

# Stanwell Power Station

## High Volume Sampling and Analysis for mercury and metals

Oct 2011



|                         |                                                          |
|-------------------------|----------------------------------------------------------|
| <b>Prepared for</b>     | Stanwell Power Station                                   |
| <b>Attention</b>        | Lauren Keliher                                           |
| <b>Client Reference</b> | 541060                                                   |
| <b>Report No.</b>       | R11/100-S1 (This report supersedes Report No. R11/100-S) |
| <b>Date tested</b>      | 12 <sup>th</sup> - 29 <sup>th</sup> Oct 2011             |
| <b>Date reported</b>    | 7 <sup>th</sup> December 2011                            |
| <b>Authorisation</b>    | Paul Chant                                               |



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Accreditation No: 16816

# High Volume Sampling Report

## Stanwell Power Station

|                    |                                              |                     |                               |
|--------------------|----------------------------------------------|---------------------|-------------------------------|
| <b>To:</b>         | Lauren Keliher                               |                     |                               |
| <b>From:</b>       | Mohammad Roohi                               | <b>Report date:</b> | 7 <sup>th</sup> December 2011 |
| <b>Test dates:</b> | 12 <sup>th</sup> - 29 <sup>th</sup> Oct 2011 | <b>Alstom job:</b>  | 541060                        |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                               |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|
| <b>From:</b>             | Alstom, 7 Terrace Place, Murarrie Qld 4172                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                         |                               |
| <b>Telephone</b>         | 07-3902 9900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>File Ref:</b>        | Ambient Air Monitoring        |
| <b>Facsimile:</b>        | 07-3902 9999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Date of issue:</b>   | 7 <sup>th</sup> December 2011 |
| <b>Email:</b>            | <a href="mailto:Paul.chant@alstom.com">Paul.chant@alstom.com</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Project manager:</b> | Paul Chant                    |
| <b>Method reference:</b> | <p>AS 3580.1.1 2007: Ambient air sampling and analysis, Guide for siting air monitoring equipment</p> <p>AS 3580.9.3 2003: Ambient air particulate matter, determination of total suspended particulate matter (TSP) – High volume sampler gravimetric method.</p> <p>USEPA 3005: Acid digestion of Dissolved metals for analysis by FLAA or ICP spectroscopy</p> <p>USEPA 6020A: Metals Analysis, Inductively Coupled Plasma-Mass Spectrometry</p> <p>NIOSH 7301/7303: Metals Analysis, Inductively Coupled Argon Plasma, Atomic Emission Spectroscopy (ICP-AES)</p> <p>OSHA ID-140: Mercury sampling and analysis in ambient air</p> |                         |                               |

**Comment:**

Three monitoring sites (State farm, Woodlands and Grape Farm) were selected to perform the sampling and analysis for total suspended particulates and metals (including mercury) levels using method - AS 3580.9.3 2003. Refer to the map in Appendix C showing the High Volume sampling site locations.

The total suspended particulates concentrations measured during sampling periods listed in Table 1 and the following metal concentrations: arsenic, cadmium, lead, manganese, nickel and vanadium measured during sampling periods listed in table 2 were significantly lower than the Queensland Air Quality Objectives – Reference Part 3 of the Environmental Protection Policy (Air) listed in Appendix B – Table 3.

The highest measured lead concentration of  $0.0080 \mu\text{g}/\text{m}^3$  measured during the sampling period listed in table 2 (filter no. 810) was significantly lower than the National Environmental Protection Measure (NEPM) maximum concentration of  $0.50 \mu\text{g}/\text{m}^3$ .

Calibration of the High Volume sampler was performed in accordance with AS 3580.9.3 2003. Details of the calibration are presented in Appendix A.

M. Roohi

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of an individuals right to privacy

7/12/2011

**Reporting Officer****Approval****Date**

Table 1 - Total Suspended Particulate (TSP) Results

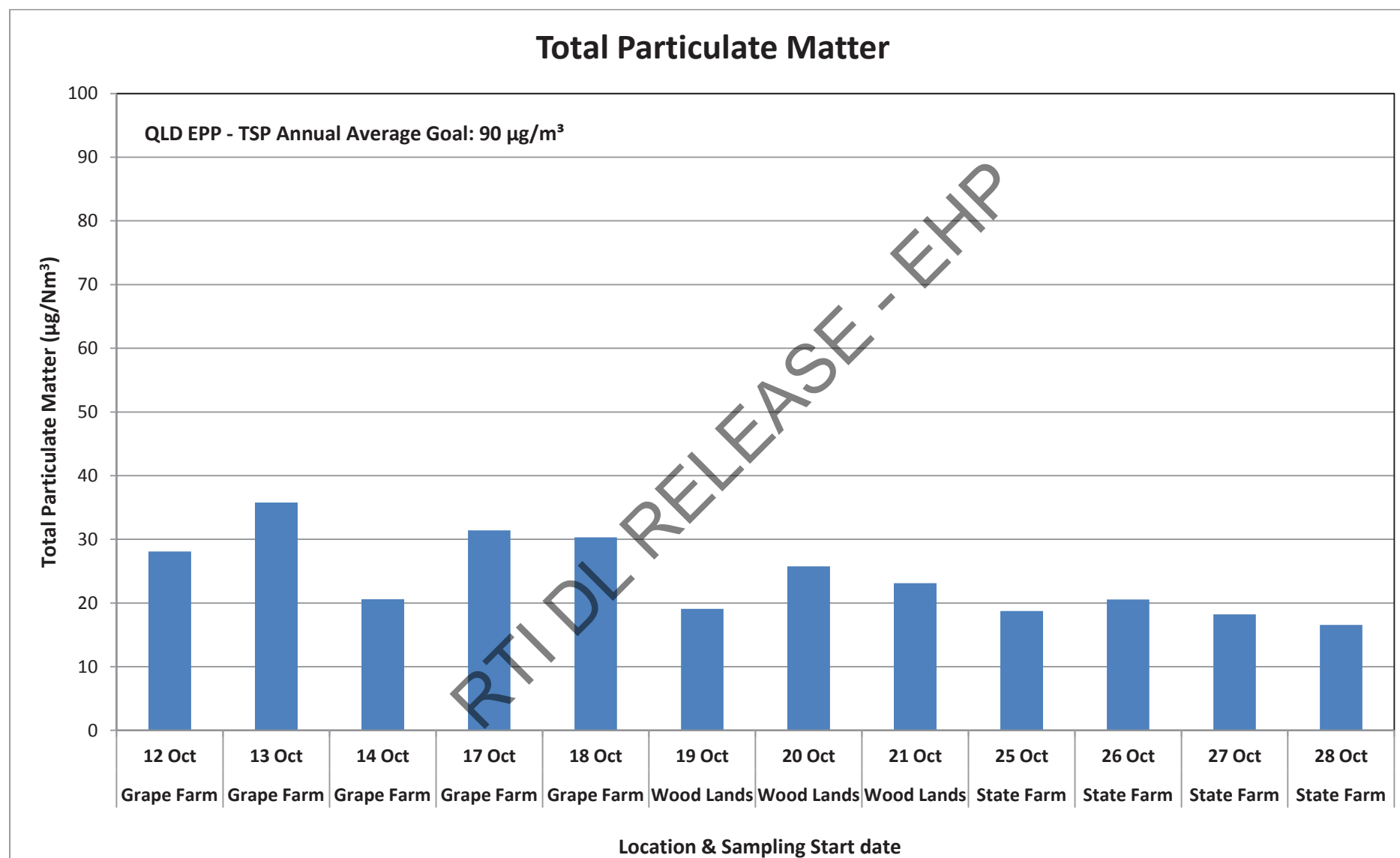
| Location   | Filter No. | Start Date | Run Time | Total Particulate Matter        |
|------------|------------|------------|----------|---------------------------------|
|            |            |            | hrs      | $\mu\text{g}/\text{Nm}^3^{(1)}$ |
| Grape Farm | 000808     | 12/10/11   | 22.43    | 28.1                            |
| Grape Farm | 000812     | 13/10/11   | 10.43    | 35.8                            |
| Grape Farm | 000815     | 14/10/11   | 68.87    | 20.6                            |
| Grape Farm | 000814     | 17/10/11   | 22.98    | 31.4                            |
| Grape Farm | 000813     | 18/10/11   | 22.98    | 30.3                            |
| Wood Lands | 000811     | 19/10/11   | 22.82    | 19.1                            |
| Wood Lands | 000810     | 20/10/11   | 22.98    | 25.8                            |
| Wood Lands | 000816     | 21/10/11   | 91.93    | 23.1                            |
| State Farm | 000821     | 25/10/11   | 22.98    | 18.7                            |
| State Farm | 000817     | 26/10/11   | 24.53    | 20.5                            |
| State Farm | 000818     | 27/10/11   | 21.37    | 18.2                            |
| State Farm | 000819     | 28/10/11   | 25.55    | 16.6                            |

<sup>(1)</sup>: Sample volumes were corrected to STP (0 °C and 1 atm)

Table 2 - Metals and Mercury Analysis Results

| Location   | Start Date | Filter No. | Antimony                        | Arsenic | Barium  | Beryllium | Cadmium | Chromium | Cobalt  | Copper  | Lead    | Manganese | Nickel  | Selenium | Silver  | Thallium | Vanadium | Zinc    | Mercury |
|------------|------------|------------|---------------------------------|---------|---------|-----------|---------|----------|---------|---------|---------|-----------|---------|----------|---------|----------|----------|---------|---------|
|            |            |            | Sb                              | As      | Ba      | Be        | Cd      | Cr       | Co      | Cu      | Pb      | Mn        | Ni      | Se       | Ag      | Tl       | V        | Zn      | Hg      |
|            |            |            | $\mu\text{g}/\text{Nm}^3^{(1)}$ |         |         |           |         |          |         |         |         |           |         |          |         |          |          |         |         |
| Grape Farm | 14 Oct     | 815        | < 0.001                         | < 0.001 | < 0.001 | < 0.001   | < 0.001 | < 0.001  | < 0.001 | < 0.001 | 0.0013  | 0.0055    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | < 0.001  | < 0.001 | < 0.001 |
| Grape Farm | 17 Oct     | 814        | < 0.001                         | < 0.001 | 0.030   | < 0.001   | < 0.001 | < 0.001  | < 0.001 | < 0.001 | < 0.001 | 0.0038    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | 0.0011   | 0.0436  | < 0.001 |
| Grape Farm | 18 Oct     | 813        | < 0.001                         | < 0.001 | 0.163   | < 0.001   | < 0.001 | < 0.001  | < 0.001 | 0.0027  | 0.0024  | 0.0055    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | < 0.001  | 0.1180  | < 0.001 |
| Wood Lands | 19 Oct     | 811        | < 0.001                         | < 0.001 | 1.649   | < 0.001   | < 0.001 | 0.0028   | < 0.001 | < 0.001 | 0.0019  | 0.0045    | 0.0015  | < 0.003  | < 0.001 | < 0.001  | 0.0015   | 1.1798  | < 0.001 |
| Wood Lands | 20 Oct     | 810        | < 0.001                         | < 0.001 | 5.790   | < 0.001   | < 0.001 | 0.0037   | < 0.001 | 0.0035  | 0.0080  | 0.0064    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | 0.0021   | 4.0961  | < 0.001 |
| Wood Lands | 21 Oct     | 816        | < 0.001                         | < 0.001 | < 0.001 | < 0.001   | < 0.001 | 0.0064   | < 0.001 | 0.0033  | 0.0016  | 0.0039    | 0.0042  | < 0.003  | < 0.001 | < 0.001  | 0.0012   | < 0.001 | < 0.001 |
| State Farm | 25 Oct     | 821        | < 0.001                         | < 0.001 | 0.013   | < 0.001   | < 0.001 | < 0.001  | < 0.001 | 0.0051  | 0.0018  | 0.0047    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | < 0.001  | 0.0150  | < 0.001 |
| State Farm | 26 Oct     | 817        | < 0.001                         | < 0.001 | < 0.001 | < 0.001   | < 0.001 | < 0.001  | < 0.001 | 0.0059  | 0.0049  | 0.0062    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | < 0.001  | < 0.001 | < 0.001 |
| State Farm | 28 Oct     | 819        | < 0.001                         | < 0.001 | < 0.001 | < 0.001   | < 0.001 | 0.0018   | < 0.001 | < 0.001 | 0.0017  | 0.0050    | < 0.001 | < 0.003  | < 0.001 | < 0.001  | 0.0012   | < 0.001 | < 0.001 |

<sup>(1)</sup>: Sample volumes were corrected to STP (0 °C and 1 atm)



## Appendix A

## High Volume Sampler Calibration Report

PRE-DEPLOYMENT CHECK. SET TO 70 s m/h\* FOR TSP SAMPLING

| ECOTECH HV3000 HI-VOL CALIBRATIONS <b>ALSTOM</b>                                                                                        |                 |                                              |                                     |                                                         |                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------|-------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------|
| Start Time <u>7:40</u>                                                                                                                  |                 | Site code - location <u>MURADIE WORKSHOP</u> |                                     |                                                         |                                                                 |
| Finish Time <u>9:50</u>                                                                                                                 |                 | Date <u>10/10/2011</u>                       |                                     | Serial Number <u>06-1081</u>                            |                                                                 |
| <b>Two-Monthly Flow Calibration</b> <small>To be done after annual calibrations</small>                                                 |                 |                                              |                                     |                                                         |                                                                 |
|                                                                                                                                         | Hi-Vol Setpoint | Expected reading                             | Manometer Readings                  |                                                         | Standard serial numbers                                         |
|                                                                                                                                         |                 |                                              | Initial                             | Final                                                   |                                                                 |
| Point 1                                                                                                                                 | <u>60</u>       | <u>123</u>                                   | <u>168.3</u>                        | <u>125.4</u>                                            | Orifice plate <u>ECOTECH 311</u>                                |
| Point 2                                                                                                                                 | <u>70</u>       | <u>167</u>                                   | <u>207.9</u>                        | <u>166.9</u>                                            | Manometer <u>921310</u>                                         |
| Point 3                                                                                                                                 | <u>80</u>       | <u>218</u>                                   | <u>267.1</u>                        | <u>219.4</u>                                            | Thermometer <u>01588235/810</u>                                 |
| Barometer <u>1050.01</u>                                                                                                                |                 |                                              |                                     |                                                         |                                                                 |
| To adjust: go to the CALIBRATION menu, wait for motor to stabilise, and then select MOTOR, ADJUST                                       |                 |                                              |                                     |                                                         |                                                                 |
| <b>Six-Monthly Timer Check</b>                                                                                                          |                 |                                              |                                     |                                                         |                                                                 |
|                                                                                                                                         | Start Time      | hh:mm:ss                                     | Finish time                         | Elapsed time (s)                                        | <input checked="" type="checkbox"/> Adjusted time (after test)  |
| Time standard                                                                                                                           | <u>8:45:38</u>  |                                              | <u>9:46:53</u>                      | <u>3675</u>                                             | <input checked="" type="checkbox"/> Passed test                 |
| Hi-Vol                                                                                                                                  | <u>8:42:51</u>  |                                              | <u>9:44:05</u>                      | <u>3674</u>                                             | Allowable difference: < ±0.3%<br>e.g. ±10.8 seconds over 1 hour |
| <b>Annual Calibrations</b>                                                                                                              |                 |                                              |                                     |                                                         |                                                                 |
| <b>Ambient Temperature and Pressure Verification</b>                                                                                    |                 |                                              |                                     |                                                         |                                                                 |
|                                                                                                                                         | Hi-Vol          | Standard                                     | Accepted?                           | Standard serial numbers                                 |                                                                 |
| Temperature                                                                                                                             | <u>19.855</u>   | <u>20.4</u>                                  | <input checked="" type="checkbox"/> | Temp. <u>01588235/810</u>                               |                                                                 |
| Ambient Pressure                                                                                                                        | <u>759.34</u>   | <u>757.8</u>                                 | <input checked="" type="checkbox"/> | Pres. <u>0495 0001</u>                                  |                                                                 |
| <small>To access the "hidden" coefficients menu, press the first "c" in the Ecotech Logo and the Select button at the same time</small> |                 |                                              |                                     |                                                         |                                                                 |
| <b>Temperature Sensor Calibration</b> <small>(perform if Temperature Verification not accepted)</small>                                 |                 |                                              |                                     |                                                         |                                                                 |
| Temp adjustment factor (x) <u>1.02745</u> <small>[Actual temperature] / [Hi-Vol temperature]</small>                                    |                 |                                              |                                     |                                                         |                                                                 |
|                                                                                                                                         | Initial         | Final                                        |                                     |                                                         |                                                                 |
| TEMP COEFF 0                                                                                                                            | <u>0.0081</u>   | DO NOT ADJUST                                |                                     | Do not adjust                                           |                                                                 |
| TEMP COEFF 1                                                                                                                            | <u>0.0185</u>   | <u>0.0180</u>                                |                                     | Set to (TEMP COEFF 1) / x                               |                                                                 |
| TEMP COEFF 2                                                                                                                            | <u>0.0006</u>   | <u>0.0006</u>                                |                                     | Set to (TEMP COEFF 2) / x <sup>2</sup> <u>(1.05565)</u> |                                                                 |
| <b>Pressure Sensor Calibration</b> <small>(perform if Pressure Verification not accepted)</small>                                       |                 |                                              |                                     |                                                         |                                                                 |
| Pres adjustment value (y) <u>-1.54</u> <small>[Actual pressure] - [Hi-Vol pressure]</small>                                             |                 |                                              |                                     |                                                         |                                                                 |
|                                                                                                                                         | Initial         | Final                                        |                                     |                                                         |                                                                 |
| PRES COEFF 0                                                                                                                            | <u>74</u>       | <u>72.46</u>                                 |                                     | Set to (PRES COEFF 0) + y                               |                                                                 |
| PRES COEFF 1                                                                                                                            | <u>168.7</u>    | DO NOT ADJUST                                |                                     | Do not adjust                                           |                                                                 |
| <small>If the Hi-Vol reading is &gt; Standard, PRES COEFF 0 Final is &lt; Initial</small>                                               |                 |                                              |                                     |                                                         |                                                                 |
| CONSULTANT <u>W. MANLEY</u>                                                                                                             |                 | SIGNATURE <u>[Signature]</u>                 |                                     |                                                         |                                                                 |
| Peer reviewed: <u>[Signature]</u>                                                                                                       |                 | Date: <u>11/10/11</u>                        |                                     |                                                         |                                                                 |

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Form 03F92 Issue B 08/09

## Appendix B

Table 3 - Queensland Air Quality Objectives – Reference Part 3 EPP (Air) for TSP, Metals and Mercury

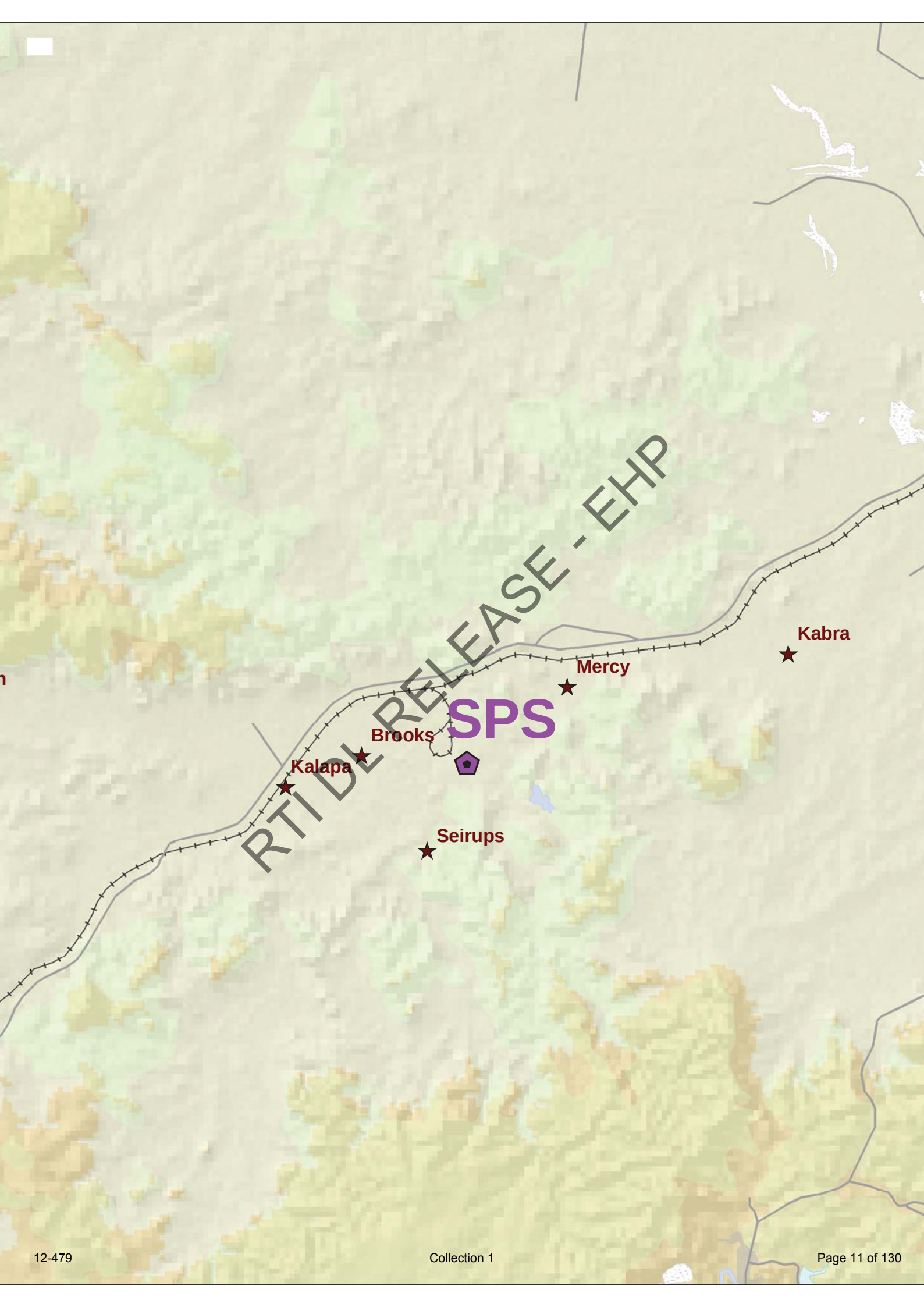
| Indicator                                                                                | Environmental Value | Air Quality Objectives<br>$\mu\text{g}/\text{m}^3$ at 0°C | Period |
|------------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------|--------|
| Total suspended particles                                                                | Health/Wellbeing    | 90                                                        | 1 Year |
| Inorganic mercury vapour                                                                 | Health/Wellbeing    | 1.1                                                       | 1 Year |
| Arsenic and compounds<br>(measured as the total metal content in $\text{PM}_{10}$ )      | Health/Wellbeing    | 0.006                                                     | 1 Year |
| Cadmium and compounds<br>(measured as the total metal content in $\text{PM}_{10}$ )      | Health/Wellbeing    | 0.005                                                     | 1 Year |
| Lead and compounds<br>(measured as the total metal content in total suspended particles) | Health/Wellbeing    | 0.5                                                       | 1 Year |
| Manganese and compounds<br>(measured as the total metal content in $\text{PM}_{10}$ )    | Health/Wellbeing    | 0.16                                                      | 1 Year |
| Nickel and compounds<br>(measured as the total metal content in $\text{PM}_{10}$ )       | Health/Wellbeing    | 0.020                                                     | 1 Year |
| Vanadium and compounds<br>(measured as the total metal content in $\text{PM}_{10}$ )     | Health/Wellbeing    | 1.1                                                       | 1 Year |

Appendix C

Map Exhibiting High Volume Sampler Site Locations

RTI DL RELEASE - EHP

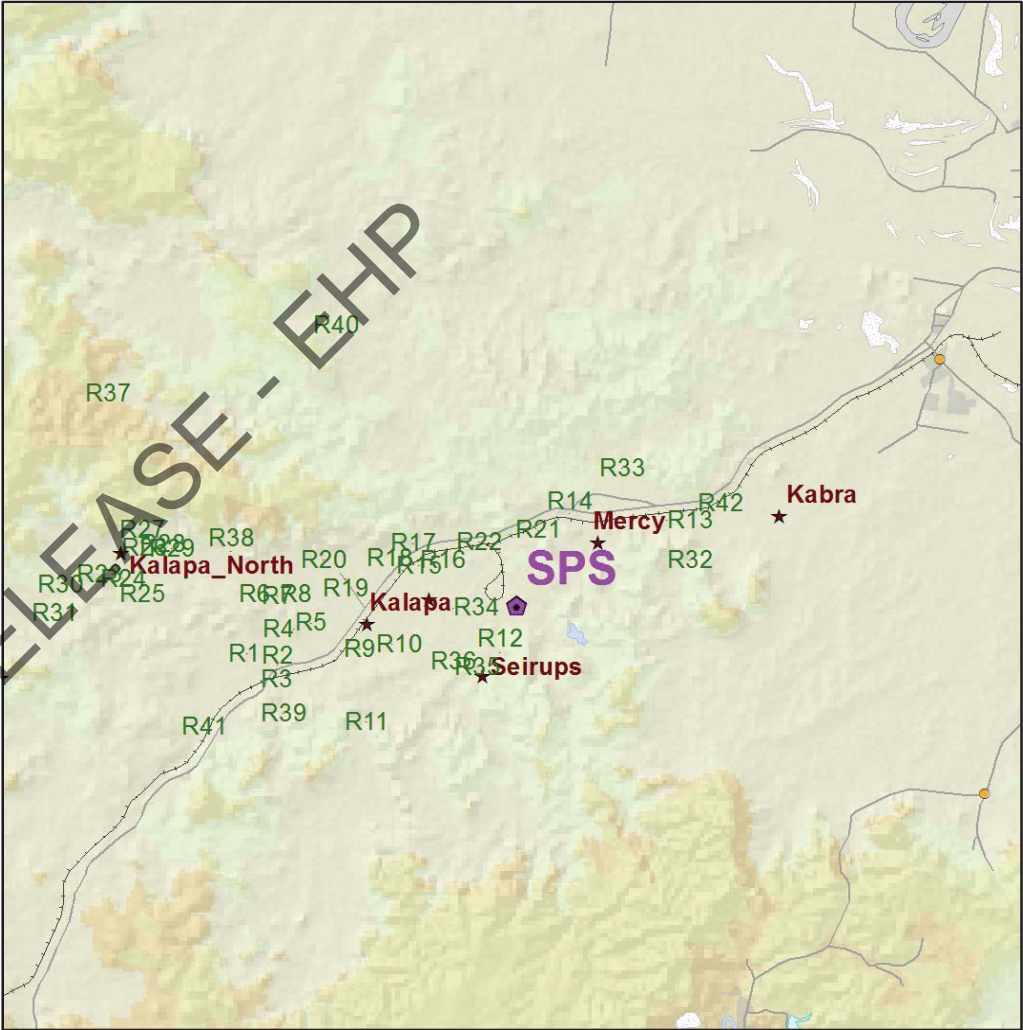




Period

Receptor

| Results (µg/m³)   |     |                                       |  |
|-------------------|-----|---------------------------------------|--|
| NO <sub>2</sub>   |     | Objective                             |  |
| Annual Average    | 33  | Health and biodiversity of ecosystems |  |
|                   | 62  | Health and wellbeing                  |  |
| Maximum one-hour  | 250 | Health and wellbeing                  |  |
| SO <sub>2</sub>   |     |                                       |  |
| Annual Average    | 22  | Health and biodiversity of ecosystems |  |
|                   | 32  | Protecting agriculture                |  |
|                   | 57  | Health and wellbeing                  |  |
| Maximum 24-hour   | 230 | Health and wellbeing                  |  |
| Maximum one-hour  | 570 | Health and wellbeing                  |  |
| PM <sub>10</sub>  |     |                                       |  |
| Maximum 24-hour   | 50  | Health and wellbeing                  |  |
| PM <sub>2.5</sub> |     |                                       |  |
| Annual Average    | 8   | Health and wellbeing                  |  |
| Maximum 24-hour   | 25  | Health and wellbeing                  |  |



# ALSTOM



## **Stanwell Corporation**

### **Deposited Particulate Matter Report**

**December 2011 - January, 2012**

**Stanwell Corporation**

**Determination of Particulate Matter**

**Report – December 2011 / January 2012**

**Prepared for** Stanwell Corporation  
**Attention** Rhiannon Hossack  
**Report No.** 12 – 011  
**Job No.** 541068  
**Prepared by** Margaret Wyganowska  
**Approved** Walter Manley  
**Date** 23 February 2012



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RTI DL RELEASE - EHP

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**Stanwell Corporation**  
**Determination of Particulate Matter**  
**Report – December 2011 / January 2012**

**1. INTRODUCTION**

Total particulate matter was collected by the dust deposition bottle method on behalf of Stanwell Corporation during this monitoring period to investigate localized dustfall trends. The monitoring consists of four monitoring sites located west of Stanwell Power Station at the following coordinates:

DG1: 224134 7397410

DG2: 224217 7397168

DG3: 224397 7396875

DG4: 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

**2. DATA COLLECTION & CALCULATION**

Dust disposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined, whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by an external NATA accredited laboratory.

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<sup>†</sup>For full information on the use of the references, visit the [StanfordFlowLab.org](http://www.StanfordFlowLab.org) or [Mechassis.com](http://www.Mechassis.com).

|                     |  |
|---------------------|--|
| AS 3580.1.1 : 2007  |  |
| AS 3580.10.1 : 2003 |  |

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DETERMINATION OF PARTICULATE MATTER  
TABULAR RESULTS SUMMARY  
STANWELL POWER STATION

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DG1

**Stanwell Power Station**

21 December 2011 – 20 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 2.9 |
| Ash Content (mg)              | mg                      | 52  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.3 |
| Combustible Matter (mg)       | mg                      | 23  |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 1.3 |
| Total Soluble Matter (mg)     | mg                      | 23  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 4.2 |
| Total Insoluble Matter (mg)   | mg                      | 75  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 5.5 |
| Total Solids                  | mg                      | 98  |

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DG2

## Stanwell Power Station

21 December 2011 – 20 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 3.9 |
| Ash Content (mg)              | mg                      | 89  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.1 |
| Combustible Matter (mg)       | mg                      | 20  |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 0.7 |
| Total Soluble Matter (mg)     | mg                      | 12  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 5.0 |
| Total Insoluble Matter (mg)   | mg                      | 89  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 5.7 |
| Total Solids (mg)             | mg                      | 101 |

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DG3

**Stanwell Power Station**

21 December 2011 – 20 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.4 |
| Ash Content (mg)              | mg                      | 25  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.1 |
| Combustible Matter (mg)       | mg                      | 20  |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 1.4 |
| Total Soluble Matter (mg)     | mg                      | 26  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 2.5 |
| Total Insoluble Matter (mg)   | mg                      | 44  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 4.0 |
| Total Solids (mg)             | mg                      | 70  |

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DG4

**Stanwell Power Station**

21 December 2011 – 20 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 0.7 |
| Ash Content (mg)              | mg                      | 12  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 0.7 |
| Combustible Matter (mg)       | mg                      | 13  |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 0.5 |
| Total Soluble Matter (mg)     | mg                      | 8   |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 1.4 |
| Total Insoluble Matter (mg)   | mg                      | 25  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 1.9 |
| Total Solids (mg)             | mg                      | 34  |

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# ALSTOM



## **Stanwell Corporation**

### **Deposited Particulate Matter Report**

**January, 2012**

**Stanwell Corporation**  
**Determination of Particulate Matter**  
**Report – January 2012**

**Prepared for** Stanwell Corporation  
**Attention** Rhiannon Hossack  
**Report No.** 12 – 012  
**Job No.** 541068  
**Prepared by** Margaret Wyganowska  
**Approved** Walter Manley  
**Date** 23 February 2012



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**Stanwell Corporation**  
**Determination of Particulate Matter**  
**Report – January 2012**

**1. INTRODUCTION**

Total particulate matter was collected by the dust deposition bottle method on behalf of Stanwell Corporation during this monitoring period to investigate localized dust fall trends. The monitoring consists of four monitoring sites located west of Stanwell Power Station at the following coordinates:

DG1 224134 7397410

DG2 224217 7397168

DG3 224397 7396875

DG4 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

**2. DATA COLLECTION & CALCULATION**

Dust disposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by an external NATA accredited laboratory.

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5. OTHER ISSUES

5.1. The purpose of this standard is to provide a common basis for the design and construction of the system. It is intended to be used in conjunction with the other standards of the series.

6. CUSTOMER STANDARDS

6.1. The customer standards shall be those specified in the contract documents.

|                     |  |
|---------------------|--|
| AS 3580.1.1 : 2007  |  |
| AS 3580.10.1 : 2003 |  |

7. WORKPLACE HEALTH AND SAFETY

7.1. The contractor shall ensure that the workplace is safe and sound.

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\*\*\* END OF DOCUMENT \*\*\*

8. TECHNICAL SPECIFICATIONS

8.1. The technical specifications shall be those specified in the contract documents.



DETERMINATION OF PARTICULATE MATTER  
TABULAR RESULTS SUMMARY  
STANWELL POWER STATION

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DG1

**Stanwell Power Station**

20 January 2012 – 27 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.2 |
| Ash Content (mg)              | mg                      | 5   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 0.6 |
| Combustible Matter (mg)       | mg                      | 3   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 6.3 |
| Total Soluble Matter (mg)     | mg                      | 26  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 1.9 |
| Total Insoluble Matter (mg)   | mg                      | 8   |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 8.1 |
| Total Solids                  | mg                      | 34  |

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DG2

**Stanwell Power Station**

20 January 2012 – 27 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.4 |
| Ash Content (mg)              | mg                      | 8   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.0 |
| Combustible Matter (mg)       | mg                      | 4   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 3.7 |
| Total Soluble Matter (mg)     | mg                      | 15  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 2.4 |
| Total Insoluble Matter (mg)   | mg                      | 10  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 6.1 |
| Total Solids (mg)             | mg                      | 25  |

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DG3

**Stanwell Power Station**

20 January 2012 – 27 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.5 |
| Ash Content (mg)              | mg                      | 6   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.0 |
| Combustible Matter (mg)       | mg                      | 4   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 4.8 |
| Total Soluble Matter (mg)     | mg                      | 20  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 2.5 |
| Total Insoluble Matter (mg)   | mg                      | 10  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 7.3 |
| Total Solids (mg)             | mg                      | 30  |

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DG4

**Stanwell Power Station**

20 January 2012 – 27 January, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 0.8 |
| Ash Content (mg)              | mg                      | 4   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 0.8 |
| Combustible Matter (mg)       | mg                      | 4   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 5.8 |
| Total Soluble Matter (mg)     | mg                      | 24  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 1.7 |
| Total Insoluble Matter (mg)   | mg                      | 7   |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 7.6 |
| Total Solids (mg)             | mg                      | 31  |

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# **Stanwell Corporation**

## **Deposited Particulate Matter Report**

**January, 2012 – February, 2012**

**Stanwell Corporation**  
**Determination of Particulate Matter**  
**Report – January / February 2012**

**Prepared for** Stanwell Corporation  
**Attention** Rhiannon Hossack  
**Report No.** 12 – 013  
**Job No.** 541068  
**Prepared by** Margaret Wyganowska  
**Approved** Walter Manley  
**Date** 23 February 2012



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**Stanwell Corporation**  
**Determination of Particulate Matter**  
**Report – January / February 2012**

**1. INTRODUCTION**

Total particulate matter was collected by the dust deposition bottle method on behalf of Stanwell Corporation during this monitoring period to investigate localized dust fall trends. The monitoring consists of four monitoring sites located west of Stanwell Power Station:

DG1 224134 7397410

DG2 224217 7397168

DG3 224397 7396875

DG4 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

**2. DATA COLLECTION & CALCULATION**

Dust disposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by an external NATA accredited laboratory.

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## 3. OTHER ISSUES

Considerable work has been done to ensure that the design of the system is compliant with the relevant standards and regulations. The design team has conducted a thorough review of the relevant standards and regulations and has ensured that the design is compliant with all applicable requirements. The design team has also conducted a thorough review of the relevant standards and regulations and has ensured that the design is compliant with all applicable requirements.

## 4. AUSTRALIAN STANDARDS

The following standards are the reference for the design of the system:

|                     |                                                             |
|---------------------|-------------------------------------------------------------|
| AS 3580.1.1 : 2007  | Concrete Reinforced Plastic Pipe                            |
| AS 3580.10.1 : 2003 | Design and Installation of Concrete Reinforced Plastic Pipe |

## 5. WORKPLACE HEALTH & SAFETY STATEMENT

### 5.1. STATEMENT

sch4p3( 3) Prejudice the protection of an individuals right to privacy



\*\*\*\*\*

### 5.2. STATEMENT

### 5.3. STATEMENT

DETERMINATION OF PARTICULATE MATTER  
TABULAR RESULTS SUMMARY  
STANWELL POWER STATION

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DG1

**Stanwell Power Station**

27 January 2012 – 08 February, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.0 |
| Ash Content (mg)              | mg                      | 7   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 0.8 |
| Combustible Matter (mg)       | mg                      | 6   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 1.4 |
| Total Soluble Matter (mg)     | mg                      | 10  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 1.9 |
| Total Insoluble Matter (mg)   | mg                      | 13  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 3.2 |
| Total Solids                  | mg                      | 23  |

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DG2

**Stanwell Power Station**

27 January 2012 – 08 February, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.8 |
| Ash Content (mg)              | mg                      | 18  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.2 |
| Combustible Matter (mg)       | mg                      | 8   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 3.2 |
| Total Soluble Matter (mg)     | mg                      | 23  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 3.0 |
| Total Insoluble Matter (mg)   | mg                      | 21  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 6.2 |
| Total Solids (mg)             | mg                      | 44  |

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DG3

**Stanwell Power Station**

27 January 2012 – 08 February, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 1.7 |
| Ash Content (mg)              | mg                      | 12  |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 1.1 |
| Combustible Matter (mg)       | mg                      | 8   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 1.2 |
| Total Soluble Matter (mg)     | mg                      | 8   |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 2.8 |
| Total Insoluble Matter (mg)   | mg                      | 20  |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 4.0 |
| Total Solids (mg)             | mg                      | 28  |

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DG4

## Stanwell Power Station

27 January 2012 – 08 February, 2012

| <i>Compound</i>               | <i>Unit</i>             |     |
|-------------------------------|-------------------------|-----|
| <b>Ash Content</b>            |                         |     |
| Ash Content                   | g/m <sup>2</sup> .month | 0.4 |
| Ash Content (mg)              | mg                      | 3   |
|                               |                         |     |
| <b>Combustible Matter</b>     |                         |     |
| Combustible Matter            | g/m <sup>2</sup> .month | 0.9 |
| Combustible Matter (mg)       | mg                      | 6   |
|                               |                         |     |
| <b>Total Soluble Matter</b>   |                         |     |
| Total Soluble Matter          | g/m <sup>2</sup> .month | 1.4 |
| Total Soluble Matter (mg)     | mg                      | 10  |
|                               |                         |     |
| <b>Total Insoluble Matter</b> |                         |     |
| Total Insoluble Matter        | g/m <sup>2</sup> .month | 1.3 |
| Total Insoluble Matter (mg)   | mg                      | 9   |
|                               |                         |     |
| <b>Total Solids</b>           |                         |     |
| Total Solids                  | g/m <sup>2</sup> .month | 2.6 |
| Total Solids (mg)             | mg                      | 19  |

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## Stanwell Corporation

### Determination of Particulate Matter Report

1<sup>st</sup> April – 30<sup>th</sup> April 2012

Amended

Report No.: DAT6034

Report issue date: 6<sup>th</sup> June 2012

Maintenance contract: MC836

**ECOTECH PTY LTD. ABN: 32005752081**  
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**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6012**



**Stanwell Corporation Pty Ltd**

| Customer Details |                                        |
|------------------|----------------------------------------|
| Customer         | Stanwell Corporation                   |
| Contact name     | Rhiannon Hossack                       |
| Address          | Power Station Road, Stanwell, QLD 4702 |
| Email            | Rhiannon.hossack@stanwell.com          |
| Phone            | (07) 4930 3331                         |

| Revision History |          |            |               |
|------------------|----------|------------|---------------|
| Report           | Revision | Date       | Analyst       |
| DAT6012          | 0        | 05/06/2012 | Robyn Edwards |
| DAT6034          | 1        | 06/06/2012 | Robyn EDWARDS |

**Report by**

Robyn EDWARDS

A handwritten signature of Robyn Edwards is written over a horizontal line.

**NATA Signatory:**

Jon ALEXANDER

A handwritten signature of Jon Alexander is written over a horizontal line.

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**Stanwell Corporation  
Determination of Particulate Matter  
Report – April 2012**

**1. INTRODUCTION**

This report supersedes the previously issued Stanwell Corporation Determination of Particulate Matter (DAT6012). The following changes have been made:

- Column added to all tables to show daily averages as requested

DG1 224134 7397410

DG2 224217 7397168

DG3 224397 7396875

DG4 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

**2. DATA COLLECTION & CALCULATION**

Dust disposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by ALS Group Environmental Division, NATA Accredited Laboratory 825. Accredited for compliance with ISO/IEC 17025.

# Stanwell Ambient Air Monitoring Network

Report No: DAT6012

Stanwell Corporation Pty Ltd



## 3. OTHER ISSUES

No other issues for the reporting period.

## 4. AUSTRALIAN STANDARDS

The following standards are the references used in the execution of the Stanwell Dust Deposition Monitoring program.

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| AS 3580.1.1 : 2007  | Ambient air – Guide for the siting of sampling units                        |
| AS 3580.10.1 : 2003 | Determination of particulate matter – Deposited matter – Gravimetric method |

## 5. WORKPLACE HEALTH & SAFETY & ENVIRONMENT

No reportable incidents.

  
Jon Alexander  
Environmental Manager

**Determination of particulate matter**

**Tabular results summary**

**STANWELL POWER STATION**

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**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6012**



Stanwell Corporation Pty Ltd

**DG1  
Stanwell Power Station  
April 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 1.0              | 0.03           |
| Ash Content (mg)              | mg               | 16               | 0.53           |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.4              | 0.01           |
| Combustible Matter (mg)       | mg               | 7                | 0.23           |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 1.5              | 0.05           |
| Total Soluble Matter (mg)     | mg               | 25               | 0.83           |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 1.4              | 0.05           |
| Total Insoluble Matter (mg)   | mg               | 23               | 0.77           |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 2.8              | 0.09           |
| Total Solids                  | mg               | 48               | 1.60           |

Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6012

Stanwell Corporation Pty Ltd



DG2  
Stanwell Power Station  
April 2012

| Compound                      | Unit             | Per Month | Per Day |
|-------------------------------|------------------|-----------|---------|
| <b>Ash Content</b>            |                  |           |         |
| Ash Content                   | g/m <sup>2</sup> | 0.4       | 0.01    |
| Ash Content (mg)              | mg               | 7         | 0.23    |
|                               |                  |           |         |
| <b>Combustible Matter</b>     |                  |           |         |
| Combustible Matter            | g/m <sup>2</sup> | 0.4       | 0.01    |
| Combustible Matter (mg)       | mg               | 6         | 0.20    |
|                               |                  |           |         |
| <b>Total Soluble Matter</b>   |                  |           |         |
| Total Soluble Matter          | g/m <sup>2</sup> | 1.4       | 0.05    |
| Total Soluble Matter (mg)     | mg               | 25        | 0.83    |
|                               |                  |           |         |
| <b>Total Insoluble Matter</b> |                  |           |         |
| Total Insoluble Matter        | g/m <sup>2</sup> | 0.8       | 0.03    |
| Total Insoluble Matter (mg)   | mg               | 13        | 0.43    |
|                               |                  |           |         |
| <b>Total Solids</b>           |                  |           |         |
| Total Solids                  | g/m <sup>2</sup> | 2.2       | 0.07    |
| Total Solids (mg)             | mg               | 38        | 1.27    |

**DG3  
Stanwell Power Station  
April 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | <b>0.5</b>       | <b>0.02</b>    |
| Ash Content (mg)              | mg               | <b>9</b>         | <b>0.30</b>    |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | <b>0.6</b>       | <b>0.02</b>    |
| Combustible Matter (mg)       | mg               | <b>11</b>        | <b>0.37</b>    |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | <b>0.6</b>       | <b>0.02</b>    |
| Total Soluble Matter (mg)     | mg               | <b>11</b>        | <b>0.37</b>    |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | <b>1.2</b>       | <b>0.04</b>    |
| Total Insoluble Matter (mg)   | mg               | <b>20</b>        | <b>0.67</b>    |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | <b>1.8</b>       | <b>0.06</b>    |
| Total Solids (mg)             | mg               | <b>31</b>        | <b>1.03</b>    |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6012**

Stanwell Corporation Pty Ltd



**DG4  
Stanwell Power Station  
April 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 0.4              | 0.01           |
| Ash Content (mg)              | mg               | 7                | 0.23           |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.6              | 0.02           |
| Combustible Matter (mg)       | mg               | 11               | 0.37           |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 1.0              | 0.03           |
| Total Soluble Matter (mg)     | mg               | 16               | 0.53           |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 1.0              | 0.03           |
| Total Insoluble Matter (mg)   | mg               | 18               | 0.60           |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 2.0              | 0.07           |
| Total Solids (mg)             | mg               | 34               | 1.13           |



**ecotech**

environmental monitoring solutions

## Stanwell Corporation

### Determination of Particulate Matter Report

1<sup>st</sup> May – 31<sup>st</sup> May 2012

Report No.: DAT6059

Report issue date: 30<sup>th</sup> June 2012

Maintenance contract: MC836

**ECOTECH PTY LTD. ABN: 32005752081**

**1492 Ferntree Gully Rd, Knoxfield VIC. 3180. AUSTRALIA**

**Tel No: 1300 364 946 Fax No: 1300 668 763**

**Email [ecotech@ecotech.com.au](mailto:ecotech@ecotech.com.au) WEB [www.ecotech.com.au](http://www.ecotech.com.au)**

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**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

**Stanwell Corporation Pty Ltd**

| Customer Details |                                        |
|------------------|----------------------------------------|
| Customer         | Stanwell Corporation                   |
| Contact name     | Rhiannon Hossack                       |
| Address          | Power Station Road, Stanwell, QLD 4702 |
| Email            | rhiannon.hossack@stanwell.com          |
| Phone            | (07) 4930 3331                         |

| Revision History |          |            |               |
|------------------|----------|------------|---------------|
| Report           | Revision | Date       | Analyst       |
| DAT6059          | 0        | 30/06/2012 | Robyn Edwards |

Report by

Robyn EDWARDS



NATA Signatory:

Jon ALEXANDER



---

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

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Stanwell Corporation Pty Ltd

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## Stanwell Ambient Air Monitoring Network

Report No: DAT6059

Stanwell Corporation Pty Ltd

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### Stanwell Corporation Determination of Particulate Matter Report – May 2012

#### 1. INTRODUCTION

Total particulate matter was collected by the dust deposition bottle method on behalf of Stanwell Corporation during this monitoring period to investigate localized dust fall trends. The monitoring consists of four monitoring sites located west of Stanwell Power Station:

DG1 224134 7397410

DG2 224217 7397168

DG3 224397 7396875

DG4 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

#### 2. DATA COLLECTION & CALCULATION

Dust deposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by ALS Group Environmental Division, NATA Accredited Laboratory 825. Accredited for compliance with ISO/IEC 17025.

The per day values in the summary table are calculated from the ALS Group Environmental Divisions data by dividing the reported values by the number of days in the reporting month.

---

## Stanwell Ambient Air Monitoring Network

Report No: DAT6059

Stanwell Corporation Pty Ltd

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### 3. OTHER ISSUES

No other issues for the reporting period.

### 4. AUSTRALIAN STANDARDS

The following standards are the references used in the execution of the Stanwell Dust Deposition Monitoring program.

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| AS 3580.1.1 : 2007  | Ambient air – Guide for the siting of sampling units                        |
| AS 3580.10.1 : 2003 | Determination of particulate matter – Deposited matter – Gravimetric method |

### 5. WORKPLACE HEALTH & SAFETY & ENVIRONMENT

No reportable incidents.

\*\*\*\*\*  
Jon Alexander

Environmental Reporting Services Manager

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**Stanwell Ambient Air Monitoring  
Network**

**Report No: DAT6059**

**Stanwell Corporation Pty Ltd**

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**Determination of Particulate Matter**

**Tabular results summary**

**May 2012**

**STANWELL POWER STATION**

RTI DL RELEASE - EHP

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

**Stanwell Corporation Pty Ltd**

**DG1  
Stanwell Power Station  
May 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 2.7              | < 0.1          |
| Ash Content                   | mg               | 43               | 1.4            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.6              | < 0.1          |
| Combustible Matter            | mg               | 9                | 0.3            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 0.9              | < 0.1          |
| Total Soluble Matter          | mg               | 14               | 0.5            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 3.3              | 0.1            |
| Total Insoluble Matter        | mg               | 52               | 1.7            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 4.2              | 0.1            |
| Total Solids                  | mg               | 67               | 2.2            |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

Stanwell Corporation Pty Ltd

**DG2  
Stanwell Power Station  
May 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 2.2              | 0.1            |
| Ash Content                   | mg               | 35               | 1.1            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.6              | < 0.1          |
| Combustible Matter            | mg               | 10               | 0.03           |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 1.1              | < 0.1          |
| Total Soluble Matter          | mg               | 18               | 0.6            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 2.8              | 0.1            |
| Total Insoluble Matter        | mg               | 45               | 1.5            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 3.9              | 0.1            |
| Total Solids                  | mg               | 62               | 2              |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

Stanwell Corporation Pty Ltd

**DG3  
Stanwell Power Station  
May 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 1.5              | < 0.1          |
| Ash Content                   | mg               | 23               | 0.7            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 1.4              | < 0.1          |
| Combustible Matter            | mg               | 23               | 0.7            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 3.4              | 0.1            |
| Total Soluble Matter          | mg               | 53               | 1.7            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 2.9              | 0.1            |
| Total Insoluble Matter        | mg               | 46               | 1.5            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 6.3              | 0.2            |
| Total Solids                  | mg               | 100              | 3.2            |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6059**

Stanwell Corporation Pty Ltd

**DG4  
Stanwell Power Station  
May 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 1.3              | 0.1            |
| Ash Content                   | mg               | 21               | 0.7            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.8              | < 0.1          |
| Combustible Matter            | mg               | 12               | 0.4            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 1.0              | < 0.1          |
| Total Soluble Matter          | mg               | 16               | 0.5            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 2.1              | 0.1            |
| Total Insoluble Matter        | mg               | 33               | 1.1            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 3.1              | 0.1            |
| Total Solids                  | mg               | 49               | 1.6            |

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**Stanwell Ambient Air Monitoring  
Network**

**Report No: DAT6059**

**Stanwell Corporation Pty Ltd**

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**Appendix**

NATA Accredited ALS Group Environmental Division Certificate of Analysis Work Order EB1215425  
attached.

RTI DL RELEASE - EHP

## Stanwell Corporation

### Determination of Particulate Matter Report

1<sup>st</sup> June – 30<sup>th</sup> June 2012

Report No.: DAT6138

Report issue date: 30<sup>th</sup> July 2012

Maintenance contract: MC836

**ECOTECH PTY LTD. ABN: 32005752081**  
**1492 Ferntree Gully Rd, Knoxfield VIC. 3180. AUSTRALIA**  
**Tel No: 1300 364 946 Fax No: 1300 668 763**  
**Email [ecotech@ecotech.com.au](mailto:ecotech@ecotech.com.au) WEB [www.ecotech.com.au](http://www.ecotech.com.au)**

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---

Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138

Stanwell Corporation Pty Ltd

| Customer Details |                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Company          | Stanwell Corporation                                                                                                                                             |
| Contact Name     | Anthony Hossack                                                                                                                                                  |
| Address          | 100 Stanwell Road, Stanwell Park NSW 2568                                                                                                                        |
| Email            | <a href="mailto:rhiannon.hossack@stanwell.com">rhiannon.hossack@stanwell.com</a><br><a href="mailto:melanie.jarvis@stanwell.com">melanie.jarvis@stanwell.com</a> |
| Phone            | 02 7455 0000                                                                                                                                                     |

| Revision History |          |            |               |
|------------------|----------|------------|---------------|
| Report           | Revision | Date       | Analyst       |
| DAT6138          | 0        | 20/07/2015 | Robyn Edwards |

Report by

Robyn EDWARDS

sch4p3( 3) Prejudice the  
protection of an individuals  
right to privacy

NATA Traceability

Jon AUSTIN

Page 2 of 11

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**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

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**Stanwell Corporation Pty Ltd**

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## Stanwell Ambient Air Monitoring Network

Report No: DAT6138

Stanwell Corporation Pty Ltd

---

### Stanwell Corporation Determination of Particulate Matter Report – June 2012

#### 1. INTRODUCTION

Total particulate matter was collected by the dust deposition bottle method on behalf of Stanwell Corporation during this monitoring period to investigate localized dust fall trends. The monitoring consists of four monitoring sites located west of Stanwell Power Station:

DG1 224134 7397410

DG2 224217 7397168

DG3 224397 7396875

DG4 223759 7397486

**Note:** all coordinates are in the Universal Transverse Mercator (UTM) system.

#### 2. DATA COLLECTION & CALCULATION

Dust deposition bottles were set up at four various locations and left to collect particulates over a given sampling period. The sample, alongside any rainwater, was passed through a sieve to remove any extraneous matter and the sieved sample containing the deposited matter was transferred to the filtration apparatus.

The insoluble and soluble materials collected were gravimetrically determined whilst the ash and combustible matter content was calculated by loss on ignition of the insoluble solids. Soluble solids were determined from the filtrate. The total solids values were obtained by the addition of the insoluble and soluble solids. Analysis was performed by ALS Group Environmental Division, NATA Accredited Laboratory 825. Accredited for compliance with ISO/IEC 17025.

The per day values in the summary table are calculated from the ALS Group Environmental Divisions data by dividing the reported values by the number of days in the reporting month.

---

## Stanwell Ambient Air Monitoring Network

Report No: DAT6138

Stanwell Corporation Pty Ltd

---

### 3. OTHER ISSUES

No other issues for the reporting period.

### 4. AUSTRALIAN STANDARDS

The following standards are the references used in the execution of the Stanwell Dust Deposition Monitoring program.

|                     |                                                                             |
|---------------------|-----------------------------------------------------------------------------|
| AS 3580.1.1 : 2007  | Ambient air – Guide for the siting of sampling units                        |
| AS 3580.10.1 : 2003 | Determination of particulate matter – Deposited matter – Gravimetric method |

### 5. WORKPLACE HEALTH & SAFETY & ENVIRONMENT

No reportable incidents.

\*\*\*\*\*  
Jon Alexander

Environmental Reporting Services Manager

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

**Determination of Particulate Matter**

**Tabular results summary**

**June 2012**

**STANWELL POWER STATION**

RTI DL RELEASE - EHP

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

**DG1  
Stanwell Power Station  
June 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 1.7              | < 0.1          |
| Ash Content                   | mg               | 29               | 1.0            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.5              | < 0.1          |
| Combustible Matter            | mg               | 9                | 0.3            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 4.4              | 0.1            |
| Total Soluble Matter          | mg               | 75               | 2.5            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 2.2              | < 0.1          |
| Total Insoluble Matter        | mg               | 38               | 1.3            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 6.6              | 0.2            |
| Total Solids                  | mg               | 113              | 3.8            |

**Stanwell Ambient Air Monitoring  
Network**

**Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

**DG2  
Stanwell Power Station**

**June 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 0.8              | < 0.1          |
| Ash Content                   | mg               | 14               | 0.5            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.5              | < 0.1          |
| Combustible Matter            | mg               | 8                | 0.3            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 3.9              | 0.1            |
| Total Soluble Matter          | mg               | 66               | 2.2            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 1.3              | < 0.1          |
| Total Insoluble Matter        | mg               | 22               | 0.7            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 5.2              | 0.2            |
| Total Solids                  | mg               | 88               | 2.9            |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

**DG3  
Stanwell Power Station  
June 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 2.3              | < 0.1          |
| Ash Content                   | mg               | 39               | 1.3            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 1.8              | < 0.1          |
| Combustible Matter            | mg               | 30               | 1.0            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 4.6              | 0.1            |
| Total Soluble Matter          | mg               | 78               | 2.6            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 4.0              | 0.1            |
| Total Insoluble Matter        | mg               | 69               | 2.3            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 8.6              | 0.3            |
| Total Solids                  | mg               | 147              | 4.9            |

**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

**DG4  
Stanwell Power Station  
June 2012**

| <i>Compound</i>               | <i>Unit</i>      | <i>Per Month</i> | <i>Per Day</i> |
|-------------------------------|------------------|------------------|----------------|
| <b>Ash Content</b>            |                  |                  |                |
| Ash Content                   | g/m <sup>2</sup> | 0.6              | < 0.1          |
| Ash Content                   | mg               | 11               | 0.4            |
|                               |                  |                  |                |
| <b>Combustible Matter</b>     |                  |                  |                |
| Combustible Matter            | g/m <sup>2</sup> | 0.6              | < 0.1          |
| Combustible Matter            | mg               | 11               | 0.4            |
|                               |                  |                  |                |
| <b>Total Soluble Matter</b>   |                  |                  |                |
| Total Soluble Matter          | g/m <sup>2</sup> | 4.8              | 0.2            |
| Total Soluble Matter          | mg               | 82               | 2.7            |
|                               |                  |                  |                |
| <b>Total Insoluble Matter</b> |                  |                  |                |
| Total Insoluble Matter        | g/m <sup>2</sup> | 1.3              | < 0.1          |
| Total Insoluble Matter        | mg               | 22               | 0.7            |
|                               |                  |                  |                |
| <b>Total Solids</b>           |                  |                  |                |
| Total Solids                  | g/m <sup>2</sup> | 6.1              | 0.2            |
| Total Solids                  | mg               | 104              | 3.5            |

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**Stanwell Ambient Air Monitoring  
Network  
Report No: DAT6138**

**Stanwell Corporation Pty Ltd**

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Appendix

NATA Accredited ALS Group Environmental Division Certificate of Analysis Work Order EB1217802  
attached.

RTI DL RELEASE - EHP

© Glenda

Ref: 392/6/7

27 September 1996



Regional Manager(Environment)  
Department of Environment  
PO BOX 3130  
ROCKHAMPTON SHOPPING FAIR  
QLD 4701

Dear Sir

**ENVIRONMENTAL MANAGEMENT PROGRAM  
PROGRAM NOTICE ST2**

I refer to our Program Notice ST2 and your Notice of Environmental Program (Ref L-FZ-02) dated 12 July 1996.

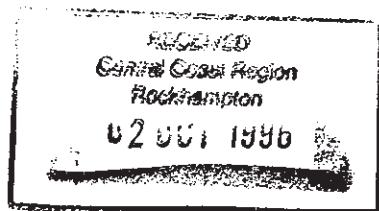
Please find attached a report on the results for the first six months of dust monitoring, as required in Objective Six of the Program.

Yours faithfully

sch4p3(3) Prejudice the protection of an individuals right to privacy

*For* E D Scott  
MANAGER STANWELL POWER STATION

Enquiries: Mr R Robinson  
Telephone (079) 303 458  
Facsimile (079) 303 212



STANWELL POWER STATION

PO BOX 5895

ROCKHAMPTON MAIL CENTRE

QUEENSLAND 4702 AUSTRALIA

TELEPHONE (079) 34 9300

P:\STAKEHLD\QMESH\DOEREP.DOC

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AUSTA ® is a Trade Mark of Queensland Generation Corporation

FACSIMILE (079) 34 9266  
FROM 1 JULY 1996

TELEPHONE (07) 3228 7111  
FACSIMILE (07) 3228 7100

Dust Monitoring of the Ash Disposal Area Environs for  
Environmental Management Program (L-FZ-02)

INTRODUCTION:

As required by objective six of the Environmental Management Program, this report summarises the dust monitoring data for the 6 month period from February to July 1996.

Directional Dust Gauges were installed at seven locations in the vicinity of the Ash Disposal Area. The locations are shown in Figure 1. Gauge 7 was located to provide background dust levels. The gauges are orientated with quadrant 1 being pointed directly towards the Ash Disposal Area. The other quadrants are numbered in an anticlockwise direction.

RESULTS:

The Insoluble Solid and Ash Residue results obtained for each month are expressed as *mg/30 days* and are displayed in Table 1. Each months results are also attached as graphs.

The Ash Residue is the parameter that best represents the dust emissions from the Ash Disposal Area. The Insoluble Solids contain all impinged matter.

The prevailing wind conditions for each month were as follows:

| MONTH    | DIRECTION       | SPEED RANGE |
|----------|-----------------|-------------|
| FEBRUARY | South-East      | 3-24 km/h   |
| MARCH    | East-South-East | 3-30 km/h   |
| APRIL    | East-South-East | 2-15 km/h   |
| MAY      | South-East      | 0-15 km/h   |
| JUNE     | East-South-East | 0-44 km/h   |
| JULY     | South-West      | 0-52 km/h   |

CONCLUSION:

Results for the six months show higher levels of Ash Residue in quadrant 1 of the dust gauges, suggesting that the Ash Disposal Area is the major dust source in the area.

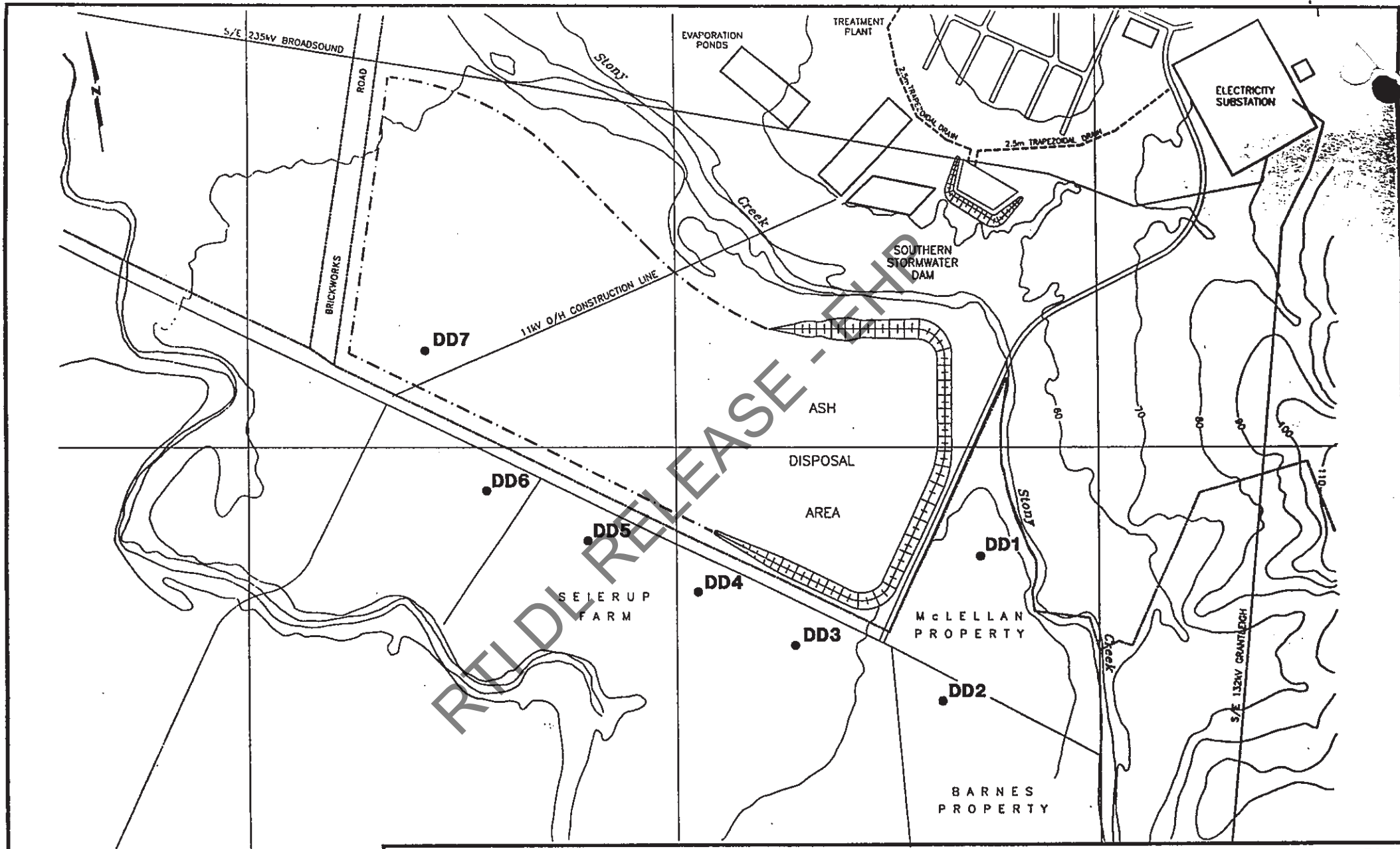
The results from the dust gauges require further statistical analysis to determine the actual impact on surrounding neighbours.

Table 1: Directional Dust Monitoring Results Stanwell Power Station

| GAUGE NUMBER | QUADRANT | Feb-96           |             | Mar-96           |             | Apr-96           |             | May-96           |             | Jun-96           |             | Jul-96           |             | Averages         |             |
|--------------|----------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
|              |          | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE | INSOLUBLE SOLIDS | ASH RESIDUE |
|              |          | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  | mg/30 days       | mg/30 days  |
| 1            | 1        | 18.8             | 11.2        | 81.9             | 39.6        | 22.3             | 8.7         | 29.1             | 9.3         |                  |             | 20.3             | 7.5         | 38.0             | 16.7        |
|              | 2        | 21.9             | 15.1        | 111.8            | 63.7        | 13.4             | 1.0         | 22.1             | 3.5         |                  |             | 23.8             | 9.8         | 42.3             | 20.8        |
|              | 3        | 12.0             | 7.7         | 66.0             | 25.7        | 32.8             | 13.6        | 18.5             | 3.0         |                  |             | 18.3             | 4.9         | 32.3             | 12.5        |
|              | 4        | 157.3            | 138.9       | 49.9             | 26.9        | 9.1              | 3.2         | 56.6             | 25.0        |                  |             | 20.6             | 9.9         | 68.2             | 38.8        |
|              | TOTAL    | 210.0            | 172.9       | 309.6            | 155.9       | 77.6             | 24.6        | 126.3            | 40.8        | n/a              | n/a         | 82.9             | 32.1        |                  |             |
| 2            | 1        | 5.9              | 5.8         | 20.0             | 7.9         | 164.9            | 149.0       | 118.9            | 99.1        | 18.6             | 2.0         | 13.3             | 0.0         | 65.7             | 52.8        |
|              | 2        | 11.4             | 10.4        | 8.1              | 2.8         | 19.9             | 4.6         | 7.2              | 1.2         | 10.6             | 1.5         | 14.0             | 2.4         | 11.4             | 4.1         |
|              | 3        | 5.4              | 4.7         | 4.3              | 3.8         | 0.8              | 0.3         | 53.0             | 31.2        | 23.7             | 7.5         | 9.5              | 0.4         | 17.4             | 9.6         |
|              | 4        | 8.3              | 4.7         | 18.0             | 8.9         | 97.7             | 79.7        | 43.2             | 14.2        | 13.0             | 3.1         | 10.4             | 0.9         | 35.6             | 22.1        |
|              | TOTAL    | 31.0             | 25.6        | 48.4             | 23.4        | 283.3            | 233.6       | 222.3            | 146.7       | 65.9             | 14.1        | 47.2             | 3.7         |                  |             |
| 3            | 1        | 59.7             | 43.6        | 47.7             | 28.3        | 25.8             | 5.2         | 28.5             | 11.9        | 10.1             | 1.2         | 547.8            | 343.4       | 34.4             | 18.0        |
|              | 2        | 31.3             | 13.9        | 25.6             | 20.9        | 25.1             | 2.5         | 8.7              | 4.9         | 8.3              | 3.9         | 49.4             | 30.5        | 19.8             | 9.2         |
|              | 3        | 51.4             | 22.7        | 39.9             | 0.0         | 96.7             | 15.0        | 74.5             | 35.5        | 12.2             | 3.0         | 27.4             | 11.4        | 54.9             | 15.2        |
|              | 4        | 11.2             | 1.8         | 54.4             | 24.6        | 21.0             | 1.4         | 28.3             | 9.1         | 11.5             | 2.2         | 26.8             | 10.9        | 25.3             | 7.8         |
|              | TOTAL    | 163.6            | 82.0        | 167.6            | 73.8        | 166.6            | 24.1        | 140.0            | 61.4        | 42.1             | 10.3        | 651.4            | 396.2       |                  |             |
| 4            | 1        | 62.4             | 53.8        | 58.9             | 30.9        | 58.9             | 30.0        | 34.8             | 13.0        | 10.1             | 3.4         | 29.9             | 15.2        | 45.0             | 26.2        |
|              | 2        | 40.8             | 40.1        | 23.1             | 7.6         | 16.1             | 1.5         | 29.7             | 10.4        | 6.1              | 0.2         | 17.6             | 5.8         | 23.2             | 12.0        |
|              | 3        | 112.8            | 32.4        | 22.9             | 9.6         | 14.7             | 8.8         | 9.6              | 5.6         | 8.7              | 1.7         | 21.3             | 7.4         | 33.7             | 11.5        |
|              | 4        | 57.8             | 30.8        | 26.7             | 7.3         | 22.5             | 2.9         | 71.3             | 60.2        | 9.4              | 0.9         | 17.7             | 6.4         | 37.6             | 20.4        |
|              | TOTAL    | 273.8            | 157.1       | 131.6            | 55.4        | 112.2            | 42.7        | 145.4            | 89.2        | 34.3             | 6.2         | 86.5             | 34.8        |                  |             |
| 5            | 1        | 76.3             | 16.9        | 62.2             | 36.3        | 35.1             | 19.0        | 37.5             | 30.7        | 13.6             | 4.0         | 17.9             | 10.8        | 44.9             | 21.4        |
|              | 2        | 24.7             | 20.8        | 28.3             | 28.2        | 23.3             | 5.4         | 18.6             | 7.8         | 14.8             | 1.7         | 13.2             | 4.5         | 21.9             | 12.8        |
|              | 3        | 25.7             | 20.0        | 75.3             |             | 150.5            | 125.4       | 49.0             | 40.8        | 10.5             | 1.5         | 16.0             | 7.1         | 62.2             | 46.9        |
|              | 4        | 82.3             | 17.3        | 53.7             | 15.2        | 8.5              | 2.9         | 12.3             | 10.2        | 15.0             | 3.7         | 12.8             | 4.5         | 34.4             | 9.9         |
|              | TOTAL    | 209.0            | 75.0        | 219.5            | 79.7        | 217.4            | 152.7       | 117.4            | 89.5        | 53.9             | 10.9        | 59.9             | 26.8        |                  |             |
| 6            | 1        | 51.0             | 8.9         | 29.0             | 13.4        | 8.1              | 1.8         | 24.6             | 0.1         | 8.6              | 2.5         | 8.4              | 2.9         | 24.3             | 5.3         |
|              | 2        | 55.1             | 24.7        | 131.4            | 6.2         | 12.7             | 3.3         | 12.4             | 0.0         | 8.1              | 0.7         | 21.7             | 4.1         | 43.9             | 7.0         |
|              | 3        | 71.7             | 8.6         | 14.2             | 5.2         | 9.6              | 1.3         | 8.3              | 5.5         | 12.6             | 1.9         | 18.3             | 9.5         | 23.3             | 4.5         |
|              | 4        | 16.7             | 11.6        | 26.3             | 5.9         | 30.4             | 7.0         | 8.5              | 2.1         | 10.6             | 2.1         | 20.6             | 5.3         | 18.5             | 5.7         |
|              | TOTAL    | 194.5            | 53.8        | 200.9            | 30.7        | 60.8             | 13.4        | 53.8             | 7.7         | 39.9             | 7.2         | 69.0             | 21.8        |                  |             |
| 7            | 1        | 85.0             | 84.9        | 40.7             | 9.1         | 11.2             | 2.7         |                  |             | 30.9             | 16.8        | 25.2             | 9.9         | 42.0             | 28.4        |
|              | 2        | 100.4            | 46.4        | 40.9             | 39.7        | 17.5             | 4.4         |                  |             | 20.4             | 9.3         | 24.0             | 7.9         | 44.8             | 25.0        |
|              | 3        | 101.4            | 68.9        | 54.9             | 25.9        | 22.7             | 2.3         |                  |             | 30.9             | 9.8         | 25.8             | 4.3         | 52.5             | 28.7        |
|              | 4        | 99.0             | 44.6        | 43.2             | 20.6        | 11.8             | 3.1         |                  |             | 22.1             | 4.3         | 26.8             | 14.1        | 44.0             | 18.2        |
|              | TOTAL    | 385.8            | 244.8       | 179.7            | 95.3        | 63.2             | 12.6        | n/a              | n/a         | 104.3            | 40.2        | 101.8            | 36.2        |                  |             |

Errors(n/a):

Mar-96  
May-96  
Jun-96Gauge: 5  
Gauge: 7  
Gauge: 1Quadrant: 3  
Quadrant: All  
Quadrant: AllCrucible cracked in oven  
Gauge knocked over  
Gauge knocked over



**HLA-ENVIROSCIENCES**  
 9 Drewe Street  
 Gladstone, QLD  
 (079) 72 6120

DRAWN  
 PW

PROJECT-TASK NUMBER  
 Collection 1 L277

**DIRECTIONAL DUST GAUGE LOCATIONS**  
 Austa Electric  
 Stonewell Power Station

APPROVED

DATE  
 August 1996

REVISED DATE  
 Page 78 of 130

FIGURE

**1**

00276

12479

# Austa Electric - Stanwell Power Stn February 1996

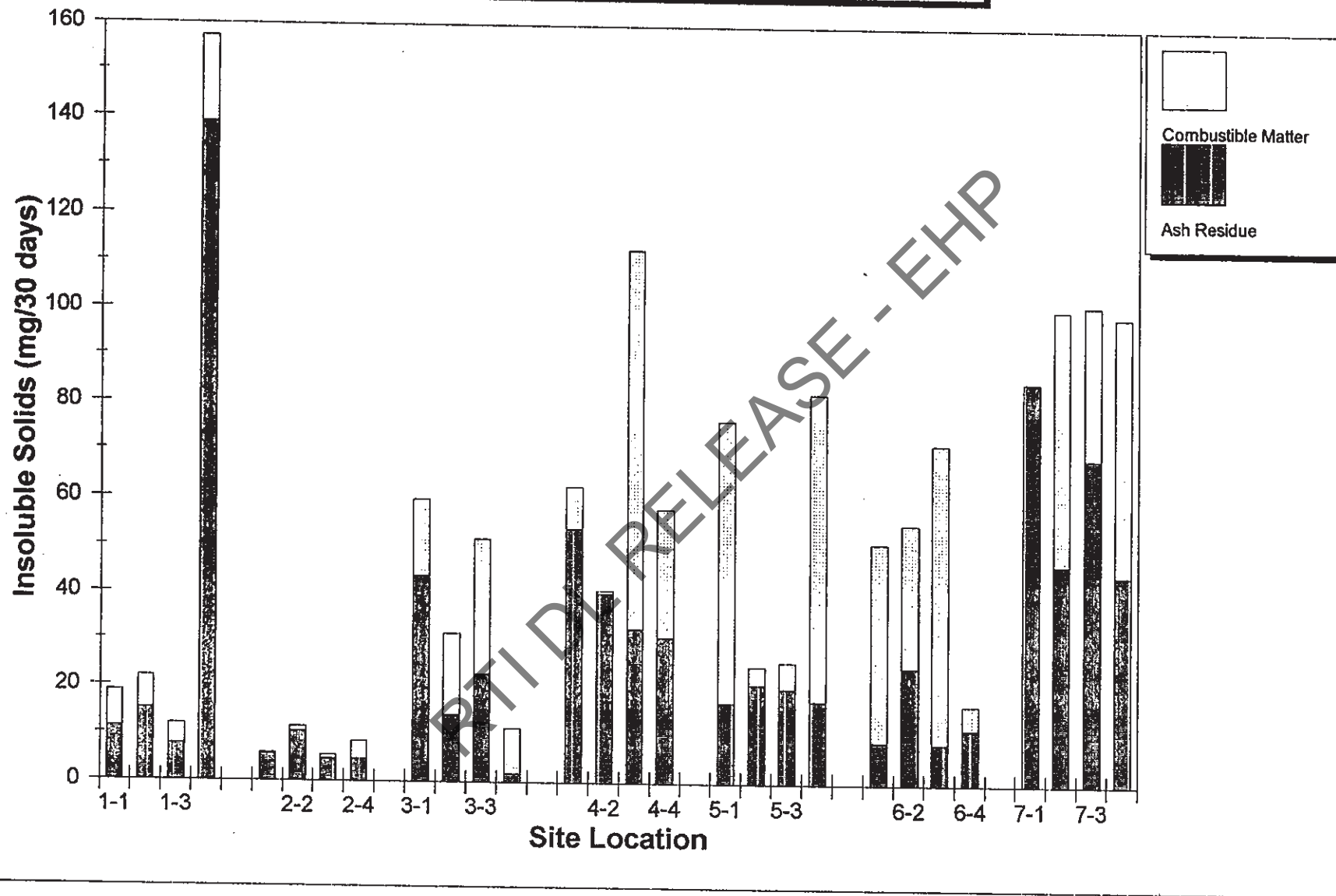


FIGURE 2:

00275

# Austa Electric - Stanwell Power Stn March 1996

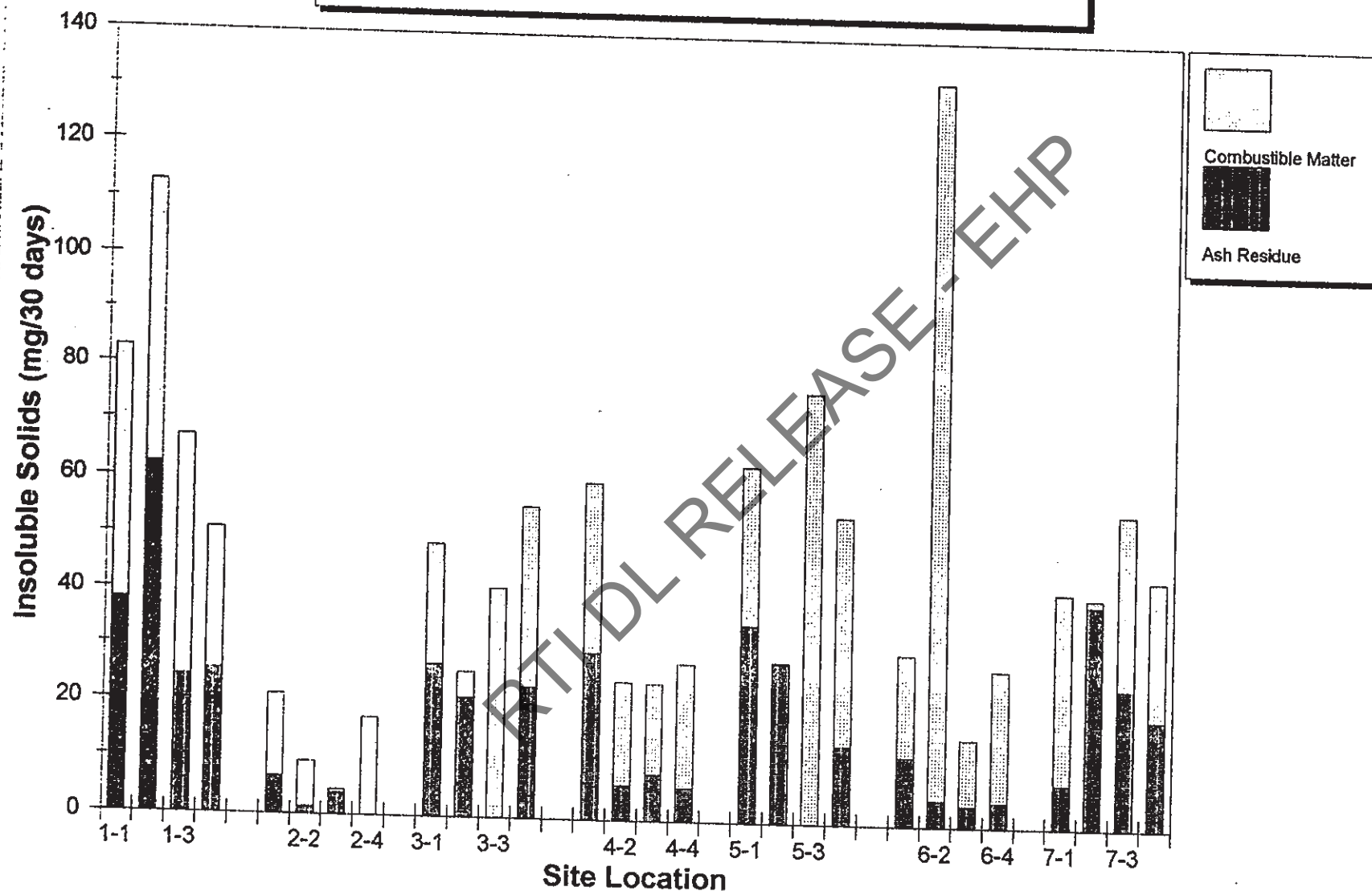


FIGURE: 2

# Austa Electric - Stanwell Power Stn April 1996

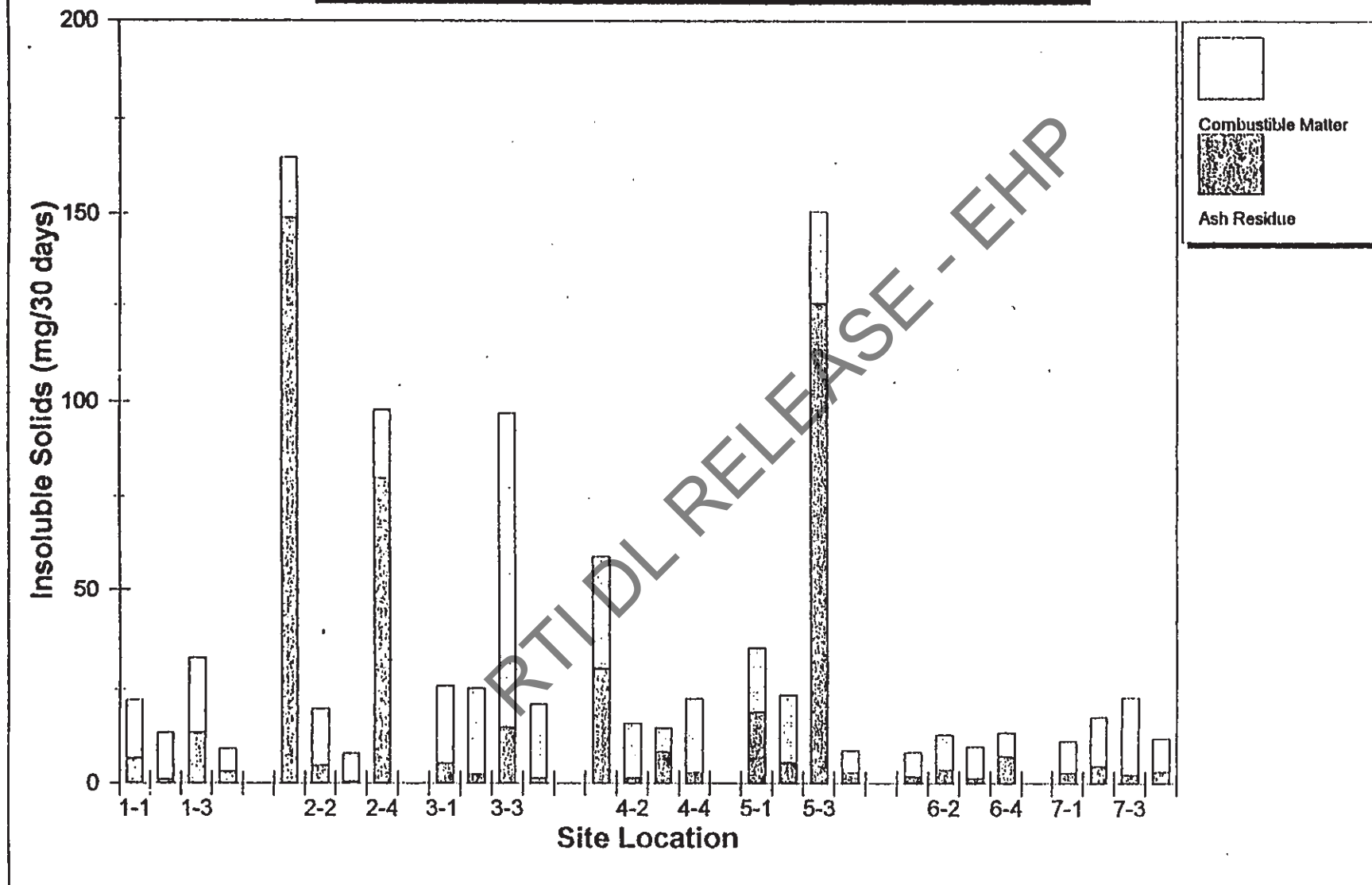
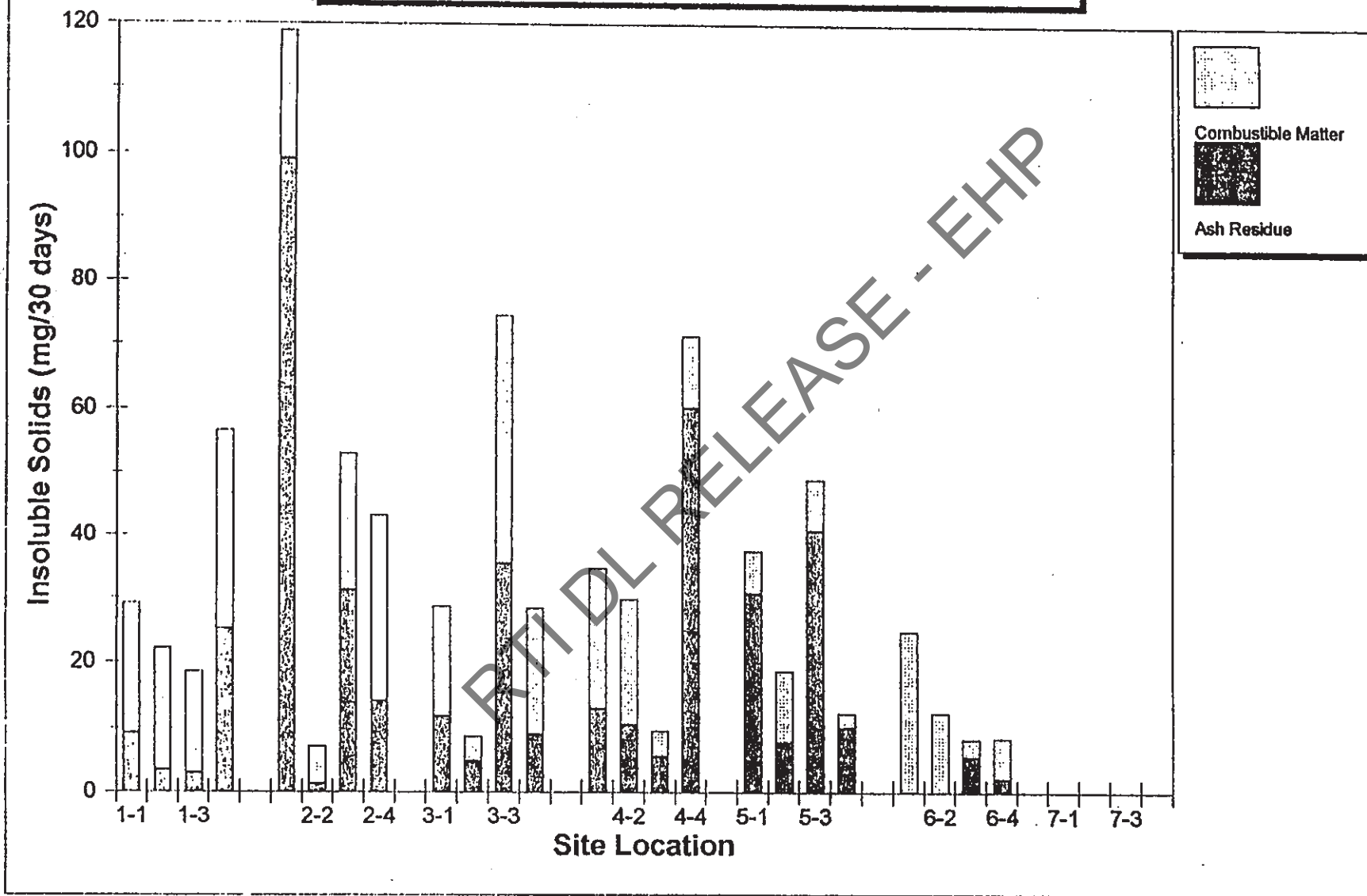


FIGURE 2:

# Austa Electric - Stanwell Power Stn May 1996



00272

FIGURE 2

**Figure 2: Insoluble Solids  
Stanwell Power Stn - June 1996**

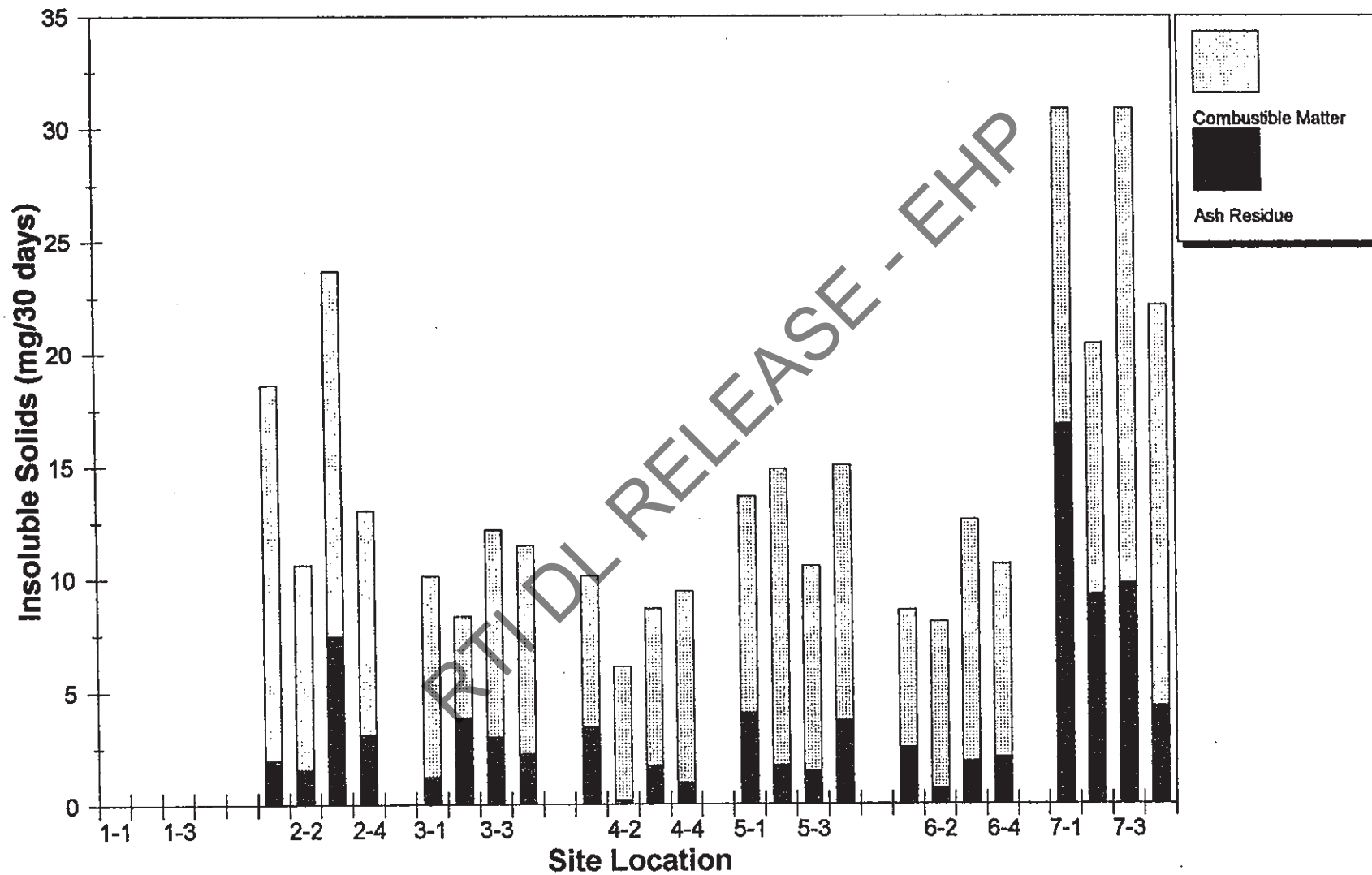
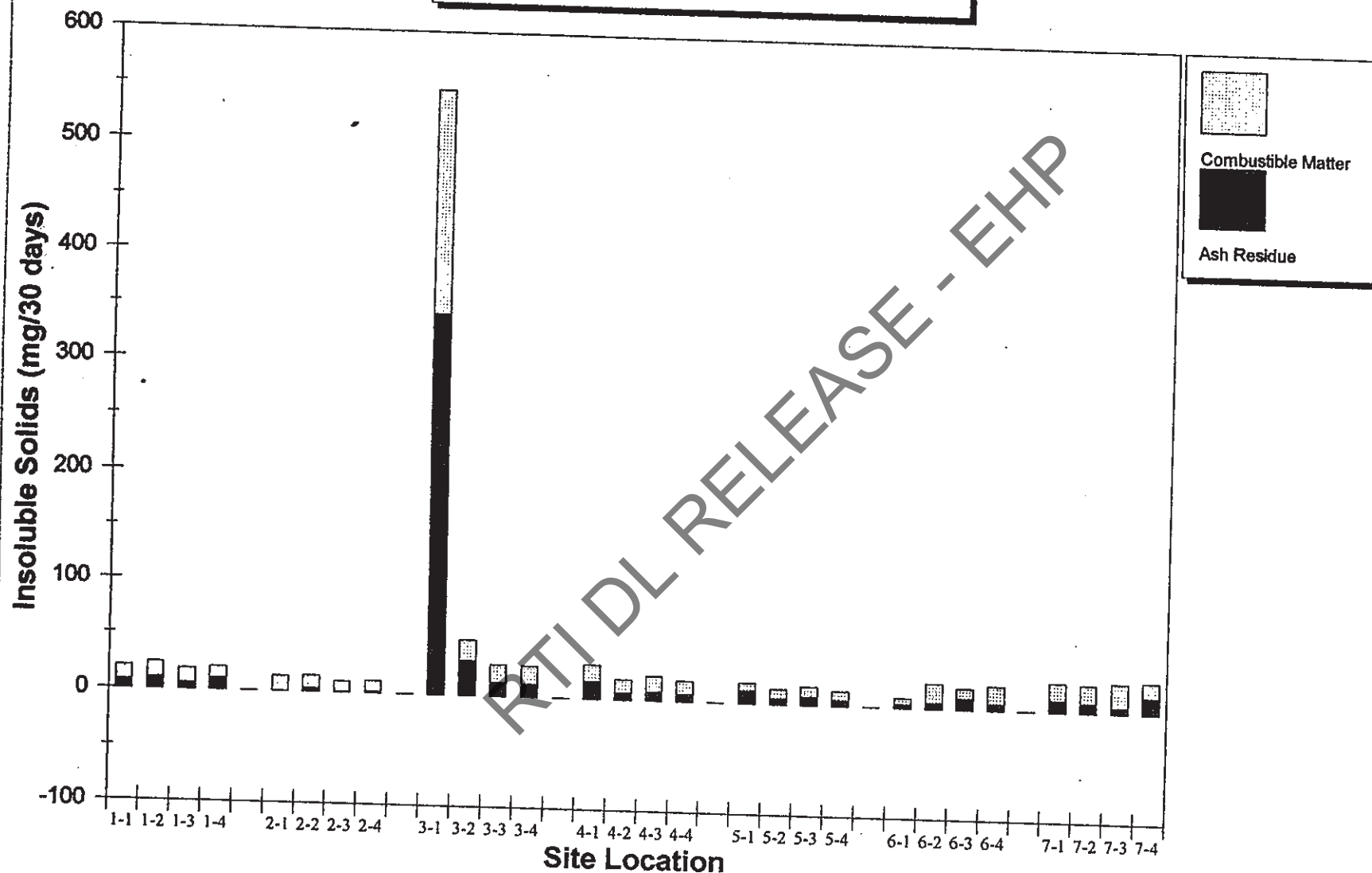


**Figure 2: Insoluble Solids  
Stanwell Power Stn - July 1996**



00270

# *Ambient Air Quality Impact of Stanwell Power Station*

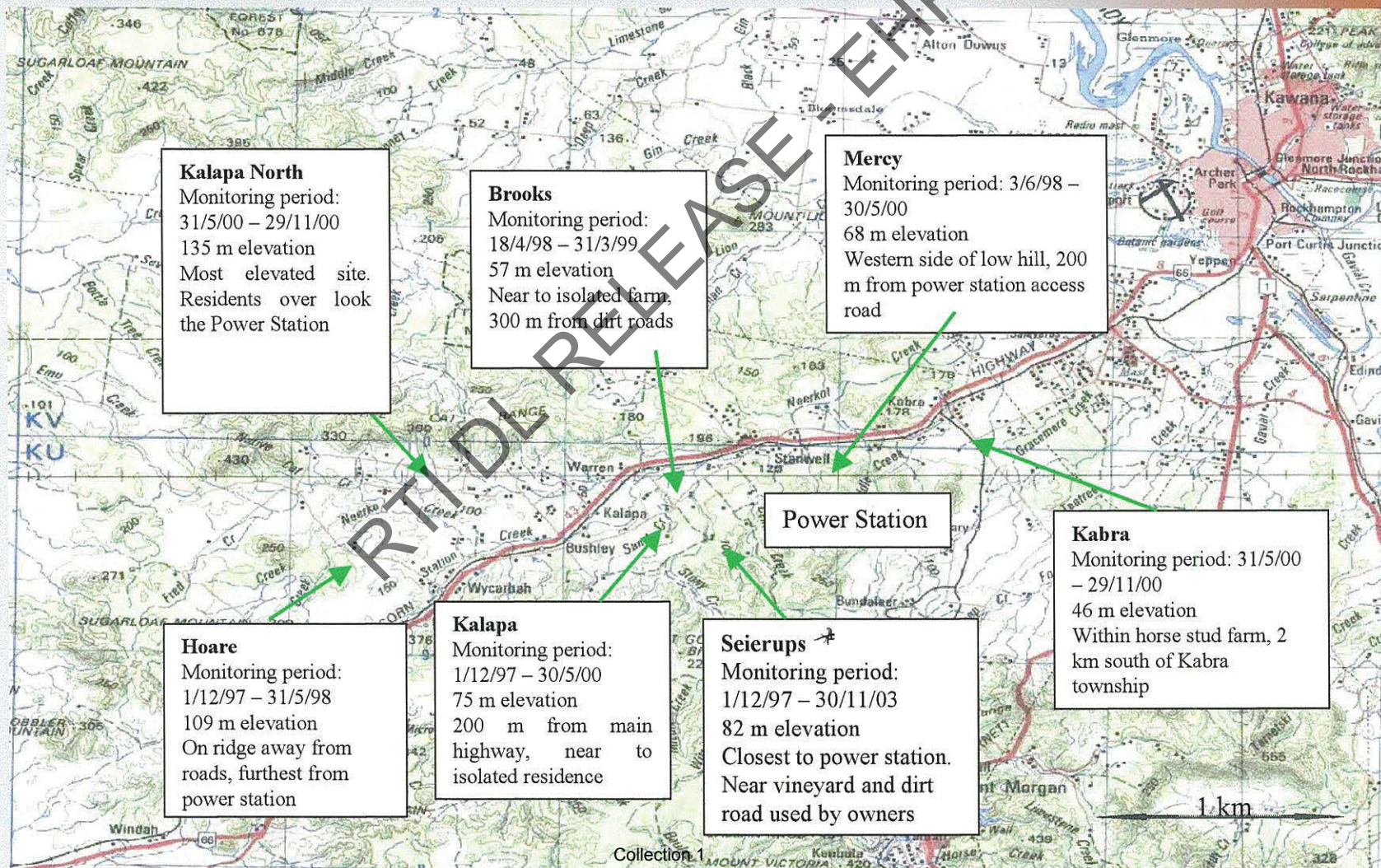
Stanwell AS Revision  
5 August 2009.

## *Ambient monitoring stations*



SPS monitored air quality and the meteorology of the region at seven sites from Dec 1997 to Dec 2000 & continued monitoring at the Seierup's site from Dec 2003 to Nov 2003

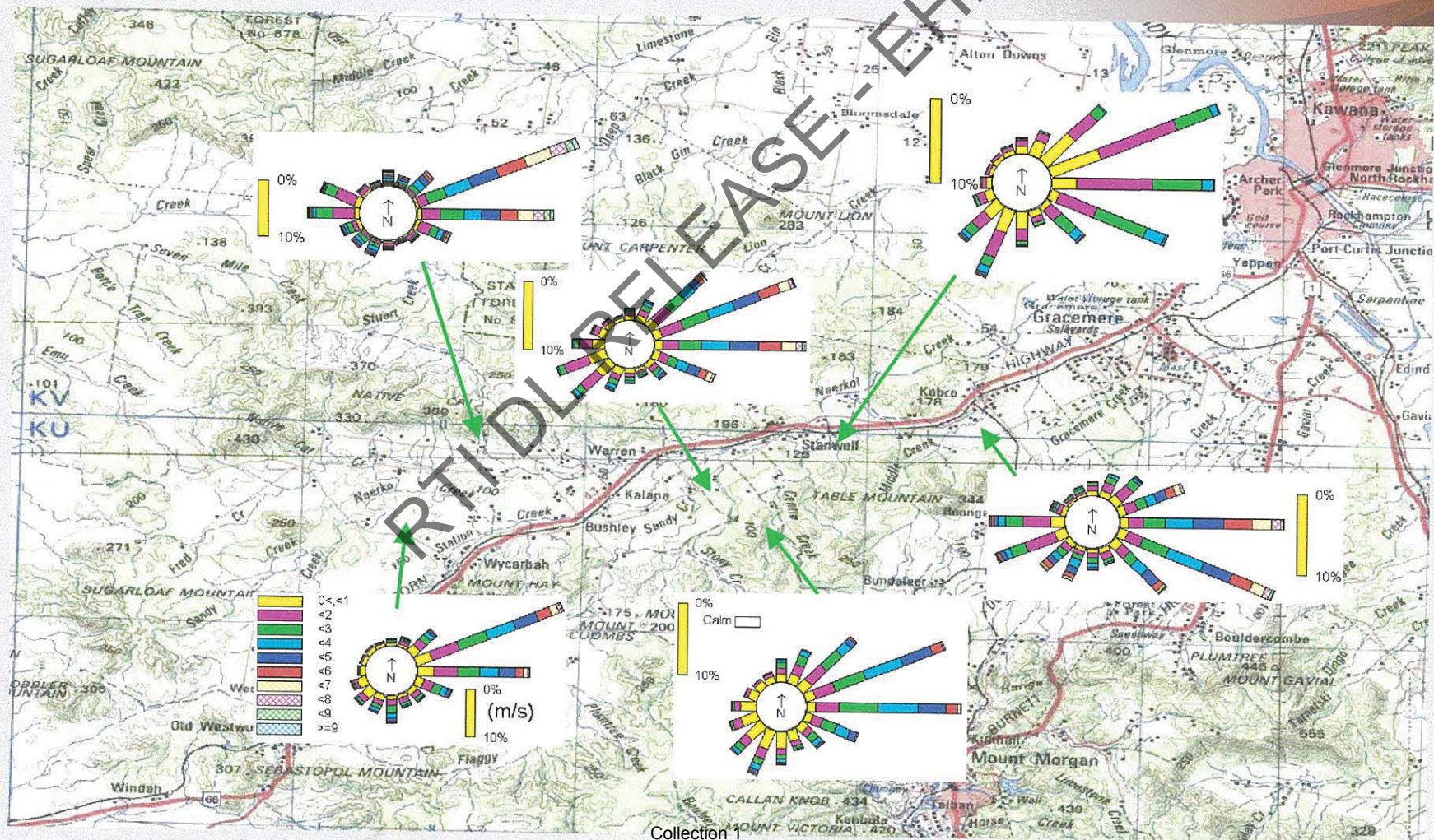
# Locations of monitoring stations



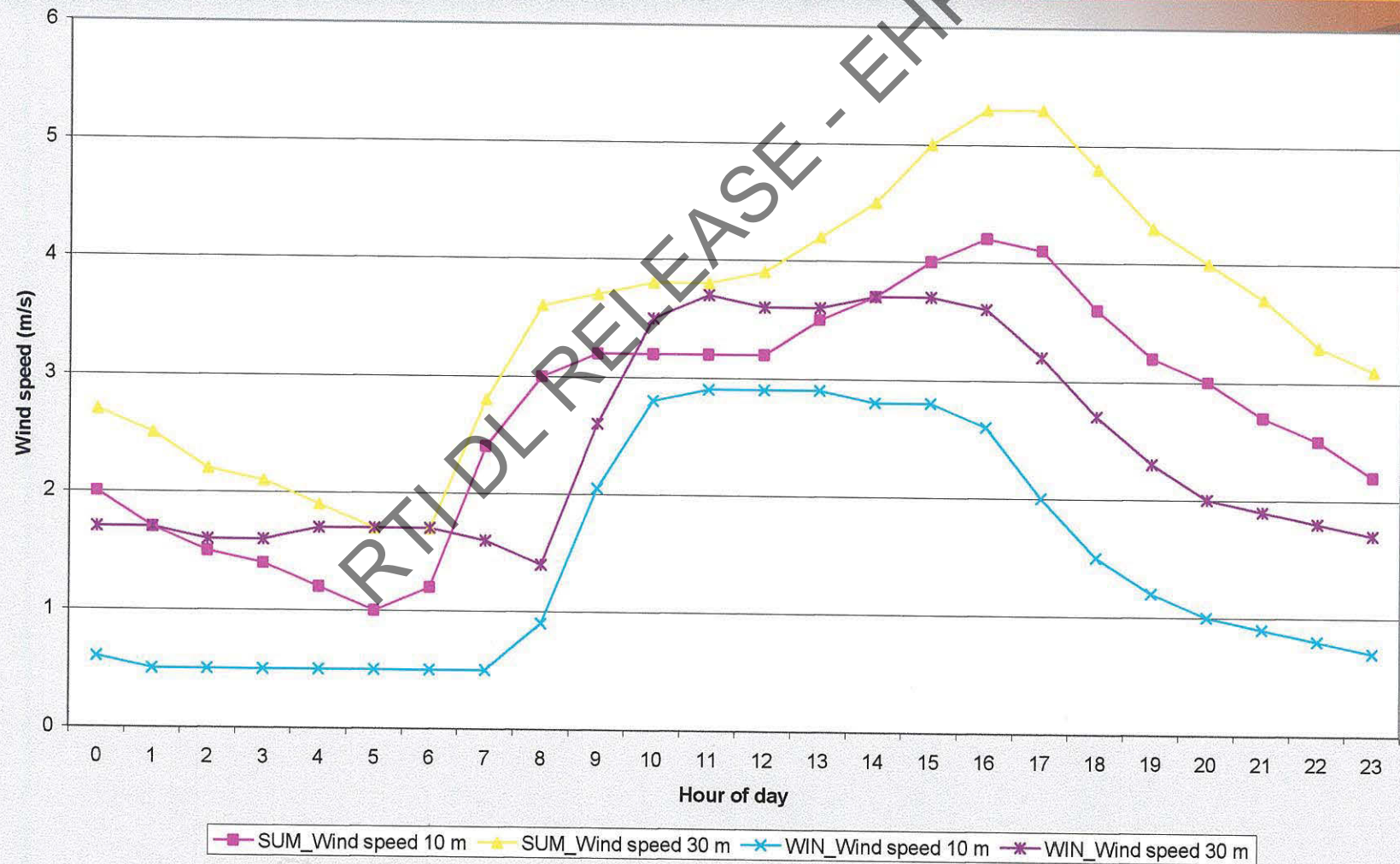
# Parameters measured

| Parameter                                                                       | Site    |                         |       |       |        |       |              |
|---------------------------------------------------------------------------------|---------|-------------------------|-------|-------|--------|-------|--------------|
|                                                                                 | Seierup | Kalapa                  | Hoare | Mercy | Brooks | Kabra | Kalapa North |
| Horizontal wind speed and direction (10m)                                       | x       | x                       | x     | x     |        | x     | x            |
| Vertical wind speed (10 m)                                                      | x       | x                       | x     | x     |        | x     | x            |
| Sigma theta (10m)                                                               | x       | x                       | x     | x     |        | x     | x            |
| Dry bulb air temperature (1.2 m)                                                | x       | Only for first 9 months |       |       |        |       |              |
| Dewpoint temperature (1.2 m)                                                    | x       |                         |       |       |        |       |              |
| Relative humidity (1.2 m)                                                       | x       |                         |       |       |        |       |              |
| Net radiation                                                                   | x       |                         |       |       |        |       |              |
| Solar radiation                                                                 | x       |                         |       |       |        |       |              |
| Rain                                                                            | x       |                         |       |       |        |       |              |
| Horizontal and vertical wind, dry bulb temperature and relative humidity (30 m) | x       |                         |       |       |        |       |              |
| Oxides of nitrogen (NO <sub>x</sub> )                                           | x       | x                       | x     | x     | x      | x     | x            |
| Sulphur dioxide (SO <sub>2</sub> )                                              | x       | x                       | x     | x     | x      | x     | x            |
| Ozone (O <sub>3</sub> )                                                         | x       |                         |       |       |        |       |              |
| Particulates (PM <sub>10</sub> )                                                | x       | x                       |       |       |        | x     |              |
| Particulates (PM <sub>2.5</sub> )                                               | x       | x                       |       |       |        | x     |              |
| Total suspended particulates (TSP)                                              |         | Collection 1            |       |       |        | x     |              |

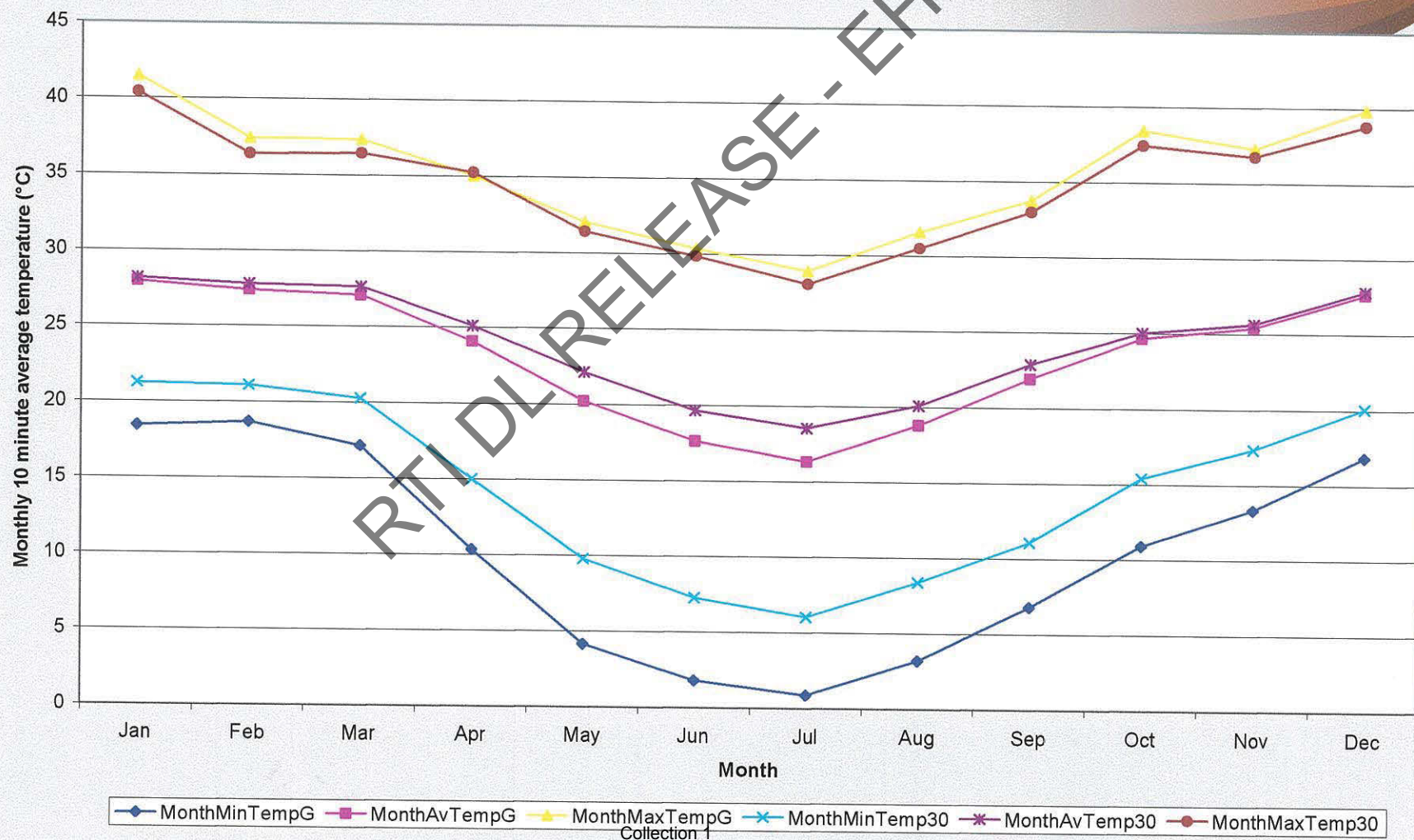
# Wind roses for the monitoring sites



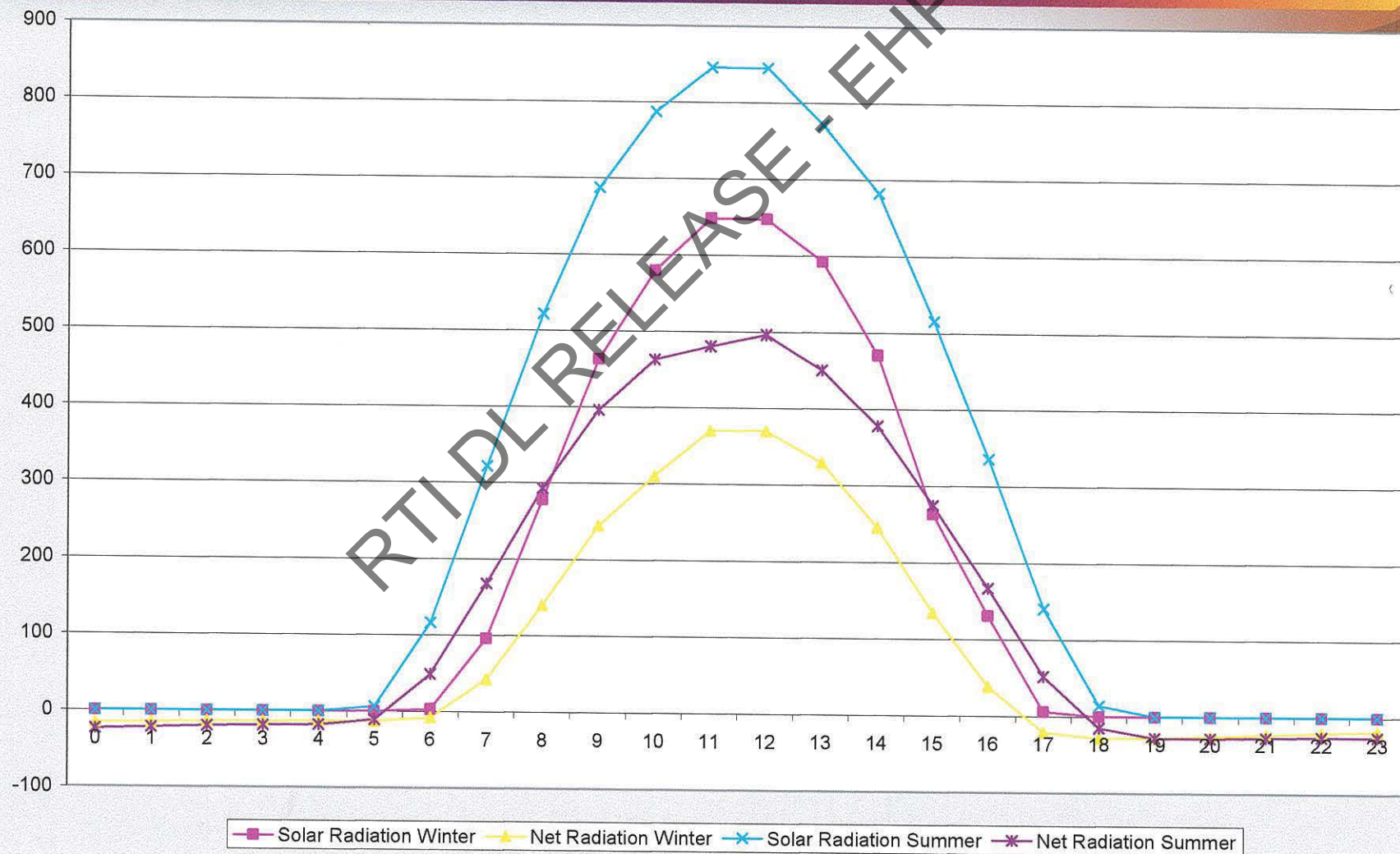
## Mean wind speed during the day



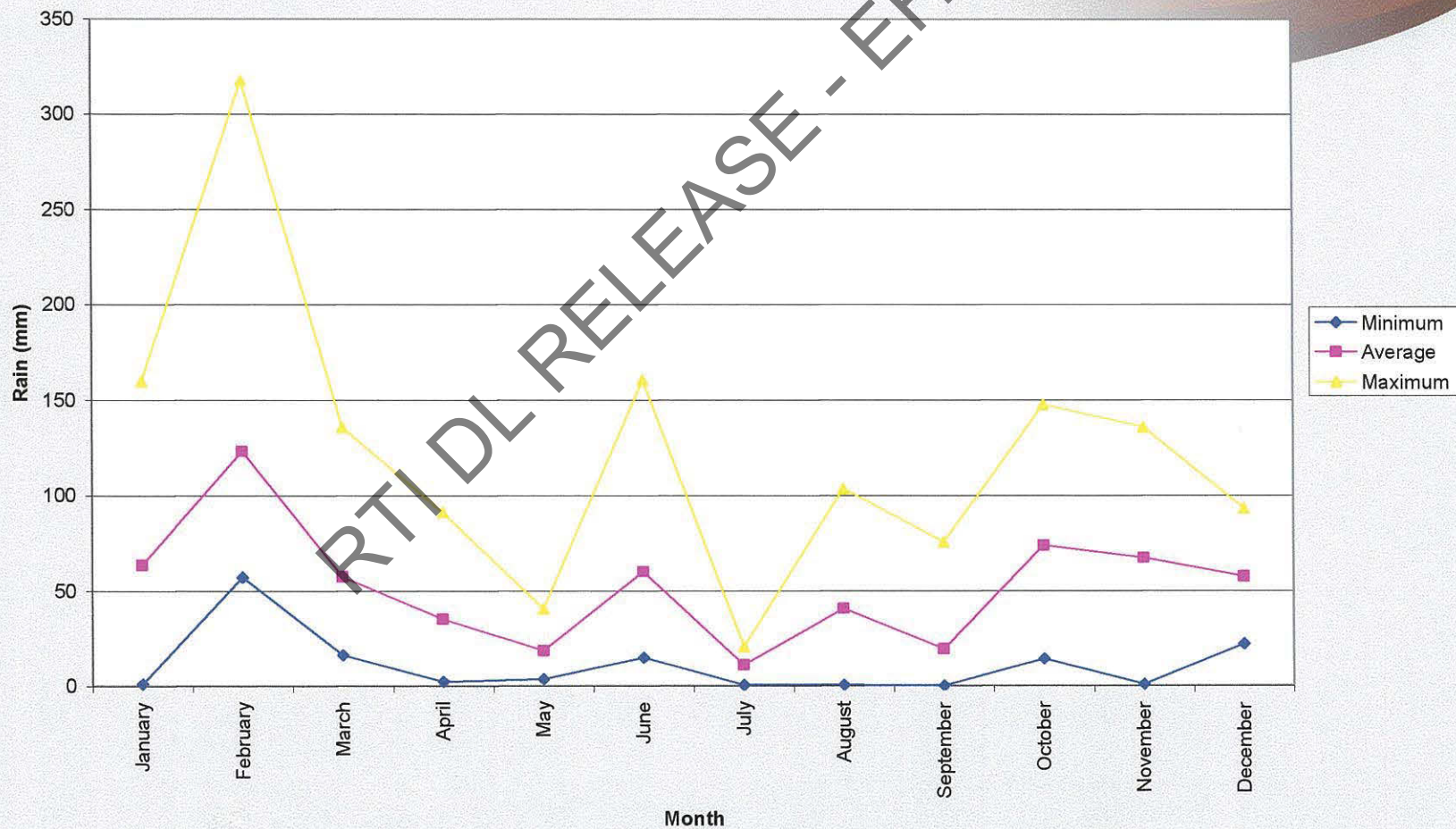
# Temperature



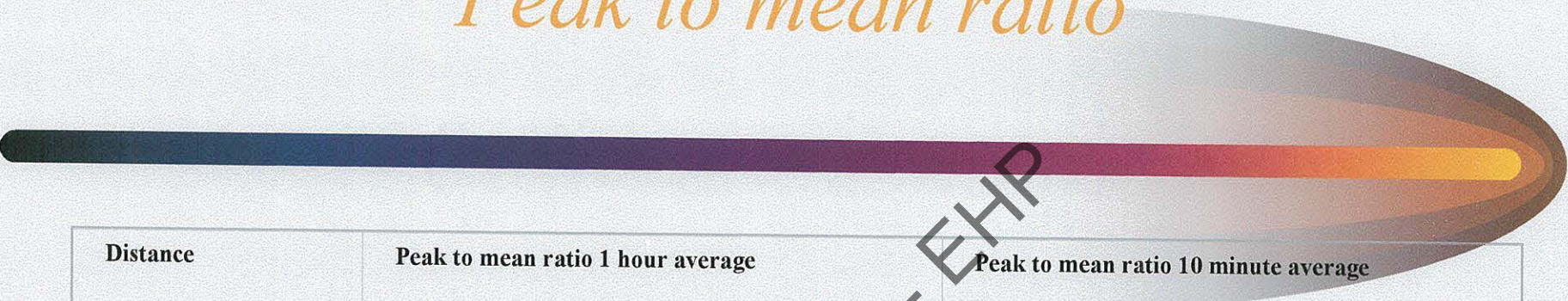
# Solar radiation



# Rainfall



# Peak to mean ratio



| Distance             | Peak to mean ratio 1 hour average |                 | Peak to mean ratio 10 minute average |                 |
|----------------------|-----------------------------------|-----------------|--------------------------------------|-----------------|
|                      | NO <sub>x</sub>                   | SO <sub>2</sub> | NO <sub>x</sub>                      | SO <sub>2</sub> |
| Near site (Seierups) | 10                                | 5               | 4                                    | 4               |
| Far site (Hoare)     | 6                                 | 6               | 2.5                                  | 2.5             |

note: Comparison to Guideline

# Ambient Air Quality vs. Guidelines

| Site         | SO <sub>2</sub> (ppb) |                  |                       |                       | NO <sub>2</sub> (ppb) |                 |                 | Ozone (ppb)      |                           | TSP (µg/m <sup>3</sup> ) | PM <sub>10</sub> (µg/m <sup>3</sup> )            | PM <sub>2.5</sub> <sup>1</sup> (µg/m <sup>3</sup> ) |
|--------------|-----------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------|-----------------|------------------|---------------------------|--------------------------|--------------------------------------------------|-----------------------------------------------------|
|              | 10 min                | 1 hr             | 24 hr                 | Annual                | 1 hr                  | 4 hr            | Annual          | 1 hr             | 4 hr                      | Annual                   | 24 hr                                            | 24 hr                                               |
| Brooks       | 178                   | 63.3             | 14.3                  | 2.1                   | 34.5                  | 29.2            | 3.3             | -                | -                         | -                        | -                                                | -                                                   |
| Hoare        | 71                    | 37               | 8.6                   | n/a                   | 22.7                  | 15.7            | n/a             | -                | -                         | -                        | -                                                | -                                                   |
| Kabra        | 59                    | 38.3             | 6.8                   | n/a                   | 27.3                  | 26.1            | n/a             | -                | -                         | -                        | 14.6                                             | -                                                   |
| Kalapa       | 124                   | 67               | 11.4                  | 2.8                   | 33.7                  | 25.6            | 4.2             | -                | -                         | 17.8                     | 30.8                                             | 16.5                                                |
| Kalapa North | 84                    | 51               | 9.7                   | n/a                   | 33.2                  | 24.2            | n/a             | -                | -                         | -                        | -                                                | -                                                   |
| Mercy        | 145                   | 80.7             | 12.2                  | 0.9                   | 105.7                 | 53.8 (1)        | 2.4             | -                | -                         | -                        | -                                                | -                                                   |
| Seierups     | 284 (4)               | 165              | 26.8                  | 2.5                   | 49                    | 39.9            | 2.7             | 87               | 81.2 (1)                  | -                        | 257 (2)<br>257 (11) <sup>3</sup>                 | 89.8 (6)                                            |
| Guideline    | 250 <sup>2</sup>      | 200 <sup>2</sup> | 35 <sup>2</sup><br>40 | 21 <sup>2</sup><br>20 | 160 <sup>2</sup>      | 50 <sup>2</sup> | 10 <sup>2</sup> | 100 <sup>2</sup> | 80 <sup>2</sup><br>3<br>2 | 90 <sup>2</sup>          | 150 <sup>2</sup><br>50 <sup>2</sup> <sup>3</sup> | 25 <sup>1</sup>                                     |

n/a  
1  
2  
3

could not be calculated as only a few months of monitoring data in period.

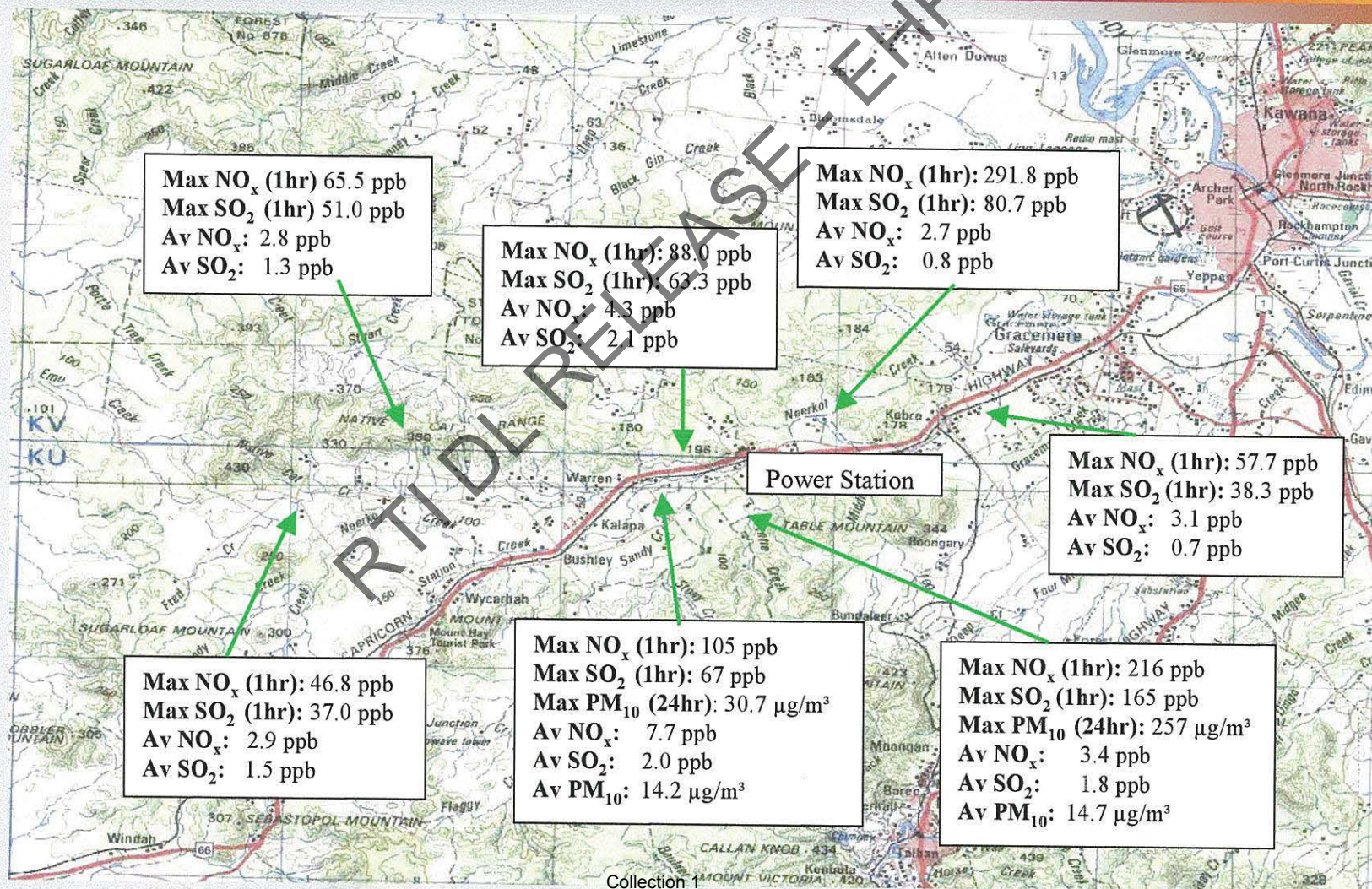
National Environment Protection Council (NEPC), (2003). "Discussion paper: setting a PM<sub>2.5</sub> standard in Australia".

Environmental Protection (Air) Amendment Policy (No. 1) 1998, Schedule 1.

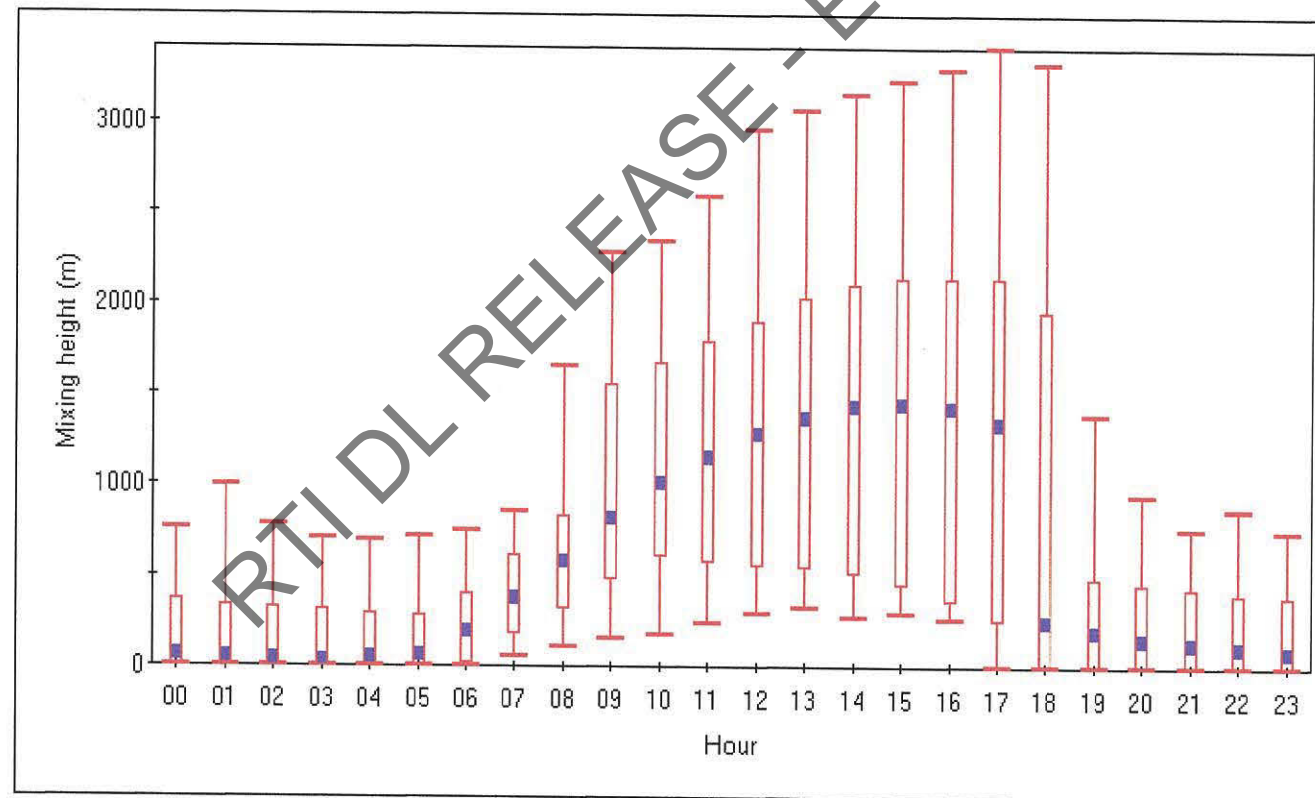
National Environment Protection Council (NEPC), (1998). "National Environment Protection Measure for ambient air quality".

3.0  
3.0

# Summary of maximum and average NO<sub>x</sub>, SO<sub>2</sub> & PM<sub>10</sub> levels



# Mixing Heights



Whisker: Low=Min, High=Max; Box: Low=5.0%, High=95.0%  
Middle: 50%

2.2010 2010  
Heavy snow

## *In Summary*

- Good quality air monitoring and met data
- Dominant wind direction: ENE to E
- Only four exceedances in 6 years
  - the 10 min SO<sub>2</sub> guideline (250 ppb) exceeded as follows: 255, 267, 278 & 284 ppb
- Other peaks measured NOT caused by the Station
- The dust impacts of the Station are low

# BAM-1020

## Continuous Particulate Monitor



Met One Instruments, Inc.

### Features

- U.S. EPA Federal Equivalent Method for PM<sub>10</sub> and PM<sub>2.5</sub> monitoring
- Long term unattended remote operation of up to 60 days between site visits
- Very low operating costs
- Automatic hourly span checks
- Fast and easy field audits using common FRM audit tools
- Bench top or equipment rack mounting in mobile or stationary shelters
- Rugged anodized aluminum, stainless steel, and baked enamel construction
- Highly accurate, reliable, and mechanically simple flow system
- Hourly filter advances minimize effects on volatile compounds
- Advanced Smart Heater technology precisely controls sample relative humidity
- Integrated datalogger allows the connection of up to six additional meteorological sensors
- Internal memory provides up to 182 days of digital data storage
- Data retrieval through RS-232 serial ports using direct PC connections, modems, printers, or digital data collection systems

### Designations

The Met One Instruments Model BAM-1020 has longstanding U.S. EPA designation as a Federal Equivalent Method (FEM) for continuous PM<sub>10</sub> particulate monitoring. In addition, the BAM-1020 is the world's first instrument to obtain U.S. EPA FEM designation for continuous PM<sub>2.5</sub> monitoring, when configured with the specified settings and accessories. The BAM-1020 has also obtained corresponding certifications in other countries and regions.

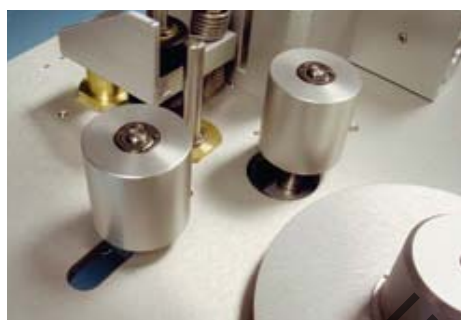
### Principle

The BAM-1020 automatically measures and records airborne particulate concentration levels (in milligrams or micrograms per cubic meter) using the industry-proven principle of beta ray attenuation. Thousands of BAM-1020 units are currently deployed worldwide, making the unit one of the most successful air monitoring platforms in the world.



## Operation

Each hour, a small  $^{14}\text{C}$  (carbon-14) element emits a constant source of high-energy electrons (known as beta rays) through a spot of clean filter tape. These beta rays are detected and counted by a sensitive scintillation detector to determine a zero reading. The BAM-1020 automatically advances this spot of tape to the sample nozzle, where a vacuum pump then pulls a measured and controlled amount of dust-laden air through the filter tape, loading it with ambient dust. At the end of the hour this dirty spot is placed back between the beta source and the detector thereby causing an attenuation of the beta ray signal which is used to determine the mass of the particulate matter on the filter tape and the volumetric concentration of particulate matter in ambient air.



## Data Collection

All data files are accessible via an industry standard two-way RS-232 serial port using common terminal programs or Met One Instruments software such as MicroMet Plus® and Comet.™ The data is available in a variety of formats including daily reports, last record, all data, and new records since last download. Configuration files, error logs, and flow statistics are also available. Digital dataloggers may obtain data from the unit using serial port commands or by recording the automatic hourly serial output.

## Error Handling

The BAM-1020 performs continuous user selected evaluation of a variety of criteria for data validation

including flow statistics and a comprehensive set of error codes including power failures, flow failures, hardware failures, tape errors, nozzle errors, span check errors, beta count errors, and more.

## Maintenance

The BAM-1020 is designed to run continuously with only monthly or bi-monthly scheduled maintenance—a single roll of filter tape will last more than 60 days. The BAM-1020 also contains a comprehensive self-test function which allows the unit to preemptively test itself for any mechanical failures in the tape control system.



## Specifications

BAM-1020

### PARAMETER

Operating Principle  
U.S. EPA Designations  
Approvals

### SPECIFICATION

Measures ambient particulate concentrations using beta ray attenuation  
PM<sub>10</sub>: FEM (EQPM-0798-122), PM<sub>2.5</sub>: Class III FEM, (EQPM-0308-170)  
CE, NRC, TUV, California ARB, ISO 9001

### PERFORMANCE

Accuracy  
Measurement Resolution  
Display Resolution  
Lower Detection Limit  
(2σ) 1 hour  
Lower Detection Limit  
(2σ) 24 hour  
Standard Range  
Optional Ranges  
Measurement Cycle Time  
Flow Rate  
Filter Tape  
Span Check  
Beta Source  
Beta Detector Type

Exceeds US-EPA Class III PM<sub>2.5</sub> FEM standards for additive and multiplicative bias  
0.1 µg/m<sup>3</sup>  
1 µg/m<sup>3</sup>  
< 4.8 µg/m<sup>3</sup> (less than 4.0 µg/m<sup>3</sup> typical)  
< 1.0 µg/m<sup>3</sup>  
0 – 1.000 mg/m<sup>3</sup> (0 - 1000 µg/m<sup>3</sup>)  
0 – 0.100, 0.200, 0.250, 0.500, 2.000, 5.000, 10.000 mg/m<sup>3</sup> (special applications)  
1 hour  
16.7 liters/minute adjustable 0–20 LPM range actual or standardized flow  
Continuous glass fiber filter tape, 30mm x 21m roll > 60 days/roll  
Automatic 0.800 mg (typical) span foil, verified hourly  
<sup>14</sup>C (carbon-14), 60 µCi ±15 µCi (<2.22 x 10<sup>6</sup> Beq), half-Life 5730 years  
Photomultiplier tube with organic plastic scintillator

### ENVIRONMENTAL

Operating Temperature  
Ambient Temperature  
Ambient Humidity  
Sample Humidity Control  
Enclosure

0 to +50°C  
-30° to +60°C  
0–90% RH, noncondensing  
Active Smart Heater module, 10–99% RH setpoint  
Weatherproof enclosure or shelter is required

### INTERFACE

User Interface  
Analog Output  
Serial Interface  
Printer Output  
Telemetry Inputs  
Alarm Contact Closures  
Error Reporting  
Memory

Menu-driven interface with 8-line 40-character LCD display and dynamic keypad  
Isolated 0–1 VDC output standard. 0–10 V, 4–20 mA, 0–16 mA switch-selectable  
RS-232 two-way serial port for PC or modem communications  
Output-only serial port for data or diagnostic output to a PC or serial printer  
Clock reset (voltage or contact closure), telemeter fault (contact closure)  
Data error, tape fault, flow error, power failure, maintenance  
User-configurable available through serial port, display, and relay outputs  
4369 records (182 days at 1 record/hr)

### ELECTRICAL

Power Supply  
Power Consumption

100–230 VAC, 50/60 Hz. Factory configured.  
Less than 0.4 kw, 3.4 A, worst case with pump and smart heater running.

### PHYSICAL

Weight  
Unit Dimensions

54 lbs (24.5 kg) without external accessories.  
Height = 12.25" (31 cm) Width = 17" (43 cm) Depth = 16" (40 cm).



## Standard Equipment

- Operation Manual
- Automatic Span Membrane
- Internal Flow Sensor
- Internal Flow Controller
- Internal Filter Temperature, Pressure, and RH Sensors
- Six-Channel Datalogger for Accessory Sensors
- Serial Communications Cable
- Universal Power Cable
- Pump Control Cable and Air Tubing
- Rack Mounting Hardware
- Reusable Packing Materials
- Comet™ Data Collection Software
- Glass Fiber Filter Tape, One Roll

## Required Accessories

- BX-802 EPA PM<sub>10</sub> Inlet (all units)
- BGI Inc. VSCC™ PM<sub>2.5</sub> Cyclone (PM<sub>2.5</sub> FEM units)
- BX-596 Ambient AT/BP Combo Sensor (PM<sub>2.5</sub> FEM units)
- BX-302 Zero Filter Calibration Kit, with leak test valve (PM<sub>2.5</sub> FEM units)
- BX-827 or BX-830 Smart Inlet Heater (PM<sub>2.5</sub> FEM units)
- BX-801 Inlet Tube Kit, with roof flange and support struts (most installations)
- Medo Linear Piston, or Gast Rotary Vane Vacuum Pump

## Optional Accessories

- BX-305 Leak Test Valve
- BX-308 Service Tool Kit
- BX-803 TSP Inlet, with Debris Screen
- BX-344 Inlet Cleaning Kit
- BX-592 Ambient Temperature Sensor
- BX-996 Modem Kit
- Custom-length inlet tubes and extension kits, max 16'
- Communications options including radio, cell, and satellite systems
- Weatherproof Outdoor Mini Enclosures BX-902 and BX-903
- Ambient RH, BP, WS, WD, and solar sensors



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# MicroVol 1100

## LOW VOLUME AIR SAMPLER

The MicroVol 1100 low volume air sampler provides a flexible sampling platform for  $PM_{10}$ ,  $PM_{2.5}$  or TSP particulates and basic meteorological parameters.

The MicroVol 1100 is suitable for both indoor and outdoor applications. The unit is microprocessor controlled and uses a mass flow sensor in conjunction with ambient temperature and pressure sensors to automatically maintain a constant volumetric flow rate.

### Approvals

- PM10 AS/NZS 3580.9.9 2006.
- PM2.5 AS/NZS 3580.9.10 2006.
- Manufactured under ISO9001 and ISO 14001.



### Indoor sampling

- Low power consumption.
- Quiet operation-ideal for indoor air quality studies.
- Volumetric flow control automatically corrected to standard reference temperature.
- Ultra-efficient, long life DC pump delivers flow rates of 1.0 to 4.5 l/min.

### Outdoor sampling

- Wind direction and speed used to activate/de-activate sampler.
- Fence line monitoring available with a network of samplers.
- Built for all conditions - light weight, rugged weatherproof construction.
- Can operate via battery or solar power sources (optional).

### Enhanced communication

- RS232 output for data collection and remote communication.
- Filter block and instrument error alarms available.
- Total control of instrument remotely from PC.
- Simple programming of sampling periods, including daily and weekly programs, with in built '1-in-X day' sampling capability.

### Directional sampling

- Wind direction and speed used to activate/de-activate sampler.
- External trigger (0-5VDC) can be used for activating sampling program.

## SPECIFICATIONS

|                                 |                                                                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation:                      | Microprocessor controlled (internal data logging)                                                                                                             |
| Volumetric flow range/accuracy: | 1.0- 4.5 l/min                                                                                                                                                |
| Flow accuracy:                  | ± 2% of reading                                                                                                                                               |
| Flow repeatability:             | ± 0.5% of reading                                                                                                                                             |
| Temperature range/accuracy:     | 0-45 deg C ± 1 deg                                                                                                                                            |
| Barometric pressure range:      | 600-900 Torr ± 4 Torr                                                                                                                                         |
| Filter types:                   | 47 mm ringed circular filter                                                                                                                                  |
| Inlets available:               | PM <sub>10</sub> , TSP (standard), PM <sub>2.5</sub> (optional)                                                                                               |
| Sampler dimensions:             | 300 mm (height) x 170 mm (diameter)                                                                                                                           |
| Sampler weight:                 | 3.75kg                                                                                                                                                        |
| Battery pack dimensions:        | 185 mm (height) x 170 mm (diameter)                                                                                                                           |
| Battery pack weight:            | 4.4 kg                                                                                                                                                        |
| Battery pack life:              | 48 hours sampling from fully charged battery pack                                                                                                             |
| Operating voltage:              | 12 V DC                                                                                                                                                       |
| Power consumption:              | 2.5 - 3 watts depending on filter loading                                                                                                                     |
| Standard accessories:           | TSP/PM <sub>10</sub> size selective inlet<br>Single 47mm filter holder<br>100-240V AC to 12V DC power converter<br>Microvol Downloader software & RS232 cable |

### Communications/Data logging

|                  |                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. of readings: | 150 (averaging period is user selectable, for example 75 hours of 30min averages)                                                                                                        |
| External inputs: | 1 x wind direction sensor input (10k potentiometer)<br>1 x wind speed sensor input (contact closure) or alternatively<br>1 x spare contact closure input (eg. Tipping bucket rain gauge) |
| Output:          | RS232C                                                                                                                                                                                   |

## OPTIONS

- Purpose built battery pack, or solar panel and battery pack.
- Moisture elimination system.
- Optional PM<sub>2.5</sub> size selective inlet adaptor.
- Optional wind speed and direction sensor or tipping bucket rain gauge.

An ISO 9001, 17025, 14001 & AS4801  
certified company



### Ecotech Pty Ltd

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**Section 3.5.15 Integrated Planning Act 1997**  
**EPA Permit<sup>1</sup> number: IPDE00732207**

Under Section 621 of the Environmental Protection Act 1994, this document replaces the document 'Development Approval No. IPDE00732207 issued on 31 October 2007.

|                                        |                                                                   |
|----------------------------------------|-------------------------------------------------------------------|
| <b>EPA Permit<sup>1</sup> number:</b>  | IPDE00732207                                                      |
| <b>Assessment Manager reference:</b>   | As above                                                          |
| <b>Issue of replacement documents:</b> | 28/01/2009                                                        |
| <b>Permit<sup>1</sup> Type:</b>        | Development Approval for a MCU involving an ERA                   |
| <b>Date of Decision:</b>               | 03/11/2008                                                        |
| <b>Relevant Laws and Policies:</b>     | Environmental Protection Act 1994 and any subordinate legislation |

The development permit attaches to the land described below, which either connects to or receives the benefits of the structure or activity that is the ERA 11(b), 15(b), 16, 18(b), 6(a), and 75(b)(iv).

**Development Activity Description**

| ERA No.       | ERA name                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ERA 11(b)     | Crude oil storing or petroleum product storing - storing crude oil or petroleum product in tanks or containers having a combined total storage capacity of 500 000 L or more.                                                                                                                                                                                                                                                       |
| ERA 15(b)     | Sewage treatment - operating a standard sewage treatment works having a peak design capacity to treat sewage of 100 or more equivalent persons but less than 1 500 equivalent persons.                                                                                                                                                                                                                                              |
| ERA 16        | Municipal water treatment plant - treating water for domestic use (other than treatment that only involves disinfection).                                                                                                                                                                                                                                                                                                           |
| ERA 18(b)     | Power station other fuel - generating power by consuming fuel at a rated capacity of 10 MW electrical or more - for any other fuel.                                                                                                                                                                                                                                                                                                 |
| ERA 6(a)      | Chemical manufacturing, processing or mixing - manufacturing or processing an inorganic chemical, organic chemical or chemical product, or mixing inorganic chemicals, organic chemicals or chemical products (other than mixing non-combustible or non-flammable chemicals or chemical products by dilution with water), in a plant or works having a design production capacity of 200 t or more, but less than 20 000 t, a year. |
| ERA 75(b)(iv) | Waste disposal - disposing of regulated waste (other than limited regulated waste) whether alone or in combination with any waste mentioned in paragraph (a), if the facility is designed to receive waste at the rate of 200 000 t or more a year.                                                                                                                                                                                 |

<sup>1</sup> Permit includes licences, approvals, permits, authorisations, certificates, sanctions or equivalent/similar as required by legislation administered by the Environmental Protection Agency and the Queensland Parks and Wildlife Service

at premises/place described as:

| Lot on Plan         | Parish   |
|---------------------|----------|
| Lot 1 on RP608422   | Stanwell |
| Lot 177 on LN2465   | Stanwell |
| Lot 187 on LN801219 | Stanwell |
| Lot 1 on SP140243   | Stanwell |
| Lot 44 on SP140243  | Stanwell |

located at:

Stanwell Power Station  
Gracemere QLD 4702

### Additional information for applicants

The standard currency periods stated in section 3.5.21 of the Integrated Planning Act 1997 or the nominated currency period, apply to each aspect of development in this permit<sup>1</sup>. For information on when this permit<sup>1</sup> takes effect and the relevant currency periods, please see point 3 in the Notice of Decision.

### Contaminated Land

It is a requirement of the *Environmental Protection Act 1994* that if an owner or occupier of land becomes aware a Notifiable Activity (as defined by Schedule 2 of the *Environmental Protection Act 1994*) is being carried out on the land or that the land has been affected by a hazardous contaminant, they must, within 30 days after becoming so aware, give notice to the Environmental Protection Agency.

### Environmentally Relevant Activities

The aforementioned description of any environmentally relevant activity (ERA) for which this permit is issued is simply a restatement of the ERA as prescribed in the legislation at the time of issuing this permit. Where there is any conflict between the abovementioned description of the ERA for which this permit is issued and the conditions specified herein as to the scale, intensity or manner of carrying out of the ERA, then such conditions prevail to the extent of the inconsistency.

This permit authorises the ERA. It does not authorise environmental harm unless a condition within this permit explicitly authorises that harm. Where there is no such condition, or the permit is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

In addition to this permit, the person to carry out the ERA must be a registered operator under the Environmental Protection Act 1994. For the person to become a registered operator, they must apply for a registration certificate under section 73F of the Environmental Protection Act 1994.

sch4p3(3) Prejudice the protection of an individual's right to privacy

Don Arnold  
Delegate  
Environmental Protection Agency  
28 January 2009



## CONDITIONS OF APPROVAL

### ACTIVITY

- ERA 11(b) Crude oil storing or petroleum product storing - storing crude oil or petroleum product in tanks or containers having a combined total storage capacity of 500 000 L or more.
- ERA 15(b) Sewage treatment - operating a standard sewage treatment works having a peak design capacity to treat sewage of 100 or more equivalent persons but less than 1 500 equivalent persons.  
ERA 16 Municipal water treatment plant - treating water for domestic use (other than treatment that only involves disinfection).
- ERA 16 Municipal water treatment plant - treating water for domestic use (other than treatment that only involves disinfection).
- ERA 18(b) Power station other fuel - generating power by consuming fuel at a rated capacity of 10 MW electrical or more - for any other fuel.
- ERA 6(a) Chemical manufacturing, processing or mixing - manufacturing or processing an inorganic chemical, organic chemical or chemical product, or mixing inorganic chemicals, organic chemicals or chemical products (other than mixing non-combustible or non-flammable chemicals or chemical products by dilution with water), in a plant or works having a design production capacity of 200 t or more, but less than 20 000 t, a year.
- ERA 75(b)(iv) Waste disposal - disposing of regulated waste (other than limited regulated waste) whether alone or in combination with any waste mentioned in paragraph (a), if the facility is designed to receive waste at the rate of 200 000 t or more a year.



## SCHEDULE A - GENERAL CONDITIONS

### Compliance with Environmental Authority

#### Prevent and /or minimise likelihood of environmental harm

- (A 1) In carrying out the environmentally relevant activities, you must take all reasonable and practicable measures to prevent and / or to minimise the likelihood of environmental harm being caused. Any environmentally relevant activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this authority.

NOTE: This authority authorises the environmentally relevant activity. It does not authorise environmental harm unless a condition contained within this authority explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition or silence shall not be construed as authorising harm.

#### Maintenance of measures, plant and equipment

- (A 2) The holder must:
- install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; and
  - maintain such measures, plant and equipment in a proper and efficient condition; and
  - operate such measures, plant and equipment in a proper and efficient manner.
- (A 3) Contaminants must not be released to the environment other than in accordance with this environmental authority.

### Compliance with Application for Environmental Authority

#### Records

- (A4) Any record required to be kept by a condition of this environmental authority must be kept at the licensed place and be available for examination by an authorised person.
- (A5) Copies of any record required to be kept by a condition of this environmental authority must be provided to any authorised person or the Administering Authority on request.

#### Alterations

- (A6) No change, replacement or operation of any plant or equipment is permitted if the change, alteration or operation of the plant or equipment increases, or is likely to substantially increase, the risk of environmental harm or environmental nuisance.

## Integrated Environmental Management System

- (A7) The holder of this environmental authority must:
- maintain an Integrated Environmental Management System (IEMS) which provides for the effective management by the holder of the actual and potential environmental risks resulting from the carrying out of the activities
- (A8) The IEMS must provide for at least the following functions:
- Training staff in the awareness of environmental issues related to carrying out the activities, which must include at least:
  - The environmental policy of the holder, so that all persons that carry out the activities are aware of all relevant commitments to environmental management; and
  - Any relevant environmental objectives and targets, so that all staff are aware of the relevant performance objectives and can work towards these; and
  - Control procedures to be implemented for routine operations for day to day activities to minimise likelihood of environmental harm, however occasioned or caused; and
  - Contingency plans and emergency procedures to be implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including any necessary site rehabilitation); and
  - Organisational structure and responsibility to ensure that roles, responsibilities and authorities are appropriately defined to manage environmental issues effectively; and
  - Effective communication to ensure two-way communication on environmental matters between operational staff and higher management;
  - Their obligations in respect of monitoring, notification and record keeping obligations under the IEMS and relevant environmental authorities and/or development approvals; and
  - Monitoring of the release of contaminants into the environment including procedures, methods, record keeping and notification of results;
  - Conducting assessment of the environmental impact of any release of contaminants into the environment;
  - Regular review of environmental performance and procedures adopted; and
  - Waste prevention, treatment and disposal; and
  - A program for continuous improvement;
  - A stormwater management plan;
  - A waste management plan.
- (A9) The holder of this environmental authority must not implement an IEMS (including any environmental management plan) that contravenes any condition of this environmental authority or any development condition applicable to carrying out the activities.

## End of Conditions for Schedule A

## SCHEDULE B - AIR

### Release of Contaminants to the Atmosphere

- (B1) Except as otherwise provided by the conditions of the Air Schedule of this environmental authority the environmentally relevant activity/activities must be carried out by such reasonable and practicable means which may be necessary to prevent or minimise the release of contaminants to the atmosphere.
- (B2) Contaminants must only be released to the atmosphere from those release points specified in Schedule B - Table 1.
- (B3) Contaminants released from each release point specified in Schedule B - Table 1 must be directed vertically upwards without any impedance or hindrance.
- (B4) Contaminants must be released to the atmosphere from a release point at a height not less than the corresponding height stated for that release point in Schedule B - Table 1.
- (B5) Contaminants must not be released to the atmosphere from a release point at a concentration in excess of that stated in Schedule B - Table 2.

### Compliance with Emission Limits

- (B6) The particulate emission and nitrogen oxide limits set out in Schedule B – Table 2 are applicable when the power generating units are synchronised with the electricity grid as indicated by the generator circuit breaker being closed.
- (B7) The particulate emission limits set out in Schedule B – Table 2 are not applicable during dust burden correlation of the particulate emission meters. The administering authority must be notified at least one week prior to undertaking dust burden correlation of the particulate emission meters.

### Air Contaminant Monitoring Equipment Conditions

- (B8) Monitoring and recording devices are to be installed and operated to indicate to the plant operator the particulate and nitrogen oxide emission concentrations in the effluent gas at the prescribed measurement point, to produce a record of that information and to warn the plant operator with audible and visual alarms when the emission exceeds a level that, based on calibration data for the monitoring devices, indicates that the limits in Schedule B – Table 2 of this approval have been reached or exceeded.
- (B9) Monitoring of nitrogen oxides will be undertaken in accordance with Schedule H - Table 1 of this environmental authority.

### Liquid-Fuel Burning Conditions

- (B10) The total sulphur content of any fuel burned in industrial fuel burning equipment is not to exceed 1.5 percent by weight.

### Solid-Fuel Burning Conditions

- (B11) The total sulphur content of coal burned in the boilers is not to exceed 0.8 percent on a monthly weighted average basis.

- (B12) Biomass is permitted to be co-fired with black coal in the coal-fired pulverised fuel boilers. The proportion of biomass burnt must not exceed ten percent of the total fuel load at any one time.

**Materials Handling Conditions**

- (B13) Water sprays are to be installed and operated on the coal receiving system taking into account all reasonable and practicable measures to minimise the release of dust and particulate matter to the atmosphere.
- (B14) All external dry material transfer conveyers must be roofed and enclosed on two sides where there are no waters sprays.

**End of Conditions for Schedule B**

RTI DL RELEASE - EHP



## SCHEDULE C - WATER

### Release of Contaminants to Waters

- (C1) Except as otherwise provided by the conditions of the water schedule of this environmental authority the environmentally relevant activity/activities must be carried out by such practicable means which may be necessary to prevent or minimise the release of contaminants to waters.
- (C2) Other than in relation to the discharge to the Effluent Dam, Drains Reclaim Dam, Number 1, 2 and 3 Coal Stockpile Runoff Ponds, Chemical Drains Pond and Southern Stormwater Dam, contaminants must not be directly or indirectly released from the licensed place to any waters or the bed and banks of any waters except as permitted under the water schedule or as provided for in the IEMS stormwater management plan.

### Release Point

- (C3) The only contaminants permitted to be released from the licensed place at Monitoring Point 5 (MP5) are process waters and stormwater from the Northern Stormwater dam to waters described as an unnamed tributary of Quarry Creek. Monitoring Point 5 (MP5) is defined as the meter pit adjacent to the Northern Stormwater Dam at Stanwell Power Station.

### Monitoring Points

- (C4) For the purposes of checking compliance with conditions of this environmental authority relating to quality of wastes discharged, the Monitoring Points are defined as follows:

Monitoring Point 1 (MP1): Unit 1/2 Blowdown metering pit.

Monitoring Point 2 (MP2): Unit 3/4 Blowdown metering pit.

Monitoring Point 3 (MP3): Quarry Creek upstream from the Northern Stormwater Dam and within 100 metres of the dam.

Monitoring Point 4 (MP4): the point where Brickworks Road crosses Neerkol Creek.

Monitoring Point 5 (MP5): the meter pit adjacent to the Northern Stormwater Dam at Stanwell Power Station.

Monitoring Point 6 (MP6): the point where the Capricorn Highway crosses Neerkol Creek, adjacent to the flow-gauging station weir structure.

(Refer to Locations in Appendix 1, Appendix 2 and Appendix 3.)

### Quantity of Process Waters Released

- (C5) The quantity of process waters released during any day must not exceed 18,000 cubic metres measured as the combined total volume of water from Monitoring Points 1 and 2.

### Quality Characteristics Of Release to Waters

- (C6) The release of contaminants to waters must comply, at the sampling or measurement points, with each of the limits specified in Schedule C - Table 1 for each quality characteristic.

### Pump Stations

- (C8) Pump stations whose failure will result in a direct or indirect release of contaminants to waters must be fitted with stand-by pumps and pump-failure alarms. Pump failure alarms must be able to operate without mains power if such power failure occurs.
- (C9) The holder of this environmental authority shall notify the Administering Authority in the event of a sewage overflow which has reached the Northern or Southern Stormwater Dams.

### End of Conditions for Schedule C

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**SCHEDULE D - STORMWATER MANAGEMENT****Contaminant Releases Caused by Rainfall**

- (D1) Other than in relation to runoff into the Drains Reclaim Dam, runoff from the Coal Stockpile into the Coal Stockpile Runoff Ponds and runoff from the former landfill site and except as provided by the conditions of the stormwater management schedule and the water schedule of this environmental authority, the environmentally relevant activities must be carried out by such practicable means necessary to prevent or minimise the contact of incident rainfall and stormwater runoff with wastes or other contaminants, and prevent or minimise the release or likelihood of release of any such contaminated runoff from the licensed place.

**End of Conditions for Schedule D****SCHEDULE E - LAND****Release of Contaminants to Land**

- (E1) Except as otherwise provided by the conditions of the land application schedule of this environmental authority the environmentally relevant activities must be carried out by such practicable means necessary to prevent or minimise the release or likelihood of release of contaminants to land.

**End of Conditions for Schedule E****SCHEDULE F - NOISE****Release of Noise**

- (F1) For the purposes of the Environmental Protection (Noise) Policy the Nature Refuge, as shown on the attached map in Appendix 4, is not a noise sensitive place.

**End of Conditions for Schedule F****SCHEDULE G - WASTE MANAGEMENT****General**

- (G1) Waste must not be released to the environment, stored, transferred or disposed contrary to any condition of this environmental authority.
- (G2) Waste must not be burnt or allowed to burn on the licensed site or removed and burnt elsewhere unless specifically permitted by an environmental authority.
- (G3) An area must be set aside for the segregation and storage of recyclable solid wastes.
- (G4) Where a no-cost recycling service is available, recyclable waste must not be deposited in the general waste stream.



### Storage and Handling Conditions

- (G5) All liquid waste, chemical and above-ground petroleum product storage areas shall be bunded and maintained so as to be impervious to the material stored within it.
- (G6) All liquid waste, chemical and above-ground petroleum product storage tanks must be bunded so that the capacity of the bund is sufficient to contain at least 110 % of the volume of the largest storage tank.
- (G7) The holder of this environmental authority must ensure that any stormwater captured within bunded areas is treated to remove contaminants or wastes prior to any off-site release.
- (G8) The holder of this environmental authority shall install, conduct and maintain all petroleum product storage tanks in accordance with the provisions of Australian Standard 1940, entitled "The storage and handling of flammable and combustible liquids".
- (G9) All loading/unloading of bulk materials must take place only within designated vehicle loading/unloading areas.

### On-site Disposal of Wastes

- (G10) The holder of this environmental authority is permitted to dispose of on-site by combustion in the Station's boilers:
  - Used ion exchange resin from water treatment.
  - Exhausted oil and chemical sorbents.
  - Boiler and Superheater Chemical Clean iron and copper bearing waste solutions.

### Regulated Wastes

- (G11) All regulated wastes must only be stored, treated, or reprocessed within those areas designated for those purposes.

### Off Site Movement of Regulated Wastes

- (G12) Where regulated waste is removed from the licensed place (other than by a release as permitted under another schedule of this environmental authority), the holder of this environmental authority must monitor and record the following:

- (a) the date, quantity and type of waste removed; and
- (b) name of the waste transporter and/or disposal operator that removed the waste; and
- (c) the intended treatment/disposal destination of the waste.

(NOTE: Records of documents maintained in compliance with a waste tracking system established under the *Environmental Protection Act 1994* or any other law for regulated waste will be deemed to satisfy this condition).

- (G13) Regulated waste must not be sent for disposal at any facility without the written approval of the person operating that facility.
- (G14) The holder of this environmental authority must ensure that only a transporter possessing a current license granted by the Administering Authority for the transport of regulated waste shall be used for the removal of the licensed waste from the facility.



## End of Conditions for Schedule G

### SCHEDULE H - SELF MONITORING AND REPORTING

#### Complaint Recording

- (H1) All complaints received by the holder of this environmental authority relating to operations at the licensed place must be recorded in a log book with the following details:
- (i) time and date of complaint;
  - (ii) type of communication (telephone, letter, personal etc.);
  - (iii) name, contact address and contact telephone number of complainant (Note: if the complainant does not wish to be identified then "Not identified" is to be recorded);
  - (iv) response and investigation undertaken as a result of the complaint;
  - (v) name of person responsible for investigating complaint; and
  - (vi) action taken as a result of the complaint investigation and signature of responsible person.

#### Monitoring of Contaminant Releases to the Atmosphere

- (H2) The holder of this environmental authority must conduct and keep records of a monitoring program of contaminant releases to the atmosphere at the release points, frequency, and for the parameters specified in Schedule H -Table 1 and which complies with the following:
- (a) Monitoring provisions for the release points listed in Schedule H - Table 1 must comply with the Australian Standard 4323.1-1995 "Stationary Source Emission Methods 1: Selection of sampling positions" or more recent editions.
  - (b) The following monitoring must be performed for each required determination specified in Schedule H Table 1:
    - Particulates; and
    - Nitrogen Oxides.
  - (c) Where practicable, samples taken must be representative of the contaminants discharged under normal operating conditions.

#### Monitoring of Contaminant Releases to Waters

- (H3) Convenient access and suitable facilities for sampling the wastes shall be maintained at all reasonable times at Monitoring Points MP1, MP2 and MP5 by the holder of this environmental authority.
- (H4) The holder of this environmental authority shall be responsible for determinations of the quality of the contaminants released for the release points, quality characteristics, and at the frequency specified in Schedule H -Table 2.



**Report Submission**

- (H5) The holder of this environmental authority must ensure that the results of all monitoring performed in accordance with this environmental authority are submitted to the Administering Authority with the annual return.

**End of Conditions for Schedule H**

RTI DL RELEASE - EHP

## SCHEDULE I - DEFINITIONS

- (11) For the purposes of this environmental authority any term not otherwise defined in the Act and any subordinate legislation made pursuant to the Act or in the Definitions Schedule of this Environmental Authority has the meaning conferred to that term in its common usage.
- (12) In the event of any inconsistency arising between the meaning of any term provided in the Definitions Schedule of this Environmental Authority and any common usage of that term, the meaning conferred in the Definitions Schedule of this environmental authority must apply.

For the purposes of this environmental authority the following definitions apply:

- (13) "Act" means the Environmental Protection Act 1994.
- (14) "Administering Authority" means the Department of Environment and Heritage or its successor.
- (15) "Biomass" Biomass consists of timber or timber products limited to:
- (i) tree prunings, trimmings and other vegetation from municipal parks, gardens and private residences;
  - (ii) other timber and vegetation wastes collected at waste transfer stations in municipalities;
  - (iii) sawdust, shavings and by-products from manufactured wood operations;
  - (iv) forest and mill residues from softwood plantations; and
  - (v) demolition and construction waste materials such as broken timber, shipping pallets, packing crates and form-work;

or other such biomass materials which may be approved by the Administering Authority.

Biomass must not include chemically treated timber except where this is a minor constituent of the biomass and has been comingled at the waste source.

- (16) "continuous monitoring" means the use of automatic monitoring and recording instrumentation where data is logged at regular intervals, with a minimum data capture rate of 80%.
- (17) "normal cubic metre" ("Nm<sup>3</sup>") means the volume of dry gas which occupies 1 cubic metre at a temperature of zero degrees Celsius and at an absolute pressure of 101.3 kilopascals.
- (18) "grab" sample means one sample collected at any point in time.
- (19) "land" means land excluding water and the atmosphere.
- (110) "maximum" means that the measured value of the quality characteristic or contaminant must not be greater than the release limit stated.
- (111) "mg/L" means milligrams per litre.
- (112) "minimum" means that the measured value of the quality characteristic or contaminant must not be less than the release limit stated.



- (I13) "range" means that the measured value of the quality characteristic or contaminant must not be higher than the release limit stated nor lower than the lower release limit stated.
- (I14) "week" means from 00:00 hrs Monday to 24:00 hrs Sunday.
- (I15) "4-hour moving average" means a calculation based upon data collected over the previous 4 hours. It is updated at an interval of not more than 10 minutes.
- (I16) "Normal operating condition" is the normal operating state of the Unit and it means that the Unit is operating on a stable coal flame (three or more coal pulverisers in service and oil support is no longer necessary). For all practical purposes, this shall be defined as "at or above a load of 140MW" and when the power generating units are synchronised with the electricity grid as indicated by the generator circuit breaker being closed.

**End of Conditions for Schedule I**

RTI DL RELEASE - EHP



**SCHEDULE B -Table 1**  
**Release Point Description**

| Release Point (RP) Number | Source Description                                                   | Minimum Release Height (metres) |
|---------------------------|----------------------------------------------------------------------|---------------------------------|
| RP1<br>RP2<br>RP3<br>RP4  | Unit 1 Chimney<br>Unit 2 Chimney<br>Unit 3 Chimney<br>Unit 4 Chimney | 210 m above ground level        |

(Refer to Appendix 1 for a map of the Release Points – Location of Release Points and Monitoring Points.)

**SCHEDULE B - Table 2**  
**Release Point Maximum Permitted Concentration of Contaminant Release Limits**

| Release Point Number     | Contaminant     | Release Limit                                                                                                                                                              | Release Limit Units                                                                                              |
|--------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| RP1<br>RP2<br>RP3<br>RP4 | Particulates    | 4-hour moving average shall not exceed 0.080 g/Nm <sup>3</sup> for 90% of the values during any week<br><br>4-hour moving average shall not exceed 0.230 g/Nm <sup>3</sup> | g/m <sup>3</sup> of effluent gas at 0 °C and 101.32 kPa corrected to 12% by volume CO <sub>2</sub>               |
| RP1<br>RP2<br>RP3<br>RP4 | Nitrogen Oxides | 4-hour moving average shall not exceed 1.3 gNO <sub>2</sub> /Nm <sup>3</sup>                                                                                               | gNO <sub>2</sub> /m <sup>3</sup> of effluent gas at 0 °C and 101.32 kPa corrected to 7% by volume O <sub>2</sub> |

**SCHEDULE C - TABLE 1**  
**Release Quality Characteristic Limits**

| QUALITY CHARACTERISTICS                   | RELEASE/ MONITORING POINT NUMBER | DISCHARGE LIMIT                                                                               | LIMIT TYPE |
|-------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------|------------|
| Suspended Solids (mg/l)                   | MP5                              | 100 mg/L, except when the Suspended Solids level at Monitoring Point 3 (MP3) exceeds 100 mg/L | maximum    |
| pH (pH Units) <sup>1</sup>                | MP5                              | 6.5                                                                                           | minimum    |
| pH (pH Units) <sup>1</sup>                | MP5                              | 9.6                                                                                           | maximum    |
| Total Dissolved Salts (calculated) (mg/l) | MP5                              | 1450 mg/L                                                                                     | maximum    |
| Dissolved Oxygen (mg/l) <sup>1</sup>      | MP5                              | 2 mg/L                                                                                        | minimum    |
| Total Residual Oxidant (as Cl) (mg/l)     | MP5                              | 0.05 mg/L                                                                                     | maximum    |



|                                    |           |          |         |
|------------------------------------|-----------|----------|---------|
| Total Chloride (mg/l)              | MP5       | 400 mg/L | maximum |
| Suspended Solids                   | MP4 & MP6 | -        | -       |
| pH <sup>1</sup>                    | MP4 & MP6 | -        | -       |
| Total Dissolved Salts (calculated) | MP4 & MP6 | -        | -       |
| Dissolved Oxygen <sup>1</sup>      | MP4 & MP6 | -        | -       |
| Total Chloride                     | MP4 & MP6 | -        | -       |
| Temperature                        | MP4 & MP6 | -        | -       |

Note: <sup>1</sup> Quality characteristic monitored in situ.

Note: Refer to Appendix 2 and Appendix 3 for location of the monitoring points MP3, MP4, MP5 and MP6.

**Schedule H - Table 1**  
**Required Release Point Determinations**

| Release Point Numbers | Determination   | Frequency             |
|-----------------------|-----------------|-----------------------|
| RP1, RP2, RP3, RP4    | Particulates    | Continuous monitoring |
| RP1, RP2, RP3, RP4    | Nitrogen Oxides | Continuous monitoring |

RTI DL RELEASE - EHP

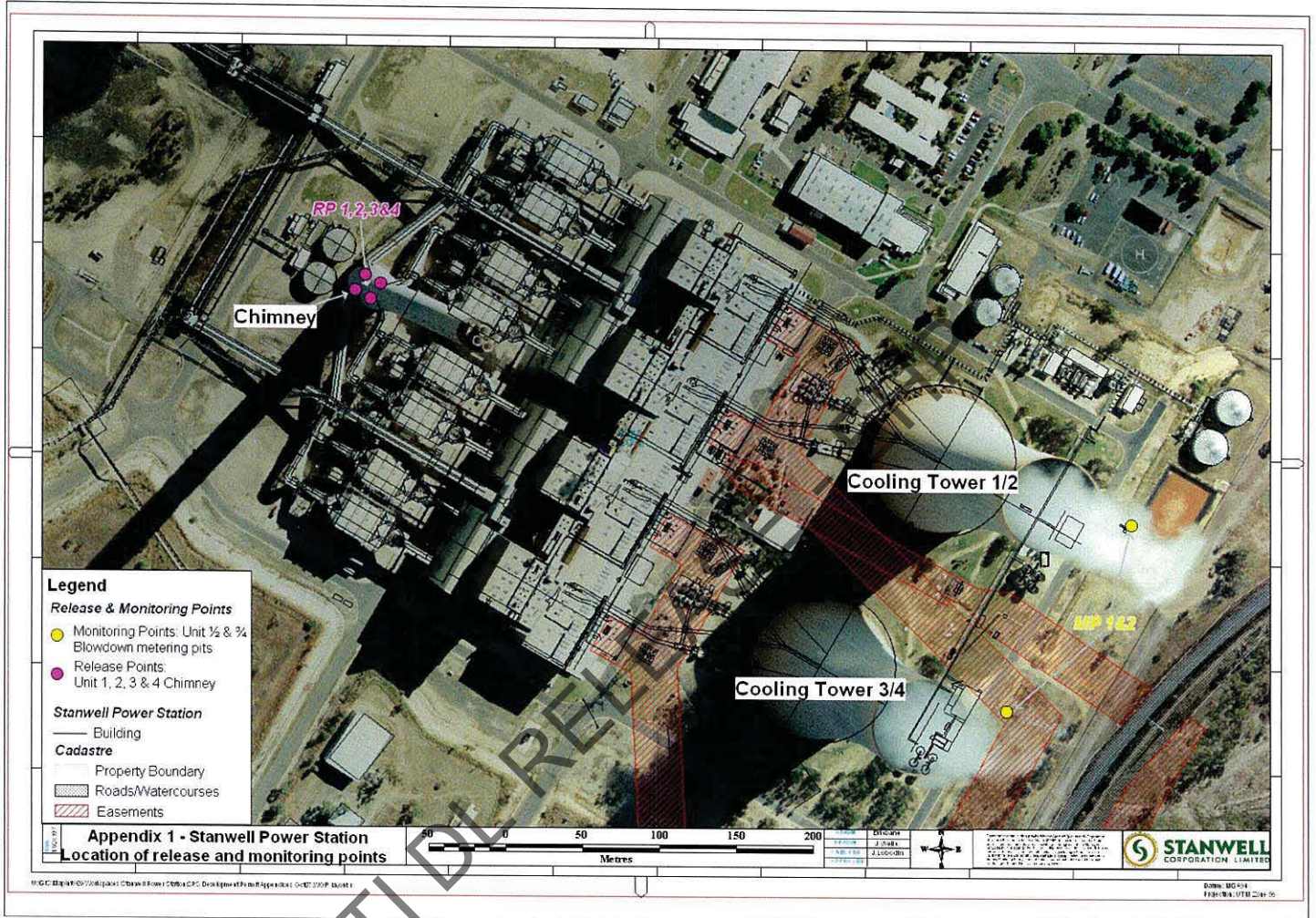


**SCHEDULE H – TABLE 2**  
**Required Release Point & Monitoring Point Determinations**

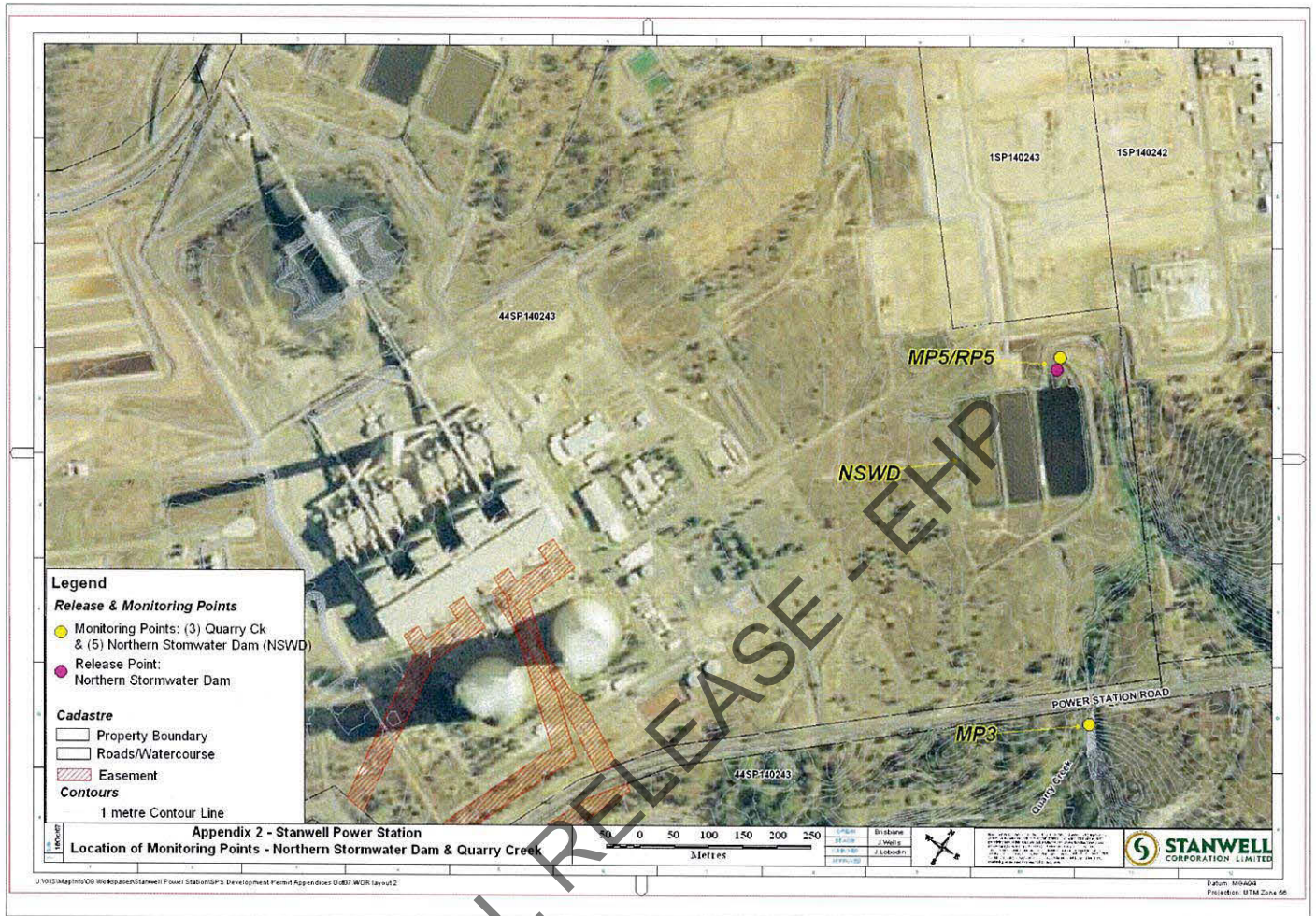
| Characteristic                                             | Monitoring & Release Points | Frequency |
|------------------------------------------------------------|-----------------------------|-----------|
| Quantity of process waters released (cubic meters per day) | MP1, MP2 & MP5              | Daily     |
| Suspended Solids                                           | MP3 & MP5                   | Weekly    |
| pH <sup>1</sup>                                            | MP5                         | Weekly    |
| Total Dissolved Salts (calculated)                         | MP5                         | Weekly    |
| Dissolved Oxygen <sup>1</sup>                              | MP5                         | Weekly    |
| Total Residual Oxidant (as C1)                             | MP5                         | Weekly    |
| Total Chloride                                             | MP5                         | Weekly    |
| Temperature                                                | MP5                         | Weekly    |
| Suspended Solids                                           | MP4 & MP6                   | Monthly   |
| pH <sup>1</sup>                                            | MP4 & MP6                   | Monthly   |
| Total Dissolved Salts (calculated)                         | MP4 & MP6                   | Monthly   |
| Dissolved Oxygen <sup>1</sup>                              | MP4 & MP6                   | Monthly   |
| Total Chloride                                             | MP4 & MP6                   | Monthly   |
| Temperature                                                | MP4 & MP6                   | Monthly   |

Note: <sup>1</sup> Quality characteristic monitored in situ.

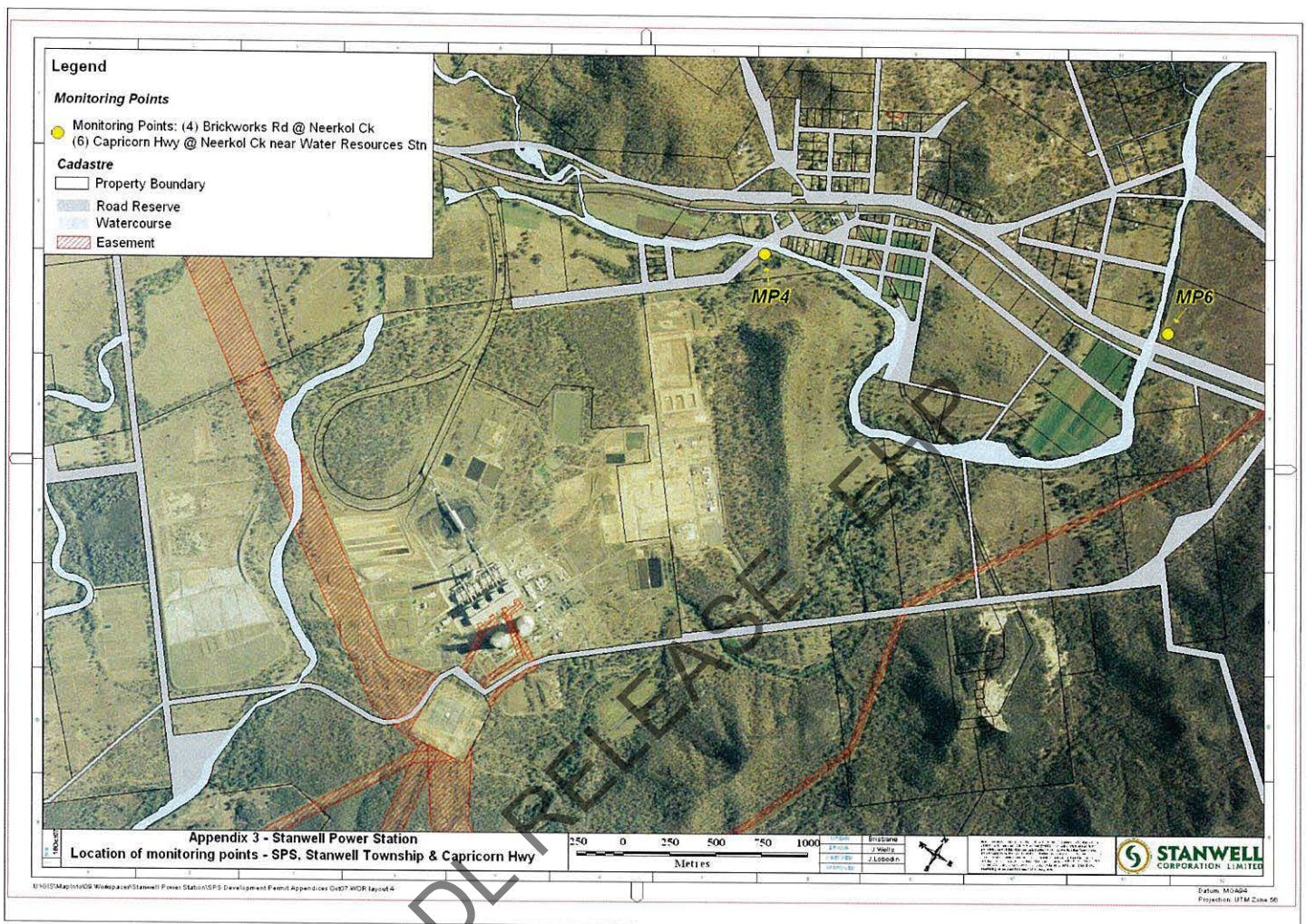
## Appendix 1



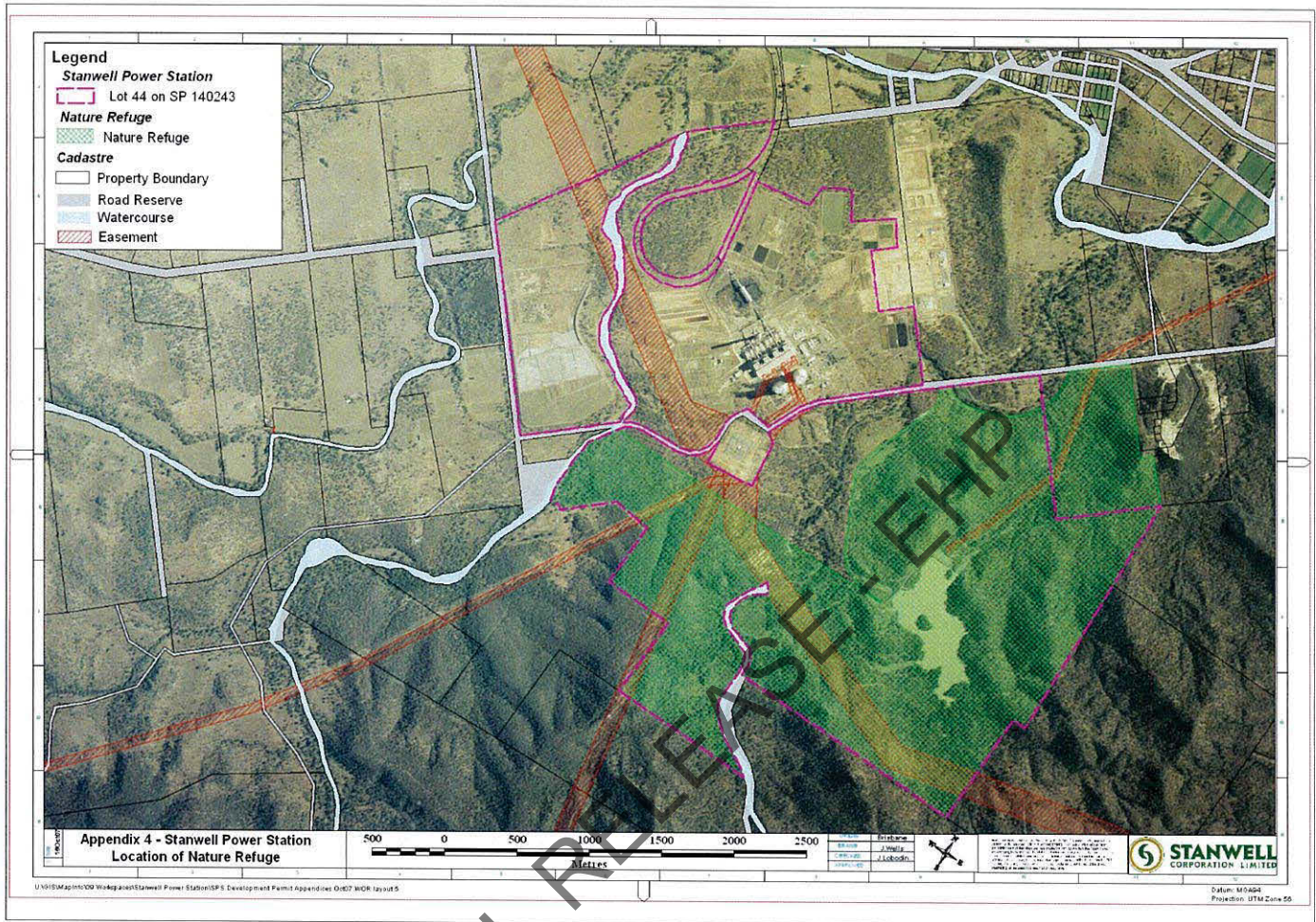
## Appendix 2



## Appendix 3



## Appendix 4



## Attachment 1

### Approved amendments to development approval conditions for DERM Permit No: IPDE00732207

Amendments approved by DERM and are detailed below:

#### SCHEDULE C - WATER

##### Monitoring Points

Add two new monitoring points to Condition C4:

(C4) Monitoring Point 7 (MP7): Raw water sampling point. Sampling to be undertaken at the inlet of the Clarified Raw Water Plant, or if the Clarified Raw Water Plant is not in service, at the inlet of the Raw Water Treatment Plant.

Monitoring Point 8 (MP8): Quarry Creek Riffle water sampling point. Sampling to be undertaken at Quarry Creek on the downstream side of the bridge below MP5.

##### Quantity of Process Waters Released

Add new conditions C5a and C5b:

(C5a) Between the dates of 29 July 2011 and 30 April 2012 where the EC of process water exceeds 500  $\mu\text{S}/\text{cm}$  at MP7, the quantity of process waters released during any one day must not exceed 40,000 cubic metres, measured as the combined total volume of water from Monitoring Points 1 and 2.

(C5b) If during the period where Condition C5a is active and the EC of raw process water measured at MP7 has subsequently returned below 500  $\mu\text{S}/\text{cm}$ , return to compliance with the release quantity detailed in Condition C5 is required, but only following three consecutive weeks where the EC at MP7 is below 500  $\mu\text{S}/\text{cm}$ .

### Quality Characteristics of Release to Waters

Add new conditions C6a and C6b:

- (C6a) Between the dates of 29 July 2011 and 30 April 2012 where the EC of process water exceeds 500  $\mu\text{S}/\text{cm}$  at MP7, the monitoring point for sampling of total residual oxidant (as Cl) to waters must change to Monitoring Point 8 (MP8).
- (C6b) If during the period where Condition C6a is active and the EC of raw process water measured at MP7 has subsequently returned below 500  $\mu\text{S}/\text{cm}$ , return to monitoring total residual oxidant (as Cl) at Monitoring Point 5 (MP5) is required, but only following three consecutive weeks where the EC at MP7 is below 500  $\mu\text{S}/\text{cm}$ .

### SCHEDULE I - DEFINITIONS

- (I17) " $\mu\text{S}/\text{cm}$ " means microsiemens per centimetre
- (I18) "EC" means electrical conductivity measured in microsiemens per centimetre

## Attachment 2

### Approved amendments to development approval conditions for Permit No: IPDE00732207

#### Development Activity Description

| ERA No. | Threshold | Description                                                                                                                                                                                                                                                                                                                                         |
|---------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14      | 2(b)      | <b>Electricity generation</b> – generating electricity by using a fuel, other than a gas, at a rated capacity of more than 150 MW electrical.                                                                                                                                                                                                       |
| 60      | 1(d)      | <b>Waste disposal</b> – operating a facility for disposing of, in a year, more than 200000 tonnes of only regulated waste, or regulated waste and any, or any combination of the following<br>(A) general waste;<br>(B) limited regulated waste;<br>(C) if the facility is in a scheduled area – no more than 5 tonnes of untreated clinical waste. |
| 63      | 2(b)(ii)  | <b>Sewage treatment</b> – operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 to 1500 EP and not to an infiltration trench, nor through an irrigation scheme                                                                                                                    |
| 64      | 3         | <b>Water treatment</b> – treating 10 ML or more raw water in a day                                                                                                                                                                                                                                                                                  |
| 7       | 3(b)      | <b>Chemical manufacturing</b> – manufacturing in a year, a total of 200 tonnes or more of agricultural chemical products or chemicals for biological control                                                                                                                                                                                        |
| 8       | 3(b)      | <b>Chemical storage</b> – storing more than 500 m <sup>3</sup> of chemicals of class C1 or C2 combustible liquids under AS1940 or dangerous goods class 3                                                                                                                                                                                           |

At premises described as:

| Lot on Plan         | County      | Parish   | Local Government     |
|---------------------|-------------|----------|----------------------|
| Lot 1 on RP608422   | Livingstone | Stanwell | Rockhampton Regional |
| Lot 1 on SP140243   | Livingstone | Stanwell | Rockhampton Regional |
| Lot 177 on LN2465   | Livingstone | Stanwell | Rockhampton Regional |
| Lot 44 on SP140243  | Livingstone | Stanwell | Rockhampton Regional |
| Lot 2 on RP801218   | Livingstone | Stanwell | Rockhampton Regional |
| Lot 187 on SP210610 | Livingstone | Stanwell | Rockhampton Regional |

Located at:

Stanwell Power Station  
Power Station Road  
Stanwell QLD 4702

sch4p3(3) Prejudice the  
protection of an individuals right  
to privacy

### Attachment 3

## Approved amendments to development approval conditions for Permit No: IPDE00732207

Amendments approved are detailed below:

### SCHEDULE C - WATER

#### Quantity of Process Waters Released

Amend conditions C5a and C5b:

- (C5a) Between the dates of 29 August 2012 and 30 April 2013 where the EC of process water exceeds 500  $\mu\text{S}/\text{cm}$  at MP7, the quantity of process waters released during any one day must not exceed 40,000 cubic metres, measured as the combined total volume of water from Monitoring Points 1 and 2.
- (C5b) If during the period where Condition C5a is active and the EC of raw process water measured at MP7 has subsequently returned below 500  $\mu\text{S}/\text{cm}$ , return to compliance with the release quantity detailed in Condition C5 is required, but only following three consecutive weeks where the EC at MP7 is below 500  $\mu\text{S}/\text{cm}$ .

#### Quality Characteristics of Release to Waters

Amend conditions C6a and C6b:

- (C6a) Between the dates of 29 August 2012 and 30 April 2013 where the EC of process water exceeds 500  $\mu\text{S}/\text{cm}$  at MP7, the monitoring point for sampling of total residual oxidant (as Cl) to waters must change to Monitoring Point 8 (MP8).
- (C6b) If during the period where Condition C6a is active and the EC of raw process water measured at MP7 has subsequently returned below 500  $\mu\text{S}/\text{cm}$ , return to monitoring total residual oxidant (as Cl) at Monitoring Point 5 (MP5) is required, but only following three consecutive weeks where the EC at MP7 is below 500  $\mu\text{S}/\text{cm}$ .

sch4p3(3) Prejudice the  
protection of an individuals  
right to privacy