4.0	75.0	80.5
DM-52 Shallow (Dup Avg)	DM-52	2017	Year 4	Phase I	0-15	<1.0	<0.5	43.7	**35.3**	62.6	6.2	**227.5**	42.6	<0.05	<7	<4	11	16.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-52 depth (downgradient of West Landfill Centre Lobe A; upgradient of West Landfill Centre Lobe)																	#N/A
14-8365	DM-52	2014	Year 1	Phase I	40-45	0.7	<1.0	61.0	**34.0**	**78.0**	<10	**220.0**	55.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-52	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-52	2016	Year 3	Phase I														#N/A
DM-52 Deep	DM-52	2017	Year 4	Phase I	20-30	<1.0	<0.5	44.0	**34.0**	64.8	5.0	**241.0**	40.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

Legend

XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

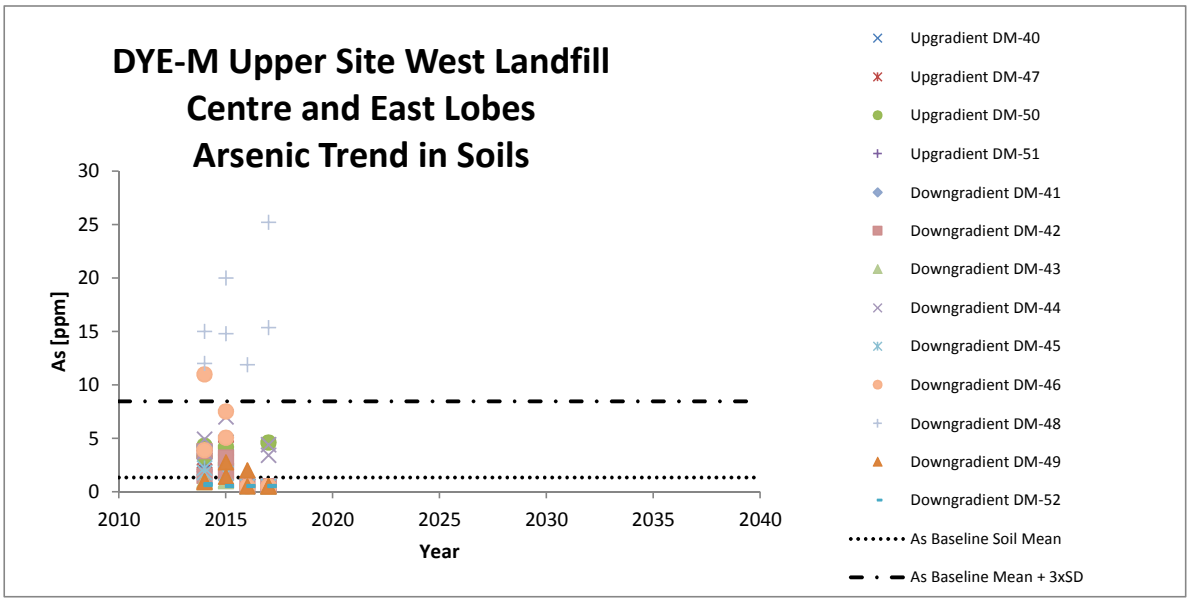
If a monitoring location is upgradient of one lobe but downgradient to another lobe of the same landfill, it is considered a downgradient location.

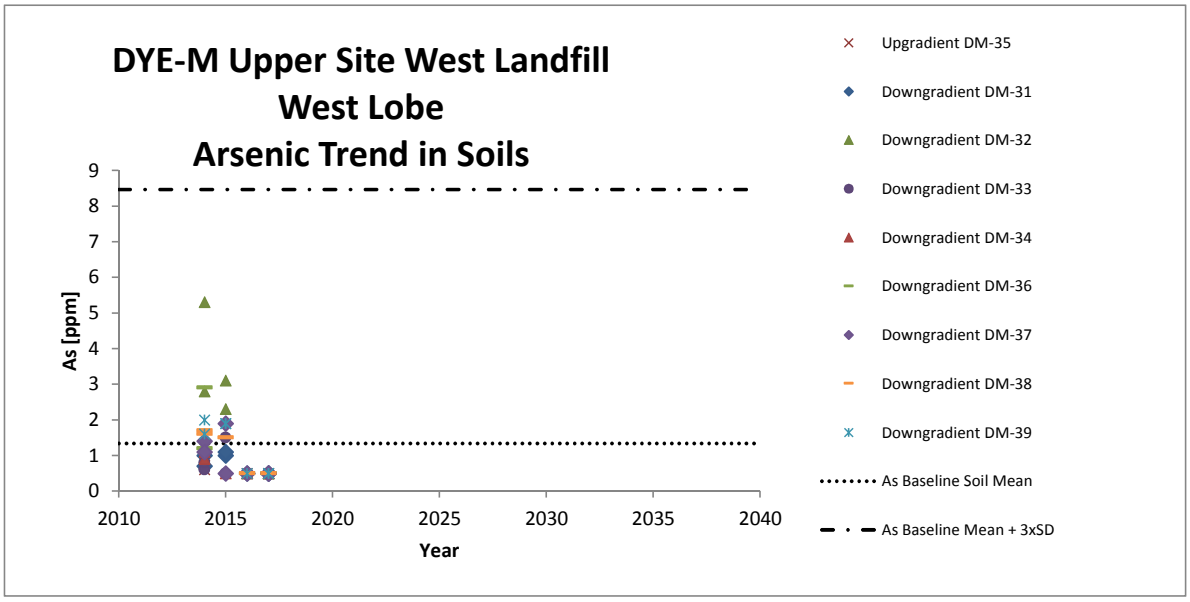
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH

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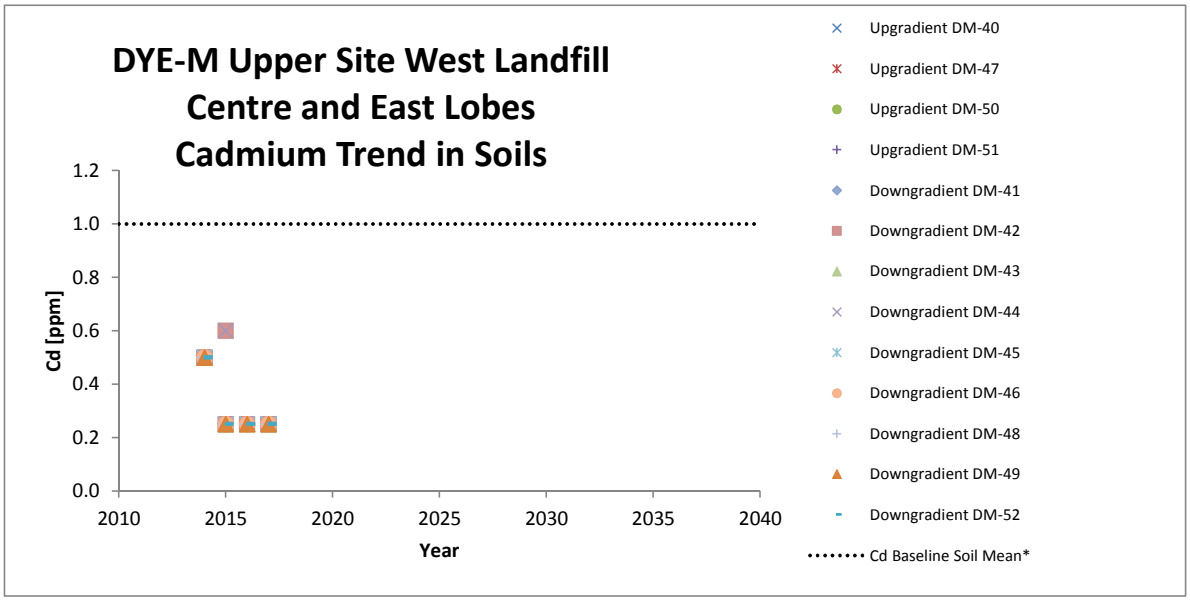
Where results are below detection, half of the detection limit has been used in the charts for the sample points.

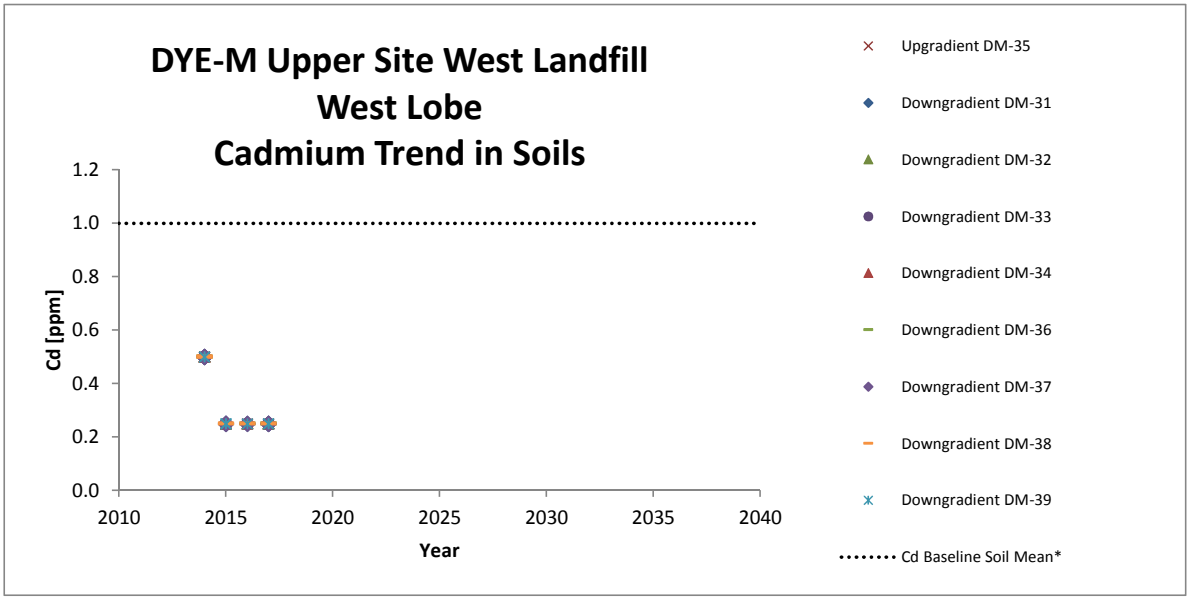
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.





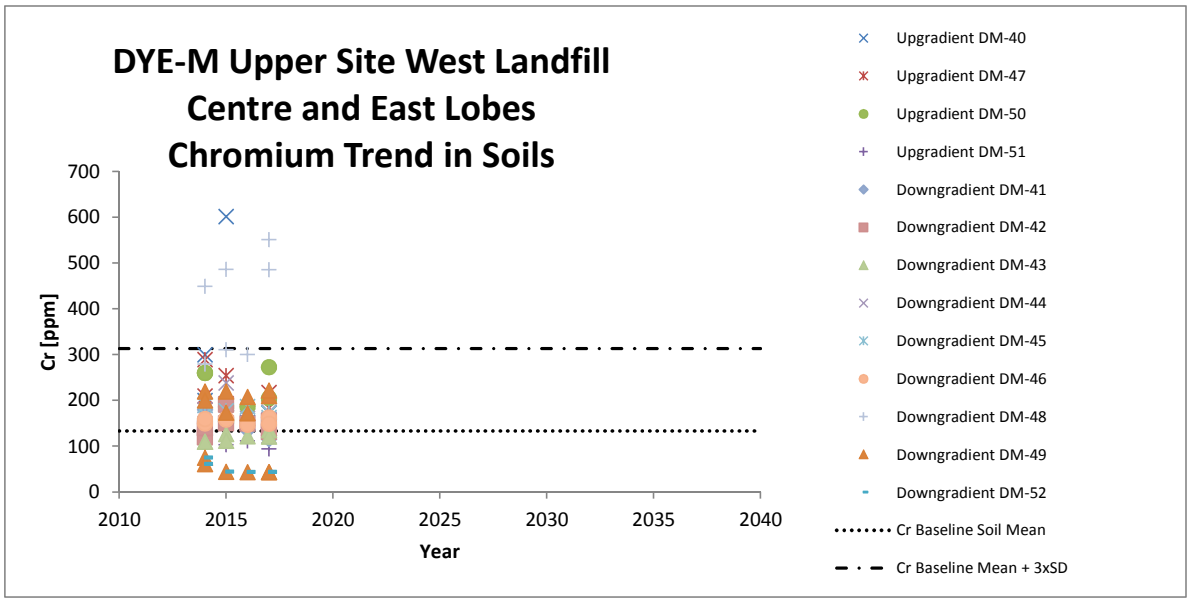
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH

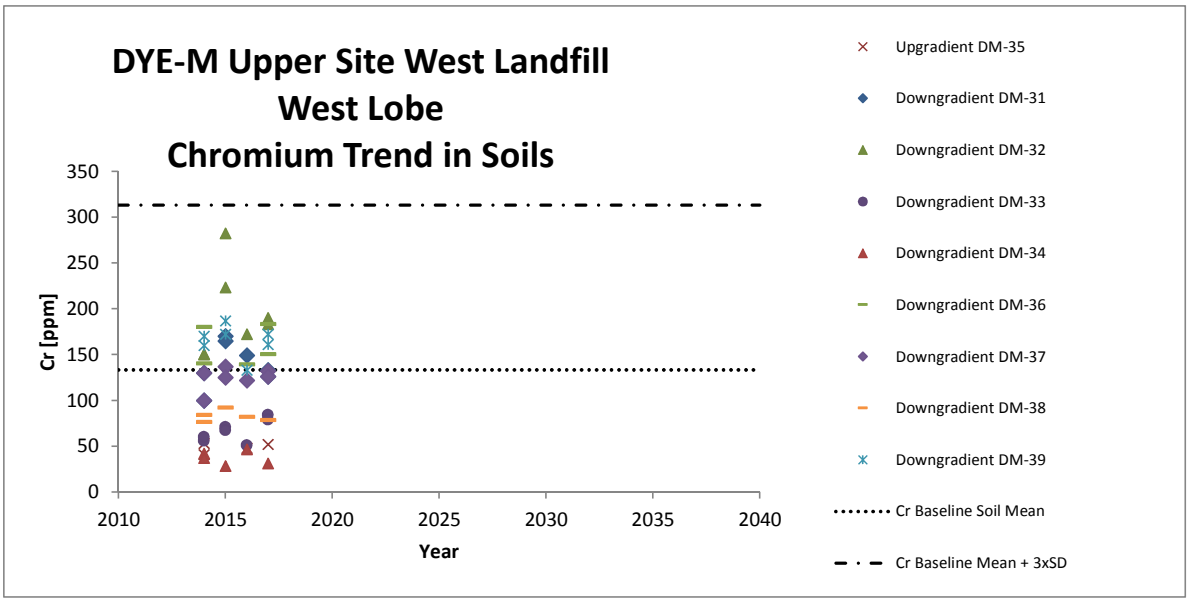




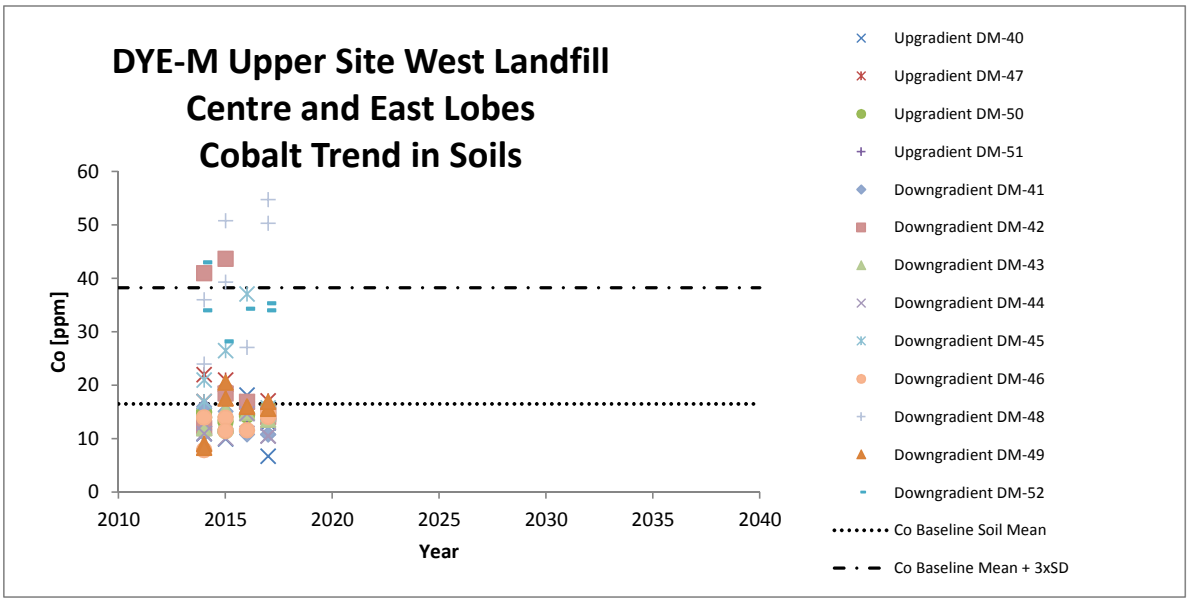
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

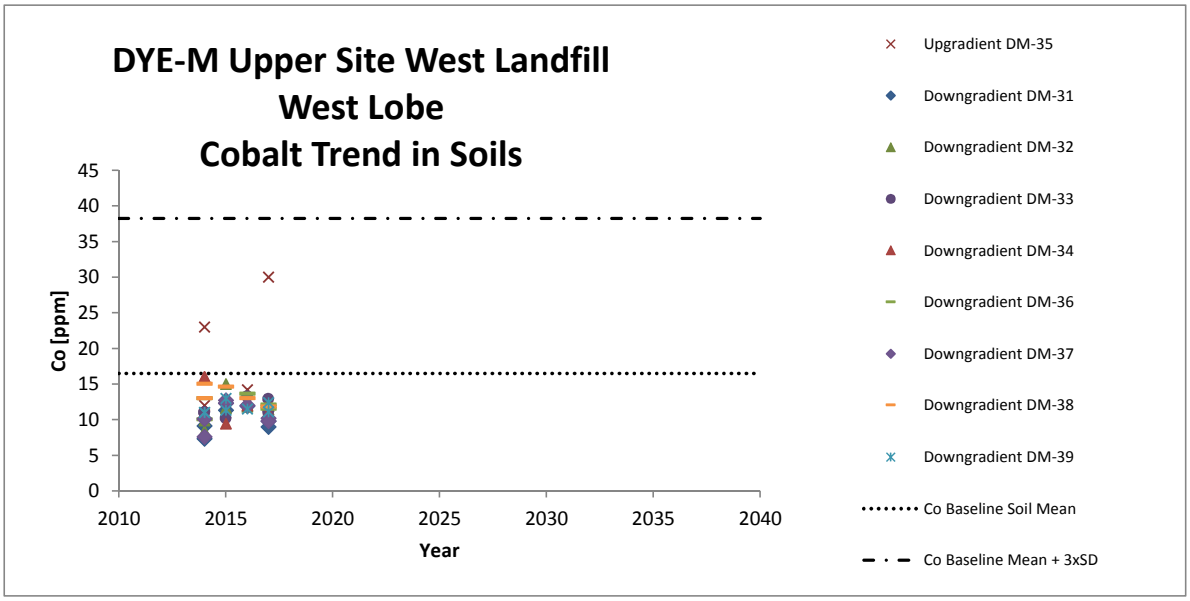
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH



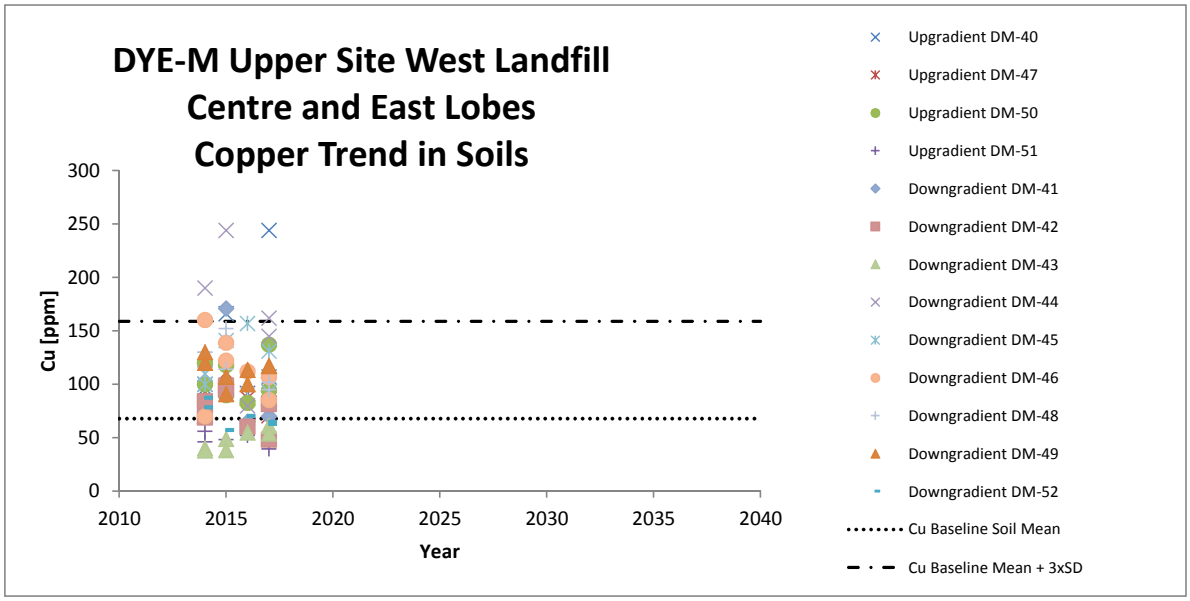


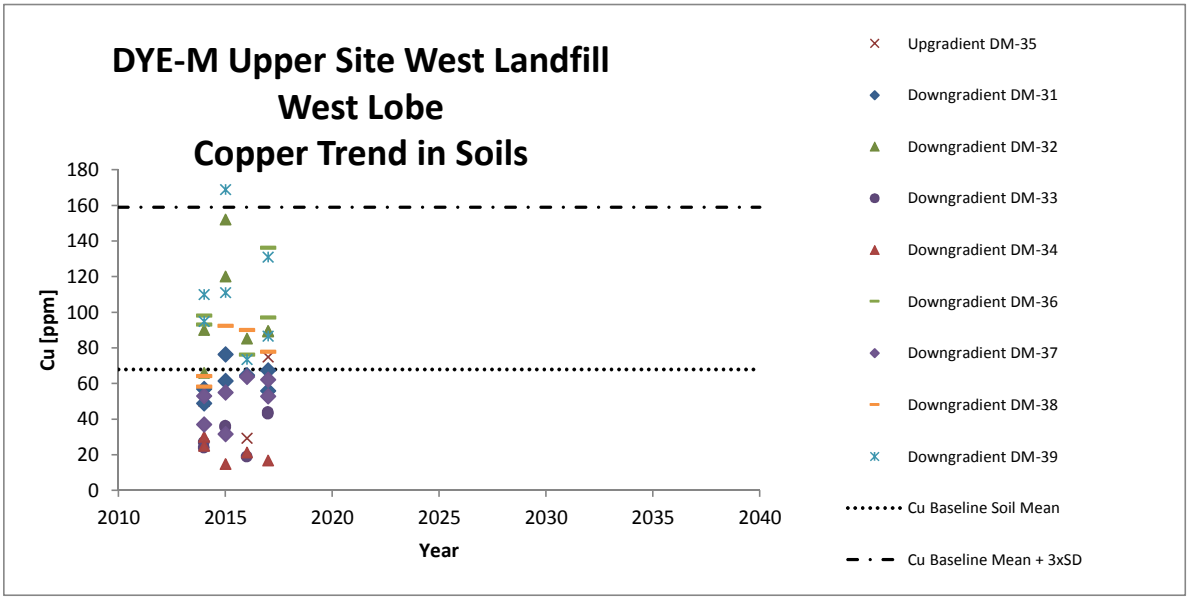
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH



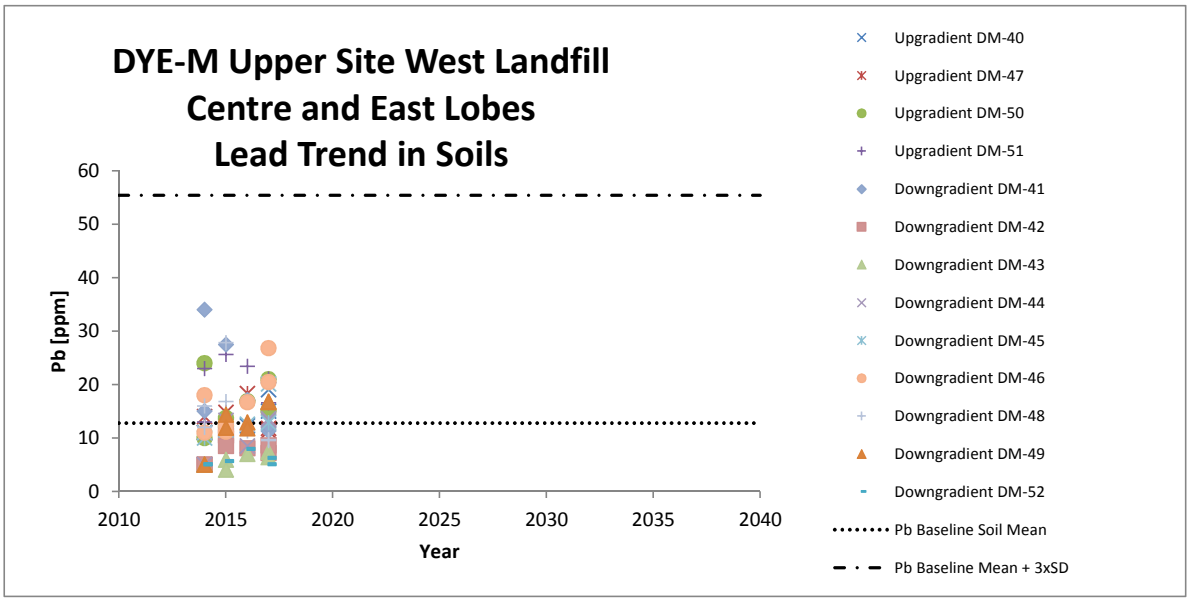


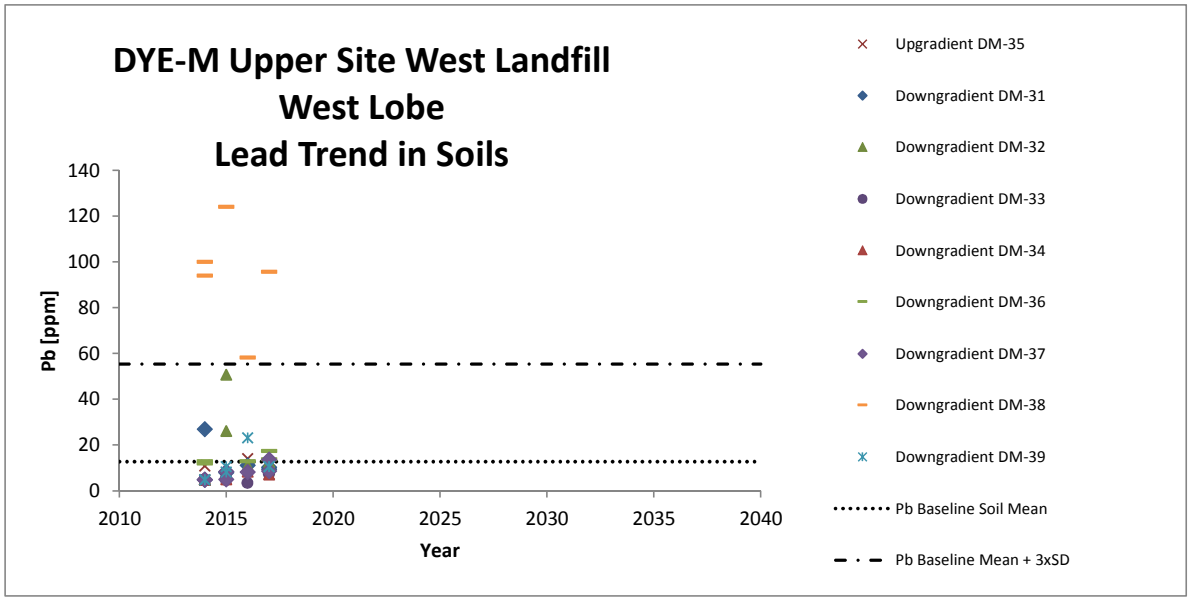
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH



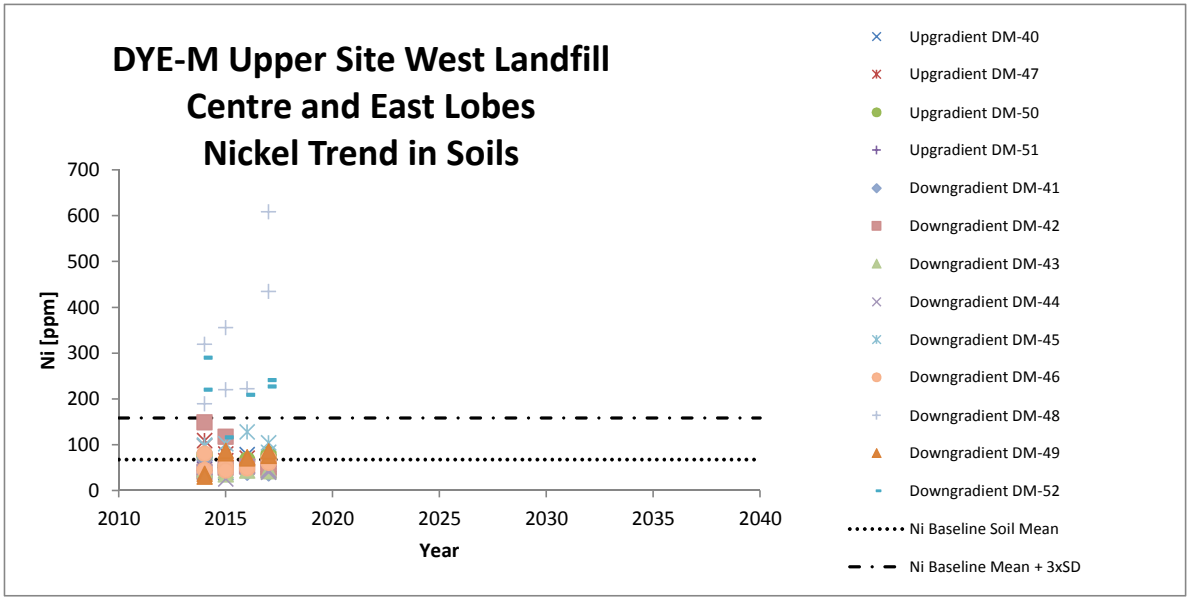


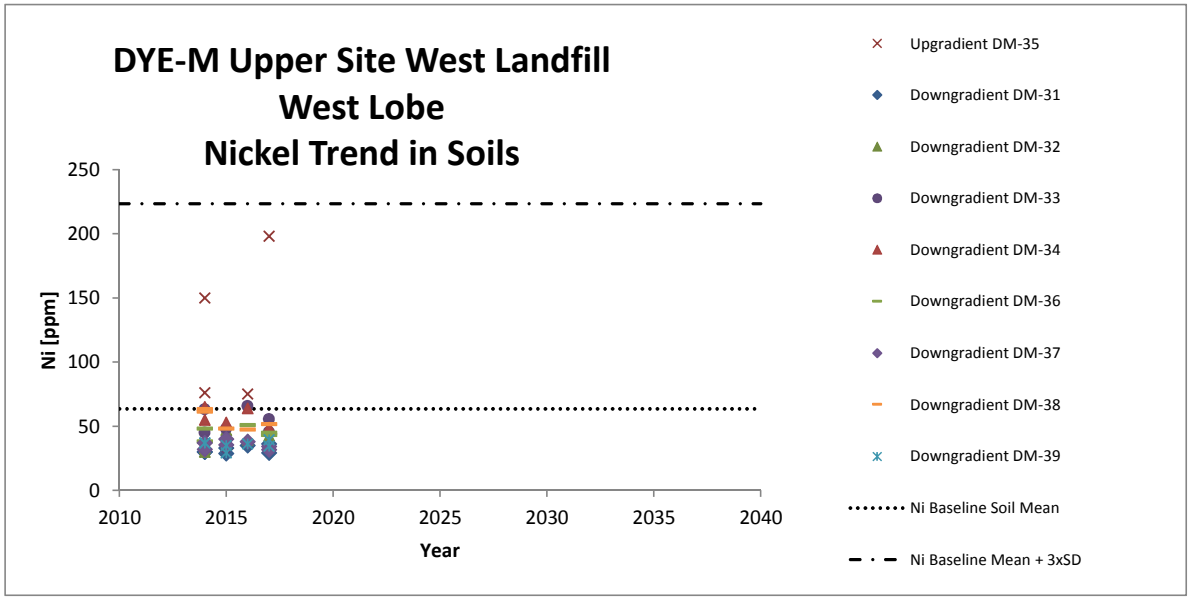
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH



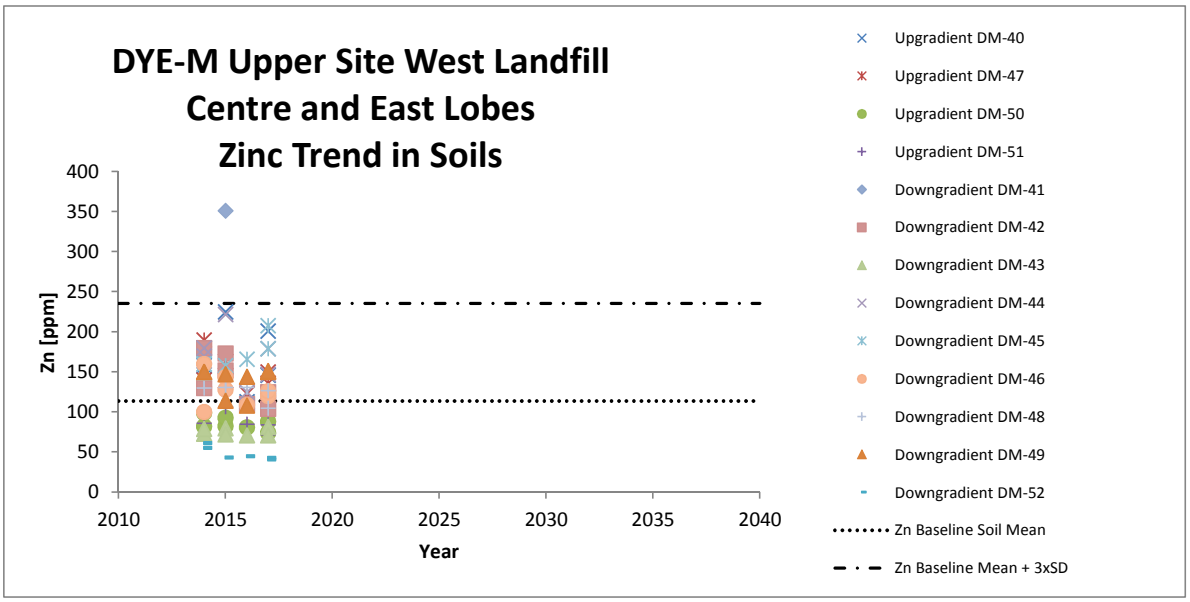


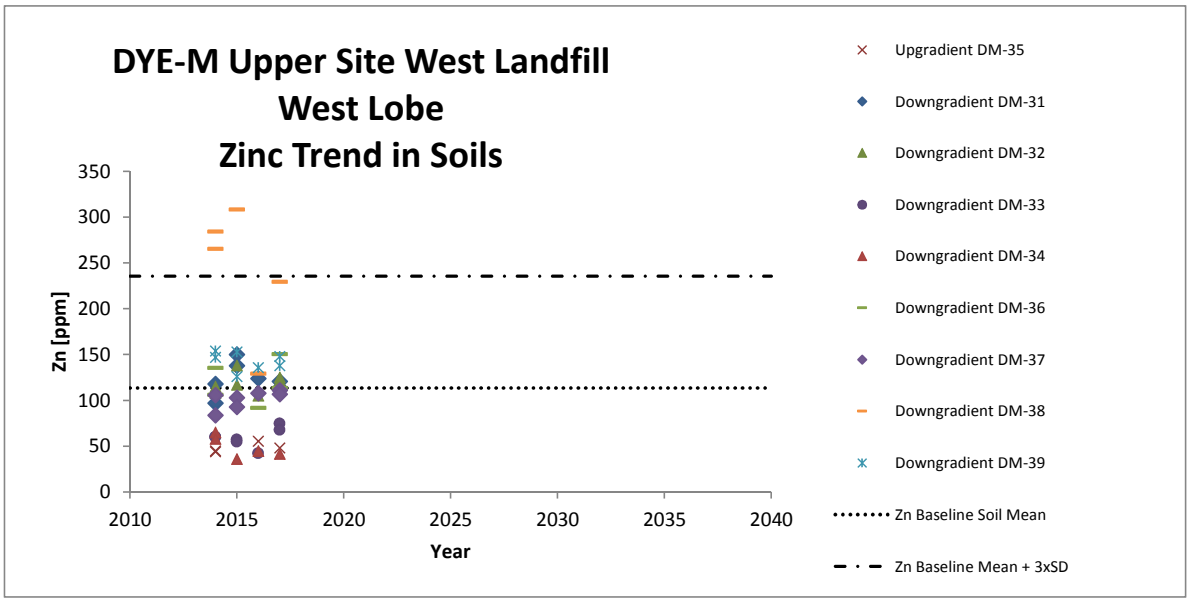
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH



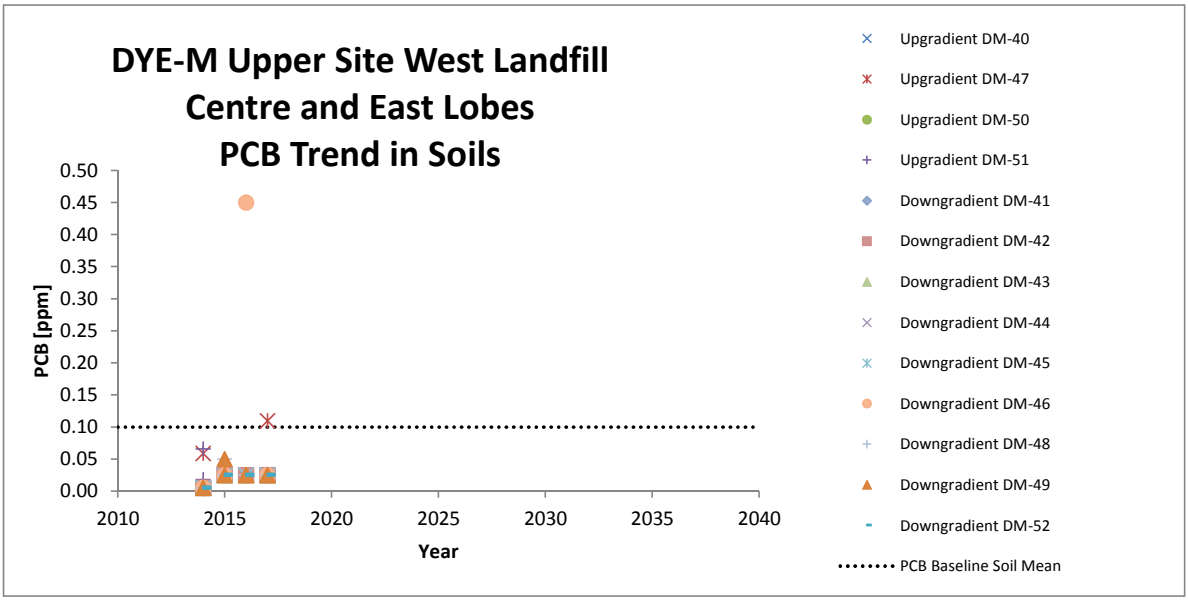


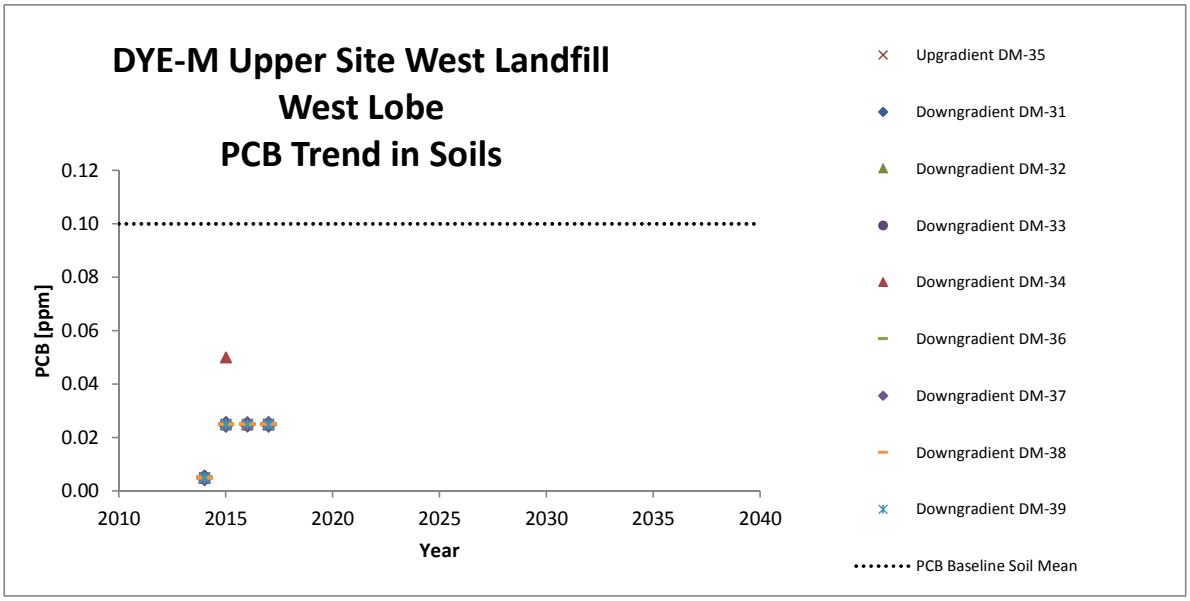
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH





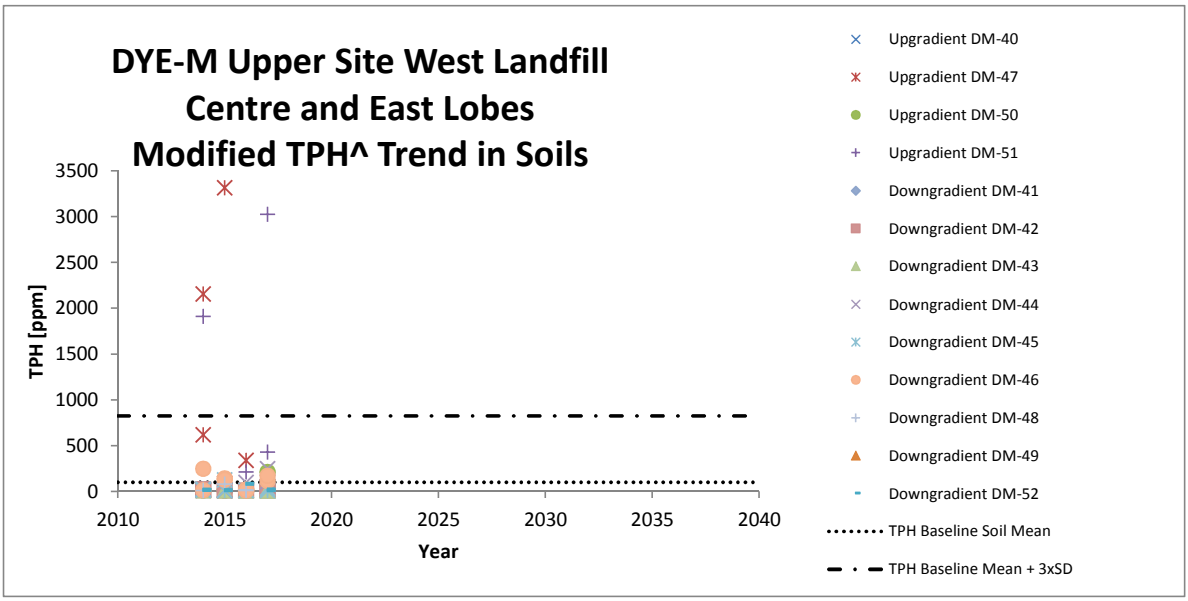
DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH

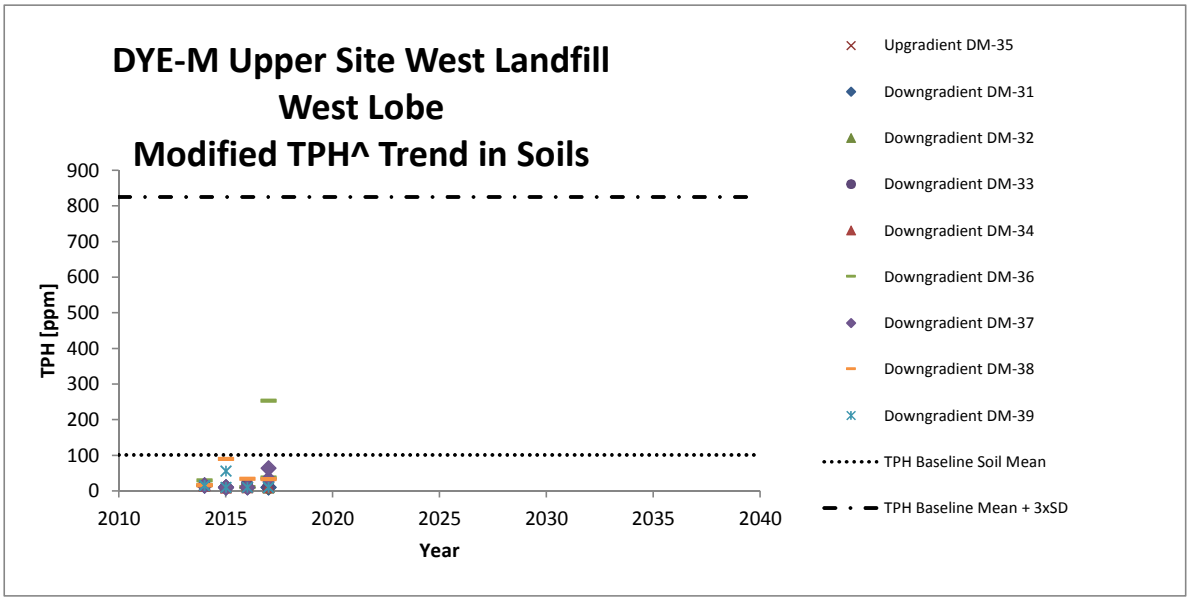




* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0

DYE-M Upper Site West Landfill Trends in Soil Inorganics, PCBs and Modified TPH





^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site Pallet Line Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-60 surface																	
14-8410/11	DM-60	2014	Year 1	Phase I	5-10	0.8	<1.0	51.5	16.0	25.5	<10	**85.0**	58.5	<0.010	<10	<10	<10	15.0
DM-60 (0-15)	DM-60	2015	Year 2	Phase I	0-15	**1.3**	<0.50	51.5	**18.3**	27.1	9.1	**87.5**	61.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-60a	DM-60	2016	Year 3	Phase I	0-15	<1.0	<0.50	60.0	**20.7**	30.9	8.8	**113.0**	56.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-60 Shallow	DM-60	2017	Year 4	Phase I	0-15	<1.0	<0.5	42.0	16.3	20.9	9.3	**90.9**	50.1	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-60 depth																	
14-8412	DM-60	2014	Year 1	Phase I	40-45	1.0	<1.0	36.0	14.0	18.0	10.0	**78.0**	49.0	<0.010	<10	<10	<10	15.0
DM-60 (40-50)	DM-60	2015	Year 2	Phase I	40-50	**1.2**	<0.50	52.5	**16.9**	25.3	7.0	**101.0**	48.5	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-60	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-60	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Pallet Line Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
Downgradient																		
	DM-50 surface (also upgradient of Upper Site West Landfill)																	
14-8338	DM-50	2014	Year 1	Phase I	5-10	**3.3**	<1.0	**260.0**	14.0	**100.0**	**24.0**	**79.0**	**82.0**	<0.010	<10	<10	<10	15.0
DM-50 (0-15)	DM-50	2015	Year 2	Phase I	0-15	**2.6**	<0.50	**154.0**	11.5	**89.9**	12.2	51.5	**82.3**	<0.050	<7.0	<4.0	<8.0	9.5
DM-50a	DM-50	2016	Year 3	Phase I	0-15	<1.0	<0.50	**186.0**	14.4	**82.6**	16.9	68.0	**80.9**	<0.050	<7.0	<4.0	<8.0	9.5
DM-50 Shallow	DM-50	2017	Year 4	Phase I	0-15	<1.0	<0.5	**205.0**	13.7	**94.4**	21.0	73.7	74.0	<0.05	<7	7.0	47.0	57.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-50 depth (also upgradient of Upper Site West Landfill)																	
14-8340/41	DM-50	2014	Year 1	Phase I	35-40	**4.3**	<1.0	**260.0**	15.0	**120.0**	10.0	74.0	**99.0**	<0.010	<10	<10	<10	15.0
DM-50 (30-40)	DM-50	2015	Year 2	Phase I	30-40	**4.2**	<0.50	**186.0**	13.2	**118.0**	13.8	55.6	**92.9**	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-50	2016	Year 3	Phase I														#N/A
DM-50 Deep	DM-50	2017	Year 4	Phase I	30-40	**4.6**	<0.5	**273.0**	15.7	**137.0**	15.1	**80.8**	**88.1**	<0.05	<7	179.0	29.0	211.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Pallet Line Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-51 surface (also upgradient of Upper Site West Landfill)																	
14-8362	DM-51	2014	Year 1	Phase I	5-10	**2.0**	<1.0	**110.0**	13.0	**46.0**	13.0	62.0	**86.0**	0.0180	<10	<10	<10	15.0
DM-51 (0-15)	DM-51	2015	Year 2	Phase I	0-15	**1.9**	<0.50	**104.0**	11.9	**48.3**	**25.6**	60.6	**107.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-51a	DM-51	2016	Year 3	Phase I	0-15	<1.0	<0.50	**112.0**	12.3	**52.2**	**23.4**	56.0	**84.8**	<0.050	<7.0	<4.0	209.0	214.5
DM-51 Shallow	DM-51	2017	Year 4	Phase I	0-15	<1.0	<0.5	**95.1**	10.8	**39.4**	16.6	52.3	71.6	<0.05	9.0	313.0	108.0	**430.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-51 depth (also upgradient of Upper Site West Landfill)																	
14-8363	DM-51	2014	Year 1	Phase I	30-35	**1.7**	<1.0	**130.0**	11.0	**56.0**	**23.0**	54.0	**100.0**	0.0660	19.0	1500.0	390.0	**1909.0**
Not sampled - refusal	DM-51	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-51	2016	Year 3	Phase I														#N/A
DM-51 Deep	DM-51	2017	Year 4	Phase I	30-40	<1.0	<0.5	**107.0**	12.2	**46.0**	21.0	52.8	**84.2**	<0.05	98.0	2320.0	607.0	**3025.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Pallet Line Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-53 surface																	
14-8395	DM-53	2014	Year 1	Phase I	5-10	**1.4**	<1.0	**87.0**	10.0	32.0	12.0	54.0	70.0	0.0130	<10	<10	<10	15.0
DM-53 (0-15)	DM-53	2015	Year 2	Phase I	0-15	1.0	<0.50	**79.8**	10.0	32.0	11.0	44.3	68.2	<0.050	<7.0	<4.0	<8.0	9.5
DM-53a (Dup Avg)	DM-53	2016	Year 3	Phase I	0-15	1.0	<0.50	**87.8**	10.8	**39.2**	12.9	50.5	**98.3**	<0.050	<6.0	<7.0	<29	21.0
DM-53 Shallow	DM-53	2017	Year 4	Phase I	0-15	<1.0	<0.5	**104.0**	11.0	**44.5**	13.8	54.6	**86.9**	<0.05	<7	8.0	61.0	72.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-53 depth																	
14-8397	DM-53	2014	Year 1	Phase I	45-50	**2.1**	<1.0	**130.0**	12.0	**50.0**	15.0	65.0	**89.0**	<0.010	<10	<10	<10	15.0
DM-53 (40-50)	DM-53	2015	Year 2	Phase I	40-50	**1.7**	<0.50	**155.0**	14.2	**65.6**	17.8	63.8	**113.0**	<0.050	<7.0	13.0	82.0	98.5
Not sampled - refusal	DM-53	2016	Year 3	Phase I														#N/A
DM-53 Deep	DM-53	2017	Year 4	Phase I	40-50	<1.0	<0.5	**207.0**	13.5	**67.2**	19.8	64.9	**121.0**	<0.05	<7	28.0	131.0	162.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-54 surface																	
14-8393	DM-54	2014	Year 1	Phase I	5-10	**1.6**	<1.0	59.0	15.0	35.0	**22.0**	**93.0**	66.0	<0.010	<10	<10	<10	15.0
DM-54 (0-15)	DM-54	2015	Year 2	Phase I	0-15	**2.6**	<0.50	54.4	13.8	36.5	**32.9**	63.4	65.2	<0.050	<7.0	<4.0	<8.0	9.5
DM-54a	DM-54	2016	Year 3	Phase I	0-15	<1.0	<0.50	**73.5**	**18.5**	**47.0**	**23.7**	**75.0**	**78.1**	<0.050	<7.0	<4.0	<8.0	9.5
DM-54 Shallow	DM-54	2017	Year 4	Phase I	0-15	<1.0	<0.5	69.5	16.2	**43.8**	**39.1**	**78.7**	**79.3**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-54 depth																	
14-8394	DM-54	2014	Year 1	Phase I	35-40	**1.5**	<1.0	56.0	15.0	34.0	**22.0**	**82.0**	66.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-54	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-54	2016	Year 3	Phase I														#N/A
DM-54 Deep	DM-54	2017	Year 4	Phase I	30-40	<1.0	<0.5	62.9	15.7	**36.8**	**30.5**	**82.6**	69.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-55 surface																	
14-8384	DM-55	2014	Year 1	Phase I	5-10	**2.4**	<1.0	63.0	16.0	**39.0**	**28.0**	**79.0**	**81.0**	<0.010	<10	<10	<10	15.0
DM-55 (0-15)	DM-55	2015	Year 2	Phase I	0-15	**5.6**	<0.50	54.8	16.5	31.9	**23.1**	55.1	67.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-55a	DM-55	2016	Year 3	Phase I	0-15	<1.0	<0.50	56.9	15.6	33.8	**37.6**	73.6	65.7	<0.050	<7.0	<4.0	<8.0	9.5
DM-55 Shallow	DM-55	2017	Year 4	Phase I	0-15	<1.0	<0.5	70.4	**16.9**	35.9	**44.3**	**88.1**	**76.9**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-55 depth																	
14-8385	DM-55	2014	Year 1	Phase I	45-50	**2.4**	<1.0	56.0	15.0	36.0	**28.0**	72.0	**77.0**	<0.010	<10	<10	<10	15.0
DM-55 (30-40)	DM-55	2015	Year 2	Phase I	30-40	**5.2**	<0.50	58.7	**16.9**	32.0	**23.3**	58.3	69.7	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-55	2016	Year 3	Phase I														#N/A
DM-55 Deep	DM-55	2017	Year 4	Phase I	20-30	<1.0	<0.5	61.3	15.4	30.3	**38.3**	**76.8**	72.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-56 surface																	
14-8387	DM-56	2014	Year 1	Phase I	5-10	**1.5**	<1.0	68.0	15.0	36.0	16.0	**97.0**	61.0	<0.010	<10	<10	<10	15.0
DM-56 (0-15)	DM-56	2015	Year 2	Phase I	0-15	**1.7**	<0.50	67.8	**17.5**	**41.8**	14.2	**102.0**	55.9	<0.050	<7.0	<4.0	<8.0	9.5
DM-56a	DM-56	2016	Year 3	Phase I	0-15	<1.0	<0.50	56.0	14.1	30.8	14.7	74.2	50.7	<0.050	<7.0	<4.0	<8.0	9.5
DM-56 Shallow	DM-56	2017	Year 4	Phase I	0-15	<1.0	<0.5	48.0	12.9	28.6	16.1	57.8	59.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-56 depth																	
14-8388	DM-56	2014	Year 1	Phase I	45-50	**1.1**	<1.0	67.0	15.0	32.0	13.0	**100.0**	58.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-56	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-56	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-56	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-57 surface																	
14-8390/91	DM-57	2014	Year 1	Phase I	5-10	**1.3**	<1.0	62.5	12.0	36.0	<10	**83.5**	64.0	<0.010	<10	<10	<10	15.0
DM-57 (0-15)	DM-57	2015	Year 2	Phase I	0-15	**1.4**	<0.50	62.6	14.7	32.9	9.7	**81.9**	62.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-57a	DM-57	2016	Year 3	Phase I	0-15	<1.0	<0.50	68.7	**16.8**	**38.0**	11.9	**90.0**	62.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-57 Shallow	DM-57	2017	Year 4	Phase I	0-15	<1.0	<0.5	**76.9**	**19.9**	**47.4**	19.0	**96.0**	**79.3**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-57 depth																	
14-8392	DM-57	2014	Year 1	Phase I	40-45	1.0	<1.0	54.0	13.0	27.0	<10	**94.0**	56.0	<0.010	<10	<10	<10	15.0
DM-57 (40-50)	DM-57	2015	Year 2	Phase I	40-50	**1.7**	<0.50	66.9	15.4	34.6	10.2	**86.3**	64.3	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-57	2016	Year 3	Phase I														#N/A
DM-57 Deep	DM-57	2017	Year 4	Phase I	30-40	<1.0	<0.5	57.8	14.6	31.0	10.1	**93.2**	54.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-58 surface																	
14-8398	DM-58	2014	Year 1	Phase I	5-10	**1.5**	<1.0	**75.0**	**18.0**	**42.0**	14.0	**110.0**	**85.0**	<0.010	<10	<10	<10	15.0
DM-58 (0-15)	DM-58	2015	Year 2	Phase I	0-15	**1.9**	<0.50	63.1	**18.6**	**37.7**	12.8	**108.0**	**85.5**	<0.050	<7.0	<4.0	<8.0	9.5
DM-58a	DM-58	2016	Year 3	Phase I	0-15	<1.0	<0.50	46.9	14.1	29.9	15.8	67.5	**391.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-58 Shallow	DM-58	2017	Year 4	Phase I	0-15	<1.0	<0.5	64.5	**16.9**	33.6	12.3	**97.8**	65.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-58 depth																	
14-8400/01	DM-58	2014	Year 1	Phase I	45-50	1.0	<1.0	56.5	16.0	29.5	10.0	**94.5**	60.5	<0.010	<10	<10	<10	15.0
DM-58 (40-50) (Dup Avg)	DM-58	2015	Year 2	Phase I	40-50	**2.0**	<0.50	**75.2**	**18.6**	**40.4**	14.4	**97.1**	**111.3**	<0.050	<6.0	<4.0	<8.0	9.0
Not sampled - refusal	DM-58	2016	Year 3	Phase I														#N/A
DM-58 Deep	DM-58	2017	Year 4	Phase I	40-50	<1.0	<0.5	**72.5**	**18.3**	**42.9**	18.5	**81.4**	**79.2**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-59 surface																	
14-8402	DM-59	2014	Year 1	Phase I	5-10	0.8	<1.0	48.0	15.0	**37.0**	11.0	**100.0**	55.0	<0.010	<10	210.0	29.0	244.0
DM-59 (0-15)	DM-59	2015	Year 2	Phase I	0-15	<1.0	<0.50	33.1	**25.4**	**71.5**	3.8	**119.0**	33.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-59a	DM-59	2016	Year 3	Phase I	0-15	<1.0	<0.50	58.7	**18.1**	**41.5**	10.5	**99.2**	58.7	<0.050	<7.0	903.0	30.0	**936.5**
DM-59 Shallow (Dup Avg)	DM-59	2017	Year 4	Phase I	0-15	<1.0	<0.5	49.4	14.7	36.4	17.6	**77.6**	60.6	<0.05	149.0	2670.0	191.0	**3010.0**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-59 depth																	
14-8403	DM-59	2014	Year 1	Phase I	40-45	0.6	<1.0	37.0	11.0	**44.0**	<10	71.0	43.0	<0.010	28.0	720.0	29.0	**777.0**
Not sampled - refusal	DM-59	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-59	2016	Year 3	Phase I														#N/A
DM-59 Deep	DM-59	2017	Year 4	Phase I	40-50	<1.0	<0.5	48.3	15.8	**41.9**	15.5	68.9	70.0	<0.05	<7	2950.0	150.0	**3103.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-61 surface																	
14-8407	DM-61	2014	Year 1	Phase I	5-10	0.9	<1.0	53.0	15.0	**46.0**	<10	**81.0**	63.0	<0.010	<10	<10	<10	15.0
DM-61 (0-15)	DM-61	2015	Year 2	Phase I	0-15	**1.7**	<0.50	50.2	14.2	30.7	12.9	54.8	57.7	<0.050	<7.0	<4.0	<8.0	9.5
DM-61a	DM-61	2016	Year 3	Phase I	0-15	<1.0	<0.50	57.6	**20.0**	**39.6**	7.0	**122.0**	48.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-61 Shallow	DM-61	2017	Year 4	Phase I	0-15	<1.0	<0.5	55.3	16.0	**42.8**	7.8	68.2	69.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-61 depth																	
14-8408	DM-61	2014	Year 1	Phase I	40-45	**1.2**	<1.0	63.0	**18.0**	**44.0**	<10	**97.0**	73.0	<0.010	<10	<10	<10	15.0
DM-61 (20-30)	DM-61	2015	Year 2	Phase I	20-30	**1.5**	<0.50	44.2	**21.5**	**54.4**	10.1	**91.5**	54.2	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-61	2016	Year 3	Phase I														#N/A
DM-61 Deep	DM-61	2017	Year 4	Phase I	30-40	<1.0	<0.5	49.9	15.9	**39.0**	8.1	72.5	66.1	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Pallet Line Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**71.8**	**16.53**	**36.7**	**21.1**	**74.6**	**75.3**	**0.100**				**253.4**
Baseline Data - Standard Deviation						0.00	0.00	35.8	6.3	17.1	24.1	25.3	33.1	0.000				447.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**179.2**	**35.4**	**88.1**	**93.5**	**150.5**	**174.6**	**0.100**				**1596.9**
	DM-62 surface																	
14-8404	DM-62	2014	Year 1	Phase I	5-10	**1.1**	<1.0	53.0	**19.0**	33.0	<10	**150.0**	46.0	<0.010	<10	<10	<10	15.0
DM-62 (0-15)	DM-62	2015	Year 2	Phase I	0-15	**1.4**	<0.50	53.7	**18.2**	**49.7**	11.8	**99.2**	60.6	<0.050	<7.0	<4.0	<8.0	9.5
DM-62a	DM-62	2016	Year 3	Phase I	0-15	<1.0	<0.50	50.3	**18.7**	**42.7**	10.2	**101.0**	54.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-62 Shallow	DM-62	2017	Year 4	Phase I	0-15	<1.0	<0.5	49.6	15.0	**55.8**	15.0	66.9	65.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-62 depth																	
14-8405	DM-62	2014	Year 1	Phase I	40-45	0.9	<1.0	53.0	16.0	36.0	<10	**110.0**	51.0	<0.010	<10	<10	<10	15.0
DM-62 (20-30)	DM-62	2015	Year 2	Phase I	20-30	1.0	<0.50	57.8	**18.6**	**57.1**	13.0	**98.6**	65.9	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-62	2016	Year 3	Phase I														#N/A
DM-62 Deep (Dup Avg)	DM-62	2017	Year 4	Phase I	40-50	<1.0	<0.5	46.8	13.8	**58.2**	16.4	60.8	66.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

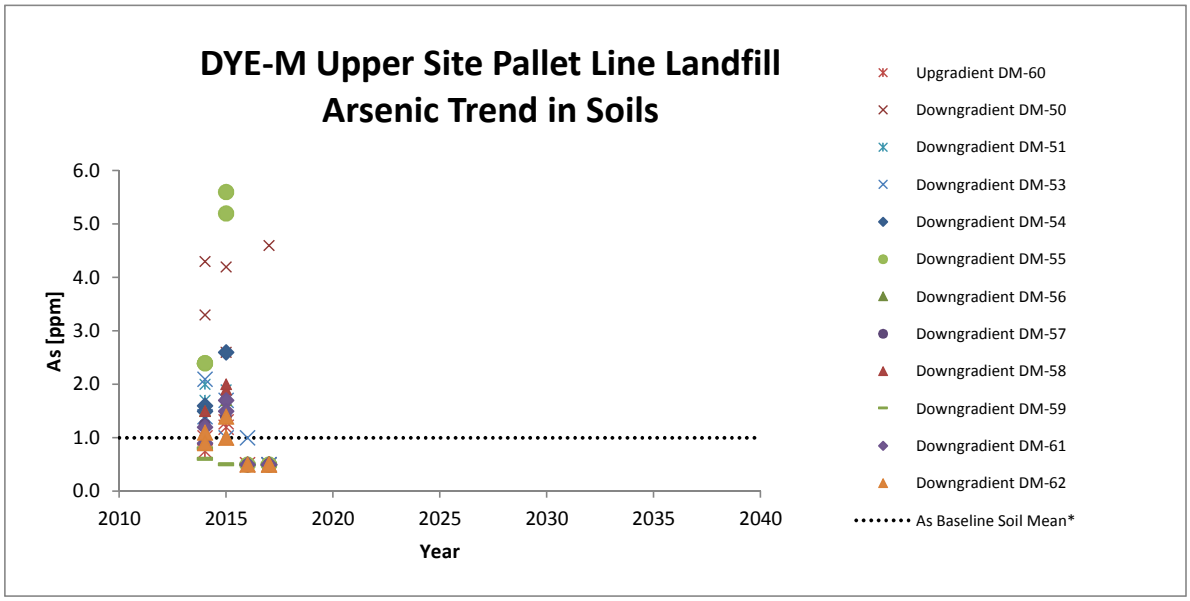
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Upper Site Pallet Line Landfill Trends in Soil Inorganics, PCBs and Modified TPH

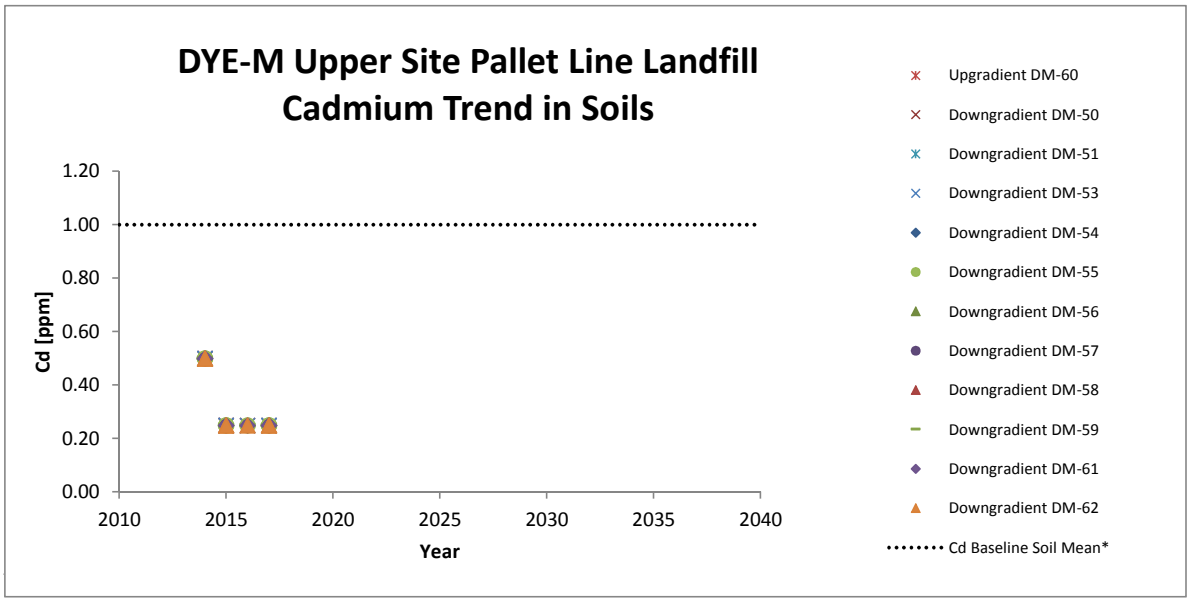
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

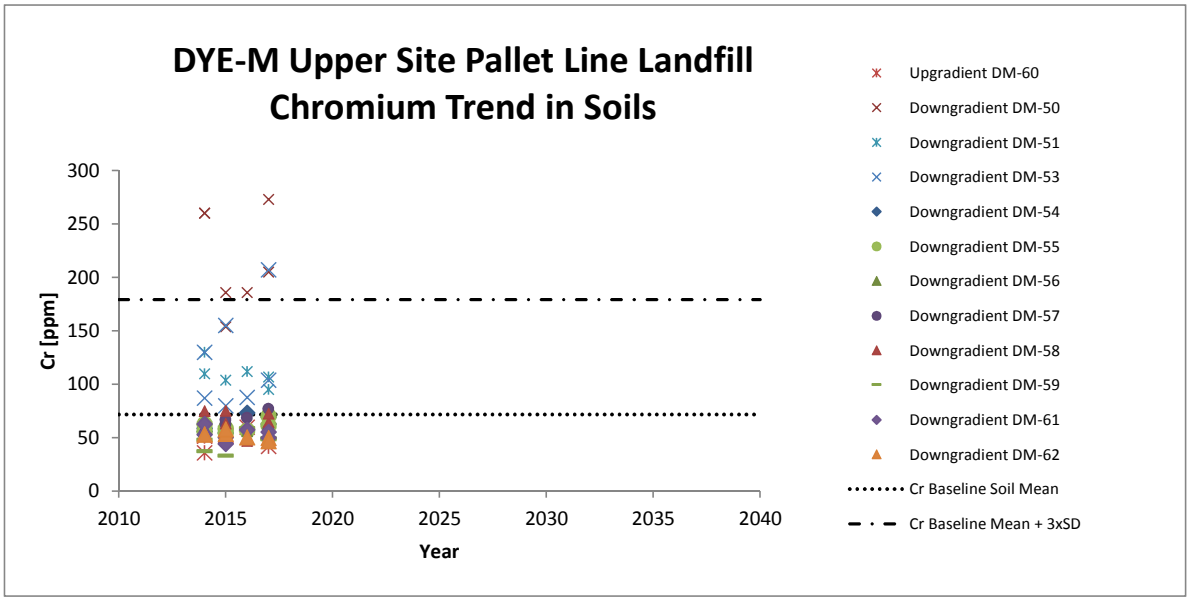


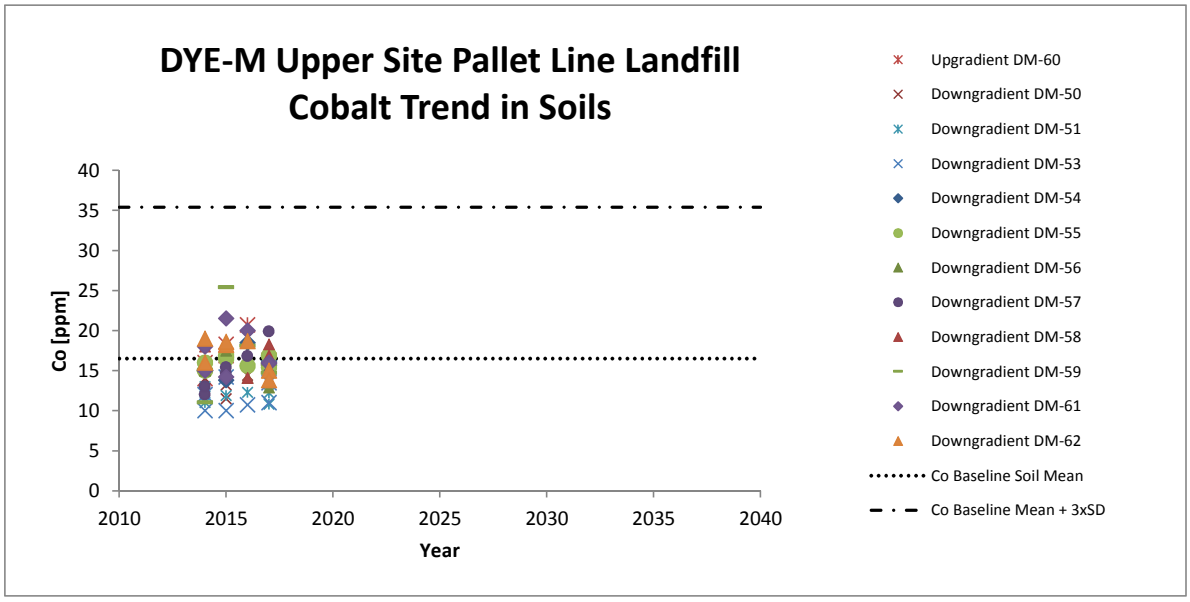
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



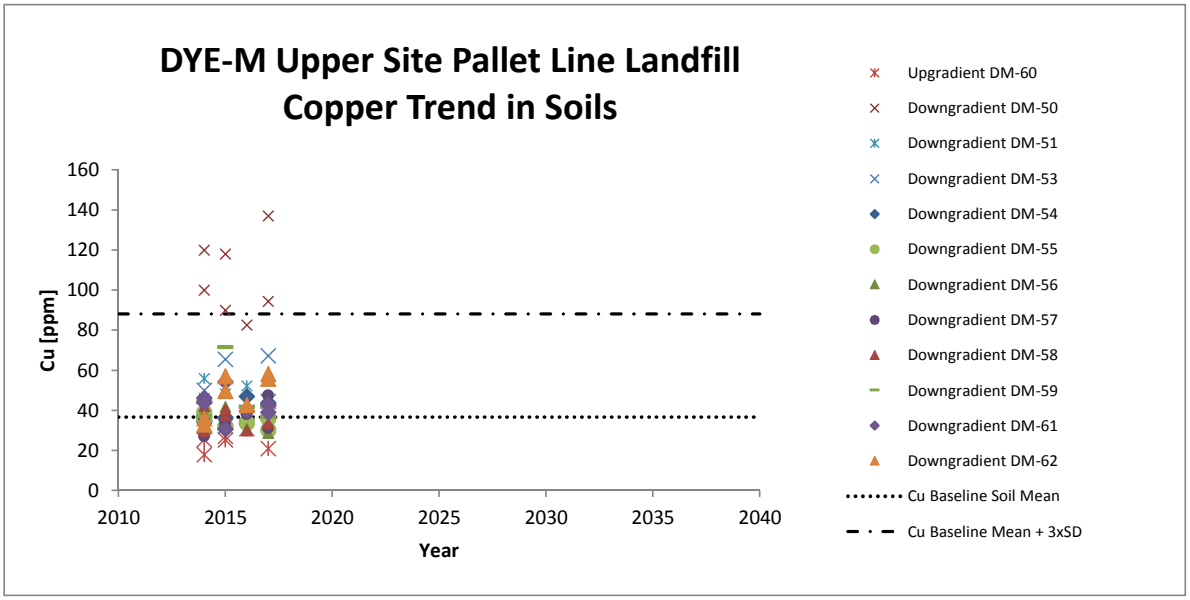
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

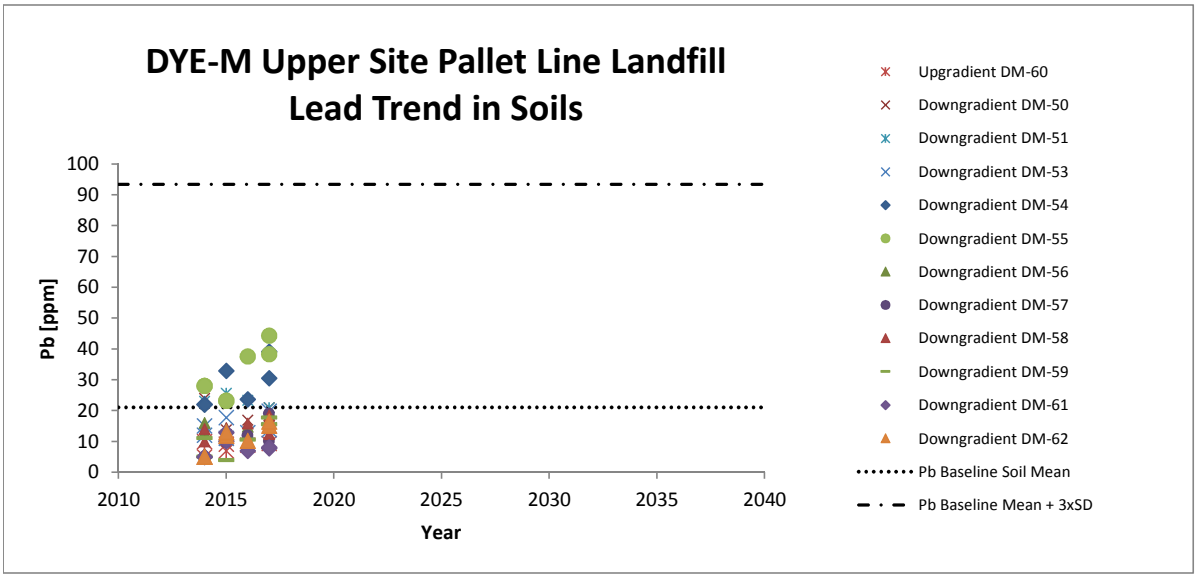
DYE-M Upper Site Pallet Line Landfill Trends in Soil Inorganics, PCBs and Modified TPH



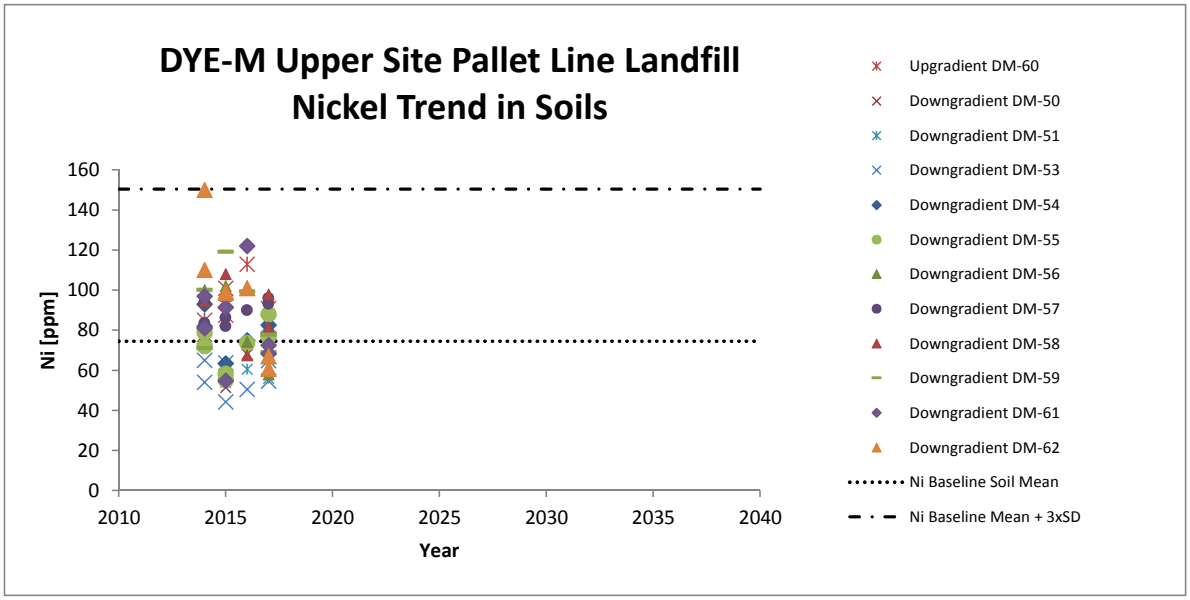


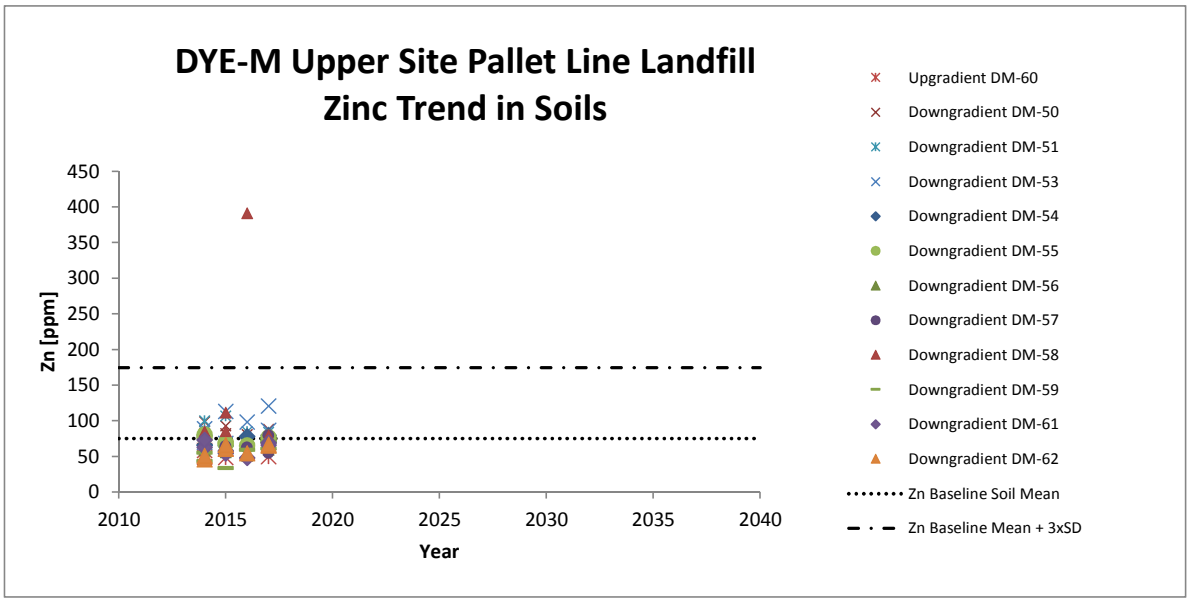
DYE-M Upper Site Pallet Line Landfill Trends in Soil Inorganics, PCBs and Modified TPH



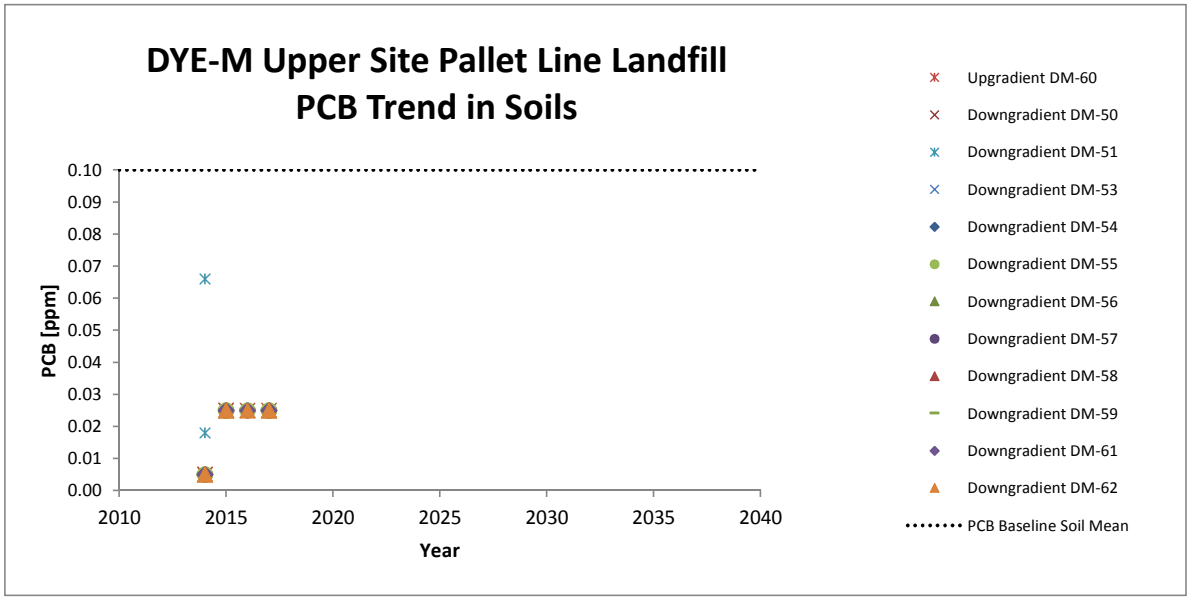


DYE-M Upper Site Pallet Line Landfill Trends in Soil Inorganics, PCBs and Modified TPH

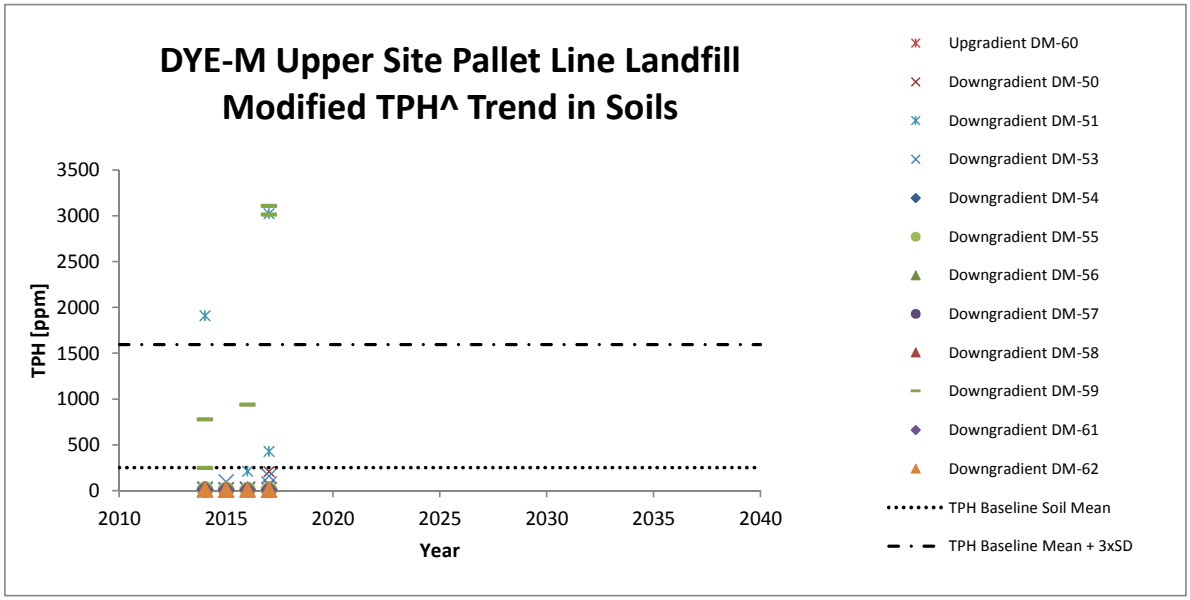




DYE-M Upper Site Pallet Line Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**41.2**	**14.2**	**26.6**	**10.0**	**59.4**	**57.1**	**0.20**				**162.1**
Baseline Data - Standard Deviation						0.00	0.00	24.5	5.8	15.9	0.0	23.9	30.4	0.00				275.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**114.5**	**31.5**	**74.2**	**10.0**	**131.2**	**148.2**	**0.20**				**987.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	MW06-18 surface																	
14-8292	MW06-18	2014	Year 1	Phase I	5-10	0.8	<1.0	33.0	12.0	25.0	<10	**62.0**	44.0	0.0340	<10	<10	<10	15.0
Not sampled, buried	MW06-18	2015	Year 2	Phase I														#N/A
MW06-18a	MW06-18	2016	Year 3	Phase I	0-15	<1.0	<0.50	34.1	11.9	**34.5**	**15.1**	47.8	48.2	0.0600	<7.0	<4.0	36.0	41.5
MW06-18 Shallow	MW06-18	2017	Year 4	Phase I	0-15	<1.0	<0.5	40.9	8.9	**28.2**	**16.3**	49.7	50.0	<0.05	<7	163.0	53.0	**219.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	MW06-18 depth																	
14-8293	MW06-18	2014	Year 1	Phase I	40-50	0.8	<1.0	33.0	12.0	24.0	<10	**63.0**	48.0	<0.010	<10	<10	<10	15.0
Not sampled, buried	MW06-18	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW06-18	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW06-18	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**41.2**	**14.2**	**26.6**	**10.0**	**59.4**	**57.1**	**0.20**				**162.1**
Baseline Data - Standard Deviation						0.00	0.00	24.5	5.8	15.9	0.0	23.9	30.4	0.00				275.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**114.5**	**31.5**	**74.2**	**10.0**	**131.2**	**148.2**	**0.20**				**987.9**
Downgradient																		
	MW06-19 surface																	
14-8294	MW06-19	2014	Year 1	Phase I	5-10	0.9	<1.0	36.0	13.0	19.0	<10	**87.0**	36.0	<0.010	<10	<10	<10	15.0
MW 06-19 (0-20)	MW06-19	2015	Year 2	Phase I	0-20	<1.0	<0.50	36.2	13.4	18.9	7.6	**82.8**	37.9	<0.050	<7.0	<4.0	<8.0	9.5
MW06-19a	MW06-19	2016	Year 3	Phase I	0-15	<1.0	<0.50	40.4	**15.0**	23.7	9.9	**81.8**	36.4	<0.050	<7.0	<4.0	<8.0	9.5
MW06-19 Shallow	MW06-19	2017	Year 4	Phase I	0-15	<1.0	<0.5	**42.1**	12.8	19.5	8.4	**73.4**	45.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	MW06-19 depth																	
14-8295	MW06-19	2014	Year 1	Phase I	25-35	0.5	<1.0	30.0	12.0	16.0	<10	**82.0**	30.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	MW06-19	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW06-19	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW06-19	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**41.2**	**14.2**	**26.6**	**10.0**	**59.4**	**57.1**	**0.20**				**162.1**
Baseline Data - Standard Deviation						0.00	0.00	24.5	5.8	15.9	0.0	23.9	30.4	0.00				275.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**114.5**	**31.5**	**74.2**	**10.0**	**131.2**	**148.2**	**0.20**				**987.9**
	MW06-20 surface																	
14-8297	MW06-20	2014	Year 1	Phase I	5-10	0.7	<1.0	27.0	11.0	26.0	<10	53.0	47.0	<0.010	<10	<10	<10	15.0
MW 06-20 (0-20)	MW06-20	2015	Year 2	Phase I	0-15	**1.2**	<0.50	28.1	11.9	23.3	5.7	**67.2**	34.6	<0.050	<7.0	<4.0	<8.0	9.5
MW06-20a	MW06-20	2016	Year 3	Phase I	0-15	<1.0	<0.50	**42.5**	**18.1**	**54.2**	**10.8**	**72.6**	**67.1**	<0.050	<7.0	<4.0	<8.0	9.5
MW06-20	MW06-20	2017	Year 4	Phase I	0-15	<1.0	<0.5	25.7	11.6	26.3	5.5	55.3	48.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	MW06-20 depth																	
14-8298	MW06-20	2014	Year 1	Phase I	40-45	0.9	<1.0	33.0	13.0	**35.0**	<10	**65.0**	56.0	<0.010	<10	<10	<10	15.0
Not sampled, refusal	MW06-20	2015	Year 2	Phase I														#N/A
Not sampled - refusal	MW06-20	2016	Year 3	Phase I														#N/A
Not sampled - refusal	MW06-20	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**41.2**	**14.2**	**26.6**	**10.0**	**59.4**	**57.1**	**0.20**				**162.1**
Baseline Data - Standard Deviation						0.00	0.00	24.5	5.8	15.9	0.0	23.9	30.4	0.00				275.3
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**114.5**	**31.5**	**74.2**	**10.0**	**131.2**	**148.2**	**0.20**				**987.9**
	MW07-21 surface																	
14-8300/01	MW07-21	2014	Year 1	Phase I	5-10	0.6	<1.0	24.0	8.8	16.0	<10	49.0	34.0	<0.010	<10	<10	<10	15.0
MW 07-21 (0-15)	MW07-21	2015	Year 2	Phase I	0-15	**1.1**	<0.50	31.1	14.0	25.8	7.3	**76.0**	42.8	<0.050	<7.0	<4.0	<8.0	9.5
MW07-21a	MW07-21	2016	Year 3	Phase I	0-15	<1.0	<0.50	22.8	10.2	21.8	6.5	49.3	32.5	<0.050	<7.0	<4.0	<8.0	9.5
MW07-21 Shallow	MW07-21	2017	Year 4	Phase I	0-15	<1.0	<0.5	30.2	13.1	25.0	6.8	**75.1**	42.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	MW07-21 depth																	
14-8302	MW07-21	2014	Year 1	Phase I	40-50	0.6	<1.0	28.0	9.9	19.0	<10	55.0	39.0	<0.010	<10	<10	<10	15.0
MW 07-21 (30-40)	MW07-21	2015	Year 2	Phase I	30-40	<1.0	<0.50	23.6	11.0	18.6	5.7	**63.1**	30.0	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	MW07-21	2016	Year 3	Phase I														#N/A
MW07-21 Deep	MW07-21	2017	Year 4	Phase I	40-50	<1.0	<0.5	30.2	12.1	24.3	6.6	**71.1**	43.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

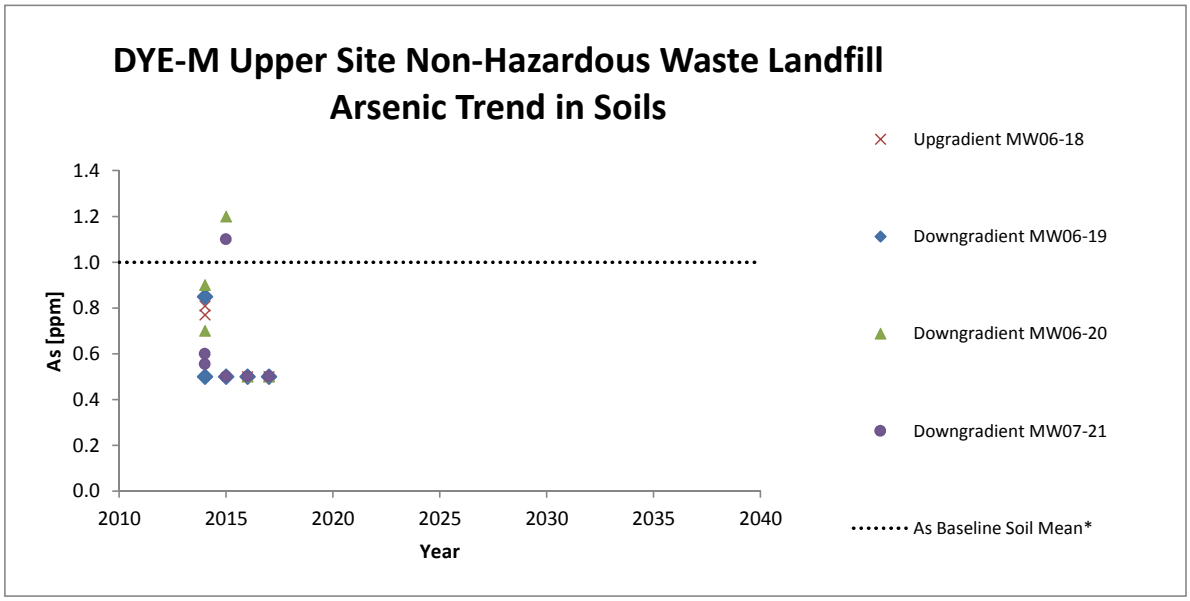
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

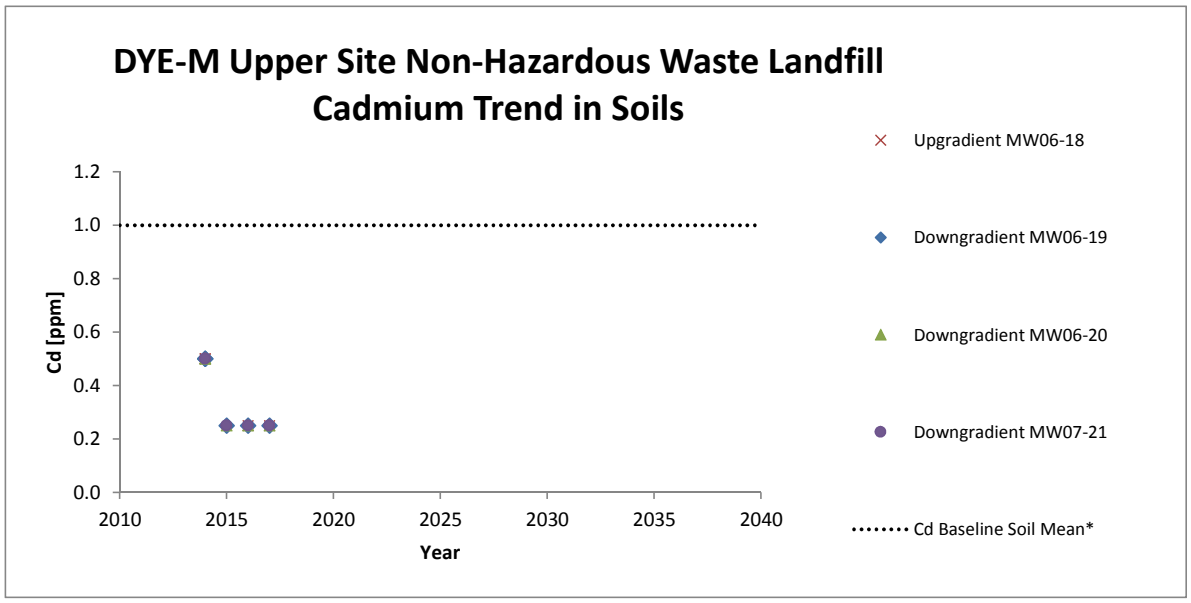
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

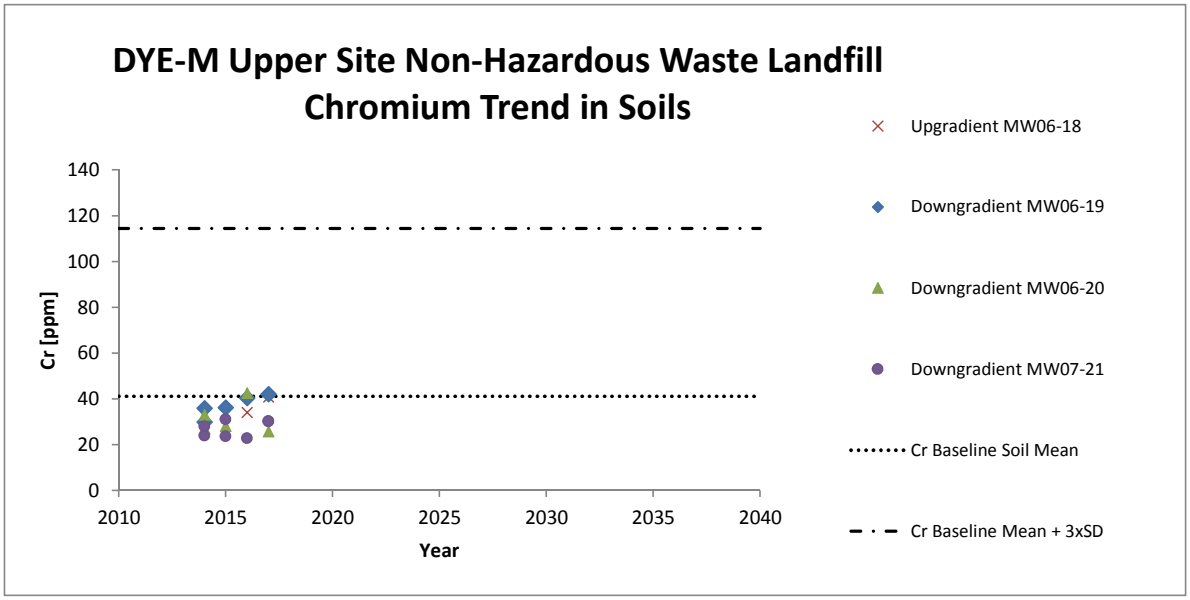


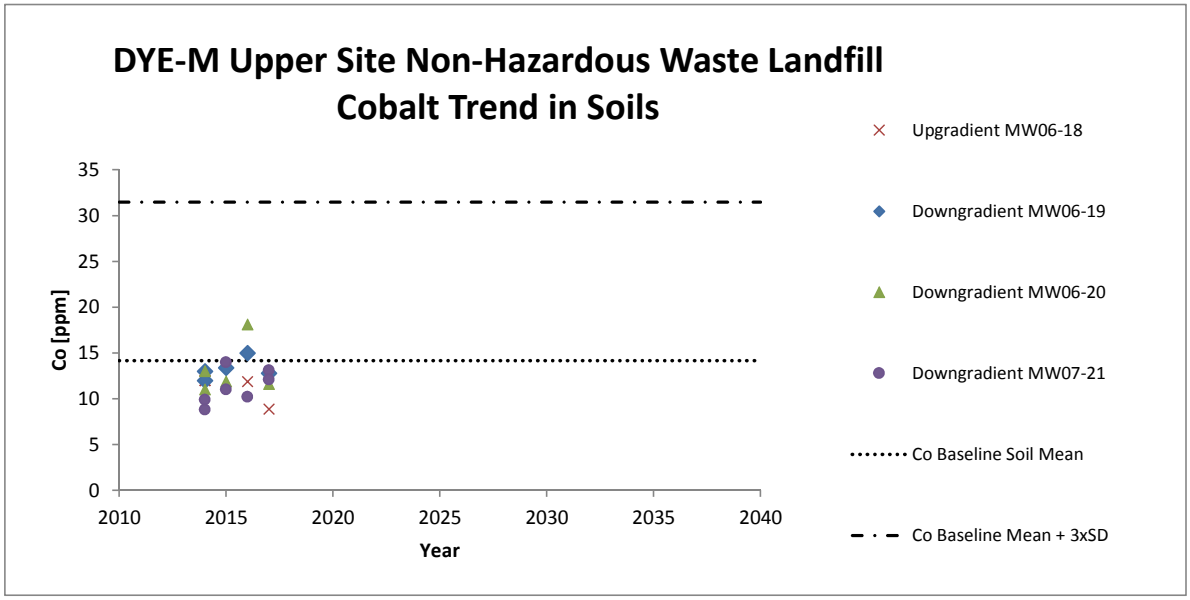
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



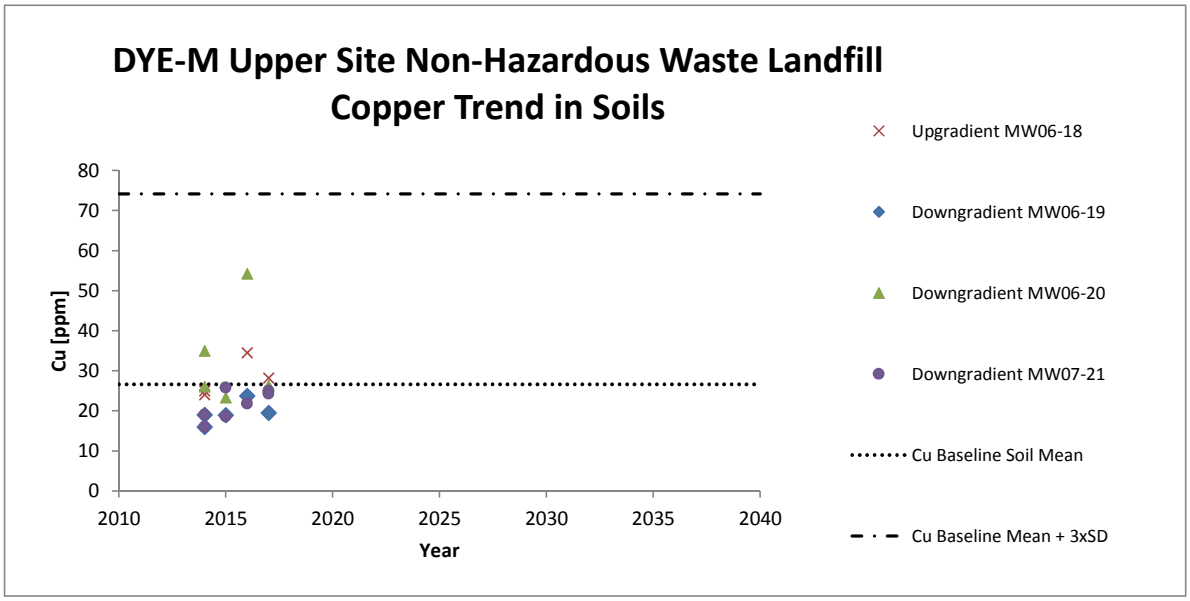
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

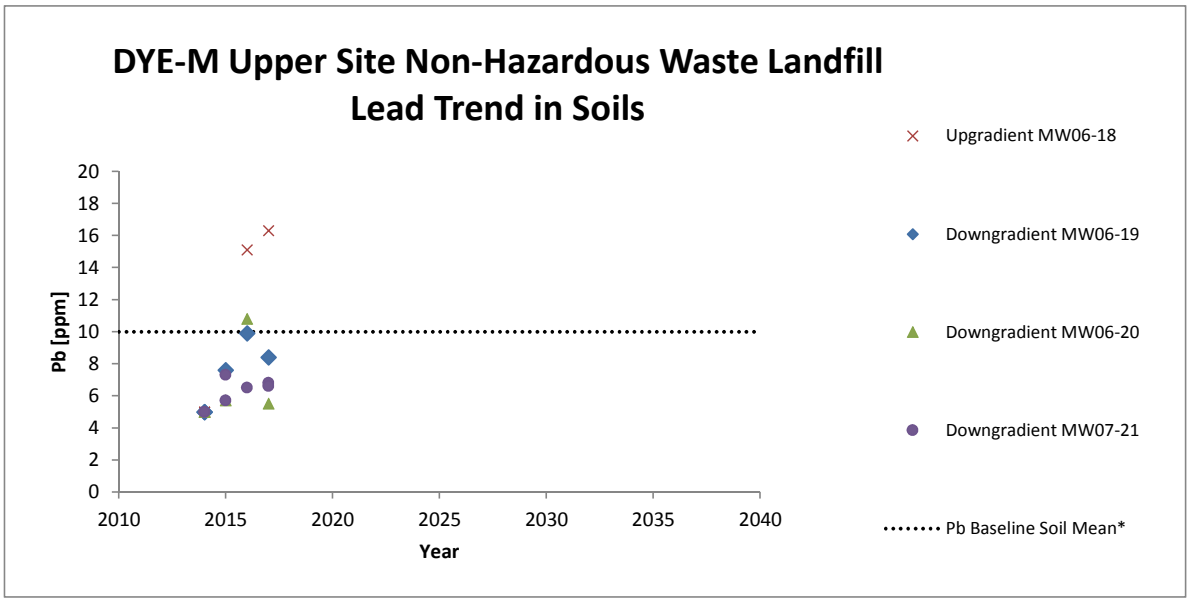
DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH





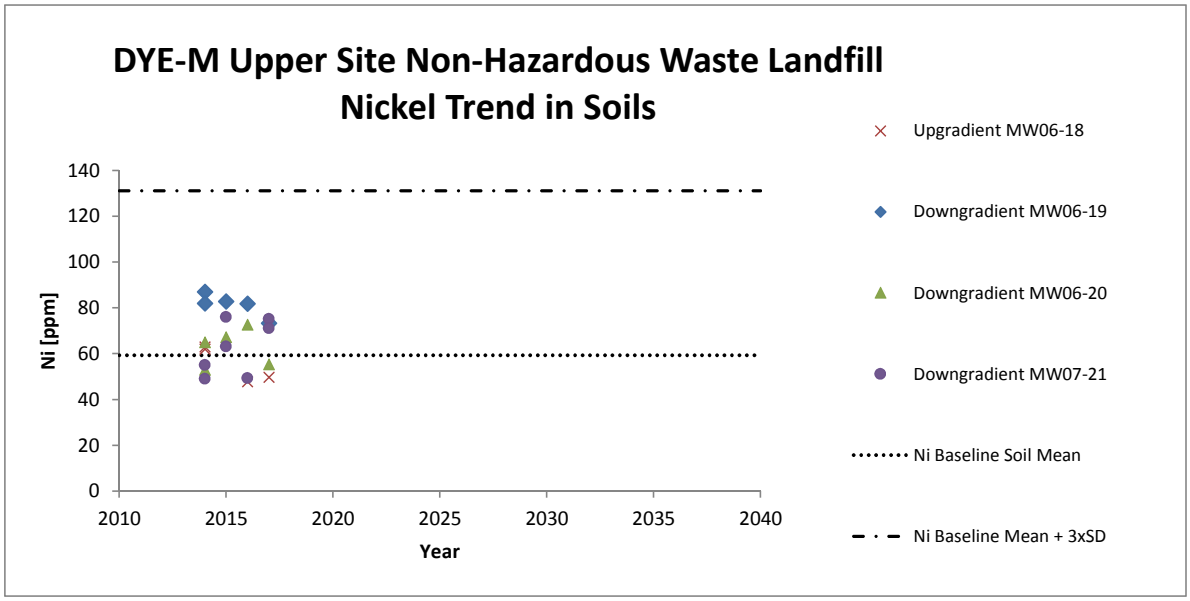
DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

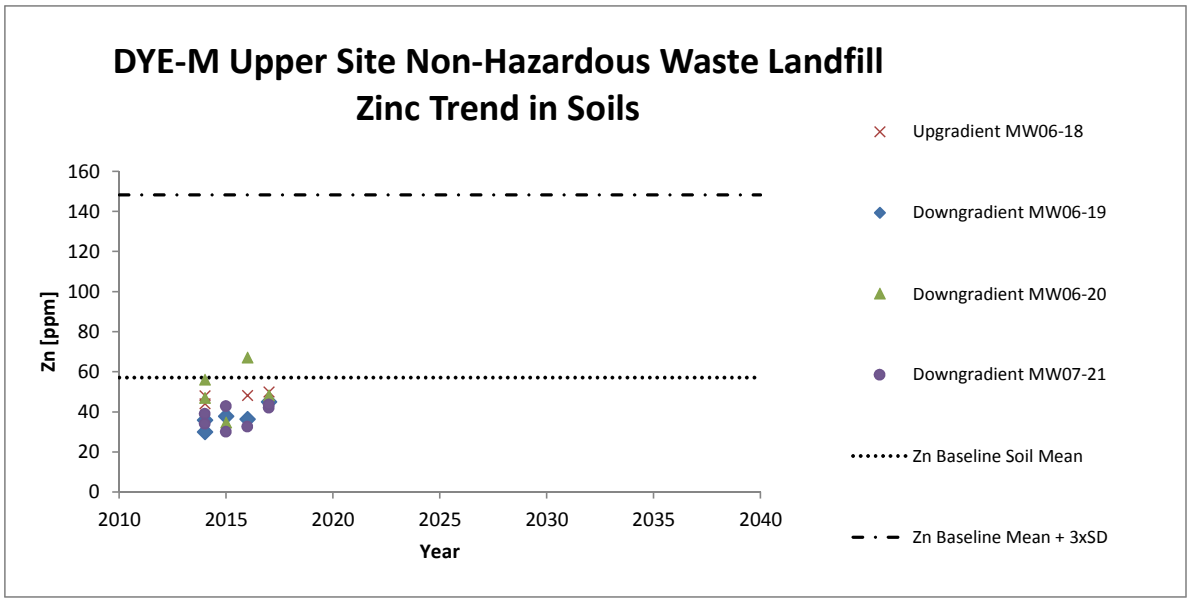




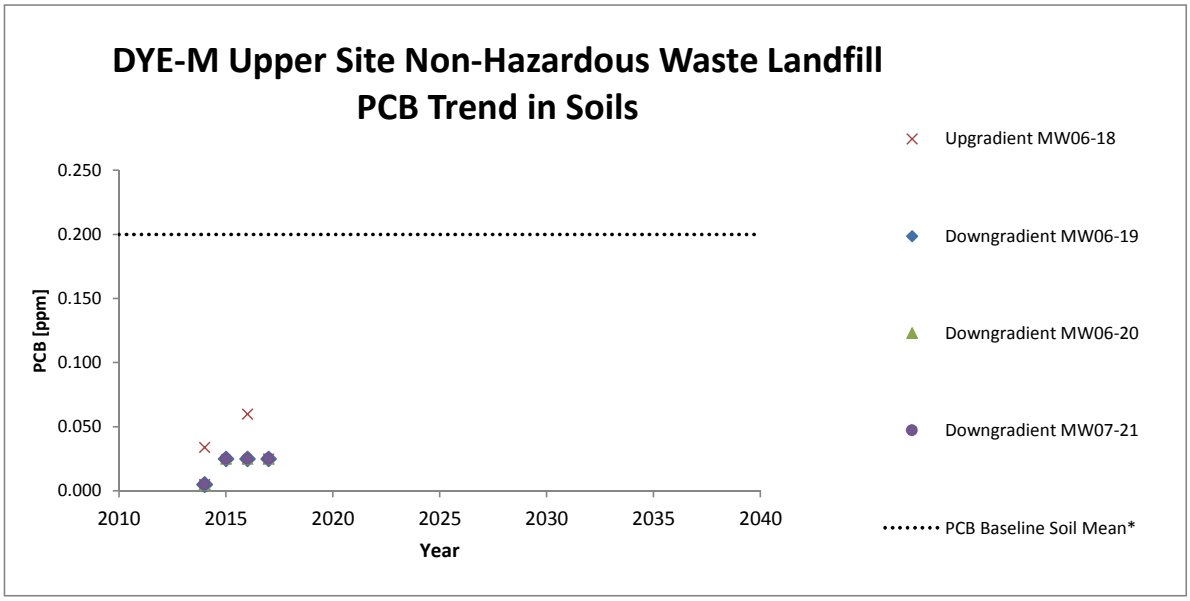
* Pb baseline arithmetic mean is equal to the baseline detection limit
* Pb baseline standard deviation = 0

DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH

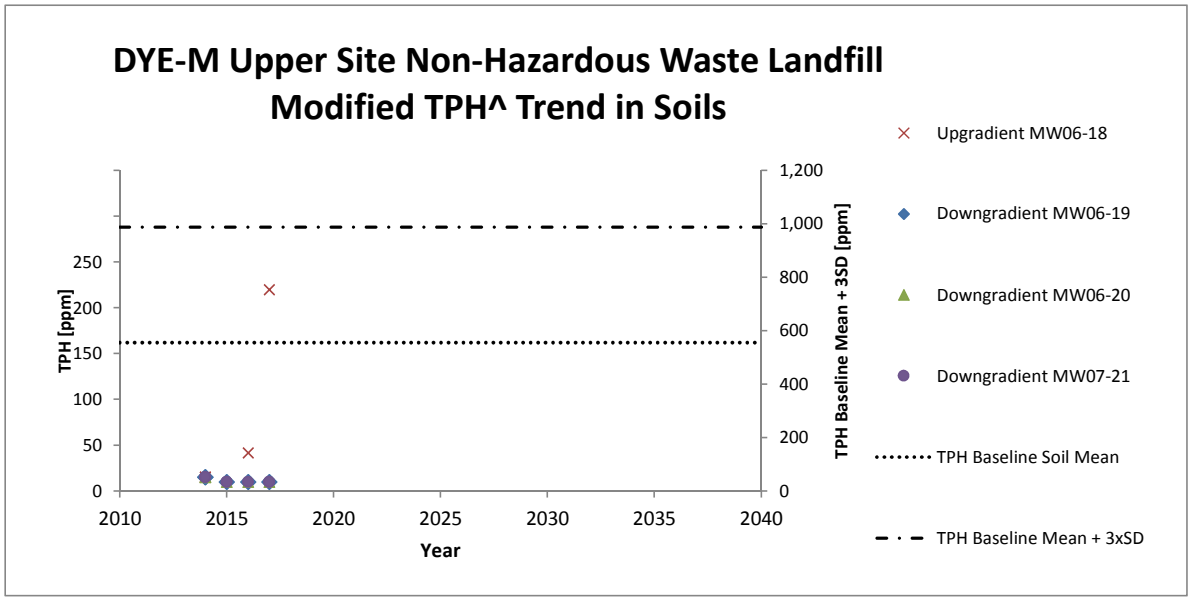




DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
08-9739	MW06-18				0.0078	<0.0010	0.0875	0.0294	0.1100	0.0406	0.0888	0.71	<0.050	<0.50	<1.0	0.78
09-21484	MW06-18				0.0200	0.0028	0.5880	0.0861	0.3760	0.2560	0.3910	18.20	<0.050	<0.50	<1.0	0.78
12-34964	MW06-18				0.0328	*<0.0010*	0.3000	*<0.0030*	*<0.0050*	*<0.0050*	*0.0061*	12.00	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9741	MW06-19				<0.0030	<0.0010	0.1900	0.0088	0.0325	<0.010	0.1100	0.05	<0.050	<0.50	<1.0	0.78
08-9740	MW06-20				0.0053	<0.0010	0.1700	0.0644	0.2500	0.0313	0.1900	1.00	<0.050	<0.50	<1.0	0.78
09-21497	MW06-19				<0.0030	0.0019	0.3100	0.0740	0.2200	0.0883	0.1900	0.29	<0.050	<0.50	<1.0	0.78
09-21493	MW06-20				0.0059	0.0033	0.3800	0.1300	0.5000	0.0681	0.3500	6.04	<0.050	<0.50	<1.0	0.78
11-12187	MW06-19				<0.0030	*<0.0010*	*0.0059*	*<0.0030*	*<0.0050*	*<0.010*	*0.0089*	0.33	<0.050	<0.50	<1.0	0.78
11-12189	MW07-21				0.0059	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.56	<0.050	<0.50	<1.0	0.78
12-34965	MW06-19				0.0025	*<0.0010*	0.1100	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.09	<0.050	<0.50	<1.0	0.78
12-34963	MW06-20				0.0183	*<0.0010*	0.4000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	9.10	<0.050	<0.50	<1.0	0.78
13-29590/91	MW06-19				<0.0010	*<0.0010*	0.0775	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.10	<0.050	<0.50	<1.0	0.78
13-29592	MW06-20				0.0048	*<0.0010*	0.0720	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	6.30	<0.050	<0.50	<1.0	0.78
13-29593	MW07-21				0.0210	*<0.0010*	0.5000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.59	<0.050	<0.50	<1.0	0.78
		N value			14	6	12	6	6	6	6	14				14
Baseline Data - Arithmetic Mean					0.0092	0.0016	0.2654	0.0654	0.2481	0.0815	0.2200	3.95				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0092**	**0.0016**	**0.2654**	**0.0654**	**0.2481**	**0.0815**	**0.2200**	**3.95**				**1.00**
Baseline Data - Standard Deviation					0.0098	0.0013	0.1750	0.0429	0.1710	0.0902	0.1243	5.67				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0387**	**0.0054**	**0.7904**	**0.1940**	**0.7610**	**0.3523**	**0.5929**	**20.96**				**1.00**
**** If baseline arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																
Dissolved metals results (italicized) have not been included in the calculation of N value, baseline arithmetic mean or standard deviation. Total metals results (i.e., those used in calculations) are not italicized.																
Monitoring Data													**TPH Sum will appear when F1, F2 and F3 fractions are entered.**			
Upgradient MW06-18																
Not sampled	MW06-18	2014	Year 1	Phase I												#N/A
Not sampled, buried	MW06-18	2015	Year 2	Phase I												#N/A
Not sampled - dry	MW06-18	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW06-18	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
08-9739	MW06-18				0.0078	<0.0010	0.0875	0.0294	0.1100	0.0406	0.0888	0.71	<0.050	<0.50	<1.0	0.78
09-21484	MW06-18				0.0200	0.0028	0.5880	0.0861	0.3760	0.2560	0.3910	18.20	<0.050	<0.50	<1.0	0.78
12-34964	MW06-18				0.0328	*<0.0010*	0.3000	*<0.0030*	*<0.0050*	*<0.0050*	*0.0061*	12.00	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9741	MW06-19				<0.0030	<0.0010	0.1900	0.0088	0.0325	<0.010	0.1100	0.05	<0.050	<0.50	<1.0	0.78
08-9740	MW06-20				0.0053	<0.0010	0.1700	0.0644	0.2500	0.0313	0.1900	1.00	<0.050	<0.50	<1.0	0.78
09-21497	MW06-19				<0.0030	0.0019	0.3100	0.0740	0.2200	0.0883	0.1900	0.29	<0.050	<0.50	<1.0	0.78
09-21493	MW06-20				0.0059	0.0033	0.3800	0.1300	0.5000	0.0681	0.3500	6.04	<0.050	<0.50	<1.0	0.78
11-12187	MW06-19				<0.0030	*<0.0010*	*0.0059*	*<0.0030*	*<0.0050*	*<0.010*	*0.0089*	0.33	<0.050	<0.50	<1.0	0.78
11-12189	MW07-21				0.0059	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.56	<0.050	<0.50	<1.0	0.78
12-34965	MW06-19				0.0025	*<0.0010*	0.1100	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.09	<0.050	<0.50	<1.0	0.78
12-34963	MW06-20				0.0183	*<0.0010*	0.4000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	9.10	<0.050	<0.50	<1.0	0.78
13-29590/91	MW06-19				<0.0010	*<0.0010*	0.0775	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.10	<0.050	<0.50	<1.0	0.78
13-29592	MW06-20				0.0048	*<0.0010*	0.0720	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	6.30	<0.050	<0.50	<1.0	0.78
13-29593	MW07-21				0.0210	*<0.0010*	0.5000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.59	<0.050	<0.50	<1.0	0.78
		N value			14	6	12	6	6	6	6	14				14
Baseline Data - Arithmetic Mean					0.0092	0.0016	0.2654	0.0654	0.2481	0.0815	0.2200	3.95				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0092**	**0.0016**	**0.2654**	**0.0654**	**0.2481**	**0.0815**	**0.2200**	**3.95**				**1.00**
Baseline Data - Standard Deviation					0.0098	0.0013	0.1750	0.0429	0.1710	0.0902	0.1243	5.67				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0387**	**0.0054**	**0.7904**	**0.1940**	**0.7610**	**0.3523**	**0.5929**	**20.96**				**1.00**
Downgradient MW06-19																
Not sampled	MW06-19	2014	Year 1	Phase I												#N/A
MW06-19	MW06-19	2015	Year 2	Phase I	<0.0010	<0.00010	<0.0010	<0.00050	0.0015	<0.00010	<0.0010	0.2010	<0.025	<0.10	<0.10	0.1125
MW06-19 (Dup Avg)	MW06-19	2016	Year 3	Phase I	<0.0010	<0.00010	0.0020	0.0007	<0.0030	<0.00010	0.0240	<0.0050	<0.025	<0.10	<0.10	0.1125
MW06-19 (*dissolved metals*)	MW06-19	2017	Year 4	Phase I	*<0.001*	*<0.0001*	*<0.001*	*<0.0005*	*0.0059*	*0.0005*	*<0.001*	*0.0750*	<0.025	<0.1	<0.1	0.1125
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_{6}-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
08-9739	MW06-18				0.0078	<0.0010	0.0875	0.0294	0.1100	0.0406	0.0888	0.71	<0.050	<0.50	<1.0	0.78
09-21484	MW06-18				0.0200	0.0028	0.5880	0.0861	0.3760	0.2560	0.3910	18.20	<0.050	<0.50	<1.0	0.78
12-34964	MW06-18				0.0328	*<0.0010*	0.3000	*<0.0030*	*<0.0050*	*<0.0050*	*0.0061*	12.00	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9741	MW06-19				<0.0030	<0.0010	0.1900	0.0088	0.0325	<0.010	0.1100	0.05	<0.050	<0.50	<1.0	0.78
08-9740	MW06-20				0.0053	<0.0010	0.1700	0.0644	0.2500	0.0313	0.1900	1.00	<0.050	<0.50	<1.0	0.78
09-21497	MW06-19				<0.0030	0.0019	0.3100	0.0740	0.2200	0.0883	0.1900	0.29	<0.050	<0.50	<1.0	0.78
09-21493	MW06-20				0.0059	0.0033	0.3800	0.1300	0.5000	0.0681	0.3500	6.04	<0.050	<0.50	<1.0	0.78
11-12187	MW06-19				<0.0030	*<0.0010*	*0.0059*	*<0.0030*	*<0.0050*	*<0.010*	*0.0089*	0.33	<0.050	<0.50	<1.0	0.78
11-12189	MW07-21				0.0059	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.56	<0.050	<0.50	<1.0	0.78
12-34965	MW06-19				0.0025	*<0.0010*	0.1100	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.09	<0.050	<0.50	<1.0	0.78
12-34963	MW06-20				0.0183	*<0.0010*	0.4000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	9.10	<0.050	<0.50	<1.0	0.78
13-29590/91	MW06-19				<0.0010	*<0.0010*	0.0775	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.10	<0.050	<0.50	<1.0	0.78
13-29592	MW06-20				0.0048	*<0.0010*	0.0720	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	6.30	<0.050	<0.50	<1.0	0.78
13-29593	MW07-21				0.0210	*<0.0010*	0.5000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.59	<0.050	<0.50	<1.0	0.78
		N value			14	6	12	6	6	6	6	14				14
Baseline Data - Arithmetic Mean					0.0092	0.0016	0.2654	0.0654	0.2481	0.0815	0.2200	3.95				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0092**	**0.0016**	**0.2654**	**0.0654**	**0.2481**	**0.0815**	**0.2200**	**3.95**				**1.00**
Baseline Data - Standard Deviation					0.0098	0.0013	0.1750	0.0429	0.1710	0.0902	0.1243	5.67				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0387**	**0.0054**	**0.7904**	**0.1940**	**0.7610**	**0.3523**	**0.5929**	**20.96**				**1.00**
Downgradient MW06-20																
14-8180/81	MW06-20	2014	Year 1	Phase I	*<0.0010*	*<0.000090*	*<0.00050*	*<0.00030*	*<0.0010*	*<0.00050*	*<0.0010*	*0.2070*	<0.025	<0.10	<0.25	0.1875
Not sampled, could not open well	MW06-20	2015	Year 2	Phase I												#N/A
Not sampled - did not recover	MW06-20	2016	Year 3	Phase I												#N/A
Not sampled - frozen	MW06-20	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

DYE-M Upper Site Non-Hazardous Waste Landfill - Summary of Groundwater Monitoring Analytical Data

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Sample ID	Location	Date	Monitoring Year	Monitoring Phase	As (mg/L)	Cd (mg/L)	Cr (mg/L)	Co (mg/L)	Cu (mg/L)	Pb (mg/L)	Ni (mg/L)	Zn (mg/L)	F1 C_6-C_{10} (mg/L)	F2 C_{10}-C_{16} (mg/L)	F3 C_{16}-C_{34} (mg/L)	Modified TPH^* Total C6-C34 (mg/L)
Baseline Data																
Upgradient																
08-9739	MW06-18				0.0078	<0.0010	0.0875	0.0294	0.1100	0.0406	0.0888	0.71	<0.050	<0.50	<1.0	0.78
09-21484	MW06-18				0.0200	0.0028	0.5880	0.0861	0.3760	0.2560	0.3910	18.20	<0.050	<0.50	<1.0	0.78
12-34964	MW06-18				0.0328	*<0.0010*	0.3000	*<0.0030*	*<0.0050*	*<0.0050*	*0.0061*	12.00	<0.050	<0.50	<1.0	0.78
Downgradient																
08-9741	MW06-19				<0.0030	<0.0010	0.1900	0.0088	0.0325	<0.010	0.1100	0.05	<0.050	<0.50	<1.0	0.78
08-9740	MW06-20				0.0053	<0.0010	0.1700	0.0644	0.2500	0.0313	0.1900	1.00	<0.050	<0.50	<1.0	0.78
09-21497	MW06-19				<0.0030	0.0019	0.3100	0.0740	0.2200	0.0883	0.1900	0.29	<0.050	<0.50	<1.0	0.78
09-21493	MW06-20				0.0059	0.0033	0.3800	0.1300	0.5000	0.0681	0.3500	6.04	<0.050	<0.50	<1.0	0.78
11-12187	MW06-19				<0.0030	*<0.0010*	*0.0059*	*<0.0030*	*<0.0050*	*<0.010*	*0.0089*	0.33	<0.050	<0.50	<1.0	0.78
11-12189	MW07-21				0.0059	*<0.0010*	*<0.0050*	*<0.0030*	*<0.0050*	*<0.010*	*<0.0050*	0.56	<0.050	<0.50	<1.0	0.78
12-34965	MW06-19				0.0025	*<0.0010*	0.1100	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.09	<0.050	<0.50	<1.0	0.78
12-34963	MW06-20				0.0183	*<0.0010*	0.4000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	9.10	<0.050	<0.50	<1.0	0.78
13-29590/91	MW06-19				<0.0010	*<0.0010*	0.0775	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.10	<0.050	<0.50	<1.0	0.78
13-29592	MW06-20				0.0048	*<0.0010*	0.0720	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	6.30	<0.050	<0.50	<1.0	0.78
13-29593	MW07-21				0.0210	*<0.0010*	0.5000	*<0.0030*	*<0.0050*	*<0.0050*	*<0.0050*	0.59	<0.050	<0.50	<1.0	0.78
		N value			14	6	12	6	6	6	6	14				14
Baseline Data - Arithmetic Mean					0.0092	0.0016	0.2654	0.0654	0.2481	0.0815	0.2200	3.95				0.78
Baseline Data - Arithmetic Mean Corrected for Detection Limit					**0.0092**	**0.0016**	**0.2654**	**0.0654**	**0.2481**	**0.0815**	**0.2200**	**3.95**				**1.00**
Baseline Data - Standard Deviation					0.0098	0.0013	0.1750	0.0429	0.1710	0.0902	0.1243	5.67				0.00
Baseline Data - Corrected Arithmetic Mean + 3xStandard Deviation					**0.0387**	**0.0054**	**0.7904**	**0.1940**	**0.7610**	**0.3523**	**0.5929**	**20.96**				**1.00**
Downgradient MW07-21																
14-8182	MW07-21	2014	Year 1	Phase I	*<0.0010*	*<0.000090*	*<0.00050*	*<0.00030*	*<0.0010*	*<0.00050*	*<0.0010*	*<0.0030*	<0.025	<0.10	<0.25	0.1875
Not sampled, frozen	MW07-21	2015	Year 2	Phase I												#N/A
MW07-21	MW07-21	2016	Year 3	Phase I	<0.0010	<0.00010	<0.0010	<0.00050	0.0006	0.0003	<0.0010	0.0200	<0.025	<0.10	<0.10	0.1125
Not sampled - frozen	MW07-21	2017	Year 4	Phase I												#N/A
			Year 5	Phase I												#N/A
			Year 7	Phase II												#N/A
			Year 10	Phase II												#N/A
			Year 15	Phase II												#N/A
			Year 25	Phase II												#N/A
																#N/A
																#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

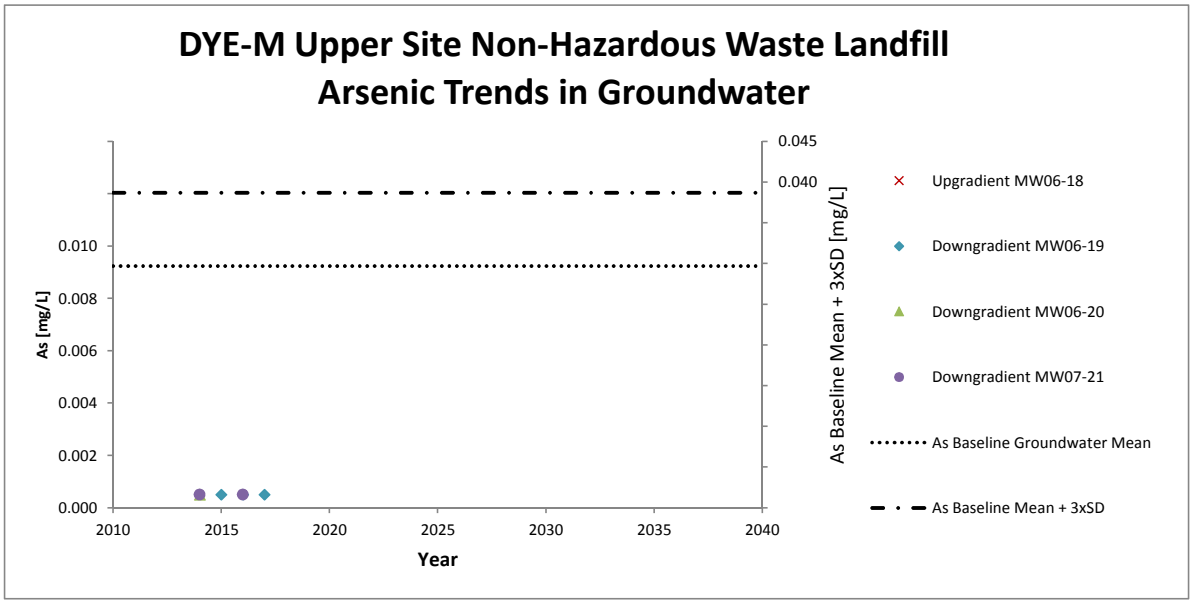
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**
XX	**Dissolved metals results**

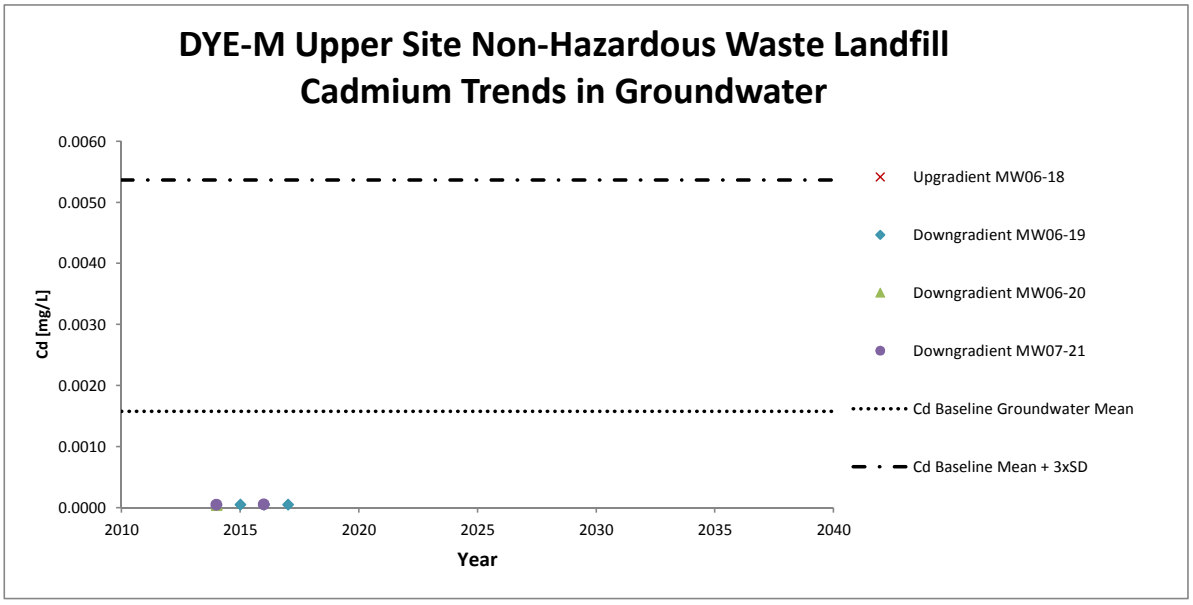
DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH

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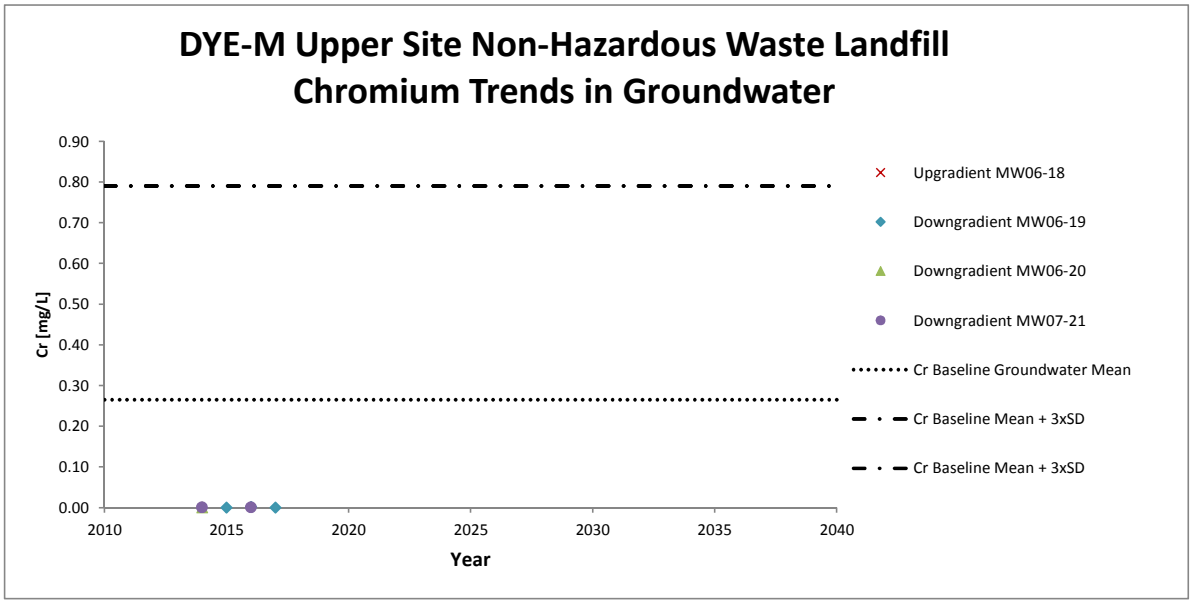
Where results are below detection, half of the detection limit has been used in the charts for the sample points.

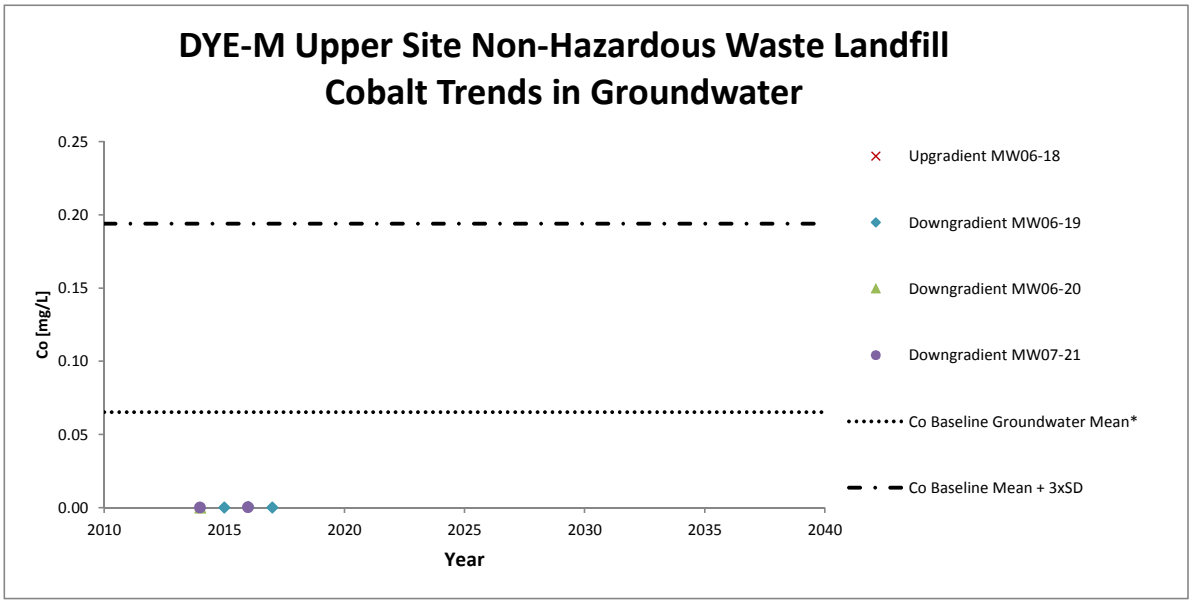
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.



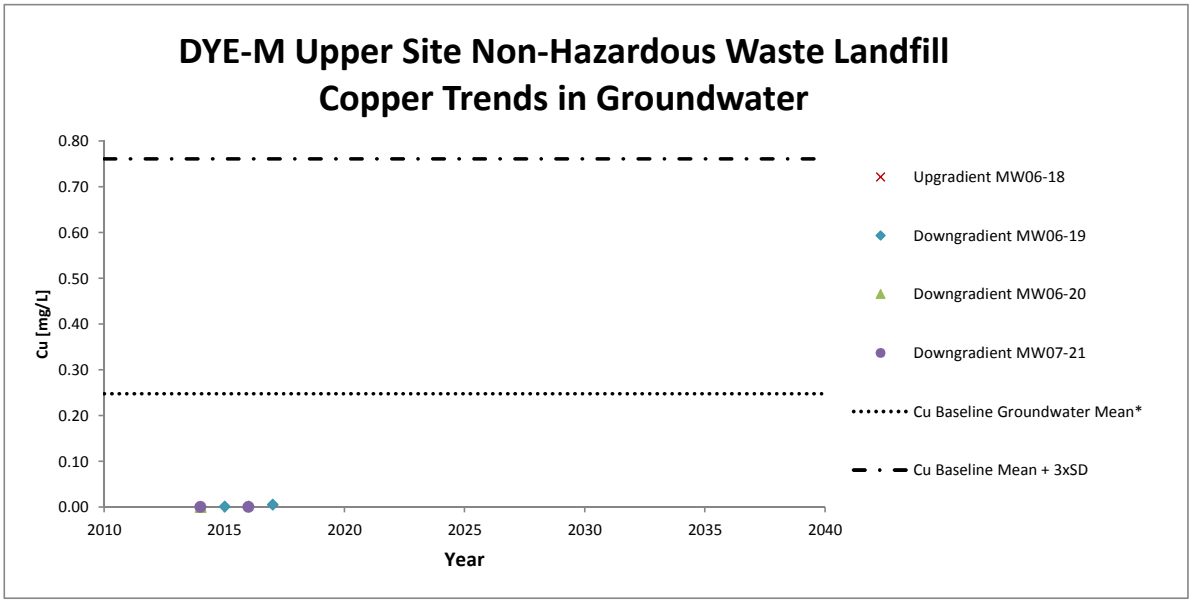


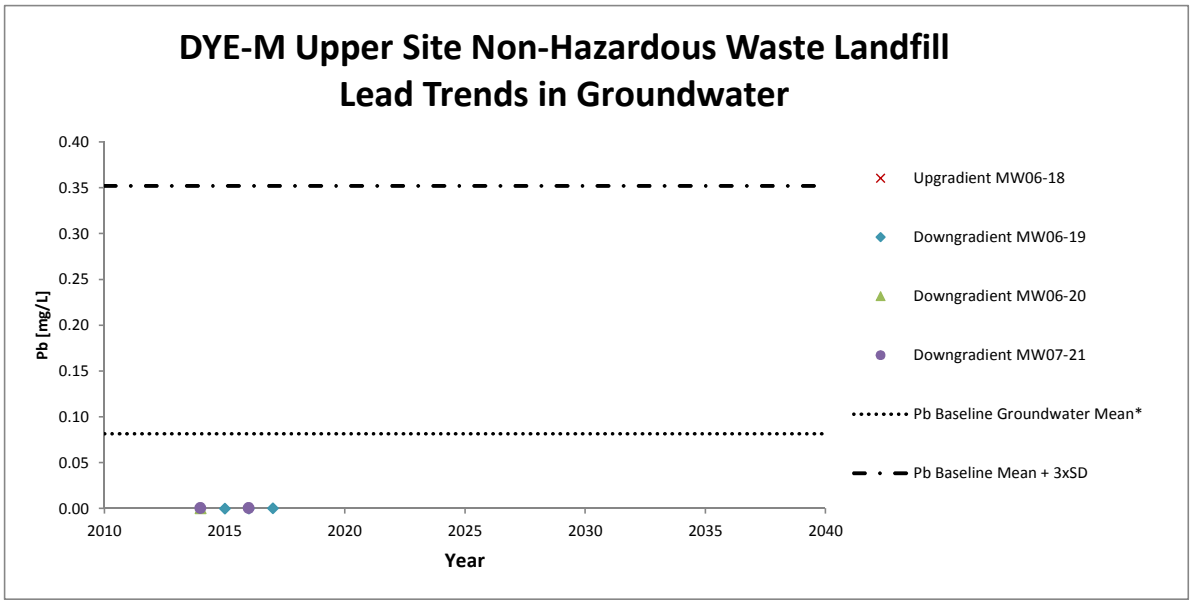
DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



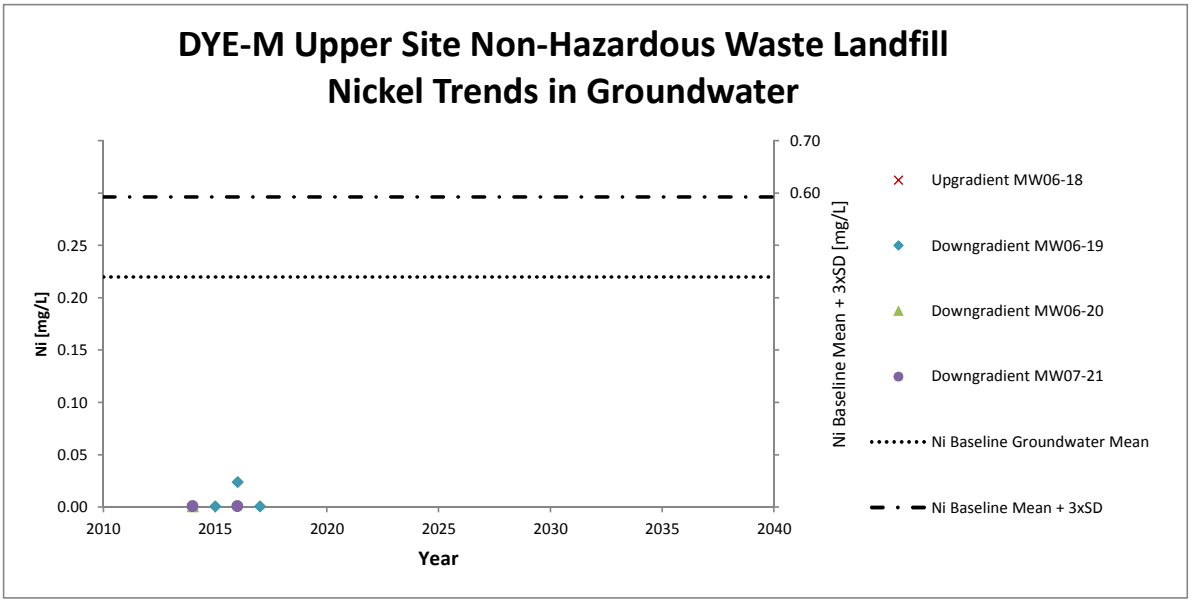


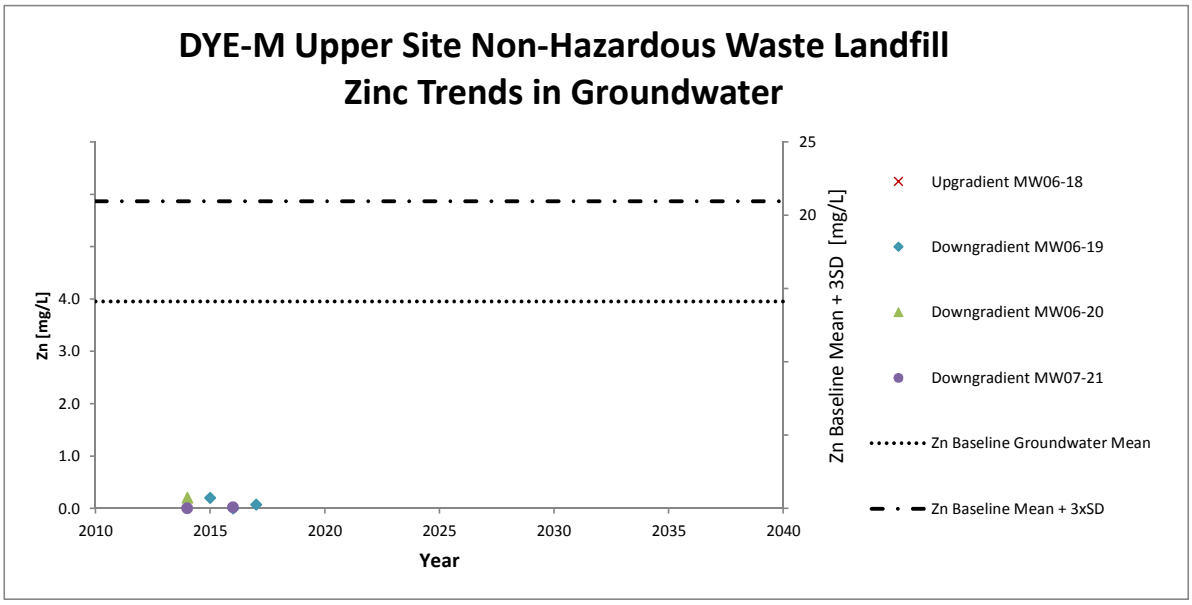
DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



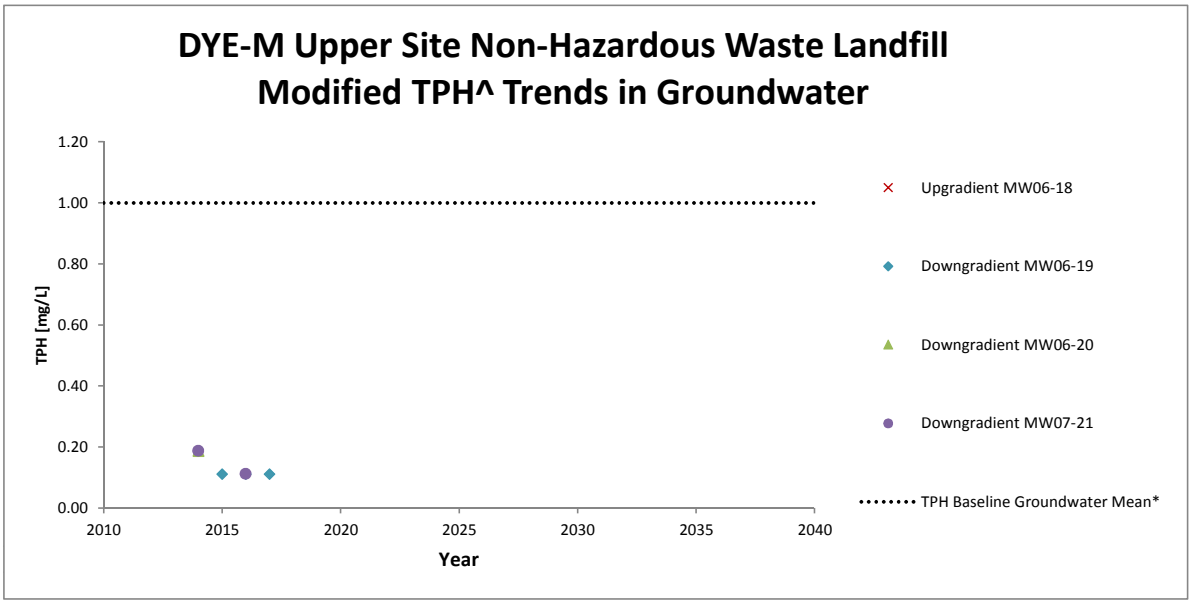


DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH





DYE-M Upper Site Non-Hazardous Waste Landfill Trends in Groundwater Inorganics, PCBs and Modified TPH



* TPH baseline arithmetic mean is equal to the baseline detection limit
* TPH baseline standard deviation = 0
^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-18 surface																	
14-8274	DM-18	2014	Year 1	Phase I	0-10	**1.1**	<1.0	26.0	9.6	23.0	**15.0**	28.0	59.0	<0.010	<10	<10	<10	15.0
DM-18 (0-10)	DM-18	2015	Year 2	Phase I	0-10	**4.4**	<0.50	**131.0**	**22.4**	**66.7**	**16.0**	**118.0**	58.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-18a	DM-18	2016	Year 3	Phase I	0-15	<1.0	<0.50	**40.1**	**10.9**	**33.1**	**14.7**	43.7	52.6	<0.050	<7.0	<4.0	<8.0	9.5
DM-18 Shallow	DM-18	2017	Year 4	Phase I	0-15	<1.0	<0.5	**72.7**	**12.2**	**36.0**	**14.4**	**67.2**	48.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-18 depth																	
14-8275	DM-18	2014	Year 1	Phase I	40-50	1.0	<1.0	21.0	9.6	23.0	**15.0**	25.0	**64.0**	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-18	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-18	2016	Year 3	Phase I														#N/A
DM-18 Deep	DM-18	2017	Year 4	Phase I	20-30	<1.0	<0.5	24.2	8.1	20.6	**10.8**	38.4	44.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
Downgradient																		
	DM-19 surface (also upgradient of Upper Site South Landfill West)																	
14-8277	DM-19	2014	Year 1	Phase I	0-10	0.6	<1.0	20.0	6.4	17.0	<10	24.0	42.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-19	2015	Year 2	Phase I														#N/A
DM-19a	DM-19	2016	Year 3	Phase I	0-15	<1.0	<0.50	14.1	4.7	12.7	6.1	16.5	29.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-19 Shallow	DM-19	2017	Year 4	Phase I	0-15	<1.0	<0.5	30.0	9.7	**25.8**	**10.4**	41.9	60.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-19 depth (also upgradient of Upper Site South Landfill West)																	
14-8278	DM-19	2014	Year 1	Phase I	40-50	0.7	<1.0	<20	<5.0	14.0	<10	17.0	36.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-19	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-19	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-19	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
	DM-20 surface																	
14-8283	DM-20	2014	Year 1	Phase I	0-10	0.6	<1.0	25.0	**12.0**	**34.0**	<10	**61.0**	44.0	<0.010	<10	<10	<10	15.0
DM-20 (0-15)	DM-20	2015	Year 2	Phase I	0-15	**1.9**	<0.50	23.1	7.9	17.1	**11.2**	28.8	48.2	<0.050	<7.0	<4.0	<8.0	9.5
DM-20a	DM-20	2016	Year 3	Phase I	0-15	<1.0	<0.50	13.9	6.6	19.2	**31.3**	20.8	47.3	<0.050	<7.0	<4.0	<8.0	9.5
DM-20 Shallow	DM-20	2017	Year 4	Phase I	0-15	<1.0	<0.5	19.2	7.3	**30.1**	**14.5**	27.1	56.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-20 depth																	
14-8284	DM-20	2014	Year 1	Phase I	30-40	0.7	<1.0	<20	<5.0	16.0	**33.0**	13.0	59.0	<0.010	<10	<10	<10	15.0
DM-20 (15-30)	DM-20	2015	Year 2	Phase I	15-30	<1.0	<0.50	20.0	7.5	14.3	**10.5**	26.3	43.7	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-20	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-20	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
	DM-21 surface																	
14-8285	DM-21	2014	Year 1	Phase I	0-10	**1.1**	<1.0	<20	8.2	15.0	**13.0**	18.0	**92.0**	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-21	2015	Year 2	Phase I														#N/A
DM-21a	DM-21	2016	Year 3	Phase I	0-15	<1.0	<0.50	14.8	9.6	18.8	**14.7**	21.1	**86.7**	<0.050	<7.0	<4.0	<8.0	9.5
DM-21 Shallow (Dup Avg)	DM-21	2017	Year 4	Phase I	0-15	<1.0	<0.5	16.9	9.7	19.4	**14.5**	24.5	**105.0**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-21 depth																	
14-8287	DM-21	2014	Year 1	Phase I	45-55	**1.6**	<1.0	<20	9.2	21.0	**14.0**	16.0	**120.0**	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-21	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-21	2016	Year 3	Phase I														#N/A
DM-21 Deep	DM-21	2017	Year 4	Phase I	20-30	<1.0	<0.5	15.3	9.0	16.7	**13.1**	22.0	**98.6**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
	DM-22 surface																	
14-8288	DM-22Old	2014	Year 1	Phase I	0-10	**1.2**	<1.0	**54.0**	**13.0**	**31.0**	10.0	**72.0**	**64.0**	<0.010	<10	<10	<10	15.0
14-8233	DM-22	2014	Year 1	Phase I	5-10	0.9	<1.0	25.0	7.9	**33.0**	<10	**48.0**	44.0	<0.050	N/A	N/A	N/A	N/A
DM-22 (0-15)	DM-22	2015	Year 2	Phase I	0-15	**1.9**	<0.50	23.7	**15.6**	**35.8**	9.5	34.0	43.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-22b	DM-22	2016	Year 3	Phase I	0-15	<1.0	<0.50	20.7	**12.3**	**30.6**	**10.3**	34.9	40.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-22 Shallow	DM-22	2017	Year 4	Phase I	0-15	<1.0	<0.5	19.8	**13.9**	**40.7**	**13.6**	35.1	51.5	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-22 depth																	
14-8290/91	DM-22Old	2014	Year 1	Phase I	25-30	0.5	<1.0	25.0	6.8	14.0	<10	29.0	43.0	<0.010	<10	<10	<10	15.0
14-8234	DM-22	2014	Year 1	Phase I	45-50	0.9	<1.0	27.0	8.0	**28.0**	<10	**50.0**	49.0	<0.050	N/A	N/A	N/A	N/A
DM-22 (40-50)	DM-22	2015	Year 2	Phase I	40-50	<1.0	<0.50	13.9	**19.3**	**54.1**	5.9	23.1	28.8	<0.050	<7.0	<4.0	<8.0	9.5
DM-22a	DM-22	2016	Year 3	Phase I	30-40	<1.0	<0.50	18.8	**14.3**	**47.5**	**14.2**	21.4	57.2	<0.050	<7.0	<4.0	<8.0	9.5
DM-22 Deep	DM-22	2017	Year 4	Phase I	20-30	<1.0	<0.5	18.2	**14.4**	**42.7**	8.8	30.9	44.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site North Warning System Landfill - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**36.5**	**10.0**	**25.4**	**10.1**	**47.0**	**63.1**	**0.10**				**190.2**
Baseline Data - Standard Deviation						0.00	0.00	35.2	4.3	14.9	8.4	44.6	30.5	0.00				392.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**142.1**	**23.0**	**70.2**	**35.3**	**181.0**	**154.6**	**0.10**				**1368.6**
	DM-23 surface (also upgradient of Upper Site South Landfill West)																	
14-8280/81	DM-23	2014	Year 1	Phase I	0-10	**1.3**	<1.0	**82.0**	9.3	**43.0**	**11.0**	44.0	**84.0**	<0.010	<10	<10	<10	15.0
DM-23 (0-20)	DM-23	2015	Year 2	Phase I	0-20	**1.1**	<0.50	35.5	9.9	17.1	9.9	**52.1**	42.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-23a (Dup Avg)	DM-23	2016	Year 3	Phase I	0-15	<1.0	<0.50	30.4	8.7	14.1	7.0	39.5	46.2	<0.050	<6.0	<7.0	<29	21.0
DM-23 Shallow	DM-23	2017	Year 4	Phase I	0-15	<1.0	<0.5	36.0	**11.1**	22.4	9.0	**66.9**	42.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-23 depth (also upgradient of Upper Site South Landfill West)																	
14-8282	DM-23	2014	Year 1	Phase I	25-35	0.7	<1.0	27.0	7.0	20.0	<10	33.0	46.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-23	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-23	2016	Year 3	Phase I														#N/A
DM-23 Deep	DM-23	2017	Year 4	Phase I	30-40	<1.0	<0.5	33.7	**11.4**	23.3	8.0	**72.9**	40.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

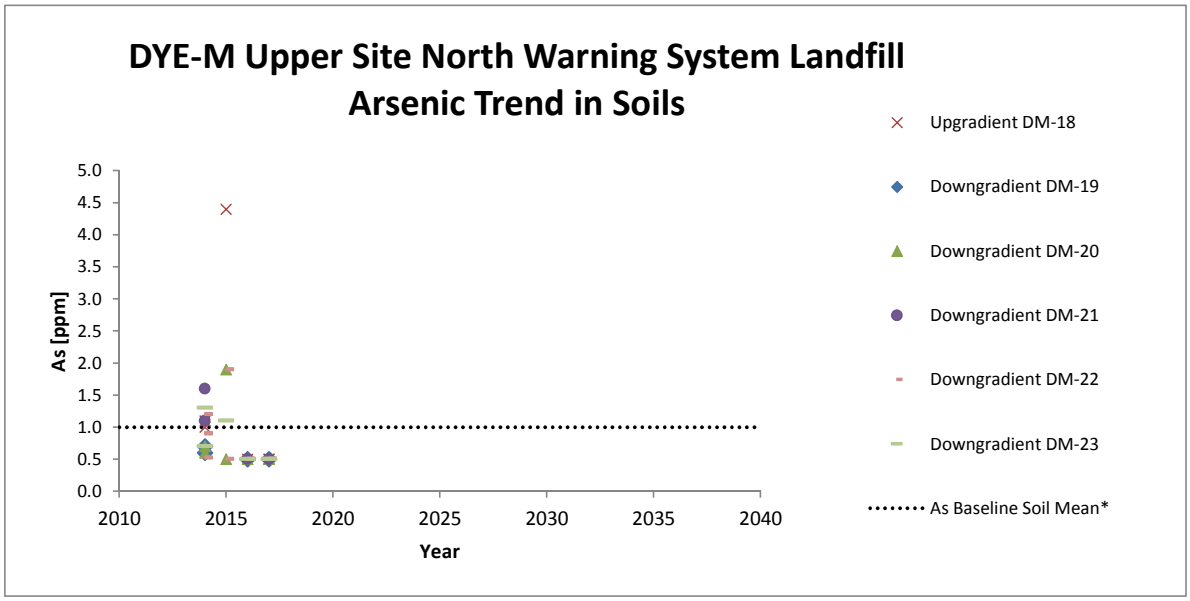
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Upper Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH

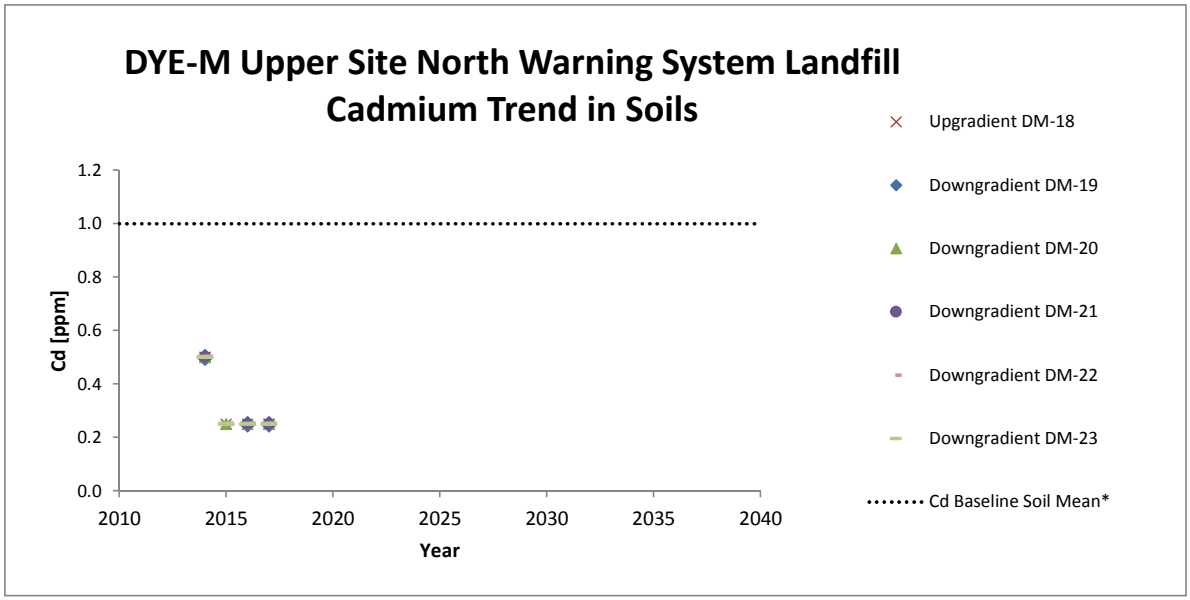
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

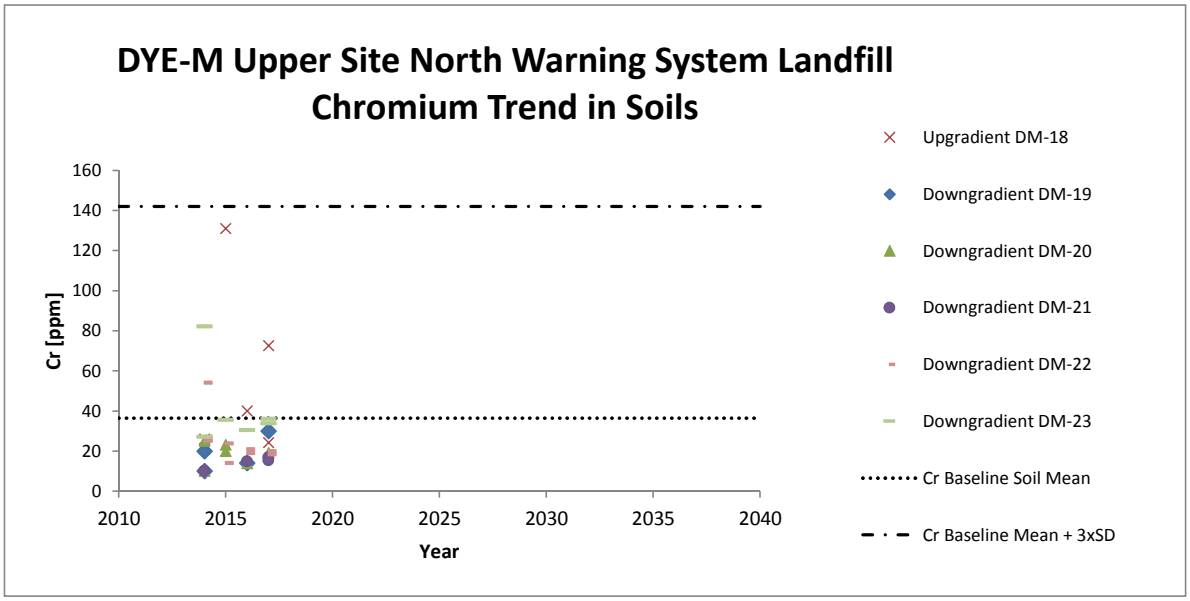


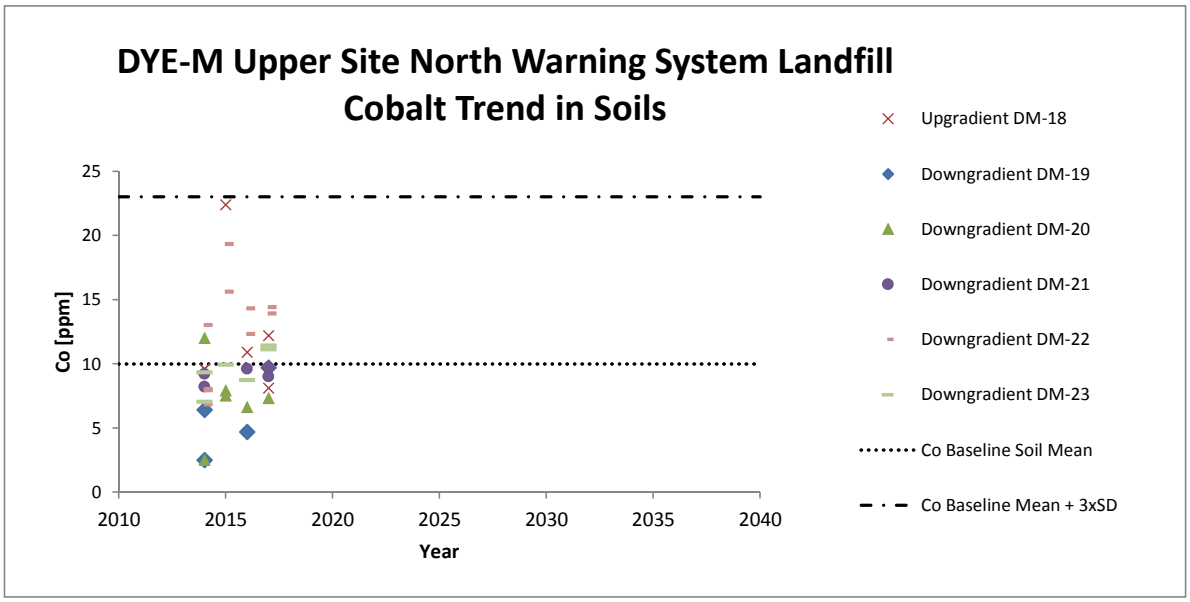
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



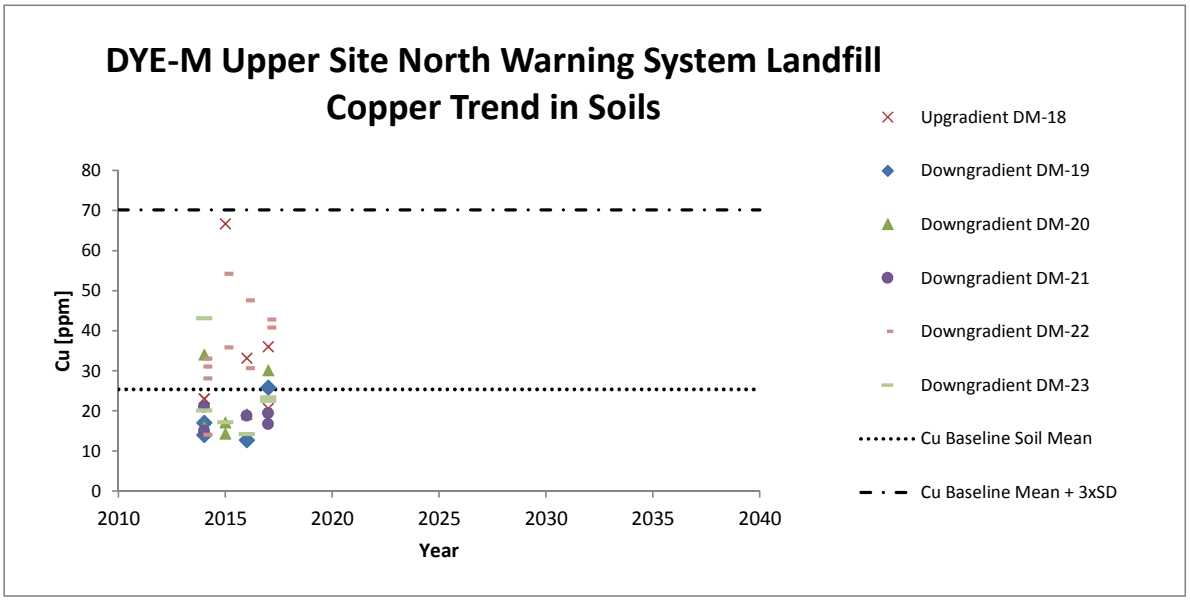
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

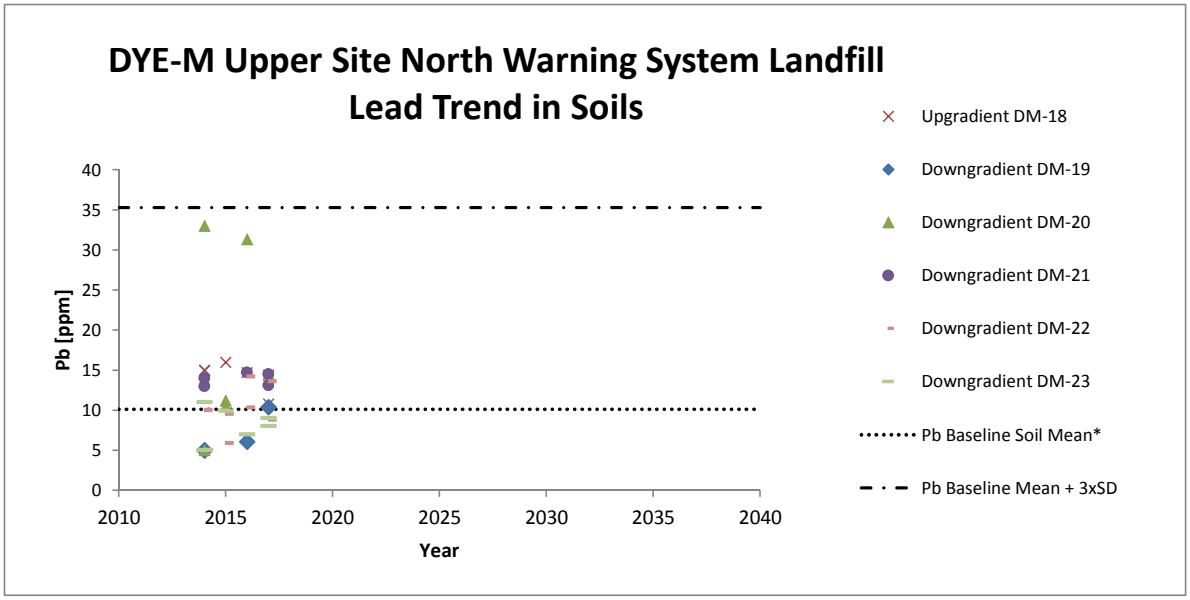
DYE-M Upper Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH



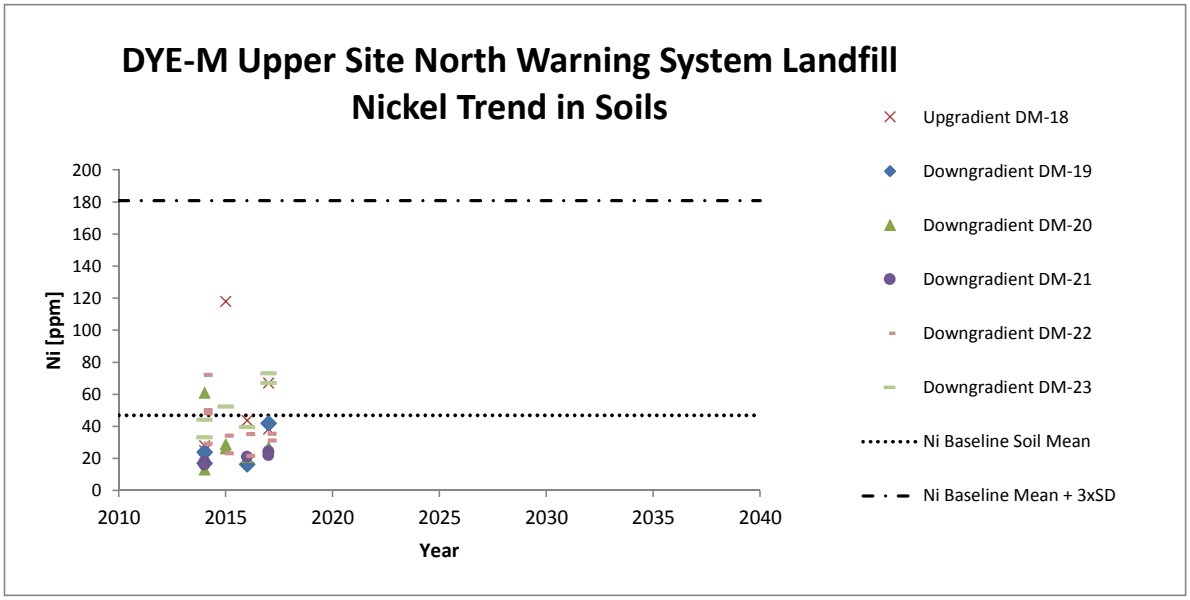


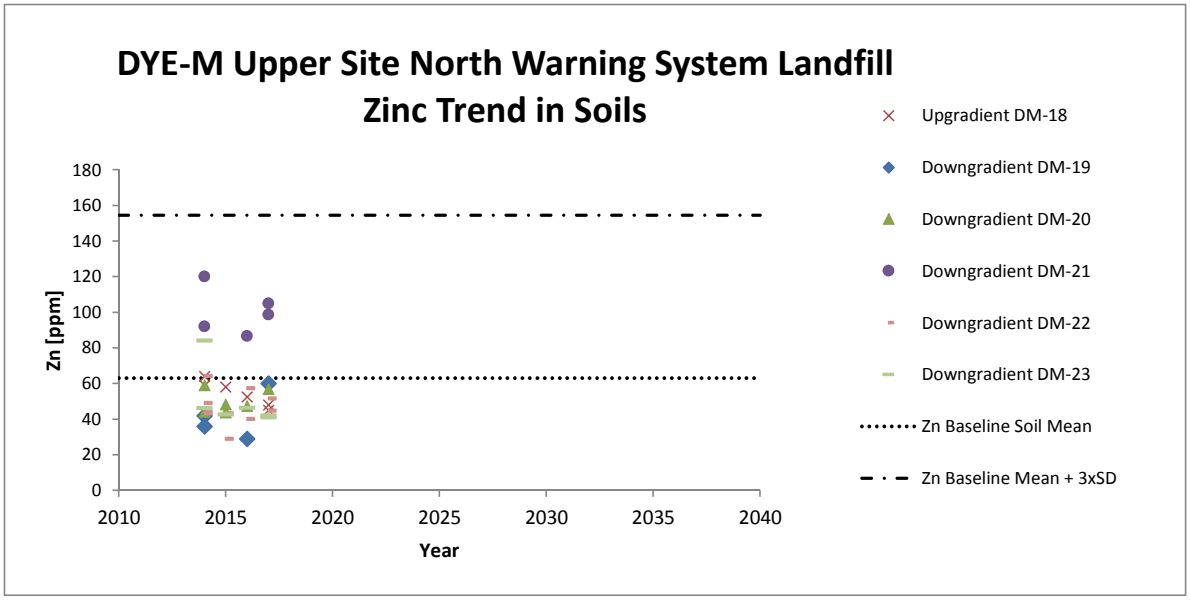
DYE-M Upper Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH



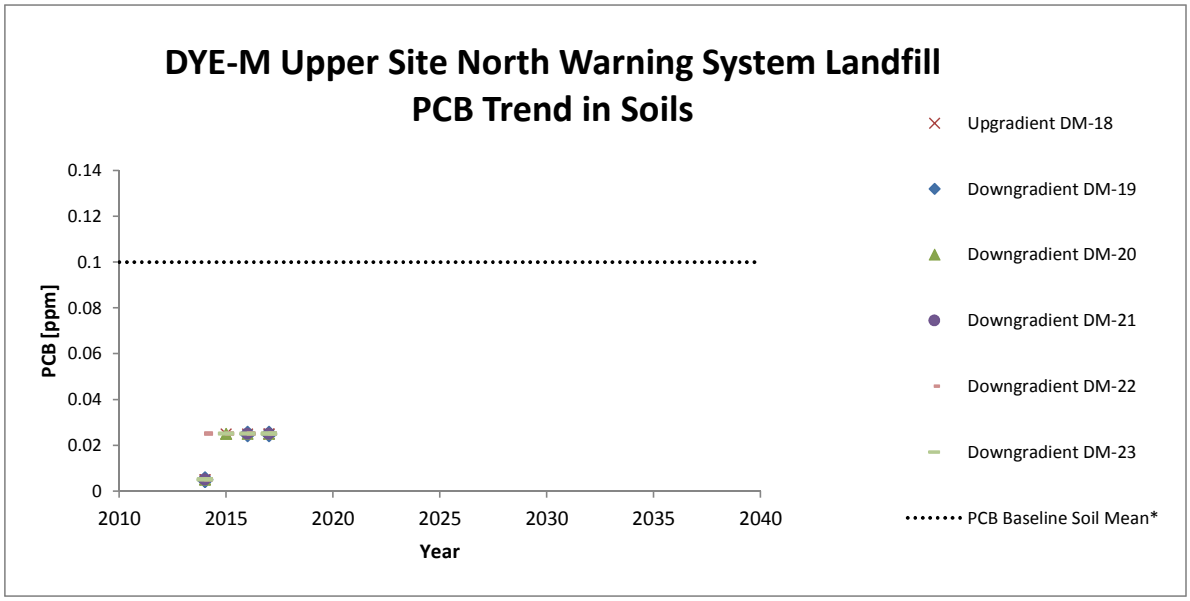


DYE-M Upper Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH

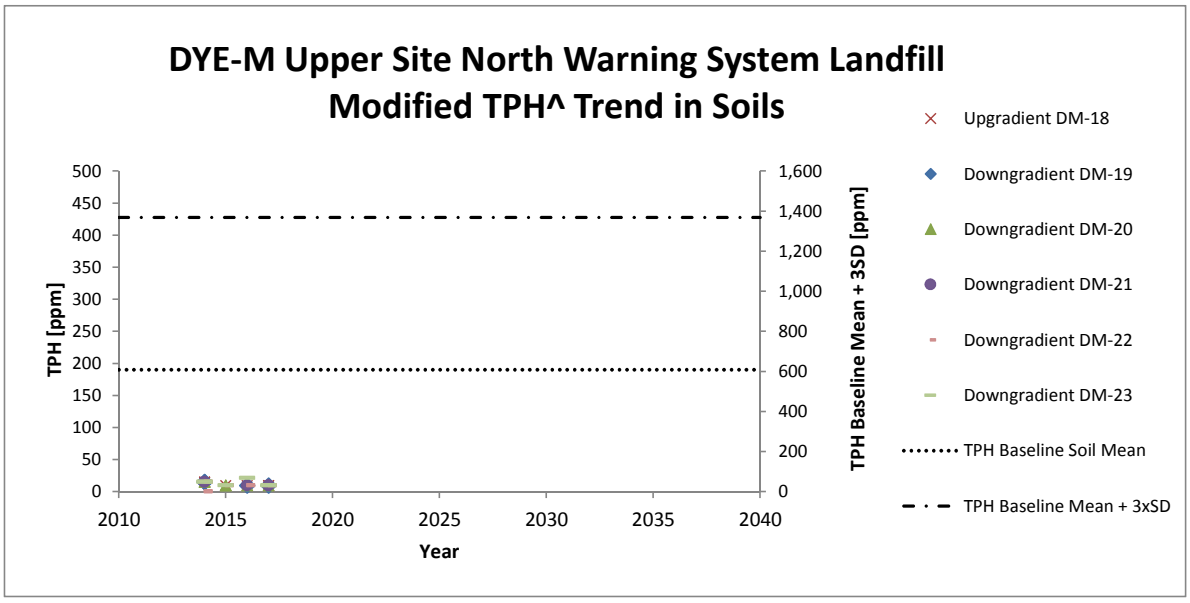




DYE-M Upper Site North Warning System Landfill Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results below detection limits



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site South Landfill West - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-19 surface (also downgradient of Upper Site North Warning System Landfill)																	
14-8277	DM-19	2014	Year 1	Phase I	0-10	0.6	<1.0	20.0	6.4	17.0	<10	24.0	42.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-19	2015	Year 2	Phase I														#N/A
DM-19a	DM-19	2016	Year 3	Phase I	0-15	<1.0	<0.50	14.1	4.7	12.7	6.1	16.5	29.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-19 Shallow	DM-19	2017	Year 4	Phase I	0-15	<1.0	<0.5	30.0	9.7	**25.8**	10.4	**41.9**	60.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-19 depth (also downgradient of Upper Site North Warning System Landfill)																	
14-8278	DM-19	2014	Year 1	Phase I	40-50	0.7	<1.0	<20	<5.0	14.0	<10	17.0	36.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-19	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-19	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-19	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site South Landfill West - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-23 surface (also downgradient of Upper Site North Warning System Landfill)																	
14-8280/81	DM-23	2014	Year 1	Phase I	0-10	**1.3**	<1.0	**82.0**	9.3	**43.0**	11.0	**44.0**	84.0	<0.010	<10	<10	<10	15.0
DM-23 (0-20)	DM-23	2015	Year 2	Phase I	0-20	**1.1**	<0.50	35.5	9.9	17.1	9.9	**52.1**	42.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-23a (Dup Avg)	DM-23	2016	Year 3	Phase I	0-15	<1.0	<0.50	30.4	8.7	14.1	7.0	39.5	46.2	<0.050	<6.0	<7.0	<29	21.0
DM-23 Shallow	DM-23	2017	Year 4	Phase I	0-15	<1.0	<0.5	36.0	11.1	22.4	9.0	**66.9**	42.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-23 depth (also downgradient of Upper Site North Warning System Landfill)																	
14-8282	DM-23	2014	Year 1	Phase I	25-35	0.7	<1.0	27.0	7.0	20.0	<10	33.0	46.0	<0.010	<10	<10	<10	15.0
Not sampled - refusal	DM-23	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-23	2016	Year 3	Phase I														#N/A
DM-23 Deep	DM-23	2017	Year 4	Phase I	30-40	<1.0	<0.5	33.7	**11.4**	23.3	8.0	**72.9**	40.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site South Landfill West - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
Downgradient																		
	DM-24 surface																	
14-8254	DM-24	2014	Year 1	Phase I	0-10	0.5	<1.0	**92.0**	**12.0**	**33.0**	<10	**73.0**	82.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-24	2015	Year 2	Phase I														#N/A
DM-24a	DM-24	2016	Year 3	Phase I	0-15	<1.0	<0.50	**58.9**	**13.5**	21.8	9.7	**45.5**	64.8	<0.050	<7.0	<4.0	<8.0	9.5
DM-24 Shallow	DM-24	2017	Year 4	Phase I	0-15	<1.0	<0.5	**142.0**	**15.5**	**41.7**	8.0	**74.5**	83.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-24 depth																	
14-8255	DM-24	2014	Year 1	Phase I	25-35	0.9	<1.0	**170.0**	**20.0**	**72.0**	<10	**170.0**	**110.0**	<0.010	<10	16.0	<10	26.0
Not sampled - frozen	DM-24	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-24	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-24	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site South Landfill West - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-25 surface																	
14-8257	DM-25	2014	Year 1	Phase I	0-10	**1.1**	<1.0	**89.0**	**14.0**	**31.0**	<10	**82.0**	81.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-25	2015	Year 2	Phase I														#N/A
DM-25a	DM-25	2016	Year 3	Phase I	0-15	<1.0	<0.50	**64.9**	**13.3**	**35.3**	9.3	**52.2**	66.9	<0.050	<7.0	<4.0	<8.0	9.5
DM-25 Shallow (Dup Avg)	DM-25	2017	Year 4	Phase I	0-15	<1.0	<0.5	35.0	**14.4**	**28.1**	10.7	**69.6**	81.6	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-25 depth																	
14-8258	DM-25	2014	Year 1	Phase I	25-35	0.7	<1.0	**71.0**	**15.0**	16.0	<10	**130.0**	**94.0**	<0.010	<10	10.0	<10	20.0
Not sampled - frozen	DM-25	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-25	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-25	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A

DYE-M Upper Site South Landfill West - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-26 surface																	
14-8260/61	DM-26	2014	Year 1	Phase I	0-10	**1.2**	<1.0	**60.0**	11.0	**72.0**	<10	**50.0**	74.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-26	2015	Year 2	Phase I														#N/A
DM-26a	DM-26	2016	Year 3	Phase I	0-15	<1.0	<0.50	**81.7**	**12.4**	**32.2**	8.1	**53.0**	53.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-26 Shallow	DM-26	2017	Year 4	Phase I	0-15	<1.0	<0.5	**68.3**	**12.8**	**27.1**	8.0	**62.9**	65.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-26 depth																	
14-8262	DM-26	2014	Year 1	Phase I	25-35	**1.5**	<1.0	**62.0**	**13.0**	**77.0**	<10	**50.0**	**94.0**	<0.010	<10	10.0	<10	20.0
Not sampled - frozen	DM-26	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-26	2016	Year 3	Phase I														#N/A
DM-26 Deep	DM-26	2017	Year 4	Phase I	30-40	<1.0	<0.5	**139.0**	**15.2**	17.4	7.5	**220.0**	82.0	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-27 surface																	
14-8263	DM-27	2014	Year 1	Phase I	0-10	0.9	<1.0	**58.0**	**13.0**	**28.0**	<10	**58.0**	78.0	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-27	2015	Year 2	Phase I														#N/A
DM-27a (Dup Avg)	DM-27	2016	Year 3	Phase I	0-15	<1.0	<0.50	19.8	8.9	14.8	7.2	19.0	60.2	<0.050	<6.0	<7.0	<29	21.0
DM-27 Shallow	DM-27	2017	Year 4	Phase I	0-15	<1.0	<0.5	28.3	10.2	**35.1**	10.9	26.7	73.1	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-27 depth																	
14-8264	DM-27	2014	Year 1	Phase I	25-35	1.0	<1.0	**61.0**	**14.0**	20.0	<10	38.0	**96.0**	<0.010	<10	<10	<10	15.0
Not sampled - frozen	DM-27	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-27	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-27	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-28 surface																	
14-8265	DM-28	2014	Year 1	Phase I	0-10	0.8	<1.0	51.0	**14.0**	**27.0**	<10	**78.0**	67.0	<0.010	<10	<10	<10	15.0
DM-28 (0-15)	DM-28	2015	Year 2	Phase I	0-15	**1.7**	<0.50	**80.7**	**12.9**	**28.8**	8.9	**55.5**	77.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-28a	DM-28	2016	Year 3	Phase I	0-15	<1.0	<0.50	23.4	8.5	15.6	5.4	30.6	40.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-28 Shallow	DM-28	2017	Year 4	Phase I	0-15	<1.0	<0.5	29.1	10.8	15.4	7.9	26.5	73.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-28 depth																	
14-8267	DM-28	2014	Year 1	Phase I	25-35	0.5	<1.0	32.0	10.0	15.0	<10	**43.0**	74.0	<0.010	<10	<10	<10	15.0
DM-28 (40-50)	DM-28	2015	Year 2	Phase I	40-50	**1.6**	<0.50	39.9	11.0	**25.6**	7.7	30.6	70.0	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-28	2016	Year 3	Phase I														#N/A
DM-28 Deep	DM-28	2017	Year 4	Phase I	40-50	<1.0	<0.5	39.5	**13.2**	21.6	8.1	**44.9**	78.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-29 surface																	
14-8268	DM-29	2014	Year 1	Phase I	0-10	0.3	<1.0	30.0	7.8	16.0	<10	**59.0**	32.0	<0.010	<10	<10	<10	15.0
DM-29 (0-20)	DM-29	2015	Year 2	Phase I	0-20	**1.3**	<0.50	34.1	11.0	**26.8**	7.9	**62.5**	42.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-29a	DM-29	2016	Year 3	Phase I	0-15	<1.0	<0.50	22.7	8.2	16.8	6.7	38.4	31.5	<0.050	<7.0	<4.0	<8.0	9.5
DM-29 Shallow	DM-29	2017	Year 4	Phase I	0-15	<1.0	<0.5	24.6	9.1	19.2	9.4	**47.9**	40.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-29 depth																	
14-8270/71	DM-29	2014	Year 1	Phase I	25-35	0.6	<1.0	23.0	6.8	15.0	<10	**50.0**	27.0	<0.010	<10	<10	<10	15.0
DM-29 (20-40)	DM-29	2015	Year 2	Phase I	20-40	**1.4**	<0.50	29.4	11.1	22.9	7.5	**65.3**	37.2	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-29	2016	Year 3	Phase I														#N/A
DM-29 Deep	DM-29	2017	Year 4	Phase I	30-40	<1.0	<0.5	31.5	8.8	20.3	7.3	**47.9**	42.3	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.00**	**1.00**	**56.6**	**11.3**	**24.9**	**14.8**	**41.4**	**87.1**	**0.10**				**128.7**
Baseline Data - Standard Deviation						0.00	0.00	40.4	4.3	15.6	0.0	17.7	48.3	0.00				296.8
Baseline Data Mean + 3xStandard Deviation						**1.00**	**1.00**	**177.7**	**24.1**	**71.8**	**14.8**	**94.5**	**232.1**	**0.10**				**1019.2**
	DM-30 surface																	
14-8272	DM-30	2014	Year 1	Phase I	0-10	0.6	<1.0	28.0	6.8	20.0	<10	35.0	44.0	<0.010	<10	<10	<10	15.0
DM-30 (0-15)	DM-30	2015	Year 2	Phase I	0-15	**1.8**	<0.50	30.6	10.5	23.2	7.7	**44.9**	52.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-30b	DM-30	2016	Year 3	Phase I	0-15	<1.0	<0.50	26.7	7.6	20.7	7.2	24.3	40.1	<0.050	<7.0	<4.0	<8.0	9.5
DM-30 Shallow	DM-30	2017	Year 4	Phase I	0-15	<1.0	<0.5	29.2	8.7	22.7	7.8	33.9	53.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-30 depth																	0.0
14-8273	DM-30	2014	Year 1	Phase I	25-35	0.3	<1.0	<20	6.2	**31.0**	<10	14.0	32.0	<0.010	<10	<10	<10	15.0
DM-30 (20-30)	DM-30	2015	Year 2	Phase I	20-30	**1.5**	<0.50	32.1	10.1	20.0	7.4	40.3	51.0	<0.050	<7.0	<4.0	<8.0	9.5
DM-30a	DM-30	2016	Year 3	Phase I	30-40	<1.0	<0.50	32.6	9.3	**28.0**	8.3	29.5	49.7	<0.050	<7.0	<4.0	<8.0	9.5
DM-30 Deep	DM-30	2017	Year 4	Phase I	40-50	<1.0	<0.5	37.7	10.5	**28.4**	9.9	37.6	63.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

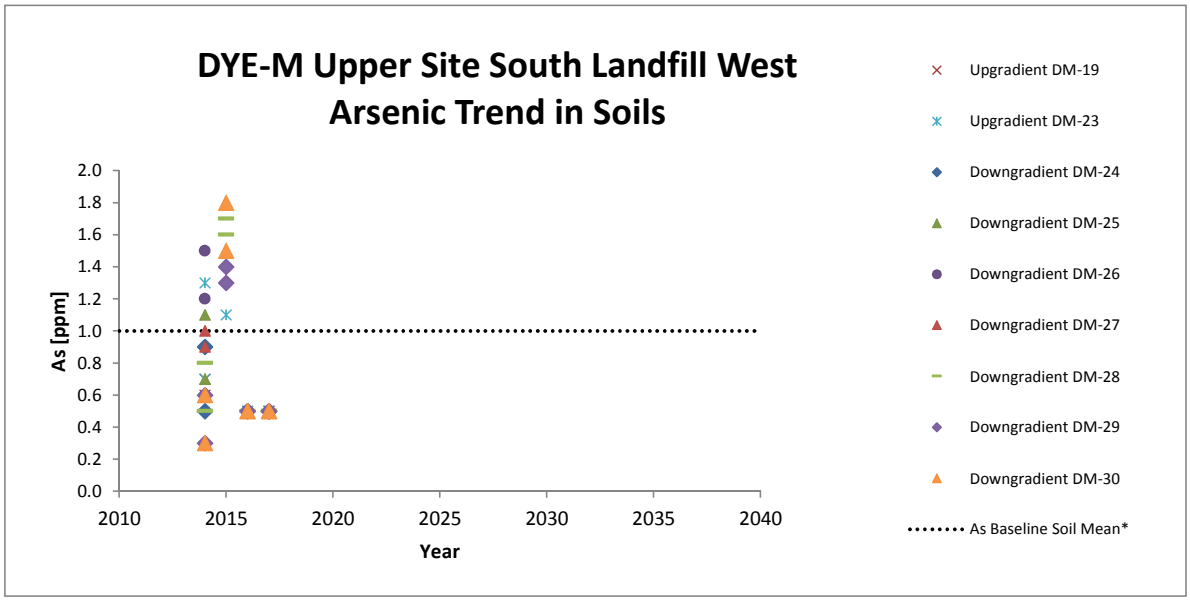
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

DYE-M Upper Site South Landfill West Trends in Soil Inorganics, PCBs and Modified TPH

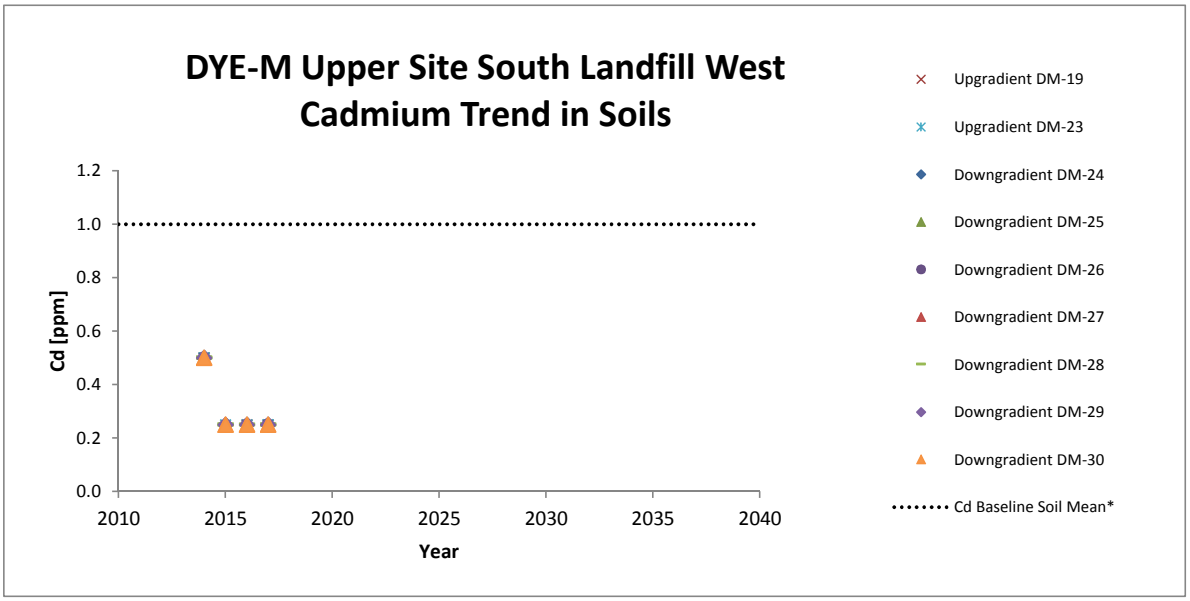
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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

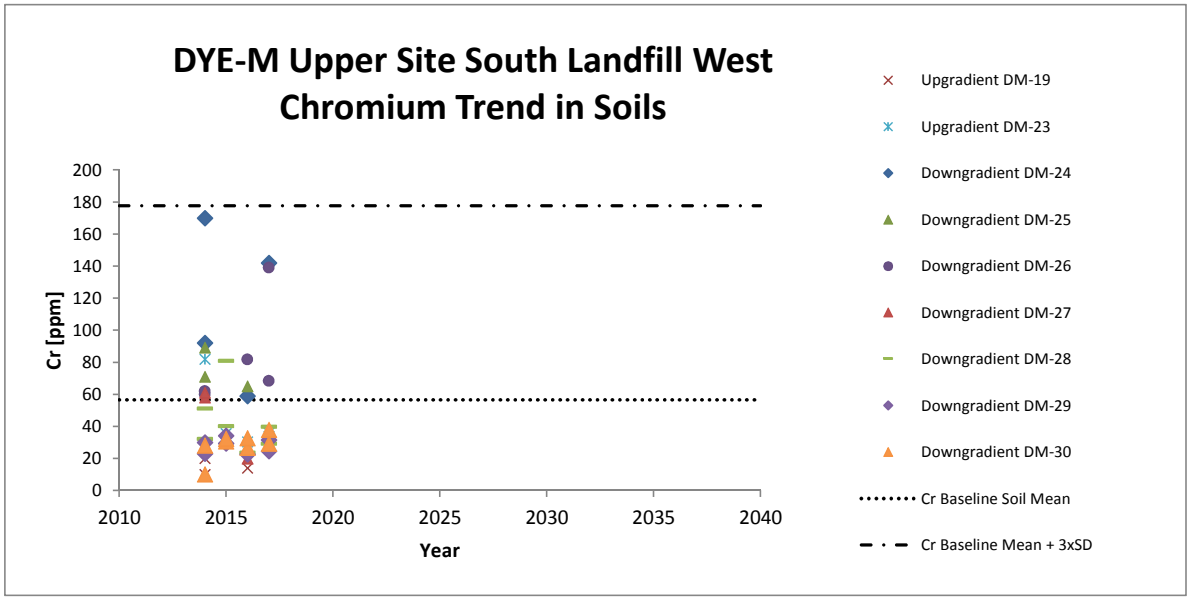


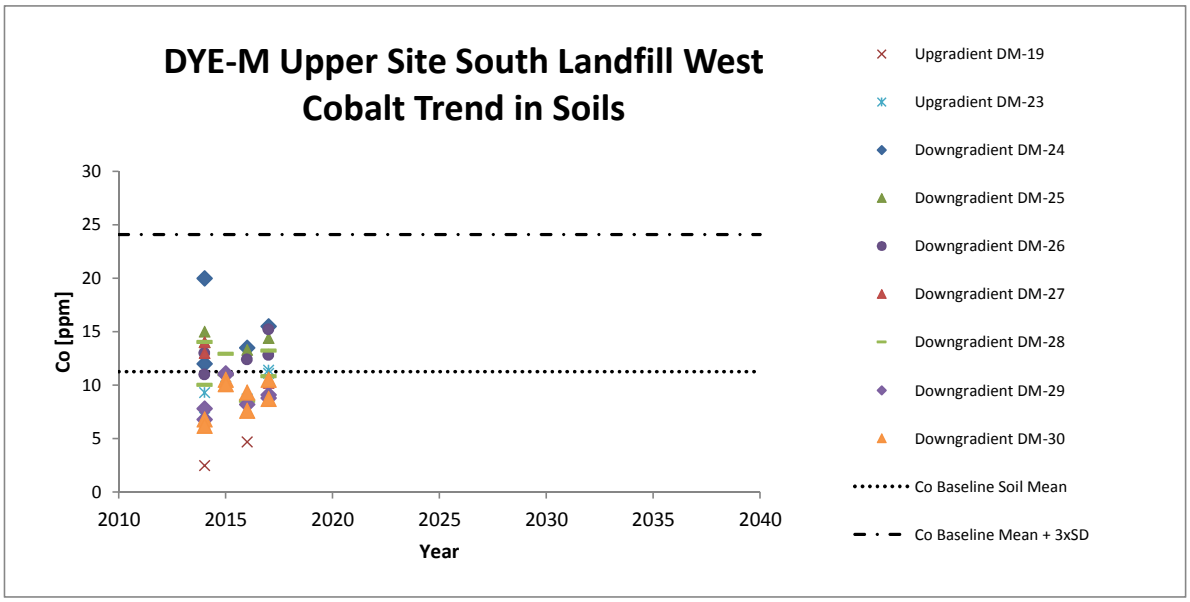
* As baseline arithmetic mean is equal to the baseline detection limit
* As baseline standard deviation = 0



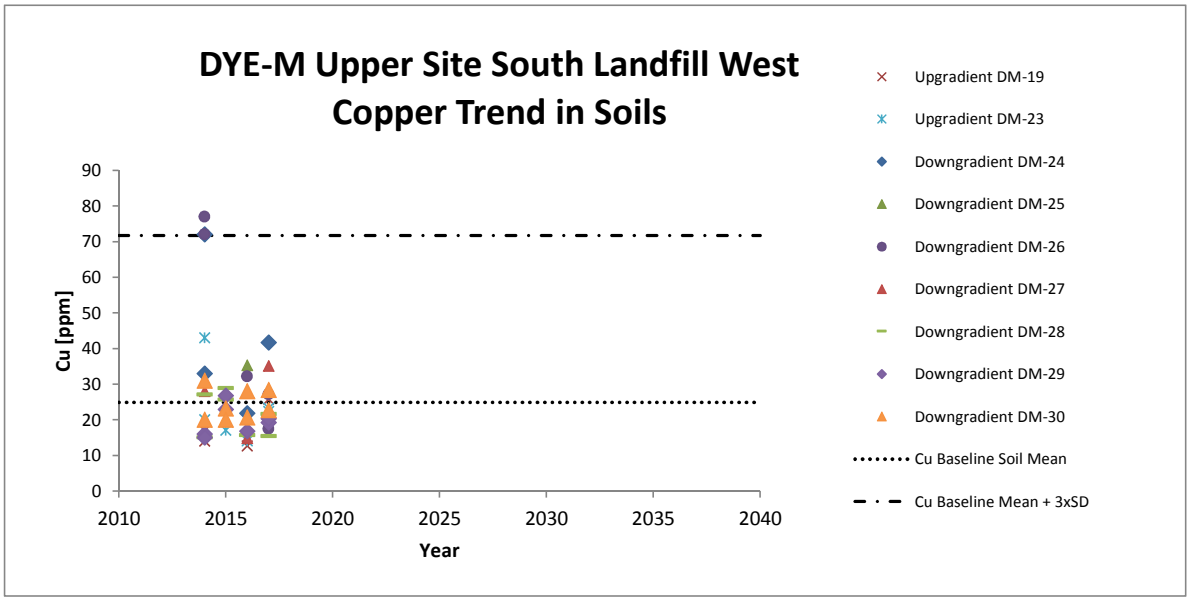
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

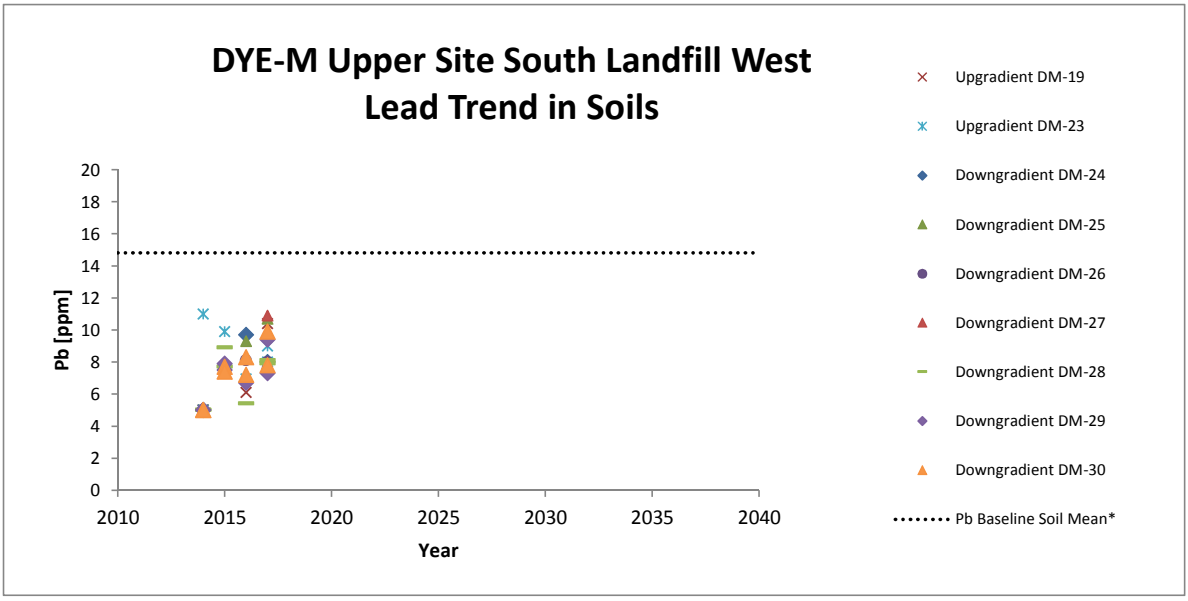
DYE-M Upper Site South Landfill West Trends in Soil Inorganics, PCBs and Modified TPH





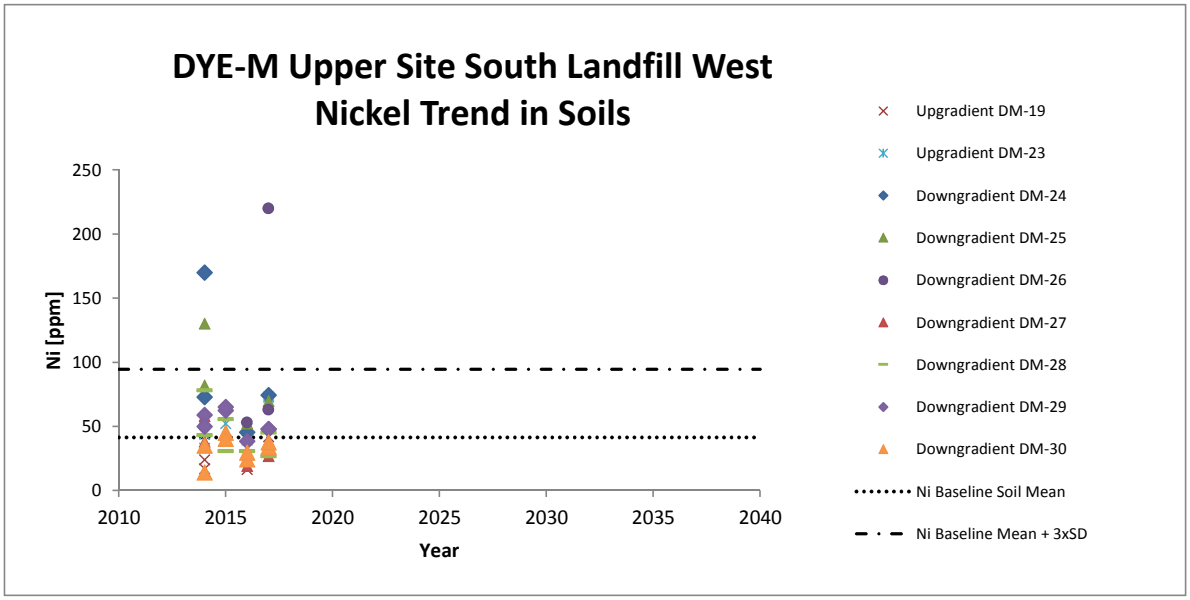
DYE-M Upper Site South Landfill West Trends in Soil Inorganics, PCBs and Modified TPH

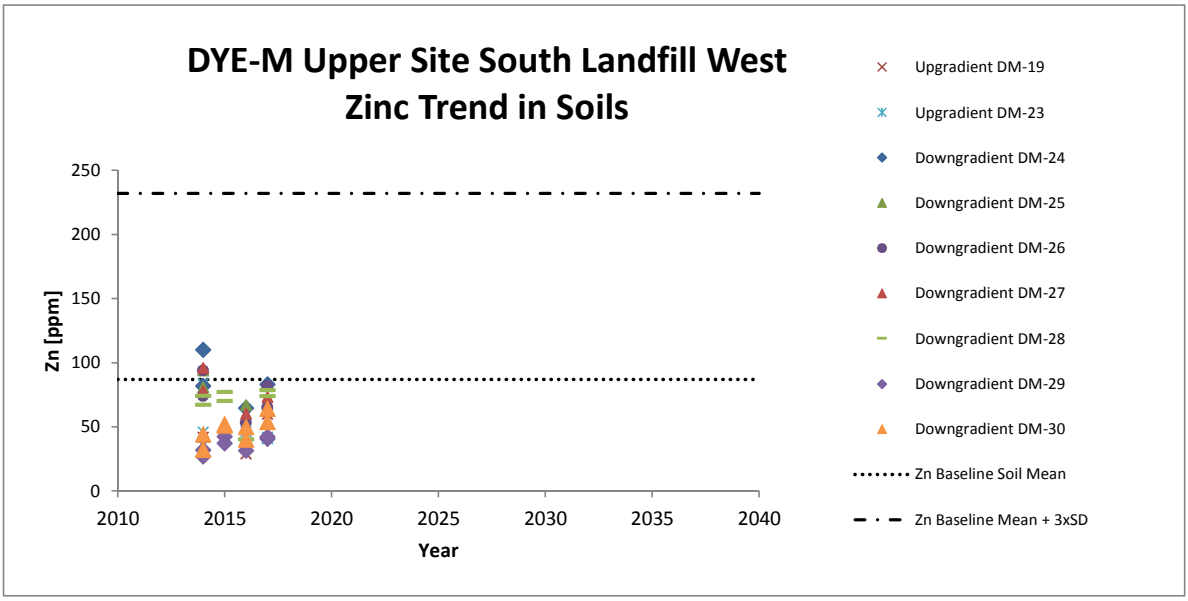




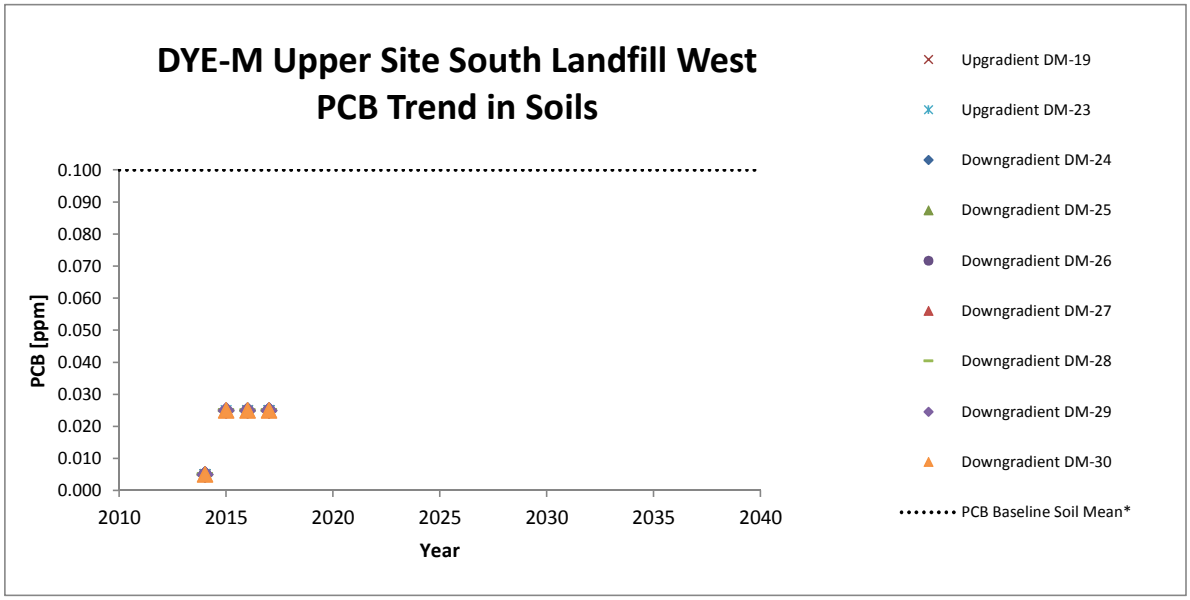
* Pb baseline standard deviation = 0

DYE-M Upper Site South Landfill West Trends in Soil Inorganics, PCBs and Modified TPH

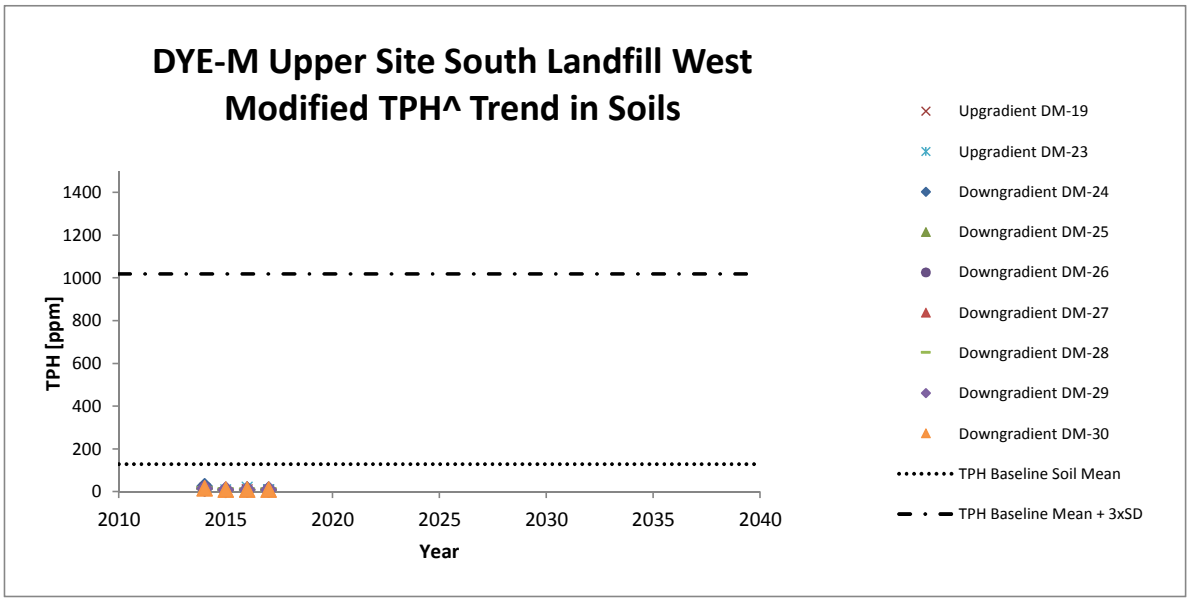




DYE-M Upper Site South Landfill West Trends in Soil Inorganics, PCBs and Modified TPH



* PCB baseline arithmetic mean is equal to the baseline detection limit
* PCB baseline standard deviation = 0
Note: variations seen to 2016 are an indication of changing detection limits; all results below detection limits



^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
**** If baseline or background arithmetic mean was below the detection limit, the mean has been modified to match the detection limit value.***																		
DEW Line Cleanup Tier I Criteria											*200*			*1*				
DEW Line Cleanup Tier II Criteria & Hydrocarbon Action Level						*30*	*5*	*250*	*50*	*100*	*500*	*100*	*500*	*5*				*2500*
Monitoring Data																		**TPH Sum will appear when F1, F2 and F3 fractions are entered.**
Upgradient																		
	DM-11 surface																	
14-8308	DM-11	2014	Year 1	Phase I	5-10	**3.0**	<1.0	**73.0**	**15.0**	**47.0**	**14.0**	**84.0**	65.0	0.0130	<10	<10	<10	15.0
14-8309 interlab	DM-11	2014	Year 1	Phase I	5-10	**1.5**	<0.50	**70.0**	**20.0**	**43.0**	**14.0**	**156.0**	62.0	<0.050	<5.0	<10	<50	32.5
DM-11 (0-15)	DM-11	2015	Year 2	Phase I	0-15	**3.6**	<0.50	**82.6**	**20.8**	**58.0**	**14.3**	**79.0**	61.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-11a	DM-11	2016	Year 3	Phase I	0-15	<1.0	<0.50	**75.1**	**16.8**	**59.6**	**14.7**	**77.7**	57.8	<0.050	<7.0	<4.0	<8.0	9.5
DM-11 Shallow	DM-11	2017	Year 4	Phase I	0-15	<1.0	<0.50	**63.7**	**14.7**	**51.3**	**12.0**	66.9	54.4	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-11 depth																	
14-8310/11	DM-11	2014	Year 1	Phase I	40-45	**4.9**	<1.0	**85.5**	11.0	**42.0**	**14.5**	71.0	**78.5**	**0.160**	<10	<10	<10	15.0
Not sampled - refusal	DM-11	2015	Year 2	Phase I														#N/A
Not sampled - refusal	DM-11	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-11	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
Downgradient																		
	DM-12 surface																	
14-8305	DM-12	2014	Year 1	Phase I	5-10	**2.6**	<1.0	**86.0**	**15.0**	**51.0**	**23.0**	**93.0**	**91.0**	**1.70**	<10	<10	110.0	**120.0**
DM-12 (0-15)	DM-12	2015	Year 2	Phase I	0-15	**4.0**	<0.50	**107.0**	**15.2**	**45.4**	**84.5**	**72.9**	**91.1**	0.08	<7.0	<4.0	<8.0	9.5
DM-12a	DM-12	2016	Year 3	Phase I	0-15	<1.0	<0.50	**76.5**	13.0	**35.2**	**17.4**	**79.2**	61.8	**1.17**	<7.0	<4.0	46.0	51.5
DM-12 Shallow	DM-12	2017	Year 4	Phase I	0-15	<1.0	<0.50	**91.1**	13.5	**45.6**	**19.5**	**82.5**	**83.1**	<0.05	<7	<4	25	30.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-12 depth																	
14-8307	DM-12	2014	Year 1	Phase I	20-30	**3.7**	<1.0	**100.0**	13.0	**48.0**	**23.0**	**87.0**	**94.0**	**0.76**	<10	<10	140.0	**150.0**
DM-12 (30-40)	DM-12	2015	Year 2	Phase I	30-40	**2.7**	<0.50	**79.5**	**14.4**	**39.6**	**21.8**	**86.9**	**70.5**	**0.35**	<7.0	<4.0	75.0	**80.5**
Not sampled - refusal	DM-12	2016	Year 3	Phase I														#N/A
DM-12 Deep (Dup Avg)	DM-12	2017	Year 4	Phase I	30-40	<1.0	<0.50	**80.7**	13.0	**43.8**	**22.2**	**87.0**	**73.2**	**0.30**	<7	<4	81	**86.5**
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
	DM-13 surface																	
14-8303	DM-13	2014	Year 1	Phase I	5-10	1.0	<1.0	24.0	6.2	26.0	**12.0**	22.0	**74.0**	**0.34**	<10	<10	<10	15.0
DM-13 (0-15)	DM-13	2015	Year 2	Phase I	0-15	**2.3**	<0.50	46.1	11.8	24.5	**14.7**	52.4	64.2	<0.050	<7.0	<4.0	55.0	60.5
DM-13a	DM-13	2016	Year 3	Phase I	0-15	<1.0	<0.50	45.0	10.7	**47.7**	**22.3**	54.6	**80.2**	**0.32**	<7.0	<4.0	92.0	**97.5**
DM-13 Shallow	DM-13	2017	Year 4	Phase I	0-15	<1.0	<0.50	57.1	12.3	34.6	**20.9**	70.0	**79.0**	0.08	<7	<4	19	24.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-13 depth																	
14-8304	DM-13	2014	Year 1	Phase I	40-45	**1.4**	<1.0	40.0	11.0	28.0	**14.0**	57.0	67.0	0.0120	<10	<10	<10	15.0
DM-13 (40-50)	DM-13	2015	Year 2	Phase I	40-50	**2.0**	<0.50	28.3	10.6	16.7	**11.6**	38.3	62.8	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-13	2016	Year 3	Phase I														#N/A
DM-13 Deep	DM-13	2017	Year 4	Phase I	40-50	<1.0	<0.50	31.6	9.0	24.1	**14.6**	38.1	65.9	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
	DM-14 surface																	
14-8312	DM-14	2014	Year 1	Phase I	5-10	**1.6**	<1.0	**130.0**	13.0	31.0	**19.0**	**89.0**	**85.0**	**0.12**	<10	<10	<10	15.0
DM-14 (0-20)	DM-14	2015	Year 2	Phase I	0-20	**2.2**	<0.50	39.6	12.3	**41.5**	9.1	61.0	**71.9**	<0.050	<7.0	<4.0	<8.0	9.5
DM-14a	DM-14	2016	Year 3	Phase I	0-15	<1.0	<0.50	**61.8**	13.0	**36.3**	**13.9**	67.4	66.9	**1.14**	<7.0	<4.0	<8.0	9.5
DM-14 Shallow (Dup Avg)	DM-14	2017	Year 4	Phase I	0-15	<1.0	<0.50	**927**	**17.6**	10.7	4.2	**186**	38.2	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
	DM-14 depth																	
14-8313	DM-14	2014	Year 1	Phase I	40-50	1.0	<1.0	56.0	8.4	20.0	<10	42.0	59.0	<0.010	<10	<10	<10	15.0
DM-14 (20-40)	DM-14	2015	Year 2	Phase I	20-40	**1.5**	<0.50	30.5	12.0	**43.4**	8.0	56.6	65.7	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-14	2016	Year 3	Phase I														#N/A
DM-14 Deep	DM-14	2017	Year 4	Phase I	40-50	<1.0	<0.50	**1020**	**20.1**	12.3	8.3	**193**	64.8	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
	DM-15 surface																	
14-8314	DM-15	2014	Year 1	Phase I	0-10	1.1	<1.0	47.0	11.0	31.0	**35.0**	**78.0**	**78.0**	0.0970	<10	<10	<10	15.0
DM-15 (0-15)	DM-15	2015	Year 2	Phase I	0-15	**3.7**	<0.50	42.6	**15.0**	26.8	9.9	**83.0**	47.4	<0.050	<7.0	<4.0	<8.0	9.5
DM-15a	DM-15	2016	Year 3	Phase I	0-15	<1.0	<0.50	56.9	12.4	**35.9**	10.7	66.4	51.6	<0.050	<7.0	<4.0	<8.0	9.5
DM-15 Shallow	DM-15	2017	Year 4	Phase I	0-15	<1.0	<0.50	46.5	10.6	28.9	**14.5**	57.6	**90.2**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
	DM-15 depth																	
not sampled	DM-15	2014	Year 1	Phase I														#N/A
DM-15 (30-40)	DM-15	2015	Year 2	Phase I	30-40	**1.9**	<0.50	42.0	**13.9**	24.4	10.6	**76.8**	46.8	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-15	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-15	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
	DM-16 surface																	
14-8315	DM-16	2014	Year 1	Phase I	0-10	**2.5**	<1.0	32.0	12.0	**150.0**	**13.0**	27.0	**130.0**	<0.010	<10	<10	<10	15.0
DM-16 (0-15)	DM-16	2015	Year 2	Phase I	0-15	**2.4**	<0.50	29.5	11.8	**53.3**	8.5	40.4	**75.2**	<0.050	<7.0	<4.0	<8.0	9.5
DM-16a	DM-16	2016	Year 3	Phase I	0-15	<1.0	<0.50	38.7	11.6	**38.6**	8.7	43.2	66.5	<0.050	<7.0	<4.0	<8.0	9.5
DM-16 Shallow	DM-16	2017	Year 4	Phase I	0-15	<1.0	<0.50	44.8	**15.4**	**40.2**	**15.9**	**91.8**	65.7	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-16 depth																	
14-8317 (Dup Avg)**	DM-16	2014	Year 1	Phase I	40-50	**2.0**	<1.0	24.0	10.0	**100.0**	<10	23.0	**97.0**	<0.010	25.0	5100	85	**5210**
DM-16 (30-40)	DM-16	2015	Year 2	Phase I	30-40	**2.1**	<0.50	37.3	13.2	**45.2**	8.1	61.3	64.0	<0.050	<7.0	<4.0	<8.0	9.5
Not sampled - refusal	DM-16	2016	Year 3	Phase I														#N/A
Not sampled - refusal	DM-16	2017	Year 4	Phase I														#N/A
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

DYE-M Upper Site Helipad Regrade Area - Summary of Soil Monitoring Analytical Data

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Sample ID	Location	Year	Monitoring Year	Monitoring Phase	Depth (cm)	As* (mg/kg)	Cd* (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb* (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Total PCB* (mg/kg)	F1 C_6-C_{10} (mg/kg)	F2 C_{10}-C_{16} (mg/kg)	F3 C_{16}-C_{34} (mg/kg)	Modified TPH^ - Total C6-C34 (mg/kg)
Background Data - Arithmetic Mean						1.00	1.00	89.8	19.7	60.4	10.0	141.3	70.1	0.005				N/A
Baseline Data - Arithmetic Mean						**1.31**	**1.00**	**57.6**	**13.8**	**34.62**	**10.8**	**72.3**	**68.1**	**0.11**				**74.2**
Baseline Data - Standard Deviation						0.82	0.00	26.7	5.8	14.0	7.3	47.3	19.1	0.13				103.2
Baseline Data Mean + 3xStandard Deviation						**3.77**	**1.00**	**137.8**	**31.1**	**76.7**	**32.6**	**214.1**	**125.5**	**0.51**				**383.9**
	DM-17 surface																	
14-8318	DM-17	2014	Year 1	Phase I	0-10	1.3	<1.0	**76.0**	**20.0**	**44.0**	**11.0**	**180.0**	64.0	0.0140	<10	<10	<10	15.0
14-8319 interlab	DM-17	2014	Year 1	Phase I	0-10	0.9	<0.50	**58.0**	8.0	24.0	3.2	30.0	38.0	<0.050	<5.0	<10	<50	32.5
DM-17 (0-20)	DM-17	2015	Year 2	Phase I	0-15	**3.7**	<0.50	20.7	**15.9**	**125.0**	10.1	41.9	**157.0**	<0.050	<7.0	<4.0	<8.0	9.5
DM-17a	DM-17	2016	Year 3	Phase I	0-15	<1.0	<0.50	36.5	11.6	**42.9**	**22.0**	64.5	59.0	**0.13**	<7.0	<4.0	81.0	**86.5**
DM-17 Shallow	DM-17	2017	Year 4	Phase I	0-15	<1.0	<0.50	19.8	13.2	**140.0**	**10.9**	43.5	**97.3**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A
	DM-17 depth																	
14-8320/21	DM-17	2014	Year 1	Phase I	20-25	1.0	<1.0	**79.0**	**18.0**	31.0	**12.0**	**170.0**	48.0	<0.010	<10	<10	<10	15.0
DM-17 (20-40) Dup Avg.	DM-17	2015	Year 2	Phase I	20-40	**2.1**	<0.50	19.0	**15.7**	**180.0**	10.0	44.0	**123.0**	<0.10	<6.0	<7.0	<29	21.0
Not sampled - refusal	DM-17	2016	Year 3	Phase I														#N/A
DM-17 Deep	DM-17	2017	Year 4	Phase I	30-40	<1.0	<0.50	11.7	11.8	**121.0**	7.6	32.8	**97.8**	<0.05	<7	<4	<8	9.5
			Year 5	Phase I														#N/A
			Year 7	Phase II														#N/A
			Year 10	Phase II														#N/A
			Year 15	Phase II														#N/A
			Year 25	Phase II														#N/A
																		#N/A
																		#N/A
																		#N/A
																		#N/A

Note ^: Modified TPH Total (C_6-C_{34}) has been calculated by adding results for F1, F2 and F3.

N/A = not analyzed

** Field notes indicate odour noted in test pit.

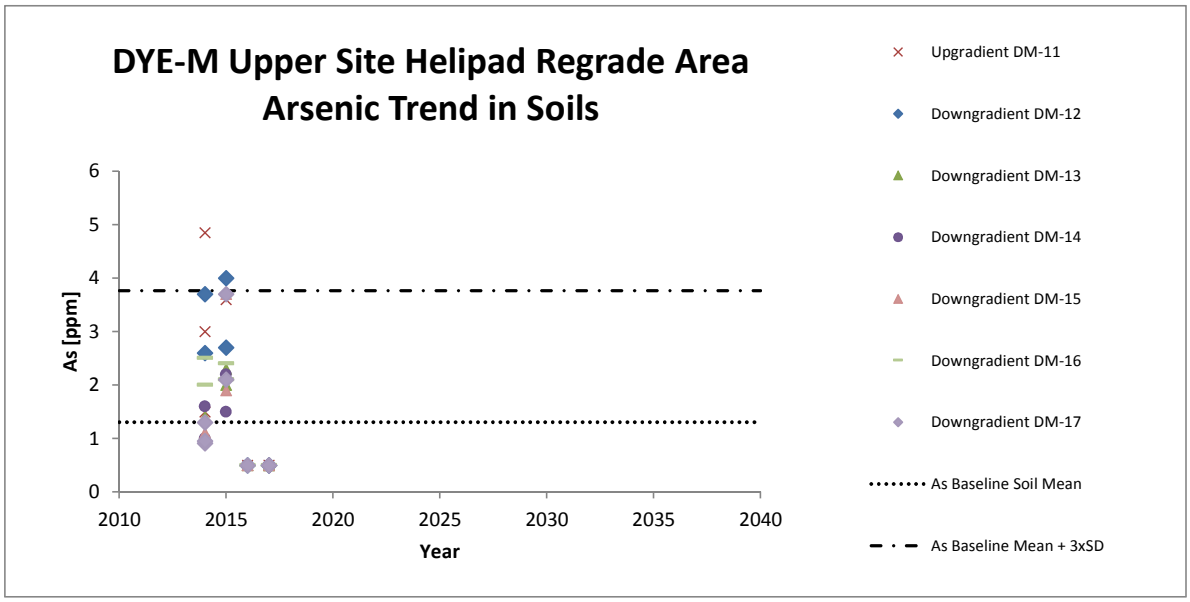
Legend	
XX	**Sample exceeds baseline mean**
XX	**Sample exceeds baseline mean + 3xSD**

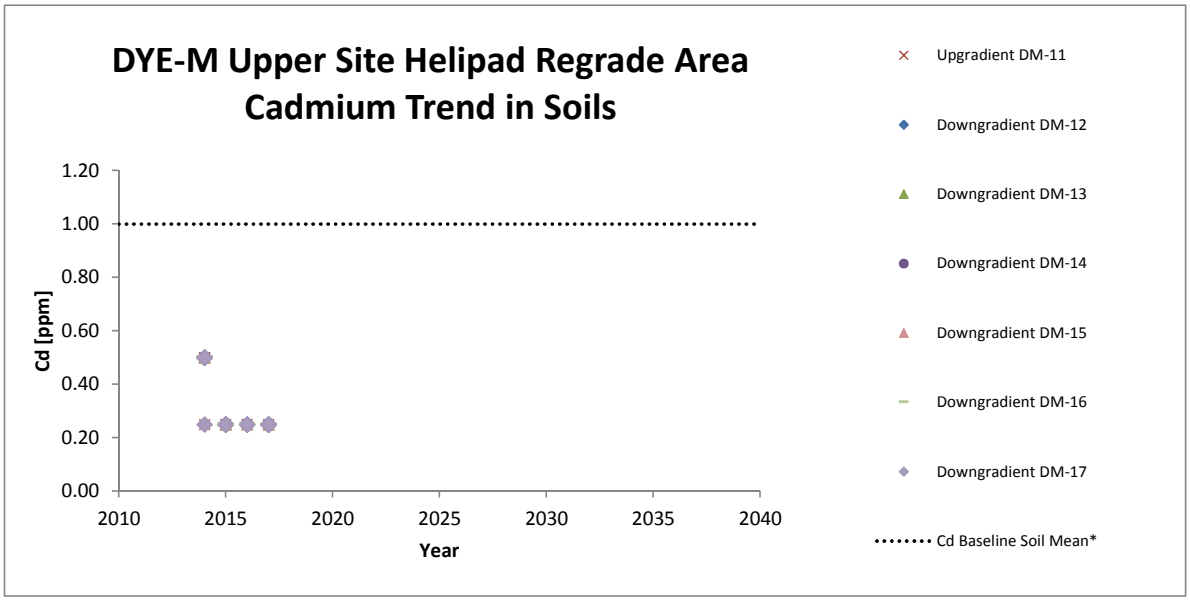
DYE-M Upper Site Helipad Regrade Area Trends in Soil Inorganics, PCBs and Modified TPH

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Where results are below detection, half of the detection limit has been used in the charts for the sample points.

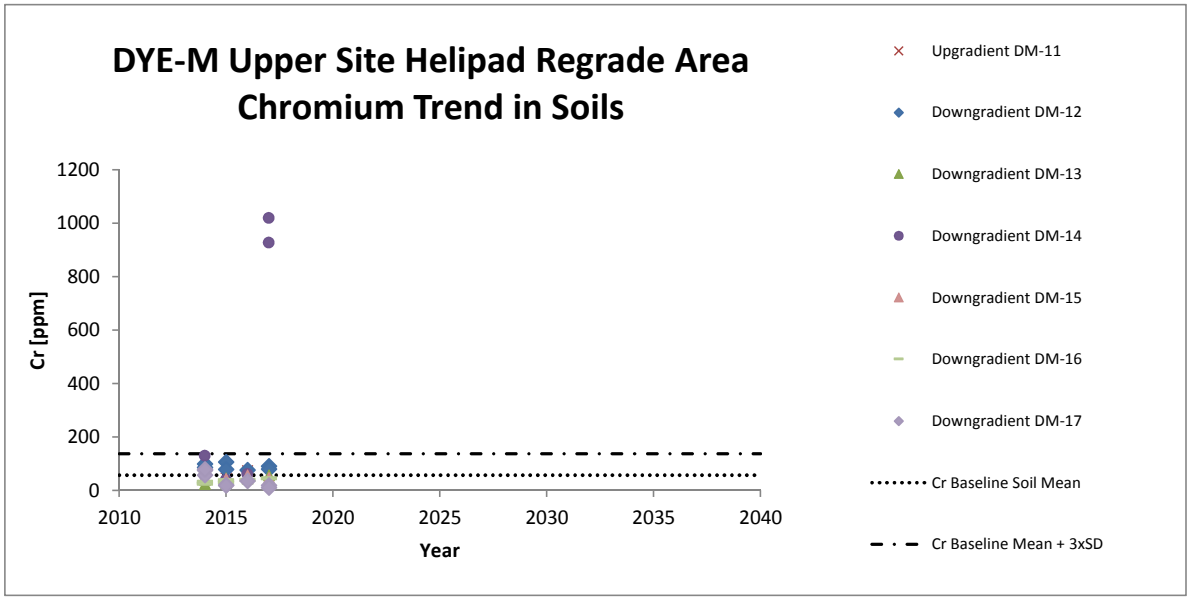
Trendlines are intended for visual interpretation of temporal trends. When all monitoring results are below detection, trendlines are a reflection of changes in detection limit. Users should refer to data tables.

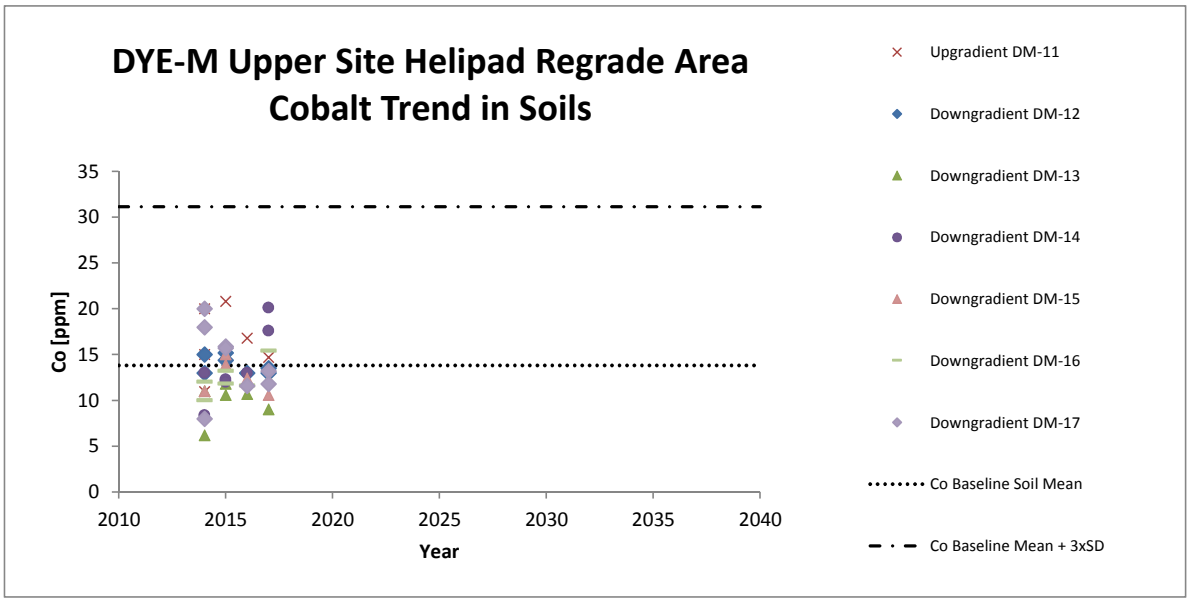




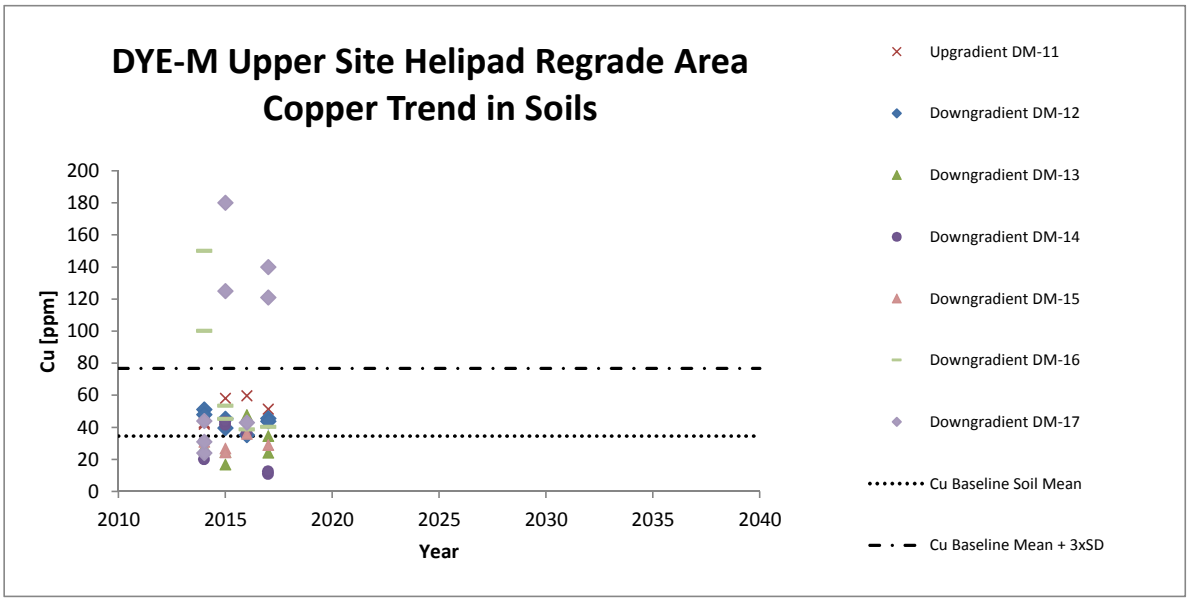
* Cd baseline arithmetic mean is equal to the baseline detection limit
* Cd baseline standard deviation = 0

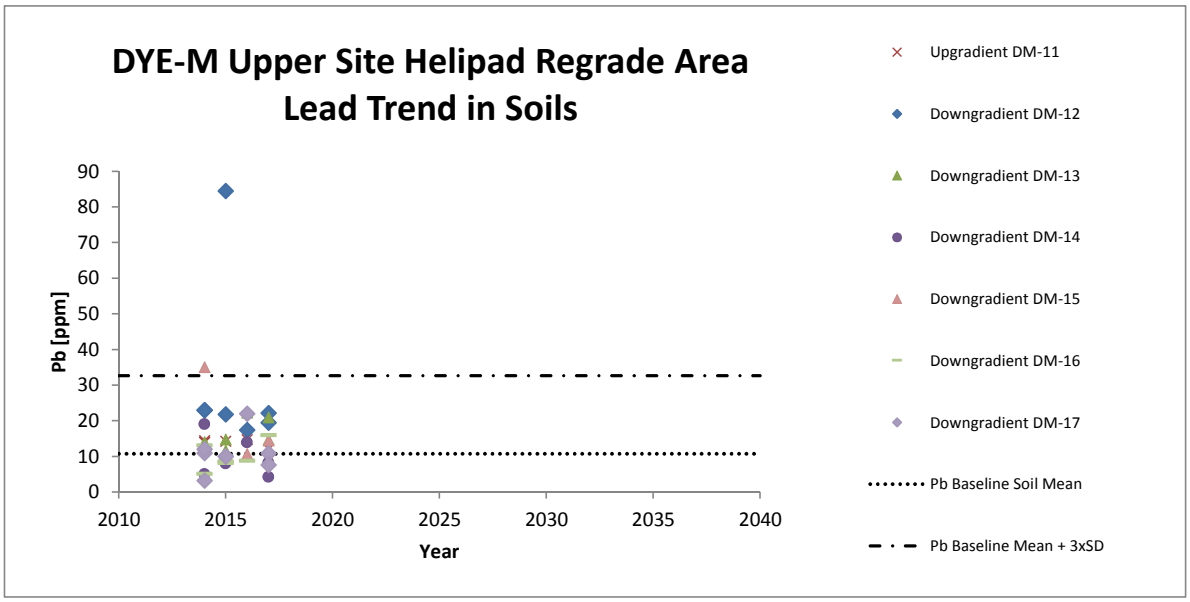
DYE-M Upper Site Helipad Regrade Area Trends in Soil Inorganics, PCBs and Modified TPH



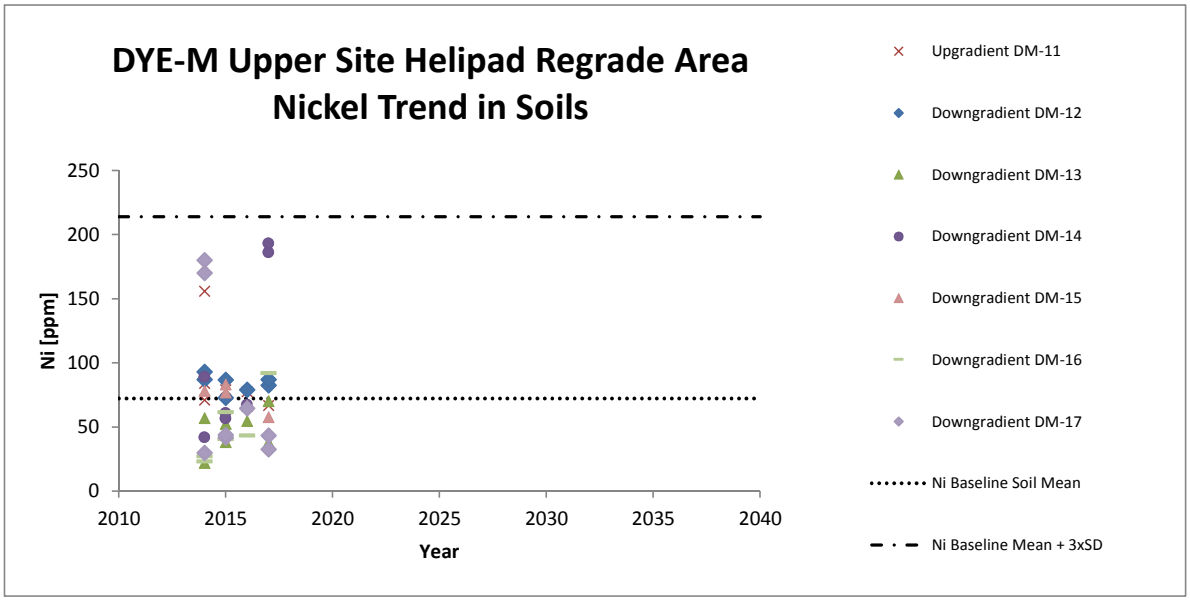


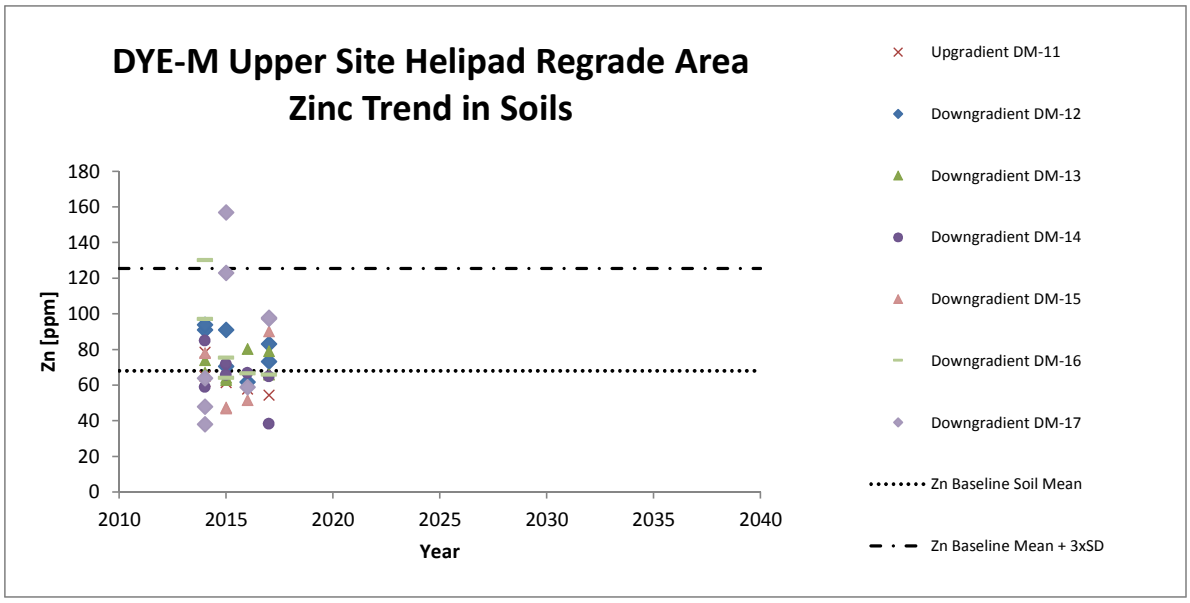
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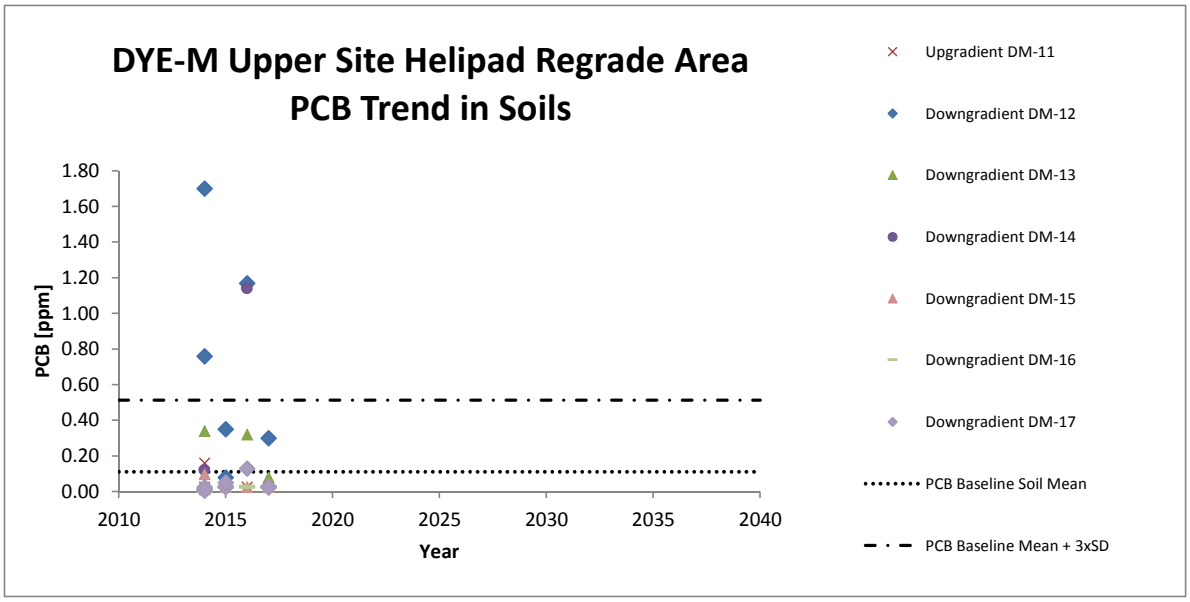


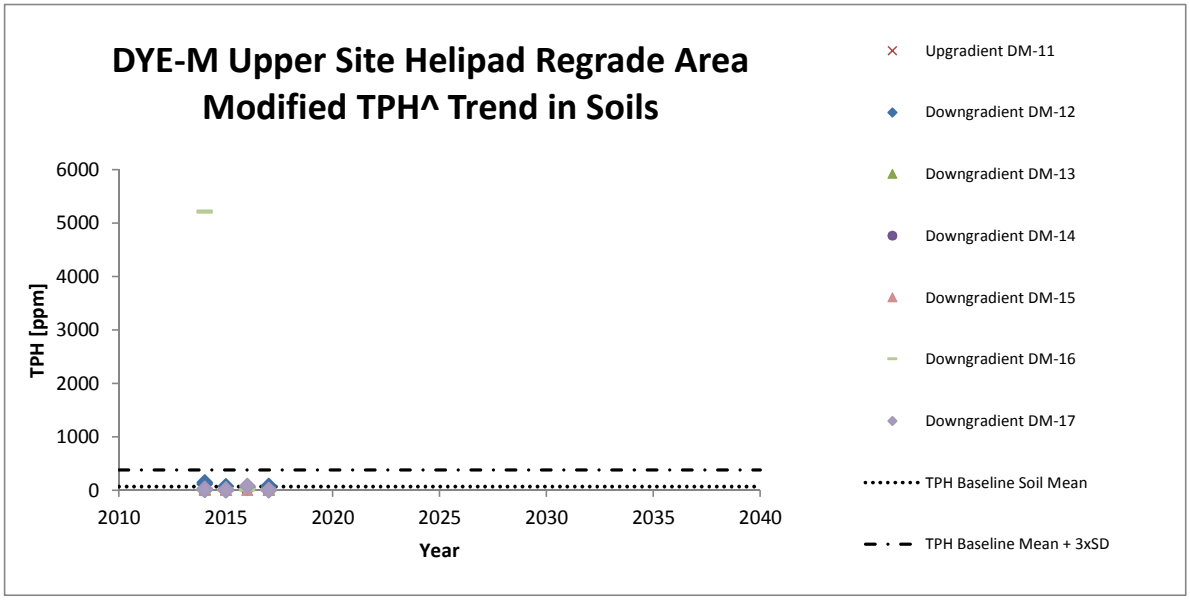
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DYE-M Upper Site Helipad Regrade Area Trends in Soil Inorganics, PCBs and Modified TPH





^ Modified TPH is sum of F1, F2 and F3 fractions (C_6 - C_{34})

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SAMPLE SUBMISSION CHECKLIST

Golder Associates Ltd. (Ottawa)

Project Number: 1530908-3000
Paracel Work Order #: 1732457
C of C #: 38302/3/4/5/6/7/8/9/10/11/12/501/500/2/3/4/5/6/7

Soil Samples

PO #: 1530908-2000
Submitted By: Alyssa Troke
Submission Date: 11-Aug-17

Item #	Sample Submission Requirement	Yes	No
	Sample Integrity		
1	Samples submitted > 10 °C *and sampled more than 1 day prior to submission*	x	
2	Samples submitted > 10 °C *on day of sampling with attempt to cool*		✓
	Chain of Custody		
3	Client information complete, including contact	✓	
4	Project reference and/or PO number provided	✓	
5	Guideline Requirements included	✓	
6	Analysis Request complete	✓	
7	TAT indicated on CoC	✓	
8	Sample Date Included	✓	
9	Submitted on Non-Paracel CoC	✓	
10	CoC signed and dated	✓	
11	Samples received submerged in water. Suspected melted ice.		✓

Comments

5 year contract- expires Dec 31, 2020. CCME Coarse Criteria.

CC: Don

Additional Bottle/Sample Integrity Qualifiers

Sample ID	Code	Qualifier Note	Additional Comment
01	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved	
02	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved	
03	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved	
04	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved	
05	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved	

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AB	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AC	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AD	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AE	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AF	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

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SAMPLE SUBMISSION CHECKLIST

AG	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AH	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AI	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AJ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AK	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AL	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AM	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AN	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AO	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AP	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AQ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AR	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AS	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AT	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AU	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AV	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AW	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AX	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AY	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
AZ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BA	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BB	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BC	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BD	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BE	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

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SAMPLE SUBMISSION CHECKLIST

BF	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BG	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BH	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BI	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BJ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BK	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BL	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BM	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BN	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BO	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BP	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BQ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BR	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BS	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BT	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BU	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BV	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BW	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BX	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BY	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
BZ	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CA	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CB	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CC	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CD	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

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SAMPLE SUBMISSION CHECKLIST

CE	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CF	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CG	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CH	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved
CI	LG-SMP005a	Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Alyssa Troke

DYE-M Soil 1 of 3

Client PO: 1530908-2000
Project: 1530908-3000
Custody: 38302/3/4/5/6/7/8/9/10/11/12/501/500/2/3/4/5/6/7

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017

Order #: 1732457

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1732457-01	DM-62-Deep
1732457-02	DM-962-Deep
1732457-03	DM-62-Shallow
1732457-04	DM-59-Deep
1732457-05	DM-54-Shallow
1732457-06	DM-61-Deep
1732457-07	DM-55-Deep
1732457-08	DM-57-Shallow
1732457-09	DM-58-Shallow
1732457-10	DM-59-Shallow
1732457-11	DM-959-Shallow
1732457-12	DM-51-Shallow
1732457-13	DM-61-Shallow
1732457-14	DM-50-Deep
1732457-15	DM-55-Shallow
1732457-16	DM-54-Deep
1732457-17	DM-50-Shallow
1732457-18	DM-51-Deep
1732457-19	DM-58-Deep
1732457-20	DM-57-Deep
1732457-21	DM-05-Shallow
1732457-22	DM-01-Shallow
1732457-23	DM-01-Deep
1732457-24	DM-05-Deep
1732457-25	DM-03-Shallow
1732457-26	DM-04-Shallow
1732457-27	DM-06-Shallow
1732457-28	DM-02-Shallow
1732457-29	DM-06-Deep
1732457-30	DM-906-Shallow

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

1732457-31	DM-03-Deep
1732457-32	MW05-15-Shallow
1732457-33	MW12-01-Shallow
1732457-34	MW12-01-Deep
1732457-35	MW12-901-Deep
1732457-36	MW05-09-Shallow
1732457-37	DM-8-Shallow
1732457-38	DM-97-Deep
1732457-39	DM-9-Shallow
1732457-40	DM-9-Deep
1732457-41	MW09-26-Shallow
1732457-42	DM-10-Shallow
1732457-43	MW05-09-Deep
1732457-44	MW05-06-Deep
1732457-45	DM-7-Deep
1732457-46	DM-7-Shallow
1732457-47	MW09-28-Deep
1732457-48	MW09-28-Shallow
1732457-49	MW05-12-Shallow
1732457-50	MW05-12-Deep

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
CCME-SQG: Metals by ICP-OES	based on MOE E3470, ICP-OES	16-Aug-17	15-Aug-17
PCBs, total	SW846 8082A - GC-ECD	15-Aug-17	20-Aug-17
PHC F1	CWS Tier 1 - P&T GC-FID	14-Aug-17	16-Aug-17
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	12-Aug-17	13-Aug-17
Solids, %	Gravimetric, calculation	15-Aug-17	15-Aug-17

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-62-Deep	DM-962-Deep	DM-62-Shallow	DM-59-Deep
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-01	1732457-02	1732457-03	1732457-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.3	90.1	87.7	92.0
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	52.1	41.5	49.6	48.3
Cobalt	1.0 mg/kg dry	14.7	12.8	15.0	15.8
Copper	1.0 mg/kg dry	58.4	58.0	55.8	41.9
Lead	1.0 mg/kg dry	16.8	15.9	15.0	15.5
Nickel	1.0 mg/kg dry	67.4	54.2	66.9	68.9
Zinc	1.0 mg/kg dry	68.0	65.4	65.0	70.0
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	2950
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	150
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	92.6%	91.2%	99.7%	84.0%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-54-Shallow	DM-61-Deep	DM-55-Deep	DM-57-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-05	1732457-06	1732457-07	1732457-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.6	88.3	90.3	89.7
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	69.5	49.9	61.3	76.9
Cobalt	1.0 mg/kg dry	16.2	15.9	15.4	19.9
Copper	1.0 mg/kg dry	43.8	39.0	30.3	47.4
Lead	1.0 mg/kg dry	39.1	8.1	38.3	19.0
Nickel	1.0 mg/kg dry	78.7	72.5	76.8	96.0
Zinc	1.0 mg/kg dry	79.3	66.1	72.4	79.3
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	82.3%	88.3%	87.9%	85.2%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-58-Shallow	DM-59-Shallow	DM-959-Shallow	DM-51-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-09	1732457-10	1732457-11	1732457-12
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.8	93.1	92.8	93.6
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	64.5	52.3	46.4	95.1
Cobalt	1.0 mg/kg dry	16.9	14.2	15.2	10.8
Copper	1.0 mg/kg dry	33.6	33.5	39.2	39.4
Lead	1.0 mg/kg dry	12.3	17.3	17.8	16.6
Nickel	1.0 mg/kg dry	97.8	80.7	74.4	52.3
Zinc	1.0 mg/kg dry	65.7	56.9	64.3	71.6
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	90	208	9
F2 PHCs (C10-C16)	4 mg/kg dry	<4	2430	2910	313
F3 PHCs (C16-C34)	8 mg/kg dry	<8	216	166	108
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	20
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	87.8%	81.2%	85.7%	93.1%

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Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-61-Shallow	DM-50-Deep	DM-55-Shallow	DM-54-Deep
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-13	1732457-14	1732457-15	1732457-16
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.2	93.6	90.6	93.0
Metals					
Arsenic	1.0 mg/kg dry	<1.0	4.6	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	55.3	273	70.4	62.9
Cobalt	1.0 mg/kg dry	16.0	15.7	16.9	15.7
Copper	1.0 mg/kg dry	42.8	137	35.9	36.8
Lead	1.0 mg/kg dry	7.8	15.1	44.3	30.5
Nickel	1.0 mg/kg dry	68.2	80.8	88.1	82.6
Zinc	1.0 mg/kg dry	69.4	88.1	76.9	69.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	179	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	29	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	91.0%	83.1%	88.2%	93.4%

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Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-50-Shallow	DM-51-Deep	DM-58-Deep	DM-57-Deep
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-17	1732457-18	1732457-19	1732457-20
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	92.2	93.1	91.6	96.7
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	205	107	72.5	57.8
Cobalt	1.0 mg/kg dry	13.7	12.2	18.3	14.6
Copper	1.0 mg/kg dry	94.4	46.0	42.9	31.0
Lead	1.0 mg/kg dry	21.0	21.0	18.5	10.1
Nickel	1.0 mg/kg dry	73.7	52.8	81.4	93.2
Zinc	1.0 mg/kg dry	74.0	84.2	79.2	54.6
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	98	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	7	2320	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	47	607	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	94	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	87.1%	78.7%	83.5%	95.4%

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Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-05-Shallow	DM-01-Shallow	DM-01-Deep	DM-05-Deep
	Sample Date:	02-Aug-17	02-Aug-17	02-Aug-17	02-Aug-17
	Sample ID:	1732457-21	1732457-22	1732457-23	1732457-24
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	92.6	86.3	92.7	94.0
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	50.3	69.4	64.7	45.4
Cobalt	1.0 mg/kg dry	7.6	10.1	8.9	6.4
Copper	1.0 mg/kg dry	26.2	37.2	31.2	23.2
Lead	1.0 mg/kg dry	8.7	9.3	7.4	3.8
Nickel	1.0 mg/kg dry	29.1	40.3	36.1	27.5
Zinc	1.0 mg/kg dry	35.1	48.8	41.7	30.0
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	70	65	46	<8
F4 PHCs (C34-C50)	6 mg/kg dry	8	7	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	86.7%	89.2%	87.9%	95.2%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-03-Shallow	DM-04-Shallow	DM-06-Shallow	DM-02-Shallow
	Sample Date:	02-Aug-17	02-Aug-17	02-Aug-17	02-Aug-17
	Sample ID:	1732457-25	1732457-26	1732457-27	1732457-28
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	92.3	91.5	88.8	91.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	56.1	62.1	69.6	70.9
Cobalt	1.0 mg/kg dry	8.6	8.6	9.8	10.4
Copper	1.0 mg/kg dry	31.9	28.1	32.1	35.5
Lead	1.0 mg/kg dry	4.6	12.9	4.6	6.3
Nickel	1.0 mg/kg dry	40.3	33.3	39.3	41.4
Zinc	1.0 mg/kg dry	33.8	45.8	44.8	45.3
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	102	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	15	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	83.5%	88.3%	78.7%	87.9%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-06-Deep	DM-906-Shallow	DM-03-Deep	MW05-15-Shallow
	Sample Date:	02-Aug-17	02-Aug-17	02-Aug-17	05-Aug-17
	Sample ID:	1732457-29	1732457-30	1732457-31	1732457-32
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.7	86.8	89.2	88.4
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	56.9	76.4	52.9	79.3
Cobalt	1.0 mg/kg dry	7.9	10.4	8.2	11.5
Copper	1.0 mg/kg dry	25.8	31.7	30.0	37.7
Lead	1.0 mg/kg dry	4.2	5.2	4.0	6.0
Nickel	1.0 mg/kg dry	32.9	40.4	37.1	44.3
Zinc	1.0 mg/kg dry	37.6	47.2	33.7	51.3
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	90.6%	96.0%	90.9%	94.2%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW12-01-Shallow	MW12-01-Deep	MW12-901-Deep	MW05-09-Shallow
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-33	1732457-34	1732457-35	1732457-36
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	87.8	86.5	88.0	89.1
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	72.0	64.9	61.7	49.8
Cobalt	1.0 mg/kg dry	9.5	9.4	8.5	7.7
Copper	1.0 mg/kg dry	29.3	28.2	25.2	34.9
Lead	1.0 mg/kg dry	5.3	5.4	4.5	6.9
Nickel	1.0 mg/kg dry	35.0	35.2	31.5	31.0
Zinc	1.0 mg/kg dry	42.8	43.4	39.6	37.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	40 [2]
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	14 [2]
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	87.9%	94.7%	103%	85.4%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-8-Shallow	DM-97-Deep	DM-9-Shallow	DM-9-Deep
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-37	1732457-38	1732457-39	1732457-40
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	93.8	89.9	81.3	88.1
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	44.8	79.3	62.2	64.9
Cobalt	1.0 mg/kg dry	7.9	12.1	9.4	8.9
Copper	1.0 mg/kg dry	20.9	32.4	30.8	31.0
Lead	1.0 mg/kg dry	8.8	6.8	6.1	5.1
Nickel	1.0 mg/kg dry	27.8	44.2	37.5	36.9
Zinc	1.0 mg/kg dry	40.7	48.3	44.4	40.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	94.5%	94.9%	92.1%	106%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	MW09-26-Shallow	DM-10-Shallow	MW05-09-Deep	MW05-06-Deep
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-41	1732457-42	1732457-43	1732457-44
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.9	94.7	92.3	91.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	43.9	71.9	53.0	46.7
Cobalt	1.0 mg/kg dry	5.6	11.1	7.8	7.0
Copper	1.0 mg/kg dry	14.5	32.3	28.3	18.1
Lead	1.0 mg/kg dry	3.6	9.0	8.0	4.1
Nickel	1.0 mg/kg dry	22.3	39.0	31.6	27.0
Zinc	1.0 mg/kg dry	28.7	53.5	42.7	31.6
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	40
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	1810
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	31	90
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	89.2%	89.0%	102%	90.8%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-7-Deep	DM-7-Shallow	MW09-28-Deep	MW09-28-Shallow
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-45	1732457-46	1732457-47	1732457-48
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	90.6	90.5	92.2	90.1
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	64.6	74.0	62.5	60.4
Cobalt	1.0 mg/kg dry	10.0	11.2	8.4	9.2
Copper	1.0 mg/kg dry	26.0	29.2	25.1	26.1
Lead	1.0 mg/kg dry	4.7	6.4	5.5	6.2
Nickel	1.0 mg/kg dry	36.7	41.0	33.6	34.7
Zinc	1.0 mg/kg dry	41.5	46.4	39.0	41.3
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	34
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	90.5%	91.2%	92.8%	102%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW05-12-Shallow	MW05-12-Deep	-	-
	Sample Date:	05-Aug-17	05-Aug-17	-	-
	Sample ID:	1732457-49	1732457-50	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	92.4	91.6	-	-
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	-	-
Cadmium	0.5 mg/kg dry	<0.5	<0.5	-	-
Chromium	1.0 mg/kg dry	73.5	93.0	-	-
Cobalt	1.0 mg/kg dry	10.2	13.2	-	-
Copper	1.0 mg/kg dry	31.1	41.3	-	-
Lead	1.0 mg/kg dry	11.0	14.6	-	-
Nickel	1.0 mg/kg dry	40.3	51.8	-	-
Zinc	1.0 mg/kg dry	55.4	76.8	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	-	-
F3 PHCs (C16-C34)	8 mg/kg dry	<8	19	-	-
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	-	-
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	-	-
Decachlorobiphenyl	Surrogate	88.4%	96.2%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg						
F2 PHCs (C10-C16)	ND	4	mg/kg						
F3 PHCs (C16-C34)	ND	8	mg/kg						
F4 PHCs (C34-C50)	ND	6	mg/kg						
Metals									
Arsenic	ND	1.0	mg/kg						
Cadmium	ND	0.5	mg/kg						
Chromium	ND	1.0	mg/kg						
Cobalt	ND	1.0	mg/kg						
Copper	ND	1.0	mg/kg						
Lead	ND	1.0	mg/kg						
Nickel	ND	1.0	mg/kg						
Zinc	ND	1.0	mg/kg						
PCBs									
PCBs, total	ND	0.05	mg/kg						
Surrogate: Decachlorobiphenyl	*0.179*		*mg/kg*		*89.7*	*60-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg dry	ND				40	
F2 PHCs (C10-C16)	ND	4	mg/kg dry	ND				30	
F3 PHCs (C16-C34)	ND	8	mg/kg dry	ND				30	
F4 PHCs (C34-C50)	ND	6	mg/kg dry	ND				30	
Metals									
Antimony	ND	1.0	mg/kg dry	ND			0.0	30	
Arsenic	ND	1.0	mg/kg dry	ND				30	
Barium	99.4	1.0	mg/kg dry	101			1.4	30	
Beryllium	ND	1.0	mg/kg dry	ND			0.0	30	
Boron	ND	1.0	mg/kg dry	ND			0.0	30	
Cadmium	ND	0.5	mg/kg dry	ND			0.0	30	
Chromium	46.0	1.0	mg/kg dry	52.1			12.4	30	
Cobalt	14.9	1.0	mg/kg dry	14.7			0.7	30	
Copper	57.5	1.0	mg/kg dry	58.4			1.5	30	
Lead	15.0	1.0	mg/kg dry	16.8			11.2	30	
Molybdenum	ND	1.0	mg/kg dry	ND			0.0	30	
Nickel	68.4	1.0	mg/kg dry	67.4			1.4	30	
Selenium	ND	1.0	mg/kg dry	ND			0.0	30	
Silver	ND	0.5	mg/kg dry	ND			0.0	30	
Thallium	ND	1.0	mg/kg dry	ND			0.0	30	
Tin	ND	5.0	mg/kg dry	ND			0.0	30	
Uranium	10.3	1.0	mg/kg dry	10.0			2.6	30	
Vanadium	55.3	1.0	mg/kg dry	54.9			0.7	30	
Zinc	66.0	1.0	mg/kg dry	68.0			3.0	30	
PCBs									
PCBs, total	ND	0.05	mg/kg dry	ND				40	
Surrogate: Decachlorobiphenyl	*0.215*		*mg/kg dry*		*96.1*	*60-140*			
Physical Characteristics									
% Solids	89.5	0.1	% by Wt.	89.3			0.2	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	162	7	mg/kg		81.1	80-120			
F2 PHCs (C10-C16)	123	4	mg/kg	ND	113	60-140			
F3 PHCs (C16-C34)	241	8	mg/kg	ND	107	60-140			
F4 PHCs (C34-C50)	142	6	mg/kg	ND	95.2	60-140			
Metals									
Antimony	242		ug/L	33.6	83.2	70-130			
Arsenic	261		ug/L	ND	105	70-130			
Barium	1530		ug/L	1320	83.3	70-130			
Beryllium	203		ug/L	ND	81.1	70-130			
Boron	219		ug/L	12.1	82.6	70-130			
Cadmium	210		ug/L	2.09	83.3	70-130			
Chromium	1050		ug/L	878	68.6	70-130			
Cobalt	477		ug/L	295	72.7	70-130			
Copper	1350		ug/L	1170	73.2	70-130			
Lead	521		ug/L	336	74.0	70-130			
Molybdenum	202		ug/L	12.9	75.5	70-130			
Nickel	683		ug/L	446	94.9	70-130			
Selenium	203		ug/L	ND	81.2	70-130			
Silver	197		ug/L	1.41	78.3	70-130			
Thallium	196		ug/L	ND	78.3	70-130			
Tin	232		ug/L	34.2	79.1	70-130			
Uranium	430		ug/L	200	92.0	70-130			
Vanadium	1280		ug/L	1100	73.1	70-130			
Zinc	788		ug/L	575	85.3	70-130			
PCBs									
PCBs, total	0.395	0.05	mg/kg	ND	88.3	60-140			
Surrogate: Decachlorobiphenyl	*0.199*		*mg/kg*		*88.9*	*60-140*			

Qualifier Notes:

Login Qualifiers :

Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

Applies to samples: DM-62-Deep, DM-962-Deep, DM-62-Shallow, DM-59-Deep, DM-54-Shallow, DM-61-Deep, DM-55-Deep, DM-57-Shallow, DM-58-Shallow, DM-59-Shallow, DM-959-Shallow, DM-51-Shallow, DM-61-Shallow, DM-50-Deep, DM-55-Shallow, DM-54-Deep, DM-50-Shallow, DM-51-Deep, DM-58-Deep, DM-57-Deep, DM-05-Shallow, DM-01-Shallow, DM-01-Deep, DM-05-Deep, DM-03-Shallow, DM-04-Shallow, DM-06-Shallow, DM-02-Shallow, DM-06-Deep, DM-906-Shallow, DM-03-Deep, MW05-15-Shallow, MW12-01-Shallow, MW12-01-Deep, MW12-901-Deep, MW05-09-Shallow, DM-8-Shallow, DM-97-Deep, DM-9-Shallow, DM-9-Deep, MW09-26-Shallow, DM-10-Shallow, MW05-09-Deep, MW05-06-Deep, DM-7-Deep, DM-7-Shallow, MW09-28-Deep, MW09-28-Shallow, MW05-12-Shallow, MW05-12-Deep

Sample Qualifiers :

2 : Peak(s) in the GC-FID Chromatogram are not typical of petroleum hydrocarbon distillates. May be the result of high concentrations of non-mineral based compounds not completely removed by the method cleanup.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Alyssa Troke

DYE-M Soil 2 of 3

Client PO: 1530908-2000
Project: 1530908-3000
Custody: 38302/3/4/5/6/7/8/9/10/11/12/501/500/2/3/4/5/6/7

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017

Order #: 1732457

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1732457-51	MW05-13-Shallow
1732457-52	MW05-13-Deep
1732457-53	MW05-15-Deep
1732457-54	MW05-16-Shallow
1732457-55	DM-32-Shallow
1732457-56	DM-37-Deep
1732457-57	MW08-25-Shallow
1732457-58	DM-36-Deep
1732457-59	MW08-925-Deep
1732457-60	MW07-22-Shallow
1732457-61	DM-46-Shallow
1732457-62	DM-36-Shallow
1732457-63	DM-32-Deep
1732457-64	DM-37-Shallow
1732457-65	MW07-23-Deep
1732457-66	DM-31-Deep
1732457-67	MW07-22-Deep
1732457-68	MW12-02-Shallow
1732457-69	DM-31-Shallow
1732457-70	MW08-24-Shallow
1732457-71	MW07-23-Shallow
1732457-72	MW08-24-Deep
1732457-73	MW08-25-Deep
1732457-74	DM-49-Shallow
1732457-75	DM-48-Shallow
1732457-76	DM-933-Shallow
1732457-77	DM-49-Deep
1732457-78	DM-948-Deep
1732457-79	DM-47-Deep
1732457-80	DM-48-Deep

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

1732457-81	DM-52-Shallow
1732457-82	DM-952-Shallow
1732457-83	DM-940-Deep
1732457-84	DM-42-Deep
1732457-85	DM-46-Deep
1732457-86	MW05-16-Deep
1732457-87	MW09-27-Deep
1732457-88	MW05-08-Shallow
1732457-89	MW05-06-Shallow
1732457-90	MW09-26-Deep
1732457-91	MW09-27-Deep
1732457-92	MW05-07-Deep
1732457-93	MW05-07-Shallow
1732457-94	MW05-05-Shallow
1732457-95	MW05-906-Shallow
1732457-96	DM-40-Shallow
1732457-97	DM-44-Shallow
1732457-98	DM-33-Deep
1732457-99	DM-43-Deep

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
CCME-SQG: Metals by ICP-OES	based on MOE E3470, ICP-OES	16-Aug-17	16-Aug-17
PCBs, total	SW846 8082A - GC-ECD	15-Aug-17	21-Aug-17
PHC F1	CWS Tier 1 - P&T GC-FID	14-Aug-17	17-Aug-17
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	12-Aug-17	14-Aug-17
Solids, %	Gravimetric, calculation	16-Aug-17	16-Aug-17

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	MW05-13-Shallow	MW05-13-Deep	MW05-15-Deep	MW05-16-Shallow
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-51	1732457-52	1732457-53	1732457-54
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.9	88.5	88.9	88.4
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	47.3	45.3	87.9	85.0
Cobalt	1.0 mg/kg dry	7.1	6.5	12.5	10.9
Copper	1.0 mg/kg dry	21.8	18.6	40.2	31.9
Lead	1.0 mg/kg dry	5.2	3.2	6.0	5.3
Nickel	1.0 mg/kg dry	27.4	26.1	46.3	41.3
Zinc	1.0 mg/kg dry	33.5	31.3	55.8	50.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	100%	91.0%	99.4%	105%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-32-Shallow	DM-37-Deep	MW08-25-Shallow	DM-36-Deep
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-55	1732457-56	1732457-57	1732457-58
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.8	92.9	90.4	90.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	183	126	474	183
Cobalt	1.0 mg/kg dry	11.9	9.8	36.5	12.1
Copper	1.0 mg/kg dry	89.6	52.8	62.6	136
Lead	1.0 mg/kg dry	12.7	8.7	23.5	17.4
Nickel	1.0 mg/kg dry	42.4	31.8	132	44.6
Zinc	1.0 mg/kg dry	122	107	74.6	150
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	50	<4	245
F3 PHCs (C16-C34)	8 mg/kg dry	<8	10	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	108%	110%	110%	106%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	MW08-925-Deep	MW07-22-Shallow	DM-46-Shallow	DM-36-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-59	1732457-60	1732457-61	1732457-62
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.6	92.4	92.8	93.1
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	702	146	163	150
Cobalt	1.0 mg/kg dry	62.6	19.0	14.8	11.5
Copper	1.0 mg/kg dry	131	103	85.2	96.8
Lead	1.0 mg/kg dry	29.3	14.7	26.8	13.8
Nickel	1.0 mg/kg dry	257	78.9	71.0	42.8
Zinc	1.0 mg/kg dry	89.2	134	120	113
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	48	25
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	196	8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	24	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	108%	99.0%	105%	104%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-32-Deep	DM-37-Shallow	MW07-23-Deep	DM-31-Deep
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-63	1732457-64	1732457-65	1732457-66
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.5	89.0	87.9	91.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	20.4	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	190	132	111	126
Cobalt	1.0 mg/kg dry	11.4	10.2	24.4	9.8
Copper	1.0 mg/kg dry	89.2	62.3	111	67.4
Lead	1.0 mg/kg dry	9.5	13.8	8.6	9.6
Nickel	1.0 mg/kg dry	38.7	34.1	178	36.2
Zinc	1.0 mg/kg dry	125	111	51.6	121
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	17	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	13	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	110%	110%	113%	100%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	MW07-22-Deep	MW12-02-Shallow	DM-31-Shallow	MW08-24-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-67	1732457-68	1732457-69	1732457-70
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.0	96.3	90.5	89.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	114	51.1	133	73.8
Cobalt	1.0 mg/kg dry	14.0	12.6	9.0	12.2
Copper	1.0 mg/kg dry	58.0	14.2	56.0	26.1
Lead	1.0 mg/kg dry	19.7	17.1	10.4	15.0
Nickel	1.0 mg/kg dry	66.3	33.2	29.1	51.4
Zinc	1.0 mg/kg dry	88.2	65.4	114	54.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	112%	97.0%	110%	128%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	MW07-23-Shallow	MW08-24-Deep	MW08-25-Deep	DM-49-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-71	1732457-72	1732457-73	1732457-74
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	90.2	89.8	90.4	87.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	129	68.0	530	210
Cobalt	1.0 mg/kg dry	27.2	12.3	39.1	15.6
Copper	1.0 mg/kg dry	62.3	24.4	73.4	117
Lead	1.0 mg/kg dry	9.4	13.3	24.1	16.7
Nickel	1.0 mg/kg dry	352	50.3	145	76.1
Zinc	1.0 mg/kg dry	54.2	50.3	74.4	150
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	72
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	38
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	124%	125%	122%	117%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-48-Shallow	DM-933-Shallow	DM-49-Deep	DM-948-Deep
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-75	1732457-76	1732457-77	1732457-78
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.7	94.1	87.1	93.0
Metals					
Arsenic	1.0 mg/kg dry	25.2	<1.0	<1.0	17.2
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	486	79.4	222	600
Cobalt	1.0 mg/kg dry	54.8	12.5	16.9	53.9
Copper	1.0 mg/kg dry	95.0	40.2	117	109
Lead	1.0 mg/kg dry	9.5	7.7	16.8	10.0
Nickel	1.0 mg/kg dry	609	56.0	86.0	472
Zinc	1.0 mg/kg dry	105	71.4	151	135
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	119	<4
F3 PHCs (C16-C34)	8 mg/kg dry	29	<8	47	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	111%	116%	126%	121%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-47-Deep	DM-48-Deep	DM-52-Shallow	DM-952-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-79	1732457-80	1732457-81	1732457-82
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.7	93.3	91.9	92.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	13.5	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	218	503	45.3	42.1
Cobalt	1.0 mg/kg dry	17.1	46.8	37.9	32.7
Copper	1.0 mg/kg dry	82.6	94.8	62.0	63.2
Lead	1.0 mg/kg dry	11.3	9.4	6.6	5.8
Nickel	1.0 mg/kg dry	63.4	399	226	229
Zinc	1.0 mg/kg dry	150	119	42.3	42.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	34	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	16	<8	11	11
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	122%	129%	111%	88.0%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-940-Deep	DM-42-Deep	DM-46-Deep	MW05-16-Deep
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	05-Aug-17
	Sample ID:	1732457-83	1732457-84	1732457-85	1732457-86
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.1	89.9	85.7	88.7
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	198	156	149	71.2
Cobalt	1.0 mg/kg dry	6.7	14.1	14.1	9.7
Copper	1.0 mg/kg dry	263	81.3	107	28.1
Lead	1.0 mg/kg dry	22.0	8.6	20.5	5.1
Nickel	1.0 mg/kg dry	55.0	46.0	61.3	35.2
Zinc	1.0 mg/kg dry	217	125	126	44.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	24	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	76	<8
F4 PHCs (C34-C50)	6 mg/kg dry	6	<6	11	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	98.3%	101%	105%	106%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW09-27-Deep	MW05-08-Shallow	MW05-06-Shallow	MW09-26-Deep
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-87	1732457-88	1732457-89	1732457-90
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.9	90.6	91.2	88.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	75.2	53.0	61.7	46.8
Cobalt	1.0 mg/kg dry	10.7	8.3	7.9	5.5
Copper	1.0 mg/kg dry	33.2	24.9	24.8	15.2
Lead	1.0 mg/kg dry	6.4	10.2	13.4	3.6
Nickel	1.0 mg/kg dry	42.9	31.7	30.9	22.8
Zinc	1.0 mg/kg dry	48.9	40.8	45.0	28.4
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	7	653	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	91	293	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	21	56	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	0.10	<0.05
Decachlorobiphenyl	Surrogate	94.2%	110%	86.8%	91.2%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW09-27-Deep	MW05-07-Deep	MW05-07-Shallow	MW05-05-Shallow
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1732457-91	1732457-92	1732457-93	1732457-94
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	86.9	91.1	91.4	92.0
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	62.0	71.3	56.1	59.6
Cobalt	1.0 mg/kg dry	8.4	10.5	8.4	8.2
Copper	1.0 mg/kg dry	26.6	32.2	26.6	26.5
Lead	1.0 mg/kg dry	7.0	5.7	9.2	9.5
Nickel	1.0 mg/kg dry	32.8	41.2	32.9	32.1
Zinc	1.0 mg/kg dry	38.5	47.5	45.6	43.3
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	16	<8	20	42
F4 PHCs (C34-C50)	6 mg/kg dry	10	<6	11	13
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	90.4%	87.0%	103%	98.0%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW05-906-Shallow	DM-40-Shallow	DM-44-Shallow	DM-33-Deep
	Sample Date:	05-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-95	1732457-96	1732457-97	1732457-98
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.1	87.4	90.9	95.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	3.4	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	57.9	173	159	78.8
Cobalt	1.0 mg/kg dry	7.0	13.0	10.6	11.1
Copper	1.0 mg/kg dry	33.1	107	145	43.0
Lead	1.0 mg/kg dry	15.2	15.0	13.6	7.4
Nickel	1.0 mg/kg dry	28.1	57.5	44.9	45.5
Zinc	1.0 mg/kg dry	45.2	146	147	67.8
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	877	24	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	211	28	9	<8
F4 PHCs (C34-C50)	6 mg/kg dry	24	6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	0.11	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	99.7%	93.0%	90.2%	104%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-43-Deep	-	-	-
	Sample Date:	03-Aug-17	-	-	-
	Sample ID:	1732457-99	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	95.7	-	-	-
Metals					
Arsenic	1.0 mg/kg dry	<1.0	-	-	-
Cadmium	0.5 mg/kg dry	<0.5	-	-	-
Chromium	1.0 mg/kg dry	121	-	-	-
Cobalt	1.0 mg/kg dry	13.6	-	-	-
Copper	1.0 mg/kg dry	53.8	-	-	-
Lead	1.0 mg/kg dry	6.4	-	-	-
Nickel	1.0 mg/kg dry	42.6	-	-	-
Zinc	1.0 mg/kg dry	71.1	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	-	-	-
F2 PHCs (C10-C16)	4 mg/kg dry	<4	-	-	-
F3 PHCs (C16-C34)	8 mg/kg dry	<8	-	-	-
F4 PHCs (C34-C50)	6 mg/kg dry	<6	-	-	-
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	92.9%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg						
F2 PHCs (C10-C16)	ND	4	mg/kg						
F3 PHCs (C16-C34)	ND	8	mg/kg						
F4 PHCs (C34-C50)	ND	6	mg/kg						
Metals									
Arsenic	ND	1.0	mg/kg						
Cadmium	ND	0.5	mg/kg						
Chromium	ND	1.0	mg/kg						
Cobalt	ND	1.0	mg/kg						
Copper	ND	1.0	mg/kg						
Lead	ND	1.0	mg/kg						
Nickel	ND	1.0	mg/kg						
Zinc	ND	1.0	mg/kg						
PCBs									
PCBs, total	ND	0.05	mg/kg						
Surrogate: Decachlorobiphenyl	*0.187*		*mg/kg*		*93.4*	*60-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg dry	ND				40	
F2 PHCs (C10-C16)	ND	4	mg/kg dry	ND				30	
F3 PHCs (C16-C34)	ND	8	mg/kg dry	ND				30	
F4 PHCs (C34-C50)	ND	6	mg/kg dry	ND				30	
Metals									
Antimony	ND	1.0	mg/kg dry	ND			0.0	30	
Arsenic	ND	1.0	mg/kg dry	ND				30	
Barium	67.0	1.0	mg/kg dry	66.1			1.4	30	
Beryllium	ND	1.0	mg/kg dry	ND			0.0	30	
Boron	ND	1.0	mg/kg dry	ND			0.0	30	
Cadmium	ND	0.5	mg/kg dry	ND			0.0	30	
Chromium	42.5	1.0	mg/kg dry	43.9			3.3	30	
Cobalt	5.58	1.0	mg/kg dry	5.59			0.2	30	
Copper	15.0	1.0	mg/kg dry	14.5			3.4	30	
Lead	3.95	1.0	mg/kg dry	3.62			8.8	30	
Molybdenum	ND	1.0	mg/kg dry	ND			0.0	30	
Nickel	22.5	1.0	mg/kg dry	22.3			1.2	30	
Selenium	ND	1.0	mg/kg dry	ND			0.0	30	
Silver	ND	0.5	mg/kg dry	ND			0.0	30	
Thallium	ND	1.0	mg/kg dry	ND			0.0	30	
Tin	ND	5.0	mg/kg dry	ND			0.0	30	
Uranium	1.13	1.0	mg/kg dry	1.02			9.7	30	
Vanadium	29.0	1.0	mg/kg dry	29.4			1.4	30	
Zinc	28.7	1.0	mg/kg dry	28.7			0.1	30	
PCBs									
PCBs, total	ND	0.05	mg/kg dry	ND				40	
Surrogate: Decachlorobiphenyl	*0.224*		*mg/kg dry*		*97.2*	*60-140*			
Physical Characteristics									
% Solids	86.5	0.1	% by Wt.	86.9			0.5	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	162	7	mg/kg		81.1	80-120			
F2 PHCs (C10-C16)	108	4	mg/kg	ND	113	60-140			
F3 PHCs (C16-C34)	214	8	mg/kg	ND	108	60-140			
F4 PHCs (C34-C50)	130	6	mg/kg	ND	98.1	60-140			
Metals									
Antimony	240		ug/L	15.6	89.6	70-130			
Arsenic	270		ug/L	ND	108	70-130			
Barium	1530		ug/L	1320	83.3	70-130			
Beryllium	219		ug/L	ND	87.5	70-130			
Boron	242		ug/L	9.69	93.0	70-130			
Cadmium	236		ug/L	ND	94.3	70-130			
Chromium	1050		ug/L	878	68.6	70-130			
Cobalt	342		ug/L	112	91.9	70-130			
Copper	525		ug/L	289	94.2	70-130			
Lead	306		ug/L	72.3	93.6	70-130			
Molybdenum	227		ug/L	2.07	89.8	70-130			
Nickel	683		ug/L	446	94.9	70-130			
Selenium	203		ug/L	ND	81.2	70-130			
Silver	234		ug/L	ND	93.6	70-130			
Thallium	196		ug/L	ND	78.3	70-130			
Tin	243		ug/L	34.6	83.3	70-130			
Uranium	261		ug/L	20.4	96.3	70-130			
Vanadium	829		ug/L	589	96.0	70-130			
Zinc	788		ug/L	575	85.3	70-130			
PCBs									
PCBs, total	0.466	0.05	mg/kg	ND	101	60-140			
Surrogate: Decachlorobiphenyl	*0.215*		*mg/kg*		*93.6*	*60-140*			

Qualifier Notes:

Login Qualifiers :

Sample - F1/BTEX/VOCs (soil) not submitted according to CCME 2016 protocols - not field preserved

Applies to samples: MW05-13-Shallow, MW05-13-Deep, MW05-15-Deep, MW05-16-Shallow, DM-32-Shallow, DM-37-Deep, MW08-25-Shallow, DM-36-Deep, MW08-925-Deep, MW07-22-Shallow, DM-46-Shallow, DM-36-Shallow, DM-32-Deep, DM-37-Shallow, MW07-23-Deep, DM-31-Deep, MW07-22-Deep, MW12-02-Shallow, DM-31-Shallow, MW08-24-Shallow, MW07-23-Shallow, MW08-24-Deep, MW08-25-Deep, DM-49-Shallow, DM-48-Shallow, DM-933-Shallow, DM-49-Deep, DM-948-Deep, DM-47-Deep, DM-48-Deep, DM-52-Shallow, DM-952-Shallow, DM-940-Deep, DM-42-Deep, DM-46-Deep, MW05-16-Deep, MW09-27-Deep, MW05-08-Shallow, MW05-06-Shallow, MW09-26-Deep, MW05-07-Deep, MW05-07-Shallow, MW05-05-Shallow, MW05-906-Shallow, DM-40-Shallow, DM-44-Shallow, DM-33-Deep, DM-43-Deep

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Alyssa Troke

DYE-M Soil 3 of 3

Client PO: 1530908-2000
Project: 1530908-3000
Custody: 38302/3/4/5/6/7/8/9/10/11/12/501/500/2/3/4/5/6/7

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017

Order #: 1732457

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1732457-AA	DM-34-Shallow
1732457-AB	DM-39-Deep
1732457-AC	DM-41-Shallow
1732457-AD	DM-42-Shallow
1732457-AE	DM-41-Deep
1732457-AF	DM-33-Shallow
1732457-AG	DM-35-Shallow
1732457-AH	DM-38-Shallow
1732457-AI	DM-43-Shallow
1732457-AJ	DM-44-Deep
1732457-AK	DM-45-Shallow
1732457-AL	DM-39-Shallow
1732457-AM	DM-47-Shallow
1732457-AN	DM-40-Deep
1732457-AO	DM-45-Deep
1732457-AP	DM-52-Deep
1732457-AQ	DM-20-Shallow
1732457-AR	DM-925-Shallow
1732457-AS	DM-25-Shallow
1732457-AT	DM-28-Shallow
1732457-AU	DM-28-Deep
1732457-AV	DM-21-Shallow
1732457-AW	DM-22-Shallow
1732457-AX	DM-29-Shallow
1732457-AY	DM-22-Deep
1732457-AZ	DM-27-Shallow
1732457-BA	DM-21-Deep
1732457-BB	MW06-20-Shallow
1732457-BC	DM-23-Shallow
1732457-BD	DM-24-Shallow

Approved By:

Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

1732457-BE	DM-23-Deep
1732457-BF	DM-921-Shallow
1732457-BG	DM-29-Deep
1732457-BH	MW06-19-Shallow
1732457-BI	DM-17-Shallow
1732457-BJ	DM-26-Deep
1732457-BK	DM-17-Deep
1732457-BL	MW07-21-Shallow
1732457-BM	DM-30-Shallow
1732457-BN	DM-19-Shallow
1732457-BO	MW07-21-Deep
1732457-BP	DM-60-Shallow
1732457-BQ	DM-30-Deep
1732457-BR	DM-18-Deep
1732457-BS	MW06-18-Shallow
1732457-BT	DM-18-Shallow
1732457-BU	DM-56-Shallow
1732457-BV	DM-26-Shallow
1732457-BW	DM-12-Shallow
1732457-BX	DM-12-Deep
1732457-BY	DM-912-Deep
1732457-BZ	DM-13-Shallow
1732457-CA	DM-13-Deep
1732457-CB	DM-14-Shallow
1732457-CC	DM-14-Deep
1732457-CD	DM-15-Shallow
1732457-CE	DM-16-Shallow
1732457-CF	DM-914-Shallow
1732457-CG	DM-11-Shallow
1732457-CH	DM-53-Shallow
1732457-CI	DM-53-Deep

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
CCME-SQG: Metals by ICP-OES	based on MOE E3470, ICP-OES	17-Aug-17	17-Aug-17
PCBs, total	SW846 8082A - GC-ECD	15-Aug-17	22-Aug-17
PHC F1	CWS Tier 1 - P&T GC-FID	14-Aug-17	18-Aug-17
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	12-Aug-17	16-Aug-17
Solids, %	Gravimetric, calculation	17-Aug-17	17-Aug-17

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-34-Shallow	DM-39-Deep	DM-41-Shallow	DM-42-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-AA	1732457-AB	1732457-AC	1732457-AD
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	95.3	85.9	90.7	91.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	31.1	172	116	132
Cobalt	1.0 mg/kg dry	11.0	11.1	10.8	14.7
Copper	1.0 mg/kg dry	16.8	131	70.0	48.2
Lead	1.0 mg/kg dry	7.2	10.7	11.3	7.2
Nickel	1.0 mg/kg dry	49.2	34.3	41.9	51.1
Zinc	1.0 mg/kg dry	41.7	138	118	104
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	94.7%	96.1%	106%	90.4%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-41-Deep	DM-33-Shallow	DM-35-Shallow	DM-38-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-AE	1732457-AF	1732457-AG	1732457-AH
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	97.0	94.7	89.2	93.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	124	89.1	52.2	78.4
Cobalt	1.0 mg/kg dry	10.8	13.3	30.0	11.8
Copper	1.0 mg/kg dry	79.7	47.7	75.0	77.6
Lead	1.0 mg/kg dry	12.1	8.3	7.3	95.6
Nickel	1.0 mg/kg dry	38.2	54.9	198	51.5
Zinc	1.0 mg/kg dry	123	78.3	48.1	229
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	27
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	21
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	91.7%	90.9%	87.4%	91.5%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-43-Shallow	DM-44-Deep	DM-45-Shallow	DM-39-Shallow
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-AI	1732457-AJ	1732457-AK	1732457-AL
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	87.1	84.6	84.1	93.5
Metals					
Arsenic	1.0 mg/kg dry	<1.0	4.4	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	135	175	173	161
Cobalt	1.0 mg/kg dry	14.6	10.5	15.8	12.4
Copper	1.0 mg/kg dry	61.1	162	131	86.6
Lead	1.0 mg/kg dry	7.4	13.2	20.1	10.7
Nickel	1.0 mg/kg dry	45.5	40.6	105	39.3
Zinc	1.0 mg/kg dry	81.5	179	179	148
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	95.9%	91.2%	91.2%	91.4%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-47-Shallow	DM-40-Deep	DM-45-Deep	DM-52-Deep
	Sample Date:	03-Aug-17	03-Aug-17	03-Aug-17	03-Aug-17
	Sample ID:	1732457-AM	1732457-AN	1732457-AO	1732457-AP
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.3	85.3	91.2	92.4
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	184	148	163	44.0
Cobalt	1.0 mg/kg dry	15.2	6.8	14.7	34.0
Copper	1.0 mg/kg dry	70.6	225	92.4	64.8
Lead	1.0 mg/kg dry	11.8	16.1	12.9	5.0
Nickel	1.0 mg/kg dry	57.5	45.6	84.1	241
Zinc	1.0 mg/kg dry	136	185	208	40.4
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	52	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	81	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	17	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	0.11	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	97.6%	101%	92.7%	88.2%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-20-Shallow	DM-925-Shallow	DM-25-Shallow	DM-28-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-AQ	1732457-AR	1732457-AS	1732457-AT
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.3	87.4	87.0	90.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	19.2	37.4	32.6	29.1
Cobalt	1.0 mg/kg dry	7.3	14.7	14.0	10.8
Copper	1.0 mg/kg dry	30.1	29.1	27.0	15.4
Lead	1.0 mg/kg dry	14.5	9.6	11.7	7.9
Nickel	1.0 mg/kg dry	27.1	71.2	67.9	26.5
Zinc	1.0 mg/kg dry	56.9	81.2	81.9	73.8
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	91.0%	107%	104%	94.5%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-28-Deep	DM-21-Shallow	DM-22-Shallow	DM-29-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-AU	1732457-AV	1732457-AW	1732457-AX
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	93.0	94.6	91.7	97.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	39.5	15.5	19.8	24.6
Cobalt	1.0 mg/kg dry	13.2	9.0	13.9	9.1
Copper	1.0 mg/kg dry	21.6	18.0	40.7	19.2
Lead	1.0 mg/kg dry	8.1	13.5	13.6	9.4
Nickel	1.0 mg/kg dry	44.9	23.3	35.1	47.9
Zinc	1.0 mg/kg dry	78.3	99.2	51.5	40.7
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	100%	95.8%	112%	94.1%

Certificate of Analysis

Report Date: 23-Aug-2017

Client: Golder Associates Ltd. (Ottawa)

Order Date: 11-Aug-2017

Client PO: 1530908-2000

Project Description: 1530908-3000

	Client ID:	DM-22-Deep	DM-27-Shallow	DM-21-Deep	MW06-20-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-AY	1732457-AZ	1732457-BA	1732457-BB
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.0	88.3	95.1	95.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	18.2	28.3	15.3	25.7
Cobalt	1.0 mg/kg dry	14.4	10.2	9.0	11.6
Copper	1.0 mg/kg dry	42.7	35.1	16.7	26.3
Lead	1.0 mg/kg dry	8.8	10.9	13.1	5.5
Nickel	1.0 mg/kg dry	30.9	26.7	22.0	55.3
Zinc	1.0 mg/kg dry	44.6	73.1	98.6	48.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	110%	102%	95.5%	105%

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 23-Aug-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

	Client ID:	DM-23-Shallow	DM-24-Shallow	DM-23-Deep	DM-921-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-BC	1732457-BD	1732457-BE	1732457-BF
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	93.8	86.8	94.6	94.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	36.0	142	33.7	18.3
Cobalt	1.0 mg/kg dry	11.1	15.5	11.4	10.3
Copper	1.0 mg/kg dry	22.4	41.7	23.3	20.7
Lead	1.0 mg/kg dry	9.0	8.0	8.0	15.4
Nickel	1.0 mg/kg dry	66.9	74.5	72.9	25.6
Zinc	1.0 mg/kg dry	42.0	83.2	40.8	110
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	98.5%	111%	102%	97.1%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-29-Deep	MW06-19-Shallow	DM-17-Shallow	DM-26-Deep
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-BG	1732457-BH	1732457-BI	1732457-BJ
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.3	95.5	87.1	81.8
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	31.5	42.1	19.8	139
Cobalt	1.0 mg/kg dry	8.8	12.8	13.2	15.2
Copper	1.0 mg/kg dry	20.3	19.5	140	17.4
Lead	1.0 mg/kg dry	7.3	8.4	10.9	7.5
Nickel	1.0 mg/kg dry	47.9	73.4	43.5	220
Zinc	1.0 mg/kg dry	42.3	45.0	97.3	82.0
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	93.8%	98.0%	104%	95.3%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-17-Deep	MW07-21-Shallow	DM-30-Shallow	DM-19-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-BK	1732457-BL	1732457-BM	1732457-BN
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	90.1	91.8	92.4	96.2
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	11.7	30.2	29.2	30.0
Cobalt	1.0 mg/kg dry	11.8	13.1	8.7	9.7
Copper	1.0 mg/kg dry	121	25.0	22.7	25.8
Lead	1.0 mg/kg dry	7.6	6.8	7.8	10.4
Nickel	1.0 mg/kg dry	32.8	75.1	33.9	41.9
Zinc	1.0 mg/kg dry	97.8	42.0	53.7	60.0
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	101%	103%	96.5%	105%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW07-21-Deep	DM-60-Shallow	DM-30-Deep	DM-18-Deep
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-BO	1732457-BP	1732457-BQ	1732457-BR
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.4	94.8	88.9	90.6
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	30.2	42.0	37.7	24.2
Cobalt	1.0 mg/kg dry	12.1	16.3	10.5	8.1
Copper	1.0 mg/kg dry	24.3	20.9	28.4	20.6
Lead	1.0 mg/kg dry	6.6	9.3	9.9	10.8
Nickel	1.0 mg/kg dry	71.1	90.9	37.6	38.4
Zinc	1.0 mg/kg dry	43.6	50.1	63.9	44.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	100%	96.0%	96.5%	95.4%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	MW06-18-Shallow	DM-18-Shallow	DM-56-Shallow	DM-26-Shallow
	Sample Date:	04-Aug-17	04-Aug-17	04-Aug-17	04-Aug-17
	Sample ID:	1732457-BS	1732457-BT	1732457-BU	1732457-BV
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.7	92.0	92.4	92.4
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	40.9	72.7	48.0	68.3
Cobalt	1.0 mg/kg dry	8.9	12.2	12.9	12.8
Copper	1.0 mg/kg dry	28.2	36.0	28.6	27.1
Lead	1.0 mg/kg dry	16.3	14.4	16.1	8.0
Nickel	1.0 mg/kg dry	49.7	67.2	57.8	62.9
Zinc	1.0 mg/kg dry	50.0	48.0	59.3	65.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	163	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	53	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	93.2%	96.1%	96.8%	101%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-12-Shallow	DM-12-Deep	DM-912-Deep	DM-13-Shallow
	Sample Date:	06-Aug-17	06-Aug-17	06-Aug-17	06-Aug-17
	Sample ID:	1732457-BW	1732457-BX	1732457-BY	1732457-BZ
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	91.9	92.3	92.9	91.7
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	91.1	80.8	80.5	57.1
Cobalt	1.0 mg/kg dry	13.5	13.5	12.4	12.3
Copper	1.0 mg/kg dry	45.6	44.7	42.8	34.6
Lead	1.0 mg/kg dry	19.5	23.8	20.5	20.9
Nickel	1.0 mg/kg dry	82.5	89.1	84.9	70.0
Zinc	1.0 mg/kg dry	83.1	76.1	70.3	79.0
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	25	52	110	19
F4 PHCs (C34-C50)	6 mg/kg dry	<6	11	25	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	0.22	0.38	0.08
Decachlorobiphenyl	Surrogate	100%	91.3%	102%	101%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-13-Deep	DM-14-Shallow	DM-14-Deep	DM-15-Shallow
	Sample Date:	06-Aug-17	06-Aug-17	06-Aug-17	06-Aug-17
	Sample ID:	1732457-CA	1732457-CB	1732457-CC	1732457-CD
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.4	88.3	93.0	94.3
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	31.6	1100	1020	46.5
Cobalt	1.0 mg/kg dry	9.0	19.5	20.1	10.6
Copper	1.0 mg/kg dry	24.1	11.0	12.3	28.9
Lead	1.0 mg/kg dry	14.6	4.6	8.3	14.5
Nickel	1.0 mg/kg dry	38.1	215	193	57.6
Zinc	1.0 mg/kg dry	65.9	41.4	64.8	90.2
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	<6
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	107%	99.4%	91.8%	98.8%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-16-Shallow	DM-914-Shallow	DM-11-Shallow	DM-53-Shallow
	Sample Date:	06-Aug-17	06-Aug-17	06-Aug-17	06-Aug-17
	Sample ID:	1732457-CE	1732457-CF	1732457-CG	1732457-CH
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	95.4	87.0	94.1	91.0
Metals					
Arsenic	1.0 mg/kg dry	<1.0	<1.0	<1.0	<1.0
Cadmium	0.5 mg/kg dry	<0.5	<0.5	<0.5	<0.5
Chromium	1.0 mg/kg dry	44.8	754	63.7	104
Cobalt	1.0 mg/kg dry	15.4	15.7	14.7	11.0
Copper	1.0 mg/kg dry	40.2	10.4	51.3	44.5
Lead	1.0 mg/kg dry	15.9	3.8	12.0	13.8
Nickel	1.0 mg/kg dry	91.8	157	66.9	54.6
Zinc	1.0 mg/kg dry	65.7	35.0	54.4	86.9
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 mg/kg dry	<4	<4	<4	8
F3 PHCs (C16-C34)	8 mg/kg dry	<8	<8	<8	61
F4 PHCs (C34-C50)	6 mg/kg dry	<6	<6	<6	14
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	<0.05	<0.05	<0.05
Decachlorobiphenyl	Surrogate	92.4%	92.8%	95.3%	100%

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 1530908-2000

Report Date: 23-Aug-2017
Order Date: 11-Aug-2017
Project Description: 1530908-3000

	Client ID:	DM-53-Deep	-	-	-
	Sample Date:	06-Aug-17	-	-	-
	Sample ID:	1732457-CI	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	86.8	-	-	-
Metals					
Arsenic	1.0 mg/kg dry	<1.0	-	-	-
Cadmium	0.5 mg/kg dry	<0.5	-	-	-
Chromium	1.0 mg/kg dry	207	-	-	-
Cobalt	1.0 mg/kg dry	13.5	-	-	-
Copper	1.0 mg/kg dry	67.2	-	-	-
Lead	1.0 mg/kg dry	19.8	-	-	-
Nickel	1.0 mg/kg dry	64.9	-	-	-
Zinc	1.0 mg/kg dry	121	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 mg/kg dry	<7	-	-	-
F2 PHCs (C10-C16)	4 mg/kg dry	28	-	-	-
F3 PHCs (C16-C34)	8 mg/kg dry	131	-	-	-
F4 PHCs (C34-C50)	6 mg/kg dry	18	-	-	-
PCBs					
PCBs, total	0.05 mg/kg dry	<0.05	-	-	-
Decachlorobiphenyl	Surrogate	108%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg						
F2 PHCs (C10-C16)	ND	4	mg/kg						
F3 PHCs (C16-C34)	ND	8	mg/kg						
F4 PHCs (C34-C50)	ND	6	mg/kg						
Metals									
Arsenic	ND	1.0	mg/kg						
Cadmium	ND	0.5	mg/kg						
Chromium	ND	1.0	mg/kg						
Cobalt	ND	1.0	mg/kg						
Copper	ND	1.0	mg/kg						
Lead	ND	1.0	mg/kg						
Nickel	ND	1.0	mg/kg						
Zinc	ND	1.0	mg/kg						
PCBs									
PCBs, total	ND	0.05	mg/kg						
Surrogate: Decachlorobiphenyl	*0.152*		*mg/kg*		*76.0*	*60-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	mg/kg dry	ND				40	
F2 PHCs (C10-C16)	ND	4	mg/kg dry	ND				30	
F3 PHCs (C16-C34)	ND	8	mg/kg dry	9			0.0	30	
F4 PHCs (C34-C50)	ND	6	mg/kg dry	ND			0.0	30	
Metals									
Antimony	1.97	1.0	mg/kg dry	1.88			4.8	30	
Arsenic	ND	1.0	mg/kg dry	ND			0.0	30	
Barium	34.1	1.0	mg/kg dry	31.4			8.1	30	
Beryllium	ND	1.0	mg/kg dry	ND			0.0	30	
Boron	ND	1.0	mg/kg dry	ND			0.0	30	
Cadmium	ND	0.5	mg/kg dry	ND			0.0	30	
Chromium	42.0	1.0	mg/kg dry	45.3			7.6	30	
Cobalt	32.8	1.0	mg/kg dry	37.9			14.6	30	
Copper	65.7	1.0	mg/kg dry	62.0			5.8	30	
Lead	7.19	1.0	mg/kg dry	6.62			8.2	30	
Molybdenum	ND	1.0	mg/kg dry	ND			0.0	30	
Nickel	227	1.0	mg/kg dry	226			0.7	30	
Selenium	ND	1.0	mg/kg dry	ND			0.0	30	
Silver	ND	0.5	mg/kg dry	ND			0.0	30	
Thallium	1.01	1.0	mg/kg dry	ND			0.0	30	
Tin	ND	5.0	mg/kg dry	ND			0.0	30	
Uranium	4.40	1.0	mg/kg dry	4.17			5.5	30	
Vanadium	31.7	1.0	mg/kg dry	30.3			4.4	30	
Zinc	41.6	1.0	mg/kg dry	42.3			1.7	30	
PCBs									
PCBs, total	ND	0.05	mg/kg dry	ND				40	
Surrogate: Decachlorobiphenyl	*0.264*		*mg/kg dry*		*121*	*60-140*			
Physical Characteristics									
% Solids	86.5	0.1	% by Wt.	86.9			0.5	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	162	7	mg/kg		81.1	80-120			
F2 PHCs (C10-C16)	90	4	mg/kg	ND	91.1	60-140			
F3 PHCs (C16-C34)	210	8	mg/kg	9	98.2	60-140			
F4 PHCs (C34-C50)	145	6	mg/kg	ND	106	60-140			
Metals									
Antimony	232		ug/L	37.5	77.9	70-130			
Arsenic	247		ug/L	ND	98.8	70-130			
Barium	853		ug/L	628	89.7	70-130			
Beryllium	202		ug/L	ND	80.7	70-130			
Boron	223		ug/L	8.97	85.5	70-130			
Cadmium	218		ug/L	ND	87.2	70-130			
Chromium	524		ug/L	310	85.4	70-130			
Cobalt	416		ug/L	220	78.4	70-130			
Copper	1470		ug/L	1240	93.0	70-130			
Lead	327		ug/L	132	78.0	70-130			
Molybdenum	202		ug/L	2.67	79.6	70-130			
Nickel	4700		ug/L	4510	77.2	70-130			
Selenium	187		ug/L	ND	74.8	70-130			
Silver	201		ug/L	0.87	79.9	70-130			
Thallium	175		ug/L	ND	70.1	70-130			
Tin	251		ug/L	57.5	77.6	70-130			
Uranium	293		ug/L	83.3	84.0	70-130			
Vanadium	843		ug/L	606	94.8	70-130			
Zinc	1030		ug/L	846	74.7	70-130			
PCBs									
PCBs, total	0.484	0.05	mg/kg	ND	111	60-140			
Surrogate: Decachlorobiphenyl	*0.243*		*mg/kg*		*112*	*60-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Paracel ID: 1732457

PARACEL LABORATORIES LTD. | TF RE RELIABLE.

Laurent Blvd.
rio K1G 4J8
1947
e: paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 38302

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Client Name: Golder Associates	Project Reference: 1530908-3000
Contact Name: Alyssa Trake / Don Mendelsohn	Quote #
Address: 1931 Robertson Road Ottawa, ON	PO # 1530908-2000
Telephone: 613-592-9600	Email Address: atrake@golder.com dplenderleith@golder.com

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:
1732457 - soil.
1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: See quote 16-010
1	DM-62-Deep	S		2	Aug. 4/17		X
2	DM-962-Deep						X
3	DM-63-Shallow						X
4	DM-59-Deep						X
5	DM-54-Shallow						X
6	DM-61-Deep						X
7	DM-55-Deep						X
8	DM-57-Shallow						X
9	DM-58-Shallow						X
10	DM-59-Shallow						X

Comments: Use sample IDs as per COCs for all.

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: A. LEDUC	Received at Lab: SUNEEPORN DOKMAI	Verified By: Rachel subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:33	Date/Time: Aug 14/17
Date/Time: Aug 11/17 1:00	Temperature: ___ °C	Temperature: 20.8 °C	pH Verified ☒ By N/A 10:50

Paracel ID: 1732457

PARACEL LABORATORIES LTD. | RELIABLE.

Office
19 St. Laurent Blvd.
, Ontario K1G 4J8
[illegible]-749-1947
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Chain of Custody
(Lab Use Only)
№ 38303

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Client Name: Golder Associates	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	DM-59-Shallow	S		2	Aug 4/17		X
2	DM-51-Shallow						X
3	DM-61-Shallow						X
4	DM-56-Deep						X
5	DM-55-Shallow						X
6	DM-54-Deep						X
7	DM-50-Shallow						X
8	DM-51-Deep						X
9	DM-58-Deep						X
10	DM-57-Deep	↓		↓	↓		X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: M. DECLUSE	Received at Lab: SUNREEPORN DOU MAI	Verified By: Rachel Subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11,2017 05:23	Date/Time: Aug 14 17.
Date/Time: Aug. 11/17 1:00	Temperature: ___ °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

Paracel ID: 1732457

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Page 3 of 4

Client Name: Golder Associate	Project Reference: 1530908-3000
Contact Name:	Quote #
Address: See Page 1	PO #
Telephone:	Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: (S) Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:
1732457 - Soil
1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	DM-05-Shallow	S		2	Aug. 2/17		X
2	DM-01-Shallow						X
3	DM-01-Deep						X
4	DM-05-Deep						X
5	DM-03-Shallow						X
6	DM-04-Shallow						X
7	DM-06-Shallow						X
8	DM-02-Shallow						X
9	DM-06-Deep						X
10	DM-906-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: M. LOUISE	Received at Lab: SUMMERFORD DAMMAN	Verified By: Rachel Subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 05:23	Date/Time: Aug 14/17 10:50
Date/Time: Aug. 11/17 1:00	Temperature: ____ °C	Temperature: 30.8 °C	pH Verified ☒ By: N/A

Paracel ID: 1732457

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Page 4 of 19

Client Name: Golder Associates	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page!	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: (S) Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	DM-03-Deep	S		2	Aug. 2/17		X
2	MW05-15-Shallow				Aug. 5/17		X
3	MW12-01-Shallow						X
4	MW12-01-Deep						X
5	MW12-901-Deep						X
6	MW05-09-Shallow						X
7	DM-8-Shallow						X
8	DM-97-Deep						X
9	DM-9-Shallow						X
10	DM-9-Deep						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: M Deguise	Received at Lab: SUNEETPORN DONMAI	Verified By: Rachel subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:23	Date/Time: Aug 14 17
Date/Time: Aug 11/17 1:00	Temperature: °C	Temperature: 26.9 °C	pH Verified ☒ By: N/A 10:50

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Paracel ID: 1732457

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Page 5 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:
1732457 - soil
1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	MW09-26-Shallow	S		2	Aug. 5/17		X
2	DM-10-Shallow						X
3	MW05-09-Deep						X
4	MW05-06-Deep						X
5	DM-7-Deep						X
6	DM-7-Shallow						X
7	MW09-28-Deep						X
8	MW09-28-Shallow						X
9	MW05-12-Shallow						X
10	MW05-12-Deep	↓		↓	↓		X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: T. DOUSE	Received at Lab: SUNEEPURN DOMAI	Verified By: Rachel subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 05:23	Date/Time: Aug 14 17.
Date/Time: Aug. 11/17 1:00	Temperature: ___ °C	Temperature: 20.8 °C	pH Verified [X] By: NA 10:50

Paracel ID: 1732457

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Page 6 of 19

Client Name: Golder	Project Reference: 1530905-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1733017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	MW05-13-Shallow	S		2	Aug 5/17		X
2	MW05-13-Deep						X
3	MW05-15-Deep						X
4	MW05-16-Shallow						X
5	DM-35-Shallow				Aug. 3/17		X
6	DM-37-Deep						X
7	~~DM-8~~ MW08-25-Shallow						X
8	DM-36-Deep						X
9	MW08-925-Deep						X
10	MW07-22-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trotte	Received by Driver/Depot: M. DeLouse	Received at Lab: SUMMERFORD DOKMAI	Verified By: Rachel Subject
Relinquished By (Print): Alyssa Trotte	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 05:23	Date/Time: Aug 14 17.
Date/Time: Aug 11/17 1:00	Temperature: °C	Temperature: 20.8 °C	pH Verified [X] By: N/A 10:50

Paracel ID: 1732457

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Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Quote 16-010
1	DM-46-Shallow	S		1	Aug 3/17		X
2	DM-36-Shallow			1			X
3	DM-32-Deep			2			X
4	DM-37-Shallow						X
5	MW07-23-Deep						X
6	DM-31-Deep						X
7	MW07-22-Deep						X
8	MW12-02-Shallow						X
9	~~Dup~~ DM-31-Shallow						X
10	MW08-24-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Troke	Received by Driver/Depot: M. Dease	Received at Lab: STONEPORT DOKMAI	Verified By: Rachel Subgrat
Relinquished By (Print): Alyssa Troke	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 09:33	Date/Time: Aug 14 '17
Date/Time: Aug. 11/17 1:00	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

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Paracel ID: 1732457

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Page 8 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: (S) (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Quote 16-01
1	MW07-23-Shallow	S		2	Aug. 3/17		X
2	MW08-24-Deep						X
3	MW08-25-Deep						X
4	~~DM-46-Shallow~~						X
5	DM-49-Shallow						X
6	DM-48-Shallow						X
7	DM-933-Shallow						X
8	DM-49-Deep						X
9	DM-948-Deep						X
10	DM-47-Deep						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Drake	Received by Driver/Depot: A. LOUISE	Received at Lab: SUNEERN DOHMAI	Verified By: Rachel subject
Relinquished By (Print): Alyssa Drake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:23	Date/Time: Aug 14 17
Date/Time: Aug. 11/17 1:00	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

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Page 9 of 19

Client Name: Golder	Project Reference: 1530908-3000
Contact Name:	Quote #
Address: See Page 1	PO #
Telephone:	Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number:
1732457 - Soil
1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Quote 16-010
1	DM-48-Deep	S		2	Aug. 3/17		X
2	DM-52-Shallow						X
3	DM-952-Shallow						X
4	DM-940-Deep						X
5	DM-42-Deep						X
6	DM-46-Deep						X
7	MW05-16-Deep				Aug 5/17		X
8	MW09-27-Deep						X
9	MW05-08-Shallow						X
10	MW05-66-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: M. Blouse	Received at Lab: Dunnville DOM MAJ	Verified By: Rachel Subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:23	Date/Time: Aug 14 '17
Date/Time: Aug. 11/17 1:00	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

Paracel ID: 1732457

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Page 10 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: (S) (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1732457 - Soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Quote 16-010										
1	MW09-26-Deep				Aug. 5/17		X										
2	MW09-27-Deep						X										
3	MW05-07-Deep						X										
4	MW05-07-Shallow						X										
5	MW05-05-Shallow						X										
6	MW05-906-Shallow						X										
7							X										
8							X										
9							X										
10							X										

Comments:

Method of Delivery: Paracel

Relinquished By (Sign): Alyssa Trake	Received by Driver/Depot: T. Trouse	Received at Lab: Vineet Phan DOHMAI	Verified By: Rachel Subject
Relinquished By (Print): Alyssa Trake	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:23	Date/Time: Aug 14 17.
Date/Time: Aug 11/17 1:00	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By N/A 10:50

Paracel ID: 1732457

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Page 11 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1732017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Quote 16-aug
1	DM-40-Shallow	S		2	Aug. 3		X
2	DM-44-Shallow						X
3	DM-33-Deep						X
4	DM-43-Deep						X
5	DM-34-Shallow						X
6	DM-39-Deep						X
7	DM-41-Shallow						X
8	DM-42-Shallow						X
9	DM-41-Deep						X
10	DM-33-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. Blouse	Received at Lab: Stonepark Dekmaj	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: Aug 11, 2017 05:23	Date/Time: Aug 14 17.
Date/Time:	Temperature: °C	Temperature: 20.81 °C	pH Verified ☒ By: N/A 10:50

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Page 12 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: Attn See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil, 1733017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Quote 16-010
1	DM-35-Shallow	S		2	Aug 3.		
2	DM-38-Shallow						
3	DM-43-Shallow						
4	DM-44-Deep						
5	DM-45-Shallow						
6	DM-39-Shallow						
7	DM-47-Shallow						
8	DM-40-Deep						
9	DM-45-Deep						
10	DM-52-Deep.						

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. Touse	Received at Lab: Jennifer Dorman	Verified By: Rachel Sobczak
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 9, 2017 05:23	Date/Time: Aug 14 17
Date/Time:	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

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Paracel ID: 1732457

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Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Quote 16-Oct-0
1	DM-20-Shallow	S		2	Aug 4/17		X
2	DM-925-Shallow						X
3	DM-25-Shallow						X
4	DM-28-Shallow						X
5	DM-28-Deep						X
6	DM-21-Shallow						X
7	DM-22-Shallow						X
8	DM-29-Shallow						X
9	DM-22-Deep						X
10	DM-27-Shallow						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. LOUISE	Received at Lab: SUNEEPORN DON MAI	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 05:23	Date/Time: Aug 14 17.
Date/Time:	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A. 10:50

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Paracel ID: 1732457

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Client Name: Golder	Project Reference: 1530908-3000
Contact Name:	Quote #
Address: See Page 1	PO #
Telephone:	Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:
1732457 - Soil
1733017 - ~~Soil~~ water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	DM-21-Deep	S		2	Aug 4/17		X
2	MW06-20-Shallow						X
3	DM-23-Shallow						X
4	DM-24-Shallow						X
5	DM-23-Deep						X
6	DM-921-Shallow						X
7	DM-29-Deep						X
8	MW06-19-Shallow						X
9							
10							

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. Scouse	Received at Lab: SUMEERAN ROUMAI	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20	Date/Time: AUG 11 2017 09:23	Date/Time: Aug 14 17.
Date/Time:	Temperature: ___ °C PH	Temperature: 20.8 °C	pH Verified ☒ By: RM 10:50

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Paracel ID: 1732457

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№ 38503

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Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - GW Soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	MW06-19	GW		4	Aug 4/17		X
2	DM-17-Shallow	S		2			X
3	DM-26-Deep						X
4	DM-17-Deep						X
5	MW07-21-Shallow						X
6	DM-30-Shallow						X
7	DM-19-Shallow						X
8	MW07-21-Deep						X
9	DM-60-Shallow						X
10	DM-30-Deep						X

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. Deruse	Received at Lab: GVRPEPARN DENMAI	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 09:23	Date/Time: Aug 14 17.
Date/Time:	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A. 10:56.

BQ.

Paracel ID: 1732457

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e: paracel@paracellabs.com

Chain of Custody
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№ 38504

Page 16 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Pg. 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - soil, 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quotes (CCME)
1	DM-18-Deep	S		2	Aug 4/17		X
2	MW16-18-Shallow						X
3	[illegible]						
4	DM-18-Shallow						X
5	DM-16-Shallow						X
6	DM-26-Shallow						X
7							
8							
9							
10							

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A. LOUISE	Received at Lab: SUMMERDOWN RMMAI	Verified By: Rachel Sabpot
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11 2017 05:29	Date/Time: Aug 14/17
Date/Time:	Temperature: °C	Temperature: 26.8 °	pH Verified ☒ By: N/A 10:50

BV.

Paracel ID: 1732457

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e: paracel@paracellabs.com

Chain of Custody (Lab Use Only)

Nº 38505

Page 17 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Pg. 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil. 1733017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote ICG-010											
1	MW08-24 ✓	GW		4	Aug 6/17		X											PHC bottle less than half full
2	DM-Shovel-R	GW		4			X											
3	DM-Probe-R	GW		4			X											
4	DM-12-Shallow	S		2			X											
5	DM-12-Deep						X											
6	DM-912-Deep						X											
7	DM-13-Shallow						X											
8	DM-13-Deep						X											
9	DM-14-Shallow						X											
10	DM-14-Deep	↓		↓	↓		X											

Comments:

Method of Delivery: Parcel

Relinquished By (Sign):	Received by Driver/Depot: T. Crouse	Received at Lab: Simerpreet Dhami	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: Aug 11, 2017 05:23	Date/Time: Aug 14/17.
Date/Time:	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:50

cc.

Paracel ID: 1732457

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e: paracel@paracellabs.com

Chain of Custody
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№ 38506

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Client Name: Golder	Project Reference: 1530908-3000)
Contact Name:	Quote #
Address: See Rg. 1	PO #
Telephone:	Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457 - Soil 1733017 - water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Guide 16-01
1	DM-15-Shallow	S		2	Aug 6/17		X
2	DM-16-Shallow						X
3	DM-914-Shallow						X
4	DM-11-Shallow						X
5	DM-53-Shallow						X
6	DM-53-Deep						X
7							
8							
9							
10							

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. Deause	Received at Lab: SUPERVAN DONMA	Verified By: Rachel subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: Aug 9/17 05:23	Date/Time: Aug 14/17
Date/Time:	Temperature: ____ °C	Temperature: 20.8°C	pH Verified ☒ By: N/A 10:50

cl.

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SAMPLE SUBMISSION CHECKLIST

Golder Associates Ltd. (Ottawa)

Project Number: 1530908-3000
Paracel Work Order #: 1733017
C of C #: 38503/38505/38507

Groundwater Samples

PO #: 1530908-2000
Submitted By: Alyssa Troke
Submission Date: 11-Aug-17

Item #	Sample Submission Requirement	Yes	No
	Sample Integrity		
1	Samples submitted > 10 °C *and sampled more than 1 day prior to submission*	x	
2	Samples submitted > 10 °C *on day of sampling with attempt to cool*		✓
	Chain of Custody		
3	Client information complete, including contact	✓	
4	Project reference and/or PO number provided	✓	
5	Guideline Requirements included	✓	
6	Analysis Request complete	✓	
7	TAT indicated on CoC	✓	
8	Sample Date Included	✓	
9	Submitted on Non-Paracel CoC	✓	
10	CoC signed and dated	✓	
11	Samples received submerged in water. Suspected melted ice.		✓

Comments

5 year contract- expires Dec 31, 2020. CCME Coarse Criteria.

CC: Don

Additional Bottle/Sample Integrity Qualifiers

Sample ID	Code	Qualifier Note	Additional Comment
01	LG-SMP010	Sample - Not field filtered -	
02	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -	
03	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -	
04	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -	
05	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -	
06	LG-SMP010	Sample - Not field filtered -	

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SAMPLE SUBMISSION CHECKLIST

07	LG-SMP010	Sample - Not field filtered -
08	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -
09	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -
10	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -
11	LG-SMP007	Sample - Filtered and preserved by Paracel upon receipt at the laboratory -
12	LG-SMP010	Sample - Not field filtered -

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Alyssa Troke

DYE-M Groundwater 1 of 1

Client PO: 1530908-2000
Project: 1530908-3000
Custody: 38503/38505/38507

Report Date: 27-Nov-2017
Order Date: 11-Aug-2017

Revised Report

Order #: 1733017

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
1733017-01	MW06-19
1733017-02	MW08-24
1733017-03	DM-Shovel-R
1733017-04	DM-Probe-R
1733017-05	MW12-01
1733017-06	MW05-13
1733017-07	MW09-27
1733017-08	MW909-26
1733017-09	MW09-26
1733017-10	MW05-05
1733017-11	MW05-08
1733017-12	DM Trip Blank

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 27-Nov-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-MS	EPA 200.8 - ICP-MS	14-Aug-17	14-Aug-17
PHC F1	CWS Tier 1 - P&T GC-FID	15-Aug-17	15-Aug-17
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	16-Aug-17	16-Aug-17

Certificate of Analysis

Report Date: 27-Nov-2017

Client: Golder Associates Ltd. (Ottawa)

Order Date: 11-Aug-2017

Client PO: 1530908-2000

Project Description: 1530908-3000

	Client ID:	MW06-19	MW08-24	DM-Shovel-R	DM-Probe-R
	Sample Date:	04-Aug-17	06-Aug-17	06-Aug-17	06-Aug-17
	Sample ID:	1733017-01	1733017-02	1733017-03	1733017-04
	MDL/Units	Water	Water	Water	Water
Metals					
Arsenic	0.001 mg/L	<0.001	0.001	<0.001	<0.001
Cadmium	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.001 mg/L	<0.001	0.003	<0.001	<0.001
Cobalt	0.0005 mg/L	<0.0005	0.0007	<0.0005	<0.0005
Copper	0.0005 mg/L	0.0059	0.0097	<0.0005	<0.0005
Lead	0.0001 mg/L	0.0005	0.0007	<0.0001	<0.0001
Nickel	0.001 mg/L	<0.001	0.012	<0.001	<0.001
Zinc	0.005 mg/L	0.075	0.051	0.009	0.006
Hydrocarbons					
F1 PHCs (C6-C10)	0.025 mg/L	<0.025	<0.025	<0.025	<0.025
F2 PHCs (C10-C16)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1
F3 PHCs (C16-C34)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1
F4 PHCs (C34-C50)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1

	Client ID:	MW12-01	MW05-13	MW09-27	MW909-26
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	05-Aug-17
	Sample ID:	1733017-05	1733017-06	1733017-07	1733017-08
	MDL/Units	Water	Water	Water	Water
Metals					
Arsenic	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Cadmium	0.0001 mg/L	<0.0001	<0.0001	<0.0001	0.0001
Chromium	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Cobalt	0.0005 mg/L	0.0007	<0.0005	0.0010	0.0014
Copper	0.0005 mg/L	<0.0005	0.0013	0.0038	0.0010
Lead	0.0001 mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	0.001 mg/L	0.007	0.003	0.015	0.069
Zinc	0.005 mg/L	0.007	2.36	1.64	2.81
Hydrocarbons					
F1 PHCs (C6-C10)	0.025 mg/L	<0.025	<0.025	<0.025	<0.025
F2 PHCs (C10-C16)	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
F3 PHCs (C16-C34)	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
F4 PHCs (C34-C50)	0.1 mg/L	<0.1	<0.1	<0.1	<0.1

Certificate of Analysis

Report Date: 27-Nov-2017

Client: Golder Associates Ltd. (Ottawa)

Order Date: 11-Aug-2017

Client PO: 1530908-2000

Project Description: 1530908-3000

	Client ID:	MW09-26	MW05-05	MW05-08	DM Trip Blank
	Sample Date:	05-Aug-17	05-Aug-17	05-Aug-17	13-Jul-17
	Sample ID:	1733017-09	1733017-10	1733017-11	1733017-12
	MDL/Units	Water	Water	Water	Water
Metals					
Arsenic	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Cadmium	0.0001 mg/L	0.0001	0.0001	0.0003	<0.0001
Chromium	0.001 mg/L	<0.001	<0.001	<0.001	<0.001
Cobalt	0.0005 mg/L	0.0014	0.0007	0.0011	<0.0005
Copper	0.0005 mg/L	0.0008	0.0010	0.0015	<0.0005
Lead	0.0001 mg/L	<0.0001	0.0003	<0.0001	<0.0001
Nickel	0.001 mg/L	0.069	0.009	0.015	<0.001
Zinc	0.005 mg/L	2.73	1.03	7.86	0.045
Hydrocarbons					
F1 PHCs (C6-C10)	0.025 mg/L	<0.025	<0.025	<0.025	<0.025
F2 PHCs (C10-C16)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1
F3 PHCs (C16-C34)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1
F4 PHCs (C34-C50)	0.1 mg/L	<0.1	<0.2 [1]	<0.1	<0.1

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 27-Nov-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	0.025	mg/L						
F2 PHCs (C10-C16)	ND	0.1	mg/L						
F3 PHCs (C16-C34)	ND	0.1	mg/L						
F4 PHCs (C34-C50)	ND	0.1	mg/L						
Metals									
Arsenic	ND	0.001	mg/L						
Cadmium	ND	0.0001	mg/L						
Chromium	ND	0.001	mg/L						
Cobalt	ND	0.0005	mg/L						
Copper	ND	0.0005	mg/L						
Lead	ND	0.0001	mg/L						
Nickel	ND	0.001	mg/L						
Zinc	ND	0.005	mg/L						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	0.025	mg/L	ND				30	
Metals									
Arsenic	ND	0.001	mg/L	ND			0.0	20	
Cadmium	ND	0.0001	mg/L	ND			0.0	20	
Chromium	ND	0.001	mg/L	ND				20	
Cobalt	ND	0.0005	mg/L	ND			0.0	20	
Copper	ND	0.0005	mg/L	ND				20	
Lead	ND	0.0001	mg/L	ND				20	
Nickel	ND	0.001	mg/L	ND				20	
Zinc	ND	0.005	mg/L	ND				20	

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 1530908-2000

Report Date: 27-Nov-2017

Order Date: 11-Aug-2017

Project Description: 1530908-3000

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1.75	0.025	mg/L		87.3	68-117			
F2 PHCs (C10-C16)	1.6	0.1	mg/L		87.4	60-140			
F3 PHCs (C16-C34)	3.1	0.1	mg/L		83.6	60-140			
F4 PHCs (C34-C50)	2.1	0.1	mg/L		83.1	60-140			
Metals									
Arsenic	49.1		ug/L	0.02	98.1	80-120			
Cadmium	47.3		ug/L	0.02	94.5	80-120			
Chromium	47.6		ug/L	ND	95.2	80-120			
Cobalt	46.4		ug/L	0.02	92.7	80-120			
Copper	45.6		ug/L	ND	91.3	80-120			
Lead	53.1		ug/L	ND	106	80-120			
Nickel	46.7		ug/L	ND	93.3	80-120			
Zinc	48		ug/L	ND	96.1	80-120			

Certificate of Analysis

Report Date: 27-Nov-2017

Client: Golder Associates Ltd. (Ottawa)

Order Date: 11-Aug-2017

Client PO: 1530908-2000

Project Description: 1530908-3000

Qualifier Notes:

Login Qualifiers :

Sample - One or more parameter received past hold time -

Applies to samples: DM Trip

Sample - Filtered and preserved by Paracel upon receipt at the laboratory -

Applies to samples: MW06-19, MW08-24, DM-Shovel-R, DM-Probe-R, MW12-01, MW05-13, MW09-27, MW909-26, MW09-26, MW05-05, MW05-08, DM Trip

Sample - Insufficient volume - PHC bottle less then half filled

Applies to samples: MW08-24, MW05-05

Sample - Not field filtered -

Applies to samples: MW06-19, MW08-24, DM-Shovel-R, DM-Probe-R, MW12-01, MW05-13, MW09-27, MW909-26, MW09-26, MW05-05, MW05-08, DM Trip

Sample Qualifiers :

1 : Elevated Reporting Limits due to limited sample volume.

Sample Data Revisions

None

Work Order Revisions / Comments:

Hold time based on preparation date for this QA sample (Trip Blank and/or Trip Spike) and the associated analytical requirements. Hold time exceedances do not preclude the validity of the Trip Blank /Spike data.

Revision 1 Please note the metals concentration reported are dissolved metals concentrations

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Paracel ID: 1733017

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Chain of Custody
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№ 38503

Page 15 of 19

Client Name: Golder	Project Reference: 1530908-3000	**Turnaround Time:**
Contact Name:	Quote #	☐ 1 Day ☐ 3 Day
Address: See Page 1	PO #	☐ 2 Day ☒ Regular
Telephone:	Email Address:	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table _ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1732457-soil, 1733017-water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Quote 16-010
1	MW06-19	GW		4	Aug 4/17		X
2	DM-17-Shallow	S		2			
3	DM-26-Deep						
4	DM-17-Deep						
5	MW07-21-Shallow						
6	DM-30-Shallow						
7	DM-19-Shallow						
8	MW07-21-Deep						
9	DM-60-Shallow						
10	DM-30-Deep	↓		↓	↓		

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: M. DeGuse	Received at Lab: GVANEPURN DENMAI	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20 PM	Date/Time: AUG 11, 2017 09:23	Date/Time: Aug 14 17.
Date/Time:	Temperature: °C	Temperature: 20.8 °C	pH Verified ☒ By: RA 10:32

BQ.

Paracel ID: 1733017

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e: paracel@paracellabs.com

Chain of Custody
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№ 38505

Page 17 of 19

Client Name: Golder	Project Reference: 1530908-3000
Contact Name:	Quote #
Address: See Pg. 1	PO #
Telephone:	Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number:
1732457 - Soil
1733017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Quote 16-010										
1	MW08-24 ✓	GW		4	Aug/17		X										PHC bottle less than half full
2	DM-Shovel-R	GW		4			X										
3	DM-Probe-R	GW		4			X										
4	DM-12-Shallow	S		2			X										
5	DM-12-Deep			1			X										
6	DM-912-Deep						X										
7	DM-13-Shallow						X										
8	DM-13-Deep						X										
9	DM-14-Shallow						X										
10	DM-14-Deep	↓		↓	↓		X										

Comments: Proceed regardless of limited volume!

Method of Delivery: Bracel

Relinquished By (Sign):	Received by Driver/Depot: T. Crouse	Received at Lab: SIMCFORM DONNA	Verified By: Rachel Subject
Relinquished By (Print):	Date/Time: 11/08/17 4:20	Date/Time: AUG 11 17 05:23	Date/Time: Aug 11 17
Date/Time:	Temperature: °C	Temperature: 9.8 °C	pH Verified ☒ By: NA 10:32

cc.

Paracel ID: 1733017

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...K1G 4J8
...047
e: paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
№ 38507

Page 19 of 19

Client Name: Golder
Contact Name:
Address: Seeley.1
Telephone:

Project Reference: 1530908-3000
Quote #
PO #
Email Address:

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☒ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number:
1732457 - Soil
1733017 - Water

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Quote 16-010										
1	MW12-01	GW		4	Aug. 5/17		X										
2	MW05-13						X										
3	MW09-27						X										
4	MW909-26						X										
5	MW09-26						X										
6	MW05-05 ✓						X										PHC bottle less than half full.
7	MW05-02						X										
8	DMTrip Blank				JUL 13, 17												PHC + VOC past hold times. RS
9																	
10																	

Comments: Proceed regardless of limited volume + hold time exceedance

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Alyssa Trafe	FT Seaside	SURREPORT DONNAI	Rachel Subject
Relinquished By (Print): Alyssa Trafe	Date/Time: 11/08/17 4:20	Date/Time: AUG 11 2017 05:20	Date/Time: Aug 14 17
Date/Time: Aug. 11/17 2:30	Temperature: °C FT	Temperature: 20.8 °C	pH Verified ☒ By: N/A 10:32

Chain of Custody (Blank) - Rev 0.4 Feb 2016

APPENDIX D

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Photo 1: *Lower Site NWS Landfill – Cover surface (Vegetation – Feature D), facing southwest (DYEM_Photo758.jpg)*



Photo 2: *Lower Site NWS Landfill – View of cover from southeast crest, facing northwest (DYEM_Photo754.jpg)*



Photo 3: *Lower Site NWS Landfill – Northwest slope (Feature B3 – sparse vegetation - Acceptable), facing northeast (DYEM_Photo757.jpg)*



Photo 4: *Lower Site NWS Landfill – Southeast crest and slope (Feature B1 – sparse vegetation - Acceptable), facing southwest (DYEM_Photo755.jpg)*



Photo 5: *Lower Site NWS Landfill – Southwest crest and slope (Feature B2 – sparse vegetation - Acceptable), facing northwest (DYEM_Photo756.jpg)*



Photo 6: *Lower Site NWS Landfill – Cover surface, Feature A – Tension crack near crest of southeast slope, facing northeast (Acceptable) (DYEM_Photo181.jpg)*

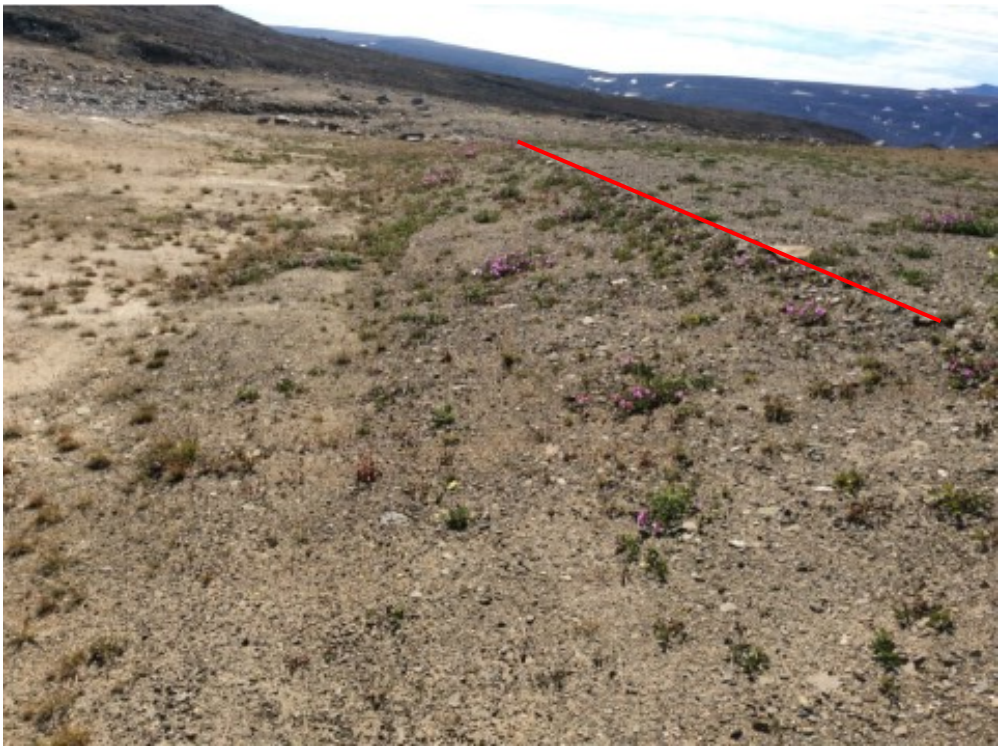


Photo 7: *Lower Site NWS Landfill – Southeast slope, Feature B1 – Sparse vegetation, facing southwest (Acceptable) (DYEM_Photo180.jpg)*



Photo 8: *Lower Site NWS Landfill – Southwest slope, Feature B2 – Sparse vegetation, facing southeast (Acceptable) (DYEM_Photo185.jpg)*



Photo 9: *Lower Site NWS Landfill – Northeast slope, Feature B4 – Sparse vegetation, facing southeast (Acceptable) (DYEM_Photo187.jpg)*



Photo 10: *Lower Site NWS Landfill – Northeast slope, Feature B4 – Sparse vegetation entire slope, facing northwest (Acceptable) (DYEM_Photo190.jpg)*

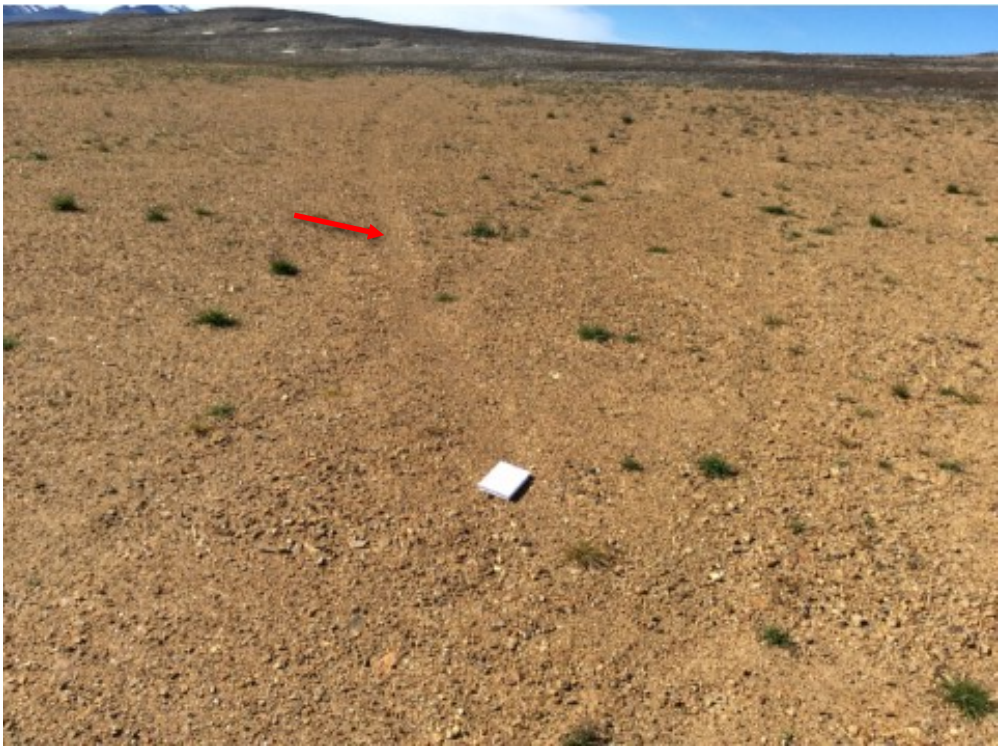


Photo 11: *Lower Site NWS Landfill – Cover surface, Feature C – Tire tracks, facing northwest (Acceptable) (DYEM_Photo182.jpg)*



Photo 12: *Lower Site NWS Landfill – Cover surface, Feature C – Tire tracks, facing north (Acceptable) (DYEM_Photo189.jpg)*



Photo 13: *Lower Site NWS Landfill – Cover surface facing southeast, Feature C – Tire tracks (Acceptable) (DYEM_Photo184.jpg)*



Photo 14: *Lower Site NWS Landfill – Cover surface, Feature D – Sparse vegetation, facing east (Acceptable) (DYEM_Photo186.jpg)*



Photo 15: *Lower Site NWS Landfill – Northeast slope, Feature E – Minor settlement, facing southeast (Acceptable) (DYEM_Photo188.jpg)*

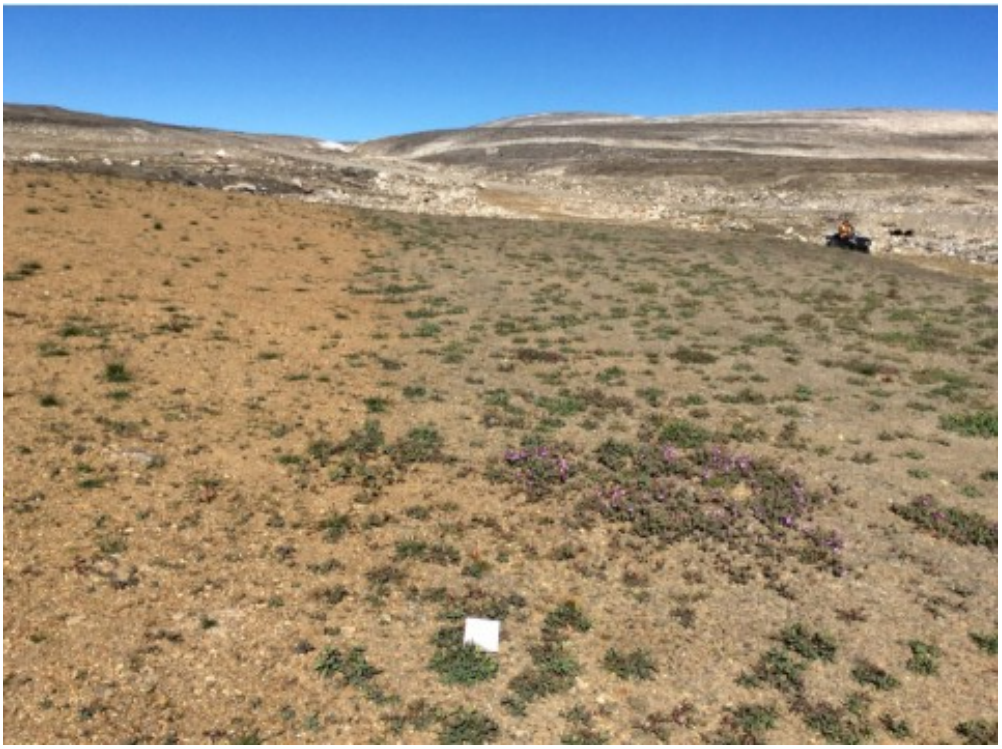


Photo 16: *Lower Site NWS Landfill – Cover surface facing northeast, Feature D – sparse vegetation (Acceptable) (DYEM_Photo183.jpg)*



Photo 17: *Lower Site NWS Landfill – Soil Sample DM-07 – Before excavation (DYEM_Photo442.jpg)*



Photo 18: *Lower Site NWS Landfill – Soil Sample DM-07 – After excavation (DYEM_Photo443.jpg)*



Photo 19: Lower Site NWS Landfill – Soil Sample DM-07 – After backfilling (DYEM_Photo446.jpg)



Photo 20: Lower Site NWS Landfill – Soil Sample DM-08 – Before excavation (DYEM_Photo435.jpg)



Photo 21: Lower Site NWS Landfill – Soil Sample DM-08 – After excavation (DYEM_Photo438.jpg)



Photo 22: Lower Site NWS Landfill – Soil Sample DM-08 – After backfilling (DYEM_Photo439.jpg)



Photo 23: *Lower Site NWS Landfill – Soil Sample DM-09 – Before excavation (DYEM_Photo436.jpg)*



Photo 24: *Lower Site NWS Landfill – Soil Sample DM-09 – After excavation (DYEM_Photo437.jpg)*



Photo 25: Lower Site NWS Landfill – Soil Sample DM-09 – After backfilling (DYEM_Photo441.jpg)



Photo 26: Lower Site NWS Landfill – Soil Sample DM-10 – Before excavation (DYEM_Photo440.jpg)



Photo 27: Lower Site NWS Landfill – Soil Sample DM-10 – After excavation (DYEM_Photo444.jpg)



Photo 28: Lower Site NWS Landfill – Soil Sample DM-10 – After backfilling (DYEM_Photo445.jpg)



Photo 29: *Lower Site Tier II Disposal Facility – Cover surface, facing northwest (DYEM_Photo734.jpg)*



Photo 30: *Lower Site Tier II Disposal Facility – Cover surface (Feature A- Tire Tracks - Acceptable), facing northwest (DYEM_Photo735.jpg)*



Photo 31: Lower Site Tier II Disposal Facility – Cover surface (Feature A- Tire Tracks - Acceptable), facing northwest (DYEM_Photo740.jpg)



Photo 32: Lower Site Tier II Disposal Facility – Cover surface, facing southwest (DYEM_Photo743.jpg)



Photo 33: Lower Site Tier II Disposal Facility – Cover surface, facing northeast (DYEM_Photo747.jpg)

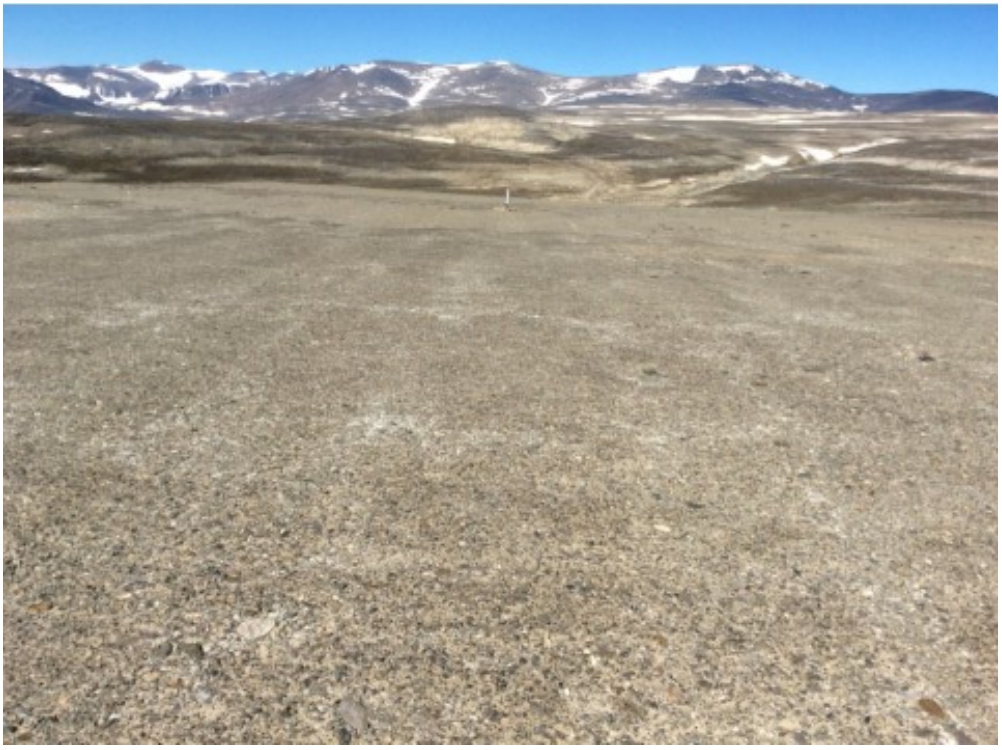


Photo 34: Lower Site Tier II Disposal Facility – Cover surface, facing northwest (DYEM_Photo750.jpg)



Photo 35: Lower Site Tier II Disposal Facility – Cover surface, facing northwest (DYEM_Photo751.jpg)



Photo 36: Lower Site Tier II Disposal Facility – Cover surface, facing southeast (DYEM_Photo753.jpg)

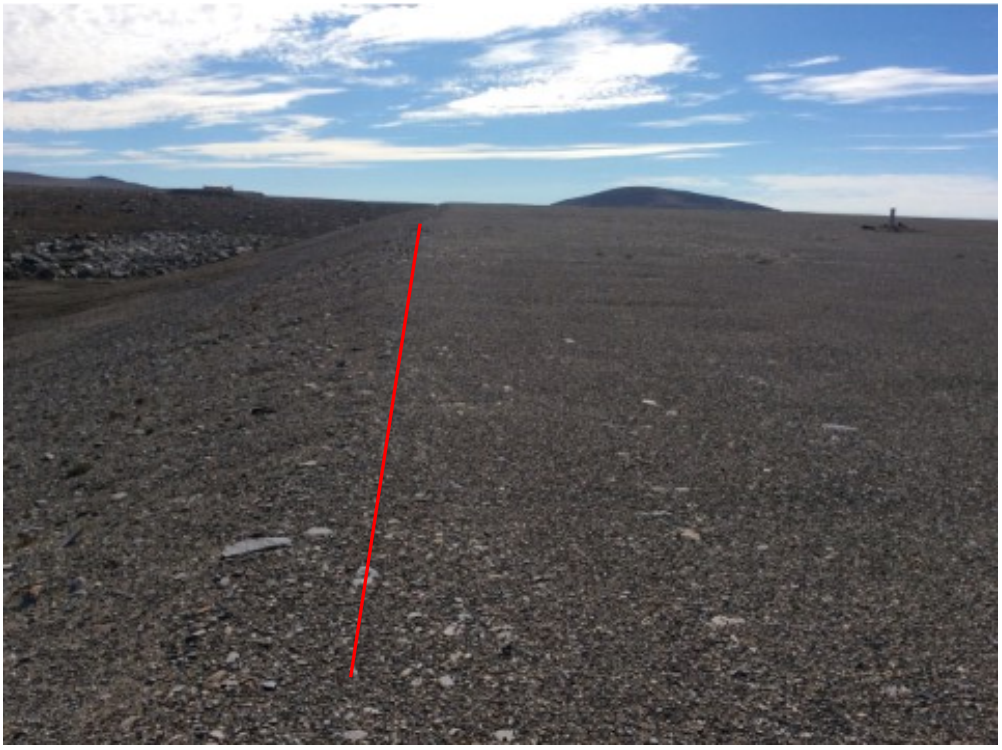


Photo 37: *Lower Site Tier II Disposal Facility – East crest, facing southeast (DYEM_Photo741.jpg)*



Photo 38: *Lower Site Tier II Disposal Facility – Cover and east crest, facing northwest (DYEM_Photo752.jpg)*



Photo 39: *Lower Site Tier II Disposal Facility – East slope, facing southwest (DYEM_Photo730.jpg)*



Photo 40: *Lower Site Tier II Disposal Facility – East slope, facing northwest (DYEM_Photo731.jpg)*



Photo 41: *Lower Site Tier II Disposal Facility – East toe – Feature W – Wet area with no seepage, facing northwest (Acceptable) (DYEM_Photo732.jpg)*



Photo 42: *Lower Site Tier II Disposal Facility – North crest, facing southwest (DYEM_Photo742.jpg)*



Photo 43: Lower Site Tier II Disposal Facility – North crest, facing northeast (DYEM_Photo744.jpg)



Photo 44: Lower Site Tier II Disposal Facility – Cover and south crest, facing northeast (DYEM_Photo748.jpg)



Photo 45: *Lower Site Tier II Disposal Facility – South slope, facing northeast (DYEM_Photo749.jpg)*



Photo 46: *Lower Site Tier II Disposal Facility – South slope and toe, facing southwest (DYEM_Photo733.jpg)*



Photo 47: *Lower Site Tier II Disposal Facility – Cover and west crest, facing southeast (DYEM_Photo745.jpg)*



Photo 48: *Lower Site Tier II Disposal Facility – West slope, facing southeast (Feature N - Acceptable) (DYEM_Photo746.jpg)*

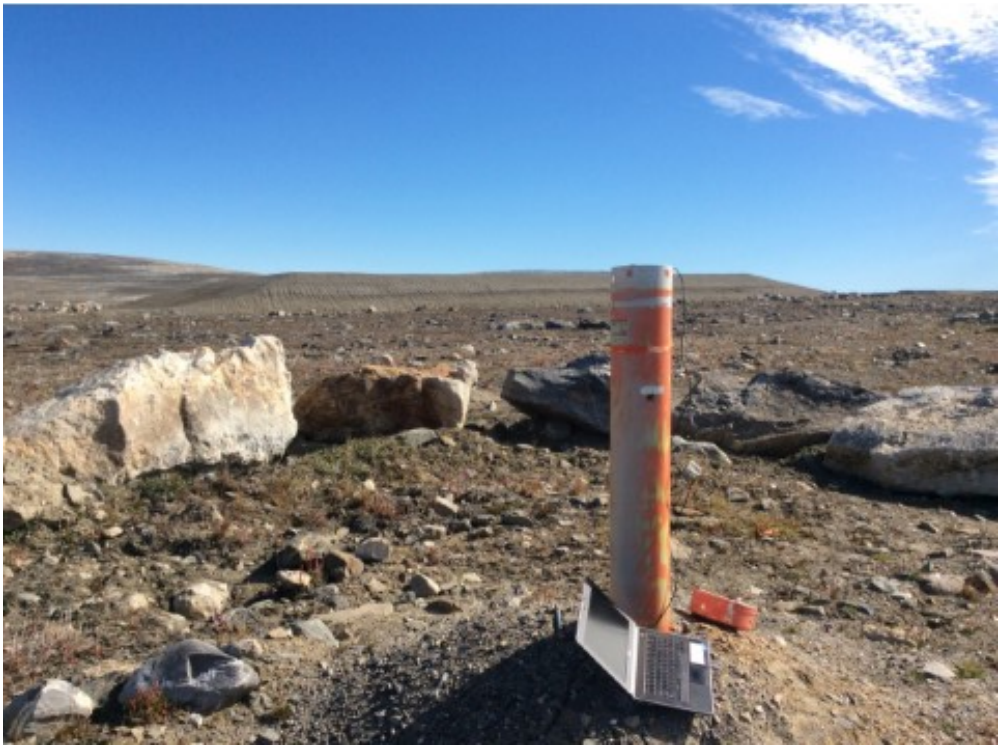


Photo 49: *Lower Site Tier II Disposal Facility – VT BL, located off the landfill to the west, facing east (DYEM_Photo738.jpg)*

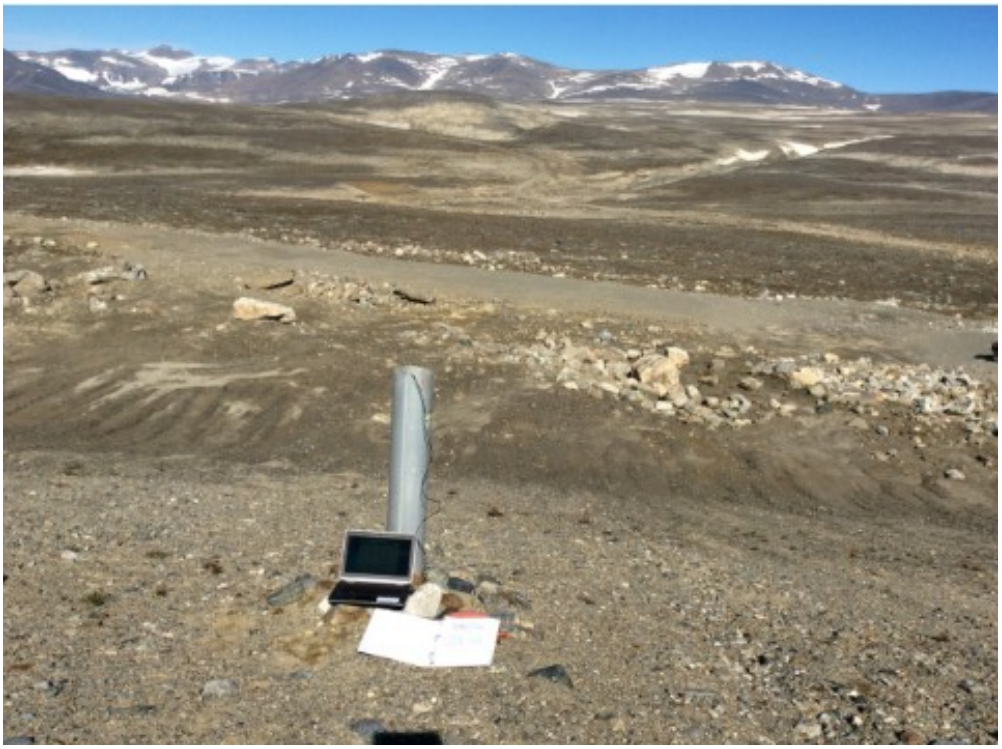


Photo 50: *Lower Site Tier II Disposal Facility – VT-1, facing northwest (DYEM_Photo736.jpg)*

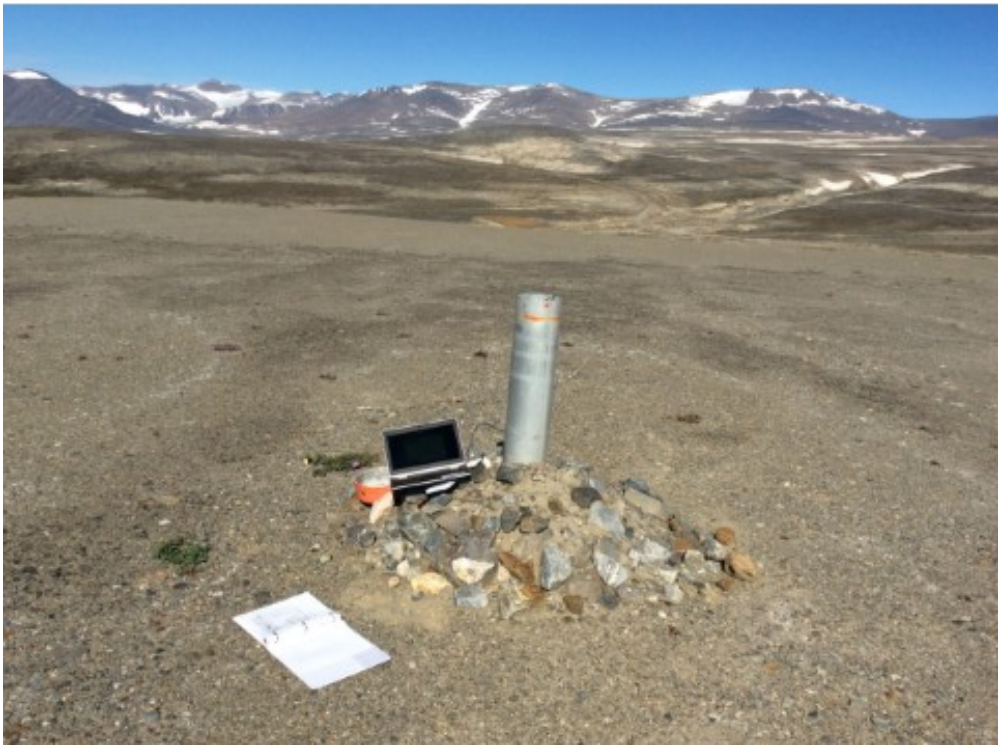


Photo 51: *Lower Site Tier II Disposal Facility – VT-2, facing northwest (DYEM_Photo737.jpg)*

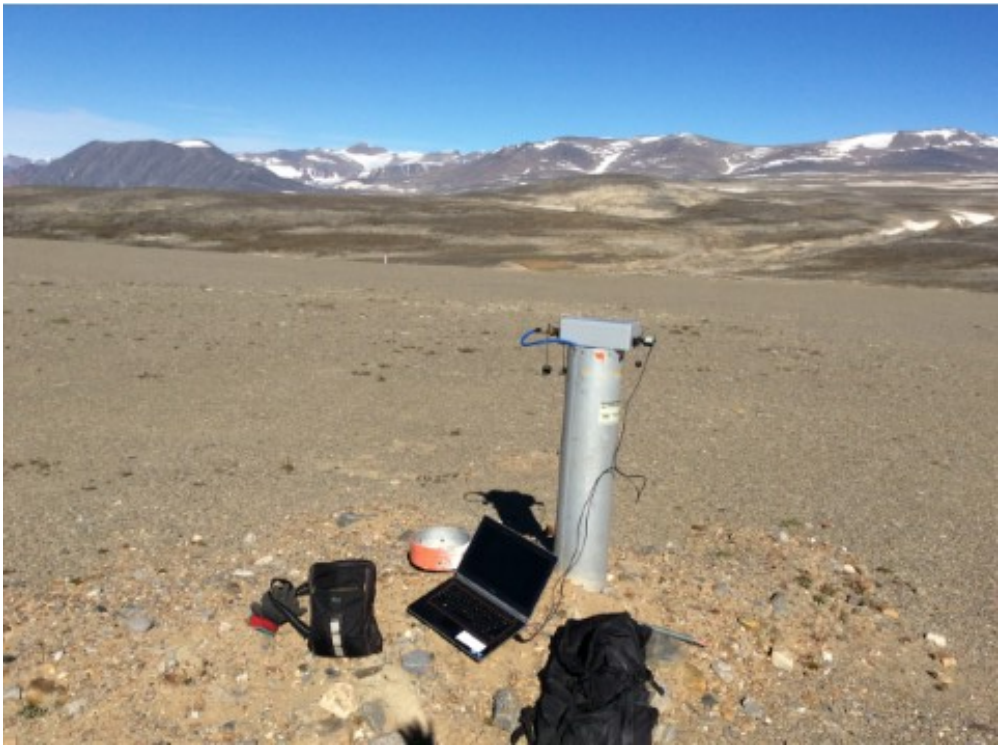


Photo 52: *Lower Site Tier II Disposal Facility – VT-3, facing northwest (DYEM_Photo729.jpg)*



Photo 53: *Lower Site Tier II Disposal Facility – VT-4, facing southeast (DYEM_Photo739.jpg)*



Photo 54: *Lower Site Tier II Disposal Facility – Feature A – Previously noted vehicle tracks on cover are now indistinguishable, facing northwest (DYEM_Photo173.jpg)*



Photo 55: *Lower Site Tier II Disposal Facility – Cover surface, Feature B – Minor self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo147.jpg)*



Photo 56: *Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing northwest (Acceptable) (DYEM_Photo148.jpg)*



Photo 57: *Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo157.jpg)*



Photo 58: *Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing northwest (Acceptable) (DYEM_Photo149.jpg)*



Photo 59: *Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing northwest (Acceptable) (DYEM_Photo150.jpg)*



Photo 60: *Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo151.jpg)*



Photo 61: Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo152.jpg)



Photo 62: Lower Site Tier II Disposal Facility – North slope, Feature C – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo154.jpg)



Photo 63: *Lower Site Tier II Disposal Facility – West slope, Feature D – Sparse vegetation, facing northwest (Acceptable) (DYEM_Photo162.jpg)*



Photo 64: *Lower Site Tier II Disposal Facility – South slope, Feature D3 – Sparse vegetation, facing southwest (Acceptable) (DYEM_Photo145.jpg)*

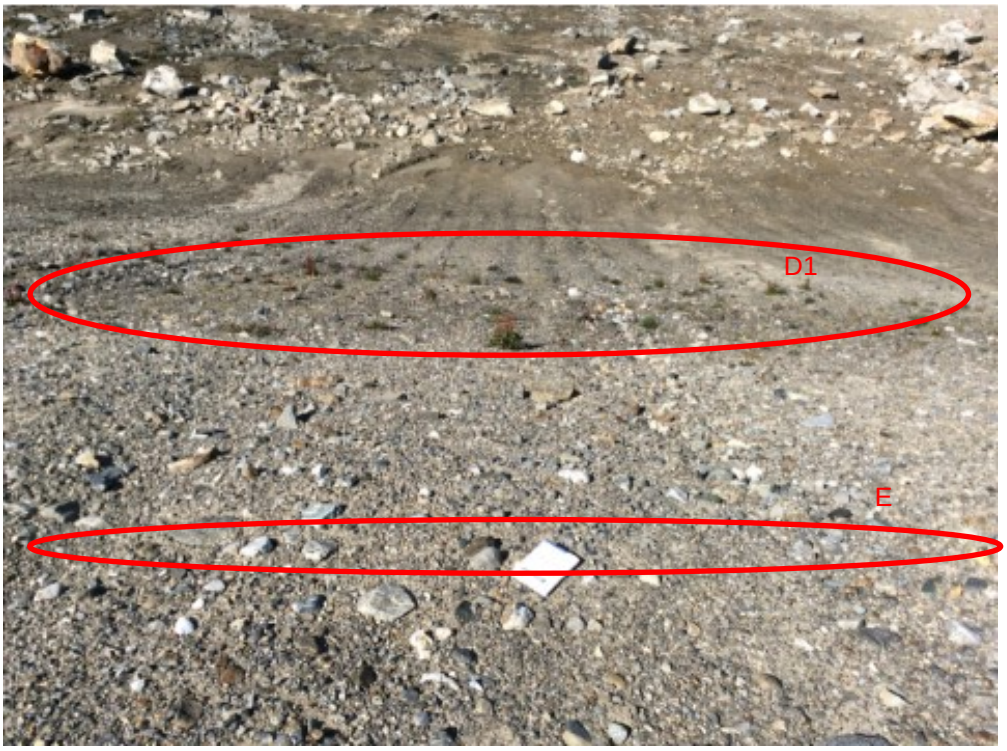


Photo 65: *Lower Site Tier II Disposal Facility – North slope, Feature D1 (Sparse vegetation) and Feature E (wet area), facing northwest, (Acceptable) (DYEM_Photo177.jpg)*



Photo 66: *Lower Site Tier II Disposal Facility – North slope, Feature D1 – Sparse vegetation, facing northeast (Acceptable) (DYEM_Photo146.jpg)*



Photo 67: *Lower Site Tier II Disposal Facility – North slope, Feature E – Wet and soft area, facing northeast (Acceptable) (DYEM_Photo156.jpg)*



Photo 68: *Lower Site Tier II Disposal Facility – North slope, Feature F – Previously observed sloughing, not wet in 2017, facing southeast upslope (Acceptable) (DYEM_Photo153.jpg)*



Photo 69: *Lower Site Tier II Disposal Facility – West slope, Feature G – Self-armouring erosion in ruts, facing southwest (Acceptable) (DYEM_Photo164.jpg)*



Photo 70: *Lower Site Tier II Disposal Facility – West slope, Feature G – Self-armouring erosion, facing northeast (Acceptable) (DYEM_Photo158.jpg)*



Photo 71: *Lower Site Tier II Disposal Facility – West slope, Feature G – Self-armouring erosion, facing northeast (Acceptable) (DYEM_Photo159.jpg)*



Photo 72: *Lower Site Tier II Disposal Facility – West slope, Feature H – Minor sloughing, facing southwest (Acceptable) (DYEM_Photo160.jpg)*



Photo 73: *Lower Site Tier II Disposal Facility – West slope near toe, Feature I – Minor tension crack, facing southeast (Acceptable) (DYEM_Photo163.jpg)*



Photo 74: *Lower Site Tier II Disposal Facility –west slope near crest, previously observed minor crack (Feature J) was not observed in 2017, facing northwest (DYEM_Photo165.jpg)*



Photo 75: *Lower Site Tier II Disposal Facility – South slope, Feature K – Self-armouring erosion in each channel, facing southeast (Acceptable) (DYEM_Photo170.jpg)*



Photo 76: *Lower Site Tier II Disposal Facility – South slope, Feature K – Self-armouring erosion in each channel, facing southeast (Acceptable) (DYEM_Photo169.jpg)*



Photo 77: *Lower Site Tier II Disposal Facility – South slope, Feature K – Self-armouring erosion in each channel, facing southeast (Acceptable) (DYEM_Photo168.jpg)*



Photo 78: *Lower Site Tier II Disposal Facility – South slope, Feature K – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo171.jpg)*



Photo 79: *Lower Site Tier II Disposal Facility – South slope, Feature K – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo172.jpg)*



Photo 80: *Lower Site Tier II Disposal Facility – South slope near crest, Feature L – Minor parallel cracks, facing northeast (Acceptable) (DYEM_Photo144.jpg)*



Photo 81: *Lower Site Tier II Disposal Facility – South slope near crest, Feature L – Minor crack, facing southwest (Acceptable) (DYEM_Photo143.jpg)*



Photo 82: *Lower Site Tier II Disposal Facility – South slope, Feature M – Minor tension crack on slope, facing northeast (Acceptable) (DYEM_Photo167.jpg)*

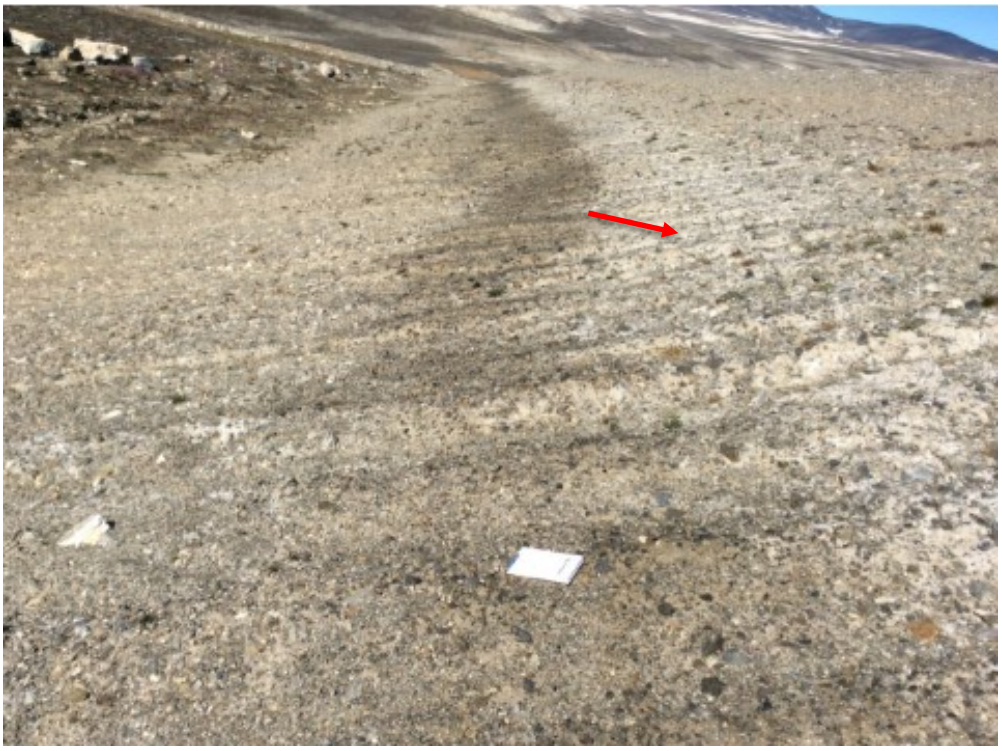


Photo 83: *Lower Site Tier II Disposal Facility – West slope, Feature N – Band of white discolouration along entire west slope, facing northwest (Acceptable) (DYEM_Photo166.jpg)*



Photo 84: *Lower Site Tier II Disposal Facility – West slope, Feature O – Minor tension crack on slope, facing northwest (Acceptable) (DYEM_Photo161.jpg)*

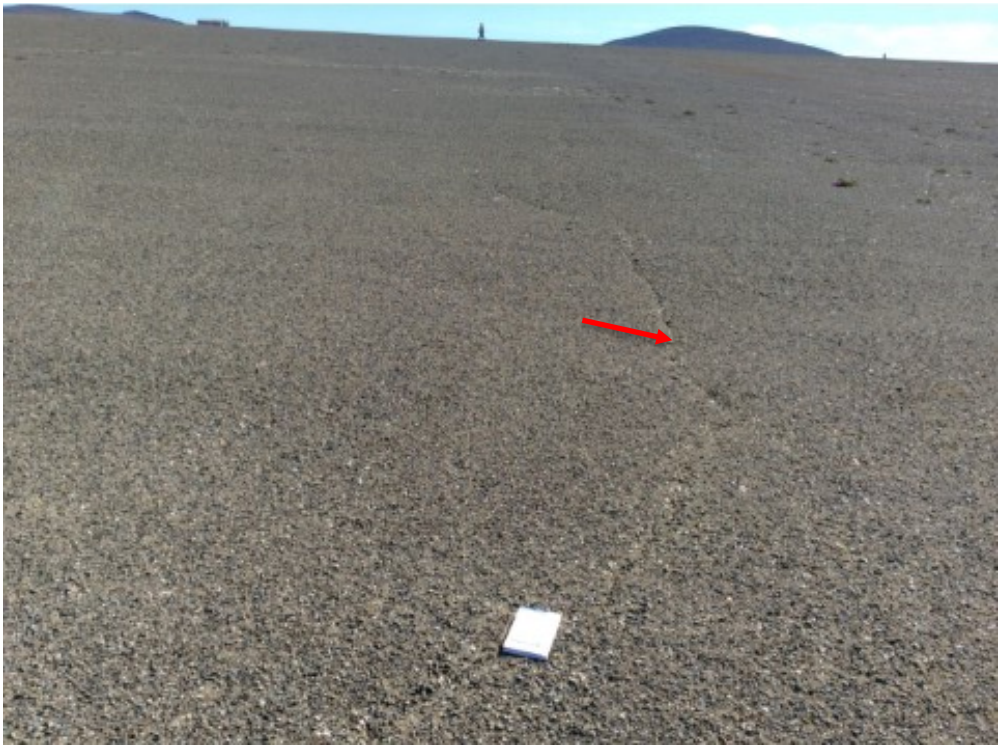


Photo 85: *Lower Site Tier II Disposal Facility – Cover surface/north slope, Feature P – Self-armouring erosion channel, facing southeast (Acceptable) (DYEM_Photo178.jpg)*



Photo 86: *Lower Site Tier II Disposal Facility – Cover surface, Feature Q – Self-armouring erosion channel, facing north (Acceptable) (DYEM_Photo176.jpg)*



Photo 87: *Lower Site Tier II Disposal Facility – Cover surface, Feature R – Cracking on cover surface, facing northeast (Acceptable) (DYEM_Photo174.jpg)*



Photo 88: *Lower Site Tier II Disposal Facility – Cover surface, Feature S – Cracking on cover surface, facing northeast (Acceptable) (DYEM_Photo175.jpg)*



Photo 89: *Lower Site Tier II Disposal Facility – East slope near toe, New Feature T – Tension crack near toe, facing northwest (Acceptable) (DYEM_Photo140.jpg)*

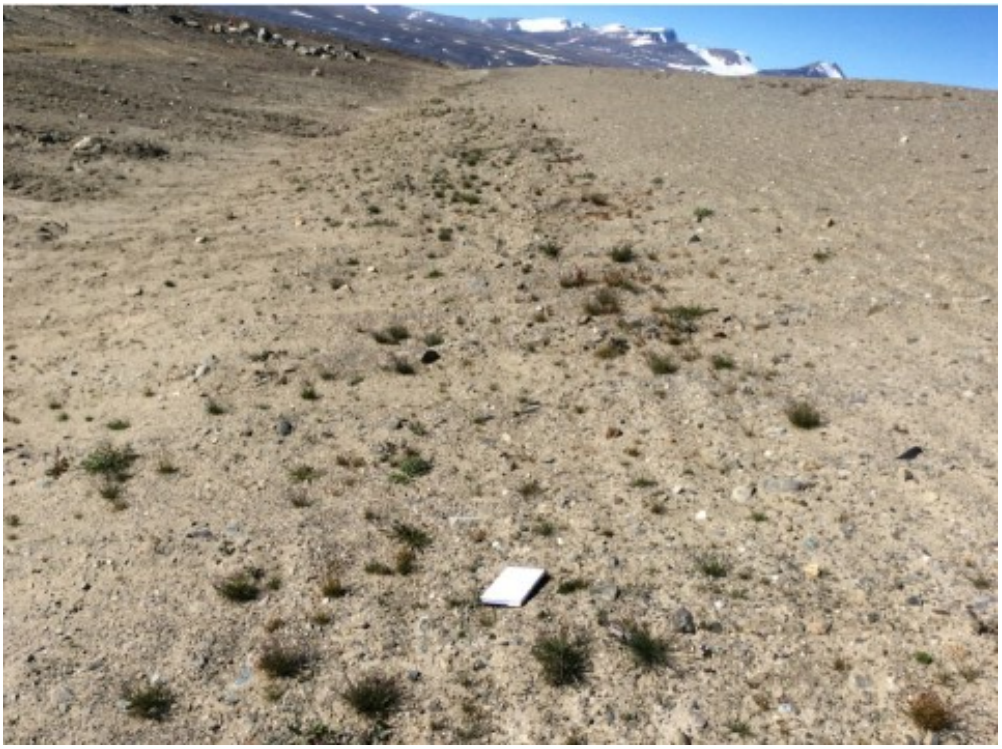


Photo 90: *Lower Site Tier II Disposal Facility – South slope, Feature D3 – Sparse vegetation, facing southwest (Acceptable) (DYEM_Photo141.jpg)*

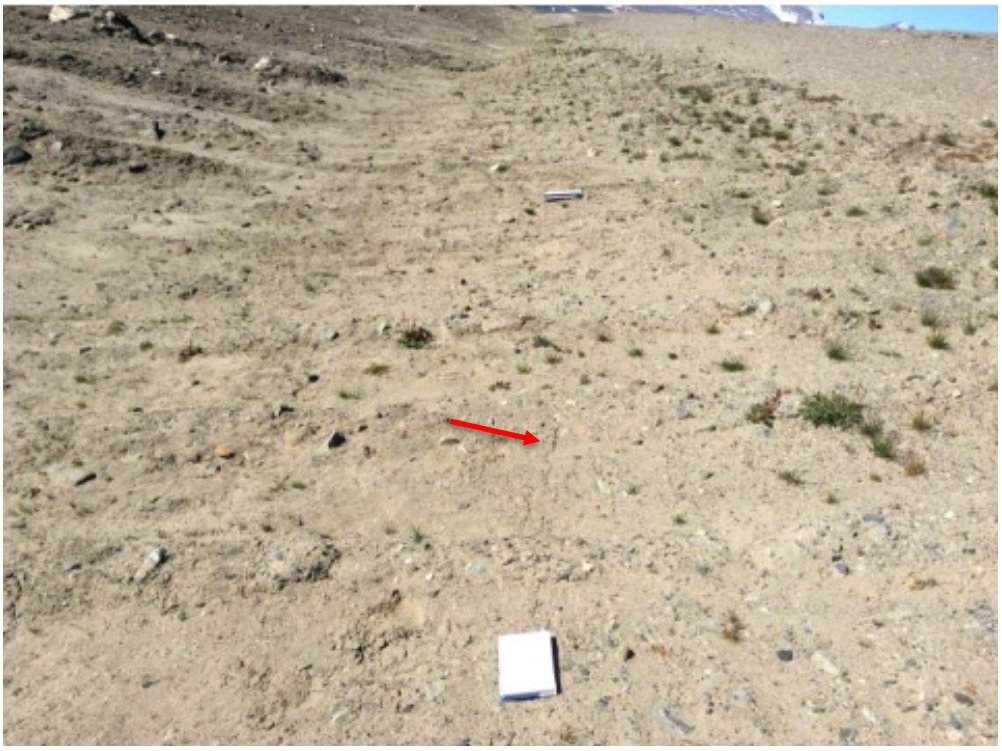


Photo 91: *Lower Site Tier II Disposal Facility – South slope near toe facing west, Feature U – Minor cracking near toe (Acceptable) (DYEM_Photo142.jpg)*



Photo 92: *Lower Site Tier II Disposal Facility – North slope, Feature D1 – Sparse vegetation, facing southwest (Acceptable) (DYEM_Photo155.jpg)*



Photo 93: *Lower Site Tier II Disposal Facility – East slope, Feature V – Minor tension crack near crest, facing northwest (Acceptable) (DYEM_Photo179.jpg)*



Photo 94: *Lower Site Tier II Disposal Facility – Soil Sample MW05-13 – Before excavation (DYEM_Photo383.jpg)*



Photo 95: Lower Site Tier II Disposal Facility – Soil Sample MW05-13 – After excavation (DYEM_Photo385.jpg)



Photo 96: Lower Site Tier II Disposal Facility – Soil Sample MW05-13 – After backfilling (DYEM_Photo386.jpg)



Photo 97: Lower Site Tier II Disposal Facility – Water Sample MW05-13 (DYEM_Photo384.jpg)



Photo 98: Lower Site Tier II Disposal Facility – Soil Sample MW05-15 – Before excavation (DYEM_Photo391.jpg)



Photo 99: *Lower Site Tier II Disposal Facility – Soil Sample MW05-15 – After excavation (DYEM_Photo393.jpg)*



Photo 100: *Lower Site Tier II Disposal Facility – Soil Sample MW05-15 – After backfilling (DYEM_Photo394.jpg)*



Photo 101: Lower Site Tier II Disposal Facility – Water Sample MW05-15 (DYEM_Photo392.jpg)



Photo 102: Lower Site Tier II Disposal Facility – Soil Sample MW05-16 – Before excavation (DYEM_Photo396.jpg)



Photo 103: Lower Site Tier II Disposal Facility – Soil Sample MW05-16 – After excavation (DYEM_Photo397.jpg)



Photo 104: Lower Site Tier II Disposal Facility – Soil Sample MW05-16 – After backfilling (DYEM_Photo398.jpg)



Photo 105: Lower Site Tier II Disposal Facility – Water Sample MW05-16 (DYEM_Photo395.jpg)



Photo 106: Lower Site Tier II Disposal Facility – Soil Sample MW12-01 – Before excavation (DYEM_Photo387.jpg)



Photo 107: Lower Site Tier II Disposal Facility – Soil Sample MW12-01 – After excavation (DYEM_Photo389.jpg)



Photo 108: Lower Site Tier II Disposal Facility – Soil Sample MW12-01 – After backfilling (DYEM_Photo390.jpg)



Photo 109: Lower Site Tier II Disposal Facility – Water Sample MW12-01 (DYEM_Photo388.jpg)



Photo 110: Lower Site Crossroads Landfill – Cover surface, facing southeast – Entire surface covered with sparse vegetation (Feature B - Acceptable) (DYEM_Photo761.jpg)



Photo 111: Lower Site Crossroads Landfill – Cover surface, facing southwest – Entire surface covered with sparse vegetation (DYEM_Photo765.jpg)



Photo 112: Lower Site Crossroads Landfill – Cover surface, facing northwest (DYEM_Photo768.jpg)



Photo 113: Lower Site Crossroads Landfill – Cover and northeast crest, facing southeast (DYEM_Photo763.jpg)



Photo 114: Lower Site Crossroads Landfill – Northeast crest, slope and toe, facing southeast (DYEM_Photo764.jpg)



Photo 115: Lower Site Crossroads Landfill – East slope and crest, facing southeast (DYEM_Photo762.jpg)



Photo 116: Lower Site Crossroads Landfill – East slope, facing southwest (DYEM_Photo766.jpg)



Photo 117: Lower Site Crossroads Landfill – Southwest slope, from off the landfill facing east (DYEM_Photo759.jpg)



Photo 118: Lower Site Crossroads Landfill – West slope, from off-landfill facing northeast (DYEM_Photo760.jpg)



Photo 119: Lower Site Crossroads Landfill – East slope, facing northeast (DYEM_Photo767.jpg)



Photo 120: Lower Site Crossroads Landfill – Cover surface, Feature B – Sparse vegetation, facing north (Acceptable) (DYEM_Photo193.jpg)



Photo 121: Lower Site Crossroads Landfill – Cover surface at west crest, Feature K – Area of differential settlement, facing southwest (Acceptable) (DYEM_Photo192.jpg)



Photo 122: Lower Site Crossroads Landfill – West slope, Feature L – Tension crack, facing southeast (Acceptable) (DYEM_Photo191.jpg)



Photo 123: Lower Site Crossroads Landfill – Soil Sample DM-01 – Before excavation (DYEM_Photo203.jpg)



Photo 124: Lower Site Crossroads Landfill – Soil Sample DM-01 – After excavation (DYEM_Photo204.jpg)



Photo 125: Lower Site Crossroads Landfill – Soil Sample DM-01 – After backfilling (DYEM_Photo205.jpg)



Photo 126: Lower Site Crossroads Landfill – Soil Sample DM-02 – Before excavation (DYEM_Photo206.jpg)



Photo 127: Lower Site Crossroads Landfill – Soil Sample DM-02 – After excavation (DYEM_Photo207.jpg)



Photo 128: Lower Site Crossroads Landfill – Soil Sample DM-02 – After backfilling (DYEM_Photo208.jpg)



Photo 129: Lower Site Crossroads Landfill – Soil Sample DM-03 – Before excavation (DYEM_Photo209.jpg)



Photo 130: Lower Site Crossroads Landfill – Soil Sample DM-03 – After excavation (DYEM_Photo210.jpg)



Photo 131: Lower Site Crossroads Landfill – Soil Sample DM-03 – After backfilling (DYEM_Photo211.jpg)



Photo 132: Lower Site Foundation Landfill – Cover surface, facing southeast (DYEM_Photo499.jpg)



Photo 133: Lower Site Foundation Landfill – Cover surface, facing southwest (DYEM_Photo500.jpg)



Photo 134: Lower Site Foundation Landfill – Cover surface, facing north (DYEM_Photo501.jpg)

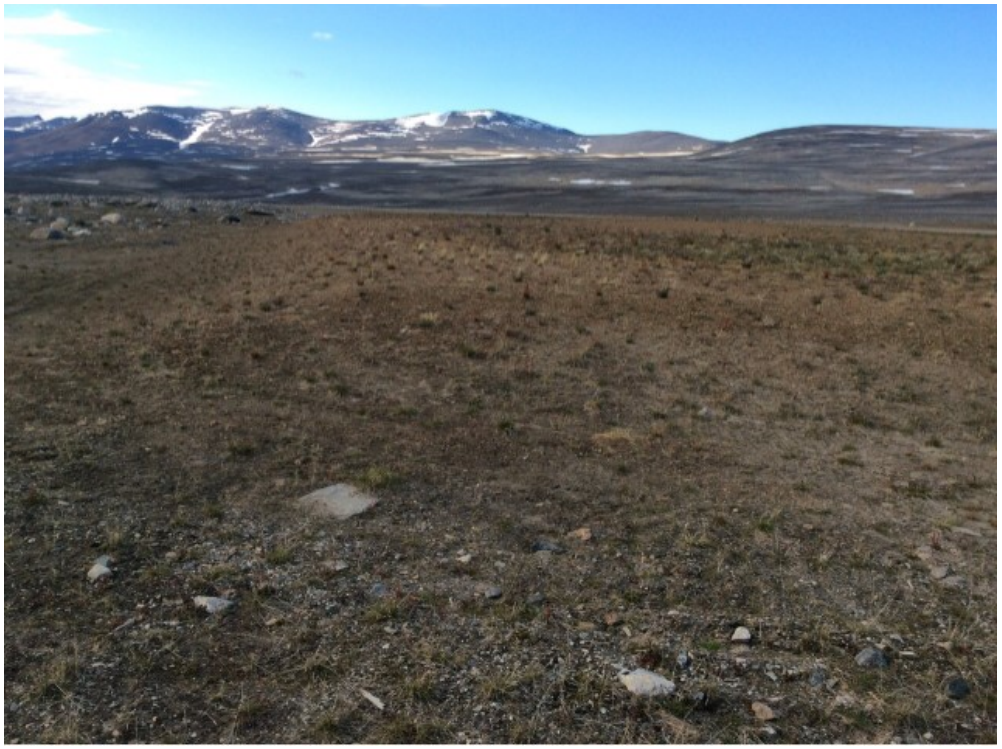


Photo 135: Lower Site Foundation Landfill – South slope, facing north (DYEM_Photo497.jpg)



Photo 136: Lower Site Foundation Landfill – West crest, slope and toe, facing northwest (DYEM_Photo498.jpg)



Photo 137: *Lower Site Foundation Landfill – Cover surface, Feature D1 – moderate vegetation, expanded area since previous inspection, facing east, (Acceptable) (DYEM_Photo29.jpg)*



Photo 138: *Lower Site Foundation Landfill – Northwest slope, Feature D2 – moderate vegetation (unchanged), facing north (Acceptable) (DYEM_Photo31.jpg)*



Photo 139: *Lower Site Foundation Landfill – Northwest slope, Feature D2 – vegetation (unchanged), facing southwest (Acceptable) (DYEM_Photo32.jpg)*



Photo 140: *Lower Site Foundation Landfill – East slope, Feature D1 – moderate vegetation expanded, facing south (Acceptable) (DYEM_Photo36.jpg)*



Photo 141: Lower Site Foundation Landfill – Northeast slope, Feature D2 – vegetation (unchanged), facing southeast (Acceptable) (DYEM_Photo34.jpg)



Photo 142: Lower Site Foundation Landfill – South crest, Feature K – Minor thaw crack, facing west (Acceptable) (DYEM_Photo40.jpg)



Photo 143: *Lower Site Foundation Landfill – East slope, Feature L – Minor thaw crack, facing north (Acceptable) (DYEM_Photo38.jpg)*



Photo 144: *Lower Site Foundation Landfill – Cover surface, Feature M – Minor settlement depression, facing southeast (Acceptable) (DYEM_Photo35.jpg)*



Photo 145: Lower Site Foundation Landfill – North crest corner, Feature N – Minor thaw crack, facing southwest (Acceptable) (DYEM_Photo33.jpg)

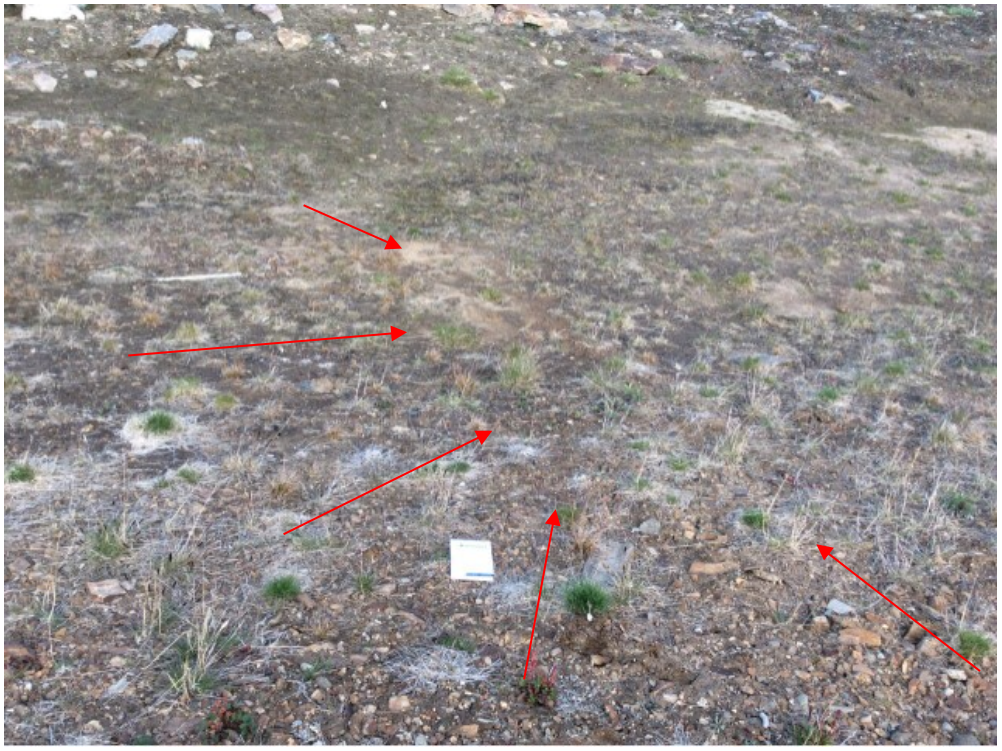


Photo 146: Lower Site Foundation Landfill – East Slope, Feature O – Area of self armouring erosion, accumulation of fines at toe of slope, facing south (Acceptable) (DYEM_Photo39.jpg)

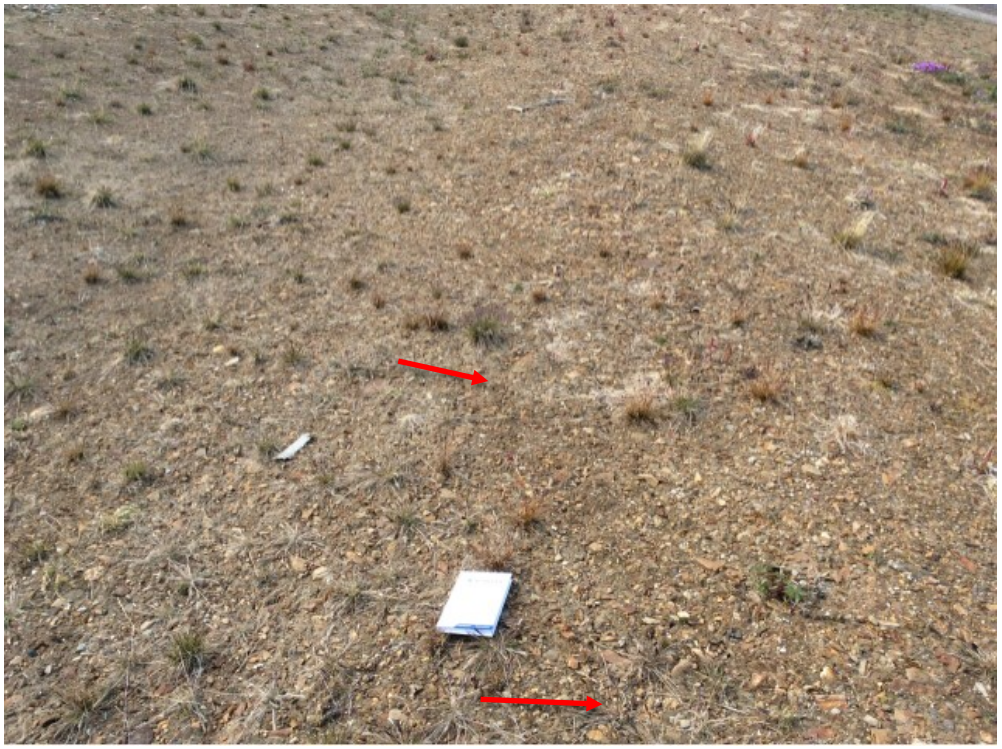


Photo 147: Lower Site Foundation Landfill – Southwest slope, Feature P – Minor thaw crack, facing southeast (Acceptable) (DYEM_Photo30.jpg)



Photo 148: Lower Site Foundation Landfill – East slope, Feature L – Minor cracking along the toe, facing south (Acceptable) (DYEM_Photo37.jpg)



Photo 149: Lower Site Foundation Landfill – Soil Sample DM-04 – Before excavation (DYEM_Photo194.jpg)



Photo 150: Lower Site Foundation Landfill – Soil Sample DM-04 – After excavation (DYEM_Photo195.jpg)



Photo 151: Lower Site Foundation Landfill – Soil Sample DM-04 – After backfilling (DYEM_Photo196.jpg)



Photo 152: Lower Site Foundation Landfill – Soil Sample DM-05 – Before excavation (DYEM_Photo200.jpg)



Photo 153: Lower Site Foundation Landfill – Soil Sample DM-05 – After excavation (DYEM_Photo201.jpg)



Photo 154: Lower Site Foundation Landfill – Soil Sample DM-05 – After backfilling (DYEM_Photo202.jpg)



Photo 155: Lower Site Foundation Landfill – Soil Sample DM-06 – Before excavation (DYEM_Photo197.jpg)



Photo 156: Lower Site Foundation Landfill – Soil Sample DM-06 – After excavation (DYEM_Photo198.jpg)



Photo 157: Lower Site Foundation Landfill – Soil Sample DM-06 – After backfilling (DYEM_Photo199.jpg)



Photo 158: Lower Site Powerhouse Landfill – Cover surface, facing southeast (DYEM_Photo771.jpg)



Photo 159: Lower Site Powerhouse Landfill – Cover surface, facing northeast (DYEM_Photo772.jpg)

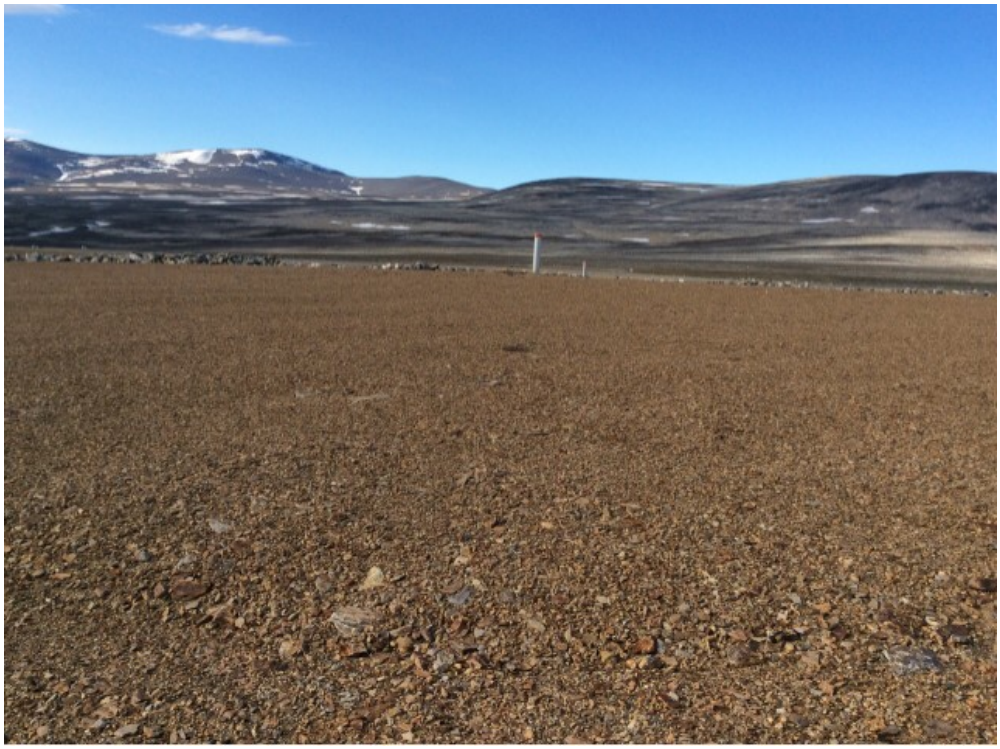


Photo 160: Lower Site Powerhouse Landfill – Cover surface, facing north, VT-6 in centre of photo (DYEM_Photo487.jpg)



Photo 161: Lower Site Powerhouse Landfill – Cover surface, facing northwest (DYEM_Photo490.jpg)

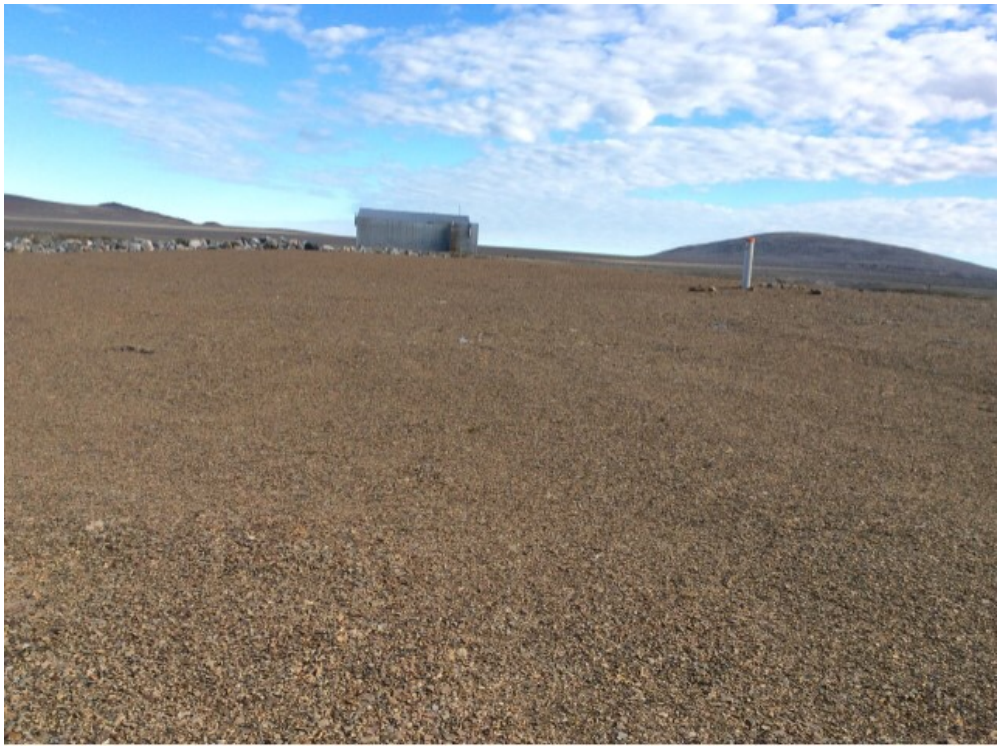


Photo 162: Lower Site Powerhouse Landfill – Cover surface, facing south, VT-6 in centre-right of photo (DYEM_Photo492.jpg)

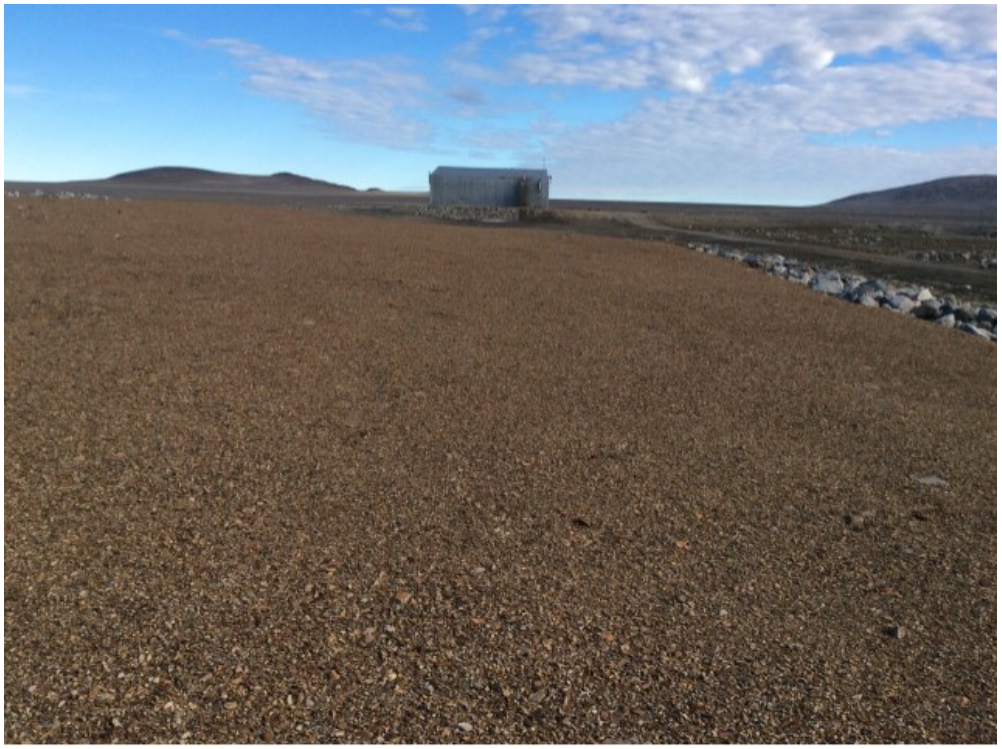


Photo 163: Lower Site Powerhouse Landfill – Cover surface, facing south (DYEM_Photo493.jpg)



Photo 164: Lower Site Powerhouse Landfill – East slope, facing northeast, VT-7 on right side. (DYEM_Photo489.jpg)



Photo 165: *Lower Site Powerhouse Landfill – North slope, facing northwest (DYEM_Photo491.jpg)*



Photo 166: *Lower Site Powerhouse Landfill – North slope, facing south, MW-05-05 at toe of slope. (DYEM_Photo496.jpg)*



Photo 167: Lower Site Powerhouse Landfill – View from off landfill, facing north (DYEM_Photo486.jpg)



Photo 168: Lower Site Powerhouse Landfill – South slope and toe, facing southwest (DYEM_Photo488.jpg)



Photo 169: Lower Site Powerhouse Landfill – West slope, facing southeast (DYEM_Photo494.jpg)



Photo 170: Lower Site Powerhouse Landfill – West slope and toe, facing southeast (DYEM_Photo495.jpg)



Photo 171: Lower Site Powerhouse Landfill – VT-5, facing south (DYEM_Photo769.jpg)

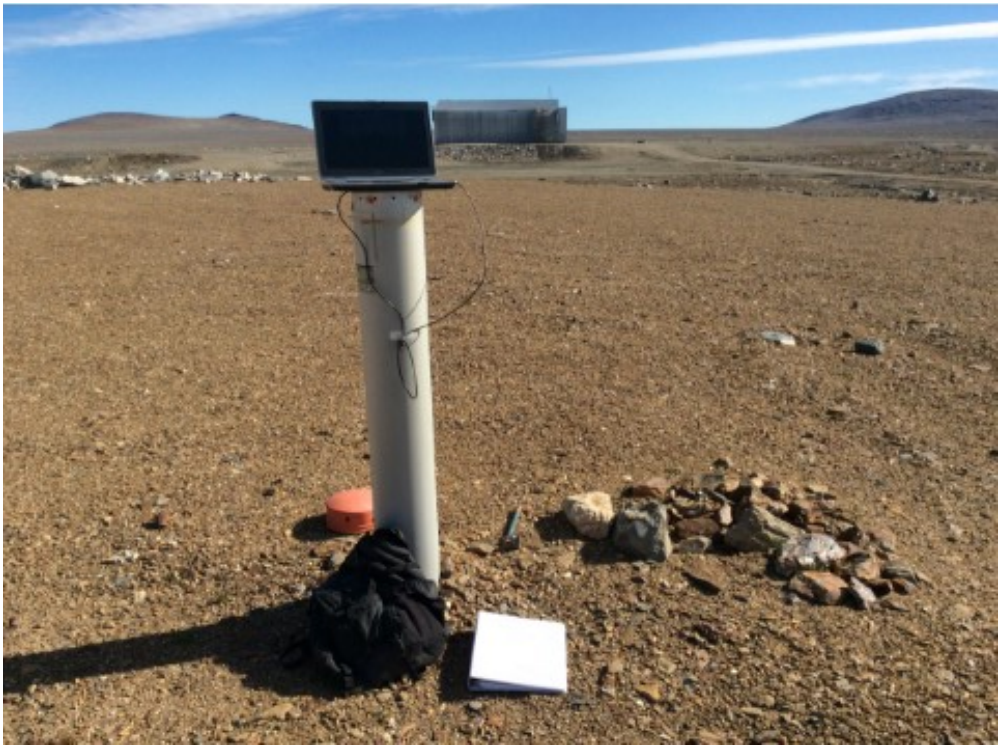


Photo 172: Lower Site Powerhouse Landfill – VT-6, facing south (DYEM_Photo770.jpg)



Photo 173: Lower Site Powerhouse Landfill – VT-7, facing southeast (DYEM_Photo773.jpg)



Photo 174: Lower Site Powerhouse Landfill – West slope northwest corner, Feature C – Self-armouring erosion at crest edge, facing northwest (Acceptable) (DYEM_Photo28.jpg)



Photo 175: Lower Site Powerhouse Landfill – Soil Sample MW05-05 – Before excavation (DYEM_Photo411.jpg)



Photo 176: Lower Site Powerhouse Landfill – Soil Sample MW05-05 – After excavation (DYEM_Photo412.jpg)



Photo 177: Lower Site Powerhouse Landfill – Soil Sample MW05-05 – After backfilling (DYEM_Photo413.jpg)



Photo 178: Lower Site Powerhouse Landfill – Water Sample MW05-05 (DYEM_Photo414.jpg)



Photo 179: Lower Site Powerhouse Landfill – Soil Sample MW05-06 – Before excavation (DYEM_Photo407.jpg)



Photo 180: Lower Site Powerhouse Landfill – Soil Sample MW05-06 – After excavation (DYEM_Photo409.jpg)



Photo 181: Lower Site Powerhouse Landfill – Soil Sample MW05-06 – After backfilling (DYEM_Photo410.jpg)



Photo 182: Lower Site Powerhouse Landfill – Water Sample MW05-06 (DYEM_Photo408.jpg)



Photo 183: Lower Site Powerhouse Landfill – Soil Sample MW05-07 – Before excavation (DYEM_Photo403.jpg)



Photo 184: Lower Site Powerhouse Landfill – Soil Sample MW05-07 – After excavation (DYEM_Photo405.jpg)



Photo 185: Lower Site Powerhouse Landfill – Soil Sample MW05-07 – After backfilling (DYEM_Photo406.jpg)



Photo 186: Lower Site Powerhouse Landfill – Water Sample MW05-07 (DYEM_Photo404.jpg)



Photo 187: Lower Site Powerhouse Landfill – Soil Sample MW05-08 – Before excavation (DYEM_Photo399.jpg)



Photo 188: Lower Site Powerhouse Landfill – Soil Sample MW05-08 – After excavation (DYEM_Photo401.jpg)



Photo 189: Lower Site Powerhouse Landfill – Soil Sample MW05-08 – After backfilling (DYEM_Photo402.jpg)



Photo 190: Lower Site Powerhouse Landfill – Water Sample MW05-08 (DYEM_Photo400.jpg)



Photo 191: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing south (DYEM_Photo468.jpg)



Photo 192: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing west (DYEM_Photo471.jpg)



Photo 193: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing north (DYEM_Photo474.jpg)



Photo 194: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing northeast (DYEM_Photo476.jpg)



Photo 195: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing northeast (DYEM_Photo477.jpg)



Photo 196: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing southeast (DYEM_Photo480.jpg)



Photo 197: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing northeast (DYEM_Photo481.jpg)



Photo 198: Lower Site Non-Hazardous Waste Landfill – Cover surface, facing southwest (DYEM_Photo482.jpg)



Photo 199: *Lower Site Non-Hazardous Waste Landfill – Cover surface, from centre of east cell, facing southeast (DYEM_Photo483.jpg)*



Photo 200: *Lower Site Non-Hazardous Waste Landfill – Cover surface, from east side of east cell, facing southwest (DYEM_Photo484.jpg)*



Photo 201: Lower Site Non-Hazardous Waste Landfill – East crest, facing southeast (DYEM_Photo469.jpg)

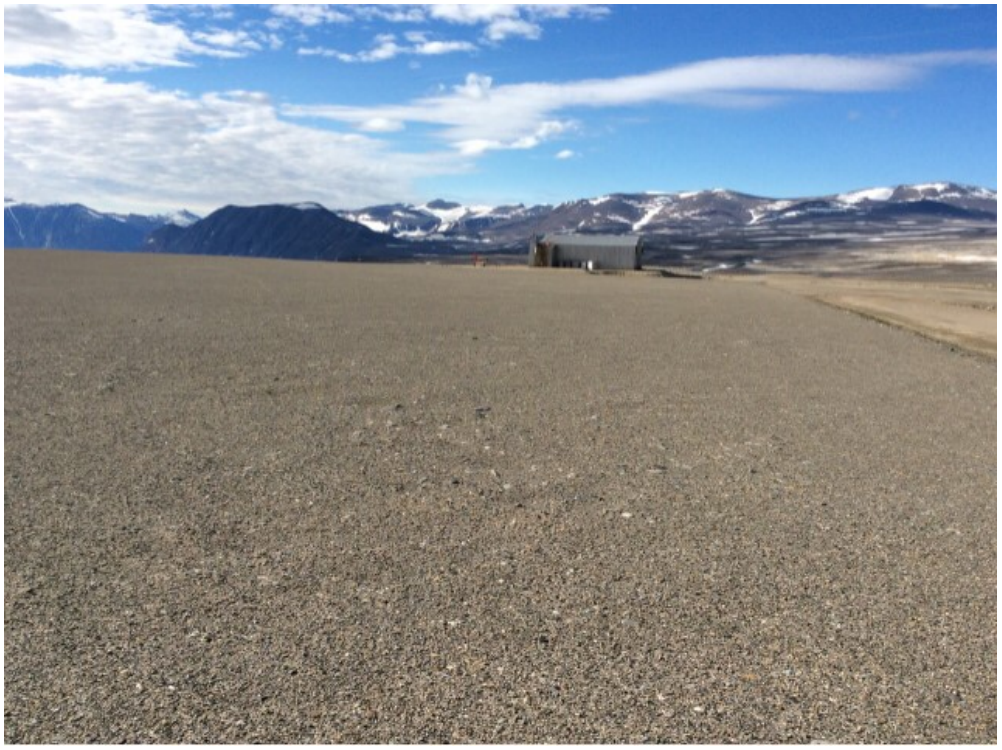


Photo 202: Lower Site Non-Hazardous Waste Landfill – East crest, facing northwest (DYEM_Photo472.jpg)

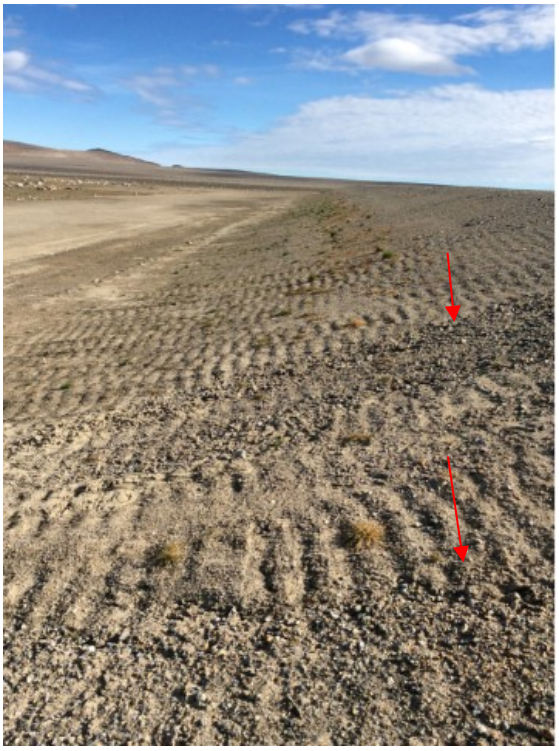


Photo 203: *Lower Site Non-Hazardous Waste Landfill – East slope, facing southeast (Feature S – self-armouring erosion - Acceptable) (DYEM_Photo470.jpg)*



Photo 204: *Lower Site Non-Hazardous Waste Landfill – North crest, facing northeast (DYEM_Photo478.jpg)*



Photo 205: *Lower Site Non-Hazardous Waste Landfill – North slope, from off landfill, facing southeast (DYEM_Photo465.jpg)*



Photo 206: *Lower Site Non-Hazardous Waste Landfill – North slope, facing southwest (DYEM_Photo466.jpg)*

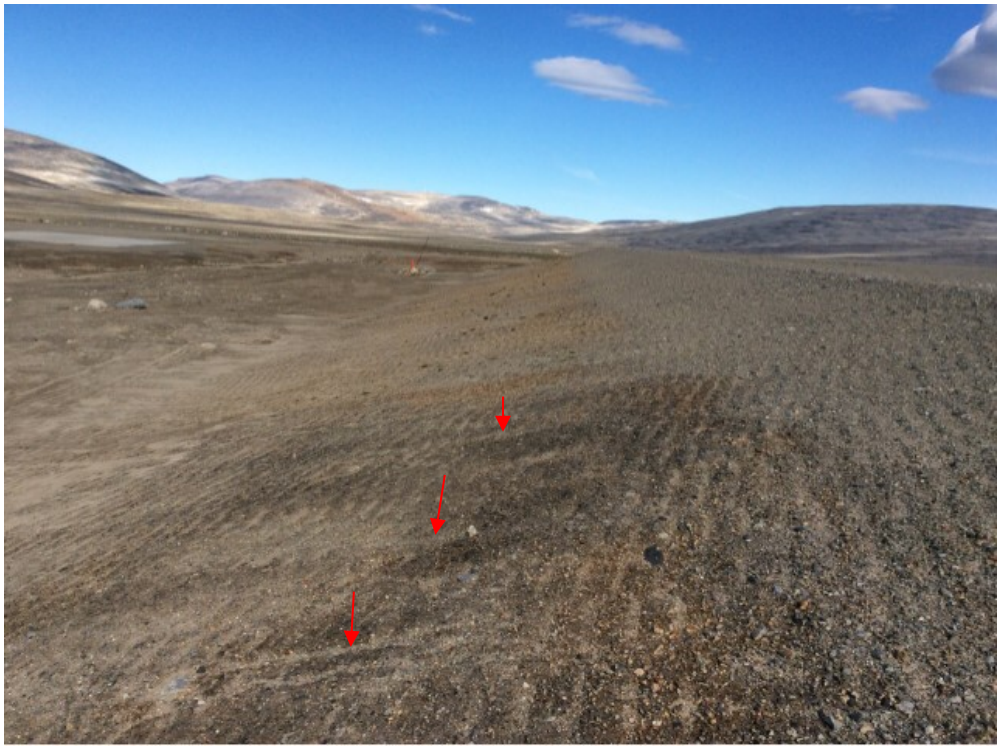


Photo 207: Lower Site Non-Hazardous Waste Landfill – North slope, from mid-point between cells, facing northeast – Self-armouring erosion (Feature O - Acceptable), previous cracking (Feature P - Acceptable) was weathered and infilled (DYEM_Photo467.jpg)



Photo 208: Lower Site Non-Hazardous Waste Landfill – North toe, facing southwest. MW-05-09 on right. (DYEM_Photo485.jpg)



Photo 209: Lower Site Non-Hazardous Waste Landfill – South slope and toe, facing southwest (DYEM_Photo473.jpg)



Photo 210: Lower Site Non-Hazardous Waste Landfill – West crest, facing northwest (DYEM_Photo475.jpg)



Photo 211: Lower Site Non-Hazardous Waste Landfill – West slope and toe, facing southeast. MW09-27 on right. (DYEM_Photo479.jpg)



Photo 212: Lower Site Non-Hazardous Waste Landfill – East slope, south end, Feature C – Tire tracks, facing west (Acceptable) (DYEM_Photo10.jpg)

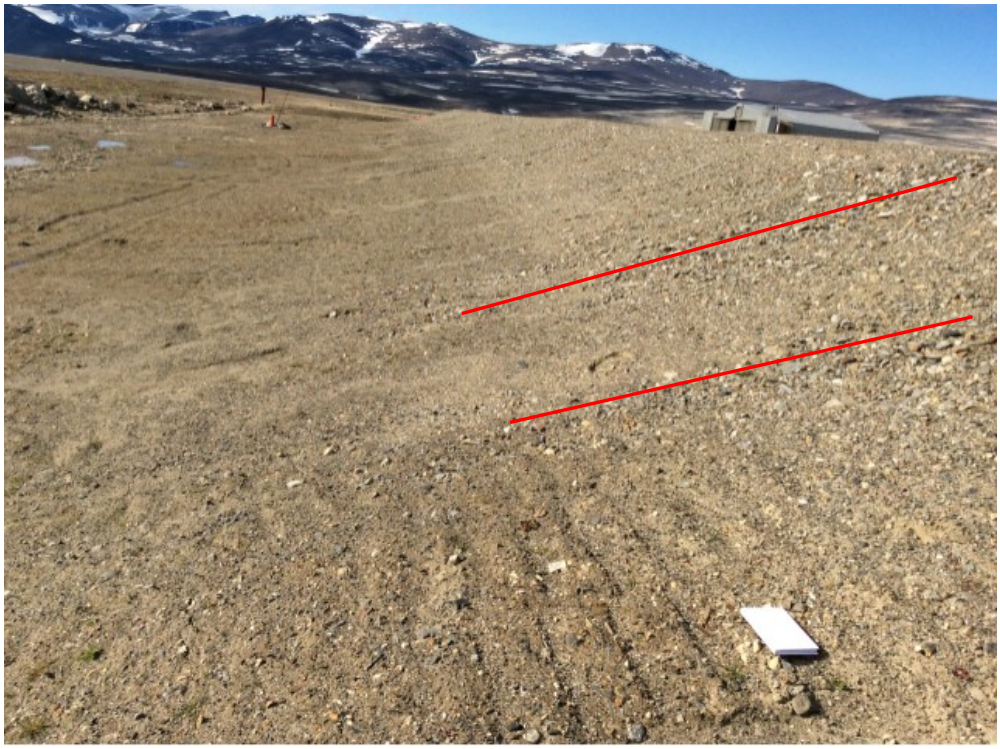


Photo 213: *Lower Site Non-Hazardous Waste Landfill – West slope, Feature D – Minor self-armouring erosion with fines washing down slope, facing northwest (Acceptable) (DYEM_Photo20.jpg)*



Photo 214: *Lower Site Non-Hazardous Waste Landfill – South toe, Feature F – Ponded water and wet area, facing south (Acceptable) (DYEM_Photo16.jpg)*



Photo 215: *Lower Site Non-Hazardous Waste Landfill – South slope, Feature G1 – Sparse grass, facing west (Acceptable) (DYEM_Photo11.jpg)*



Photo 216: *Lower Site Non-Hazardous Waste Landfill – East slope, Feature G2 – Sparse grass, facing northwest (Acceptable) (DYEM_Photo8.jpg)*

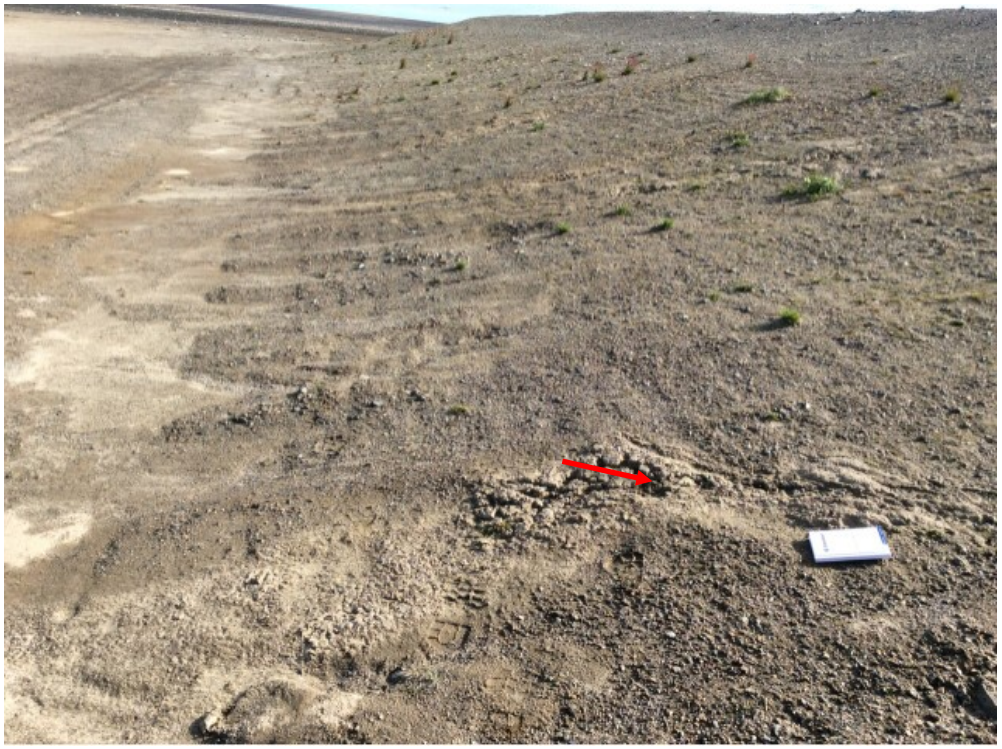


Photo 217: *Lower Site Non-Hazardous Waste Landfill – East slope, Feature H – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo9.jpg)*



Photo 218: *Lower Site Non-Hazardous Waste Landfill – North slope, Feature J – Previously noted tire tracks are from construction equipment (not reported in 2017), facing southeast (Acceptable) (DYEM_Photo27.jpg)*



Photo 219: *Lower Site Non-Hazardous Waste Landfill – West crest, Feature K – Minor crack, facing southeast (Acceptable) (DYEM_Photo21.jpg)*



Photo 220: *Lower Site Non-Hazardous Waste Landfill – North crest, Feature L1 – Minor thaw crack, facing southwest (Acceptable) (DYEM_Photo6.jpg)*



Photo 221: Lower Site Non-Hazardous Waste Landfill – North crest, Feature L2 – Minor thaw crack, facing southwest (Acceptable) (DYEM_Photo25.jpg)



Photo 222: Lower Site Non-Hazardous Waste Landfill – North slope, Feature M – Sparse vegetation, facing southwest (Acceptable) (DYEM_Photo23.jpg)



Photo 223: Lower Site Non-Hazardous Waste Landfill – North slope, Feature N – self-armouring erosion on slope, facing northwest (Acceptable) (DYEM_Photo24.jpg)



Photo 224: Lower Site Non-Hazardous Waste Landfill – North slope, Feature O – Minor self-armouring erosion with fines washing down slope, facing northwest (Acceptable) (DYEM_Photo1.jpg)



Photo 225: *Lower Site Non-Hazardous Waste Landfill – North slope, Feature P – New minor parallel tension cracking, facing northeast (Acceptable) (DYEM_Photo2.jpg)*



Photo 226: *Lower Site Non-Hazardous Waste Landfill – North slope, Feature Q – Minor self-armouring erosion with fines washing down slope, facing northwest (Acceptable) (DYEM_Photo3.jpg)*



Photo 227: Lower Site Non-Hazardous Waste Landfill – North slope, Feature R – Weathered crack, facing southwest (Acceptable) (DYEM_Photo5.jpg)



Photo 228: Lower Site Non-Hazardous Waste Landfill – East slope, Feature S – Minor self-armouring erosion with fines washing down slope, facing northeast (Acceptable) (DYEM_Photo7.jpg)

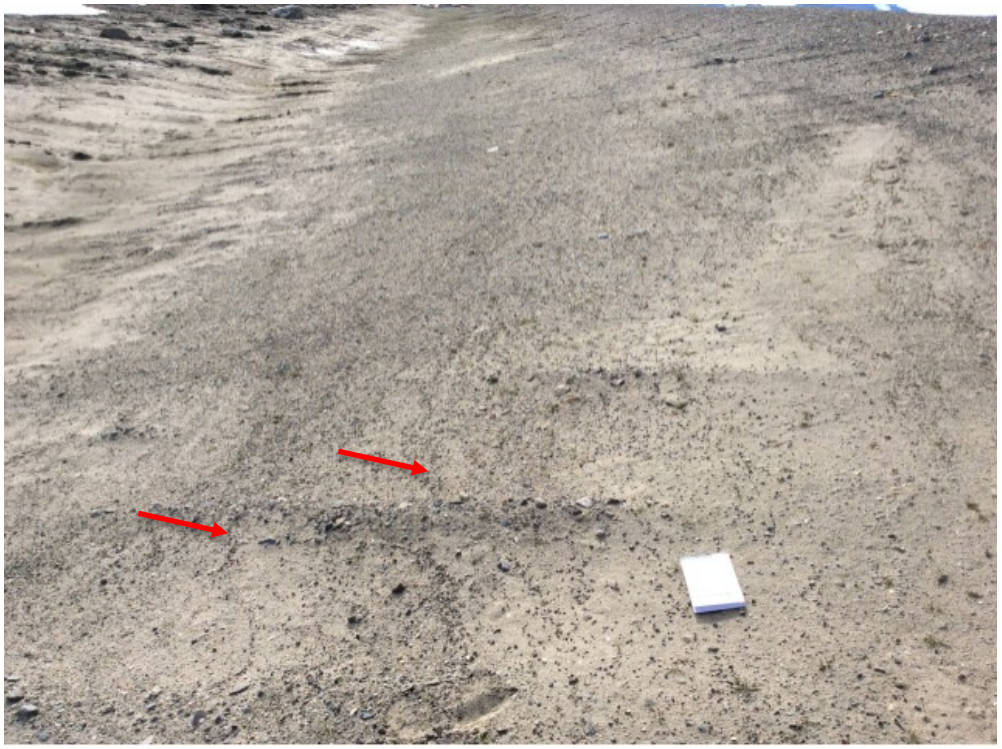


Photo 229: *Lower Site Non-Hazardous Waste Landfill – South slope, Feature T – Parallel tension cracks on slope, facing west (Acceptable) (DYEM_Photo14.jpg)*

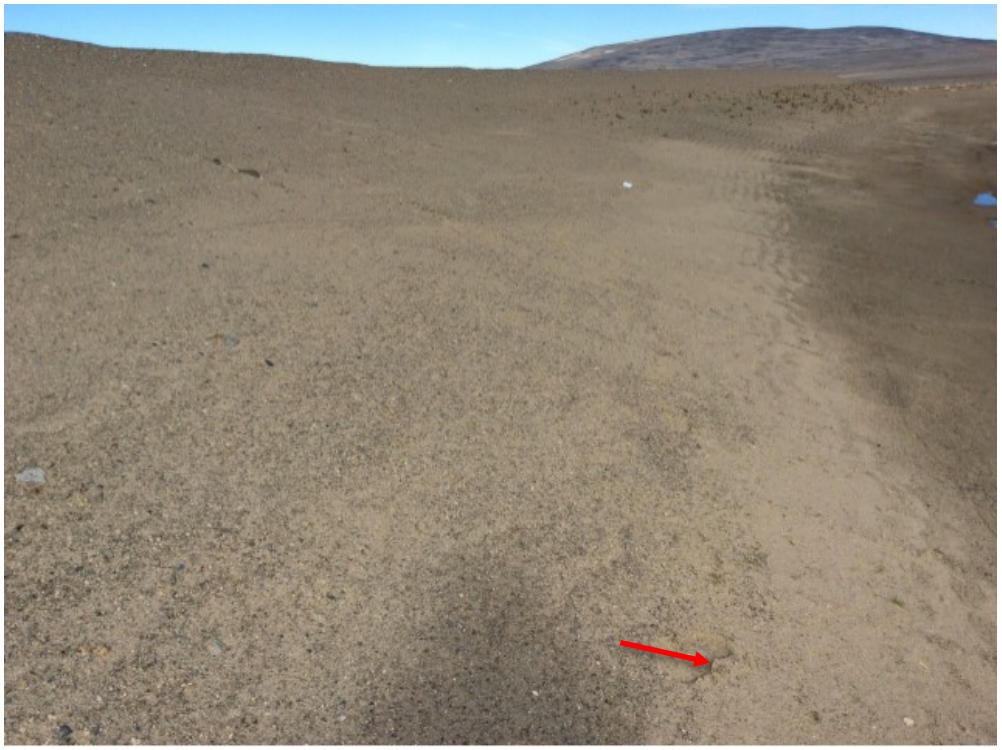


Photo 230: *Lower Site Non-Hazardous Waste Landfill – South slope, Feature U – Minor Tension cracking near toe of slope, facing northeast (Acceptable) (DYEM_Photo13.jpg)*

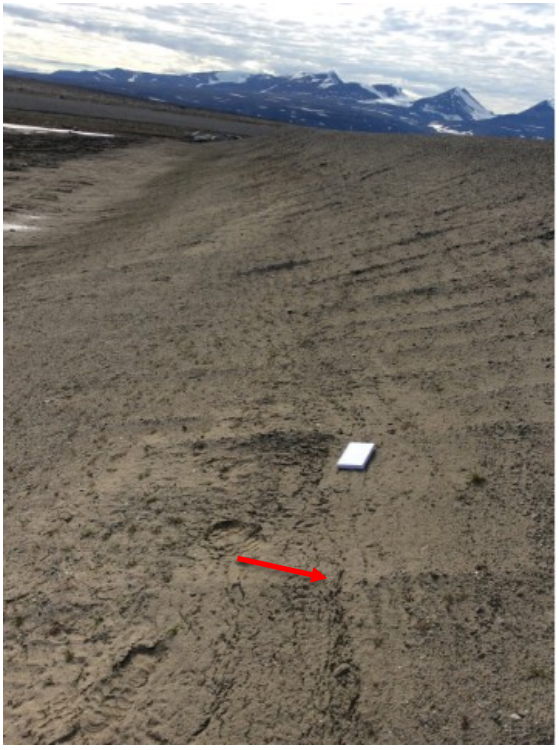


Photo 231: Lower Site Non-Hazardous Waste Landfill – South slope, Feature V – Tension cracking, facing southwest (Acceptable) (DYEM_Photo15.jpg)



Photo 232: Lower Site Non-Hazardous Waste Landfill – Feature V – West end of Feature V facing northeast (Acceptable) (DYEM_Photo17.jpg)

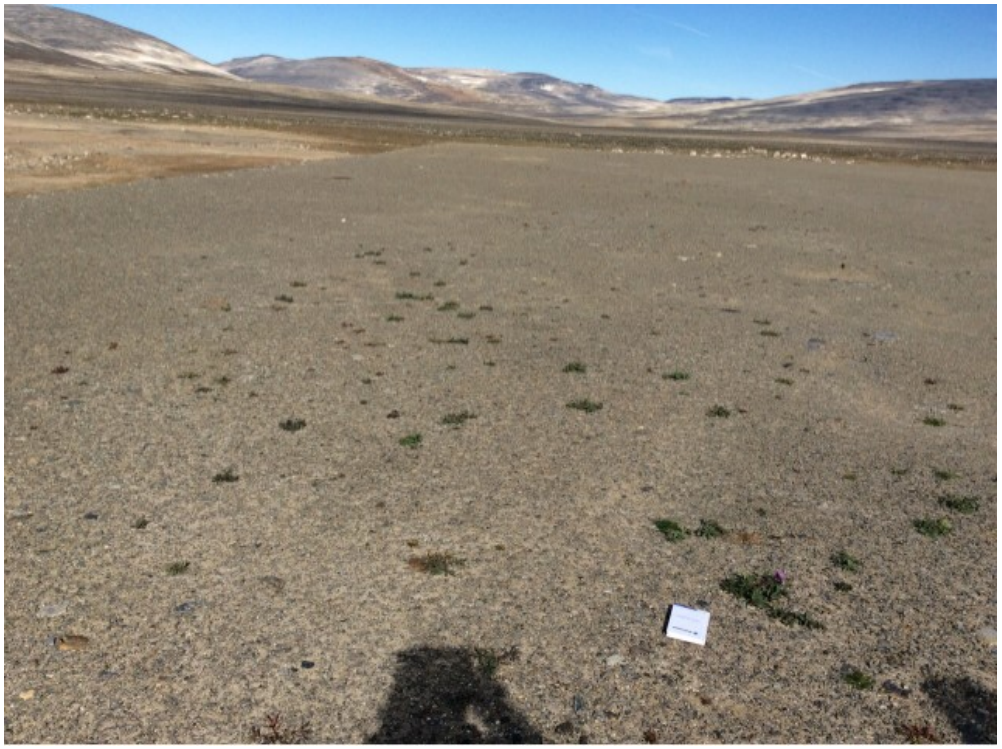


Photo 233: *Lower Site Non-Hazardous Waste Landfill – Cover surface, Feature W – Sparse vegetation, north side, facing northeast (Acceptable) (DYEM_Photo4.jpg)*



Photo 234: *Lower Site Non-Hazardous Waste Landfill – South slope, Feature X- Erosion channel, and Feature G1 vegetation, facing south (Acceptable) (DYEM_Photo12.jpg)*

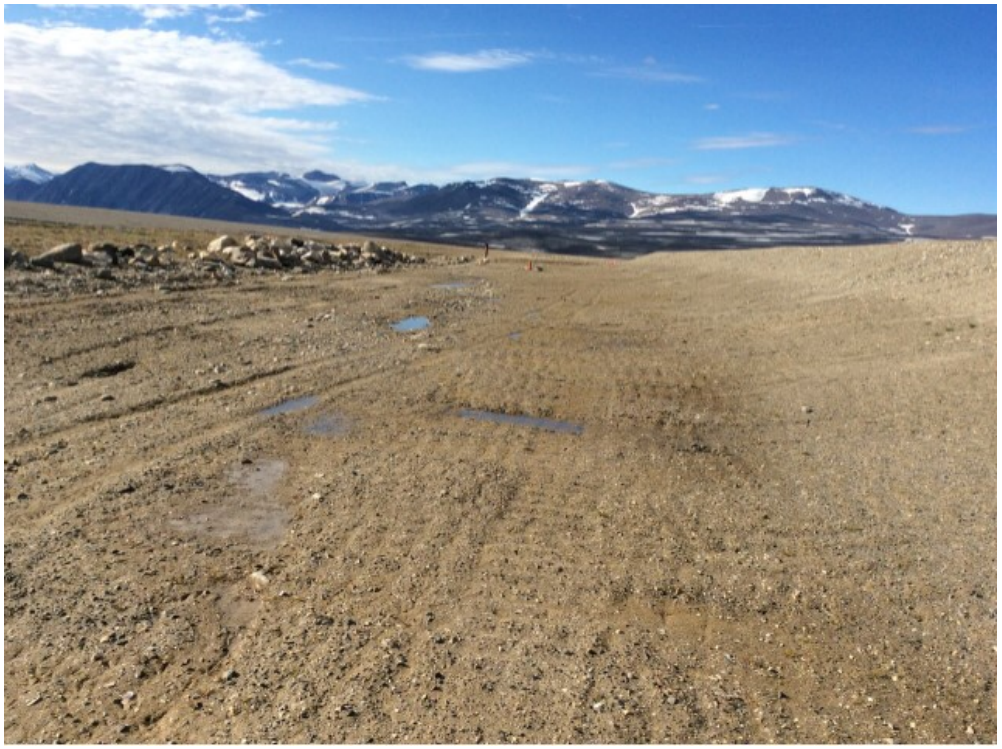


Photo 235: *Lower Site Non-Hazardous Waste Landfill – West toe, Feature E – Wet area and ponded water, facing northwest (Acceptable) (DYEM_Photo18.jpg)*



Photo 236: *Lower Site Non-Hazardous Waste Landfill – West slope, Feature Y – Minor cracking on the slope, facing northwest (Acceptable) (DYEM_Photo19.jpg)*



Photo 237: *Lower Site Non-Hazardous Waste Landfill – West slope, Feature Z – Minor cracking on the slope near toe, facing southeast (Acceptable) (DYEM_Photo22.jpg)*



Photo 238: *Lower Site Non-Hazardous Waste Landfill – North slope, Feature L3 – Minor crack on the north slope near toe, facing southwest (Acceptable) (DYEM_Photo26.jpg)*



Photo 239: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-12 – Before excavation (DYEM_Photo420.jpg)



Photo 240: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-12 – After excavation (DYEM_Photo421.jpg)



Photo 241: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-12 – After backfilling (DYEM_Photo422.jpg)



Photo 242: Lower Site Non-Hazardous Waste Landfill – Water Sample MW05-12 (DYEM_Photo419.jpg)



Photo 243: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-09 – Before excavation (DYEM_Photo423.jpg)



Photo 244: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-09 – After excavation (DYEM_Photo425.jpg)



Photo 245: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW05-09 – After backfilling (DYEM_Photo426.jpg)



Photo 246: Lower Site Non-Hazardous Waste Landfill – Water Sample MW05-09 (DYEM_Photo424.jpg)



Photo 247: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-27 – Before excavation (DYEM_Photo431.jpg)



Photo 248: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-27 – After excavation (DYEM_Photo432.jpg)



Photo 249: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-27 – After backfilling (DYEM_Photo434.jpg)



Photo 250: Lower Site Non-Hazardous Waste Landfill – Water Sample MW09-27 (DYEM_Photo433.jpg)



Photo 251: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-28 – Before excavation (DYEM_Photo428.jpg)



Photo 252: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-28 – After excavation (DYEM_Photo429.jpg)



Photo 253: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-28 – After backfilling (DYEM_Photo430.jpg)



Photo 254: Lower Site Non-Hazardous Waste Landfill – Water Sample MW09-28 (DYEM_Photo427.jpg)



Photo 255: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-26 – Before excavation (DYEM_Photo415.jpg)



Photo 256: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-26 – After excavation (DYEM_Photo416.jpg)



Photo 257: Lower Site Non-Hazardous Waste Landfill – Soil Sample MW09-26 – After backfilling (DYEM_Photo417.jpg)



Photo 258: Lower Site Non-Hazardous Waste Landfill – Water Sample MW09-26 (DYEM_Photo418.jpg)



Photo 259: *Upper Site Tier II Disposal Facility – Cover surface, facing northwest, VT-10 in top right (DYEM_Photo510.jpg)*



Photo 260: *Upper Site Tier II Disposal Facility – Cover surface, facing southwest, VT-10 on left (DYEM_Photo514.jpg)*



Photo 261: Upper Site Tier II Disposal Facility – Cover surface, facing southeast, VT-10 at top (DYEM_Photo518.jpg)



Photo 262: Upper Site Tier II Disposal Facility – Cover surface, facing northeast (DYEM_Photo523.jpg)



Photo 263: Upper Site Tier II Disposal Facility – Cover surface, from centre facing northwest (DYEM_Photo524.jpg)



Photo 264: Upper Site Tier II Disposal Facility – Northeast crest, facing northwest (DYEM_Photo511.jpg)



Photo 265: Upper Site Tier II Disposal Facility – Northeast slope, facing northwest (DYEM_Photo512.jpg)



Photo 266: Upper Site Tier II Disposal Facility – Northeast toe, facing northwest (DYEM_Photo513.jpg)



Photo 267: Upper Site Tier II Disposal Facility – Northwest crest, facing southwest (DYEM_Photo516.jpg)



Photo 268: Upper Site Tier II Disposal Facility – Northwest crest and slope, facing southwest (DYEM_Photo517.jpg)



Photo 269: *Upper Site Tier II Disposal Facility – Northwest slope, facing northeast – Snow covered toe (DYEM_Photo521.jpg)*

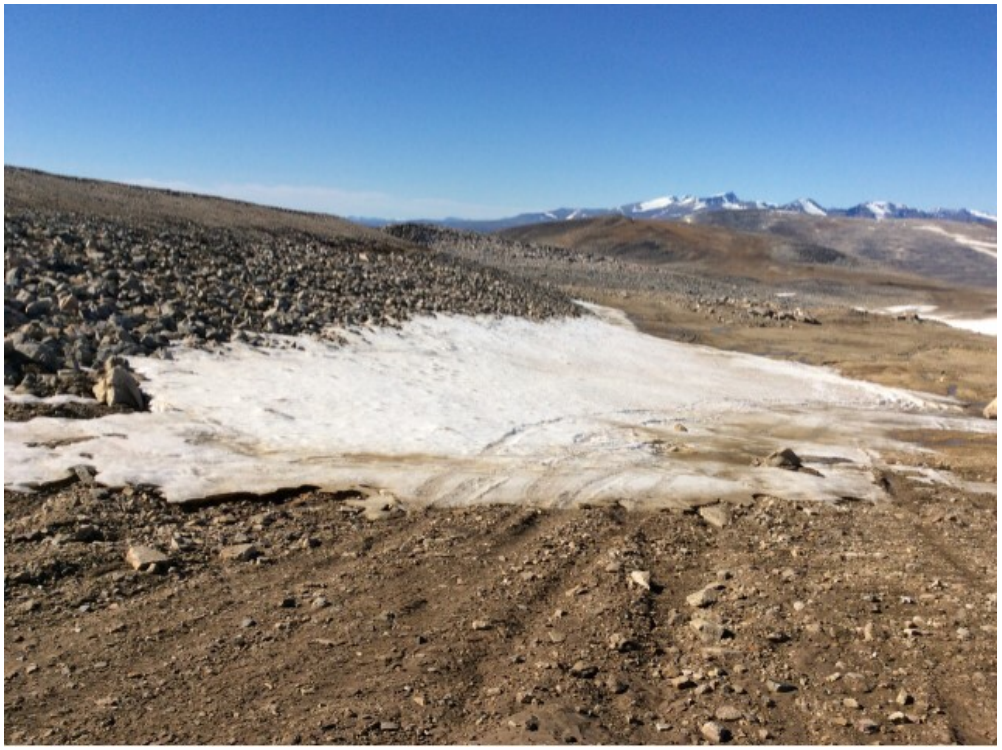


Photo 270: *Upper Site Tier II Disposal Facility – Northwest toe, facing southwest – Snow covered toe (DYEM_Photo525.jpg)*



Photo 271: Upper Site Tier II Disposal Facility – Southeast crest, facing northeast (DYEM_Photo509.jpg)



Photo 272: Upper Site Tier II Disposal Facility – Southeast slope, facing northeast (DYEM_Photo507.jpg)



Photo 273: Upper Site Tier II Disposal Facility – Southeast toe and slope, facing northeast (DYEM_Photo506.jpg)



Photo 274: Upper Site Tier II Disposal Facility – Southwest crest, facing southeast (DYEM_Photo519.jpg)



Photo 275: Upper Site Tier II Disposal Facility – Southwest slope, facing northwest (DYEM_Photo508.jpg)



Photo 276: Upper Site Tier II Disposal Facility – Southwest slope, facing southeast, VT-8 near top of slope (DYEM_Photo520.jpg)



Photo 277: Upper Site Tier II Disposal Facility – Southwest toe, facing southeast (DYEM_Photo522.jpg)



Photo 278: Upper Site Tier II Disposal Facility – VT-8, facing northwest (DYEM_Photo504.jpg)



Photo 279: *Upper Site Tier II Disposal Facility – VT-9 at south corner of landfill, facing northwest (DYEM_Photo503.jpg)*



Photo 280: *Upper Site Tier II Disposal Facility – VT-10 (near centre of landfill), facing northeast (DYEM_Photo502.jpg)*

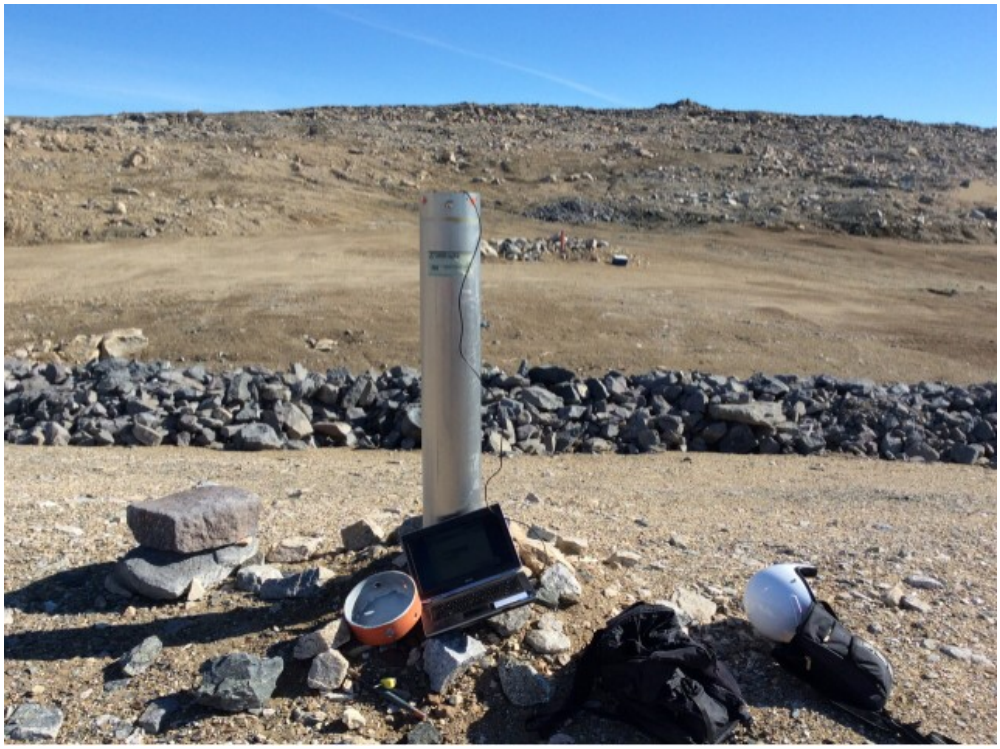


Photo 281: Upper Site Tier II Disposal Facility – VT-11, facing northeast (DYEM_Photo515.jpg)



Photo 282: Upper Site Tier II Disposal Facility – VT-BU (off landfill to south), facing north (DYEM_Photo505.jpg)



Photo 283: *Upper Site Tier II Disposal Facility – Northwest crest, Feature A – Tension crack, facing southwest (Acceptable) (DYEM_Photo45.jpg)*



Photo 284: *Upper Site Tier II Disposal Facility – Northwest slope, Feature B1 – Two self-armouring erosion channels, facing northwest (Acceptable) (DYEM_Photo46.jpg)*

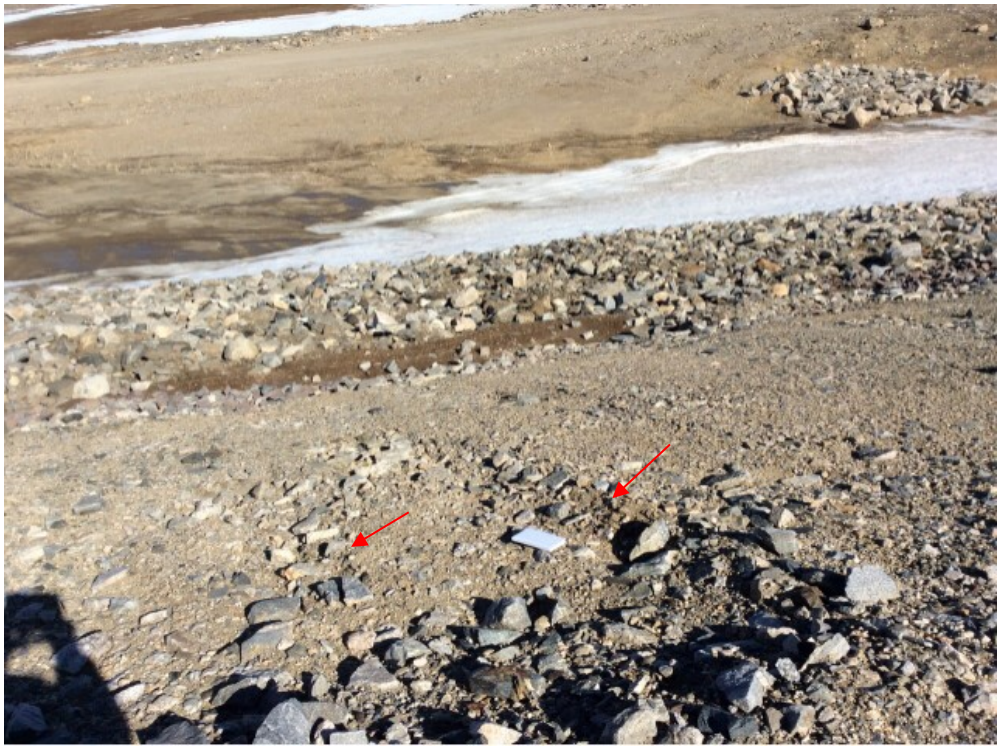


Photo 285: Upper Site Tier II Disposal Facility – Northwest slope, Feature B2 – Two self-armouring erosion channels, facing northwest (Acceptable) (DYEM_Photo47.jpg)



Photo 286: Upper Site Tier II Disposal Facility – West crest corner, Feature C – Rough area, facing west (Acceptable) (DYEM_Photo48.jpg)



Photo 287: Upper Site Tier II Disposal Facility – Southwest slope, Feature D – Sparse vegetation, facing northwest (Acceptable) (DYEM_Photo41.jpg)



Photo 288: Upper Site Tier II Disposal Facility – Southeast slope, Feature E – Self-armouring erosion and accumulation of fines, facing southeast (Acceptable) (DYEM_Photo42.jpg)



Photo 289: *Upper Site Tier II Disposal Facility – East crest corner, Feature F – Rough area, facing northwest (Acceptable) (DYEM_Photo43.jpg)*



Photo 290: *Upper Site Tier II Disposal Facility – Northeast crest, facing southeast (DYEM_Photo44.jpg)*



Photo 291: Upper Site Tier II Disposal Facility – Northeast toe near north end, Feature H – Running and ponded water along the toe, facing southeast (Acceptable) (DYEM_Photo49.jpg)



Photo 292: Upper Site Tier II Disposal Facility – Soil Sample MW07-22 – Before excavation (DYEM_Photo212.jpg)



Photo 293: Upper Site Tier II Disposal Facility – Soil Sample MW07-22 – After excavation (DYEM_Photo213.jpg)



Photo 294: Upper Site Tier II Disposal Facility – Soil Sample MW07-22 – After backfilling (DYEM_Photo214.jpg)



Photo 295: Upper Site Tier II Disposal Facility – Water Sample MW07-22 (DYEM_Photo215.jpg)



Photo 296: Upper Site Tier II Disposal Facility – Soil Sample MW07-23 – Before excavation (DYEM_Photo216.jpg)



Photo 297: Upper Site Tier II Disposal Facility – Soil Sample MW07-23 – After excavation (DYEM_Photo217.jpg)



Photo 298: Upper Site Tier II Disposal Facility – Soil Sample MW07-23 – After backfilling (DYEM_Photo218.jpg)



Photo 299: Upper Site Tier II Disposal Facility – Water Sample MW07-23 (DYEM_Photo219.jpg)



Photo 300: Upper Site Tier II Disposal Facility – Soil Sample MW08-24 – Before excavation (DYEM_Photo221.jpg)



Photo 301: Upper Site Tier II Disposal Facility – Soil Sample MW08-24 – After excavation (DYEM_Photo222.jpg)



Photo 302: Upper Site Tier II Disposal Facility – Soil Sample MW08-24 – After backfilling (DYEM_Photo223.jpg)



Photo 303: Upper Site Tier II Disposal Facility – Water Sample MW08-24 (DYEM_Photo220.jpg)



Photo 304: Upper Site Tier II Disposal Facility – Soil Sample MW08-25 – Before excavation (DYEM_Photo225.jpg)



Photo 305: Upper Site Tier II Disposal Facility – Soil Sample MW08-25 – After excavation (DYEM_Photo226.jpg)



Photo 306: Upper Site Tier II Disposal Facility – Soil Sample MW08-25 – After backfilling (DYEM_Photo227.jpg)



Photo 307: Upper Site Tier II Disposal Facility – Water Sample MW08-25 (DYEM_Photo224.jpg)



Photo 308: Upper Site Tier II Disposal Facility – Soil Sample MW12-02 – Before excavation (DYEM_Photo229.jpg)



Photo 309: Upper Site Tier II Disposal Facility – Soil Sample MW12-02 – After excavation (DYEM_Photo230.jpg)



Photo 310: Upper Site Tier II Disposal Facility – Soil Sample MW12-02 – After backfilling (DYEM_Photo231.jpg)



Photo 311: Upper Site Tier II Disposal Facility – Water Sample MW12-02 (DYEM_Photo228.jpg)



Photo 312: Upper Site West Landfill (West Lobe) – Cover surface, facing north (DYEM_Photo527.jpg)



Photo 313: Upper Site West Landfill (West Lobe) – Cover surface, facing south (DYEM_Photo528.jpg)



Photo 314: Upper Site West Landfill (West Lobe) – Cover surface, facing southwest (DYEM_Photo531.jpg)

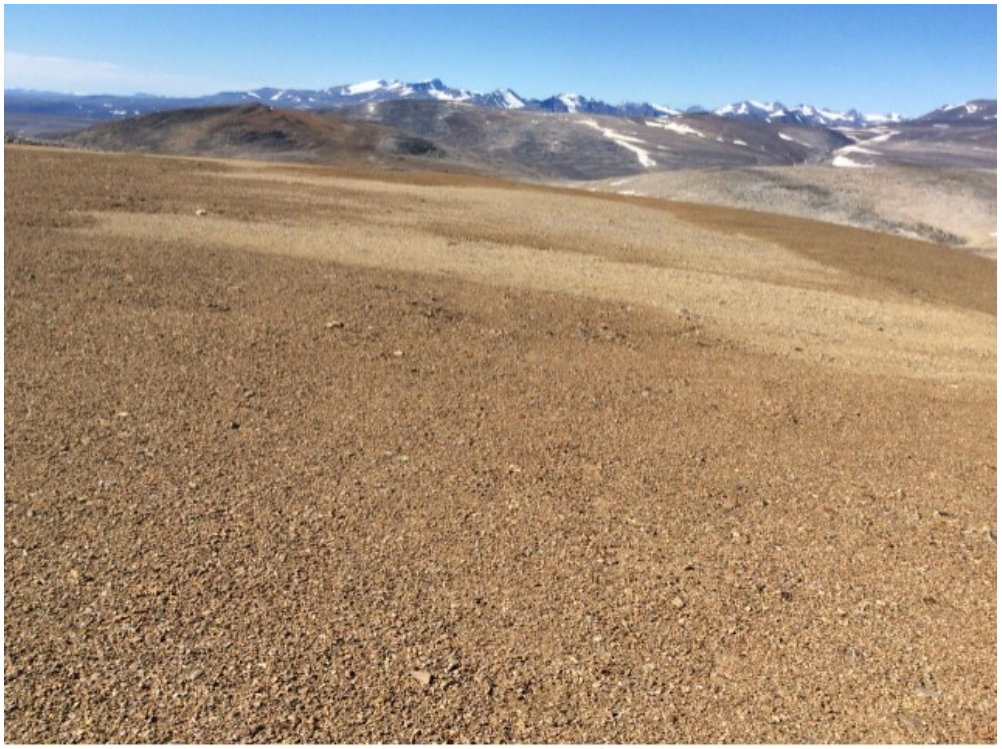


Photo 315: Upper Site West Landfill (West Lobe) – Cover surface, facing southwest (DYEM_Photo537.jpg)



Photo 316: Upper Site West Landfill (West Lobe) – Cover surface, facing southwest (DYEM_Photo538.jpg)



Photo 317: Upper Site West Landfill (West Lobe) – Cover surface, facing east (DYEM_Photo539.jpg)



Photo 318: Upper Site West Landfill (West Lobe) – Cover surface, facing north (DYEM_Photo543.jpg)



Photo 319: Upper Site West Landfill (West Lobe) – Internal west crest, facing south (DYEM_Photo540.jpg)



Photo 320: Upper Site West Landfill (West Lobe) – East toe, facing north (DYEM_Photo545.jpg)



Photo 321: Upper Site West Landfill (West Lobe) – North crest near west end, facing southwest DYEM_Photo529.jpg)



Photo 322: Upper Site West Landfill (West Lobe) – North crest, near centre, facing northeast (DYEM_Photo532.jpg)



Photo 323: Upper Site West Landfill (West Lobe) – North crest, facing southwest (DYEM_Photo534.jpg)



Photo 324: Upper Site West Landfill (West Lobe) – North crest, near east end, facing southwest (DYEM_Photo535.jpg)



Photo 325: Upper Site West Landfill (West Lobe) – North slope, facing south (DYEM_Photo536.jpg)



Photo 326: Upper Site West Landfill (West Lobe) – Internal west slope and toe, facing south (DYEM_Photo541.jpg)



Photo 327: Upper Site West Landfill (West Lobe) – South and west slopes, facing northwest (DYEM_Photo548.jpg)



Photo 328: Upper Site West Landfill (West Lobe) – South crest, facing southwest (DYEM_Photo530.jpg)



Photo 329: Upper Site West Landfill (West Lobe) – South crest, facing southwest (DYEM_Photo533.jpg)



Photo 330: Upper Site West Landfill (West Lobe) – South slope, facing northeast (DYEM_Photo526.jpg)



Photo 331: Upper Site West Landfill (West Lobe) – South slope, facing southwest (DYEM_Photo542.jpg)



Photo 332: Upper Site West Landfill (West Lobe) – South toe, facing east (DYEM_Photo547.jpg)



Photo 333: Upper Site West Landfill (West Lobe) – Internal east toe, facing north (DYEM_Photo546.jpg)



Photo 334: Upper Site West Landfill (West Lobe) – East crest, facing north (DYEM_Photo544.jpg)

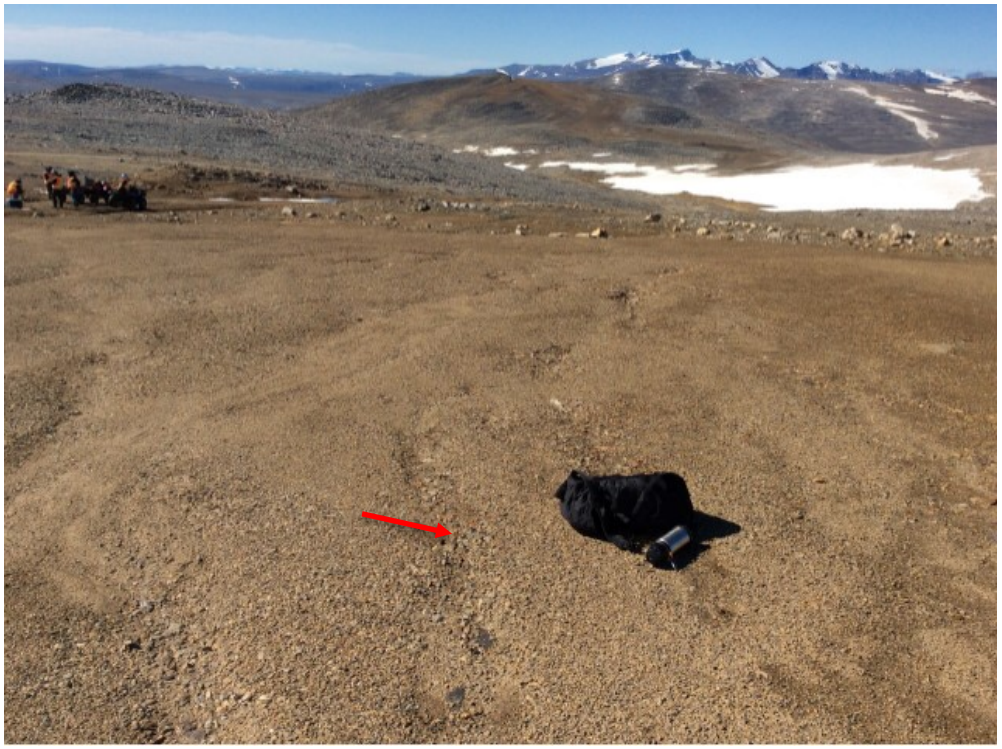


Photo 335: Upper Site West Landfill (West Lobe) – Cover surface west end, Feature A – Area of minor self-armouring erosion, facing southwest (Acceptable) (DYEM_Photo50.jpg)



Photo 336: Upper Site West Landfill (West Lobe) – Southwest, Feature C – Previously observed running water and erosion along toe beyond riprap, facing southwest (Acceptable) (DYEM_Photo58.jpg)



Photo 337: *Upper Site West Landfill (West Lobe) – Cover surface near southwest slope, Feature D – Self-armouring erosion, facing southwest (Acceptable) (DYEM_Photo57.jpg)*



Photo 338: *Upper Site West Landfill (West Lobe) – Southwest slope, Feature E – Small erosion channel, facing southwest (Acceptable) (DYEM_Photo56.jpg)*



Photo 339: *Upper Site West Landfill (West Lobe) – North toe, Feature F – self-armouring erosion at toe, facing west (Acceptable) (DYEM_Photo52.jpg)*

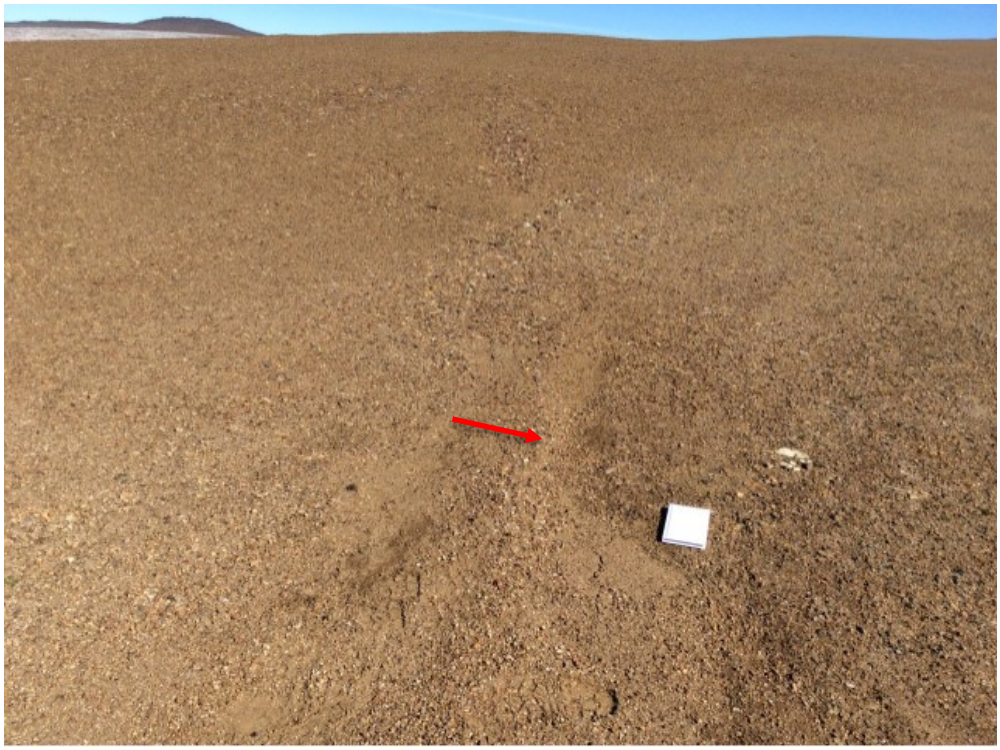


Photo 340: *Upper Site West Landfill (West Lobe) – Cover surface, Feature G – minor self-armouring erosion (Acceptable) facing northeast (DYEM_Photo51.jpg)*



Photo 341: *Upper Site West Landfill (West Lobe) – Southwest slope, Feature H – Self-armouring erosion, facing southwest (Acceptable) (DYEM_Photo60.jpg)*



Photo 342: *Upper Site West Landfill (West Lobe) – Cover surface, Feature I – Cracking on surface of landfill, facing south (Acceptable) (DYEM_Photo59.jpg)*



Photo 343: *Upper Site West Landfill (West Lobe) – South slope, Feature J – A previously observed minor tension crack on the south slope was not observed in 2017, facing west (DYEM_Photo55.jpg)*



Photo 344: *Upper Site West Landfill (West Lobe) – Crest of south slope, Feature K – Weathered tension cracking, facing west (Acceptable) (DYEM_Photo54.jpg)*

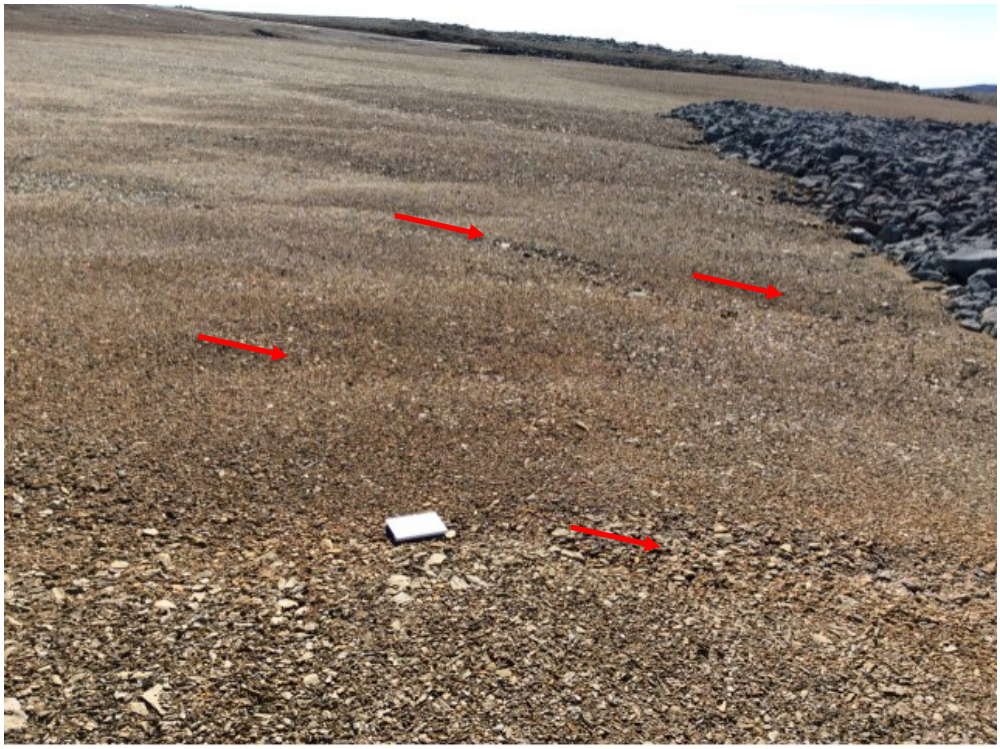


Photo 345: *Upper Site West Landfill (West Lobe) – Cover surface, Feature L – Area of self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo53.jpg)*



Photo 346: *Upper Site West Landfill (West Lobe) – Soil Sample DM-31 – Before excavation (DYEM_Photo235.jpg)*



Photo 347: Upper Site West Landfill (West Lobe) – Soil Sample DM-31 – After excavation (DYEM_Photo236.jpg)



Photo 348: Upper Site West Landfill (West Lobe) – Soil Sample DM-31 – After backfilling (DYEM_Photo237.jpg)



Photo 349: Upper Site West Landfill (West Lobe) – Soil Sample DM-32 – Before excavation (DYEM_Photo232.jpg)



Photo 350: Upper Site West Landfill (West Lobe) – Soil Sample DM-32 – After excavation (DYEM_Photo233.jpg)



Photo 351: Upper Site West Landfill (West Lobe) – Soil Sample DM-32 – After backfilling (DYEM_Photo234.jpg)



Photo 352: Upper Site West Landfill (West Lobe) – Soil Sample DM-33 – Before excavation (DYEM_Photo244.jpg)



Photo 353: Upper Site West Landfill (West Lobe) – Soil Sample DM-33 – After excavation (DYEM_Photo246.jpg)



Photo 354: Upper Site West Landfill (West Lobe) – Soil Sample DM-33 – After backfilling (DYEM_Photo247.jpg)



Photo 355: Upper Site West Landfill (West Lobe) – Soil Sample DM-34 – Before excavation (DYEM_Photo245.jpg)



Photo 356: Upper Site West Landfill (West Lobe) – Soil Sample DM-34 – After excavation (DYEM_Photo248.jpg)



Photo 357: Upper Site West Landfill (West Lobe) – Soil Sample DM-34 – After backfilling (DYEM_Photo249.jpg)



Photo 358: Upper Site West Landfill (West Lobe) – Soil Sample DM-35 – Before excavation (DYEM_Photo287.jpg)



Photo 359: Upper Site West Landfill (West Lobe) – Soil Sample DM-35 – After excavation (DYEM_Photo290.jpg)



Photo 360: Upper Site West Landfill (West Lobe) – Soil Sample DM-35 – After backfilling (DYEM_Photo291.jpg)



Photo 361: Upper Site West Landfill (West Lobe) – Soil Sample DM-36 – Before excavation (DYEM_Photo241.jpg)



Photo 362: Upper Site West Landfill (West Lobe) – Soil Sample DM-36 – After excavation (DYEM_Photo242.jpg)



Photo 363: Upper Site West Landfill (West Lobe) – Soil Sample DM-36 – After backfilling (DYEM_Photo243.jpg)



Photo 364: Upper Site West Landfill (West Lobe) – Soil Sample DM-37 – Before excavation (DYEM_Photo238.jpg)



Photo 365: Upper Site West Landfill (West Lobe) – Soil Sample DM-37 – After excavation (DYEM_Photo239.jpg)



Photo 366: Upper Site West Landfill (West Lobe) – Soil Sample DM-37 – After backfilling (DYEM_Photo240.jpg)



Photo 367: Upper Site West Landfill (West Lobe) – Soil Sample DM-38 – Before excavation (DYEM_Photo250.jpg)



Photo 368: Upper Site West Landfill (West Lobe) – Soil Sample DM-38 – After excavation (DYEM_Photo252.jpg)



Photo 369: Upper Site West Landfill (West Lobe) – Soil Sample DM-38 – After backfilling (DYEM_Photo253.jpg)



Photo 370: Upper Site West Landfill (West Lobe) – Soil Sample DM-39 – Before excavation (DYEM_Photo251.jpg)



Photo 371: Upper Site West Landfill (West Lobe) – Soil Sample DM-39 – After excavation (DYEM_Photo254.jpg)



Photo 372: Upper Site West Landfill (West Lobe) – Soil Sample DM-39 – After backfilling (DYEM_Photo255.jpg)



Photo 373: Upper Site West Landfill (Centre and East Lobes) – Cover surface, facing east (DYEM_Photo551.jpg)



Photo 374: Upper Site West Landfill (Centre Lobe) – Cover surface, facing south (DYEM_Photo554.jpg)



Photo 375: Upper Site West Landfill (Centre Lobe) – Cover surface west side, area of self-armouring erosion (Feature J), facing west (DYEM_Photo555.jpg)



Photo 376: Upper Site West Landfill (Centre Lobe) – Cover surface, facing northeast (DYEM_Photo556.jpg)



Photo 377: Upper Site West Landfill (Centre Lobe) – Cover surface, facing east (DYEM_Photo557.jpg)



Photo 378: Upper Site West Landfill (Centre Lobe) – Cover surface, facing south (DYEM_Photo558.jpg)

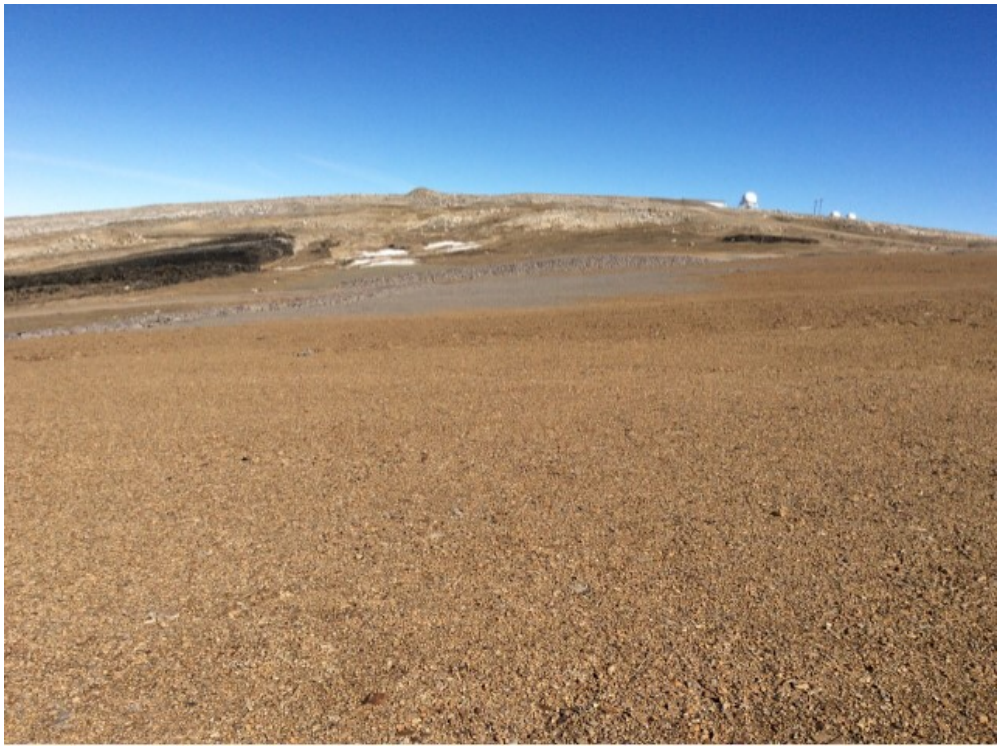


Photo 379: Upper Site West Landfill (Centre Lobe) – Cover surface, facing east (DYEM_Photo559.jpg)



Photo 380: Upper Site West Landfill (Centre Lobe) – Cover surface, facing south (DYEM_Photo561.jpg)



Photo 381: Upper Site West Landfill (Centre Lobe) – Cover surface from east side, facing west (DYEM_Photo565.jpg)



Photo 382: Upper Site West Landfill (Centre Lobe) – Cover surface near south crest, facing east (DYEM_Photo573.jpg)



Photo 383: Upper Site West Landfill (Centre Lobe) – Cover surface, facing northwest (DYEM_Photo575.jpg)

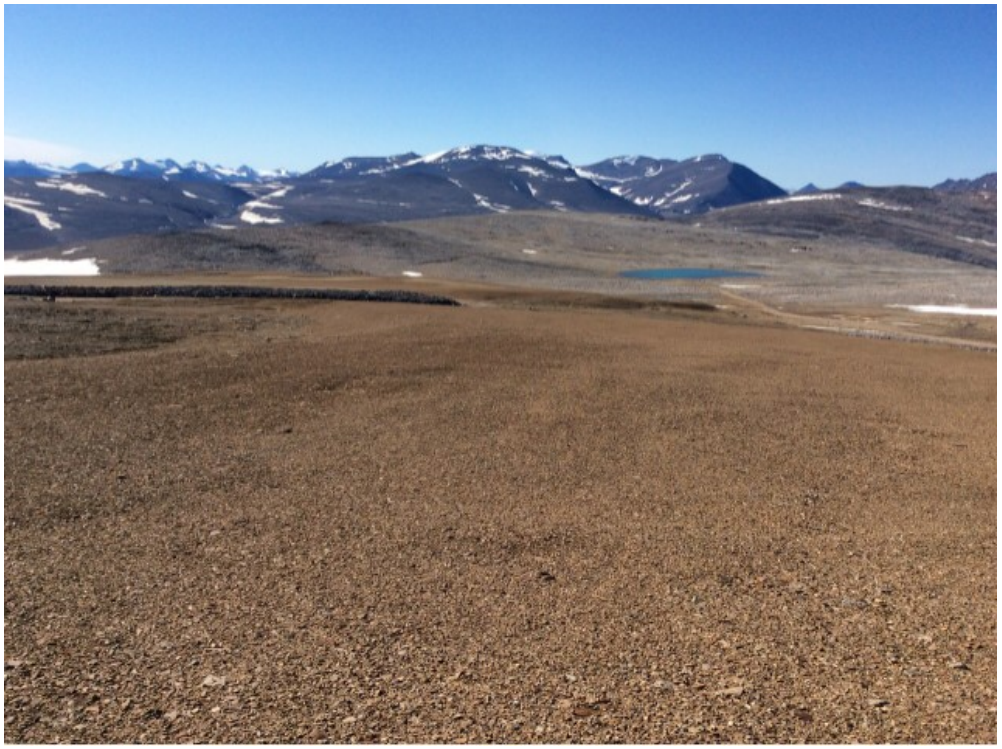


Photo 384: Upper Site West Landfill (Centre Lobe) – Cover surface, facing northwest (DYEM_Photo578.jpg)



Photo 385: Upper Site West Landfill (East Lobe) – Cover surface, facing northwest (DYEM_Photo611.jpg)

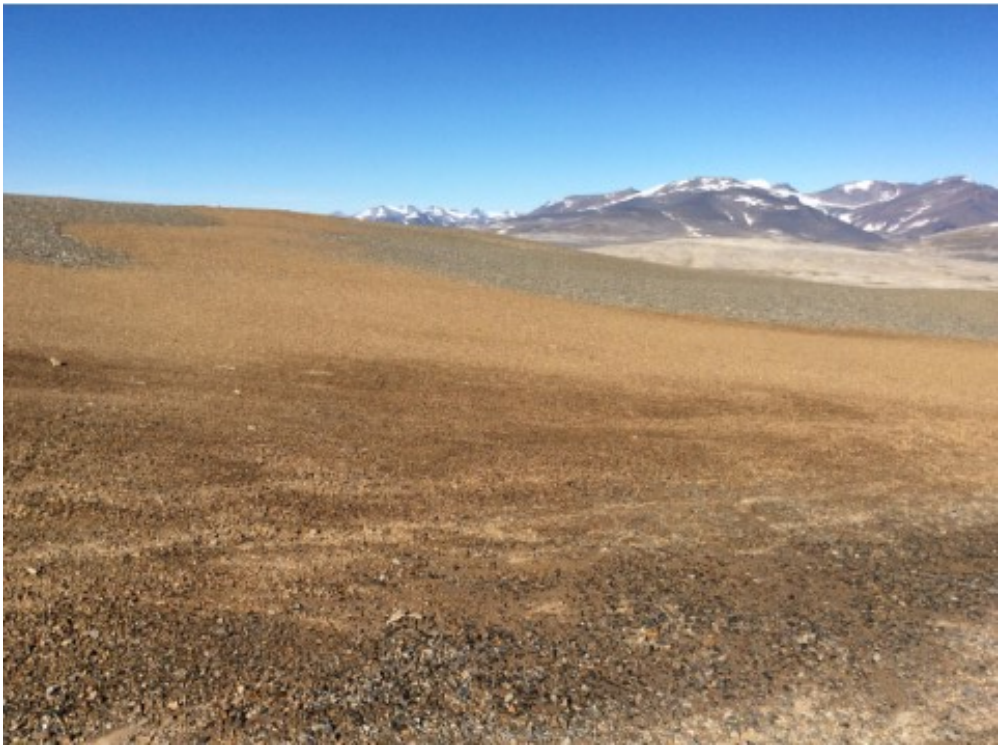


Photo 386: Upper Site West Landfill (East Lobe) – Cover surface, facing west (DYEM_Photo612.jpg)



Photo 387: Upper Site West Landfill (East Lobe) – Cover surface, facing north (DYEM_Photo617.jpg)



Photo 388: Upper Site West Landfill (East Lobe) – Cover surface, facing north (DYEM_Photo618.jpg)



Photo 389: Upper Site West Landfill (Centre Lobe) – East crest, facing north (DYEM_Photo564.jpg)



Photo 390: Upper Site West Landfill (Centre Lobe) – East slope, facing southeast (DYEM_Photo567.jpg)



Photo 391: Upper Site West Landfill (East Lobe) – East slope, facing north (DYEM_Photo610.jpg)



Photo 392: Upper Site West Landfill (Centre Lobe) – East slope and toe, facing southeast (DYEM_Photo563.jpg)



Photo 393: Upper Site West Landfill (Centre Lobe) – North slope, facing east (DYEM_Photo553.jpg)



Photo 394: Upper Site West Landfill (Centre Lobe) – North slope, facing west (DYEM_Photo560.jpg)

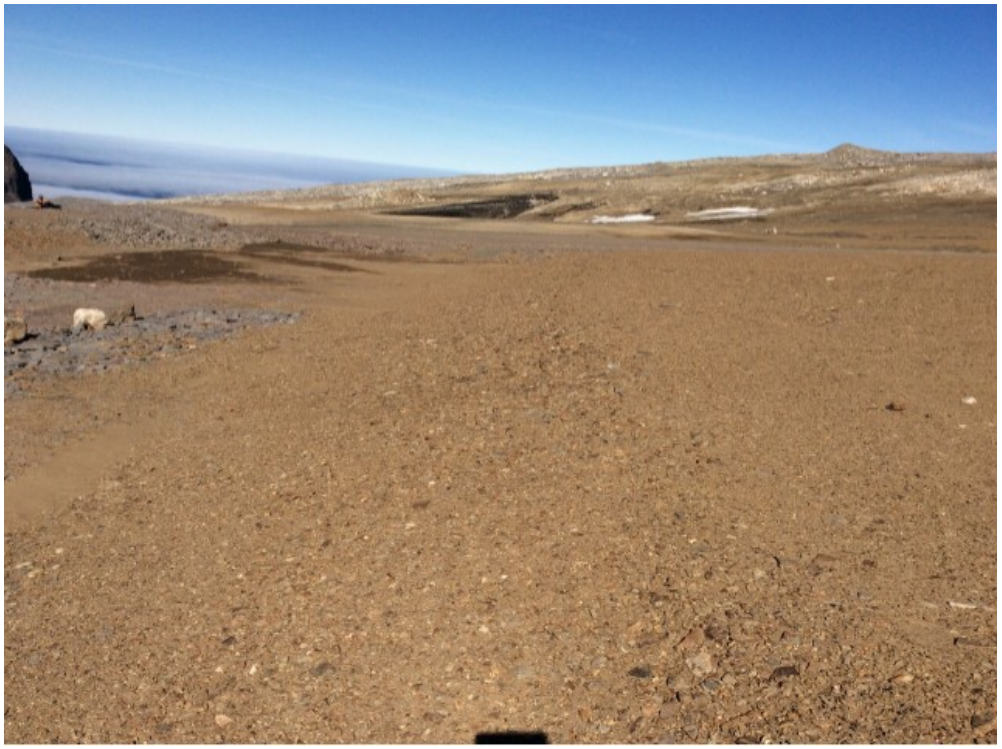


Photo 395: Upper Site West Landfill (Centre Lobe) – North slope, facing northeast (DYEM_Photo568.jpg)

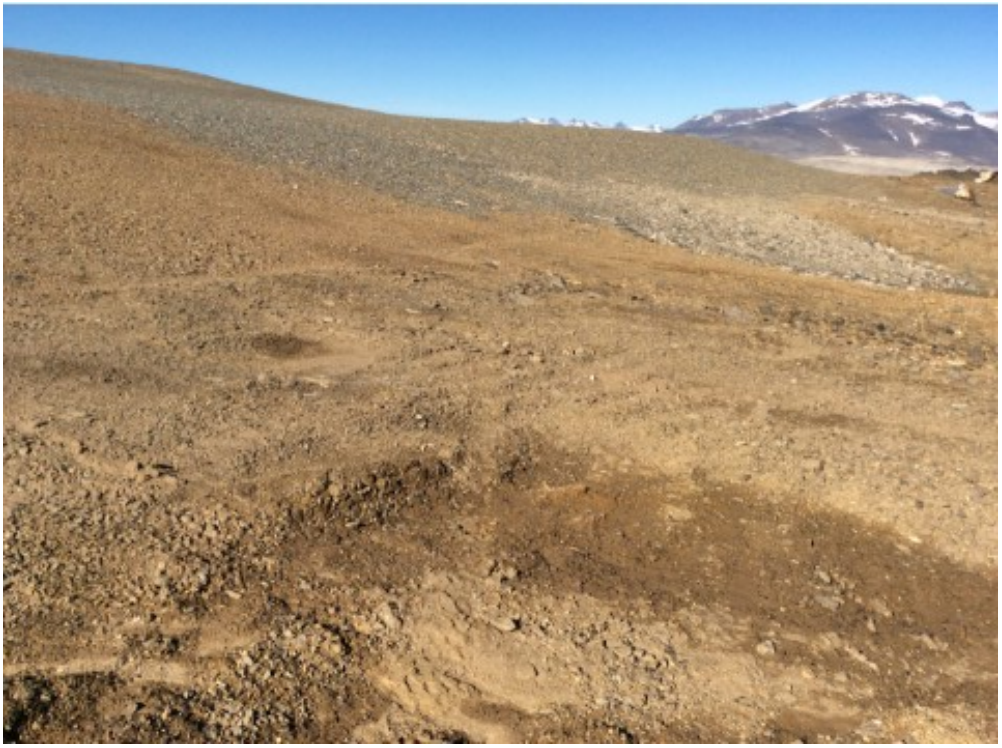


Photo 396: Upper Site West Landfill (East Lobe) – North slope, facing northwest (DYEM_Photo613.jpg)



Photo 397: Upper Site West Landfill (East Lobe) – North slope, facing west (DYEM_Photo614.jpg)



Photo 398: Upper Site West Landfill (Centre Lobe) – North toe, facing west (DYEM_Photo562.jpg)



Photo 399: *Upper Site West Landfill (Centre Lobe) – South crest, facing east – Feature L – Rough surface (Acceptable) (DYEM_Photo570.jpg)*



Photo 400: *Upper Site West Landfill (Centret Lobe) – South crest, facing west (DYEM_Photo576.jpg)*



Photo 401: Upper Site West Landfill (East Lobe) – South crest, facing southeast (DYEM_Photo616.jpg)



Photo 402: Upper Site West Landfill (Centre Lobe) – South slope from west end, facing east (DYEM_Photo550.jpg)



Photo 403: Upper Site West Landfill (Centre Lobe) – South slope from east end, facing west (DYEM_Photo566.jpg)



Photo 404: Upper Site West Landfill (Centre Lobe) – South slope, facing southwest (DYEM_Photo574.jpg)



Photo 405: Upper Site West Landfill (Centre Lobe) – South slope, facing northwest (DYEM_Photo577.jpg)

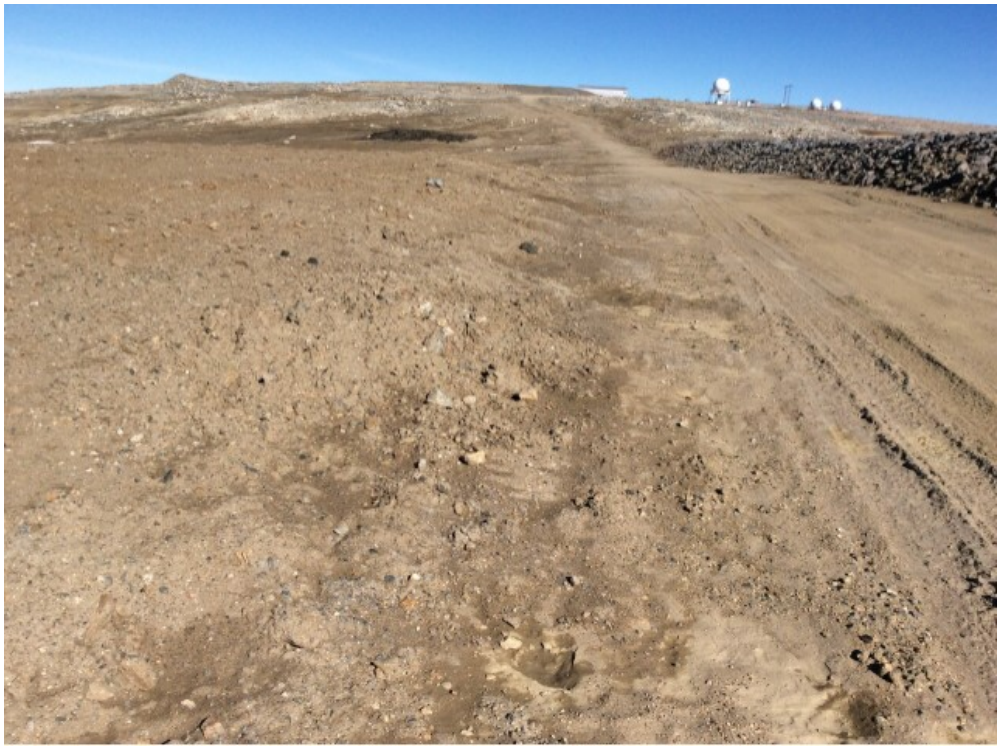


Photo 406: Upper Site West Landfill (Centre Lobe) – South toe, facing east (DYEM_Photo571.jpg)



Photo 407: Upper Site West Landfill (Centre Lobe) – West crest, area of self-armouring erosion (Feature K), facing south (DYEM_Photo552.jpg)

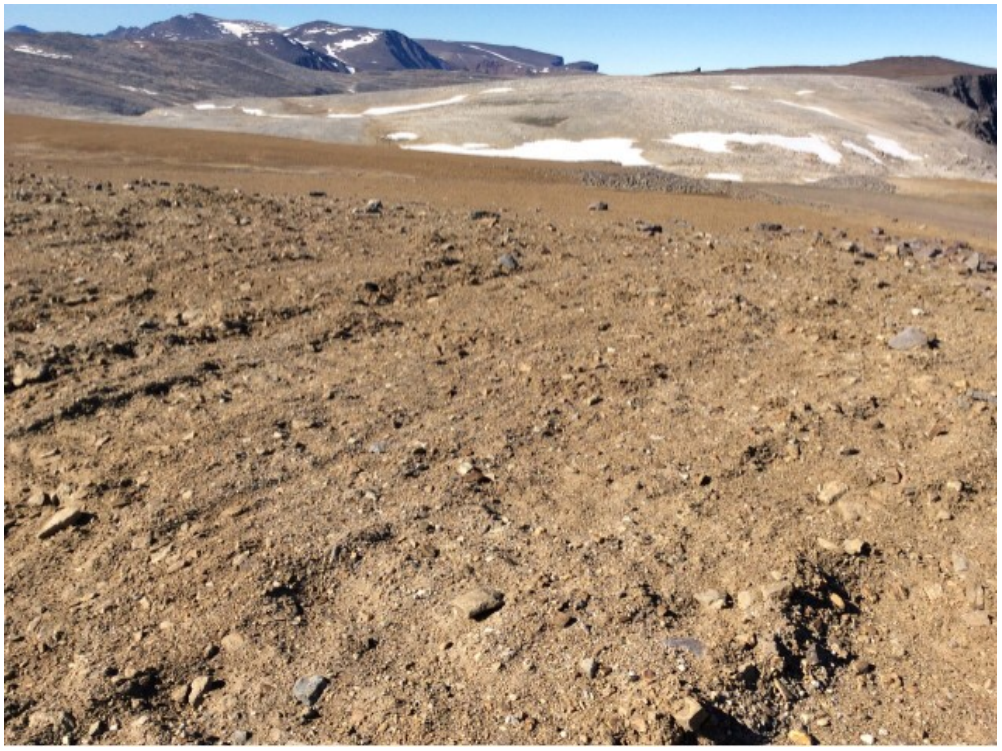


Photo 408: Upper Site West Landfill (Centre Lobe) – West crest (Feature L – uneven ground), facing north (Acceptable) (DYEM_Photo572.jpg)



Photo 409: Upper Site West Landfill (East Lobe) – West crest, facing north (DYEM_Photo615.jpg)



Photo 410: Upper Site West Landfill (Centre Lobe) – West slope, facing north – Uneven ground (DYEM_Photo569.jpg)



Photo 411: Upper Site West Landfill (Centre Lobe) – West slope and toe, facing north (DYEM_Photo549.jpg)



Photo 412: Upper Site West Landfill (East Lobe) – North slope, Feature B – Tension crack, facing east (Acceptable) (DYEM_Photo92.jpg)



Photo 413: *Upper Site West Landfill (East Lobe) – East slope, Feature D – Self-armouring erosion area with fines washing out downslope, facing southeast (Acceptable) (DYEM_Photo91.jpg)*



Photo 414: *Upper Site West Landfill (Centre Lobe) – North slope, Feature E – Self-armouring erosion, facing south (Acceptable) (DYEM_Photo67.jpg)*

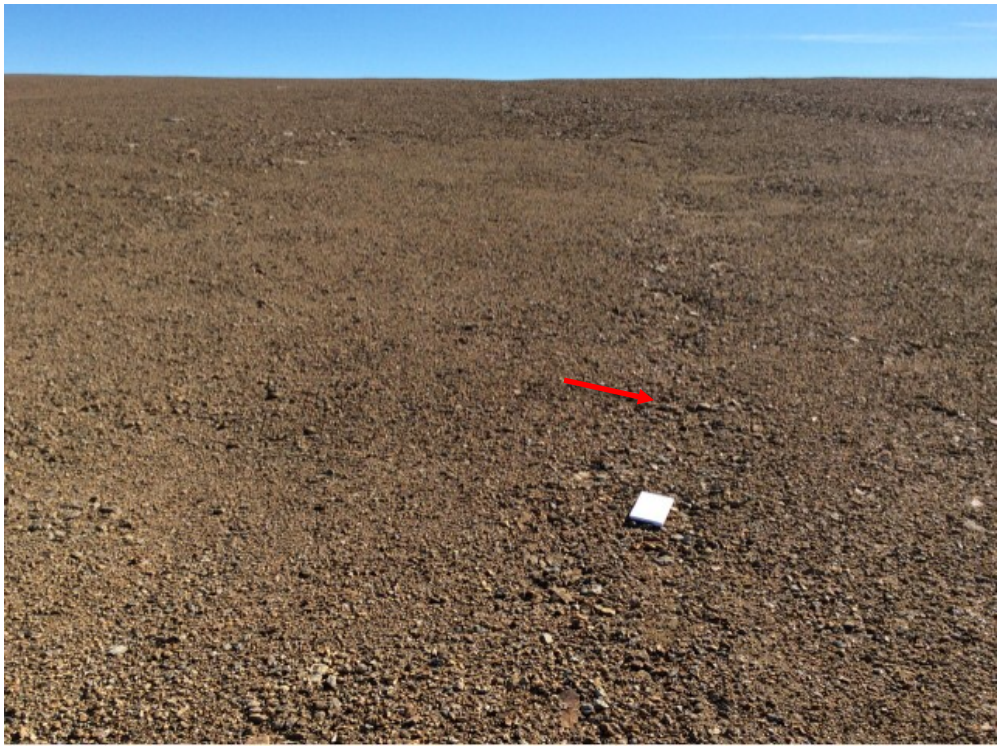


Photo 415: *Upper Site West Landfill (Centre Lobe) – North slope, Feature F – Self-armouring erosion transporting fines down slope, facing south (Acceptable) (DYEM_Photo66.jpg)*



Photo 416: *Upper Site West Landfill (Centre Lobe) – West slope, Feature G – Area of self-armouring erosion on slope, facing west (Acceptable) (DYEM_Photo62.jpg)*



Photo 417: Upper Site West Landfill (Centre Lobe) – Cover surface, Feature H – Minor self-armouring erosion. facing west (Acceptable) (DYEM_Photo65.jpg)

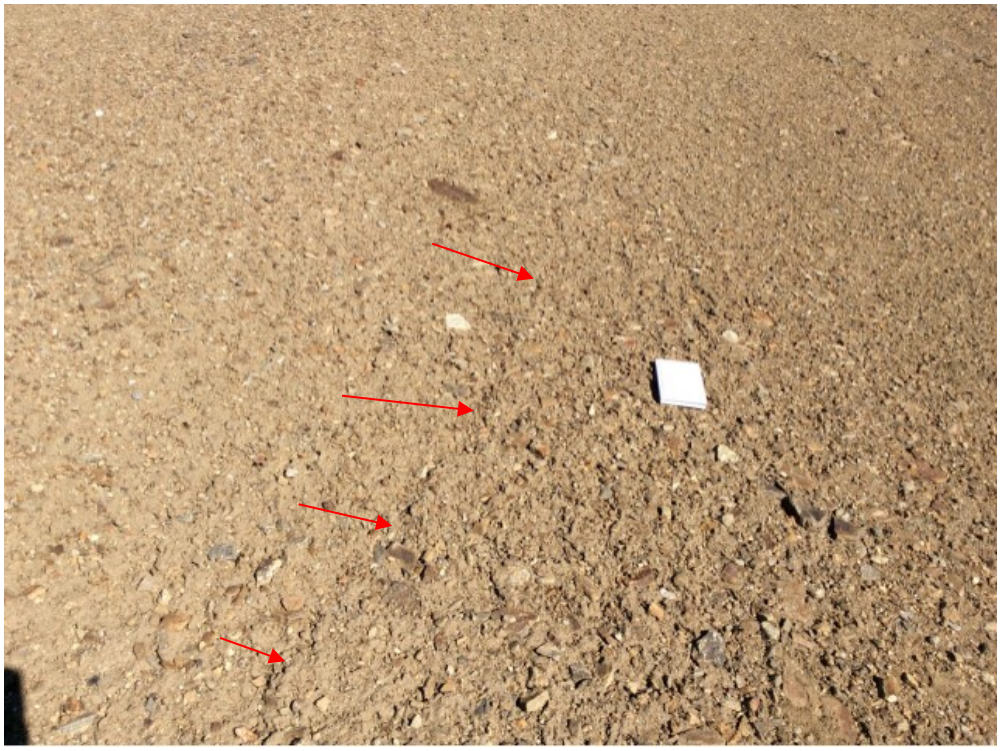


Photo 418: Upper Site West Landfill (Centre Lobe) – Southwest corner, Feature I – Thaw creep cracks at Southwest corner, facing east (Acceptable) (DYEM_Photo61.jpg)

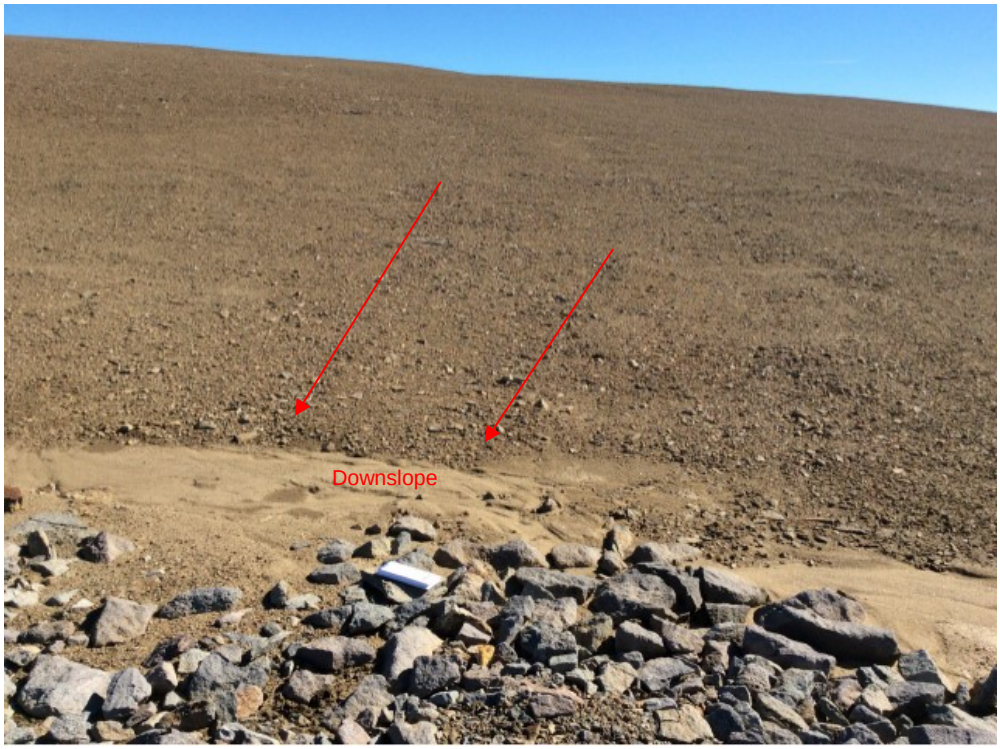


Photo 419: Upper Site West Landfill (Centre Lobe) – Cover surface, Feature J – Area of self-armouring erosion transporting fines down slope, facing south (Acceptable) (DYEM_Photo64.jpg)

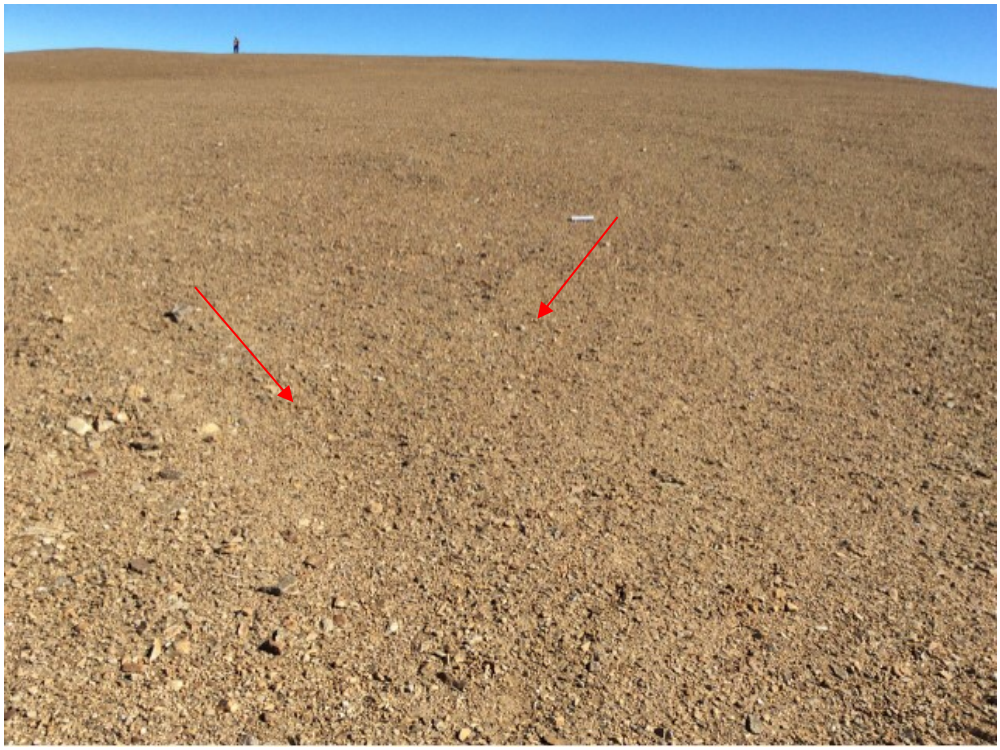


Photo 420: Upper Site West Landfill (Centre Lobe) – Cover surface, Feature K – Area of self-armouring erosion transporting fines down slope, facing east (Acceptable) (DYEM_Photo63.jpg)



Photo 421: *Upper Site West Landfill (Centre Lobe) –Cover surface, Feature L – Rough, uneven surface, facing northeast (Acceptable) (DYEM_Photo70.jpg)*



Photo 422: *Upper Site West Landfill (Centre Lobe) – Cover surface east end, Feature M – Equipment/tire tracks, facing west (Acceptable) (DYEM_Photo68.jpg)*

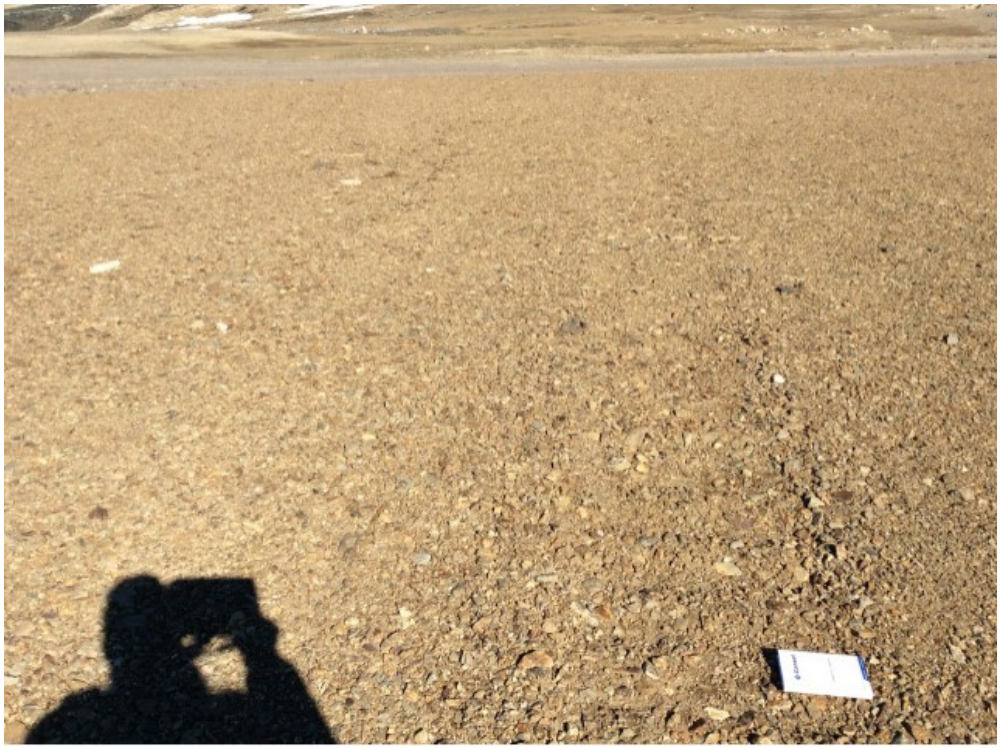


Photo 423: *Upper Site West Landfill (Centre Lobe) – Cover surface, Feature M – Tire tracks, facing east (Acceptable) (DYEM_Photo69.jpg)*

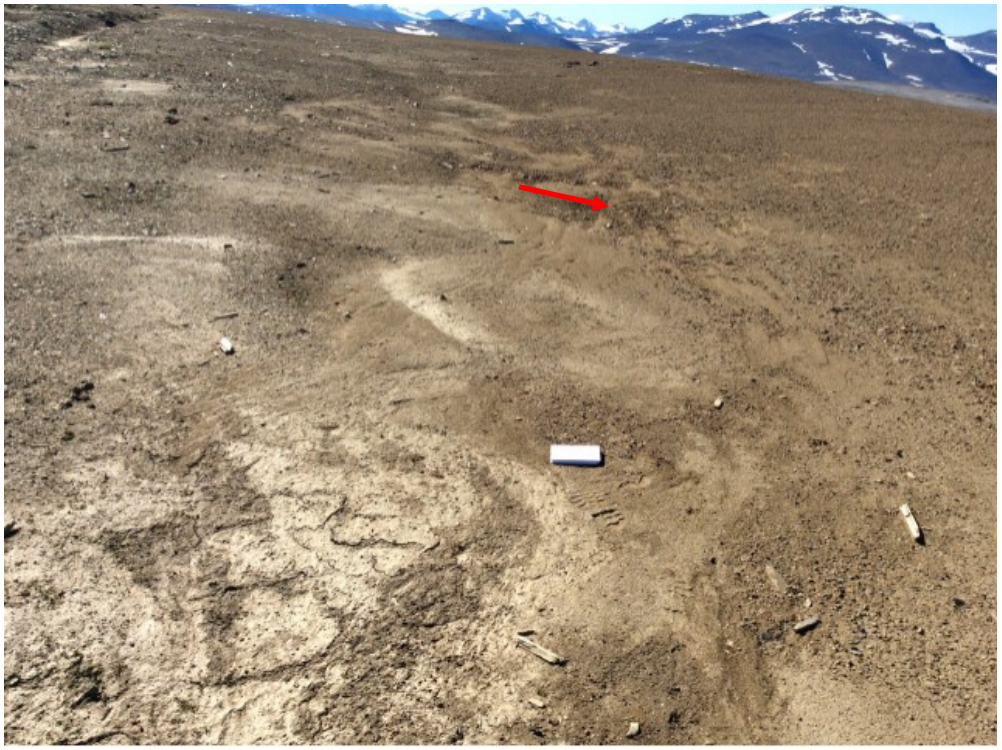


Photo 424: *Upper Site West Landfill (Centre Lobe) – South toe, Feature N – East end of self-armouring erosion and accumulation of fines, facing west (Acceptable) (DYEM_Photo71.jpg)*

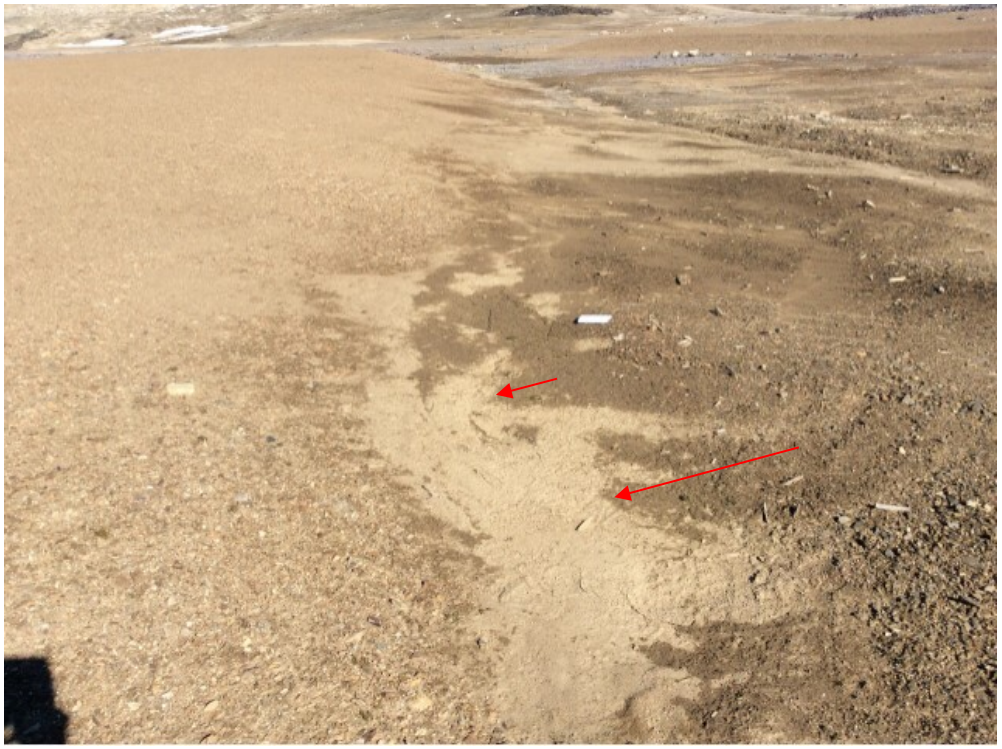


Photo 425: *Upper Site West Landfill (Centre Lobe) – South toe, West end of self-armouring erosion and fines accumulation (Feature N), facing east (Acceptable) (DYEM_Photo72.jpg)*



Photo 426: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-40 – Before excavation (DYEM_Photo281.jpg)*



Photo 427: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-40 – After excavation (DYEM_Photo285.jpg)*



Photo 428: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-40 – After backfilling (DYEM_Photo286.jpg)*



Photo 429: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-41 – Before excavation (DYEM_Photo284.jpg)*



Photo 430: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-41 – After excavation (DYEM_Photo288.jpg)*



Photo 431: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-41 – After backfilling (DYEM_Photo289.jpg)*



Photo 432: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-42 – Before excavation (DYEM_Photo256.jpg)*



Photo 433: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-42 – After excavation (DYEM_Photo258.jpg)*



Photo 434: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-42 – After backfilling (DYEM_Photo259.jpg)*



Photo 435: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-43 – Before excavation (DYEM_Photo257.jpg)*



Photo 436: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-43 – After excavation (DYEM_Photo260.jpg)*



Photo 437: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-43 – After backfilling (DYEM_Photo263.jpg)*



Photo 438: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-44 – Before excavation (DYEM_Photo261.jpg)*



Photo 439: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-44 – After excavation (DYEM_Photo262.jpg)*



Photo 440: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-44 – After backfilling (DYEM_Photo264.jpg)*



Photo 441: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-45 – Before excavation (DYEM_Photo265.jpg)*



Photo 442: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-45 – After excavation (DYEM_Photo268.jpg)*



Photo 443: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-45 – After backfilling (DYEM_Photo269.jpg)*



Photo 444: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-46 – Before excavation (DYEM_Photo266.jpg)*



Photo 445: Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-46 – After excavation (DYEM_Photo267.jpg)



Photo 446: Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-46 – After backfilling (DYEM_Photo270.jpg)



Photo 447: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-47 – Before excavation (DYEM_Photo275.jpg)*



Photo 448: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-47 – After excavation (DYEM_Photo278.jpg)*



Photo 449: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-47 – After backfilling (DYEM_Photo279.jpg)*



Photo 450: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-48 – Before excavation (DYEM_Photo271.jpg)*



Photo 451: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-48 – After excavation (DYEM_Photo272.jpg)*



Photo 452: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-48 – After backfilling (DYEM_Photo273.jpg)*



Photo 453: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-49 – Before excavation (DYEM_Photo274.jpg)*



Photo 454: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-49 – After excavation (DYEM_Photo276.jpg)*



Photo 455: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-49 – After backfilling (DYEM_Photo277.jpg)*



Photo 456: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-52 – Before excavation (DYEM_Photo280.jpg)*



Photo 457: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-52 – After excavation (DYEM_Photo282.jpg)*



Photo 458: *Upper Site West Landfill (Centre and East Lobes) – Soil Sample DM-52 – After backfilling (DYEM_Photo283.jpg)*



Photo 459: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Cover surface, facing west (DYEM_Photo582.jpg)*



Photo 460: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Cover surface, facing south (DYEM_Photo583.jpg)*



Photo 461: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Cover surface, facing east (DYEM_Photo585.jpg)



Photo 462: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Cover surface, facing north (DYEM_Photo589.jpg)



Photo 463: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, facing northeast (DYEM_Photo592.jpg)*



Photo 464: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – East crest and slope (New Feature F – Tire tracks), facing southeast (Acceptable) (DYEM_Photo581.jpg)*



Photo 465: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Cover, east crest and slope, facing northwest (DYEM_Photo590.jpg)



Photo 466: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, east side, facing north (DYEM_Photo601.jpg)



Photo 467: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, facing west (DYEM_Photo608.jpg)



Photo 468: Upper Site Pallet Line Landfill – Lobe 1 – West crest, facing north (DYEM_Photo619.jpg)



Photo 469: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface southwest side, facing west (DYEM_Photo595.jpg)



Photo 470: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, facing east (DYEM_Photo596.jpg)

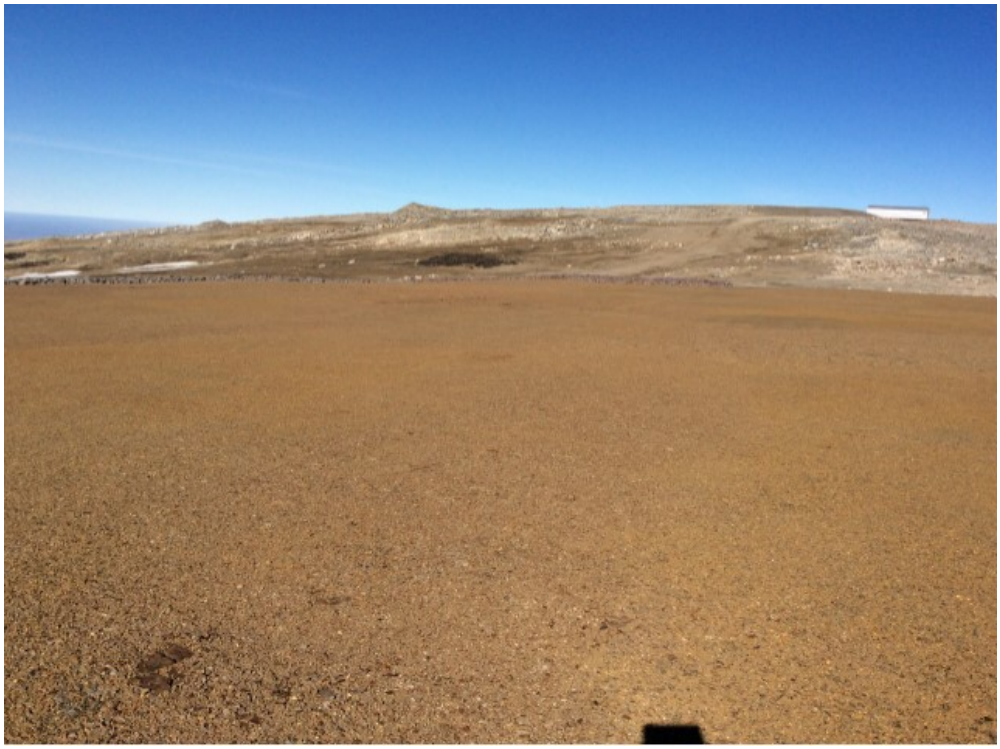


Photo 471: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, south-central, facing northeast (DYEM_Photo597.jpg)*

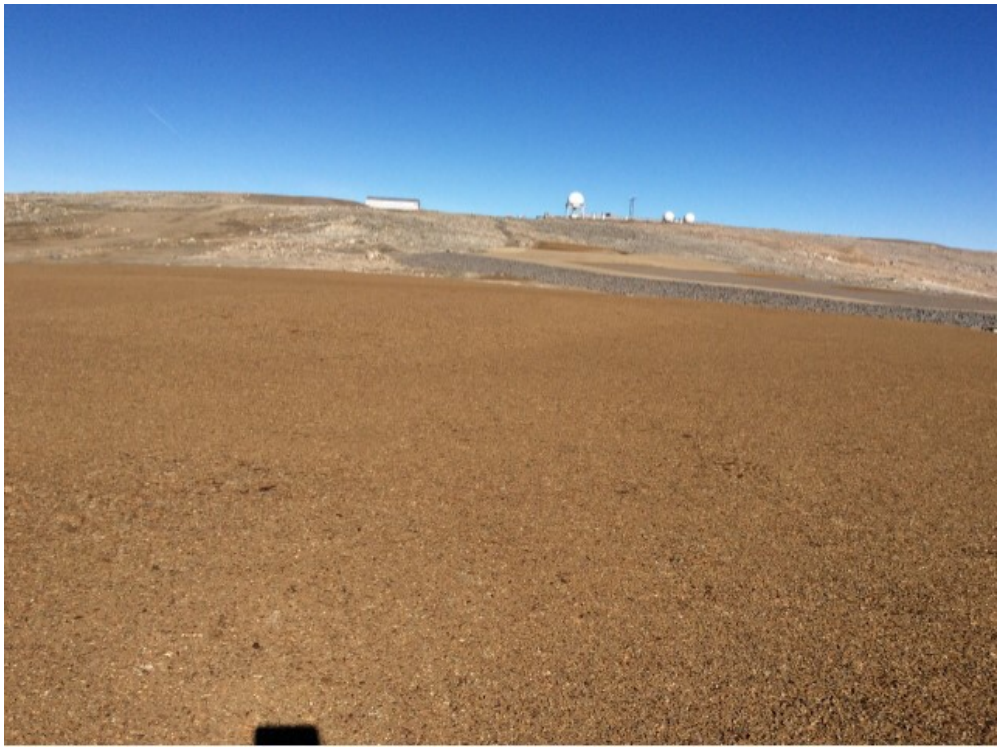


Photo 472: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, facing east (DYEM_Photo599.jpg)*



Photo 473: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, east side, facing northwest (DYEM_Photo603.jpg)



Photo 474: Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, east side, facing west (DYEM_Photo604.jpg)



Photo 475: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface east central, facing south (DYEM_Photo607.jpg)*



Photo 476: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, west central, facing northwest (DYEM_Photo609.jpg)*



Photo 477: Upper Site Pallet Line Landfill – Lobe 1 – Internal west crest, facing southeast (DYEM_Photo598.jpg)

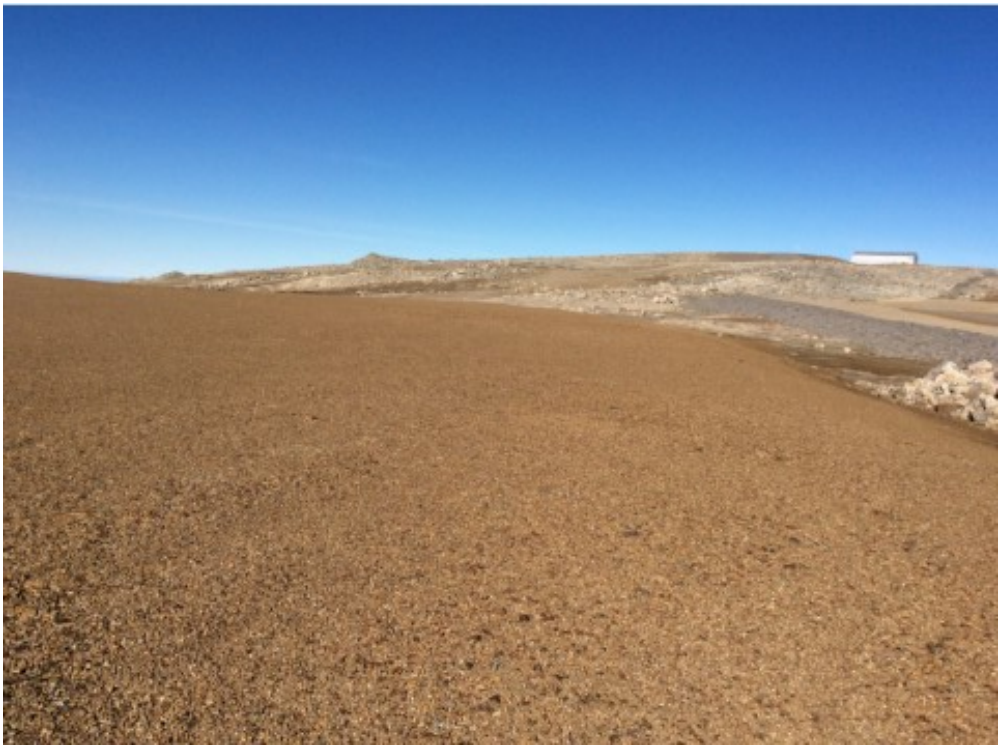


Photo 478: Upper Site Pallet Line Landfill – Lobe 1 – South crest, facing northeast (DYEM_Photo600.jpg)



Photo 479: Upper Site Pallet Line Landfill – Lobe 1 – North crest, facing west (DYEM_Photo605.jpg)



Photo 480: Upper Site Pallet Line Landfill – Lobe 1 – North toe, facing east (DYEM_Photo622.jpg)



Photo 481: Upper Site Pallet Line Landfill – Lobe 1 – Southeast slope and toe, facing southwest (DYEM_Photo602.jpg)



Photo 482: Upper Site Pallet Line Landfill – Lobe 1 – West crest, facing north (DYEM_Photo620.jpg)



Photo 483: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Northwest slope and toe, facing southwest (DYEM_Photo623.jpg)



Photo 484: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Northwest crest, facing southwest (DYEM_Photo624.jpg)



Photo 485: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing southwest (DYEM_Photo633.jpg)



Photo 486: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing southwest (DYEM_Photo634.jpg)



Photo 487: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing northeast (DYEM_Photo635.jpg)



Photo 488: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing west (DYEM_Photo639.jpg)



Photo 489: *Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface near southwest end, facing northeast (DYEM_Photo641.jpg)*



Photo 490: *Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, near southwest end, facing northeast (DYEM_Photo642.jpg)*

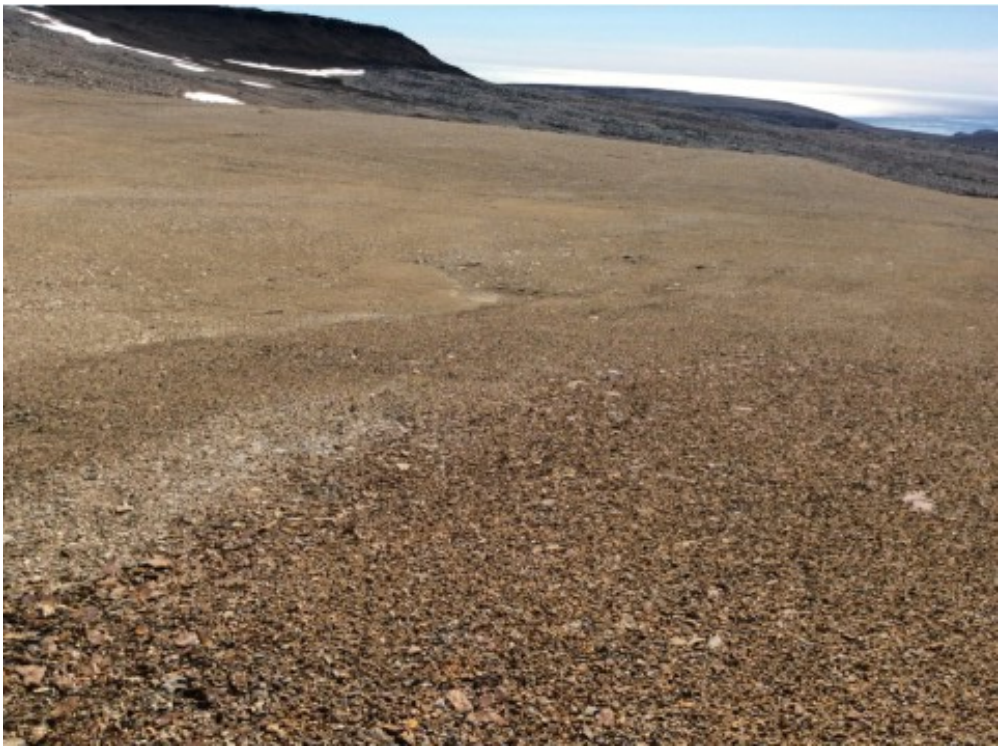


Photo 491: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing south (DYEM_Photo643.jpg)



Photo 492: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing southwest (DYEM_Photo644.jpg)



Photo 493: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, facing northeast (DYEM_Photo645.jpg)



Photo 494: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, northwest side facing southwest (DYEM_Photo649.jpg)



Photo 495: *Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – East slope and toe, facing northwest (DYEM_Photo631.jpg)*



Photo 496: *Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface internal slope, facing southwest (DYEM_Photo650.jpg)*

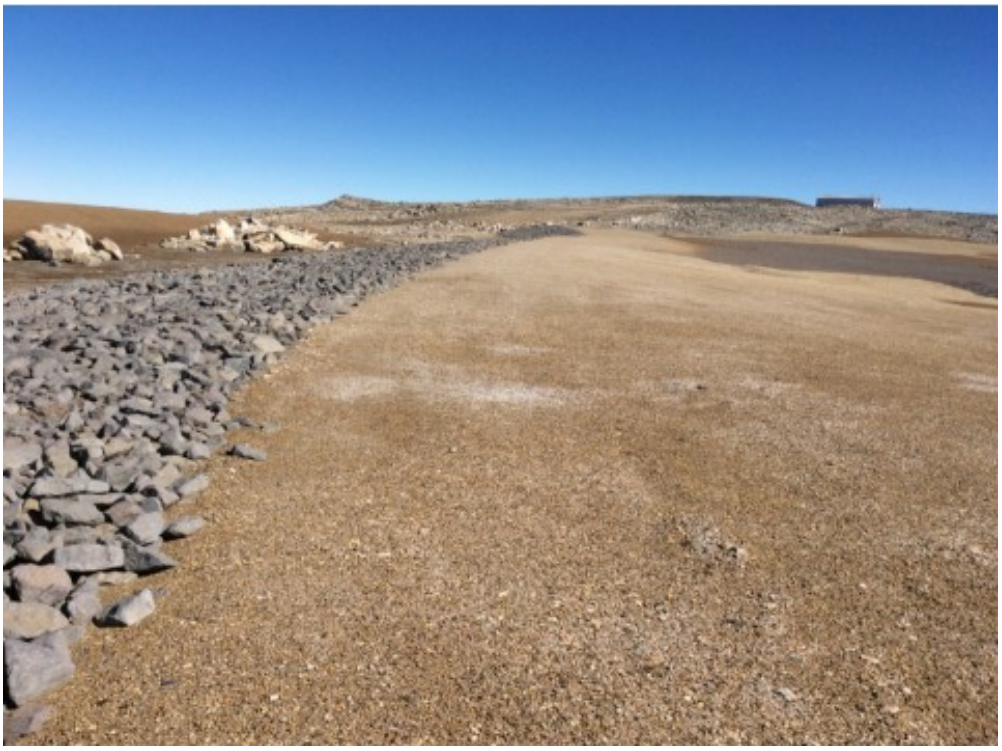


Photo 497: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Northwest crest, facing northeast (DYEM_Photo648.jpg)



Photo 498: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Northwest crest, facing southwest (DYEM_Photo651.jpg)



Photo 499: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – North slope, facing east (DYEM_Photo625.jpg)



Photo 500: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – North slope, facing southwest (DYEM_Photo626.jpg)



Photo 501: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Northwest toe, facing northeast (DYEM_Photo647.jpg)



Photo 502: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – South slope near northeast end, facing southwest (DYEM_Photo632.jpg)



Photo 503: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – South crest, facing southwest (DYEM_Photo640.jpg)



Photo 504: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – South slope, facing northeast (DYEM_Photo636.jpg)



Photo 505: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – South slope, facing west (DYEM_Photo637.jpg)



Photo 506: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – South slope, facing northeast (DYEM_Photo638.jpg)



Photo 507: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – West crest, facing south (DYEM_Photo646.jpg)



Photo 508: Upper Site Pallet Line Landfill – Lobe 5 – Cover surface, facing east (DYEM_Photo627.jpg)



Photo 509: Upper Site Pallet Line Landfill – Lobe 5 – East crest, facing south (DYEM_Photo629.jpg)

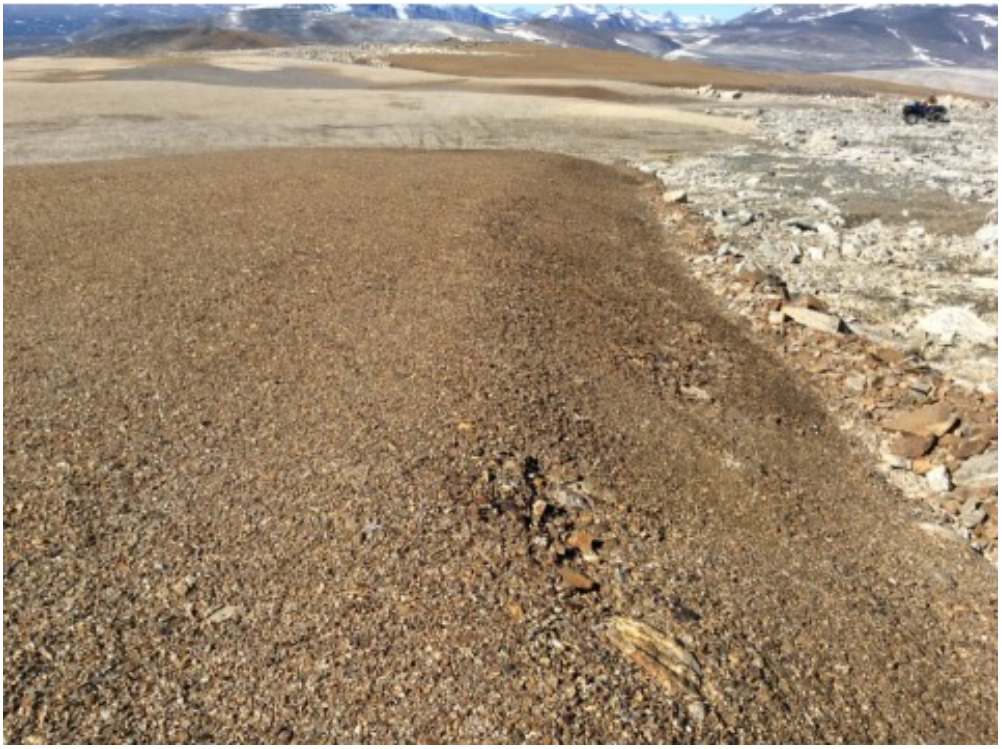


Photo 510: Upper Site Pallet Line Landfill – Lobe 5 – North crest, facing west (DYEM_Photo628.jpg)



Photo 511: Upper Site Pallet Line Landfill – Lobe 5 – South crest, facing west (DYEM_Photo630.jpg)



Photo 512: Upper Site Pallet Line Landfill – Lobe 1 – Internal east crest, facing northeast (DYEM_Photo594.jpg)



Photo 513: *Upper Site Pallet Line Landfill – Lobe 1 – South crest, facing west (DYEM_Photo593.jpg)*



Photo 514: *Upper Site Pallet Line Landfill – Lobe 1 – North crest, facing east (DYEM_Photo621.jpg)*



Photo 515: Upper Site Pallet Line Landfill – Lobe 1 – North toe and slope, facing west (DYEM_Photo606.jpg)



Photo 516: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Northeast crest, facing northwest (DYEM_Photo580.jpg)



Photo 517: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – South crest, facing east (DYEM_Photo587.jpg)



Photo 518: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – South crest, facing west (DYEM_Photo588.jpg)

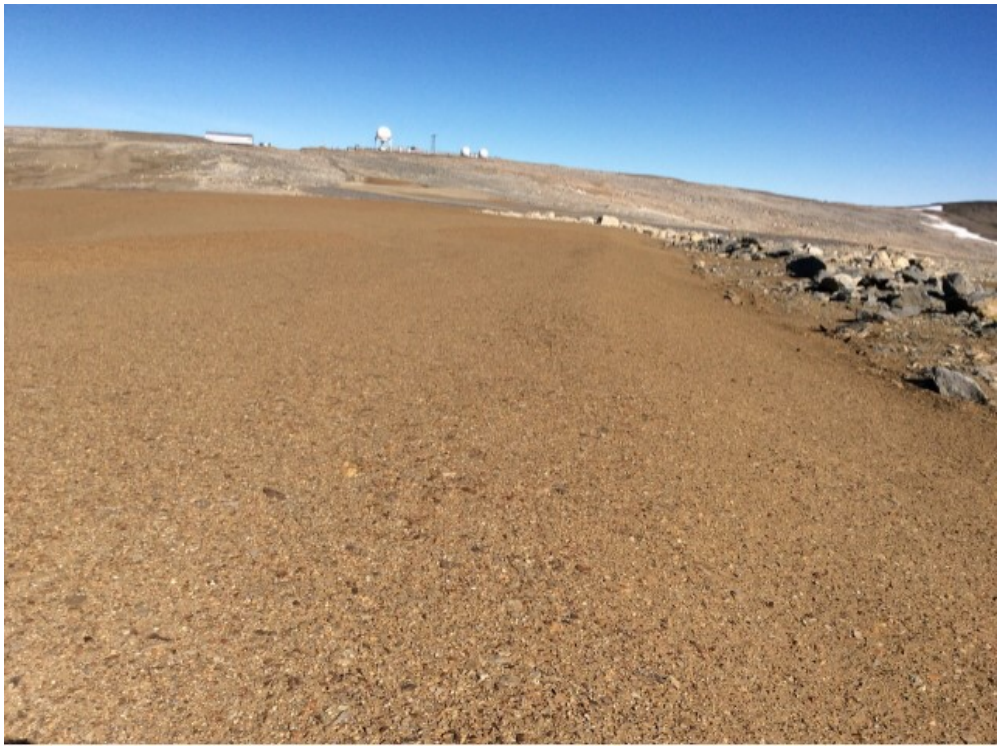


Photo 519: Upper Site Pallet Line Landfill – Lobe 1 – South crest and slope, facing east (DYEM_Photo591.jpg)



Photo 520: Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – West crest and slope, facing southeast (DYEM_Photo579.jpg)



Photo 521: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe - West crest and slope, facing southwest (DYEM_Photo586.jpg)*



Photo 522: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – West slope and crest, facing south (DYEM_Photo584.jpg)*

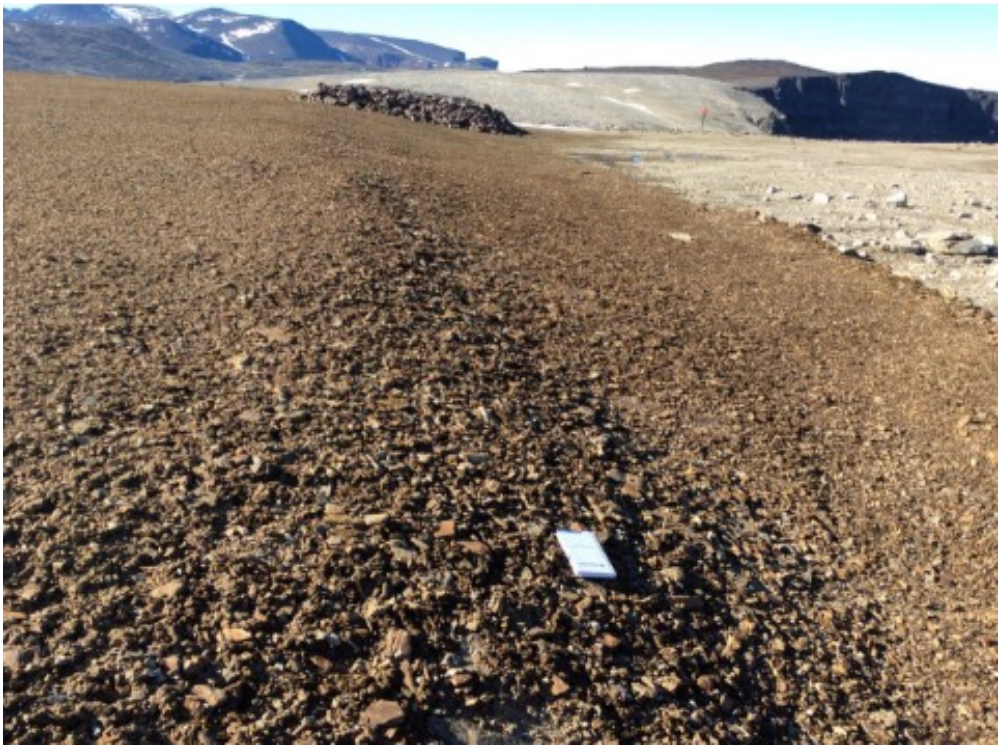


Photo 523: *Upper Site Pallet Line Landfill – Lobe 1 – East slope, previously noted parallel tension cracks (Feature AB) were not observed due to self-armouring erosion, facing northwest (DYEM_Photo85.jpg)*



Photo 524: *Upper Site Pallet Line Landfill – Lobe 1 – South slope, previously noted tension crack (Feature AC) near toe was not observed due to self-armouring erosion, facing east (DYEM_Photo83.jpg)*



Photo 525: *Upper Site Pallet Line Landfill – Lobe 1 – South slope, previously noted tension crack (Feature AD) was not observed due to self-armouring erosion, facing southwest (DYEM_Photo79.jpg)*



Photo 526: *Upper Site Pallet Line Landfill – Lobe 1 – South slope, Feature AE – Tension crack on slope slightly covered with fines, facing east (Acceptable) (DYEM_Photo78.jpg)*



Photo 527: *Upper Site Pallet Line Landfill – Lobe 1 – South slope, Feature AF – Tension crack at crest of slope slightly covered with fines, facing east (Acceptable) (DYEM_Photo77.jpg)*



Photo 528: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, Feature AG – Minor settlement, facing south (Acceptable) (DYEM_Photo88.jpg)*



Photo 529: Upper Site Pallet Line Landfill – Lobes 2, Feature A – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo106.jpg)



Photo 530: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, Feature B – Minor self-armouring erosion, facing north (Acceptable) (DYEM_Photo105.jpg)



Photo 531: *Upper Site Pallet Line Landfill – Lobe 1 – Internal west slope, Feature C – Minor crack, facing south (Acceptable) (DYEM_Photo82.jpg)*



Photo 532: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe - Feature F – Tire tracks were not observed at south end where previously noted, insignificant uneven ground was observed, facing southeast (Acceptable) (DYEM_Photo74.jpg)*



Photo 533: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Feature G – Segregated materials, facing southwest (Acceptable) (DYEM_Photo101.jpg)

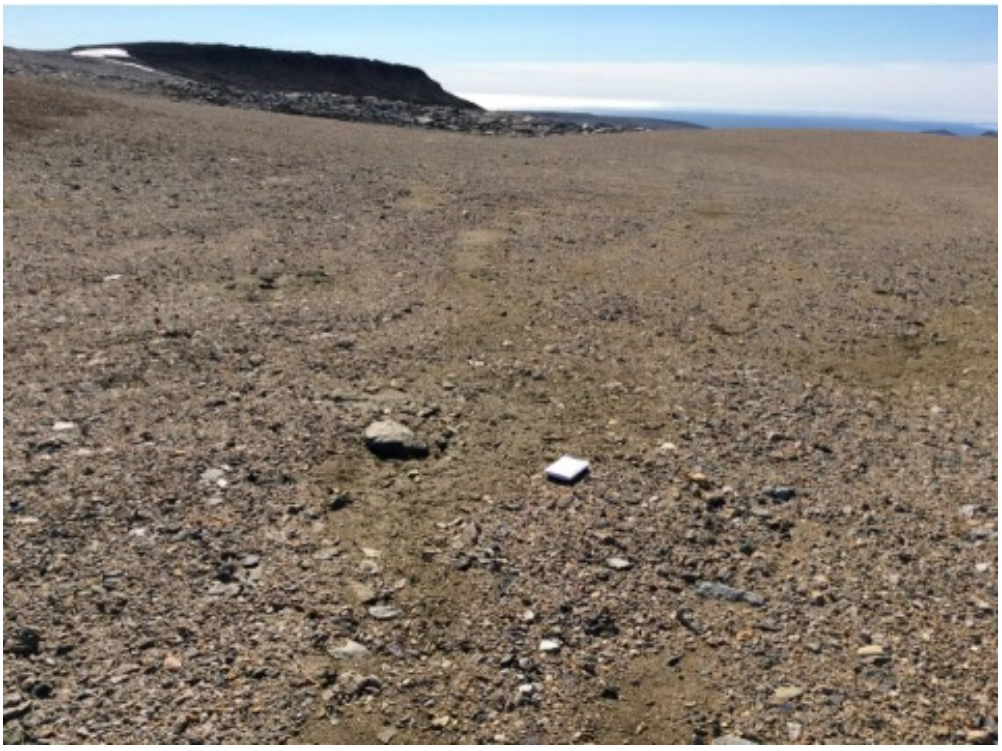


Photo 534: Upper Site Pallet Line Landfill – Between Lobes 2, 3 and 4 and Lobe 5, Ponded water (Feature I) was not observed in 2017, facing southeast (DYEM_Photo95.jpg)



Photo 535: *Upper Site Pallet Line Landfill – Lobe 1 – Internal east slope, Feature K – Previously observed minor crack, weathered and difficult to locate/identify in 2017, facing southwest (Acceptable) (DYEM_Photo80.jpg)*



Photo 536: *Upper Site Pallet Line Landfill – Lobe 1 – South slope, Feature L – Series of minor weathered cracks covered with fines, facing east (Acceptable) (DYEM_Photo81.jpg)*

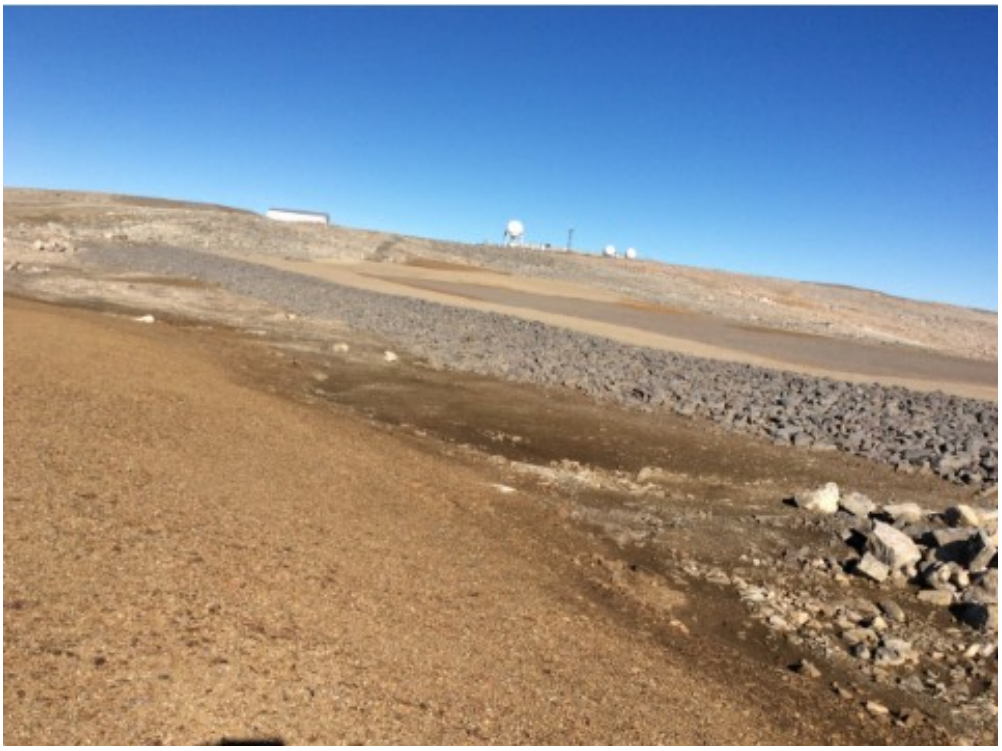


Photo 537: *Upper Site Pallet Line Landfill – Between Lobe 1 and Lobes 2, 3 and 4, No ponded water (previously noted Feature M), facing east (DYEM_Photo84.jpg)*



Photo 538: *Upper Site Pallet Line Landfill – Lobe 5 – East toe, No ponded water (previously noted Feature O), facing north (DYEM_Photo96.jpg)*



Photo 539: *Upper Site Pallet Line Landfill – Lobe 5 – South slope, Feature Q – Minor tension crack and settlement, facing west (Acceptable) (DYEM_Photo97.jpg)*



Photo 540: *Upper Site Pallet Line Landfill – Lobes 2,3 and 4 – Southeast slope, Feature R – Some minor erosion into boulders, facing southeast (Acceptable) (DYEM_Photo99.jpg)*



Photo 541: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Southeast slope, Feature S – Previously reported uneven ground that appears to be an as-built condition, facing northeast (Acceptable) (DYEM_Photo102.jpg)



Photo 542: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Southeast slope, Feature T – Self-armouring erosion, facing southeast (Acceptable) (DYEM_Photo104.jpg)



Photo 543: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe – Toe of northeast slope, Feature U – Two small sinkholes at toe of slope, facing northwest (Acceptable) (DYEM_Photo76.jpg)*



Photo 544: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe - Cover surface, Feature V – Uneven ground, potential settlement, some self-armouring erosion, facing south (Acceptable) (DYEM_Photo73.jpg)*



Photo 545: *Upper Site Pallet Line Landfill – Lobe 1 – West slope, Feature W – Minor self-armouring erosion area, facing north (Acceptable) (DYEM_Photo94.jpg)*



Photo 546: *Upper Site Pallet Line Landfill – Lobe 1 – Cover surface, Feature X – Equipment tracks, facing northeast (Acceptable) (DYEM_Photo93.jpg)*

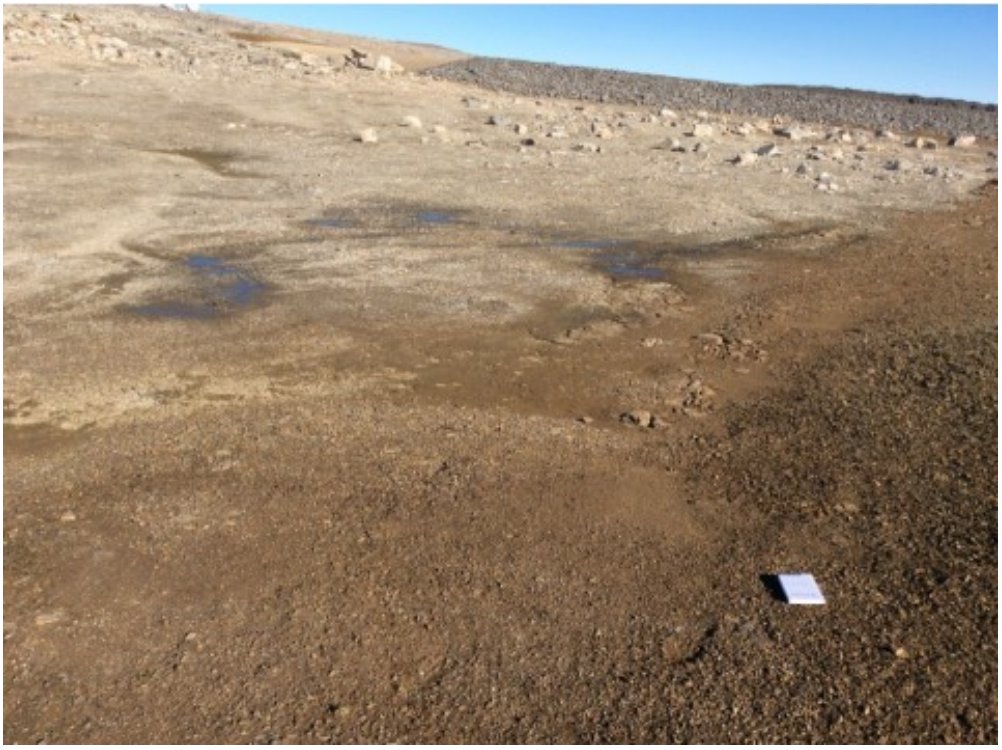


Photo 547: *Upper Site Pallet Line Landfill – Lobe 1 – Feature Z – Ponded water at toe, no seepage or sheen, facing southeast (Acceptable) (DYEM_Photo86.jpg)*

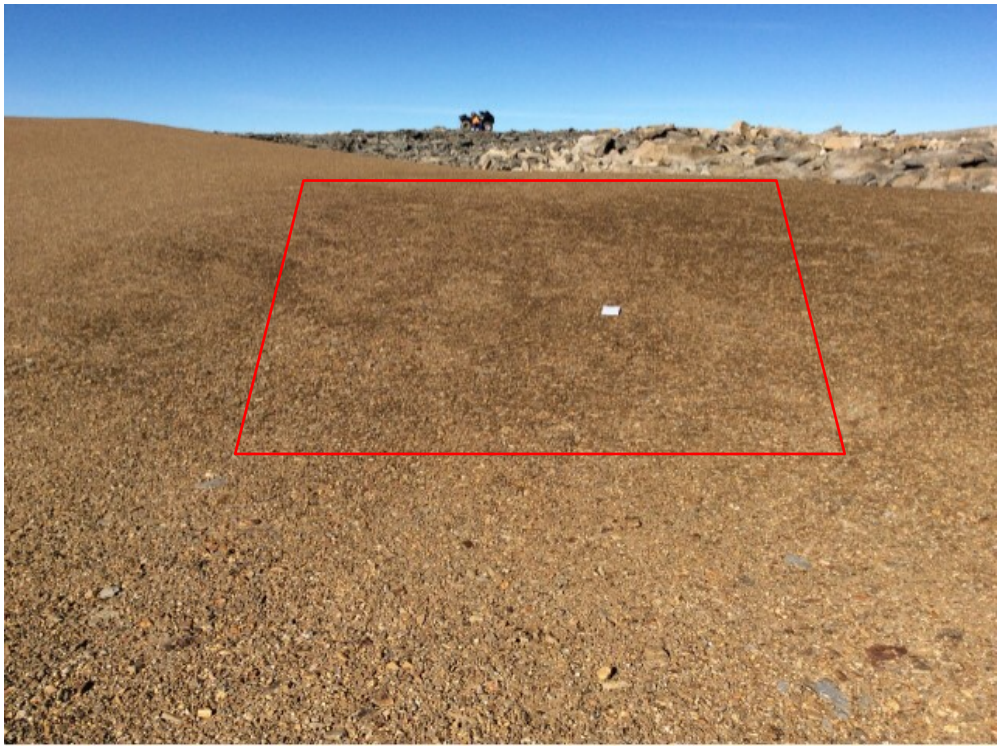


Photo 548: *Upper Site Pallet Line Landfill – Abandoned Landfill Lobe, Cover surface, New Feature AH – Wet area, facing northwest (Acceptable) (DYEM_Photo75.jpg)*

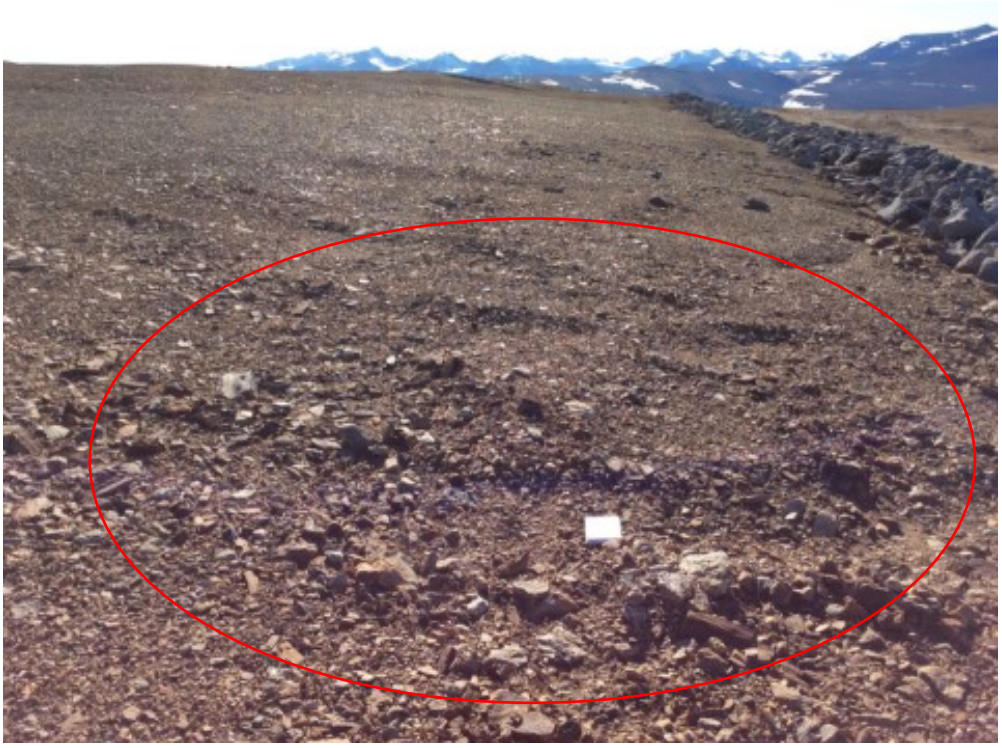


Photo 549: *Upper Site Pallet Line Landfill – Lobe 1 – North crest, New Feature AI – Uneven ground, facing west (Acceptable) (DYEM_Photo87.jpg)*



Photo 550: *Upper Site Pallet Line Landfill – Lobe 1 - Cover surface, New Feature AJ – Erosion channel, facing east (Acceptable) (DYEM_Photo89.jpg)*

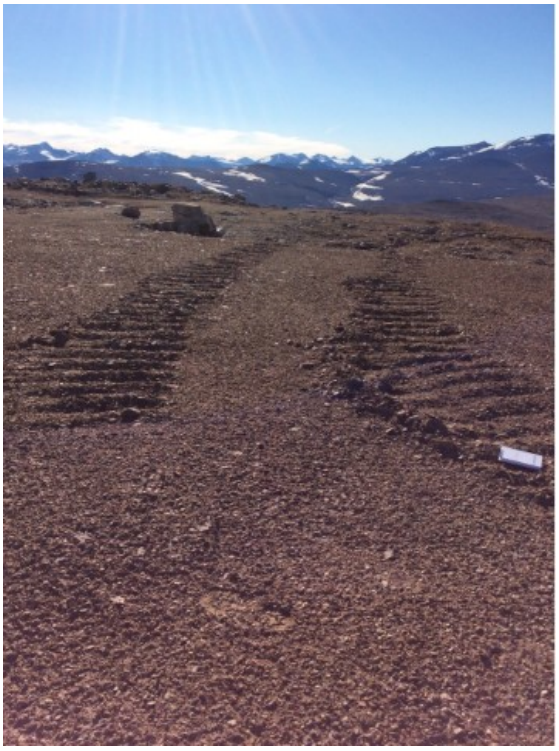


Photo 551: Upper Site Pallet Line Landfill – Lobe 1 – Feature X – Equipment/tire tracks, facing southwest (Acceptable) (DYEM_Photo90.jpg)



Photo 552: Upper Site Pallet Line Landfill – Lobe 5 – Southeast corner, Feature P – Sparse vegetation, facing north (Acceptable) (DYEM_Photo98.jpg)



Photo 553: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Cover surface, New Feature AK – Erosion channel, facing southwest (Acceptable) (DYEM_Photo100.jpg)

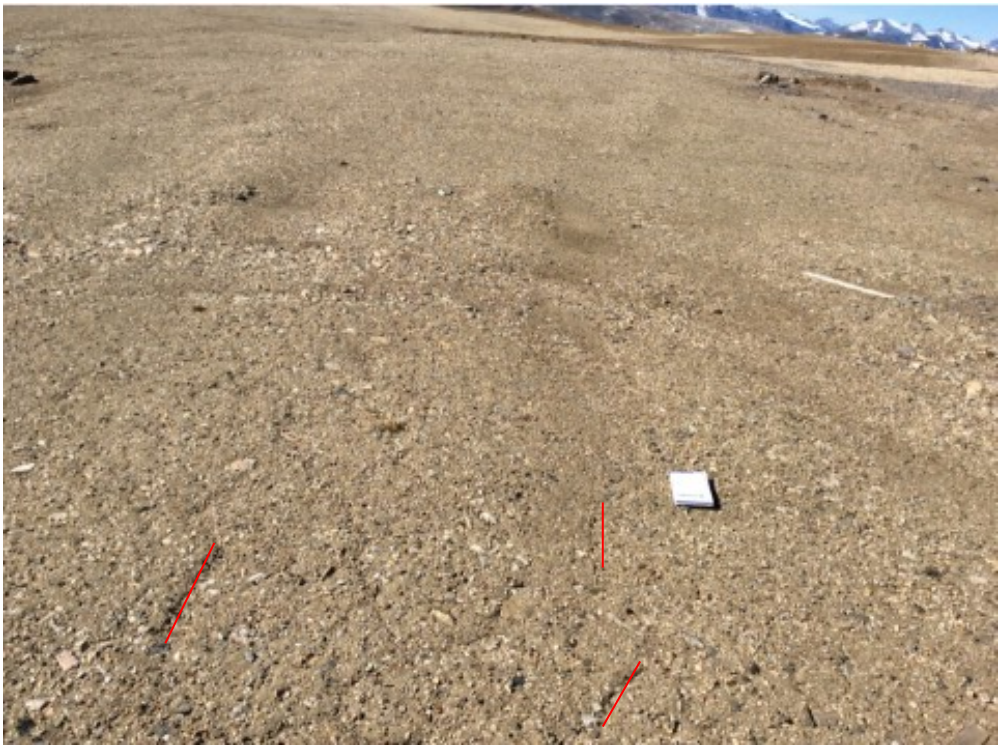


Photo 554: Upper Site Pallet Line Landfill – Lobes 2, 3 and 4 – Southeast slope near toe, New Feature AL – Series of very thin minor tension cracks, facing north (Acceptable) (DYEM_Photo103.jpg)



Photo 555: Upper Site Pallet Line Landfill – Soil Sample DM-50 – Before excavation (DYEM_Photo320.jpg)



Photo 556: Upper Site Pallet Line Landfill – Soil Sample DM-50 – After excavation (DYEM_Photo323.jpg)



Photo 557: Upper Site Pallet Line Landfill – Soil Sample DM-50 – After backfilling (DYEM_Photo324.jpg)



Photo 558: Upper Site Pallet Line Landfill – Soil Sample DM-51 – Before excavation (DYEM_Photo319.jpg)



Photo 559: Upper Site Pallet Line Landfill – Soil Sample DM-51 – After excavation (DYEM_Photo321.jpg)



Photo 560: Upper Site Pallet Line Landfill – Soil Sample DM-51 – After backfilling (DYEM_Photo322.jpg)



Photo 561: Upper Site Pallet Line Landfill – Soil Sample DM-53 – Before excavation (DYEM_Photo774.jpg)



Photo 562: Upper Site Pallet Line Landfill – Soil Sample DM-53 – After excavation (DYEM_Photo775.jpg)



Photo 563: Upper Site Pallet Line Landfill – Soil Sample DM-53 – After backfilling (DYEM_Photo776.jpg)



Photo 564: Upper Site Pallet Line Landfill – Soil Sample DM-54 – Before excavation (DYEM_Photo305.jpg)



Photo 565: Upper Site Pallet Line Landfill – Soil Sample DM-54 – After excavation (DYEM_Photo309.jpg)



Photo 566: Upper Site Pallet Line Landfill – Soil Sample DM-54 – After backfilling (DYEM_Photo310.jpg)



Photo 567: Upper Site Pallet Line Landfill – Soil Sample DM-55 – Before excavation (DYEM_Photo314.jpg)



Photo 568: Upper Site Pallet Line Landfill – Soil Sample DM-55 – After excavation (DYEM_Photo317.jpg)



Photo 569: Upper Site Pallet Line Landfill – Soil Sample DM-55 – After backfilling (DYEM_Photo318.jpg)



Photo 570: Upper Site Pallet Line Landfill – Soil Sample DM-56 – Before excavation (DYEM_Photo313.jpg)



Photo 571: Upper Site Pallet Line Landfill – Soil Sample DM-56 – After excavation (DYEM_Photo315.jpg)



Photo 572: Upper Site Pallet Line Landfill – Soil Sample DM-56 – After backfilling (DYEM_Photo316.jpg)



Photo 573: Upper Site Pallet Line Landfill – Soil Sample DM-57 – Before excavation (DYEM_Photo308.jpg)



Photo 574: Upper Site Pallet Line Landfill – Soil Sample DM-57 – After excavation (DYEM_Photo311.jpg)



Photo 575: Upper Site Pallet Line Landfill – Soil Sample DM-57 – After backfilling (DYEM_Photo312.jpg)



Photo 576: Upper Site Pallet Line Landfill – Soil Sample DM-58 – Before excavation (DYEM_Photo302.jpg)



Photo 577: Upper Site Pallet Line Landfill – Soil Sample DM-58 – After excavation (DYEM_Photo306.jpg)



Photo 578: Upper Site Pallet Line Landfill – Soil Sample DM-58 – After backfilling (DYEM_Photo307.jpg)



Photo 579: Upper Site Pallet Line Landfill – Soil Sample DM-59 – Before excavation (DYEM_Photo299.jpg)



Photo 580: Upper Site Pallet Line Landfill – Soil Sample DM-59 – After excavation (DYEM_Photo303.jpg)



Photo 581: Upper Site Pallet Line Landfill – Soil Sample DM-59 – After backfilling (DYEM_Photo304.jpg)



Photo 582: Upper Site Pallet Line Landfill – Soil Sample DM-60 – Before excavation (DYEM_Photo292.jpg)



Photo 583: Upper Site Pallet Line Landfill – Soil Sample DM-60 – After excavation (DYEM_Photo295.jpg)



Photo 584: Upper Site Pallet Line Landfill – Soil Sample DM-60 – After backfilling (DYEM_Photo296.jpg)



Photo 585: Upper Site Pallet Line Landfill – Soil Sample DM-61 – Before excavation (DYEM_Photo293.jpg)



Photo 586: Upper Site Pallet Line Landfill – Soil Sample DM-61 – After excavation (DYEM_Photo294.jpg)



Photo 587: Upper Site Pallet Line Landfill – Soil Sample DM-61 – After backfilling (DYEM_Photo298.jpg)



Photo 588: Upper Site Pallet Line Landfill – Soil Sample DM-62 – Before excavation (DYEM_Photo297.jpg)



Photo 589: Upper Site Pallet Line Landfill – Soil Sample DM-62 – After excavation (DYEM_Photo300.jpg)



Photo 590: Upper Site Pallet Line Landfill – Soil Sample DM-62 – After backfilling (DYEM_Photo301.jpg)



Photo 591: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing northeast (DYEM_Photo654.jpg)



Photo 592: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing east (DYEM_Photo656.jpg)



Photo 593: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing east (DYEM_Photo658.jpg)



Photo 594: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing east (DYEM_Photo662.jpg)



Photo 595: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing south (DYEM_Photo663.jpg)



Photo 596: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing south (DYEM_Photo665.jpg)



Photo 597: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing north (DYEM_Photo668.jpg)



Photo 598: Upper Site Non-Hazardous Waste Landfill – Cover surface, facing north (DYEM_Photo670.jpg)



Photo 599: *Upper Site Non-Hazardous Waste Landfill – East crest, facing southwest, previously observed tire tracks (Feature A) not considered a feature in 2017 (DYEM_Photo672.jpg)*



Photo 600: *Upper Site Non-Hazardous Waste Landfill – East slope and toe, facing northeast (DYEM_Photo669.jpg)*



Photo 601: Upper Site Non-Hazardous Waste Landfill – North crest, facing southeast (DYEM_Photo660.jpg)



Photo 602: Upper Site Non-Hazardous Waste Landfill – At midpoint of north crest, facing northwest (DYEM_Photo664.jpg)



Photo 603: Upper Site Non-Hazardous Waste Landfill – North slope, facing southeast (DYEM_Photo661.jpg)



Photo 604: Upper Site Non-Hazardous Waste Landfill – North slope and crest from east end, facing northwest (DYEM_Photo671.jpg)



Photo 605: Upper Site Non-Hazardous Waste Landfill – Southeast crest, facing northeast (DYEM_Photo652.jpg)

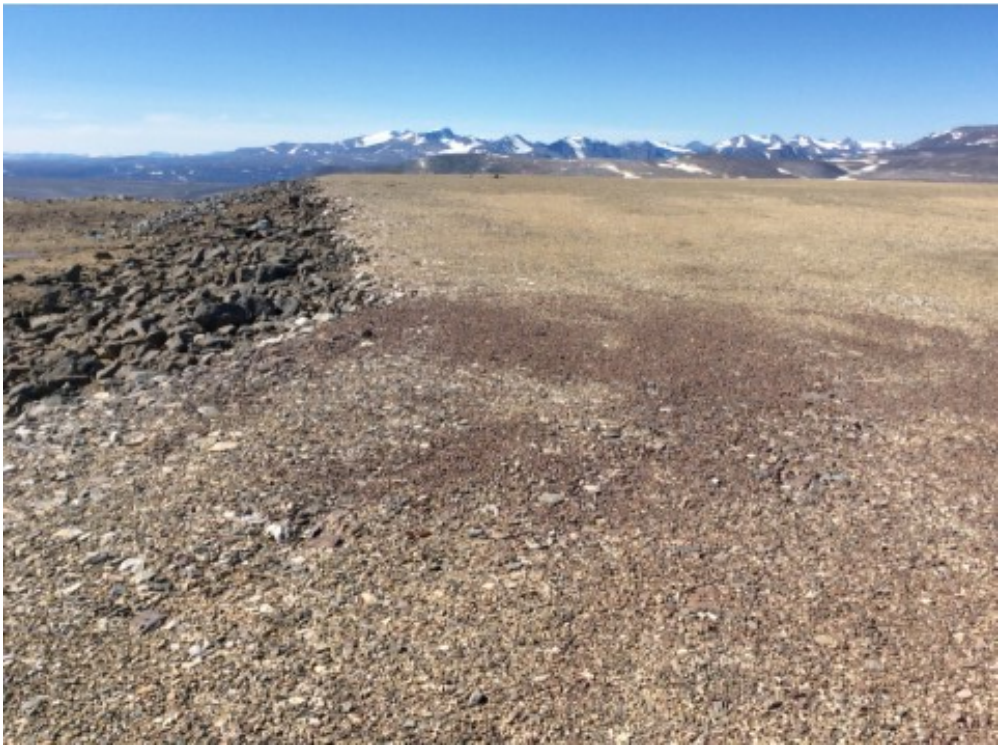


Photo 606: Upper Site Non-Hazardous Waste Landfill – Southeast crest, facing southwest (DYEM_Photo666.jpg)



Photo 607: Upper Site Non-Hazardous Waste Landfill – South slope and crest, facing west (DYEM_Photo653.jpg)



Photo 608: Upper Site Non-Hazardous Waste Landfill – South slope and toe (eastern portion), facing southeast (DYEM_Photo667.jpg)

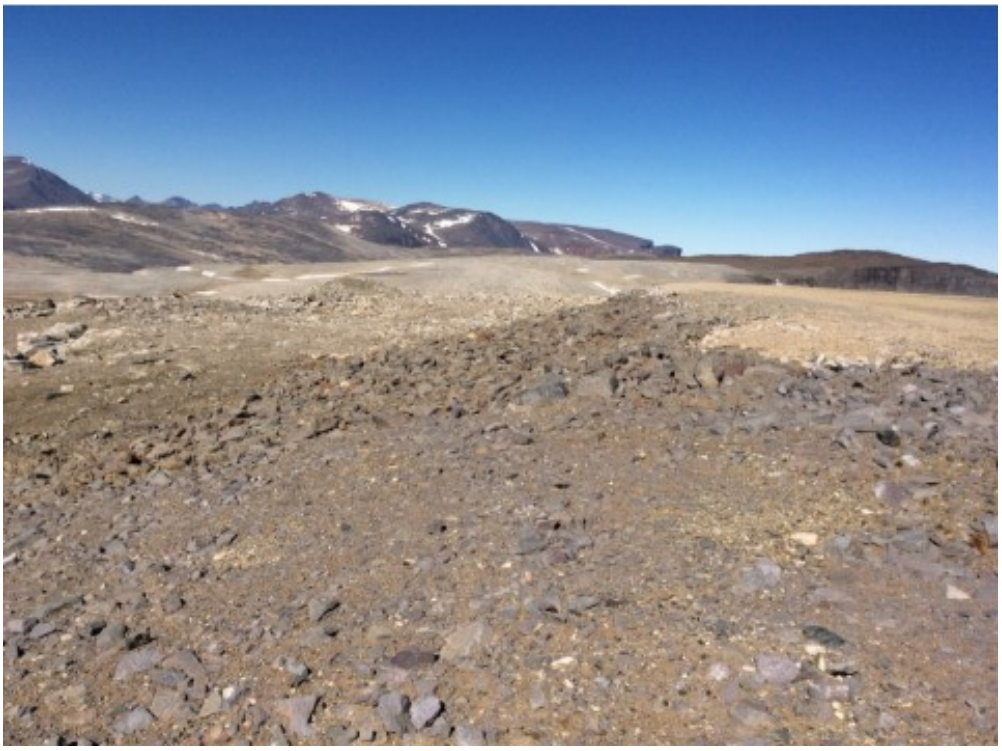


Photo 609: Upper Site Non-Hazardous Waste Landfill – Southwest slope, facing northwest (DYEM_Photo655.jpg)



Photo 610: Upper Site Non-Hazardous Waste Landfill – West crest, facing southwest (DYEM_Photo659.jpg)



Photo 611: Upper Site Non-Hazardous Waste Landfill – West slope and crest, facing northeast (DYEM_Photo657.jpg)



Photo 612: Upper Site Non-Hazardous Waste Landfill – East slope, facing east (DYEM_Photo110.jpg)



Photo 613: *Upper Site Non-Hazardous Waste Landfill – Southeast corner of crest, Feature B1 – Area of segregation, facing northwest (Acceptable) (DYEM_Photo109.jpg)*

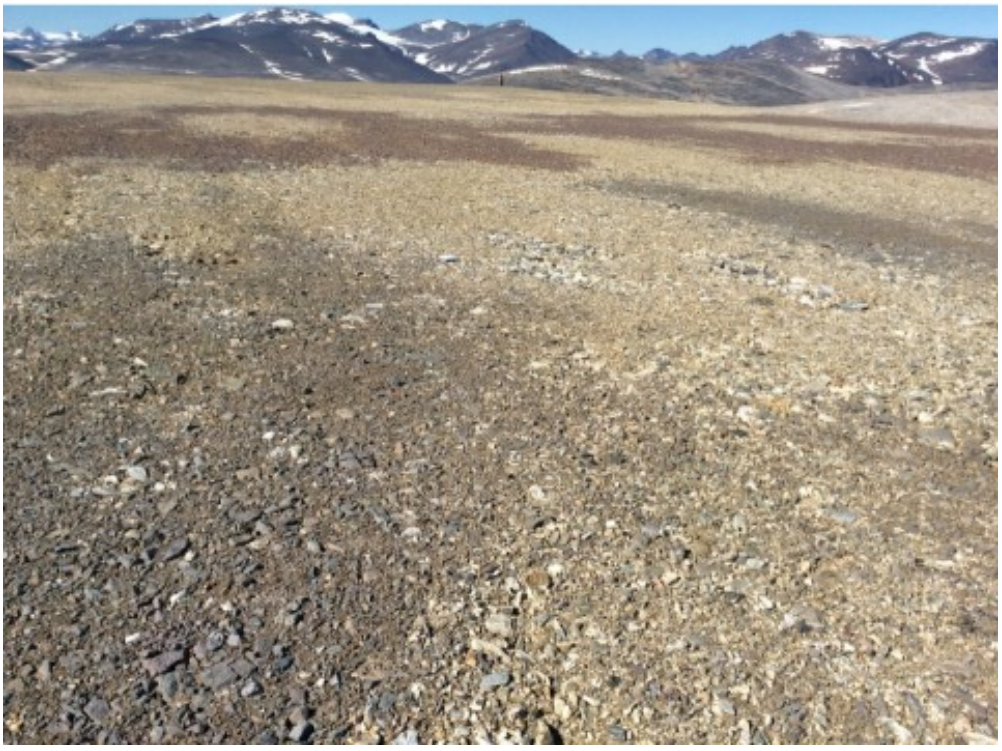


Photo 614: *Upper Site Non-Hazardous Waste Landfill – Cover surface, Feature B2 – Area of segregation, facing southwest (Acceptable) (DYEM_Photo107.jpg)*



Photo 615: *Upper Site Non-Hazardous Waste Landfill – Surface cover north of warehouse, Feature B3 – Area of segregation, facing south (Acceptable) (DYEM_Photo108.jpg)*



Photo 616: *Upper Site Non-Hazardous Waste Landfill – Cover surface, along East crest, Feature E – Minor tension cracking, facing northeast (Acceptable) (DYEM_Photo111.jpg)*



Photo 617: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-18 – Before excavation (DYEM_Photo325.jpg)



Photo 618: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-18 – After excavation (DYEM_Photo331.jpg)



Photo 619: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-18 – After backfilling (DYEM_Photo332.jpg)



Photo 620: Upper Site Non-Hazardous Waste Landfill – Water Sample MW06-18 (DYEM_Photo326.jpg)



Photo 621: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-19 – Before excavation (DYEM_Photo337.jpg)



Photo 622: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-19 – After excavation (DYEM_Photo339.jpg)



Photo 623: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-19 – After backfilling (DYEM_Photo340.jpg)



Photo 624: Upper Site Non-Hazardous Waste Landfill – Water Sample MW06-19 (DYEM_Photo338.jpg)



Photo 625: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-20 – Before excavation (DYEM_Photo333.jpg)



Photo 626: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-20 – After excavation (DYEM_Photo335.jpg)



Photo 627: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW06-20 – After backfilling (DYEM_Photo336.jpg)



Photo 628: Upper Site Non-Hazardous Waste Landfill – Water Sample MW06-20 (DYEM_Photo334.jpg)



Photo 629: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW07-21 – Before excavation (DYEM_Photo327.jpg)



Photo 630: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW07-21 – After excavation (DYEM_Photo329.jpg)



Photo 631: Upper Site Non-Hazardous Waste Landfill – Soil Sample MW07-21 – After backfilling (DYEM_Photo330.jpg)



Photo 632: Upper Site Non-Hazardous Waste Landfill – Water Sample MW07-21 (DYEM_Photo328.jpg)



Photo 633: *Upper Site NWS Landfill – Cover surface, facing north (DYEM_Photo699.jpg)*



Photo 634: *Upper Site NWS Landfill – Cover surface, facing northwest (DYEM_Photo700.jpg)*



Photo 635: *Upper Site NWS Landfill – Cover surface, facing southeast (DYEM_Photo701.jpg)*



Photo 636: *Upper Site NWS Landfill – Cover surface, facing southeast (DYEM_Photo704.jpg)*



Photo 637: Upper Site NWS Landfill – Cover surface, facing northwest (DYEM_Photo705.jpg)



Photo 638: Upper Site NWS Landfill – Cover surface, facing west (DYEM_Photo706.jpg)



Photo 639: *Upper Site NWS Landfill – Cover surface, facing southeast (DYEM_Photo707.jpg)*



Photo 640: *Upper Site NWS Landfill – Cover surface, facing east (DYEM_Photo712.jpg)*



Photo 641: Upper Site NWS Landfill – Cover surface, facing west (DYEM_Photo715.jpg)



Photo 642: Upper Site NWS Landfill – East crest, facing north (DYEM_Photo697.jpg)



Photo 643: Upper Site NWS Landfill – East crest and slope, facing south (DYEM_Photo714.jpg)



Photo 644: Upper Site NWS Landfill – East toe and road, facing south (DYEM_Photo716.jpg)



Photo 645: Upper Site NWS Landfill – Internal south slope, facing northwest (DYEM_Photo703.jpg)



Photo 646: Upper Site NWS Landfill – North crest, facing northwest (DYEM_Photo711.jpg)



Photo 647: Upper Site NWS Landfill – North crest, facing southeast (DYEM_Photo713.jpg)



Photo 648: Upper Site NWS Landfill – Northwest slope, facing southwest (DYEM_Photo710.jpg)



Photo 649: Upper Site NWS Landfill – South crest, facing northwest (DYEM_Photo698.jpg)



Photo 650: Upper Site NWS Landfill – South slope at west end, facing east (DYEM_Photo708.jpg)



Photo 651: Upper Site NWS Landfill – South toe, facing southeast (DYEM_Photo702.jpg)



Photo 652: Upper Site NWS Landfill – West slope, facing north (DYEM_Photo709.jpg)



Photo 653: *Upper Site NWS Landfill – Lower south slope, Feature B – Partially buried steel cable, facing north (Acceptable) (DYEM_Photo125.jpg)*



Photo 654: *Upper Site NWS Landfill – South slope, Feature C – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo131.jpg)*



Photo 655: Upper Site NWS Landfill – South slope, Feature C – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo130.jpg)



Photo 656: Upper Site NWS Landfill – South slope, Feature C – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo129.jpg)



Photo 657: *Upper Site NWS Landfill – South slope, Feature C – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo128.jpg)*



Photo 658: *Upper Site NWS Landfill – South slope, Feature C – Minor self-armouring erosion area, facing southwest (Acceptable) (DYEM_Photo127.jpg)*



Photo 659: *Upper Site NWS Landfill – West end of cover surface, Feature D – Minor self-armouring erosion, facing east (Acceptable) (DYEM_Photo132.jpg)*



Photo 660: *Upper Site NWS Landfill – South slope, Feature E, facing southeast (Acceptable) (DYEM_Photo126.jpg)*



Photo 661: Upper Site NWS Landfill – Soil Sample DM-18 – Before excavation (DYEM_Photo378.jpg)



Photo 662: Upper Site NWS Landfill – Soil Sample DM-18 – After excavation (DYEM_Photo379.jpg)



Photo 663: Upper Site NWS Landfill – Soil Sample DM-18 – After backfilling (DYEM_Photo382.jpg)



Photo 664: Upper Site NWS Landfill – Soil Sample DM-19 – Before excavation (DYEM_Photo368.jpg)



Photo 665: Upper Site NWS Landfill – Soil Sample DM-19 – After excavation (DYEM_Photo370.jpg)



Photo 666: Upper Site NWS Landfill – Soil Sample DM-19 – After backfilling (DYEM_Photo371.jpg)



Photo 667: Upper Site NWS Landfill – Soil Sample DM-20 – Before excavation (DYEM_Photo369.jpg)



Photo 668: Upper Site NWS Landfill – Soil Sample DM-20 – After excavation (DYEM_Photo373.jpg)



Photo 669: *Upper Site NWS Landfill – Soil Sample DM-20 – After backfilling (DYEM_Photo374.jpg)*



Photo 670: *Upper Site NWS Landfill – Soil Sample DM-21 – Before excavation (DYEM_Photo372.jpg)*



Photo 671: Upper Site NWS Landfill – Soil Sample DM-21 – After excavation (DYEM_Photo375.jpg)



Photo 672: Upper Site NWS Landfill – Soil Sample DM-21 – After backfilling (DYEM_Photo376.jpg)



Photo 673: Upper Site NWS Landfill – Soil Sample DM-22 – Before excavation (DYEM_Photo377.jpg)



Photo 674: Upper Site NWS Landfill – Soil Sample DM-22 – After excavation (DYEM_Photo380.jpg)



Photo 675: *Upper Site NWS Landfill – Soil Sample DM-22 – After backfilling (DYEM_Photo381.jpg)*



Photo 676: *Upper Site South Landfill West – Cover surface, facing east (DYEM_Photo676.jpg)*



Photo 677: Upper Site South Landfill West – Cover surface, facing northwest (DYEM_Photo677.jpg)



Photo 678: Upper Site South Landfill West – Cover surface, facing south (DYEM_Photo678.jpg)



Photo 679: Upper Site South Landfill West – Cover surface, facing northeast (DYEM_Photo681.jpg)



Photo 680: Upper Site South Landfill West – Cover surface, facing northeast (DYEM_Photo682.jpg)

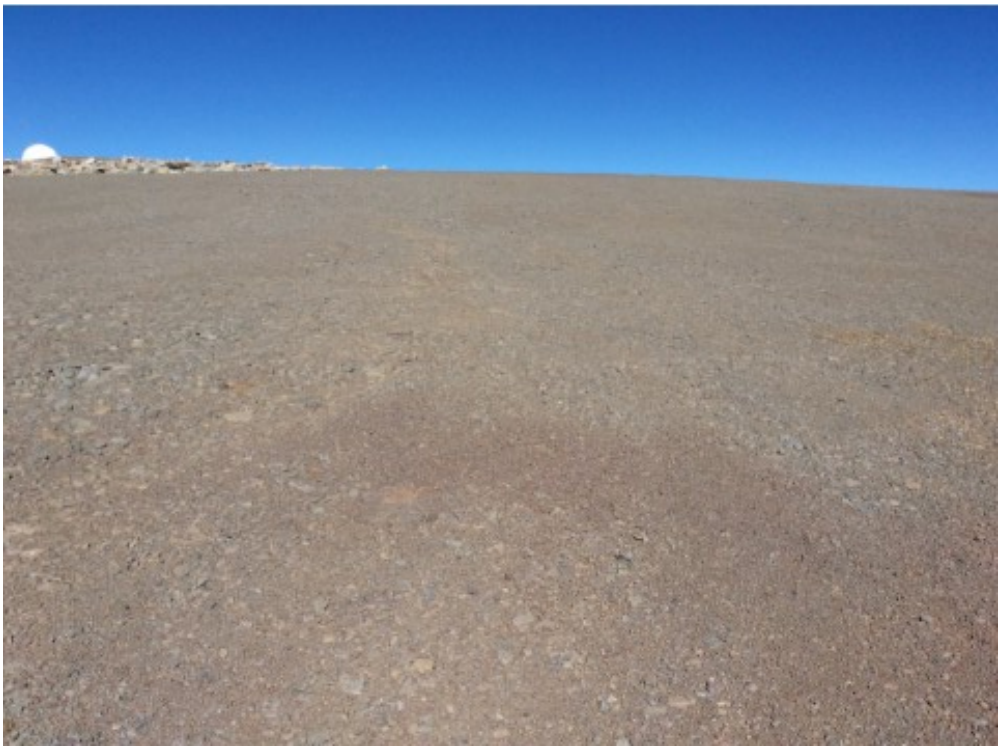


Photo 681: *Upper Site South Landfill West – Cover surface from southwest corner, facing northeast (DYEM_Photo686.jpg)*



Photo 682: *Upper Site South Landfill West – Cover surface, facing southwest (DYEM_Photo689.jpg)*



Photo 683: Upper Site South Landfill West – Cover surface, facing southwest (DYEM_Photo690.jpg)



Photo 684: Upper Site South Landfill West – Cover surface, facing south (DYEM_Photo691.jpg)



Photo 685: Upper Site South Landfill West – Cover surface, facing southeast (DYEM_Photo694.jpg)



Photo 686: Upper Site South Landfill West – Cover surface, facing east (DYEM_Photo695.jpg)



Photo 687: Upper Site South Landfill West – Cover surface east side, facing south (DYEM_Photo696.jpg)



Photo 688: Upper Site South Landfill West – East crest, facing south (DYEM_Photo673.jpg)



Photo 689: *Upper Site South Landfill West – Internal East slope, facing northeast (DYEM_Photo683.jpg)*



Photo 690: *Upper Site South Landfill West – North crest, facing southwest (DYEM_Photo692.jpg)*



Photo 691: Upper Site South Landfill West – North crest, facing southeast (DYEM_Photo693.jpg)



Photo 692: Upper Site South Landfill West – North slope, facing northeast (DYEM_Photo688.jpg)

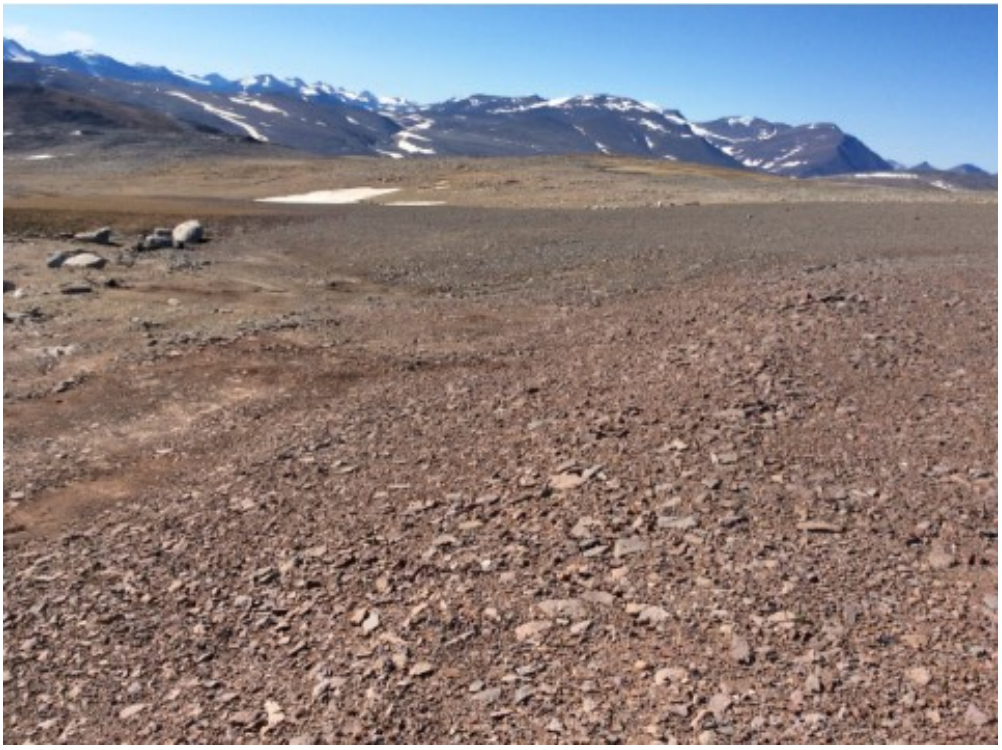


Photo 693: Upper Site South Landfill West – South crest, mid-point, facing west (DYEM_Photo680.jpg)



Photo 694: Upper Site South Landfill West – South slope, east end, facing northwest (DYEM_Photo674.jpg)



Photo 695: Upper Site South Landfill West – South slope, facing east (DYEM_Photo675.jpg)



Photo 696: Upper Site South Landfill West – South slope and toe, near mid-point, facing east (DYEM_Photo679.jpg)



Photo 697: Upper Site South Landfill West – South slope and toe, near west end, facing east (DYEM_Photo684.jpg)

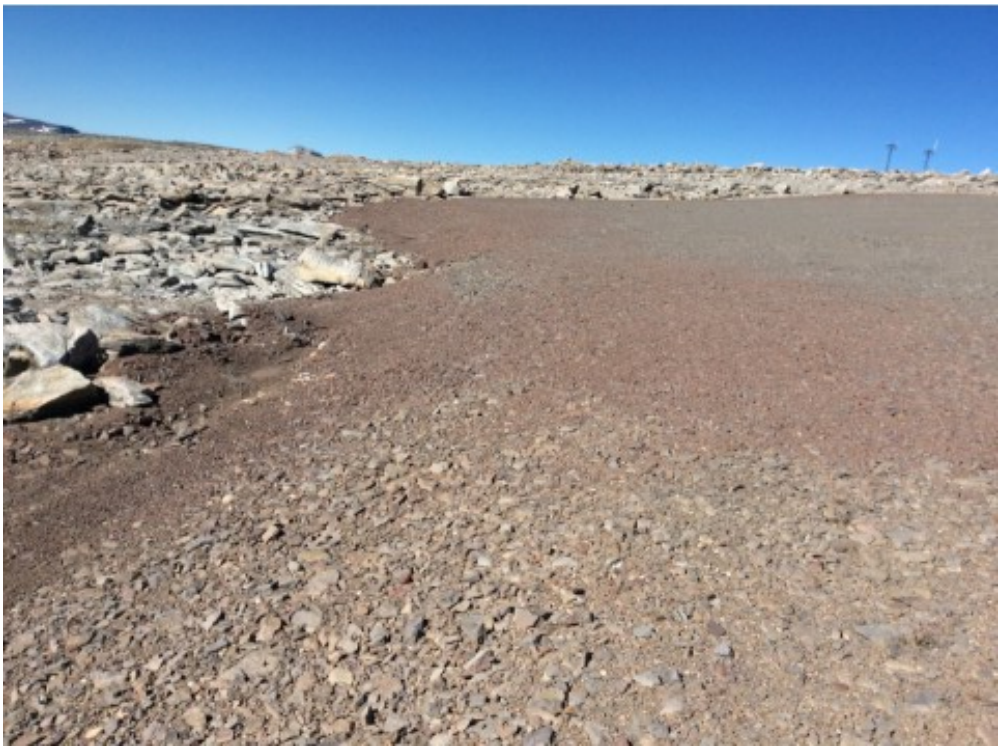


Photo 698: Upper Site South Landfill West – West slope, facing north (DYEM_Photo685.jpg)

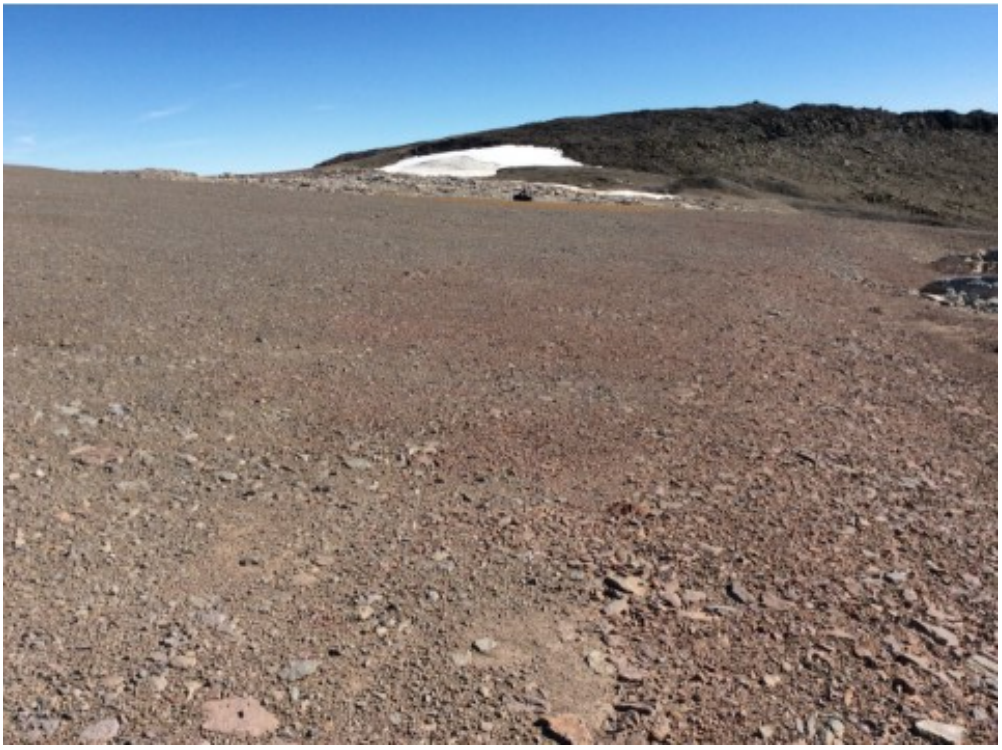


Photo 699: Upper Site South Landfill West – West slope, facing southeast (DYEM_Photo687.jpg)



Photo 700: Upper Site South Landfill West – South slope, Feature A – Very sparse vegetation, facing east (Acceptable) (DYEM_Photo120.jpg)



Photo 701: *Upper Site South Landfill West – Cover surface, Feature C – Minor self-armouring erosion with accumulation of fines in a low area from erosion above, facing northeast (Acceptable) (DYEM_Photo122.jpg)*

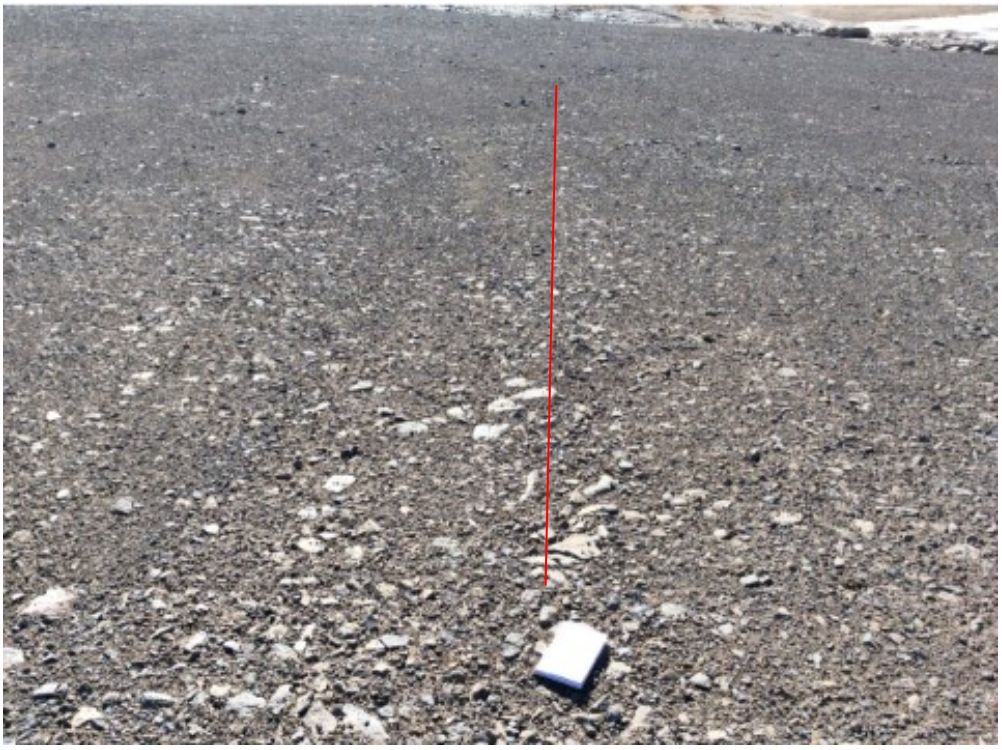


Photo 702: *Upper Site South Landfill West – Cover surface, Feature E – Minor self-armouring erosion with accumulation of fines below, facing southwest (Acceptable) (DYEM_Photo124.jpg)*

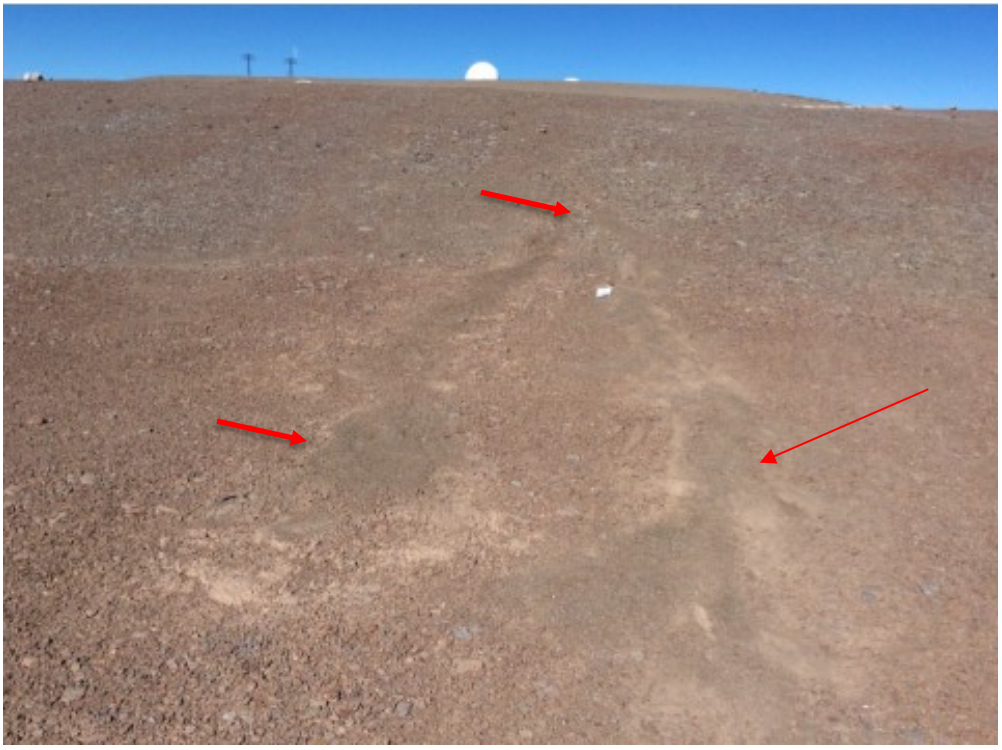


Photo 703: *Upper Site South Landfill West – Cover surface, Feature F1 – Minor self-armouring erosion with fines washing downslope, facing northeast (Acceptable) (DYEM_Photo114.jpg)*

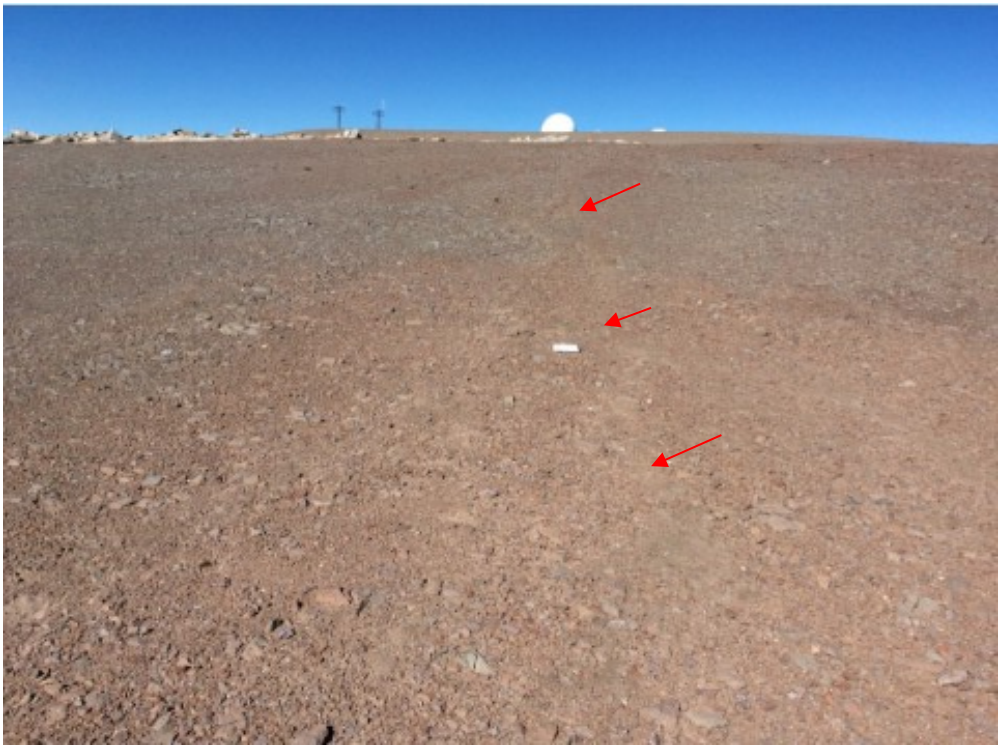


Photo 704: *Upper Site South Landfill West – Cover surface, Feature G – Minor self-armouring erosion, facing northeast (Acceptable) (DYEM_Photo117.jpg)*



Photo 705: Upper Site South Landfill West – Cover surface, Feature H – Minor self-armouring erosion channel, facing southwest (Acceptable) (DYEM_Photo121.jpg)

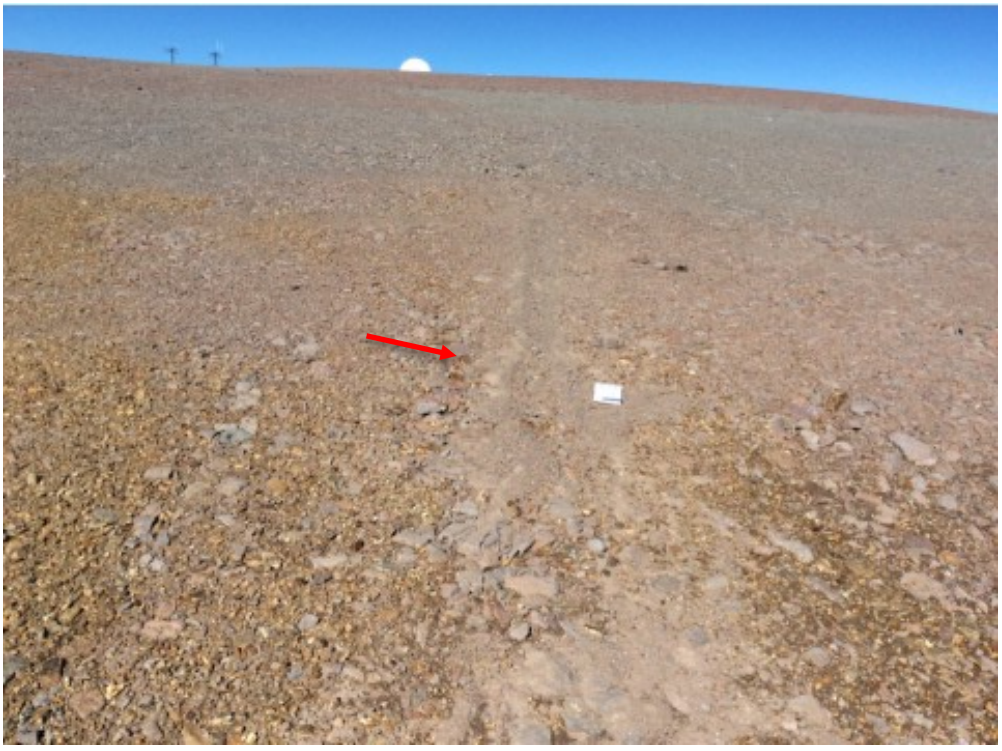


Photo 706: Upper Site South Landfill West – Cover surface, Feature I – Minor self-armouring erosion, facing north (Acceptable) (DYEM_Photo113.jpg)

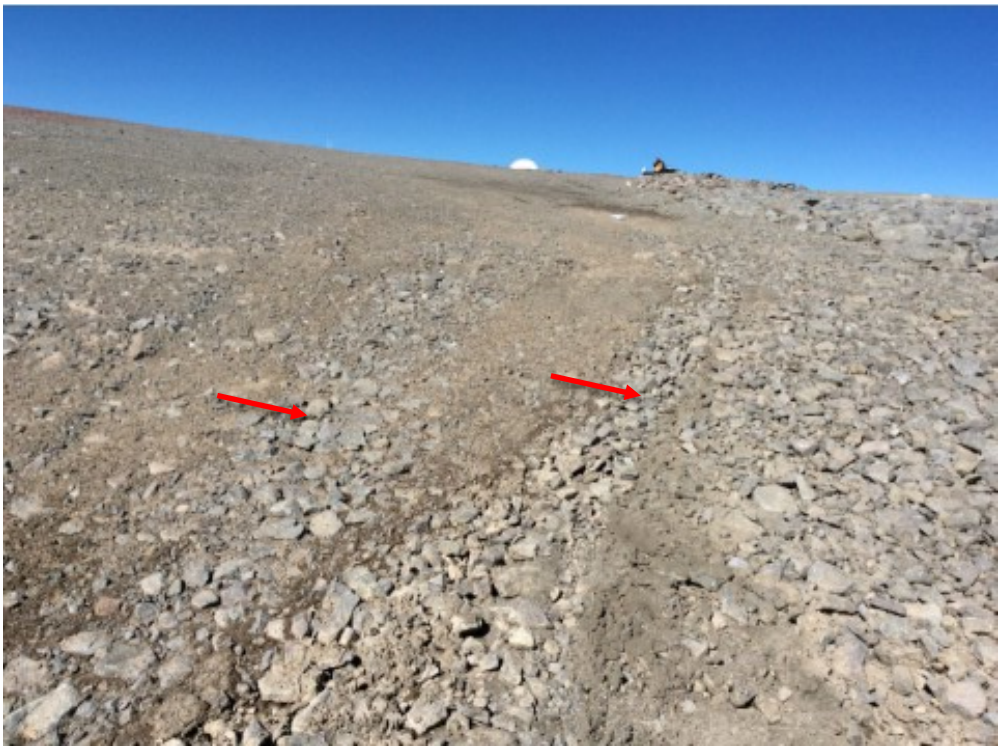


Photo 707: Upper Site South Landfill West – Cover surface, Feature J – Area of self-armouring erosion that appears to be stabilizing, facing north (Acceptable) (DYEM_Photo112.jpg)



Photo 708: Upper Site South Landfill West – Cover surface, Feature K – Very sparse vegetation, facing southeast (Acceptable) (DYEM_Photo116.jpg)



Photo 709: *Upper Site South Landfill West – North crest, (Minor tension cracking not observed in 2017), facing southwest (DYEM_Photo123.jpg)*

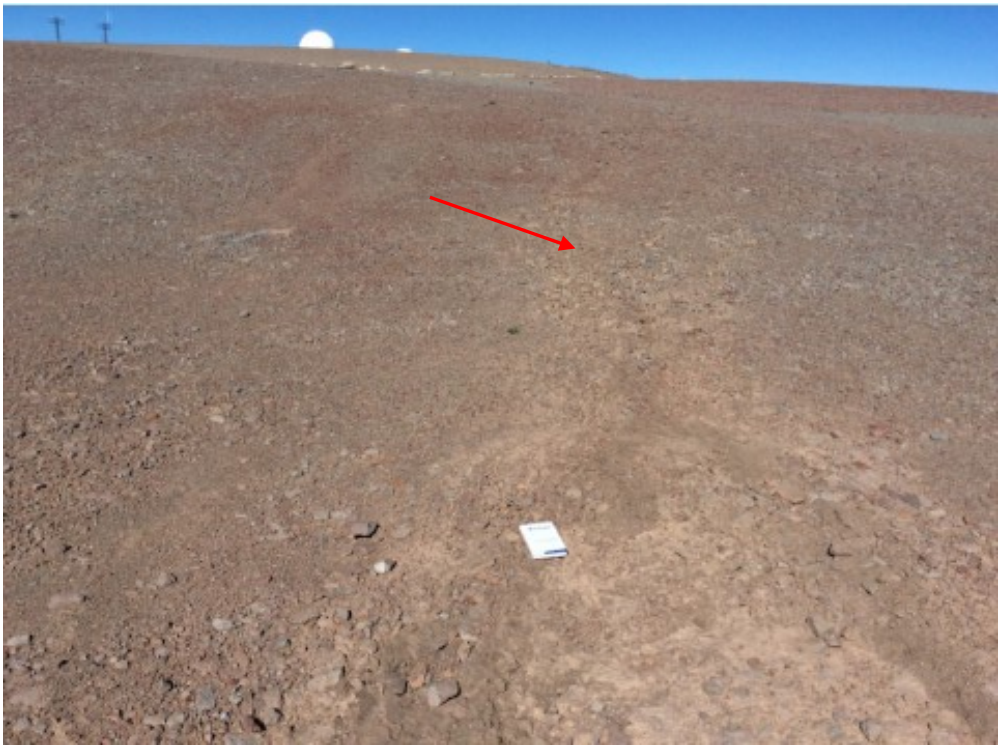


Photo 710: *Upper Site South Landfill West – Cover surface, Feature F2 – New minor self-armouring erosion with fines washing downslope, facing northeast (Acceptable) (DYEM_Photo115.jpg)*



Photo 711: Upper Site South Landfill West – South slope, Feature M – Self-armouring erosion, facing north (Acceptable) (DYEM_Photo118.jpg)

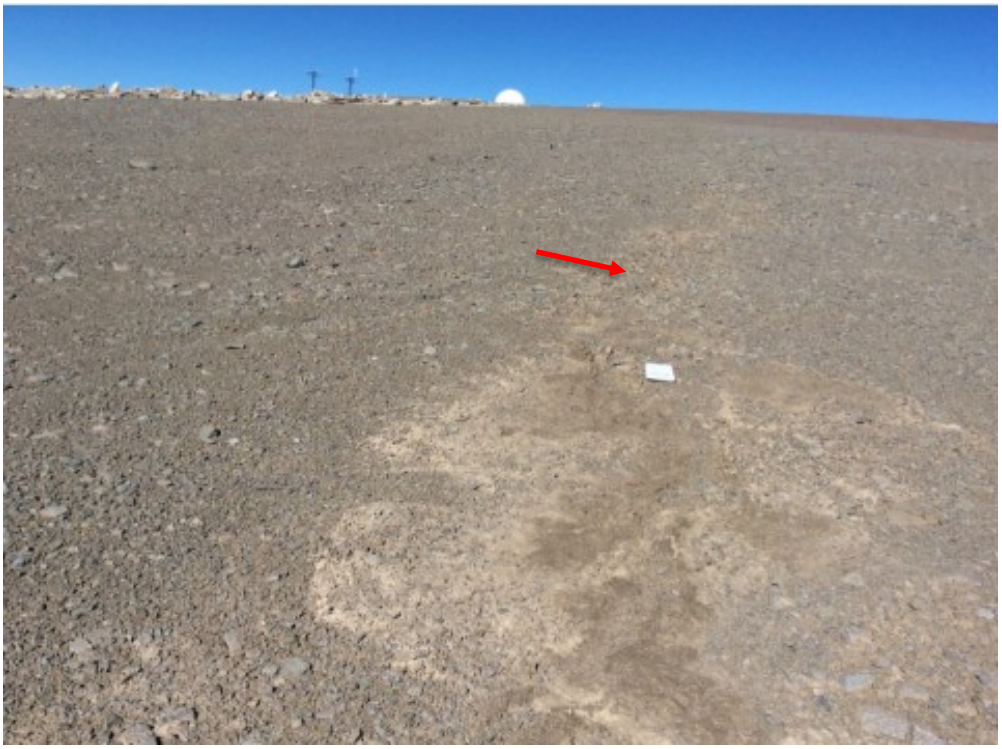


Photo 712: Upper Site South Landfill West – Cover surface, Feature N – New self-armouring erosion, facing northeast (Acceptable) (DYEM_Photo119.jpg)



Photo 713: Upper Site South Landfill West – Soil Sample DM-23 – Before excavation (DYEM_Photo365.jpg)



Photo 714: Upper Site South Landfill West – Soil Sample DM-23 – After excavation (DYEM_Photo366.jpg)



Photo 715: Upper Site South Landfill West – Soil Sample DM-23 – After backfilling (DYEM_Photo367.jpg)



Photo 716: Upper Site South Landfill West – Soil Sample DM-24 – Before excavation (DYEM_Photo344.jpg)



Photo 717: Upper Site South Landfill West – Soil Sample DM-24 – After excavation (DYEM_Photo345.jpg)



Photo 718: Upper Site South Landfill West – Soil Sample DM-24 – After backfilling (DYEM_Photo346.jpg)



Photo 719: *Upper Site South Landfill West – Soil Sample DM-25 – Before excavation – Wet area with orange coloured soil and running water (Feature O) (DYEM_Photo347.jpg)*



Photo 720: *Upper Site South Landfill West – Soil Sample DM-25 – After excavation (DYEM_Photo349.jpg)*



Photo 721: Upper Site South Landfill West – Soil Sample DM-25 – After backfilling (DYEM_Photo350.jpg)



Photo 722: Upper Site South Landfill West – Soil Sample DM-26 – Before excavation (DYEM_Photo348.jpg)



Photo 723: Upper Site South Landfill West – Soil Sample DM-26 – After excavation (DYEM_Photo351.jpg)



Photo 724: Upper Site South Landfill West – Soil Sample DM-26 – After backfilling (DYEM_Photo352.jpg)



Photo 725: Upper Site South Landfill West – Soil Sample DM-27 – Before excavation (DYEM_Photo353.jpg)



Photo 726: Upper Site South Landfill West – Soil Sample DM-27 – After excavation (DYEM_Photo355.jpg)



Photo 727: Upper Site South Landfill West – Soil Sample DM-27 – After backfilling (DYEM_Photo356.jpg)



Photo 728: Upper Site South Landfill West – Soil Sample DM-28 – Before excavation (DYEM_Photo354.jpg)



Photo 729: Upper Site South Landfill West – Soil Sample DM-28 – After excavation (DYEM_Photo360.jpg)



Photo 730: Upper Site South Landfill West – Soil Sample DM-28 – After backfilling (DYEM_Photo361.jpg)



Photo 731: Upper Site South Landfill West – Soil Sample DM-29 – Before excavation (DYEM_Photo357.jpg)



Photo 732: Upper Site South Landfill West – Soil Sample DM-29 – After excavation (DYEM_Photo358.jpg)



Photo 733: Upper Site South Landfill West – Soil Sample DM-29 – After backfilling (DYEM_Photo359.jpg)



Photo 734: Upper Site South Landfill West – Soil Sample DM-30 – Before excavation (DYEM_Photo362.jpg)



Photo 735: Upper Site South Landfill West – Soil Sample DM-30 – After excavation (DYEM_Photo363.jpg)



Photo 736: Upper Site South Landfill West – Soil Sample DM-30 – After backfilling (DYEM_Photo364.jpg)



Photo 737: Upper Site Helipad Landfill – Cover surface, facing west (DYEM_Photo718.jpg)



Photo 738: Upper Site Helipad Landfill – Cover surface, facing north (DYEM_Photo723.jpg)



Photo 739: *Upper Site Helipad Landfill – Cover surface from south crest, facing northeast (DYEM_Photo725.jpg)*



Photo 740: *Upper Site Helipad Landfill – Cover surface, facing south (DYEM_Photo727.jpg)*



Photo 741: *Upper Site Helipad Landfill – Cover surface, facing southeast (DYEM_Photo728.jpg)*



Photo 742: *Upper Site Helipad Landfill – Northeast crest, facing southeast (Feature D1 – Tire tracks - Acceptable) (DYEM_Photo721.jpg)*



Photo 743: *Upper Site Helipad Landfill – North crest west end, facing east (DYEM_Photo719.jpg)*



Photo 744: *Upper Site Helipad Landfill – South slope, facing northeast (DYEM_Photo722.jpg)*



Photo 745: Upper Site Helipad Landfill – South slope, facing west (DYEM_Photo724.jpg)



Photo 746: Upper Site Helipad Landfill – West slope and toe, facing south (DYEM_Photo720.jpg)



Photo 747: Upper Site Helipad Landfill – West slope, facing north (DYEM_Photo717.jpg)

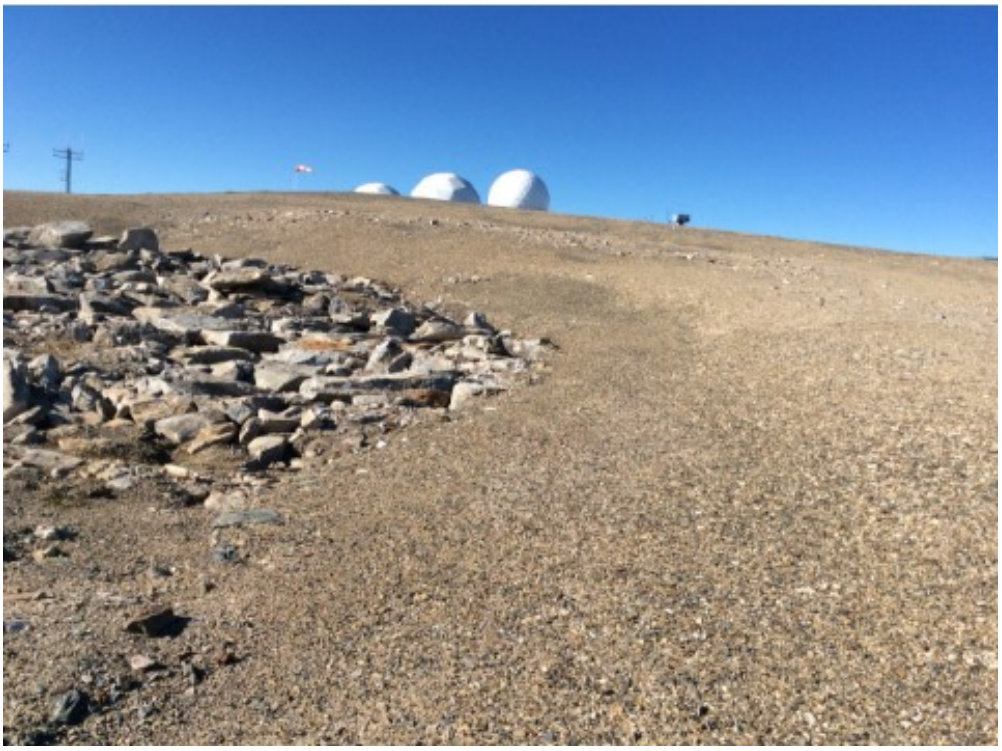


Photo 748: Upper Site Helipad Landfill – West slope, facing north (DYEM_Photo726.jpg)



Photo 749: *Upper Site Helipad Landfill – Cover surface, facing west, Feature A – Minor settlement area (Acceptable) (DYEM_Photo138.jpg)*



Photo 750: *Upper Site Helipad Landfill – South slope, Feature B – Rough area, facing northwest (Acceptable) (DYEM_Photo139.jpg)*



Photo 751: *Upper Site Helipad Landfill – Cover surface, Feature C – Minor settlement, facing southeast (Acceptable) (DYEM_Photo134.jpg)*



Photo 752: *Upper Site Helipad Landfill – Cover surface, Feature D1 – Tire tracks, facing southwest (Acceptable) (DYEM_Photo135.jpg)*



Photo 753: *Upper Site Helipad Landfill – West slope, Feature D2 – New tire tracks, facing northeast (Acceptable) (DYEM_Photo133.jpg)*



Photo 754: *Upper Site Helipad Landfill – North west corner, facing north, Feature E – New settlement/depression area (Acceptable) (DYEM_Photo136.jpg)*



Photo 755: *Upper Site Helipad Landfill – Cover surface, Feature F – Staining, facing south (Acceptable) (DYEM_Photo137.jpg)*



Photo 756: *Upper Site Helipad Landfill – Soil Sample DM-11 – Before excavation (DYEM_Photo462.jpg)*



Photo 757: Upper Site Helipad Landfill – Soil Sample DM-11 – After excavation (DYEM_Photo463.jpg)



Photo 758: Upper Site Helipad Landfill – Soil Sample DM-11 – After backfilling (DYEM_Photo464.jpg)



Photo 759: *Upper Site Helipad Landfill – Soil Sample DM-12 – Before excavation (DYEM_Photo447.jpg)*



Photo 760: *Upper Site Helipad Landfill – Soil Sample DM-12 – After excavation (DYEM_Photo448.jpg)*



Photo 761: Upper Site Helipad Landfill – Soil Sample DM-12 – After backfilling (DYEM_Photo449.jpg)



Photo 762: Upper Site Helipad Landfill – Soil Sample DM-13 – Before excavation (DYEM_Photo450.jpg)



Photo 763: Upper Site Helipad Landfill – Soil Sample DM-13 – After excavation (DYEM_Photo451.jpg)



Photo 764: Upper Site Helipad Landfill – Soil Sample DM-13 – After backfilling (DYEM_Photo452.jpg)



Photo 765: Upper Site Helipad Landfill – Soil Sample DM-14 – Before excavation (DYEM_Photo453.jpg)



Photo 766: Upper Site Helipad Landfill – Soil Sample DM-14 – After excavation (DYEM_Photo454.jpg)



Photo 767: Upper Site Helipad Landfill – Soil Sample DM-14 – After backfilling (DYEM_Photo455.jpg)



Photo 768: Upper Site Helipad Landfill – Soil Sample DM-15 – Before excavation (DYEM_Photo456.jpg)



Photo 769: Upper Site Helipad Landfill – Soil Sample DM-15 – After excavation (DYEM_Photo457.jpg)



Photo 770: Upper Site Helipad Landfill – Soil Sample DM-15 – After backfilling (DYEM_Photo458.jpg)



Photo 771: Upper Site Helipad Landfill – Soil Sample DM-16 – Before excavation (DYEM_Photo459.jpg)



Photo 772: Upper Site Helipad Landfill – Soil Sample DM-16 – After excavation (DYEM_Photo460.jpg)



Photo 773: Upper Site Helipad Landfill – Soil Sample DM-16 – After backfilling (DYEM_Photo461.jpg)



Photo 774: Upper Site Helipad Landfill – Soil Sample DM-17 – Before excavation (DYEM_Photo341.jpg)



Photo 775: Upper Site Helipad Landfill – Soil Sample DM-17 – After excavation (DYEM_Photo342.jpg)



Photo 776: Upper Site Helipad Landfill – Soil Sample DM-17 – After backfilling (DYEM_Photo343.jpg)



Photo 777: *Aerial Photograph, Lower Site NWS Landfill (DYEM_Photo777.jpg)*

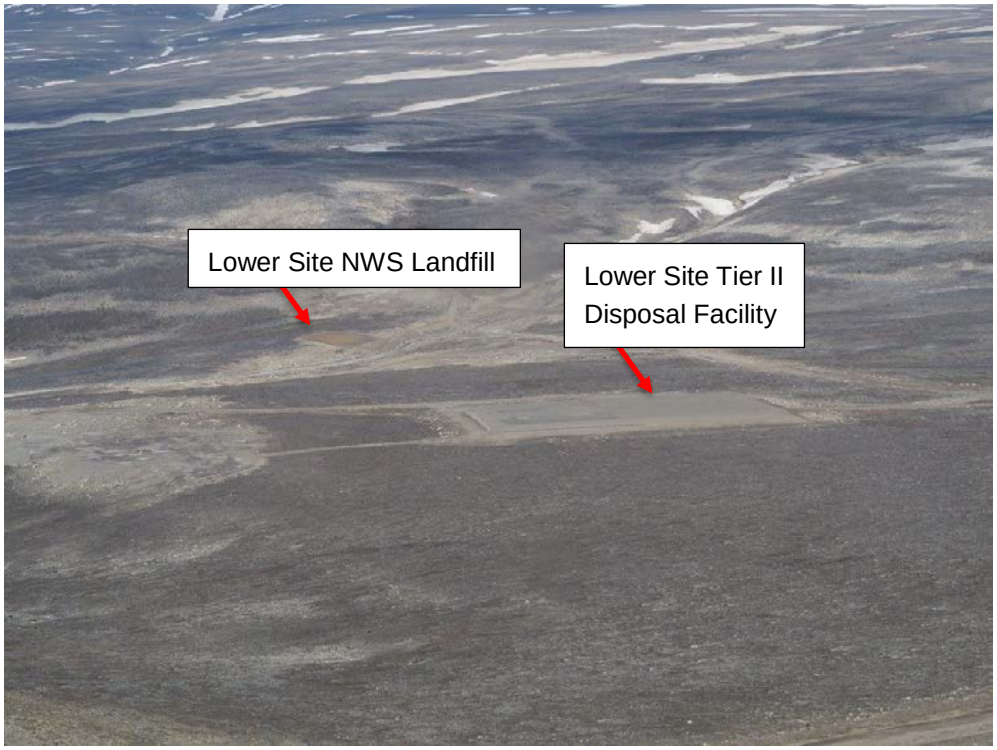


Photo 778: *Aerial Photograph, Lower Site Tier II Disposal Facility (foreground) and Lower Site NWS Landfill (background) (DYEM_Photo778.jpg)*



Photo 779: Aerial Photograph, West Landfill – West Lobe (DYEM_Photo779.jpg)

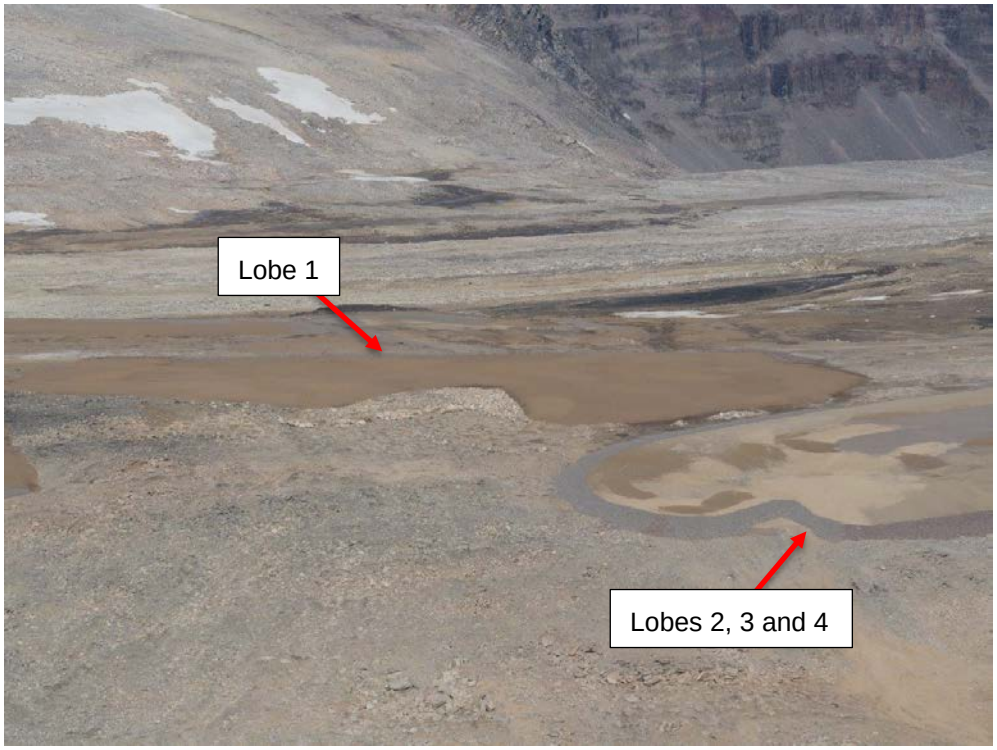


Photo 780: Aerial Photograph, Pallet Line Landfill – Lobes 1, 2, 3 and 4 (DYEM_Photo780.jpg)



Photo 781: Aerial Photograph, Upper Site Tier II Disposal Facility (DYEM_Photo781.jpg)



Photo 782: Aerial Photograph, Upper Site Non-Hazardous Waste Landfill (DYEM_Photo782.jpg)

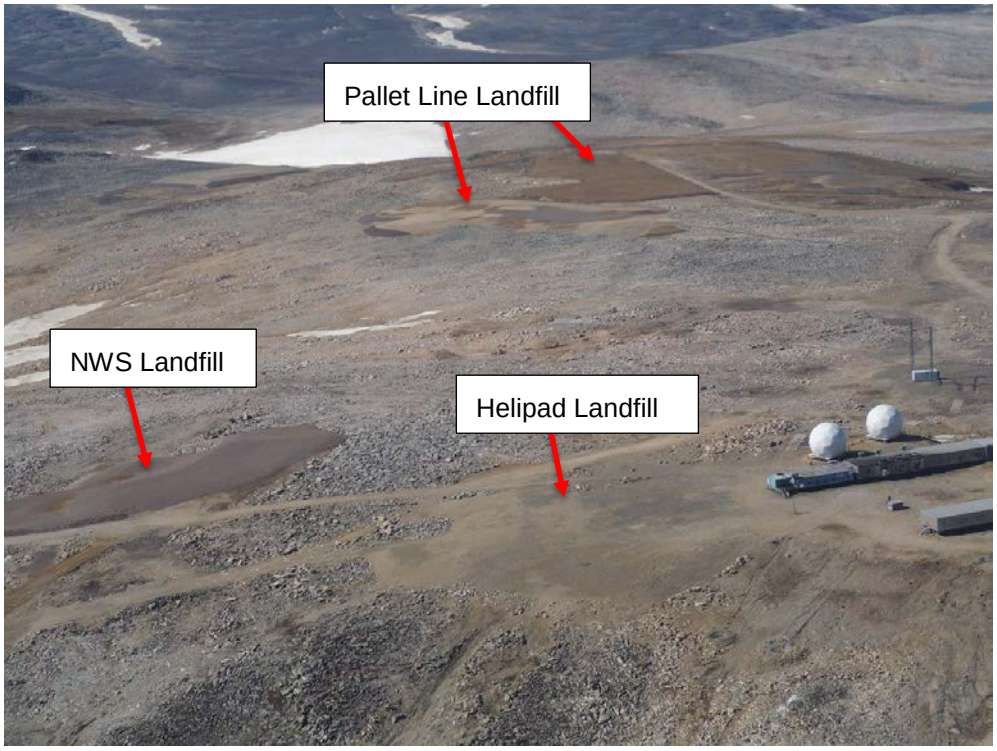


Photo 783: Aerial Photograph, Upper Site Helipad and NWS Landfills (foreground), Pallet Line Landfill (background) (DYEM_Photo783.jpg)



Photo 784: Aerial Photograph, Upper Site South Landfill West (foreground) and NWS Landfill (background) (DYEM_Photo784.jpg)

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