Appendix F:
Residual Management Plan (DMP).

12/11/08 2:48 PM

Mr. Kealon Reynolds,
Office of Environmental Enforcement,
EPA
John Moore Road,
Castlebar,
Co. Mayo

12th Feb 2008

Register No: **PO269-01**

Company Name: **Basta Parsons Ltd**

Re: ***Condition 7.6 Residuals Management Plan***

Dear Mr. Reynolds,

Please find enclosed one original and two copies of our Residuals Management Plan for your attention.

If you require any further information, please do not hesitate to contact us.

Yours Sincerely

Tim Rabbitte
Environmental Engineer
Basta Parsons Ltd

ENVIRONMENTAL REPORT

Closure, Restoration and Aftercare Management Plan

at the

Basta Parsons Ltd Facility

Tubbercurry,

Co Sligo.

December 2007

Reference: CE02053/RMP				
Issue		Prepared by	Checked by	Verified by
V1	January 07			
V2	-			
V3	-			
V4	-	Karen Kirk	Colm Staunton	Michael Cunningham
V5	-	Environmental Scientist	Principal Environmental Scientist	Director
File Reference: CE02053/Reports/RMP				

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EXECUTIVE SUMMARY

The report was prepared in accordance with the EPA publication of 2006 entitled *'Guidance on Environmental Liability Risk Assessment, residuals Management Plans and Financial Provision'* hereon referred to as the EPA guidance document.

A Closure, Restoration and Aftercare Management Plan (CRAMP) was prepared in order to comply with Condition 7.6 of the company's IPPC Licence. The risk classification tool was used and the site was found to be a ***Risk Category 2*** site, therefore the full scope of CRAMP was found to be required. A site evaluation was carried out and two closure scenarios were identified which included partial closure and full closure. The main closure considerations were found to relate to buildings, plant and equipment at surface level. All buildings, plant and equipment were accounted for and were fully costed. Site restoration was proposed and allowed for the rehabilitation of the site to an agreed end use. Aftercare maintenance and monitoring, as it is related to the site restoration, over a 3 year period was detailed and anticipated costings were outlined.

1.0 INTRODUCTION

1.1 Site Details

The Basta Parsons Limited (Basta) site is situated on the western side of Tubbercurry, Co. Sligo, on the Ballina road and has been in operation at this site for over 50 years. The operation of the site is as a manufacturing facility for builders hardware. The site comprises a 9,755m^2 manufacturing facility, surrounded by landscaped gardens.

The main processes carried out in the manufacturing facility are the manufacture of zinc die-cast components, the coating of zinc die-cast components by electroplating or P.V.C. powder coating, and also the manufacture of pressed metal components from coil steel. The main products of the facility include window stays, fasteners, lever handles, two lever locks and bathroom fittings.

1.2 Facility's Licence Details

The facility is an IPPC licensed site (PO269-01) for *'The surface treatment of metals and plastic materials using an electrolytic or chemical process where the volume of the treatment vats exceeds 30m³'*. The IPPC license granted in 1998 was amended by the EPA in November 2005 and the additional conditions of the license under the Condition 7.6 states that:

"*7.6.1 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.*

7.6.2 Residuals Management Plan:

7.6.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for the decommissioning or closure of the site or part thereof. This plan shall be submitted to the Agency for agreement within twelve months of the date of grant of this amendment.

7.6.2.2 The plan shall be reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

7.6.3 The Residuals Management Plan shall include as a minimum, the following:-

7.6.3.1 A scope statement for the plan.

7.6.3.2 The criteria which define the successful decommissioning of the activity or part thereof, which ensures minimum impact to the environment.

7.6.3.3 A programme to achieve the stated criteria.

7.6.3.4 Where relevant, at test programme to demonstrate the successful implementation of the decommissioning plan.

7.6.3.5 Details of costings for the plan and financial provisions to underwrite these costs.

7.6.4 *A final validation report to include a certificate of completion for the residuals management plan, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment."*

At the request of Basta, White Young Green Environmental (Ireland) Limited (WYG), were commissioned to compile a Closure, Restoration and Aftercare Management Plan (CRAMP) to comply with the requirements outlined above. This CRAMP has been prepared in accordance with the EPA guidance document entitled *'Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision'*.

1.3 Facility's Closure Scenarios

For the purposes of this assessment two hypothetical scenarios were considered.

- Scenario 1: The manufacturing will be ceased and the relevant sections of the plant decommissioned and decontaminated while the distribution facilities of the site remain operational
- Scenario 2: The entire facility is closed, decommissioned and decontaminated

2.0 SITE EVALUATION

2.1 The Basta Facility

As mentioned earlier the Basta facility is located in Tubbercurry, Co. Sligo. The site had previously been a Greenfield site, prior to being developed approximately 50 years ago. Basta is the manufacturer of locks, hinges and handles for timber, PVCu, steel and aluminium doors and windows.

The facility comprises two buildings and a tree plantation on a 3.56 hectare site which is owned by Basta. The plantation is located to the north of the buildings. The Tubbercurry River is located further north, beyond the plantation. Two streams, one located to the east and one to the north of the facility, feed into the Tubbercurry River.

2.2 Initial Screening and Risk Rating

The initial screening and operational risk assessment for the site has been determined using the systematic approach as outlined in the EPA 2006 guidance document. A quantified risk rating is calculated by the following formula:

Total Score = Complexity x Environmental Sensitivity x Compliance Record

The total score is then categorised using Table 3.1 below

Table 2.1 EPA Risk Category

Risk Category	Total Score
Category 1	< 5
Category 2	5-23
Category 3	>23

2.2.1 Complexity

The complexity band for the Basta operation is determined by reference to Appendix B *'IPPC and Waste Activities Complexity Look-Up Tables'* of the EPA guidance document. This provides predetermined complexity ratings for all IPPC and Waste licensed facilities. According to the look-up tables, the Basta facility is determined as being G3 complexity which gives a quantitative complexity rating of 3 for the facility. A G3 complexity facility must consider the environmental sensitivity and compliance record.

2.2.1.1 Complexity Score

Table 2.2 Complexity Score

Class	Description	Complexity Band	Complexity Score
12.3	The surface treatment of metals and plastic materials using an electrolytic chemical process where the volume of treatment vats exceed $30m^3$	G3	3

2.2.2 Environmental Sensitivity

Key receptors considered in the determination of environmental sensitivity are:

- Human Beings
- Groundwater
- Surface Water
- Air Quality
- Protected Ecological Sites
- Sensitive Agricultural Receptors

A predetermined rating for each aspect is presented in the EPA guidance document. The total environmental attribute score calculated was then used to determine the environmental sensitivity classification in Table 2.3 below.

Table 2.3 EPA Environmental Sensitivity Classification

Total Environmental Attribute Score	Environmental Sensitivity Classification
Low < 7	1
Moderate 7-12	2
High > 12	3

Table 2.4 displays how the environmental sensitivity rating (***Moderate***) for the site was determined.

Table 2.4 Site Environmental Sensitivity Rating

Environmental Sensitivity	Reference Source	Details	Sub Matrix Score
Human Occupation	Site Survey	< 50m	5
Groundwater Protection	Geological Survey of Ireland (GSI)	Regionally important aquifer Aquifer vulnerability rated as high to low – only interim study took place	2 2
Sensitivity of Receiving Waters	Environmental Protection Agency (EPA)	Class A Site located within the River Moy catchment	3
Protected Ecological Sites	National Parks and Wildlife Services (NPWS)	Located >1km from protected site	0
Air Quality and Topography	Ordnance Survey Ireland (OSI)	Simple Terrain Relatively flat terrain, where receptor elevations are between stack base and stack tip elevation	0
Sensitive Agricultural Receptors	Site Survey	Fruit, vegetable or dairy farming >150m from the activity footprint	0
		Sub Matrix Score	12

2.2.2.1 Environmental Sensitivity Score

Table 2.5 Sensitivity Score

Sub Matrix Score	Qualitative Environmental Sensitivity Classification	Quantitative Environmental Sensitivity Score
12	Moderate	2

2.2.3 *Compliance Record*

The compliance history of the facility and whether contamination or pollution has arisen from the on-site activities determines the compliance score. According to the EPA Guidance Document existing facilities with minor non-compliances and minor soil and groundwater contamination are classified as Minor Non-Compliant. Based on the historical soil and groundwater monitoring at the site, discussed in more detail in Section 2.3, the Basta facility falls into this category of Minor Non-Compliant which has a score of *three*.

2.2.3.1 Compliance Record Score

Table 2.6 Compliance Record Score

Sub Matrix Score	Qualitative Environmental Sensitivity Classification	Quantitative Compliance Record Score
Following a review of the extensive groundwater and surface monitoring results available for the site, the contamination present is deemed to be minor and does not pose a risk to the environment.	Minor Non-Compliant	3

2.2.4 Overall Risk Score for the Facility

The overall quantitative risk rating for the facility was then determined using the following formula, as prescribed in the EPA guidance document.

Table 2.7 Risk Score for the Facility

Complexity Score	x	Sensitivity Score	x	Compliance Score	=	Total Score
3	x	2	x	3	=	18

The facility is assigned **Risk Category 2** (See Table 2.1).

2.3 Facility Environmental Performance

The environmental performance of the Basta facility is monitored under its IPPC licensing requirements. A requirement of the licence is to have in place an Environmental Management System (EMS). Amongst other items the EMS shall include a schedule of environmental objectives and targets, Environmental Management Programme and a Pollution Emission Register all of which should be reported to the EPA as part of Basta's Annual Environmental Report (AER). The IPPC license also requires Basta to undertake periodic monitoring of emissions to the atmosphere and water which are discussed below.

2.3.1 Site Investigations

A detailed site investigation has been undertaken at the facility over a number of phases and groundwater monitoring has been undertaken since 1998. Condition 9.2.1 of the IPPC licence required Basta to undertake a comprehensive hydrogeological investigation of the site. This was undertaken in 1998 during which time four groundwater-monitoring wells (MW-1 to MW-4) were installed. Since the commencement of groundwater monitoring, trichloroethylene (TCE) and/or its breakdown products have been detected in these monitoring wells.

A Tier II Quantitative Risk Assessment (QRA) was undertaken in 2002 during which five additional wells were installed. The QRA recommended further investigative works which were subsequently undertaken in December 2004. The contamination detected at the site was above background concentration levels, however the risk assessment process established that the concentrations detected did not pose a risk to the environment. The report concluded that monitored natural attenuation (MNA) would be the most suitable methodology to managing the TCE contamination present at the site. The most recent groundwater monitoring event in September 2007 reaffirms this recommendation as there has been an overall reduction in the concentrations of TCE and it's breakdown products since September 2006. Elevated ammonia was detected in four of the wells but as the upgradient well is impacted the source would appear to be off-site.

2.3.2 Emissions to Surface Water

The discharge from the effluent treatment plant is to the lowest point of the weir of the Tubbercurry Stream. Groundwater monitoring and surface water discharge monitoring is undertaken at the site on a quarterly basis

The total emissions to water from the effluent treatment plant is summarised in Table 2.8. This information is detailed in the Basta IPPC Annual Environmental Reports (AERs). As can be seen from the table there has been 100% compliance from 2003 to 2006 for suspended solids,

ammonia, total phosphorous, BOD, Phenols, Cadmium, Oils, Fats and Greases. The main non-compliances include COD, cyanide, zinc, nickel and copper. The compliances for COD has improved significantly from 2004 to 2006 and there has also been improvements in relation to cyanide, zinc, nickel and copper. The non-compliances detailed below have resulted from an issue with the wastewater treatment system in 2004 which has since been upgraded.

Table 2.8 Discharge to Surface Water from Effluent Treatment Plant

Parameter	2003 Annual Mass Emission (Kg)	% Compliance 2003	2004 Annual Mass Emission (Kg)	% Compliance 2004	2005 Annual Mass Emission (Kg)	% Compliance 2005	2006 Annual Mass Emission (Kg)	% Compliance 2006
COD	2,421.6	51.6	27,655	13.5	8,481.978	85	789.32	97.84
Suspended Solids	74.4	100	661	100	474.4992	100	33.87	100
Ammonia	0.96	100	18.886	100	16.901	100	5.18	100
Total Phosphorous	9.6	100	39.122	100	20.480	100	7.15	100
BOD	91.3	100	359	100	305.4191	100	126.67	100
Phenols	0.14	100	8.251	100	0.733	N/A	0.09	100
Cyanide	0.36	100	4.047	94.3	1.466	98	0.2	99.64
Zinc	1.44	100	57.738	91.7	33.84	92	1.99	99.64
Nickel	8.17	92	57.738	90.1	26.388	95.7	1.93	98.88
Copper	3.36	100	63.674	87.8	29.075	96	1.34	99.64
Chromium	0.98	100	5.058	100	5.986	100	0.83	99.64
Chromium VI	<0.48	100	10.702	100	2.443	100	0.46	99.15
Cadmium	<0.72	100	1.349	100	1.221	100	0.19	100
Oils, Fats & Greases	403	100	719.488	100	610.838	100	55.4	100

2.3.3 *Emissions to Atmosphere*

The emissions to atmosphere were monitored bi-annually at two reference points on the furnace which is located in the process building. Since July 2006 an agreement between the EPA and Basta resulted in reduced monitoring frequencies for some parameters. It is noted from the summary of results presented in Table 2.9 that Basta was fully compliant with the limits set out in the IPPC licence.

Table 2.9 Emissions to Atmosphere from the Facility

Parameter	2003 Mass Emissions	2004 Mass Emissions	2005 Mass Emissions	2006 Mass Emissions	% Compliance
TA Luft Inorganic Dust Class I	<1,108g	<2,992g	2,246.404g	< 0.2mg/m³	100
TA Luft Inorganic Dust Class II	<10,100g	<14,962g	3,369.606g	< 1.0mg/m³	100
TA Luft Inorganic Dust Class III	<49,950g	<74,814g	46,425.66g	< 5.0mg/m³	100
Particulates	<82,600g	<34,564g	475,114.724g	-	100

2.4 Facility Processes and Activities

The process involved in the manufacture of the products begins in the foundry where ingots of zinc are fed into a furnace and melted at 430°C. The molten metal is subsequently fed into die-cast machines to create a formed component. The components undergo a cooling process and transferred to robots for sanding and polishing. The polished components undergo metal finishing by either a plating process or powder coating. The components are then assembled and packed.

2.5 Inventory of Site Buildings, Plant, Raw Materials and Waste

The items of plant and chemical substances used in the manufacturing process are presented in Tables 2.10 and 2.11. Wastes generated from the processes are presented in Table 2.12.

Table 2.10 Annual Chemical Usage in Manufacturing Process

Substance	2003	2004	2005	2006
Zinc	383.9kg	391.9kg	557.2kg	583.7kg
Copper	3,750kg	3,885kg	4,600kg	2,719kg
Nickel	7,980kg	6,620kg	5,900kg	5,750kg
Nickel Chloride	780L	690L	270L	8250L
Nickel Sulphate	1,050L	1,440L	1,140L	1,725L
Potassium Cyanide	2,400kg	2,450kg	1,850kg	1,950kg
Sodium Cyanide	23.25kg	0kg	0.50kg	0kg
1-Methoxy-2-Propanol	781L	1,240L	470L	590L

Table 2.11 Inventory of Buildings and Plant

Building/Plant Area	Equipment	No.
Foundry	Furnace	1
	Die Casting Machine	9
	Air Compressors	3
	Boiler House	1
	Trim Press Tools	9
Manufacturing Area	Robots	3
	Autolathes	2
	Vacuum Moulding	2
Vibrobowl Polishing	Vibrating bowls	4
	Centrifuge	1
Plating Line	Alkali Cleaner Tanks	2
	Sulphuric Acid Tanks	2
	Cyanide Copper Tanks	3
	Bright Nickel Tanks	3
	Satin Nickel Tank	1
	Chrome Tank	1
	Recirculating Rinse Water Tank	4
	Static Rinse Water Tanks	6
	Cyanide Treatment Tank	1
	Chrome Treatment Tanks	2
Barrel Plating Line	Alkali Cleaner Tank	1
	Sulphuric Acid Tanks	2
	Cyanide Copper Tank	3
	Bright Nickel Tanks	3
	Recirculating Rinse Water Tanks	6
	Static Rinse Water Tanks	2
	Cyanide Treatment Tank	1
Brass Line	Alkali Cleaner Tank	1
	Sulphuric Acid Tanks	1
	Fresh Water Rinse Tanks	6
	Clear Clad Solution Tank	1
	Curing Ovens	6
Powder Coat	Chromate Tank	1
	Zinc Phosphate Tank	1
	Powder Coaters	2

	Rinse Water Tanks	4
	Curing Ovens	2
WWTP External	Maintenance Tanks (10,000 litres)	3
	Renovexx Feed Tank (6,500 litres)	1
WWTP Downstairs	Centrifuge Feed Tank (1,000 litres)	1
	Storage Tanks (12,000 litres)	2
	Cyanide Treatment Tank (5,000 litres)	1
	Chrome Treatment Tank (5,000 litres)	1
	Rinse Water Tank (6,000 litres)	1

Table 2.12 Quantity of Non-Hazardous and Hazardous Waste sent off-site for Disposal/Recovery

Description	2003	2004	2005	2006	Disposal or Recovery Contractor
Quantity of **non-hazardous** waste produced each year	324.68 tonnes	258.03 tonnes	318.613 tonnes	206.11 tonnes	-
Quantity of **non-hazardous** waste sent off-site for recovery	239.68 tonnes	199.81tonnes	269.853 tonnes	150.32 tonnes	DGT Ltd./Galway Metal/Bergin Waste Disposal
Quantity of **non-hazardous** waste sent off-site for disposal	85 tonnes	58.22 tonnes	48.76 tonnes	55.79 tonnes	Bergin Waste Disposal/Barna Waste Disposal
Quantity of **hazardous** waste produced on site each year	60 tonnes 27,400 litres	103,200 litres	64.69 tonnes 12,220 litres	144.483 tonnes	-
Quantity of **hazardous** waste sent off-site for recovery	-	-	1,620 litres	15 tonnes	Enva Ireland/Atlas Environmental
Quantity of **hazardous** waste sent off-site for disposal	60 tonnes 27,400 litres	64 tonnes 103,200 litres	64.69 tonnes 10,600 litres	129.483 tonnes	SITA Environmental Ltd/ Shannon Environmental Services Ltd/ Revatech S.A./NickelHutte/AGR Vertrieb/ Recyfuel/ Kommunekemi A-S/

3.0 CLOSURE CONSIDERATIONS

3.1 Introduction

In the event of closure or part closure of the facility this would most likely be organised and planned over the course of one year prior to the event. It should be noted that this would be accounted for when purchasing the raw materials therefore any raw materials remaining would be minimal, so raw materials have not been accounted for in the plan.

It is proposed that upon complete closure, decontamination, decommissioning and removal of plant items and machinery relating to the manufacturing process would occur and buildings would then be sold for industrial use. Therefore the costs for demolishing buildings are not included for as part of the closure plan.

This section of the Closure Plan details the plant, equipment and other materials which require consideration as part of the closure process. Two closure scenarios are presented; (a) partial closure of the facility and (b) full plant closure.

3.2 Closure Declaration

The closure of a site can be defined as 'clean closure' or 'non-clean closure' and the identification of such closure is based on the risk category and the presence of pollution or contamination on site. Clean closure is described as no remaining environmental liabilities following closure and decommissioning of the site. Non-clean closure is described as environmental liabilities remaining on site following the closure and decommissioning of the facility that require a restoration and aftercare management plan.

The Basta facility is classified as *Risk Category 2* and the EPA Guidance states *'For some Category 2 and the majority of Category 3 facilities, clean closure may not be achievable due to either the nature of the operation or due to residual contaminated land issued that require restoration or remediation. If a limited aftercare period is necessary, such as monitored natural attenuation of groundwater and soil contamination, then passive aftercare can be undertaken. Following its completion and verification. clean closure can be achieved.'*

Therefore the following closure plan is based on ***non-clean closure*** and will incorporate the restoration and aftercare management plan (RAMP) for the site which will lead to clean closure.

3.2.1 *Closure Scenarios*

Two closure scenarios have been assessed for a hypothetical shutdown:

Scenario 1: Decommissioning of the manufacturing processes and associated processes. Basta to use the site for warehousing and distribution purposes

Scenario 2: The entire facility is closed, decommissioned and decontaminated. The site (including buildings) is sold for industrial use

Steps involved in both closure scenarios are described below and both surface and subsurface decommissioning is considered. It should be noted that the only subsurface services at the facility are part of the waste water treatment process, process waste pipework and the foul water drains which are associated with the toilets and the canteen. The buildings will be included as part of the sale of the site.

3.3 Scenario 1:

A project programme detailing a logical sequence for decommissioning, decontaminating and removal of the manufacturing equipment and associated pipework has been developed and is detailed below. Plant necessary for the distribution and support of the hardware will be left in-situ.

3.3.1 *Step 1: Decommissioning of Foundry*

It is presumed that manufacturing has ceased and the furnace was been switched off. The furnace will be decontaminated through cleaning processes which will be undertaken in-house using specified cleaning materials. The wash-water will be transported and disposed off at a licensed facility. Any residual zinc will be removed from the die cast machines and the machines will be decontaminated through cleaning processes and removed from the foundry. The leftover water and coolant will be transferred to the waste water treatment plant (WWTP). The coolant machines and air compressors will be decommissioned and removed from the foundry. The scrap zinc from the trimming process will be collected and sold on for reuse. All manufacturing plant equipment will be removed from the foundry for resale. The floors and surfaces of the foundry will be cleaned and the wash-water disposed off at a licensed facility.

The cost for decontaminating and decommissioning the foundry will be minimal as the cleaning will be undertaken in house and plant will be sold on.

3.3.2 *Step 2: Decommissioning of Coating Processes*

The robots and associated carousels will be decommissioned and following a cleansing process they will be sold on for re-use in a similar manufacturing facility. All plant within the metal finishing area will be decontaminated following the removal of any residual metals, chemicals, rinse waters and substances. The decontamination of the equipment will be either undertaken in-house or by a specialist contractor using suitable cleaning agents. All liquid wastes generated from this cleaning process will be sent for disposal. All items of plant will be sold following decommissioning and decontamination.

Non-spent dipping solutions contained in process tanks will be pumped to suitable separate intermediate bulk containers (IBCs). These will then be removed from site for reuse or disposal. All tanks and process lines (input and waste pipework) will then be cleaned and decontaminated and liquids generated from the cleaning process will be sent for disposal. The process pipework will subsequently be decommissioned and removed for scrap. All spent solutions from process tanks will be treated on site in the WWTP. All bunded areas will be flushed and cleaned. The foul drains (from toilets and canteen) will be left in-situ following decommissioning of the facility and therefore they are not accounted for in the following closure plan.

3.3.3 *Step 3: Decommission of Laboratory, Chemical Store and Paint Strip Area*

All excess chemicals from the store and paint strip area will be sent back to the supplier however the volume is assumed to be minimal. The laboratory equipment will be decontaminated by the standard cleaning procedures and the equipment will be removed and sold. The surfaces within the rooms will be cleaned and the wash-water sent for disposal. All non-hazardous wastes will be segregated, and sorted for recycling or disposal in accordance with Basta's waste management plan.

3.4 Scenario 2

In addition to the steps outlined in Scenario 1, the following steps will be undertaken to enable closure of the entire facility. It is hypothesised in this Scenario that the site (including buildings) would be sold by Basta for industrial use.

3.4.1 Step 1: Emptying of Fuel Oil Tanks

All fuel oil tanks would be emptied and collected by a licensed contractor

3.4.2 Step 2: Shutdown and Decommissioning of Boilers

A specialist contractor would decommission the boilers and associated system.

3.4.3 Step 3: Emptying and Decommissioning of Distribution Facilities

Any remaining stock stored in the facility would be sent to Basta's sister plant located in the UK.

3.4.4 Step 4: Decommissioning of WWTP

The tanks and pumps in the WWTP would require cleaning which would be undertaken by on-site personnel. The sludge would be removed and disposed of in accordance with Basta's in house procedures and high pressure washing of the tanks would be undertaken with suitable cleaning agents to decontaminate. Wash water generated would be recovered and disposed off in accordance with waste management legislation. The Renovexx micro filtration unit and the sludge centrifuge would be sold following decontamination and decommissioning.

3.5 Waste Disposal/Recovery

There will be a requirement for off-site disposal of waste materials from most of the facility which will incur a financial cost. Table 3.1 details the types and quantities of waste for disposal from the Basta facility during 2007.

Table 3.1 Type and Quantities of Waste for Disposal

Waste Type	Including	Methods of Disposal	Amount per annum	Annual Cost	Annual Recovery
Hazardous Waste	Oil/water/coolant mixture	Licensed Contractor	2,000 litres	€500	
	Pyrene/water/clearclad waste	Licensed Contractor	1,400 litres	€1,165	
	Carbon nickel waste	Licensed Contractor	4,000 litres	€2,780	
	Waste cyanide liquid	Licensed Contractor	1,000 litres	€695	
	Cyanide treatment waste sludge	Licensed Contractor	1,000 litres	€695	
	Glydo line waste	Licensed Contractor	1,000 litres	€695	
	Zinc hydroxide sludge	Licensed Contractor	40,000 litres	€14,400	
	Semi-solid zinc hydroxide sludge	Licensed Contractor	2	€560	
	Used nickel filters	Licensed Contractor	1,000 litres	€925	
	Hazardous empty drums	Licensed Contractor	6 Pallets	€1,198	
	Used copper filters	Licensed Contractor	800 litres	€740	
	Vibro bowl polish compound waste	Licensed Contractor	200 litre	€185	
	Ohmax/pyrene solid waste	Licensed Contractor	200 litre	€185	
	Zinc hydroxide from vibes	Licensed Contractor	200 litre	€185	
	Solid waste from powder plant	Licensed Contractor	200 litre	€185	
	Absorbent materials containing zinc hydroxide and sodium hypochlorite	Licensed Contractor	200 litre	€185	
	Oily rags	Licensed Contractor	600 litre	€555	
	Hazardous chemical bags	Licensed Contractor	400 litre	€350	
	Empty lab containers	Licensed Contractor	720 litre	€200	
	Used COD vials	Licensed Contractor	60 litre	€100	

	Spent resin from deionised water unit	Licensed Contractor	60 litre	€150	
	Oily/water waste	Licensed Contractor	200 litre	€75	
	Absorbent materials contaminated with nickel	Licensed Contractor	200 litre	€185	
	Nickel rounds cloths	Licensed Contractor	200 litre	€185	
	Dry Ohmax solid waste	Licensed Contractor	200	€185	
Non Hazardous Waste	Scrap Metal	Licensed Contractor	35.28 tonnes		€2,469.60
	Non-hazardous empty drums	Licensed Contractor	2 Pallets	€322	
	Scrap Product, skimming and dross	Licensed Contractor	21.5 tonnes		€24,385.65
	General Refuse	Licensed Contractor	55 tonnes	€12,000	
	Waste cardboard, paper and plastic including PVC film waste	Licensed Contractor	28.25 tonnes		Free of Charge
	Glass	Licensed Contractor	480 litres	€14.50	
	Mixed Recyclables	Licensed Contractor	3,900kgs	€1,404	

3.6 Test Programme

A test programme would be required to verify the full decontamination of drains, pipelines and bunds. Testing would be undertaken by qualified contractors following the shut-down decommissioning and decontamination. All tested drains, bunds and pipelines would require integrity certification and the approved documentation will be retained for the validation audit. In the event of any failures of structures, a soil and groundwater investigation will be required to assess potential ground contamination beneath failed structures. Key areas which will require certification of non contamination status are:

- Tanks used in the treatment /coating process
- Chemical bund areas
- Fuel oil bunds
- Waste water treatment plan

All IPPC licence monitoring with respect to surface water, effluent, groundwater, soil, waste management and noise will remain in effect over the course of the decommissioning phase.

4.0 CRITERIA FOR SUCCESSFUL CLOSURE

As ***Non-Clean Closure*** is anticipated for this site, the criteria for successful closure is a Restoration, Aftercare and Monitoring Programme (RAMP). The RAMP is set cut in Section 9.0 and following completion of the programme Clean Closure will be achieved with no residual Liabilities or constraints.

5.0 CLOSURE PLAN COSTING

The expected costs associated with Closure Scenario 1 are outlined in Table 5.1, below.

Table 5.1 Closure Costs for Scenario 1

Item	Approximate Cost €
Decommissioning Foundry	€2,500.00
Decommissioning of Coating Process	€8,355.00
Decommissioning of Laboratory/Chemical Store/Paint Strip Area	€7,695.00
Decommissioning & Plant Removal Supervision	€7,500.00

The expected costs associated with Closure Scenario 2 are to include the above items in Table 5.1 and the additional items in Table 5.2 below;

Table 5.2 Closure Costs for Scenario 2

Item	Approximate Cost €
Emptying and removal of fuel tanks	€18,800.00
Decommission Boilers	€5,000.00
Empting and Decommissioning of Distribution Facilities	No Cost
Decommissioning of WWTP	€12,000.00
Decommissioning & Plant Removal Supervision	€7,500.00
Environmental Exit Audit /Independent Verification Audit /Report to EPA	€6,000.00

Total Cost for Scenario 2	€75,350.00
Contingency @ 25%	€18,837.50
Total	€94,187.50*

* These costs are based on best estimates within the market place and will vary with time. The costs have been kept to a minimum as the need for specialist contactors is limited as the majority of the decontamination will be undertaken by in-house staff.

6.0 CLOSURE PLAN UPDATE AND REVIEW

The Closure Plan will be reviewed and updated annually as part of the Annual Environmental Report submission to the EPA under the IPPC License Requirements.

The updated and reviewed Closure Plan will take account of any site or process changes, technology changes, costing changes and any changes to the IPPC License.

7.0 CLOSURE PLAN IMPLEMENTATION

In the unlikely event of closure Basta will provide written notification to the EPA detailing the agreed time frame and methodology for partial or full closure of the facility. Any other relevant statutory bodies would likewise receive written notification of closure.

An Environmental Exit Audit of the site would be carried out following the announcement of closure and prior to actual decommissioning and closure operations taking place. The audit would devise an accurate inventory of all plant, equipment and wastes on the site. This inventory would be used as a benchmark against which successful decommissioning will be assessed.

8.0 CLOSURE PLAN VALIDATION

Subsequent to the implementation of the Closure Plan, a Validation Audit would be undertaken to determine if the full implementation of the Closure Plan has been completed. The validation audit would be carried out by an independent and qualified auditor. The audit would assess the certification paperwork, bund integrity tests certificates and disposal/removal of waste certificates. Upon verification that the Plan has been implemented, a validation report and closure certification would be presented to the EPA.

9.0 RESTORATION AND AFTERCARE MANAGEMENT PLAN

9.1 Site Restoration and Remediation Proposals

The following restoration and aftercare management plan (RAMP) is a requirement for the facility due to historical contamination encountered on-site. The RAMP is based on Closure Scenario 2, when the entire facility will be shut down. It is envisaged that the afteruse for the site will remain industrial and the site will be sold with the building and site infrastructure intact therefore no surface restoration costs are considered necessary. It is assumed that the site will be sold following the completion of the remediation programme.

The current risk assessment of the site indicates that although there is contamination on-site it is not a risk to the environment. Although not considered likely, any deterioration in the groundwater quality will be restored by the implementation of remediation programmes (if required). Therefore the main costs set out below would include identifying if contamination exists on site, upon closure, and restoring of the soil and groundwater quality, if necessary, to a state that does not pose a risk to the environment.

9.1.1 Historical Site Investigation Findings

Historical soil and groundwater contamination has been encountered at the facility therefore site investigations and groundwater monitoring have previously been carried out at the facility. As previously discussed in Section 2 the current issues (September 2007) affecting the site are:

- The breakdown compounds of Trichloroethene (TCE) have been detected at a number of groundwater and surface water monitoring locations
- Ammonia concentrations were found to be elevated at a number of monitoring wells
- One monitoring well (MW-4) recorded elevated zinc and nickel concentrations

This site investigations and subsequent QRA found that ***monitored natural attenuation*** of the TCE contamination was the most appropriate remedial option. Quarterly IPPC groundwater sampling is currently ongoing at the facility in monitoring wells (MW-1 to MW-4).

Following the closure, decontamination and decommissioning of the site, it may be necessary to undertake a contamination assessment as part of the test programme detailed in Section 3.6.

9.2 Site Investigation and Quantitative Risk Assessment

The objective of the contamination assessment, if necessary, will be to determine the subsurface conditions following the decommissioning of the facility, particularly in the area of the WWTP.

In accordance with *BS 10175:2001: Investigation of Contaminated Sites – Code of Practice, and following guidance given in the Environment Agency document 'Model Procedures for the Management of Contaminated land' CLR7*, it is proposed to adopt a risk based and phased approach, to determine the presence, extent and potential sources of soil and/or groundwater contamination at the facility. It is proposed to ensure that the *"suitable for use"* principle is applied to any potential contamination issues that may arise.

This phased work will incorporate a desk top study, subsequent intrusive investigative works, and the completion of a Generic Quantitative Risk Assessment (GQRA). If required, a Detailed Quantitative Risk Assessment (DQRA) using the appropriate modelling software and the development of a suitable remedial programme will also be completed.

A number of groundwater monitoring wells exist on-site therefore the site investigation will involve the drilling of a small number of additional boreholes in areas identified as part of the *Test Programme*. If deemed necessary, boreholes will be installed as additional groundwater monitoring wells across the site. The objective of the second phase of investigation is to provide the required information to carry out the GQRA, which will use generic screening data to provide a scientifically based understanding of the risks associated with potential contamination at the site.

The completion of the GQRA will outline any specific contamination issues associated with the site and provide the relevant information for the completion of a site specific Detailed Quantitative Risk Assessment (DQRA) to determine, if required, site specific remedial targets (SSRTs). This would consist of remediation objectives and a resulting remedial programme to address all identified risks, and mitigate them to a level outlined by the DQRA.

9.2.1 Remediation Proposals

Following the results of the QRA (if required), a remedial options appraisal will be developed to determine the most efficient and cost effective remediation strategy for the site. The format of the options appraisal will follow current guidance given in Chapter 3 of the Environment Agency document *'Model Procedures for the Management of Contaminated Land'* (CLR 11). A preliminary cost analysis will also be undertaken to determine the most cost effective remediation strategy.

Prior to the commencement of any remedial work the EPA will be consulted with regarding the remediation proposals and following the completion of the remediation programme a validation report on the groundwater and soil will be issued to the client and the EPA.

9.3 Aftercare Management

For the purposes of the aftercare management programme it is assumed that if a contamination assessment identifies new sources of contamination in the groundwater then a remedial programme will have been completed. This section deals primarily with the aftercare of the underlying groundwater following completion of a remedial programme.

9.3.1 Proposed Short Term Aftercare Monitoring and Maintenance

Following the completion, if necessary, of a remedial programme a short term period of aftercare groundwater monitoring will be essential. This will ensure there is no remobilisation of contamination and that the remediation programme has been effective. It is proposed that for a period of one year following the completion of the groundwater remediation programme the groundwater monitoring wells will be monitored on a quarterly basis. The groundwater samples will be forwarded to an accredited laboratory for the same suite of analysis as is currently analysed as part of the IPPC licence. Following receipt of the analytical results a report will be forwarded to the client and the EPA.

Access to the wells must also be maintained to ensure that regular monitoring can be undertaken and to prevent the neglect of the wells. The maintenance of the wells will be undertaken once a year.

9.3.2 Proposed Long Term Aftercare Monitoring and Maintenance

The long term aftercare monitoring and maintenance is concerned with the underlying groundwater quality. Monitoring frequencies and the number of sampling locations can be increased or decreased as appropriate during the aftercare monitoring period depending on sample analysis results and the requirements of the EPA. At this stage it is proposed that the groundwater monitoring should take place on a yearly basis over a time-frame of at least three years however this will be agreed with the EPA following closure of the site. The groundwater monitoring wells will be maintained on a yearly basis for a period of three years.

Following completion of the yearly monitoring rounds a yearly report will be issued to the client and the EPA. After the three year period, and assuming there has been no deterioration in the groundwater quality, the aftercare monitoring and maintenance programme, in consultation with the EPA, will terminate. It is unlikely that the groundwater quality will deteriorate following remediation however a small contingency fee will be included for in the event that any contamination remobilises. A report will be issued to the client, EPA and site user detailing the groundwater quality.

9.4 Site Remediation and Aftercare Management Costs

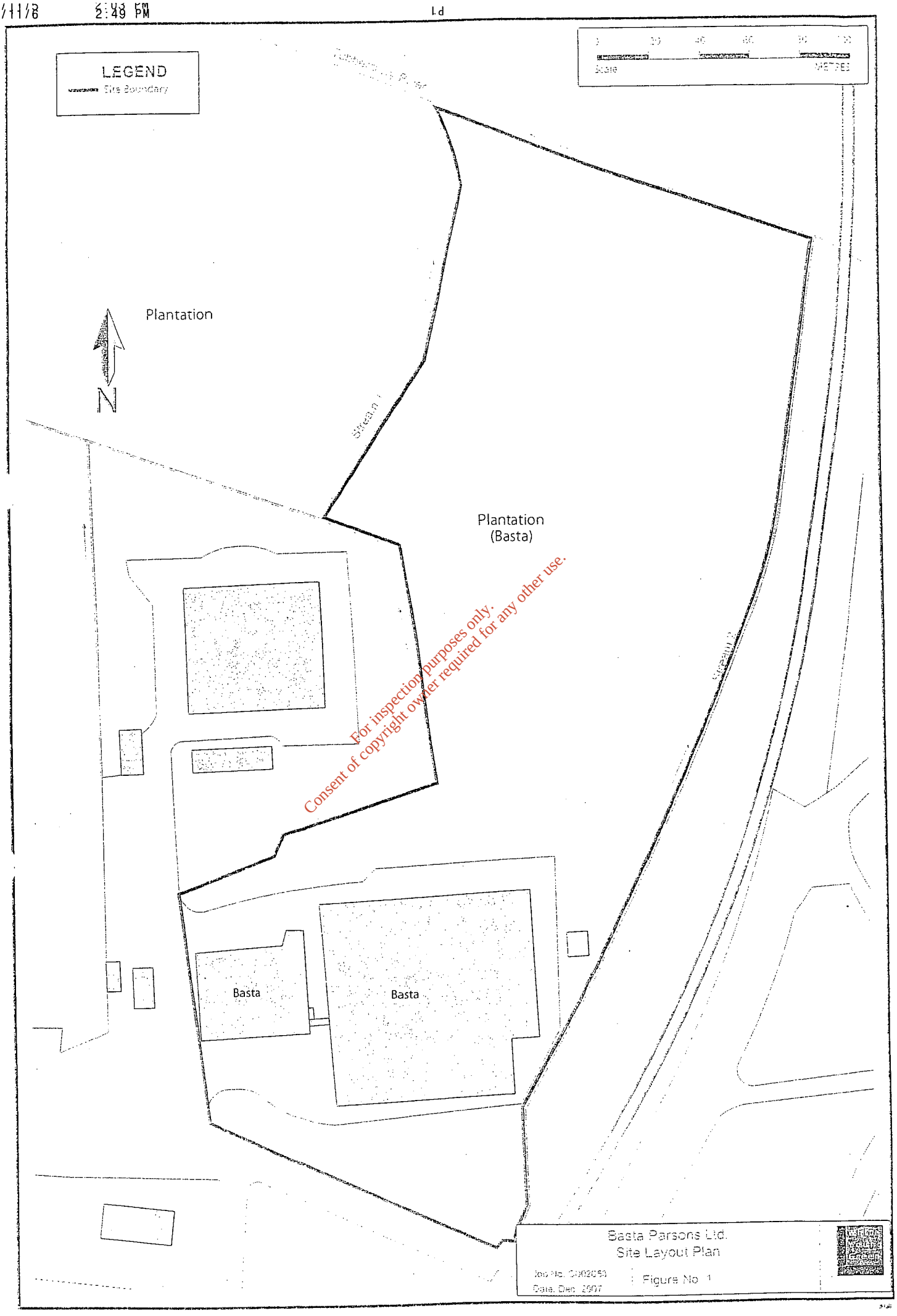
9.4.1 Remediation Costings

Item	Cost (€)
Phase I Preliminary Risk Assessment and Phase II Site Investigation for GQRA	€17,480.00
Phase III DQRA and Phase IV Remedial Option Study and Design	€7,000.00
Remediation Programme for Soil and Groundwater Hydrocarbon Contamination	€25,365.00
Validation testing of hydrocarbon remediated soil and groundwater	€6,302.50
Remediation Programme for Soil and Groundwater Metal Contamination	€77,450.00
Validation testing of chemical/metal remediated soil and groundwater	€5,285.00
Total	**€138,882.50**

9.4.2 Aftercare Costings

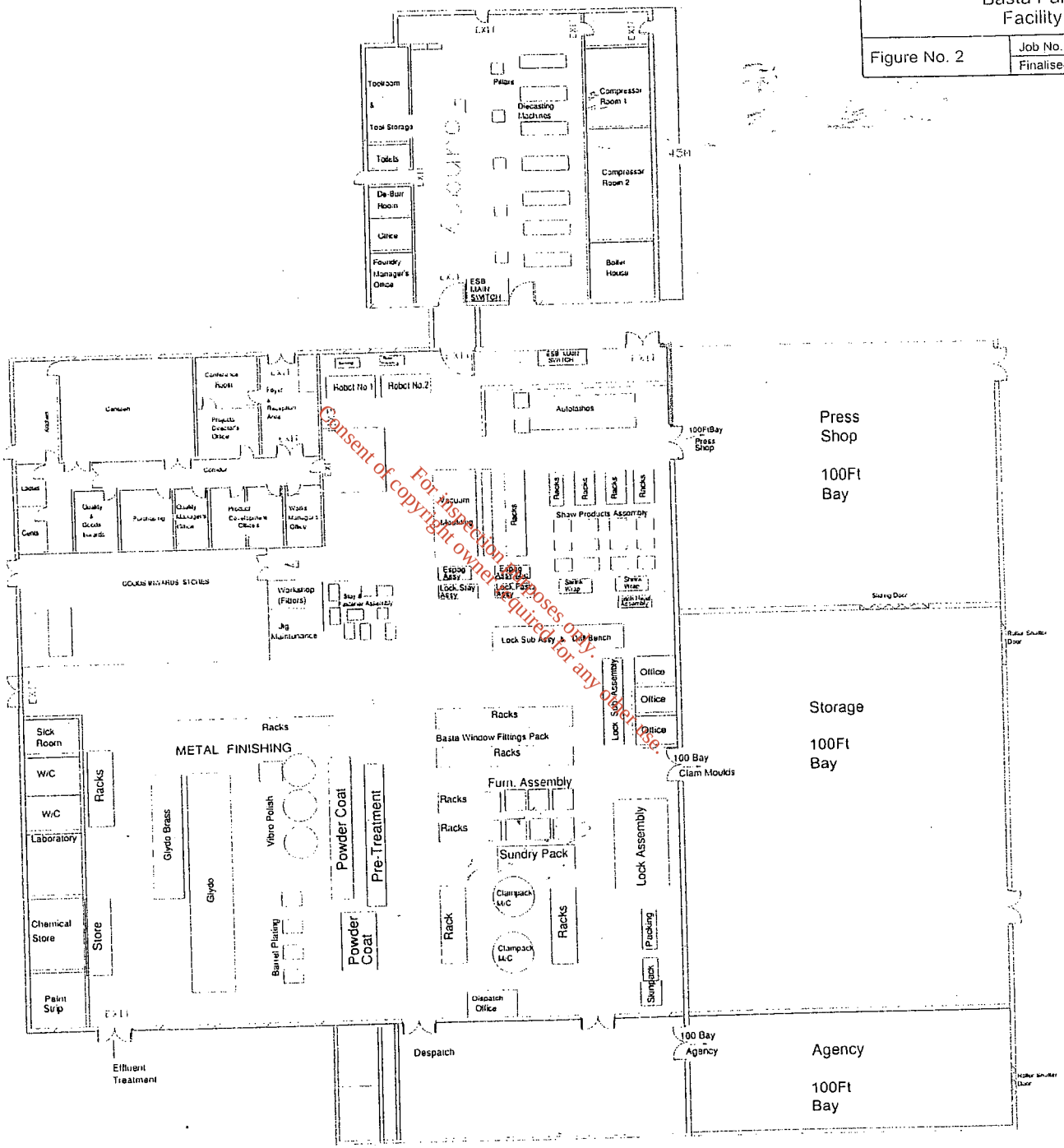
Item	Cost €
Short Term – One year of quarterly groundwater monitoring and maintenance	€8,920.00
Long Term – Yearly groundwater monitoring and maintenance based on a period of three years	€14,600.00
Contingency Fee based on deterioration of groundwater quality following remediation	€10,000.00
Total	€33,520.00

FIGURES



Basta Parsons Ltd.
Facility Layout

Figure No. 2	Job No. CE02053	Date. Dec. 2007
	Finalised By - KK	Office - 1404



NOTE: Drawing is for diagrammatic purposes only. No measurements to be taken.