# SOLDER

#### REPORT

# Leachate Storage Pond (LP03), Shoal Bay Waste Management Facility, Darwin, Northern Territory

Manufacturers Data Report

Submitted to:

City of Darwin GPO Box 84 Darwin NT 0801

Submitted by:

#### WSP Australia Pty Ltd

Level 12, 900 Ann Street. Fortitude Valley, QLD, 4006, Australia

+61 7 3854 6200

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# **Record of Issue**

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#### **1.0 INTRODUCTION AND BACKGROUND**

The City of Darwin Council (Council) manages and operates the Shoal Bay Waste Management Facility (SBWMF), located in Darwin, Northern Territory. The SBWMF operates as the sole waste landfill for Darwin, Litchfield and Palmerston Councils and receives over 180,000 tons of waste materials per annum.

Council commissioned WSP Australia Pty Ltd (WSP Golder) as the Principal Consultant/Contractor (PC) to design and construct a 15ML, geosynthetic lined and covered leachate storage pond (LP03) at the SBWMF. The floating geosynthetic cover on LP03 was designed and installed by Fabtech Australia Pty Ltd as the nominated sub- consultant and geosynthetic installer, under the management and direction of the PC.

Existing ponds LP01 & LP02 receive and store untreated leachate from the landfill areas within SBWMF. The untreated leached from LP01 & LP02 is pumped into the leachate treatment plant located to the West of these ponds. LP03 is intended to store treated leachate supplied from the leachate treatment plant. LP03 might also be used to store untreated leachate generated from the landfills if the demand for future storage capacity at the SBWMF increases.

This Manufacturers Data Report (MDR) presents a summary of the construction, geosynthetic lining works and the construction quality assurance (CQA) activities undertaken and associated with LP03. The MDR shall be read in conjunction with the Technical Specification and Design Drawings of LP03.

#### 1.1 Location

LP03 is located within the boundaries of the SBWMF and to the north of the existing leachate ponds (LP01 & LP02), please see Figure 1 below.



Figure 1: LP03 Located to the north of the existing ponds.

#### 1.2 **Definitions**

The key parties and terms referred to in this MDR are described in Table 1.

#### Table 1: Definitions

| Party / Term  | Description   |
|---|---|
| Principal   | City of Darwin  |
| Contractor  | WSP Australia Pty Ltd (WSP Golder).<br>Company that was responsible for the construction of the Works including<br>management of subcontractors.  |
| Sub-Contractor (Civils)                                 | East Arm Civils (EAC)   |
| Geosynthetics Installer                                 | Fabtech Australia   |
| Site  | Area of the North of the current Leachate Ponds located to the north of the Landfill Site, as shown on Drawing D002 and D003.   |
| Landfill Site   | Shoal Bay Waste Management Facility, Darwin, Northern Territory, as shown on Drawing D001.  |
| Works   | All works described in this MDR the Specification and Drawings.   |
| Superintendent  | Individual appointed by Principal to act as the Principal's Authorised Person.  |
| Geotechnical Inspection and<br>Testing Authority (GITA) | Was engaged by the Client to undertake inspection of Unit 1 Engineered Fill<br>and Unit 2 Select Fill and inspection of Unit 10 BGM, Unit 11 Geonet and<br>Unit 12 HDPE Geomembrane indicated in the Specification, and to provide<br>an opinion on the compliance of the works with the Specification and<br>Construction Quality Assurance (CQA) Plan.<br>The GITA was on Site on a full-time basis when works for which they are<br>engaged to inspect was being undertaken. |
| Geotechnical Testing<br>Authority (GTA)                 | Coffey Testing, was engaged by the Contractor and approved by the<br>Superintendent to undertake quality assurance testing of Unit 1 Engineered<br>Fill, Unit 2 Select Fill, Unit 4 Subgrade Drainage Aggregate, Unit 5 Sump<br>Drainage Aggregate and Unit 7 Riprap as indicated in the Specification.   |
| NATA Laboratory   | National Association of Testing Authorities (NATA) accredited geotechnical testing laboratory appointed by the Contractor and approved by the Superintendent to undertake independent testing of earthworks and construction materials for Unit 1 Engineered Fill, Unit 2 Select Fill, Unit 4 Subgrade Drainage Aggregate, Unit 5 Sump Drainage Aggregate and Unit 7 Riprap   |
| Specification   | Technical Specification, Design Drawings and any subsequent amendments.   |
| Drawings  | Design drawings issued for construction.  |

#### 2.0 SUMMARY OF CONSTRUCTION ACTIVITIES

The work undertaken was for the construction of one 15 ML geosynthetic lined and covered leachate storage pond (LP03) at the SBWMF. Please see Table 2 below for a summary of the works completed. Construction photographs of the activities described below are presented in Appendix A.

#### Table 2: Works Summary

| Works Part                     | Summary of work  |
|--------------------------------|--|
| Planning and<br>Preparation    | Prepared and implemented Works control measures:<br>Workplace health, safety and environmental management planning.<br>Construction programs.<br>Construction management plans.<br>Construction method statements.<br>Supply and setup site management infrastructure, including access roads, signage,<br>traffic management, Contractor's facilities, erosion and sediment control and surface<br>water management.  |
| Surface water<br>diversion     | Construction of the diversion drain along western toe of the pond to collect runoff<br>from the catchment west of the pond and drain to the north around the pond.<br>Construction of the swale drain along southern toe of pond to collect runoff from the<br>catchment south of the pond and drain to the east around the pond.  |
| Bulk Earthworks                | Prepared subgrade surface:<br>Cleared and grubbed work area, including removal of vegetation and topsoil.<br>Stripped granular laterite soils and sand lenses to expose acceptable embankment<br>foundation materials.<br>Excavation to grades and levels indicated on the drawings.<br>Proof rolling exposed surfaces prior to fill placement.<br>Stockpiled excavated materials by material type for re-use.<br>Constructed perimeter embankments and access ramps:<br>Constructed access ramps as was approved by Superintendent with consideration of<br>access track location.<br>Constructed perimeter embankments with Unit 1 Engineered Fill in accordance with<br>the Drawings.<br>Proof rolled subgrade surface. |
| Groundwater<br>Drainage System | <ul> <li>Excavated groundwater drainage trenches to the lines and levels shown on the drawings.</li> <li>Construction of the groundwater drainage system:</li> <li>Placed Unit 9 Separation Geotextile, Unit 15 Groundwater Collection Pipe and Unit 4 Subgrade Drainage Aggregate in groundwater drainage trenches.</li> <li>Placed Unit 21 Geocomposite Drain on the internal excavated batters and tied into the groundwater drainage trenches.</li> <li>Construction of the gravel groundwater drainage blanket with Unit 9 Separation Geotextile and Unit 4 Subgrade Drainage Aggregate.</li> </ul>   |
| Emergency<br>overflow system   | Excavated trench for overflow weir box and Unit 19 Overflow Pipe.<br>Constructed concrete overflow weir box, FRP Grate and Unit 19 Overflow Pipe<br>connection.<br>Backfilled pipe with Unit 6 Cement Stabilised Sand.   |
| External batter protection     | Placed Unit 3 Topsoil and Unit 14 Erosion Protection on areas indicated in the Drawings.   |
| Secondary Liner                | Construction of the pond liners:<br>Placed 200 mm thick Unit 2 Select Fill, overlain by Unit 10 BGM, Unit 11 Geonet and<br>Unit 12 HDPE Geomembrane.   |
| Leakage<br>Collection System   | Installation of Unit 11 Geonet:<br>Constructed Leakage collection sump and riser:<br>Installed Unit 17 Riser Pipe with end caps.   |

| Works Part                               | Summary of work  |
|--|--|
|  | Placed Unit 5 Sump Drainage Aggregate and Unit 13 Cushion Geotextile over the Unit 17 Riser Pipe in accordance with the Drawings.  |
| Primary Liner                            | Installed Unit 12 HDPE Geomembrane.  |
| Leachate<br>Extraction Sump<br>and Riser | Construction of the pond sumps and risers:<br>Constructed concrete slabs and headwall for Unit 17 Riser Pipe placement at the<br>crest of embankments.<br>Placed Unit 13 Cushion Geotextile over Unit 12 HDPE Geomembrane on the internal<br>batter and in the sump along the alignment of the Unit 17 Riser Pipe.<br>Installed Unit 17 Riser Pipe with end caps.<br>Placed Unit 5 Sump Drainage Aggregate over the Unit 17 Riser Pipe in accordance<br>with the Drawings. Placed the riser pipe in the pre-cast concrete box. |
| Anchor Trench                            | Secured Unit 10 BGM, Unit 11 Geonet and Unit 12 HDPE Geomembrane in the anchor trenches. Backfilling of the anchor trenches using Unit 6 Cement Stabilised Sand.   |
| External Spillway                        | Constructed the external spillway which included the spillway, chute, dissipation<br>basin and channel.<br>Constructed concrete slab.<br>Placed Unit 7 Rip Rap over Unit 9 Separation Geotextile in the external spillway.<br>Placed rock mattress as part of dissipation basin.   |
| Leachate Inlet<br>pipe                   | Installed the leachate inlet pipe:<br>Constructed concrete footing and headwall for connection with leachate inlet pipe.<br>Installed Unit 13 Cushion Geotextile.<br>Installed the leachate inlet pipe with Stabilised sand cover.   |
| Floating Cover                           | Install LLDPE Geomembrane and fix to headwalls.  |
| Crest access                             | Constructed crest access:<br>Place and compact Unit 8 Pavement Material.<br>Installed post and chain marker fence.   |

#### 2.1 Construction Program

Refer to Figure 2 and Figure 3 below for the timeline and sequence of construction. The construction program is also presented in Appendix B of this report.

|  | uk Faarne  | Duration  | Bacalina State   | Matalina Facult  | Dat   | Fields  | 10  | Jan ay a fan ar a fan   | - 24      |
|--|--|---|--|--|---|---|---|---|-----------|
|  | arwin - Shoai Bay - 15LM Leachate Pond   | 171 days  | Fri 4/11/22  | Men 13/03/23   | Rei 4/11/22   | Tue 13/06/23  | 102%  |   | 21 1 1 1  |
|  | Conditions Precedent to Site Access  | E days  | FH 4/11/22   | The 10/11/22   | Bri 4/11/22   | Thu 10/11/22  | 100%  | 4/11 10/11  | 1         |
|  | Letter of Acceptance / Award (latest date)   | 1 dwy   | Rri 4/11/22  | \$H 4/11/22  | En 4/11/22  | Frt 4/11/22   | 107%  | 4/11-4/11   |           |
|  | Approvals, Management Plans, Delapidation Report   | 6 days  | Eri 4/11/22  | Thu 10/11/22   | Pri 4/11/22   | Thu 10/11/22  | 100%  | 471,  |           |
|  | and General Mobilitation   |   |  |  |   |   | 1.1   |   |           |
|  | Possession of Site / Convencement Date   | 0 days  | Mari 7/11/32   | Man 7/11/32  | Man 7/11/22   | Mon 7/11/33   | 102N  | 1aa 2/11  |           |
|  | Mobilisation, Demobilisation and Exabling Works  | 160 days  | Mon 7/11/22  | Mon 13/03/23   | Man 7/11/22   | Tue 13/06/23  | 100%  |   |           |
|  | General Mobilisation of Workers, Plant and<br>Equipment, including internal transfers and          | 6 days  | Mon 7/11/32  | Sat 12/11/22   | Mon 7/11/33   | Sat 12/11/22  | 102%  |   |           |
|  | Implementation of ERS, Environmental Controls,<br>Deliveration of Brad Bevenie and Protected Areas | Ø days  | Sue 12/11/22   | Sat 12/11/22   | Sat 13/11/22  | Set 13/11/22  | 102%  | d 12/11   |           |
|  | Handover of Manuals and Quality Documents<br>Progressive (one week after completion of each        | 0 days  | Set 13/11/13   | Sat 12/11/22   | Sat 12/11/22  | Sat 12/11/32  | 102%  | a 12/11   |           |
|  | Demobilization + Final Handover  | 6 data  | PH 10/03/23  | Mon 13/03/23   | Wed 7/06/23   | Tue 13/06/23  | 102%  |   | 7/06      |
|  | Construction Works   | 165 days  | Tue 8/11/22  | Mon 13/03/23   | Tue 8/11/22   | Fri 9/06/23   | 100%  | 8/11  | 1 3/0     |
| Q         Mode         Mo  | Phase 1  | 165 days  | Tue 8/11/22  | Men 13/03/23   | Tue 8/11/22   | Frt 9/06/23   | 100%  | 8/11  | 1 3/0     |
|  | Bulk Earthworks  | 105 days  | Tue 8/11/22  | Wed 21/12/22   | Tue 8/11/22   | Sat 25/03/23  | 100%  | 8/11 25/03  |           |
|  | Cauring and Grubbing (Mulching)  | 3 days  | Tue 8/11/22  | Thu 10/11/22   | Tue 8/11/22   | The 10/11/22  | 103%  | 8/11  |           |
|  | Topsoil Excession  | 4 days  | Rei 11/11/22   | Tue 15/11/22   | Rn 11/11/22   | Tue 15/11/22  | 100%  | 11/11   |           |
|  | Escavation for Diversion Drain   | 2 days  | Wed 18/11/22   | Thu 17/11/23   | Wed 14/11/23  | Thu 17/11/22  | 102%  | 36/31 🖀 32/28   |           |
|  | Foundation Preparation / Proof Roll  | 2 days  | Pet 18/11/22   | Sat 10/11/22   | Fri 18/11/22  | Sat 18/11/32  | 100%  | [a/3] <u>a/3</u>  |           |
| 0     Subset 7 basis from 5 month     An     North 7 2 month     North 7 2 mont  | Subgrade Replacement/Soft Spots  | 3 days  | Man 21/11/32   | Wed 23/11/22   | Mar 21/11/33  | Wed 21/11/22  | 102%  | 2011 22/11  |           |
| 1          | Constact Trials to Existing Material   | 1 stay  | Wed 23/11/22   | Wed 23/11/22   | Wed 21/11/22  | Wed 21/11/22  | 1025  | 24/11 22/01   |           |
| 6     Australity Register with Register with Register Regi                           | Cel to Fill Earthworks (No Rock Allowance)   | 28.2 days   | The 24/33/22   | Set 17/12/22   | Pt) 25/33/22  | The \$2/03/25   | 100%  | 23/11   |           |
|  | Foundation Preparation   | 6.6 days  | Mon 19/12/33   | Tue 30/33/22   | Thu 12/01/25  | Pri 20/01/21  | 100%  | - 12/01.0   |           |
| G         Market Autobase Prov         Diago         No.24/LU2         No.24/LU2 <th< td=""><td>Subgrade Replacement / Soft Spots</td><td>3 days</td><td>Mon 19/12/22</td><td>Wed 21/12/22</td><td>The 12/01/23</td><td>Wed 25/01/23</td><td>102%</td><td></td><td></td></th<>   | Subgrade Replacement / Soft Spots  | 3 days  | Mon 19/12/22   | Wed 21/12/22   | The 12/01/23  | Wed 25/01/23  | 102%  |   |           |
| 6         Bescene of them         100         Del 2012         No.2012         No.2012 <td< td=""><td>Section Solid Orainage Pipe</td><td>87 days</td><td>Thu 24/11/22</td><td>FH 2/12/22</td><td>Tue 29/11/22</td><td>Sat 25/63/23</td><td>102%</td><td><sup>22</sup>(1) - 1 2/03</td><td></td></td<>   | Section Solid Orainage Pipe  | 87 days   | Thu 24/11/22   | FH 2/12/22   | Tue 29/11/22  | Sat 25/63/23  | 102%  | <sup>22</sup> (1) - 1 2/03  |           |
| 0         image: market and imark and image: market and image: market and image: market                                  | Excavation of Trench   | 1 day   | Thu 34/11/22   | Thu 24/11/22   | Tue 29/11/22  | Tue 29/11/22  | 100%  |   |           |
|  | mutatlation of Geofatric in Tranch (Unit 9)  | a day   | en 25/11/22  | sn 25/11/22  | wed 30/11/32  | west 30/11/22   | 102%  |   |           |
| 0         missionary funding         1000         missionary funding         1000  | Laying of Badding and Seepage Pipes  | 2 days  | pag 38/11/33   | mon 28/11/22   | 110 1/13/22   | en 2/32/22  | 102%  | 1212-122  |           |
|  | mutatution of Geofetics bottom of Pond   | 2 they  | meth 28/11/22  | mon 28/11/22   | Pri 2/32/22   | Pri 2/32/22   | 100%  | 310. 372  |           |
|  | mutation of Aggregate Lever (Unit 4)   | 1 day   | Tue 29/11/22   | Tue 20/11/22   | Sat 3/12/22   | Set 1/13/23   | 100%  | 4/1-2 / / / / / / / / / / / / / / / / / / /   |           |
|  | Wrapping of Aggregate with Geofabric   | 1 day   | Wed 30/11/32   | Wed 30/11/23   | Mon 5/12/23   | Mon 3/12/23   | 102%  |   |           |
|  | Sang   | 15 days   | The 1/13/23  | #n 2/32/22   | wed 7/12/22   | 548 25/03/23  | 1190%   |   |           |
|  | Embarkment   | 162 days  | Pel 11/11/22   | Men 13/03/23   | FH 11/11/22   | Frt 9/06/23   | 100%  |   | 1 200     |
| Bit         Control         Co   | Transport or Imported Muterial   | as days   | 90 11/11/22  | 4440 31/11/23  | +n 11/11/22   | MDE 9/01/23   | 200%  | 101   |           |
| 0       Converse the lat Nov       2400       National of the lat Nov       1000       100   | Over Pres Headland   | A data  | ting any negative  | Figh 31/04/25  | 1600 21/01/22   | The 2403/25   | 1000  | 200   |           |
| 0       Screents if is it  | Execution of the Soll Way  | 2 days  | Map 21/01/21   | Tue 24/01/23   | Mag 27/03/21  | Tise 28,803/23  | 100%  | 27/03 - 28/03   |           |
|  | Concrete at Soil Way   | 1 days  | Bird 25/01/21  | Sat 28/01/23   | Wed 7/06/23   | Dri 0/06/23   | 102%  |   | 7/06 3/04 |
| 0       No   | Reportant Table 2 at Creat   | 7 dea   | Set 6/03/21  | Men 6/03/23  | Thu 9/01/21   | Ert 10/03/21  | 1025  |   |           |
| 0       Substrate       4000       VALUAD  | Trimming of Embackments  | 3 stand   | 14.6   | NA   | Tue 21/08/23  | Thu 23/03/23  | 1025  | 21/03 23/03   |           |
| 0       Convert       Vistor       Link  | Topsoil of Embanisments  | 4 days  | Tue 7/03/23  | FH 10/03/23  | Fri 28/03/23  | Tue 28/03/23  | 102%  | 24/03/07 - 29/03  |           |
| 1         100  | Grassing / Hydromukching   | 2 days  | Sat 11/03/23   | Mon 13/03/03   | Mar 24/04/23  | Tue 25/04/23  | 102%  | - 24/4 - 24/94  |           |
| 0       Decision/Lineary Frage Trans.       3.24.4.0.0       No.1002/2       No  | Phase 2  | 150 days  | Fri 13/01/25   | Men 11/03/23   | Tue 32/31/25  | Tue 6/06/23   | 100%  | 22/11   | 4/06      |
| 0       Construint of Hmah       11.000       40.102/12       to 10.02/12       40.102/12  | Drainage / Seepage Pipe Works  | 22.4 days   | Rei 13/01/23   | Fri 20/01/23   | Thu 19/01/23  | Wed 15/02/23  | 102%  | 942 4   |           |
| 0     maximum of sizedaria frame (1604)     4.49     4.44 (20.17)     10.720(27)     0.84 (20.17)     10.720(27)     0.85       0     maximum of sizedaria frame (1604)     1.49     10.12(12)     10.22(12)     10.12(12) </td <td>Excavation of Trench</td> <td>2.5 days</td> <td>FH 13/01/23</td> <td>Sat 14/01/25</td> <td>Thu 19/01/23</td> <td>Wed 25/01/23</td> <td>102%</td> <td>13 25/01</td> <td></td>   | Excavation of Trench   | 2.5 days  | FH 13/01/23  | Sat 14/01/25   | Thu 19/01/23  | Wed 25/01/23  | 102%  | 13 25/01  |           |
| 0       Support Integrating and Support Parts       3.440       Mole 200/201       9.62/201/20       967       967         0       Support Integrating and Support Parts       3.460       Mole 200/201       9.62/201/20       967       967       96   | Installation of Geofabric in Trench (Unit 9)   | 1 days  | Sat 14/01/23   | Tue 17/01/23   | Tue 24/01/23  | Pri 27/01/23  | 100%  | 22/01   |           |
| 0     Imposition of Secondaria Grandman Office League 1     1400     Mat L2002     M   | Laying of Bedding and Seepage Pipes  | 3 days  | Man 16/01/23   | Wed 18/01/33   | Wed 25/01/23  | Wed 1/02/33   | 102%  | 210 100   |           |
| 6     Including of Supergine Line (2014)     1 400     Multilized 2012     1 202021     No.120221     No.120221<   | Installation of Geofabric/Geo Net bottom of Po   | nz 4 days   | Tue 17/01/23   | Fri 20/01/23   | Wed 1/02/21   | Wed 15/02/23  | 102%  | 1.1002pp  |           |
| 6     Hunger of Agergerie in Strateging     1 Arge     Not 12 Microsoft     1 Arge     <  | Installation of Aggregate Layer (Unit 4)   | 3 days  | Wed 18/01/21   | Fri 30/01/23   | Thu 2/02/23   | Wed 15/02/23  | 100%  | 2/02/04   |           |
| 6     Univ 21 instance     2 app.     No. 100/201     No. 100/201 </td <td>Wrapping of Aggregate with Geofabric</td> <td>3 stays</td> <td>Wed 18/01/23</td> <td>FH 20/01/21</td> <td>Thu 2/02/23</td> <td>Wed 15/02/23</td> <td>102%</td> <td></td> <td></td>  | Wrapping of Aggregate with Geofabric   | 3 stays   | Wed 18/01/23   | FH 20/01/21  | Thu 2/02/23   | Wed 15/02/23  | 102%  |   |           |
| Note:         1000 <t< td=""><td>Unit 21 installation</td><td>2 days</td><td>Thu 19/01/28</td><td>Fri 20/01/21</td><td>Wed 1/02/23</td><td>Wed 15/02/23</td><td>100%</td><td>1/02/05</td><td></td></t<>  | Unit 21 installation   | 2 days  | Thu 19/01/28   | Fri 20/01/21   | Wed 1/02/23   | Wed 15/02/23  | 100%  | 1/02/05   |           |
| 0     Impulsational Stress Refut quest     14.7 mol     14.27 mol <td>Select Fill Layer, BGM, Geonet &amp; HDPE</td> <td>306 days</td> <td>Sat 21/01/23</td> <td>Fri 10/03/23</td> <td>Tue 17/01/23</td> <td>Fri 26/05/23</td> <td>102%</td> <td>hyeri</td> <td>26,05</td>   | Select Fill Layer, BGM, Geonet & HDPE  | 306 days  | Sat 21/01/23   | Fri 10/03/23   | Tue 17/01/23  | Fri 26/05/23  | 102%  | hyeri   | 26,05     |
|  | Installation of Select Fill Layer  | 18.7 days   | Sat 21/01/23   | Sat 28/01/22   | Tue 17/01/23  | Thu 2/01/23   | 100%  | 17/01/2   |           |
| 5       Socialization Honore Treating       4 stage       Main 2002/123       Was 2002/23       Was 2002/2   | Free Issued Materials Required Date  | © days  | Sat 28/01/23   | 5at 28/01/23   | Sat 11/02/23  | Set 11/03/23  | 102%  | 0 1 <del>10</del>   |           |
| Implified         12 Stars         Tex. 2(2)/2         Min. 12(2)/2  | Excavation of Anchor Trench  | 3 clays   | Man 30/01/23   | Wed 1/02/23  | Fri 17/03/23  | Tue 21/03/23  | 100%  | 17/03   |           |
| Important of Games         4 Aug         Yes, (19/17)         Max (19/17) <thmax (19="" 17)<="" th="">         Max (19/17)</thmax>   | Installation of BGM  | 22 days   | Thu 3/02/23  | Mon 33/03/23   | Mon 11/03/23  | Thu 6/04/23   | 102%  | 12/02/2001  |           |
| Bit Second Sec                        | installation of General  | 4 chays   | Thu 0/83/33  | Adam 30/02/33  | Set 1/64/33   | Wed 5/04/73   | 100%  |   |           |
| G         Billion Ther Pare of Gamp Notich         Bit Age         Mon27/2023         Billion Ther Pare of Gamp Notich         Bit Age         Mon27/2023         Billion Ther Pare of Gamp Notich         Bit Age         Mon27/2023         Bind State   | installation of HDPE   | 7 days  | Wed 15/02/33   | Sat 25/02/23   | Thu 13/04/23  | Thu 20/04/23  | 102%  | 1500  |           |
| 1         Installation of EGM and Reading Jumps and 1 App         Mac. 2712/22 3 Mar. 2720/22 3 Mar   | 450mm River Pipes and Sump Works   | 18 days   | Mon 27/02/23   | Fri 10/03/23   | Tue 11/04/23  | Wed 3/05/23   | 102%  | 11,04 3,05  |           |
| Image         Image </td <td>installation of BGM and Georet (sump and</td> <td>1 they</td> <td>Mon 27/02/23</td> <td>Man 27/02/23</td> <td>Tue 13/04/23</td> <td>Tue 11/04/23</td> <td>100%</td> <td>- 1004 1004</td> <td></td>  | installation of BGM and Georet (sump and   | 1 they  | Mon 27/02/23   | Man 27/02/23   | Tue 13/04/23  | Tue 11/04/23  | 100%  | - 1004 1004   |           |
|  | maal(1))   |   |  |  |   |   | -   |   |           |
| Strain Ran - 10 M Lanchede Ford Tak Lancary E Instra Binary E Instra Statutes I Tak Lancary Lance Statutes I Tak Lancary Lance Statutes I Tak Lance Statutes | traislation of Seepage Estruction flash  | 2 days  | Twe 28/02/23   | Wed 3/03/23  | pares 12/04/23  | The \$3/24/23   | 2007%   | = 1204 <b>Z</b> 1204  |           |
|  |  |   |  |  |   |   |   |   |           |
| Seal   |  | market in the second seco | <ul> <li>Part Part Part Part Part Part Part Part</li></ul> | material         12 mage         16 mage         16 mage           contraine-beneration to the state         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage           contraine the state         16 mage         16 mage         16 mage | mate         mate <th< td=""><td>materPart and<br/>Part and<br>Part and<br>Part and<br>Part and<br/>Part and<br/>P</br></br></br></td><td>Processor         Parton         Part</td><td>mater         base         <t< td=""><td></td></t<></td></th<> | materPart and<br>Part and<br> | Processor         Parton         Part | mater         base         base <t< td=""><td></td></t<> |           |

Figure 2: Construction Program of Works



Figure 3: Construction Program of Works Continued

#### 3.0 INSPECTION AND VERIFICATION PERSONNEL

The roles and responsibilities of the WSP Golder inspection and verification personnel involved with this project are set out in Table 3 below.

#### Table 3: Roles and Responsibilities

| Role              | Responsibilities   |
|-------------------|--|
| Project Manager   | <ul> <li>Overall authority and accountability for the attainment of the project quality and<br/>assignment of resources.</li> </ul>  |
|                   | Review this MDR completed by the CQA Engineer.   |
| Site/Construction | The Construction Manager was the Project Manager representative on site.   |
|                   | <ul> <li>Supported and facilitated the implementation of the quality management plan.</li> </ul>   |
|                   | <ul> <li>Reviewed quality reports, request for information (RFIs), technical queries (TQs),<br/>non-conformance reports (NCRs), site inspection (SIs) and audit reports related<br/>to the project.</li> </ul> |
|                   | The Construction Manager was involved in quality related investigations at times.  |
|                   | <ul> <li>Review this MDR completed by the CQA Engineer.</li> </ul>   |
|                   | <ul> <li>Was on Site on a full-time basis till practical completion was reached.</li> </ul>  |

| Role             | Responsibilities   |
|------------------|--|
| CQA Engineer     | Had the responsibility on-site for implementing the quality management plan.   |
|                  | <ul> <li>Monitoring of materials and work to be compliant.</li> </ul>  |
|                  | <ul> <li>Generated, managed, maintained and communicated ITPs.</li> </ul>  |
|                  | <ul> <li>Coordinated and organised relevant field testing or inspections by qualified personnel as was required under the construction specifications.</li> <li>Performed hold point inspections as required under the construction specifications.</li> <li>Inspected existing conditions prior to the start of the new work, performed inprocess and follow-up inspections.</li> <li>Was an authorised inspectorate or designate of ITRs and observed and documented nominated Hold and Witness Points as the work progressed.</li> <li>Monitored and reported the correction of non-conformances, where it was appropriate.</li> <li>Resolved quality matters and worked with the Project Engineer to resolve technical engineering and managed changes in design.</li> <li>Provided technical knowledge of soil conditions and disseminate information gained from geotechnical investigation and analysis.</li> <li>Issued quality reports, request for information (RFIs), technical queries (TQs), non-conformance reports (NCRs), site inspection (SIs) and audit reports reviewed by the Project/Construction Manager.</li> <li>Was involved in all quality related investigations about the above.</li> <li>Reported directly to the Construction Manager on all matters/issues concerning quality assurance.</li> <li>Completed daily, weekly, and monthly quality reports.</li> <li>Was on Site on a full-time basis till practical completion was reached.</li> </ul> |
| Project Engineer | <ul> <li>The Project Engineer has liaised with the CQA Engineer and resolved technical engineering issues and managed change in design.</li> <li>Had responsibility for communicating any changes to the site management team to ensure adherence with design.</li> <li>Had responsibility for managing material selection for quality.</li> <li>Coordinated and managed material procurement, handling and storage.</li> <li>In liaison with the CQA Engineer organised conformance testing of procured materials in accordance with the quality management plan and the contract specifications.</li> <li>Maintained the project Document Control registers and files, electronically and hard copies on site.</li> <li>Filed of subcontractor or supplier quality management information.</li> <li>Recorded and distributed minutes of quality information.</li> <li>Reported directly to the Construction Manager and has completed daily reports that was included in the Project Manager's weekly and monthly construction reports.</li> <li>Was on Site on a full-time basis till practical completion was reached.</li> </ul>  |
| GITA             | <ul> <li>Inspected Unit 10 BGM, Unit 11 Geonet and Unit 12 HDPE Geomembrane<br/>indicated in the Specification.</li> </ul>   |

| Role | Responsibilities  |  |  |  |  |  |  |  |  |
|------|---|--|--|--|--|--|--|--|--|
|      | Provided an opinion to the client on the compliance of the works with the<br>Specification and Construction Quality Assurance (CQA) Plan. |  |  |  |  |  |  |  |  |
|      | The GITA was on Site on a full-time basis when works for which they are<br>engaged to inspect was being undertaken.                       |  |  |  |  |  |  |  |  |
| GTA  | Coffey Testing Pty Ltd.   |  |  |  |  |  |  |  |  |

# 4.0 ISSUED FOR CONSTRUCTION DRAWINGS AND TECHNICAL SPECIFICATION

The pond construction was done according to and in line with the technical specification and drawings set out in Table 4 and Table 5 below. The documents are presented in Appendix C of this report.

#### Table 4: Specifications

| Document<br>No. | Title  | Originator | Revision<br>No. | Date of<br>Issue |
|-----------------|--|------------|-----------------|------------------|
| 004-R           | Shoal Bay Waste Management Facility – Leachate<br>Storage Pond 3 – Technical Specification | WSP        | 0               | 24/11/2022       |
| QA-MAN-<br>005  | QA QC Manual for the Installation of Geosynthetic<br>Membranes                             | Fabtech    | 1               | 25/10/2021       |
| -               | Construction Methodology Statement (CMS)   | Fabtech    | А               | 02/03/2023       |

#### Table 5: Drawing Register

| Drawing<br>No. | Title  | Originator | Revision<br>No. | Date of<br>Issue |
|----------------|--|------------|-----------------|------------------|
| 001            | Locality Plan and Drawing Index                          | WSP        | 0               | 24/11/2022       |
| 002            | Existing Conditions Plan                                 | WSP        | 0               | 24/11/2022       |
| 003            | Earthworks Cut & Fill Plan                               | WSP        | 0               | 24/11/2022       |
| 004            | Groundwater Drainage Plan                                | WSP        | 0               | 24/11/2022       |
| 005            | General Arrangement Plan                                 | WSP        | 0               | 24/11/2022       |
| 006            | Long Sections – Leachate Storage Pond                    | WSP        | 0               | 24/11/2022       |
| 007            | Long Sections – Spillway and Groundwater<br>Drainage     | WSP        | 0               | 24/11/2022       |
| 008            | Typical Details - Embankment                             | WSP        | 0               | 24/11/2022       |
| 009            | Plan and Details – Emergency Leachate Overflow<br>System | WSP        | 0               | 24/11/2022       |
| 010            | Typical Details – Liner and Drainage                     | WSP        | 0               | 24/11/2022       |
| 011            | Plan and Sections – Sump and Riser Pipes                 | WSP        | 0               | 24/11/2022       |

| Drawing<br>No. | Title   | Originator | Revision<br>No. | Date of<br>Issue |
|----------------|---|------------|-----------------|------------------|
| 012            | Typical Details – Sump and Riser Pipes                                    | WSP        | 0               | 24/11/2022       |
| 013            | Plan and Section – Stormwater Spillway                                    | WSP        | 0               | 24/11/2022       |
| 014            | Typical Details – Stormwater Spillway                                     | WSP        | 0               | 24/11/2022       |
| 015            | Plan and Typical Details – Inlet Pipe                                     | WSP        | 0               | 24/11/2022       |
| 016            | Plan, Section and Typical Details – Diversion Drain                       | WSP        | 0               | 24/11/2022       |
| 020            | General Notes Sheet 1   | WSP        | 0               | 23/03/2023       |
| 021            | General Notes Sheet 2   | WSP        | 0               | 23/03/2023       |
| 025            | Plan and Sections – Sump and Riser Pipes –<br>Structural                  | WSP        | 0               | 23/03/2023       |
| 026            | Sections and Details – Sump and Riser Pipes –<br>Structural Sheet 1       | WSP        | 0               | 23/03/2023       |
| 027            | Sections and Details – Sump and Riser Pipes –WSP0Structural Sheet 2       |            | 0               | 23/03/2023       |
| 028            | Sections and Details – Sump and Riser Pipes – WSP 0<br>Structural Sheet 3 |            | 0               | 23/03/2023       |
| 030            | Plan and Sections – Emergency Leachate<br>Overflow System - Structural    | WSP        | 0               | 23/03/2023       |
| 035            | Plans – Inlet Pipe – Structural   | WSP        | 0               | 23/03/2023       |
| 036            | Sections and Details – Inlet Pipe – Structural                            | WSP        | 0               | 23/03/2023       |
| 040            | Plan and Sections – Stormwater Spillway -<br>Structural                   | WSP        | 0               | 23/03/2023       |
| CD-2004-<br>01 | Assumed Pond Size and Sections  | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>02 | Cover General Arrangement   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>03 | Cover GM Panel Layout   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>04 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>05 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>06 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>07 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>08 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |
| CD-2004-<br>09 | Ancillaries Details   | Fabtech    | 00              | 19/04/2023       |

| Drawing<br>No. | Title                              | Originator | Revision<br>No. | Date of<br>Issue |
|----------------|------------------------------------|------------|-----------------|------------------|
| CD-2004-<br>10 | Ancillaries Details                | Fabtech    | 00              | 19/04/2023       |
| MD-2004-<br>11 | Access Hatch Manufacturing Drawing | Fabtech    | 00              | 28/02/2023       |
| MD-2004-<br>13 | Access Hatch Manufacturing Drawing | Fabtech    | 00              | 28/02/2023       |

#### 5.0 DESIGN CHANGE MANAGEMENT

#### 5.1 Non – Conformance Reports (NCR)

A total of five non – conformances were raised for the works, all of them with potential design quality implications. NCRs were issued by the WSP Golder Project Manager to the WSP Golder Design Engineer. Concessions and corrective actions generated from NCRs were reviewed and accepted by the Design engineer. The NCRs are presented in Appendix D. The NCR register (NCRR) is presented in Table 6 below.

#### Table 6: NCR Register

| NCR<br>No. | Description   | Date<br>Raised | Action Taken           |
|------------|---|----------------|------------------------|
| 001        | Site won material – Material not meeting requirements of the technical specification.                 | 17-Mar-23      | Use As Is              |
| 002        | Unit 15 Ground Water Collection Pipe – Constructed works not meeting design levels.                   | 12-Jan-23      | Design<br>Modification |
| 003        | Unit 21 Geocomposite Drain- TN220 – Material not meeting requirements of the technical specification. | 1-Mar-23       | Use As Is              |
| 004        | Unit 11 Geonet– Material not meeting requirements of the technical specification.                     | 17-Mar-23      | Use As Is              |
| 005        | Omitted as a modification to the erosion protection seed mix was not deemed a non-conformance.        |                | non-conformance.       |
| 006        | Unit 9 Separation Geotextile– Material not meeting requirements of the technical specification.       | 14-Apr-23      | Use As Is              |

#### 5.2 Documented Design Changes

A summary of the design changes is shown in Table 7 below and the documents accompanying the changes are presented in Appendix E.

#### **Table 7: Design Changes**

| Description and Details  | Status   | Document                             |
|--|----------|--------------------------------------|
| Unit 16 – Solid Drainage Pipe. Due to material shortage, use a DN120<br>SDR11 PN16 PE100 ENVIROPRESSURE pipe instead of the specified<br>SDR13.6 DN110 Pipe. | Approved | Document No.<br>EAC-TDF-FRM-<br>4102 |

| Description and Details   | Status   | Document                  |
|---|----------|---------------------------|
| Reduce the depth of the groundwater drainage trench by 100 mm and widen<br>the trench by 100 mm to maintain equivalent flow cross-sectional area and to<br>maintain drainage grades consistent with the design.   | Approved | NCR 002                   |
| Unit 14 – Erosion Protection. Alternative seed mix than what was specified due to adverse weather crop shortage & inferior seed quality in the US at the time. As a result, there was almost no Pensacola (Paspalum notatum Pensacola) seed imported into Australia along with low availability of couch. | Approved | Email dated<br>13/04/2023 |
| Sub-contractor proposed to blend lot 1 outer embankment slope into southern diversion drain for constructability and maintenance.   | Approved | Email dated 30/03/2023    |
| Sub-contractor proposed change to diversion drain outlet. Remove 90-<br>degree bend at outlet to prevent discharge against perimeter fence and to<br>avoid erosion underneath the fence.  | Approved | Email dated<br>26/04/2023 |

#### 6.0 INSPECTION AND TESTING REQUIREMENTS

Project specific Inspection and Testing Plans (ITP) with supplementary Inspection and Test Records (ITR) were developed for the different stages pond construction and lining works. These documents were submitted for review and comments in accordance with the Quality Management Plan (QMP) and were approved by WSP prior to commencing the activities identified in each ITP. Table 8 provides a summary of the ITP register.

| Sr/ No | ITP No     | Work Description                                   | Performed By |
|--------|------------|--|--------------|
| 01     | PC-ITP-001 | Clear Grub & Topsoil Strip                         | EAC          |
| 02     | PC-ITP-002 | Bulk Earth Work Excavation                         | EAC          |
| 03     | PC-ITP-003 | Subgrade Preparation & Inspection                  | EAC          |
| 04     | PC-ITP-004 | Embarkment Construction                            | EAC          |
| 05     | PC-ITP-005 | Under Drainage & Secondary Liner                   | EAC          |
| 06     | PC-ITP-006 | Select Fill Placement & Liner Subgrade Preparation | EAC          |
| 07     | PC-ITP-007 | Geonet & Primary Liner                             | EAC          |
| 08     | PC-ITP-008 | Spillway Works                                     | EAC          |
| 09     | PC-ITP-009 | Overflow Weir Box & Solid Overflow Pipe            | EAC          |
| 10     | PC-ITP-010 | Leakage Extraction Pipe                            | EAC          |
| 11     | PC-ITP-011 | Sump & Leachate Extraction Pipe                    | EAC          |
| 12     | PC-ITP-012 | Leachate Inlet Pipe                                | EAC          |
| 13     | PC-ITP-013 | Southern Embarkment Swale Drain                    | EAC          |
| 14     | PC-ITP-014 | Grassing, Hydro mulching of embarkment             | EAC          |
| 15     | PC-ITP-015 | Floating Cover Installation                        | Fabtech      |
| 16     | PC-ITP-016 | Finishing Works                                    | EAC          |
| 17     | PC-ITP-17  | Anchor Trench                                      | EAC          |

#### Table 8: WSP ITP Register.

Completed WSP ITPS and ITRs are presented in Appendix F. A copy of the Civil Contractors MDR is presented in Appendix G, and the CQA data for the floating cover recorded by the Geosynthetics Installer is presented in Appendix H.

#### 7.0 MATERIAL QUALITY ASSURANCE

#### 7.1 Summary and Description of Materials

Materials used during the construction of LP03 are defined in Table 9 below.

| Unit                                  | Description   |
|---------------------------------------|---|
| Soil Materials                        |   |
| Unit 1 Engineered Fill                | Soil material with a minimum fines content of 30% and maximum particle size of 130 mm that is excavated, transported, moisture conditioned, compacted and tested according to the performance standards in the Specification.   |
| Unit 2 Select Fill                    | Clay rich soil sourced by the Contactor with a minimum fines content of 30% and a maximum particle size of 37.5 mm that was excavated, transported, placed, moisture conditioned, compacted and tested according to the performance standards in the Specification.   |
| Unit 3 Topsoil                        | Soil to establish and maintain grass cover that is placed according to the Specification.   |
| Granular Materials                    |   |
| Unit 4 Subgrade Drainage<br>Aggregate | Low fines content aggregate.  |
| Unit 5 Sump Drainage<br>Aggregate     | Low fines content aggregate.  |
| Unit 6 Cement Stabilised<br>Sand      | 5% cement stabilised sand pre-mixed at a concrete batch plant of type approved by the Superintendent.   |
| Unit 7 Rip Rap                        | D50 of 100 mm for erosion protection.   |
| Unit 8 Pavement Material              | Recently quarried Type II Gravel in accordance with Northern Territory<br>Government's Department of Infrastructure Technical Specification for<br>Pavement Materials. The Unit 8 Pavement Material is to provide erosion<br>protection and a surface for controlled traffic access on selected portions of<br>the crests of the ponds, as indicated on the Drawings. |
| Geosynthetics                         |   |
| Unit 9 Separation Geotextile          | Medium to separate materials.   |
| Unit 10 BGM                           | Bituminous Geomembrane liner (BGM)  |
| Unit 11 Geonet                        | Continuous leakage collection layer installed across the pond footprint.  |
| Unit 12 HDPE Geomembrane              | 2.0 mm thick High-Density Polyethylene (HDPE) geomembrane installed by the Geosynthetics Installer.   |
| Unit 13 Cushion Geotextile            | Medium to protect underlying/overlying geosynthetics materials.   |
| Unit 21 Geocomposite Drain            | Continuous groundwater seepage collection layer installed on the internal batters around the pond up to existing ground level   |

| Unit                                   | Description  |
|--|--|
| Pipes                                  |  |
| Unit 15 Groundwater<br>Collection Pipe | Perforated Nominal Diameter 90 mm pipe approved by the Superintendent, to be installed by the Pipe Installer. Used to collect and convey groundwater seepage.                                |
| Unit 16 Solid Drainage Pipe            | Solid Nominal Diameter 110 mm pipe approved by the Superintendent, to be installed by the Pipe Installer. Used to convey groundwater seepage collected in the system to the outlet location. |
| Unit 17 Riser Pipe                     | Nominal Diameter 450 mm HDPE PE100 pipe to be installed by the Pipe<br>Installer. Used for the seepage extraction and leachate extraction systems.   |
| Unit 18 Leachate Inlet Pipe            | Pipe installed above the liner system to allow leachate discharge into the pond (below the floating cover).  |
| Other Materials                        |  |
| Unit 14 – Erosion Protection           | Hydro mulch mix placed on the outer batters of leachate storage pond,<br>stormwater drains and disturbed areas agreed between the Principal and<br>the Contractor.                           |
| Unit 19 Overflow Pipe                  | Solid Nominal Diameter 200 mm pipe approved by the Superintendent, to be installed by the Pipe Installer. Used to convey emergency overflow from the leachate storage                        |
| Unit 20 – Concrete                     | 32 MPa concrete (with steel reinforcement where it was required).  |

#### 7.2 **Review and Approval of Construction Materials**

As a hold point (HP2) to the respective construction activities, the material listed in Table 9 has been reviewed and approved by the Superintendent prior to delivery and prior to use on site. Records of review are presented in Appendix I.

#### 8.0 HEALTH SAFETY AND ENVIRONMENT

Health and Safety on the project was managed by the project management/supervisory team supported by safety advisors. The contractor also had a HSE resource based on site to provide additional support in the field and to provide documentation.

#### 8.1 Risk Management Process

Prior to the commencement of the project, a comprehensive desk top risk review was conducted by the project management/supervisory team supported by safety advisors. In addition to the desk top review a Hazld Workshop was undertaken by the project management/supervisory team, safety advisors and the construction contractor engaged to complete the works. A further Hazld Workshop was held prior to the commencement of the lining works with the lining contractor and the construction contractor.

This process ensured alignment with the risk management processes of all parties and led to the identification of the critical risks on the project including mobile plant/pedestrian interaction, lifting operations and fit for purpose plant and the competency of the operator.

Supporting these processes was the Take 5 process, which aided in effective decision making and ensured changes in conditions throughout were identified and risk controls implemented.

Minimum weekly site walkthroughs with the construction contractor and field inspections took place reviewing environmental and traffic controls, documentation compliance, in field behaviors and site conditions.

#### 8.2 Permit to Work System

A documented "Permit to Work" (PTW) system was established providing a way of ensuring safety, environmental and cultural heritage clearances are obtained. Prior to any high-risk task being performed the scope of work was discussed with the Permit Recipient. The Work Method Statement (SWMS) for the task and the JSA were reviewed and collated into a work pack for the task, confirming hazards associated with the proposed task have been identified, assessed, and controlled.

14 Authority to Work, 10 Hot Work, 7 Lifting and 8 Ground Penetration Permits were issued and completed within accordance with the site standards and management protocols and closed out during the project.

#### 8.3 Induction and Training Records

In the early works at the commencement of the project, until a WSP construction zone was established, WSP and contractors integrated into Veolia's induction and permitting systems. In total 114 workers were inducted onto the project. That included 37 inductions delivered face to face and 77 inducted via a site-specific online induction developed in conjunction with Sine Pro. Both the face to face and online inductions has a questionnaire to check for understanding and acknowledgement. Copies of qualifications, competencies and VOC's were requested and maintained to ensure the worker was qualified for the task.

The need for additional controls to ensure individuals were fit for duty was identified. All workers were required to be drug and alcohol free while on site and passive alcohol testing was conducted daily. A total of 1247 passive alcohol tests and 8 random drug tests were conducted.

Daily site sign in via the online Sine Pro app outlined conditions of entry, emergency evacuation muster point, stop work authority, as well as a tool to communicate additional information such as changes to site conditions.

#### 8.4 Mobile Plant Mobilization

A number of the critical risks identified on the project related to the operation of heavy mobile plant and equipment. These risks were mitigated through the verification of competency process conducted on all plant operators to ensure plant and or equipment was not only being operated by ticketed personnel, but these personnel had been deemed competent.

Before the plant or equipment was allowed on site a pre-mobilization inspection and supporting documentation was undertaken to ensure that it was safe for use, fit for purpose, licensed, or registered as required and compliant with applicable legislative and other requirements. Plant pre-start checks were conducted by the operators prior to commencing works for the day. Throughout the project 37 mobile plant and heavy vehicles were utilized on site.

Two environmental incidents occurred due to hydraulic hose failure on mobile plant while working on site.

#### 8.5 HSE Consultation and Communication

Regular and open communication was identified as a critical success factor for HSE on the project. This was achieved through daily pre-start meetings, involving all work teams. The daily pre-start meetings provided a forum to discuss the scope of work for the day, relevant critical hazards associated with this work and what controls are required to be in place. All relevant hazards and controls were documented on a JSEA and acknowledged by all in attendance. The JSEA was then used for any visitors attending the site to inform them

of the day's works and what the identified hazards were. They too would then acknowledge by signing onto the JSEA.

Both WSP and the construction contractor held regular Toolbox Meetings to inform the work group of items such as workplace procedures, relevant industry news or incidents and emergency response drills. A combined 24 Toolbox meetings were delivered during the project.

To provide workers and visitors to the site with relevant safety information a safety notice board was established in the lunchroom. The safety notice board had information such as WSP HSEQ Policy, Emergency Contact Numbers, Site Evacuation and Emergency Procedures, Site Muster Point, Traffic Control Plan and other industry news.

#### Table 10: Project H&S Statistics.

| Metric                           | Unit | Total  |
|----------------------------------|------|--------|
| Site Construction Hours Direct   | Hrs  | 7,524  |
| Site Construction Hours Indirect | Hrs  | 20,268 |
| Take 5                           | -    | 169    |
| Authority to Work Permit         | -    | 14     |
| Hot Works Permit                 | -    | 10     |
| Lifting Operations Permit        | -    | 7      |
| Ground Penetration Permit        | -    | 8      |
| Veolia Permit                    | -    | 2      |
| Total Permits                    | -    | 39     |
| Project Inductions Completed     | -    | 114    |
| Passive Alcohol Testing          | -    | 1247   |
| Random Drug Testing              | -    | 8      |
| Plant Premobilisations           | -    | 37     |
| Field Inspections                | -    | 19     |
| Toolbox Meetings                 | -    | 24     |
| Site Walkthrough with Contractor | -    | 34     |
| Lost Day Injuries                | LDI  | 0      |
| Medically Treated Injuries       | MTI  | 0      |
| First Aid Incident               | FAI  | 0      |
| Restricted Workday Injury        | RWDI | 0      |
| Environment Incident             | ENV  | 2      |
| No injury Incident               | INC  | 0      |
| Total Incidents                  | -    | 2      |

#### 9.0 PROJECT CLOSE OUT

The construction of the pond was done in line with and according to the specifications and design drawings attached to this MDR. We trust this document meets all requirements, however if you require further information, please do not hesitate to contact the undersigned.

# Signature Page

Louie Hogewind Construction Manager Glen Fuller Project Manager

PM:LH/GJF/pm;lh:gjf

https://wsponline.sharepoint.com/sites/au-ps132636/shared documents/6. deliverables/028\_mdr/ps132636\_028\_reva\_manufacturers report.docx

**APPENDIX A** 

# **Construction Photographs**

(To be provided)

APPENDIX B

**Construction Program** 

APPENDIX C

Issued for Construction Specification and Drawings

APPENDIX D

# Non-Conformance Reports

APPENDIX E

# **Design Change Documents**

APPENDIX F

## Completed WSP ITPs and ITRs Records

(To be provided)

APPENDIX G

# EAC Materials Data Report (MDR)

**APPENDIX H** 

# Construction Quality Assurance -Floating Cover

(To be provided)

**APPENDIX I** 

# **Record of Review - Materials**

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