Kleinfelder Australia Pty Ltd
ABN: 23 146 082 500
Level 1, 95 Coventry Street
South Melbourne VIC 3205
T| 03 9907 6000 **F|** 03 9907 6090
www.kleinfelder.com/australia

22 December 2016

20162414.001A/TCL/MLB16L47775

Cleanaway Solid Waste Pty Ltd
46 Victory Road
Clarinda, VIC, 3169

Attention: Kieren McDermott

Email: kieren.mcdermott@cleanaway.com.au

Subject: **Tullamarine Closed Landfill – Surface Water, Groundwater and Leachate Monitoring Specification**
Tullamarine Closed Landfill
Western Avenue, Westmeadows, Victoria.

INTRODUCTION

Kleinfelder Australia Pty Ltd (Kleinfelder) is pleased to provide Cleanaway Solid Waste Pty Ltd (Cleanaway) with the following Surface Water, Groundwater and Leachate Monitoring Specification for the Tullamarine Closed Landfill (TCL, the site) located at the western end of Western Avenue, Westmeadows for Environmental Auditor and community comment. This specification includes monitoring of leachate and Light Non-Aqueous Phase Liquids (LNAPL) as well as groundwater and surface water. This specification should be read in conjunction with Revision 1 of the sites Surface Water, Groundwater and Leachate Management Plan (SW, GW and LMP). This specification serves to detail the specific requirements for monitoring based on recommendations made in the 2014 Technical Report for Auditor Review (TRAR), the Auditors verification of the TRAR and Revision 1 of the SW, GW and LMP. This specification covers the following regulatory requirements and voluntary monitoring regimes:

Groundwater Monitoring:

- Voluntary LNAPL Quarterly Monitoring Bores (**Figure 1**).
- Moonee Ponds Creek – Salinity Monitoring Network (**Figure 2**).
- Moonee Ponds Creek – Vicinity Monitoring Network (**Figure 3**).
- Voluntary Natural Attenuation Monitoring Network (**Figure 4**).

- Hydraulic Flow Lines Monitoring Network (**Figure 5**).
- Voluntary LNAPL Monitoring Network (**Figure 6**).
- Remaining Wells Monitoring Network (**Figure 7**).
- Groundwater monitoring parameters and frequencies are provided in **Table 1**. The sampling interval applicable to each groundwater monitoring well is depicted in **Figure 8**.

Surface Water Monitoring:

- Surface Water Field Parameters (**Figure 9**).
- Surface Water Laboratory Analysis (Lab EC) (**Figure 10**).
- Surface Water Laboratory Analysis – Contaminants of Interest (COI) (**Figure 11**).
- Surface water monitoring parameters and frequencies are provided in **Table 2**.

Frog and macroinvertebrate monitoring has not been included in this specification as the monitoring frequencies and parameters are yet to be determined by Cleanaway in consultation with their specialists.

Leachate Monitoring:

Refer to Item 3.1 of Task 001 (Leachate Management) of the SW, GW and LMP for interim and target leachate levels for each Landfill Mound. The levels will be checked during quarterly monitoring as outlined in **Figure 1** and **Table 3** of this specification and Item 2.1 of Task 001 (Leachate Management) of the SW, GW and LMP.

PLAN DEVELOPMENT METHODOLOGY

The adopted methodology for amending monitoring plans (from the previous Revision 6 of the GQMP) was as follows:

1. Review current monitoring plan requirements.
2. Review adequacy of monitoring to meet objective(s).
3. Review of the source / receptor linkage being monitored.
4. Review historical data to identify trends.
5. Review of applicable contaminants of interest.

These steps were completed during development of the 2014 TRAR.

Recommendations Made in the Environmental Auditor Review

Mr Anthony Lane (the Environmental Auditor) of Cardno Victoria Pty Ltd completed a review of the 2014 TRAR and provided the following recommendations pertinent to groundwater and surface water monitoring:

- Changes to Contaminants of Interest (CoI):
  - Removal of fluoride as a CoI;
  - Inclusion of salinity (as EC) as an indicator of potential leachate movement to groundwater;
  - Inclusion of Magnesium and 1-2-Dichlorobenzen as CoI;
  - Removal of dissolved cadmium, 2-Chlorophthalene and 1,4-Dichlorobenzene as CoI.
- Re-commencing of chlorinated hydrocarbons analysis at MB61 and MB61L as the concentrations have not been demonstrated to have stabilised.
- The ongoing monitoring and review of salinity data to confirm trends, in particular for bores on flow path towards MPC and offsite to the east and southeast.
- Future surface water monitoring to take into consideration stratification and (if possible) approximate creek flow rates or observations of no flow conditions.

These recommendations have been included in the monitoring regimes, the following section summarises the results of the plan development methodology.

ALTERATIONS FROM REVISION 6 GROUNDWATER QUALITY MANAGEMENT PLAN

Based on the methodology above, the following alterations from the Revision 6 GQMP have been made, rationale for each change is provided in **Table 1.1**:

Groundwater Monitoring:

- LNAPL monitoring plan:
  - Now considered voluntary monitoring.
  - Reduction in frequency from monthly to quarterly.
- Moonee Ponds Creek – Salinity Monitoring Network:
  - Removal of 'Lower' screened wells: MB46L, MB65L, MB45L and MB68L.
  - Addition of MB66U and MB69.
- Moonee Ponds Creek – Vicinity Monitoring Network:
  - Removal of Volatile Organic Compounds (VOCs) from the analytical suite.
- Voluntary Natural Attenuation Monitoring Network:
  - Forms an additional monitoring network not previously included.
- Hydraulic Flow Lines Monitoring Network:
  - Removal of well MB40.
  - Addition of wells: MB86U and MB86L; and proposed wells: MB89U, MB89L, MB90U and MB90L.
  - East flow line frequency decreased from yearly to once every two years.
- LNAPL Monitoring Network:
  - Now considered voluntary monitoring.
  - Field check for Dense Non-Aqueous Phase Liquids (DNAPL) have been voluntarily added to monitoring to meet community requests.
- Remaining Wells Monitoring Network:
  - Removal of total nitrogen, total kjeldahl nitrogen, ammonia and nitrate from the analytical suite.
  - Removal of datalogger monitoring.

Surface Water Monitoring:

- Surface Water Field Parameters:
    - No change.
- Surface Water Laboratory Analysis (Lab EC):
    - Addition of locations MPCL06, Upper MPC and MPCL12.
- Surface Water Laboratory Analysis (COI):
    - Reduced frequency to once every two years.
    - Removal of MPCL01A, MPCL02, MPCL04, MPCL07, MPCL13, MPCL15 and Rock Pond; and addition of Upper MPC.

Table 1.1: Changes in Monitoring Plans (from GQMP Revision 6)

Monitoring Plan	Change	Rationale
Groundwater: LNAPL monitoring	Reduction in frequency form monthly to quarterly.	Based on updated understanding of LNAPL behaviour and migration potential, quarterly gauging is considered sufficient for identifying significant changes in LNAPL thickness or distribution.
Groundwater: Moonee Ponds Creek Salinity Monitoring Network.	Removal of 'Lower' screened wells: MB46L, MB65L, MB45L and MB68L.	'Upper' screened wells are considered more representative of potential groundwater interaction with the creek. Removed 'Lower' screened wells will be retained in the 'Monee Ponds Creek Vicinity Monitoring network.
	Addition of MB66U and MB69 to monitoring network.	To provide additional coverage adjacent to (and downstream of) TCL.
Groundwater: Moonee Ponds Creek Vicinity Monitoring Network.	Removal of VOCs from the analytical suite.	VOCs assessment is proposed to be completed through the newly created Natural Attenuation Monitoring Network.
Groundwater: Natural Attenuation Monitoring Network.	New monitoring network.	Specific network to assess bio-degradation of petroleum and chlorinated hydrocarbons.

Monitoring Plan	Change	Rationale
Groundwater: Hydraulic Flow Lines Monitoring Network.	Removal of well MB40 (north flow line). Addition of wells: MB86U/MB86L (south east flow line); and proposed wells: MB89U/MB89L (east flow line) and MB90U/ MB90L (south east flow line).	Updated bore list to reflect current (and proposed) monitoring network. MB40 is located in the eastern portion of Mound 3 and therefore is not considered representative of a northern flow direction. MB40 is retained in the LNAPL monitoring networks and 'Remaining Well network'.
	Reduced east flow line monitoring frequency.	East flow line frequency now consistent with other flow lines. Monitored natural attenuation network (with a large contingent of east flow line wells) sampling frequency is yearly.
Groundwater: LNAPL Monitoring Network	Additional voluntary field check for DNAPL.	To 'reality check' conceptual understanding of dense (chlorinated) hydrocarbon behaviour within LNAPL / leachate – as requested by the Community.
Groundwater: Remaining Well Network	Removal of total nitrogen, total kjeldahl nitrogen, ammonia and nitrate from analytical suite	Coverage provided by Moonee Ponds Creek Vicinity and Flow Lines networks. Existing networks considered adequate based on conceptual site model.
	Removal of datalogger monitoring.	No monitoring frequency was specified in Revision 6 of the GQMP. Manual level monitoring as part of all groundwater sampling is considered sufficient for the site.
Surface Water Laboratory Analysis (Lab EC)	Addition of locations MCCL06, Upper MPC and MPC12.	To provide a better coverage of Monee Ponds Creek.
Surface Water Laboratory Analysis (COI)	Reduced frequency to once every 2 years.	Laboratory electric conductivity to form the primary method for assessing potential impact to Moonee Ponds Creek (via groundwater discharge). COI monitoring to increase in frequency if electric conductivity data (or groundwater monitoring between the landfill and Moonee Ponds Creek) indicates a potential increase in the risk profile (i.e. the conceptual site model changes).

Monitoring Plan	Change	Rationale
	Removal of MPCL01A, MPCL02, MPCL04, MPCL07, MPCL13, MPCL15 and Rock Pond and addition of Upper MPC	Sampling locations to target area of increased potential of discharge of landfill impacted groundwater.

QUALITY ASSURANCE AND QUALITY CONTROL REQUIREMENTS

To adequately assess the presence or significance of any data quality issues over the monitoring period, the following Quality Assurance / Quality Control (QA/QC) sampling is to be adopted:

Table1.2: QA/QC Requirements - Groundwater, Surface Water and Leachate

QC Sample	Definition	Objective	Frequency	Analysis
Duplicate	A duplicate sample of the primary sample – generally sent to the same laboratory as the primary sample	To quality check the precision and accuracy of field sampling techniques and laboratory analysis results	1 : 20 primary samples for groundwater 1 : 20 primary samples for surface water/leachate. With a minimum of 1 duplicate collected per monitoring event.	Same analysis as the primary sample
Triplicate	A triplicate sample of the primary sample – generally sent to a secondary laboratory	To quality check the precision and accuracy of field sampling techniques and laboratory analysis results	1 : 40 primary samples for groundwater 1 : 40 primary samples for surface water/leachate With a minimum of 1 triplicate collected per monitoring event.	Same analysis as the primary sample
Equipment rinsate blank	A sample of deionised water used to rinse the sampling equipment between the decontamination and sampling steps	To quality check field equipment decontamination procedures	1 sample per event	Same analysis as per primary sample analysis.
Field blank	A sample of analyte free water poured into the container in the field, preserved and shipped to laboratory with field samples	To assess contamination from field conditions during sampling	1 per analytical batch	Same metals and volatile component of primary sample analysis
Trip Blank	A laboratory prepared sample of deionised water to accompany primary samples during transit.	To assess cross contamination of volatile compounds during transit.	1 per analytical batch where volatile compounds are included in primary analysis.	Volatile component of primary sample analysis.

If you require additional information or clarification, please contact the undersigned at (03) 9907 6000.

Sincerely,

Kleinfelder Australia Pty Ltd

Mark Walker
Senior Scientist

Tim Russell
Senior Principal

ATTACHMENTS

Figures

Figure 1: LNAPL Distribution and Quarterly Monitoring Bores
Figure 2: Moonee Ponds Creek – Salinity Monitoring Network
Figure 3: Moonee Ponds Creek – Vicinity Monitoring Network
Figure 4: Monitored Natural Attenuation Monitoring Network
Figure 5: Hydraulic Flow Lines Monitoring Network
Figure 6: LNAPL Monitoring Network
Figure 7: Remaining Wells Monitoring Network
Figure 8: Minimum Sampling Interval
Figure 9: Surface Water Field Parameters
Figure 10: Surface Water Laboratory Analysis (Lab EC)
Figure 11: Surface Water Laboratory Analysis (COI)

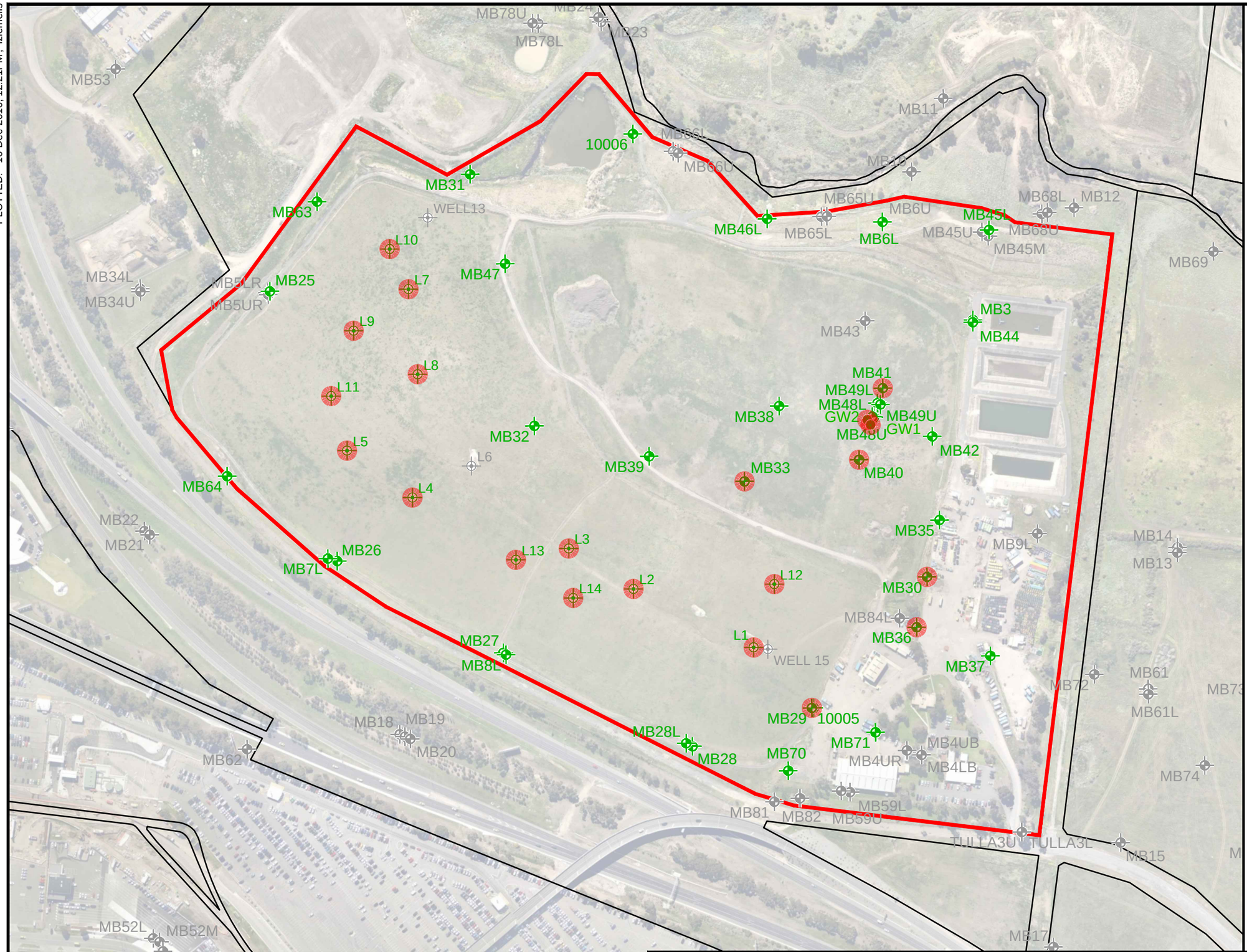
Tables

Table 1: Groundwater Sampling Parameters and Frequency
Table 2: Surface Water Sampling Parameters and Frequency
Table 3: Monitoring Regime

FIGURES

PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis LAYOUT: 1

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"
CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures
MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- PUMP TRIAL WELLS
- BORES FOR QUARTERLY FIELD MONITORING
- LNAPL PRESENT IN WELL

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

SCALE 1:3500 (A3) METRES
0 35 70 105 140 175

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	21.06.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

LNAPL DISTRIBUTION AND MONTHLY MONITORING BORES

TULLAMARINE CLOSED LANDFILL
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE
1

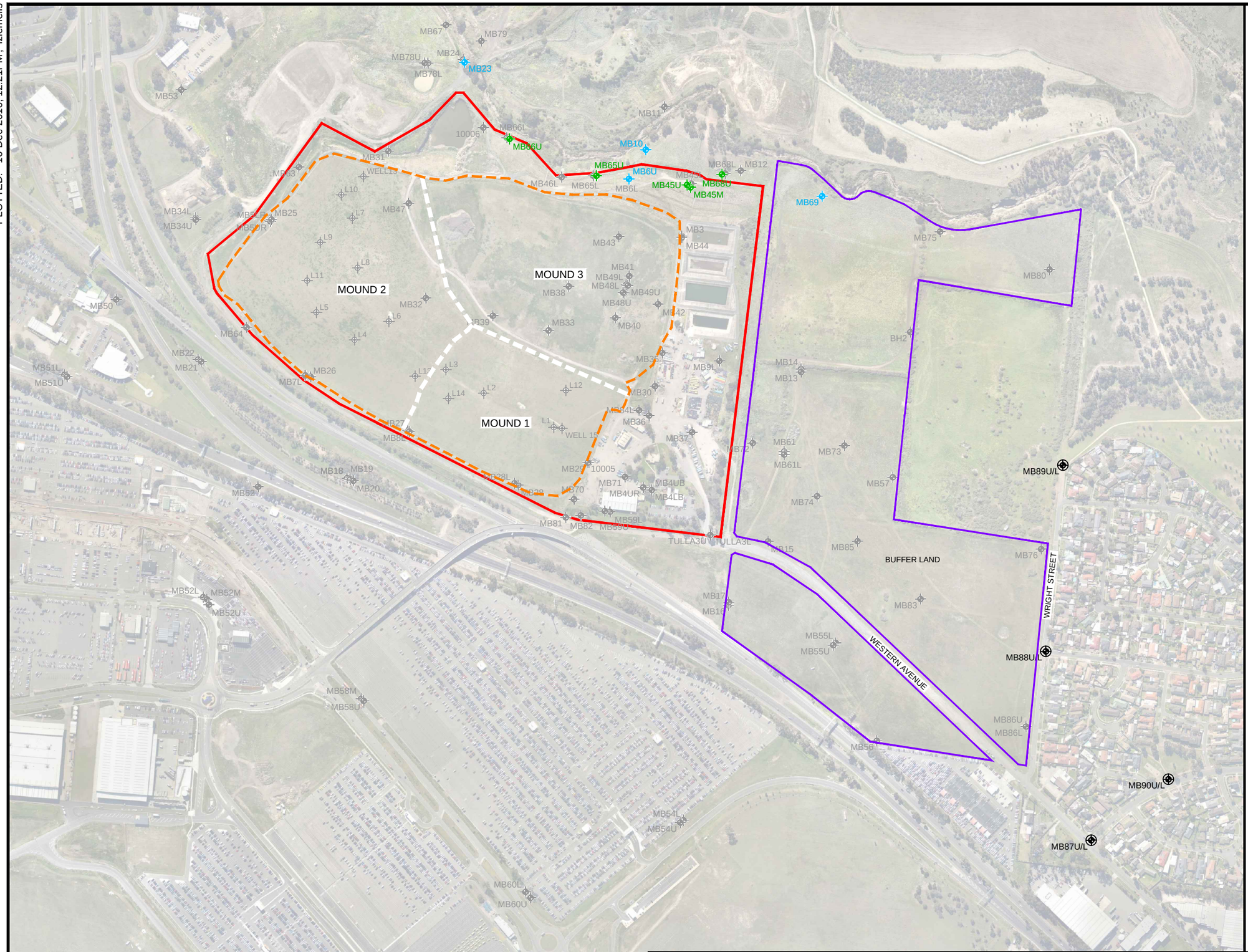
PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis

LAYOUT: 2

CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"

MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED QUARTERLY
- MONITORED SIX MONTHLY

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

N

0 60 120 180 240 300

SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

MOONEE PONDS CREEK - SALINITY MONITORING NETWORK

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE 2

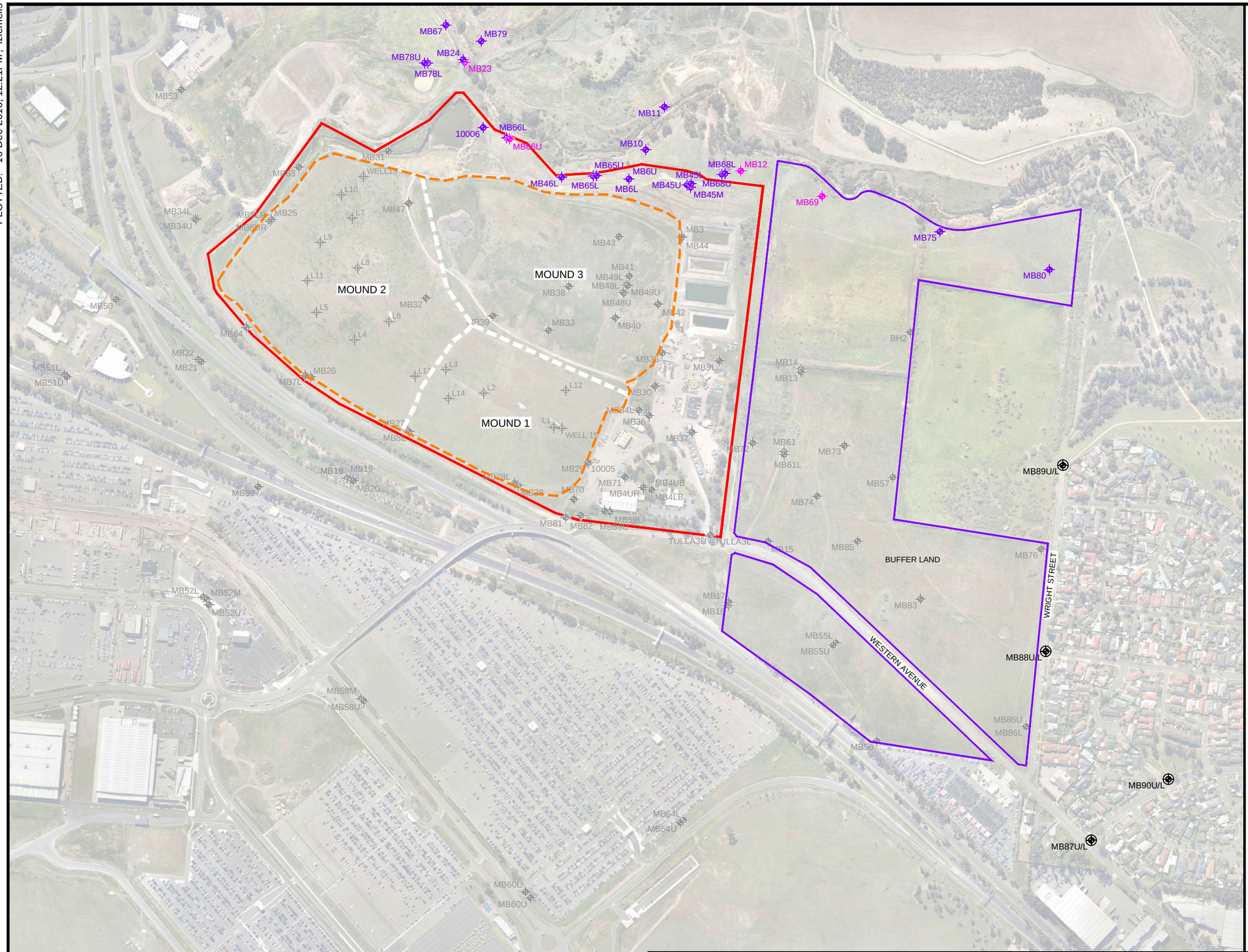
PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis

LAYOUT: 3

CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"

MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED YEARLY
- MONITORED EVERY 2 YEARS

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 60 120 180 240 300

SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

MOONEE PONDS CREEK - VICINITY MONITORING NETWORK

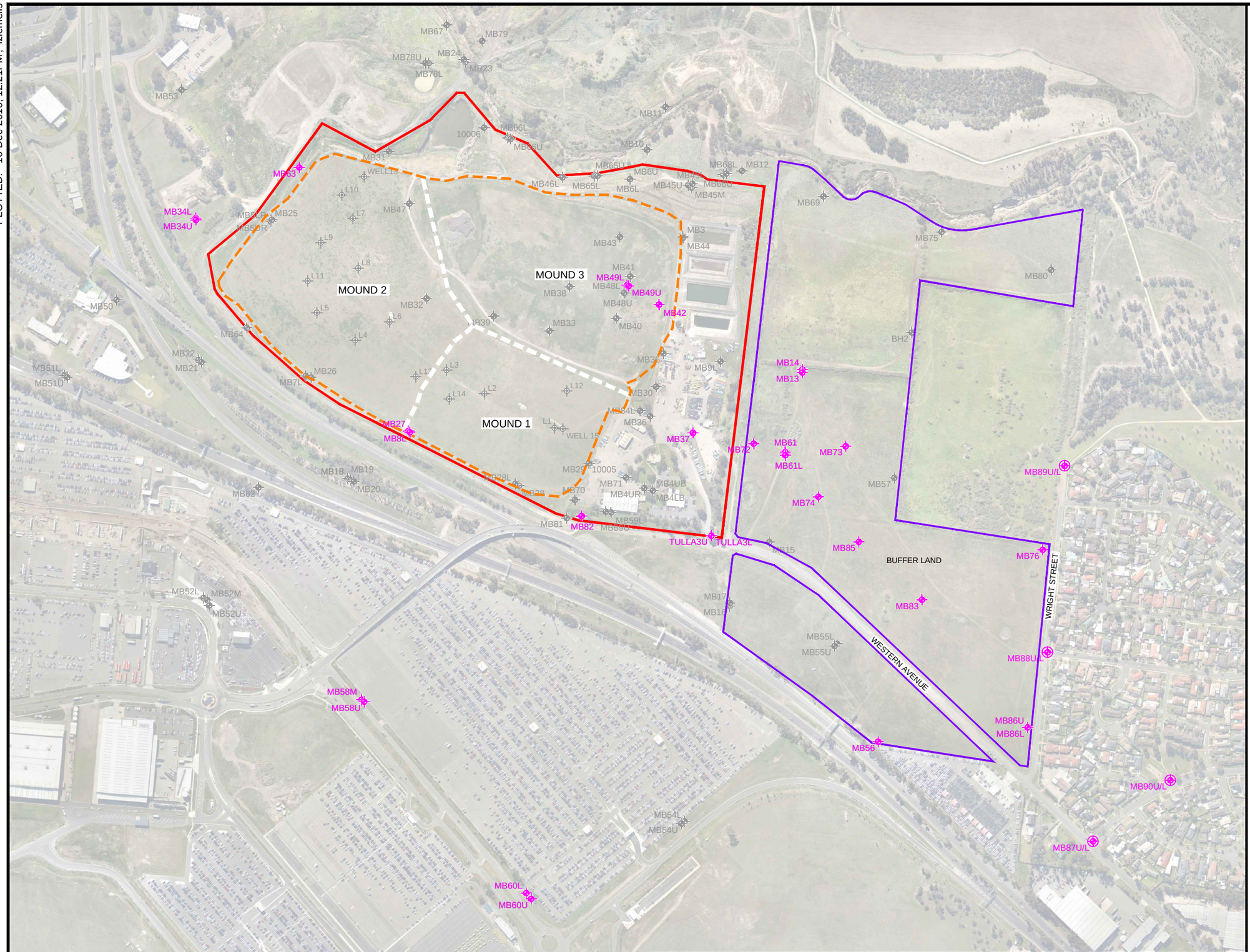
TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE

3

PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis LAYOUT: 4

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"
CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172\0143795.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures
MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED YEARLY

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

N

0 60 120 180 240 300
SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

MONITORED NATURAL ATTENUATION MONITORING NETWORK

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE
4

PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis

LAYOUT: 5

CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172\20143795.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"

MELBOURNE, AU

MOUND 1

MOUND 2

MOUND 3

BUFFER LAND

WESTERN AVENUE

WRIGHT STREET

MB67 MB79 MB78U MB24 MB23 MB78L MB53 MB11 MB66L 10006 MB66U MB10 MB31 WELL13 MB63 MB65U1 MB68L MB12 MB6U MB46L MB65L MB6L MB45U MB66U MB45M MB69 L10 L7 MB47 MB34L MB34U MB50R MB25 MB3 MB44 MB43 MB75 L9 L8 MB41 MB80 L11 MB49L MB48L MB38 MB49U MB50 MB48U MB42 MB32 L5 L6 MB39 MB33 MB40 BH2 MB64 L4 MB22 MB21 MB35 MB9L MB14 MB51L MB51U MB26 MB7L L12 L3 MB13 L14 L2 L12 MB30 MB34L MB27 MB8L MB36 L1 WELL 15 MB37 MB72 MB61 MB73 MB61L MB18 MB19 MB29 10005 MB89U/L MB28L MB71 MB4UB MB57 MB62 MB20 MB28 MB70 MB4UR MB4LB MB74 MB81 MB82 MB59U MB59L TULLA3U TULLA3L MB15 MB85 MB76 MB52L MB52M MB52U MB17 MB16 MB83 MB55L MB55U MB88U/L MB58M MB58U MB86U MB86L MB56 MB90U/L MB54L MB54U MB87U/L MB60L MB60U

LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED EVERY2 YEARS

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

N

0 60 120 180 240 300

SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

HYDRAULIC FLOW LINES MONITORING NETWORK

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE

5

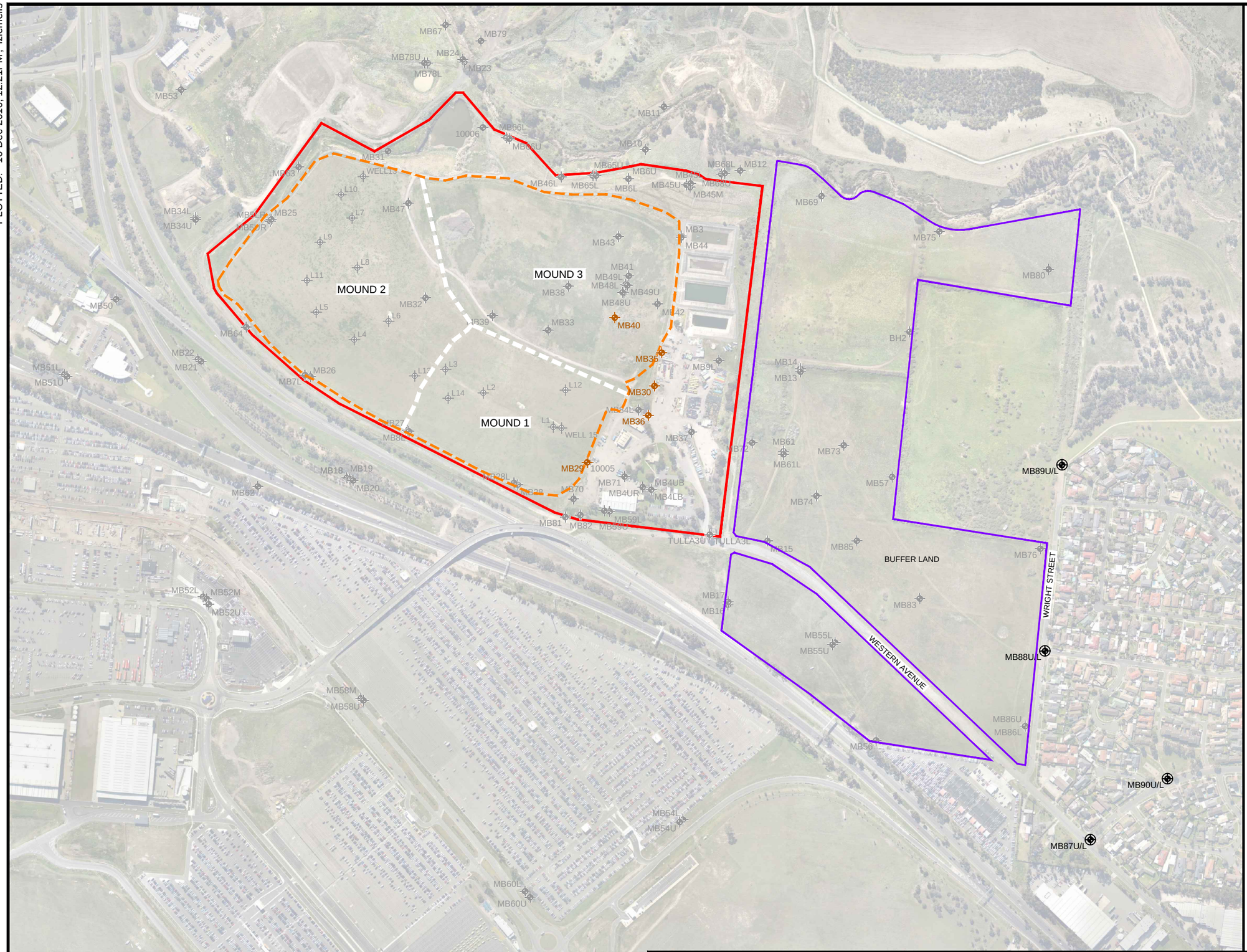
PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis

LAYOUT: 6

CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"

MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED EVERY 3 YEARS

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 60 120 180 240 300

SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

LNAPL MONITORING NETWORK

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

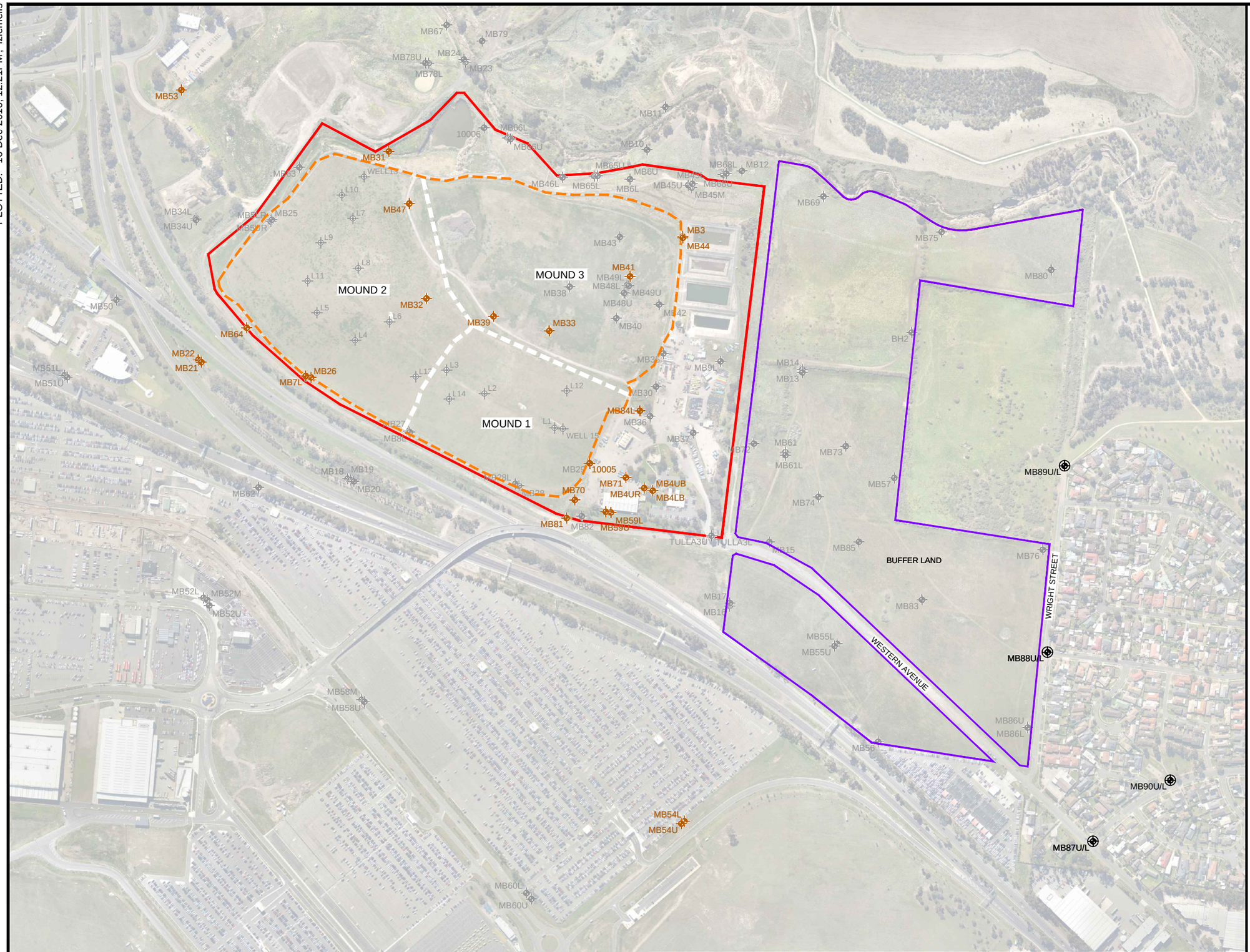
FIGURE

6

PLOTTED: 16-Dec-2016, 12:21PM , Iziemelis

LAYOUT: 7

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"
CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172\20143795.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures
MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED EVERY 3 YEARS

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

N

0 60 120 180 240 300
SCALE 1:6000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

REMAINING MONITORING NETWORK

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE 7

PLOTTED: 16-Dec-2016, 12:21PM , Iziemelis

LAYOUT: 8

CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"

MELBOURNE, AU

MB67 MB79 MB78U MB24 MB23 MB78L MB53 MB11 10006 MB66L MB66U MB10 MB31 MB63 WELL13 MB65U MB6U MB68L MB12 MB46L MB65L MB6L MB45U MB68U MB45M MB69 MB34L MB34U MB52R MB25 MB47 MB3 MB44 MB43 MB75 L10 L7 L9 L8 L11 MB41 MB49L MB48L MB49U MB80 MOUND 3 MOUND 2 MB38 MB48U MB42 MB50 MB32 MB39 MB33 MB40 L5 L6 L4 MB64 BH2 MB22 MB21 MB35 MB9L MB14 MB51L MB51U MB26 MB7L L12 L3 L2 L14 MB13 MB30 MB84L MB36 MB27 MB8L MOUND 1 L1 WELL 15 MB37 MB72 MB61 MB73 MB61L MB89U/L MB18 MB19 MB29 10005 MB71 MB4UB MB28L MB70 MB4UR MB4LB MB57 MB62 MB20 MB28 MB74 MB81 MB82 MB59L MB59U TULLA3U TULLA3L MB15 MB85 BUFFER LAND MB76 MB17 MB16 MB83 WRIGHT STREET MB55L MB55U WESTERN AVENUE MB88U/L MB52L MB52M MB52U MB86U MB86L MB58M MB58U MB56 MB90U/L MB54L MB54U MB87U/L MB60L MB60U

LEGEND

- SITE BOUNDARY
- 140-202 WESTERN AVE. BOUNDARY
- LANDFILL CAP BOUNDARY
- MONITORING WELL
- LEACHATE EXTRACTION WELL
- 2016 INSTALLED GROUNDWATER MONITORING WELL
- MONITORED QUARTERLY
- MONITORED SIX MONTHLY
- MONITORED YEARLY
- MONITORED EVERY 2 YEARS
- MONITORED EVERY 3 YEARS

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 60 120 180 240 300

SCALE 1:6000 (A3) METRES

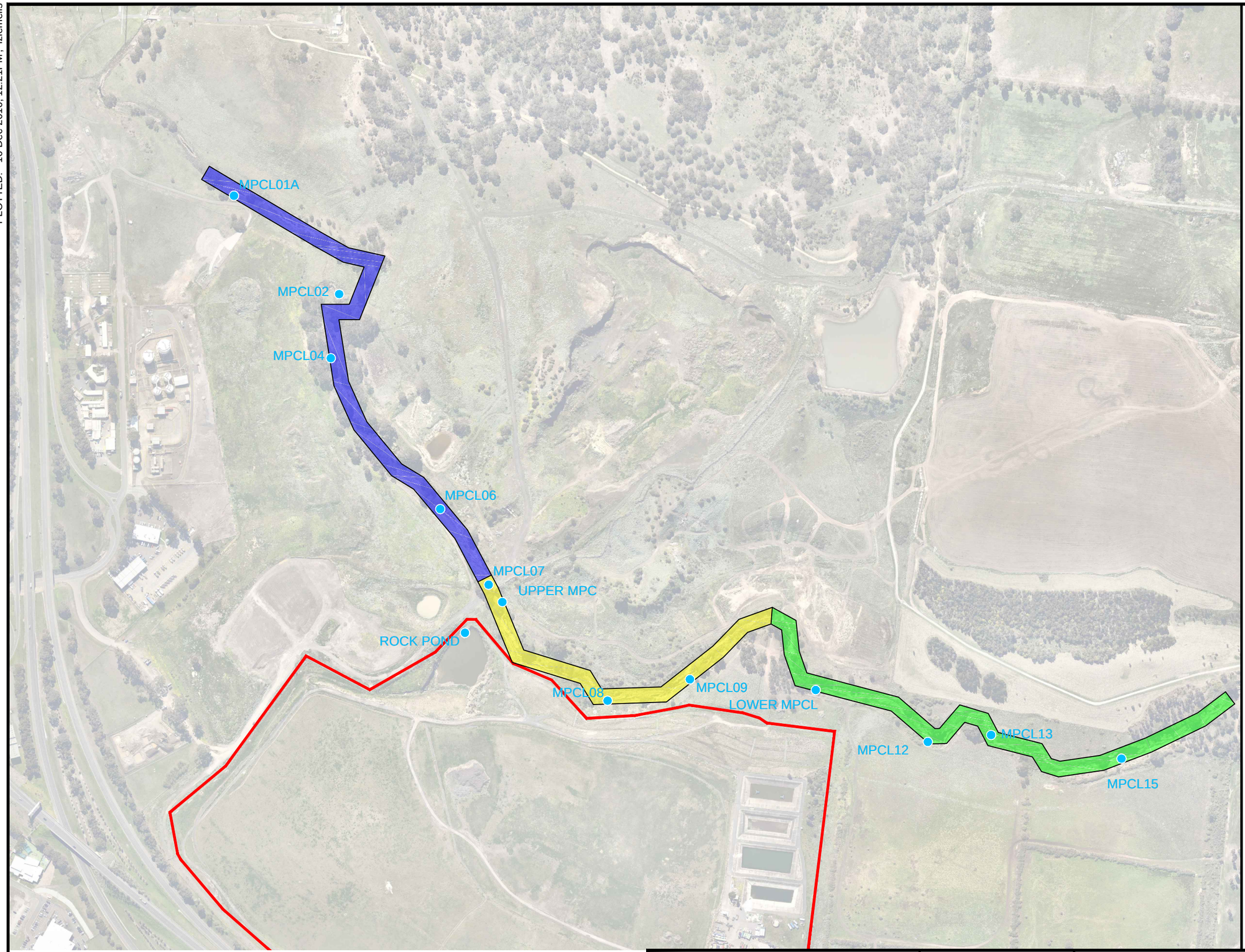
KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20162414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

MINIMUM SAMPLING INTERVAL

TCL TULLAMARINE
MONITORING WELL INSTALLATION
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE 8



LEGEND

- SITE BOUNDARY
- SURFACE WATER SAMPLING LOCATIONS
- ZONE 1
- ZONE 2
- ZONE 3
- MONITORED QUARTERLY

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 50 100 150 200 250
SCALE 1:5000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20142414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

SURFACE WATER FIELD PARAMETERS

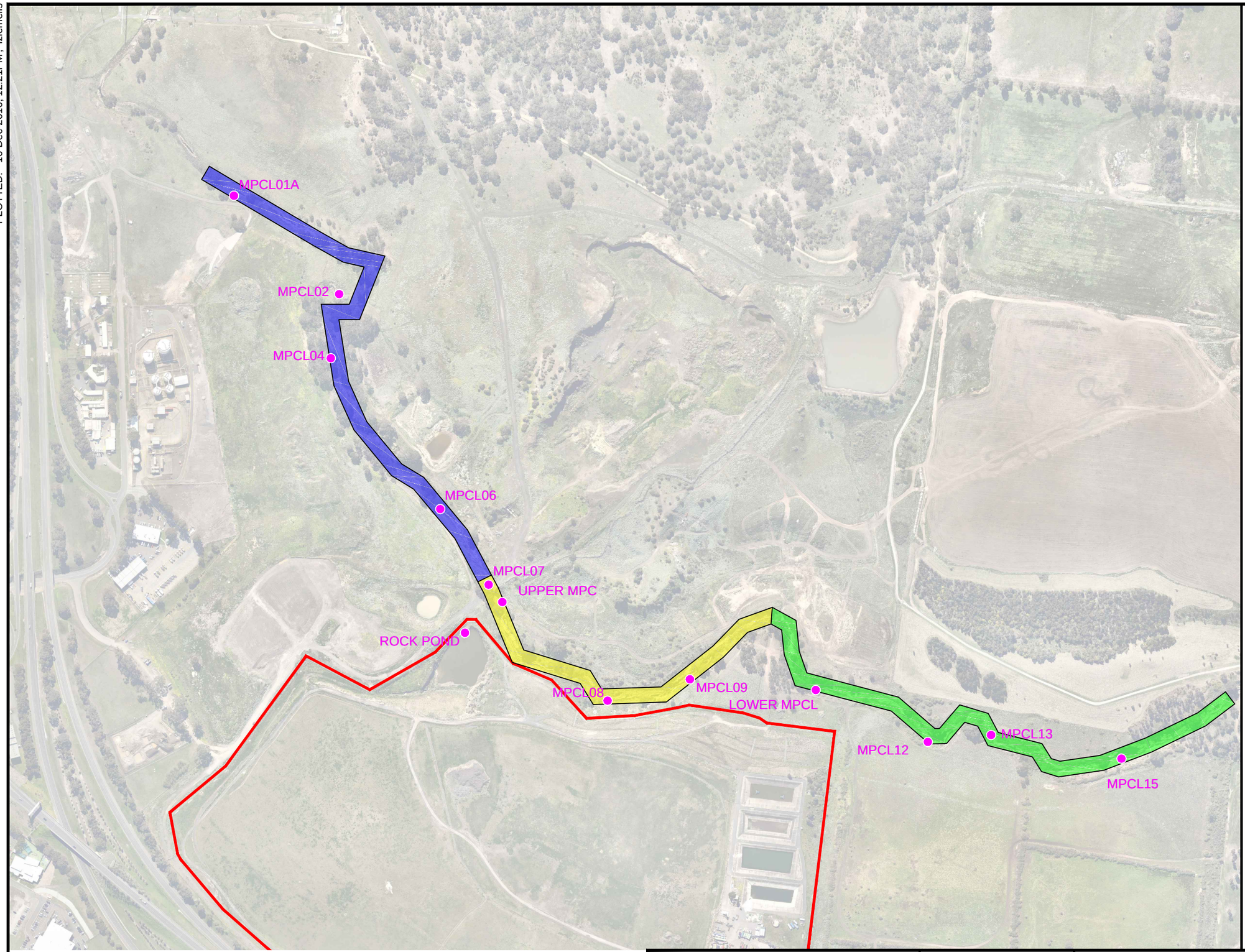
2014 TECHNICAL REPORT FOR AUDITOR REVIEW
TULLAMARINE CLOSED LANDFILL
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE
9

PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis

LAYOUT: 10

ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"
CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\20172014379S.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures
MELBOURNE, AU



LEGEND

- SITE BOUNDARY
- SURFACE WATER SAMPLING LOCATIONS
- ZONE 1
- ZONE 2
- ZONE 3
- MONITORED YEARLY

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 50 100 150 200 250
SCALE 1:5000 (A3) METRES

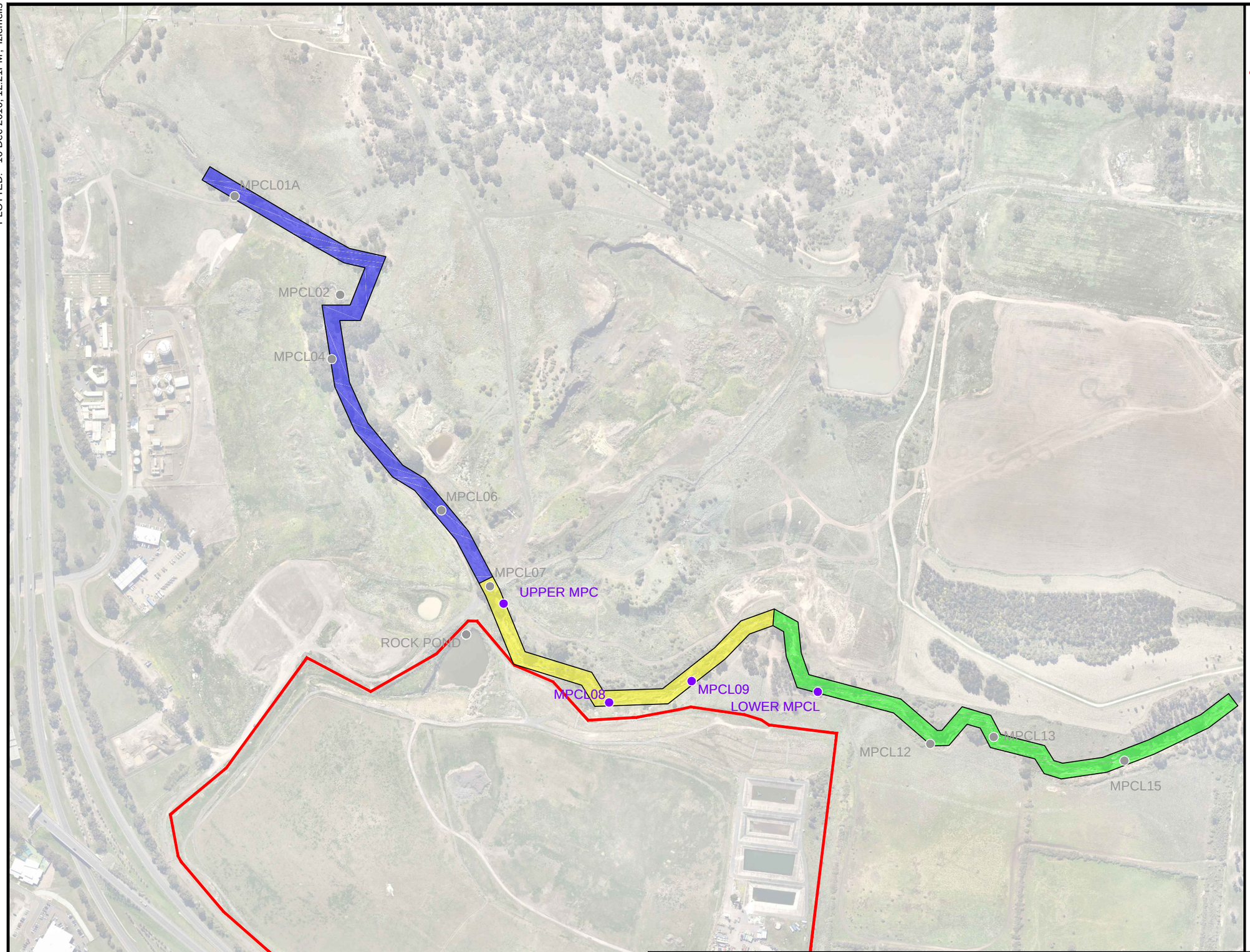
KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20142414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

SURFACE WATER LABORATORY ANALYSIS (LAB EC)

2014 TECHNICAL REPORT FOR AUDITOR REVIEW
TULLAMARINE CLOSED LANDFILL
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE
10



LEGEND

- SITE BOUNDARY
- SURFACE WATER SAMPLING LOCATIONS
- ZONE 1
- ZONE 2
- ZONE 3
- MONITORED EVERY 2 YEARS

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m).

0 50 100 150 200 250
SCALE 1:5000 (A3) METRES

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT:	20142414.001A
DATE DRAWN:	13.09.16
DRAWN BY:	LZ
CHECKED BY:	MW
FILE NAME:	20162414.001A.dwg

SURFACE WATER
LABORATORY ANALYSIS
(COI)

2014 TECHNICAL REPORT FOR AUDITOR REVIEW
TULLAMARINE CLOSED LANDFILL
WESTERN AVENUE
WESTMEADOWS, VICTORIA

FIGURE
11

PLOTTED: 16-Dec-2016, 12:21PM, Iziemelis LAYOUT: 11
ATTACHED IMAGES: "1-1.jpg" "golder base.jpg" "north.jpg" "site2.jpg"
CAD FILE: \\melbourne.kleinfelder.com\Melbourne-Data\Data\09_Projects\DELTEK Projects\Regular\2017\20143795.001A Cleanaway Tulla Landfill\GQMP\Draft\GQMP Figures
MELBOURNE, AU

TABLES

Table 1
Groundwater Sampling Parameters and Frequency
Tullamarine Closed Landfill

Minimum Interval between Sampling (years)

Bore ID	TDS	EC	Total Nitrogen	TKN	Ammonia	Nitrate	VOCs	Metals	Cyanide	Anions and Cations	BTEXN	TRH (NEPM)	Ethene / Ethane	Nirate / Nitrite	Manganese	Ferric/Ferrous	Sulphate	Methane	Phenols	PAH	Folmaldehyde	Field L/DNAPL Check
10005	3	3					3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
10006	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
10010	3	3					3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
BH2	2	2	2	2	2	1	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
GW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25
GW2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25
MB3	3	3	3	3	3	3	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB8L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB9L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB10	0.25; 2.0	0.25; 2.0	2	2	2	2	3	2	3	0.25; 2.0	-	-	-	-	-	-	-	-	3	3	3	3
MB11	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB12	1	1	1	1	1	1	3	1	3	1	-	-	-	-	-	-	-	-	3	3	3	3
MB13	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB14	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB15	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB16	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB17	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB18	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB19	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB20	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB21	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB22	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB23	0.25; 1.0	0.25; 1.0	1	1	1	1	3	1	3	0.25; 1.0	-	-	-	-	-	-	-	-	3	3	3	3
MB24	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB25	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB26	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB27	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB28	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB28L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB29	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB30	2	2	2	2	2	2	1	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB31	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB32	3	33	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25
MB34L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB34U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB35	3	3	-	-	-	-	1	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB36	2	2	2	2	2	2	1	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB37	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB38	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB39	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB40	3	3	-	-	-	-	1	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.25
MB42	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB43	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB44	3	3	-	-	-		3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB45L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB45M	0.5; 2	0.5; 2	2	2	2	2	3	2	3	0.5; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB45U	0.5; 2	0.5; 2	2	2	2	2	3	2	3	0.5; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB46L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB47	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB48L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB48U	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB49L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB49U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB4LB	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB4UB	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB4UR	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB50	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB51L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB51U	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB52U	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB52M	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB52L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB53	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB54L	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB54U	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB55L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB55U	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB56	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB57	2	2	2	2	2	2	3	2	3	2									3	3	3	3
MB58M	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1

Table 1
Groundwater Sampling Parameters and Frequency
Tullamarine Closed Landfill

Minimum Interval between Sampling (years)

Bore ID	TDS	EC	Total Nitrogen	TKN	Ammonia	Nitrate	VOCs	Metals	Cyanide	Anions and Cations	BTEXN	TRH (NEPM)	Ethene / Ethane	Nirate / Nitrite	Manganese	Ferric/Ferrous	Sulphate	Methane	Phenols	PAH	Folmaldehyde	Field L/DNAPL Check
MB58U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB59L	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB59U	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB5LR	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB5UR	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB60L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB60U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB61	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB61L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB62	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB63	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	0.25
MB64	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB65L	2	2	-	-	-	-	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB65U	0.5; 2	0.5; 2	2	2	2	2	3	2	3	0.5; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB66L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB66U	0.5; 2	0.5; 2	1	1	1	1	3	2	3	0.5; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB67	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB68L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB68U	0.5;2	0.5;2	2	2	2	2	3	2	3	0.5;2	-	-	-	-	-	-	-	-	3	3	3	3
MB69	0.25; 2	0.25; 2	1	1	1	1	3	2	3	0.25; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB6L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	0.25
MB6U	0.25; 2	0.25; 2	2	2	2	2	3	2	3	0.25; 2	-	-	-	-	-	-	-	-	3	3	3	3
MB70	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB71	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB72	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB73	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB74	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB75	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB76	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB78L	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB78U	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB79	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB7L	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	0.25
MB80	2	2	2	2	2	2	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
MB81	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB82	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB83	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB84L	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
MB85	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB86L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB86U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB8L	2	2	-	-	-	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	0.25
MB9L	2	2	-	-	-	-	3	2	3	2	-	-	-	-	-	-	-	-	3	3	3	3
P3	3	3	-	-	-	-	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	3
TULLA3L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
TULLA3U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB87U	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB87L	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB89U	3	3	2	2	2	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB89L	3	3	2	2	2	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB88U	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB88L	3	3	-	-	-	1	1	3	3	3	1	1	1	1	1	1	1	1	3	3	3	1
MB90U	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1
MB90L	2	2	2	2	2	1	1	2	3	2	1	1	1	1	1	1	1	1	3	3	3	1

Table 2
Surface Water Sampling Parameters and Frequency
Tullamarine Closed Landfill

MPC Interval between sampling (years)

Location	Barium	Cobalt	Copper	Manganese (total)	Nickel	Zinc	EC and TDS (lab)	Cations / Anions	Field Parameters (including EC)
MPCLO1A	-	-	-	-	-	-	1	-	0.25
MPCL02	-	-	-	-	-	-	1	-	0.25
MPCL04	-	-	-	-	-	-	1	-	0.25
MPCL06	-	-	-	-	-	-	1	-	0.25
MPCL07	-	-	-	-	-	-	1	-	0.25
UPPER MPC	2	2	2	2	2	2	1	2	0.25
MPCL08	2	2	2	2	2	2	1	2	0.25
MPCL09	2	2	2	2	2	2	1	2	0.25
LOWER MPCL	2	2	2	2	2	2	1	2	0.25
MPCL12	-	-	-	-	-	-	1	-	0.25
MPCL13	-	-	-	-	-	-	1	-	0.25
MPCL15	-	-	-	-	-	-	1	-	0.25
ROCK POND	-	-	-	-	-	-	1	-	0.25

Two samples to be collected from each location during sampling events: one from base of stream and one from water surface.
Sampling interval may be decreased based on Field EC and/or Lab EC results.
Yearly Lab EC to be collected during summer months.

Table 3
Monitoring Regime
Tullamarine Closed Landfill

Monitoring Regime	2017												2018											
	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Groundwater Monitoring:												Commence 2018 TRAR	Commence 2018 TRAR											
LNAPL Gauging																								
Moonee Ponds Creek - Salinity Monitoring Network		All Wells			Quarterly wells only			All Wells			Quarterly wells only			All Wells			Quarterly wells only			All Wells			Quarterly wells only	
Moonee Ponds Creek - Vicinity Monitoring Network			All Wells												Annual Wells Only									
Natural Attenuation Monitoring																								
Hydraulic Flow Lines Monitoring																								
LNAPL Monitoring Network - Laboratory Analysis																All LNAPL containing wells								
Remaining Wells Monitoring																								
Surface Water Monitoring:																								
Field Parameters																								
Stream Reconnaissance																								
Laboratory Analysis - EC																								
Laboratory Analysis - COI																								
High Spatial Resolution Salinity Study																								
Biota Sampling																								
Fogs																								
Macroinvertebrate																								

Notes:

Where a monitoring well is included in multiple monitoring regiemes with differeing monitoring frequencies, it may be appropriate to consolidate sampling into single events as long as the sampling frequency provided in Table 1 is not exceeded.

Table 3
Monitoring Regime
Tullamarine Closed Landfill

Monitoring Regime	2019												2020											
	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Groundwater Monitoring:						2018 / 2019 Annual Groundwater Review												2019 / 2020 Annual Groundwater Review						
LNAPL Gauging																								
Moonee Ponds Creek - Salinity Monitoring Network		All Wells			Quarterly wells only			All Wells			Quarterly wells only			All Wells			Quarterly wells only			All Wells			Quarterly wells only	
Moonee Ponds Creek - Vicinity Monitoring Network			All Wells												Annual Wells Only									
Natural Attenuation Monitoring																								
Hydraulic Flow Lines Monitoring																								
LNAPL Monitoring Network - Laboratory Analysis																								
Remaining Wells Monitoring																								
Surface Water Monitoring:																								
Field Parameters																								
Stream Reconnaissance																								
Laboratory Analysis - EC																								
Laboratory Analysis - COI																								
High Spatial Resolution Salinity Study																								
Biota Sampling																								
Fogs																								
Macroinvertebrate																								

Table 3
Monitoring Regime
Tullamarine Closed Landfill

Monitoring Regime	2021												2022
	January	February	March	April	May	June	July	August	September	October	November	December	January
Groundwater Monitoring:						2020 / 2021 Annual Groundwater Review						Commence 2022 TRAR	
LNAPL Gauging													
Moonee Ponds Creek - Salinity Monitoring Network		All Wells			Quarterly wells only			All Wells			Quarterly wells only		
Moonee Ponds Creek - Vicinity Monitoring Network			All Wells										
Natural Attenuation Monitoring													
Hydraulic Flow Lines Monitoring													
LNAPL Monitoring Network - Laboratory Analysis				All LNAPL containing wells									
Remaining Wells Monitoring													
Surface Water Monitoring:													
Field Parameters													
Stream Reconnaissance													
Laboratory Analysis - EC													
Laboratory Analysis - COI													
High Spatial Resolution Salinity Study													
Biota Sampling													
Fogs													
Macroinvertebrate													