ringaskiddy

INDAVER IRELAND

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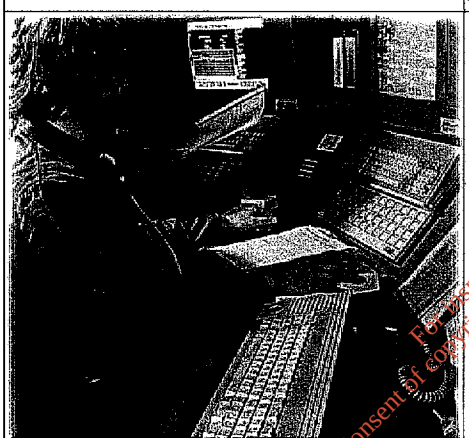
Consulting Engineers



waste management facility

environmental impact statement
Response in Accordance with Article 14 (2)(b)(ii)
of the Waste Management (Licensing) Regulations,
Article 13 Compliance, September 2003

RESPONSE TO THE NOTICE UNDER ARTICLE 14(2)(B)(II) OF THE WASTE MANAGEMENT (LICENSING) REGULATIONS

ARTICLE 13 COMPLIANCE REQUIREMENTS

RESPONSE TO THE NOTICE UNDER ARTICLE 14(2)(b)(ii) OF THE WASTE MANAGEMENT (LICENSING) REGULATIONS - ARTICLE 13 COMPLIANCE REQUIREMENTS

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1.0 INTRODUCTION

Indaver Ireland received a notice, dated 30th July 2003, from the EPA requesting additional information in connection with the application for a waste licence for the Ringaskiddy Waste Management Facility. The information requested with reference to Article 13 Compliance Requirements is presented below.

2.0 ARTICLE 13 COMPLIANCE REQUIREMENTS

2.1 Additional Badger Study

1. *Indicate whether a further badger study was carried out as recommended in Section 10.8 of the EIS and if undertaken a copy of this study should be submitted.*

A further badger survey was undertaken in January 2002. No additional setts were found. The report of this survey is attached, in Appendix 1.

Badgers, over time, may abandon a sett and excavate a new one. In the time period between the initial badger surveys and the start of construction, the badgers may construct new setts. Another badger survey will be undertaken immediately prior to construction. If a sett is located in the area, which would be affected by construction activities, the badgers will be removed under licence from the National Parks and Wildlife Section of the Department of the Environment, Heritage and Local Government.

2.2 Waste Elimination

2. *Based on current knowledge and methods of assessment outline the measures proposed of the elimination of waste generated at your facility. Reference as a minimum should be made to residue arising from flue gas abatement and their likely significant effects.*

2.2.1 Waste Minimisation

Section 14.4 of the reference document, submitted with the waste licence application, deals with the technologies chosen for the facility, which will minimise waste. Section 14.5 of the reference document outlines the technologies chosen to minimise energy consumption.

2.2.2 Scrubber Options

The three options proposed for the alkaline reagents to be used in the scrubbing system, which is part of the flue gas cleaning system, are lime, limestone and caustic. Refer to Section 2.9 and Table 2.9.4 of the additional information requested for article 12 compliance. The advantages and disadvantages of the three reagents are listed in Table 2.9.4. of the additional information requested for article 12 compliance.

The quantities of residues, which will be produced by the flue gas cleaning system, with the different scrubber options, are given in Table 12.3 of the reference document submitted

Gypsum is formed in the reaction with SO_2 in the flue gases, when lime or limestone is used as reagent. Refer to Section 9.5.6 of the reference document for chemical equations. The gypsum can be recovered for reuse. This results in less flue gas cleaning residues than when caustic is used as reagent. It is probable that the flue gas cleaning residue will have to be disposed off to a hazardous waste landfill. Thus the use of lime or limestone has a major cost benefit, as all waste requiring disposal in a hazardous waste landfill will have to be exported until a hazardous waste landfill is constructed in Ireland.

However, the quantity of solid residues produced is just one element in the operation of the system. The robustness of the system, its operability and energy consumption must also be included in the balance.

For example, use of a single scrubber using lime milk, in conjunction with the injection of lime into the spray tower, gives the greatest quantity of solid residues. However, the experience in the plants in Flanders has been that the injection of lime into the spray tower reduces the amount of calcium chloride in the residues. This is an advantage as the calcium chloride is hygroscopic which makes the residues difficult to handle. This would be expected to be more of a problem in Ringaskiddy, which is expected generally to have a higher relative humidity than Flanders. Thus, while the single scrubber option gives the greatest quantity solid residues, it gives a residue which is easier to handle and results in a system which is generally more robust and easier to operate. The final decision on the scrubber options will be taken at the detailed design stage. The resulting quantities of ash, the robustness of the system, operability and energy consumption will be taken into consideration.

2.3 Ambient Nickel Levels

3. *Background levels of Ni determined by ambient monitoring (Section 9) indicated that proposed standards are not achieved. Provide evidence to support your statement that background levels of this compound are expected to be minor during the operation of your facility.*

Section 9.10.5 of the EIS stated:

"Background levels of nickel were detected at above the proposed ambient air quality standard during the monitoring period. Although a source of heavy metals may have been present during the monitoring period, future projections of emissions in the region did not identify any significant local sources of Ni in a detailed cumulative assessment of nearby sources. Thus, it may be expected that background levels of this compound are likely to be minor during operations of Indaver Ireland."

The baseline monitoring study detected raised levels of Nickel during the 12-week monitoring period. A review of the IPC Licences in the area indicated that two facilities in the area were licensed to emit Nickel during this monitoring period. Firstly, Irish Ispat Ltd (IPC Licence 498) was licensed to emit Nickel (via emission points A2-1, A2-2, A2-4) although the facility ceased operation shortly after the completion of the monitoring programme. Secondly, Novartis Ringaskiddy Ltd (IPC Licence 545) was also licensed to emit a sum of metals which included Nickel (via emission points 3 and 4, solid and liquid waste incinerators respectively).

A detailed cumulative assessment of metal emissions outlined in Council Directive 1999/30/EC (Sum of Metals Sb, As, Pb, Cr, Co, Cu, Mn, Ni and V) which includes nickel is outlined in Table A9.15 of the EIS. As Irish Ispat Ltd. had ceased operations by the time of the assessment, the contribution from this facility was not included in the cumulative assessment. Results indicated that there was no significant impact from Novartis Ringaskiddy Ltd with annual average concentrations at the proposed Indaver Ireland site of the order of 1.2 ng/m^3 for the sum of metals including Nickel due to emissions from this facility.

A monitoring program carried out by the EPA focussed on emissions impacting on the Haulbowline Naval Base, on Haulbowline Island, which is situated directly to the west of Irish Ispat Ltd. The ambient air monitoring study was carried out by the EPA between 1 June 2000 – 15 August 2000. The survey measured a range of parameters including metals. The result for Nickel is given below in Table 4.3.1:

Table 2.3.1 Levels of Nickel Measured by the EPA at Haulbowline Naval Base, Cork, 01/06/00 – 15/08/00.

Species	Average (ng/m^3)	Limit Values (ng/m^3)(1)
Nickel	15.8	20

(1) Proposed standard recommended in "Proposal for a Directive of the European Parliament and of the Council relating to As, Cd, Hg, Ni and PAHs in Ambient Air" (1)

Although this level does not exceed the proposed standard recommended in "Proposal for a Directive of the European Parliament and of the Council relating to As, Cd, Hg, Ni and PAHs in Ambient Air" for Nickel, the level is significantly higher than would be expected for a rural or urban background location. The above Proposal indicates ambient levels of nickel ranging from up to 2 ng/m^3 in rural areas and urban background levels of between 1.4 to 13 ng/m^3 . Measurements in the location of industrial facilities including steel plants ranged from 20 – 102 ng/m^3 (1).

The EPA survey also found high levels of PM_{10} including three very high episodes of PM_{10} emissions lasting several days on each occasion. The PM_{10} levels peaked at 374.6 µg/m^3 for a 24-hour period which should be compared with the EU limit value set out in Council Directive 1999/30/EC of 50 µg/m^3. The high episodes corresponded with an easterly wind thus pointing to Irish Ispat Ltd as the source of the emissions. It is also likely that during this period, high levels of metals were also emitted as metals are emitted as particulates, with steel manufacturing a known significant source of metals including nickel.

The evidence would thus indicate that Irish Ispat Ltd was the primary source of raised levels of nickel during the monitoring period. As the facility has since ceased operations, it would be expected that levels would be in the region of that expected for a rural or urban background location as no significant existing sources of nickel are now present.

2.4 Maximum Flow in Flue 1

4. Confirm the maximum volume flow for "Maximum Flue 1" as set out in the source emission data in table A9.18.

The maximum volume flow for "Maximum Flue 1" in Table A9.18 stated a value of 10930 Nm^3/hr. This was a typographical error. The correct value, which is outlined in Table 9.20 of the EIS and which was used in the modelling assessment is 101900 Nm^3/hr.

2.5 Assessment of the Impact of the Annual Average Emission of SO_2

5. An assessment of the annual average impact of SO_2 should be included.

2.5.1 SO_2 Source Information

Source information including emission release heights, volume flows, locations and stack diameters has been summarised in Appendix 9.6 of the EIS.

Ambient Ground Level Concentrations (GLCs) of Sulphur Dioxide (SO_2) has been predicted for the following scenarios in Table 2.5.1.

Table 2.5.1 Emission Scenario for Sulphur Dioxide

Pollutant	Scenario	Concentration	Emission Rate (g/s)
SO_2	Max (1.1 x design)	50 mg/m^3	2.5
	Design	20 mg/m^3	0.92
	50% of maximum	50 mg/m^3	1.3

2.5.2 Comparison with Standards And Guidelines

The relevant air quality standards for Sulphur Dioxide has been detailed in Table 2.5.2. In this report the ambient air concentrations for SO_2 has been referenced to Council Directive 1999/30/EC (S.I. 271 of 2002).

Table 2.5.2 EU Ambient Air Standard - Council Directive 1999/30/EC

Pollutant	Regulation	Limit Type	Margin of Tolerance	Value
Sulphur Dioxide	1999/30/EC	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	43% until 2001 reducing linearly until 0% by 2005	350 $\mu g/m^3$
		Daily limit for protection of human health - not to be exceeded more than 3 times/year	None	125 $\mu g/m^3$
		Annual & Winter limit for the protection of ecosystems	None	20 $\mu g/m^3$

In relation to the protection of ecosystems and vegetation, EU Council Directive 1999/30/EC has stated that:

"(b) Protection of ecosystems and vegetation.

Sampling points targeted at the protection of ecosystems or vegetation should be sited more than 20 km from agglomerations or more than 5 km from other built-up areas, industrial installations or motorways. As a guideline, a sampling point should be sited to be representative of air quality in a surrounding area of at least 1000 km^2. A Member State may provide for a sampling point to be sited at a lesser distance or to be representative of air quality in a less extended area, taking account of geographical conditions."

Due to the industrial location of the site and the built-up nature of the surrounding 20 km, the annual limit value for the protection of ecosystems would not be deemed applicable in the current location.

2.5.3 Modelling Results

Modelling was carried out for the three scenarios described in Section 2.5.1.

Table 2.5.3 details the predicted SO_2 annual average and winter average GLC for each scenario.

Table 2.5.3 Dispersion Model Results – Sulphur Dioxide.

Pollutant / Scenario	Background ($\mu g/m^3$)	Averaging Period	Process Contribution ($\mu g/m^3$)	Predicted Emission Concentration ($\mu g/Nm^3$)	Standard[1] ($\mu g/Nm^3$)
SO_2 / Maximum	10	Annual Average	5.7	16	20
		Winter Average[2]	2.3	12	20
SO_2 / Design	10	Annual Average	2.2	12	20
		Winter Average[2]	0.93	11	20
SO_2 / 50% of maximum	10	Annual Average	3.9	14	20
		Winter Average[2]	1.6	12	20

1. Directive 1999/30/EC
2. Winter: 1 October to 31 March (Cork Airport Met Data from 1 October 1995 – 31 March 1996 used in model).

2.5.4 Concentration Contours

The geographical variation in SO_2 ground level concentrations beyond the site boundary is illustrated as a concentration contour in Figure 2.5.1. Figure 2.5.1 is provided in Appendix 2

2.5.5 Result Findings

SO_2 modelling results indicate that the ambient ground level concentrations are below the relevant air quality standards for sulphur dioxide under both typical and maximum operation of the site. Thus, no adverse environmental impact is envisaged to occur under these conditions at or beyond the site boundary. Emissions at maximum operations equate to an ambient SO_2 concentration (including background concentrations), which is 62% of the annual limit value at the worst-case boundary receptor.

2.5.6 References

(1) European Commission (2003) Proposal for a Directive of the European Parliament and of the Council relating to As, Cd, Hg, Ni and PAHs in Ambient Air.

2.6 Heat Emissions

6. *Provide details on heat emissions, including source, location, nature, composition, quantity, level and rate; the impact of such emissions on the environment; and details on the monitoring of any such emissions.*

2.6.1 Heat Balance for the Fluidised Bed and Post Combustion Chamber

The thermal input to the fluidised bed and post combustion chamber line will be 44.8 MW. For this furnace line the heat balance is expected to be as follows:

The heat loss by radiation from the hot equipment (furnace, boiler, steam cycle, etc.) will be 1.0 MW (2.2 %). This will make the air in the building hot. This heat will be evacuated through the natural draft building ventilation to the atmosphere.

34.2 MW will be converted to steam. The remaining heat of 9.6 MW in the flue gas cleaning system and 0.9 MW heat radiation in the buildings will not be recovered.

The 34.2 MW steam will be converted in 10.3 MW electricity, 22.2 MW hot air and 1.7 MW steam for flue gas reheating. The hot air will come from the aerocondenser. Steam at 40 bar / 400 °C will enter the turbine. Steam at 0.15 bar / 50 °C and for only 10 % condensed will leave the turbine. The remaining 90 % steam will be condensed in the aerocondenser. It will be indirect cooling. The steam will be condensed in a closed loop and the ambient air will be heated.

The 9.6 MW at the outlet of the boiler will be reduced to 6.6 MW in the spray dryer. The difference of 3 MW represents the evaporation of water in the spray dryer. Sensible heat of 3 MW will be converted to latent heat.

The 6.6 MW at the entrance of the wet flue gas cleaning system will become 2.0 MW at the outlet because once again water will be evaporated. Sensible heat of 4.6 MW will be converted to latent heat.

Finally 1.7 MW will be added to the 2.0 MW coming from the wet flue gas cleaning system by means of flue gas reheating with steam. (tapped from the turbine at some 8 bar).

Refer to Figure 2.6.1 below.

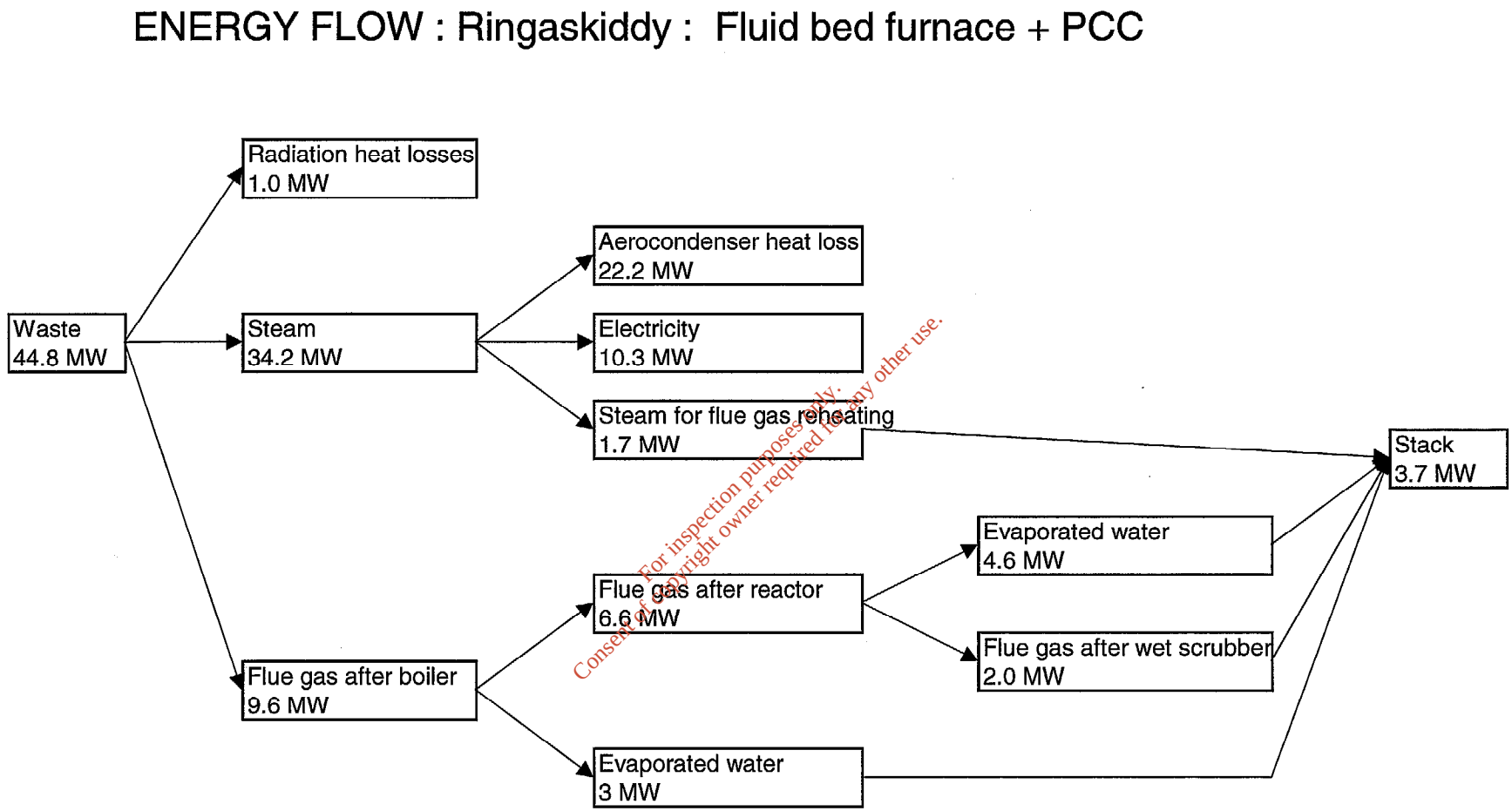

Figure 2.6.1 Heat Balance for Fluidised Bed Furnace and Post Combustion Chamber

2.6.2 Heat Balance for the Grate furnace

The thermal input to the fluidised bed and post combustion chamber line will be 35.2 MW. For this furnace line the heat balance is expected to be as follows:

The heat loss by radiation from the hot equipment (furnace, boiler, steam cycle, etc.) will be 0.7 MW (2 %). This will make the air in the building hot. This heat will be evacuated through the natural draft building ventilation to the atmosphere.

27.3 MW will be converted to steam. The remaining heat of 7.2 MW in the flue gas cleaning system and 0.7 MW heat radiation in the buildings will not be recovered.

The 27.3 MW steam will be converted in 8.2 MW electricity, 17.8 MW hot air and 1.3 MW steam for flue gas reheating. The hot air will come from the aerocondenser. Steam at 40 bar / 400 °C will enter the turbine. Steam at 0.15 bar / 50 °C and for only 10 % condensed will leave the turbine. The remaining 90 % steam will be condensed in the aerocondenser. It will be indirect cooling. The steam will be condensed in a closed loop and the ambient air will be heated.

The 7.2 MW at the outlet of the boiler will be reduced to 5.0 MW in the spray dryer. The difference of 2.2 MW represents the evaporation of water in the spray dryer. Sensible heat of 2.2 MW will be converted to latent heat.

The 5.0 MW at the entrance of the wet flue gas cleaning system will become 1.5 MW at the outlet because once again water will be evaporated. Sensible heat of 3.5 MW will be converted to latent heat.

Finally 1.3 MW will be added to the 1.5 MW coming from the wet flue gas cleaning system by means of flue gas reheating with steam. (tapped from the turbine at some 8 bar).

Refer to Figure 2.6.2 below.

2.6.3 Impact of Heat Emissions

The heat emissions are not expected to have a significant impact on the environment.

2.6.4 Monitoring of Heat Emissions

It is not proposed to undertake monitoring of heat emissions.

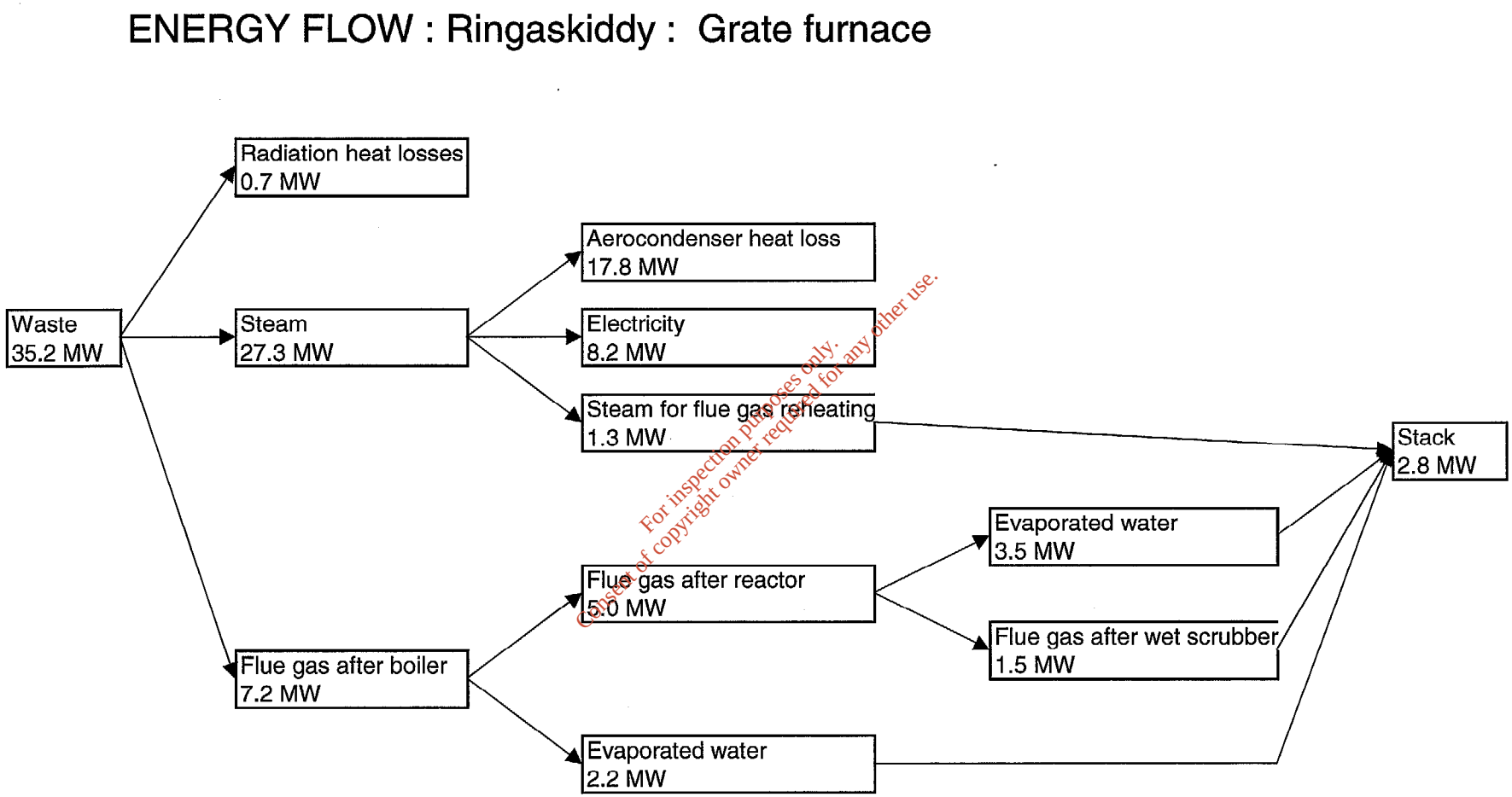

Figure 2.6.1 Heat Balance for Fluidised Bed Furnace and Post Combustion Chamber

3.0 NON TECHNICAL SUMMARY IN THE ENVIRONMENTAL IMPACT STATEMENT (EIS)

The additional information provided in this submission describes in greater detail issues and aspects of the proposed facility, which are already described in the EIS. This submission does not change the facility description contained in the EIS. Thus it is considered that a revision to the Non Technical Summary provided in the EIS is not warranted.

APPENDIX 1

REPORT ON A WINTER VISIT TO REVIEW THE STATUS OF WILD MAMMALS, IN PARTICULAR BADGERS AT THE PROPOSED DEVELOPMENT SITE, RINGASKIDDY, CO. CORK

(SECOND REPORT)

REPORT ON A WINTER VISIT TO REVIEW THE STATUS OF WILD MAMMALS, IN PARTICULAR BADGERS AT THE PROPOSED DEVELOPMENT SITE, RINGASKIDDY, CO. CORK

(SECOND REPORT)

INTRODUCTION

The site was visited, by request, on 10th and 11th of January 2002, specifically to ascertain if there were further badger (*Meles meles*) setts (burrows) on the site. No further setts were found however other observations were also made which are recorded here.

Badgers

The area was walked and searched for badgers setts during the two visits. The badger main sett identified on the last visit in May was also revisited. At that time the sett had an associated above-ground-bed (a sort of nest), a latrine and four active entrances. This time six entrances were found, due no doubt, to greater visibility, and of these three were active and three had spoil heaps. There were, as on the last visit, many active badger paths, two of which lead into the Hammond Lane property, and this time two latrines were found. There was also grass bedding being dragged into two of the main sett entrances, which suggests cubs will be born underground, near these sett entrances, around about the end of this month. The other two setts identified in May were not active and no further badger setts were found. On the two visits to the main sett five piles of a mixture of peanuts, coloured plastic pellets and treacle were left under stones, for the badgers to feed on. If this badger social group's territory is to be studied then the feeding of such a mixture for 10 days to 2 weeks will be helpful. This was a 'starter' to get the badgers used to the idea.

The badgers mark their territories with pits, which they defecate into; several of these make up a frontier latrine. There is an example of one of these at the gate at the top left hand side of the site. The plastic pellet mixture, described above is fed at a badger main sett for 10 days to two weeks. After this the latrines are found and when the plastic is found in the pits the latrine is joined to the main sett by a straight line on a map, allowing the territory to be identified. This technique is called bait marking. If the badgers on the site are to be persuaded to move to another set, off site, yet in their territory, then this needs to be done. This will involve fieldwork on the surrounding land(s).

Other Mammals

The number of fox (*Vulpes vulpes*) earths identified has increased there are now three in comparison to one in May. There were also signs that there are now a significant number of common (*Rattus norvegicus*) rats on this site, which may be why there appears to have been an increase in fox activity. If work begins on the site control of rats ought be considered ***before*** work begins.
Refer to Figure 1.

Recommendations:

1. Bait-marking of the badger main sett should be considered as this might increase options as to the badgers. This is best done in early spring or late autumn.
2. Any construction work on site should be preceded by effective rat control.

Legend:

- Tracks
- Dens
- L — Latrine of medium sized mammals
- B — Above Ground Beds of medium sized mammals
- Fox Earth - Jan 2002
- Badger Frontrier Latrine - Jan 2002

INDAVER IRELAND — Ringaskiddy waste management facility

Repeat Survey - (January 2002)

ARUP Consulting Engineers

Files Located : J:/jobs/756/graphics/EIS figures

Ordnance Map : Ordnance Survey Ireland Licence No. EN 0002801 © Government of Ireland

Figure Title : Locations of Mammal Burrows found

Figure No : 1.0

APPENDIX 2

FIGURE 2.5.1. GEOGRAPHICAL VARIATION IN SO_2 GROUND LEVEL CONCENTRATIONS BEYOND THE SITE BOUNDARY

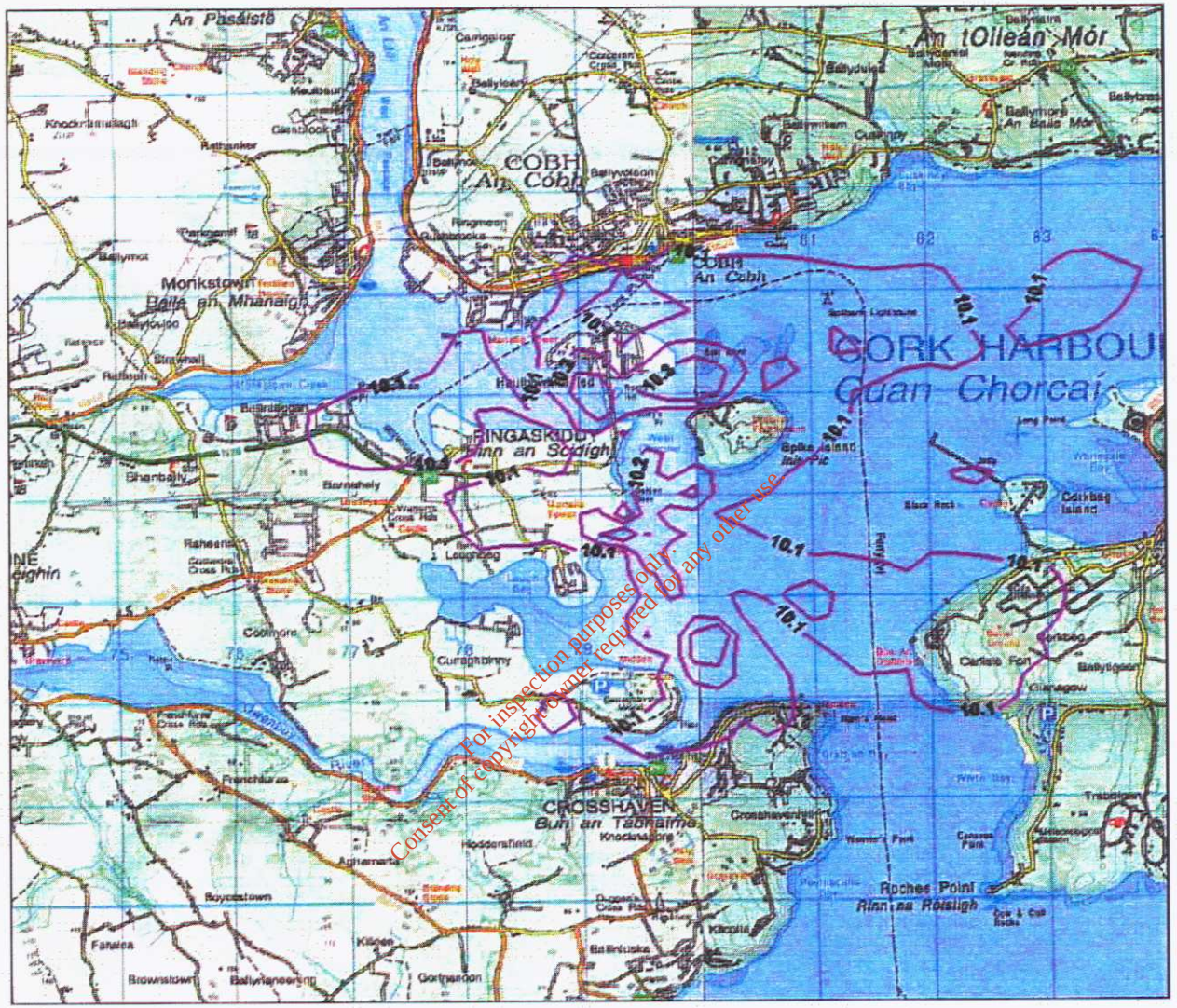

Figure 5.1: Predicted annual mean SO2 concentration (microg/m3) Maximum operation, Indaver Ireland Waste Management Facility

Scale: 1:70000 approx

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