

## **ATTACHMENT F.1: EMISSIONS CONTROL DEVICES**

### **F.1.A: ACID GAS SCRUBBER (AGS-1)**

This device is located next to the aluminium chloride storage tank. AGS-1 is connected to the vent of the above tank, to the vents from the sludge bulking equipment and also to the vents from the drum washing equipment. It is a water scrubber where the water-soluble components are removed from the vent stream before it is vented to atmosphere. The vent gases pass through a packed bed where they are counter-currently contacted with a recirculating water stream driven by a pump. The scrubbed gases are vented to atmosphere via a stack. A fan pulls air from the sludge bulking equipment and exhausts it through the scrubber. Valves isolate the sludge bulking and drum washing vents when the other is in use. Figure F.1.a shows a schematic of the AGS system.

### **F.1.B: WATER SCRUBBER/ CARBON FILTER (WSCF-1)**

This is a similar device to AGS-1, but has a carbon filter bed positioned between the outlet of the scrubber and the vent fan. The purpose of the carbon bed is to absorb any material, particularly volatile organic compounds (VOCs) and other such material, which may be inadequately absorbed by the wet scrubber. The carbon absorber consists of two beds of carbon in parallel. Each bed can be isolated and sent for regeneration when spent. There is no possibility of personnel exposure or fugitive emissions during this procedure. Figure F.1.B shows a schematic of WSCF-1.

### **F.1.C: WATER SCRUBBER/ CARBON FILTER (WSCF-2) (Proposed)**

Will be a similar device to WSCF-1, but has no vent fan. Figure F.1.C shows a schematic of WSCF-2.

A carbon filter alone would suffice for WSCF-2 where there will be no acidic gases present. However the water scrubber will extend the life of the carbon bed and also keep the inlet vapours to the absorber wet, thus inerting the VOCs absorbed on the carbon.

### **F.1.D: OIL INTERCEPTORS AND GRIT TRAPS**

The surface water system incorporates 4 Class 1 oil interceptors, each being fed from a different area of the yard. Careful grading was carried out so that the various areas slope towards a specific drain. In this way a spill in one area will not affect other areas of the yard. The oil interceptors and grit traps are inspected regularly and emptied if required. Alarms are fitted on the former to indicate whether a level of the top phase exceeds 10 mm.

FIGURE F.1A: SCHEMATIC OF AGS-1

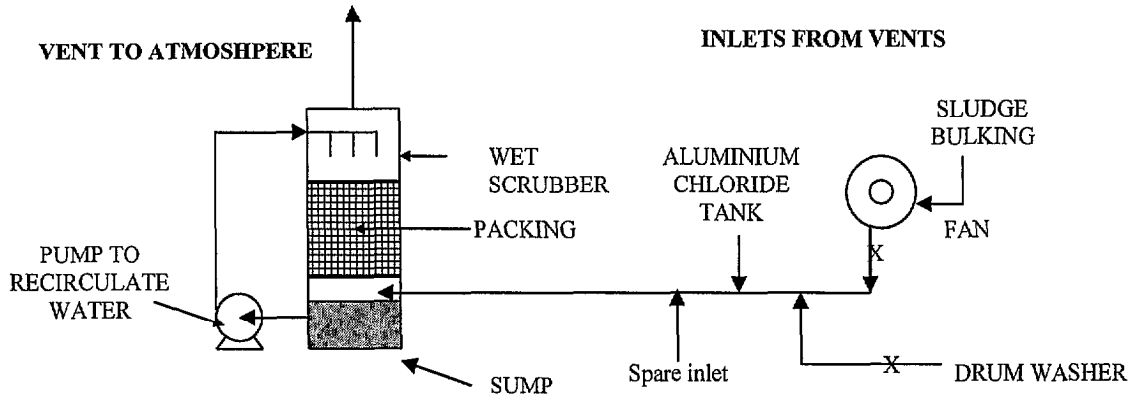


FIGURE F.1.B: SCHEMATIC OF WSCF-1

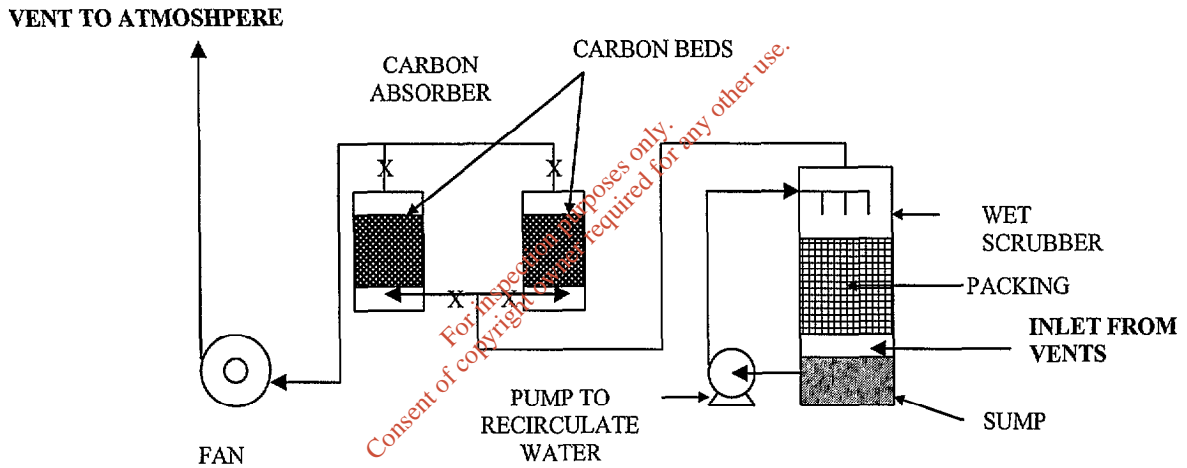
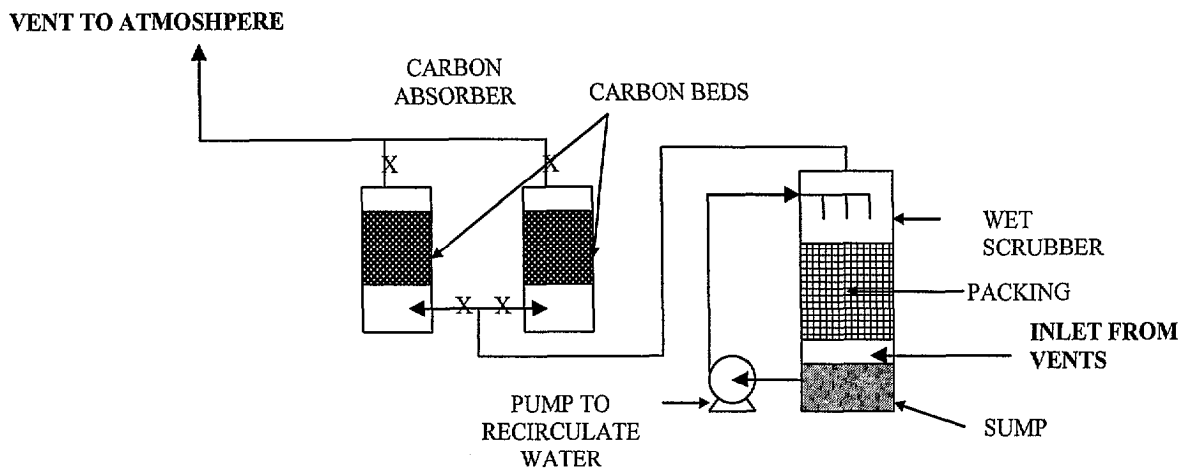


FIGURE F.1.B: SCHEMATIC OF WSCF-2



**ATTACHMENT F.2:  
EMISSIONS MONITORING AND SAMPLING POINTS**

**F.2.1: INTRODUCTION**

The following Tables detail the various emissions monitoring points and the accompanying text records any proposed modifications to the location, frequency or parameters monitored. Figure F.2 shows the locations of the monitoring points.

**F.2.2: AIR EMISSIONS MONITORING**

**TABLE F.2.2 POINT SOURCES**

*Emission Point Reference No(s) :* AGS1, WSCF1, WSCF-2

Parameter	Monitoring frequency	Accessibility of Sampling Points
HCl (AGS-1 and WSCF-1)	Quarterly (Note a)	Accessible
VOCs (WSCF-1 and WSCF-2)	Quarterly	Accessible

*Note a: In the license the frequency is monthly. This was changed to quarterly with the approval of the agency (Letter from Agency, )*

**TABLE F.f.1: FUGITIVE EMISSIONS - VOCs**

*Monitoring Point Reference No :* Fugitive Emissions - VOCs

Parameter	Monitoring frequency	Accessibility of Sampling point
Fugitive VOC Emissions  The PID is mounted daily on the fence and recording takes place for 3 – 8 hours. The data is downloaded and tabulated monthly	Daily	Accessible

**TABLE F.f.2: FUGITIVE EMISSIONS - ASBESTOS**

*Monitoring Point Reference No :* Fugitive Emissions - ASBESTOS

Parameter	Monitoring frequency	Accessibility of Sampling point
Asbestos Fibre Monitoring  An approved independent contractor conducts asbestos monitoring using approved methodologies. Results and the interpretation thereof is reported to the Agency in accordance with the terms of License 50-1	Quarterly	Accessible

**It is not proposed to alter the current air-monitoring program.**

### F. 3: SURFACE WATER MONITORING

Surface water is monitored under two headings.

The run-off from the facility, after passing through the grit and oil separators, is continuously monitored as shown in Table F.3.1. This is an active monitoring and if any parameter is exceeded an alarm is sent to the monitoring station and a valve is automatically closed diverting the water to a holding tank as per SW 202 Procedure for the continuous monitoring of conductivity, pH and TOC.

In addition, the Shanowenadrimina stream and its sediment are monitored by taking grab samples as recorded in Tables F.3.2 and F.3.3.

**TABLE F. 3.1: POINT SOURCES**

*Emission Point Reference No(s) : SWD-1 (Tank B)*

Parameter	Monitoring frequency	Accessibility of Sampling Points
pH	Continuous	Accessible
Flow	Continuous	Accessible
Total Organic Carbon	Continuous	Accessible
Conductivity	Continuous	Accessible
Other Parameters	When required or in response to an incident	Accessible

**It is not proposed to modify the continuous monitoring of the above parameters. A continuous improvement process is in progress to minimise emissions from this source.**

**TABLE F.3.2: SHANOWENADRIMINA STREAM**

*Monitoring Point Reference No(s).* : **WSP 1 and WSP 2**

The stream water quality and ecology are monitored at points above (WSP-1) and below (WSP-2) the discharge of the surface water run-off from the site.

Parameter	Monitoring frequency	Sampling Points
pH	Quarterly	Accessible
BOD	Quarterly	Accessible
Dissolved oxygen	Quarterly	Accessible
Temperature	Quarterly	Accessible
Suspended Solids	Quarterly	Accessible
Total Hardness	Quarterly	Accessible
Electrical conductivity EC	Quarterly	Accessible
Ammoniacal nitrogen NH <sub>4</sub> -N	Quarterly	Accessible
Chemical oxygen demand	Annually	Accessible
Biochemical oxygen demand	Annually	Accessible
Dissolved oxygen DO	Annually	Accessible
Calcium Ca	Annually	Accessible
Cadmium Cd	Annually	Accessible
Chromium Cr	Annually	Accessible
Chloride Cl	Quarterly	Accessible
Copper Cu	Annually	Accessible
Cyanide	Annually	Accessible
Iron Fe	Annually	Accessible
Lead Pb	Annually	Accessible
Magnesium Mg	Annually	Accessible
Manganese Mn	Annually	Accessible
Nickel Ni	Annually	Accessible
Potassium K	Annually	Accessible
Sodium Na	Annually	Accessible
Sulphate SO <sub>4</sub>	Annually	Accessible
Zinc Zn	Annually	Accessible
Total alkalinity (as CaCO <sub>3</sub> )	Annually	Accessible
Total organic carbon TOC	Annually	Accessible
Total oxidised nitrogen TON	Annually	Accessible
Nitrite NO <sub>2</sub>	Annually	Accessible
Nitrate NO <sub>3</sub>	Annually	Accessible
Faecal coliforms (/100mls)	Annually	Accessible
Total coliforms (/100mls)	Annually	Accessible
Total phosphorous (P)	Annually	Accessible
DRH	Annually	Accessible
ROE	Annually	Accessible
16 PAH	Annually	Accessible
USEPA 6 PAH	Annually	Accessible
Semivolatiles	Annually	Accessible
Stream Ecology (EPA "Q")	Annually	Accessible

**TABLE F.3.3: SHANOWENADRIMINA STREAM SEDIMENT**

**Monitoring Point Reference No(s) :** WSP 1 and WSP 2

The sediment quality is monitored at points above (WSP-1) and below (WSP-2) the discharge of the surface water run-off from the site.

Parameter	Monitoring frequency	Sampling Points
Cadmium Cd	Annually	Accessible
Chromium Cr	Annually	Accessible
Copper Cu	Annually	Accessible
Lead Pb	Annually	Accessible
Nickel Ni	Annually	Accessible
Zinc Zn	Annually	Accessible
Hydrocarbons	Annually	Accessible

The ecology and environmental quality (EPA "Q" scale) of the Shanowendramina stream at locations WSP-1 (above) and WSP-2) below the outfall of the surface water drain is monitored annually. A contractor (Aquatic Services Unit of University College Cork) takes samples and analyses the relative populations of flora and fauna.

**It is not proposed to change the surface water monitoring program.**

**F.4: SEWER DISCHARGE MONITORING**

At present there is no discharge to sewer of any sewer connection. Once the connection is made a monitoring program will be instigated. Monitoring of sewer discharge will be carried out at a point to be agreed with the sanitary authority and approved by the agency.

The frequency of sampling and the tests to be carried out are recorded in Table F.4.1.

**TABLE F.4.1: SEWER DISCHARGE MONITORING**

**Monitoring Point Reference No(s) :** SE-1

Parameter	Monitoring frequency	Sampling Points
pH	Quarterly	Will be Accessible
BOD	Quarterly	Will be Accessible
COD	Quarterly	Will be Accessible
Total Suspended Solids	Quarterly	Will be Accessible
Total Nitrogen (as N)	Quarterly	Will be Accessible
Total Phosphorus(as P)	Quarterly	Will be Accessible
Chloride	Quarterly	Will be Accessible
Total Heavy Metals	Quarterly	Will be Accessible

**F.5: GROUNDWATER MONITORING**

Two series of boreholes/wells are sampled and analysed for a number of parameters as detailed in Table F.2.5.1 A and B.

**TABLE F.5.1: GROUNDWATER MONITORING**

A. Monitoring Point Reference No(s) : **BH-1, BH-2, BH-3a**

The onsite boreholes are monitored quarterly and annually for the following parameters.

Parameter	Monitoring frequency	Sampling Points
pH	Quarterly	Accessible
Temperature	Quarterly	Accessible
Conductivity	Quarterly	Accessible
Ammonia	Quarterly	Accessible
Residue on Evaporation	Annually	Accessible
Cadmium	Annually	Accessible
Chromium	Annually	Accessible
Chloride	Quarterly	Accessible
Copper	Annually	Accessible
Cyanide	Annually	Accessible
Fluoride	Annually	Accessible
Iron	Annually	Accessible
Lead	Annually	Accessible
Manganese	Annually	Accessible
Mercury	Annually	Accessible
Phosphorous	Annually	Accessible
Potassium	Quarterly	Accessible
Sodium	Quarterly	Accessible
Zinc	Annually	Accessible
TOC	Quarterly	Accessible
Total Oxidised Nitrogen	Quarterly	Accessible
Faecal Col	Annually	Accessible
Total Col	Annually	Accessible
Diesel Range Hydrocarbons	Quarterly	Accessible
Residue on Evaporation	Annually	Accessible
16 PAH	Annually	Accessible
USEPA 6 PAH	Annually	Accessible
EU Water 4 PAH	Annually	Accessible
Semivolatiles	Annually	Accessible

**B. Monitoring Point Reference No(s) :** H-1, H-2, N-1, N-2, N-3, N-4, N-5, Holy Well

The off site boreholes are currently monitored as described.

Parameter	Monitoring frequency	Sampling Points
pH	Annually	Accessible
Temperature	Annually	Accessible
Conductivity	Annually	Accessible
Ammonia	Annually	Accessible
Residue on Evaporation	Annually	Accessible
Cadmium	Annually	Accessible
Chromium	Annually	Accessible
Chloride	Annually	Accessible
Copper	Annually	Accessible
Cyanide	Annually	Accessible
Fluoride	Annually	Accessible
Iron	Annually	Accessible
Lead	Annually	Accessible
Manganese	Annually	Accessible
Mercury	Annually	Accessible
Phosphorous	Annually	Accessible
Potassium	Annually	Accessible
Sodium	Annually	Accessible
Zinc	Annually	Accessible
TOC	Annually	Accessible
Total Oxidised Nitrogen	Annually	Accessible
Faecal Col	Annually	Accessible
Total Col	Annually	Accessible
Diesel Range Hydrocarbons	Annually	Accessible
Residue on Evaporation	Annually	Accessible
16 PAH	Annually	Accessible
USEPA 6 PAH	Annually	Accessible
EU Water 4 PAH	Annually	Accessible
Semivolatiles	Annually	Accessible

In the past only one sample has been collected from N5 because of problems of access. It is an irregularly occupied property (a place of worship).

It is proposed not to monitor any off site boreholes in the future. The on-site boreholes are actually located in the perimeter of the site. BH-1 is up gradient of the site, whilst BH-2 and BH-3a are down gradient. The 3 on-site boreholes triangulate the site and effectively provide the required information.

All 3 on-site boreholes were drilled to the same specification and thus samples from them are directly comparable. The off-site samples are obtained in a variety of ways,



(tap at rear of house, dip sample from Holy Well) each susceptible to its unique sampling problems. Also the piping used on some of the wells could well introduce contaminants. These factors contribute to the scatter seen in the data.

Overall the on-site boreholes provide more accurate and reliable information than the plethora of samples currently analysed and will more readily detect any pollution to groundwater caused by the transfer station with less ambiguity.

It is not proposed to change the schedule of tests carried out on samples from BH-1, BH-2 and BH-3a.

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**F.6: NOISE MONITORING**

Annual noise monitoring is carried out at locations MP-1, to MP-5 as shown in Figure F.2 and in Table F.6. The 5 locations are recorded in Figure 2.a. 1.

**TABLE F.6.1: NOISE MONITORING LOCATIONS**

*Monitoring Point Reference No(s) : MP1, MP2, MP3, MP4, MP5*

Point	Location	Note	Monitoring frequency	Sampling Points
MP 1	Nearest dwelling 100 m S	Nearest Noise Sensitive Location	Annually	Accessible
MP 2	South perimeter		Annually	Accessible
MP 3	North perimeter		Annually	Accessible
MP 4	East perimeter		Annually	Accessible
MP 5	House 350 m W		Annually	Accessible

Daytime noise levels are monitored annually by an outside contractor in accordance with BS 7445: 1991, *Description and Measurement of Environmental Noise* and BS 4142: 1990 *Methods for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*.

**It is not proposed to alter the noise monitoring program.**

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**F.7: WEATHER MONITORING**

A weather station on site continuously monitors the weather. The weather parameters monitored are recorded in Table F.7.1.

**TABLE F.7.1: WEATHER MONITORING**

*Monitoring Point Reference No(s) : On-site weather station*

Parameter	Monitoring frequency	Sampling Points
WIND SPEED	Continuous	Accessible
WIND DIRECTION	Continuous	Accessible
TEMPERATURE (Max and Min)	Continuous	Accessible
PRECIPITATION	Continuous	Accessible
EVAPORATION RATE	Continuous	Accessible
RELATIVE HUMIDIDTY	Continuous	Accessible

The results of the monitoring are discussed in Attachment I.1.

The weather station will have to be relocated because the area it is located on will be affected by the construction of the Fermoy/Rathcormac by-pass. A new location will be agreed with Agency.

It is proposed only to record the wind speed, wind direction, temperature and precipitation only in future. See Attachment I.1 Section 2.h for the reasons.

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**FIGURE F.2: LOCATIONS OF MONITORING POINTS**

