

April 8, 2011

Received

Reference No. 04-1440-062

Sajid Barlas, Section Head
BC Ministry of Environment
Environmental Management Section
102 Industrial Place
Penticton, BC
V2A 7C8

APR 11 2011

102 Industrial Place
Penticton, BC V2A 7C8

**WESTSIDE LANDFILL, DISTRICT OF WEST KELOWNA
EXEMPTIONS FOR FUTURE DEVELOPMENT WITHIN 300 METRES OF THE CLOSED LANDFILL**

Dear Mr. Barlas,

On behalf of the Regional District of Central Okanagan (RDCO), Golder Associates Ltd. (Golder) has prepared this letter summarizing landfill gas monitoring data collected at the Westside Landfill, which is operated by the RDCO. The purpose of this information is to provide a technical basis for the consideration of residential development near the soon-to-be closed landfill. The District of West Kelowna (DWK) is the local municipality responsible for land use planning and approving development applications near the landfill. The DWK has requested that the RDCO obtain clarification from the BC Ministry of Environment (MoE) on how to address residential development proposals within 300 metres of the landfill, now that the landfill is being closed.

Landfill Closure Status

The Westside Landfill is currently in the process of being closed. Refuse has not been accepted at the landfill since July 16, 2010, and the RDCO retained CH2M Hill to prepare a final Closure Plan. A draft Closure Plan, dated October 2010, was submitted by CH2M Hill to the MoE for comment. The RDCO is currently undergoing the final closure activities in 2011, such as surface grading, placing the final cover material, and installing a landfill gas (LFG) recovery and monitoring system.

Landfill Operational Certificate

The current Operational Certificate (OC) issued by the MoE in May 1997 (PR12217) requires a 50 metre buffer zone between municipal solid waste (MSW) and the property boundary, and a reduced buffer not less than 15 metres may be authorized by the Regional Waste Manager (Section 2.7 of the OC). Section 2.8 of the OC states that the distance between MSW and the nearest residence is to be a minimum 300 metres, although an exemption was granted for the existing residential subdivision located east of the landfill. The 300 metre distance for nearby development is consistent with siting requirements for active landfills outlined in the MoE *Landfill Criteria for Municipal Solid Waste ("Landfill Criteria")*.

Which
Side was
fitted
last?



Now that the landfill is closed and not accepting MSW, many of the operational issues previously associated with residential land near a landfill are no longer present. As described in the draft Closure Plan, the primary concern remaining for any closed landfill is the migration of underground landfill gas (LFG) and leachate in groundwater. As lands near the Westside Landfill are provided potable water through the local water authority, the potential migration of landfill leachate beyond the landfill boundaries is not anticipated to adversely impact local development in the area. The RDCO, CH2M Hill and Golder met with the MoE in December 2010 to discuss the draft Closure Plan. At that time, the MoE agreed to consider providing guidance on future development within 300 metres, and asked that the RDCO submit the following background information and historical LFG monitoring results.

Description of Site and Surrounding Area

A plan of the Westside Landfill and surrounding area is attached. As described in the draft Closure Plan, the landfill is approximately 16.7 hectares in size and zoned for "community facilities". The landfill has been developed to a height approximately 20 metres above the surrounding landscape. A 50 metre buffer is present between the edge of MSW and the property boundary. The landfill is accessed from Asquith Road, which borders the south portion of the west property boundary. Areas to the west and north are currently undeveloped. The land to the south is undeveloped north of Shannon Lake Road, located at least 200 m from the edge of MSW. The land to the east is occupied by single-family residential buildings, which in some cases are as close as 50 metres from the landfill.

Future residential development is proposed for properties located to the west and north of the landfill. The DWK have indicated they are currently reviewing applications for residential development in three separate parcels west of the landfill and one parcel north of the landfill. One of the applications is associated with an existing subdivision where a number of undeveloped lots are within 300 metres of the landfill.

Landfill Gas Monitoring

Golder has monitored the subsurface LFG at the Westside Landfill on a semi-annual basis since 2000. The LFG is monitored for typical landfill parameters including methane, hydrogen sulphide, carbon monoxide, and carbon dioxide. The monitoring results are presented in annual reports that are submitted to the MoE.

The LFG monitoring network on the west and north landfill boundaries currently includes the following locations, shown on Figure 1:

- Four probes located along the landfill's west boundary (MW99-1 to 4).
- Five probes near the landfill's north boundary (VP07-4, 5, 8, 9, MW07-1).

spacing? + depth
" "

A detailed assessment of landfill gas was completed by Golder in 2008, and determined that concentrations of potential volatile compounds were low and met provincial risk-based standards for human health. Consequently, methane was the primary potential chemical of concern, which is typically generated in landfills with degrading refuse. The Landfill Criteria specifies that methane in ground at the property boundary must be less than 50,000 parts per million (ppm) (100% lower explosive limit), and less than 12,500 ppm at any on-site or off-site buildings.

The historical methane readings since 2006 are summarized in Table 1 attached. The maximum historical methane concentrations measured on the west and north boundaries are 2,300 ppm and 2,260 ppm, respectively. Those concentrations are more than 20 times below the limits outlined in the Landfill Criteria. In

Criteria is for no residential building with 300m

addition, the methane concentrations have been relatively stable over time with only seasonal fluctuations in winter due to frost or snow cover. As of July 2010, final cover material had been placed over more than 50% of the landfill (including the west and north portions), and methane levels remained stable during the most recent monitoring in December 2010.

Closure Plan – Landfill Gas Management

The landfill gas management system is outlined in the draft Closure Plan, and is based on the requirements in the *Landfill Criteria* and the new *BC LFG Management Regulation*. As described in the Closure Plan, there is no regulatory requirement in the *LFG Management Regulation* to install a LFG recovery system, based on the quantities of methane generated at the Westside Landfill. Regardless, the Closure Plan does propose installation of a passive recovery system given the proximity of residential land use. The proposed LFG management system will include the following two components:

- A recovery system consisting of eight gravel-filled collection trenches connected to 12 vertical high density polyethylene (HDPE) pipes that vent to atmosphere.
- A monitoring program that will consist of a minimum of 12 monitoring wells along the landfill perimeter, measured quarterly, plus monthly during winter.

The monitoring results will be assessed continually to evaluate the effectiveness of the LFG recovery and monitoring system. As mentioned earlier, the LFG concentrations to date have consistently been well below the *Landfill Criteria*, and therefore the purpose of the monitoring program is to confirm that present LFG levels are maintained.

Exemptions for Development within 300 metres of Landfill

The historical LFG monitoring completed by Golder since 2000 confirms that landfill gas levels are stable and have not approached the maximum levels allowed in the *Landfill Criteria*. Although there is no regulatory requirement to install a LFG recovery system, the RDCO have elected to include a recovery system in the Closure Plan because the RDCO is aware of land development pressures in the surrounding area. As outlined in the draft Closure Plan, the LFG management system will include an engineered passive venting system to further enhance release of LFG to the atmosphere. A total of 12 new LFG monitoring probes will also be added along the landfill perimeter and the monitoring frequency will be increased to quarterly, with monthly measurements during the winter. The monitoring program outlined in the draft Closure Plan will therefore be used to detect any changes in LFG levels inside the landfill property boundaries, and the RDCO will make the data available to both the MoE and the DWK.

The *Landfill Criteria* do not identify setback requirements for closed landfills. A 50 metre buffer is currently in place between MSW and the property boundary, and the current Operational Certificate requires that the distance between the landfill footprint and off-site residences be a minimum 300 metres, although an exemption was granted for the existing residential subdivision located east of the landfill, which is closer than 300 metres. Based on aerial photographs, some of the existing residential properties are located as close as 50 metres from the east landfill footprint.

The DWK has requested that the RDCO ask the MoE for guidance on assessing development applications near the closed landfill. Based on the consistently low methane levels measured along the landfill perimeter and the LFG recovery system that will be installed, it is our opinion there is enough information and contingencies for the

MoE to consider allowing exemptions for specific development proposals less than 300 metres from the landfill, as previously granted for the residential subdivision to the east.

On behalf of the RDCO, we respectfully request that the MoE consider adopting a process with the DWK for reviewing development applications within 300 metres of the landfill. We suggest a meeting among the three parties to develop specific criteria that should be in a proponent's application to the DWK, in order to address technical issues associated with proximity to the landfill.

Closure

We trust the information presented herein is sufficient for your consideration. If you have any questions or wish to discuss this matter further with the RDCO and DWK, please contact myself or Mr. Chris Radford at the RDCO.

Yours truly,

GOLDER ASSOCIATES LTD.



Rick Peleshytyk, P.Eng.
Associate, Environmental Engineer

Reviewed by: Jacqueline Foley, M.Sc., Geo.L.
Associate/ Hydrogeologist

RP/JF/jc

cc: Chris Radford, Regional District of Central Okanagan
Nancy Henderson, District of West Kelowna
Gary O'Rourke, District of West Kelowna

Attachments: Figure 1: Site Plan with Vapour Probe Locations at West and North Boundaries
Table 1: Methane Concentrations at West Boundary
Table 2: Methane Concentrations at North Boundary

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LEGEND

- ⊕ MW99-1 VAPOUR MONITORING LOCATION (APPROX.)
- VP07-18 VAPOUR PROBE LOCATION (APPROX.)
- - - - - APPROXIMATE LANDFILL PROPERTY BOUNDARY

REFERENCE

1. ORTHOPHOTOS: RDCO, DATED 2009.
FILE NAMES: 82E.082.049.JPG, 82E.082.050.JPG, 82E.082.059.JPG & 82E.082.060.JPG

PROJECT
**RDCO WESTSIDE LANDFILL
 KELOWNA, B.C.**

TITLE
**SITE PLAN WITH VAPOUR PROBE
 LOCATIONS AT WEST AND NORTH
 BOUNDARIES**



| | | | | | |
|-------------|------------------|---------|------------------|----------------------|--------|
| PROJECT No. | 04-1440-062.3000 | | FILE No. | 041440062_3000_1.dwg | |
| DESIGN | RP | 07APR11 | SCALE | 1:5,000 | REV. 0 |
| CADD | JG/AR | 08APR11 | FIGURE: 1 | | |
| CHECK | RP | 08APR11 | | | |
| REVIEW | RP | 08APR11 | | | |

**Table 1: Methane Concentrations at West Boundary
Westside Landfill, West Kelowna, BC**

| Date | MW99-1 (ppm) | MW99-2 (ppm) | MW99-3 (ppm) | MW99-4 (ppm) |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|
| 21-Dec-10 | 450 | 460 | 470 | 440 |
| 19-Jul-10 | 480 | 420 | 360 | 440 |
| 17-Dec-09 | 1,820 | 1,820 | 1,120 | 1,900 |
| 24-Jul-09 | 160 | 180 | 140 | 140 |
| 31-Dec-08 | 1,310 | 60 | 720 | 1,670 |
| 17-Jul-08 | 1,420 | 1,160 | 2,140 | 1,860 |
| 20-Dec-07 | 280 | 80 | 260 | 660 |
| 26-Jul-07 | 340 | 360 | 340 | 300 |
| 11-Dec-06 | 1,740 | 2,140 | 1,280 | 2,300 |
| 26-Jul-06 | 1,780 | 1,960 | 1,960 | 1,220 |
| Maximum | 1,820 | 2,140 | 2,140 | 2,300 |
| Landfill Criteria ² | 50,000 | | | |

Notes:

1. ppm = parts per million.
2. Maximum allowable methane concentration at landfill property boundary, from "Landfill Criteria for Municipal Solid Waste" (BC Ministry of Environment, June 1993).

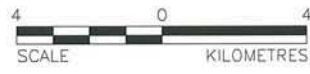
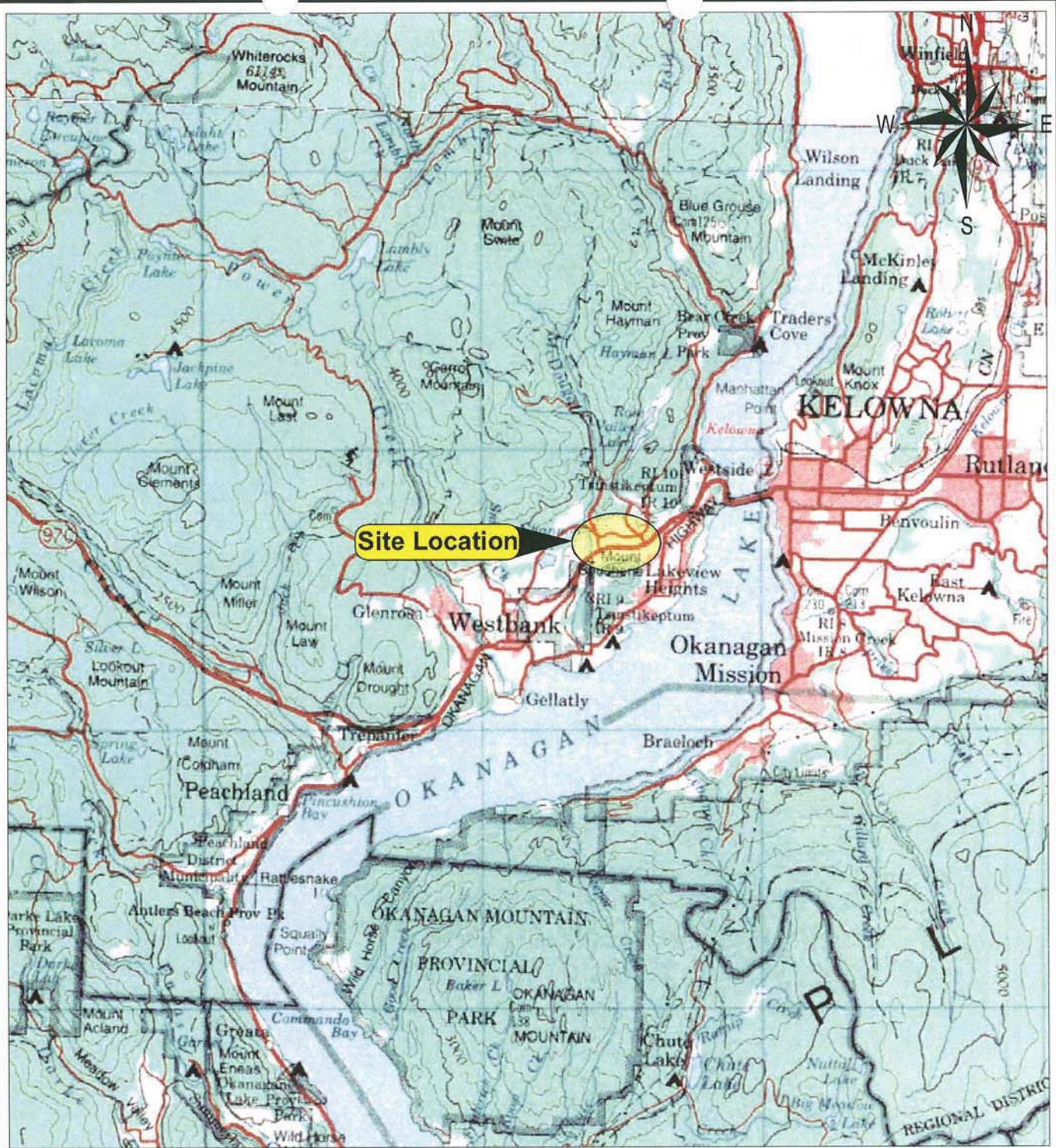
Table 2: Methane Concentrations at North Landfill Boundary
Westside Landfill, West Kelowna, BC

| Date | VP07-4 (ppm) | VP07-5 (ppm) | VP07-8 (ppm) | VP07-9 (ppm) | MW07-1 (ppm) |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 19-Jul-10 | Broken | 320 | 480 | 400 | 480 |
| 17-Dec-09 | 1,040 | 2,000 | 1,280 | 1,100 | 2,260 |
| 24-Jul-09 | 300 | 1,460 | 780 | 500 | 680 |
| 16-Oct-08 | 1,040 | 2,000 | 1,120 | 760 | 2,260 |
| 22-Aug-08 | 380 | 1,020 | 1,280 | 1,100 | 1,140 |
| 27-Mar-08 | 1,000 | 1,460 | 780 | 500 | 680 |
| Maximum | 1,040 | 2,860 | 1,280 | 1,100 | 2,260 |
| Landfill Criteria ² | 50,000 | | | | |

Notes:

1. ppm = parts per million.
2. Maximum allowable methane concentration at landfill property boundary, from "Landfill Criteria for Municipal Solid Waste" (BC Ministry of Environment, June 1993).

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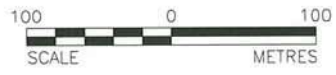
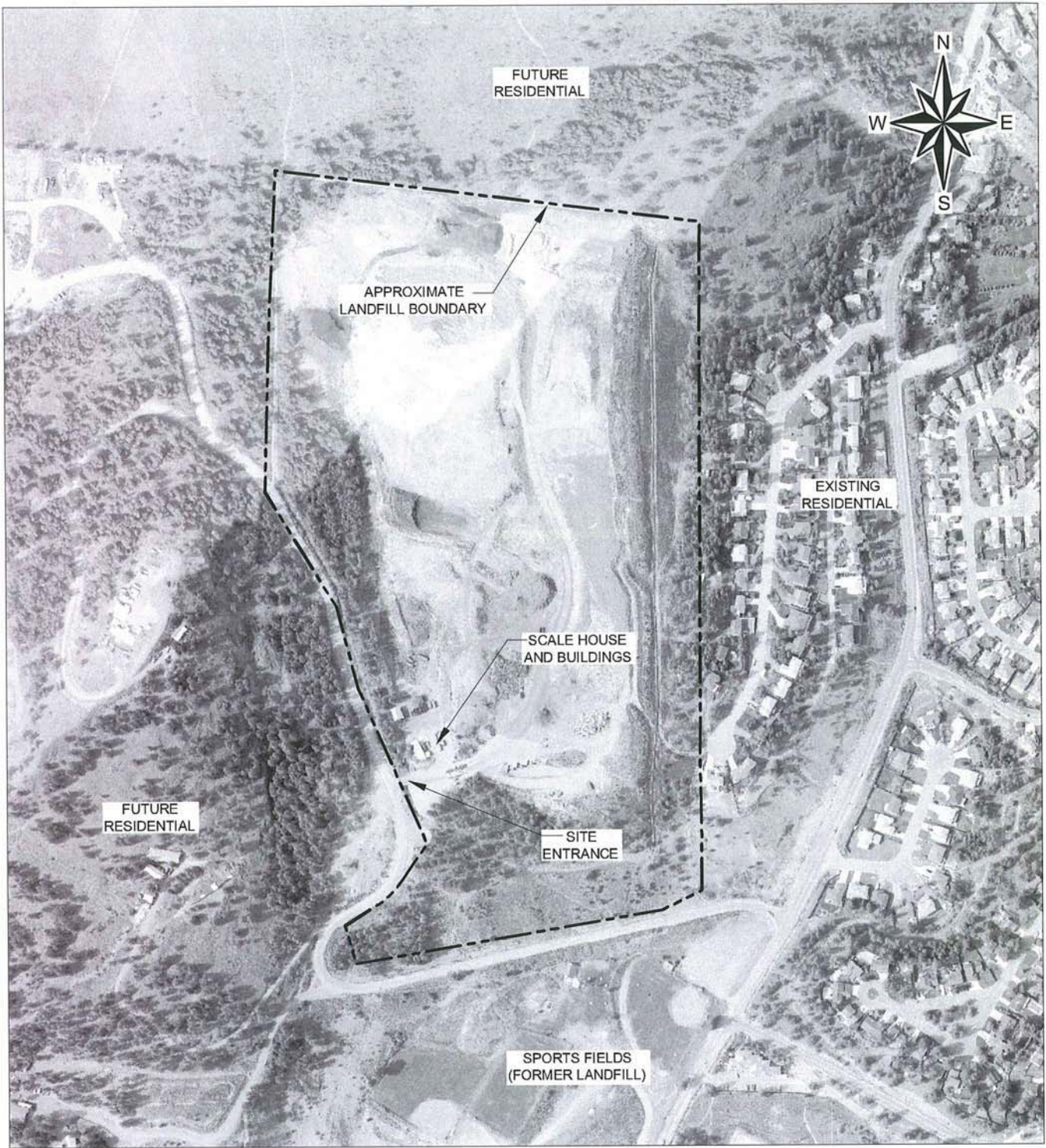
REFERENCES

1.) COORDINATE REFERENCE: UTM ZONE 11n, NAD83
 MAP REFERENCE: PRODUCED UNDER LICENSES GRANTED BY HER MAJESTY THE QUEEN IN RIGHT OF CANADA, REPRESENTED BY THE DEPARTMENT OF NATURAL RESOURCES, AND BY SOFTMAP TECHNOLOGIES INC.


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|-------------------------------|-----|-------------------------------------|----------------------|
| PROJECT | | WESTSIDE LANDFILL WESTBANK, B.C. | |
| TITLE | | KEY PLAN | |
| PROJECT No. 04-1440-062(3000) | | FILE No. 041440062_3000_1.dwg | |
| DESIGN | RP | 06/JUL/07 | SCALE 1:5,000 REV. 0 |
| CADD | SWD | 31/DEC/07 | |
| CHECK | RR | 13/JAN/09 | |
| REVIEW | RP | 13/JAN/09 | |



FIGURE: 1



LEGEND

 APPROXIMATE LANDFILL BOUNDARY

REFERENCES

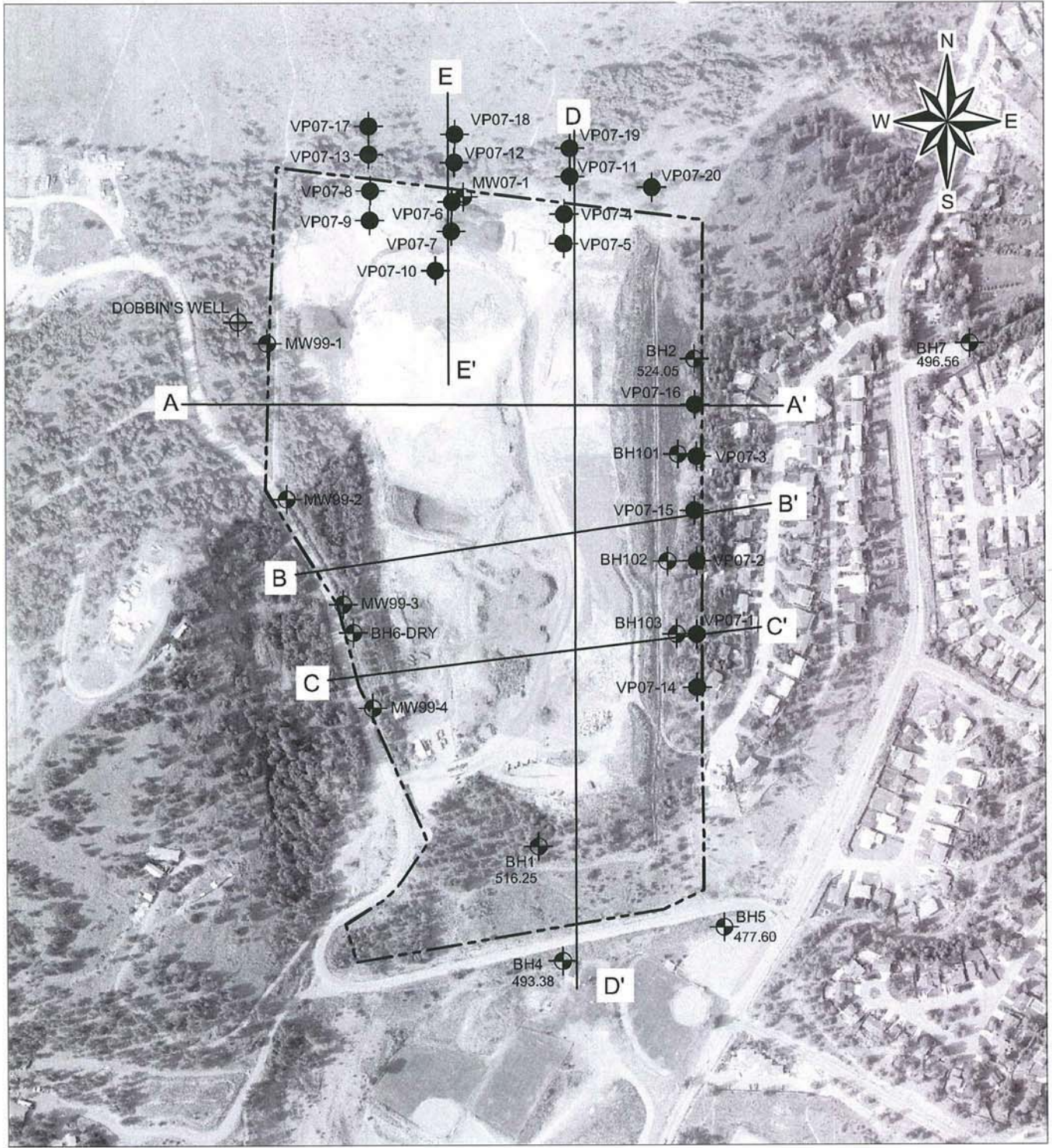
- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

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| PROJECT | | WESTSIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | SITE PLAN | |
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| DESIGN | RR | 10/JUL/07 | SCALE AS SHOWN REV. 0 |
| CADD | SWD | 20/NOV/08 | |
| CHECK | RR | 13/JAN/09 | |
| REVIEW | RP | 13/JAN/09 | |



FIGURE: 2

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LEGEND

- BH4 APPROX. MONITORING WELL LOCATION
- 493.38 APPROX. MONITORING WELL GROUNDWATER ELEVATION
- VP07-2 APPROX. SOIL VAPOUR MONITOR LOCATION (2007)
- APPROXIMATE LANDFILL BOUNDARY
- CROSS-SECTION LOCATION

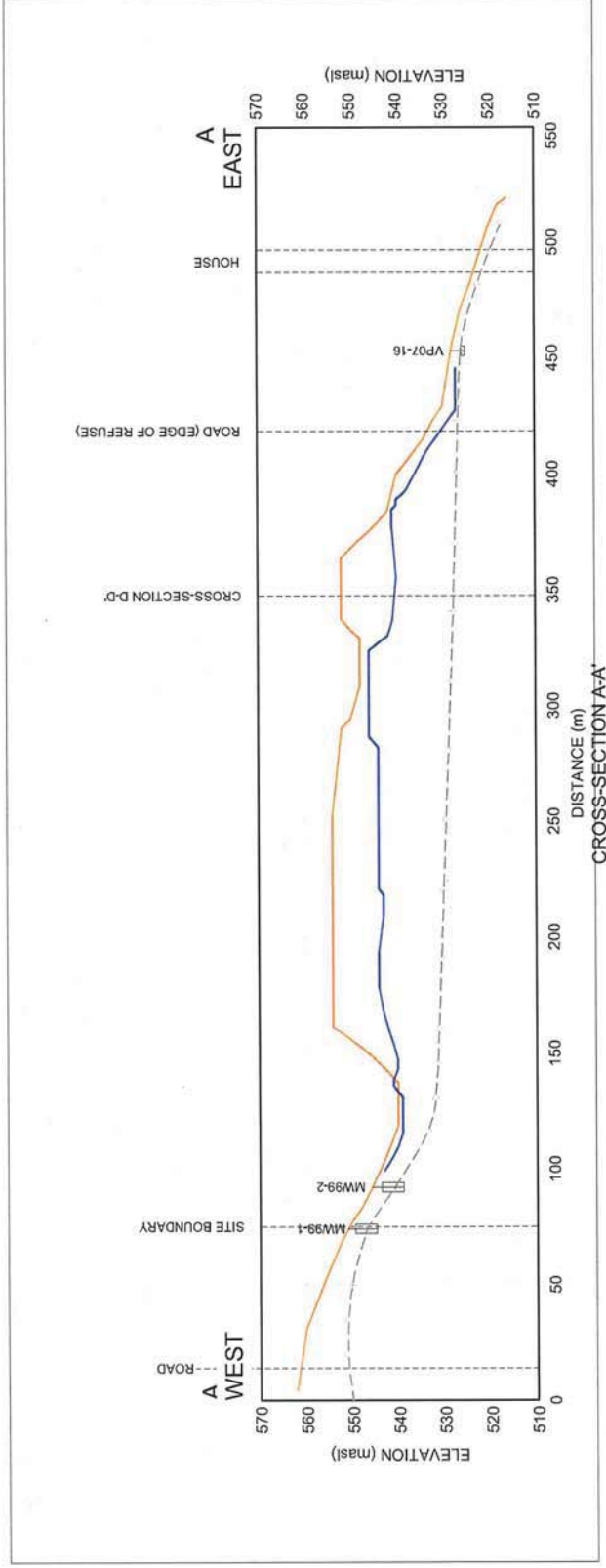
REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

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| PROJECT | | WESTIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | VAPOUR MONITORING LOCATIONS & CROSS-SECTION KEY PLAN | |
| PROJECT No. 04-1440-062(3000) | | FILE No. 041440062_3000_3.dwg | |
| DESIGN | RR | 10/JUL/07 | SCALE AS SHOWN REV. D |
| CADD | SWD | 20/NOV/08 | |
| CHECK | RR | 13/JAN/09 | |
| REVIEW | RP | 13/JAN/09 | |



FIGURE: 3



LEGEND

- 1992 GROUND ELEVATION (REID CROWTHER & PARTNERS)
- JUNE 2006 GROUND ELEVATION (CITY OF KELOWNA SURVEY)
- TOP OF BEDROCK
- WELL ID
- TOP OF WELL
- SCREEN INSTALLATION

MMW92-1

MMW92-2

PROJECT

WESTSIDE LANDFILL
WESTSIDE, B.C.

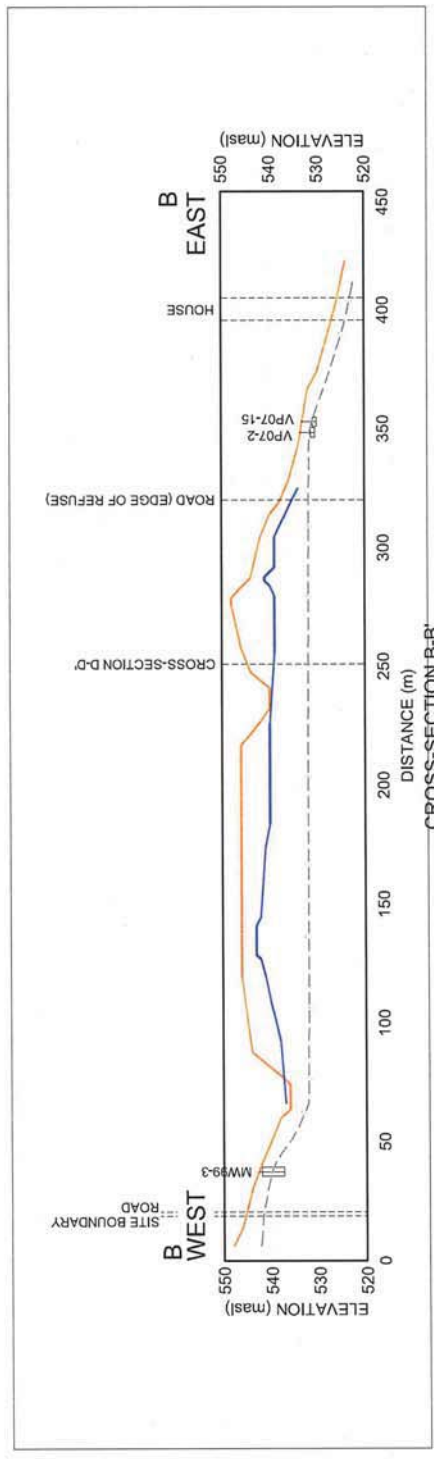
TITLE

CROSS-SECTION A-A'

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| DESIGN | RR | DATE | 10/JUL/07 |
| CADD | RD | DATE | 11/JUN/08 |
| CHECK | RR | DATE | 13/JAN/09 |
| REVIEW | RP | DATE | 13/JAN/09 |

FIGURE: 4A

Golden Associates
Kelowna, BC



LEGEND

- 1992 GROUND ELEVATION (REID CROWTHER & PARTNERS)
- JUNE 2006 GROUND ELEVATION (CITY OF KELOWNA SURVEY)
- TOP OF BEDROCK
- WELL ID
- TOP OF WELL
- SCREEN INSTALLATION

MW99-3

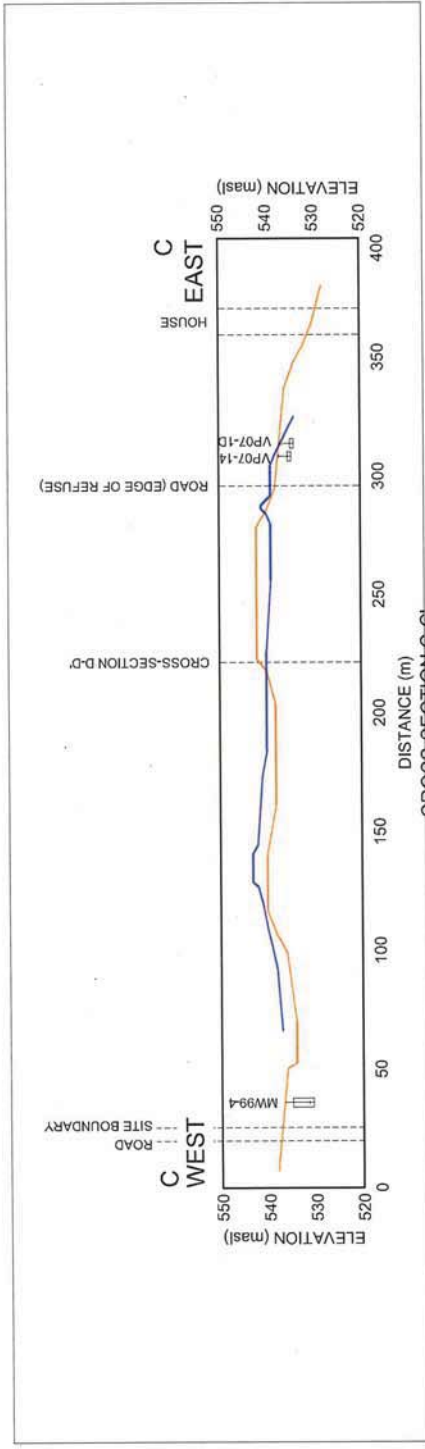
PROJECT
WESTSIDE LANDFILL
WESTSIDE, B.C.

TITLE
CROSS-SECTION B-B'

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| EDITION | RR | DATE | 10/JUL/07 |
| DRAWN | SRD | CHECK | SR |
| SCALE | 1:2000 | REVISION | 12,000 |
| | | | REV. D |

Goldier Associates
Kelowna, BC

FIGURE: 4B

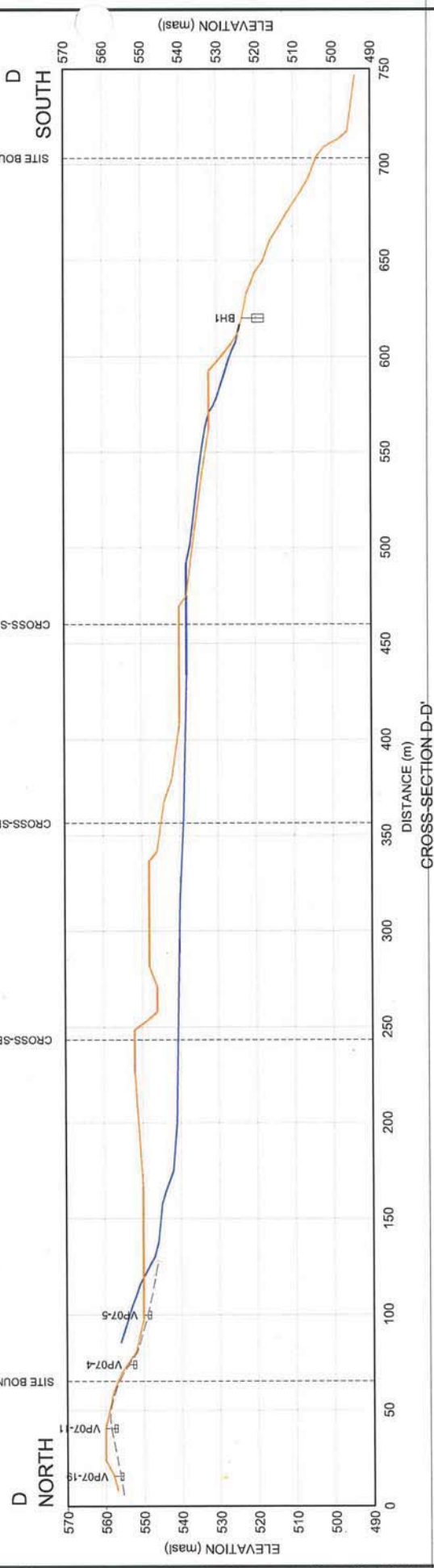


LEGEND

- 1992 GROUND ELEVATION (RED CROWTHER & PARTNERS)
- JUNE 2006 GROUND ELEVATION (CITY OF KELLOWNA SURVEY)
- TOP OF BEDROCK
- WELL ID
- TOP OF WELL
- SCREEN INSTALLATION

MW94-4
 ROAD
 SITE BOUNDARY

| | | | |
|-------------------------|---------------------------|---|---------------------|
| PROJECT | | WESTSIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | CROSS-SECTION C-C' | |
| | | | |
| PROJECT NO. 04-1440-062 | FILE NO. 041440062_3000_3 | DESIGN DATE 10/JUL/07 | SCALE 1:2000 REV. 0 |
| CHECK DATE 11/NOV/08 | REVIEW DATE 13/JAN/09 | FIGURE: 4C | |



40 0 40
 HORIZONTAL SCALE 1:2000 METRES
 VERTICAL SCALE 1:1000

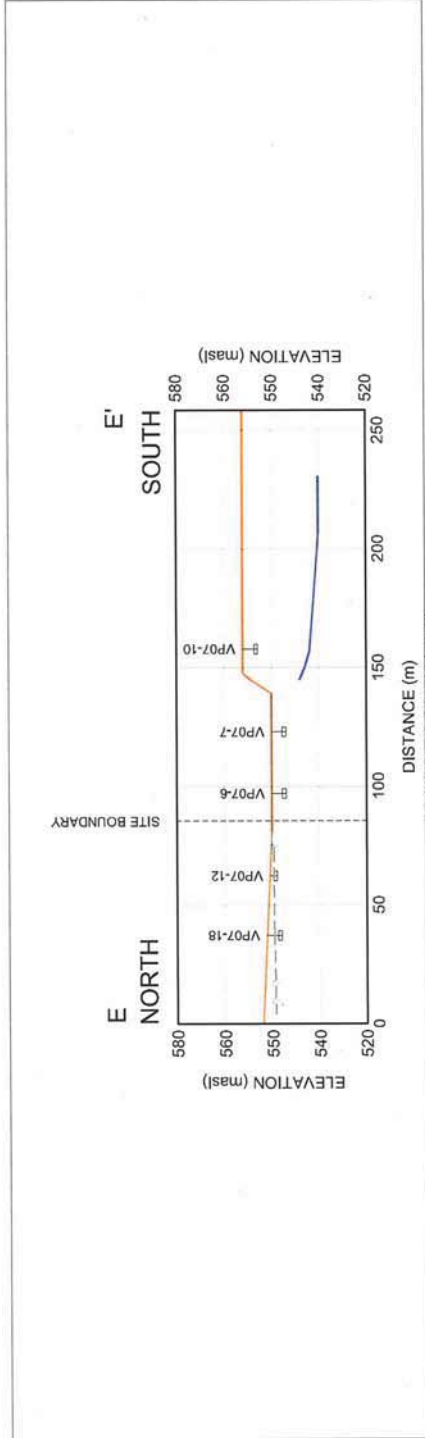
PROJECT
 WESTIDE LANDFILL
 WESTSIDE, B.C.

CROSS-SECTION D-D'



| | | | |
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| DESIGN | RR | DATE | 10/24/07 |
| SCALE | 1:2000 | REV. | 0 |
| CHECK | RR | DATE | 11/09/08 |
| REVIEW | RR | DATE | 12/01/08 |

FIGURE: 4D



LEGEND

- 1992 GROUND ELEVATION (REID CROWTHER & PARTNERS)
- JUNE 2008 GROUND ELEVATION (CITY OF KELLOWNA SURVEY)
- - - TOP OF BEDROCK
- WELL ID
- TOP OF WELL
- SCREEN INSTALLATION

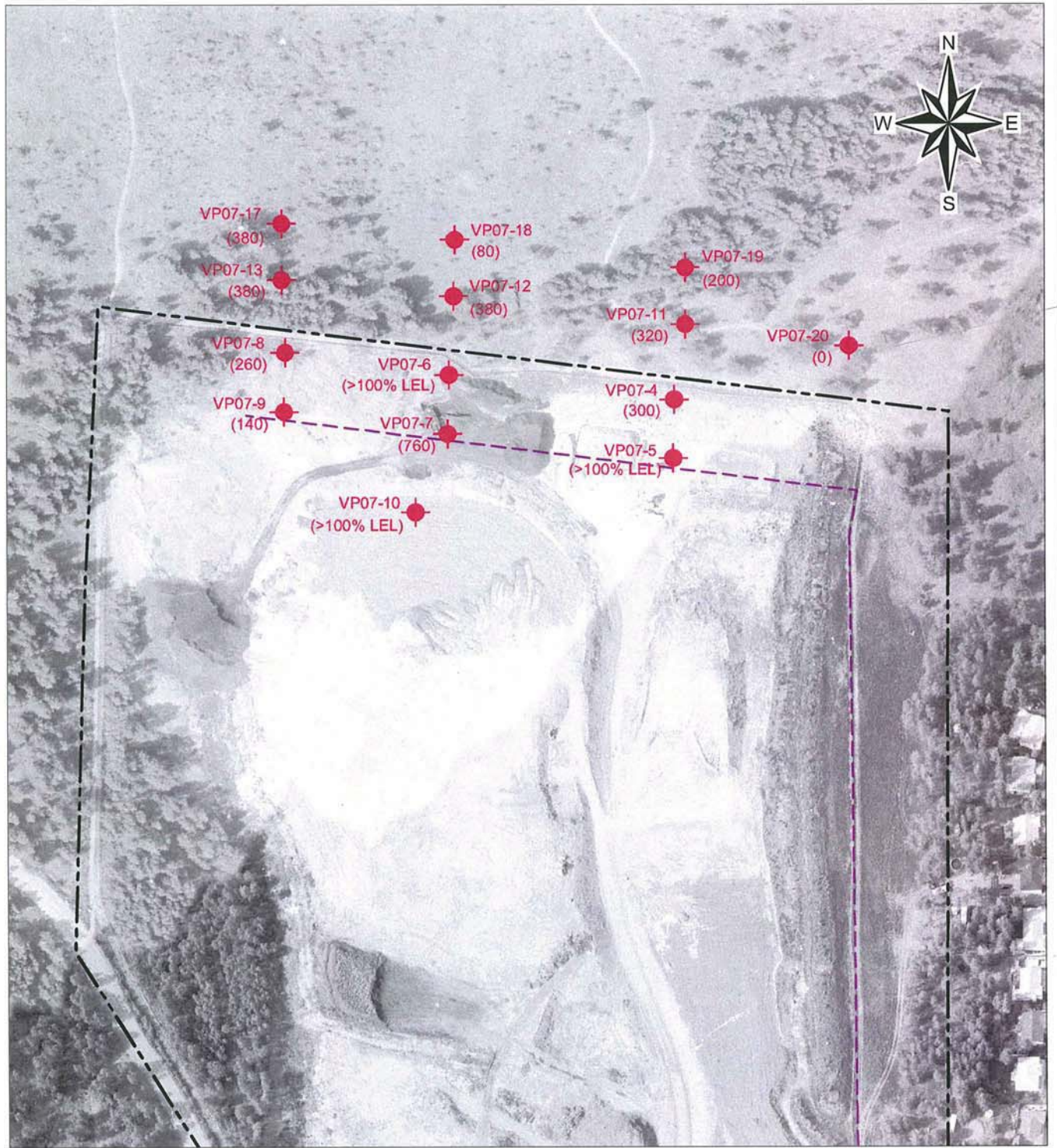
PROJECT: WESTIDE LANDFILL
WESTSIDE, B.C.

TITLE: CROSS-SECTION E-E'



| | | | |
|-------------|-------------|-----------|----------------------|
| PROJECT No. | 04-1440-062 | FILE No. | 04-1440-062-3000-3 |
| DESIGN | BR | 10/AUG/07 | SCALE 1:2,000 REV. 0 |
| DRAW | SWD | 11/NOV/08 | |
| CHECK | BR | 13/JAN/09 | |
| REVISION | RP | 13/JAN/09 | |

FIGURE: 4E



private property?



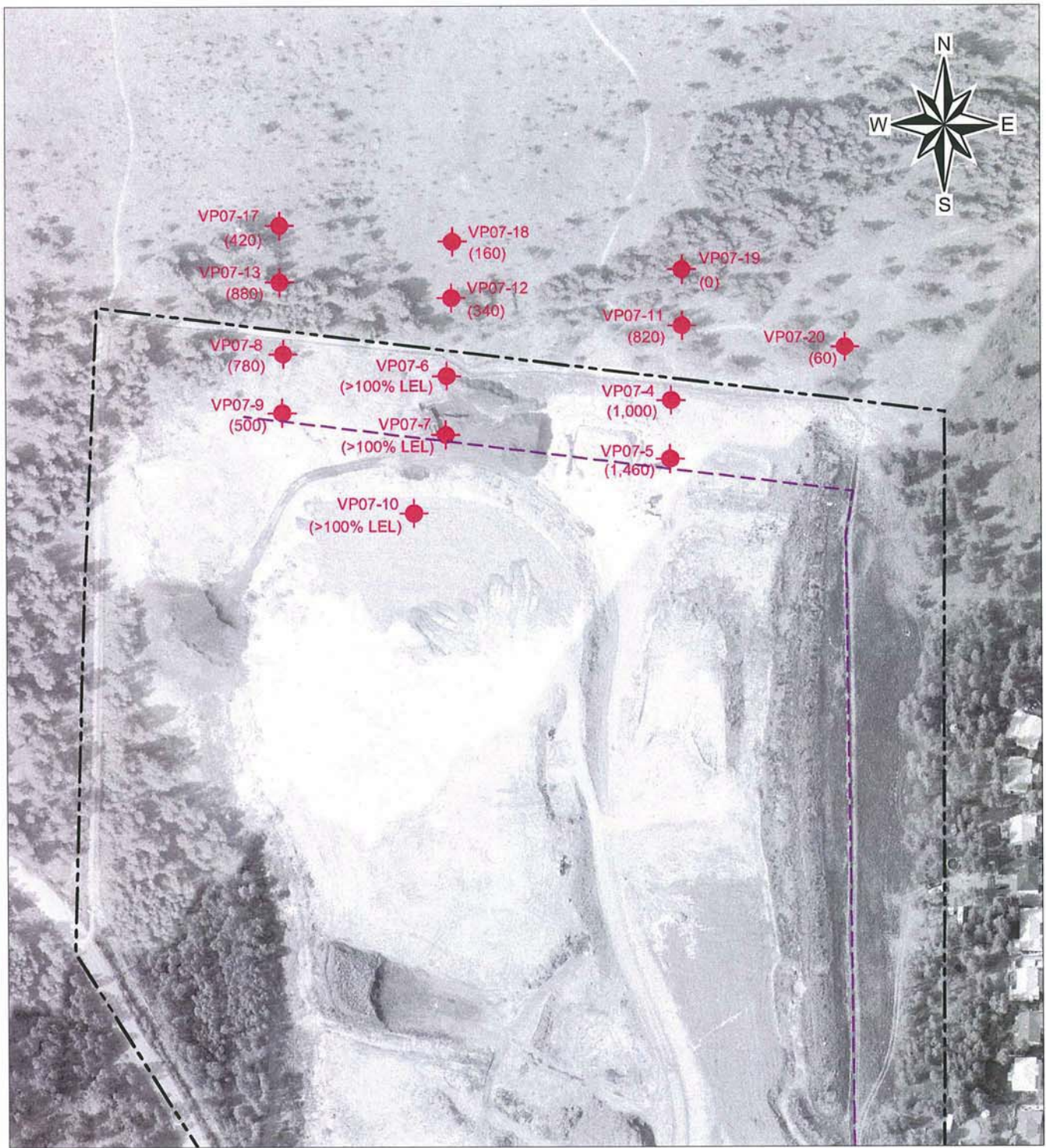
LEGEND

- APPROX. SOIL VAPOUR MONITOR LOCATION (2007) METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

| | | | |
|-------------------------------|-----|---|-----------------------|
| PROJECT | | WESTIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | METHANE CONCENTRATIONS NEAR NORTH BOUNDARY JULY 25, 2007 | |
| PROJECT No. 04-1440-062(3000) | | FILE No. 041440062_3000_5A.dwg | |
| DESIGN | RR | 10/JUL/07 | SCALE AS SHOWN REV. 0 |
| CADD | SWD | 20/NOV/08 | |
| CHECK | RR | 13/JAN/09 | |
| REVIEW | RP | 13/JAN/09 | |
| Kelowna, BC | | | FIGURE: 5A |



LEGEND

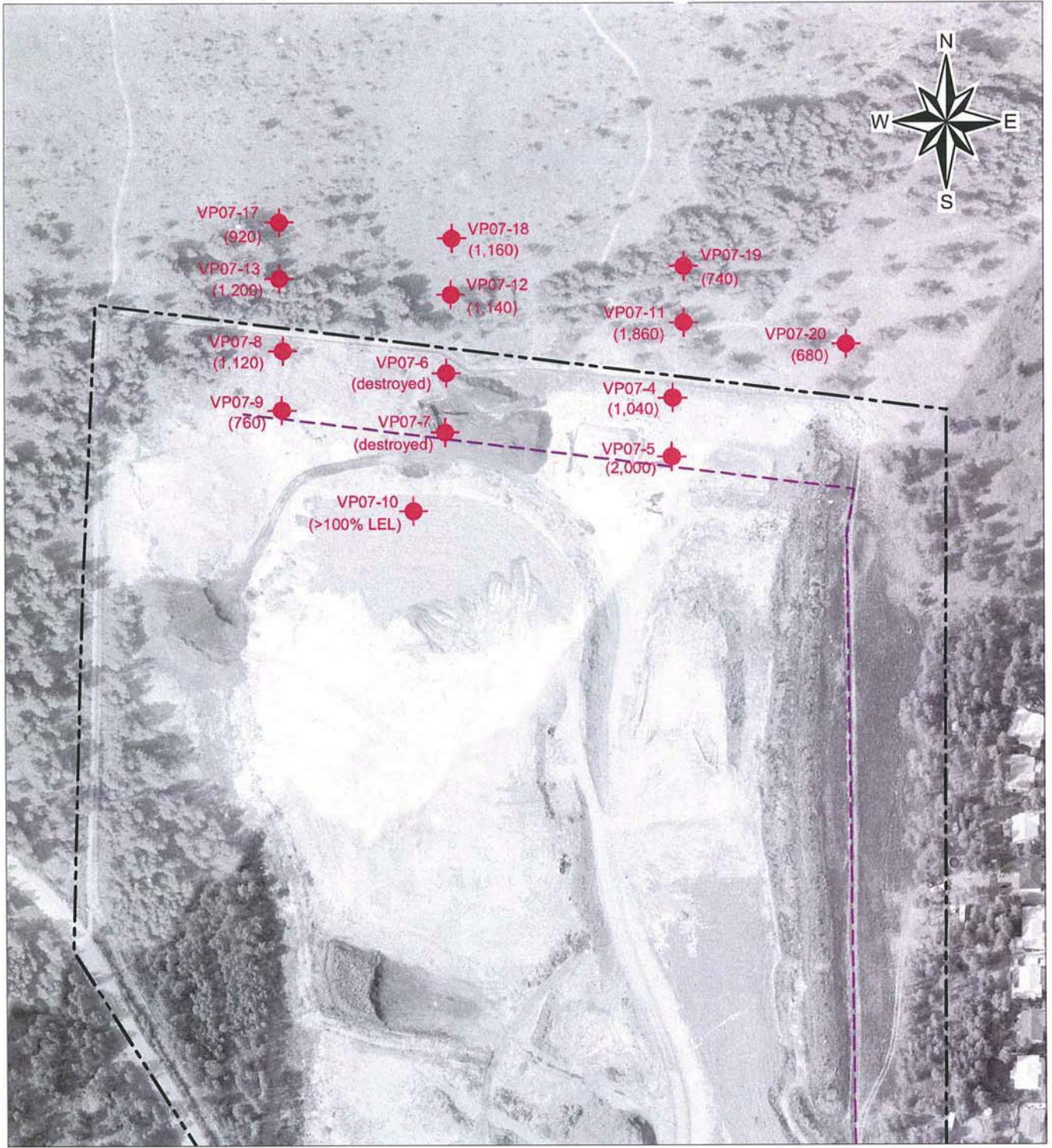
- APPROX. SOIL VAPOUR MONITOR LOCATION (2007) METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

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|---|--|--------------------------------|--------|
| PROJECT | WESTIDE LANDFILL WESTSIDE, B.C. | | |
| TITLE | METHANE CONCENTRATIONS NEAR NORTH BOUNDARY MARCH 27, 2008 | | |
| Golder Associates Kelowna, BC | PROJECT No. 01-1440-062(3000) | FILE No. 041440062_3000_5B.dwg | |
| | DESIGN RR 10/JUL/07 | SCALE AS SHOWN | REV. 0 |
| | CADD SWD 20/NOV/08 | | |
| | CHECK RR 13/JAN/09 | | |
| REVIEW RP 13/JAN/09 | FIGURE: 5B | | |

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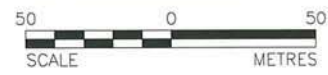
LEGEND

- APPROX. SOIL VAPOUR MONITOR LOCATION (2007) METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

| | | | |
|---|--|--------------------------------|--|
| PROJECT | WESTIDE LANDFILL WESTSIDE, B.C. | | |
| TITLE | METHANE CONCENTRATIONS NEAR NORTH BOUNDARY OCTOBER 16, 2008 | | |
| Golder Associates Kelowna, BC | PROJECT No. 04-1440-062(3000) | FILE No. 041440062_3000_5C.dwg | |
| | DESIGN RR 10/JUL/07 | SCALE AS SHOWN REV. 0 | |
| | CADD SWD 20/NOV/08 | | |
| | CHECK RR 13/JAN/09 | | |
| | REVIEW RP 13/JAN/09 | | |
| | | FIGURE: 5C | |



LEGEND

- BH103** APPROX. BOREHOLE LOCATION (2007)
METHANE CONCENTRATION (ppm)
- VP07-18** (1160) APPROX. SOIL VAPOUR MONITOR LOCATION (2007)
METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

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|-------------------------------|-----|--|-----------------------|
| PROJECT | | WESTSIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | METHANE CONCENTRATIONS NEAR EAST BOUNDARY JULY 25, 2007 | |
| PROJECT No. 04-1440-062(3000) | | FILE No. 041440062_3000_6A.dwg | |
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| CADD | SWD | 20/NOV/08 | |
| CHECK | RR | 13/JAN/09 | |
| REVIEW | RP | 13/JAN/09 | |



FIGURE: 6A



LEGEND

- BH 102 (620) APPROX. BOREHOLE LOCATION (2007) METHANE CONCENTRATION (ppm)
- VP07-18 (1160) APPROX. SOIL VAPOUR MONITOR LOCATION (2007) METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

| | | | | |
|--------------------------------------|---|-------------------|-----------|-----------------------|
| PROJECT | WESTIDE LANDFILL WESTSIDE, B.C. | | | |
| TITLE | METHANE CONCENTRATIONS NEAR EAST BOUNDARY MARCH 27, 2008 | | | |
| Golder Associates Kelowna, BC | PROJECT No. | 04-1440-062(3000) | FILE No. | 041440062_3000_6B.dwg |
| | DESIGN | RR | 10/JUL/07 | SCALE AS SHOWN REV. 0 |
| | CADD | SWD | 20/NOV/08 | |
| | CHECK | RR | 13/JAN/09 | |
| | REVIEW | RP | 13/JAN/09 | |
| | | | | FIGURE: 6B |



LEGEND

- BH 102 (3,040) APPROX. BOREHOLE LOCATION (2007) METHANE CONCENTRATION (ppm)
- VP07-18 (1160) APPROX. SOIL VAPOUR MONITOR LOCATION (2007) METHANE CONCENTRATION (ppm)
- APPROXIMATE LANDFILL BOUNDARY
- APPROXIMATE EXTENT OF MUNICIPAL SOLID WASTE

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

| | | | |
|-------------|-------------------|--|-----------------------|
| PROJECT | | WESTSIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | METHANE CONCENTRATIONS NEAR EAST BOUNDARY OCTOBER 16, 2008 | |
| PROJECT No. | 04-1440-062(3000) | FILE No. | 041440062_3000_6C.dwg |
| DESIGN | RR 10/JUL/07 | SCALE | AS SHOWN |
| CADD | SWD 20/NOV/08 | REV. | D |
| CHECK | RR 13/JAN/09 | FIGURE: 6C | |
| REVIEW | RP 13/JAN/09 | | |

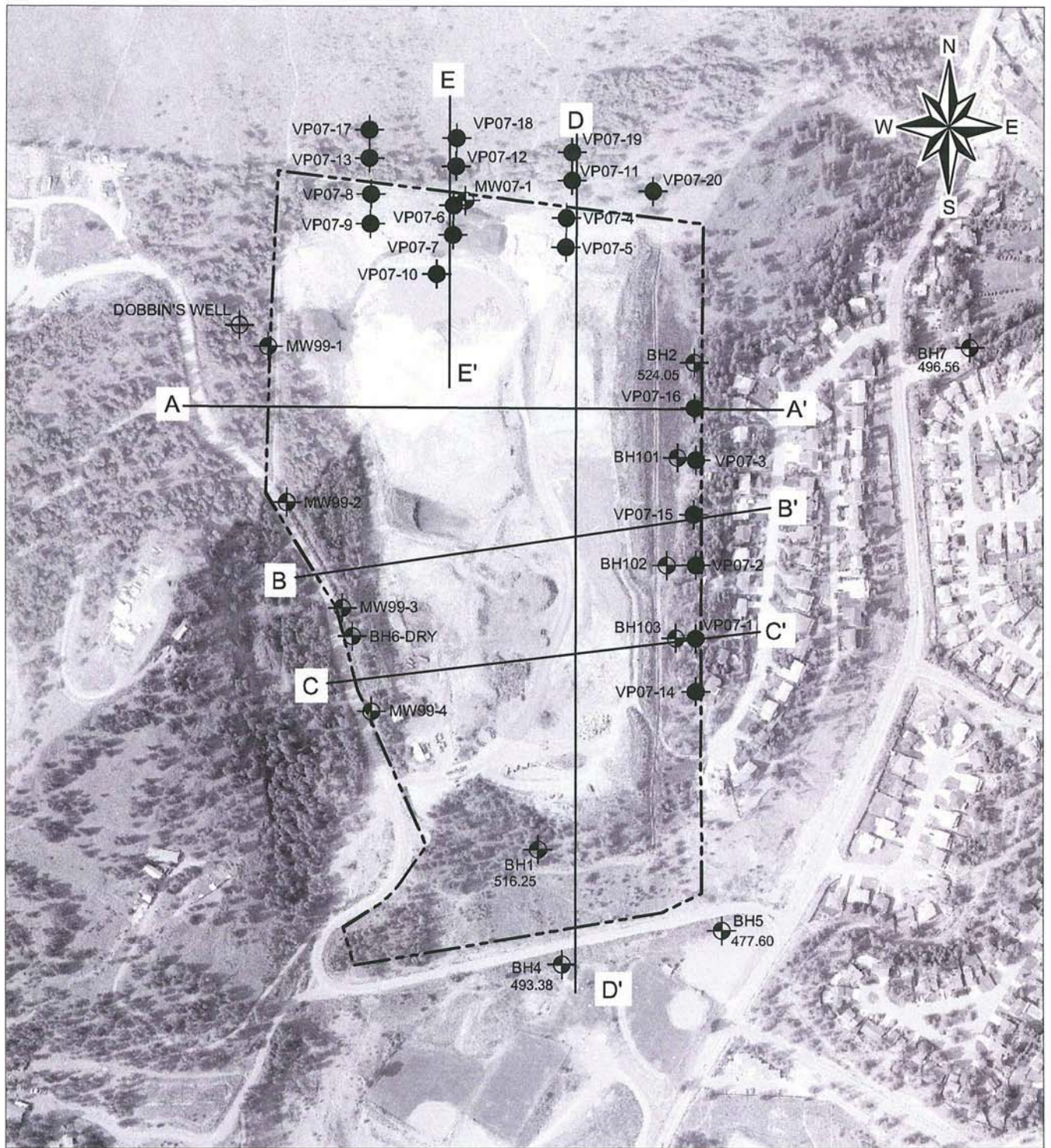




APPENDIX I

Screening of Predicted Air Concentrations Against Interim Air Concentration Criteria

N:\Active\2004\1440 - Kelowna\04-1440-062 RDCO Westside Landfill\3000 Risk Assessment\Drafting\Drawing\041440062_3000_3-4.dwg Jan 14, 2009 - 6:35pm



LEGEND

- BH4 APPROX. MONITORING WELL LOCATION
- 493.38 APPROX. MONITORING WELL GROUNDWATER ELEVATION
- VP07-2 APPROX. SOIL VAPOUR MONITOR LOCATION (2007)
- APPROXIMATE LANDFILL BOUNDARY
- CROSS-SECTION LOCATION

REFERENCES

- 1.) 82E-082-049_bw.jpg, 82E-082-050_bw.jpg, 82E-082-059_bw.jpg, 82E-082-060_bw.jpg

| | | | |
|-------------------------------|-----|---|------------------|
| PROJECT | | WESTIDE LANDFILL WESTSIDE, B.C. | |
| TITLE | | VAPOUR MONITORING LOCATIONS & CROSS-SECTION KEY PLAN | |
| PROJECT No. 04-1440-062(3000) | | FILE No. 041440062_3000_3.dwg | |
| DESIGN | RR | 10/JUL/07 | SCALE AS SHOWN |
| CADD | SWD | 20/NOV/08 | REV. 0 |
| CHECK | RR | 13/JAN/09 | FIGURE: 3 |
| REVIEW | RP | 13/JAN/09 | |



Meeting Agenda

Westside Landfill Closure

Location: Ministry of Environment office, 102 Industrial Place, Penticton

Date: April 27, 2011

Time: 10:00 a.m.

not present

Invitees: Sajid Barlas, Gerri Huggins (MoE), Chris Radford (RDCO), Nancy Henderson (DWK), Rick Peleshytyk (Golder)

Agenda Items

Introduction

- Meeting overview

Residential Development Near Landfill

- Site and surrounding land uses
- Typical process for approving development applications

Landfill Gas Management

- Methane results to date
- Landfill gas recovery and monitoring system (described in Closure Plan)

Process for Future Development Applications

- Options for addressing restrictions in Operational Certificate
- MoE examples in other regions of BC?

Site Closure Status – General Update

- Status of site activities
- Draft Closure Plan - MoE comments. Next steps for finalizing the Plan.