Environment

Defence Construction Canada

PIN-4 Byron Bay, Nunavut
Baseline Landfill Monitoring

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Revision #	Revised By	Date	Issue / Revision Description
0	Katie Scott	March 27, 2014	Final

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1. PIN-4 Byron Bay, Nunavut

1.1 Introduction

PIN-4, Byron Bay, is located on the south coast of Victoria Island, approximately 160 kilometres (km) west of Cambridge Bay (Ikaluktutiak), Nunavut. The site consists of a Station Area, an Airstrip Area, and a Beach Area on Dease Strait. The Airstrip is located approximately 5 km inland from Dease Strait or 8 km along the access road. The Station Area is approximately 300 metres (m) from the Airstrip, or 1.4 km along the road from the Airstrip Apron. The Beach Area is situated on the coast of the Dease Strait, southeast of the main station area, accessed by approximately 5 km of winding road.

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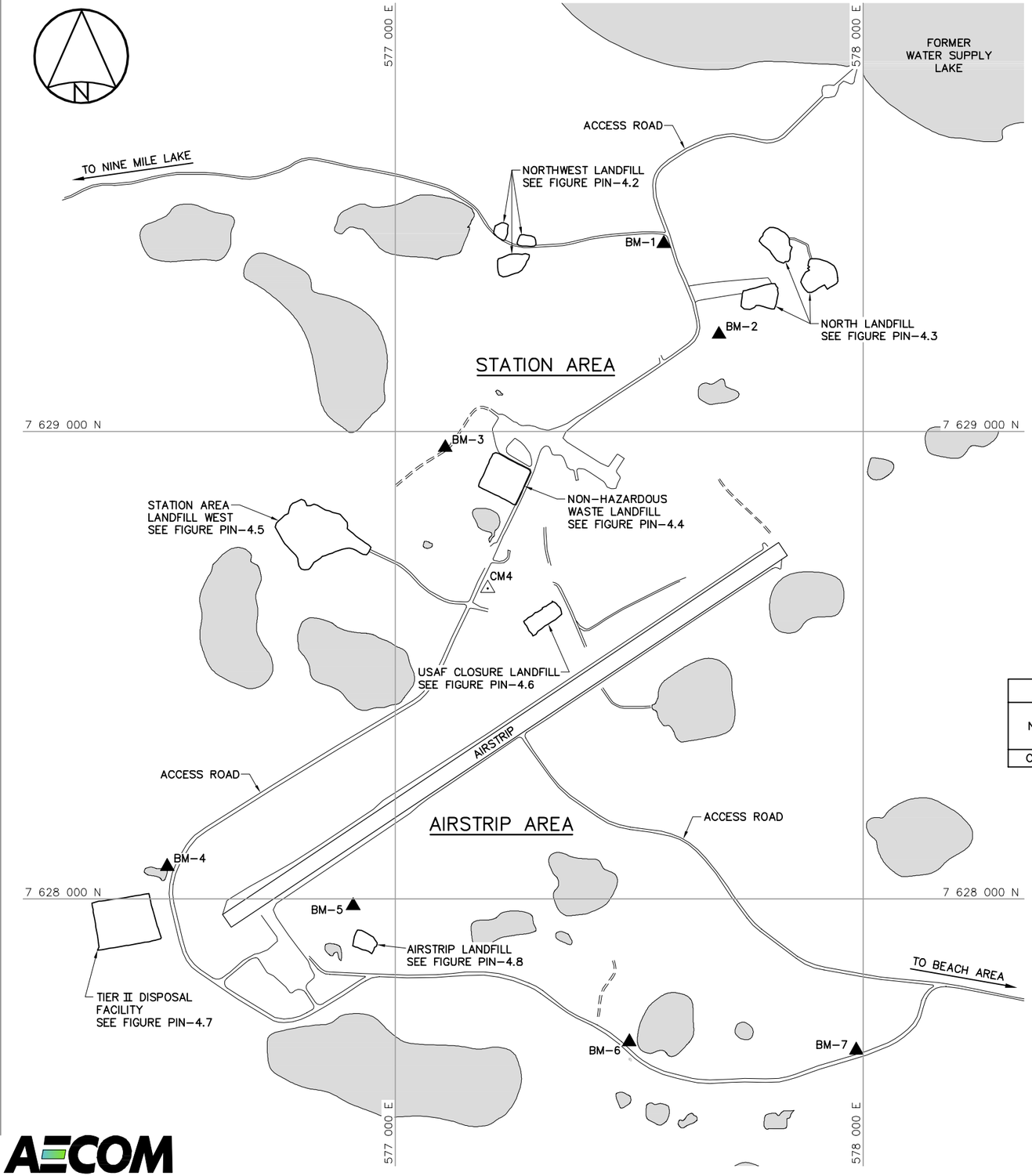
PIN-4 was constructed as an auxiliary site in the 1950s as part of the Distant Early Warning (DEW) Line system. It operated until the early 1990s until the DEW Line system was replaced by the more modern North Warning System (NWS). The PIN-4 DEW Line station was decommissioned and boarded up in August, 1993. None of the NWS facilities have been constructed at or near this former DEW Line station. (UMA 1991)

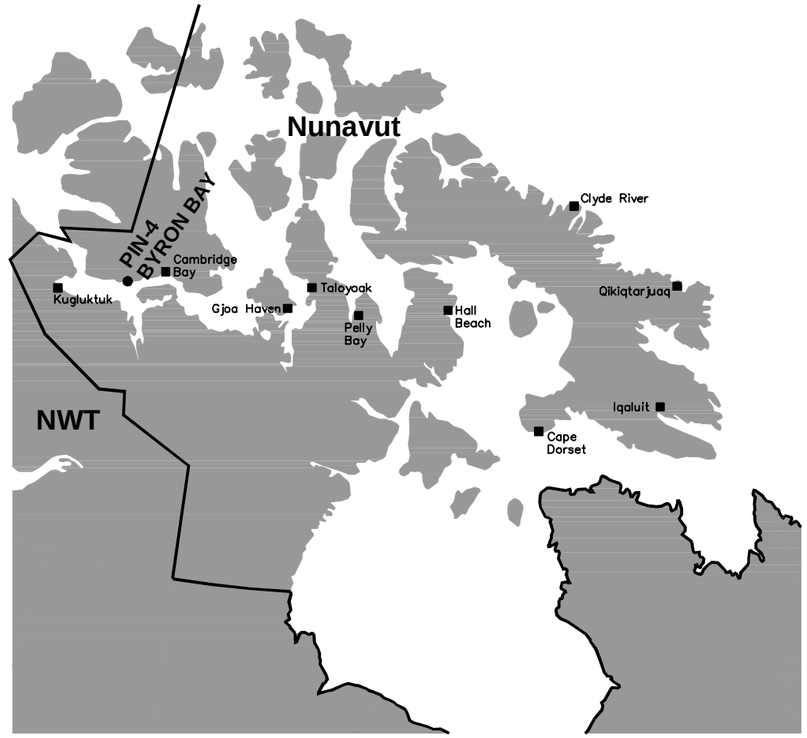
Site investigations were carried out at PIN-4 in 1990, 1992, 1993, and 2003 as part of an assessment of the environmental status of DEW Line installations. These investigations were carried out by UMA Engineering Ltd. (UMA, now AECOM) in 1990 and the Environmental Sciences Group (ESG) in 1992. Follow up investigations were completed by UMA in 1993, and by UMA and ESG in the summer of 2003 to provide data for detailed design and the development of construction and specifications required for the remediation of the PIN-4 site.

The remediation of PIN-4 began in 2009 and was completed in the summer of 2012. The cleanup included the remediation of six existing landfills as well as the construction of two new engineered landfill facilities: a Non-Hazardous Waste Landfill for the disposal of site debris and demolition waste, and a Tier II Disposal Facility for the disposal of metal and PCB contaminated soil. The existing landfills and new landfills, as shown on the overall site plan, Figure PIN-4.1, include:

- Northwest Landfill
- North Landfill
- Non-Hazardous Waste Landfill
- Station Area Landfill West
- USAF Closure Landfill
- Tier II Disposal Facility
- Airstrip Landfill

In accordance with the NTI-DND Cooperation Agreement, landfill monitoring is required at PIN-4 following the completion of remedial work. The landfills requiring monitoring are listed above and identified in Figure PIN-4.1 and are described in further detail below. The monitoring schedule for the PIN-4 Byron Bay site is provided in Table 1.1.





LOCATION OF BYRON BAY WITHIN NUNAVUT TERRITORY
SCALE: NTS

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM4	7 628 665.138	577 197.194	106.968	GEODETIC MONUMENT 649020

PERMANENT BENCHMARK (AS–BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM–1	7 629 402.938	577 573.748	105.711	25mm DIA. STEEL PIPE
BM–2	7 629 208.381	577 691.650	106.895	25mm DIA. STEEL PIPE
BM–3	7 628 966.171	577 106.215	102.610	25mm DIA. STEEL PIPE
BM–4	7 628 070.119	576 511.803	90.608	25mm DIA. STEEL PIPE
BM–5	7 627 986.564	576 909.188	87.778	25mm DIA. STEEL PIPE
BM–6	7 627 694.789	577 499.858	88.479	25mm DIA. STEEL PIPE
BM–7	7 627 677.411	577 985.417	88.710	25mm DIA. STEEL PIPE

RECORD DRAWING
NOT FOR CONSTRUCTION

0 100 200 m SCALE 1:10000

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- △CM4 — SURVEY CONTROL MONUMENT
- ▲BM–1 — PERMANENT BENCHMARK LOCATION (7)
- LIMIT OF LANDFILLS
- BODY OF WATER

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

LOCATION PLAN
FIGURE PIN-4.1

AECOM

Table 1.1: Monitoring Schedule – PIN-4 Byron Bay

No. Of Years After Construction	Monitoring Event Number	Year
Prior to and during*	Baseline	1990, 1992, 1993, 2003 & 2009-2012
1*	*1*	*2013*
2	2	2014
3	3	2015
4	4	2016
5	5	2017
7	6	2019
10	7	2022
15	8	2027
25	9	2037

* Monitoring events completed by the DEW Line Clean-up project team.

This report presents a summary of the baseline assessment work carried out at PIN-4, Byron Bay, and includes site investigation information as well as sample analytical data collected during environmental cleanup. Soil and groundwater sampling was conducted by ESG, with analytical work completed by the Queen's University and the Royal Military College laboratories in Kingston, Ontario. The final construction inspection of the landfills was carried out by AECOM.

The following sections provide an overview of the site biophysical environment, traditional land use activities, site background conditions, the landfill monitoring methodology, and the basis for evaluation of monitoring results.

1.2 Background

1.2.1 Geology and Background Geochemical Conditions

The Station Area is situated on an ancient beach ridge overlooking Dease Strait at an approximate elevation of 110 metres above sea level (masl). The regional landscape consists of unconsolidated glacial till that was reworked by marine waters, resulting in an extensive network of raised beach complexes. Surface material consists of sand, gravel, and cobble-sized rocks with variable silt and clay content, derived mainly from the weathering of the underlying bedrock. (UMA, 1991)

The regional geologic formation comprises Phanerozoic sandstones and dolostones (EBA, 1993); however, sandstone was not observed during the 2003 investigation (ESG, 2003). Instead, dolomite was noted to have formed in moderately strong, flat beds and moderately to highly weathered exposiers with evidence of frost fracturing. Additionally, the other dominant material was shale/mudstone, which was noted as weak, limey and flat exposures that are moderately to highly weathered and had significant evidence of frost fracturing (EBA, 1993).

Local terrain consists of four levels of raised beaches and two levels of marine terraces. One of the four beaches was an active beach, where there were raised beaches created through post-glaciation (most recent) isostatic rebound. Troughs of fine-grained material have formed between the ridges, where vegetation has established among the sand, gravel, cobbles, and thick organic deposits. The first marine terrace is a relatively flat, moderately vegetated plateau which is characterized by frost polygons, ponds, thermokarst lakes, and bar-like marine deposits. Here the surficial soils include a mixture of sand, gravel, silt and clay. The second marine terrace is higher elevation than the first and has been extensively anthropogenically disturbed, but the ridges and bar complexes of the beach (bedrock-derived angular material) are still evident. Little vegetation was noted outside the ridges of fine-grained material.

Soil samples were collected in locations removed from site activities within appropriate terrain units to establish background geochemical conditions in areas investigated at the site. Sample results are presented in Table 1.2. Inorganic element concentrations were below criteria for all analytes.

1.2.2 Biophysical Environment

PIN-4 is situated on Victoria Island where the mean annual precipitation is 108 millimetres (mm); 62.2 mm is received as rain and 45.8 mm as snow. On average, most of the moisture falls from July to October. The mean annual temperature is -13.9 degrees Celsius (°C), with July being the warmest month with an average temperature of 9.2°C, and January and February being the coldest with lows of -32°C. Winds are relatively constant throughout the year, averaging 21.9 kilometres per hour (km/h). Climate normals for the site, from 1961 to 1990, are provided in Table 1.3.

Table 1.2: PIN-4 Byron Bay – Summary of Site Background Soil Analytical Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-11586				0	23	10	7.0	<1.0	<10	20	<20	2.2		<0.1				
03-11587	03-11586			45	12	9.7	6.5	<1.0	<10	18	<20	1.1		<0.1				
03-11588				0	57	8.0	<5.0	<1.0	<10	<15	<20	1.1		<0.1				
03-11589	03-11588			55	27	11	7.2	<1.0	<10	23	<20	<1.0		<0.1				
03-11606				0	9.1	<5.0	<5.0	<1.0	<10	<15	<20	1.4		<0.1				
03-11607	03-11606			40	7.0	<5.0	<5.0	<1.0	<10	<15	<20	1.5		<0.1				
03-11608	03-11606			80	8.8	6.0	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-11609				0	11	<5.0	<5.0	<1.0	<10	19	<20	1.9		<0.1				
03-11610/611	03-11609			40	7.6	<5.0	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-11612	03-11609			70	7.9	5.3	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-12570/71	03-12748			70	13	7.0	<5.0	<1.0	<10	<15	<20	1.4		<0.1				
03-12748				0	15	6.0	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-12749	03-12748			40	8.1	10	6.4	<1.0	<10	17	<20	1.9		<0.1				
03-12775				0	16	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12776	03-12775			30	7.7	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12777	03-12775			50	9.0	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12778	03-12779			20	11	9.4	5.9	<1.0	<10	<15	<20	2.0		<0.1				
03-12779				0	5.9	5.0	<5.0	<1.0	<10	<15	<20	1.1		<0.1				
03-12780/81	03-12779			50	15	12	7.3	<1.0	<10	21	<20	2.3		<0.1				
03-12752				0	52	20	11	<1.0	<10	39	31	1.0		<0.1				
03-12753	03-12752			40	13	14	8.4	<1.0	<10	27	24	1.2		<0.1				
03-12754				0	17	5.1	<5.0	<1.0	<10	19	<20	<1.0		<0.1				
03-12755	03-12754			50	11	22	10	<1.0	<10	37	45	<1.0		<0.1				
03-12756				0	11	5.7	<5.0	<1.0	<10	28	<20	<1.0		<0.1				
03-12757	03-12756			50	5.0	8.8	<5.0	<1.0	<10	17	<20	<1.0		<0.1				
03-12758	03-12756			90	5.7	8.6	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12759				0	11	9.2	<5.0	<1.0	14	<15	23	2.9		<0.1				
03-12760/61	03-12759			30	18	13	7.3	<1.0	19	<15	35	4.2		<0.1				
03-12762	03-12759			70	18	12	7.6	<1.0	19	<15	33	5.5		<0.1				
03-12763				0	14	7.1	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12764	03-12763			30	14	9.8	6.3	<1.0	12	<15	23	4.2		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12765	03-12763			75	18	11	6.4	<1.0	12	<15	27	5.2		<0.1				
03-12766				0	11	6.4	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-12767	03-12766			40	16	11	6.5	<1.0	10	18	26	3.5		<0.1				
03-12768				0	26	7.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12769	03-12767			50	30	5.1	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12770/71				0	8.5	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12772				0	13	8.6	<5.0	<1.0	11	<15	<20	1.1		<0.1				
03-12773	03-12772			25	23	15	7.0	<1.0	15	<15	32	1.9		<0.1				
03-12774	03-12772			40	19	17	7.8	<1.0	14	<15	38	1.9		<0.1				
03-12783	03-12782			30	14	13	11	<1.0	<10	23	23	1.0		<0.1				
03-12784	03-12782			55	18	11	10	<1.0	<10	21	21	2.1		<0.1				
03-14179				0	31	16	8.5	<1.0	<10	25	23	1.3		<0.1				
03-14180/01	03-14179			40	33	14	7.6	<1.0	<10	21	22	<1.0		<0.1				
03-14182	03-14179			100	28	15	8.3	<1.0	<10	27	23	1.2		<0.1				
03-14183				0	33	16	9.1	<1.0	<10	34	21	1.1		<0.1				
03-14184	03-14183			30	34	13	7.7	<1.0	<10	29	<20	<1.0		<0.1				
03-14185	03-14183			95	37	11	7.0	<1.0	<10	23	<20	1.4		<0.1				
		N Value			48	48	48	48	48	48	48	48	0	48	0			
		Average			17.8	9.3	5.2	<1.0	<10	<15	<20	1.6		<0.1				
		Standard Deviation			11.5	4.9	2.9					1.2						
		Minimum			5.0	<5.0	<5.0		<10	<15	<20	<1.0						
		Maximum			57.0	22.0	11.0	<1.0	19	39	45	5.5		<0.1				
		95% Confidence Limit			3.2	1.4	0.8					0.3						

Vegetative cover is thick across the site, with exceptions of the beach ridges and the worked areas (anthropogenic disturbance). Common vegetation noted across the site includes: various arctic willow species, sedges, grasses, mosses, lousewort, saxifrages, and oxytropes. Specific species include: cotton grass, mountain avens, Arctic fireweed, Arctic poppies, mountain sorrel, Arctic heather, mastodon flowers and Arctic paintbrush. Sheltered, wet, low-lying areas and those around seasonal or permanent waterbodies, tend to have the most lush vegetation.

Wildlife observed during site investigations were rough-legged hawks, Peregrine falcons, sandhill cranes, Arctic loons, gulls, Canada geese, semipalmated sandpipers, Baird's sandpiper, sandhill cranes, Lapland longspur, horned lark, snow bunting, glaucous gull, Thayer's gull, northern raven, parasitic jaeger, long-tailed jaeger, several plover species, caribou, muskox, Arctic hares, Arctic fox, Arctic ground squirrels, grizzly bears, seals, wolverine, and wolf.

As for marine animals, beluga whales and narwhals migrate nearby with potential for strays to end up in the Dease Strait. Bearded seals and ringed seals are common in the area. As for fish, Arctic char, lake trout, least cisco, Arctic cisco, lake whitefish, fourhour sculpin and ninespine stickleback are present in the area.

Table 1.3: Climate Normals for Byron Bay A (1961 to 1990)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation													
Mean Rainfall	0	0	0	0	2	8.3	23.5	24.6	10.4	0.5	0	0	69.4
Mean Snowfall	3	3.7	3.1	4.2	4.4	1.6	0	0.3	5.6	14	5.7	3.8	49.2
Precipitation (mm)	3	3.7	3.1	4.2	6.4	9.8	23.6	24.9	16	14.5	5.7	3.8	118.6
No. days w/ meas. rain	0	0	0	*	*	3	7	8	4	*	*	0	24
No. days w/ meas. snow	2	2	2	3	3	*	*	*	4	8	4	3	34
Temperature													
Mean Daily Max.	-28.8	-28.6	-25.7	-16.6	-5.1	5.9	13.1	9.9	2.1	-7.2	-19.3	-24.9	-10.4
Mean Daily Min.	-36	-35.7	-33.4	-25	-12.6	-0.6	5.2	3.4	-2.8	-13.9	-26.7	-32.2	-17.5
Daily Mean	-32.3	-32	-29.5	-20.7	-8.8	2.7	9.2	6.6	-0.3	-10.5	-22.9	-28.3	-13.9
Extreme Max.	-2.4	-7.9	-6.7	4.4	10.2	21.1	27.8	23.7	16.1	8.2	2.2	18	
Extreme Min.	-50.6	-50	-47.2	-41.7	-29.1	-17.8	-1.7	-8.3	-18.9	-36.7	-50.6	-48.3	
Degree Days													
Above 18°C	0	0	0	0	0	0	0.3	0	0	0	0	0	0
Below 18°C	1571	1431.6	1477.6	1168.5	833.1	462.3	274.4	351.9	549.7	886.6	1222.1	1452.6	11681
Above 5°C	0	0	0	0	0	29.9	130.8	70.8	3.9	0	0	0	235
Below 0°C	1013	923.3	919.6	628.5	277.4	28	0	0.7	50.7	329.9	682.1	894.6	5748
Month-end Snow Cover (cm)	22	24	25	24	9	0	0	0	2	12	17	20	

* -- quantity is less than 1.
Source: Environment Canada – Climate Normals 1961-1990 for Byron Bay, Nunavut.

1.2.3 Traditional Land Use

Special status or environmental/ecological protection has not been awarded to this region; however, southeast of Byron Bay is a large density of gyrfalcons, which is one of the highest in the world (Poole and Bromley, 1988).

Archaeological and heritage resources were identified at the PIN-4 site; these included two Inuit grave sites, ancient Tuniit campsites and tent rings. Both graves date back to the time of station operation. One grave site is located approximately 300 m north of the module train and has been identified as an adult's grave. The other grave site is located approximately 600 m northwest of the module train and has been identified as a child's grave. Because the grave sites are not within close proximity of any proposed work areas they are not expected to be disturbed during work activities.

The ancient Tuniit campsites and less ancient tent rings are scattered to the east and west of the site along Dease Strait and Coronation Gulf and are not within close proximity of the PIN-4 Beach Area.

1.3 Landfill Monitoring Program

The general components of the landfill monitoring program at PIN-4 include:

- Visual inspection
- Surface and shallow depth soil sampling and analyses
- Groundwater sampling and analyses
- Ground temperature monitoring

The requirements for landfill monitoring, as laid out in Environmental Provisions of the NTI-DND Agreement, are summarized in Table 1.4.

Table 1.4: General Landfill Monitoring Requirements

Landfill Classification	Visual Inspection	Groundwater Sampling	Soil Sampling	Thermal Monitoring
Existing Landfill, High Potential Environmental Risk (Class A)	Not required, as landfill to be excavated.			
Existing Landfills, Moderate Potential Environmental Risk (Class B)	√	√	√	√
Existing Landfills, Low Potential Environmental Risk (Class C)	√		√	
New Landfill, Non-Hazardous Waste Landfill	√	√	√	
New Landfill, Tier II Disposal Facility	√	√	√	√

A summary of these requirements, as related to the specific landfills at PIN-4, is provided in Table 1.5. The rationale for the monitoring requirement is provided in the landfill-specific sections.

Table 1.5: PIN-4 Byron Bay Landfill Monitoring Requirements

Landfill Designation	Visual Inspection	Groundwater Sampling	Soil Sampling	Thermal Monitoring
Northwest Landfill	√		√	
North Landfill	√		√	
Station Area Landfill West	√		√	
Non-Hazardous Waste Landfill	√	√	√	
USAF Closure Landfill	√		√	
Tier II Disposal Facility	√	√	√	√
Airstrip Landfill	√		√	

1.3.1 Visual Inspection

The physical condition of each landfill is inspected in accordance with the Visual Inspection Checklist provided in the Environmental Provisions of the NTI-DND Agreement. Documented observations include: evidence of settlement, ponding, frost action, erosion and lateral movement, sloughing of berms and thermal contraction cracks. Documentation of observations is supported using hand drawn sketches, as applicable. Photographic records are provided to document the general condition of the landfill and to substantiate all recorded observations.

1.3.2 Soil Sampling

Background (naturally occurring) conditions refer to native soil geochemistry and represent soil quality from an area not impacted by site activities. Soil sampling to establish general site background conditions was conducted in 2003. Results are reported in Table 1.2.

Baseline conditions refer to existing soil chemistry at the landfill area prior to and during construction. The baseline landfill monitoring program consists of two phases: samples collected as part of the landfill assessment program which determined whether the landfill posed a potential environmental risk, and samples collected during the construction/closure of the landfill. The results of subsequent landfill monitoring events are compared to baseline and background values to evaluate any potential changes in environmental conditions.

As part of the baseline sampling program, soil samples are collected in areas up-gradient and down-gradient of each landfill. Up-gradient samples are targeted to areas near the landfill, but not influenced by migration of contaminants through the landfill. Up-gradient samples are meant to be representative of contaminant input conditions to the landfill and serve as the primary basis upon which to compare the down-gradient contaminant concentrations.

Down-gradient soil samples are collected at surface/shallow depths from designated areas at the toe of each landfill and from areas of preferential drainage. These soil samples are collected and analyzed to document whether there has been migration of contaminants, either historically or recently, from the landfill area. Although contaminants are primarily transported in water (surface and groundwater), they have a tendency to adsorb to soil particles the water is migrating through. The soil, thus, retains information regarding the historical input of contaminants.

Analytical results of soil samples collected down-gradient of a landfill are compared to contaminant concentrations of samples collected up-gradient. Down-gradient samples are also compared to overall site background contaminant levels because they help in establishing a more broad level of naturally occurring contaminant concentrations that

can be found at the site, particularly where different soil or rock types are present. Contaminant concentrations in down-gradient samples that are significantly higher than background or up-gradient concentrations, particularly where there have been changes over time; provide evidence of contaminants having migrated to, and possibly beyond, the soil sampling location. These data, in conjunction with other site-specific information, were used in the assessment of the environmental status of the landfill and the determination of an appropriate remediation solution.

Soil sampling locations are indicated on the site-specific landfill drawings included in the annexes to this report included in Appendix A. Analytical results are presented under the discussion for each landfill

Samples collected during baseline and subsequent landfill monitoring events are analyzed for the following parameters:

- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury
- PCBs (polychlorinated biphenyls – total Aroclor)
- TPH (Total Petroleum Hydrocarbons) – as represented by the sum of F1 (nC_6 to nC_{10}), F2 (nC_{10} to nC_{16}), and F3 (nC_{16} to nC_{34}), as defined by the CCME Tier I Method – Rev 5, Analyses of Total Petroleum Hydrocarbons in soil

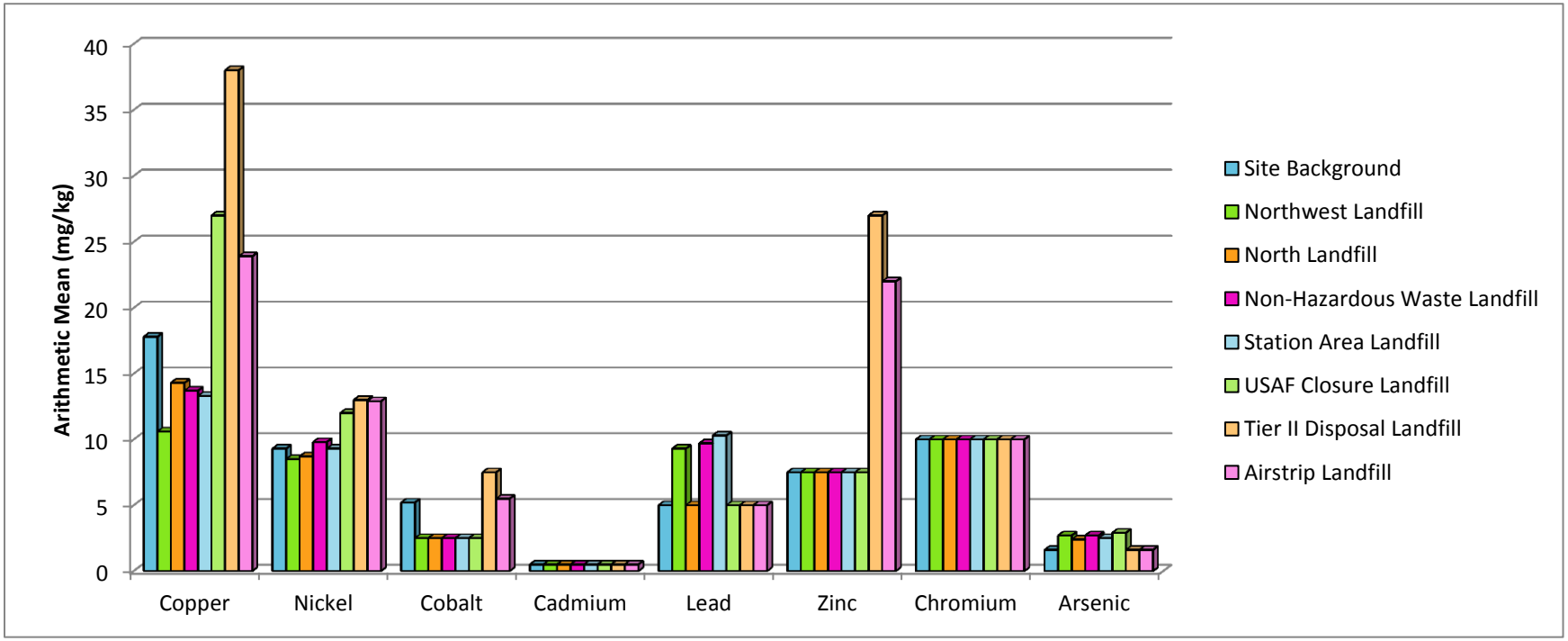
Baseline samples are obtained and analyzed to provide record information on the environmental status of the landfill should potential problems be identified during the monitoring program.

To provide a basis of evaluation for subsequent monitoring analytical results, simple statistical analyses were carried out to determine the arithmetic mean, standard deviation and 95% confidence interval for each inorganic parameter analyzed. In general, for samples in which the concentration was less than the method detection limit (MDL), one-half of the MDL was used in the statistical analyses. However, in cases where the majority of the analytical results fell below the MDL, the arithmetic mean is represented as less than the MDL. It should be noted that MDLs for analyses completed under previous years' landfill assessment programs may not be the same. In cases where the contaminant was not detected, the chemical baseline is typically represented as a range over the different MDLs. Summaries of the arithmetic mean of the concentration of inorganic elements in soil are presented in Table 1.6 and Figure 1.1. Additional statistical data is presented under the discussion for each landfill.

Table 1.6: PIN-4 Byron Bay – Summary of Arithmetic Mean – Soil Baseline Data

Area	Arithmetic Mean (mg/kg)								Range
	Copper	Nickel	Cobalt	Cadmium	Lead	Zinc	Chromium	Arsenic	PCB
Site Background	17.8	9.3	5.2	<1.0	<10	<15	<20	1.6	<0.1
Northwest Landfill	10.6	8.5	<5.0	<1.0	9.3	<15	<20	2.7	<0.05 to 0.150
North Landfill	14.3	8.7	<5.0	<1.0	<10	<15	<20	2.4	0.007 to <0.1
Non-Hazardous Waste Landfill	13.7	9.8	<5.0	<1.0	9.7	<15	<20	2.7	0.004 to <0.1
Station Area Landfill West	13.3	9.3	<5.0	<1.0	10.3	<15	<20	2.5	0.006 to <0.1
USAF Closure Landfill	27.0	12.0	<5.0	<1.0	<10	<15	<20	2.9	0.006 to 0.710
Tier II Landfill	38.0	13.0	7.5	<1.0	<10	27	<20	1.6	<0.0030 to <0.1
Airstrip Landfill	23.9	12.9	5.5	<1.0	<10	22.	<20	1.6	<0.030 to <0.1

Figure 1.1: PIN-4 Byron Bay – Summary of Arithmetic Mean – Soil Baseline Data



1.3.3 Groundwater Sampling

Groundwater monitoring at the wells were installed at all existing landfills classified as moderate environmental risk (Class B landfills) and new landfills. There were no landfills classified as moderate risk at PIN-4. Surface and shallow depth soil samples are also collected adjacent to monitoring well locations. Analytical data from water samples collected from wells up and down-gradient are reviewed in conjunction with soil analytical data to evaluate potential impacts associated with the landfill. Baseline groundwater data exists from the site investigation at temporary wells, as well as from the site clean-up period. A summary of arithmetic mean baseline data concentrations of contaminants in groundwater is provided in Table 1.7 and in Figure 1.2. Groundwater monitoring well locations are found in Table 1.9.

For baseline and for future monitoring events, the following physical measurements are recorded prior to the collection of groundwater samples from a monitoring well:

- Water elevation
- Total depth of water
- Height of well stick-up
- Depth to bottom of well
- Presence of hydrocarbons
- Hydrocarbon thickness (if appropriate)

Prior to sampling, monitoring wells are purged until groundwater parameters such as pH, temperature and conductivity stabilize. In the event of low recharge volumes, standing water may be sampled and specifically documented. Water samples are not filtered.

Following withdrawal of a water sample, other physical measurements recorded include:

- Colour and odour
- pH, conductivity and temperature

Groundwater samples are analyzed for the following parameters:

- Inorganic elements (total concentrations): arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc and mercury
- PCBs (polychlorinated biphenyls – total Aroclor)
- TPH (Total Petroleum Hydrocarbons) – C_6 to C_{32}

Minimum MDLs are specified in Table 1.8. A summary of the PIN-4 landfill monitoring installations / sampling locations is provided in Table 1.9.

Table 1.7: PIN-4 Byron Bay - Summary Arithmetic Mean – Groundwater Baseline Data

Area	Copper (mg/kg)	Nickel (mg/kg)	Cobalt (mg/kg)	Cadmium (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Chromium (mg/kg)	Arsenic (mg/kg)
Non-Hazardous Waste Landfill	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.0050	<0.0030
Tier II Disposal Facility	0.015	0.097	0.016	<0.0010	<0.10	1.330	0.101	<0.0030

Figure 1.2: PIN-4 Byron Bay – Summary of Arithmetic Mean – Groundwater Baseline Data

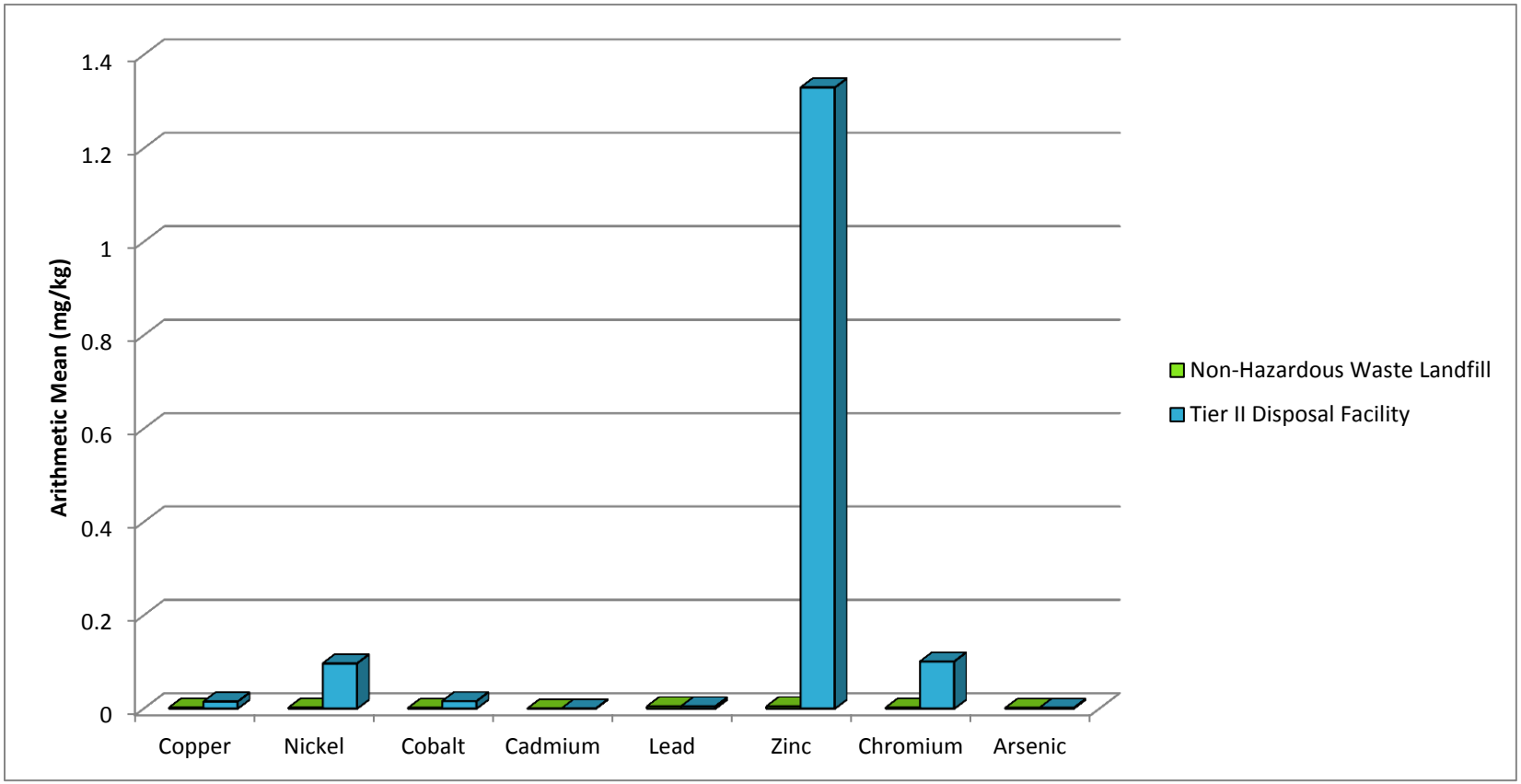


Table 1.8: Detection Limits for Analytical Requirements

Parameter	Soil Samples Minimum Analytical Detection Limit (mg/kg = ppm)	Water Samples Minimum Analytical Detection Limit (mg/L = ppm)
Copper	<3.0	<0.005
Nickel	<5.0	<0.010
Cobalt	<5.0	<0.005
Cadmium	<1.0	<0.001
Lead	<10	<0.01
Zinc	<15	<0.005
Chromium (total)	<20	<0.005
Arsenic	<0.2	<0.05
Mercury	<0.1	<0.001
PCBs	<0.05	<0.003
TPH	<40	<1

1.3.4 Thermal Monitoring

For moderate risk landfills and Tier II Disposal Facilities where a component of the design includes the placement of sufficient fill to raise the level of permafrost through the landfill contents, geothermal modeling is conducted to determine the maximum depth of the layer of soil that thaws each year (the active layer) at the landfill and the amount of fill required on the landfill surface to avoid active layer penetration into the landfill contents following remediation. Geothermal modelling considers soil type, soil thermal properties, presence or absence of insulating cover (vegetation or snow drift), measured ground temperatures at the site or at nearby sites, measured air temperature and climatic data (1956 to 1990 climate normals data from Environment Canada for Dewar Lakes, Nunavut), an estimated 1 in 100 warm year air temperature, an estimated ten consecutive 1 in 100 warm years, and an estimate of the effect of global warming (based on estimates of temperature change reported by Canadian Climate Impact Scenario project, 2000). At PIN-4, a typical active layer depth based on 10 consecutive mean years of climatic data is 2.1 m for the Tier II Soil Disposal Facility. The predicted active layer depth for a 1 in 100 warm year is 2.6 m and for 10 consecutive 1 in 100 warm years is 2.8 m. The predictive active layer depth for the landfill after 100 years of global warming (using the average of the four Global Circulation Models) is 3.3 m. The active layer depth used for the Tier II Disposal Facility at PIN-4 is the resultant active layer depth from modeling 100 years of global warming plus one 1:100 warm year – a depth of 3.8 m. It is expected to take one year for the landfill contents to freeze back with this depth of cover fill.

During landfill construction, vertical thermistors were installed within the landfill to record ground temperatures. Measured ground temperatures and compared to the active layer depth and freeze back time modeled during design. It is anticipated that all landfills where freeze back is an integral part of the design will reach thermal equilibrium within approximately five years following closure. If thermal equilibrium is not achieved within five years, it may be necessary to increase the frequency of the thermal monitoring.

1.4 Scope of Report

The following sections of the report are organized according to landfill designation. For each landfill included in the monitoring program, the following information is provided:

- A brief description of the landfill
- Qualitative assessment of the potential environmental risk
- Summary of the remediation design
- Baseline conditions (as applicable)

Table 1.9: Summary of Landfill Monitoring Installations/Sampling Locations PIN-4 Byron Bay

	UTM Coordinates		Elevation
Landfill Designation/Monitoring Locations	**North (m)**	**East (m)**	**(masl)**
Northwest Landfill			
P4-1 (soil)	7629376.7	577298.7	
P4-2 (soil)	7629322.7	577235.6	
P4-3 (soil)	7629351.0	577199.3	
P4-4 (soil)	7629444.3	577205.9	
P4-5 (soil)	7629421.8	577251.2	
North Landfill			
P4-6 (soil)	7629341.6	577822.5	
P4-7 (soil)	7629443.7	577820.0	
P4-8 (soil)	7629433.1	577847.1	
P4-9 (soil)	7629367.8	577937.8	
P4-10 (soil)	7629356.2	577962.3	
P4-11 (soil)	7629267.0	577816.6	
P4-12	7629256.0	577768.1	
Non-Hazardous Waste Landfill			
MW-05 (soil and groundwater)	7628915.1	577296.1	107.9
MW-06 (soil and groundwater)	7628826.1	577230.7	104.7
MW-07 (soil and groundwater)	7628874.6	577163.2	103.7
MW-08 (soil and groundwater)	7628954.4	577191.4	103.6
Station Area Landfill West			
P4-13 (soil)	7628765.6	576950.3	
P4-14 (soil)	7628720.6	576770.6	
P4-15 (soil)	7628768.8	576733.0	
P4-16 (soil)	762882.2	576751.6	
P4-17 (soil)	7628848.2	576818.8	
USAF Closure Landfill			
P4-18 (soil)	7628618.2	577300.7	
P4-19 (soil)	7628599.2	577357.5	
P4-20 (soil)	7628572.4	577326.9	
P4-21 (soil)	7628557.2	577296.0	
Tier II Disposal Facility			
MW-01 (soil and groundwater)	7628016.6	576448.1	89.8
MW-02 (soil and groundwater)	7627906.3	576509.7	85.2
MW-03 (soil and groundwater)	7627878.8	576436.9	84.7
MW-04 (soil and groundwater)	7627928.6	576345.4	86.8
VT-1 (temperature)	7627991.0	576439.6	94.4
VT-2 (temperature)	7627960.9	576441.6	93.9
VT-3 (temperature)	7627952.9	576398.7	93.8
VT-4 (temperature)	7627922.6	576401.2	93.3

Airstrip Landfill			
P4-22 (soil)	7627937.5	576954.5	
P4-23 (soil)	7627884.5	576927.6	
P4-24 (soil)	7627902.9	576896.6	

2. Northwest Landfill

The Northwest Landfill is located approximately 300 m directly north of the Station Area, or 1 km by road. Access to the landfill is via the main station road heading north beyond the station and then west along the secondary access road. The landfill consists of three individual lobes B, C, D with sizes of 500 square metres (m^2), 200 m^2, and 250 m^2, respectively.

During the assessment, the landfill cover was generally found to be greater than 0.3 m with some scattered surface debris throughout the landfill area and beyond the toe. Based on surface assessment sampling, none of the lobes are leaching. Based on pathway and receptor characteristics, Lobes B, C and D were scored as a low potential environmental risk. The landfill was covered with 0.75 m of Type 2 granular fill.

The monitoring plan consists of visual monitoring and collection of soil samples. Approximate locations for the collection of soil samples are identified on Figure PIN-4.2.

2.1 Baseline Data

Sample locations for soil baseline data are shown in Figure PIN-4.2. A summary of the baseline soil analytical data is provided in Table 2.1. Baseline data is obtained from samples collected up and down-gradient of the landfill in 2003 and samples collected at permanent monitoring locations up and down-gradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels with the exception of arsenic concentrations which were slightly higher than background levels. PCB results were not detectable or very low levels. The PCB results ranged from <0.050 to 0.150 milligrams per kilogram (mg/kg). Concentrations of TPH ranged between <10 and 155 mg/kg.

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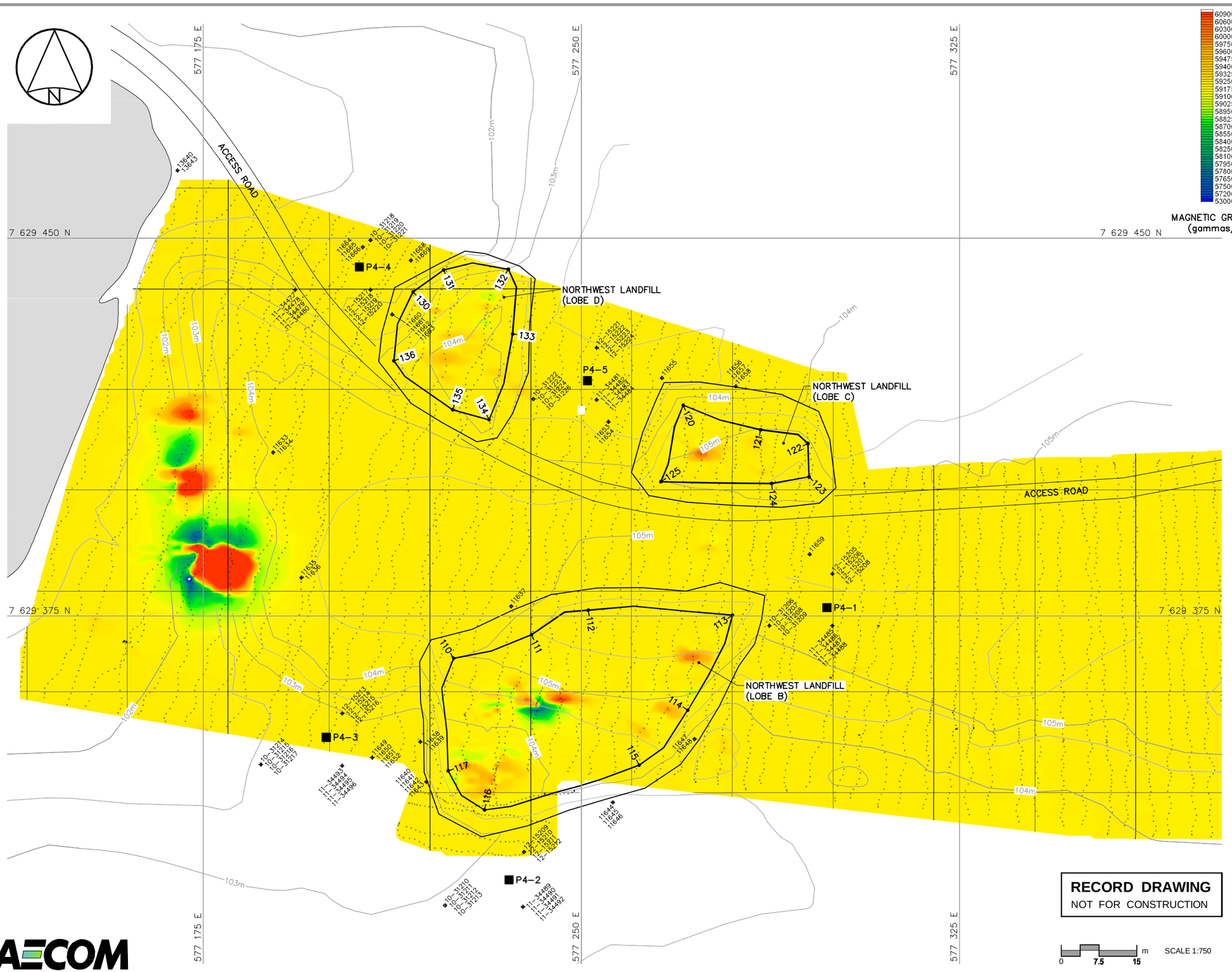


GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 110 — COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION (5)
- 11659 — SOIL SAMPLE TAG LOCATION
- BODY OF WATER

NORTHWEST LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
110	7 629 366.7	577 224.6	105.0
111	7 629 371.4	577 240.1	105.5
112	7 629 376.2	577 251.3	105.7
113	7 629 375.2	577 280.0	105.8
114	7 629 356.3	577 271.1	104.8
115	7 629 345.4	577 261.4	104.4
116	7 629 336.5	577 230.7	103.8
117	7 629 344.3	577 223.5	103.7

NORTHWEST LANDFILL (LOBE C) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
120	7 629 416.9	577 270.2	104.3
121	7 629 412.0	577 285.5	105.0
122	7 629 409.3	577 294.9	105.1
123	7 629 402.7	577 295.1	105.6
124	7 629 401.4	577 287.7	105.5
125	7 629 401.7	577 265.7	105.0

NORTHWEST LANDFILL (LOBE D) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
130	7 629 439.4	577 216.6	102.3
131	7 629 443.8	577 222.6	102.1
132	7 629 443.9	577 235.5	103.0
133	7 629 431.0	577 236.3	103.6
134	7 629 414.0	577 231.7	104.2
135	7 629 416.0	577 224.4	103.9
136	7 629 425.7	577 212.8	103.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NORTHWEST LANDFILL LOBES B, C, D

FIGURE PIN-4.2

Table 2.1: Northwest Landfill – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
03-11644			2003	0	11	<5.0	<5.0	<1.0	<10	17	<20	1.7		<0.1				
03-11645	03-11644		2003	30	3.3	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11646	03-11644		2003	55	4	6.7	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11647			2003	0	8.1	8.9	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-11648	03-11647		2003	20	13	12	6.1	<1.0	<10	17	<20	2.2		<0.1				
03-11659			2003	60	7.3	6.3	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
10-31206*/07		P4-1	2010	0-10	6.1	5.5	<5.0	<1.0	<10	<15	<20	3.2	<0.10	0.1	<9.0	N/A	<4.0	<9.0
10-31208*/09		P4-1	2010	30-40	6.5	6.2	<5.0	<1.0	13	<15	<20	3.1	<0.10	0.011	14	N/A	<4.0	12
11-34485*/86		P4-1	2011	0-10	7	9.3	3.5	<0.50	10.7	8.3	10.8	3.83	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34487*/88		P4-1	2011	30-40	5.9	6.4	2.9	<0.50	10	8.4	9.5	3.59	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15205*/06		P4-1	2012	0-10	7.6	22.0	<5.0	<1.0	15	<15	<20	4.2	0.0196	0.07	<30	<30	<10	<10
12-15207*/08		P4-1	2012	30-40	7.2	7.3	<5.0	<1.0	12	<15	<20	3.9	0.0209	<0.050	<30	<30	<10	<10
Downgradient Soil Samples																		
03-11633			2003	0	8.9	7.4	<5.0	<1.0	11	<15	<20	<1.0		<0.1				
03-11634	03-11633		2003	70	7.3	8	<5.0	<1.0	<10	<15	<20	1.1		<0.1				
03-11635			2003	0	25	6.7	<5.0	<1.0	12	<15	<20	<1.0		<0.1				
03-11636	03-11635		2003	65	6.9	7.6	<5.0	<1.0	<10	23	<20	3.2		<0.1				
03-11637			2003	30	9.4	14	<5.0	<1.0	21	<15	24	2.7		<0.1				
03-11638			2003	0	5.6	<5.0	<5.0	<1.0	<10	<15	<20	3		<0.1				
03-11639	03-11638		2003	50	11	5.2	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11640/41			2003	0	7.8	6.2	<5.0	<1.0	<10	<15	<20	2		<0.1				
03-11642	03-11640		2003	40	14	12	5.9	<1.0	12	<15	25	5.1		<0.1				
03-11643	03-11640		2003	80	15	13.0	6.8	<1.0	<10	26	23	<1.0		<0.1				
03-11649			2003	0	13	5.6	<5.0	<1.0	<10	56	<20	3.4		<0.1				
03-11650/51	03-11649		2003	30	22	10.5	<5.0	<1.0	<10	<15	<20	3.15		<0.1				
03-11652	03-11649		2003	85	26	12	7.4	<1.0	<10	22	24	<1.0		<0.1				
03-11653			2003	0	10	9.9	<5.0	<1.0	11	<15	<20	1.5		<0.1				
03-11654	03-11653		2003	50	7.2	7.8	<5.0	<1.0	<10	<15	<20	1.3		<0.1				
03-11655			2003	40	6.3	6.2	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11656			2003	0	7.6	7.5	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11657	03-11656		2003	30	7	7.4	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11658	03-11656		2003	75	8.9	7.5	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-11660/61			2003	0	10.8	11.75	<5.0	<1.0	16.5	<15	<20	2.45		<0.1				
03-11662	03-11660		2003	40	9.6	9.2	<5.0	<1.0	10	<15	<20	1.5		<0.1				
03-11663	03-11660		2003	80	9.8	9.3	<5.0	<1.0	11	<15	<20	1.9		<0.1				
03-11664			2003	0	12	8.4	<5.0	<1.0	13	<15	<20	1.1		<0.1				
03-11665	03-11664		2003	30	14	9.7	<5.0	<1.0	14	<15	<20	1.3		<0.1				
03-11666	03-11664		2003	70	14	10	<5.0	<1.0	15	<15	<20	1.3		<0.1				
03-11668			2003	40	12	9.2	<5.0	<1.0	17	<15	<20	<1.0		<0.1				
03-11669			2003	0	13	9.9	<5.0	<1.0	10	<15	<20	<1.0		<0.1				
03-14193			2003	0	14	8.3	<5.0	<1.0	12	32	<20	3.8		<0.1				
03-14194	03-14193		2003	40						<15								
03-14195			2003	0	13	<5.0	<5.0	<1.0	<10	57	<20	1.2		<0.1				
03-14196	03-14195		2003	40	11	6.7	<5.0	<1.0	12	18	<20	2.7						
09-19178*/79		P4-2	2009	0-10	14	8.7	<5.0	<1.0	<10	<15	<20	2.5	<0.10	<0.0030	155	<10	10	140
09-19180*/81		P4-2	2009	30-40	16	11	<5.0	<1.0	<10	<15	21	2	<0.10	<0.0030	142	<10	6.8	130
09-19174*/75		P4-3	2009	0-10	9.2	8	<5.0	<1.0	10	19	<20	3	<0.10	<0.0030	73	<10	5.5	62
09-19176*/77		P4-3	2009	30-40	8.8	8.9	<5.0	<1.0	11	<15	<20	3.8	<0.10	<0.0030	74	<10	4.7	64
09-19170*/71*		P4-4	2009	0-10	9.6	9.1	<5.0	<1.0	14	<15	<20	3.5	<0.10	<0.0030	54	<10	3.4	46
09-19172*/73		P4-4	2009	30-40	9.5	8.1	<5.0	<1.0	10	<15	<20	2.9	<0.10	<0.0030	88	<10	5.7	77
10-31210*/11*		P4-2	2010	0-10	11	9.4	3.9	<1.0	<10	<15	<20	3.2	<0.10	0.032	26	N/A	<4.0	24
10-31212*/13		P4-2	2010	30-40	15	9.6	<5.0	<1.0	<10	<15	<20	2.7	<0.10	0.12	83	N/A	<4.0	81
10-31214*/15		P4-3	2010	0-10	8.5	7.6	<5.0	<1.0	11	20	<20	3.5	<0.10	0.15	36	N/A	<4.0	34
10-31216*/17		P4-3	2010	30-40	8.5	7.9	<5.0	<1.0	11	17	<20	4	<0.10	0.09	33	N/A	<4.0	31
10-31218*/19		P4-4	2010	0-10	9.5	7.9	<5.0	<1.0	13	<15	<20	3	<0.10	0.017	<9.0	N/A	<4.0	<9.0
10-31220*/21		P4-4	2010	30-40	10	8	<5.0	<1.0	13	<15	<20	3.5	<0.10	0.0056	19	N/A	<4.0	17
10-31222*/23		P4-5	2010	0-10	7.0	6.9	<5.0	<1.0	<10	<15	<20	3.1	<0.10	0.0099	18	N/A	<4.0	16
10-31224*/26*		P4-5	2010	30-40	7	6.8	<5.0	<1.0	8.5	<15	<20	3.6	<0.10	0.052	13	N/A	<4.0	11
11-34489*/90		P4-2	2011	0-10	17.3	9.7	3.7	<0.50	9.7	15.7	16.7	4.6	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34491*/92		P4-2	2011	30-40	15	11.6	4.6	<0.50	8	27.6	20.9	3.4	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34493*/94		P4-3	2011	0-10	8.4	8.3	3.5	<0.50	10.2	14.8	11.7	4.43	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34495*/96		P4-3	2011	30-40	8.5	8.4	3.3	<0.50	10.9	21.9	12.3	4.15	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34477*/78		P4-4	2011	0-10	11.4	9.1	3	<0.50	13.4	11.6	11.6	3.3	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34479*/80*		P4-4	2011	30-40	10.8	8.1	3	<0.50	13.3	9.1	12	13.01	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34481*/82		P4-5	2011	0-10	8.2	8.2	3.6	<0.50	10.4	8.7	11.5	4.09	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34483*/84		P4-5	2011	30-40	7.3	7.6	3.3	<0.50	9.9	8.1	11.3	3.7	<0.050	<0.030	<50	<5.0	<6.0	<50

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
12-15209*/10		P4-2	2012	0-10	20	7.5	<5.0	<1.0	<10	<15	<20	2.6	0.0328	<0.050	80	<30	<10	60
12-15211*/12		P4-2	2012	30-40	16	9.9	<5.0	<1.0	<10	<15	<20	3.4	0.0212	<0.050	44	<30	<10	24
12-15213*/14		P4-3	2012	0-10	10	9.4	<5.0	<1.0	13	32	<20	3.3	0.0255	<0.050	41	<30	<10	21
12-15215*/16		P4-3	2012	30-40	9.9	10	<5.0	<1.0	12	23	<20	4.6	0.0216	<0.050	37	<30	<10	17
12-15217*/18		P4-4	2012	0-10	11	9.8	<5.0	<1.0	16	<15	<20	4.1	0.0107	<0.050	35	<30	<10	15
12-15219*/20*		P4-4	2012	30-40	11.0	10	<5.0	<1.0	14	<15	<20	3.1	0.012	0.07	36	<30	<10	16
12-15221*/22		P4-5	2012	0-10	7.3	8.4	<5.0	<1.0	12	<15	<20	3.4	0.0181	<0.050	<30	<30	<10	<10
12-15223*/24		P4-5	2012	30-40	7.6	8.4	<5.0	<1.0	11	<15	<20	3.4	0.0167	<0.050	<30	<30	<10	<10
		N Value			72	72	72	72	72	73	72	72	36	71	36			
		Average			10.6	8.5	<5.0	<1.0	9.3	<15	<20	2.7	<0.10	<0.050	36.3			
		Standard Deviation			4.3	2.8			4.0			1.8			36.4			
		Minimum			3.3	<5.0	2.9	<0.50	8.0	8.1	9.5	<1.0	0.011	0.006	<9.0			
		Maximum			26.0	22.0	7.4	<1.0	21.0	57.0	25.0	13.0	0.0328	0.150	155.0			
		95% Confidence Limit			1.0	0.6			0.9			0.4			11.9			

3. North Landfill

The North Landfill is located along the main station access road near the junction to the Northwest Landfill. The landfill consists of three individual lobes A, B and C with sizes of 1,800 m^2, 1,300 m^2 and 2,000 m^2, respectively. There was no surface debris evident at Lobes A or B and exposed debris was present at Lobe C.

The soil in the landfill area is primarily coarse-grained on the bedrock ridge with some finer grained material present to the south and at the toe of the bedrock ridge to the east. There are bedrock outcrops along the east side of the ridge, with a gentler slope of gravel and cobbles along the ridge slope to the north.

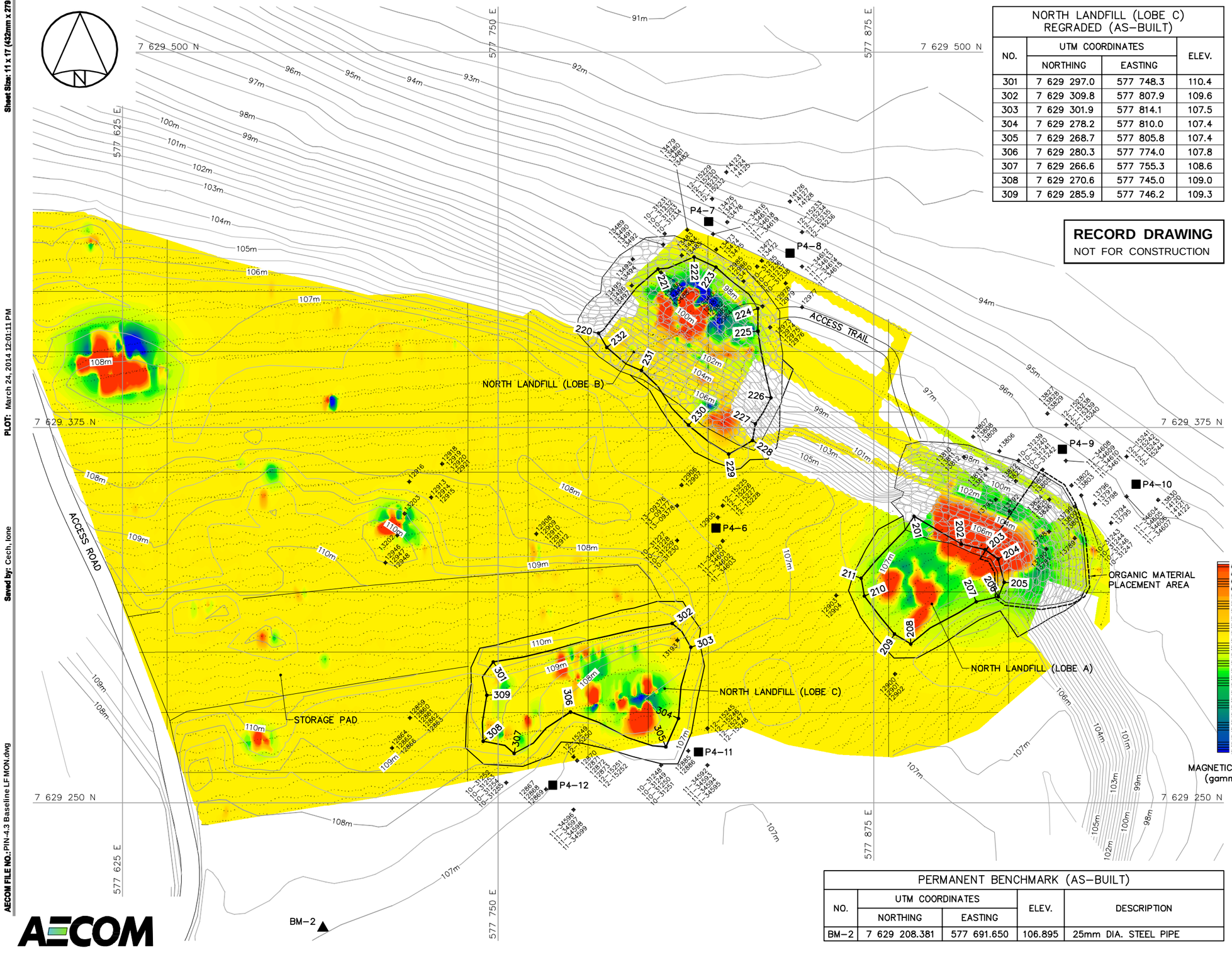
Several contaminated soil areas were identified during assessment. The tier II/hazardous contaminated soil areas were remediated by excavation. Tier I/Type A soils were covered with a minimum of 0.3 m granular fill.

Lobes A, B (evaluated together) and C were all classified as a low potential environmental risk. The assessment was based on the landfill lobes as a contaminant source, the low potential for migration and the minimal presence of down gradient receptors. Accordingly, surface and partially exposed debris was removed and the landfill was regraded. Lobe A was covered with 0.75 m Type 1 and Type 2 granular fill on the slope and 0.75 m Type 2 granular fill on the top. Lobe B was regraded with 0.5 m Type 1 granular material over 0.75 m Type 2 granular material. Lobe C was covered with 0.75 m Type 2 granular material.

The monitoring plan consists of visual monitoring and collection of soil samples. Approximate locations for the collection of soil samples are identified on Figure PIN-4.3.

3.1 Baseline Data

Sample locations for soil baseline data are shown in Figure PIN-4.3. A summary of the baseline soil analytical data is provided in Table 3.1. Baseline data is comprised of site investigation information collected up and down-gradient of the landfill in 2003 and samples collected at permanent monitoring locations up and down-gradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels with the exception of arsenic concentrations which were slightly higher than background levels. PCB results were not detectable or very low levels. The PCB results ranged from 0.007 to <0.1 mg/kg. Concentrations of TPH ranged between <9.0 and 657 mg/kg.



NORTH LANDFILL (LOBE C) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
301	7 629 297.0	577 748.3	110.4
302	7 629 309.8	577 807.9	109.6
303	7 629 301.9	577 814.1	107.5
304	7 629 278.2	577 810.0	107.4
305	7 629 268.7	577 805.8	107.4
306	7 629 280.3	577 774.0	107.8
307	7 629 266.6	577 755.3	108.6
308	7 629 270.6	577 745.0	109.0
309	7 629 285.9	577 746.2	109.3

RECORD DRAWING
NOT FOR CONSTRUCTION

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-2 — PERMANENT BENCHMARK LOCATION (1)
- 201 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (7)
- 13827 — SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL

NORTH LANDFILL (LOBE A) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
201	7 629 345.5	577 888.4	106.6
202	7 629 336.2	577 904.2	107.4
203	7 629 334.4	577 912.0	107.4
204	7 629 331.3	577 916.3	107.3
205	7 629 323.5	577 918.4	106.9
206	7 629 318.7	577 916.5	106.8
207	7 629 317.1	577 909.1	106.9
208	7 629 303.0	577 887.3	107.0
209	7 629 306.3	577 881.9	107.1
210	7 629 319.0	577 871.9	106.9
211	7 629 324.9	577 870.8	106.8

NORTH LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
220	7 629 406.5	577 783.4	105.0
221	7 629 427.8	577 803.2	99.0
222	7 629 431.8	577 815.1	97.4
223	7 629 428.5	577 822.5	97.3
224	7 629 414.7	577 836.4	97.5
225	7 629 407.2	577 836.5	98.4
226	7 629 385.0	577 840.8	100.5
227	7 629 376.3	577 835.6	105.0
228	7 629 370.7	577 834.6	107.1
229	7 629 366.2	577 826.7	108.0
230	7 629 375.9	577 813.3	107.7
231	7 629 394.1	577 797.6	106.0
232	7 629 401.7	577 786.1	105.3

0 12.5 25 m SCALE 1:1250

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-2	7 629 208.381	577 691.650	106.895	25mm DIA. STEEL PIPE

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NORTH LANDFILL LOBES A, B, C

FIGURE PIN-4.3

Table 3.1: North Landfill – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
03-12867			2003	0										<0.1				
03-12868	03-12867		2003	20	7	5.4	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-12869	03-12867		2003	40	6	<5.0	<5.0	<1.0	<10	<15	<20	1.1		<0.1				
03-12870/71			2003	0	14	8.2	<5.0	<1.0	11.5	<15	<20	1.5		<0.1				
03-12872	03-12870/71		2003	20														
03-12873	03-12870/71		2003	50	12	10.0	5.2	<1.0	12	<15	<20	3.0		<0.1				
10-31252*/53		P4-12	2010	0-10	6	<5.0	<5.0	<1.0	<10	<15	<20	1.6	<0.10	0.017	146	N/A	5.7	140
10-31254*/55		P4-12	2010	30-40	6	<5.0	<5.0	<1.0	<10	<15	<20	1.7	<0.10	0.014	657	N/A	7.1	650
11-34596*/97		P4-12	2011	0-10	4	2.8	2.7	<0.50	6.3	<5.0	6	3.0	<0.050	<0.050	187	<15	<18	170
11-34498*/99		P4-12	2011	30-40	49	52.5	23.2	<0.50	4.3	77.2	90.2	2.4	<0.050	<0.030	60	<5.0	<6.0	54
12-15249*/50		P4-12	2012	0-10	8	7.3	<5.0	<1.0	<10	21	<20	1.5	0.0356	<0.050	75	<30	<10	55
12-15251*/52		P4-12	2012	30-40	9	7.5	<5.0	<1.0	<10	25	<20	1.9	0.044	<0.050	48	<30	<10	28
Downgradient Soil Samples																		
03-12859			2003	0	12	<5.0	<5.0	<1.0	17	<15	<20	2.0		<0.1				
03-12860/61	03-12859		2003	20	9	5.2	<5.0	<1.0	16.5	<15	<20	2.0		<0.1				
03-12862	03-12859		2003	50	7	<5.0	<5.0	<1.0	<10	<15	<20	1.2		<0.1				
03-12863	03-12859		2003	90	7	<5.0	<5.0	<1.0	14	<15	<20	1.1		<0.1				
03-12864			2003	0	6	<5.0	<5.0	<1.0	13	<15	<20	1.5		<0.1				
03-12865	03-12864		2003	40	7	5.4	<5.0	<1.0	12	<15	<20	1.6		<0.1				
03-12866	03-12864		2003	75	8	5.7	<5.0	<1.0	21	<15	<20	2.5		<0.1				
03-12900/01			2003		9	<5.0	<5.0	<1.0	<10	<15	<20	1.3		<0.1				
03-12902	03-12900/01		2003		7	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-12903			2003		7	<5.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12904	03-12903		2003		9	<5.0	<5.0	<1.0	<10	<15	<20	1.2		<0.1				
03-12905			2003	0	11	5.4	<5.0	<1.0	<10	<15	<20	3.6		<0.1				
03-12906			2003	20	11	6.8	<5.0	<1.0	14	<15	<20	3.8		<0.1				
03-12907	03-12906		2003	50	9	5.9	<5.0	<1.0	11	<15	<20	2.6		<0.1				
03-12908			2003	0	9	5.3	<5.0	<1.0	<10	<15	<20	2.3		<0.1				
03-12909	03-12908		2003		9	8.0	<5.0	<1.0	<10	<15	<20	1.2		<0.1				
03-12910/11	03-12908		2003	70														
03-12912	03-12908		2003	110	17	12.0	5.7	<1.0	<10	<15	23	2.2		<0.1				
03-12913			2003	0	8	<5.0	<5.0	<1.0	<10	<15	<20	2.6		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12914	03-12913		2003															
03-12915	03-12913		2003	40	8	<5.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12916			2003	0	11	6.3	<5.0	<1.0	<10	<15	<20	3.6		<0.1				
03-12918			2003	0														
03-12919	03-12918		2003	20	8	5.2	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12920/21	03-12918		2003	40														
03-12946			2003	0	14	5.5	<5.0	<1.0	39	<15	<20	2.9		<0.1				
03-12947	03-12946		2003	40	10	5.0	<5.0	<1.0	<10	<15	<20	2.9		<0.1				
03-12948	03-12946		2003	70	10	5.8	<5.0	<1.0	<10	<15	<20	3.3		<0.1				
03-12949			2003	0	69	5.2	<5.0	<1.0	190	86	<20	3.2		<0.1				
03-12950/51	03-12949		2003	50	110	6.2	<5.0	<1.0	70	47	<20	2.1		<0.1				
03-12952	03-12949		2003	100	56	<5.0	<5.0	<1.0	78	55	<20	2.3		<0.1				
03-12973			2003	0	19	13.0	6.9	<1.0	11	<15	27	2.1		<0.1				
03-12974	03-12973		2003	40														
03-12975	03-12973		2003	60	19	14.0	7.5	<1.0	11	<15	33	2.4		<0.1				
03-12976	03-12973		2003	100	20	14.0	7.5	<1.0	11	<15	28	3.1		<0.1				
03-12977			2003	30	13	10.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12978			2003	0														
03-12979	03-12978		2003	70	10	8.1	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-12980/81			2003	0	19	13.5	6.8	<1.0	11.5	16.5	26	3.4		<0.1				
03-12982	03-12980/81		2003	50	16	11.0	5.2	<1.0	<10	<15	<20	2.2		<0.1				
03-12983	03-12980/81		2003	60	14	12.0	5.8	<1.0	10	<15	<20	2.8		<0.1				
03-12984	03-12980/81		2003	90														
03-12985			2003	0	15	9.7	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-12986	03-12985		2003	40	16	11.0	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-13470	03-12985		2003	70	15	10.7	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-13471			2003	0														
03-13472	03-13471		2003	85	13	8.6	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-13473			2003	0	16	11.3	5.3	<1.0	<10	<15	<20	2.1		<0.1				
03-13474	03-13473		2003	50														
03-13475	03-13473		2003	90	14	9.9	<5.0	<1.0	<10	<15	<20	2.3		<0.1				
03-13476			2003	0														
03-13477	03-13476		2003	50	11	8.8	<5.0	<1.0	<10	<15	<20	1.5		<0.1				
03-13478	03-13476		2003	80	14	9.4	<5.0	<1.0	<10	<15	<20	1.9		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-13479			2003	0														
03-13480/81	03-13479		2003	50	15	11.1	5.1	<1.0	<10	<15	<20	2.3		<0.1				
03-13482	03-13479		2003	90	16	11.8	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-13483			2003	0	18	14.0	6.7	<1.0	10.0744	<15	22.6003	3.5		<0.1				
03-13484	03-13483		2003	30														
03-13485	03-13483		2003	70	16	11.4	5.3	<1.0	<10	<15	<20	2.2		<0.1				
03-13486			2003	0	19	12.6	6.4	<1.0	12.3743	<15	22.4256	2.5		<0.1				
03-13487	03-13486		2003	50	17	10.8	5.4	<1.0	11.4163	<15	<20	2.8		<0.1				
03-13489			2003	0														
03-13490/91	03-13489		2003	50	19	13.6	6.3	<1.0	<10	<15	21.75	2.7		<0.1				
03-13492	03-13489		2003	80	12	8.9	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-13493			2003	0	18	12.0	6.4	<1.0	12.0934	<15	<20	1.7		<0.1				
03-13494	03-13493		2003	60														
03-13495			2003	0	19	13.5	7.1	<1.0	13.6902	<15	23.7023	2.3		<0.1				
03-13496	03-13495		2003	50	23	21.1	10.3	<1.0	15.7544	<15	39.3098	3.8		<0.1				
03-13497	03-13495		2003	80														
03-13794			2003	70	17	13.0	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-13795	03-13794		2003	0	12	9.3	<5.0	<1.0	<10	41	<20	2.6		<0.1				
03-13796			2003	0														
03-13797	03-13796		2003	60	18	12.0	<5.0	<1.0	<10	<15	<20	2.9		<0.1				
03-13798	03-13796		2003	90	20	15.0	5.6	<1.0	<10	<15	<20	2.5		<0.1				
03-13799			2003	0	35	11.0	<5.0	<1.0	<10	<15	<20	2.6		<0.1				
03-13800/01	03-13799		2003	80														
03-13802			2003	0														
03-13803	03-13802		2003	70	18	12.0	<5.0	<1.0	<10	17	<20	2.1		<0.1				
03-13804			2003	0														
03-13805	03-13804		2003	80	30	12.0	<5.0	<1.0	<10	19	<20	2.2		<0.1				
03-13806			2003	0	8	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-13807			2003	0														
03-13808	03-13807		2003	30	22	17.0	9.1	<1.0	13	<15	34	2.0		<0.1				
03-13809	03-13807		2003	80	11	6.3	<5.0	<1.0	<10	<15	<20	1.2		<0.1				
03-13810/11			2003	0	5	<5.0	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-13812	03-13810/11		2003	30														
03-13813			2003	10	17	13.0	7.6	<1.0	<10	<15	23	3.2		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-13814	03-13813		2003	50														
03-13822			2003	0	42	12.0	<5.0	<1.0	<10	24	<20	1.8		<0.1				
03-13823	03-13822		2003	30	36	11.0	<5.0	<1.0	12	<15	22	2.6		<0.1				
03-13824			2003	0	33	14.0	<5.0	<1.0	<10	<15	<20	5.0		<0.1				
03-13825	03-13824		2003	20	26	19.0	17.0	<1.0	13	<15	34	7.2		<0.1				
03-13826	03-13824		2003	50														
03-13827			2003	50	15	9.0	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-13828	03-13827		2003	0	19	10.0	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-13829	03-13827		2003	90	15	9.1	<5.0	<1.0	<10	<15	<20	1.9		<0.1				
03-13830			2003	0	16	11.0	<5.0	<1.0	<10	<15	<20	1.8		<0.1				
03-14120/21	03-13830		2003	30	13	12.0	<5.0	<1.0	<10	<15	<20	1.5		<0.1				
30-14122	03-13830		2003	90	12	8.6	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-14123			2003	0	16	11.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-14124	03-14123		2003	60	10	8.0	<5.0	<1.0	<10	<15	<20	1.6		<0.1				
03-14125	03-14123		2003	100	11	8.6	<5.0	<1.0	<10	<15	<20	1.5		<0.1				
03-14126			2003	0	12	6.4	<5.0	<1.0	<10	37	<20	<1.0		<0.1				
03-14127	03-14126		2003	60	15	9.5	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-14128	03-14126		2003	100	15	11.0	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
10-31227*/28		P4-6	2010	0-10	6	5.4	<5.0	<1.0	13	<15	<20	3.7	<0.10	0.025	<9.0	N/A	<4.0	<9.0
10-31229*/30		P4-6	2010	30-40	6	5.1	<5.0	<1.0	<10	<15	<20	3.5	<0.10	0.014	19	N/A	<4.0	17
10-31231*/32		P4-7	2010	0-10	15	11.0	<5.0	<1.0	<10	<15	<20	2.8	<0.10	0.008	<9.0	N/A	<4.0	<9.0
10-31233*/34		P4-7	2010	30-40	12	10.0	<5.0	<1.0	<10	<15	<20	3.4	<0.10	0.025	13	N/A	<4.0	11
10-31235*/36		P4-8	2010	0-10	9	9.0	<5.0	<1.0	<10	<15	<20	3.1	<0.10	0.007	25	N/A	<4.0	23
10-31237*/38		P4-8	2010	30-40	5	5.2	<5.0	<1.0	<10	<15	<20	1.9	<0.10	0.026	15	N/A	<4.0	13
10-31239*/40		P4-9	2010	0-10	11	12.0	5.2	<1.0	<10	<15	<20	3.5	<0.10	0.033	25	N/A	<4.0	23
10-31241*/42		P4-9	2010	30-40	7	6.7	<5.0	<1.0	<10	<15	<20	1.7	<0.10	0.02	17	N/A	<4.0	15
10-31243*/44*		P4-10	2010	0-10	9	8.4	<5.0	<1.0	<10	29	<20	2.6	<0.10	0.044	85	N/A	4.1	81
10-31246*/47		P4-10	2010	30-40	10	9.6	<5.0	<1.0	<10	22	<20	2.8	<0.10	0.02	76	N/A	<4.0	74
10-31248*/49		P4-11	2010	0-10	8	<5.0	<5.0	<1.0	<10	<15	<20	1.4	<0.10	0.015	81	N/A	<4.0	79
10-31250*/51		P4-11	2010	30-40	8	<5.0	<5.0	<1.0	<10	<15	<20	1.3	<0.10	0.02	55	N/A	<4.0	53
11-34600*/01*		P4-6	2011	0-10	5	5.3	2.3	<0.50	8.9	7.7	7.6	3.9	<0.05	<0.030	<50	<5.0	<6.0	<50
11-34602*/03		P4-6	2011	30-40	5	4.7	2.2	<0.50	7.8	6.7	7	3.4	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34616*/17		P4-7	2011	0-10	5	5.5	2.3	<0.50	5.1	7.1	7.3	2.0	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34618*/19		P4-7	2011	30-40	5	6.5	2.4	<0.50	5.6	5.5	8.9	2.0	<0.050	<0.030	<18	<5.0	<6.0	<18

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
11-34612*/13		P4-8	2011	0-10	10	9.9	4.4	<0.50	7.6	7.7	11.7	3.5	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34614*/15		P4-8	2011	30-40	8	8.9	3.8	<0.50	6.2	8.5	10.1	3.2	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34608*/09		P4-9	2011	0-10	7	8.1	3.1	<0.50	6.2	6.4	9.4	3.3	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34610*/11		P4-9	2011	30-40	7	8.4	3.2	<0.50	6.4	7.3	9.9	3.5	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34604*/05		P4-10	2011	0-10	6	7.6	2.9	<0.50	6.5	9.3	9.5	2.9	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34606*/07		P4-10	2011	30-40	6	7.9	3.0	<0.50	6.5	9.1	9.2	3.0	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34592*/93		P4-11	2011	0-10	11	5.3	4.4	<0.50	3	27.2	17.3	1.4	0.062	<0.040	121	<10	<12	110
11-34594*/95		P4-11	2011	30-40	9	4.9	1.9	<0.50	3.6	26.1	5.5	1.5	<0.050	<0.030	<50	<5.0	<6.0	<50
12-15225*/26		P4-6	2012	0-10	6	6.6	<5.0	<1.0	10	<15	<20	4.5	0.0106	<0.050	<30	<30	<10	<10
12-15227*/28		P4-6	2012	30-40	6	6.2	<5.0	<1.0	<10	<15	<20	3.6	0.0148	<0.050	<30	<30	<10	<10
12-15229*/30		P4-7	2012	0-10	11	9.8	<5.0	<1.0	<10	<15	<20	3.7	0.0094	<0.050	<30	<30	<10	<10
12-15231*/32		P4-7	2012	30-40	17	8.4	<5.0	<1.0	<10	<15	<20	2.5	0.0105	<0.050	<30	<30	<10	<10
12-15233*/34*		P4-8	2012	0-10	8	9.7	<5.0	<1.0	<10	<15	<20	3.0	0.0095	<0.050	<30	<30	<10	<10
12-15235*/36		P4-8	2012	30-40	8	8.8	<5.0	<1.0	<10	<15	<20	3.4	0.0135	<0.050	<30	<30	<10	<10
12-15237*/38		P4-9	2012	0-10	9	9.3	<5.0	<1.0	<10	<15	<20	2.7	0.0298	<0.050	46	<30	<10	26
12-15239*/40		P4-9	2012	30-40	8	9.7	<5.0	<1.0	<10	<15	<20	2.7	0.0234	<0.050	<30	<30	<10	<10
12-15241*/42		P4-10	2012	0-10	14	9.3	<5.0	<1.0	<10	<15	<20	2.7	0.0246	<0.050	<30	<30	<10	<10
12-15243*/44		P4-10	2012	30-40	12	9.7	<5.0	<1.0	<10	<15	<20	3.1	0.0281	<0.050	<30	<30	<10	<10
12-15245*/46		P4-11	2012	0-10	8	5.4	<5.0	<1.0	<10	22	<20	1.1	0.0432	<0.050	42	<30	<10	22
12-15247*/48*		P4-11	2012	30-40	12	7.6	<5.0	<1.0	<10	<15	<20	1.9	0.035	<0.050	37	<30	<10	17
		N Value			128	128	128	128	128	128	128	128	42	129	42			
		Average			14.3	8.7	<5.0	<1.0	<10	<15	<20	2.4	<0.050	<0.1	<30			
		Standard Deviation			12.8	5.4						0.9						
		Minimum			3.6	2.8	1.9	<0.50	3.0	5.5	5.5	<1.0	0.009	0.007	<9.0			
		Maximum			109.5	52.5	23.2	<1.0	190.0	86.0	90.2	7.2	0.062	<0.1	657.0			
		95% Confidence Limit			2.2	0.9						0.2						

4. Non-Hazardous Waste Landfill

The Non-Hazardous Waste Landfill is a new landfill constructed for the disposal of non-hazardous wastes and debris generated and collected during remediation activities. The landfill is located at the Station Area.

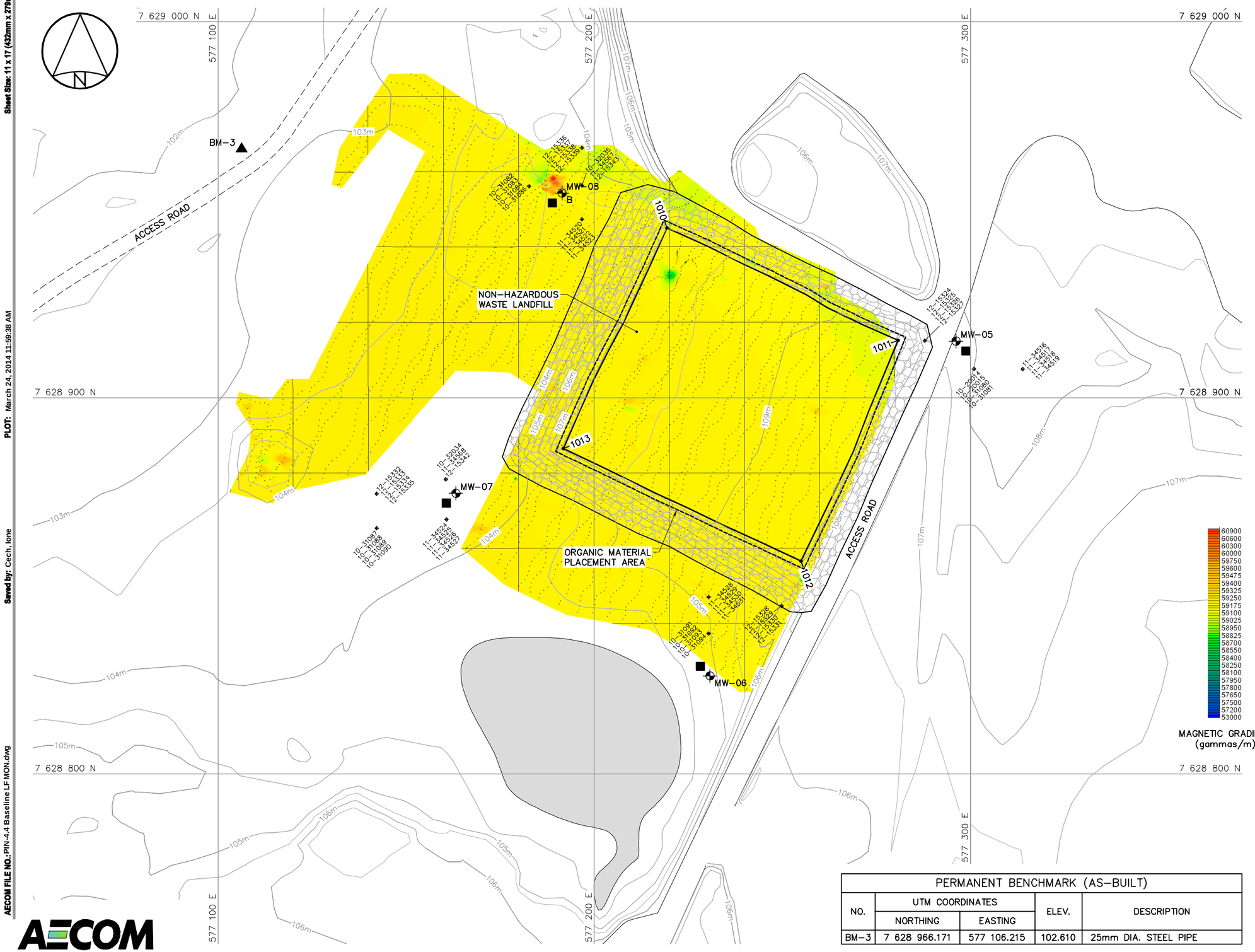
The design of this landfill included perimeter berms and placement of a cover of compacted granular fill over the landfilled material. Four groundwater monitoring wells were installed around the perimeter of the landfill.

The monitoring plan will consist of visual monitoring and periodic collection of soil and groundwater samples. Approximate locations for the collection of soil and groundwater samples are identified on Figure PIN-4.4.

4.1 Baseline Data

Sample locations for soil baseline data are shown in Figure PIN-4.4. A summary of the baseline soil analytical data is provided in Table 4.1. Baseline data is comprised of site investigation information collected up and down-gradient of the landfill in 2003 and samples collected at permanent monitoring locations up and down-gradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels, with the exception of nickel and arsenic concentrations which were slightly higher than background levels. PCB results were not detectable or very low levels with results that ranged from 0.004 to <0.1 mg/kg. Concentrations of TPH ranged between <10 and 147 mg/kg.

A summary of baseline groundwater data is provided in Table 4.2. Baseline data was collected from permanent monitoring locations in 2010, 2011 and 2012. Low level copper and nickel were detected in MW-06, 07 and 08. Low levels of cobalt were detected in MW-06 and 07. TPH was detected in MW-08 with a concentration of 1.4 mg/kg.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-3 — PERMANENT BENCHMARK LOCATION (1)
- 1010 — COORDINATE POINT
- MW-05 — MONITORING WELL LOCATION (3)
- MW-08 B — BACKGROUND MONITORING WELL LOCATION (1)
- MONITORING SOIL SAMPLE LOCATION (4)
- 20014 — SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL
- BODY OF WATER

NON-HAZARDOUS WASTE LANDFILL FINAL GRADING (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
1010	7 628 945.2	577 219.3	108.0
1011	7 628 915.3	577 280.7	109.5
1012	7 628 856.6	577 254.9	109.4
1013	7 628 886.5	577 191.7	108.1

NOTE:
COORDINATE POINTS AND ELEVATIONS PROVIDED ARE TO THE FINAL GRADE OF THE TYPE 2 GRANULAR FILL CAP PRIOR TO THE PLACEMENT OF THE TYPE 1 GRANULAR FILL ON THE SIDE SLOPES.

NON-HAZARDOUS WASTE LANDFILL MONITORING WELLS (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW-05	7 628 915.1	577 296.1	107.9
MW-06	7 628 826.1	577 230.7	104.7
MW-07	7 628 874.6	577 163.2	103.7
MW-08	7 628 954.4	577 191.4	103.6

60900
60600
60300
60000
59750
59600
59475
59400
59325
59250
59175
59100
59025
58950
58825
58700
58550
58400
58250
58100
57950
57800
57650
57500
57200
53000

MAGNETIC GRADIENT (gammas/m)

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-3	7 628 966.171	577 106.215	102.610	25mm DIA. STEEL PIPE

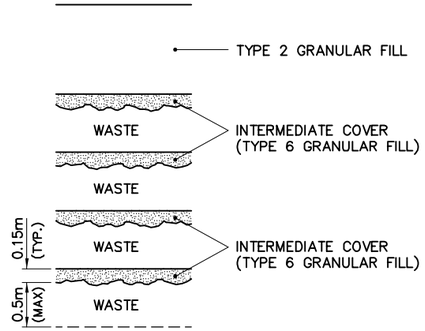
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NON - HAZARDOUS WASTE LANDFILL

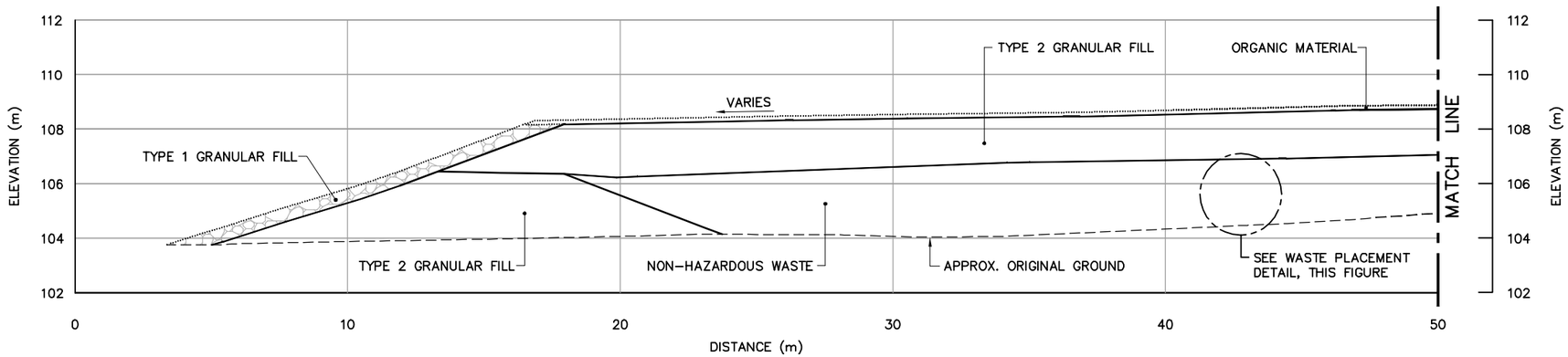
FIGURE PIN-4.4

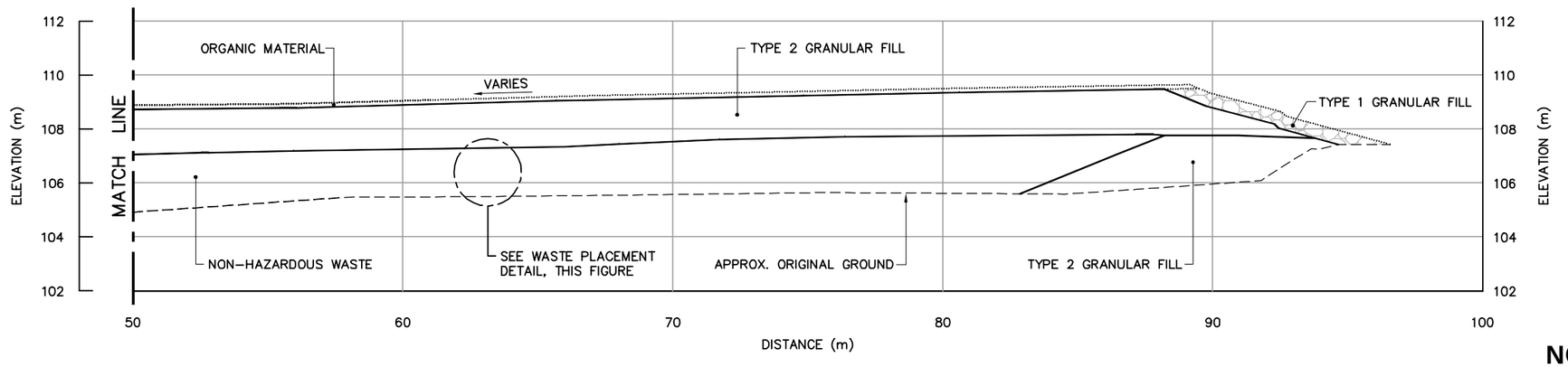
AECOM



WASTE PLACEMENT DETAIL

SCALE: NTS





SECTION A 4.4

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

GENERATED BASED ON AS–BUILT SURVEY INFORMATION

CONSTRUCTED AS PER DESIGN, NO AS–BUILT SURVEY INFORMATION

RECORD DRAWING
NOT FOR CONSTRUCTION

0 2 4 m SCALE 1:200

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NON-HAZARDOUS WASTE LANDFILL CROSS SECTION AND DETAIL

FIGURE PIN-4.4A

AECOM

Table 4.1: Non-Hazardous Waste Landfill – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
10-20014*/15		MW-05B	2010	0-10	8	6.5	<5.0	<1.0	11	<15	<20	1.8	<0.10	0.011	18	<10	<4.0	11
10-31080*/81		MW-05B	2010	30-40	7	6.5	<5.0	<1.0	23	<15	<20	2.5	<0.10	0.0035	<10	<10	<4.0	<9.0
11-34516*/17		MW-05B	2011	0-10	12	8.0	4.3	<0.50	12	19.4	12	2.6	<0.050	<0.030	<50	<5.0	<6	<50
11-34518*/19		MW-05B	2011	30-40	14	8.5	4.3	<0.50	13.1	19.3	14	2.8	<0.050	<0.030	<18	<5.0	<6	<18
12-15324*/25*		MW-05B	2012	0-10	19	12.0	5.3	<1.0	<10	59	<20	2.4	0.0059	0.053	<10	<10	<10	<10
12-15326*/27		MW-05B	2012	30-40	12	9.6	<5.0	<1.0	<10	18	<20	2.2	0.0071	<0.050	<10	<10	<10	<10
Downgradient Soil Samples																		
03-14417			2003	0	7	<5.0	<5.0	<1.0	<10	<15	<20	1.0		<0.1				
03-14418	03-14417		2003	60	7	7.6	<5.0	<1.0	12	<15	<20	2.1		<0.1	<40			
03-14419			2003	0	7	7.0	<5.0	<1.0	14	<15	<20	2.7		<0.1				
03-14420/21	03-14419		2003	40	11	7.7	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-14422	03-14419		2003	90	13	7.3	<5.0	<1.0	<10	<15	<20	2.5		<0.1				
03-14423			2003	0	10	7.0	<5.0	<1.0	12	<15	<20	2.0		<0.1	<40			
03-14424	03-14423		2003	40	17	9.7	<5.0	<1.0	<10	16	<20	2.6		<0.1				
10-31091*/92		MW-06	2010	0-10	14	7.4	<5.0	<1.0	<10	17	<20	<1.0	<0.10	<0.0030	50	<10	4.6	40
10-31093*/94		MW-06	2010	30-40	13	7.4	<5.0	<1.0	<10	38	<20	<1.0	<0.10	<0.0030	37	<10	<4.0	30
10-31087*/88		MW-07	2010	0-10	14	7.1	<5.0	<1.0	<10	20	<20	<1.0	<0.10	<0.0030	147	<10	12	130
10-31089*/90		MW-07	2010	30-40	19	12.0	<5.0	<1.0	<10	<15	<20	3.1	<0.10	<0.0030	46	<10	<4.0	39
10-31082*/83*		MW-08	2010	0-10	11	8.5	<5.0	<1.0	15	<15	<20	3.3	<0.10	0.0079	40	<10	<4.0	33
10-31084*/86		MW-08	2010	30-40	10	9.1	<5.0	<1.0	15	<15	<20	3.7	<0.10	0.0075	22	<10	<4.0	15
11-34528*/29		MW-06	2011	0-10	14	8.6	3.5	<0.50	5.2	19.3	11.8	2.2	<0.050	<0.030	<18	<5.0	<6	<18
11-34530*/31		MW-06	2011	30-40	21	13.6	5.4	<0.50	7.9	17.3	19.5	3.2	<0.050	<0.030	<18	<5.0	<6	<18
11-34524*/25		MW-07	2011	0-10	20	13.6	5.3	<0.50	6.3	7.5	12.3	4.9	<0.050	<0.040	<100	<5.0	<12	<100
11-34526*/27		MW-07	2011	30-40	27	17.3	4.0	<0.50	16.3	7.7	14.9	4.0	<0.050	<0.030	61	<5.0	<6	55
11-34520*/21*		MW-08	2011	0-10	13	9.6	3.5	<0.50	14.2	13.25	12.9	4.0	<0.050	<0.030	<18	<5.0	<6	<18
11-34522*/23		MW-08	2011	30-40	9	8.1	3.4	<0.50	13.1	17.3	10	3.8	<0.050	<0.030	<18	<5.0	<6	<18
12-15328*/29		MW-06	2012	0-10	18	14.0	<5.0	<1.0	<10	<15	<20	2.3	0.0088	<0.050	29	19	<10	<10
12-15330*/31		MW-06	2012	30-40	22	16.0	6.2	<1.0	<10	21	26	3.9	0.0073	<0.050	<10	<10	<10	<10
12-15332*/33		MW-07	2012	0-10	19	11.0	<5.0	<1.0	<10	<15	<20	1.9	0.0586	0.08	39	<10	<10	29
12-15334*/35*		MW-07	2012	30-40	16	15.0	5.4	<1.0	13	<15	24	3.1	0.0169	<0.050	44	34	<10	<10
12-15336*/37		MW-08	2012	0-10	12	11.0	<5.0	<1.0	17	<15	<20	4.0	0.0139	<0.050	<10	<10	<10	<10
12-15338*/39		MW-08	2012	30-40	11	16.0	<5.0	<1.0	16	<15	<20	4.5	0.0143	<0.050	21	11	<10	<10

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
		N Value			31	31	31	31	31	31	31	31	31	31	26			
		Average			13.7	9.8	<5.0	<1.0	9.7	<15	<20	2.7	<0.050	<0.1	<100			
		Standard Deviation			5.0	3.4			5.1			1.1						
		Minimum			6.5	<5.0	3.4	<0.50	5.2	7.5	10.0	<1.0	0.0059	0.004	<10			
		Maximum			27.1	17.3	6.2	<1.0	23.0	59.0	26.0	4.9	<0.1	<0.1	147.0			
		95% Confidence Limit			1.8	1.2			1.8			0.4						

Table 4.2: Non-Hazardous Waste Landfill – Baseline Groundwater Data

Sample #	Location	Date	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	PCBs [mg/L]	TPH [mg/L]	TPH Identity		
														F1	F2	F3
Downgradient Groundwater Samples																
10-32034	MW-07	2010	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
10-32035	MW-08	2010	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
11-34569	MW-06	2011	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.005	<0.003	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
11-34568	MW-07	2011	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.005	<0.003	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
11-34567	MW-08	2011	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	0.0053	<0.003	<0.00040	<0.0030	1.4	<0.050	0.9	<1.0
12-15340/41	MW-06	2012	0.050	0.054	0.022	<0.0010	0.1500	0.2400	0.0660	0.0320	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15342	MW-07	2012	0.057	0.031	0.010	<0.0010	0.0340	3.0000	0.0480	0.0070	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15343	MW-08	2012	0.011	0.018	<0.0030	<0.0010	<0.0050	0.0070	0.0510	0.0030	<0.00040	<0.0030	1.4	<0.050	0.9	<1.0
N Value			8	8	8	8	8	8	8	8	8	8	8			
Average			<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.0030	<1.0			
Standard Deviation																
Minimum			<0.0050	<0.0050	<0.0030		<0.0050	0.007	<0.0050	<0.0030		<0.000020	<1.0			
Maximum			0.057	0.054	0.022	<0.0010	0.150	3.000	0.0660	0.0320	<0.00040	<0.0030	1.4			
95% Confidence Limit																

5. Station Area Landfill West

The Station Area Landfill West is located southwest of the station area, approximately 600 m by road. Access is via the main road from the station and by a secondary access road into the landfill area to the west of the main road. The landfill consists of one large lobe with an area of 9,200 m^2.

The soil throughout the landfill is coarse-grained and consists, in general, of gravel with some sand or cobbles and occasional minor silt. Drainage from the landfill is to the west/southwest. The most relief in this area occurs on the west side of the landfill where the ground gently slopes at a grade of about 5%.

Surface samples were collected at the landfill and no criteria exceedances were measured.

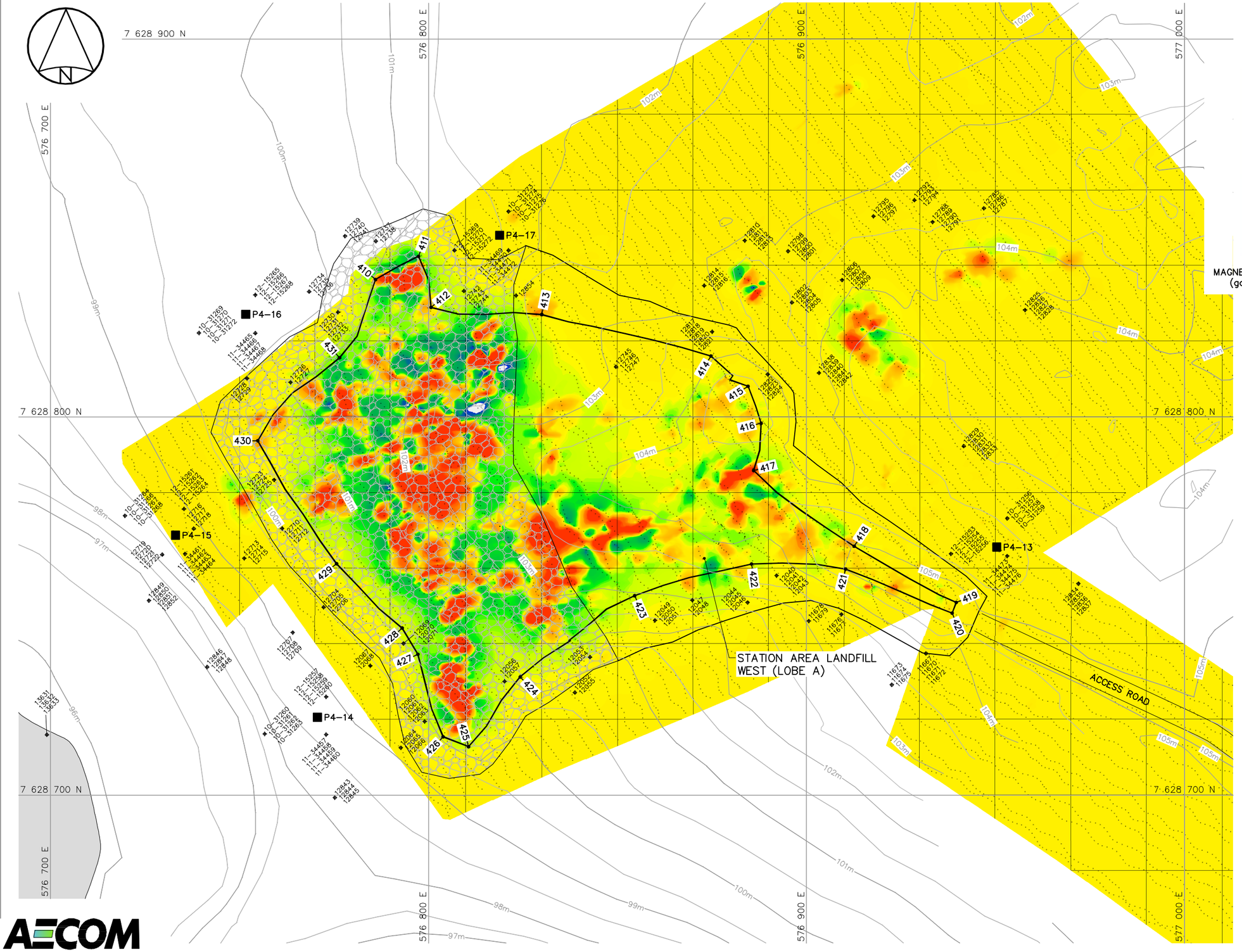
The landfill was classified as a low potential environmental risk based on a low score for the landfill as a source of contamination (little exposed debris, no contamination, no evidence of leaching), low potential for contaminant migration (subdued grade, coarse-grained material cover, no evidence of erosion) and moderate receptor sensitivity (lush vegetation away from landfill toe and presence of nearby ponds). The remedial plan for the landfill was 0.4 m Type 1 granular cover over 0.35 m Type 2 granular cover on the side slope and 0.75 m Type 2 granular cover on the top of the landfill.

The long term monitoring plan consists of visual monitoring and collection of soil samples. Approximate locations for the collection of soil samples are identified on Figure PIN-4.5.

5.1 Baseline Data

Sample locations for soil baseline data are shown in Figure PIN-4.5. A summary of the baseline soil analytical data is provided in Table 5.1. Baseline data is comprised of site investigation information collected up and down-gradient of the landfill in 2003 and samples collected at permanent monitoring locations up and down-gradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels, with the exception of lead and arsenic concentrations which were slightly higher than background levels. PCB results were not detectable or very low levels with results that ranged from <0.1 to 0.006 mg/kg. Concentrations of TPH ranged between <9.0 and 73 mg/kg.

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March 24, 2014 11:57:01 AM
Saved by: Cech, Ione
AECOM FILE NO.: PIN-4.5 Baseline LF MON.dwg



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 410 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- 12825 — SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL
- BODY OF WATER

STATION AREA LANDFILL–WEST (LOBE A) REGRADED (AS–BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
410	7 628 836.5	576 785.9	101.0
411	7 628 842.6	576 797.3	101.5
412	7 628 829.1	576 800.6	101.7
413	7 628 827.2	576 829.9	102.7
414	7 628 816.2	576 874.6	103.9
415	7 628 808.2	576 884.5	104.9
416	7 628 798.4	576 887.9	104.9
417	7 628 785.9	576 886.0	104.3
418	7 628 765.9	576 912.5	105.0
419	7 628 751.0	576 939.6	105.5
420	7 628 748.2	576 938.5	105.4
421	7 628 759.9	576 910.3	105.0
422	7 628 761.2	576 885.4	103.7
423	7 628 752.8	576 854.5	103.0
424	7 628 731.3	576 824.2	101.1
425	7 628 712.9	576 810.5	100.1
426	7 628 715.4	576 803.8	100.1
427	7 628 737.3	576 797.2	100.6
428	7 628 744.2	576 793.0	100.7
429	7 628 761.3	576 775.6	100.5
430	7 628 793.8	576 754.8	100.6
431	7 628 815.8	576 776.4	101.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

STATION AREA LANDFILL WEST LOBE A

FIGURE PIN-4.5

Table 5.1: Station Area Landfill West – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
03-12834			2003	0	15	8.8	<5.0	<1.0	29	<15	<20	2.4		<0.1				
03-12835		03-12834	2003	30	12	11.0	<5.0	<1.0	14	<15	<20	2.3		<0.1				
03-12836		03-12834	2003	60	21	8.8	<5.0	<1.0	12	<15	<20	2.3		<0.1				
03-12837		03-12834	2003	110	14	9.0	<5.0	<1.0	13	<15	<20	3.7		<0.1				
09-19214*/15		P4-13	2009	0-10	9	9.7	<5.0	<1.0	22	<15	<20	2.4	<0.10	<0.0030	21	<10	<4.0	14
09-19216*/17		P4-13	2009	30-40	8	9.4	<5.0	<1.0	21	<15	<20	2.8	<0.10	<0.0030	35	<10	7.7	22
10-31256*/57		P4-13	2010	0-10	14	9.3	<5.0	<1.0	<10	<15	<20	2.2	<0.10	0.012	24	N/A	6	18
10-31258*/59		P4-13	2010	30-40	11	9.4	<5.0	<1.0	13	<15	<20	3.0	<0.10	0.0056	16	N/A	<4.0	14
11-34473*/74		P4-13	2011	0-10	28	11.5	6.5	<0.50	4.4	24.4	15.3	1.8	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34475*/76		P4-13	2011	30-40	22	12.1	6.8	<0.50	7.9	20.5	15.9	2.7	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15253*/54		P4-13	2012	0-10	24	14.0	7.8	<1.0	<10	22	<20	2.5	0.009	0.07	<10	<10	<10	<10
12-15255*/56		P4-13	2012	30-40	15	15.0	6.3	<1.0	19	<15	20	3.1	0.0092	<0.050	<10	<10	<10	<10
Downgradient Soil Samples																		
03-11667			2003	0	10	11.0	<5.0	<1.0	12	<15	<20	1.5		<0.1				
03-11670/71	03-11671	03-11667	2003	40	13	11.0	<5.0	<1.0	14	<15	<20	<1.0		<0.1				
03-11672			2003	70	12	13.0	<5.0	<1.0	14	<15	<20	<1.0		<0.1				
03-11673			2003	0														
03-11674		03-11673	2003	40														
03-11675		03-11673	2003	70														
03-11676			2003	0	12	7.9	<5.0	<1.0	<10	<15	<20	<1.0		<0.1				
03-11677		03-11676	2003	40	12	10.0	<5.0	<1.0	17	<15	<20	1.7		<0.1				
03-11678			2003	0														
03-11679		03-11678	2003	40														
03-12040/41	03-12041		2003	0	12	11.0	<5.0	<1.0	23	<15	<20	<1.0		<0.1				
03-12042		03-12040	2003	60	11	12.0	<5.0	<1.0	21	<15	<20	1.5		<0.1				
03-12043		03-12040	2003	100	10	8.9	<5.0	<1.0	17	<15	<20	3.0		<0.1				
03-12044			2003	0														

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12045		03-12044	2003	30														
03-12046		03-12044	2003	90														
03-12047			2003	0	14	5.0	<5.0	<1.0	<10	<15	<20	3.4		<0.1				
03-12048		03-13047	2003	40	11	10.0	<5.0	<1.0	12	<15	<20	1.9		<0.1				
03-12049			2003	0														
03-12050/51	03-12051	03-12049	2003	40														
03-12052			2003	0														
03-12053			2003	0	21	7.7	<5.0	<1.0	<10	<15	<20	2.5		<0.1				
03-12054		03-12053	2003	40	14	7.1	<5.0	<1.0	<10	<15	<20	1.4		<0.1				
03-12055		03-12052	2003	40														
03-12056			2003	0	11	8.0	<5.0	<1.0	11	<15	<20	1.2		<0.1				
03-12057		03-12056	2003	40	13	12.0	5.8	<1.0	14	<15	<20	1.8		<0.1				
03-12060/61	03-12061		2003	0	11	8.5	<5.0	<1.0	10	19	<20	1.6		<0.1				
03-12062		03-12062	2003	10	12	11.0	<5.0	<1.0	10	<15	<20	2.3		<0.1				
03-12063		03-12062	2003	60	14	13.0	6.4	<1.0	12	<15	23	2.4		<0.1				
03-12064			2003	0														
03-12065		03-12064	2003	40														
03-12066		03-12064	2003	70														
03-12067			2003	0	13	8.0	<5.0	<1.0	14.3128	21.9505	<20	1.1						
03-12068		03-12067	2003	30	11	9.9	<5.0	<1.0	11.4672	<15	<20	1.8						
03-12069			2003	0	14	9.5	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-12070/71	03-12071	03-12069	2003	30	21	19.0	8.1	<1.0	18	<15	28	2.5		<0.1				
03-12704			2003	0	16	11.0	6.6	<1.0	12	17	25	3.3		<0.1				
03-12705		03-12704	2003	30														
03-12706		03-12704	2003	60	17	11.0	6.5	<1.0	13	<15	24	3.1		<0.1				
03-12707			2003	10														
03-12708		03-12707	2003	50	14	12.0	6.4	<1.0	10	17	23	2.3		<0.1				
03-12709		03-	2003	100	15	13.0	7.8	<1.0	11	15	24	3.2		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
		12707																
03-12710/11	03-12711		2003	0	15	5.3	<5.0	<1.0	<10	<15	<20	2.6		<0.1				
03-12712		03-12710	2003	40	21	9.7	<5.0	<1.0	11	<15	<20	2.9		<0.1				
03-12713		03-12714	2003	20	21	10.0	5.2	<1.0	10	<15	<20	2.1		<0.1				
03-12714			2003	0														
03-12715		03-12714	2003	40	16	9.8	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-12716			2003	0	13	8.7	<5.0	<1.0	<10	<15	<20	1.9		<0.1				
03-12717		03-12716	2003	40	16	12.0	6.3	<1.0	11	<15	24	2.8		<0.1				
03-12718		03-12716	2003	110														
03-12719			2003	0														
03-12720/21	03-12721	03-12719	2003	40	16	10.0	<5.0	<1.0	<10	<15	<20	2.3		<0.1				
03-12722		03-12719	2003	100	18	6.4	<5.0	<1.0	<10	<15	<20	2.5		<0.1				
03-12723			2003	0	22	11.0	5.8	<1.0	12	<15	23	2.6		<0.1				
03-12724		03-12723	2003	30	15	9.3	<5.0	<1.0	11	<15	<20	1.9		<0.1				
03-12725		03-12723	2003	80	17	11.0	5.9	<1.0	12	<15	25	2.7		<0.1				
03-12726			2003	0	21	6.8	<5.0	<1.0	33	<15	<20	2.6		<0.1				
03-12727		03-12726	2003	40	16	6.6	<5.0	<1.0	19	<15	<20	3.1		<0.1				
03-12728			2003	0														
03-12729			2003	50	20	11.0	5.5	<1.0	12	<15	<20	2.8		<0.1				
03-12730/31	03-12731		2003	0	15	6.1	<5.0	<1.0	<10	18	<20	3.9		<0.1				
03-12732		03-12730	2003	40														
03-12733		03-12730	2003	90	13	9.2	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-12734			2003	0	21	12.0	5.3	<1.0	12	<15	28	1.9		<0.1				
03-12735		03-12734	2003	40	21	13.0	5.6	<1.0	12	<15	28	1.9						
03-12736		03-12734	2003	60														
03-12737			2003	0	15	8.2	<5.0	<1.0	14	16	<20	1.8		<0.1				
03-12738		03-12737	2003	40	15	7.6	<5.0	<1.0	<10	<15	<20	1.3		<0.1				
03-12739			2003	0														

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12740/41	03-12741	03-12739	2003	40	18	11.0	<5.0	<1.0	12	<15	21	2.0		<0.1				
03-12742			2003	0	18	5.8	<5.0	<1.0	<10	<15	<20	8.6		<0.1				
03-12743		03-12742	2003	40	14	9.7	<5.0	<1.0	10	<15	<20	2.4		<0.1				
03-12744		03-12742	2003	80	16	8.3	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-12745			2003	0	21	6.6	<5.0	<1.0	<10	<15	<20	2.7		<0.1				
03-12746		03-12745	2003	50	11	9.1	<5.0	<1.0	11	24	<20	2.6		<0.1				
03-12747		03-12745	2003	120	10	7.3	<5.0	<1.0	<10	<15	<20	1.9		<0.1				
03-12785			2003	0	11	8.4	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-12786		03-12785	2003	30														
03-12787		03-12785	2003	80	10	7.8	<5.0	<1.0	<10	<15	<20	2.3		<0.1				
03-12788			2003	0	13	8.1	<5.0	<1.0	12	<15	<20	2.6		<0.1				
03-12789		03-12788	2003	40	10	8.2	<5.0	<1.0	10	<15	<20	2.4		<0.1				
03-12790/91	03-12791	03-12788	2003	70														
03-12792			2003	0														
03-12793		03-12792	2003	40	11	8.9	<5.0	<1.0	12	<15	<20	2.6		<0.1				
03-12794		03-12792	2003	100	9	7.3	<5.0	<1.0	12	<15	<20	2.2		<0.1				
03-12795			2003	0														
03-12796		03-12795	2003	40	11	7.9	<5.0	<1.0	10	<15	<20	2.0		<0.1				
03-12797		03-12795	2003	80	10	8.3	<5.0	<1.0	20	<15	<20	3.0		<0.1				
03-12798			2003	0														
03-12799		03-12798	2003	40	9	9.5	<5.0	<1.0	<10	<15	<20	2.5		<0.1				
03-12800/01	03-12801	03-12798	2003	110	10	8.5	<5.0	<1.0	12	<15	<20	2.5		<0.1				
03-12802			2003	0	11	8.7	<5.0	<1.0	11	<15	<20	1.9		<0.1				
03-12803		03-12802	2003	40														
03-12804		03-12802	2003	90	11	9.8	<5.0	<1.0	15	<15	<20	3.6		<0.1				
03-12805		03-12802	2003	130	12	8.9	<5.0	<1.0	13	<15	<20	4.4		<0.1				
03-12806			2003	0	12	8.3	<5.0	<1.0	11	<15	<20	3.0		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12807		03-12806	2003	40	13	9.6	<5.0	<1.0	14	<15	<20	2.6		<0.1				
03-12808		03-12806	2003	70														
03-12809		03-12806	2003	130	15	8.6	<5.0	<1.0	19	<15	<20	3.4		<0.1				
03-12810/11	03-12811		2003	0	12	8.6	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-12812		03-12810	2003	40														
03-12813		03-12810	2003	100	11	8.0	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-12814			2003	0	15	6.3	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-12815		03-12814	2003	40	11	9.0	<5.0	<1.0	11	<15	<20	2.7		<0.1				
03-12816		03-12814	2003	90														
03-12817			2003	0	12	6.1	<5.0	<1.0	<10	<15	<20	1.9		<0.1				
03-12818		03-12817	2003	30	14	11.0	<5.0	<1.0	13	<15	<20	2.6		<0.1				
03-12819		03-12817	2003	50														
03-12820/21	03-12821	03-12817	2003	100	12	8.1	<5.0	<1.0	11	<15	<20	2.9		<0.1				
03-12822			2003	0	12	8.5	<5.0	<1.0	14	<15	<20	2.4		<0.1				
03-12823		03-12822	2003	50	15	9.5	<5.0	<1.0	14	<15	<20	3.0		<0.1				
03-12824		03-12822	2003	100	15	8.6	<5.0	<1.0	15	<15	<20	3.5		<0.1				
03-12825			2003	0	17	8.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-12826		03-12825	2003	20	13	9.5	<5.0	<1.0	19	<15	<20	2.9		<0.1				
03-12827		03-12825	2003	60	12	8.0	<5.0	<1.0	<10	<15	<20	2.0		<0.1				
03-12828		03-12825	2003	110	12	8.1	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-12829			2003	0	13	8.0	<5.0	<1.0	14	<15	<20	2.0		<0.1				
03-12830/31	03-12831	03-12829	2003	30	12	8.7	<5.0	<1.0	10	<15	<20	1.9		<0.1				
03-12832		03-12829	2003	80	10	7.9	<5.0	<1.0	<10	<15	<20	1.6		<0.1				
03-12833		03-12829	2003	120	11	7.7	<5.0	<1.0	11	<15	<20	2.7		<0.1				
03-12838			2003	0	11	8.0	<5.0	<1.0	11	<15	<20	2.5		<0.1				
03-12839		03-12838	2003	30														
03-12840/41	03-12841	03-	2003	70	13	8.3	<5.0	<1.0	12	<15	<20	2.4		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
		12838																
03-12842		03-12838	2003	120	9	7.8	<5.0	<1.0	14	<15	<20	2.1		<0.1				
03-12843			2003	0														
03-12844		03-12843	2003	40	15	11.0	<5.0	<1.0	<10	<15	21	2.5		<0.1				
03-12845		03-12843	2003	60	18	13.0	6.7	<1.0	13	<15	28	3.5		<0.1				
03-12846			2003	0	9	<5.0	<5.0	<1.0	<10	42	<20	<1.0		<0.1				
03-12847		03-12846	2003	40	16	12.0	6.4	<1.0	11	<15	24	2.7						
03-12848		03-12846	2003	90	19	14.0	7.2	<1.0	11	<15	33	2.9		<0.1				
03-12849			2003	0	11	5.7	<5.0	<1.0	<10	<15	<20	1.2		<0.1				
03-12850/51	03-12851	03-12849	2003	30	18	12.0	6.2	<1.0	<10	<15	26	2.8		<0.1				
03-12852		03-12849	2003	70										<0.1				
09-19210*/11		P4-14	2009	0-10	9	6.9	<5.0	<1.0	<10	<15	<20	1.2	<0.10	<0.0030	59	<10	7.6	46
09-19212*/13		P4-14	2009	30-40	13	12.0	5.8	<1.0	11	<15	22	2.5	<0.10	<0.0030	31	<10	4.6	21
09-19206*/07		P4-15	2009	0-10	13	12.0	5.6	<1.0	11	<15	22	2.1	<0.10	<0.0030	52	<10	5.1	42
09-19208*/09		P4-15	2009	30-40	11	28.0	<5.0	<1.0	<10	<15	100	1.8	<0.10	<0.0030	29	<10	4.8	19
09-19202*/03		P4-16	2009	0-10	14	6.4	<5.0	<1.0	<10	<15	<20	3.4	<0.10	<0.0030	38	<10	6.9	26
09-19204*/05		P4-16	2009	30-40	11	6.5	<5.0	<1.0	<10	18	<20	2.4	<0.10	<0.0030	58	<10	8.1	45
09-19198*/99		P4-17	2009	0-10	8	8.5	<5.0	<1.0	11	<15	<20	2.9	<0.10	<0.0030	27	<10	4.9	17
09-19200*/01*		P4-17	2009	30-40	8	8.7	<5.0	<1.0	11	<15	<20	2.7	<0.10	<0.0030	21	<10	4.3	12
10-31260*/61		P4-14	2010	0-10	9	7.4	<5.0	<1.0	<10	<15	<20	2.1	<0.10	0.011	28	N/A	<4.0	26
10-31262*/63		P4-14	2010	30-40	9	6.1	<5.0	<1.0	<10	<15	<20	1.8	<0.10	0.0096	73	N/A	<4.0	71
10-31264*/66		P4-15	2010	0-10	10	8.9	<5.0	<1.0	<10	<15	<20	2.3	<0.10	0.0058	14	N/A	<4.0	12
10-31267*/68*		P4-15	2010	30-40	10	8.4	<5.0	<1.0	<10	<15	<20	2.7	<0.10	0.063	23	N/A	<4.0	21
10-31269*/70		P4-16	2010	0-10	12	6.6	<5.0	<1.0	<10	<15	<20	3.2	<0.10	0.014	25	N/A	<4.0	23
10-31271*/72		P4-16	2010	30-40	12	6.8	<5.0	<1.0	<10	<15	<20	3.1	<0.10	0.013	23	N/A	<4.0	21
10-31273*/74		P4-17	2010	0-10	9	8.9	<5.0	<1.0	12	<15	<20	3.3	<0.10	0.027	<9.0	N/A	<4.0	<9.0
10-31275*/76*		P4-17	2010	30-40	9	8.5	<5.0	<1.0	11	<15	<20	3.6	<0.10	0.016	<9.0	N/A	<4.0	<9.0
11-34457*/58		P4-14	2011	0-10	9	7.5	3.6	<0.50	8.9	18.5	9.9	2.7	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34459*/60*		P4-14	2011	30-40	10	7.7	3.6	<0.50	4.7	14	9.8	3.1	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34461*/62		P4-15	2011	0-10	12	9.9	4.6	<0.50	14.4	24.1	13.3	3.3	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34463*/64		P4-15	2011	30-40	10	9.0	4.3	<0.50	9	12.7	13.2	3.1	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34465*/66		P4-16	2011	0-10	10	8.9	4.2	<0.50	10.2	12.9	13.1	3.7	<0.050	<0.030	<50	<5.0	<6.0	<50

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
11-34467*/68		P4-16	2011	30-40	10	7.9	4.0	<0.50	9.3	17	11.1	3.2	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34469*/70		P4-17	2011	0-10	8	9.1	4.1	<0.50	12	8.8	9.6	3.5	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34471*/72		P4-17	2011	30-40	9	10.0	4.8	<0.50	14.5	13.1	11.2	4.0	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15257*/58*		P4-14	2012	0-10	9	7.2	<5.0	<1.0	<10	17	<20	2.2	0.051	<0.050	29	<10	<10	19
12-15259*/60		P4-14	2012	30-40	9	7.7	<5.0	<1.0	<10	<15	<20	2.9	0.0366	<0.050	<10	<10	<10	<10
12-15261*/62		P4-15	2012	0-10	12	12.0	<5.0	<1.0	<10	<15	<20	3.7	0.0225	<0.050	20	<10	<10	10
12-15263*/64		P4-15	2012	30-40	11	11.0	<5.0	<1.0	11	<15	<20	3.4	0.0221	<0.050	<10	<10	<10	<10
12-15265*/66		P4-16	2012	0-10	11	7.3	<5.0	<1.0	<10	19	<20	2.6	0.0425	<0.050	50	<10	<10	40
12-15267*/68		P4-16	2012	30-40	14	8.1	<5.0	<1.0	<10	<15	<20	4.2	0.026	<0.050	<10	<10	<10	<10
12-15269*/70		P4-17	2012	0-10	10	11.0	<5.0	<1.0	12	<15	<20	4.3	0.0129	<0.050	<10	<10	<10	<10
12-15271*/72*		P4-17	2012	30-40	10	13.0	<5.0	<1.0	12	<15	<20	4.0	0.013	<0.050	<10	<10	<10	<10
		N Value			140	140	140	140	140	140	140	140	40	141	40			
		Average			13.3	9.3	<5.0	<1.0	10.3	<15	<20	2.5	<0.10	<0.1	22.4			
		Standard Deviation			3.8	2.7			5.2			0.9			17.1			
		Minimum			7.7	<5.0	3.6	<0.50	4.4	8.8	9.6	<1.0	0.0090	0.006	<9.0			
		Maximum			28.3	28.0	8.1	<1.0	33.0	42.0	100.0	8.6	<0.10	<0.1	73.0			
		95% Confidence Limit			0.6	0.5			0.9			0.2			5.3			

6. USAF Closure Landfill

The USAF Closure Landfill is located about 300 m directly south of the station area. The landfill is most easily accessed via the airstrip. The landfill consists of one continuous lobe of 1,500 m^2.

Soil in the landfill proximity consists of sand and gravel at surface, grading to angular bedrock fragments at depth. The ridge immediately downgradient of the landfill consisted of gravelly material with little vegetation and the airstrip is located approximately 100 m downgradient of the ridge. There is a 20 m wide strip of moderately vegetated land between the ridge and the airstrip.

Minor surface debris was encountered on the landfill surface during the site investigation. Sampling for contaminated soil was not conducted at this landfill because of good surface cover and lack of debris exposure or staining.

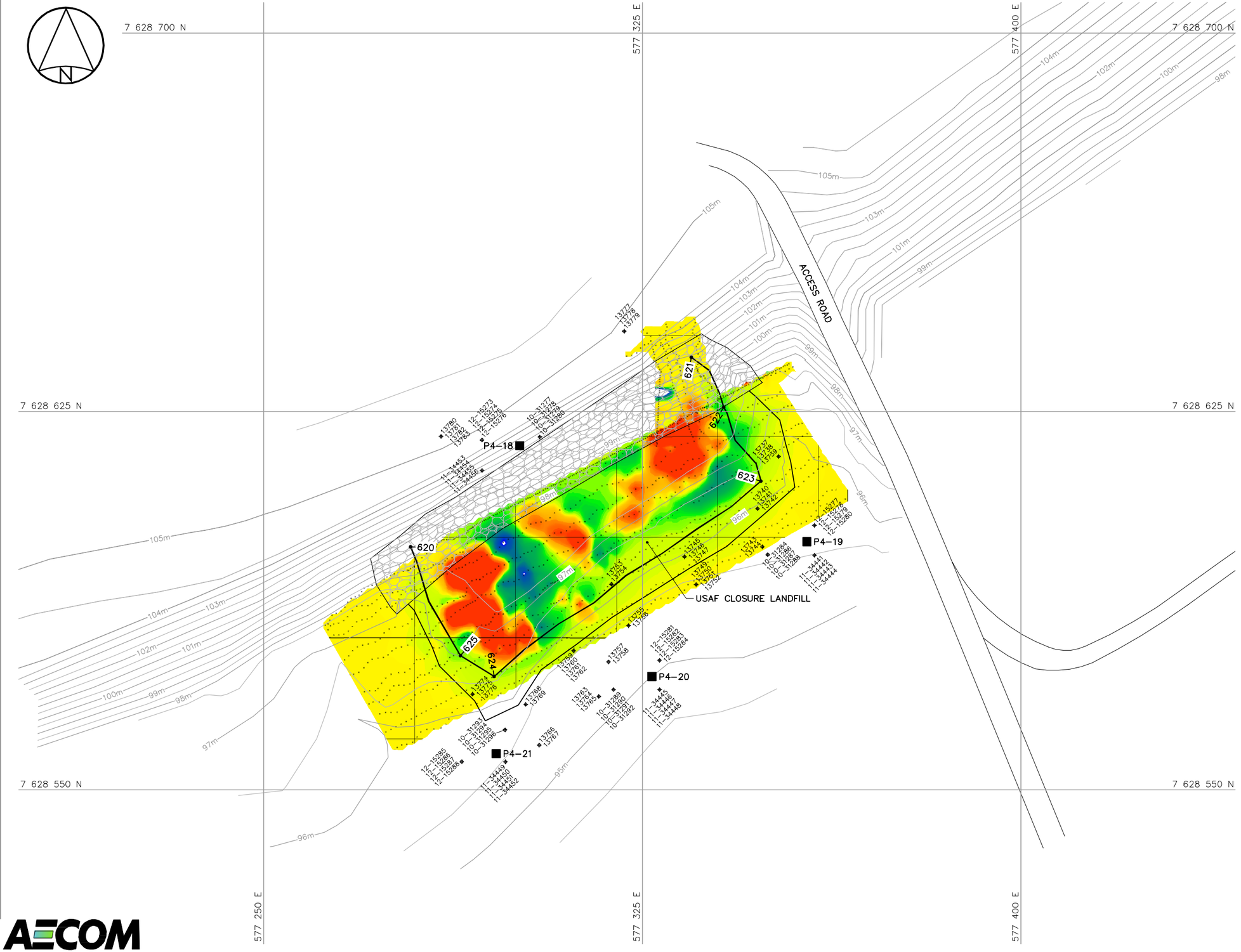
The landfill is classified as a low potential environmental risk. Accordingly, surface and partially exposed debris was removed and the landfill was regraded with 0.5 m of Type 1 granular fill over 0.5 m of Type 2 granular fill.

The long term monitoring plan consists of visual monitoring and collection of soil samples. Approximate locations for the collection of soil samples are identified on Figure PIN-4.6.

6.1 Baseline Data

Sample locations for soil baseline data are shown on Figure PIN-4.6. A summary of the baseline soil analytical data is provided in Table 6.1. Baseline data is comprised of site investigation information collected up and downgradient of the landfill in 2003 and samples collected at permanent monitoring locations up and downgradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels, with the exception of copper, nickel, and arsenic which are all slightly higher than background levels. PCB results were not detectable or very low levels. The PCB results ranged from 0.006 to <0.1 mg/kg. Concentrations of TPH ranged between <9.0 and 51 mg/kg.

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March 24, 2014 11:53:52 AM
Saved by: Cech, Ione
AECOM FILE NO.: PIN-4.6 Baseline LF MON.dwg



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 620 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (4)
- 13737 — SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL

60900
60600
60300
60000
59750
59600
59475
59400
59325
59250
59175
59100
59025
58950
58825
58700
58550
58400
58250
58100
57950
57800
57650
57500
57200
53000

MAGNETIC GRADIENT (gammas/m)

USAF CLOSURE LANDFILL REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
620	7 628 598.2	577 279.1	99.6
621	7 628 635.7	577 334.7	101.9
622	7 628 625.9	577 341.1	98.0
623	7 628 611.2	577 348.5	96.3
624	7 628 572.5	577 295.6	96.6
625	7 628 576.6	577 289.0	97.0

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

USAF CLOSURE LANDFILL

FIGURE PIN-4.6

AECOM

Table 6.1: USAF Closure Landfill – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
03-13777			2003	0	19	9.3	<5.0	<1.0	30	<15	<20	3.0		<0.1				
03-13778		03-13777	2003	50	24	8.3	<5.0	<1.0	15	<15	<20	3.0		<0.1				
03-13779		03-13777	2003	100	12	10.0	<5.0	<1.0	13	<15	<20	3.1		<0.1				
03-13780/81	03-13781		2003	0	11	8.5	<5.0	<1.0	<10	<15	<20	2.4		<0.1				
03-13782		03-13780	2003	50	9	8.8	<5.0	<1.0	17	<15	<20	3.3		<0.1				
03-13783		03-13780	2003	110	10	7.6	<5.0	<1.0	16	<15	<20	3.2		<0.1				
09-19194*/95		P4-182	2009	0-10	11	8.6	<5.0	<1.0	12	<15	<20	3.2	<0.10	<0.0030	<10	<10	<4.0	<9.0
09-19196*/97*		P4-182	2009	30-40	230	9.3	<5.0	<1.0	275	17	<20	3.1	<0.10	0.0055	<10	<10	<4.0	<9.0
10-31277*/78		P4-182	2010	0-10	21	8.3	<5.0	<1.0	20	27	<20	3.3	<0.10	0.71	<9.0	N/A	<4.0	<9.0
10-31279*/80*		P4-182	2010	30-40	640	8.2	<5.0	<1.0	12	17	<20	3.6	<0.10	0.099	<9.0	N/A	<4.0	<9.0
11-34453*/54		P4-18	2011	0-10	17	11.0	5.5	<0.50	15.2	21.4	12.7	4.3	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34455*/56		P4-18	2011	30-40	39	9.4	4.2	<0.50	21.5	45.1	13	3.9	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15273*/74		P4-18	2012	0-10	32	13.0	5.3	<1.0	39	150	<20	4.8	0.0158	0.06	<10	<10	<10	<10
12-15275*/76		P4-18	2012	30-40	17	18.0	6.4	<1.0	43	120	<20	6.5	0.0136	<0.050	<10	<10	<10	<10
Downgradient Soil Samples																		
03-13737			2003	0	14	12.0	<5.0	<1.0	13	20	<20	1.5		<0.1				
03-13738		03-13737	2003	40	13	14.0	5.5	<1.0	<10	17	<20	2.7						
03-13739		03-13737	2003	80	13	13.0	5.3	<1.0	<10	<15	<20	2.1		<0.1				
03-13740/41	03-13741		2003	0	13	16.0	5.6	<1.0	<10	<15	<20	2.1		<0.1				
03-13742		03-13740	2003	50														
03-13743			2003	0														
03-13744		03-13743	2003	50	9	6.3	<5.0	<1.0	<10	<15	<20	1.1		<0.1				
03-13745			2003	0	11	12.0	<5.0	<1.0	<10	<15	<20	1.9		<0.1				
03-13746		03-13746	2003	40														
03-13747		03-13746	2003	90	11	8.1	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-13749			2003	0	13	14.0	5.6	<1.0	10	<15	<20	2.5		<0.1				
03-13750/51	03-13751	03-13749	2003	50	11	12.0	6.1	<1.0	<10	<15	<20	1.6		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-13752		03-13749	2003	90														
03-13753			2003	90	13	14.0	5.5	<1.0	11	<15	<20	2.4		<0.1				
03-13754		03-13753	2003	40														
03-13755			2003	0														
03-13756		03-13755	2003	50	9	11.0	<5.0	<1.0	<10	<15	<20	2.1		<0.1				
03-13757			2003	0	11	12.0	<5.0	<1.0	10	<15	<20	2.1		<0.1				
03-13758		03-13757	2003	50	11	13.0	<5.0	<1.0	<10	<15	<20	2.2		<0.1				
03-13759			2003	0	14	13.0	<5.0	<1.0	10	<15	<20	3.0		<0.1				
03-13760/61	03-13761	03-13759	2003	50										<0.1				
03-13762		03-13759	2003	70	13	13.0	5.2	<1.0	11	<15	<20	2.7		<0.1				
03-13763			2003	0														
03-13764		03-13763	2003	40	11	12.0	<5.0	<1.0	<10	<15	<20	1.8		<0.1				
03-13765		03-13763	2003	70	19	14.0	<5.0	<1.0	<10	<15	<20	1.7		<0.1				
03-13766			2003	0	12	11.0	<5.0	<1.0	<10	<15	<20	1.6		<0.1				
03-13767		03-13766	2003	50														
03-13768			2003	0	12	10.0	<5.0	<1.0	<10	<15	<20	2.8		<0.1				
03-13769		03-13768	2003	50														
03-13770/71	03-13771		2003	0	12	14.0	5.3	<1.0	<10	<15	<20	2.3		<0.1				
03-13772		03-13770	2003	50	19	15.0	6.5	<1.0	<10	<15	<20	2.1		<0.1				
03-13773		03-13770	2003	90														
03-13774			2003	0	17	14.0	7.2	<1.0	11	16	23	2.7		<0.1				
03-13775		03-13774	2003	50														
03-13776		03-13774	2003	80	17	12.0	<5.0	<1.0	<10	<15	<20	2.5		<0.1				
09-19190*/91*		P4-19	2009	0-10	8	9.6	<5.0	<1.0	8.5	<15	<20	2.3	<0.10	<0.0030	33	<10	3.2	25
09-19192*/93		P4-19	2009	30-40	9	11.0	<5.0	<1.0	<10	<15	<20	2.3	<0.10	<0.0030	24	<10	4.4	15
09-19186*/87		P4-20	2009	0-10	10	12.0	<5.0	<1.0	<10	<15	<20	2.8	<0.10	<0.0030	36	<10	6.2	25
09-19188*/89		P4-20	2009	30-40	10	11.0	<5.0	<1.0	<10	<15	<20	2.5	<0.10	<0.0030	44	<10	5.1	34
09-19182*/83		P4-21	2009	0-10	9	12.0	<5.0	<1.0	<10	<15	<20	2.7	<0.10	<0.0030	49	<10	4.5	39
09-19184*/85		P4-21	2009	30-40	9	12.0	<5.0	<1.0	<10	<15	<20	2.8	<0.10	<0.0030	51	<10	6	40

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
10-31286*/87		P4-19	2010	0-10	10	12.0	<5.0	<1.0	<10	<15	<20	2.7	<0.10	0.012	17	N/A	<4.0	15
10-31288*/84		P4-19	2010	30-40	10	12.0	<5.0	<1.0	<10	<15	<20	2.9	<0.10	0.053	<9.0	N/A	<4.0	<9.0
10-31289*/90		P4-20	2010	0-10	8	9.6	<5.0	<1.0	15	<15	<20	3.2	<0.10	0.07	24	N/A	<4.0	22
10-31291*/92		P4-20	2010	30-40	9	11.0	<5.0	<1.0	<10	<15	<20	3.0	<0.10	0.055	16	N/A	<4.0	14
10-31293*/94*		P4-21	2010	0-10	10	12.0	<5.0	<1.0	<10	<15	<20	2.9	<0.10	0.092	10	N/A	<4.0	7.8
10-31295*/96		P4-21	2010	30-40	10	13.0	<5.0	<1.0	<10	<15	<20	2.5	<0.10	0.014	<9.0	N/A	<4.0	<9.0
11-34441*/42		P4-19	2011	0-10	11	13.8	5.4	<0.50	15.7	12.3	13.3	3.7	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34443*/44		P4-19	2011	30-40	12	14.6	5.7	<0.50	10.8	12.7	12.7	3.4	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34445*/46		P4-20	2011	0-10	9	12.3	5.0	<0.50	8.1	9	11.7	3.4	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34447*/48		P4-20	2011	30-40	9	10.6	4.0	<0.50	8.8	10.6	12.2	3.2	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34449*/50		P4-21	2011	0-10	9	11.9	4.5	<0.50	8.5	9.6	12.9	3.2	<0.050	<0.030	<50	<5.0	<6.0	<50
11-34451*/52		P4-21	2011	30-40	9	12.9	5.0	<0.50	7.7	8.8	11.6	3.4	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15277*/78*		P4-19	2012	0-10	15	15.0	4.2	<1.0	11	<15	<20	3.8	0.017	<0.050	18	<10	<10	7.5
12-15279*/80		P4-19	2012	30-40	12	17.0	5.4	<1.0	<10	<15	<20	3.8	0.0174	<0.050	<10	<10	<10	<10
12-15281*/82		P4-20	2012	0-10	11	13.0	<5.0	<1.0	<10	<15	<20	3.3	0.0127	<0.050	<10	<10	<10	<10
12-15283*/84		P4-20	2012	30-40	10	15.0	<5.0	<1.0	<10	<15	<20	3.5	0.0121	<0.050	<10	<10	<10	<10
12-15285*/86		P4-21	2012	0-10	11	16.0	5.4	<1.0	33	<15	<20	4.0	0.0149	<0.050	<10	<10	<10	<10
12-15287*/88*		P4-21	2012	30-40	11	16.0	5.6	<1.0	<10	<15	<20	3.6	0.016	<0.050	20	<10	<10	10
		N Value			61	61	61	61	61	61	61	61	60	62	32			
		Average			27	12.0	<5.0	<1.0	<10	<15	<20	2.9	<0.10	<0.1	28.5			
		Standard Deviation			85	2.5						0.9			13.8			
		Minimum			8	6.3	4.0	<0.50	7.7	8.8	11.6	1.1	0.012	0.006	<9.0			
		Maximum			640	18.0	7.2	<1.0	275.0	150.0	23.0	6.5	<0.1	0.710	51.0			
		95% Confidence Limit			21	0.6						0.2			4.8			

7. Tier II Disposal Facility

The Tier II Disposal Facility was constructed at the PIN-4 site for the disposal of Tier II soil excavated during the remediation. The facility is located at the southwest end of the airstrip.

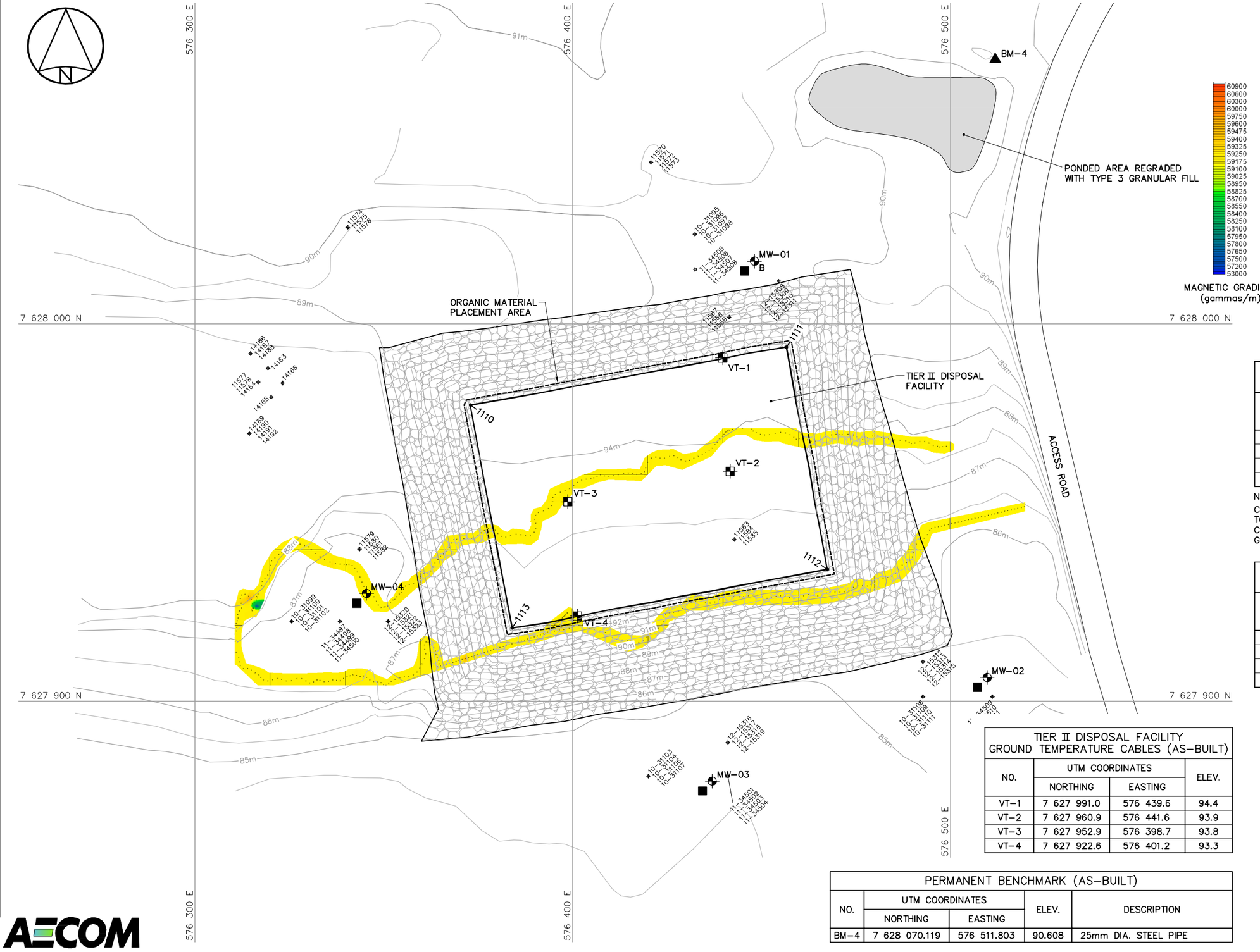
The Tier II Disposal Facility design is a double containment system. The landfill was constructed with the placement of low-permeability, saturated, compacted berms keyed into frozen/saturated ground below existing ground, the installation of a liner system over the berms and along the landfill base, the placement of a surface liner system over the landfill contents, and the placement of sufficient overlying granular fill to promote freeze back of landfill contents. Four groundwater monitoring wells were installed around the landfill perimeter and four thermistors were installed within the landfill to monitor ground temperatures.

The monitoring plan consists of visual monitoring, periodic collection of soil and groundwater samples and monitoring of subsurface ground temperatures in the berms and in the main body of the disposal facility. Locations for the collection of soil and groundwater samples and thermistor installations are identified on Figure PIN-4.7.

7.1 Baseline Data

Sample locations for the baseline soil samples are shown on Figure PIN-4.7. A summary of the baseline soil analytical data is provided in Table 7.1. Baseline soil data is comprised of samples collected in the vicinity of the Tier II Disposal Facility during the site investigation in 2006 and samples collected at permanent monitoring locations during 2009, 2010, 2011 and 2012. Copper, nickel, cobalt and zinc soil baseline concentrations were slightly elevated above the background levels. The remaining inorganic elements were consistent, or below, the background levels. PCBs were below detection limits which ranged from <0.0030 to <0.1. Low level TPH concentrations were detected at several of the sample locations. Hydrocarbon concentrations ranged between <10 mg/kg to 116 mg/kg.

A summary of baseline groundwater data is provided in Table 7.2. Baseline data was collected from permanent monitoring locations in 2010, 2011 and 2012. Low level copper, nickel, cobalt, zinc, chromium, and arsenic were detected in all monitoring wells. Lead was detected in low levels in MW-02 and 03. Mercury and PCBs were below detection limits. TPH was detected in MW-03 and ranged from <1.0 to 1.1 mg/kg.



MAGNETIC GRADIENT (gammas/m)

60900
60600
60300
60000
59750
59600
59475
59400
59325
59250
59175
59100
59025
58950
58825
58700
58550
58400
58250
58100
57950
57800
57650
57500
57200
53000

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-4 — PERMANENT BENCHMARK LOCATION (1)
- 1110 — COORDINATE POINT
- MW-02 — MONITORING WELL LOCATION (3)
- MW-01 B — BACKGROUND MONITORING WELL LOCATION (1)
- VT-1 — GROUND TEMPERATURE CABLE LOCATION (4)
- MONITORING SOIL SAMPLE LOCATION (4)
- 11567 — SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL

TIER II DISPOSAL FACILITY FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
1110	7 627 978.4	576 372.9	94.4
1111	7 627 993.8	576 456.5	94.2
1112	7 627 935.0	576 467.3	93.2
1113	7 627 919.4	576 383.9	93.2

NOTE:
COORDINATE POINTS AND ELEVATIONS PROVIDED ARE TO THE FINAL GRADE OF THE TYPE 2 GRANULAR FILL CAP PRIOR TO THE PLACEMENT OF THE TYPE 1 GRANULAR FILL ON THE SIDE SLOPES.

TIER II DISPOSAL FACILITY MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW-01	7 628 016.6	576 448.1	89.8
MW-02	7 627 906.3	576 509.7	85.2
MW-03	7 627 878.8	576 436.9	84.7
MW-04	7 627 928.6	576 345.4	86.8

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

TIER II DISPOSAL FACILITY GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-1	7 627 991.0	576 439.6	94.4
VT-2	7 627 960.9	576 441.6	93.9
VT-3	7 627 952.9	576 398.7	93.8
VT-4	7 627 922.6	576 401.2	93.3

PERMANENT BENCHMARK (AS-BUILT)

NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-4	7 628 070.119	576 511.803	90.608	25mm DIA. STEEL PIPE

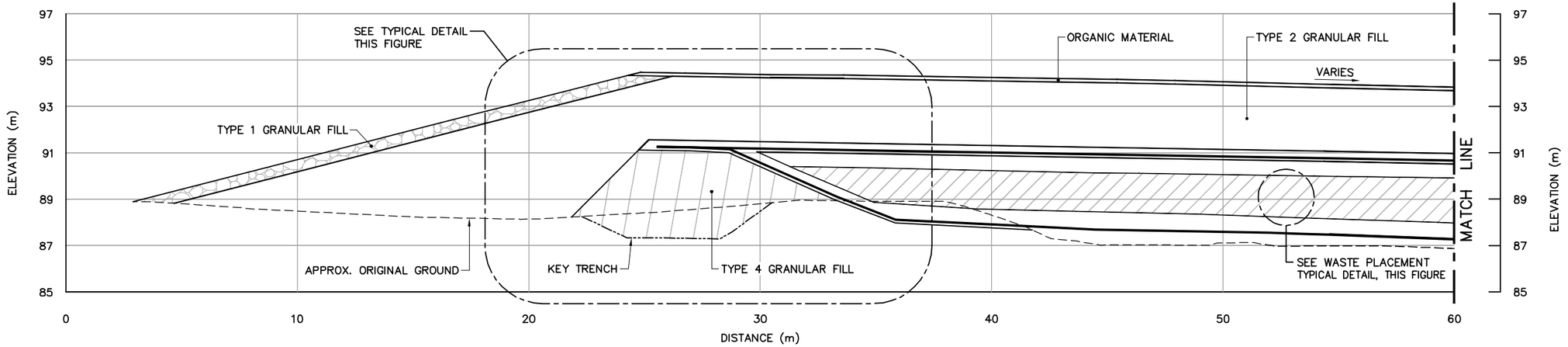
DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

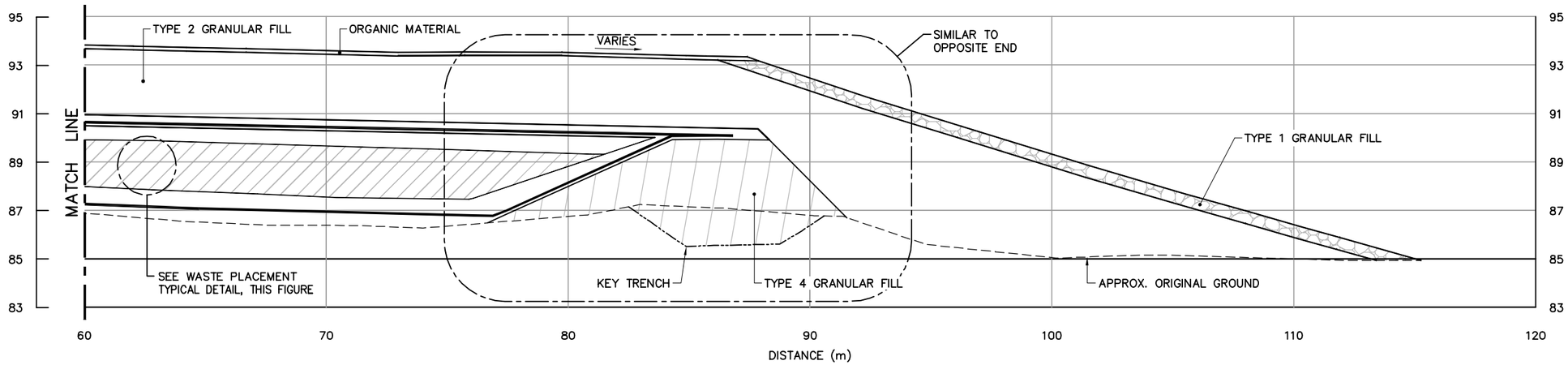
PIN-4 BYRON BAY

TIER II DISPOSAL FACILITY

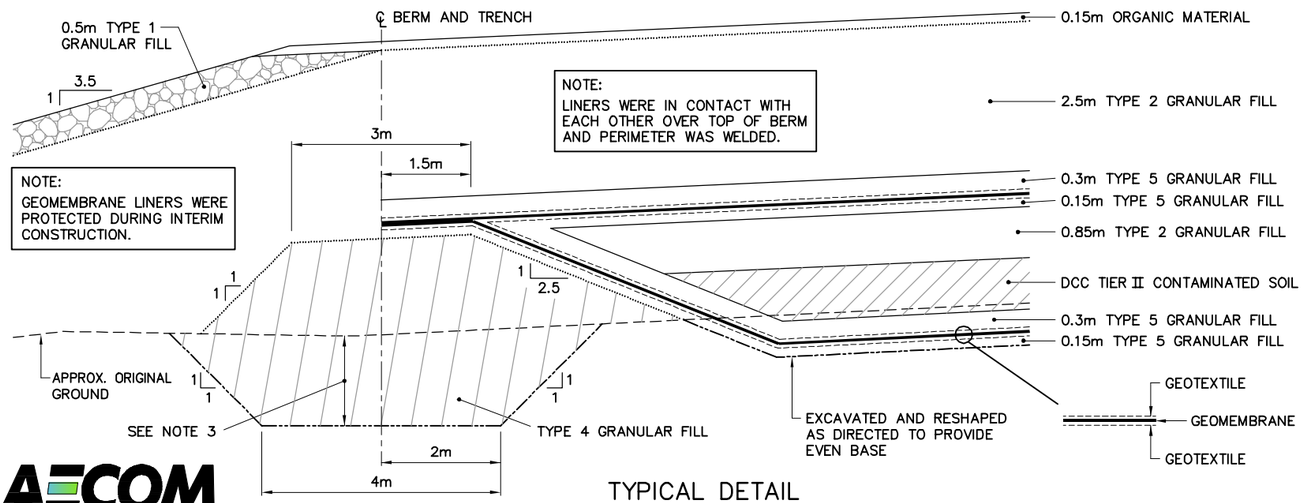
FIGURE PIN-4.7

AECOM

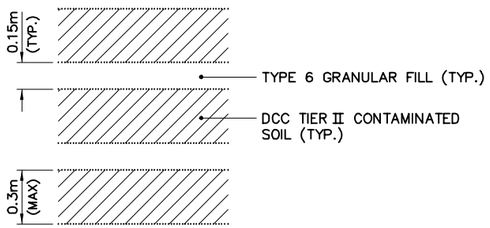




SECTION B 4.7



TYPICAL DETAIL
SCALE: NTS



WASTE PLACEMENT TYPICAL DETAIL
SCALE: NTS

RECORD DRAWING
NOT FOR CONSTRUCTION

0 2 4 m SCALE 1:200

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. KEY TRENCH WAS EXCAVATED TO SATURATED GROUND OR ICE SATURATED PERMAFROST. EXCAVATION DEPTH WAS FIELD CONFIRMED BY THE SITE ENGINEER.

LEGEND:

GENERATED BASED ON AS-BUILT SURVEY INFORMATION

CONSTRUCTED AS PER DESIGN, NO AS-BUILT SURVEY INFORMATION

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

TIER II DISPOSAL FACILITY CROSS SECTION AND DETAIL

FIGURE PIN-4.7A

Table 7.1: Tier II Disposal Facility – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
03-11570/71	03-11571		2003	0	21	12.0	7.4	<1.0	<10	32	<20	1.0		<0.1				
03-11572		03-11570	2003												<40			
03-11573			2003	80	19	15.0	9.4	<1.0	<10	27	23	1.6		<0.1				
03-11574			2003	0														
03-11575		03-11574	2003	30	23	8.2	6.1	<1.0	<10	18	<20	1.5		<0.1				
03-11576		03-11574	2003	75	39	12.0	7.5	<1.0	<10	25	<20	1.2		<0.1	<40			
10-31095*/96		MW-01B	2010	0-10	40	11.0	7.4	<1.0	<10	22	<20	1.3	<0.10	<0.0030		<10	<4.0	15
10-31097*/98		MW-01B	2010	30-40	15	11.0	7.3	<1.0	<10	21	<20	1.1	<0.10	<0.0030		<10	<4.0	10
11-34505*/06		MW-01B	2011	0-10	24	11.3	7.3	<0.50	5.2	22.9	15	2.6	<0.050	<0.030		<5.0	<6.0	<18
11-34507*/08		MW-01B	2011	30-40	38	12.9	8.1	<0.50	5.9	22.8	16.2	3.2	<0.050	<0.030		<5.0	<6.0	<18
12-15308*/09		MW-01B	2012	0-10	13	6.0	<5.0	<1.0	<10	<15	<20	1.2	0.0058	<0.050		19	<10	<10
12-15310*/11		MW-01B	2012	30-40	29	11.0	6.9	<1.0	<10	21	<20	2.4	0.0116	<0.050		<10	<10	<10
Downgradient Soil Samples																		
03-11567			2003	0	20	10.0	6.6	<1.0	<10	24	<20	1.4		<0.1	<40			
03-11568		03-11567	2003	30	22	12.0	7.5	<1.0	<10	24	<20	1.2		<0.1				
03-11569		03-11567	2003	90														
03-11577			2003	10	140	19.0	16.0	<1.0	<10	48	<20	<1.0		<0.1	<40			
03-11578		03-11577	2003	70	47	13.0	8.8	<1.0	<10	29	23	<1.0		<0.1				
03-11579			2003	0	25	12.0	7.8	<1.0	<10	30	<20	1.2		<0.1				
03-11580/81	03-11851	03-11579	2003	40											<40			
03-11582		03-11579	2003	90	24	13.0	7.9	<1.0	<10	28	<20	<1.0		<0.1				
03-11583			2003	0														
03-11584		03-11583	2003	50	26	11.0	7.4	<1.0	<10	27	<20	1.0		<0.1				
03-11585		03-11583	2003	100	39	11.0	7.1	<1.0	<10	25	<20	1.6		<0.1	<40			
03-14163			2003	0	<100				<100	<100								
03-14164			2003	0	<100				<100	<100								
03-14165			2003	0	<100				<100	<100								

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-14166			2003	0	30													
03-14186			2003	0	43	8.8	<5.0	<1.0	<10	45	<20	<1.0		<0.1				
03-14187		03-14186	2003	50	44													
03-14188		03-14186	2003	105	160	13.0	5.7	<1.0	<10	17	<20	2.4		<0.1				
03-14189			2003	0	30	14.0	8.0	<1.0	<10	28	20	<1.0		<0.1				
03-14190/91	03-14191	03-14189	2003	30	32	15.0	8.4	<1.0	<10	27	20	1.2		<0.1				
03-14192		03-14189	2003	115														
10-31108*/09		MW-02	2010	0-10	48	36.0	9.0	<1.0	<10	43	<20	1.7	<0.10	<0.0030	87	<10	11	71
10-31110*/11		MW-02	2010	30-40	40	17.0	7.1	<1.0	<10	24	<20	<1.0	<0.10	<0.0030	69	<10	10	54
10-31103*/04		MW-03	2010	0-10	30	13.0	9.8	<1.0	<10	21	<20	1.3	<0.10	<0.0030	26	<10	<4.0	19
10-31106*/07*		MW-03	2010	30-40	31	14.0	10.0	<1.0	<10	24	<20	1.1	<0.10	<0.0030	<10	<10	<4.0	<9.0
10-31099*/00		MW-04	2010	0-10	25	10.0	6.3	<1.0	<10	19	<20	1.2	<0.10	<0.0030	29	<10	<4.0	22
10-31101*/02		MW-04	2010	30-40	22	13.0	8.6	<1.0	<10	25	<20	1.5	<0.10	<0.0030	19	<10	<4.0	12
11-34509*/10		MW-02	2011	0-10	38	15.6	5.8	<0.50	7.3	27.1	13.9	2.3	<0.050	<0.030	90	<5.0	<6.0	84
11-34511*/12		MW-02	2011	30-40	63	12.3	5.6	<0.50	4.7	36.8	9.7	2.2	<0.050	<0.040	116	<5.0	<6.0	110
11-34501*/02		MW-03	2011	0-10	29	9.8	5.7	<0.50	4.3	24.7	13	1.5	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34503*/04		MW-03	2011	30-40	28	11.0	6.3	<0.50	4.2	22.6	15.4	1.9	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34497*/98		MW-04	2011	0-10	33	12.1	7.8	<0.50	5.2	21.7	14.9	2.8	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34499*/00*		MW-04	2011	30-40	26	10.9	7.7	<0.50	5.7	21.2	15.4	4.6	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15312*/13		MW-02	2012	0-10	47	14.0	7.2	<1.0	<10	21	21	2.6	0.0095	<0.050	<10	<10	<10	<10
12-15314*/15		MW-02	2012	30-40	32	12.0	7.1	<1.0	<10	19	<20	2.0	<0.0050	<0.050	<10	<10	<10	<10
12-15316*/17		MW-03	2012	0-10	40	13.0	7.3	<1.0	<10	23	<20	1.8	<0.0050	<0.050	<10	<10	<10	<10
12-15318*/19		MW-03	2012	30-40	37	15.0	8.7	<1.0	<10	25	<20	1.8	<0.0050	<0.050	44	34	<10	<10
12-15320*/21		MW-04	2012	0-10	37	17.0	7.5	<1.0	<10	21	<20	2.1	<0.0050	<0.050	<10	<10	<10	<10
15-15322*/23*		MW-04	2012	30-40	25	13.0	7.4	<1.0	<10	20	<20	2.9	<0.0050	<0.050	<10	<10	<10	<10
		N Value			45	40	40	40	43	43	40	40	24	40	37			
		Average			38	13.0	7.5	<1.0	<10	27	<20	1.6	<0.10	<0.1	<40			
		Standard Deviation			27	4.5	2.1			10		0.9						
		Minimum			13	6.0	5.6	<0.50	4	17	10	<1.0	<0.0050	<0.0030	<10			
		Maximum			160	36.0	16.0	<1.0	<10	48	23	4.6	<0.10	<0.1	116			
		95% Confidence Limit			8	1.4	0.6			3		0.3						

Table 7.2: Tier II Disposal Facility – Baseline Groundwater Data

Sample #	Location	Date	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	PCBs [mg/L]	TPH [mg/L]	TPH Identity		
														F1	F2	F3
Upgradient Groundwater Samples																
10-32054	MW-01B	2010	<0.0050	<0.0050	<0.0030	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
11-34574	MW-01B	2011	0.005	0.060	0.007	<0.0010	<0.010	0.6940	0.0237	<0.0030	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15344	MW-01B	2012	0.025	0.450	0.010	<0.0010	<0.0050	0.1200	0.8700	0.0010	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
Downgradient Groundwater Samples																
10-32036	MW-02	2010	0.0107	0.0374	0.032	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
10-32037	MW-03	2010	0.011	0.025	0.006	<0.0010	<0.010	<0.010	<0.0050	<0.0030	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
10-32038	MW-04	2010	0.010	0.014	0.007	<0.0010	<0.010	1.4000	<0.0050	0.0037	<0.00040	<0.000020	<1.0	<0.050	<0.50	<1.0
11-34570/71	MW-02	2011	<0.0050	0.140	0.063	<0.0010	<0.010	0.6765	<0.0050	<0.0030	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
11-34572	MW-03	2011	0.017	0.025	0.008	<0.0010	<0.010	3.9200	<0.0050	<0.0030	<0.00040	<0.0030	1.1	<0.050	0.6	<1.0
11-34573	MW-04	2011	0.008	0.070	0.004	<0.0010	<0.010	0.4140	0.0109	<0.0030	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15345	MW-02	2012	0.035	0.098	0.038	<0.0010	0.0060	3.2000	0.0380	0.0090	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15346	MW-03	2012	0.039	0.051	0.010	<0.0010	0.0050	5.2000	0.0720	0.0030	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
12-15347	MW-04	2012	0.014	0.094	0.010	<0.0010	<0.0050	0.3200	0.1800	0.0030	<0.00040	<0.0030	<1.0	<0.050	<0.50	<1.0
N Value			12	12	12	12	12	12	12	12	12	12	12			
Average			0.015	0.097	0.016	<0.0010	<0.010	1.330	0.101	<0.0030	<0.00040	<0.0030	<1.0			
Standard Deviation			0.012	0.117	0.018			1.698	0.237							
Minimum			0.005	0.014	0.004		<0.0050	0.120	0.011	0.001		<0.000020	<1.0			
Maximum			0.039	0.140	0.063	<0.0010	<0.010	5.200	0.180	0.009	<0.00040	<0.0030	1.1			
95% Confidence Limit			0.007	0.066	0.010			0.961	0.134							

8. Airstrip Landfill

The Airstrip Landfill is located approximately 200 m east of the airstrip, north of the access road to the beach. The landfill consists of one lobe covering 370 m^2.

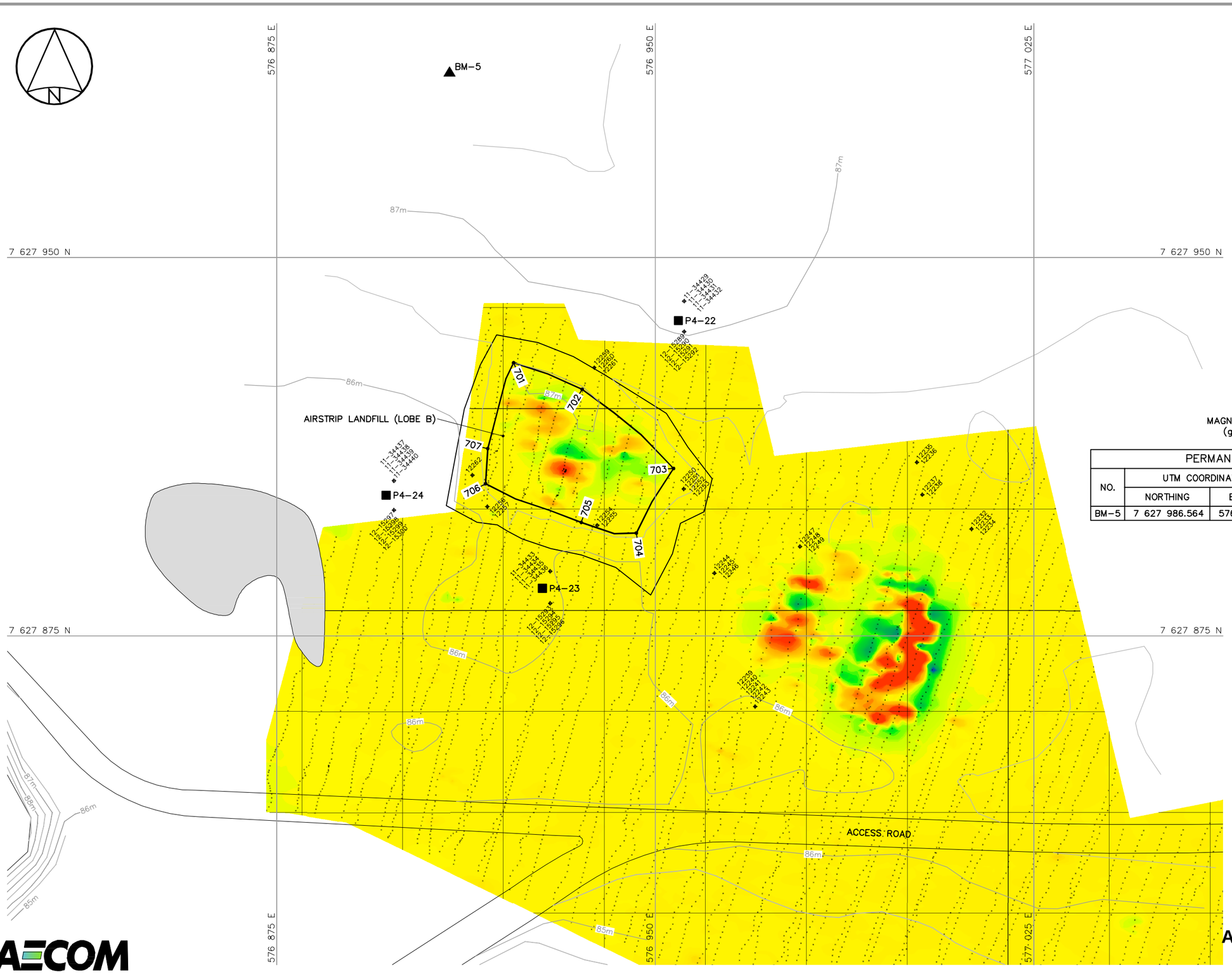
Very little exposed debris was observed during the site investigation due to the dense vegetation on the surface of the landfill. One Tier II contaminated soil area was identified on the surface of the landfill.

The landfill was classified as a moderate potential risk. The primary risk associated with this landfill was the presence of surface contamination. Receptors in the vicinity were considered moderately sensitive because of dense vegetation and observed habitat usage. Typical remediation protocol for a moderate risk landfill is leachate containment or excavation, however, the Environmental Working Group (EWG) recommended that excavating the surface Tier II contaminated soil would acceptably reduce the risk of the landfill. The landfill remediation involved excavation of the identified Tier II contaminated soil and covering the landfill with 0.75 m of Type 2 granular fill.

The long term monitoring plan consists of visual monitoring and collection of soil samples. Approximate locations for the collection of soil samples are identified on Figure PIN-4.8.

8.1 Baseline Data

Sample locations for soil baseline data are shown on Figure PIN-4.8. A summary of the baseline soil analytical data is provided in Table 8.1. Baseline data is comprised of site investigation information collected up and downgradient of the landfill in 2003 and samples collected at permanent monitoring locations up and downgradient of the landfill in 2009, 2010, 2011, and 2012. Mean soil baseline concentrations of inorganic elements are consistent with or lower than site background levels, with the exception of copper, nickel, cobalt, and zinc which are all slightly higher than background levels. PCB results were not detectable or very low and ranged from <0.030 to <0.1 mg/kg. Concentrations of TPH ranged between <10 and 85 mg/kg.



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-5 — PERMANENT BENCHMARK LOCATION (1)
- 701 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (3)
- 12235 — SOIL SAMPLE TAG LOCATION

60900
60600
60300
60000
59750
59600
59475
59400
59325
59250
59175
59100
59025
58950
58825
58700
58550
58400
58250
58100
57950
57800
57650
57500
57200
53000

MAGNETIC GRADIENT (gammas/m)

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-5	7 627 986.564	576 909.188	87.778	25mm DIA. STEEL PIPE

AIRSTRIP LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
701	7 627 929.2	576 921.9	87.0
702	7 627 923.9	576 935.4	87.0
703	7 627 908.2	576 953.6	86.9
704	7 627 895.4	576 946.2	86.6
705	7 627 897.5	576 935.3	86.6
706	7 627 905.2	576 916.3	86.5
707	7 627 912.2	576 916.8	86.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

AIRSTRIP LANDFILL LOBE B

FIGURE PIN-4.8

AECOM

Table 8.1: Airstrip Landfill – Baseline Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Upgradient Soil Samples																		
11-34429*/30		P4-22	2011	0-10	12	7.5	3.9	<0.50	3.4	14.7	12.1	2.1	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34431*/32		P4-22	2011	30-40	25	6.9	3.0	<0.50	4.4	20.6	7.9	2.3	<0.050	<0.030	<50	<5.0	<6.0	<50
12-15289*/90*		P4-22	2012	0-10	30	9.3	<5.0	<1.0	<10	16	<20	3.0	0.065	<0.050	59	11	<10	43
12-15291*/92		P4-22	2012	30-40	24	8.7	<5.0	<1.0	<10	<15	<20	2.3	0.03	<0.050	26	<10	<10	16
Downgradient Soil Samples																		
03-12235			2003	0	25	14.0	7.2	<1.0	<10	24	27	2.5		<0.1				
03-12236		03-12235	2003	30	27	14.0	7.0	<1.0	<10	23	22	2.4		<0.1				
03-12237			2003	0	27	14.0	6.9	<1.0	<10	24	25	1.1		<0.1				
03-12238		03-12238	2003	50	21	12.0	6.5	<1.0	<10	23	21	<1.0		<0.1				
03-12239			2003	0	23	12.0	7.2	<1.0	<10	23	<20	1.9		<0.1				
03-12240/41	03-12241	03-12239	2003	40										<0.1				
03-12242		03-12239	2003	70	10	10.0	5.5	<1.0	<10	18	<20	1.7		<0.1				
03-12243		03-12239	2003	100	23	17.0	10.0	<1.0	<10	30	31	3.9		<0.1				
03-12244			2003	0	19	10.0	6.0	<1.0	<10	19	<20	<1.0		<0.1				
03-12245		03-12245	2003	50														
03-12246		03-12245	2003	90	24	11.0	6.4	<1.0	<10	22	<20	<1.0		<0.1				
03-12247			2003	0	22	12.0	6.8	<1.0	<10	22	<20	<1.0		<0.1				
03-12248		03-12247	2003	50	21	12.0	7.5	<1.0	<10	20	<20	1.6		<0.1				
03-12249		03-12247	2003	80														
03-12250/51	03-12251		2003	0	21	11.0	6.8	<1.0	<10	20	<20	<1.0		<0.1				
03-12252		03-12250	2003	40														
03-12253		03-12250	2003	60	28	14.0	7.3	<1.0	<10	21	<20	<1.0		<0.1				
03-12254			2003	0	36	23.0	<5.0	<1.0	<10	<15	<20	3.3		<0.1				
03-12255		03-12255	2003	40	25	14.0	8.0	<1.0	<10	26	21	1.2		<0.1				
03-12256			2003	0	17	11.0	<5.0	<1.0	17	<15	<20	1.4		<0.1				
03-12257		03-12256	2003	40	23	13.0	7.0	<1.0	<10	22	21	1.4		<0.1				

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
03-12259			2003	0	17	7.5	<5.0	<1.0	<10	29	<20	1.3		<0.1				
03-12260		03-12259	2003	20	22	11.0	6.9	<1.0	<10	20	<20	2.1		<0.1				
03-12261		03-12259	2003	20	20	10.0	6.8	<1.0	<10	20	<20	2.0		<0.1				
03-12262			2003	0	37	20.0	<5.0	<1.0	<10	59	<20	2.1		<0.1				
03-13630			2003		40	18.0	6.0	<1.0	<10	61	<20	<1.0		<0.1	<40			
11-34433*/34		P4-23	2011	0-10	32	16.8	3.1	<0.50	1.9	14.5	6.8	0.9	<0.050	<0.030	85	<5.0	<10	77
11-34435*/36		P4-23	2011	30-40	23	13.0	5.3	<0.50	4.6	21.9	16	1.4	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34437*/38		P4-24	2011	0-10	29	15.7	7.1	<0.50	3.6	26.2	15	2.3	<0.050	<0.030	<18	<5.0	<6.0	<18
11-34439*/40*		P4-24	2011	30-40	22	12.7	6.4	<0.50	3.335	22.6	14.5	1.8	<0.050	<0.030	<18	<5.0	<6.0	<18
12-15293*/94		P4-23	2012	0-10	22	12.0	<5.0	<1.0	<10	16	<20	2.0	0.0125	<0.050	54	<10	<10	44
12-15295*/96		P4-23	2012	30-40	26	12.0	<5.0	<1.0	<10	<15	<20	0.8	0.014	<0.050	66	<10	<10	56
12-15297*/98		P4-24	2012	0-10	21	16.0	6.8	<1.0	<10	19	<20	1.6	0.0073	<0.050	<10	<10	<10	<10
12-15299*/00		P4-24	2012	30-40	19	16.0	7.0	<1.0	<10	21	<20	2.1	<0.0050	<0.050	<10	<10	<10	<10
		N Value			34	34	34	34	34	34	34	34	12	35	13			
		Average			23.9	12.9	5.5	<1.0	<10	22.0	<20	1.6	<0.050	<0.1	<40			
		Standard Deviation			6.3	3.5	2.1			11.2		0.9						
		Minimum			9.8	6.9	3.0	<0.050	1.9	14.5	6.8	0.8	<0.0050	<0.030	<10			
		Maximum			40.0	23.0	10.0	<1.0	17.0	61.0	31.0	3.9	0.065	<0.1	85			
		95% Confidence Limit			2.1	1.2	0.7			3.8		0.3						

Appendix A

PIN-4 Byron Bay Year 1 Monitoring Data

PIN-4 Byron Bay – 2013 Landfill Monitoring

In August 2013, AECOM completed visual inspections of each landfill and downloaded temperature data from on-site thermistors as required. Soil and groundwater samples were collected where applicable by the Environmental Sciences Group (ESG). Samples were analyzed at Queen's University and Royal Military College laboratories, in Kingston, Ontario.

The following table documents the specific monitoring requirements for 2013 (year 1 of monitoring) at each landfill.

Landfill Designation	Visual Inspection	Groundwater Sampling	Soil Sampling	Thermal Monitoring
Northwest Landfill	√		√	
North Landfill	√		√	
Non-Hazardous Waste Landfill	√	√	√	
Station Area Landfill West	√		√	
USAF Closure Landfill	√		√	
Tier II Disposal Facility	√	√	√	√
Airstrip Landfill	√		√	

This appendix serves as a summary of the AECOM geotechnical report (AECOM 2013) and the ESG environmental report (ESG 2013) to document the results of landfill monitoring from year 1. The data is organized by landfill in separate annexes. The following information is provided in each Annex:

- Visual inspection checklist
- Visual inspection drawing mark-up
- A selection of visual inspection photos (all photos will be provided electronically)
- Thermal monitoring summary (where applicable)
- Plots of ground temperatures with depth at each thermistors installation (where applicable)
- Evaluation of 2013 soil analytical data, as compared to baseline conditions
- Summary of 2013 soil analytical data
- Summary of 2013 groundwater analytical data
- Monitoring well development/sampling reports (where applicable)

Summary of Significant Observations

With the exception of thermal data, no interpretation or recommendations have been provided in this appendix; these shall be provided by the Environmental Working group – Nunavut Tunngavik Incorporated (EWG-NTI). Meeting minutes from the EWG-NTI review will be appended to this report (when available).

Annex 1 Northwest Landfill – Year 1 Data

Figures:

- PIN-4.2: Site Plan – Northwest Landfill

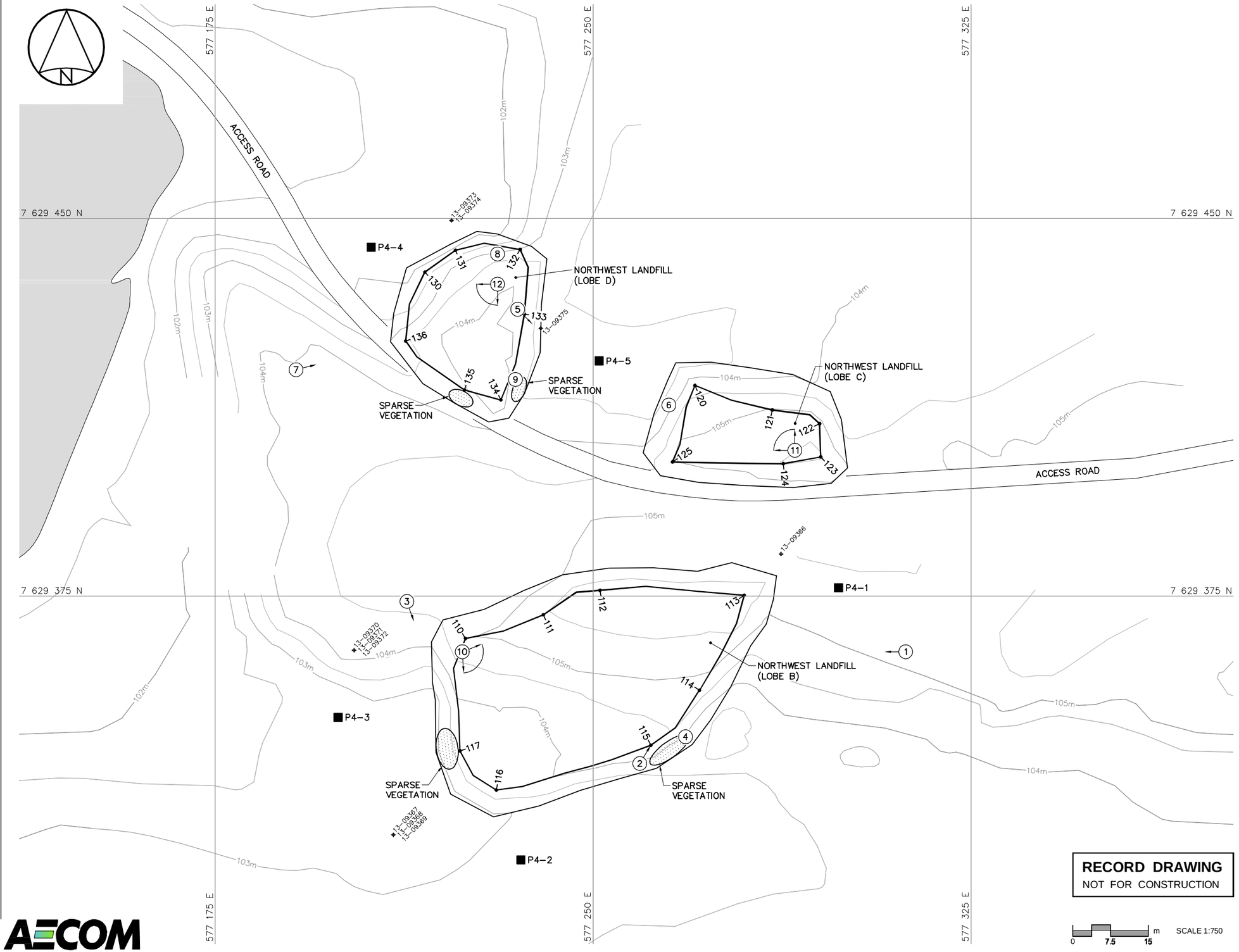
Tables:

- Landfill Visual Inspection – Northwest Landfill
- Northwest Landfill – Evaluation of Year 1 Soil Data
- Northwest Landfill – Year 1 (2013) Soil Data

Photographic Records:

- Photos 1 and 2
- Photos 3 and 4
- Photos 5 and 6
- Photos 7 and 8
- Photo 9
- Photo 10
- Photo 11
- Photo 12

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March 20, 2014 12:14:19 PM
Saved by: Cechi
AECOM FILE NO.: PIN-4.2 Year 1 LF MON.dwg



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 110 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- MONITORING SITE FEATURE
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-09366 — 2013 SOIL SAMPLE TAG LOCATION
- BODY OF WATER

NORTHWEST LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
110	7 629 366.7	577 224.6	105.0
111	7 629 371.4	577 240.1	105.5
112	7 629 376.2	577 251.3	105.7
113	7 629 375.2	577 280.0	105.8
114	7 629 356.3	577 271.1	104.8
115	7 629 345.4	577 261.4	104.4
116	7 629 336.5	577 230.7	103.8
117	7 629 344.3	577 223.5	103.7

NORTHWEST LANDFILL (LOBE C) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
120	7 629 416.9	577 270.2	104.3
121	7 629 412.0	577 285.5	105.0
122	7 629 409.3	577 294.9	105.1
123	7 629 402.7	577 295.1	105.6
124	7 629 401.4	577 287.7	105.5
125	7 629 401.7	577 265.7	105.0

NORTHWEST LANDFILL (LOBE D) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
130	7 629 439.4	577 216.6	102.3
131	7 629 443.8	577 222.6	102.1
132	7 629 443.9	577 235.5	103.0
133	7 629 431.0	577 236.3	103.6
134	7 629 414.0	577 231.7	104.2
135	7 629 416.0	577 224.4	103.9
136	7 629 425.7	577 212.8	103.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NORTHWEST LANDFILL LOBES B, C, D

FIGURE PIN-4.2

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**Northwest Landfill Lobes B, C, and D**
Date of Inspection:	**15-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	Yes	One minor tension crack near the crest of the north slope of Lobe D.	Approximately 0.75 m.	Approximately 3 mm.		Much less than 1%	See photograph.	Picture P8150288		Isolated	Acceptable
Animal Burrows	No									None	
Vegetation	Yes	Occasional areas of vegetation were found on Lobes B and D (refer to drawing for specific locations). Occasional individual pieces of vegetation were found on all of the lobes.	Areas: up to approximately 10 m. Individual: up to 100 mm.	Areas: up to approximately 4 m. Individual: up to 100 mm.	Up to 800 mm tall.	Extent of areas cover approximately 3%	See photographs.	Pictures P8150230 to P8150233, P8150239, P8150260, P8150269, P8150270, P8150277, P8150280, P8150283, and P8150289		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Occasional debris was observed in the vicinity of the landfill lobes - non found on the actual lobes.				Much less than 1%.	Boot, piece of wire, and piece of metal. The observed debris did not originate from within the landfill. See photographs.	Pictures P8150237, P8150238, and P8150297		Occasional	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Occasional areas (specifically on Lobes B and C) contain fine material that hold moisture.	Up to 2 m.	Up to 1 m.		Less than 1%.	These areas of fine material have a higher moisture content then the surrounding areas. See photographs.	Pictures P8150236, P8150242, P8150245, P8150263		Occasional	Acceptable
Landfill Performance											Acceptable

NORTHWEST LANDFILL - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	72	10.6 +/- 1.0	26	All concentrations within 95% confidence limit, with four exceptions.	The surface and depth samples at P4-2 had concentrations of 30.0 and 18.5 mg/kg, respectively. The surface and depth sample at P4-4 had concentrations of 13.0 and 12.6 mg/kg. The surface sample at P4-2 was above the baseline maximum.
Nickel	72	8.5 +/- 0.6	22	All concentrations within 95% confidence limit, with five exceptions.	The surface and depth samples at P4-2 and P4-4 had concentrations of 10.4, 11.5, 10.6, and 11.1 mg/kg, respectively. The depth sample at P4-5 had a concentration of 9.6 mg/kg. All results are below the baseline maximum.
Cobalt	72	<5.0	7.4	Concentrations consistent with baseline mean (non-detect).	
Cadmium	72	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	72	9.3 +/- 0.9	21	All concentrations within 95% confidence limit, with five exceptions.	The depth samples at P4-1 and P4-3 had concentrations of 10.9 and 11.1 mg/kg, respectively. The surface and depth samples at P4-4 had concentrations of 11.8 and 14.5 mg/kg, respectively. The depth sample at P4-5 had a concentration of 13.2 mg/kg. All results were below the baseline maximum.
Zinc	73	<15	57	All concentrations within 95% confidence limit, with two exceptions.	The surface and depth samples at P4-3 had concentrations of 36 and 26 mg/kg, respectively. All results were below the baseline maximum.
Chromium	72	<20	25	Concentrations consistent with baseline mean (non-detect).	
Arsenic	72	2.7 +/- 0.4	13	All concentrations within 95% confidence limit, with six exceptions.	The surface and depth samples at P4-3 and P4-4 had concentrations of 3.3, 3.9, 3.2, and 3.4 mg/kg, respectively. The depth samples at P4-1 and P4-5 had concentrations of 4.0 and 4.8 mg/kg, respectively.
Mercury	36	<0.10	0.0328	Concentrations consistent with baseline mean (non-detect).	
PCBs	71	<0.050	0.15	Concentrations consistent with baseline mean (non-detect).	
TPH	36	36.3 +/- 11.9	155	All concentrations within 95% confidence limit.	

Northwest Landfill - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Northwest Landfill- Baseline Concentrations					**10.6 +/- 1.0**	**8.5 +/- 0.6**	**<5.0**	**<1.0**	**9.3 +/- 0.9**	**<15**	**<20**	**2.7 +/- 0.4**	**<0.10**	**<0.050**	**36.3 +/- 11.9**			
Northwest Landfill - Maximum Concentrations					**26**	**22**	**7.4**	**<1.0**	**21**	**57**	**25**	**13**	**0.0328**	**0.15**	**155**			
Upgradient Soil Samples																		
13-09366*		P4-1	2013	30-40	8.3	8.9	4	<0.50	10.9	7	11	4.0	0.011	<0.020	<5.0	<10	<50	<50
Downgradient Soil Samples																		
13-09367*/68		P4-2	2013	0-10	30.0	10.4	2.8	<0.50	4.3	9	7	1.8	0.069	<0.040	<5.0	<20	160	<100
13-09369*		P4-2	2013	30-40	18.5	11.5	4	<0.50	8.4	13	18	2.6	0.023	<0.020	<5.0	<10	<50	<50
13-09370*/71*		P4-3	2013	0-10	11.1	8.0	3	<0.50	9.75	36	11	3.3	0.0485	<0.020	<5.0	<10	<50	<50
13-09372*		P4-3	2013	30-40	10.7	8.8	3.3	<0.50	11.1	26	11	3.9	0.028	<0.020	<5.0	<10	<50	<50
13-09373*		P4-4	2013	0-10	13.0	10.6	3.1	<0.50	11.8	<5.0	12	3.2	0.012	<0.020	<5.0	<10	<50	<50
13-09374*		P4-4	2013	30-40	12.6	11.1	3.4	<0.50	14.5	<5.0	12	3.4	0.013	<0.020	<5.0	<10	<50	<50
13-09375*		P4-5	2013	30-40	9.7	9.6	3.8	<0.50	13.15	11	12	4.8	0.018	<0.020	<5.0	<10	<50	<50

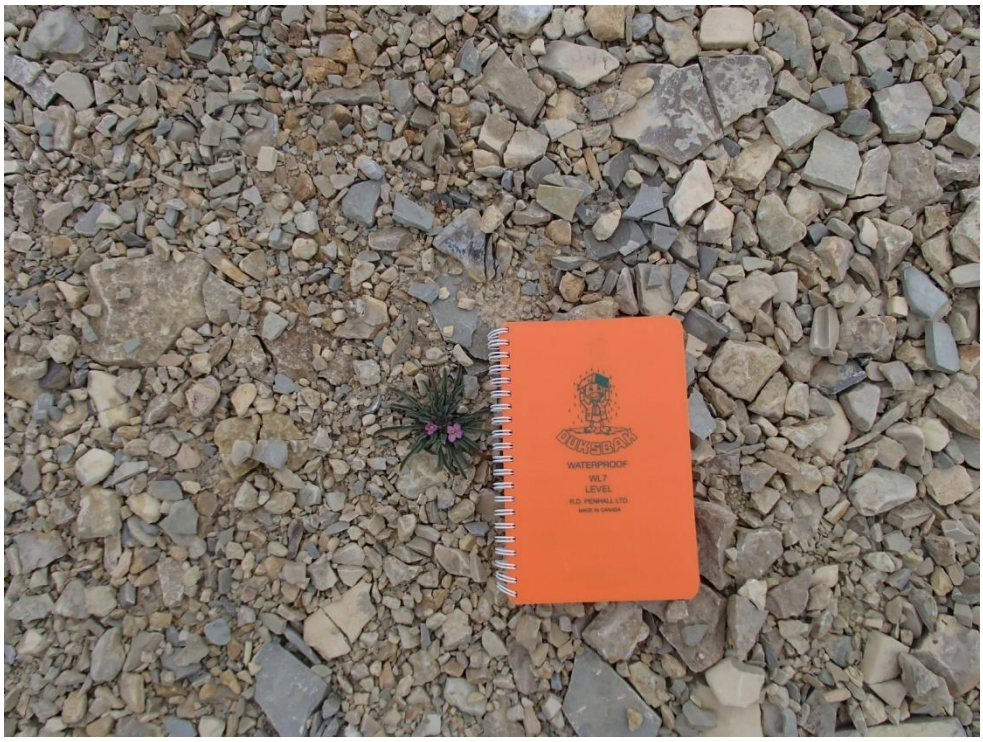
Photograph 1. Northwest Landfill Lobe B – overall picture of landfill. Picture P8150298 ↑

Photograph 2. Northwest Landfill Lobe B – area of fine material on southeast side of landfill. Picture P8150236 ↑

Photograph 3. Northwest Landfill Lobe B – west side of landfill with vegetation creeping up slope. Picture P8150231 ↑

Photograph 4. Northwest Landfill Lobe B – vegetation on southeast side of landfill. Picture P8150239 ↑

Photograph 5. Northwest Landfill Lobe C – overall picture of landfill. Picture P8150296 ↑



Photograph 6. Northwest Landfill Lobe C – vegetation on west side of landfill. Picture P8150270 ↑

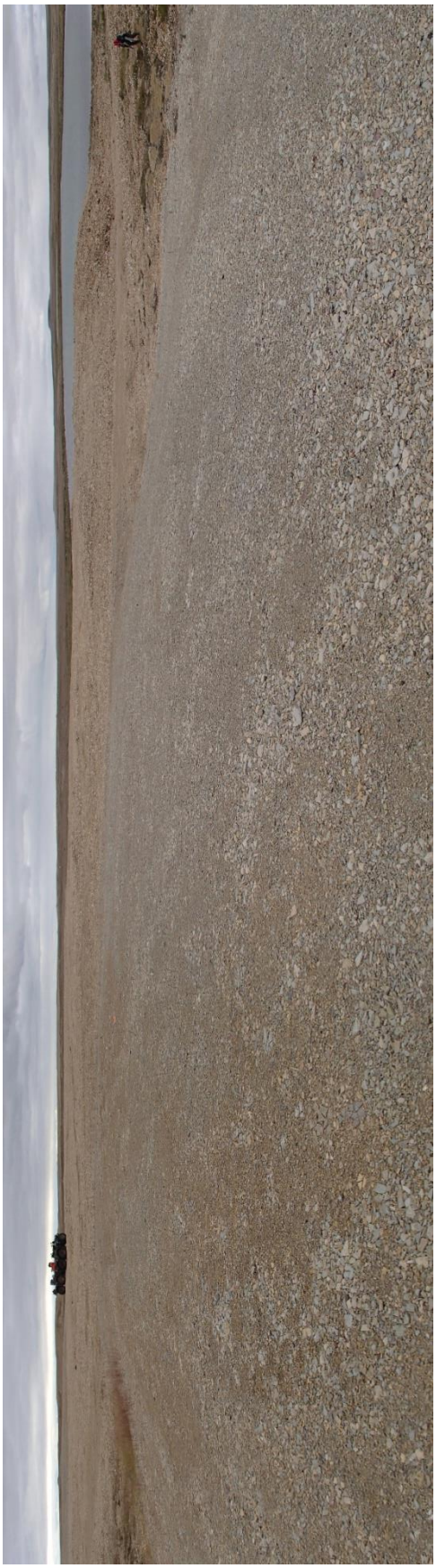
Photograph 7. Northwest Landfill Lobe D – overall picture of landfill. Picture P8150295 ↑

Photograph 8. Northwest Landfill Lobe D – small tension crack on top of landfill. Picture P8150288 ↑

Photograph 9. Northwest Landfill Lobe D – vegetation on east side of landfill. Picture P8150280 ↑

Photograph 10. Northwest Landfill Lobe B – top of landfill. Picture P8150257 – P8150259 ➔

Photograph 11. Northwest Landfill Lobe C – top of landfill. Picture P8150274 – P8150276 ←



Photograph 12. Northwest Landfill Lobe D – top of landfill. Picture P8150290 – P8150292 ←

Annex 2 North Landfill – Year 1 Data

Figures:

- PIN-4.3: Site Plan – North Landfill

Tables:

- Landfill Visual Inspection – North Landfill
- North Landfill – Evaluation of Year 1 Soil Data
- North Landfill – Year 1 (2013) Soil Data

Photographic Records:

- Photos 13 and 14
- Photos 15 and 16
- Photos 17 and 18
- Photos 19 and 20
- Photos 21 and 22
- Photos 23 and 24
- Photo 25
- Photo 26
- Photo 27
- Photo 28

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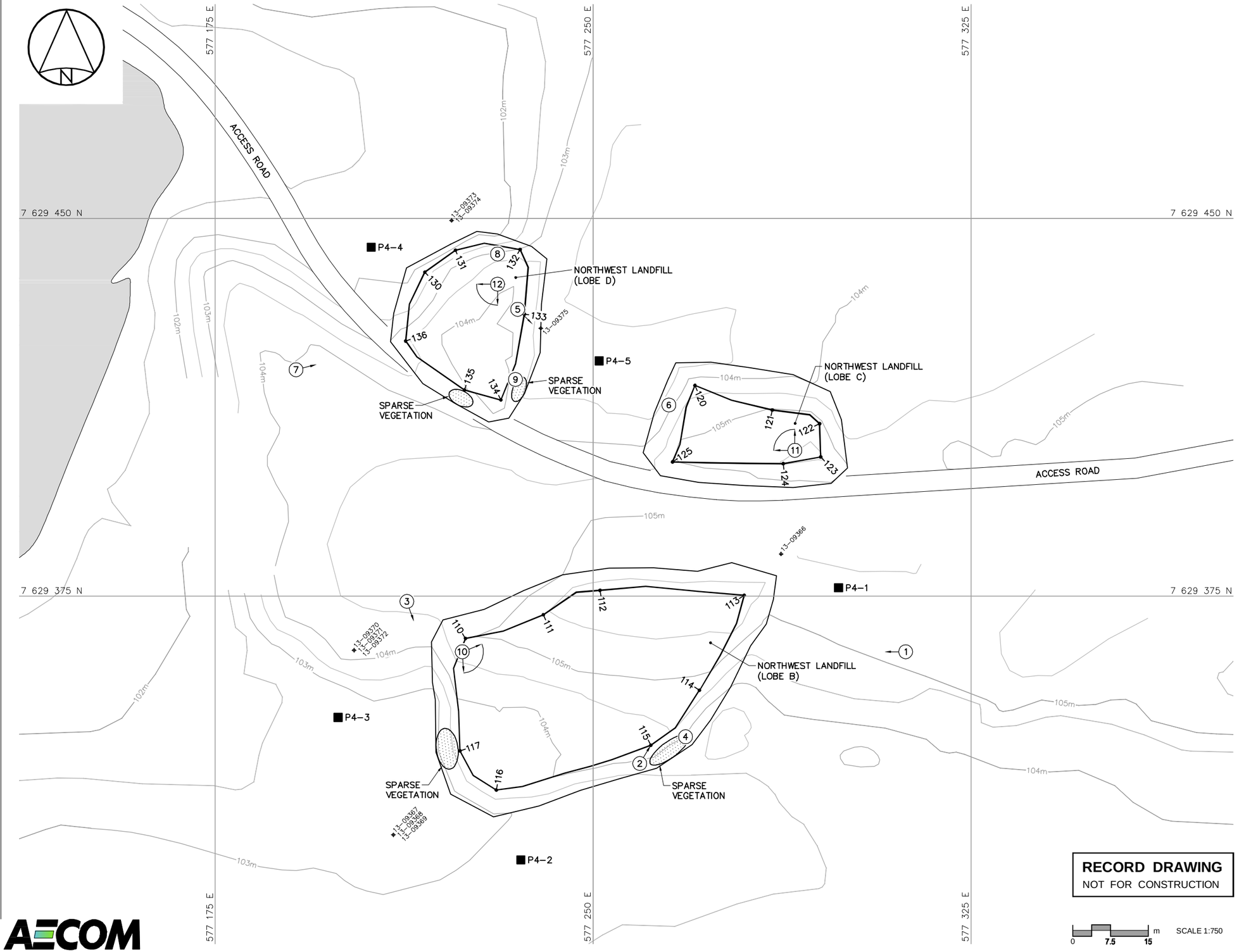
PLOT: March 20, 2014 12:14:19 PM
Saved by: Cechi
AECOM FILE NO.: PIN-4.2 Year 1 LF MON.dwg



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 110 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- MONITORING SITE FEATURE
- (1) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-09366 — 2013 SOIL SAMPLE TAG LOCATION
- BODY OF WATER

NORTHWEST LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
110	7 629 366.7	577 224.6	105.0
111	7 629 371.4	577 240.1	105.5
112	7 629 376.2	577 251.3	105.7
113	7 629 375.2	577 280.0	105.8
114	7 629 356.3	577 271.1	104.8
115	7 629 345.4	577 261.4	104.4
116	7 629 336.5	577 230.7	103.8
117	7 629 344.3	577 223.5	103.7

NORTHWEST LANDFILL (LOBE C) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
120	7 629 416.9	577 270.2	104.3
121	7 629 412.0	577 285.5	105.0
122	7 629 409.3	577 294.9	105.1
123	7 629 402.7	577 295.1	105.6
124	7 629 401.4	577 287.7	105.5
125	7 629 401.7	577 265.7	105.0

NORTHWEST LANDFILL (LOBE D) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
130	7 629 439.4	577 216.6	102.3
131	7 629 443.8	577 222.6	102.1
132	7 629 443.9	577 235.5	103.0
133	7 629 431.0	577 236.3	103.6
134	7 629 414.0	577 231.7	104.2
135	7 629 416.0	577 224.4	103.9
136	7 629 425.7	577 212.8	103.4

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

AECOM

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NORTHWEST LANDFILL LOBES B, C, D

FIGURE PIN-4.2

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**North Landfill Lobes A, B, and C**
Date of Inspection:	**15-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	Yes	Occasional areas of fine material were observed at the base of the northeast slope of Lobe B indicating some very minor erosion of fines from the material on the slope. It is likely loose fines within the upslope material were washed away during runoff. It is expected this will not worsen.	Area of fines is up to approximately 2 m.	Area of fines is up to approximately 1 m.		Extent of area of fines is approximately 1% of the landfill area.	See photographs.	Pictures P8150338, P8150349, P8150351, and P8150352		Occasional	Acceptable
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Small isolated area with several pieces of vegetation on Lobe A.	Up to 100 mm.	Up to 100mm.	Approximately 100 mm tall.	Much less than 1%.	See photograph.	Picture P8150324		Isolated	
Staining	Yes	Two stains were observed on the top of Lobe A and one stain was observed near the toe of the high slope of Lobe A.	Up to 350 mm.	Up to 300 mm.		Much less than 1%.	The staining is likely not from within the landfill but as a result of leaks from equipment during the construction phase. See photographs.	Pictures P8150309, P8150311, and P8150322		Occasional	Acceptable
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Occasional debris was observed in the vicinity of the landfill lobes.				Much less than 1%.	Piece of wire and several pieces of metal. The observed debris did not originate from within the landfill. See photographs.	Pictures P8150329, P8150359, and P8150371		Occasional	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Occasional areas contain fine material that hold moisture.	Typically up to 2 m (one area is approxmiately 5 m).	Typically up to 0.5 m (one area is approximately 2 m).		Less than 1%.	See photographs.	Pictures P8150314, P8150330, P8150331, P8150334, P8150344, and P8150372		Occasional	Acceptable
	Yes	The northeast slope on Lobe A is partially covered in nutrients to promote growth of vegetation.	Approximately 30 m.	Approximately 30 m.		Approximately 8%.	See photographs.	Pictures P8150320, P8150321, P8150323, P8150325, and P8150328		Occasional	
	Yes	There is a small moist area on the northeast slope of Lobe A.	Approximately 3 m.	Approximately 2 m.		Much less than 1%.	See photograph.	Picture P8150327		Occasional	
Landfill Performance											Acceptable

NORTH LANDFILL - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	128	14.3 +/- 2.2	109.5	All concentrations within 95% confidence limit.	
Nickel	128	8.7 +/- 0.9	52.5	All concentrations within 95% confidence limit, with three exceptions.	The depth sample at P4-8 had a concentration of 10.7 mg/kg. The surface and depth samples at P4-9 had concentrations of 10.8 and 10.9 mg/kg, respectively. All results were below the baseline maximum.
Cobalt	128	<5.0	23.2	Concentrations consistent with baseline mean (non-detect).	
Cadmium	128	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	128	<10	190	All concentrations consistent with baseline mean (non-detect), with one exceptions.	The depth sample at P4-6 had a concentration of 10.8 mg/kg. The result was below the baseline maximum.
Zinc	128	<15	86	All concentrations within 95% confidence limit, with three exceptions.	The surface samples at P4-12 and P4-6 have concentrations of 18 and 31 mg/kg, respectively. The surface and depth samples at P4-11 have concentrations of 31 and15 mg/kg, respectively. All results were below the baseline maximum.
Chromium	128	<20	90	Concentrations consistent with baseline mean (non-detect).	
Arsenic	128	2.4 +/- 0.2	7.2	All concentrations above the 95% confidence limit, with three exceptions.	The surface and depth samples at P4-11 and the surface sample at P4-12 were within the 95% confidence limit. The samples that exceeded were below the baseline maximum.
Mercury	42	<0.050	0.062	Concentrations consistent with baseline mean (non-detect).	
PCBs	129	<0.1	<0.1	Concentrations consistent with baseline mean (non-detect).	
TPH	42	<30	657	Concentrations consistent with baseline mean (non-detect), with two exceptions.	The surface samples at P4-11 and P4-12 had concentrations of 42 and 130 mg/kg, respectively. All results were below the baseline maximum.

North Landfill - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
North Landfill- Baseline Concentrations					**14.3 +/- 2.2**	**8.7 +/- 0.9**	**<5.0**	**<1.0**	**<10**	**<15**	**<20**	**2.4 +/- 0.2**	**<0.050**	**<0.1**	**<30**			
North Landfill - Maximum Concentrations					***109.5***	**52.5**	**23.2**	**<1.0**	**190**	**86**	**90**	**7.2**	**0.062**	**<0.1**	**657**			
Upgradient Soil Samples																		
13-09393*		P4-12	2013	0-10	6.1	2.5	<1.0	<0.50	3.2	18	3	0.9	0.049	<0.020	133	<5.0	<20	120
13-09394*		P4-12	2013	30-40	10.5	6.1	2.6	<0.50	6.8	9	7	2.9	0.033	<0.020	<50	<5.0	<10	<50
Downgradient Soil Samples																		
13-09376*		P4-6	2013	0-10	7.0	5.2	2.8	<0.50	9.5	31	7	3.8	0.039	<0.020	<50	<5.0	<10	<50
13-09377*/78		P4-6	2013	30-40	6.0	5.9	3.2	<0.50	10.8	11	7	4.8	0.023	<0.020	<50	<5.0	<10	<50
13-09379*		P4-7	2013	0-10	9.0	9.1	4	<0.50	6.7	7	10	3.1	0.012	<0.020	<50	<5.0	<10	<50
13-09380*/81*		P4-7	2013	30-40	8.8	8.9	3.9	<0.50	7.4	7	11	3.1	0.0185	<0.020	<50	<5.0	<10	<50
13-09382*		P4-8	2013	0-10	8.7	9.4	3.9	<0.50	7	7	11	3.5	0.015	<0.020	<50	<5.0	<10	<50
13-09383*		P4-8	2013	30-40	10.2	10.7	4.6	<0.50	8.8	8	13	3.9	0.02	<0.020	<50	<5.0	<10	<50
13-09384*		P4-9	2013	0-10	9.2	10.8	4.7	<0.50	7	6	12	3.2	0.013	<0.020	<50	<5.0	<10	<50
13-09385*		P4-9	2013	30-40	8.8	10.9	4.4	<0.50	8.1	6	11	3.1	0.014	<0.020	<50	<5.0	<10	<50
13-09386*		P4-10	2013	0-10	7.6	9.4	3.7	<0.50	6.6	5	10	3.1	0.013	<0.020	<50	<5.0	<10	<50
13-09387*/88		P4-10	2013	30-40	7.8	9.5	3.6	<0.50	7.1	6	11	3.2	0.015	<0.020	<50	<5.0	<10	<50
13-09390*/91*		P4-11	2013	0-10	11.7	4.7	1.3	<0.50	3.7	31	3	1.7	0.033	<0.020	42	<5.0	<10	33.5
13-09392*		P4-11	2013	30-40	10.2	3.9	1.3	<0.50	6.3	15	4	1.7	0.028	<0.020	<50	<5.0	<10	<50

Photograph 13. North Landfill – overall picture of landfill taken from the air. Picture P8150197 ↑
(Picture has been cropped from the original)

Photograph 14. North Landfill Lobe A – overall picture of northeast side of landfill. Picture P8150328 ↑

Photograph 15. North Landfill Lobe A – stain on the top of landfill. Picture P8150311 ↑

Photograph 16. North Landfill Lobe A – vegetation on northeast side of landfill. Picture P8150324 ↑

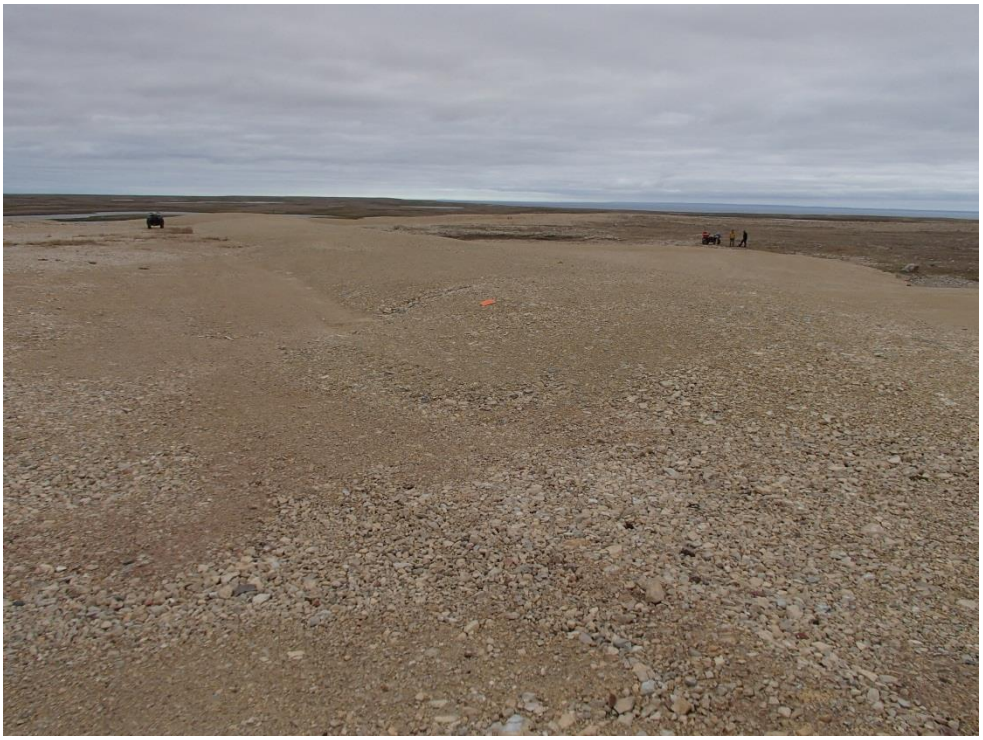
Photograph 17. North Landfill Lobe B – overall picture of northeast side of landfill. Picture P8150334 ↑

Photograph 18. North Landfill Lobe B – southwest side of landfill. Picture P8150354 ↑

Photograph 19. North Landfill Lobe B – metal debris located near landfill. Picture P8150329 ↑

Photograph 20. North Landfill Lobe B – possible water runoff exit point. Picture P8150332 ↑

Photograph 21. North Landfill Lobe B – fines located at the base of landfill. Picture P8150352 ↑



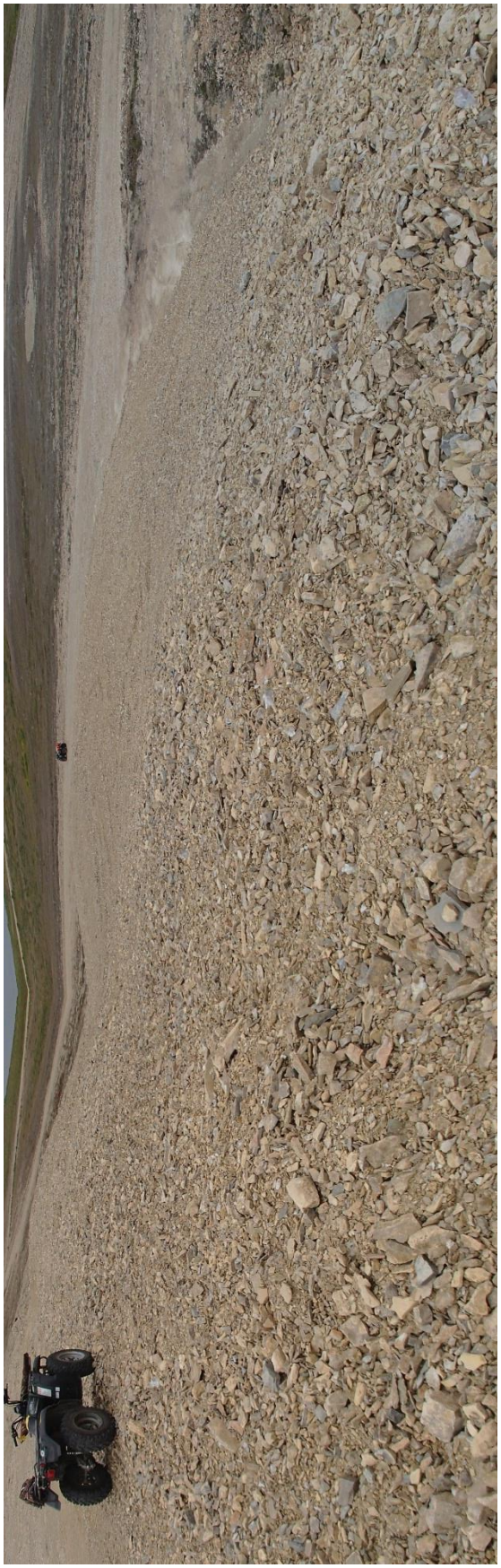
Photograph 22. North Landfill Lobe C – north side of landfill. Picture P8150358 ↑

Photograph 23. North Landfill Lobe C – south side of landfill. Picture P8150364

Photograph 24. North Landfill Lobe C – metal debris located near landfill. Picture P8150359

Photograph 25. North Landfill Lobe C – area of fine material on top of landfill. Picture P8150372 ↑

Photograph 26. North Landfill Lobe A – top of landfill. Picture P8150299 – P8150302 ➔



Photograph 27. North Landfill Lobe B – top of landfill. Picture P8150348 – P8150350 ←

Photograph 28. North Landfill Lobe C – top of landfill. Picture P8150374 – P8150376 ←

Annex 3 Non-Hazardous Waste Landfill – Year 1 Data

Figures:

- PIN-4.4: Site Plan – Non-Hazardous Waste Landfill

Tables:

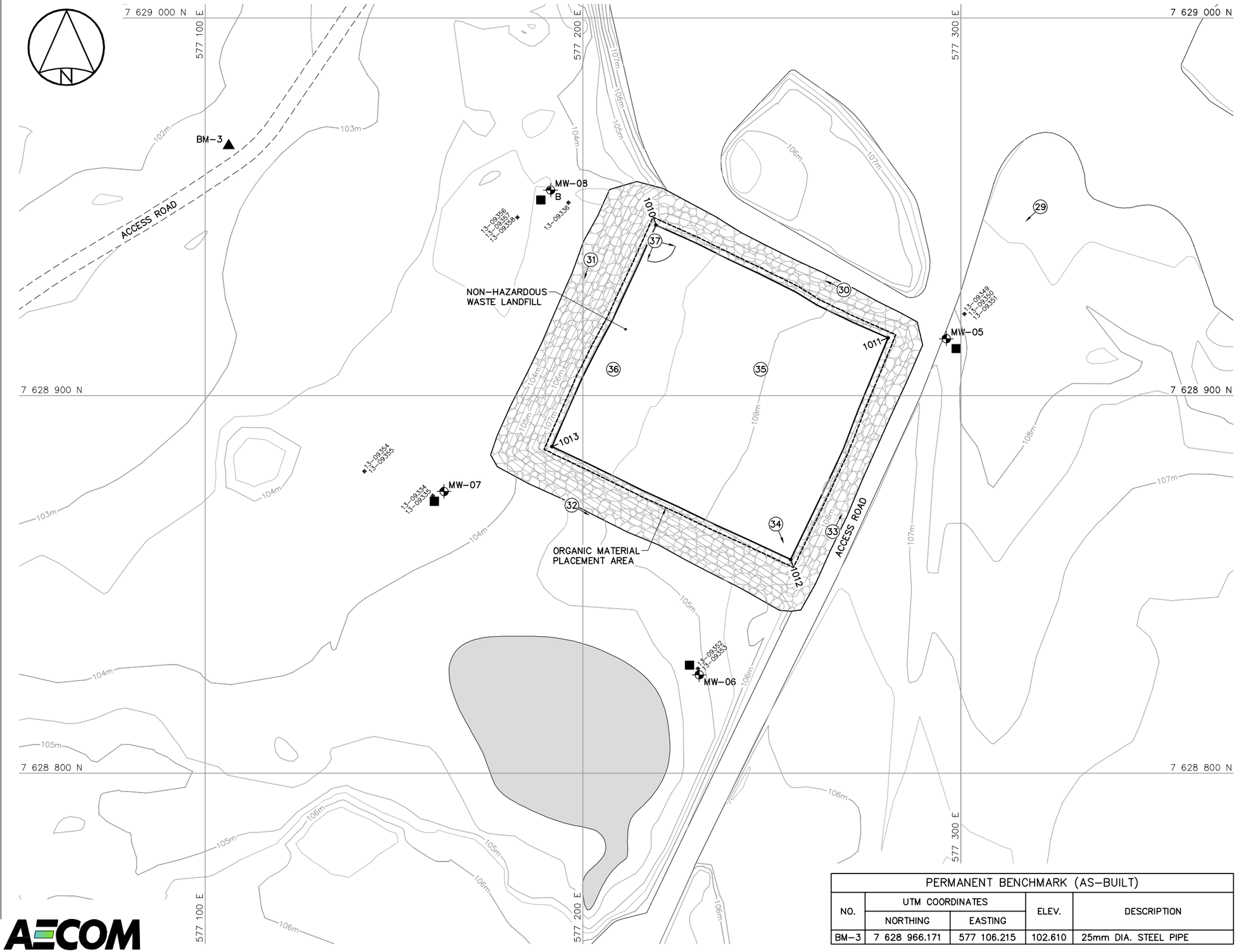
- Landfill Visual Inspection – Non-Hazardous Waste Landfill
- Non-Hazardous Waste Landfill – Evaluation of Year 1 Soil Analytical Data
- Non-Hazardous Waste Landfill – Year 1 (2013) Soil Data
- Non-Hazardous Waste Landfill – Year 1 (2013) Groundwater Data

Photographic Records:

- Photos 29 and 30
- Photos 31 and 32
- Photos 33 and 34
- Photos 35 and 36
- Photos 37

Well Sampling Records:

- Well MW-05
- Well MW-06
- Well MW-07
- Well MW-08



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-3 — PERMANENT BENCHMARK LOCATION (1)
- 1010 — COORDINATE POINT
- MW-05 — MONITORING WELL LOCATION (3)
- MW-08 B — BACKGROUND MONITORING WELL LOCATION (1)
- MONITORING SOIL SAMPLE LOCATION (4)
- 29 — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-09349 — 2013 SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL
- BODY OF WATER

NON-HAZARDOUS WASTE LANDFILL FINAL GRADING (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
1010	7 628 945.2	577 219.3	108.0
1011	7 628 915.3	577 280.7	109.5
1012	7 628 856.6	577 254.9	109.4
1013	7 628 886.5	577 191.7	108.1

NOTE:
COORDINATE POINTS AND ELEVATIONS PROVIDED ARE TO THE FINAL GRADE OF THE TYPE 2 GRANULAR FILL CAP PRIOR TO THE PLACEMENT OF THE TYPE 1 GRANULAR FILL ON THE SIDE SLOPES.

NON-HAZARDOUS WASTE LANDFILL MONITORING WELLS (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW-05	7 628 915.1	577 296.1	107.9
MW-06	7 628 826.1	577 230.7	104.7
MW-07	7 628 874.6	577 163.2	103.7
MW-08	7 628 954.4	577 191.4	103.6

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-3	7 628 966.171	577 106.215	102.610	25mm DIA. STEEL PIPE

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

NON - HAZARDOUS WASTE LANDFILL

FIGURE PIN-4.4

AECOM

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**Non-Hazardous Waste Landfill**
Date of Inspection:	**14-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found on the top portion of the landfill.	Up to 0.2 m.	Up to 0.2 m.	Up to 50 mm tall.	Less than 1%.	See photographs.	Pictures P8140081 to P8140086		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	Yes	Refer to drawing and Monitoring Well Logs.									Acceptable
Features of Note	Yes	Several ruts / ridges / depressions were observed on the surface of the landfill, likely resulting from construction activities.	Varies (Up to approximately 4 m).	Varies (Up to approximately 1 m).	Up to 150 mm high.	Less than 1%.	See photographs.	Pictures P8140079, P8140080, P8140089, and P8140091		Occasional	Acceptable
	Yes	The top of the landfill is covered in nutrients to promote growth of vegetation.	70 m.	65 m.		Approximately 50%.	See photographs.	Pictures P8140067 to P8140078, P8140106, and P8140107		Extensive	
Landfill Performance	Acceptable										

NON-HAZARDOUS WASTE LANDFILL - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	31	13.7 +/- 1.8	27.1	All concentrations within 95% confidence limit, with four exceptions.	The surface and depth samples at MW-06 and MW-07 had concentrations of 23.4, 20.1, 19.9, and 22.1 mg/kg, respectively. All results were below the baseline maximum.
Nickel	31	9.8 +/- 1.2	17.3	All concentrations within 95% confidence limit, with six exceptions.	The surface and depth samples at MW-06, MW-07 and MW-08 had concentration of 15.1, 14.8, 12.4, 16.0, 15.2, and 15.8 mg/kg, respectively. All results were below the baseline maximum.
Cobalt	31	<5.0	6.2	Concentrations consistent with baseline mean (non-detect), with six exceptions.	The surface and depth samples at MW-06, MW-07 and MW-08 had concentration of 5.7, 6.2, 5.3, 5.3, 5.5, and 6.2 mg/kg, respectively. All results were below the baseline maximum.
Cadmium	31	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	31	9.7 +/- 1.8	23	All concentrations within 95% confidence limit, with five exceptions.	The surface sample at MW-05 had a concentration of 11.9 mg/kg. The depth sample at MW-07 had a concentration 12.1 mg/kg. The surface and depth samples at MW-08 had concentrations of 17.2, 17.3 mg/kg, respectively. All results were below the baseline maximum.
Zinc	31	<15	59	Concentrations consistent with baseline mean (non-detect), with four exceptions.	The surface sample at MW-05 had a concentration of 21 mg/kg. The surface and depth samples at MW-06 had concentrations of 18 and 19 mg/kg, respectively. The surface sample at MW-07 had a concentration of 17 mg/kg. All results were below the baseline maximum.
Chromium	31	<20	26	Concentrations consistent with baseline mean (non-detect), with six exceptions.	The surface and depth samples at MW-06, MW-07 and MW-08 had concentrations of 21, 23, 24, 23, 25, and 30 mg/kg, respectively. The depth sample at MW-08 exceeded the baseline maximum.
Arsenic	31	2.7 +/- 0.4	4.9	All concentrations above the 95% confidence limit, with three exceptions.	The surface sample at MW-07 had a concentration of 3.6 mg/kg. The surface and depth samples at MW-08 had concentrations of 3.6 and 3.7 mg/kg, respectively. All results were below the baseline maximum.
Mercury	31	<0.10	<0.10	Concentrations consistent with baseline mean (non-detect).	
PCBs	31	<0.1	<0.1	Concentrations consistent with baseline mean (non-detect).	
TPH	26	<100	147	Concentrations consistent with baseline mean (non-detect).	

Non-Hazardous Waste Landfill - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Non-Hazardous Waste Landfill- Baseline Concentrations					**13.7 +/- 1.8**	**9.8 +/- 1.2**	**<5.0**	**<1.0**	**9.7 +/- 1.8**	**<15**	**<20**	**2.7 +/- 0.4**	**<0.10**	**<0.1**	**<100**			
Non-Hazardous Waste Landfill - Maximum Concentrations					**27.1**	**17.3**	**6.2**	**<1.0**	**23**	**59**	**26**	**4.9**	**<0.10**	**<0.1**	**147**			
Upgradient Soil Samples																		
13-09349*		MW-05B	2013	0-10	14.2	8.2	4.8	<0.50	11.9	21	12	1.7	<0.010	<0.020	<50	<5.0	<10	<50
13-09350*/51*		MW-05B	2013	30-40	10.2	8.1	4.3	<0.50	8.7	11	11	2.3	0.011	<0.020	<50	<5.0	<10	<50
Downgradient Soil Samples																		
13-09352*		MW-06	2013	0-10	23.4	15.1	5.7	<0.50	8.9	18	21	3.1	0.012	<0.020	<50	<5.0	<10	<50
13-09353*		MW-06	2013	30-40	20.1	14.8	6.2	<0.50	9.1	19	23	3.1	<0.010	<0.020	<50	<5.0	<10	<50
13-09354*		MW-07	2013	0-10	19.9	12.4	5.3	<0.50	9.4	17	24	2.5	<0.010	<0.020	<50	<5.0	<10	<50
13-09355*		MW-07	2013	30-40	22.1	16.0	5.3	<0.50	12.1	14	23	3.6	0.016	<0.020	95	<5.0	<10	87
13-09356*		MW-08	2013	0-10	13.5	15.2	5.5	<0.50	17.2	7	25	3.6	<0.010	<0.020	<50	<5.0	<10	<50
13-09357*/58		MW-08	2013	30-40	15.5	15.8	6.2	<0.50	17.3	7	30	3.7	<0.010	<0.020	<50	<5.0	<10	<50

Photograph 29. Non-Hazardous Waste Landfill – overall picture of landfill. Picture P8140106

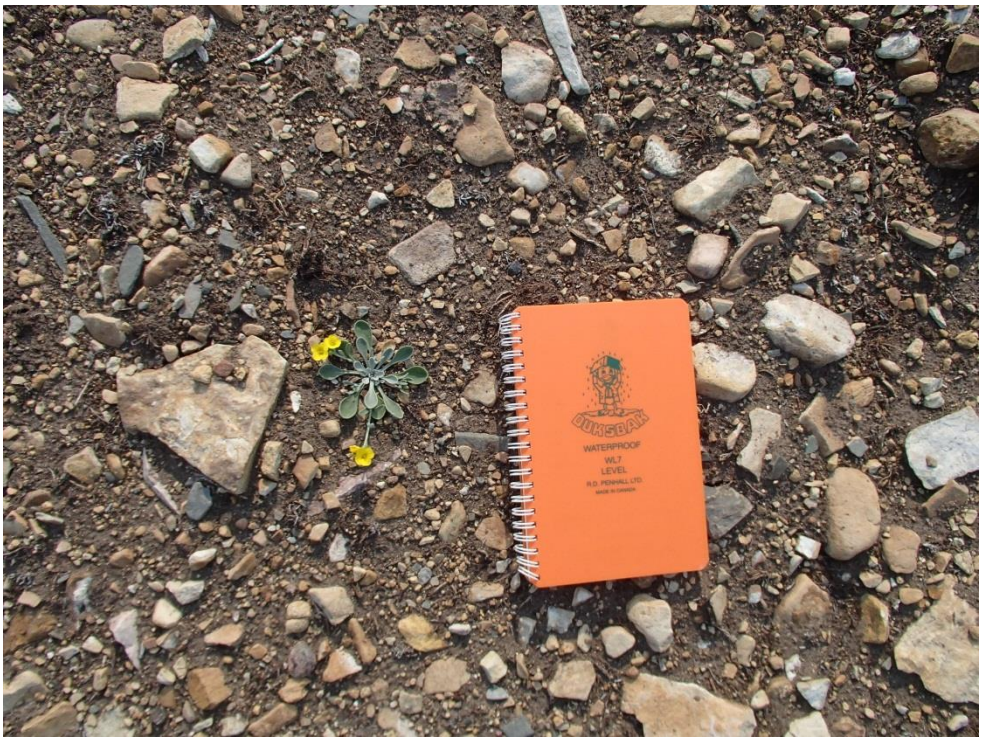
Photograph 30. Non-Hazardous Waste Landfill – northeast side of landfill. Picture P8140089

Photograph 31. Non-Hazardous Waste Landfill – northwest side of landfill. Picture P8140094

Photograph 32. Non-Hazardous Waste Landfill – southwest side of landfill. Picture P8140098

Photograph 33. Non-Hazardous Waste Landfill – southeast side of landfill. Picture P8140103 ↑

Photograph 34. Non-Hazardous Waste Landfill – ruts and ridges left during construction of landfill. Picture P8140079 ↑



Photograph 35. Non-Hazardous Waste Landfill – vegetation on top of landfill. Picture P8140084 ↑

Photograph 36. Non-Hazardous Waste Landfill – vegetation on top of landfill. Picture P8140086 ↑

Photograph 37. Non-Hazardous Waste Landfill – top of landfill. Picture P8140070 – P8140072 ←

Table B-33: Monitoring Well Sampling Log — MW-05B, 2013

Site Name:	PIN-4					
Date of Sampling Event:	14-Aug-13					
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow					
Monitoring Well ID:	MW-05B					
Facility:	NHWL					
Water Sample Measured Data						
Condition of Well:	Good					
Procedure/Equipment:	Interface meter			Procedure/Equipment:	Interface meter	
Well height above ground (m)=	N/A			Depth to water surface (m)=	N/A	
Diameter of well (m)=	0.05			Static water level* (m)=	N/A	
Depth of installation* (m)=	4.5			Depth to bottom (m)=	1.71	
Length screened section (m)=	3.0			Free product thickness (mm)=	N/A	
Depth to top of screen* (m)=	0.5					
Calculations				**Notes**		
Depth of water (m)=	N/A			Evidence of sludge etc:	N/A	
Well volume of water (L)=	N/A			Evidence of freezing/siltation: (compare to installation record)	yes, freezing	
Length screen collecting water (m)=	N/A					
Development/Purging Information						
Equipment:	Interface meter, watera tubing					
Note: Well frozen at time of sampling event.						
Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
19-Aug	N/A	N/A	N/A	N/A	N/A	N/A
Water Sampling				**Soil Sampling**		
Date and time collected:	N/A			Date and time collected:	14-Aug-13	
Sample Number - Water:	N/A			Sample Number - Soil:	13-09349 (surface)	
					13-09350/51 (depth)	
Sample containers:	1 L Amber glass			Sample containers:	240 mL glass jar	
3x 40 mL vials	2x 250 mL glass				120 mL glass jar	
	2x 120 mL plastic				60 mL glass jar	
Procedure/Equipment:	N/A			Procedure/Equipment:	Disposable scoop, pickaxe, shovel	
Water description:	N/A			Soil description:	Light brown sand with 10% gravel, increasing in size with depth	
Filtration: (Y/N)	N			Sampling Equipment Decontamination:	Y	
Acidification: (Y/N)	N			Number washes:	0	
				Number rinses:	1	
Sampling Equipment Decontamination: (Y/N)	N/A					
Number washes:	N/A					
Number rinses:	N/A					

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Table B-34: Monitoring Well Sampling Log — MW-06, 2013

Site Name:	PIN-4					
Date of Sampling Event:	14-Aug-13					
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow					
Monitoring Well ID:	MW-06					
Facility:	NHWL					
Water Sample Measured Data						
Condition of Well:	Good					
Procedure/Equipment:	Interface meter			Procedure/Equipment:	Interface meter	
Well height above ground (m)=	0.7			Depth to water surface (m)=	N/A	
Diameter of well (m)=	0.05			Static water level* (m)=	N/A	
Depth of installation* (m)=	4.3			Depth to bottom (m)=	1.7	
Length screened section (m)=	3.0			Free product thickness (mm)=	N/A	
Depth to top of screen* (m)=	0.3					
Calculations				**Notes**		
Depth of water (m)=	N/A			Evidence of sludge etc:	no	
Well volume of water (L)=	N/A			Evidence of freezing/siltation: (compare to installation record)	yes, freezing	
Length screen collecting water (m)=	N/A					
Development/Purging Information						
Equipment:	Interface meter, watera tubing					
Note: Well frozen at time of sampling event.						
Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Sampling				**Soil Sampling**		
Date and time collected:	N/A			Date and time collected:	13-Aug-13	
Sample Number - Water:	N/A			Sample Number - Soil:	13-09352 (surface)	
					13-09353 (depth)	
Sample containers:	N/A			Sample containers:	240 mL glass jar	
3x 40 mL vials					120 mL glass jar	
					60 mL glass jar	
Procedure/Equipment:	N/A			Procedure/Equipment:	Disposable scoop, pickaxe, shovel	
Water description:	N/A			Soil description:	Medium brown fine-grained organic-rich loam.	
Filtration: (Y/N)	N/A					
Acidification: (Y/N)	N/A			Sampling Equipment Decontamination:	Y	
				Number washes:	0	
Sampling Equipment Decontamination: (Y/N)	N/A			Number rinses:	1	
Number washes:	N/A					
Number rinses:	N/A					

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Table B-35: Monitoring Well Sampling Log — MW-07, 2013

Site Name:	PIN-4
Date of Sampling Event:	14-Aug-13
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow
Monitoring Well ID:	MW-07
Facility:	NHWL

Water Sample Measured Data

Condition of Well:	**Good**		
Procedure/Equipment:	Interface meter	Procedure/Equipment:	Interface meter
Well height above ground (m)=	0.5	Depth to water surface (m)=	1.92
Diameter of well (m)=	0.05	Static water level* (m)=	1.42
Depth of installation* (m)=	4.5	Depth to bottom (m)=	2.21
Length screened section (m)=	3	Free product thickness (mm)=	0
Depth to top of screen* (m)=	0.5		
Calculations		**Notes**	
Depth of water (m)=	0.29	Evidence of sludge etc:	no
Well volume of water (L)=	0.6	Evidence of freezing/siltation: (compare to installation record)	no
Length screen collecting water (m)=	0.29		

Development/Purging Information

Equipment:	Interface meter, watera tubing

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
Aug 14, 1418h	0.8	7.2	7.54	990	131	Cloudy, transparent
Aug 14, 1422h	0.6	7.4	7.52	890	130	Cloudy, transparent

Water Sampling		**Soil Sampling**	
Date and time collected:	14-Aug-13, 1425h	Date and time collected:	14-Aug-13
Sample Number - Water:	13-09344 (Blank)	Sample Number - Soil:	13-09354 (surface)
	13-09345		13-09355 (depth)
Sample containers:	1 L Amber glass	Sample containers:	240 mL glass jar
3x 40 mL vials	2x 250 mL glass		120 mL glass jar
	2x 120 mL plastic		60 mL glass jar
Procedure/Equipment:	Watera tubing	Procedure/Equipment:	Disposable scoop, pickaxe, shovel
Water description:	Cloudy, transparent	Soil description:	Dark brown sandy clay
Filtration: (Y/N)	N		
Acidification: (Y/N)	N	Sampling Equipment Decontamination:	Y
		Number washes:	0
Sampling Equipment Decontamination: (Y/N)	Y	Number rinses:	1
Number washes:	1		
Number rinses:	1		

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Table B-36: Monitoring Well Sampling Log — MW-08, 2013

Site Name:	PIN-4
Date of Sampling Event:	14-Aug-13
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow
Monitoring Well ID:	MW-08
Facility:	NHWL

Water Sample Measured Data

Condition of Well:	Good		
Procedure/Equipment:	Interface meter	Procedure/Equipment:	Interface meter
Well height above ground (m)=	0.5	Depth to water surface (m)=	1.82
Diameter of well (m)=	0.05	Static water level* (m)=	1.32
Depth of installation* (m)=	4.5	Depth to bottom (m)=	2.2
Length screened section (m)=	3.0	Free product thickness (mm)=	0
Depth to top of screen* (m)=	0.5		
Calculations		**Notes**	
Depth of water (m)=	0.38	Evidence of sludge etc:	no
Well volume of water (L)=	0.7	Evidence of freezing/siltation: (compare to installation record)	yes, freezing
Length screen collecting water (m)=	0.38		

Development/Purging Information

Equipment:	Interface meter, watera tubing

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
14 Aug, 1500h	0.6	9.4	7.56	744	119	cloudy, translucent
14 Aug, 1504h	0.7	10.9	7.48	670	206	cloudy, translucent
14 Aug, 1509h	0.6	10.7	7.4	671	124	cloudy, translucent

Water Sampling		**Soil Sampling**	
Date and time collected:	13-Aug, 1528h	Date and time collected:	13-Aug-13
Sample Number - Water:	13-09336	Sample Number - Soil:	13-09356 (surface)
			13-09357/58 (depth)
Sample containers:	1 L Amber glass	Sample containers:	240 mL glass jar
3x 40 mL vials	2x 250 mL glass		120 mL glass jar
	2x 120 mL plastic		60 mL glass jar
Procedure/Equipment:	Watera tubing	Procedure/Equipment:	Disposable scoop, pickaxe, shovel
Water description:	cloudy, translucent	Soil description:	Light brown/yellow fine to medium grained sand. Gravel at surface.
Filtration: (Y/N)	N	Sampling Equipment Decontamination:	Y
Acidification: (Y/N)	N	Number washes:	0
		Number rinses:	1
Sampling Equipment Decontamination: (Y/N)	Y		
Number washes:	1		
Number rinses:	1		

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Annex 4 Station Area Landfill West – Year 1 Data

Figures:

- PIN-4.5: Site Plan – Station Area Landfill West

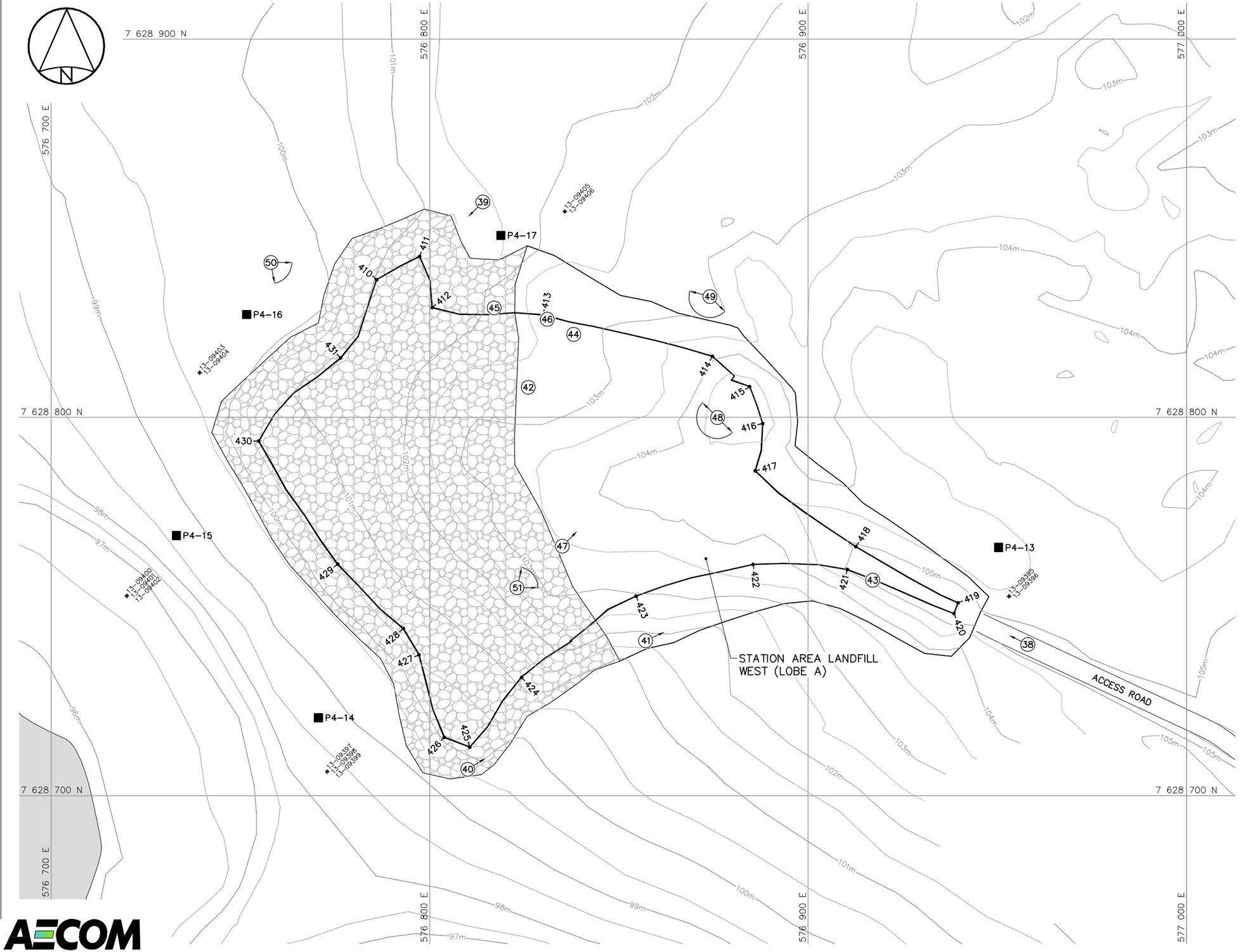
Tables:

- Landfill Visual Inspection – Station Area Landfill West
- Station Area Landfill West – Evaluation of Year 1 Soil Data
- Station Area Landfill West – Year 1 (2013) Soil Data

Photographic Records:

- Photos 38 and 39
- Photos 40 and 41
- Photos 42 and 43
- Photos 44 and 45
- Photos 46 and 47
- Photo 48
- Photo 49
- Photo 50
- Photo 51

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March 20, 2014 12:12:57 PM
Saved by: Cechi
AECOM FILE NO.: PIN-4.5 Year 1 LF MON.dwg



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 410 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (5)
- (38) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13–09405 — 2013 SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL
- BODY OF WATER

STATION AREA LANDFILL–WEST (LOBE A) REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
410	7 628 836.5	576 785.9	101.0
411	7 628 842.6	576 797.3	101.5
412	7 628 829.1	576 800.6	101.7
413	7 628 827.2	576 829.9	102.7
414	7 628 816.2	576 874.6	103.9
415	7 628 808.2	576 884.5	104.9
416	7 628 798.4	576 887.9	104.9
417	7 628 785.9	576 886.0	104.3
418	7 628 765.9	576 912.5	105.0
419	7 628 751.0	576 939.6	105.5
420	7 628 748.2	576 938.5	105.4
421	7 628 759.9	576 910.3	105.0
422	7 628 761.2	576 885.4	103.7
423	7 628 752.8	576 854.5	103.0
424	7 628 731.3	576 824.2	101.1
425	7 628 712.9	576 810.5	100.1
426	7 628 715.4	576 803.8	100.1
427	7 628 737.3	576 797.2	100.6
428	7 628 744.2	576 793.0	100.7
429	7 628 761.3	576 775.6	100.5
430	7 628 793.8	576 754.8	100.6
431	7 628 815.8	576 776.4	101.1

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

STATION AREA LANDFILL WEST LOBE A

FIGURE PIN-4.5

AECOM

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**Station Area Landfill West Lobe A**
Date of Inspection:	**14-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	Yes	Two depressions, likely caused by settlement, were observed within approximately 0.5m of each other.	0.4 m to 0.7 m.	0.4 m to 0.6 m.	75 mm to 200 mm.	Much less than 1%.	See photograph.	Picture P8140145		Isolated	Acceptable
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found on the top portion of the landfill.	Up to 0.2 m.	Up to 0.2 m.	Up to 60 0mm tall.	Much less than 1%.	See photographs.	Pictures P8140157, P8140171, and P8140180		Occasional	
Staining	Yes	One stain was observed on the landfill.	1 m.	0.45 m.		Much less than 1%.	See photograph.	Picture P8140172		Isolated	Acceptable
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	One ridge and several depressions were observed on the surface of the landfill, likely resulting from construction activities.	Varies (Up to approximately 2.5 m).	Varies (Up to approximately 1.3 m).	Up to 250 mm high.	Less than 1%.	See photographs.	Pictures P8140159, P8140160, P8140163, P8140164, P8140186, P8140188, P8140189, and P8140196		Occasional	Acceptable
	Yes	Isolated areas contain fine material that hold moisture.	Approximately 1 m.	Approximately 0.5 m.		Much less than 1%.	See photograph.	Picture P8140184		Isolated	Acceptable
Landfill Performance											Acceptable

Station Area Landfill West Lobe A - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	140	13.3 +/- 0.6	28.3	All concentrations within 95% confidence limit, with one exception.	The depth sample had a concentration of 14.0 mg/kg. The results were below the baseline maximum.
Nickel	140	9.3 +/- 0.5	28	All concentrations within 95% confidence limit, with five exceptions.	The surface and depth samples at P4-15 and P4-16 had concentrations of 10.4, 10.5, 12.2, and 10.3 mg/kg, respectively. The surface sample at P4-17 had a concentration of 10.0 mg/kg. All results were below the baseline maximum.
Cobalt	140	<5.0	8.1	Concentrations consistent with baseline mean (non-detect), with three exceptions.	The surface and depth samples at P4-15 had concentrations of 5.1 and 5.2 mg/kg, respectively. The surface sample at P4-16 has a concentration of 5.4 mg/kg. All results were below the baseline maximum.
Cadmium	140	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	140	10.3 +/- 0.9	33	All concentrations within 95% confidence limit, with five exceptions.	The surface sample at P4-14 had a concentration of 11.5 mg/kg. The surface and depth samples at P4-16 and P4-17 had concentrations of 12.0, 13.6, 14.2, and 11.9 mg/kg, respectively. All results were below the baseline maximum.
Zinc	140	<15	42	Concentrations consistent with baseline mean (non-detect), with one exception.	The surface sample at P4-14 had a concentration of 22 mg/kg. All results were below the baseline maximum.
Chromium	140	<20	100	Concentrations consistent with baseline mean (non-detect).	
Arsenic	140	2.5 +/- 0.2	8.6	All concentrations above the 95% confidence limit, with six exceptions.	The surface samples at P4-14 and P4-16 had concentrations of 2.8 and 4.3 mg/kg, respectively. The surface and depth samples at P4-15 and P4-17 had concentrations of 3.3, 3.5, 3.7, and 3.7 mg/kg, respectively. All results were below the baseline maximum.
Mercury	40	<0.10	<0.10	Concentrations consistent with baseline mean (non-detect).	
PCBs	141	<0.1	<0.1	Concentrations consistent with baseline mean (non-detect).	
TPH	40	22.4 +/- 5.3	73	All concentrations above the 95% confidence limit, with one exception.	The surface sample at P4-14 had a concentration of 88 mg/kg and exceeded the baseline maximum.

Station Area Landfill West Lobe A - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Station Area Landfill West Lobe A- Baseline Concentrations					**13.3 +/- 0.6**	**9.3 +/- 0.5**	**<5.0**	**<1.0**	**10.3 +/- 0.9**	**<15**	**<20**	**2.5 +/- 0.2**	**<0.10**	**<0.1**	**22.4 +/- 5.3**			
Station Area Landfill West Lobe A - Maximum Concentrations					**28.3**	**28**	**8.1**	**<1.0**	**33**	**42**	**100**	**8.6**	**<0.10**	**<0.1**	**73**			
Upgradient Soil Samples																		
13-093952[1]		P4-13	2013	0-10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
13-093962[1]		P4-13	2013	30-40	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Downgradient Soil Samples																		
13-09397*/98		P4-14		0-10	11.8	7.1	3.3	<0.50	11.5	22	9	2.8	0.042	<0.020	88	<5.0	<10	80
13-09399*		P4-14		30-40	10.6	7.5	3.3	<0.50	9.2	14	11	2.5	0.035	<0.020	<50	<5.0	<10	<50
13-09400*/01*		P4-15		0-10	10.8	10.4	5.1	<0.50	9.5	8	16	3.3	0.0235	<0.020	<50	<5.0	<10	<50
13-09402*		P4-15		30-40	11.2	10.5	5.2	<0.50	10	7	17	3.5	0.027	<0.020	<50	<5.0	<10	<50
13-09403*		P4-16		0-10	13.3	12.2	5.4	<0.50	12.9	6	20	4.3	0.014	<0.020	<50	<5.0	<10	<50
13-09404*		P4-16		30-40	14.0	10.3	3.5	<0.50	13.6	<5.0	18	2.7	0.017	<0.020	<50	<5.0	<10	<50
13-09405*		P4-17		0-10	9.0	10.0	4.6	<0.50	14.2	6	11	3.7	0.019	<0.020	<50	<5.0	<10	<50
13-09406*		P4-17		30-40	8.8	9.8	4.4	<0.50	11.9	<5.0	10	3.7	0.018	<0.020	<50	<5.0	<10	<50

[1] samples were collected but left at sample location and could not be analyzed.

Photograph 38. Station Area Landfill Lobe A – overall picture of landfill taken from the east. Picture P8140161

Photograph 39. Station Area Landfill Lobe A – west side of landfill. Picture P8140147

Photograph 40. Station Area Landfill Lobe A – south side of landfill. Picture P8140156 ↑

Photograph 41. Station Area Landfill Lobe A – south side (east portion) of landfill. Picture P8140158 ↑

Photograph 42. Station Area Landfill Lobe A – area of fine material on top of landfill. Picture P8140184 ↑

Photograph 43. Station Area Landfill Lobe A – low spot (approx. 75 mm deep) on landfill. Picture P8140163 ↑

Photograph 44. Station Area Landfill Lobe A – isolated low spot (75 mm to 200 mm deep) on top of landfill. Picture P8140145 ↑

Photograph 45. Station Area Landfill Lobe A – stain on top of landfill. Picture P8140172 ↑

Photograph 46. Station Area Landfill Lobe A – vegetation on top of landfill. Picture P8140171 ↑

Photograph 47. Station Area Landfill Lobe A – vegetation on top of landfill. Picture P8140180 ↑

Photograph 48. Station Area Landfill Lobe A – top of landfill. Picture P8140191 – P8140195 ←

Photograph 49. Station Area Landfill Lobe A – north side of landfill. Picture P8140167 – P8140169 ←

Photograph 50. Station Area Landfill Lobe A – west side of landfill. Picture P8140149 – P8140150 ←

Photograph 51. Station Area Landfill Lobe A – transition from Type 1 to Type 2 on top of landfill. Picture P8140178 – P8140179 ←

Annex 5 USAF Closure Landfill – Year 1 Data

Figures:

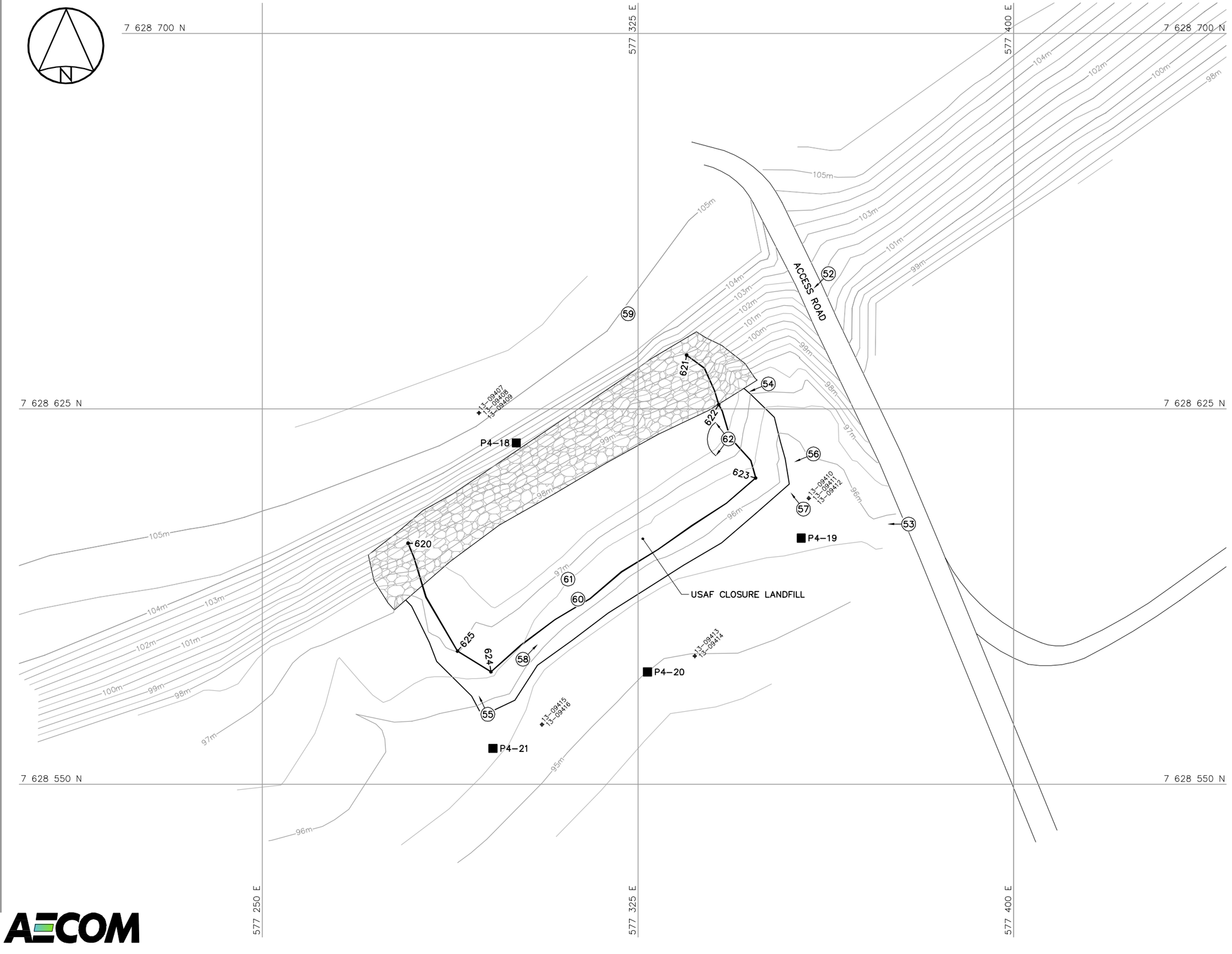
- PIN-4.6: Site Plan – USAF Closure Landfill

Tables:

- Landfill Visual Inspection – USAF Closure Landfill
- USAF Closure Landfill – Evaluation of Year 1 Soil Data
- USAF Closure Landfill – Year 1 (2013) Soil Data

Photographic Records:

- Photos 52 and 53
- Photos 54 and 55
- Photos 56 and 57
- Photos 58 and 59
- Photos 60 and 61
- Photo 62



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- 620 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (4)
- (52) — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13–09410 — 2013 SOIL SAMPLE TAG LOCATION
- TYPE 1 GRANULAR FILL

USAF CLOSURE LANDFILL REGRADED (AS–BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
620	7 628 598.2	577 279.1	99.6
621	7 628 635.7	577 334.7	101.9
622	7 628 625.9	577 341.1	98.0
623	7 628 611.2	577 348.5	96.3
624	7 628 572.5	577 295.6	96.6
625	7 628 576.6	577 289.0	97.0

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

USAF CLOSURE LANDFILL

FIGURE PIN-4.6

AECOM

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**USAF Closure Landfill**
Date of Inspection:	**14-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found within the boundaries of the landfill.	Up to 0.1 m.	Up to 0.1 m.	Up to 350 mm tall.	Much less than 1%.	See photographs.	Pictures P8140132 and P8140133		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Occasional debris was observed in the vicinity of the landfill.				Much less than 1%.	Pieces of metal. The observed debris did not originate from within the landfill. See photographs.	Pictures P8140142 and P8140143		Occasional	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	There is an area retaining moisture near the southeast slope toe.	25 m.	4 m.		Approximately 3%.	See photographs.	Pictures P8140130 and P8140131		Isolated	Acceptable
Landfill Performance	Acceptable										

USAF CLOSURE LANDFILL - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	61	27 +/- 21	640	All concentrations within 95% confidence limit.	
Nickel	61	12.0 +/- 0.6	18	All concentrations within 95% confidence limit, with four exceptions.	The surface and depth samples at P4-19 and P4-21 had concentrations of 14.5, 14.6, 13.3, and 13.8 mg/kg, respectively. All results were below the baseline maximum.
Cobalt	61	<5.0	7.2	Concentrations consistent with baseline mean (non-detect), with two exceptions.	The surface and depth samples at P4-19 had concentrations of 5.6 and 5.6 mg/kg. All results were below the baseline maximum.
Cadmium	61	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	61	<10	275	All concentrations within 95% confidence limit, with four exceptions.	The surface and depth samples at P4-18 and P4-19 had concentrations of 12.1, 11.9, 22.1, and 11.1 mg/kg, respectively. All results were below the baseline maximum.
Zinc	61	<15	150	Concentrations consistent with baseline mean (non-detect).	
Chromium	61	<20	23	Concentrations consistent with baseline mean (non-detect).	
Arsenic	61	2.9 +/- 0.2	6.5	All concentrations above the 95% confidence limit.	All results were below the baseline maximum.
Mercury	60	<0.10	<0.10	Concentrations consistent with baseline mean (non-detect).	
PCBs	62	<0.1	0.71	Concentrations consistent with baseline mean (non-detect).	
TPH	32	28.5 +/- 4.8	51	All concentrations above the 95% confidence limit.	

USAF Closure Landfill - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
USAF Closure Landfill- Baseline Concentrations					**27 +/- 21**	**12.0 +/- 0.6**	**<5.0**	**<1.0**	**<10**	**<15**	**<20**	**2.9 +/- 0.2**	**<0.10**	**<0.1**	**28.5 +/- 4.8**			
USAF Closure Landfill - Maximum Concentrations					**640**	**18**	**7.2**	**<1.0**	**275**	**150**	**23**	**6.5**	**<0.10**	**0.71**	**51**			
Upgradient Soil Samples																		
13-09407*/08		P4-18	2013	0-10	8.1	9.0	3.9	<0.50	12.1	6	10	4.0	0.018	<0.020	<50	<5.0	<10	<50
13-09409*		P4-18	2013	30-40	7.9	8.3	3.8	<0.50	11.9	6	10	4.0	0.017	<0.020	<50	<5.0	<10	<50
Downgradient Soil Samples																		
13-09410*/11*		P4-19	2013	0-10	11.3	14.5	5.6	<0.50	22.1	11	12	3.4	0.020	<0.020	<50	<5.0	<10	<50
13-09412*		P4-19	2013	30-40	11.5	14.6	5.6	<0.50	11.1	9	12	3.4	0.018	<0.020	<50	<5.0	<10	<50
13-09413*		P4-20	2013	0-10	9.2	11.7	4.4	<0.50	9.4	8	12	3.4	0.013	<0.020	<50	<5.0	<10	<50
13-09414*		P4-20	2013	30-40	8.8	11.5	4	<0.50	8.7	7	11	3.3	0.011	<0.020	<50	<5.0	<10	<50
13-09415*		P4-21	2013	0-10	9.5	13.3	4.7	<0.50	9.3	9	12	3.5	0.017	<0.020	<50	<5.0	<10	<50
13-09416*		P4-21	2013	30-40	10.6	13.8	5	<0.50	9.5	9	13	3.5	0.017	<0.020	<50	<5.0	<10	<50

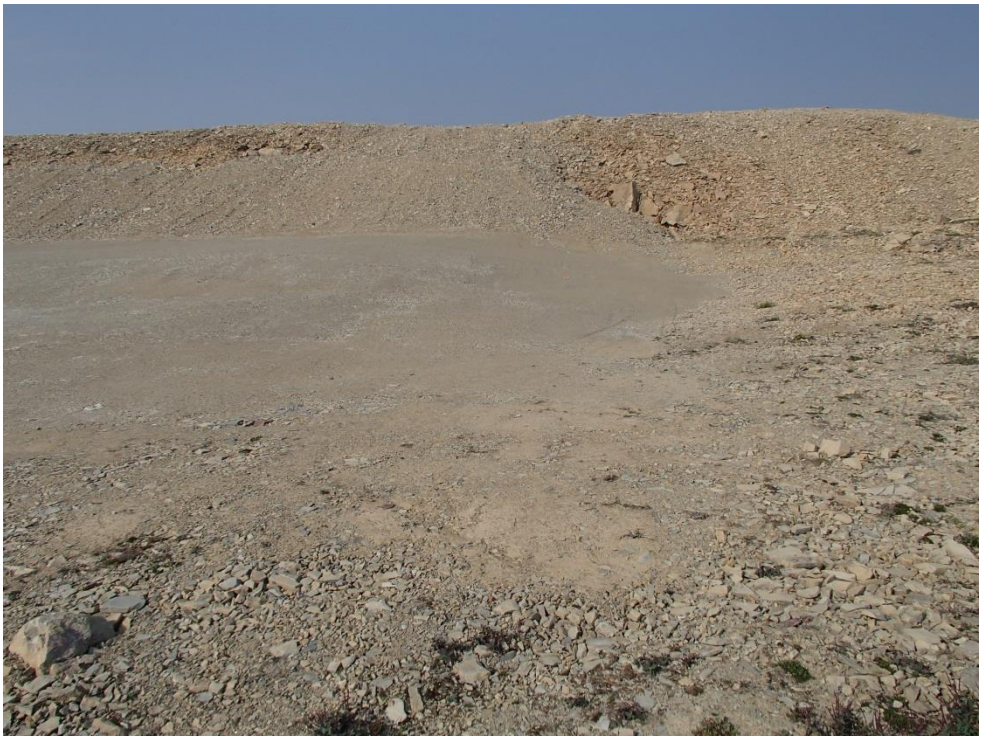
Photograph 52. USAF Closure Landfill – overall picture of landfill from the northeast. Picture P8140109 ↑

Photograph 53. USAF Closure Landfill – overall picture of landfill from the southeast. Picture P8140139 ↑

Photograph 54. USAF Closure Landfill – northwest side of landfill. Picture P8140122 ↑

Photograph 55. USAF Closure Landfill – southwest side of landfill. Picture P8140129 ↑

Photograph 56. USAF Closure Landfill – southeast side of landfill. Picture P8140136



Photograph 57. USAF Closure Landfill – northeast side of landfill. Picture P8140137

Photograph 58. USAF Closure Landfill – moist area on southeast side of landfill. Picture P8140131 ↑

Photograph 59. USAF Closure Landfill – metal debris located near landfill. Picture P8140143 ↑

Photograph 60. USAF Closure Landfill – vegetation on southeast side of landfill. Picture P8140132 ↑

Photograph 61. USAF Closure Landfill – vegetation on southeast side of landfill. Picture P8140133 ↑

Photograph 62. USAF Closure Landfill – top of landfill. Picture P8140116 – P8140118 ←

Annex 6 Tier II Disposal Facility – Year 1 Data

Figures:

- PIN-4.7: Site Plan – Tier II Disposal Facility
- Ground Temperature Profile Tier II Disposal Facility Vertical Thermistor VT-1
- Ground Temperature Profile Tier II Disposal Facility Vertical Thermistor VT-2
- Ground Temperature Profile Tier II Disposal Facility Vertical Thermistor VT-3
- Ground Temperature Profile Tier II Disposal Facility Vertical Thermistor VT-4

Tables:

- Landfill Visual Inspection – Tier II Disposal Facility
- Tier II Disposal Facility – Evaluation of Year 1 Soil Analytical Data
- Tier II Disposal Facility – Year 1 (2013) Soil Data
- Tier II Disposal Facility – Year 1 (2013) Groundwater Data

Photographic Records:

- Photos 63 and 64
- Photos 65 and 66
- Photos 67 and 68
- Photos 69 and 70
- Photos 71 and 72
- Photos 73 and 74
- Photos 75 and 76
- Photo 77
- Photo 78

Well Sampling Records:

- Well MW-01
- Well MW-02
- Well MW-03
- Well MW-04

Thermistor Annual Maintenance Records:

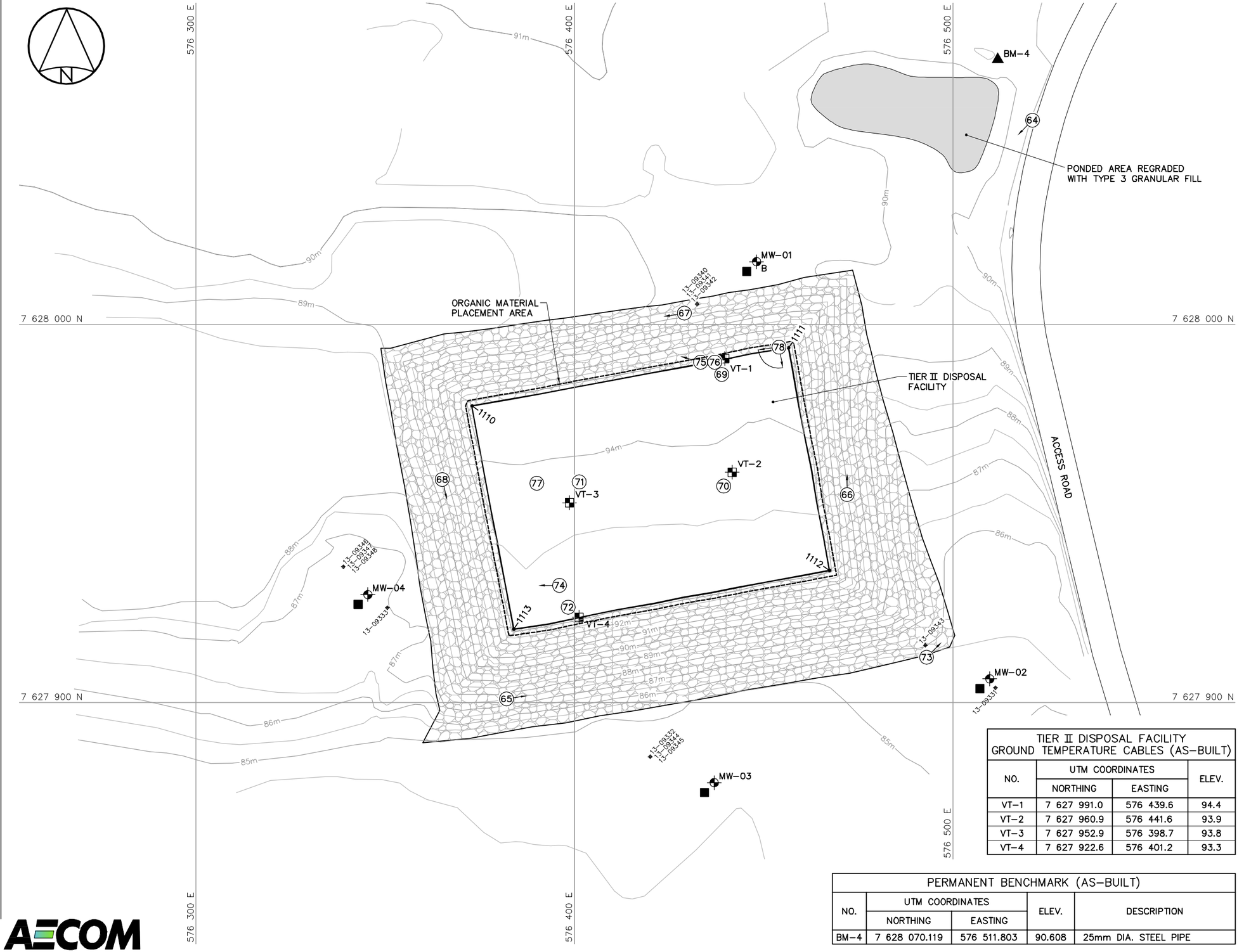
- VT-1
- VT-2
- VT-3
- VT-4

Tier II Disposal Facility – Evaluation of Ground Temperature Data

Ground temperature profiles for the vertical thermistors are attached, showing ground temperature curves since August 2013. The table shows the depth of the active layer as defined by the 0°C isotherm for August 13, 2013.

Summary of Tier II Disposal Facility Thermal Results				
	VT-1	**VT-2**	**VT-3**	**VT-4**
Depth (m) of 0°C Isotherm (August 13/12)	-2.01	-2.52	-2.21	-1.78

The inferred active layer depth noted above is less than the thickness of the 3.8 m granular cover over the Tier II soil; the landfill contents are frozen. The ground temperatures are likely warmer and active layers deeper than the long term condition and ground temperatures are expected to cool over the next several years (EBA 2013).



GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

BM-4	PERMANENT BENCHMARK LOCATION (1)
1110	COORDINATE POINT
MW-02	MONITORING WELL LOCATION (3)
MW-01 B	BACKGROUND MONITORING WELL LOCATION (1)
VT-1	GROUND TEMPERATURE CABLE LOCATION (4)
	MONITORING SOIL SAMPLE LOCATION (4)
64	APPROX. PHOTOGRAPHIC VIEWPOINT
13-09340	2013 SOIL SAMPLE TAG LOCATION
	TYPE 1 GRANULAR FILL

TIER II DISPOSAL FACILITY
FINAL GRADING (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
1110	7 627 978.4	576 372.9	94.4
1111	7 627 993.8	576 456.5	94.2
1112	7 627 935.0	576 467.3	93.2
1113	7 627 919.4	576 383.9	93.2

NOTE:
COORDINATE POINTS AND ELEVATIONS PROVIDED ARE TO THE FINAL GRADE OF THE TYPE 2 GRANULAR FILL CAP PRIOR TO THE PLACEMENT OF THE TYPE 1 GRANULAR FILL ON THE SIDE SLOPES.

TIER II DISPOSAL FACILITY
MONITORING WELLS (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
MW-01	7 628 016.6	576 448.1	89.8
MW-02	7 627 906.3	576 509.7	85.2
MW-03	7 627 878.8	576 436.9	84.7
MW-04	7 627 928.6	576 345.4	86.8

RECORD DRAWING
NOT FOR CONSTRUCTION

0 10 20 m SCALE 1:1000

TIER II DISPOSAL FACILITY
GROUND TEMPERATURE CABLES (AS-BUILT)

NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
VT-1	7 627 991.0	576 439.6	94.4
VT-2	7 627 960.9	576 441.6	93.9
VT-3	7 627 952.9	576 398.7	93.8
VT-4	7 627 922.6	576 401.2	93.3

PERMANENT BENCHMARK (AS-BUILT)

NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-4	7 628 070.119	576 511.803	90.608	25mm DIA. STEEL PIPE

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

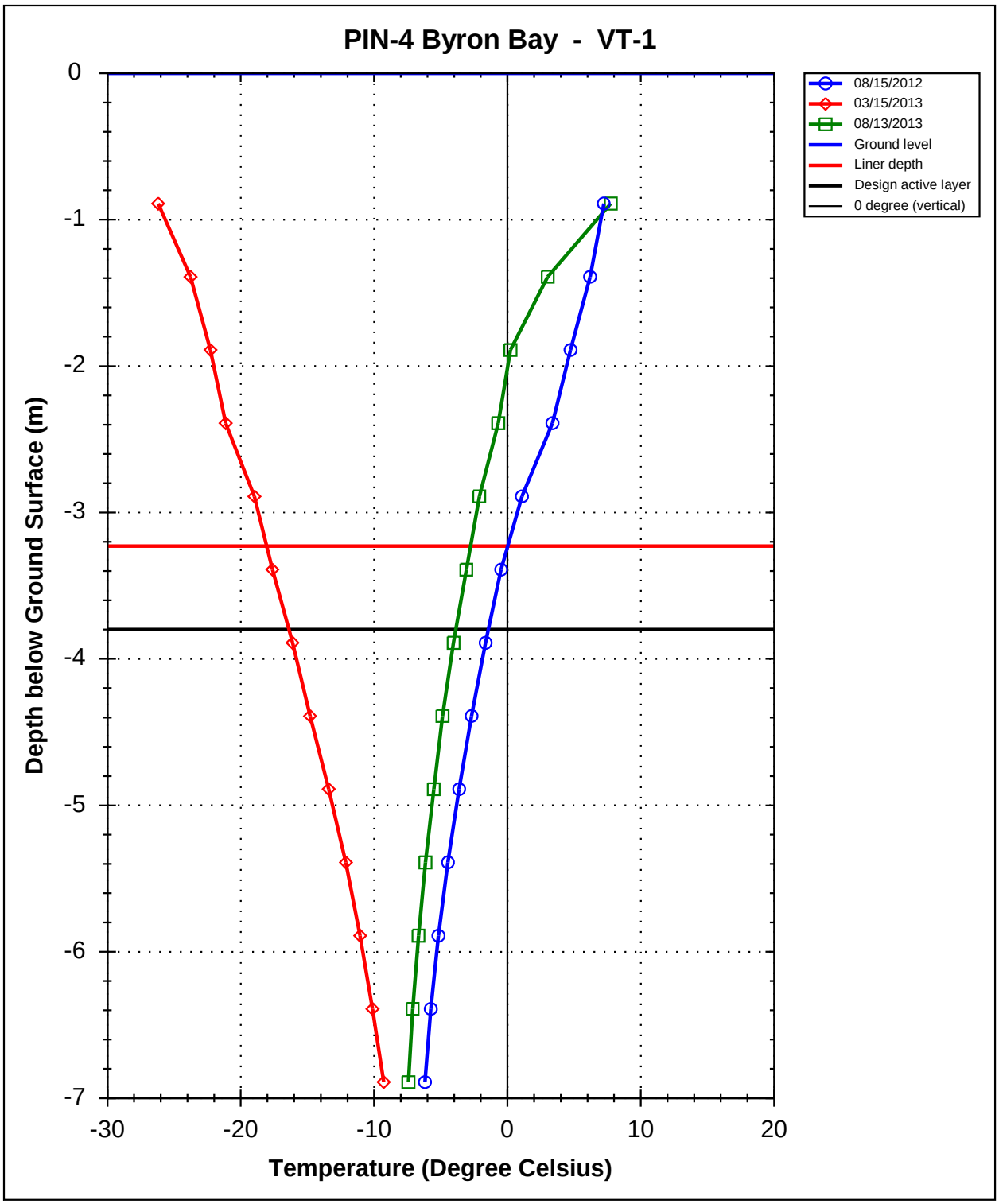
PIN-4 BYRON BAY

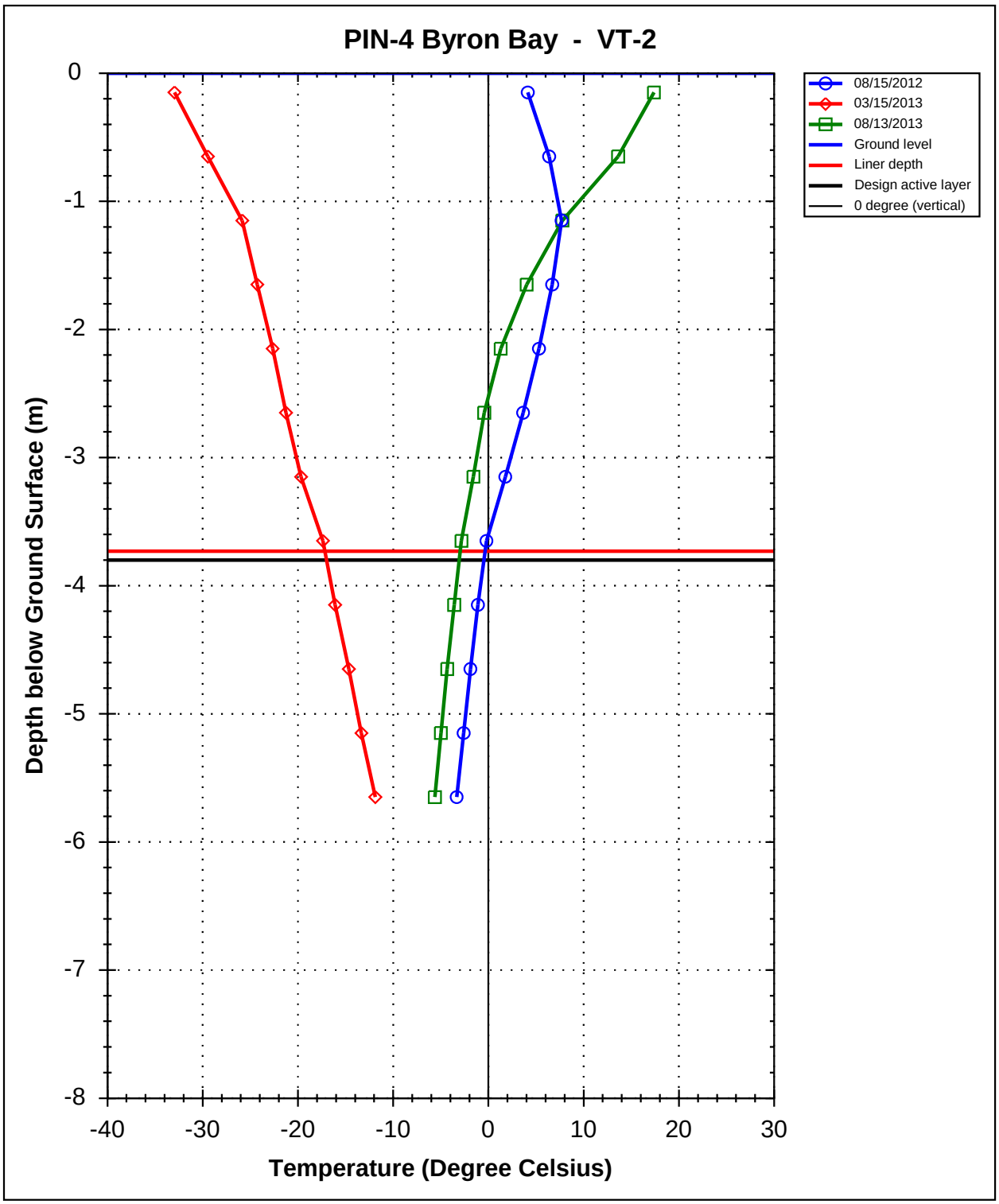
TIER II DISPOSAL FACILITY

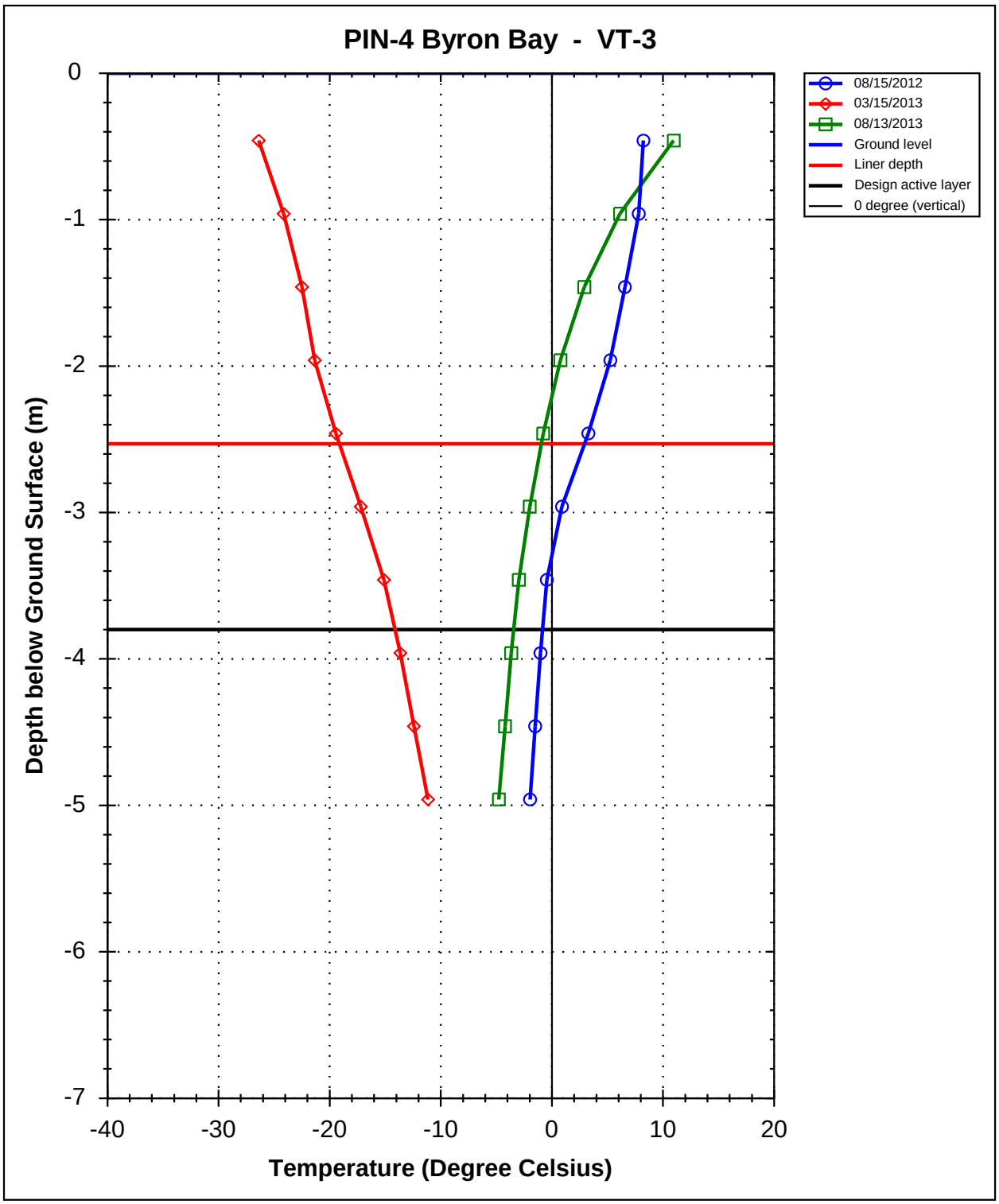
FIGURE PIN-4.7

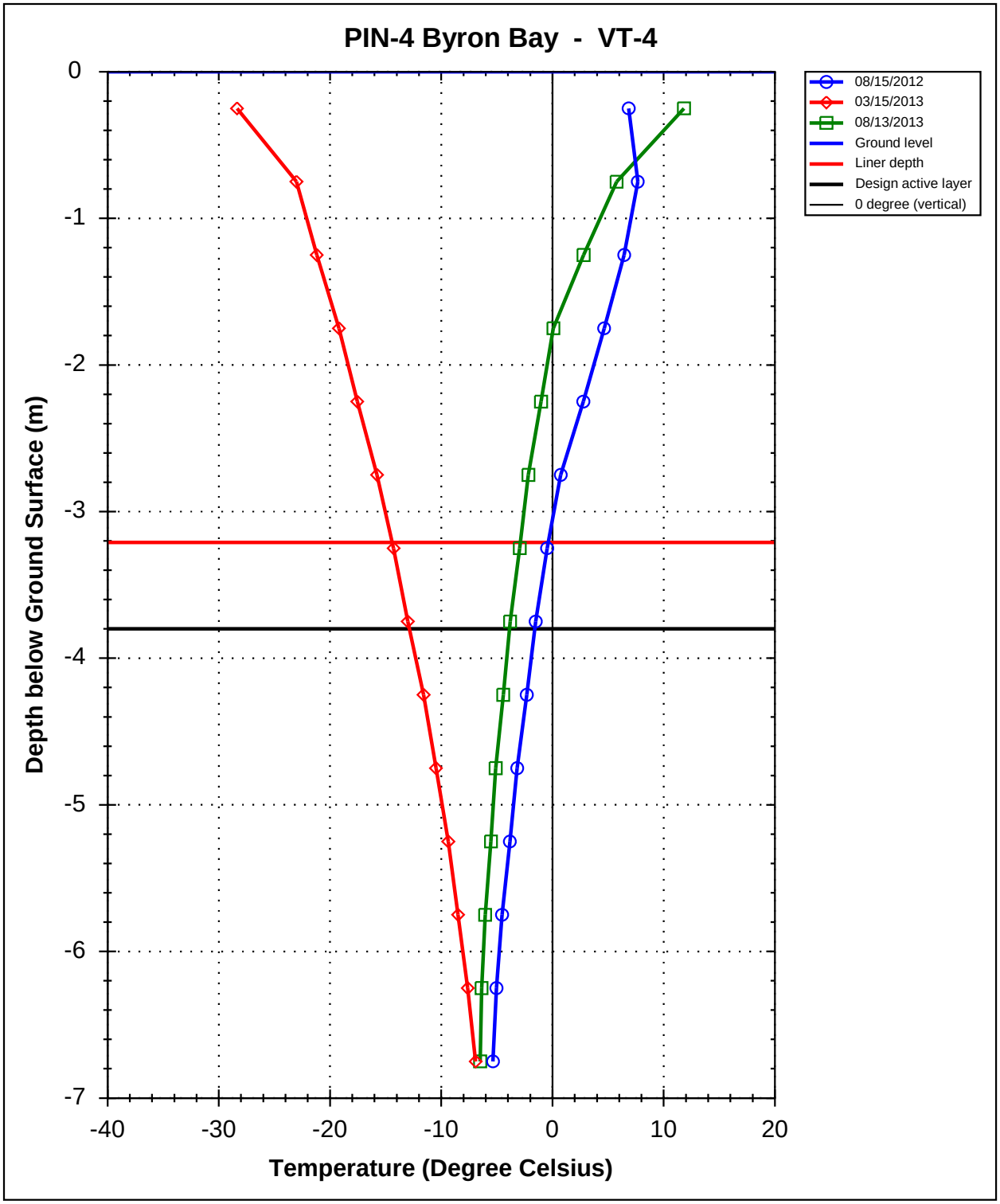
AECOM

Sheet Size: 11 x 17 (432mm x 279mm)
PLOT: March 20, 2014 12:12:33 PM
Saved by: Cechi
AECOM FILE NO.:PIN-4.7 Year 1 LF MON.dwg


PIN-4 Byron Bay - VT-1
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-6
-7
-30
-20
-10
0
10
20
08/15/2012
03/15/2013
08/13/2013
Ground level
Liner depth
Design active layer
0 degree (vertical)


PIN-4 Byron Bay - VT-2
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-6
-7
-8
-40
-30
-20
-10
0
10
20
30
08/15/2012
03/15/2013
08/13/2013
Ground level
Liner depth
Design active layer
0 degree (vertical)


PIN-4 Byron Bay - VT-3
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-6
-7
-40
-30
-20
-10
0
10
20
08/15/2012
03/15/2013
08/13/2013
Ground level
Liner depth
Design active layer
0 degree (vertical)


PIN-4 Byron Bay - VT-4
Depth below Ground Surface (m)
Temperature (Degree Celsius)
0
-1
-2
-3
-4
-5
-6
-7
-40
-30
-20
-10
0
10
20
08/15/2012
03/15/2013
08/13/2013
Ground level
Liner depth
Design active layer
0 degree (vertical)

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**Tier II Disposal Facility**
Date of Inspection:	**13-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	No									None	
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found within the boundaries of the landfill.	Up to 0.2 m.	Up to 0.2 m.	Up to 500 mm tall.	Much less than 1%.	See photographs.	Pictures P8130029 to P8130033		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	No									None	
Presence/Condition - Monitoring Instruments	Yes	Refer to drawing, Thermistor Inspection Reports, and Monitoring Well Logs.					See photographs.	Pictures P8130001 to P8130012			Acceptable
Features of Note	Yes	Several ridges and depressions were observed on the surface of the landfill, likely resulting from construction activities.	Varies (Up to approximately 3.5 m).	Varies (Up to approximately 2.0 m).	Up to 150 mm high; Up to 185 mm deep.	Approximately 1%.	See photographs.	Pictures P8130016, P8130026 to P8130028, and P8130054		Occasional	Acceptable
	Yes	Isolated ponding, stagnant water at SE corner of Tier II due to low area in vicinity.	Approximately 7 m.	Approximately 3 m.		Approximately 1%.	See photographs.	Pictures P8130038 and P8130040		Isolated	Acceptable
	Yes	The top of the landfill is covered in nutrients to promote growth of vegetation.	85 m.	60 m.		Approximately 35%.	See photographs.	Pictures P8130013 to P8130015, P8130017 to P8130025, and P8130059		Numerous	
Landfill Performance	Acceptable										

TIER II DISPOSAL FACILITY - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	45	38 +/- 8	160	All concentrations within 95% confidence limit, with two exceptions.	The depth sample at MW-03 had a concentration of 47.6 mg/kg and the surface sample at MW-04 had a concentration of 51.6 mg/kg. All results were below the baseline maximum.
Nickel	40	13.0 +/- 1.4	36	All concentrations within 95% confidence limit, with two exceptions.	The surface sample at MW-02 had a concentration of 17.1 mg/kg and the depth sample at MW-03 had a concentration of 15.6 mg/kg. All results were below the baseline maximum.
Cobalt	40	7.5 +/- 0.6	16	All concentrations within 95% confidence limit, with two exception.	The depth sample at MW-03 had a concentration of 8.3 mg/kg and the surface sample at MW-04 had a concentration of 8.3 mg/kg. All results were below the baseline maximum.
Cadmium	40	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	43	<10	<10	Concentrations consistent with baseline mean (non-detect).	
Zinc	43	27 +/- 3	48	All concentrations within 95% confidence limit.	
Chromium	40	<20	23	Concentrations consistent with baseline mean (non-detect).	
Arsenic	40	1.6 +/- 0.3	4.6	All concentrations below the 95% confidence limit, with three exception.	The depth sample at MW-01 had a concentration of 2.7 mg/kg. The surface and depth samples at MW-04 had concentrations of 2.8 and 2.5 mg/kg, respectively. All results were below the baseline maximum.
Mercury	24	<0.10	<0.10	Concentrations consistent with baseline mean (non-detect).	
PCBs	40	<0.1	<0.1	Concentrations consistent with baseline mean (non-detect).	
TPH	37	<40	116	All concentrations below the 95% confidence limit, with one exception.	The surface sample at MW-02 Had a concentration of 158 mg/kg. This results exceeded the baseline maximum.

Tier II Disposal Facility - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity F1	TPH Identity F2	TPH Identity F3
Tier II Disposal Facility - Baseline Concentrations					**38 +/- 8**	**13.0 +/- 1.4**	**7.5 +/- 0.6**	**<1.0**	**<10**	**27 +/- 3**	**<20**	**1.6 +/- 0.3**	**<0.10**	**<0.1**	**<40**			
Tier II Disposal Facility - Maximum Concentrations					**le at MW-0**	**36**	**16**	**<1.0**	**<10**	**48**	**23**	**4.6**	**<0.10**	**<0.1**	**116**			
Upgradient Soil Samples ration of 17.1 mg/kg and the depth sample at MW-03 had a concentration of 15.6 mg/kg. All results were below the baseline maximum.																		
13-09340*/41*		MW-01B	2013	0-10	le at MW-(	6.7	4.1	<0.50	3.4	13	10	1.6	<0.010	<0.020	<50	<5.0	<10	<50
13-09342*		MW-01B	2013	30-40	27.5	11.8	7.2	<0.50	6.1	20	15	2.7	0.012	<0.020	<50	<5.0	<10	<50
Downgradient Soil Samples																		
13-09343*		MW-02	2013	0-10	36.5	17.1	6.7	<0.50	7.0	27	17	1.6	0.019	<0.020	158	<5.0	<10	150
13-09344*		MW-03	2013	0-10	29.2	10.3	5.9	<0.50	4.1	22	14	1.3	<0.010	<0.020	<50	<5.0	<10	<50
13-09345*		MW-03	2013	30-40	47.6	15.6	8.3	<0.50	4.1	26	14	1.7	0.012	<0.020	<50	<5.0	<10	<50
13-09346*		MW-04	2013	0-10	51.6	12.6	8.3	<0.50	7.6	23	17	2.8	<0.010	<0.020	<50	<5.0	<10	<50
13-09347*/48		MW-04	2013	30-40	27.3	9.9	7	<0.50	5.5	17	14	2.5	<0.010	<0.020	<50	<5.0	<10	<50

Non-Hazardous Waste Landfill - Year 1 (2013) Groundwater Data

Sample #	Location	Date	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	PCBs [mg/L]	TPH [mg/L]	TPH Identity		
														F1	F2	F3
Downgradient Groundwater Samples																
13-09330/31	MW-02	2013	0.059	0.065	0.0198	0.000	0.01	0.615	0.023	0.006	<0.00010	0.000039		<0.10	<0.10	<0.15
13-09332	MW-03	2013	0.016	0.063	0.0079	0.000	0.00	0.039	0.210	0.002	<0.00010	<0.000020		<0.10	<0.10	<0.15
13-09333	MW-04	2013	0.120	2.000	0.0419	<0.000090	<0.0050	0.790	6.800	<0.010†	0.00014	0.000034		<0.10	<0.10	<0.15

Photograph 63. Tier II Disposal Facility – overall picture of landfill taken from the air. Picture P8140059 ↑

Photograph 64. Tier II Disposal Facility – overall picture of landfill. Picture P8130055 ↑

Photograph 65. Tier II Disposal Facility – south side of landfill. Picture P8130035

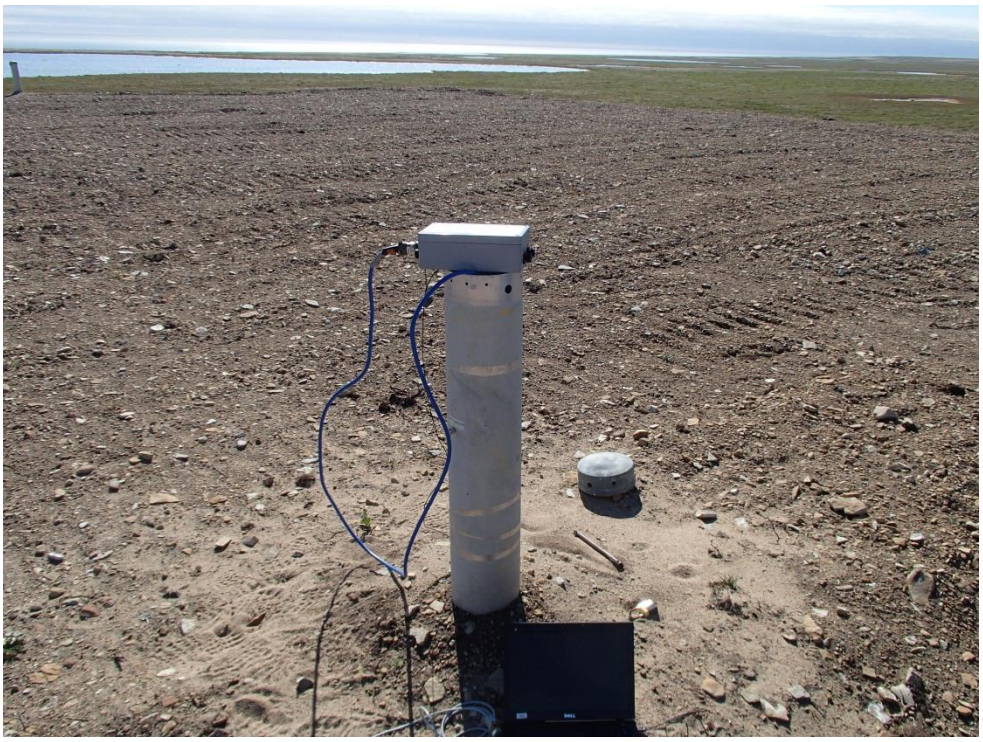
Photograph 66. Tier II Disposal Facility – east side of landfill. Picture P8130041

Photograph 67. Tier II Disposal Facility – north side of landfill. Picture P8130045

Photograph 68. Tier II Disposal Facility – west side of landfill. Picture P8130050

Photograph 69. Tier II Disposal Facility – thermistor VT-1. Picture P8130001 ↑

Photograph 70. Tier II Disposal Facility – thermistor VT-2. Picture P8130004 ↑



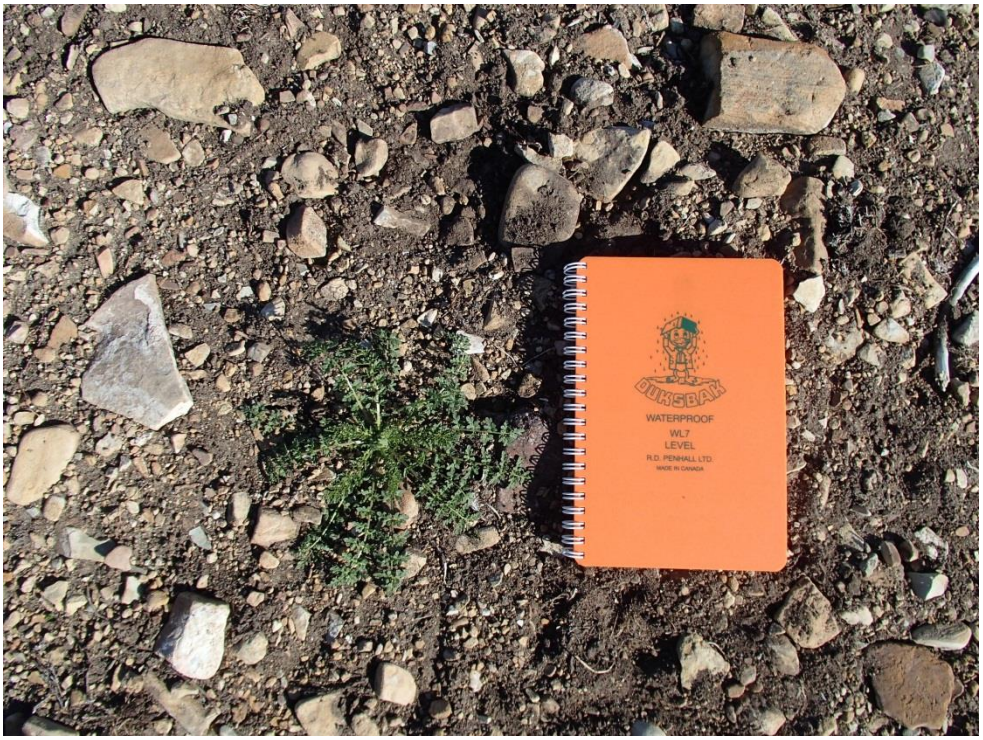
Photograph 71. Tier II Disposal Facility – thermistor VT-3. Picture P8130007

Photograph 72. Tier II Disposal Facility – thermistor VT-4. Picture P8130010

Photograph 73. Tier II Disposal Facility – wet area of ponding water near southeast corner of landfill. Picture P8130038 ↑

Photograph 74. Tier II Disposal Facility – low spot from construction activities on landfill. Picture P8130026 ↑

Photograph 75. Tier II Disposal Facility – low spot and ridge from construction activities on landfill. Picture P8130027 ↑



Photograph 76. Tier II Disposal Facility – vegetation on top of landfill. Picture P8130030 ↑

Photograph 77. Tier II Disposal Facility – vegetation on top of landfill. Picture P8130032

Photograph 78. Tier II Disposal Facility – top of landfill. Picture P8130020 – P8130022 ←

Table B-15: Monitoring Well Sampling Log — MW-01B, 2013

Site Name:	PIN-4					
Date of Sampling Event:	13/08/13					
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow					
Monitoring Well ID:	MW-01B					
Facility:	Tier II Disposal Facility					
Water Sample Measured Data						
Condition of Well:	Good					
Procedure/Equipment:	Interface meter			Procedure/Equipment:	Interface meter	
Well height above ground (m)=	0.51			Depth to water surface (m)=	0	
Diameter of well (m)=	0.05			Static water level* (m)=	0.00	
Depth of installation* (m)=	4.5			Depth to bottom (m)=	2.14	
Length screened section (m)=	3.0			Free product thickness (mm)=	0	
Depth to top of screen* (m)=	0.5					
Calculations				**Notes**		
Depth of water (m)=	0			Evidence of sludge etc:	no	
Well volume of water (L)=	0.0			Evidence of freezing/siltation: (compare to installation record)	yes, freezing	
Length screen collecting water (m)=	0					
Development/Purging Information						
Equipment:	Interface meter, watera tubing					
Note: Well frozen at time of sampling event						
Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Sampling				**Soil Sampling**		
Date and time collected:	N/A			Date and time collected:	13/08/13	
Sample Number - Water:	well was frozen			Sample Number - Soil:	13-09340/41 (surface)	
					13-09342 (depth)	
Sample containers:				Sample containers:	240 mL glass jar	
					120 mL glass jar	
					60 mL glass jar	
Procedure/Equipment:				Procedure/Equipment:	Disposable scoop, pickaxe, shovel	
Water description:				Soil description:	Light brown medium grained sand with 25% gravel.	
Filtration: (Y/N)						
Acidification: (Y/N)						
Sampling Equipment Decontamination: (Y/N)				Sampling Equipment Decontamination: (Y/N)	Y	
Number washes:				Number washes:	0	
Number rinses:				Number rinses:	1	

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Table B-16: Monitoring Well Sampling Log — MW-02, 2013

Site Name:	PIN-4					
Date of Sampling Event:	13-Aug-13					
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow					
Monitoring Well ID:	MW-02					
Facility:	Tier II Disposal Facility					
Water Sample Measured Data						
Condition of Well:	Lots of water around well					
Procedure/Equipment:	Interface meter			Procedure/Equipment:	Interface meter	
Well height above ground (m)=	0.6			Depth to water surface (m)=	0.72	
Diameter of well (m)=	0.05			Static water level* (m)=	0.12	
Depth of installation* (m)=	4.5			Depth to bottom (m)=	1.73	
Length screened section (m)=	3.0			Free product thickness (mm)=	0	
Depth to top of screen* (m)=	0.6					
Calculations				**Notes**		
Depth of water (m)=	1.01			Evidence of sludge etc:	no	
Well volume of water (L)=	2.0			Evidence of freezing/siltation: (compare to installation record)	yes, freezing	
Length screen collecting water (m)=	1.13					
Development/Purging Information						
Equipment:	Interface meter, waterra tubing					
Date & Time	Volume Removed (L)	Temperature (°C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
Aug 13, 1440h	0.75	10.5	5.54	"Or"	101	Cloudy, translucent
Aug 13, 1447h	0.8	6.8	6.11	"Or"	230	Cloudy, translucent
Aug 13, 1451h	0.8	6.5	6.0	"Or"	230	Cloudy, translucent
Water Sampling				**Soil Sampling**		
Date and time collected:	Aug 13, 1455h			Date and time collected:	13-Aug-13	
Sample Number - Water:	13-09330/31			Sample Number - Soil:	13-09343 (surface)	
					no depth sample	
Sample containers:	1 L Amber glass			Sample containers:	240 mL glass jar	
3x 40 mL vials	2x 250 mL glass				120 mL glass jar	
	2x 120 mL plastic				60 mL glass jar	
Procedure/Equipment:	Watera tubing, interface meter			Procedure/Equipment:	Disposable scoop, pickaxe, shovel	
Water description:	Cloudy, translucent			Soil description:	Completely saturated. Dark brown muddy silty clay with organics. No depth sample could be collected due to standing water.	
Filtration: (Y/N)	N					
Acidification: (Y/N)	N					
Sampling Equipment Decontamination: (Y/N)	Y			Sampling Equipment Decontamination: (Y/N)	Y	
Number washes:	1			Number washes:	0	
Number rinses:	1			Number rinses:	1	

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Or= Indicates the reading was greater than 100000 uS-cm.

Table B-17: Monitoring Well Sampling Log — MW-03, 2013

Site Name:	PIN-4
Date of Sampling Event:	13-Aug-13
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow
Monitoring Well ID:	MW-03
Facility:	Tier II Disposal Facility

Water Sample Measured Data

Condition of Well:	Good		
Procedure/Equipment:	Interface meter	Procedure/Equipment:	Interface meter
Well height above ground (m)=	0.6	Depth to water surface (m)=	2.03
Diameter of well (m)=	0.05	Static water level* (m)=	1.43
Depth of installation* (m)=	4.5	Depth to bottom (m)=	2.27
Length screened section (m)=	3.0	Free product thickness (mm)=	0
Depth to top of screen* (m)=	0.4		
Calculations		**Notes**	
Depth of water (m)=	0.24	Evidence of sludge etc:	no
Well volume of water (L)=	0.5	Evidence of freezing/siltation: (compare to installation record)	yes, freezing
Length screen collecting water (m)=	0.24		

Development/Purging Information

Equipment:	Interface meter, watera tubing

Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
Aug 13, 1550h	0.75	7.7	6.44	33100	46.5	Transparent with some light brown sediment
Aug 13, 1602h	0.75	8.4	7.14	33600	95	Transparent with some light brown sediment
Aug 13, 1607h	0.9	6.7	7.2	33100	173	Transparent with some light brown sediment

Water Sampling		**Soil Sampling**	
Date and time collected:	13-Aug-13, 1608h	Date and time collected:	8/13/2013
Sample Number - Water:	13-09332	Sample Number - Soil:	13-09344 (surface)
			13-09345 (depth)
Sample containers:	1 L Amber glass	Sample containers:	240 mL glass jar
3x 40 mL vials	2x 250 mL glass		120 mL glass jar
	2x 120 mL plastic		60 mL glass jar
Procedure/Equipment:	Watera tubing, interface meter	Procedure/Equipment:	Disposable scoop, pickaxe, shovel
Water description:	Transparent with some light brown sediment	Soil description:	Light brown, sandy loam.
Filtration: (Y/N)	N		
Acidification: (Y/N)	N		
Sampling Equipment Decontamination: (Y/N)	Y	Sampling Equipment Decontamination: (Y/N)	Y
Number washes:	1	Number washes:	0
Number rinses:	1	Number rinses:	1

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Table B-18: Monitoring Well Sampling Log — MW-04, 2013

Site Name:	PIN-4					
Date of Sampling Event:	13-Aug-13					
Names of Samplers:	Kathryn Eagles, Jeff Donald, Mike Musclow					
Monitoring Well ID:	MW-04					
Facility:	Tier II Disposal Facility					
Water Sample Measured Data						
Condition of Well:	Good					
Procedure/Equipment:	Interface meter			Procedure/Equipment:	Interface meter	
Well height above ground (m)=	0.59			Depth to water surface (m)=	1.17	
Diameter of well (m)=	0.05			Static water level* (m)=	0.58	
Depth of installation* (m)=	4.5			Depth to bottom (m)=	2.35	
Length screened section (m)=	3.0			Free product thickness (mm)=	0	
Depth to top of screen* (m)=	0.5					
Calculations				**Notes**		
Depth of water (m)=	1.18			Evidence of sludge etc:	no	
Well volume of water (L)=	2.3			Evidence of freezing/siltation: (compare to installation record)	yes, freezing	
Length screen collecting water (m)=	1.18					
Development/Purging Information						
Equipment:	Interface meter, watera tubing					
Date & Time	Volume Removed (L)	Temperature (^{o}C)	pH	Conductivity (uS/cm)	Turbidity (NTU)	Description of water
Aug 13, 1651h	0.8	5.8	7.49	19330	463	transparent, light brown/orange
Aug 13, 1702h	0.8	9.9	7.54	17400	547	transparent, light brown/orange
Water Sampling				**Soil Sampling**		
Date and time collected:	13-Aug-13, 1703h			Date and time collected:	8/13/2013	
Sample Number - Water:	13-09333			Sample Number - Soil:	13-09346 (surface)	
					13-09347/48 (depth)	
Sample containers:	1 L Amber glass			Sample containers:	240 mL glass jar	
3x 40 mL vials	2x 250 mL glass				120 mL glass jar	
	2x 120 mL plastic				60 mL glass jar	
Procedure/Equipment:	Watera tubing, interface meter			Procedure/Equipment:	Disposable scoop, pickaxe, shovel	
Water description:	transparent, light brown/orange			Soil description:	Light brown medium grained sandy loam.	
Filtration: (Y/N)	N					
Acidification: (Y/N)	N					
Sampling Equipment Decontamination: (Y/N)	Y			Sampling Equipment Decontamination: (Y/N)	Y	
Number washes:	1			Number washes:	0	
Number rinses:	1			Number rinses:	1	

n/a=not applicable

*From ground surface. Unless this is stated, all measurements are assumed to be from the top of the casing

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: AUG. 13, 2013
Prepared By: BEN REICH	

Thermistor Information

Site Name: PIN-4	Thermistor Location: TIER II		
Thermistor Number: UT-1	Inclination ~5° ? 2-5°?		
Install Date: AUG. 13, 2012	First Date Event AUG. 1, 2012	Last Date Event AUG. 13, 2013	
Coordinates and Elevation	N 7627991	E 457 6440	Elev —
Length of Cable (m) 2.	Cable Lead Above Ground (m) ~1.9m ABOVE CASING	Nodal Points 13	
Datalogger Serial # 12030012		Cable Serial Number TS07060012 (UT-4) ?	

CASING ~0.45 M ABOVE GROUND

Thermistor Inspection

	Good	Needs Maintenance
Casing	? ✓ (CAN'T SEE TOP)	?
Cover	? ✓	?
Data Logger	? ✓	?
Cable	? ✓	?
Beads	? ✓ ?	?
Battery Installation Date		
Battery Levels	Main 11.34 V	Aux ~~13.38 V~~ 13.50 V

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	11.077	
2	14.002	
3	16.197	
4	17.008	
5	18.258	
6	19.15	
7	20.08	
8	20.95	

Bead	ohms	Degrees C
9	21.68	
10	22.33	
11	22.86	
12	23.43	
13	23.92	
14	N/A	
15	N/A	
16	N/A	

Observations and Proposed Maintenance

THE CABLE IS LABELLED UT-4
DATA LOGGER LABELLED UT-1

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: AUG. 13, 2013
Prepared By: BEN RYLICH	

Thermistor Information

BATT EXP. 14/08M

Site Name:	DIN-4	Thermistor Location	TIER II		
Thermistor Number:	VT-2	Inclination	VERTICAL		
Install Date:	~~EXP DATE~~	First Date Event	AUG. 1, 2012	Last Date Event	AUG. 13, 2013
Coordinates and Elevation	N 7627965	E 0576436	Elev	—	
Length of Cable (m)	3	Cable Lead Above Ground (m)	3.05m	Nodal Points	13
Datalogger Serial #	~~07~~ 07060012			Cable Serial Number	TS07060014 (VT-2)

CASING ~0.65m ABOVE GROUND / ABOVE CASING

Thermistor Inspection

	Good	Needs Maintenance
Casing	(?) ✓ (CAN SEE TOP)	?
Cover	? ✓	?
Data Logger	? ✓	?
Cable	? ✓	?
Beads	(?) ✓	?
Battery Installation Date	?	
Battery Levels	Main 11.34V	Aux 13.38

Manual Ground Temperature Readings

Bead	Kohms	Degrees C
1	7.881	
2	8.272	
3	9.049	
4	11.006	
5	13.317	
6	15.294	
7	16.608	
8	17.753	

Bead	ohms	Degrees C
9	18.859	
10	19.618	
11	20.30	
12	20.93	
13	21.79	
14	N/A	
15	N/A	
16	N/A	

Observations and Proposed Maintenance

GOOD SHAPE!

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: AUG. 13, 2013
Prepared By: BEN REICH	

Thermistor Information

Site Name: PIN-4	Thermistor Location TIER II		
Thermistor Number: VT-3	Inclination VERTICAL		
Install Date: ?	First Date Event AUG. 1 2012	Last Date Event AUG. 13, 2013	
Coordinates and Elevation N 7627956	E 0576396	Elev ?	
Length of Cable (m) ?	Cable Lead Above Ground (m) 3.3m	Nodal Points 13	
Datalogger Serial # 07040011		Cable Serial Number TS07260021 (VT-3)	

CASING ~0.45m ABOVE GROUND — ABOVE CASING

Thermistor Inspection

	Good	Needs Maintenance
Casing	(?) ✓ CAN SEE TOP	?
Cover	? ✓	?
Data Logger	? ✓	?
Cable	?	?
Beads	(?) ✓ 1 EXPOSED ~0.25m CASING ABOVE	?
Battery Installation Date	(EXP DATE 14/08/14)	
Battery Levels	Main 11.34 ✓	Aux 13.38 ✓

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	7.108	
2	7.373	
3	8.338	
4	9.499	
5	11.935	
6	14.061	
7	15.717	
8	17.043	

Bead	ohms	Degrees C
9	18.116	
10	19.046	
11	19.660	
12	20.15	
13	20.83	

Observations and Proposed Maintenance

GOOD SHAPE !

Thermistor Annual Maintenance Report

Contractor Name:	Inspection Date: AUG 13, 2013
Prepared By: BEN REICH	

Thermistor Information

Site Name: PIN-4	Thermistor Location TIER 2		
Thermistor Number: NT-4	Inclination VERTICAL		
Install Date:	First Date Event AUG. 1, 2012	Last Date Event AUG. 13, 2013	
Coordinates and Elevation	N 7627923	E 0576400	Elev —
Length of Cable (m) 7	Cable Lead Above Ground (m) 3.95	Nodal Points	
Datalogger Serial # 07060014		Cable Serial Number TS0704001	(NT-1)?

↳ ABOVE CASING
CASING ~ 0.4m ABOVE GROUND

Thermistor Inspection

	Good	Needs Maintenance
Casing	(?) ✓ CAN SEE TOP	?
Cover	? ✓	?
Data Logger	? ✓	?
Cable	? ✓	?
Beads	(?) ✓	?
Battery Installation Date	EXP DATE 14/08 M	
Battery Levels	Main 11.34V	Aux 13.38V

Manual Ground Temperature Readings

Bead	Kohms	Degrees C
1	7.492	
2	8.219	
3	9.288	
4	12.168	
5	14.162	
6	16.289	
7	17.260	
8	~~48.249~~	18.247

Bead	ohms	Degrees C
9	~~19.965~~	18.968
10	19.816	
11	20.32	
12	20.97	
13	21.26	
14	21.86	
15	22.02	
16	22.06	

Observations and Proposed Maintenance

LOGGER IS LABELED NT-4
CABLE IS LABELED NT-1

Tier II Disposal Facility – Evaluation of Ground Temperature Data

Ground temperature profiles for the vertical thermistors are attached, showing ground temperature curves since August 2013. The table shows the depth of the active layer as defined by the 0°C isotherm for August 13, 2013.

Summary of Tier II Disposal Facility Thermal Results				
	VT-1	**VT-2**	**VT-3**	**VT-4**
Depth (m) of 0°C Isotherm (August 13/12)	-2.01	-2.52	-2.21	-1.78

The inferred active layer depth noted above is less than the thickness of the 3.8 m granular cover over the Tier II soil; the landfill contents are frozen. The ground temperatures are likely warmer and active layers deeper than the long term condition and ground temperatures are expected to cool over the next several years (EBA 2013).

Annex 7 Airstrip Landfill – Year 1 Data

Figures:

- PIN-4.8: Site Plan – Airstrip Landfill

Tables:

- Landfill Visual Inspection – Airstrip Landfill
- Airstrip Landfill – Evaluation of Year 1 Soil Data
- Airstrip Landfill – Year 1 (2013) Soil Data

Photographic Records:

- Photos 79 and 80
- Photos 81 and 82
- Photos 83 and 84
- Photos 85 and 86
- Photos 87 and 88
- Photo 89

GENERAL NOTES:

1. ALL COORDINATES ARE REFERENCED TO NAD83 (CSRS), UTM ZONE 12N. ALL ELEVATIONS REFER TO GEODETIC DATUM.
2. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

LEGEND:

- BM-5 — PERMANENT BENCHMARK LOCATION (1)
- 701 — COORDINATE POINT
- ■ — MONITORING SOIL SAMPLE LOCATION (3)
- MONITORING SITE FEATURE
- 79 — APPROX. PHOTOGRAPHIC VIEWPOINT
- 13-09359 — 2013 SOIL SAMPLE TAG LOCATION

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-5	7 627 986.564	576 909.188	87.778	25mm DIA. STEEL PIPE

AIRSTRIP LANDFILL (LOBE B) REGRADED (AS-BUILT)			
NO.	UTM COORDINATES		ELEV.
	NORTHING	EASTING	
701	7 627 929.2	576 921.9	87.0
702	7 627 923.9	576 935.4	87.0
703	7 627 908.2	576 953.6	86.9
704	7 627 895.4	576 946.2	86.6
705	7 627 897.5	576 935.3	86.6
706	7 627 905.2	576 916.3	86.5
707	7 627 912.2	576 916.8	86.7

RECORD DRAWING
NOT FOR CONSTRUCTION

0 7.5 15 m SCALE 1:750

DEW LINE CLEAN UP
LANDFILL MONITORING PLAN

PIN-4 BYRON BAY

AIRSTRIP LANDFILL LOBE B

FIGURE PIN-4.8

AECOM

DEW Line Cleanup: Post-Construction - Landfill Monitoring
Visual Inspection Checklist and Preliminary Stability Assessment

Site Name:	**PIN-4 Byron Bay**
Landfill Designation:	**Airstrip Landfill Lobe B**
Date of Inspection:	**15-Aug-13**
Inspected By:	**Benjamin Reich**
Report Prepared By:	**Benjamin Reich**
Report Reviewed By:	**Roland Merkosky**
The inspector/reporter represents to the best of their knowledge, the following statement and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.	
Signature:	Ben Reich

Checklist Item	Present Yes/No	Location (Describe relative to existing monuments/features and relative to landfill design i.e. surface, berms, toe)	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records Focal length, location, view point & direction (relative to true north) Feature of note Scale	Additional Comments	Frequency Observed	Severity Rating
Settlement	No									None	
Erosion	No									None	
Frost Action	No									None	
Sloughing and Cracking	Yes	Two minor tension cracks on east side of landfill and one crack on top due to drying / shrinkage of material.	Up to approximately 2 m.	Approximately 3 mm.		Much less than 1%.	See photographs.	Pictures P8150209 and P8150227		Isolated	Acceptable
Animal Burrows	No									None	
Vegetation	Yes	Occasional individual pieces of vegetation were found within the boundaries of the landfill.	Up to 0.2 m.	Up to 0.2 m.	Up to 700 mm tall.	Much less than 1%.	See photographs.	Pictures P8150223, P8150225, and P8150226		Occasional	
Staining	No									None	
Vegetation Stress	No									None	
Seepage Points	No									None	
Debris Exposed	Yes	Occasional debris was observed in the vicinity of the landfill.				Much less than 1%.	Pieces of metal. The observed debris did not originate from within the landfill. See photographs.	Pictures P8150205 and P8150228		Occasional	Acceptable
Presence/Condition - Monitoring Instruments	No									None	
Features of Note	Yes	Several ruts / depressions were observed on the surface of the landfill, likely resulting from construction activities.	Up to 1.6 m.	Up to 0.8 m.	Up to 175 mm.	Much less than 1%.	See photographs.	Pictures P8150222 and P8150224		Occasional	Acceptable
	Yes	Isolated area contains more fine material than surrounding area.	Approximately 4 m.	Approximately 2 m.		Less than 1%.	See photograph.	Picture P8150227		Isolated	Acceptable
Landfill Performance											Acceptable

AIRSTRIP LANDFILL LOBE B - EVALUATION OF YEAR 1 SOIL ANALYTICAL DATA

Parameter	N value Baseline	Arithmetic Mean +/- 95% Confidence Limit Baseline	Baseline Maximum [mg/kg]	2013	Comments
Copper	34	23.9 +/- 2.1	40	All concentrations within 95% confidence limit.	
Nickel	34	12.9 +/- 1.2	23	All concentrations within 95% confidence limit, with one exception.	The depth sample at P4-24 had a concentration of 14.9 mg/kg. All results were below the baseline maximum.
Cobalt	34	5.5 +/- 0.7	10	All concentrations within 95% confidence limit, with two exceptions.	The surface and depth samples at P4-24 had concentrations of 7.5 and 6.4 mg/kg, respectively. All results were below the baseline maximum.
Cadmium	34	<1.0	<1.0	Concentrations consistent with baseline mean (non-detect).	
Lead	34	<10	17	Concentrations consistent with baseline mean (non-detect).	
Zinc	34	22 +/- 3.8	61	All concentrations within 95% confidence limit, with one exception.	The surface sample at P4-22 had a concentration of 32 mg/kg. All results were below the baseline maximum.
Chromium	34	<20	31	Concentrations consistent with baseline mean (non-detect).	
Arsenic	34	1.6 +/- 0.3	3.9	All concentrations below the 95% confidence limit, with one exception.	The depth sample at P4-22 had a concentration of 2.7 mg/kg. All results were below the baseline maximum.
Mercury	12	<0.050	0.065	Concentrations consistent with baseline mean (non-detect), with one exception.	The surface sample at P4-22 had a concentration of 0.079 mg/kg. The result exceeded the baseline maximum.
PCBs	35	<0.1	<0.1	Concentrations consistent with baseline mean (non-detect).	
TPH	13	<40	85	All concentrations below the 95% confidence limit, with one exception.	The surface sample at P4-22 had a concentration of 148 mg/kg. The result exceeded the the baseline maximum.

Airstrip Landfill Lobe B - Year 1 (2013) Soil Data

Sample #	Surface/ Reference Tag #	Location	Date	Depth (cm)	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	TPH [mg/kg]	TPH Identity		
																F1	F2	F3
Airstrip Landfill Lobe B - Baseline Concentrations					**23.9 +/- 2.1**	**12.9 +/- 1.2**	**5.5 +/- 0.7**	**<1.0**	**<10**	**22 +/- 3.8**	**<20**	**1.6 +/- 0.3**	**<0.050**	**<0.1**	**<40**			
Airstrip Landfill Lobe B - Maximum Concentrations					**40**	**23**	**10**	**<1.0**	**17**	**61**	**31**	**3.9**	**0.065**	**<0.1**	**85**			
Upgradient Soil Samples																		
13-09359*		P4-22	2013	0-10	21.9	6.5	3.1	<0.50	3.8	32	8	1.4	0.079	<0.020	148	<5.0	<10	140
13-09360*/61*		P4-22	2013	30-40	16.1	8.1	4.6	<0.50	4.7	17	11	2.7	0.029	<0.020	<50	<5.0	<10	<50
Downgradient Soil Samples																		
13-09362*		P4-23	2013	0-10	19.0	11.4	5.2	<0.50	4.5	16	15	1.4	<0.010	<0.020	<50	<5.0	<10	<50
13-09363*		P4-23	2013	30-40	20.9	12.2	5.2	<0.50	4.4	17	15	1.3	<0.010	<0.020	<50	<5.0	<10	<50
13-09364*		P4-24	2013	0-10	20.7	14.1	7.5	<0.50	3.9	21	17	1.7	<0.010	<0.020	<50	<5.0	<10	<50
13-09365*		P4-24	2013	30-40	22.0	14.9	6.4	<0.50	3.7	22	15	1.5	<0.010	<0.020	<50	<5.0	<10	<50

Photograph 79. Airstrip Landfill Lobe B – overall picture of landfill. Picture P8150229 ↑

Photograph 80. Airstrip Landfill Lobe B – south side of landfill. Picture P8150201 ↑

Photograph 81. Airstrip Landfill Lobe B – west side of landfill. Picture P8150203 ↑

Photograph 82. Airstrip Landfill Lobe B – north side of landfill. Picture P8150204 ↑

Photograph 83. Airstrip Landfill Lobe B – east side of landfill. Picture P8150208 ↑

Photograph 84. Airstrip Landfill Lobe B – area of fine material on top of landfill. Picture P8150227 ↑

Photograph 85. Airstrip Landfill Lobe B – metal debris located near landfill. Picture P8150205

Photograph 86. Airstrip Landfill Lobe B – low spot from construction activities on landfill. Picture P8150222

Photograph 87. Airstrip Landfill Lobe B – tension crack on east side of landfill. Picture P8150209 ↑

Photograph 88. Airstrip Landfill Lobe B – vegetation on top of landfill. Picture P8150223 ↑

Photograph 89. Airstrip Landfill Lobe B – top of landfill. Picture P8150213 – P8150215 ➔

Appendix B

Laboratory Analytical Results (on DVD)

Appendix C

Field Notes (on DVD)

Appendix D

Photographs (on DVD)