

## **Attachment K. Remediation, Decommissioning, Restoration and Aftercare**

PANDA has prepared an Environmental Liability Risk Assessment (ELRA) and Decommissioning Management Plan (DMP) for the facility and these, along with a proposal for Financial Provision, were submitted to the Office of Environmental Enforcement (OEE) in December 2013. A copy of the ELRA and the DMP is included in this Attachment.

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**ENVIRONMENTAL LIABILITY RISK ASSESSMENT**

**PANDA WASTE SERVICES**

**WASTE RECYCLING FACILITY**

**CAPPOGUE**

**FINGLAS**

**DUBLIN 11**

**WASTE LICENCE NO. W0261-01**

**Prepared For: -**

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**December 2013**

Project		Environmental Liability Risk Assessment Panda Waste Services Cappagh Road.		
Client		Panda Waste Services Ltd W0261-01		
Report No	Date	Status	Prepared By	Reviewed By
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# 1. INTRODUCTION

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Nurendale Ltd, trading as Panda Waste Services (Panda), operates its Materials Recovery Facility (MRF) at Cappagh Road under Waste Licence Reg. No.W0261-01 issued by the Environmental Protection Agency (Agency). Condition 12.2.2 of the Licence requires Panda to prepare a fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10.2.1 for execution of the Decommissioning Management Plan (DMP)

Panda appointed O'Callaghan Moran & Associates (OCM) to prepare the ELRA. OCM is an environmental consultancy, established in 1997, which provides environmental services to private and public sectors. OCM has been involved in the completion of environmental risk assessments for Waste Licensed and Integrated Pollution Prevention Control licensed facilities since 2001.

## 1.1 Methodology

OCM's assessment was based on the Agency's recently issued draft revised guidance 'Guidance on assessing and costing environmental liabilities' (July 2013) and included the following:

- A review of site operations including waste acceptance, handling and on-site recovery processes, raw material storage and handling practices and emissions to identify and assess existing and potential sources of environmental pollution;
- Establishment of the environmental setting and the identification of any particular sensitive receptors that could be impacted in the short, medium and long term by the site operations;
- Review of the site history and regulatory compliance.

## 1.2 Limitations

The Waste Licence authorises the construction and operation of three separate waste processing buildings and to accept and process Construction and Demolition Waste, Dry Recyclable Household and Commercial and Industrial Waste and Paper & Cardboard.

The Licence authorises the acceptance of 200,000 tonnes of waste when the site is fully developed (when all three buildings are operational) but until then the annual intake is restricted to 70,000 tonnes.

PANDA has constructed the first of the three waste processing buildings, which takes in Construction and Demolition and Dry Recyclable Commercial and Industrial wastes. The other two buildings, which will house Dry Recyclables and Paper & Cardboard are under

construction. These works also include paving the entire operational area and it is understood that this will be completed by April 2014.

The assessments of costs required to reduce or mitigate the environmental liabilities identified in this report are based on the information available at the time of the report preparation and may be subject to amendment based on future investigations.

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## 2. SITE OPERATION

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### 2.1 Facility Location

The site is located on the Cappagh Road, approximately 2.5km southwest of Dublin Airport.

### 2.2 Facility Layout

The site encompasses 2.53 ha. The initial site development works included the provision of site services, construction of perimeter security fencing, internal access roads and paved yards in the northern and central parts of the site, foul and surface water drainage system, weighbridge(s), Building A1 (1,760m<sup>2</sup>) and an electrical substation. A 3m high acoustic wall was constructed at the south east boundary. Portacabin offices, canteen and staff welfare facilities have been temporarily located adjacent to the weighbridge at site entrance and at the south east side of the building.

The construction works that are underway, involves the construction of the Buildings B1 (2,800m<sup>2</sup>) and B2 (4,680m<sup>2</sup>), the completion of the paving of the open areas and the extension of the surface water drainage system. Details of the site infrastructure are in Table 2.1

**Table 2.1 – Site Infrastructure**

Ref	Infrastructure	Details
1	Electrical Substation	Located at the western boundary.
2	2 No Weighbridges and associated portacabin type office	Located close to the facility entrance (78m <sup>2</sup> )
3	Building A1	C&D and C&I processing (1,760m <sup>2</sup> )
4	Building B1	Dry Recyclables (2,800m <sup>2</sup> )
	Building B2	Paper & Cardboard (4,608m <sup>2</sup> )
4	Underground Stormwater Attenuation Tank	1,400m <sup>3</sup>
5	Paved Yard	16,212m <sup>2</sup>
6	External Storage Bays	Temporary, formed by large concrete blocks
7	Oil Storage Tanks	20,000 litres and 5000 litres

### 2.3 Services

Electricity is supplied by Electric Ireland, which has an electrical substation on-site. Water is obtained from an on-site well. Sanitary wastewater is collected and stored in an underground tank pending removal off-site for treatment in a municipal wastewater treatment plant.

### 2.4 Waste Types & Volumes

The facility accepts predominantly skip waste from construction and demolition sites, household renovations/clearances and C&I Dry Mixed Municipal Waste. Source segregated

baled cardboard, baled plastic and boxed plastic hangers are also accepted from a commercial customer who has nationwide outlets. No hazardous, putrescible or liquid wastes are accepted. The licence allows the acceptance of 200,000 tonnes annually.

## 2.5 Waste Acceptance & Handling Procedures

When the on-going construction works are complete, the mixed C&D and C&I waste are handled in Building A1, the Dry Recyclables will be handled in Building B1 and the Paper and Cardboard will be handled in Building B2.

Current operations include the processing of C&D and C&I wastes inside Building A1; the bulking up of the plastic hangers into specially designed transport vehicle near the western site boundary; the storage of the source segregated baled cardboard and baled plastic in an open paved area along the southern site boundary and the storage of recovered waste electronic and electrical waste (WEEE) and timber on paved areas adjacent to Building A1. The external storage of the wastes is a temporary measure and will stop following the construction of Buildings B1 and B2.

In Building A1 ferrous and non-ferrous metals, waste electrical and electronic equipment (WEEE), wood and bulky wastes are segregated manually and mechanically using a mechanical grab. The WEEE is stored in cages on a paved area at the rear of the processing building. The timber is stored in open bays formed by large concrete blocks on a paved area to the south west of the processing building. The remaining mixed waste is then bulked up and sent to PANDA's Beuaparc facility for processing.

In Building B1, the pre-segregated dry recyclables will be baled. The mixed recyclables will be separated manually and mechanically into the different waste streams (paper, cardboard, plastic, glass and metal) using a sorting line incorporating a loading hopper, conveyor, picking line, ballistic separators and magnets. The paper, cardboard, plastic and metal cans will be baled. The glass will be stored in a bin.

In Building B2, the higher value, low quantity paper will be sorted using a picking line comprising a conveyor that it passes over five open top bins. Each of the bins will be dedicated to a particular grade. As the waste paper passes along the conveyor, the sorting personnel will pick out the particular grade and deposit it into the appropriate bin. Any unsorted paper will fall into an end bin (the lowest value grade). When a bin is full it will be emptied on to a conveyor and sent to a baler.

Lower grades of mixed paper will not be sorted but will be baled. All the bales will be tied with wire. On average the weight of each bale is 750 kg, but this can vary from 500 kg to 1,000 kg depending on size, density, waste paper type and moisture content. The finished bales will be moved to the designated storage areas inside the building using a clamp truck.

## 2.6 Waste Storage

Waste electrical and electronic equipment (WEEE) recovered from the incoming wastes are stored externally in cages on a paved area at the rear of the processing building. Green waste recovered from the skips and C&D waste (predominantly timber) is stored in open bays formed by large concrete blocks on a paved area to the south west of the processing building.



The source segregated baled cardboard and baled plastic are stored in an open paved area along the southern site boundary pending consignment to other authorised waste recovery facilities

## 2.7 Plant & Equipment

Facility operations require the use of a range of fixed and mobile plant which are listed in Table 2.3.

**Table 2.3** Plant and Equipment

Type of Plant	Building 1
Front Loading Shovel	2
Trommel	1
Baler	1
Grabs	1
Conveyor	2
Bag Opener	1
Forklift	1
Yardsweeper	1

## 2.8 Vehicle Parking and Receptacle Storage

Employee vehicles are parked on the paved area to the west of the processing building. Empty bins and empty skips are stored in the unpaved areas in the east and south of the site.

## 2.9 Oils & Chemicals

The only hazardous materials currently used are diesel, gas oil and adblu (a diesel additive). The diesel is stored in an above ground integrally bunded steel tank located on a paved area at the south east corner of the processing building. The dispensing pump sits in a drip collection tray.

**Table 2.2 – Volume of Hazardous Materials**

Products	Quantity Stored litres
Diesel Oil	20,000
Gas Oil	5,000
Adblu	1000

## 2.10 Fire Detection & Supression

A fire detection and alarm system and fire suppression system will be put in place before wastes are accepted in Buildings B1 and B2. The detection and alarm system will include:

- Site staff will alert other staff members in the event of a fire;
- 24 hour netwatch system
- Designated Safety Coordinators, with responsibility for assessing the scale of an incident, controlling employees at the assembly area and, alerting the fire service.

The fire suppression system will include:

- Dry Powder Fire Extinguishers
- Water Fire Extinguishers
- No Carbon Dioxide Fire Extinguishers
- Foam Fire Extinguishers
- Hose Reels – Access will be provided and maintained to all individual plant items within the buildings. Hose reels will be fed by internal pipework.
- Ring main with eight (8No.) hydrants.
- Heat activated roof mounted sprinkler system that covers all areas where plant items and materials are stored. The water will be obtained from an above ground tank.

## 2.11 Emissions

Potential and actual emissions from the facility include: -

- Noise,
- Dust,
- Surface Water,
- Wastewater,

Schedule B of the Licence sets emission limits for noise and dust. Schedule C specifies a monitoring programme, which includes surface water and wastewater monitoring.

## 2.12 Emergency Response

PANDA has prepared and adopted an Accident Prevention Policy (APP) and Emergency Response Procedures (ERP). The APP addresses all potential hazards, with particular reference to the prevention of accidents that may cause damage to the environment. The ERP identifies all potential hazards at the site that may cause damage to the environment and also specifies roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts.

PANDA has a documented procedure on the handling and storage of potentially polluting substances used at the facility, e.g. oils. The procedure describes how filling the fuel storage

tanks and refuelling/servicing the mobile plant should be carried out to minimise the risk of accidental spills and ensure that if these occur there is a rapid and effective response.

### 2.13 Risk Mitigation Measures

The Licence conditions require the provision of mitigation measures, both infrastructural and procedural, that effectively minimise the risk of environmental liabilities associated with unplanned events. Such measures, which are subject to regular review both by the licensee and in response to the findings of Agency inspections, include:

- Provision of an appropriately experienced Facility Management Team and implementation of appropriate staff programmes;
- Implementation of a site specific Environmental Management System (EMS), including an Environmental Management Programme (EMP) and Corrective Action Procedures;
- Adoption of site specific APP and ERP, which are reviewed annually;
- Provision of impermeable concrete surfaces in all areas of the facility associated with the movement, processing, handling and storage of waste;
- Provision and maintenance of attenuation tank and oil interceptor on the storm water system;
- Provision of appropriate bundling for all tank and drum storage areas, and routine integrity testing of these and underground tanks and pipework to ensure that they are fit for purpose;
- Provision and maintenance of appropriate spill response and clean-up equipment in areas where there is a risk of spills occurring;
- Regular site inspections and visual inspections of the surface water emissions from the site.
- Full time on-site security outside of operational hours

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### 3. OPERATION PERFORMANCE

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#### 3.1 Site History

The site was initially developed in 2006. Prior to this the site had been used for agricultural purposes. Fingal County Council issued a Waste Permit for the facility in May 2006. The facility opened in October 2006 and has been in continuous operation since then. The Agency granted the Waste Licence August 2010.

#### 3.2 Facility Management

The facility is managed by a suitably qualified and experienced Facility Manager and all facility personnel are provided with appropriate training and have the requisite qualifications and experience to complete their assigned tasks. The Facility Manager has 9 years experience in Waste Management and holds a Certificate in the FAS Waste Management Training Course. The Deputy Manager has 18 years experience in waste management and holds a Certificate in Waste Management and EPA Waste Licence Training (agreed equivalent to the FAS Waste Management Training Course)

Panda has prepared a documented Environmental Management Programme (EMP) which serves as a guidance document for facility staff and describes operational control and management practices. The EMP is a core element of the facility's Environmental Management System (EMS).

Panda has prepared and adopted an Accident Prevention Policy (APP) and Emergency Response Procedures (ERP). The APP addresses all potential hazards, with particular reference to the prevention of accidents that may cause damage to the environment. The ERP identifies all potential hazards at the site that may cause damage to the environment and also specifies roles, responsibilities and actions required to deal quickly and efficiently with all foreseeable major incidents and to minimise environmental impacts.

PANDA has prepared documented procedures on the handling and storage of potentially polluting substances used at the facility, e.g. oils. The procedure describes how filling the diesel storage tank and refuelling/servicing the mobile plant should be carried out to minimise the risk of accidental spills and ensure that if these occur there is a rapid and effective response.

#### 3.3 Incident History

There have been no incidents (spills, fires, leaks etc) since PANDA began operations at the site that had potential to cause environmental pollution.

### 3.4 Compliance History

Site inspections carried out in 2011 and 2013 by the Agency identified a total of 4 non compliances with the Licence conditions. These were

- Failure to have copies of Waste Collection Permits for the vehicles that delivered waste cardboard and plastic hangers to the site;
- Failure to ensure that the Nominated Facility Deputy Manager was present at the site in the absence of the Nominated Facility Manager;
- Failure to consistently record details of the visual inspection and in situ monitoring of the surface water emission, and
- Exceedance of annual waste tonnage limit in 2012.

### 3.5 Enforcement History

There has been no enforcement action taken by regulatory authorities against the facility.

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## 4. ENVIRONMENTAL SENSITIVITY

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### 4.1 Surrounding Land Use

The surrounding land uses consist of a mix of industrial, quarrying and agricultural activities. They have been intensively developed in recent years for industrial, commercial and quarrying uses, with the infrastructure in place for further development.

The lands surrounding the site have been intensively developed for industrial, commercial and quarrying uses. There is one private residence located close to the facility, approximately 30m from the south eastern boundary, with ten more residence approximately 450 m to the south east also on the southern side of the Cappagh Road.

The Cappagh Road forms the eastern site boundary and to the east of this is Huntstown Quarry, which covers more than 1km<sup>2</sup>. The lands to the west are zoned for warehousing and the site adjacent the northwest boundary is occupied by a Coca Cola distribution centre and further northwest is Irish Asphalt. Millennium Business Park is to the north and Stadium Business Park is to the south

### 4.2 Surface Water

The site is located in the catchment of the Tolka River, which is approximately 2 kilometres to the south west of the site. There is an open drain along the western site boundary, which is predominantly dry. There are no water courses on the surrounding lands.

Surface water from the paved yards and building roof passes through a silt trap and oil interceptor before entering a storm water attenuation tank. The outfall from the tank connects to the storm water sewer in the adjoining Stadium Business Park. It is understood that this sewer outfalls to the Tolka River.

### 4.3 Geology & Hydrogeology

The subsoils in the locality comprise sandy gravelly boulder clays, which range in thickness from less than 1.3 m to more than 8 m. A site investigation carried out at the site in 2005 revealed approximately 25 cm of top soils overlying a boulder clay that ranged in thickness from 0.8 to 1.35 m.

The underlying bedrock locally comprises nodular muddy limestone and shale. The bedrock in has been extensively quarried locally, both immediately to the east of the site and further away to the west and north. The underlying bedrock at the site is classified by the GSI as being a Moderately Productive only in local zones (LI) There is no record of any groundwater abstraction wells within 2 kilometres of the site. Based on the available information on the type and thickness of the subsoil, the vulnerability of the bedrock aquifer ranges from High to Extreme across the site. The local direction of groundwater flow is likely to be greatly influenced by the quarrying activities to the east and north of the site.

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## 5. RISK ASSESSMENT

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### 5.1 Environmental Liabilities

Environmental liabilities arise from contamination or damage to environmental media (air, surface water, soils and groundwater), which can act as pathways to sensitive receptors. There are no known liabilities associated with past site use. The Agency, in reaching a decision to grant the Waste Licence, concluded that the facility, if designed and operated in accordance with the Licence conditions, will not give rise to environmental liabilities.

Therefore, for the purposes of this ELRA, future environmental liabilities are confined to incidents such as fires, explosions, spills and leaks. The receptors that are potentially susceptible to adverse impacts associated with such incidents include, air, soils, groundwater, surface water and nearby commercial activities and residences.

### 5.2 Emissions to Air

Potential emissions to air include odours, dust, litter, and noise that could occur as a result of a fire at the site. The ERP sets out the measures that will be taken by trained staff in the event of a fire or explosion. In the event of release to air during an incident, for example a fire, such emissions (smoke, dust, odours etc) will only have short-term impacts, which will not require post incident remediation.

### 5.3 Emissions to Soil & Groundwater

Potential emissions that might affect the quality of the run-off are associated with unexpected releases e.g. spills or leaks of oils and contaminated fire water run-off. The area of the site where wastes are moved, processed, handled and stored is fully paved with concrete.

Separate sanitary wastewater and surface water collection systems are provided. Sanitary wastewater is collected in an underground storage tank. Surface water from the paved yards and building roof passes through a silt trap and oil interceptor before entering the storm water attenuation tank. The outfall from the tank connects to the storm water sewer in the adjoining Stadium Business Park.

The only risk to soil and groundwater is discharge through damaged paved areas or leaks from the underground surface and waste water tanks and pipework. All open areas and the floor of the MRF buildings are regularly visually inspected for evidence of damage. Any damaged areas are repaired as soon as practical.

The pipe work and storage tanks, including the oil interceptor and underground wastewater storage tank are tested every three years to confirm they are fit for purpose. The most recent tests, which were completed in 2012, confirmed the tanks and pipework are fit for purpose and working satisfactorily.

## 5.4 Emissions to Surface Water

Surface water from the paved yards and building roof passes through a silt trap and oil interceptor before entering a storm water attenuation tank (1400m<sup>3</sup>). The outfall from the tank connects to the storm water sewer in the adjoining Stadium Business Park. There is a shut off device on the outlet from the tank that can be activated in the event of an incident that has the potential to cause surface water pollution.

The diesel storage tank has an integral bund and the dispensing pump is located in a drip tray. Spills and leaks of oil can occur during the refuelling of plant, filling of the storage tank and when handling and storing lubricants, hydraulic fluids and waste oils. PANDA has prepared and implemented written procedures for the proper handling of oils at the site, which include the corrective actions to be taken in the event of a spill. PANDA maintains an adequate supply of spill kits to contain and absorb any spill that may occur and facility personnel are provided with appropriate training to deal with any such incidents.

In the event of an incident (spill, explosion, fire), the shut off device on the attenuation tank will be activate to contain contaminated run off inside the site. The interceptor and tank storage tank will be emptied and the contents sent off site for treatment as soon as practical following the incident.

A potential source of surface water contamination is firewater run-off. Details of the fire response procedures, which ensure a rapid response to and control of any fire so as to minimise the adverse impacts, are in the ERP and include the activation of the shut off device at the storm water attenuation tank. PANDA has not yet completed an assessment of the firewater retention capacity at the facility, although the surface water attenuation tank has a capacity of 1,400m<sup>3</sup>.

## 5.5 Risk Identification

The plausible risks identified at the site are presented in Table 5.1.

**Table 5.1 Risks**

Risk ID	Process	Potential Hazards/Risks
1	Diesel/Oil Storage	Accidental release of diesel from bulk storage tanks-surface water contamination
2		Accidental release of diesel during deliveries and dispensing-surface water contamination.
3		Accidental release of diesel and oils- soil and groundwater and surface water contamination.
4	Wastewater	Leak from underground storage tanks-soil and groundwater contamination
5		Overtopping of the underground storage tanks
6	Fire in Process Buildings	Emissions to air.
7		Firewater run-off to surface water drains-surface water contamination.
8		Firewater infiltration to ground-soil, groundwater and surface water contamination



## 5.6 Risk Analysis

An assessment of the risks presented by the facility operations was completed taking consideration of site specific characteristics and the Classification Tables for Likelihood and Consequence in the Agency's Draft Guidance Document (Ref Table 5.2 and 5.3).

**Table 5.2 – Risk Classification Table (Likelihood)**

<b>Risk</b>	<b>Category</b>	<b>Description</b>
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

**Table 5.3– Risk Classification Table (Consequence)**

<b>Risk</b>	<b>Category</b>	<b>Description</b>
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor/localised impact or nuisance
3	Moderate	Moderate damage to the environment
4	Major	Severe damage to the environment
5	Massive	Massive damage to a large area, irreversible in the medium term

The Risk Analysis Form is presented in Table 5.4. The assignment of the severity rating scores takes into consideration the mitigation measures that are already in place and will be provided by April 2014.

ELRAs are normally based on the existing conditions at the time the ELRA was prepared. However as construction works for Buildings B1 and B2 are underway and the entire site will be paved by April 2014, it is reasonable to factor these into the assessment of risks

**Table 5.4 Risk Analysis Form**

Risk ID	Process*	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
1	Diesel Storage	Uncontrolled release from above ground bulk storage tank that escapes the bund and enters surface water drains	Contamination of surface water drains within the site, in Stadium Business Park and the River Tolka	1	The bund design and construction complies with licence requirements and has more than 110% capacity of the largest tank (20m <sup>3</sup> ). The bund is subject to regular visual inspection and routine integrity testing and repaired as required. Staff fully trained in spill prevention and clean-up. All surface water passes through a silt trap and Class 1 Oil Interceptor. Shut off facility provided on the outlet from the interceptor that can be activated in the event of a spill/release to contain oil contaminated water within the site. The risk is <b>Very Low</b>	2	The activation of the shut off device will contain contaminated runoff within the site and allow the removal of floating product. Given the relatively limited quantity of oil stored on site, the rapid response to an incident and presence of the interceptor and shut off valve the amount of oil that would enter the Stadium Business Park sewer would be negligible. The severity of the impact, would be <b>Minor</b>	2
2	Diesel Storage	Entry of diesel or oil to surface water drainage system during filling/dispensing	Contamination of the surface water drains within the site and in Stadium Business Park and contamination of the River Tolka	2	Oil stored in banded tank, staff fully trained in spill prevention and clean-up. All surface water passes through a silt trap and Class 1 Oil Interceptor. Shut off device on the attenuation tank activated in the event of a spill/release will contain contaminated water within the site. The risk <b>Low</b>	2	The activation of the shut off device will contain contaminated runoff within the site and allow the removal of floating product. Given the limited amount of oil that would be released in the incident and the presence of the interceptor and shut off valve the amount of oil that would enter the Stadium Business Park sewer would be negligible. The severity of the impact would be <b>Minor</b>	4

Risk ID	Process	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
3	Diesel/Oil Storage	Oil spill that leak through damaged paving	Soil / Groundwater contamination	2	Documented procedure for tank refilling and dispensing. Staff fully trained in spill prevention and clean-up. All operational areas are paved with concrete. Routine inspection and repair of damaged paved areas. The APP and ERP minimises the risk of accidents and ensure rapid response to incident. The risk is <b>Low</b> .	1	Subsoils are poorly permeable and not water bearing. Aquifer vulnerability ranges from High to Low. Given the limited amount of oil stored on site and, the rapid response to an incident, the amount of oil that would escape would be relatively small. The severity of the impact would be <b>Trivial</b>	2
4	Wastewater Storage	Leak of sanitary wastewater from underground storage tank	Soil / Groundwater contamination	2	Routine inspections and integrity testing of the tank. The risk is <b>Low</b> .		Aquifer vulnerability ranges from High to Extreme. Aquifer vulnerability ranges from High to Extreme. On site well The severity of the impact would be <b>Trivial</b> .	2
5	Wastewater	Overtopping of wastewater storage tanks	Contamination of surface water drains	2	Regular inspection and emptying of the tank. The risk is <b>Low</b>	1	Given the small volume of the tank, the distance to the attenuation and the dilution that would occur in the surface water drains the impact would be <b>Trivial</b> .	2
6	Fire in Waste Building/ Office/ Yard	Smoke emission to air.	Air pollution	5	ERP ensures rapid response to incident. The risk is Very High.	1	Smoke presents a potential health risk. Surrounding land use primarily commercial. Emergency Service Co-ordinator will make decision on the need to evacuate nearby commercial premises. Could be significant disruption during incident, but no long term effect. The severity of the impact would be <b>Trivial</b> .	5

Risk ID	Process	Potential Risks	Environmental Effect	Likelihood	Basis of Likelihood	Consequence	Basis of Severity	Risk Score (Severity x Occurrence)
7	Firewater Run-off	Contamination of storm sewer serving the Stadium Business Park escape of firewater to surface water drainage system	Surface water contamination of the Tolka River	3	All surface water run-off from the paved area passes through attenuation tank and Class 1 Oil Interceptor. Staff trained in emergency response measures. Shut off device on the attenuation tank will be activated in the event of a fire to contain contaminated water within the site. Firewater retention capacity assessment not completed. The risk is <b>Medium</b> .	2	The activation of the shut off valve will contain contaminated runoff within the site. Given the likely rapid response to an incident, the capacity of the attenuation tank (1400m <sup>3</sup> ) and presence of the shut off valve the amount of firewater that would enter the Stadium Business Park sewer would be low and would receive significant dilution before it reached the Tolka River. The severity of the impact would be <b>Minor</b>	6
8	Firewater Run-off	Firewater run-off that leaks through damaged paving and damaged surface water drains	Soil / Groundwater contamination	2	Routine inspection and repair of damaged paved areas. The APP and ERP minimises the risk of fire and ensure rapid response to incident. Routine integrity testing of drains. Firewater retention assessment not completed. The risk is <b>Low</b>	1	Subsoils are poorly permeable and not water bearing. Aquifer vulnerability ranges from High to Extreme. Aquifer vulnerability ranges from High to Extreme. The severity of the impact would be <b>Trivial</b> .	2

## 5.7 Risk Evaluation

The risks associated with the operation of the facility fall into two categories

- 1 Risk of surface water and or soil and groundwater contamination associated with oil storage and handling.
- 2 Risk of surface water and/or soil and groundwater contamination associated with a fire in one of the process buildings.
3. Risk of groundwater contamination associated with sanitary wastewater storage tank.

The diesel and gas oil storage tanks are located inside a bund and the maximum combined amount of diesel and gas oil stored in the tanks at any one time is 25,000 litres. The areas where wastes are handled and stored are paved with concrete and the storm water drains in these areas connect to an attenuation tank and oil interceptor. It was assumed that an oil spill would occur during a rainfall event.

The maximum volume of waste inside any of the buildings at any one time is 1,000 tonnes. The risk of fire spread from Building A1, is low given the distance between it and Buildings B1 and B2. As Buildings B1 and B2 are adjoining it was assumed that a fire in one building would spread to the second.

A firewater retention assessment has not been completed and for the purpose of this ELRA, it is assumed that firewater associated with a fire inside the buildings would escape the building flow onto the yard. The attenuation tank has a storage capacity of 1400m<sup>3</sup>.

The sanitary wastewater storage tank has a capacity of 13.5m<sup>3</sup> and the contents are routinely removed from the tank for off-site treatment. The tank is subject to routine integrity testing.

Each of the risks have been ranked to assist in the prioritisation of treatment and these are presented in Table 5.5. Only those risks with a risk score greater than 2 have been included.

**Table 5.4 Risk Ranking**

Risk ID	Process	Potential Risk	Consequence	Likelihood	Risk Score
5	Firewater Run-off	Surface water contamination	2	3	6
6	Fire in Process Buildings	Air Pollution	1	5	5
2	Diesel Storage	Surface water contamination	2	2	4

A colour coded risk matrix (Table 5.5) has been prepared to provide a broad indication of the critical nature of each risk and is a visual tool for regular risk reviews since the success of mitigation can be easily identified.

**Table 5.5 Risk Matrix**

**Likelihood**

V. High	5	6				
High	4					
Medium	3		5			
Low	2		2			
V. Low	1					
<b>Consequence</b>		Trivial	Minor	Moderate	Major	Massive
		1	2	3	4	5

Red – High-level risks requiring priority attention.

Amber – Medium-level risks requiring treatment, but not as critical as a High Risk .

Green – Lowest-level risks that do not need immediate attention but there is a need for continuing awareness and monitoring on a regular basis.

There are no risks in the red or amber zones requiring priority attention. There are three risks in the green zone indicating a need for continuing awareness and monitoring on a regular basis. This will be achieved by a combination of the material handling procedures, site inspections and maintenance programmes, routine integrity testing of the tanks, pipelines and bunds and regular training in materials handling and emergency response procedures.

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## 6. RISK TREATMENT

The risk management programme for the facility is set out in Table 6 .1

**Table 6.1 –Risk Management Plan**

Risk ID	Potential Risk	Risk Score	Mitigation Measures	Outcome	Action	Person Responsible
5	Entry of firewater run-off to the surface water drain in Stadium Business Park and the River Tolka.	4	The site design and method of operation minimises the risk of fire, while the ERP ensures a rapid response to incident. All drainage passes through an attenuation tank that has a capacity of 1,400m <sup>3</sup> that has a shut off device and an oil interceptor. ERP refers to activating the device in the event of a fire.	Firewater retention assessment not completed	Completed Firewater retention assessment. Continue staff refresher training on ERP and activation of shut off device.	Group Environmental Manager Facility Manager
4	Smoke from fire causes localised air pollution	5	APP and ERP prepared and staff trained	While the risk of occurrence is very high, the impact would be trivial. No further physical mitigation measures required.	Staff refresher training on ERP to continue	Facility Manager
2	Contamination of the River Cammock and the surface water drains by diesel	3	Shut off device on the surface water drains. Documented procedure on filling tanks and refuelling plant prepared, spill kits provided and staff trained in spill response.	No further physical mitigation measures required	Staff refresher training on refuelling procedure to continue	Facility Manager

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## 7. COSTING

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### 7.1 Worst Case Scenario

The risk analysis identified that a fire in the processing building and the consequent run-off of contaminated firewater onto unpaved areas, with consequent risk of soil and groundwater contamination is the worst case scenario.

### 7.2 Quantification & Costing

The costs of dealing with the 'worst case' scenario, which are presented in Table 7.1, are based on the experience of the fire at PANDA's Beauparc in June 2012 and the following assumptions:

- The surface water shut-off device is closed before the emergency services arrive at the site. The volume of firewater run-off will be 794m<sup>3</sup>, which is derived from the firewater retention study for Nurendale's Irish Packaging and Recycling MRF in Ballymount, which handles similar amounts of paper and cardboard. The retention capacity provided by the existing attenuation tank (1,400m<sup>3</sup>) and the deployment of PANDA's own vacuum tanker fleet is sufficient to contain the fire water run-off.
- The fire service will be on site within 8 minutes of the alarm being raised. It is assumed that the fire will be fought over a 24 hour period by four fire crews working 3 shifts, with the attendance of one crew on site for 8 hours after the fire has been extinguished.
- A fire in Building A1 will be contained inside that building. Given the distance between the Building A1 and Building B1 and B2 this is not unreasonable. A fire in Building B1 will spread to Building B2.
- It is assumed that there will be approximately 1000 tonnes of waste in Building B1, 1000 tonnes of waste in Building B2 and 300 tonnes in Building A1 at the time of the fire. The waste will not be completely destroyed and that the fire damaged wastes will have to be disposed of off-site. The disposal costs are those currently incurred by PANDA.
- The rates for transport and treatment of contaminated water are those current rates incurred by PANDA.
- Given the sensitivity of the environmental setting, it is considered prudent to allow a contingency of 5%

In addition to making provision for unexpected environmental liabilities, account must be taken of the costs managing an unplanned closure scenario. The costs of this are presented in the separately prepared DMP, and are contained in Table 7.2



**Table 7.1 Worst Case Costs**

<b>Task</b>	<b>Description</b>	<b>Quantity (No.)</b>	<b>Measurement Unit</b>	<b>Unit Rate (€)</b>	<b>Cost (€)</b>	<b>Source of unit rates</b>
Emergency Response	Fire Services Attendance on Site	78	Man Days	€250	€19,500	
	Spill containment consumables (extinguishers booms)	1	Incident	€5,000	€5,000	
Clean Up Actions	Transport and off-site treatment of contaminated fire water	794	tonne	€23	€18,262	Current agreement between PANDA and operators of municipal WWTP)
	Removal and off-site disposal of fire damaged materials	2000	tonne	€65	€130,000	Rate agreed with licensed WtE plant
	Cleaning Yard*s	1				
	Cleaning Drains	1	Event	2,000	2,000	PANDA jet vac rate
	Surface water quality monitoring		Sample**	250	640	
<b>Total (€)</b>					<b>175,402</b>	
<b>Contingency (10%)</b>					<b>17,5402</b>	
<b>Total Including Contingency (€)</b>					<b>192,942.20</b>	

\*Use on-site road sweeper

\*\* Includes labour costs

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Task	Description	Quantity (No.)	Measurement Unit	Unit Rate (€)	Cost (€)	Source of unit rates
Facility Management	Site Manager 3, No operatives 20 days Utility Bills	20	Day	600	12,000 1,000	
Materials/Waste Disposal/Recovery	Removal and off site recovery of processed C&D waste	40	Tonnes	40	1,600	
	Removal and off-site recovery of processed C& I waste	40	Tonnes	97.50	3,600	Rate agreed with WtE facility
	Removal and off-site disposal of residual waste	10	Tonnes	97.50	900	Rate agreed with WtE facility
	Removal and off site recovery of unprocessed cardboard/paper	300	Tonnes	-70	21,000	Asset value provided by Panda
	Removal and off site recovery of processed cardboard/paper	700	Tonnes	-100	70,000	"
	Removal and off site recovery of unprocessed MDR	300	Tonnes	-70	21,000	"
	Removal and off site recovery of processed MDR	700		-100	70,000	
	Removal					
	Removal and off site disposal of diesel, engine and waste oils	15,000	litres	70c	10,500	EPA Guidance
Building Plant & Equipment Clean Out	Clean out of Building 1 and Portacabin Offices(Included in Management Cost)		Day Rate			"
	Cleaning Plant and Equipment (Included in Management Cost)		Day Rate			
	Removal of Plant and Equipment*	-	-	-	-	-
	Cleaning of oil interceptor	2	Day Rate	1,000	2000	PANDA charge out rates
	Removal of sanitary waste water from tank	13.5	m <sup>3</sup>	5	405	"
Yard Cleaning	Cleaning open yard (Roadsweeper)*	1	Daily Hire			
Env. Monitoring	Surface water quality monitoring	4	Sample	200	800	
Validation Audit	Validation Report (Consultant)	1		2,500	2,500	
Security Costs	Included in Management Cost		Day			
Services Disconnection	Disconnect electricity and telecoms	1	Day	400	400	
Total Liability (€)					35,705	
Contingency (10%)					3,570.50	
Less the Asset Value of the Cardboard/Paper and Dry Recyclables (€)					182,000	
Net Costs (€)					142,724.50	

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## 8. CONCLUSION

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This ELRA has been carried out in accordance with Agency's draft Guidance (July 2013). The costs associated with the 'worst case' scenario is €192,294. Based on PANDA's experience of the fire at its Beuparc facility in 2012, the cost of dealing with an incident will be covered by operational funds.

The asset value of the materials processed at the facility will cover the cost of the DMP.

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## **DECOMMISSIONING PLAN**

### **WASTE RECYCLING FACILITY**

**CAPPOGUE**

**FINGLAS**

**DUBLIN 11**

**WASTE LICENCE REG. NO. – W0260-01**

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#### **Prepared For: -**

PANDA Waste Services Ltd.,  
Cappogue,  
Finglas,  
Dublin 11

#### **Prepared By: -**

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**December 2013**

Project		Decommissioning Management Plan Panda Waste Services Cappagh Road.		
Client		Panda Waste Services Ltd W0260-01		
Report No	Date	Status	Prepared By	Reviewed By
138160202	12/12.2013	Draft	Michael Watson MA	Jim O'Callaghan MSc, CEnv, MCIWM, IEMA
	20/12/2013	Final		

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# 1. INTRODUCTION

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Nurendale Ltd operates a Materials Recovery Facility at Cappagh Road Finglas, Dublin 11 under a Waste Licence (W0261-01) issued by the Environmental Protection Agency (the Agency). Nurendale Ltd, which trades as Panda Waste Services, is the holder of Waste Licences at three other waste management facilities in Dublin and Meath

Condition 10.2.1 of the Licence requires the preparation of a Decommissioning Management Plan (DMP) that identifies the actions that will be taken in the event of the decommissioning or closure of the facility and details the costs. PANDA commissioned O'Callaghan Moran & Associates (OCM) to prepare the DMP.

OCM is an environmental consultancy, established in 1997, which provides environmental services to private and public sectors. OCM has been involved in the completion of environmental risk assessments for Waste Licensed and Integrated Pollution Prevention Control licensed facilities since 2001. OCM's approach was based on the guidance in the Agency's recently issued draft revised guidance 'Guidance on assessing and costing environmental liabilities' (July 2013).

The Waste Licence authorises the construction and operation of three separate waste processing buildings and to accept and process 200,000 tonnes per annum of Construction and Demolition (C&D) waste, Dry Recyclable Household and Commercial and Industrial (C&I) waste and Paper & Cardboard. Until all three buildings are operational, only 70,000 tonnes of waste can be processed annually, as agreed with the Agency's Office of Environmental Enforcement (OEE).

At present PANDA has constructed one of the three waste processing buildings, which takes in C&D and C&I. The other two buildings, which will house Dry Recyclables and Paper & Cardboard are under construction. These works will be fully completed by December 2014.

## 1.1 Facility Description

The site is located on the Cappagh Road, approximately 2.5km southwest of Dublin. It encompasses 2.53 ha and, when the current construction works are complete, will be occupied by Building A1, Buildings B1 and B2, Electrical Substation, concrete paved yards foul and surface water drainage system, weighbridge, and portacabin type offices, canteen and staff welfare facilities

Prior to acquisition by PANDA in 2005 the site had been used for agricultural purposes. Fingal County Council issued a Waste Permit in May 2006. The facility opened in October 2006 and has been in continuous operation since then. The Agency granted the Waste Licence in August 2010.



## 1.2 Closure Scenarios

The facility has no defined lifetime and the risk of closure is low. Given the integrated nature of the waste activities it is not envisaged that partial closure or decommissioning will ever occur. The commercial viability of the facility will be kept under review and, if market conditions dictate the need to close the facility, the Agency and Fingal County Council will be notified and the Plan will be implemented.

## 1.3 Plan Update & Review

The DMP will be reviewed and updated annually during the preparation of the Annual Environmental Report. The Plan may also be reviewed based on the impacts of any future on-site incidents that have the potential to affect soil and groundwater.

## 1.4 Scope of the Plan

The DMP deals with the facility decommissioning and closure, which will involve the removal of all residual consumable materials and wastes; emptying and degassing the oil storage tanks; cleaning and removal of all plant and equipment, including office equipment; cleaning of all buildings, and emptying and cleaning of oil interceptors. Following successful closure, PANDA may, depending on the future plans for the facility, apply to surrender the Licence.

## 1.5 Limitations

The Waste Licence authorises the construction and operation of three separate waste processing buildings and the acceptance and processing Construction and Demolition Waste, Dry Recyclable Household and Commercial and Industrial Waste and Paper & Cardboard. The Licence authorises the acceptance of 200,000 tonnes of waste when the site is fully developed (when all three buildings are operational), but until then the annual intake was restricted to 50,000 tonnes, however the OEE has agreed to allow 70,000 tonnes per annum to be accepted.

At present PANDA has constructed one of the three waste processing buildings, which takes in Construction and Demolition and Dry Recyclable Commercial and Industrial wastes. The DMP is based on the assumption that all three buildings will be operational at the time the DMP is implemented.

The assessments of costs associated with the implementation of the DMP are on the information available at the time of the report preparation, including the Agency's draft guidance and may be subject to amendment based on future investigations.

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## 2. SITE EVALUATION

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### 2.1 Operator Performance

#### 2.1.1 Facility Management

The facility is managed by a suitably qualified and experienced Facility Manager and all facility personnel are provided with appropriate training and have the requisite qualifications and experience to complete their assigned tasks. The Facility Manager has 9 years experience in Waste Management and holds a Certificate in the FAS Waste Management Training Course. The Deputy Manager has 18 years experience in waste management and holds a Certificate in Waste Management and EPA Waste Licence Training (agreed equivalent to the FAS Waste Management Training Course)

#### 2.1.2 Incident History

There have been no incidents (spills, fires, leaks etc) since PANDA began operations at the site in 2006 that had potential to cause environmental pollution.

#### 2.1.3 Compliance History

Site inspections carried out in 2011 and 2013 by the Agency identified a total of 4 non compliances with the Licence conditions. These were

- Failure to have copies of Waste Collection Permits for the vehicles that delivered waste cardboard and plastic hangers to the site;
- Failure to ensure that the Nominated Facility Deputy Manager was present at the site in the absence of the Nominated Facility Manager;
- Failure to consistently record details of the visual inspection and in situ monitoring of the surface water emission, and
- Exceedance of annual waste tonnage limit in 2012.

#### 2.1.4 Enforcement History

There has been no enforcement action taken by regulatory authorities against the facility.

## **2.2 Environmental Pathways & Sensitivities**

### *2.2.1 Surface Water*

The site is located in the catchment of the Tolka River, which is approximately 2 kilometres to the south of the site. There are no water courses on the surrounding lands and the nearest significant water feature is a tributary of the Tolka, which is approximately 1km to the west. Surface water from the paved yards and building roof passes through an attenuation tank and oil interceptor before discharging to the storm water sewer that serves the adjoining Stadium Business Park. It is understood that this sewer outfalls to the Tolka River.

### *2.2.2 Geology & Hydrogeology*

The subsoils in the locality comprise sandy gravelly boulder clay that range in thickness from 0.8 to 1.35 m. The underlying bedrock locally comprises nodular muddy limestone and shale. The aquifer classification is Moderately Productive Aquifer only in local zones. The aquifer vulnerability to pollution from the ground surface ranges from High to Extreme across the site. There is one on-site well that supplies water for the welfare facilities. The local direction of groundwater flow is to the south but is likely to be greatly influenced by the large scale quarrying immediately to the east of the site.

### *2.2.3 Surrounding Land Use*

The surrounding land uses consist of a mix of industrial, quarrying and agricultural activities. They have been intensively developed in recent years for industrial, commercial and quarrying use.

The lands to the west have been restored and are currently grassed. To the north of this are building materials manufacturers Irish Asphalt and Goode Concrete Ltd. Further north is the Northwest Business Park, which is occupied by industrial and commercial enterprises with some heavy industries.

To the east is a quarry, which extends for some 1 - 2 km<sup>2</sup>. Stadium Business Park adjoins the southern site boundary. There are two (2 No) residences within 300 m of the facility, which are located approximately 30m from south eastern boundary and 200 from the northern boundary.

## **2.3 Site Processes & Activities**

### *2.3.1 Waste Types & Volumes*

The facility accepts predominantly skip waste from construction and demolition sites, household renovations/clearances and C&I Dry Mixed Municipal Waste. Source segregated baled cardboard, baled plastic and boxed plastic hangers are also accepted from a commercial customer who has nationwide outlets. No hazardous, putrescible or liquid wastes are accepted. At present, as only one of the waste processing buildings has been constructed, the licence caps the annual waste intake at 70,000 tonnes, as agreed with the OEE.

### 2.3.2 Waste Acceptance & Handling Procedures

When the on-going construction works are complete, the mixed C&D and C&I waste are handled in Building A1, the Dry Recyclables will be handled in Building B1 and the Paper and Cardboard will be handled in Building B2.

Current operations include the processing of C&D and C&I wastes inside Building A1; the bulking up of the plastic hangers into specially designed transport vehicle near the western site boundary; the storage of the source segregated baled cardboard and baled plastic in an open paved area along the southern site boundary and the storage of recovered waste electronic and electrical waste (WEEE) and timber on paved areas adjacent to Building A1. The external storage of the wastes is a temporary measure and will stop following the construction of Buildings B1 and B2.

In Building A1 ferrous and non-ferrous metals, waste electrical and electronic equipment (WEEE), wood and bulky wastes are segregated manually and mechanically using a mechanical grab. The WEEE is stored in cages on a paved area at the rear of the processing building. The timber is stored in open bays formed by large concrete blocks on a paved area to the south west of the processing building. The remaining mixed waste is then bulked up and sent to PANDA's Beuaparc facility for processing.

In Building B1, the pre-segregated dry recyclables will be baled. The mixed recyclables will be separated manually and mechanically into the different waste streams (paper, cardboard, plastic, glass and metal) using a sorting line incorporating a loading hopper, conveyor, picking line, ballistic separators and magnets. The paper, cardboard, plastic and metal cans will be baled. The glass will be stored in a bin.

In Building B2, the higher value, low quantity paper will be sorted using a picking line comprising a conveyor that it passes over five open top bins. Each of the bins will be dedicated to a particular grade. As the waste paper passes along the conveyor, the sorting personnel will pick out the particular grade and deposit it into the appropriate bin. Any unsorted paper will fall into an end bin (the lowest value grade). When a bin is full it will be emptied on to a conveyor and sent to a baler.

Lower grades of mixed paper will not be sorted but will be baled. All the bales will be tied with wire. On average the weight of each bale is 750 kg, but this can vary from 500 kg to 1,000 kg depending on size, density, waste paper type and moisture content. The finished bales will be moved to the designated storage areas inside the building. using a clamp truck.

### 2.3.3 Emissions

Potential and actual emissions from the facility include: -

- Noise,
- Dust,
- Surface Water,
- Wastewater.

## 2.4 Buildings, Plant and Equipment

The site layout is shown on Drawing No and details of the on-site infrastructure are presented in Table 2.1-

**Table 2.1 – Site Infrastructure**

Facility operations require the use of a range of fixed and mobile plant which are listed in Table 2.1.

**Table 2.1 – Site Infrastructure**

Ref	Infrastructure	Details
1	2 No Weighbridge and associated portacabin office and staff welfare facilities	Located close to the facility entrance
2	Building A1	C&D and C&I processing (1760m <sup>2</sup> )
3	Building B1	Dry Recyclables (2,800m <sup>2</sup> )
4	Building B2	Paper & Cardboard (4,608m <sup>2</sup> )
5	Underground storm water attenuation Tank	1,400m <sup>3</sup>
6	Underground wastewater storage tank.	13.5m <sup>3</sup>
7	Paved yard	16,212m <sup>2</sup>
8	External storage bays	Temporary, formed by large concrete blocks
9	Oil Storage Tanks	20,000 litre diesel and 5000 litre Gas Oils
10	Electrical Substation	

**Table 2.2 Plant and Equipment**

Item	Building A1	Building B1	Building B2
Front Loading Shovel	2	1	
Trommel		-	
Baler		2	2
Air Compressor	-	-	1
Grabs	1	1	1
Shredder	-	1	-
Conveyor		2	2
Bag Opener		1	
Forklift	1	2	
Yard sweeper	1	-	

## 2.5 Inventory of Raw Materials

The materials/products used on site and the maximum storage capacity are given in Table 2.2. The only hazardous materials currently used are diesel, gas oil and adblu (a diesel additive). The diesel is stored in an above ground integrally banded steel tank located on a paved area at the south east corner of the processing building. The dispensing pump sits in a drip collection tray.

**Table 2.3 – Volume of Hazardous Materials**

Products	Quantity Stored litres
Diesel Oil	20,000
Gas Oil	5,000
Adblu	1,000

The quantities given in the Table are based on the volumes kept on site at any one time, but in the event of the planned closure, the actual quantities should be considerably smaller, as the shutdown would be preceded by a reduction in the on-site inventory.

## 2.6 Site Services

There is an on-site electrical substation controlled by Electric Ireland. Water is obtained from an on-site well. Sanitary wastewater is collected and stored in an underground tank (13.5m<sup>3</sup>) pending removal off-site for treatment in a municipal wastewater treatment plant.

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## 3. CLOSURE TASKS & PROGRAMMES

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### 3.1 Closure Tasks

#### 3.1.1 Materials Management

A planned shutdown of operations would be carried out after the last batches of waste received at the site had been processed and consigned. It would be preceded by a scaling down of activities, thereby reducing the quantities of materials, particularly fuel and wastes, to be dealt with when implementing the DMP.

It should be possible to return some materials e.g. diesel, engine and hydraulic oils to the suppliers either for resale, or reuse. The remaining materials may have to be disposed of as waste, some of which may be deemed hazardous due to their composition e.g. waste oils.

A vacuum tanker will empty the oil interceptor and the contents will be sent for disposal at a suitably licensed facility. As the routine surface water monitoring has never identified a problem with the operation of the attenuation tank and oil interceptor on the surface water drainage system it is not considered necessary to empty and clean out the attenuation tank.

#### 3.1.2 Buildings

It is not proposed to demolish any of the buildings or remove the portacabins. All of the buildings will be cleaned out and left in situ for future use. Given the nature of the waste handled at the facility, specialist decontamination will not be required inside the buildings and the cleaning will primarily involve the use of a road sweeper to clean the floor. The contents of the portacabin offices, which will include office equipment, tables, chairs and lockers, will be removed.

#### 3.1.3 Plant & Equipment

The plant and equipment will either be sent other facilities operated by Nurendale Ltd, sold for use, or scrapped at an approved waste recycling/recovery facility. At the time of the preparation of this DMP it is not possible to determine if every item listed in Table 2.2 would be suitable either for use at other Nurendale Ltd facilities or for sale, as this depends on their condition at the time of the closure.

Those items that cannot be sold will be scrapped. Given the nature of the waste handled at the facility, none of the plant items will require specialist decontamination or cleaning before being scrapped. All the metal items have a scrap value and therefore the removal of the plant and equipment should be cost neutral.

### 3.1.4 Soil & Groundwater Assessment

There is no evidence of any soil and groundwater contamination at the site. The scope of any such assessment, if required, will be agreed in advance with the Agency, but it may comprise the installation of soil borings and groundwater monitoring wells and the collection and testing of soil and groundwater samples. The investigations will be supervised by an experienced geologist/environmental scientist..

The field observations and results of laboratory results will form the basis for the assessment of the significance of the impact, if any, and the need for and extent of any remedial works. If remedial works are considered necessary, a proposed scope will be submitted to the Agency for approval before implementation.

### 3.1.5 Environmental Monitoring

Monitoring will continue following the closure of the facility and pending the surrender of the Licence. The extent of the monitoring and the frequency may be amended, subject to the Agency's approval, to reflect the fact that the facility is closed.

## 3.2 Closure Programme

In the event that the entire facility is closed, all the operational areas will be decommissioned. The decommissioning will take approximately 4 weeks and will be carried out in a number of tasks, some of which will happen concurrently.

Task 1: Removal of consumables and wastes from Buildings A1, B1 and B2 and the external storage yards; 1 week

Task 2: Clean out of Buildings A1, B1 and B2 and Portacabins; 1 week.

Task 3: Cleaning and consignment of plant and equipment; 1 week.

Task 4 Cleaning of yards; 2 days.

Task 5: Emptying of diesel tank; 1 day.

Task 6: Emptying and cleaning of oil interceptor; 1 day

Task 7: Removal of sanitary wastewater 1 day

Task 8: Disconnecting site services; 1 day.

Task 9: Closure Plan Validation 2 weeks.



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## 4. CRITERIA FOR SUCCESSFUL CLOSURE

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Successful decommissioning will be complete when;

- All buildings have been cleaned out and are secured;
- All equipment, materials, wastes or any other materials that could result in environmental pollution are removed from the site and recycled, recovered or disposed in accordance with all regulations in force at the time;
- All storage tanks, bunds and interceptors have been emptied and the oil storage tanks degassed, and
- There is no evidence of any soil or groundwater contamination at the site.

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## 5. CLOSURE PLAN VALIDATION

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### 5.1 Closure Audit & Validation Report

Following the completion of the site decommissioning, PANDA will appoint an experienced independent environmental auditor, who will be approved by the Agency, to carry out a Closure Audit and produce a Validation Report that demonstrates the successful implementation of the Plan. The Closure Audit will address: -

1. Disposal of raw materials;
2. Disposal of wastes;
3. Decommissioning of plant, equipment and storage tanks;
4. Cleaning of buildings, plant and equipment;
5. Destination of all items of plant and equipment sent from the site;
6. Results of monitoring and testing during the decommissioning period;
7. Soil & Groundwater Assessment, and
8. The need for on-going monitoring, remedial actions or aftercare management.

The Validation Report will describe all of the activities carried out during the Closure Audit and will contain records of the destinations of all wastes, materials, plant and equipment consigned from the site. The Report will be submitted to the Agency within three months of execution of the Plan.

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## 6. CLOSURE PLAN COSTING

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The costs of a planned closure will be met in full by PANDA. The cost of implementing the DMP in an unplanned closure scenario, where PANDA is not in a position to meet the costs are presented in Table 6.1. The costs are based on the following assumptions:

- The closure will be unforeseen and unexpected, with no advance warning that would allow an orderly wind down of activities.
- The entire facility will be decommissioned and cleaned, with all wastes and consumables being removed from the site.
- The removal of the wastes, consumables, plant and equipment and the plant and building and plant cleaning will be carried out by third parties.
- Although the works could be done by another waste contractor it is assumed that a temporary site manager and general operatives will be appointed to implement the DMP.
- A total of 2,150 tonnes of waste will be on site, comprising 40 tonnes of unprocessed C&D and 40 tonnes of unprocessed C&I waste, 50 tonnes of processed C&D and C&I (timber, metal, rubble) C&I, 300 tonnes of unprocessed dry recyclables, 700 tonnes of processed dry recyclables, 300 tonnes of mixed paper and cardboard and 700 tonnes of baled paper and cardboard tonnes of baled paper.
- The diesel storage tank (20,000l) and gas oil tank (5,000l) are full. Some of these will be consumed during plant clean out.
- The paper, cardboard and dry recyclables processed at the facility are traded on the international recyclables markets and have a significant value. The materials on site at the time of closure will be sold and the money used to finance the costs of the DMP. Given the quality of the materials recovered at the facility and the proven sustainable markets for them, this is a reasonable assumption. While the price fluctuates in response to international conditions, the rates used by IPR are based on long term averages.
- The cleaning of the plant and equipment and off-site removal will be cost neutral given their resale/scrap value. This is a conservative approach given the type of plant and equipment on-site.
- It is not proposed to demolish any of the buildings, or remove the portacabins or the oil storage tanks.
- A soils and groundwater assessment will not be required. This is based on the current conditions at the site, where there is no evidence of the presence of soil and

groundwater contamination. This will be kept under review and the DMP may be amended in the future to include for such an assessment.

The asset value of the materials on-site at the time of the unplanned closure will more than adequately cover the DMP costs.

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ask	Description	Quantity (No.)	Measurement Unit	Unit Rate (€)	Source of unit rates	
					Cost (€)	
Facility Management	Site Manager 3, No operatives 20 days Utility Bills	20	Day	600	12,000 1,000	
Materials/Waste Disposal/Recovery	Removal and off site recovery of processed C&D waste	40	Tonnes	40	1,600	
	Removal and off-site recovery of processed C& I waste	40	Tonnes	97.50	3,600	Rate agreed with WtE facility
	Removal and off-site disposal of residual waste	10	Tonnes	97.50	900	Rate agreed with WtE facility
	Removal and off site recovery of unprocessed cardboard/paper	300	Tonnes	-70	21,000	Asset value provided by Panda
	Removal and off site recovery of processed cardboard/paper	700	Tonnes	-100	70,000	"
	Removal and off site recovery of unprocessed MDR	300	Tonnes	-70	21,000	"
	Removal and off site recovery of processed MDR	700		-100	70,000	
	Removal					
Building Plant & Equipment Clean Out	Removal and off site disposal of diesel, engine and waste oils	15,000	litres	70c	10,500	EPA Guidance
	Clean out of Building 1 and Portacabin Offices(Included in Management Cost)		Day Rate			"
	Cleaning Plant and Equipment (Included in Management Cost)		Day Rate			
	Removal of Plant and Equipment*	-	-	-	-	-
	Cleaning of oil interceptor	2	Day Rate	1,000	2000	PANDA charge out rates
Yard Cleaning	Removal of sanitary waste water from tank	13.5	m <sup>3</sup>	5	405	"
	Cleaning open yard (Roadsweeper)*	1	Daily Hire			
Env. Monitoring	Surface water quality monitoring	4	Sample	200	800	
Validation Audit	Validation Report (Consultant)	1		2,500	2,500	
Security Costs	Included in Management Cost		Day			
Services Disconnection	Disconnect electricity and telecoms	1	Day	400	400	
Total Liability (€)					35,705	
Contingency (10%)					3,570.50	
Less the Asset Value of the Cardboard/Paper and Dry Recyclables (€)					182,000	
Net Costs (€)					142,724.50	

\*Cost neutral: \*\* Use PANDA's on-site road sweeper