

- TEMPORARY BENCHMARK
- PERMANENT BENCHMARK
- MONITORING WELL
- LOCATION
- VERTICAL THERMISTOR
- COORDINATE POINT
- MONITORING SOIL SAMPLE
- LOCATION

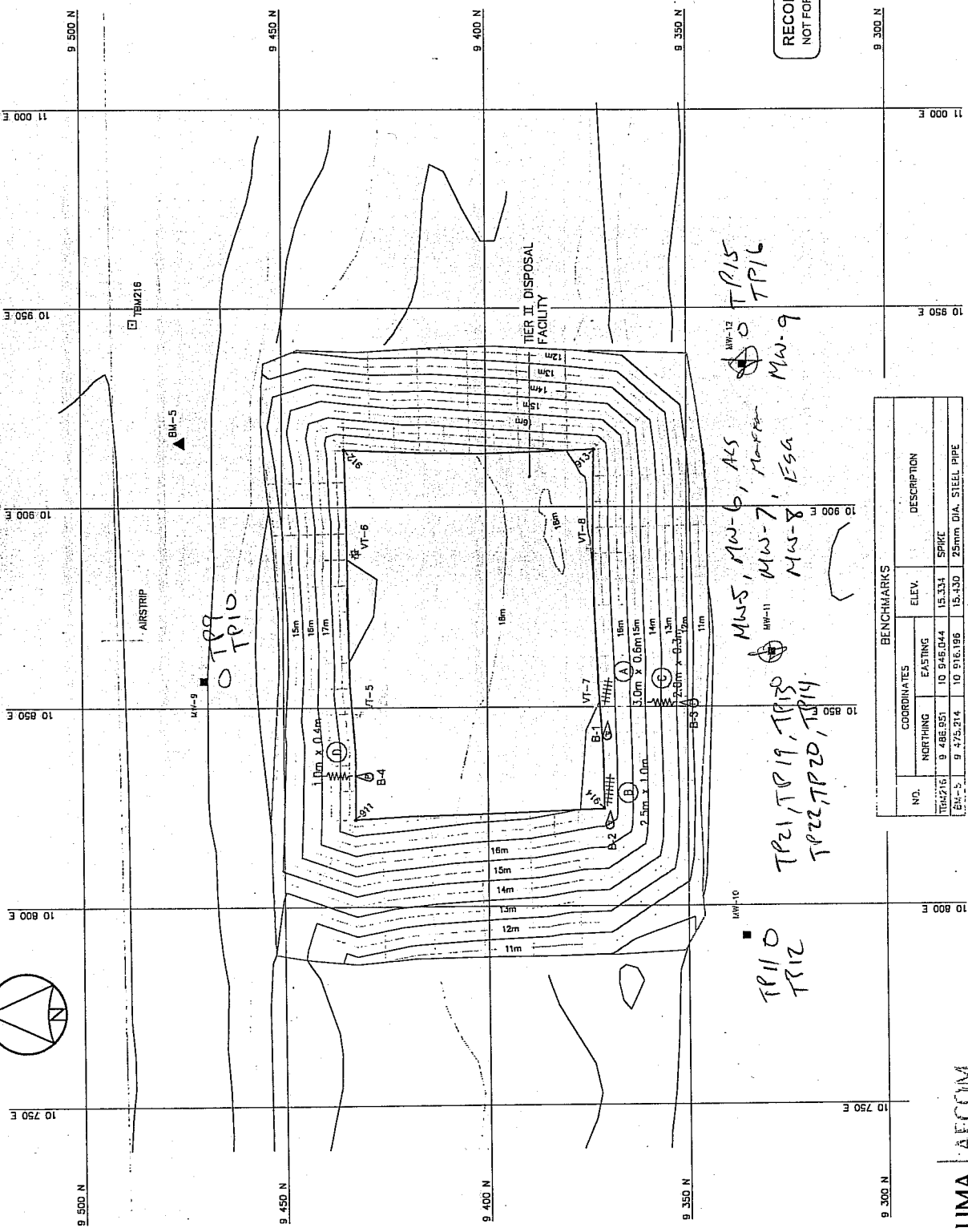
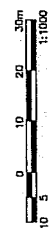
- PHOTOGRAPH REFERENCE
- SETTLEMENT (NTS)
- EROSION (NTS)
- PONDING
- OBSERVATION OF CHECKLIST ITEM

COORDINATE POINTS (AS-BUILT) FINAL LANDFILL SURFACE			
NO.	NORTHING	EASTING	ELEV.
911	9 432.2	10 822.0	18.34
912	9 434.4	10 914.4	18.49
913	9 373.5	10 914.5	17.33
914	9 371.3	10 824.3	17.34

MONITORING WELLS			
NO.	NORTHING	EASTING	ELEV.
MW-9	9 470.139	10 860.245	15.26
MW-10	9 335.781	10 794.677	10.88
MW-11	9 329.010	10 566.508	10.65
MW-12	9 335.353	10 936.239	10.96

THERMISTORS			
NO.	NORTHING	EASTING	ELEV.
VT-5	9 430.805	10 848.417	19.62
VT-6	9 431.639	10 856.360	18.59
VT-7	9 373.743	10 849.853	17.50
VT-8	9 374.576	10 860.744	17.52

RECORD DRAWING
NOT FOR CONSTRUCTION



BENCHMARKS			
NO.	COORDINATES		DESCRIPTION
	NORTHING	EASTING	
TM216	9 488.951	10 946.044	SPIKE
BM-5	9 475.914	10 916.196	25mm DIA. STEEL PIPE

UMA AECOM

Tier II Disposal Facility

Thermal Monitoring Ground Temperature Annual Maintenance Report

Contractor Name: <u>GLL</u>	Inspection Date: <u>Aug 16</u>
Prepared By: <u>Dennis Lu</u>	

Thermistor Information

Site Name: PIN-3	Thermistor Location: Tier II Disposal Facility
Thermistor Number: VT5	Inclination: Vertical
Install Date: 9-Sep-03	First Date Event: 23-Aug-05 Last Date Event: 23-Aug-05
Coordinates and Elevation: N 9430.72 E 10848.42	Elev: 18.5
Length of Cable (m): 11.5	Cable Lead Above Ground (m): 0 Nodal Points: 16
Datalogger Serial #: 108066	Cable Serial Number: 1611

Code PIN-3VT5

Thermistor Inspection

	Good	Needs Maintenance
Casing	☒	☐
Cover	☒	☐
Data Logger	☒	☐
Cable	☒	☐
Beads	☒	☒ <u>10 + 16</u>
Battery Installation Date	<u>Aug 16, 2006</u>	
Battery Levels	Main <u>11.34</u>	Aux <u>12.65</u>

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	5,335	18.36
2	5,892	18.19
3	5,901	18.74
4	8,931	11.07
5	10,29	7.30
6	11,76	6.60
7	13,84	3.31
8	17,04	-0.82

Bead	ohms	Degrees C
9	17.85	-1.70
10	4.1 ?	89.54
11	19.54	-3.42
12	20.17	-4.02
13	20.84	-4.61
14	21.54	-5.25
15	22.49	-6.05
16	23.50	-

Observations and Proposed Maintenance

39% Humidity
key hard to insert

Thermal Monitoring Ground Temperature Annual Maintenance Report

Contractor Name:	Inspection Date:
Prepared By:	

Thermistor Information

Site Name: PIN-3	Thermistor Location: Tier II Disposal Facility
Thermistor Number: VT6	Inclination: Vertical
Install Date: 8-Sep-03	First Date Event: 23-Aug-05 Last Date Event: 23-Aug-05
Coordinates and Elevation: N 9431.74 E 10888.36	Elev: 18.5
Length of Cable (m): 11.5	Cable Lead Above Ground (m): 4.5 Nodal Points: 16
Datalogger Serial #: 111096	Cable Serial Number: 1612

Code PIN-3VT6

Thermistor Inspection

	Good	Needs Maintenance
Casing	☒	☐
Cover	☒	☐
Data Logger	☒	☐
Cable	☒	☐
Beads	☒	☒ 16 ? No reading
Battery Installation Date	Aug 16, 2006	
Battery Levels	Main 11.34	Aux 13.02

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	5,408	17.451
2	5,983	17.53
3	5,756	17.90
4	8,310	11.66
5	10,48	8.89
6	12.21	5.90
7	15.13	1.58
8	17.26	-1.00

Bead	ohms	Degrees C
9	17.88	-1.70
10	18.61	-2.48
11	19.42	-3.27
12	20.22	-4.04
13	20.90	-4.67
14	21.52	-5.23
15	22.62	-6.15
16	23.41	—

Observations and Proposed Maintenance

398 Missing
key hard to insert

Thermal Monitoring Ground Temperature Annual Maintenance Report

Contractor Name: <u>GLL</u>	Inspection Date: <u>Aug 16</u>
Prepared By: <u>Dennis Lu</u>	

Thermistor Information

Site Name: PIN-3	Thermistor Location	Tier II Disposal Facility
Thermistor Number: VT7	Inclination	Vertical
Install Date: 10-Sep-03	First Date Event	23-Aug-05 Last Date Event 23-Aug-05
Coordinates and Elevation N 9373.65	E 10849.85	Elev 17.4
Length of Cable (m) 10.5	Cable Lead Above Ground (m) 0	Nodal Points 16
Datalogger Serial # 111099	Cable Serial Number 1613	

Code PIN-3VT7

Thermistor Inspection

	Good	Needs Maintenance
Casing	☒	☐
Cover	☒	☐
Data Logger	☒	☐
Cable	☒	☐
Beads	☐	☒ <u>16 not ready</u>
Battery Installation Date	<u>Aug 16, 2006</u>	
Battery Levels	Main <u>11.34</u>	Aux <u>13.14</u>

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	5.548	19.01
2	7.324	13.27
3	9.917	9.91
4	11.57	6.91
5	13.57	3.65
6	16.75	-0.39
7	17.34	-1.08
8	17.99	-1.80

Bead	ohms	Degrees C
9	18.81	-2.66
10	19.56	-3.41
11	20.24	-4.06
12	20.89	-4.67
13	21.48	-5.19
14	22.02	-5.62
15	22.44	-5.98
16	22.59	—

Observations and Proposed Maintenance

39% running
key hard to insert

Thermal Monitoring Ground Temperature Annual Maintenance Report

Contractor Name: <u>GLL</u>	Inspection Date: <u>Aug 16</u>
Prepared By: <u>Dennis Lu</u>	

Thermistor Information

Site Name: PIN-3	Thermistor Location: Tier II Disposal Facility
Thermistor Number: VT8	Inclination: Vertical
Install Date: 9-Sep-03	First Date Event: 23-Aug-05 Last Date Event: 23-Aug-05
Coordinates and Elevation: N 9374.48 E 10889.74	Elev: 17.4
Length of Cable (m): 10.5	Cable Lead Above Ground (m): 3.5 Nodal Points: 16
Datalogger Serial #: 111091	Cable Serial Number: 1614

Code PIN-3VT8

Thermistor Inspection

	Good	Needs Maintenance
Casing	☒	☐
Cover	☒	☐
Data Logger	☒	☒ <u>5</u>
Cable	☒	☐ <u>2</u>
Beads	☒	☒ <u>16 not reading</u>
Battery Installation Date	<u>Aug 16</u>	
Battery Levels	Main <u>11.34</u>	Aux <u>12.65</u>

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	5.644	19.36
2	7.573	13.33
3	9.82	10.15
4	11.22	7.51
5	13.26	3.99
6	16.54	-0.26
7	17.36	-1.16
8	18.06	-1.93

Bead	ohms	Degrees C
9	17.80	-2.64
10	19.55	-3.35
11	20.28	-4.09
12	21.06	-4.80
13	21.68	-5.35
14	22.13	-5.70
15	22.55	-6.05
16	22.93	

Observations and Proposed Maintenance

16 gives temp but data logger does not read

Table 7: Monitoring Well Observations (MW-09)

Development of Monitoring Wells (2005)			
Site Name:	PIN-3-mon		
Date of Sampling Event:	Aug 17	Time: 8:00 am	8:30
Names of Samplers:			
Monitoring Well ID:	MW-09		
Landfill Name:	Tier II Disposal		
Sample Number:			
Condition of Well:	good		
Purging: (Y/N)	N	Procedure/Equipment:	
Volume Purged Water=			
Sampling Equipment:			
Filtration: (Y/N)	N		
Acidification: (Y/N)	N		
Decontamination required: (Y/N)	Y		
Number washes:			
Number rinses:			
Measured Data			
Well height above ground=	42		
Diameter of well (cm)=	2"		
Depth of installation (cm)=		From ground surface	
Length screened section (cm)=			
Depth to top of screen=		From ground surface	
Depth to water surface (cm)=		Method:	Interface probe
Static water level (cm)=		From ground surface	
Depth to bottom (cm)=	197	Evidence of sludge etc:	
		Evidence of freezing/siltation: (compare to installation record)	
Free product thickness (mm)=	/	Method:	Interface probe
pH=	/		
Conductivity (uS/cm)=	/		
Temperature (degC)=	/		
Depth of water (cm)=	/		
Well volume of water (mL)=	/		
Turbidity (NTU)=	not available		
Length screen collecting water=			
Shape factor=	/		

n/a=not applicable

well dry @ 197 bottom evidence of ice
bentonite

Table 7: Monitoring Well Observations (MW-10)

Development of Monitoring Wells (2005)			
Site Name:	PIN-3-mon		
Date of Sampling Event:	Aug 17	Time: 9:00 am	
Names of Samplers:			
Monitoring Well ID:	MW-10		
Landfill Name:	Tier II Disposal		
Sample Number:			
Condition of Well:			
Purging: (Y/N)	N	Procedure/Equipment:	
Volume Purged Water=			
Sampling Equipment:			
Filtration: (Y/N)	N		
Acidification: (Y/N)	N		
Decontamination required: (Y/N)	Y		
Number washes:			
Number rinses:			
Measured Data			
Well height above ground=	65	65	
Diameter of well (cm)=			
Depth of installation (cm)=	460	From ground surface	
Length screened section (cm)=	299		
Depth to top of screen=	50	From ground surface	
Depth to water surface (cm)=		Method:	Interface probe
Static water level (cm)=		From ground surface	
Depth to bottom (cm)=	114	Evidence of sludge etc:	
		Evidence of freezing/siltation: (compare to installation record)	
Free product thickness (mm)=		Method:	Interface probe
pH=			
Conductivity (uS/cm)=			
Temperature (degC)=			
Depth of water (cm)=			
Well volume of water (mL)=			
Turbidity (NTU)=	not available		
Length screen collecting water=	0		
Shape factor=	#NUM!		

n/a=not applicable

114 Bottom - packed sand (filter)

Bentonite heavily around stickup

Table 7: Monitoring Well Observations (MW-11)

Development of Monitoring Wells (2005)			
Site Name:	PIN-3-mon		
Date of Sampling Event:	Aug 17	Time: 9:00 am	
Names of Samplers:			
Monitoring Well ID:	MW-11		
Landfill Name:	Tier II Disposal		
Sample Number:	MW-11 MW-5		
Condition of Well:			
Purging: (Y/N)	Y	Procedure/Equipment:	
Volume Purged Water=	4.5 L		
Sampling Equipment:			
Filtration: (Y/N)	N		
Acidification: (Y/N)	N		
Decontamination required: (Y/N)	Y		
Number washes:			
Number rinses:			
Measured Data			
Well height above ground=	41	33 + 10 cm round	
Diameter of well (cm)=			
Depth of installation (cm)=	483	From ground surface	
Length screened section (cm)=	300		
Depth to top of screen=	74	From ground surface	
Depth to water surface (cm)=	142	Method:	Interface probe
Static water level (cm)=		From ground surface	
Depth to bottom (cm)=	200	Evidence of sludge etc:	
		Evidence of freezing/siltation: (compare to installation record)	
Free product thickness (mm)=		Method:	Interface probe
pH=	8.05		
Conductivity (uS/cm)=	2340		
Temperature (degC)=	5.4		
Depth of water (cm)=	58		
Well volume of water (mL)=	12 L		
Turbidity (NTU)=	not available		
Length screen collecting water=	0		
Shape factor=	#NUM!		

n/a=not applicable

MW-6 ALS Dup
 MW-7 Maxxam Dup
 MW-8 ESG Dup

TP A, TP 20 Maxxam Dup
 TP 20, TP 21 ESG Dup

Table 7: Monitoring Well Observations (MW-12)

Development of Monitoring Wells (2005)			
Site Name:	PIN-3-mon		
Date of Sampling Event:	Aug 17	Time: 9:00 am	
Names of Samplers:	JP + DK		
Monitoring Well ID:	MW-12		
Landfill Name:	Tier II Disposal		
Sample Number:	M43-9		
Condition of Well:			
Purging: (Y/N)		Procedure/Equipment:	
Volume Purged Water=	6 L		
Sampling Equipment:			
Filtration: (Y/N)	N		
Acidification: (Y/N)	N		
Decontamination required: (Y/N)	Y		
Number washes:			
Number rinses:	2		
Measured Data			
Well height above ground=	63		
Diameter of well (cm)=			
Depth of installation (cm)=	470	From ground surface	
Length screened section (cm)=	300		
Depth to top of screen=	56	From ground surface	
Depth to water surface (cm)=	139	Method:	Interface probe
Static water level (cm)=		From ground surface	
Depth to bottom (cm)=	224	Evidence of sludge etc:	
		Evidence of freezing/siltation: (compare to installation record)	
Free product thickness (mm)=		Method:	Interface probe
pH=	7.55		
Conductivity (uS/cm)=	2506		
Temperature (degC)=	8.3		
Depth of water (cm)=			
Well volume of water (mL)=			
Turbidity (NTU)=	not available		
Length screen collecting water=	0		
Shape factor=	#NUM!		

n/a=not applicable

TP 15 + TP 16

Aug 17

P.W. 3 Hawthorn

P.W. 3 Hawthorn

MW-9 = dry @ 197

TP9 = 0-15

TP10 = 40-50 cm

0-50 cm - gravel with sand
matrix → fill from workshop

MW-10 = dry @ 114

TP11 = 0-150

TP12 = 40-50

0-10 - dark brown organics, grass roots

10-50 - red sand, light brown zone

rocks

MW-11 = MW5 → MW6, MW7, MW8
ALS, Maxon, EACG

TP12 0-15 TP17, TP20

TP13 40-50 TP21, TP22

Maxon EACG

0-10 cm dark brown organics with roots

0-50 medium sand with cobbles

MW12 (MW-9)

TP15 0-15

TP16 40-50

0-10 cm dark brown organics with

roots willow/grass

10-50 gravel (rounded) with medium

grain sand red in bottom

3 shot panoramic
 NHWL-12 408862/7597571
 looking NW from SE corner

sta-0132

to sta-0134

end of inspection for the day - East
 slope in complete shadow - take photos
 in the morning

Photos 135 to 138 Old radar balls viewed from camp

Sunny 6°C 8am

Aug 17th

Back @ NHWL

NHWL-13 408872/7597561 looking N
 from SE corner (Dennis for scale)

img-0139

NHWL-14 408864/7597572 looking
 N

img-0140

NHWL-15 408868/7597600 looking N
 to camp

img-0141

NHWL-16 408872/7597615 organics
 along toe NE edge of landfill between
 slope and road -> dump but no noticeable
 seepage baseball cap for scale

img-0142

Aug 17/2006 15

8:30am TIER II Site

- starting in gravel walk over
- slopes have been tracted perpendicular to
 crest -> increasing potential for channelized flow
- no obvious erosion, but numerous deep track
 marks
- surface is rough and undulating
- some deep ruts along crest - SW corner
 and near VT-7
- > ruts make it difficult to observe changes
- noticeable depression along crest just East of VT-6
- > appears related to repeated traffic

T2-1 409614/7597447 looking 230°
 to NE corner panoramic East N slopes
 sta-0143 to sta-0146 L to R

T2-2 SW corner crest 409476/7597353
 Area of depression - no signs of recent
 movement -> construction remnant?

(img-0148 deleted)

T2-3 409478/7597351 looking East
 to VT-7

img-0149

T2-4 Rattings @ VT-7 409503/7597350

img-0150

Aug 17

T2-5 409511/7597351 looking E
img-0151 along crest

T2-6 409539/7597351 looking E
img-0152 along crest

T2-7 409571/7597349 looking N
img-0153 from SE corner along crest

T2-8 409567/7597371 looking N
img-0154 along crest

T2-9 409574/7597390 looking S
img-0155 area of rutting (not nec. problematic)

T2-10 409572/7597407 looking W
img-0156 along crest to VT
- depression adjacent to

T2-11 409548/7597402 looking 60° ish
img-0157 depression near VT-6 on north face

photo deleted

Aug 17

T2-12 409543/7597413 looking W
img-0159 to VT-5 - depression on north
slope adjacent to VT-5

T2-13 409521/7597410 looking W
img-0160 - depression adjacent to VT-5

T2-14 409472/7597403 looking S
img-0161 along crest from NW corner

T2-15 409477/7597385 looking S to
img-0162 SW corner

T2-16 Panoramic 409481/7597353 looking
sta-0163 NE 4 shots
to sta-0166

T2-17 SW corner toe 409441/7597324
img-0167 looking ENE entire S slope

T2-18 409453/7597333 looking E along toe
img-0168 ground piled heavily and matted w. organic along
toe but no signs of seepage

T2-19ST 409514/7597327 looking E
sta-0169
sta-0170

60725

Aug 17/2006

T2-20 409528/7597337 looking S
from mid slope → trenched - dry
img-0171 MW-11 in background

T2-21st 409571/7597344 looking WSW
sta-0172 - south slope of landfill view of
sta-0173 from SE corner near crest

T2-22st 409590/7597324 looking NNE
entire eastern slope
sta-0174
sta-0175

T2-23 409539/7597323 looking W
along toe/organic interface south toe
img-0176

T2-24 409570/7597430 looking W
img-0177 along toe of north slope

T2-25 409520/7597430 looking W
img-0178 - north slope toe

T2-26 409456/7597444 looks S
entire west slope view from NW of landfill
img-0179

T2-27 409452/7597368 looking S
img-0180 to SW corner from toe slope

T2-28 409445/7597366 looking SSW
img-0181 ponded water adjacent to western toe

T2-29st Five photo panorama W to S (R to L)
sta-0183 409559 7597404 (NE corner)
sta-0187

DONE - back to camp and on to
NWS landfill

11:45am arrive NWS landfill - taking
a quick inventory area perimeter prior to
starting photographs

- There are 3 separate areas which I will refer to as East (main), Centre (mid sized) and west (smallest)
- this is a former burn pit and relatively low consequence facility

* MAIN LANDFILL VIEWED FROM NWS
407893/7598009