MONITORING REPORT FORM (F-CDM-MR)
Version 02.0

MONITORING REPORT

Title of the project activity	GHG emission reduction by thermal oxidation of HFC 23 at Navin Fluorine International Limited (NFIL), Surat, Gujarat, India
Reference number of the project activity	0838
Version number of the monitoring report	01
Completion date of the monitoring report	06/11/2012
Registration date of the project activity	30/03/2007
Monitoring period number and duration of this monitoring period	Twenty Third Monitoring period 01/10/2012 to 31/10/2012 (Both days included)
Project participant(s)	Navin Fluorine International Limited (NFIL), India INEOS Fluor Limited (IFL), United Kingdom of Great Britain and Northern Ireland Sumitomo Corporation, Japan BHP Billiton Marketing AG, Switzerland E. ON UK plc, United Kingdom of Great Britain and Northern Ireland Mercuria Energy Trading SA, Switzerland NATIXIS, France Gazprom Marketing & Trading Limited, United Kingdom of Great Britain and Northern Ireland
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope - 11 : Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride Methodologies – AM0001, version 4 - Incineration of HFC 23 Waste Streams
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	233,512 tCO_{2e} for this monitoring period (apportioned for 1 month)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	275,303 tCO_{2e}

SECTION A. Description of project activity
A.1. Purpose and general description of project activity
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Purpose of project activity and GHG reduction:

Navin Fluorine International Limited (NFIL) is engaged in manufacturing of a range of refrigerants and speciality chemicals in their production facility at Bhestan, Surat, India. One of their main products is refrigerant HCFC22. HFC 23 (CHF_3) is being generated as byproduct from the HCFC 22 production process. HFC 23 has low toxicity but is a green house gas (GHG), whose GWP is large (GWP = 11,700). The main objective of the registered CDM project activity is to reduce GHG emission through destruction of HFC 23, using a thermal oxidation system, since there are currently no regulations restricting the emissions of HFC 23 in India. The project activity captures the HFC23 generated and destructs it by means of thermal oxidation.

Installed technology and equipments*:*

The technology for the HFC23 capture and destruction is supplied by INEOS Fluor Limited, UK (IFL). In this project, NFIL has installed storage capacity to store HFC 23 initially until the thermal oxidizer is commissioned, and also for periods when the thermal oxidizer is offline. NFIL has installed a thermal oxidizer system, which completely decomposes (>99.999%) the HFC 23, with the discharge of HFC 23 to the atmosphere reduced to a level close to zero. As part of the thermal oxidizer system, quench and absorption towers have been installed to rapidly cool the combusted gases and to control emissions. The facility is set up with a sufficient capacity to handle the HFC 23 capture, storage and destruction at the HCFC22 production plant. The existing neutralization and effluent treatment facilities available at the plant are being used for treatment of the waste aqueous streams from the thermal oxidizer system. The entire process is computer controlled using a Distributed Control System.

Relevant dates for project activity:

The relevant details of the project activity are given below:

1. Project Registered by CDM board: 30/03/2007
2. HFC23 Storage Facility commissioned: 01/04/2007
3. Start of crediting period: 01/05/2007
4. Storage of HFC23 considered from: 01/05/2007
   (Material stored for destruction between 01/04/2007 and 30/04/2007 is outside of the CDM project boundary)
5. Start of thermal oxidation of HFC23: 17/07/2007
6. First Monitoring Period: 01/05/2007 to 15/08/2007
7. Second Monitoring Period: 16/08/2007 to 15/10/2007.
8. Third Monitoring period: 16/10/2007 to 31/12/2007.
9. Fourth Monitoring period: 01/01/2008 to 29/02/2008.
10. Fifth Monitoring Period: 01/03/2008 to 30/04/2008.
11. Sixth Monitoring period: 01/05/2008 to 30/06/2008.
12. Seventh Monitoring period: 01/07/2008 to 30/11/2008.
13. Eighth Monitoring period: 01/12/2008 to 30/04/2009.
14. Ninth Monitoring period: 01/05/2009 to 31/07/2009.
15. Tenth Monitoring period: 01/08/2009 to 30/11/2009.
16. Eleventh Monitoring period: 01/12/2009 to 30/04/2010.
17. Twelfth Monitoring period: 01/05/2010 to 30/11/2010.
18. Thirteenth Monitoring period : 01/12/2010 to 31/01/2011.

19. Fourteenth Monitoring period : 01/02/2011 to 30/04/2011.
20. Fifteenth Monitoring period : 01/05/2011 to 31/08/2011.
21. Sixteenth Monitoring period : 01/09/2011 to 31/10/2011.
22. Seventeenth Monitoring period: 01/11/2011 to 31/01/2012.
23. Eighteenth Monitoring period: 01/02/2012 to 29/02/2012.
24. Nineteenth Monitoring period: 01/03/2012 to 30/04/2012.
25. Twentieth Monitoring period: 01/05/2012 to 30/06/2012.
26. Twenty first Monitoring period : 01/07/2012 to 31/08/2012.
27. Twenty second Monitoring period: 01/09/2012 to 30/09/2012.
28. Twenty third Monitoring period : 01/10/2012 to 31/10/2012

The total Certified Emission Reduction units being claimed in this monitoring period is **275,303 tCO_{2e}**.

A.2. Location of project activity

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(a) Host Party: India
(b) Region/ State/ Province: Gujarat
(c) City/Town/District: Surat
(d) The project is located at the Navin Fluorine International Limited (NFIL) site with Latitude - 21° 12' N and Longitude - 72° 55' E

A.3. Parties and project participant(s)

Party involved **((host) indicates a host Party)**	**Private and/or public entity(ies) project participants (as applicable)**	**Indicate if the Party involved wishes to be considered as project participant (Yes/No)**
India (host)	Navin Fluorine International Limited (NFIL)	No
United Kingdom of Great Britain and Northern Ireland	INEOS Fluor Limited (IFL),. Gazprom Marketing & Trading Limited E. ON UK plc	No
Japan	Sumitomo Corporation	No
Switzerland	BHP Billiton Marketing AG Mercuria Energy Trading SA	No
France	NATIXIS	No

A.4. Reference of applied methodology

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Approved Baseline methodology AM0001: “Incineration of HFC 23 Waste Streams”, Version 4, is applied to this project, under Sectoral Scope 11.

A.5. Crediting period of project activity

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The project activity has chosen a fixed 10 year crediting period, which started on the 01/05/2007.
Crediting period: 01/05/2007 to 30/04/2017

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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Implementation status:

The project crediting period start date is 01/05/2007. The thermal oxidation facility for HFC23 was fully implemented and commissioned on 17/07/2007. Since then the plant and thermal oxidation facility is working efficiently.

Technical description of the project

The HFC23 destruction by thermal oxidation involves several steps for capturing, storage, thermal oxidation and effluent treatment. A brief description about the same is discussed below.

Decomposition process description

1) *HFC 23 Conditioning & Storage*

The conditioning and storage of HFC 23 comprises waste gas scrubbers, waste gas compressors, refrigerated condensers, refrigerated storage tanks and refrigeration compressors. The waste gases from the HCFC 22 plant are scrubbed, to remove acidity and moisture, compressed by the waste gas compressors and transferred to the storage tanks. The stored waste gas can be maintained in liquid form by the use of the refrigeration system. Waste gas can be fed to the thermal oxidizer via a flow meter from the waste gas storage. The quantity of HFC 23 stored together with its quality is recorded separately.

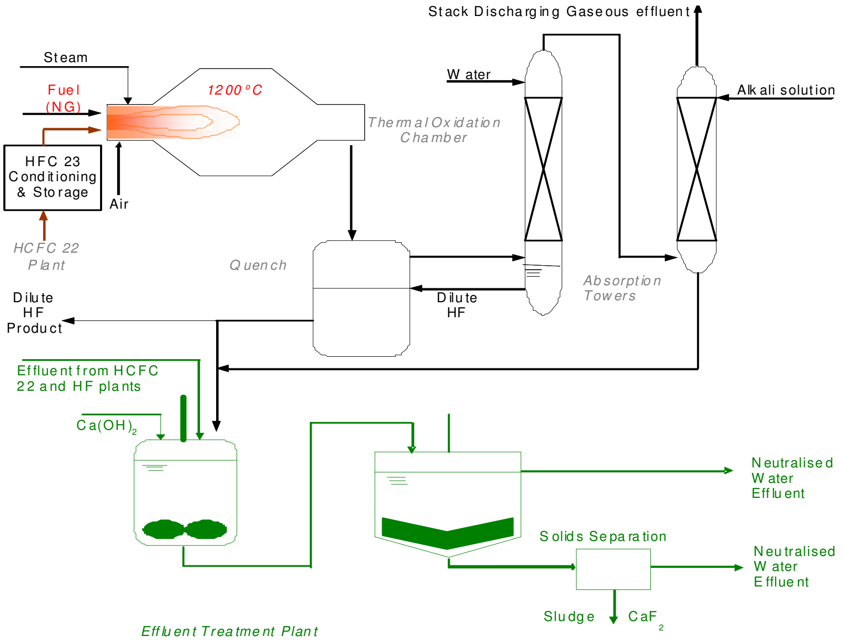

Figure 1: HFC 23 Decomposing Operation

2) *Oxidation of HFC 23 in the thermal oxidation chamber*:

Natural Gas is fed with air to the oxidation chamber, where it burns (oxidizes) to carbon dioxide (CO_2) and water vapour. HFC 23 (potentially containing low levels of HCFC 22) is fed simultaneously to the chamber and is oxidised to CO_2 and HF. Steam, as an additional source of hydrogen, is fed to the furnace to ensure complete conversion of halogens to hydrogen halides.

CHF_3 (HFC 23) + H_2O + ½ O_2 => CO_2 + 3 HF
$CHClF_2$ (HCFC 22) + H_2O + ½ O_2 => CO_2 + 2 HF + HCl
CH_4 + 2 O_2 => CO_2 + $2H_2O$

The temperature in the chamber is kept at around 1200 ^{0}C, so as to promote decomposition of the HFC/HCFC and minimize the formation of unwanted combustion by-products such as dioxins and furans. (Throughout this document, "dioxin" will henceforth be used as a general descriptor of dioxin and furan species).

3) *Quench*:

The combusted gases are then fed to the Quench where they are rapidly cooled down with water to close to ambient temperature. The oxidized gases are cooled and form dilute hydrofluoric acid to be recovered as aqueous solution (a by-product) or neutralized in the effluent treatment plant (ETP).

4) *Absorption towers*:

The weak residual gas (comprising mainly inert gases) leaves the quench chamber and will be fed into the bottom of the absorption towers. The gases will pass through the absorption towers counter current to the flow of the absorption agent, which will be fed to the top of each absorption tower. The scrubbed gases comprising oxygen, nitrogen, carbon dioxide and water vapour, emanating from the absorption towers are then discharged to atmosphere via the stack. Discharge to atmosphere is as per national statutory requirements.

5) Dilute Hydrofluoric acid handling

In general the dilute Hydrofluoric acid produced in the process will be sold externally, using the existing dilute Hydrofluoric acid handling equipment on site.

6) *Effluent Treatment Plant*:

The aqueous effluent from the process will be routed through the existing ETP before reuse or disposal. The existing NFIL effluent treatment facility will be used for these neutralization and precipitation processes as it has excess capacity, sufficient to cope with the load that will be generated by the new process equipment.
The dilute acids produced in the Quench and absorption towers, which are not sold, are neutralized with neutralizing agents, typically hydrated lime (Calcium hydroxide) and caustic soda. The resultant Calcium fluoride (CaF_2) and small quantities of Calcium Chloride ($CaCl_2$) solids are then settled / precipitated with the aid of alum. In the event that excess neutralizing agent is added or the solids fail to precipitate, small amounts of acid (eg. hydrochloric acid) and flocculating agents may be required. From the neutralization and precipitation system, the neutralized water effluent is discharged to the

environment and the solid sediment CaF_2 sludge is dehydrated to use for safe land filling or recycled for use at the same facilities for producing fluorine based chemicals.

The procedures necessary to operate the thermal oxidation process in an environmentally and socially safe manner are well established at IFL in the UK and IFL will be providing technical support at each stage of the project activity. This will enable NFIL to operate the technology in an environmentally and socially safe manner thus contributing to sustainability of the proposed operations.

HCFC 22 and CDM plant shut down periods

Following is the detail of major shut down periods of HCFC 22 and CDM plant during this monitoring period.

i) HCFC 22 Production plant:

- During the monitoring period (01/10/2012 to 31/10/2012), HCFC 22 plant was remain under operation and there was no shut down taken for preventive maintenance work.

ii) HFC 23 destruction facility:

- During the monitoring period (01/10/2012 to 31/10/2012), CDM destruction plant was under shut down from 02/10/2012 to 07/10/2012 for maintenance work.

- During this period the waste HFC 23 produced by the HCFC 22 plant was held in storage.

Applicability of the methodology

No events or situations occurred during the monitoring period, which impacted the applicability of the methodology.

It is to be noted that there is no change in HCFC 22 production facility and operation during the monitoring period as compared to the baseline and w factor identification period (2001-2004).

B.2. Post registration changes
B.2.1. Temporary deviations from registered monitoring plan or applied methodology
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There is no temporary deviation from registered monitoring plan or applied methodology during this monitoring period.

B.2.2. Corrections
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There is no correction to project information or parameters fixed at validation during this monitoring period.

B.2.3. Permanent changes from registered monitoring plan or applied methodology
>>
There are no permanent changes from registered monitoring plan or applied methodology during this monitoring period.

B.2.4. Changes to project design of registered project activity
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There are no changes to project design of registered project activity during this monitoring period.

B.2.5. Changes to start date of crediting period

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There is no change to start date of crediting period since registration.

B.2.6. Types of changes specific to afforestation or reforestation project activity

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This section is not applicable to this project activity.

SECTION C. Description of monitoring system

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Approved monitoring methodology AM0001 version 04 is applied to this project.

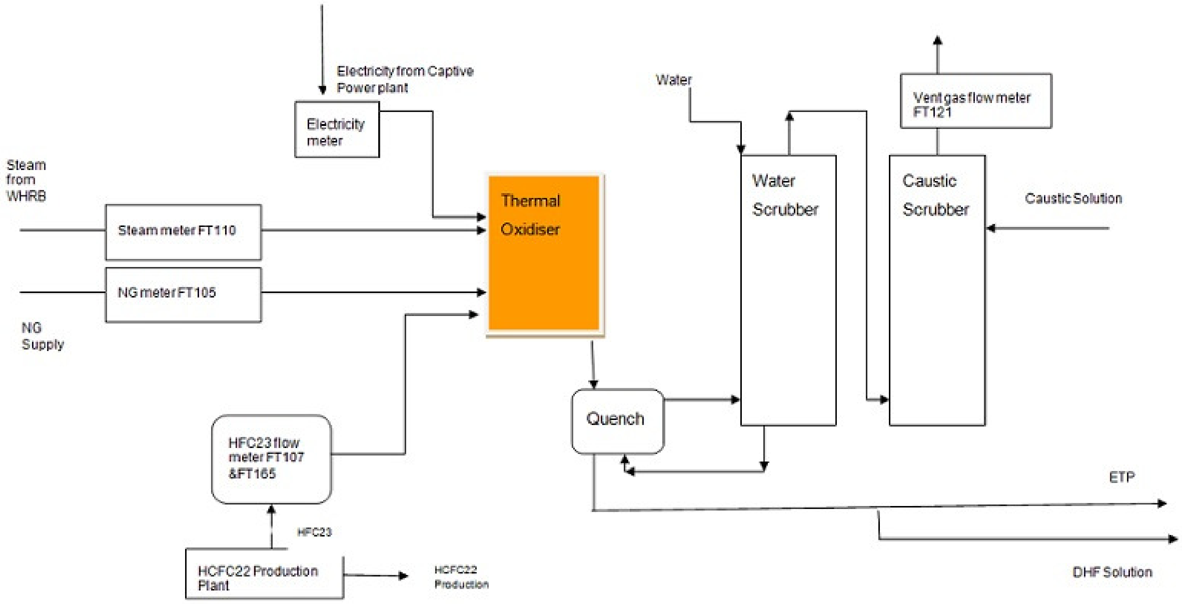
Applicability:

This methodology is applicable to HFC 23 (CHF_3) waste streams from an existing HCFC22 production facility with at least three (3) years of operating history between beginning of the year 2000 and the end of the year 2004 where the project activity occurs and where no regulation requires the destruction of the total amount of HFC23 waste. The present project activity satisfies these conditions so the monitoring methodology is applicable to the project activity.

1) Data collection procedures:

   The monitoring plan is fully implemented in the project activity and there are well defined data collection and reporting system established in the plant. The day to day monitoring of the data is being done at the plant level, where plant operators monitoring and records daily data. The plant operators are qualified and experience personnel with CDM monitoring training imparted on them. The daily recording of data is done by plant log books and DCS system. Based on the daily monitored data weekly and monthly aggregation is done by plant management and emission reduction calculation is being carried out. Detailed information about data collection in order to monitor GHG emission reduction is provided in the section D and appendix 1 to 5.

   Below diagram depicts Major monitoring points for the project activity.



2) Quality Control (QC) and Quality Assurance (QA)

i) Quality Management System:

NFIL Bestan production plant has ISO 9001:2008 and ISO14001:2004 certification. This Quality management system also covers the CDM project plant and boundary. NFIL operating personnel, who have received special training from the equipment/technology suppliers, operate the thermal oxidation plant.

The Managing Director has assigned the responsibility of the project management and also for monitoring, measurement and reporting to the President – Operation, who is being assisted by Deputy General Manager (Production).Full details of the organizational structure are provided in the company's Departmental Systems Manual. The organization structure, operation, data transfer and reporting procedures for the project are incorporated within the Company's ISO 9001 procedures.

ii) QA /QC procedures that are being undertaken for data monitored

The quality assurance and quality control procedures, in terms of equipment operation and maintenance, and analytical methods, have been defined based on applicable international standards, as well as standards provided by INEOS Fluor Limited and the Equipment Suppliers. **QA /QC** procedures for all data collection and monitoring procedure are being followed as per ISO 9001:2008 procedures and applicable guidance from monitoring methodology AM0001, version 04.

3) Accuracy of equipment used: Calibration and Maintenance details for measurement and analytical Instruments

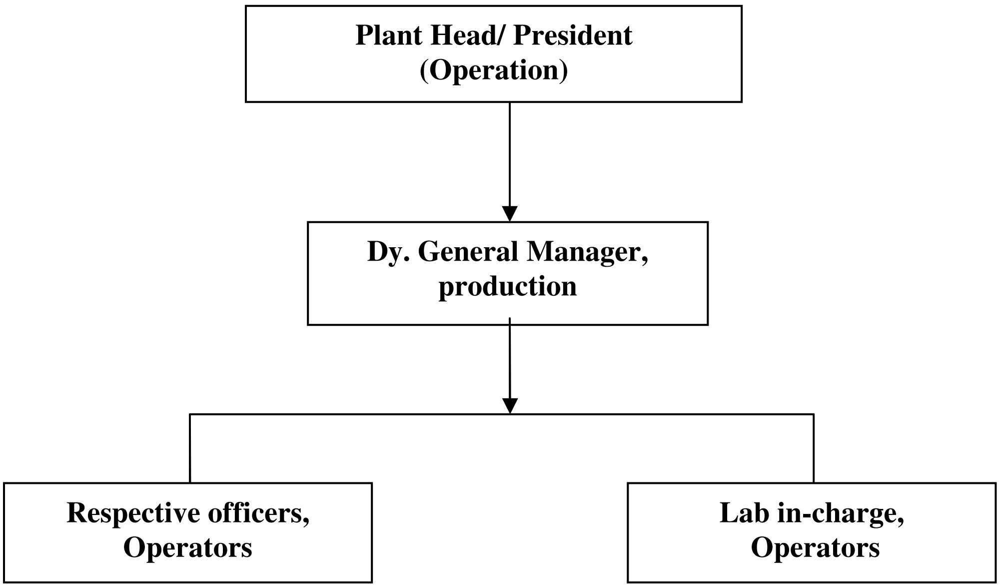
All measuring and analytical instruments being used for data monitoring have worked perfectly during the monitoring period. The measurement instruments are calibrated as per the approved methodology AM0001 Version 04. Maintenance and Calibration procedures have been incorporated in NFIL's Quality Management System and Procedures. The maintenance methods and procedures have been incorporated as part of the ISO 9001 procedures, and form an integrated part of the systems and procedures for NFIL.

The details about various calibrations and zero check carried out for meters/measurement instruments are attached in separate Appendix 2 to this report.

4) Organization structure:

NFIL has well defined organization structure for monitoring plan. The President (Operation) of the plant is overall responsible for the monitoring and has full authority for implementation. Emergency procedures are part of quality management system and incorporated in NFIL ISO manual.

Structure for CDM monitoring



5) Environmental Impacts monitoring:

i) Gaseous emissions:

As indicated in applied monitoring methodology AM0001, version 04, regular analysis/verification of the gaseous effluents is carried out twice in a month to verify the gaseous releases discharged from the plant. The same is being submitted to local regulatory body in monthly report along with total plant analysis in line with local regulation. The table below provides the details maximum value observed for the gaseous effluents during the monitoring period. As evident from the data, the plant operation has been within compliance of the environmental standards.

Table 1 showing analysis of the Gaseous Emissions for Thermal Oxidation plant

Parameter	Permissible Limit as per local pollution control board standard	Actual analysis (Maximum observed during Monitoring period)
Cl_2, mg/Nm^3	9	0
CO, mg/Nm^3	100	2
Dioxin, ng/Nm^3 TEQ	0.1	0.0105
HCl, mg/Nm^3	20	0
HF, mg/Nm^3	6	1.06
NO_x, mg/Nm^3	120	0.87
SPM, mg/Nm^3	100	0
SO_2, mg/Nm^3	40	0.99
Total organics in Vent mg/Nm^3	No Limit	0

2) Liquid effluents:

The aqueous streams from the plant pass to the site's effluent treatment plant where they are combined with the effluent from the other plants and undergo treatment. The analysis for the effluent is carried out once in a month and submitted to local regulatory body. The table below provides the details of the maximum values observed for combined aqueous effluent during the monitoring period. As evident from the data, the plant operation has been within compliance of the environmental standards.

Table 2 Showing analysis of the aqueous emissions from the Effluent Treatment Plant

Parameter	Permissible Limit as per local pollution control board standard	Actual analysis (Maximum observed during Monitoring period)
pH	6.5-8.5	7.24
COD	100 mg/litre	85
BOD	30 mg/litre	28
Suspended solids	100 mg/litre	38
Phenolic compounds	1 mg/litre	0.034
Normal hexane extracts (n- H)	NA	Nil
Copper	3 mg/litre	Not detected
Zinc	5 mg/litre	
Chromium	2 mg/litre	
Manganese	NA	

SECTION D. Data and parameters
D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/Parameter	Q_HCFC
Unit	Tonnes
Description	Maximum Production of HCFC 22 for which emission can be generated
Source of data	Production records for 2002 to 2004
Value(s) applied	7,992
Purpose of data	Used to determine the maximum baseline emission
Additional comment	This is ex ante fix value or applied cap

Data/Parameter	W
Unit	NA
Description	Maximum ratio of HFC 23 to HCFC 22 for which emission can be generated
Source of data	Production records for 2002 to 2004 and IPCC default value
Value(s) applied	0.03 (3%)
Purpose of data	Used to determine the maximum baseline emission
Additional comment	This is ex ante fix value or applied cap

Data/Parameter	GWP_HFC23
Unit	GWP value
Description	Global Warming Potential of HFC 23
Source of data	IPCC data
Value(s) applied	11,700
Purpose of data	Used to determine the maximum the baseline emission an also in the project emission calculation
Additional comment	-

Data/Parameter	EF
Unit	Tonnes of CO_2/tonne of HFC 23
Description	Emission factor for HFC 23 combustion
Source of data	Approved methodology AM 0001 Version 4
Value(s) applied	0.62857
Purpose of data	Used in the project emission calculation.
Additional comment	-

Data/Parameter	$\boldsymbol{E\_F_{lime,y}}$
Unit	Tonnes of CO_2/tonne of lime used
Description	CO_2 intensity of lime
Source of data	Chemical composition
Value(s) applied	0.710
Purpose of data	Used in the leakage calculation
Additional comment	Value corrected in the first monitoring period

Data/Parameter	$E\_F_{NaOH,y}$
Unit	Tonnes of CO_2/tonne of 100 % NaOH used
Description	CO_2 intensity of 100 % NaOH
Source of data	Standard NaOH manufacturing data
Value(s) applied	1.599
Purpose of data	Used in the leakage calculation
Additional comment	-

Data/Parameter	$E\_F_{alum,y}$
Unit	Tonnes of CO_2/tonne of alum used
Description	CO_2 intensity of alum
Source of data	Alum manufacturing data
Value(s) applied	2
Purpose of data	Used in the leakage calculation
Additional comment	-

Data/Parameter	$E\_F_{refrigerant,y}$
Unit	Tonnes of CO_2/tonne of refrigerant used
Description	CO_2 intensity of refrigerant
Source of data	Refrigerant HCFC 22 Global warming potential and manufacturing data
Value(s) applied	2,134
Purpose of data	Used in the leakage calculation
Additional comment	-

Data/Parameter	$E\_F_{fuel,y}$
Unit	Tonnes of CO_2/tonne of diesel used
Description	CO_2 intensity of diesel
Source of data	Indian national Statistics
Value(s) applied	3.1
Purpose of data	Used in the leakage calculation
Additional comment	-

D.2. Data and parameters monitored

Data/Parameter	Q_HFC23_y
Unit	Metric Tonnes
Description	Quantity of HFC 23 Destroyed by Project Activity
Measured/Calculated /Default	Calculated
Source of data	Project meter readings and purity
Value(s) of monitored parameter	24.521
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Calculated and recorded each monitoring period
Calculation method (if applicable)	q_{HFC23y} x $P_{\_HFC23y}$ (Quantity of HFC23 measured* Purity of HFC23)
QA/QC procedures	As per section C of monitoring report
Purpose of data	Baseline and Project Emissions calculation
Additional comment	-

<table>
<tr><td>Data/Parameter</td><td>q_HFC23_y</td></tr>
<tr><td>Unit</td><td>Metric Tonnes</td></tr>
<tr><td>Description</td><td>Quantity of waste HFC 23 supplied to the destruction process</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Electronic output from mass flow meters</td></tr>
<tr><td>Value(s) of monitored parameter</td><td><table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>24.675</td></tr><tr><td>01/10/2012 to 31/10/2012
(23rd Monitoring period)</td><td>24.675</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td><table><tr><td>Type</td><td>Coriolis mass flow meter</td></tr><tr><td>Accuracy class</td><td>+/- 0.35 % of rate</td></tr><tr><td>Sr. No</td><td>Details given in Appendix 2 of monitoring report</td></tr><tr><td>Calibration frequency</td><td>Six monthly calibration with weekly zero checks</td></tr><tr><td colspan="2">Calibration dates: Details given in Appendix 2 of monitoring report
Validity of calibration: 29/11/2012</td></tr></table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Continuous measurement, data read every 2 seconds, recorded Hourly and reported Monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>The lower value of the two readings is used to estimate the HFC 23 waste flows.</td></tr>
<tr><td>QA/QC procedures</td><td>As per section C of monitoring report</td></tr>
<tr><td>Purpose of data</td><td>Baseline and Project Emissions calculation</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data/Parameter	**P_HFC23_y**
Unit	**ppm w/w**
Description	Purity of waste HFC23 supplied to the destruction process
Measured/Calculated /Default	Measured
Source of data	Gas Chromatograph
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 – Values: 993,790 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) – Values: 993,790
Monitoring equipment	Type: SHIMADZU -2014 GC Accuracy class: As per industrial standard Sr. No: C 11484403676SA Calibration frequency: Monthly Calibration dates: Details given in Appendix 2 of monitoring report Validity: 15/11/2012
Measuring/Reading/ Recording frequency	Recorded monthly
Calculation method (if applicable)	Average of measurements taken over the month
QA/QC procedures	As per section C of monitoring report
Purpose of data	Baseline and project Emissions calculation
Additional comment	-

Data/Parameter	**B_HFC23_y**
Unit	**Metric Tonnes**
Description	Baseline Quantity of HFC 23 Destroyed
Measured/Calculated /Default	Calculated
Source of data	Indian Regulations
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 – Values: 0.000 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) – Values: 0.000
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Calculated and recorded monthly
Calculation method (if applicable)	$Q\_HFC23_y * r_y$
QA/QC procedures	N/A
Purpose of data	Baseline emission calculations
Additional comment	-

Data/Parameter	***W***
Unit	NA
Description	Fraction of actual HCFC production
Measured/Calculated /Default	Calculated
Source of data	Q_HFC23 is calculated from measured variables Q_HCFC is measured directly and recorded in production records
Value(s) of monitored parameter	Actual value =0.0316 Value applied for emission reduction = 0.03
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Calculated and recorded each monitoring period
Calculation method (if applicable)	*w* = Q_HFC23/Q_HCFC
QA/QC procedures	N/A as calculated value.
Purpose of data	Baseline Emissions calculation
Additional comment	-

<table>
<tr><td>Data/Parameter</td><td>Q_HCFC$_y$</td></tr>
<tr><td>Unit</td><td>Metric Tonnes</td></tr>
<tr><td>Description</td><td>Actual HCFC 22 Production</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Production Records</td></tr>
<tr><td>Value(s) of monitored parameter</td><td><table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>785</td></tr><tr><td>01/10/2012 to 31/10/2012
(23rd Monitoring period)</td><td>785</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td><table><tr><td>Type</td><td>Side mounted magnetic float level gauge</td></tr><tr><td>Accuracy class</td><td>+/- 1.0 %</td></tr><tr><td>Sr. No</td><td>N/A</td></tr><tr><td>Calibration frequency</td><td>Monthly</td></tr><tr><td>Calibration dates</td><td>26/10/2012</td></tr><tr><td>Validity</td><td>26/11/2012</td></tr></table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measured daily, recorded monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>N/A</td></tr>
<tr><td>QA/QC procedures</td><td>As per section C of monitoring report</td></tr>
<tr><td>Purpose of data</td><td>Baseline emission calculations</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data/Parameter	**$Q\_Fsteam_{,y}$**
Unit	**Kg-steam**
Description	Quantity of steam consumed for destruction process during year
Measured/Calculated /Default	Measured
Source of data	Electronic output from flow meter
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 20,215 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 20,215
Monitoring equipment	Type: Vortex flow meter Accuracy class: +/- 2 % Sr. No: I 080265 Calibration frequency: Monthly Calibration dates: Details given in Appendix 2 of monitoring report Validity: 16/11/2012
Measuring/Reading/ Recording frequency	Measured continuously, read hourly and recorded monthly
Calculation method (if applicable)	N/A
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculation
Additional comment	-

Data/Parameter	**$Q\_Fpower_{,y}$**
Unit	**kWh**
Description	Quantity of power consumed by the destruction process during year.
Measured/Calculated /Default	Measured
Source of data	Output from electricity meter
Value(s) of monitored parameter	Period: Values 01/10/2012 to 31/10/2012: 82,070 01/10/2012 to 31/10/2012 (23rd Monitoring period): 82,070
Monitoring equipment	Type: Multifunction static electric meter Accuracy class: +/- 1 % Sr. No: 10/01/1165 Calibration frequency: Monthly Calibration dates: Details given in Appendix 2 of monitoring report Validity: 26/11/2012
Measuring/Reading/ Recording frequency	Measured continuously, Read daily and recorded monthly.
Calculation method (if applicable)	N/A
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculation
Additional comment	-

Data/Parameter	**E_Fsteam,y**
Unit	**Kg CO_2/kg – steam**
Description	GHG emission value for steam
Measured/Calculated /Default	Calculated
Source of data	Site steam production data
Value(s) of monitored parameter	0 kg CO_2/kg steam
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recorded each monitoring period, see appendix 3
Calculation method (if applicable)	As given in Appendix 3
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emission calculation
Additional comment	If the steam used by the process is generated by waste heat recovery then the GHG factor is zero. In the event that the waste heat recovery steam is not available a factor taken from the efficiency of the site steam generation plant will be used.

Data/Parameter	**E_Fpower_y**
Unit	**Kg CO_2/kWh**
Description	GHG emission value for electricity
Measured/Calculated /Default	Calculated
Source of data	Electricity generation data
Value(s) of monitored parameter	0.555
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recorded each monitoring period, see appendix 3
Calculation method (if applicable)	Power plant efficiency (NG consumption in M3 / kWh unit produced) multiplied by E_NG_y
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculation
Additional comment	-

Data/Parameter	**Q_Lime**
Unit	**Metric Tonnes**
Description	Quantity of lime used in the effluent treatment plant for neutralising the effluent from the thermal oxidiser
Measured/Calculated /Default	Calculated
Source of data	Number of bags of lime used
Value(s) of monitored parameter	<table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>5.550</td></tr><tr><td>01/10/2012 to 31/10/2012 (23rd Monitoring period)</td><td>5.550</td></tr></table>
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Number of bags used recorded daily and lime use attributed to the Thermal oxidizer calculated monthly
Calculation method (if applicable)	Total lime used * (load due to thermal oxidiser / total site load)
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**Q_NaOH_y**
Unit	**Metric Tonnes**
Description	Quantity of NaOH used in the absorption tower.
Measured/Calculated /Default	Measured
Source of data	CDM plant log record
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 0.498 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 0.498
Monitoring equipment	Type: Side mounted magnetic float type level gauge Accuracy class: +/- 1.00 % Sr. No: T 109 Calibration frequency: Monthly Calibration dates: 26/10/2012 Validity: 26/11/2012
Measuring/Reading/ Recording frequency	Measured daily and recorded monthly
Calculation method (if applicable)	N/A
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**Q_Sludge_y**
Unit	**Metric Tonne**
Description	Quantity of sludge (Solid waste) generated from thermal oxidiser effluent transported off-site.
Measured/Calculated /Default	Calculated
Source of data	Effluent treatment Plant records
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 13.876 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 13.876
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Calculated and recorded monthly
Calculation method (if applicable)	Refer Appendix 4
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**$Q\_refrigerant\ used_{,y}$**
Unit	**Metric tonnes**
Description	Quantity of refrigerant used by HFC 23 refrigerated tanks
Measured/Calculated /Default	Measured
Source of data	Log book records of refrigerant added
Value(s) of monitored parameter	<table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>0.061</td></tr><tr><td>01/10/2012 to 31/10/2012 (23rd Monitoring period)</td><td>0.061</td></tr></table>
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recorded monthly.
Calculation method (if applicable)	Number of cylinders used * 61 kg/cylinder
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**$Q\_DHF_{,y}$**
Unit	**Metric Tonne**
Description	Dilute HF generated by process and not sent to the effluent treatment plant
Measured/Calculated /Default	Weight and strength measured
Source of data	Plant log book
Value(s) of monitored parameter	<table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>17.549</td></tr><tr><td>01/10/2012 to 31/10/2012 (23rd Monitoring period)</td><td>17.549</td></tr></table>
Monitoring equipment	<table><tr><td>Type</td><td>Radar type level instrument</td></tr><tr><td>Accuracy class</td><td>+/- 1.0 %</td></tr><tr><td>Sr. No</td><td>6LT 611/612</td></tr><tr><td>Calibration frequency</td><td>Monthly</td></tr><tr><td>Calibration dates</td><td>26/10/2012.</td></tr><tr><td>Validity</td><td>26/11/2012.</td></tr></table>
Measuring/Reading/ Recording frequency	The weight of DHF sent to the HF plant is summated daily The DHF strength is measured for each lot
Calculation method (if applicable)	Summation of the daily weight of DHF sent to the HF plant * the DHF strength
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**Q_Alum$_{,y}$**
Unit	**Metric Tonnes**
Description	Quantity of Alum used in the effluent treatment plant for neutralising effluent from thermal oxidiser
Measured/Calculated /Default	Calculated
Source of data	Number of bags of alum used
Value(s) of monitored parameter	Period / Values: 01/10/2012 to 31/10/2012: 0.022 01/10/2012 to 31/10/2012 (23rd Monitoring period): 0.022
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Number of bags used recorded daily and alum use attributed to the Thermal oxidizer calculated monthly
Calculation method (if applicable)	Total alum used * (load due to thermal oxidiser / total site load)
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculations
Additional comment	-

Data/Parameter	**F_Fuel Transport$_{,y}$**
Unit	**Tonnes of diesel per tonne of product transported**
Description	Quantity of fuel used to transport lime, NaOH, Alum, solid waste, dilute HF & Refrigerant
Measured/Calculated /Default	Round trip distance to supplier measured and then value calculated using typical vehicle efficiencies
Source of data	Purchase records
Value(s) of monitored parameter	0.016 tonnes of diesel per tonne of dilute HF 0.06 tonnes of diesel per tonne of lime 0.006 tonnes of diesel per tonne of caustic 0.016 tonnes of diesel per tonne of alum 0.0008 tonnes of diesel per tonne of sludge 0.0 tonnes of diesel per tonne of refrigerant.
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recording frequency once per year or monitoring period
Calculation method (if applicable)	Round trip distance * typical vehicle efficiency
QA/QC procedures	As per section C of monitoring report
Purpose of data	Leakage Emissions calculation
Additional comment	-

Data/Parameter	**$ND\_HFC23_{,y}$**
Unit	**Metric Tonnes**
Description	Quantity of HFC 23 not destroyed during year
Measured/Calculated /Default	Calculation
Source of data	Thermal oxidiser vent gas flow and thermal oxidiser vent purity
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 0.000 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 0.000
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Calculated and recorded monthly
Calculation method (if applicable)	Multiplication of thermal oxidiser vent gas flow and thermal oxidiser vent purity
QA/QC procedures	As per section C of monitoring report
Purpose of data	Project Emissions calculation
Additional comment	-

Data/Parameter	**$Vent\_Flow_{,y}$**
Unit	**m3**
Description	Thermal oxidiser vent gas flow
Measured/Calculated /Default	Measured
Source of data	Output from vent flow meter
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 411,542 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 411,542
Monitoring equipment	Type: Pitot Tube type flow meter Accuracy class: +/- 0.065 % Sr. No: 01614636 Calibration frequency: Monthly Calibration dates: 16/10/2012. Validity: 16/11/2012.
Measuring/Reading/ Recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	N/A
QA/QC procedures	As per section C of monitoring report
Purpose of data	Project Emission calculation
Additional comment	-

<table>
<tr><td>Data/Parameter</td><td>P_Vent</td></tr>
<tr><td>Unit</td><td>mg/m^3</td></tr>
<tr><td>Description</td><td>Purity of vent gas leaving the destruction process</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Gas Chromatograph output</td></tr>
<tr><td>Value(s) of monitored parameter</td><td><table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>0.000</td></tr><tr><td>01/10/2012 to 31/10/2012
(23rd Monitoring period)</td><td>0.000</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td><table><tr><td>Type</td><td>SHIMADZU -2014 GC</td></tr><tr><td>Accuracy class</td><td>As per industrial standard</td></tr><tr><td>Sr. No</td><td>C 11484403676SA</td></tr><tr><td>Calibration frequency</td><td>Monthly</td></tr><tr><td>Calibration dates</td><td>15/10/2012.</td></tr><tr><td>Validity</td><td>15/11/2012</td></tr></table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measured monthly and when the thermal oxidiser stops</td></tr>
<tr><td>Calculation method (if applicable)</td><td>N/A</td></tr>
<tr><td>QA/QC procedures</td><td>As per section C of monitoring report</td></tr>
<tr><td>Purpose of data</td><td>Project Emissions calculations</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data/Parameter	**E_NG,y**
Unit	**Tonnes of CO_2/m^3**
Description	GHG emission factor for natural gas or other fossil fuel during year
Measured/Calculated /Default	Calculated
Source of data	Gas suppliers composition data
Value(s) of monitored parameter	0.001949
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recorded each monitoring report and/or annually
Calculation method (if applicable)	Calculated based on the carbon content and composition of the natural gas
QA/QC procedures	As per section C of monitoring report
Purpose of data	Project Emissions calculation
Additional comment	Detailed calculation given in Appendix 3

<table>
<tr><td>Data/Parameter</td><td>Q_NG,y</td></tr>
<tr><td>Unit</td><td>m^3</td></tr>
<tr><td>Description</td><td>Quantity of Natural Gas consumed by the destruction process</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Output of flow meter</td></tr>
<tr><td>Value(s) of monitored parameter</td><td><table><tr><td>Period</td><td>Values</td></tr><tr><td>01/10/2012 to 31/10/2012</td><td>17,128</td></tr><tr><td>01/10/2012 to 31/10/2012
(23rd Monitoring period)</td><td>17,128</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td><table><tr><td>Type</td><td>Vortex Flow meter</td></tr><tr><td>Accuracy class</td><td>+/- 1.00 %</td></tr><tr><td>Sr. No</td><td>E8048D20000</td></tr><tr><td>Calibration frequency</td><td>Monthly</td></tr><tr><td>Calibration dates</td><td>16/10/2012</td></tr><tr><td>Validity</td><td>16/11/2012</td></tr></table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measured continuously and recorded monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>N/A</td></tr>
<tr><td>QA/QC procedures</td><td>As per section C of monitoring report.</td></tr>
<tr><td>Purpose of data</td><td>Project Emissions calculation</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

<table>
<tr><td>Data/Parameter</td><td>Q_HFC23_Storage$_{,y}$</td></tr>
<tr><td>Unit</td><td>Metric Tonne</td></tr>
<tr><td>Description</td><td>Total of waste HFC23 gas in storage</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Output from instruments</td></tr>
<tr><td>Value(s) of monitored parameter</td><td><table><tr><td>Month end dates</td><td>Values</td></tr><tr><td>31/10/2012</td><td>8.848</td></tr><tr><td>31/10/2012 (end of monitoring period)</td><td>8.848</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td><table><tr><td>Type</td><td>Electronic load cell</td></tr><tr><td>Accuracy class</td><td>+/- 0.05 %</td></tr><tr><td>Sr. No</td><td>Details given in Appendix 2 of monitoring report</td></tr><tr><td>Calibration frequency</td><td>Monthly</td></tr><tr><td>Calibration dates</td><td>Details given in Appendix 2 of monitoring report</td></tr><tr><td>Validity</td><td>25/11/2012</td></tr></table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Continuous measurement with monthly recording</td></tr>
<tr><td>Calculation method (if applicable)</td><td>N/A</td></tr>
<tr><td>QA/QC procedures</td><td>As per section C of monitoring report</td></tr>
<tr><td>Purpose of data</td><td>Baseline Emissions calculation</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

Data/Parameter	**P_HFC23_Storage**
Unit	**ppm w/w**
Description	Purity of waste supplied to the destruction process (Storage)
Measured/Calculated /Default	Measured
Source of data	Output from gas chromatograph
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 994,020 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 994,020
Monitoring equipment	Type: SHIMADZU -2014 GC Accuracy class: As per industrial standard Sr. No: C 11484403676SA Calibration frequency: Monthly Calibration dates: 15/10/2012 Validity: 15/11/2012
Measuring/Reading/ Recording frequency	Recorded monthly
Calculation method (if applicable)	Average of measurements taken over the month
QA/QC procedures	As per section C of monitoring report
Purpose of data	Baseline Emissions calculation
Additional comment	-

Data/Parameter	**HFC23_Sold**
Unit	**Metric tonne**
Description	Total of HFC 23 gas sold
Measured/Calculated /Default	Measured
Source of data	Sales receipts
Value(s) of monitored parameter	Period: 01/10/2012 to 31/10/2012 — Values: 0.000 Period: 01/10/2012 to 31/10/2012 (23rd Monitoring period) — Values: 0.000
Monitoring equipment	N/A
Measuring/Reading/ Recording frequency	Recorded Monthly or each monitoring period
Calculation method (if applicable)	N/A
QA/QC procedures	As per section C of monitoring report
Purpose of data	Baseline Emissions calculation
Additional comment	-

D.3. Implementation of sampling plan

>>

As data and parameters monitored described in section D.2 above are not determined by a sampling approach, Implementation of sampling plan is not applicable.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>>

The baseline quantity B_HFC 23 is the quantity of the HFC23 waste stream required to be destroyed by the applicable regulations. If the fraction of the waste stream required to be destroyed by the applicable regulations during the period y is r_y, and Q_HFC23_y is the total amount of HFC23 waste destroyed, then the quantity required to be destroyed by the applicable regulations is:

$$B\_HFC23_y = Q\_HFC23_y * r_y.$$

In the absence of regulations requiring the destruction of HFC23 waste in India, $r_y = 0$.

$$B\_HFC23_y = 24.521 * 0$$

$$= 0$$

Parameter	Value	Data Unit	Reference
Q_HFC23_y	24.521	MT	Section D.2
r_y	0		Regulation
B_HFC23_y	0.000	MT	Calculated

<u>Calculation of (Q_HFC23y(Eligible) - B_HFC23_y) * GWP_HFC23</u>

(23.550 – 0.000) * 11,700 = 275,535 tCO_2e

Parameter	Value	Data Unit	Reference
Q_HFC23_y (Eligible)	23.550	MT	Appendix - 1
B_HFC23_y	0.000	MT	Calculated above
GWP_HFC23	11,700	tCO_2e/MT	IPCC Guidelines/PDD
(Q_HFC23_y - B_HFC23_y) * GWP_HFC23	275,535	tCO_2e	Calculated

E.2. Calculation of project emissions or actual net GHG removals by sinks

>>

<u>Calculation of E_DP_y</u>

The emissions due to the destruction process (E_DP_y) are the emissions of HFC 23 not destroyed, emissions due to any fuel use, and the greenhouse gas emissions of the destruction process. Thus:

$$E\_DP_y = ND\_HFC23_y * GWP\_HFC23 + Q\_NG_y * E\_NG_y + Q\_HFC23_y * EF$$

Where

ND_HFC23_y = quantity of HFC23 not destroyed during the period y. The quantity of HFC23 not destroyed (ND_HFC23_y) is typically small. The monitoring plan provides for the periodic on site measurement of ND_HFC23_y, such that

$$ND\_HFC23_y = Vent\_Flow_y * P\_vent_y.$$

$$= 411{,}542 * 0.0$$

$$= 0 \text{ mg or } 0 \text{ MT}$$

Parameter	Value	Data Unit	Reference
$Vent\_flow_y$	411,542	m^3	Section D.2
P_vent_y	0	mg/m^3	Section D.2
ND_HFC23_y	0	MT	Calculated

Q_NG_y = the quantity of natural gas used by the destruction process measured in m^3.

E_NG_y (tCO2/m3) = the emissions coefficient for Natural gas combustion is based on the net calorific value of the actual fuel used at site, as given by the fuel supplier.

The thermal destruction process converts the carbon in the HFC23 into CO_2, which is released to the atmosphere. The quantity of CO_2 produced by the destruction process is the product of the quantity of waste HFC23 (Q_HFC23_y) destroyed and the emission factor (EF). The emission factor is from AM0001 (Version 4) i.e. 0.62857 tCO2e/MT HFC23

Therefore,

$$E\_DP_y = ND\_HFC23_y * GWP\_HFC23 + Q\_NG_y * E\_NG_y + Q\_HFC23_y * EF$$

$$= 0 * 11{,}700 + 17{,}128 * 0.001949 + 24.521 * 0.62857$$

$$= 0 + 33.38 + 15.41$$

$$= 49 \text{ tCO}_2\text{e}$$

Parameter	Value	Data Unit	Reference
ND_HFC23_y	0	MT	Calculated above
GWP_HFC23	11,700	tCO_2e/MT	PDD
Q_NG_y	17,128	m3	Section D.2
E_NG_y	0.001949	tCO2/m3	Section D.2
Q_HFC23_y	24.521	MT	Section D.2
EF	0.62857	tCO_2e/MT	Section D.1
E_DP_y	49	tCO_2e	Calculated (rounded up)

E.3. Calculation of leakage

>>

Calculation of L_y

Leakage is emissions of greenhouse gases due to the project activity that occur outside the project boundary. The sources of leakage due to the destruction process are:

- Greenhouse gas emissions associated with the production of purchased energy and/or electricity)
- CO_2 emissions due to transport of sludge to the landfill and dilute HF for sale

Ly = Σi (Q_Fi,y * E_Fi,$_y$) + ET$_y$ + L_lime,$_y$ + L_caustic,$_y$ + L_alum$_y$ + L_refrgerant,$_y$

Where

Q_Fi,$_y$ is the quantity of energy type Fi purchased for the destruction process during period y

E_Fi,$_y$ is the greenhouse gas emissions factor for energy type Fi during period y,

ET$_y$ the greenhouse gas emissions associated with transport during period y.

ET$_y$ = Q_DHF,$_y$ * F_fuel transport,$_y$ * E_F fuel transport,$_y$ + Q_alum,$_y$ * F_fuel transport,$_y$ * E_F fuel transport,$_y$ + Q_Lime,$_y$ * F_fuel transport,$_y$ * E_F fuel transport,$_y$ + Q_NaOH,$_y$ * F_fuel transport,$_y$ * E_F fuel transport,$_y$ + Q_sludge,$_y$ * F_fuel transport,$_y$ * E_Ffuel transport,$_y$ + Q_refrigerant used ,$_y$ * F_fueltransport,$_y$ * E_F fuel transport,$_y$

Leakage due to emissions from production of lime (CaO), alum (used in the neutralizing process), NaOH, and production and use of refrigerant are taken into account.

L_Lime,$_y$	**= Q_lime,$_y$ * E_FLime,$_y$**
L_caustic,$_y$	**= Q_NaOH,$_y$ * E_FNaOH,$_y$**
L_refrigerant,$_y$	**= Q_refrigerant used,$_y$*E_Frefrigerant used,$_y$**
L_alum,$_y$	**= Q_alum,$_y$ * E_Falum,$_y$**

For this project

Q_Fsteam,$_y$	Quantity of steam consumed for the destruction process during period y
Q_Fpower,$_y$	Quantity of power consumed for the destruction process during period y
E_Fsteam,$_y$	GHG emission factor for steam during period y.
E_Fpower,$_y$	GHG emission factor for electricity during period y.
Q_Lime,$_y$	Quantity of CaO used in the Effluent Treatment Plant for neutralisation of effluent from the thermal oxidation system in period y.
Q_NaOH,$_y$	Quantity of NaOH used in the scrubbing system in period y.
Q_sludge,$_y$	Quantity of solid waste (sludge), generated through the destruction of HFC 23, shipped offsite for disposal in period y.
Q_refrigerant used,$_y$	Quantity of refrigerant added in period y
Q_alum,$_y$	Quantity of alum used in the neutralisation system in period y.
Q_DHF,$_y$	Quantity of Dilute Hydrofluoric acid produced in period y.
E_FNaOH,$_y$	GHG emission factor for the production of 1 MT of NaOH (100%) in period y.
E_FLime,$_y$	CO_2e emissions for the production of 1 MT of CaO
E_Falum,$_y$	CO_2e emissions for the production of 1 MT of alum
E_Frefrigerant used,$_y$	CO_2e emitted per MT refrigerant used
F_fuel transport,$_y$	MT of transport fuel used for the round trip distance for each utility or waste
E_Ffuel transport,$_y$	CO_2e emissions per MT of transport fuel,

Thus,

L_y = (82,070 * 0.555 /1000) (Power)
+ (20,215* 0) (Steam)
+ (17.549 * 0.016 * 3.1) (HF Transport)
+ (0.022 * 0.016 * 3.1) (Alum Transport)
+ (5.550 * 0.06 * 3.1) (Lime Transport)
+ (0.498 * 0.006 * 3.1) (NaOH Transport)
+ (13.876 * 0.0008 * 3.1) (Waste Sludge Transport)
+ (0.061 * 0 * 3.1) (Refrigerant Transport)
+ (5.550 * 0.710) (Lime Manufacturing)
+ (0.498 * 1.599) (NaOH Manufacturing)
+ (0.061 * 2,134) (Refrigerant Manufacturing)
+ (0.022 * 2) (Alum Manufacturing)

= 45.549 + 0.000 + 0.870 + 0.0011 + 1.032 + 0.009 + 0.034 + 0.000 + 3.941 + 0.797 + 130.174 + 0.043
= 183 tCO_2e

Parameter	Value	Data Unit	Reference
Q_FPower_y	82,070	KWh	Section D.2
Q_FSteam_y	20,215	Kg	Section D.2
Q_DHF_y	17.549	MT as 100 % HF	Section D.2
$F\_fuel\ transport,_y$	0.016	MT of diesel/MT of DHF	Section D.2
Q_Alum_y	0.022	MT	Section D.2
$F\_fuel\ transport,_y$	0.016	MT of diesel/MT of alum	Section D.2
Q_Lime_y	5.550	MT as Lime	Section D.2
$F\_fuel\ transport,_y$	0.06	MT of diesel/MT of Lime	Section D.2
$Q\__{NaOHy}$	0.498	MT as 100 % NaOH	Section D.2
$F\_fuel\ transport,_y$	0.006	MT of diesel/MT of Caustic	Section D.2
Q_Sludge_y	13.876	MT	Section D.2
$F\_fuel\ transport,_y$	0.0008	MT of diesel/MT of sludge	Section D.2
$Q\_refrigerant_y$	0.061	MT as Refrigerant	Section D.2
$F\_fuel\ transport,_y$	0	MT of diesel/MT of Refrigerant	Section D.2
E_F fuel	3.1	tCO_2e/MT diesel	Section D.1
E_Fpower_y	0.555	kg CO_2e/ kWh	Section D.2
E_Fsteam_y	0	tCO_2e/kg	Section D.2
$E\_F\ Lime_y$	0.710	tCO_2e/MT of Lime	Section D.1
$E\_F_{\ NaOHy}$	1.599	tCO_2e/MT of 100 % NaOH	Section D.1
$E\_F\ refrigerant,_y$	2,134	tCO_2e/MT of refrigerant	Section D.1
$E\_F\ Alum,_y$	2	tCO2/MT of alum	Section D.1
L_y	183	tCO_2e	Calculated (rounded up)

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_{2e})	Leakage (tCO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO_2e)
1st October2012 to 31st October 2012	275,535	49	183	275,303

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO_2e)	233,512	275,303

E.6. Remarks on difference from estimated value in registered PDD

>>

The total emission reduction claimed up to end of this monitoring period for the Sixth crediting year of project activity is within the set cap value estimated in PDD. The actual values reached during the monitoring period is higher by 41,719 tCO_{2e} than values applied in ex-ante calculation of 1 month in the registered PDD mainly due to higher HCFC 22 production rate during the monitoring period then the estimated monthly average production as per registered PDD.

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History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Form **Business Function**: Issuance		

Appendix 1

Check against Baseline requirements

Q_HCFC22 (the maximum eligible HCFC 22 production)

To exclude the possibility of manipulating the production process to increase the quantity of waste produced, the Approved Methodology requires that the maximum eligible HCFC production is limited to the maximum historical annual production of HCFC22 at NFIL during the years 2000 – 2004. The maximum historical production for NFIL is 7,992 metric tonnes per year, as per the approved PDD.

The HCFC 22 production rate during the Sixth year is currently equal to 4,671 MT, which is below cut-off rate defined in the Project Design Document and so all 785 MT of HCFC 22 produced in the current monitoring period is allowable within the project.

W (maximum eligible HFC 23 Waste Generation Rate)

To exclude the possibility of manipulating the production process to increase the quantity of waste produced, the Approved Methodology requires the HCFC22 produced to be compared with the sum of the HFC23 recovered for sale, the HFC 23 stored and HFC23 destroyed. The quantity of HFC23 that is eligible under the methodology is limited to a fraction of the actual HCFC22 production during the period at the originating plant (Q_HCFC22_y). This cut-off ratio limits the ratio of HFC23 generated to HCFC22 (W) allowed for the purpose of determining the destruction of HFC23 and is 3 % as per the approved PDD.

i) No cylinders of HFC23 were sold or filled during the Monitoring Period
ii) The change in amount of HFC 23 stored was 0.272 MT
iii) The total amount of HFC 23 destroyed was 24.521 MT

Total HFC 23 generated is therefore (0 + 0.272 + 24.521) = 24.793 MT

HFC 23 to HCFC 22 ratio is (24.793 / 785) = 3.16 %

This is above the maximum value of 3 % so the eligible HFC generation rate will be set at 3 %

Paragraph 90 of EB 35.

HCFC 22 production during the Sixth year of the project is currently 4,671 MT, which is below the 7,992 MT annual maximum limit so all 785 MT of HCFC 22 production during current monitoring period is eligible.

The HFC23 to HCFC 22 generation rate during the Sixth year of the project is currently 3.21 %, which is above the 3.0 % cut-off rate defined in the registered Project Design Document; therefore the HFC 23 to HCFC 22 generation rate used to generate CERs has been set at 3.0 % for the monitoring period.

Calculation of Maximum amount of HFC-23 eligible for crediting in a year

As per procedure prescribed in EB 39 report, annexure 8, The maximum amount of HFC-23 that is eligible for crediting in a year is calculated applying following formula.

$Q_{HFC23,e,y} = Q_{HFC23,co,y} + MIN\ (Q_{HFC23,g,y}\ ,\ (Q_{HCFC22y}\ x\ w\ )\ ,\ (Q_{HCFC22eHIST}\ x\ w\ )\ ,\ (Q_{HCFC22eHIST}\ x\ Q_{HFC23,g,y}\ /\ Q_{HCFC22,y}\ )\ )$

The maximum amount of HFC-23 that is eligible for crediting in Sixth year up to 31st October 2012 (end of current monitoring period) is,

$Q_{HFC23,e,y}$ = 0 + MIN(150.115 , (4671 x 0.03), (7992 x 0.03), (7992 x 150.115/4671))
= 0 + MIN (150.115, 140.130, 239.760, 256.844)
= 140.130

Parameter	Value	Data Unit	Reference
$Q_{HFC23,e,y}$	140.130	MT	Calculated above
$\sum Q_{HFC23\ d,n,y}$	151.745	MT	Appendix – 5
$Q_{HFC23,co,y}$	0.000	MT	Appendix – 5
$Q_{HFC23,g,y}$	150.115	MT	Appendix – 5
Q_HCFC_{eHIST}	7,992	MT/MT	Section D.1
QHCFC22y	4,671	MT	Section D.2
W	0.03	MT/MT	Section D.1

Accounting of eligible HFC 23

As per procedure prescribed in EB 39 report, Annexure 8 in order to ensure that the overall CERs issued in a year are consistent with the provisions of the methodology and to minimize the risk of excessive issuance.

$Q_{HFC23,cr,i,y} = MIN(MIN(QHCFC22_{HIST}\ ;\ \sum Q_{HCFC22,n,y})\ x\ MIN\ (\ w\ ,\ \sum Q_{HFC23,g,n,y}\ /\ \ \sum Q_{HCFC22,n,y}) + Q_{HFC23\ ,\ co,,i,y}\ ;\ \sum Q_{HFC23\ d,n,y}\ ) - \sum Q_{\ HFC23\ ,\ cr,\ m,y}$

The quantity of HFC23 destruction credited in this Monitoring period of Sixth year is described below by applying above formula,

$Q_{HFC23,cr,\ i,y}$ =

MIN (MIN (7992, 4,671) x MIN (0.03, 150,115/4671) + 0.000 , 151,745) – 116.580
= MIN (4671 x 0.03 + 0, 151,745) – 116.580
= MIN (140.130, 151.745) – 116.580
= 140.130 – 116.580
= 23.550

Parameter	Value	Data Unit	Reference
$Q_{HFC23,cr,i,y}$	23.550	MT	Calculated above
$QHCFC22_{HIST}$	7,992	MT	PDD
$\sum Q_{HCFC22,n,y}$	4,671	MT	Section D.2
W	0.03	MT/MT	Section D.1
$\sum Q_{HFC23,g,n,y}$	150.115	MT	Appendix 5

Parameter	Value	Data Unit	Reference
$Q_{HFC23\ ,\ co,,i,y}$	0.000	MT	Appendix 5
$\sum Q_{HFC23\ d,n,y}$	151.745	MT	Appendix 5
$\sum Q_{\ HFC23\ ,\ cr,\ m,y}$	116.580	MT	Appendix 5

Appendix 2

Calibration details for the monitoring period:

1) HFC 23 Flow meters:

In accordance with the approved methodology AM0001 Version 04 and the Registered PDD for Project 0838, the HFC 23 flow meters are maintained during the monitoring period. As per NFIL Quality procedure every six monthly a new calibrated meters are being installed for HFC 23 flow measurement. These meters are also subject to weekly zero check as per monitoring methodology AM0001, version 004.

i) HFC 23 flow meter 1: 6 FT 107

The flow meter with serial number 3203579 has worked from 01/10/2012 to 31/10/2012. The meter was calibrated on 24/04/2012 before installation on 30/05/2012. During the monitoring period weekly zero check was carried out on 02/10/2012, 09/10/2012, 16/10/2012, 23/10/2012 and 30/10/2012.

ii) HFC 23 flow meter 1: 6 FT 165

The flow meter with serial number 3204387 has worked from 01/10/2012 to 31/10/2012. The meter was calibrated on 24/04/2012 before installation on 30/05/2012. During the monitoring period weekly zero check was carried out on 02/10/2012, 09/10/2012, 16/10/2012, 23/10/2012 and 30/10/2012.

2) Natural gas flow meter (Tag – 6FT 105):

Natural gas flow meter serial number E8048D20000 is used for monitoring period. During the monitoring period the meter was calibrated on 16/09/2012 (Previous monitoring period), 16/10/2012.

3) Steam Flow meter (Tag – 6FT 110):

Flow meter I080265 is used for monitoring period. During the monitoring period the meter was calibrated on 16/09/2012 (Previous monitoring period), 16/10/2012.

4) Stack (Vent) gas Meter (Tag - 6FT 121):

Flow meter 01614636 is used for monitoring period. During the monitoring period the meter was calibrated on 16/09/2012 (Previous monitoring period), 16/10/2012.

5) Electric Meter:

Energy meter (10/01/1165) has worked during the monitoring period. This meter is calibrated on 26/09/2012 (Previous monitoring period), 26/10/2012.

6) Gas Chromatograph:

Gas chromatograph SHIMADZU – 2014 (C 11484403676SA) has worked during the monitoring period. Calibration dates are 15/09/2012(Previous monitoring period), 15/10/2012.

7) HFC 23 storage tank V417 A:

Weight measurement load shells (WI 1571) are installed at the storage tank. The load shells are calibrated on 24/09/2012 (previous monitoring period), 24/10/2012.

8) HFC 23 storage tank V417 B:

Weight measurement load shells (WI 1572) are installed at the storage tank. The load shells are calibrated on 25/09/2012 (previous monitoring period), 25/10/2012.

9) HFC 23 storage tank V417 C:

Weight measurement load shells (WI 1573) are installed at the storage tank. The load shells are calibrated on 25/09/2012 (previous monitoring period), 25/10/2012.

10) HFC 23 storage tank V417 D:

Weight measurement load shells (WI 1574) are installed at the storage tank. The load shells are calibrated on 24/09/2012 (previous monitoring period), 24/10/2012.

11) Weigh bridge:

Weigh bridge instrument at the plant (WI 301) was calibrated on 20/09/2012 (previous monitoring period), 20/10/2012.

12) HCFC 22 storage tank. (F-1, F-2, F-19, F-20)

The level instruments installed on storage tanks were calibrated on 26/09/2012 (previous monitoring period), 26/10/2012.

13) DHF storage tank (T-101A & T-101B)

The level instrument installed on Dilute HF storage tanks were calibrated on 26/09/2012 (previous monitoring period), 26/10/2012.

14) Caustic storage tank (T-109).

The Level instrument installed on storage tank was calibrated on 26/09/2012 (previous monitoring period), 26/10/2012.

Appendix 3

Basis for the Emission Factors applicable for the period 1st October 2012 to 31st October 2012

Natural Gas Emission Factor

Natural gas is supplied to the site by pipeline.

E_NG_y = the emissions coefficient for natural gas (or other fossil fuel) combustion measured in tonnes CO_2 per m3 of natural gas (or other fuel) ($tCO_2e/m3$)

The composition of natural gas (molecular ratio) in Gujarat provided by the gas supplier may vary over time. The current composition is used to calculate the actual **E_NG_y**, and is expected to be essentially constant throughout the lifetime of the project, but will be checked periodically to confirm the composition.

During the current monitoring period, the natural gas compositions based on supplier data are given below.

tCO_2/tNG Gujarat		Mol wt	No of C	% C
CH_4	97.818	16	1	73.36
C_2H_6	1.006	30	2	0.80
C_3H_8	0.261	44	3	0.21
C_4H_{10}	0.168	58	4	0.14
C_5H_{12}	0.024	84	5	0.02
C_6H_{14}	0.024	98	6	0.02
N_2	0.167	28	0	0.00
CO_2	0.226	44	1	0.06
NG	100			74.39
tCO_2/tNG				2.728
tCO_2/m^3NG				0.001949

The conversion factor for Natural Gas is 1,400 m^3 per tonne

Hence, emission factor of natural gas for the monitoring period is **E_NG_y = 0.001949 tCO_2e/m^3 of Natural Gas for the local gas supply.**

If a different fuel, such as liquid petroleum gas (LPG), is used for the incineration process, the variable **E_NG_y** will be replaced with the appropriate variable for the emissions coefficient for that fuel.

Electricity and steam generation efficiencies & emission factors

During the monitoring period

i) 82,070 KWHr of electricity was procured from the captive gas based power plant for the CDM Plant
ii) 0 KWHr of electricity was procured from Gujarat Electricity Board (GEB) for the CDM plant

The CO_2 intensity of power from the captive power plant is calculated based on the performance of the gas based captive power plant from where power is drawn for operating the facility. Even though the steam is assumed to be purchased, the CO_2 intensity of steam is estimated as zero, as steam is generated in the process without any incremental energy consumption as it is steam from waste heat recovery (i.e., H_2SO_4 plant and heat recovery steam generation from the gas turbines in the captive power plant).

For the current monitoring period, the power plant produced 1,809,034 kWh using 514,449 Nm^3 of Natural gas or 0.2844 Nm^3 of Natural Gas per kWh, it is assumed in this calculation that 100 % of the natural gas on the captive power plant is used in the production of electricity and the steam produced in the waste heat boiler receives accounts for 0 % of the natural gas used on the captive power plant.

Using the natural Gas Emission factor for the monitoring period (0.001949 tCO_2e/m^3 of Natural Gas for the local gas supply) this corresponds to 0.555 tCO_2e/MWh or 0.000555 tCO_2e/KWh or 0.555 kg CO_2e/KWh. The Gas emission factor is calculated for each monitoring period by using the values from test report for the supplied gas.

i.e 0.2844 Nm^3/ kWh X 0.001949 tCO_2e/m^3 = 0.000555 tCO_2e/KWh

Electricity Emission Factor based on October 2012 is **$E\_Fpower_{,y}$ = 0.555 tCO_2e/MWh**

The CO_2 intensity of steam is estimated as zero, as steam is generated in the process without any incremental energy consumption, as it is steam from waste heat recovery (i.e., H_2SO_4 plant and heat recovery steam generation from the gas turbines in the thermal power plant). The steam generation from waste heat recovery will be monitored throughout the project lifetime to take into account changes, if any, in the source and in any incremental natural gas consumption in the production of steam.

Steam Emission Factor for the monitoring period is **$E\_Fsteam_{,y}$ = 0 tCO_2e/MT of steam**

Appendix 4

ETP usage and production rates :

HF is produced when CHF_3 (HFC 23) is incinerated

$2CHF_3 + 2CH_4 + 5O_2 \Rightarrow 4\ CO_2 + 6\ HF + 2H_2O$

Therefore 70 kg of CHF_3 produces 60 kg of HF

Lime is used to neutralise the DHF by the following equation

$CaO + 2\ HF \Rightarrow CaF_2 + 2H_2O$

Therefore 84 kg of CaO is required to neutralise 60 kg of HF and produces 117 kg of CaF_2.

Or

1 MT of 100 % HF requires 1.4 MT of CaO and produces ~ 2 MT of CaF_2

Lime is only 90 % CaO, therefore 1 MT of 100 % HF requires 1.6 MT of Lime.

ETP sludge contains about 50 % water so 1 MT of 100 % HF produces 4 MT of sludge

Alum is used to help precipitation in the ETP and the ratio of Alum to Lime at the ETP is 0.00388 for the Twenty third monitoring period so for every MT of lime used 0.00388 MT of alum will also be consumed.

Therefore 1 MT of 100 % HF requires 1.6 MT of lime, 0.00621 MT of alum and produces 4 MT of sludge.

Appendix 5

HFC 23 Storage Material Balance

The HFC 23 generated during the period as well as the material balance is given in the following table:

Monitoring period	HFC 23 generated this period	HFC 23 Generation in Excess of Cap	Total eligible HFC 23 destroyed in this period		Cumulative HFC 23 Destroyed (eligible)	HFC 23 destroyed (ineligible)	Change in HFC 23 stored during this period	Change in Eligible HFC 23 stored during this period	Change in Ineligible HFC 23 stored during this period	Cumulative HFC 23 storage – Closing stock this monitoring period	
			From HCFC 22 plant	From Storage						Eligible	In eligible
	MT	MT	MT		MT	MT	MT	MT	MT	MT	MT
Year 1, (1st May 2007 to 30th April 2008)											
1st May 2007 – 15th August 2007	89.33	7.4	0	37.177	37.177	0.000	52.153	44.753	7.4	44.753	7.4
16th August 2007 to 15th October 2007	50.109	6.354	50.109	16.611	103.897	0.000	-16.611	-22.965	6.354	21.788	13.754
16th October 2007 to 31st December 2007	57.567	5.502	52.065	15.973	171.935	0.000	-10.471	-15.973	5.502	5.815	19.256
1st January 2008 to 29th February 2008	33.216	1.580	31.635	0.666	204.236	0.000	0.914	-0.666	1.580	5.149	20.836
1st March 2008 to 30th April 2008	33.469	3.094	30.375	5.149	239.76	12.258	-14.313	-5.149	-9.164	0.000	11.672
Year 2 ,(1st May 2008 to 30th April 2009)											
1st May 2008 to 30th June 2008	48.312	1.452	38.252	0.000	38.252	0.000	10.060	8.608	1.452	8.608	13.124
1st July 2008 to 30th November 2008	103.598	9.578	94.020	8.608	140.880	9.798	-8.828	-8.608	-0.220	0.000	12.904
1st December 2008 to 30th April 2009	115.949	17.069	98.880	0.000	239.760	18.353	-1.284	0.000	-1.284	0.000	11.620
Year 3 ,(1st May 2009 to 30th April 2010)											
1st May 2009 to 31st July 2009	76.074	7.104	43.153	0.000	43.153	0.000	32.921	25.817	7.104	25.817	18.724

Monitoring period	HFC 23 generated this period	HFC 23 Generation in Excess of Cap	Total eligible HFC 23 destroyed in this period		Cumulative HFC 23 Destroyed (eligible)	HFC 23 destroyed (ineligible)	Change in HFC 23 stored during this period	Change in Eligible HFC 23 stored during this period	Change in Ineligible HFC 23 stored during this period	Cumulative HFC 23 storage – Closing stock this monitoring period	
			From HCFC 22 plant	From Storage						Eligible	In eligible
	MT	MT	MT		MT	MT	MT	MT	MT	MT	MT
1st August 2009 to 30th November 2009	94.852	5.542	89.310	25.817	158.280	12.881	-33.156	-25.817	-7.339	0.000	11.385
1st December 2009 to 30th April 2010	118.234	36.754	81.48	0.000	239.760	35.181	1.573	0.000	1.573	0.000	12.958
Year 4 ,(1st May 2010 to 30th April 2011)											
1st May 2010 to 30th November 2010	163.569	8.739	154.830	0.000	154.830	6.685	2.054	0.000	2.054	0.000	15.012
1st December 2010 to 31st January2011	51.972	2.022	49.950	0.000	204.780	0.378	1.644	0.000	1.644	0.000	16.656
1st February 2011 to 30th April 2011	76.627	41.647	34.980	0.000	239.760	42.051	-0.404	0.000	-0.404	0.000	16.251
Year 5 ,(1st May 2011 to 30th April 2012)											
1st May 2011 to 31st August 2011	114.803	13.613	101.190	0.000	101.190	13.522	0.091	0.000	0.091	0.000	16.342
1stSeptember 2011 to 31st October 2011	40.048	6.803	33.24	0.000	134.430	10.267	-3.459	0.000	-3.459	0.000	12.883
1stNovember 2011 to 31st January 2012	49.419	2.169	47.250	0.000	181.680	2.649	-0.480	0.000	-0.480	0.000	12.403
1st February 2012 to 29th February 2012	23.140	0.610	22.530	0.000	204.210	0.844	-0.234	0.000	-0.234	0.000	12.169
1st March 2012 to 30th April 2012	44.936	9.386	35.550	0.000	239.760	11.129	-1.743	0.000	-1.743	0.000	10.426
Year 6 ,(1st May 2012 to 30th April 2013)											
1st May 2012 to 30th June 2012	54.428	3.338	51.090	0.000	51.090	3.674	-0.336	0.000	-0.336	0.000	10.090
1st July 2012 to 31st August 2012	54.451	3.571	50.880	0.000	101.970	3.065	0.506	0.000	0.506	0.000	10.595
1stSeptember 2012 to 30th September 2012	16.443	1.833	14.610	0.000	116.580	3.905	-2.072	0.000	-2.702	0.000	8.523

Monitoring period	HFC 23 generated this period	HFC 23 Generation in Excess of Cap	Total eligible HFC 23 destroyed in this period		Cumulative HFC 23 Destroyed (eligible)	HFC 23 destroyed (ineligible)	Change in HFC 23 stored during this period	Change in Eligible HFC 23 stored during this period	Change in Ineligible HFC 23 stored during this period	Cumulative HFC 23 storage – Closing stock this monitoring period	
			From HCFC 22 plant	From Storage						Eligible	In eligible
1st October 2012 to 31st October 2012	24.793	1.243	23.550	0.000	140.130	0.971	0.272	0.000	0.272	0.000	8.795

All numbers are as pure HFC 23.

$\sum Q_{HFC23\ d,n,y}$ is sum of the total eligible and total ineligible HFC 23 destroyed in monitoring year y. For the sixth monitoring year this equals 151.745 MT. (140.130 MT eligible and 11.615 MT ineligible HFC 23 destructed)

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