



**KWD Recycling**  
Aghacurreen, Killarney, Co. Kerry

**Bund Integrity Inspections**  
In compliance with condition 3.11.5 of Waste  
Licence W0217-01

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May 2016



**Client: -** KWD Recycling Ltd, Aughacurreen, Killarney, County Kerry

**Address of Facility: -** Aughacurreen, Killarney, County Kerry

**Townland: -** Aughacurreen

**ITM Coordinates: -** E 493640, N 593990

**Date of Report: -** May 2016

**Revision No: -** 01

**Prepared by: -** **Donal Moynihan BE, C. Eng, M.IEI,**  
**CHARTERED ENGINEER,**  
**Donal Moynihan Consulting Engineers Ltd,**  
**Boolacullane,**  
**Farranfore,**  
**Co. Kerry**  
**V93 XN22**

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## INTRODUCTION

Donal Moynihan Consulting Engineers Ltd has been employed by KWD Recycling to carry out visual inspections and 24 Hour Hydrostatic integrity tests on the bunded areas within the waste facility at Aughacurreen.

The tests are to be carried out to ensure compliance with condition 3.11.5 of Waste Licence W0217-01

The bunded areas which were assessed during the inspections can be identified as follows:-

- Sump 1 Leachate Sump located internally within the materials recovery facility
- Sump 2 Near Office area
- Sump 3 Near Timber Shredder
- Sump 4 Oil Bund
- Sump 5 Oil Water Interceptor near Diesel Shed

Locations of the individual Sumps are shown on enclosed site layout plan in Appendix A

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## METHODOLOGY

The following describes the methodology used to assess the integrity of the bunds.

The bund integrity tests were performed in accordance with the Environmental Protection Agency (EPA) guidelines '*The Storage and Transfer of Materials for Scheduled Activities*' (2004) which provides guidance for the inspection and testing of bund structures.

The main guidelines are:

- The sealed surface providing the retention must be impermeable to the liquid being retained. This applies also to any connecting elements, such as pipes, penetrating the structure, the sealing of which must provide the same level of retention as the bund itself;
- There must be no adverse chemical reaction that could occur between different liquids in a bund that would impact on the integrity of the bund or the safety of personnel in its vicinity;
- In general bund walls should not exceed 1.5 m in height so that:
  - Fire-fighting operations are not hindered
  - Egress from a banded area in event of an emergency is relatively easy.
  - Natural ventilation of the banded area is encouraged.
- It is important that, where practicable, pumps, valves, couplings, delivery nozzles and other items associated with the operation of a tank are located inside the bund, although health and safety implications must be taken into account where pumps and other electrical equipment operate in bunds where flammable vapours may collect.
- Items not connected with the operation of the tanks should not be located within the banded area;
- The overflow vent from a storage tank being overfilled should be contained within the bund;
- It is strongly recommended that all pipe work leading to or from tanks within a bund is routed over the top of the bund in order to avoid the need to breach the walls;
- Bunds may be filled with liquid in event of a spillage or may be deliberately filled with liquid during testing; electrical equipment should therefore ideally be placed above the maximum liquid height or designed for submersion;
- Bulk chemical storage bunds should be designed to contain 110% of the capacity of the largest storage vessel located within the bund;
- Bund design should take into account the capture of spigot flow from ruptured tanks;
- Valved drainage from bunds should be avoided;
- Individual bunding is preferred to common bunding;

Where two or more tanks are installed within the same bund, the recommended capacity of the bund is the greater of:

- 110% of the capacity of the largest tank within the bund, or
- 25% of the total capacity of all of the tanks within the bund, except

Where tanks are hydraulically linked in which case they should be treated as if they were a single tank



## SITE INSPECTION

A preliminary site visit was arranged on the 17<sup>th</sup> of May 2016 to perform a visual inspection of the bunds and to ensure the bunds were filled for a 24-hour period. Two of the bunds (Oil bund, Leachate tank) were both roofed and hence protected from rainwater ingress. The other areas were covered for the 24 hour period to ensure no rain water entered.

Photographs were taken of the bunds and are enclosed in Appendix B.

Before the bunds were filled with water to test for water tightness and any possible leaks, the following potential defects were looked for around each of the bunds:

- **Holes for Pipes:** All holes in bunds to facilitate pipes have been properly plugged.
- **Electrical Equipment:** None of the bunds on site have electric equipment devices inside the bund that need to be raised for a bund integrity assessment.
- **Tank Retention:** Care was taken that any tanks partially emerged by the test water would not float. To guard against this any tank that would be partially submerged during the test was filled.
- **Other Defects:** All debris and spillages were removed from bunds before the bund integrity assessment.

The effective capacities of the bunds, where applicable, were also calculated at this stage.

The bunds were generally filled to 150mm from the top of the bund on the 17<sup>th</sup> of May and the level of the water was monitored to allow for adsorption by the concrete of the water. The bunds were then topped up and checked after a 24 Hour period. On the 18<sup>th</sup> of May the Inspections were undertaken.

Weather conditions were good for the test, calm day with light showers. All the bunding integrity tests were carried out simultaneously over a twenty four hour period. Containers were placed near the bunds to determine the evaporation rate of the water, (i.e. four separate containers were filled with water to a level of 30mm and were monitored over the testing period to calculate relative rates of evaporation and rainfall ingress).



**RESULT OF INTEGRITY TESTS**

All bunds tested were found to be without defects. No leakage was observed from any of the bunds and sumps tested. Allowing for the ingress of rainfall there was no drop in water level recorded across the site.

After the test was complete all bunds were emptied. The test showed that the walls were impervious to water and could adequately retain the required volume without danger of leakage or collapse. Therefore the bunds on-site conform to Condition 3.11.5 of the Waste licence W0217-01.

A summary of the findings of the visual and hydrostatic tests are provided below. Copies of the test record sheets in Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities are enclosed as Appendix C.

**SUMMARY OF RESULTS**

SUMP NUMBER	Date of Testing	Result	Comment
Sump No.1 (Leachate Sump)	17/5/2016-18/5/2016	Passed	Reinforced Concrete in good condition.
Sump No.2 (Near Office)	17/5/2016-18/5/2016	Passed	Reinforced Concrete in good condition.
Sump No.3 (Near Timber Shed)	17/5/2016-18/5/2016	Passed	Reinforced Concrete in good condition.
Sump No.4 (Oil Bund)	17/5/2016-18/5/2016	Passed	Reinforced Concrete in good condition.
Sump No.5 (Oil/Water Interceptor near Diesel Shed)	17/5/2016-18/5/2016	Passed	Reinforced Concrete in good condition.

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## APPENDICES

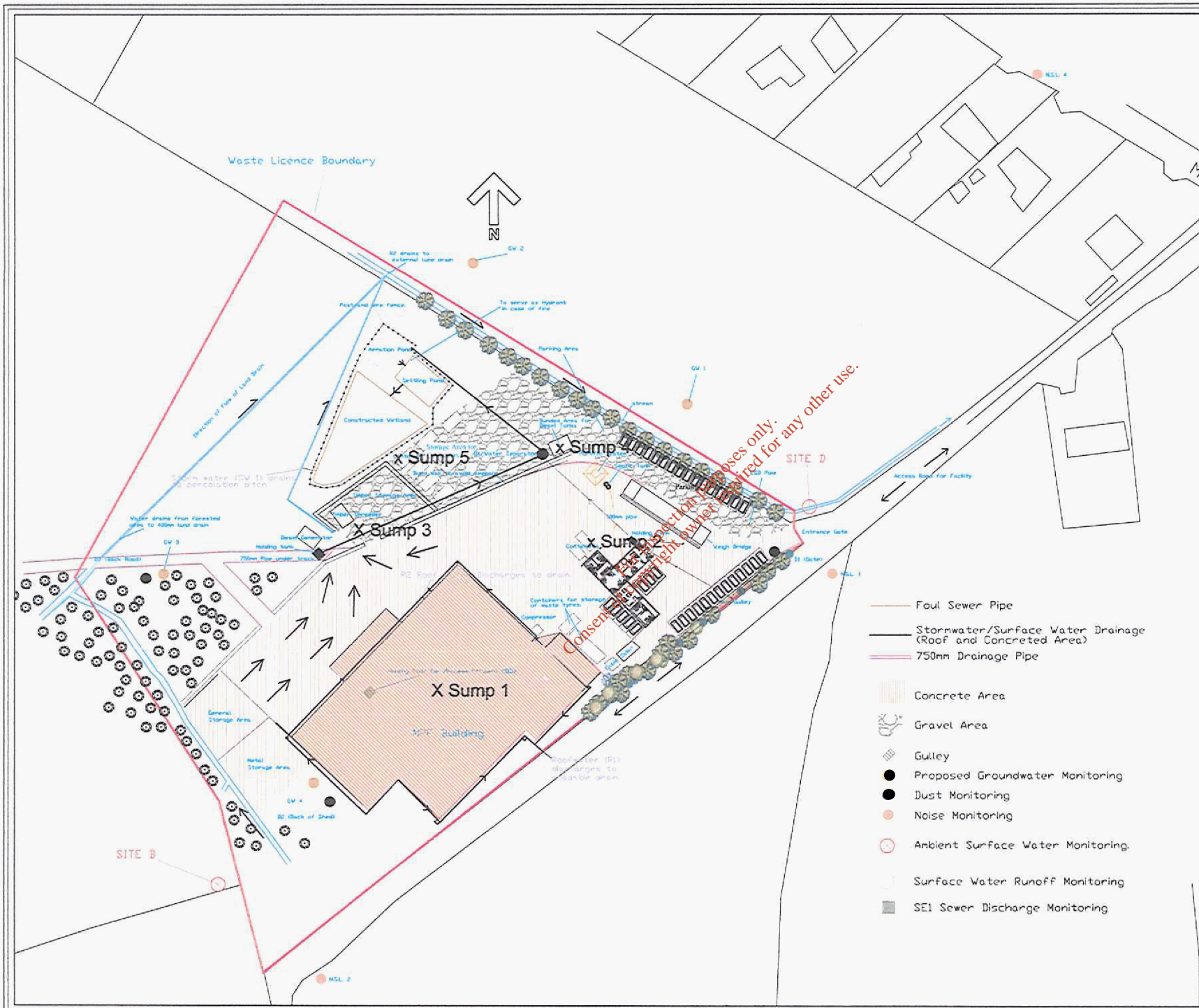
- Appendix A**      Site Layout showing positions of Bunds/Sumps tested
- Appendix B**      Photographic Record
- Appendix C**      Record Sheets of Bund Tests

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## Appendix A Site Layout showing positions of Bunds/Sumps tested

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NOTES:  
 THIS DRAWING IS COPYRIGHT ©  
 DO NOT SCALE FROM THIS DRAWING.  
 DIMENSIONS AND SPACING TO BE REPORTED TO THE ARCHITECT.

### APPENDIX A

LOCATION OF SUMPS  
 TESTED MAY 2016

- Foul Sewer Pipe
- Stormwater/Surface Water Drainage (Roof and Concrete Area)
- 750mm Drainage Pipe
- Concrete Area
- Gravel Area
- Gully
- Proposed Groundwater Monitoring
- Dust Monitoring
- Noise Monitoring
- Ambient Surface Water Monitoring
- Surface Water Runoff Monitoring
- SE1 Sewer Discharge Monitoring

REV NO.	DATE	REVISION

paudie  
o'mahoney  
and associates  
consulting engineers and architects

company name: paudie o'mahoney and associates  
 registered office: 100A-100B17, 100A17, 100A18, 100A19, 100A20, 100A21, 100A22, 100A23, 100A24, 100A25, 100A26, 100A27, 100A28, 100A29, 100A30, 100A31, 100A32, 100A33, 100A34, 100A35, 100A36, 100A37, 100A38, 100A39, 100A40, 100A41, 100A42, 100A43, 100A44, 100A45, 100A46, 100A47, 100A48, 100A49, 100A50, 100A51, 100A52, 100A53, 100A54, 100A55, 100A56, 100A57, 100A58, 100A59, 100A60, 100A61, 100A62, 100A63, 100A64, 100A65, 100A66, 100A67, 100A68, 100A69, 100A70, 100A71, 100A72, 100A73, 100A74, 100A75, 100A76, 100A77, 100A78, 100A79, 100A80, 100A81, 100A82, 100A83, 100A84, 100A85, 100A86, 100A87, 100A88, 100A89, 100A90, 100A91, 100A92, 100A93, 100A94, 100A95, 100A96, 100A97, 100A98, 100A99, 100A100

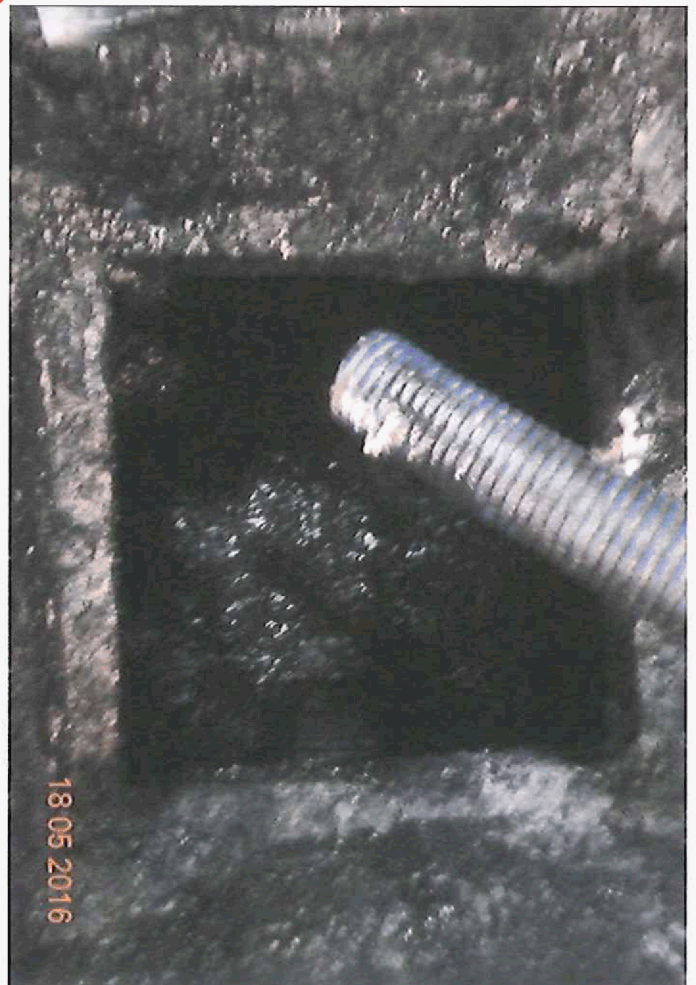
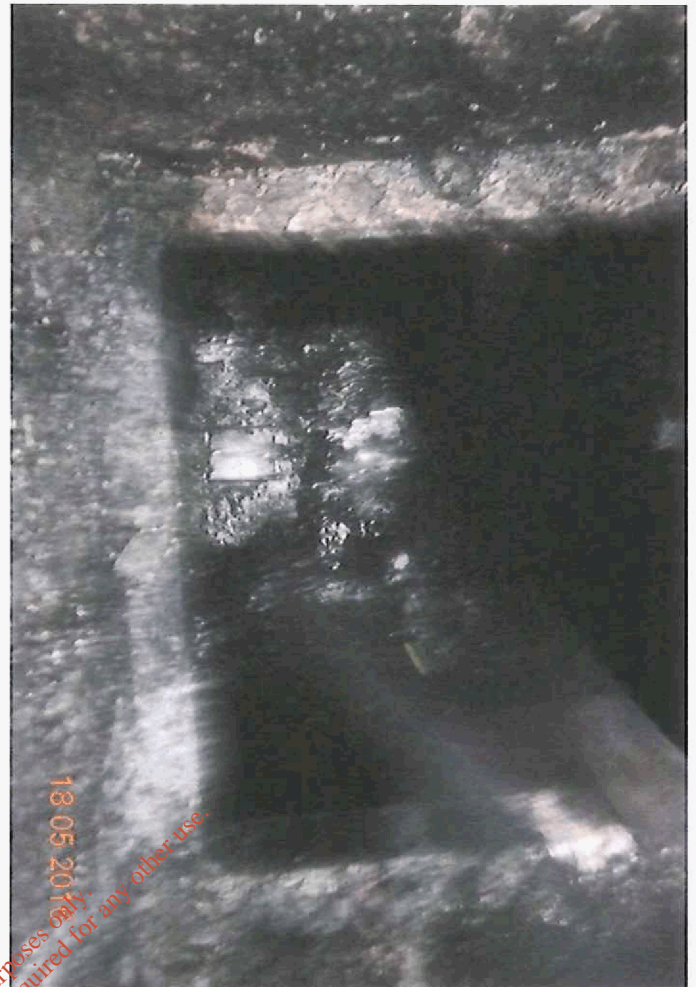
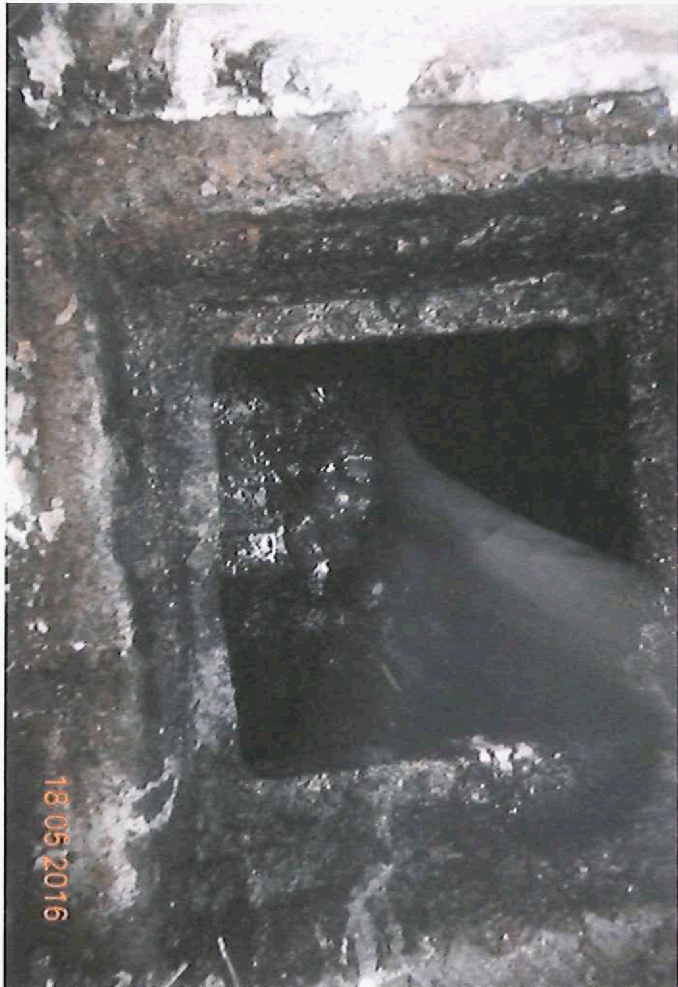
CLIENT:	Kilmer Waste Disposal Ltd		
PROJECT:	Waste Licence Review Application		
DRAWING:	Detailed Site Layout Plan		
SCALE:	NTS	DATE:	March '09
DRAWING NO.:	DG0035-01	DESIGNER:	D'GM
REV NO.:	F	DATE:	

## Appendix B Photographic Record

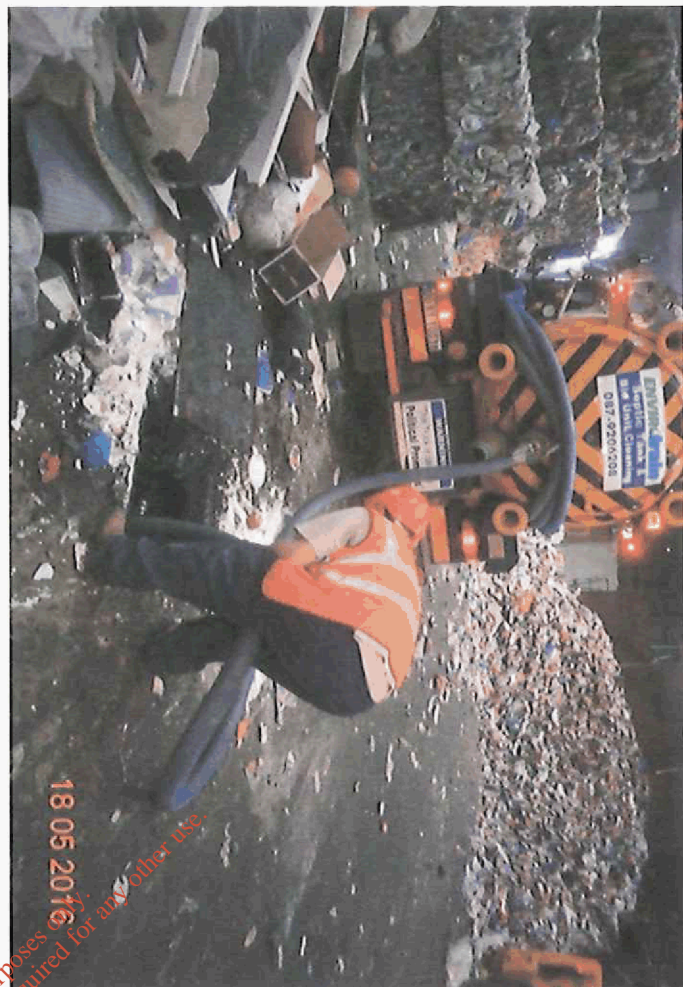
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## Sump 1

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18 05 2016

## Sump 2

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## Sump 3

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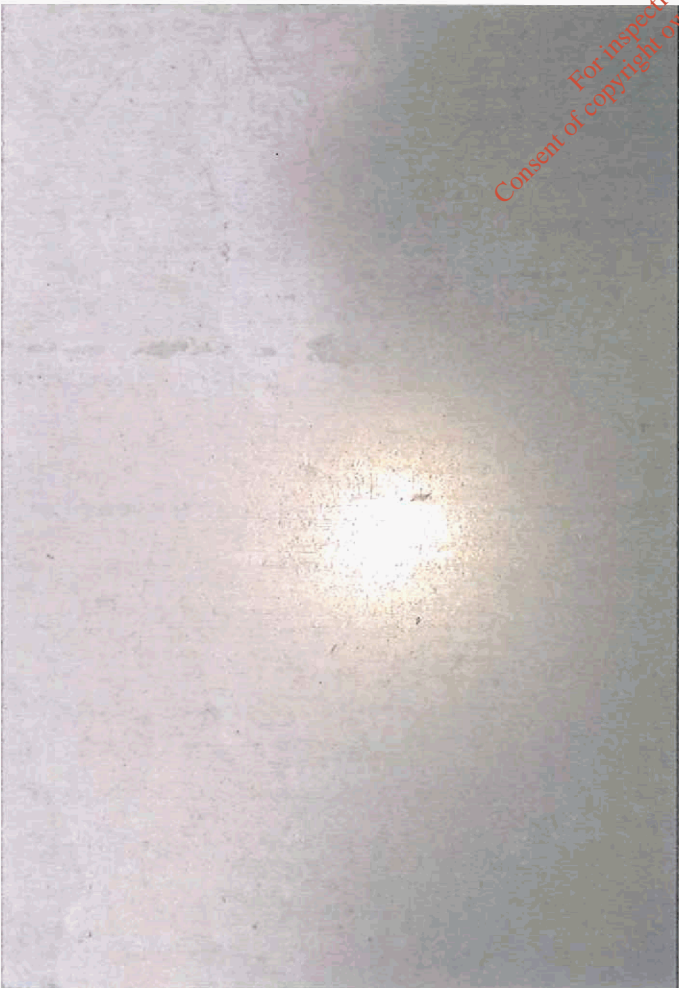
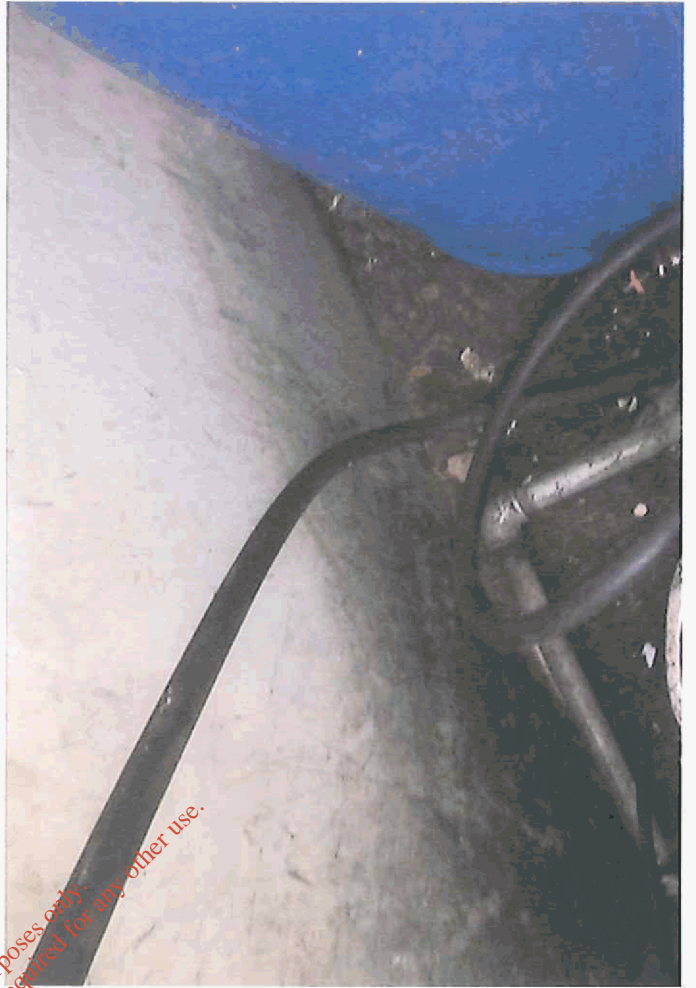
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19 05 2016

## Sump 4

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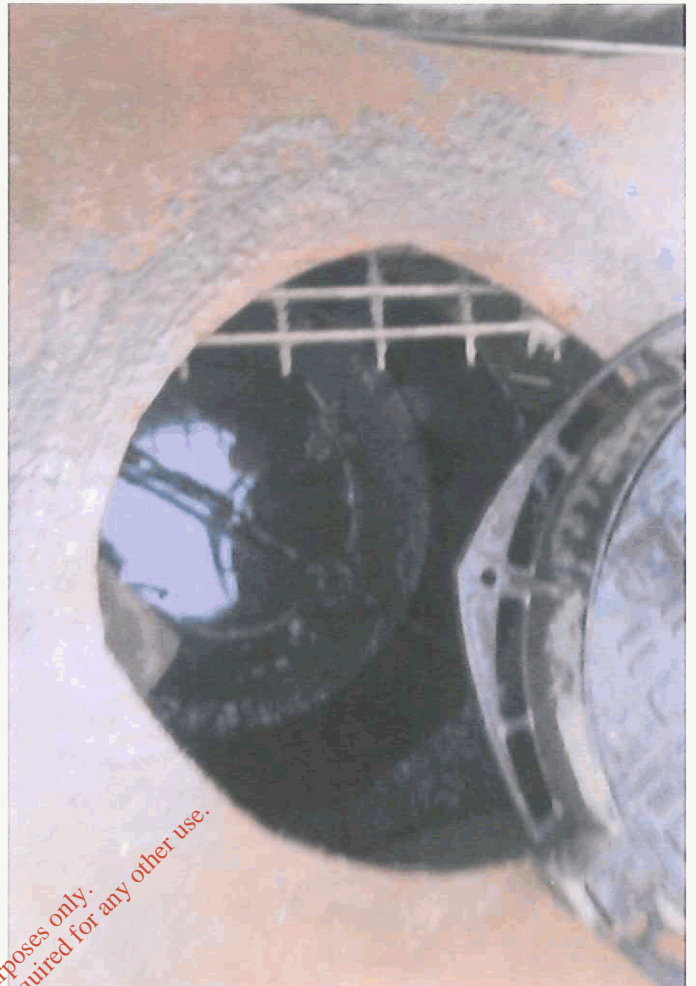




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**Sump 5**

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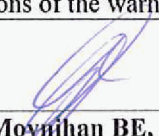
## Appendix C Record Sheets of Bund Tests

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# RECORD SHEET FOR BUND TESTING


(In Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities)  
 Hydrostatic & Visual Assessment  
**Sump 1 Leachate Storage Tank**

<b>Company: KWD Recycling Ltd</b>	<b>IPPC Reference: W0217-01</b>																		
<b>Date: 17/05/2016-18/05/2016</b>	<b>Bund Location:</b> Located internally within the Materials recovery Facility.																		
<b>Bund Ref. No.:</b> Sump 1 Leachate Storage Tank	<b>Bund Type – Concrete</b>																		
<b>Bund Dimensions:</b> Unknown	<b>Primary Vessels – Materials of Construction:</b> N/A																		
<b>Bund Materials of Construction:</b> Bund constructed from cast concrete	<b>Primary Vessels – Unknown-</b> there is an active warning light that flashes once bund is nearly full. This light has been tested and is currently working.																		
<b>Bund Lining Material:</b> None- Cast Concrete Design.	<b>Primary Vessels – N/A</b>																		
<b>Bund Retention Volume (Local):</b> 9,100L	<b>Weather conditions-</b> Dry Light Showers.																		
<b>Deemed practicable/safe to conduct hydrostatic test:</b> Yes																			
<b>If no, give reasons:</b> Not Applicable																			
<b>Date of Visual Inspection:</b>	<b>17/05/2016-18/05/2016</b>																		
<b>Description &amp; Results of Visual Inspection:</b> The bund was constructed between 2005 and 2006. There is no evidence of cracks on the side walls of the bund. The bund is located underground. On visual inspection the structural integrity of the bund appears sound. The warning light is working.																			
<b>Description and Results of Hydrostatic testing:</b> <b>24 Hour Test:</b> The bund was filled to a mark 150mm from the top of the bund. This was allowed to stabilise for a 24 hour period on the 18/05/2016. The Bund test was started at 09.00am on the 17/05/2016 and finished at 15.00 on the 18/05/2016.  There was no change in the water level in the container used to monitor evaporation and rainfall ingress. The water level was checked on the 18/05/2016 over a six hour period. The results of the test are shown below:																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #4F81BD; color: white;"> <th style="width: 50%;">Date &amp; Time</th> <th style="width: 50%;">Level below top of Bund Wall</th> </tr> </thead> <tbody> <tr><td>17/05/2016 9:00</td><td>150mm</td></tr> <tr><td>18/05/2016 9:00</td><td>150mm</td></tr> <tr><td>18/05/2016 10:00</td><td>150mm</td></tr> <tr><td>18/05/2016 11:00</td><td>150mm</td></tr> <tr><td>18/05/2016 12:00</td><td>150mm</td></tr> <tr><td>18/05/2016 13:00</td><td>150mm</td></tr> <tr><td>18/05/2016 14:00</td><td>150mm</td></tr> <tr><td>18/05/2016 15:00</td><td>150mm</td></tr> </tbody> </table>		Date & Time	Level below top of Bund Wall	17/05/2016 9:00	150mm	18/05/2016 9:00	150mm	18/05/2016 10:00	150mm	18/05/2016 11:00	150mm	18/05/2016 12:00	150mm	18/05/2016 13:00	150mm	18/05/2016 14:00	150mm	18/05/2016 15:00	150mm
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18/05/2016 15:00	150mm																		
Pass <input checked="" type="checkbox"/> Fail <input type="checkbox"/>																			
<b>Recommendations:</b> Re-test in three years time (2019) and undertake regular visual assessments and inspections of the warning light.																			
<b>Signed:</b>   <hr/> Donal Moynihan BE, C. Eng M.IEI	<b>Title/Position:</b>  CHARTERED ENGINEER	<b>Date:</b> 19/05/2016																	

# RECORD SHEET FOR BUND TESTING


(In Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities)  
Hydrostatic & Visual Assessment

## Sump 2 near Office Area

<b>Company: KWD Recycling Ltd</b>		<b>IPPC Reference: W0217-01</b>																		
<b>Date: 17/04/2016-18/04/2016</b>		<b>Bund Location:</b> Located internally within the Materials recovery Facility.																		
<b>Bund Ref. No.:</b> Sump 2 Near Office Area		<b>Bund Type – Concrete</b>																		
<b>Bund Dimensions:</b> Unknown		<b>Primary Vessels – Materials of Construction:</b> N/A																		
<b>Bund Materials of Construction:</b> Bund constructed from cast concrete		<b>Primary Vessels – Unknown-</b> there is an active warning light that flashes once bund is nearly full. This light has been tested and is currently working.																		
<b>Bund Lining Material:</b> None- Cast Concrete Design.		<b>Primary Vessels – N/A</b>																		
<b>Bund Retention Volume (Local):</b> 9,100L		<b>Weather conditions-</b> Dry Light Showers.																		
<b>Deemed practicable/safe to conduct hydrostatic test:</b> Yes																				
<b>If no, give reasons:</b> Not Applicable																				
<b>Date of Visual Inspection:</b>		<b>17/05/2016 - 18/04/2016</b>																		
<b>Description &amp; Results of Visual Inspection:</b> The bund was constructed between 2005 and 2006. There is no evidence of cracks on the side walls of the bund. The bund is located underground. On visual inspection the structural integrity of the bund appears sound. The warning light is working.																				
<b>Description and Results of Hydrostatic testing:</b> <b>24 Hour Test:</b> The bund was filled to a mark 150mm from the top of the bund. This was allowed to stabilise for a 24 hour period on the 17/05/2016. The Bund test was started at 09.05am on the 17/05/2016 and finished at 15.05 on the 18/05/2016.																				
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<b>Signed:</b>  Donal Moynihan BE, C. Eng M.IEI	<b>Title/Position:</b>  CHARTERED ENGINEER	<b>Date:</b> 19/05/2016																		

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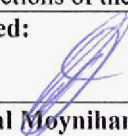
(In Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities)  
 Hydrostatic & Visual Assessment  
**Sump 3 near Timber Shredder**

<b>Company: KWD Recycling Ltd</b>		<b>IPPC Reference: W0217-01</b>																		
<b>Date: 17/05/2016-18/05 /2016</b>		<b>Bund Location:</b> See Appendix A / Sump located near timber shredding area.																		
<b>Bund Ref. No.:</b> Sump 3 near Timber Shredder		<b>Bund Type – Concrete</b>																		
<b>Bund Dimensions:</b> 2.4m x 1.5m x 2.4m Deep		<b>Primary Vessels – Materials of Construction:</b> N/A																		
<b>Bund Materials of Construction:</b> Bund constructed from cast concrete		<b>Primary Vessels – N/A</b>																		
<b>Bund Lining Material:</b> None- Cast Concrete Design.		<b>Primary Vessels – N/A</b>																		
<b>Bund Retention Volume (Local):</b> 8,640L		<b>Weather conditions-</b> Dry Light Showers.																		
<b>Deemed practicable/safe to conduct hydrostatic test:</b> Yes																				
<b>If no, give reasons:</b> Not Applicable																				
<b>Date of Visual Inspection:</b>		<b>17/05/2016-18/05/2016</b>																		
<b>Description &amp; Results of Visual Inspection:</b> The bund was constructed between 2005 and 2006. There is no evidence of cracks on the side walls of the bund. The bund is located underground. On visual inspection the structural integrity of the bund appears sound.																				
<b>Description and Results of Hydrostatic testing:</b> <b>24 Hour Test:</b> The bund was filled to a mark 150mm from the top of the bund. This was allowed to stabilise for a 24 hour period on the 18/05/2016. The Bund test was started at 09.10am on the 17/05/2016 and finished at 15.10 on the 18/05/2016.  There was no change in the water level in the container used to monitor evaporation and rainfall ingress. The water level was checked on the 18/05/2016 over a six hour period. The results of the test are shown below:																				
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# RECORD SHEET FOR BUND TESTING

(In Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities)  
Hydrostatic & Visual Assessment


## Sump 4 Oil Bund

<b>Company: KWD Recycling Ltd</b>		<b>IPPC Reference: W0217-01</b>																		
<b>Date: 17/05/2016-18/05/2016</b>		<b>Bund Location:</b> Located as shown on Site Layout Plan Appendix A / To North of the site/ located internally.																		
<b>Bund Ref. No.:</b> Sump 4 Oil Bund		<b>Bund Type – Concrete</b>																		
<b>Bund Dimensions:</b> 5.25m x 3.3m x 0.9m High		<b>Primary Vessels – Materials of Construction:</b> Plastic Storage Tank																		
<b>Bund Materials of Construction:</b> Bund constructed from cast concrete		<b>Primary Vessels – Main Diesel Tank 5,000L and smaller Tank is 1,000L.</b>																		
<b>Bund Lining Material:</b> None- Cast Concrete Design.		<b>Primary Vessels – 110% of the volume of the largest vessel.</b>																		
<b>Bund Retention Volume (Local):</b> 15,600L		<b>Weather conditions-</b> Dry Light Showers.																		
<b>Deemed practicable/safe to conduct hydrostatic test:</b> Yes																				
<b>If no, give reasons:</b> Not Applicable																				
<b>Date of Visual Inspection:</b>		<b>17/05/2016-18/05/2016</b>																		
<b>Description &amp; Results of Visual Inspection:</b> The bund was constructed in 2007. There is no evidence of cracks on the side walls of the bund. The bund is located underground. On visual inspection the structural integrity of the bund appears sound.																				
<b>Description and Results of Hydrostatic testing:</b> <b>24 Hour Test:</b> The bund was filled to a mark 150mm from the top of the bund. This was allowed to stabilise for a 24 hour period on the 17/05/2016. The Bund test was started at 09.15am on the 17/05/2016 and finished at 15.15 on the 18/05/2016.  There was no change in the water level in the container used to monitor evaporation and rainfall ingress. The water level was checked on the 18/05/2016 over a six hour period. The results of the test are shown below:																				
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<b>Recommendations:</b> Re-test in three years time (2019) and undertake regular visual assessments and inspections of the warning light.																				
<b>Signed:</b>  Donal Moynihan BE, C. Eng M.IEI	<b>Title/Position:</b>  CHARTERED ENGINEER	<b>Date:</b> 19/05/2016																		

# RECORD SHEET FOR BUND TESTING

(In Accordance with EPA Guidance Note on Storage & Transfer of Materials for Scheduled Activities)  
Hydrostatic & Visual Assessment

## Sump 5 Oil/Water Interceptor near Diesel Tank

<b>Company: KWD Recycling Ltd</b>		<b>IPPC Reference: W0217-01</b>																		
<b>Date: 08/04/2016-09/04/2016</b>		<b>Bund Location: See Appendix A.</b>																		
<b>Bund Ref. No.:</b> Sump 5 Oil/Water Interceptor near Diesel Tank		<b>Bund Type – Concrete</b>																		
<b>Bund Dimensions: 0.9m Diameter x 1.0m deep x 2 number</b>		<b>Primary Vessels – Materials of Construction: N/A</b>																		
<b>Bund Materials of Construction:</b> Bund constructed from cast concrete		<b>Primary Vessels – N/A</b>																		
<b>Bund Lining Material: None- Cast Concrete Design.</b>		<b>Primary Vessels – N/A</b>																		
<b>Bund Retention Volume (Local): 1,271L</b>		<b>Weather conditions- Dry Light Showers.</b>																		
<b>Deemed practicable/safe to conduct hydrostatic test: Yes</b>																				
<b>If no, give reasons: Not Applicable</b>																				
<b>Date of Visual Inspection:</b>		<b>17/05/2016- 18/05/2016</b>																		
<b>Description &amp; Results of Visual Inspection:</b> The bund was constructed between 2005 and 2006. There is no evidence of cracks on the side walls of the bund. The bund is located underground. On visual inspection the structural integrity of the bund appears sound.																				
<b>Description and Results of Hydrostatic testing:</b> <b>24 Hour Test:</b> The bund was filled to a mark 50mm from the top of the bund. This was allowed to stabilise for a 24 hour period on the 17/05/2016. The Bund test was started at 09.20am on the 17/05/2016 and finished at 15.20 on the 18/05/2016.  There was no change in the water level in the container used to monitor evaporation and rainfall ingress. The water level was checked on the 18/05/2016 over a six hour period. The results of the test are shown below:																				
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