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# **PORT HEDLAND GREEN STEEL PROJECT AIR EMISSIONS ASSESSMENT**



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# PORT HEDLAND GREEN STEEL PROJECT AIR EMISSIONS ASSESSMENT

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Prepared by **Maheshinderjeet Garg**  
Checked by **Martin Parsons**  
Approved by **Martin Parsons**

Ramboll  
Level 7  
41 St Georges Terrace  
Perth  
WA 6000  
Australia

T +61 8 9225 5199  
<https://ramboll.com>

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# 1. INTRODUCTION

## 1.1 Background

Port Hedland Green Steel Pty Ltd (PHGS) are evaluating the feasibility of developing a large-scale downstream processing capability at the Boodarie Strategic Industrial Area (BSIA) in Port Hedland, Western Australia, sourcing magnetite concentrate from iron ore operations in the Pilbara to produce Hot Briquetted Iron (HBI) for export to customers who will convert the HBI into a low carbon emission steel overseas. The project is called the Port Hedland Green Steel Project (Project). PHGS have commissioned Preston Consulting to engage and contract all relevant environmental studies.

PHGS plan to seek approval under Part IV of the Environmental Protection Act 1986 (EP Act) to enable the development of the Project. An air quality modelling assessment is required for the project and the Environmental Impact Assessment (EIA) process.

## 1.2 Purpose of this Report

This report presents the assessment of the potential air quality impacts arising from atmospheric emissions from the Project and the comparison against recognised Australian air quality standards. The following compounds have been considered in the air dispersion modelling assessment:

- Oxides of nitrogen (NO<sub>x</sub>), including nitrogen dioxide (NO<sub>2</sub>);
- Sulphur dioxide (SO<sub>2</sub>);
- Carbon monoxide (CO);
- Hydrogen sulphide (H<sub>2</sub>S); and
- Ammonia (NH<sub>3</sub>)

The approach, methodology and results of the predicted impacts are outlined in the following sections.

## 1.3 Site Description

The Project site is located within the Boodarie Strategic Industrial Area (BSIA), approximately 7 km from the Town of South Hedland and approximately 10 km south-west of Port Hedland in the Pilbara region Figure 1. The area surrounding the site of the Project is predominantly flat with sparse vegetation. The nearest residences to the site of the proposed Project are the South Hedland Rural Estate (Boodarie locality), Town of South Hedland and Boodarie Homestead.

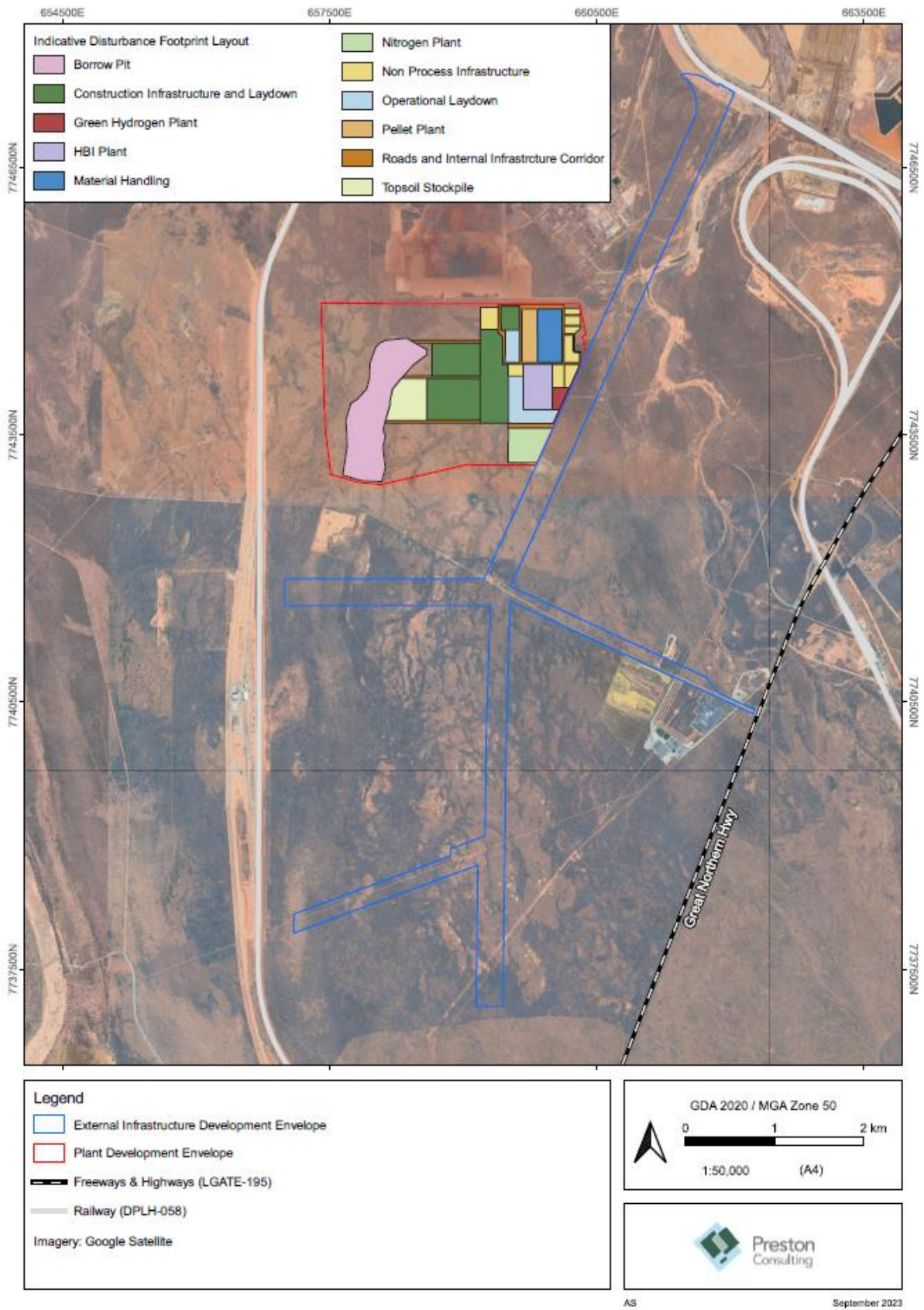


Figure 1: Project layout of Port Hedland Green Steel Project



### 1.4 Project Description

The Project will be developed in stages. Stage 1 of the Project will develop the Iron Ore Processing Facility consisting of a Pellet Plant which will consume approximately 3 - 3.5 million tonnes per annum (Mtpa) of iron ore (trucked in from iron ore operations in the Pilbara) and a HBI Plant which will further process approximately 2 Mtpa of the pellets into HBI (Stage 1). The disturbance footprint for Stage 1 of the Project will likely be around 300 - 400 hectares (ha) within the BSIA. A conceptual project layout for Stage 1 of the Project (Project Area) is detailed in Figure 2 (yellow outline).

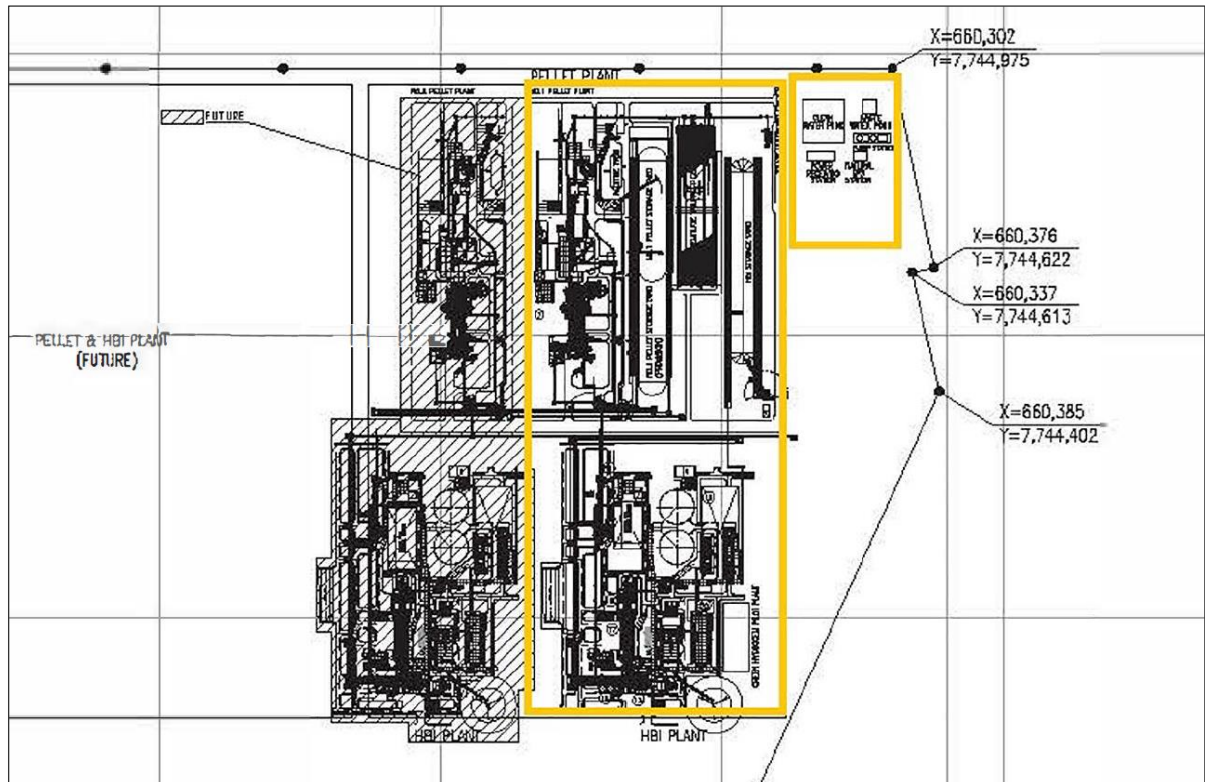


Figure 2: Conceptual project layout for Stage 1

## 2. EXISTING ENVIRONMENT

### 2.1 Regional Climate

The Port Hedland climate is a semi-desert tropical climate. Weather patterns are characterised by extremes in both temperature and rainfall. Tropical cyclonic activity generally occurs between November and March, although tropical cyclones can occur outside of this period (New Energy, 2012).

Local meteorological conditions at the site are influenced by coastal wind patterns, tropical cyclonic activity, and the low surface roughness of the surrounding environment. Winds are variable seasonally in direction and strength. The windiest conditions are experienced in summer, with winds generally prevailing from the north-west. West and north-westerly winds are dominant in summer, spring and most of autumn. In general, westerly winds are dominant in the morning, shifting to north-westerly in the afternoon, with an accompanying increase in speed. In winter, east to south-easterly winds are dominant in the mornings and shift to north-easterlies in the afternoon before easing in the evening in response to diurnal land temperature changes (New Energy, 2012).

Regional climate information was also obtained from the nearest Bureau of Meteorology (the Bureau) monitoring station to the site, Port Hedland Airport, for which the data shows that during the summer months (December to February) the maximum average temperatures can regularly reach upwards of 36°C and during the winter months (June to August) the minimum average temperatures can be as low as 12.5°C. The average maximum and minimum temperature plots can be seen below in Figure 3 and Figure 4 respectively.

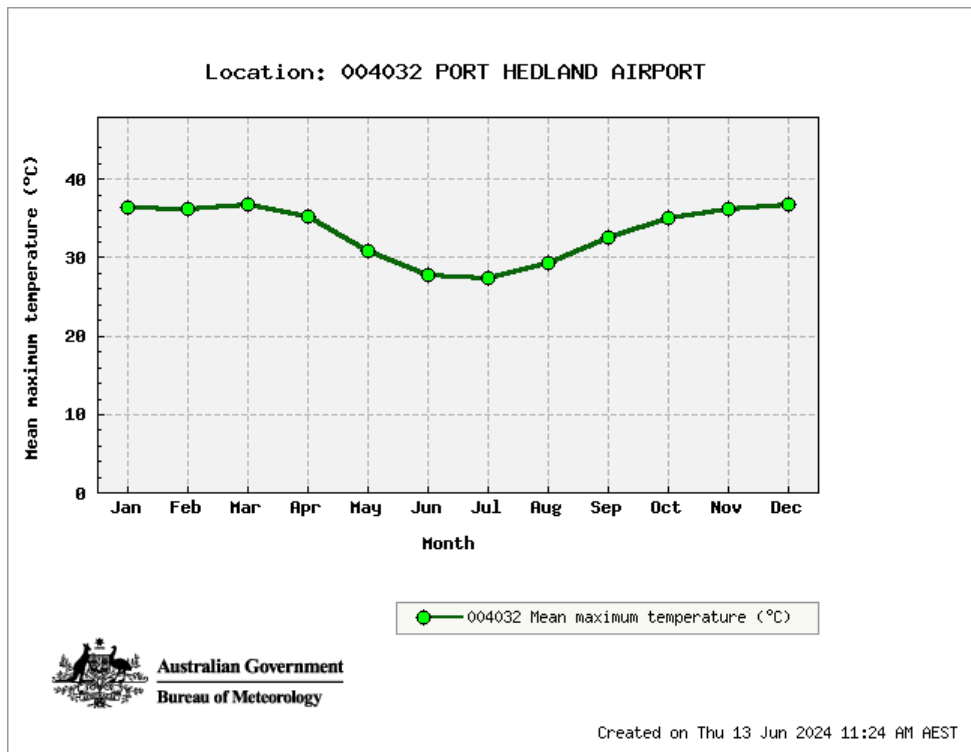


Figure 3: Mean Maximum Temperature Recorded at the Bureau Monitoring Site – Port Hedland Airport (1948 - 2024)

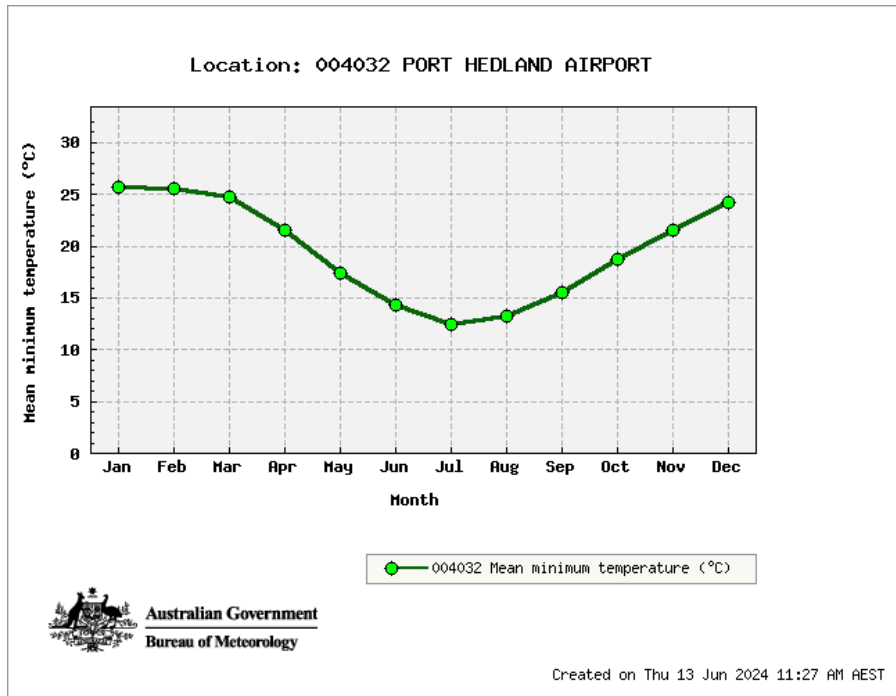


Figure 4: Mean Minimum Temperature Recorded at the Bureau Monitoring Site – Port Hedland Airport (1948 - 2024)

The annual average rainfall at the nearest meteorological station is 314 millimetres. The majority of the rainfall within the region occurs between December and March, and the remaining period September to November is usually dry with hot and sunny conditions (Figure 5).

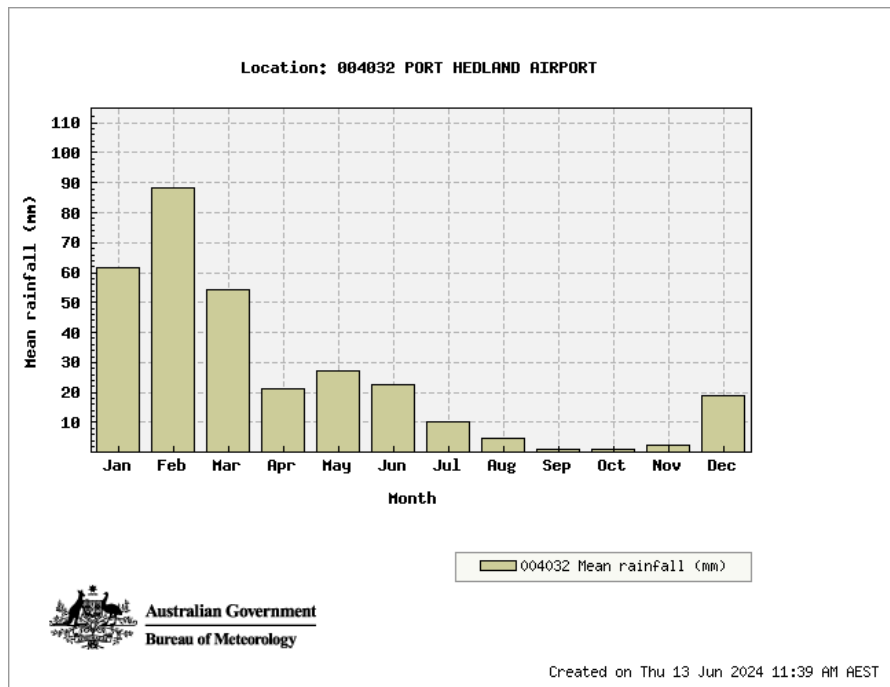


Figure 5: Mean Rainfall at the Bureau Monitoring Station – Port Hedland Airport (1948 - 2024)

### 3. AMBIENT AIR QUALITY

#### 3.1 Air Quality Criteria

The predicted ground level concentrations (GLCs) for each of the modelled scenarios was compared with the relevant ambient air quality criteria which included consideration to relevant guidance namely the Air Quality Modelling Guidance Notes (Department of Environment, March 2006), the draft Guideline: Air Emissions (DWER, October 2019) and the National Environment Protection Measures (NEPMs). The criteria included in this assessment are presented in Table 1.

It should be noted that on the 18<sup>th</sup> of May 2021, the National Environment Protection Council (NEPC) modified ambient standards for several pollutants, based on international guidance (NEPC, 2021). Relevant changes to the standards impacting the reporting of NO<sub>2</sub> include significantly strengthening NO<sub>2</sub> reporting standards for 1-hour and annual average NO<sub>2</sub> to 80 ppb and 15 ppb respectively, bringing forward standards initially proposed for 2025.

**Table 1: Ambient Air Quality Guideline values**

Pollutant	Averaging Period	Guideline ( $\mu\text{g}/\text{m}^3$ ) <sup>1</sup>	Reference
Carbon monoxide (CO)	1-hour	30,000	DWER (2019)
	8-Hours	10,000	NEPC (2021)
Nitrogen Dioxide (NO <sub>2</sub> )	1-hour	151	NEPC (2021)
	Annual	28	NEPC (2021)
Sulfur Dioxide (SO <sub>2</sub> )	1-hour	262	NEPC (2021)
	24-hour	52	NEPC (2021)
	Annual	52	DWER (2019)
Hydrogen Sulphide (H <sub>2</sub> S)	1-hour	2,800	DWER (2019)
	24-hour	150	DWER (2019)
	Annual	2	DWER (2019)
Ammonia (NH <sub>3</sub> )	1-hour	330	DWER (2019)

Notes

1. Referenced to 25°C, and 101.3 kPa.

#### 3.2 Existing air quality

A representative background concentration of pollutants nitrogen dioxide (NO<sub>2</sub>) and sulphur dioxide (SO<sub>2</sub>) in the Port Hedland region was required to assess potential cumulative impacts for the purposes of this study.

No specific guidance for selection of an appropriate background level is provided in Western Australia. Accordingly, in Victoria, the State Environment Protection Policy (Ambient Air Quality) (SEPP (AQM)) (EPA VIC, 2001) states that the 70<sup>th</sup> percentile concentration (concentration which is exceeded by 30% of concentrations for that averaging period) should be adopted as the background level.

The Port Hedland Industries Council (PHIC) has established a network of ambient air quality monitoring stations around the Port Hedland area. The network has been established to ensure that dust generated by port and industry operations does not adversely impact the Port Hedland community. The focus of the monitoring network is therefore on the measurement of particulates, however ambient NO<sub>2</sub> and SO<sub>2</sub> are being monitored at a number of locations to determine the relative change in the ambient concentration of these pollutants over time.

Live and historical data is available on Port Hedland air quality monitoring network website. The Taplin St station data provided the five-minute average concentration of the relevant background air quality data. The 70th percentile 1-hour and 24-hour average as well as the annual average concentrations for the pollutants of interest were obtained and are presented in Table 2.

**Table 2: Background Monitoring Concentrations – Port Hedland (Taplin St monitoring station)**

Compound	Averaging Period	Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>1</sup>
SO <sub>2</sub>	70 <sup>th</sup> Percentile 1-hour	2.6
	70 <sup>th</sup> Percentile 24-hour	2.6
	Annual Average	2.5
CO	70 <sup>th</sup> Percentile 1-hour	154
	70 <sup>th</sup> Percentile 8-hour	155
NO <sub>2</sub>	70 <sup>th</sup> Percentile 1-hour	33.2
	Annual Average	12.2

Notes

1. Referenced to 25°C, and 101.3 kPa.

## 4. AIR DISPERSION MODELLING AND METHODOLOGY

### 4.1 Air Dispersion Model

The air dispersion modelling was conducted using AERMOD (version 22112) which is a steady-state Gaussian (plume) model and is the recommended regulatory model for short range (<50 km) dispersion in the United States. AERMOD is used in widely in Australia for regulatory approvals applications and is accepted for use by the Department of Water and Environment Regulation (DWER). AERMOD is a current-generation air dispersion model that incorporates concepts such as planetary boundary layer theory and advanced methods for handling complex terrain. The utilization of AERMOD is consistent with the considerations of EIA outlined in the EPAs Environmental Factor Guideline for Air Quality (EPA, 2020).

### 4.2 Meteorological Data

A model ready meteorological dataset based on the PHIC Cumulative Air Model was provided by the PHIC was used for input into AERMOD. The annual average wind rose derived from the Port Hedland Airport meteorological dataset (2013) is presented as Figure 6.

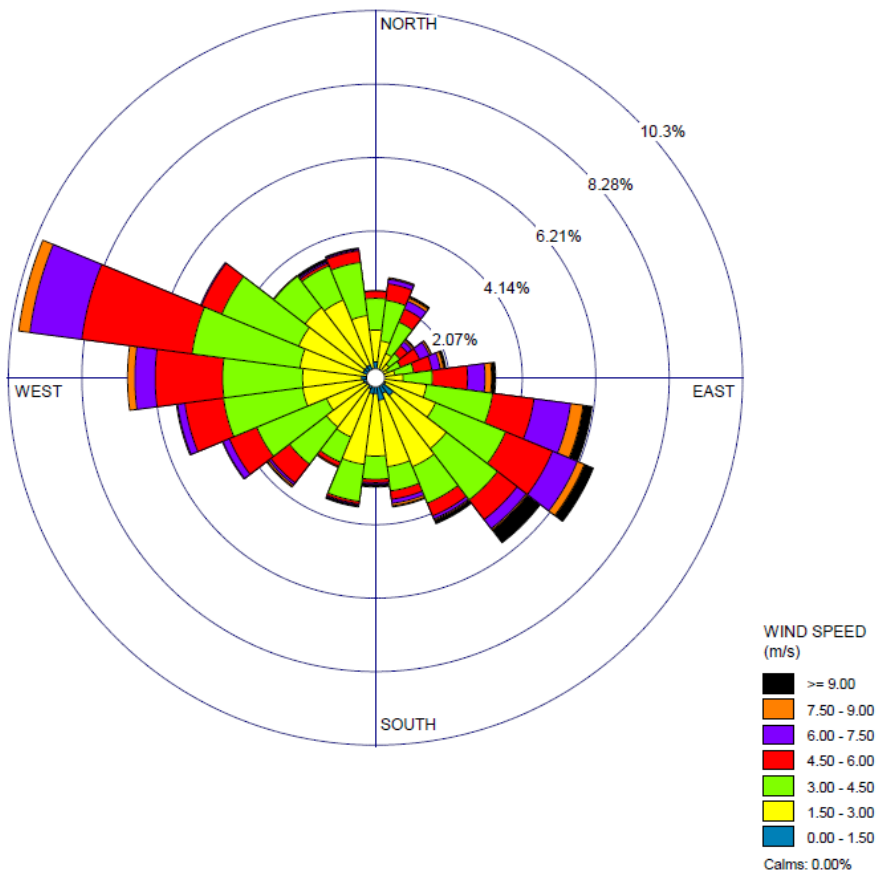


Figure 6: Windrose for Port Hedland Airport

## 4.3 Model Parameterisation

### 4.3.1 AERMOD

A summary of the receptor grid for air dispersion modelling is presented in Table 3. In addition to the grid, 10 discrete receptor locations, representing the sensitive receptor locations were also included.

**Table 3: AERMOD Grid Receptor Parameters**

Parameter	Grid
Dimensions	13 km x 10 km
Spacing	200 m
SW Easting <sup>1</sup> (mE)	656,500
SW Northing <sup>1</sup> (mN)	7,738,500
No. of Points	65 x 50

Notes

1. MGA94

Terrain elevation data for the model domain were obtained from the US National Aeronautics and Space Administration's (NASA) Shuttle Radar Topography Mission (SRTM3/SRTM1) and incorporated into AERMOD using the AERMAP terrain processor. Samples of the AERMOD input files are included as Appendix 1.

#### 4.3.1.1 Building Wake Effects

Building wake effects were incorporated into AERMOD using the Building Profile Input Program (BPIP) – Plume Rise Model Enhancements (PRIME) building algorithm. The locations and dimensions of buildings that have the potential to influence plume dispersion were supplied in the form of facility drawings by PHGS.

### 4.3.2 Receptor Locations

In addition to the gridded receptors for AERMOD, discrete receptors were positioned throughout the modelled domain to represent residential dwellings and recreational locations. These discrete receptors are summarised in Table 4 and shown in Figure 7.

**Table 4: Discrete Receptor Locations**

ID	Receptor	Easting (MGA94) (m)	Northing (MGA94) (m)
R1	Quartz Quarry Road, South Hedland Rural Estate	666,130	7,738,865
R2	Port Hedland Golf Club	664,308	7,743,142
R3	Wedgfield	665,655	7,745,537
R4	South Hedland Sports Complex	666,364	7,743,109
R5	Scadden Rd, South Hedland	666,298	7,742,616
R6	Colebatch Way, South Hedland	666,105	7,741,983
R7	Wambiri St, South Hedland	666,985	7,741,465
R8	Steamer Ave, South Hedland	667,325	7,740,973
R9	Cottier Dr (roundabout), South Hedland	667,487	7,742,749
R10	Parker St, South Hedland	666,900	7,744,025





Figure 7: Receptors location.



#### 4.4 Emission Estimates and Stack Parameters

A summary of the stack parameters and emissions data used in the modelling assessment is presented in Table 5. The physical stack parameters, exhaust characteristics and emission estimates for each emissions source were provided by PHGS.

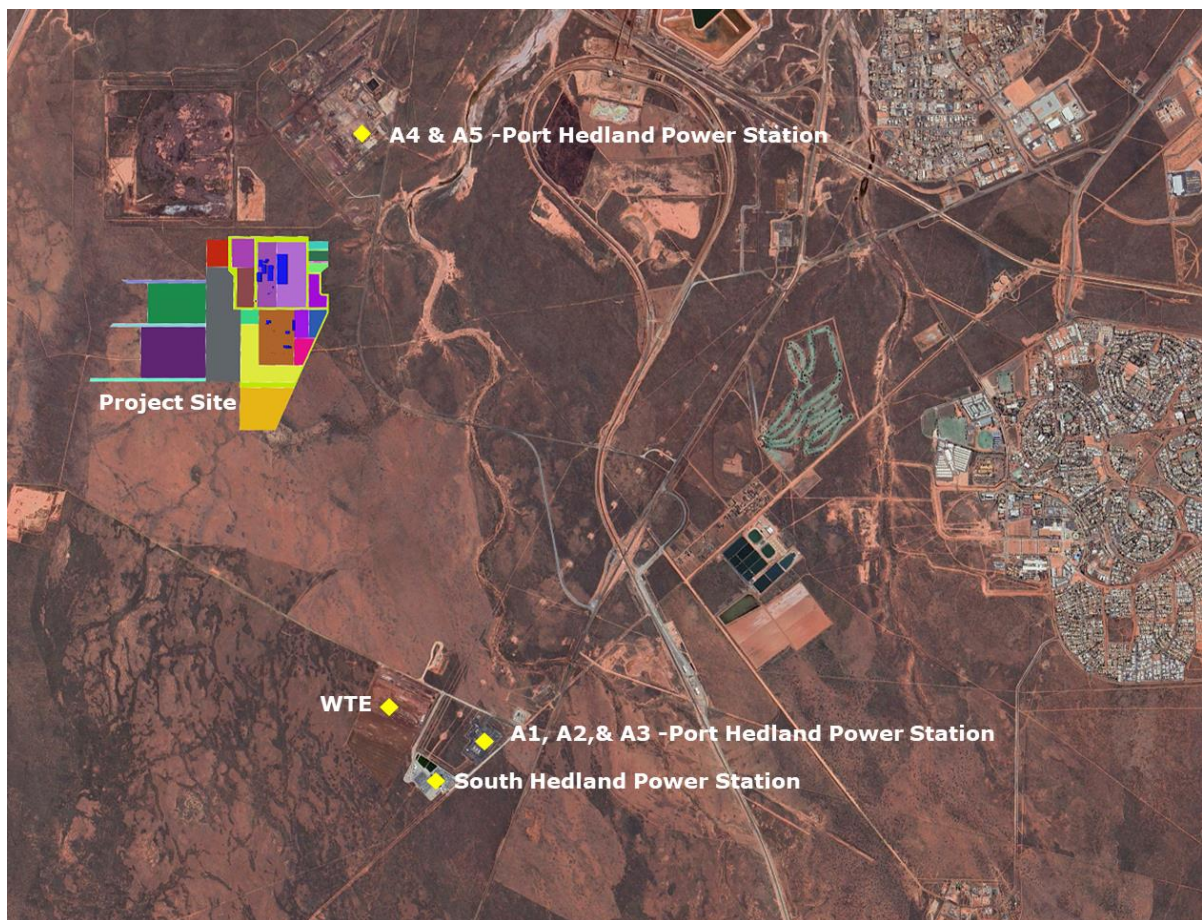
**Table 5: Summary of Source Parameters**

Parameter	Unit	Emission Point										
		Flue Gas Stack	Bottom seal gas dedusting	Briquette dedusting	Oxide screening dedusting	Vent pipe / stack	Degasser - Top Gas Weir Drain	Degasser – Top Gas Cone Drain	Degassing unit Process Water Clean	Cooling Towers for Clean Proc. Water	Oxide Coating Bin Vent Filter	Pellet Plant Main Exhaust Stack
<b>Emission point</b>	ID	E01	E03	E04	E05	E07	E08	E09	E10	E12	E13	SK-551
<b>Location</b>	mE	659,818	659,907	659,907	659,751	659,820	659,884	659,874	659,857	659,998	659,760	659,791
	mN	7,744,095	7,743,899	7,743,893	7,744,209	7,743,894	7,744,163	7,744,163	7,744,216	7,744,124	7,744,153	7,744,449
<b>Stack height</b>	m	60.0	30.0	30.0	30.0	137.2	20.0	20.0	17.5	12.0	20.0	50.0
<b>Chimney mouth diameter</b>	m	4.3	1.7	1.4	1.0	1.4	0.9	0.3	0.4	6.1	0.3	4.9
<b>Stack flow rate</b>	m <sup>3</sup> /s	271.0	21.0	31.0	15.7	30.2	18.7	2.1	2.9	318.0	0.6	358.9
<b>Stack temperature</b>	°C	358.0	56.0	30.0	35.0	98.0	80.0	80.0	40.0	40.0	25.0	101.0
<b>Stack exit velocity</b>	m/s	18.1	9.4	20.0	20.3	19.0	29.3	29.3	23.2	10.9	9.2	19.4
<b>Pollutant Emission Rate (g/s)</b>												
<b>CO</b>		5.6	61.8	70.1	-	57.1	16.1	1.8	5.2	-	-	-
<b>NO<sub>x</sub> (as NO<sub>2</sub>)</b>		10.6	0.1	0.5	-	-	-	-	-	-	-	7.9
<b>SO<sub>2</sub></b>		0.9	0.0	0.0	-	-	-	-	-	-	-	17.0
<b>NH<sub>3</sub></b>		-	0.1	0.6	-	0.51	0.29	0.03	0.013	2.9	-	0.5
<b>H<sub>2</sub>S</b>		-	-	-	-	-	0.07	0.008	0.013	-	-	-

#### 4.5 Other Emission Estimates and Stack Parameters

The cumulative impact due to background pollutant levels and other emission sources in the region needs to be taken into account to enable an assessment of overall compliance with the ambient criteria.

The approved and existing NO<sub>x</sub> gaseous emission sources in the region are included into the assessment to calculate the cumulative NO<sub>x</sub> concentrations as they are major sources of NO<sub>x</sub> gaseous emissions (Figure 8). These sources are South Hedland Power Station (existing), Port Hedland Power Station (existing), and New Energy Boodarie Waste to Energy (WTE) and Materials Recovery Facility (This has been approved but not built yet).



**Figure 8: Project site and other emission sources.**

TransAlta built, owns and operates South Hedland Power Station power station in the Pilbara region of Western Australia. This is 150-megawatt (MW) power station, generated by two Combined Cycle Gas Turbines (CCGT) units (108 MW combined), and one Open Cycle Gas Turbines (OCGT) unit (42 MW). The emissions information and stack release parameters for these sources has been sourced from previous air dispersion modelling reports (ENVIRON, 2014).

Alinta operates the Port Hedland Power Station, which is comprised of three 30 MW gas turbines (A1- A3) and two 30 MW gas turbines (A4 - A5) located approximately 5 km to the north. The emissions information and stack release parameters sources has been sourced from previous air dispersion modelling reports (ENVIRON, 2014).

New Energy has environmental regulatory approval for the Boodarie Waste to Energy and Materials Recovery Facility proposed to be located on a site adjacent to the South Hedland Power Station power station premises boundary. The emissions information and stack release parameters for this facility has been sourced from the Air Quality Impact Assessment report (Synergetics, 2012).

The emissions information and stack release parameters used as inputs to the modelling are presented in Table 6.

#### **4.6 Treatment of Oxides of Nitrogen**

Oxides of nitrogen are formed during high-temperature combustion processes from the oxidation of nitrogen in the air or fuel.  $\text{NO}_x$  from combustion consists largely of nitrogen oxide (NO) and partly of  $\text{NO}_2$ . After emission from the stack, NO is transformed to  $\text{NO}_2$  through oxidation with atmospheric ozone. Ramboll has assumed 100% conversion of NO to  $\text{NO}_2$ . It is the most conservative method as specified by the NSW Environment Protection Authority (NSW EPA, 2016).

**Table 6: Summary of other Emission Source Parameters**

Parameter	Units	Emission Point								
		South Hedland Power Station			Port Hedland Power Station					WTE
<b>Emission point (ID)</b>	ID	OC1	CC1	CC2	A1	A2	A3	A4	A5	WTE
<b>Location</b>	mE	661,308	661,338	661,361	661,653	661,675	661,696	660,573	660,580	660,600
	mN	7,740,080	7,740,065	7,740,041	7,740,278	7,740,262	7,740,246	7,745,894	7,745,887	7,740,800
<b>Stack height</b>	m	25.0	35.0	35.0	13.0	13.0	13.0	15.5	15.5	30.0
<b>Chimney mouth diameter</b>	m	3.2	2.3	2.3	3.2	3.2	3.2	3.5	3.5	2.5
<b>Stack temperature</b>	°C	33.9	33.9	33.9	38.1	38.1	38.1	24.4	24.4	17.9
<b>Stack exit velocity</b>	m/s	743.2	383.2	383.2	773.0	773.0	773.0	813.0	813.0	438.0
<b>NO<sub>x</sub> (as NO<sub>2</sub>) Emission Rate (g/s)</b>		5.6	5.6	5.6	10.3	10.3	10.3	14.4	14.4	2.7

## 5. MODELLING RESULTS

### 5.1 The Project in isolation

The maximum GLCs across the model domain and at the nominated receptor locations have been predicted for the proposed Project. The maximum predicted average concentrations (in isolation and cumulatively) at sensitive receptor locations for each pollutant of concern was compared against their respective ambient air quality criteria and are presented in Table 7 to Table 11.

The results of the modelling indicate that the air quality impacts due to emissions from the Project in isolation are predicted to be well below the relevant ambient criteria at the receptor locations. No exceedances were predicted at any of the sensitive receptors for the compounds of interest.

### 5.2 Cumulative impact Assessment

Where ambient monitoring data is available for the compounds of interest, this has been used to determine the cumulative impacts of the Project at the sensitive receptor locations.

Background monitoring data was available for NO<sub>2</sub>, SO<sub>2</sub> and CO.

The cumulative impact of NO<sub>x</sub> emissions from the Project and other sources and other approved sources within the region have been evaluated using air dispersion modelling results. Ambient monitoring data available for NO<sub>2</sub> has been used, together with model predictions, to determine the cumulative impacts of the Project at the receptor locations.

Table 9 presents the cumulative maximum 1-hour average and annual average NO<sub>2</sub> GLCs at the receptor locations. No exceedances of the maximum 1-hour average and annual average NO<sub>2</sub> guideline were predicted. The maximum predicted cumulative 1-hour average GLCs at sensitive receptor (R1) for NO<sub>2</sub> was 36 µg/m<sup>3</sup> (23.7% of the 1-hour NO<sub>2</sub> ambient air quality guideline). The maximum predicted cumulative annual average GLCs at sensitive receptor (R1) for NO<sub>2</sub> was 12.8 µg/m<sup>3</sup>, which was 45.7% of the ambient air quality guideline.

Model predictions indicate that the GLCs of NO<sub>2</sub> at the receptor locations will increase marginally due to emissions from the proposed Project. The increase in the maximum 1-hour average GLCs of NO<sub>2</sub> at receptor locations is predicted to be less than 3 µg/m<sup>3</sup>. This increase is not considered to be significant when compared to existing air quality and the relevant ambient air quality criteria.

For SO<sub>2</sub> and CO, only the background data was used to calculate the cumulative impacts as there are no other major point sources of SO<sub>2</sub> and CO in the region. Table 7 presents cumulative maximum 1-hour average and annual average CO GLCs at the receptor locations and Table 8 presents the cumulative maximum 1-hour average, 24-hour average and annual average SO<sub>2</sub> GLCs at the receptor locations. No exceedances of the CO short-term (1-hour) or mid-term (8-hour) averaging period guidelines were predicted. Similarly, no exceedances of the SO<sub>2</sub> 1-hour, 24-hour average and annual averaging period guidelines were predicted.

Contour plots of the cumulative predicted NO<sub>2</sub>, SO<sub>2</sub> and CO GLCs are presented in Figure 9 to Figure 15.

**Table 7: Predicted CO – GLCs for 1-hr and 8-hur Averaging Periods at Receptors**

CO - 1 hr Averaging period						
Receptor	Guideline (µg/m³)	Maximum Predicted GLCs in Isolation		Background (µg/m³)	Cumulative Maximum Predicted GLCs	
		AERMOD (µg/m³)	% of Guideline		AERMOD (µg/m³)	% of Guideline
R1	30,000	391.4	1.3%	154	545	1.8%
R2	30,000	636.0	2.1%	154	790	2.6%
R3	30,000	681.5	2.3%	154	836	2.8%
R4	30,000	606.3	2.0%	154	760	2.5%
R5	30,000	632.3	2.1%	154	786	2.6%
R6	30,000	573.1	1.9%	154	727	2.4%
R7	30,000	605.2	2.0%	154	759	2.5%
R8	30,000	582.1	1.9%	154	736	2.5%
R9	30,000	487.7	1.6%	154	642	2.1%
R10	30,000	622.6	2.1%	154	777	2.6%
CO - 8 hr Averaging period						
Receptor	Guideline (µg/m³)	Maximum Predicted GLCs in Isolation		Background (µg/m³)	Cumulative Maximum Predicted GLCs	
		AERMOD (µg/m³)	% of Guideline		AERMOD (µg/m³)	% of Guideline
R1	10,000	68.5	0.7%	156	224	2.2%
R2	10,000	361.0	3.6%	156	517	5.2%
R3	10,000	171.6	1.7%	156	327	3.3%
R4	10,000	218.6	2.2%	156	374	3.7%
R5	10,000	313.4	3.1%	156	469	4.7%
R6	10,000	173.2	1.7%	156	329	3.3%
R7	10,000	165.2	1.7%	156	321	3.2%
R8	10,000	145.5	1.5%	156	301	3.0%
R9	10,000	258.0	2.6%	156	414	4.1%
R10	10,000	218.6	2.2%	156	374	3.7%

Note:

1. All values referenced at 25°C and 1 atm.

**Table 8: Predicted SO<sub>2</sub> – GLCs for 1-hr, 24-hr and Annual Averaging Periods at Receptors**

SO <sub>2</sub> - 1 hr Averaging period						
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation		Background (µg/m <sup>3</sup> ) <sup>2</sup>	Cumulative Maximum Predicted GLCs	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	52	6.3	12.1%	2.6	8.9	17.1%
R2	52	5.4	10.3%	2.6	8.0	15.3%
R3	52	5.1	9.9%	2.6	7.7	14.9%
R4	52	4.8	9.3%	2.6	7.4	14.3%
R5	52	5.0	9.5%	2.6	7.6	14.5%
R6	52	5.7	11.0%	2.6	8.3	16.0%
R7	52	5.3	10.2%	2.6	7.9	15.2%
R8	52	5.6	10.7%	2.6	8.2	15.7%
R9	52	4.5	8.6%	2.6	7.1	13.6%
R10	52	5.6	10.7%	2.6	8.2	15.7%
SO <sub>2</sub> - 24 hr Averaging period						
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation		Background (µg/m <sup>3</sup> ) <sup>2</sup>	Cumulative Maximum Predicted GLCs	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	52	3.4	6.5%	2.6	6.0	11.5%
R2	52	3.0	5.7%	2.6	5.6	10.7%
R3	52	2.4	4.6%	2.6	5.0	9.6%
R4	52	3.0	5.8%	2.6	5.6	10.8%
R5	52	3.3	6.4%	2.6	5.9	11.4%
R6	52	2.6	5.0%	2.6	5.2	10.0%
R7	52	3.0	5.8%	2.6	5.6	10.8%
R8	52	2.8	5.4%	2.6	5.4	10.4%
R9	52	2.7	5.1%	2.6	5.3	10.1%
R10	52	2.7	5.1%	2.6	5.3	10.1%
SO <sub>2</sub> - Annual Average						
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation		Background (µg/m <sup>3</sup> ) <sup>2</sup>	Cumulative Maximum Predicted GLCs	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	10,310	0.1	0.0%	2.5	2.6	0.0%
R2	10,310	0.2	0.0%	2.5	2.7	0.0%
R3	10,310	0.1	0.0%	2.5	2.6	0.0%
R4	10,310	0.1	0.0%	2.5	2.6	0.0%
R5	10,310	0.1	0.0%	2.5	2.6	0.0%
R6	10,310	0.1	0.0%	2.5	2.6	0.0%
R7	10,310	0.1	0.0%	2.5	2.6	0.0%
R8	10,310	0.1	0.0%	2.5	2.6	0.0%
R9	10,310	0.1	0.0%	2.5	2.6	0.0%
R10	10,310	0.1	0.0%	2.5	2.6	0.0%

Note:

1. All values referenced at 25°C and 1 atm.

**Table 9: Predicted NO<sub>2</sub> – GLCs for 1-hr and Annual Averaging Periods at Receptors**

NO <sub>2</sub> - 1 hr Averaging period							
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation		Maximum Predicted GLCs with Existing Sources	Background (µg/m <sup>3</sup> ) <sup>2</sup>	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline			AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	151	2.6	1.7%	13.4	33	36	23.7%
R2	151	0.2	0.2%	15.0	33	33	22.1%
R3	151	0.2	0.1%	22.0	33	33	22.1%
R4	151	0.1	0.0%	17.4	33	33	22.0%
R5	151	0.1	0.1%	18.0	33	33	22.0%
R6	151	0.1	0.1%	16.4	33	33	22.0%
R7	151	1.3	0.8%	13.7	33	34	22.8%
R8	151	1.0	0.7%	13.2	33	34	22.7%
R9	151	0.1	0.1%	15.9	33	33	22.0%
R10	151	0.1	0.1%	16.8	33	33	22.1%
NO <sub>2</sub> - Annual Averaging period							
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation		Maximum Predicted GLCs with Existing Sources	Background (µg/m <sup>3</sup> ) <sup>2</sup>	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline			AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	28.0	0.1	0.3%	0.5	12.2	12.8	45.6%
R2	28.0	0.2	0.8%	0.4	12.2	12.7	45.5%
R3	28.0	0.1	0.3%	0.3	12.2	12.6	44.9%
R4	28.0	0.1	0.5%	0.4	12.2	12.7	45.2%
R5	28.0	0.1	0.5%	0.4	12.2	12.7	45.3%
R6	28.0	0.1	0.5%	0.4	12.2	12.7	45.2%
R7	28.0	0.1	0.4%	0.4	12.2	12.6	45.1%
R8	28.0	0.1	0.4%	0.4	12.2	12.6	45.1%
R9	28.0	0.1	0.4%	0.4	12.2	12.7	45.2%
R10	28.0	0.1	0.4%	0.4	12.2	12.6	45.1%

Note:

1. All values referenced at 25°C and 1 atm.



**Table 10: Predicted H<sub>2</sub>S – GLCs for 1-hr, 24 hr and Annual Averaging Periods at Receptors**

H <sub>2</sub> S - 1 hr Averaging period			
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	2,800	0.2	0.01%
R2	2,800	0.4	0.01%
R3	2,800	0.3	0.01%
R4	2,800	0.3	0.01%
R5	2,800	0.3	0.01%
R6	2,800	0.3	0.01%
R7	2,800	0.3	0.01%
R8	2,800	0.2	0.01%
R9	2,800	0.3	0.01%
R10	2,800	0.3	0.01%
H <sub>2</sub> S - 24 hr Averaging period			
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	150	0.0	0.01%
R2	150	0.1	0.05%
R3	150	0.0	0.02%
R4	150	0.1	0.04%
R5	150	0.1	0.04%
R6	150	0.1	0.04%
R7	150	0.1	0.04%
R8	150	0.0	0.03%
R9	150	0.1	0.04%
R10	150	0.0	0.02%
H <sub>2</sub> S - Annual Average			
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	2	0.0	0.07%
R2	2	0.0	0.44%
R3	2	0.0	0.31%
R4	2	0.0	0.32%
R5	2	0.0	0.32%
R6	2	0.0	0.23%
R7	2	0.0	0.19%
R8	2	0.0	0.14%
R9	2	0.0	0.27%
R10	2	0.0	0.25%

Note:

1. All values referenced at 25°C and 1 atm.

**Table 11: Predicted NH<sub>3</sub> – GLCs for 1-hr Annual Averaging Periods at Receptors**

NH <sub>3</sub> - 1 hr Averaging period			
Receptor	Guideline (µg/m <sup>3</sup> )	Maximum Predicted GLCs in Isolation	
		AERMOD (µg/m <sup>3</sup> )	% of Guideline
R1	330	6.5	2.0%
R2	330	26.9	8.2%
R3	330	9.1	2.7%
R4	330	9.1	2.8%
R5	330	13.6	4.1%
R6	330	16.0	4.9%
R7	330	9.5	2.9%
R8	330	8.9	2.7%
R9	330	8.0	2.4%
R10	330	7.0	2.1%

Note:

1. All values referenced at 25°C and 1 atm.

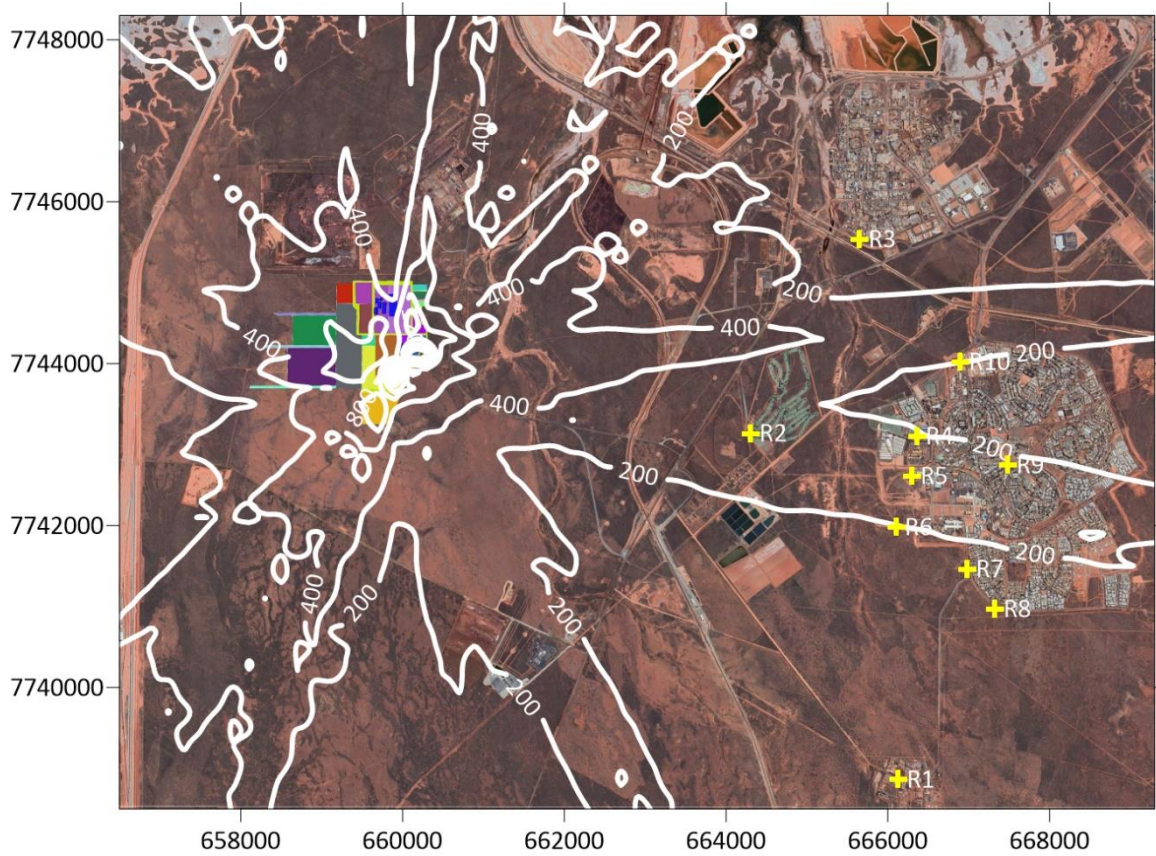


Figure 9: Cumulative 8-hr Max Average CO GLC ( $\mu\text{g}/\text{m}^3$ ) Contour Plot (Guideline:  $10,000 \mu\text{g}/\text{m}^3$ )

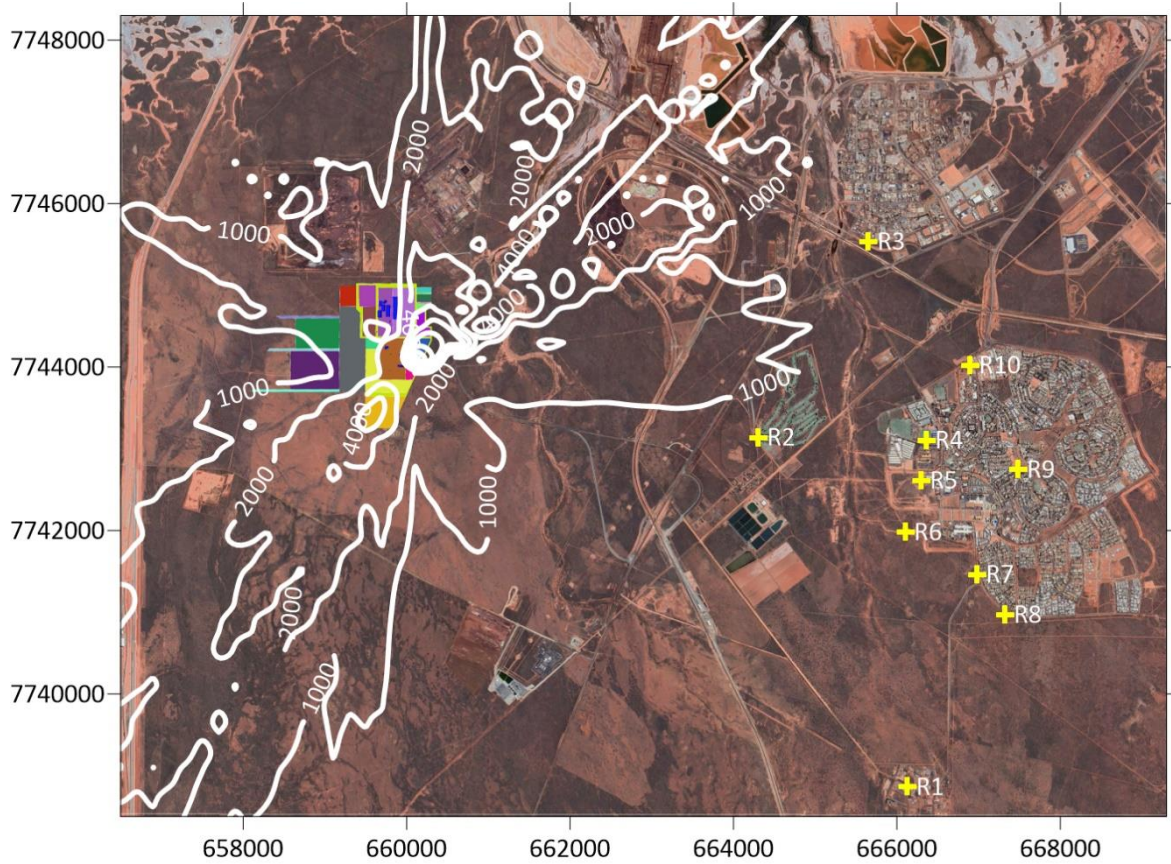


Figure 10: Cumulative 1-hr Max Average CO GLC ( $\mu\text{g}/\text{m}^3$ ) Contour Plot (Guideline: 30,000  $\mu\text{g}/\text{m}^3$ )



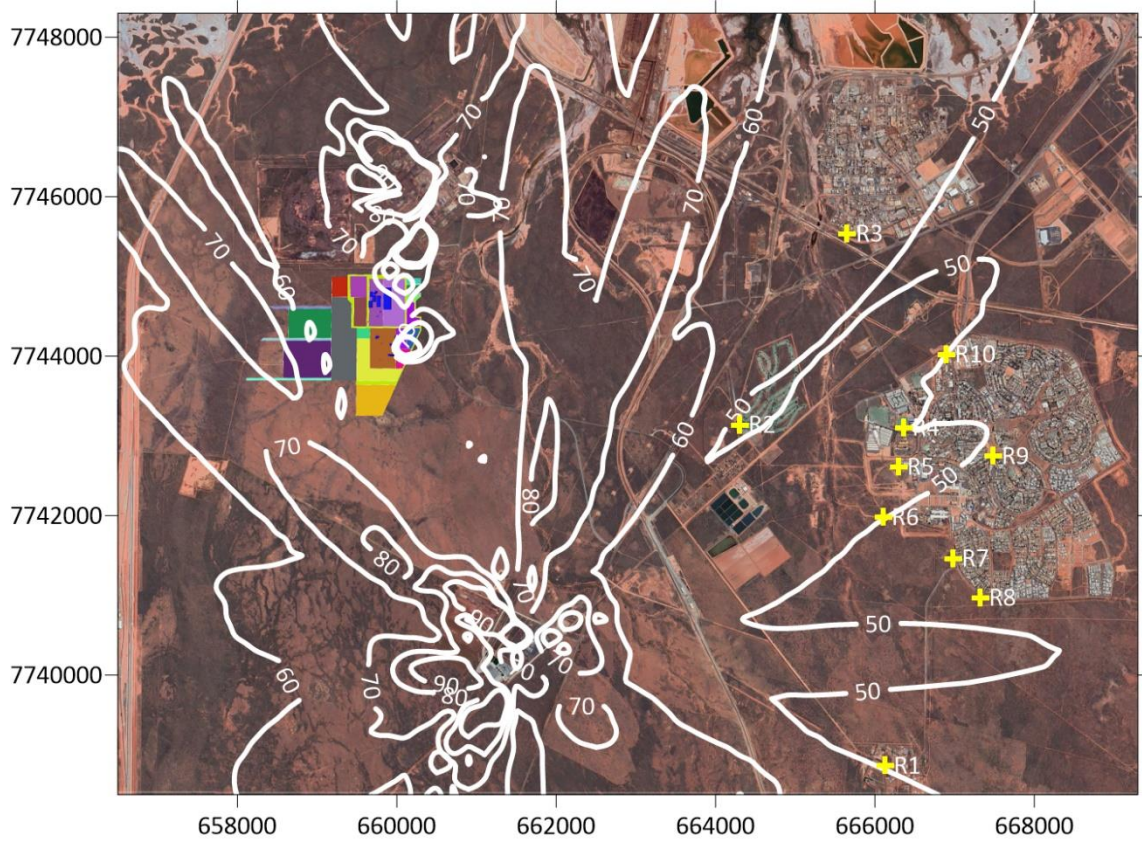


Figure 11: Cumulative 1-hr Max Average NO<sub>2</sub> GLC (µg/m<sup>3</sup>) Contour Plot (Guideline: 151 µg/m<sup>3</sup>)

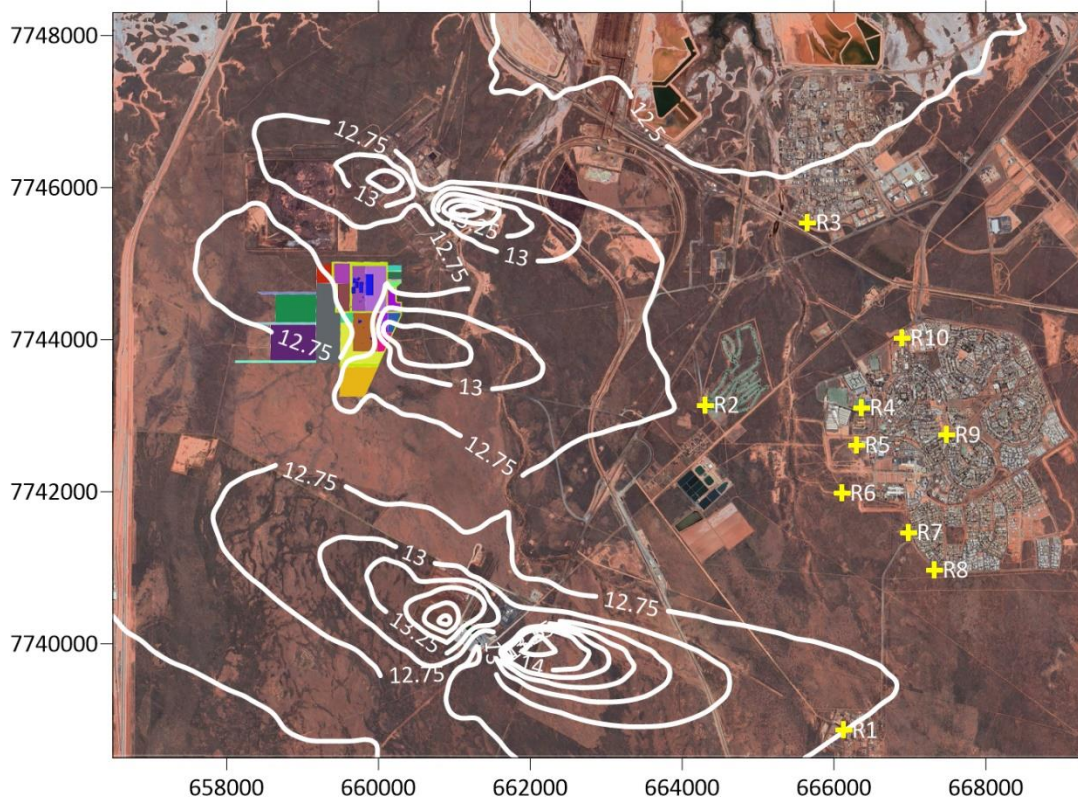
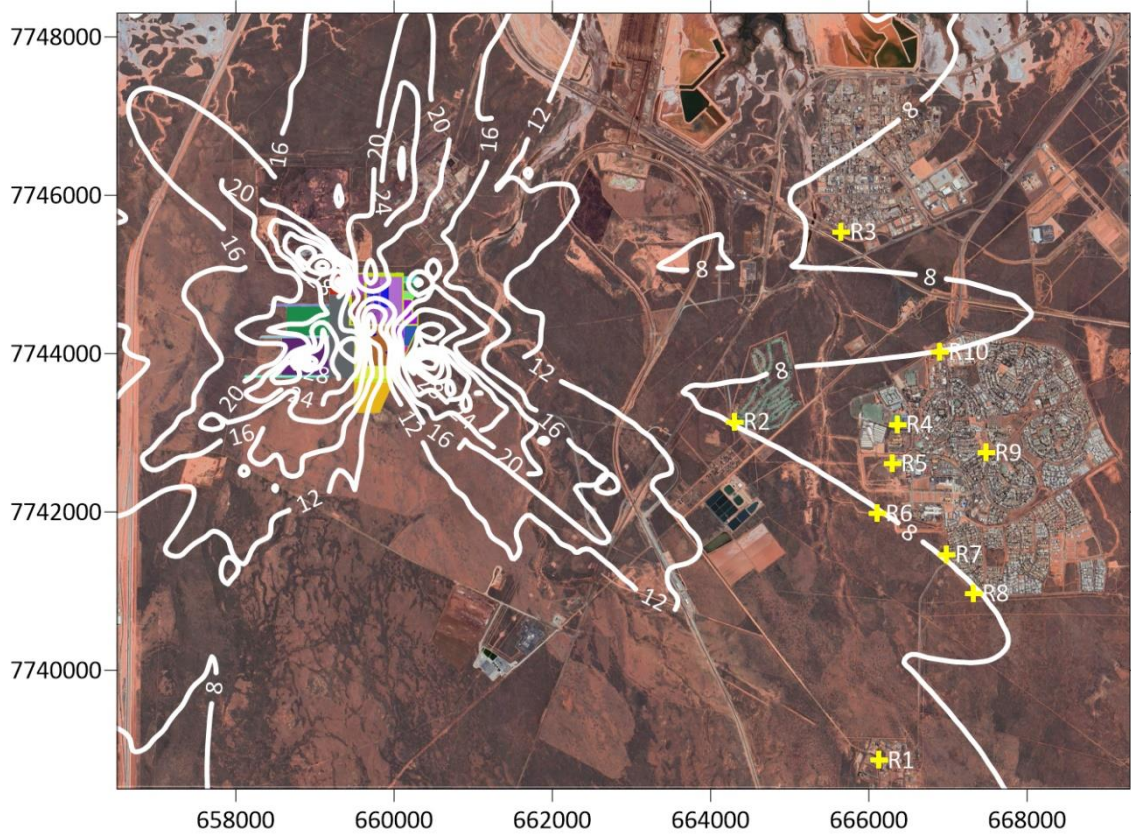


Figure 12: Cumulative Annual Average NO<sub>2</sub> GLC (µg/m<sup>3</sup>) Contour Plot (Guideline: 28 µg/m<sup>3</sup>)





**Figure 13: Cumulative 1-hr Max Average SO<sub>2</sub> GLC (µg/m<sup>3</sup>) Contour Plot (Guideline: 262 µg/m<sup>3</sup>)**

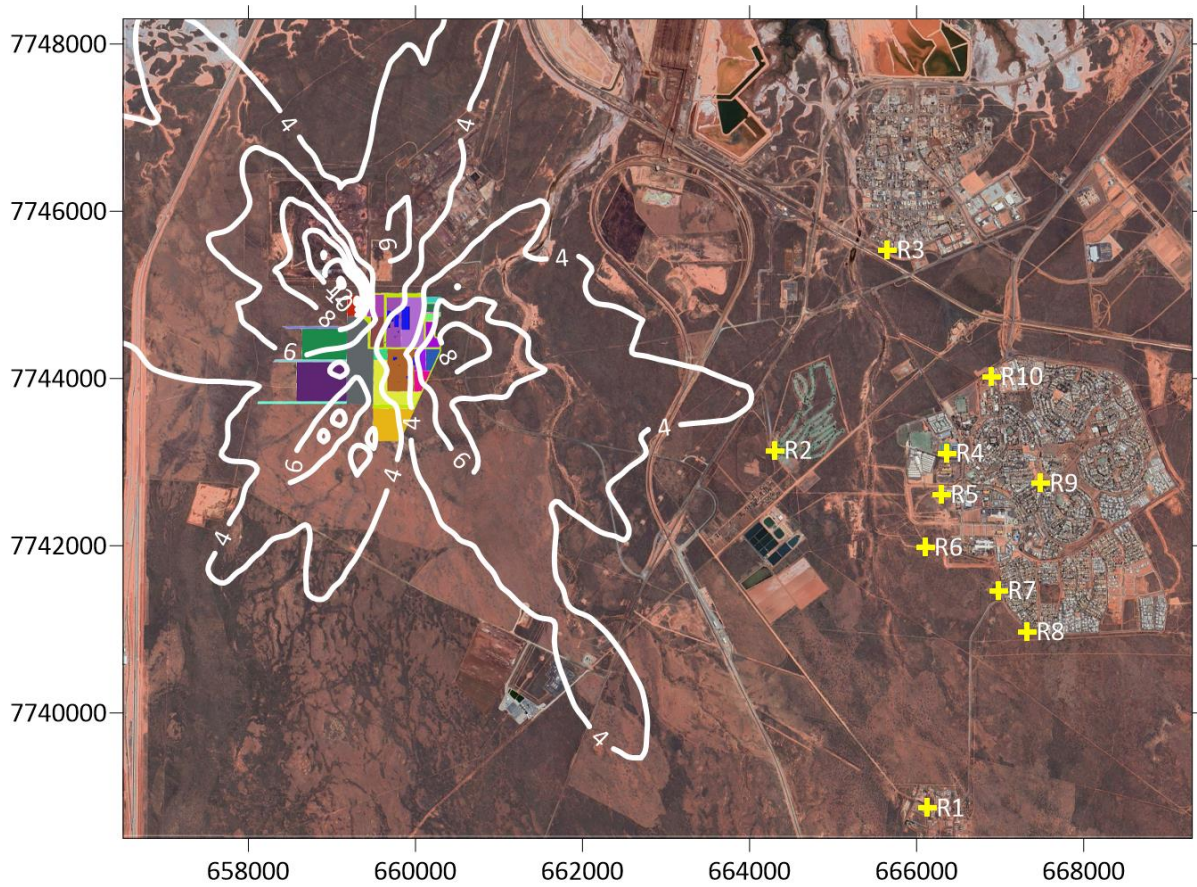


Figure 14: Cumulative 24-hr Max Average SO<sub>2</sub> GLC (µg/m<sup>3</sup>) Contour Plot (Guideline: 52 µg/m<sup>3</sup>)



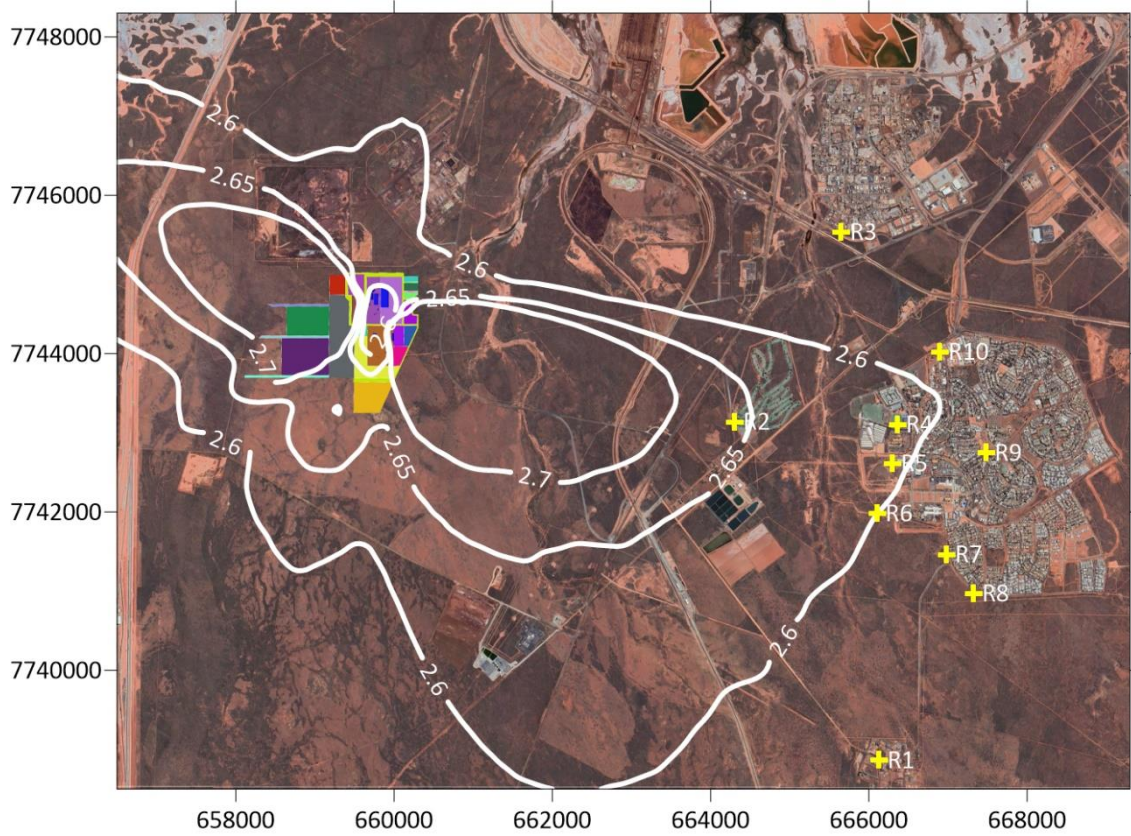


Figure 15: Cumulative Annual Average SO<sub>2</sub> GLC ( $\mu\text{g}/\text{m}^3$ ) Contour Plot (Guideline:  $52 \mu\text{g}/\text{m}^3$ )

## 6. SUMMARY

Air dispersion modelling has been completed to assess the potential air quality impacts associated with various pollutants of concern (CO, NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub> and H<sub>2</sub>S) emissions from the proposed Port Hedland Green Steel Project (Project). The maximum GLCs across the model domain and at the nominated receptor locations have been predicted using the AERMOD model. The results of the modelling indicate that the air quality impacts due to emissions from the Project in isolation and cumulative are predicted to be below the relevant ambient criteria at the receptor locations. No exceedances were predicted at any of the sensitive receptors for the compounds of interest.

## 7. LIMITATIONS

Ramboll prepared this report in accordance with the scope of work as outlined in our proposal to Preston Consulting Pty Ltd dated 15<sup>th</sup> June 2023 and in accordance with our understanding and interpretation of current regulatory standards.

The conclusions presented in this report represent Ramboll's professional judgement based on information made available during the course of this assignment and are true and correct to the best of Ramboll's knowledge as at the date of the assessment.

Ramboll did not independently verify all of the written or oral information provided during the course of this investigation. While Ramboll has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Ramboll was itself complete and accurate.

This report does not purport to give legal advice. This advice can only be given by qualified legal advisors.

### 7.1 User Reliance

This report has been prepared for Preston Consulting Pty Ltd and may not be relied upon by any other person or entity without Ramboll's express written permission.

## 8. REFERENCES

Department of Water and Environmental Regulation (DWER). 2019. '*Guideline Air Emissions – Draft for External Consultation.*' October 2019.

Department of Environment Regulation (DER). 2017. '*Guidance Statement: Risk Assessments.*' February 2017.

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NSW EPA (2016). '*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*'. State of New South Wales and the Environment Protection Authority, November 2016.

PHIC (2013). "Annual Report Ambient Air Quality Monitoring Report to the Port Hedland Dust Management Taskforce (2012 – 2013)." Port Hedland Industries Council, 3 September 2013

New Energy. 2012. "Public Environmental Review Boodarie Waste to Energy and Materials Recover Facility, Port Hedland." New Energy Corporation, August 2012.

ENVIRON (2014). "South Hedland Power Station Air Quality Assessment". ENVIRON Australia Pty Ltd, June 2014.

Synergetics (2012). "Final Report: Air Quality Impact Assessment for the Proposed Waste Gasification Power Station in Boodarie, Western Australia for New Energy Corporation." Synergetics Pty Ltd, 12 July 2012.

## **APPENDIX 1 AERMOD INPUT FILES**

```

**
*****
****
**
** AERMOD Input Produced by:
** AERMOD View Ver. 12.0.0
** Lakes Environmental Software Inc.
** Date: 29/05/2024
** File:
E:\Preston\Green_steel_air_emiss\AERMOD\
GSP\GSP.ADI
**
*****
****
**
**
*****
****
** AERMOD Control Pathway
*****
****
**
**
CO STARTING
  TITLEONE E:\P0930 Boodarie
PS\Sc1\Sc1.isc
  TITLETWO TEA South Hedland Power
Station -Met Assessment
  MODELOPT CONC
  AVERTIME 1
  POLLUTID CO
  RUNORNOT RUN
  SAVEFILE SCENARIOS.SV1 5
  ERRORFIL SCENARIOS.ERR
CO FINISHED
**
*****
****
** AERMOD Source Pathway
*****
****
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
  LOCATION STCK1    POINT
659817.920 7744095.010    10.570
** DESCRSRC E01
  LOCATION STCK3    POINT
659907.350 7743899.480    13.810
** DESCRSRC E03
  LOCATION STCK4    POINT
659906.840 7743892.910    13.550
** DESCRSRC E04
  LOCATION STCK5    POINT
659750.720 7744209.200    11.620
** DESCRSRC E05
  LOCATION STCK6    POINT
659820.440 7743893.920    12.580
** DESCRSRC E07
  LOCATION STCK7    POINT
659884.110 7744162.710    10.140
** DESCRSRC E08
  LOCATION STCK8    POINT
659873.500 7744163.220    10.000
** DESCRSRC E09
  LOCATION STCK9    POINT
659857.330 7744215.760    9.000
** DESCRSRC E10
  LOCATION STCK10   POINT
659997.790 7744124.310    10.620
** DESCRSRC E12
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659759.810 7744153.110    11.570
** DESCRSRC E13
  LOCATION STCK12   POINT
659791.150 7744448.910    11.920
** DESCRSRC SK 551
  LOCATION STCK13   POINT
661307.823 7740080.407    16.790
** DESCRSRC OC1
  LOCATION STCK14   POINT
661337.754 7740065.041    17.070
** DESCRSRC CC1
  LOCATION STCK15   POINT
661361.306 7740041.437    17.010
** DESCRSRC CC2
  LOCATION STCK16   POINT
661652.728 7740278.013    20.000
** DESCRSRC A1
  LOCATION STCK17   POINT
661674.825 7740261.824    19.730
** DESCRSRC A2
  LOCATION STCK18   POINT
661696.390 7740245.665    19.090
** DESCRSRC A3
  LOCATION STCK19   POINT
660573.224 7745893.649    18.740
** DESCRSRC A4
  LOCATION STCK20   POINT
660579.589 7745886.536    17.870

```

** DESCRSRC A5					BUILDHGT STCK1	23.80	49.50		
LOCATION STCK21	POINT				49.50	49.50	49.50	0.00	
660600.000	7740800.000	15.670			BUILDHGT STCK1	0.00	0.00		
** DESCRSRC WTE					0.00	0.00	0.00	33.30	
** Source Parameters **					BUILDHGT STCK1	33.30	33.30		
SRCPARAM STCK1	1.0	60.000			52.90	52.90	0.00	0.00	
631.150	18.14	4.3			BUILDHGT STCK1	142.00	142.00		
SRCPARAM STCK3	1.0	30.000			0.00	0.00	0.00	0.00	
329.150	9.4	1.7			BUILDHGT STCK3	142.00	142.00		
SRCPARAM STCK4	1.0	30.000			142.00	142.00	142.00	142.00	
303.150	20	1.4			BUILDHGT STCK3	142.00	0.00		
SRCPARAM STCK5	1.0	30.000			0.00	0.00	0.00	0.00	
308.150	20.3	1			BUILDHGT STCK3	0.00	0.00		
SRCPARAM STCK6	1.0	137.200			0.00	0.00	0.00	0.00	
371.150	19	1.4			BUILDHGT STCK3	142.00	142.00		
SRCPARAM STCK7	1.0	20.000			142.00	142.00	142.00	142.00	
353.150	29.3	0.9			BUILDHGT STCK3	142.00	0.00		
SRCPARAM STCK8	1.0	20.000			0.00	0.00	0.00	0.00	
353.150	29.3	0.3			BUILDHGT STCK3	0.00	0.00		
SRCPARAM STCK9	1.0	17.500			0.00	0.00	0.00	0.00	
313.150	23.2	0.4			BUILDHGT STCK4	142.00	142.00		
SRCPARAM STCK10	1.0	12.000			142.00	142.00	142.00	142.00	
313.150	10.9	6.1			BUILDHGT STCK4	0.00	0.00		
SRCPARAM STCK11	1.0	20.000			0.00	0.00	0.00	0.00	
298.150	9.2	0.3			BUILDHGT STCK4	0.00	0.00		
SRCPARAM STCK12	1.0	50.000			0.00	0.00	0.00	0.00	
374.150	19.4321605509586	4.85			BUILDHGT STCK4	0.00	0.00		
SRCPARAM STCK13	1.0	25.000			0.00	0.00	0.00	0.00	
743.150	33.92976	3.16			BUILDHGT STCK4	142.00	142.00		
SRCPARAM STCK14	1.0	35.000			142.00	142.00	142.00	142.00	
383.150	33.901	2.27			BUILDHGT STCK4	0.00	0.00		
SRCPARAM STCK15	1.0	35.000			0.00	0.00	0.00	0.00	
383.150	33.901	2.27			BUILDHGT STCK4	0.00	0.00		
SRCPARAM STCK16	1.0	13.000			0.00	0.00	0.00	0.00	
773.000	38.05	3.2			BUILDHGT STCK5	49.50	49.50		
SRCPARAM STCK17	1.0	13.000			49.50	0.00	0.00	0.00	
773.000	38.05	3.2			BUILDHGT STCK5	0.00	0.00		
SRCPARAM STCK18	1.0	13.000			0.00	0.00	49.50	49.50	
773.000	38.05	3.2			BUILDHGT STCK5	49.50	49.50		
SRCPARAM STCK19	1.0	15.500			49.50	49.50	49.50	49.50	
813.000	24.36305	3.5			BUILDHGT STCK5	49.50	49.50		
SRCPARAM STCK20	1.0	15.500			49.50	0.00	0.00	0.00	
813.000	24.36305	3.5			BUILDHGT STCK5	0.00	0.00		
SRCPARAM STCK21	1.0	30.000			0.00	0.00	49.50	49.50	
438.000	17.94758	2.5			BUILDHGT STCK5	49.50	49.50		
** Building Downwash **					49.50	49.50	49.50	49.50	
BUILDHGT STCK1	0.00	0.00			BUILDHGT STCK6	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDHGT STCK1	0.00	0.00							
0.00	0.00	0.00	0.00						

BUILDHGT STCK6	0.00	0.00		BUILDHGT STCK10	142.00	142.00
0.00	0.00	0.00	0.00	52.90	52.90	52.90
BUILDHGT STCK6	0.00	0.00		BUILDHGT STCK10	52.90	33.30
0.00	0.00	0.00	0.00	33.30	33.30	33.30
BUILDHGT STCK6	0.00	0.00		BUILDHGT STCK10	33.30	33.30
0.00	0.00	0.00	142.00	33.30	33.30	33.30
BUILDHGT STCK6	142.00	0.00		BUILDHGT STCK10	33.30	52.90
0.00	0.00	0.00	0.00	52.90	52.90	52.90
BUILDHGT STCK6	0.00	0.00		BUILDHGT STCK10	52.90	33.30
0.00	0.00	0.00	0.00	33.30	33.30	33.30
				BUILDHGT STCK10	33.30	33.30
BUILDHGT STCK7	0.00	0.00		33.30	33.30	142.00
0.00	0.00	0.00	0.00			
BUILDHGT STCK7	33.30	33.30		BUILDHGT STCK11	49.50	49.50
33.30	49.50	49.50	0.00	49.50	49.50	49.50
BUILDHGT STCK7	33.30	33.30		BUILDHGT STCK11	49.50	49.50
33.30	33.30	0.00	0.00	23.80	23.80	23.80
BUILDHGT STCK7	0.00	0.00		BUILDHGT STCK11	49.50	49.50
0.00	0.00	0.00	0.00	49.50	49.50	49.50
BUILDHGT STCK7	33.30	33.30		BUILDHGT STCK11	49.50	49.50
33.30	33.30	33.30	33.30	49.50	49.50	49.50
BUILDHGT STCK7	52.90	52.90		BUILDHGT STCK11	49.50	49.50
52.90	142.00	142.00	0.00	23.80	23.80	23.80
				BUILDHGT STCK11	49.50	49.50
BUILDHGT STCK8	0.00	0.00		49.50	49.50	49.50
0.00	0.00	0.00	0.00			
BUILDHGT STCK8	33.30	33.30		BUILDHGT STCK12	0.00	0.00
33.30	49.50	49.50	0.00	0.00	0.00	5.00
BUILDHGT STCK8	0.00	33.30		BUILDHGT STCK12	5.00	0.00
33.30	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT STCK8	0.00	0.00		BUILDHGT STCK12	53.60	53.60
0.00	0.00	0.00	0.00	53.60	53.60	38.30
BUILDHGT STCK8	33.30	33.30		BUILDHGT STCK12	34.00	34.00
33.30	33.30	33.30	33.30	34.00	34.00	34.00
BUILDHGT STCK8	52.90	52.90		BUILDHGT STCK12	0.00	0.00
142.00	142.00	0.00	0.00	0.00	0.00	0.00
				BUILDHGT STCK12	0.00	0.00
BUILDHGT STCK9	0.00	0.00		0.00	0.00	0.00
0.00	0.00	49.50	49.50			
BUILDHGT STCK9	49.50	49.50		BUILDHGT STCK13	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT STCK9	0.00	0.00		BUILDHGT STCK13	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT STCK9	0.00	0.00		BUILDHGT STCK13	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00
BUILDHGT STCK9	0.00	0.00		BUILDHGT STCK13	0.00	0.00
0.00	33.30	33.30	33.30	0.00	0.00	0.00
BUILDHGT STCK9	33.30	52.90		BUILDHGT STCK13	0.00	0.00
52.90	0.00	0.00	0.00	0.00	0.00	0.00
				BUILDHGT STCK13	0.00	0.00
				0.00	0.00	0.00





BUILDHGT STCK21	0.00	0.00			BUILDWID STCK5	32.20	34.22		
0.00 0.00 0.00	0.00				35.20 0.00 0.00	0.00			
BUILDHGT STCK21	0.00	0.00			BUILDWID STCK5	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 28.61	31.76			
					BUILDWID STCK5	33.95	35.11		
BUILDWID STCK1	0.00	0.00			35.20 34.22 32.20	29.20			
0.00 0.00 0.00	0.00								
BUILDWID STCK1	0.00	0.00			BUILDWID STCK6	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK1	41.86	35.11			BUILDWID STCK6	0.00	0.00		
35.20 34.22 32.20	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK1	0.00	0.00			BUILDWID STCK6	0.00	0.00		
0.00 0.00 0.00	90.49				0.00 0.00 0.00	0.00			
BUILDWID STCK1	104.12	114.58			BUILDWID STCK6	0.00	0.00		
21.50 26.04 0.00	0.00				0.00 0.00 0.00	33.67			
BUILDWID STCK1	39.22	42.43			BUILDWID STCK6	29.35	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
					BUILDWID STCK6	0.00	0.00		
BUILDWID STCK3	44.13	44.66			0.00 0.00 0.00	0.00			
44.35 42.43 39.22	34.81								
BUILDWID STCK3	29.35	0.00			BUILDWID STCK7	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK3	0.00	0.00			BUILDWID STCK7	104.12	114.58		
0.00 0.00 0.00	0.00				121.56 24.59 28.61	0.00			
BUILDWID STCK3	44.13	44.66			BUILDWID STCK7	142.34	136.79		
44.35 42.43 39.22	34.81				127.09 113.53 0.00	0.00			
BUILDWID STCK3	29.35	0.00			BUILDWID STCK7	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK3	0.00	0.00			BUILDWID STCK7	104.12	114.58		
0.00 0.00 0.00	0.00				121.56 133.01 140.42	143.56			
					BUILDWID STCK7	34.47	35.27		
BUILDWID STCK4	44.13	44.81			35.00 44.92 44.13	0.00			
44.35 42.43 39.22	34.81								
BUILDWID STCK4	0.00	0.00			BUILDWID STCK8	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK4	0.00	0.00			BUILDWID STCK8	104.12	114.58		
0.00 0.00 0.00	0.00				121.56 24.59 28.61	0.00			
BUILDWID STCK4	44.13	44.81			BUILDWID STCK8	0.00	136.79		
44.35 42.43 39.22	34.81				127.09 0.00 0.00	0.00			
BUILDWID STCK4	0.00	0.00			BUILDWID STCK8	0.00	0.00		
0.00 0.00 0.00	0.00				0.00 0.00 0.00	0.00			
BUILDWID STCK4	0.00	0.00			BUILDWID STCK8	104.12	114.58		
0.00 0.00 0.00	0.00				121.56 133.01 140.42	143.56			
					BUILDWID STCK8	34.47	35.27		
BUILDWID STCK5	32.20	34.22			44.35 44.92 0.00	0.00			
35.20 0.00 0.00	0.00								
BUILDWID STCK5	0.00	0.00			BUILDWID STCK9	0.00	0.00		
0.00 0.00 28.61	31.76				0.00 0.00 33.95	31.76			
BUILDWID STCK5	33.95	35.11			BUILDWID STCK9	28.61	24.59		
35.20 34.22 32.20	29.20				0.00 0.00 0.00	0.00			

BUILDWID STCK9	0.00	0.00			BUILDWID STCK13	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK9	0.00	0.00			BUILDWID STCK13	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK9	0.00	0.00			BUILDWID STCK13	0.00	0.00		
0.00	133.01	140.42	143.56		0.00	0.00	0.00	0.00	
BUILDWID STCK9	142.34	35.27			BUILDWID STCK13	0.00	0.00		
35.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
					BUILDWID STCK13	0.00	0.00		
BUILDWID STCK10	44.13	44.92			0.00	0.00	0.00	0.00	
35.00	35.27	34.47	32.62						
BUILDWID STCK10	29.78	114.58			BUILDWID STCK14	0.00	0.00		
121.56	133.01	140.42	143.56		0.00	0.00	0.00	0.00	
BUILDWID STCK10	142.34	136.79			BUILDWID STCK14	0.00	0.00		
127.09	113.53	96.52	19.00		0.00	0.00	0.00	0.00	
BUILDWID STCK10	73.83	33.66			BUILDWID STCK14	0.00	0.00		
35.00	35.27	34.47	32.62		0.00	0.00	0.00	0.00	
BUILDWID STCK10	29.78	114.58			BUILDWID STCK14	0.00	0.00		
121.56	133.01	140.42	143.56		0.00	0.00	0.00	0.00	
BUILDWID STCK10	142.34	136.79			BUILDWID STCK14	0.00	0.00		
127.09	113.53	96.52	42.00		0.00	0.00	0.00	0.00	
					BUILDWID STCK14	0.00	0.00		
BUILDWID STCK11	32.20	34.22			0.00	0.00	0.00	0.00	
35.20	35.11	33.95	31.76						
BUILDWID STCK11	28.61	24.59			BUILDWID STCK15	0.00	0.00		
31.15	35.54	38.85	31.76		0.00	0.00	0.00	0.00	
BUILDWID STCK11	33.95	35.11			BUILDWID STCK15	0.00	0.00		
35.20	34.22	32.20	29.20		0.00	0.00	0.00	0.00	
BUILDWID STCK11	32.20	34.22			BUILDWID STCK15	0.00	0.00		
35.20	35.11	33.95	31.76		0.00	0.00	0.00	0.00	
BUILDWID STCK11	28.61	24.59			BUILDWID STCK15	0.00	0.00		
31.15	35.54	38.85	31.76		0.00	0.00	0.00	0.00	
BUILDWID STCK11	33.95	35.11			BUILDWID STCK15	0.00	0.00		
35.20	34.22	32.20	29.20		0.00	0.00	0.00	0.00	
					BUILDWID STCK15	0.00	0.00		
BUILDWID STCK12	0.00	0.00			0.00	0.00	0.00	0.00	
0.00	0.00	15.00	13.56						
BUILDWID STCK12	11.71	0.00			BUILDWID STCK16	0.00	0.00		
0.00	0.00	0.00	84.64		0.00	0.00	0.00	0.00	
BUILDWID STCK12	82.13	77.14			BUILDWID STCK16	0.00	0.00		
69.79	60.33	64.88	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK12	136.50	177.86			BUILDWID STCK16	0.00	0.00		
213.81	243.26	265.33	279.33		0.00	0.00	0.00	0.00	
BUILDWID STCK12	0.00	0.00			BUILDWID STCK16	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK12	0.00	0.00			BUILDWID STCK16	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
					BUILDWID STCK16	0.00	0.00		
BUILDWID STCK13	0.00	0.00			0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00						

BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK17	0.00	0.00			BUILDWID STCK21	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	35.11	33.95		
0.00	0.00	0.00	0.00		31.76	28.61	24.59	0.00	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	127.09	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	113.53	96.52		
0.00	0.00	0.00	0.00		28.00	31.31	0.00	0.00	
BUILDWID STCK18	0.00	0.00			BUILDLEN STCK1	42.43	39.22		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	23.00	29.35		
0.00	0.00	0.00	0.00		34.81	39.22	42.43	44.35	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	44.92	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	23.00	29.35		
0.00	0.00	0.00	0.00		34.81	39.22	42.43	44.35	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	44.92	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK19	0.00	0.00			BUILDLEN STCK3	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	23.00	29.35		
0.00	0.00	0.00	0.00		34.81	39.22	42.43	44.35	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	23.00	29.35		
0.00	0.00	0.00	0.00		34.81	39.22	42.43	44.35	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDWID STCK20	0.00	0.00			BUILDLEN STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	

BUILDLEN STCK4	0.00	0.00			BUILDLEN STCK8	113.53	96.52
0.00	0.00	0.00	0.00		76.57	73.83	68.85
					61.95		
					BUILDLEN STCK8	35.27	34.47
BUILDLEN STCK5	24.59	28.61			34.81	29.35	0.00
31.76	0.00	0.00	0.00		0.00		
BUILDLEN STCK5	0.00	0.00			BUILDLEN STCK9	0.00	0.00
0.00	0.00	34.22	35.20		0.00	0.00	35.11
BUILDLEN STCK5	35.11	33.95			35.20		
31.76	28.61	24.59	19.82		BUILDLEN STCK9	34.22	32.20
BUILDLEN STCK5	24.59	28.61			0.00	0.00	0.00
31.76	0.00	0.00	0.00		BUILDLEN STCK9	0.00	0.00
BUILDLEN STCK5	0.00	0.00			0.00	0.00	0.00
0.00	0.00	34.22	35.20		BUILDLEN STCK9	0.00	0.00
BUILDLEN STCK5	35.11	33.95			0.00	0.00	0.00
31.76	28.61	24.59	19.82		BUILDLEN STCK9	0.00	0.00
					0.00	73.83	68.85
					61.95		
					BUILDLEN STCK9	73.05	34.47
BUILDLEN STCK6	0.00	0.00			32.62	0.00	0.00
0.00	0.00	0.00	0.00				
BUILDLEN STCK6	0.00	0.00			BUILDLEN STCK10	23.00	29.35
0.00	0.00	0.00	0.00		32.62	34.47	35.27
BUILDLEN STCK6	0.00	0.00			35.00		
0.00	0.00	0.00	0.00		BUILDLEN STCK10	33.66	96.52
BUILDLEN STCK6	0.00	0.00			76.57	73.83	68.85
0.00	0.00	0.00	44.35		61.95		
BUILDLEN STCK6	44.92	0.00			BUILDLEN STCK10	73.05	81.92
0.00	0.00	0.00	0.00		90.49	104.12	114.58
BUILDLEN STCK6	0.00	0.00			91.00		
0.00	0.00	0.00	0.00		BUILDLEN STCK10	133.01	29.78
BUILDLEN STCK6	0.00	0.00			32.62	34.47	35.27
0.00	0.00	0.00	0.00		35.00		
BUILDLEN STCK6	0.00	0.00			BUILDLEN STCK10	33.66	96.52
0.00	0.00	0.00	0.00		76.57	73.83	68.85
					61.95		
					BUILDLEN STCK10	73.05	81.92
BUILDLEN STCK7	0.00	0.00			90.49	104.12	114.58
0.00	0.00	0.00	0.00		15.95		
BUILDLEN STCK7	113.53	96.52			BUILDLEN STCK11	24.59	28.61
76.57	32.20	34.22	0.00		31.76	33.95	35.11
BUILDLEN STCK7	73.05	81.92			35.20		
90.49	104.12	0.00	0.00		BUILDLEN STCK11	34.22	32.20
BUILDLEN STCK7	0.00	0.00			29.20	32.20	34.22
0.00	0.00	0.00	0.00		35.20		
BUILDLEN STCK7	113.53	96.52			BUILDLEN STCK11	35.11	33.95
76.57	73.83	68.85	61.95		31.76	28.61	24.59
BUILDLEN STCK7	35.27	34.47			19.82		
32.62	29.35	23.00	0.00		BUILDLEN STCK11	24.59	28.61
					31.76	33.95	35.11
					35.20		
					BUILDLEN STCK11	34.22	32.20
BUILDLEN STCK8	0.00	0.00			29.20	32.20	34.22
0.00	0.00	0.00	0.00		35.20		
BUILDLEN STCK8	113.53	96.52			BUILDLEN STCK11	35.11	33.95
76.57	32.20	34.22	0.00		31.76	28.61	24.59
BUILDLEN STCK8	0.00	81.92			19.82		
90.49	0.00	0.00	0.00		BUILDLEN STCK12	0.00	0.00
BUILDLEN STCK8	0.00	0.00			0.00	0.00	15.99
0.00	0.00	0.00	0.00		16.49		
					BUILDLEN STCK12	16.49	0.00
					0.00	0.00	0.00
					69.79		
					BUILDLEN STCK12	77.14	82.13
					84.64	84.57	111.98
					0.00		





BUILDLN STCK20	0.00	0.00			XBADJ STCK4	50.53	53.28		
0.00	0.00	0.00	0.00		54.42	53.90	51.74	48.01	
BUILDLN STCK20	0.00	0.00			XBADJ STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDLN STCK20	0.00	0.00			XBADJ STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
BUILDLN STCK20	0.00	0.00			XBADJ STCK4	-73.53	-82.63		-
0.00	0.00	0.00	0.00		89.23	-93.11	-94.16	-92.36	
BUILDLN STCK20	0.00	0.00			XBADJ STCK4	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
					XBADJ STCK4	0.00	0.00		
BUILDLN STCK21	0.00	0.00			0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00						
BUILDLN STCK21	0.00	0.00			XBADJ STCK5	-38.17	-35.18		-
0.00	0.00	0.00	0.00		31.13	0.00	0.00	0.00	
BUILDLN STCK21	0.00	0.00			XBADJ STCK5	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	13.49	16.16	
BUILDLN STCK21	0.00	0.00			XBADJ STCK5	18.33	19.96		
0.00	0.00	0.00	0.00		20.97	21.35	21.08	20.17	
BUILDLN STCK21	0.00	0.00			XBADJ STCK5	13.58	6.57		-
0.00	0.00	0.00	0.00		0.64	0.00	0.00	0.00	
BUILDLN STCK21	0.00	0.00			XBADJ STCK5	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	-47.70	-51.35	
					XBADJ STCK5	-53.44	-53.91		-
XBADJ STCK1	0.00	0.00			52.74	-49.96	-45.67	-39.99	
0.00	0.00	0.00	0.00						
XBADJ STCK1	0.00	0.00			XBADJ STCK6	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
XBADJ STCK1	-106.54	-110.71		-	XBADJ STCK6	0.00	0.00		
111.52	-108.94	-103.04	0.00		0.00	0.00	0.00	0.00	
XBADJ STCK1	0.00	0.00			XBADJ STCK6	0.00	0.00		
0.00	0.00	0.00	-214.81		0.00	0.00	0.00	0.00	
XBADJ STCK1	-213.46	-205.63		-	XBADJ STCK6	0.00	0.00		
142.98	-144.93	0.00	0.00		0.00	0.00	0.00	-166.68	
XBADJ STCK1	-222.49	-222.02			XBADJ STCK6	-168.59	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
					XBADJ STCK6	0.00	0.00		
XBADJ STCK3	43.97	46.93			0.00	0.00	0.00	0.00	
48.47	48.53	47.12	44.28						
XBADJ STCK3	40.10	0.00			XBADJ STCK7	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
XBADJ STCK3	0.00	0.00			XBADJ STCK7	14.58	32.17		
0.00	0.00	0.00	0.00		48.79	-129.03	-127.76	0.00	
XBADJ STCK3	-66.97	-76.29		-	XBADJ STCK7	62.10	45.28		
83.28	-87.75	-89.55	-88.63		27.08	8.05	0.00	0.00	
XBADJ STCK3	-85.02	0.00			XBADJ STCK7	0.00	0.00		
0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	
XBADJ STCK3	0.00	0.00			XBADJ STCK7	-128.11	-128.69		-
0.00	0.00	0.00	0.00		125.36	-134.02	-138.62	-138.99	
					XBADJ STCK7	-117.59	-119.39		-
					117.57	-242.05	-236.39	0.00	

					XBADJ STCK11	-10.43	-5.10
XBADJ STCK8	0.00	0.00			0.38	5.85	11.15
0.00	0.00	0.00	0.00				16.10
XBADJ STCK8	24.38	42.53			XBADJ STCK12	0.00	0.00
59.40	-118.49	-117.62	0.00		0.00	0.00	-34.80
XBADJ STCK8	0.00	52.49			XBADJ STCK12	-35.57	0.00
32.82	0.00	0.00	0.00		0.00	0.00	0.00
XBADJ STCK8	0.00	0.00			XBADJ STCK12	-206.43	-213.02
0.00	0.00	0.00	0.00		213.15	-206.79	-289.30
XBADJ STCK8	-137.90	-139.05	-		XBADJ STCK12	-365.27	-374.59
135.97	-144.56	-148.76	-148.44		372.53	-359.16	-334.86
XBADJ STCK8	-126.04	-126.60	-		XBADJ STCK12	0.00	0.00
246.09	-246.15	0.00	0.00		0.00	0.00	0.00
					XBADJ STCK12	0.00	0.00
XBADJ STCK9	0.00	0.00			0.00	0.00	0.00
0.00	0.00	-106.22	-109.53				
XBADJ STCK9	-109.51	-106.17			XBADJ STCK13	0.00	0.00
0.00	0.00	0.00	0.00		0.00	0.00	0.00
XBADJ STCK9	0.00	0.00			XBADJ STCK13	0.00	0.00
0.00	0.00	0.00	0.00		0.00	0.00	0.00
XBADJ STCK9	0.00	0.00			XBADJ STCK13	0.00	0.00
0.00	0.00	0.00	0.00		0.00	0.00	0.00
XBADJ STCK9	0.00	0.00			XBADJ STCK13	0.00	0.00
0.00	-169.61	-181.92	-188.71		0.00	0.00	0.00
XBADJ STCK9	-189.77	-177.24	-		XBADJ STCK13	0.00	0.00
176.90	0.00	0.00	0.00		0.00	0.00	0.00
					XBADJ STCK13	0.00	0.00
XBADJ STCK10	-193.15	-195.27	-		0.00	0.00	0.00
78.36	-82.33	-83.79	-82.71				
XBADJ STCK10	-79.11	-73.11	-		XBADJ STCK14	0.00	0.00
64.89	-58.43	-50.20	-40.61		0.00	0.00	0.00
XBADJ STCK10	-49.66	-57.21	-		XBADJ STCK14	0.00	0.00
63.02	-66.91	-68.77	-68.54		0.00	0.00	0.00
XBADJ STCK10	-69.53	42.24			XBADJ STCK14	0.00	0.00
45.74	47.86	48.52	47.71		0.00	0.00	0.00
XBADJ STCK10	45.45	-23.40	-		XBADJ STCK14	0.00	0.00
11.68	-15.40	-18.66	-21.35		0.00	0.00	0.00
XBADJ STCK10	-23.38	-24.71	-		XBADJ STCK14	0.00	0.00
27.47	-37.21	-45.81	-185.16		0.00	0.00	0.00
					XBADJ STCK14	0.00	0.00
XBADJ STCK11	15.49	14.42			0.00	0.00	0.00
12.90	11.00	8.76	6.25				
XBADJ STCK11	3.55	0.75	-		XBADJ STCK15	0.00	0.00
2.08	-8.29	-14.24	-19.76		0.00	0.00	0.00
XBADJ STCK11	-24.68	-28.85	-		XBADJ STCK15	0.00	0.00
32.15	-34.47	-35.74	-35.92		0.00	0.00	0.00
XBADJ STCK11	-40.08	-43.03	-		XBADJ STCK15	0.00	0.00
44.67	-44.95	-43.86	-41.45		0.00	0.00	0.00
XBADJ STCK11	-37.77	-32.95	-		XBADJ STCK15	0.00	0.00
27.12	-23.91	-19.98	-15.44		0.00	0.00	0.00

XBADJ	STCK15	0.00	0.00	XBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK15	0.00	0.00	XBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK16	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK17	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK18	0.00	0.00	XBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK18	0.00	0.00	YBADJ	STCK1	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK18	0.00	0.00	YBADJ	STCK1	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK18	0.00	0.00	YBADJ	STCK1	31.17	19.14
0.00	0.00	0.00	0.00	2.57	-14.07	-30.29	0.00
XBADJ	STCK18	0.00	0.00	YBADJ	STCK1	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.79
XBADJ	STCK18	0.00	0.00	YBADJ	STCK1	19.13	-9.10
0.00	0.00	0.00	0.00	12.97	-9.62	0.00	0.00
XBADJ	STCK19	0.00	0.00	YBADJ	STCK1	24.16	-11.16
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
XBADJ	STCK19	0.00	0.00	YBADJ	STCK3	-40.21	-29.97
0.00	0.00	0.00	0.00	18.81	-7.09	4.85	16.65
XBADJ	STCK19	0.00	0.00	YBADJ	STCK3	27.93	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

YBADJ	STCK3	0.00	0.00	YBADJ	STCK7	-60.11	-46.08	-
0.00	0.00	0.00	0.00	30.64	-3.25	-22.81	0.00	
YBADJ	STCK3	40.21	29.97	YBADJ	STCK7	32.50	47.01	
18.81	7.09	-4.85	-16.65	60.09	71.34	0.00	0.00	
YBADJ	STCK3	-27.93	0.00	YBADJ	STCK7	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
YBADJ	STCK3	0.00	0.00	YBADJ	STCK7	60.11	46.08	
0.00	0.00	0.00	0.00	30.64	15.05	-0.99	-17.00	
YBADJ	STCK4	-39.57	-28.20	YBADJ	STCK7	21.44	3.75	-
15.97	-3.25	9.56	22.08	14.04	5.63	-33.93	0.00	
YBADJ	STCK4	0.00	0.00	YBADJ	STCK8	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
YBADJ	STCK4	0.00	0.00	YBADJ	STCK8	-64.22	-48.42	-
0.00	0.00	0.00	0.00	31.15	-1.91	-19.66	0.00	
YBADJ	STCK4	39.57	28.20	YBADJ	STCK8	0.00	54.81	
15.97	3.25	-9.56	-22.08	69.02	0.00	0.00	0.00	
YBADJ	STCK4	0.00	0.00	YBADJ	STCK8	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
YBADJ	STCK4	0.00	0.00	YBADJ	STCK8	64.22	48.42	
0.00	0.00	0.00	0.00	31.15	13.71	-4.14	-21.87	
YBADJ	STCK5	-26.51	-30.59	YBADJ	STCK8	15.01	-4.05	
33.75	0.00	0.00	0.00	36.10	-4.16	0.00	0.00	
YBADJ	STCK5	0.00	0.00	YBADJ	STCK9	0.00	0.00	
0.00	0.00	-20.87	-15.25	0.00	0.00	26.57	10.77	
YBADJ	STCK5	-9.15	-2.78	YBADJ	STCK9	-5.36	-21.32	
3.67	10.02	16.06	21.61	0.00	0.00	0.00	0.00	
YBADJ	STCK5	26.51	30.59	YBADJ	STCK9	0.00	0.00	
33.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
YBADJ	STCK5	0.00	0.00	YBADJ	STCK9	0.00	0.00	
0.00	0.00	20.87	15.25	0.00	0.00	0.00	0.00	
YBADJ	STCK5	9.15	2.78	YBADJ	STCK9	0.00	0.00	
3.67	-10.02	-16.06	-21.61	0.00	62.65	39.70	15.55	
YBADJ	STCK6	0.00	0.00	YBADJ	STCK9	-9.07	17.34	-
0.00	0.00	0.00	0.00	10.71	0.00	0.00	0.00	
YBADJ	STCK6	0.00	0.00	YBADJ	STCK10	9.82	-21.88	
0.00	0.00	0.00	0.00	22.94	11.81	0.33	-11.16	
YBADJ	STCK6	0.00	0.00	YBADJ	STCK10	-22.32	11.48	
0.00	0.00	0.00	0.00	7.76	3.02	-1.81	-6.58	
YBADJ	STCK6	0.00	0.00	YBADJ	STCK10	-11.16	-15.39	-
0.00	0.00	0.00	21.99	19.16	-22.35	-24.85	2.18	
YBADJ	STCK6	-3.43	0.00	YBADJ	STCK10	-21.51	-33.36	-
0.00	0.00	0.00	0.00	22.94	-11.81	-0.33	11.16	
YBADJ	STCK6	0.00	0.00	YBADJ	STCK10	22.32	-11.48	-
0.00	0.00	0.00	0.00	7.76	-3.02	1.81	6.58	
YBADJ	STCK7	0.00	0.00	YBADJ	STCK10	11.16	15.39	
0.00	0.00	0.00	0.00	19.16	22.35	24.85	41.21	

YBADJ STCK11	-7.81	-2.87							
2.16 7.13 11.88 16.27					YBADJ STCK15	0.00	0.00		
YBADJ STCK11	20.16	23.44			0.00 0.00 0.00	0.00			
20.35 22.31 23.61 28.79					YBADJ STCK15	0.00	0.00		
YBADJ STCK11	27.97	26.31			0.00 0.00 0.00	0.00			
23.85 20.66 16.85 12.52					YBADJ STCK15	0.00	0.00		
YBADJ STCK11	7.81	2.87	-		0.00 0.00 0.00	0.00			
2.16 -7.13 -11.88 -16.27					YBADJ STCK15	0.00	0.00		
YBADJ STCK11	-20.16	-23.44	-		0.00 0.00 0.00	0.00			
20.35 -22.31 -23.61 -28.79					YBADJ STCK15	0.00	0.00		
YBADJ STCK11	-27.97	-26.31	-		0.00 0.00 0.00	0.00			
23.85 -20.66 -16.85 -12.52					YBADJ STCK15	0.00	0.00		
					0.00 0.00 0.00	0.00			
YBADJ STCK12	0.00	0.00			YBADJ STCK16	0.00	0.00		
0.00 0.00 6.23 1.48					0.00 0.00 0.00	0.00			
YBADJ STCK12	-3.32	0.00			YBADJ STCK16	0.00	0.00		
0.00 0.00 0.00 66.84					0.00 0.00 0.00	0.00			
YBADJ STCK12	38.28	8.55	-		YBADJ STCK16	0.00	0.00		
21.44 -50.78 -19.50 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK12	64.28	24.33	-		YBADJ STCK16	0.00	0.00		
16.36 -56.55 -95.02 -130.60					0.00 0.00 0.00	0.00			
YBADJ STCK12	0.00	0.00			YBADJ STCK16	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK12	0.00	0.00			YBADJ STCK16	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK13	0.00	0.00			YBADJ STCK16	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK13	0.00	0.00			YBADJ STCK17	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK13	0.00	0.00			YBADJ STCK17	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK13	0.00	0.00			YBADJ STCK17	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK13	0.00	0.00			YBADJ STCK17	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			
YBADJ STCK14	0.00	0.00			YBADJ STCK18	0.00	0.00		
0.00 0.00 0.00 0.00					0.00 0.00 0.00	0.00			

YBADJ	STCK18	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK19	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK20	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00
YBADJ	STCK21	0.00	0.00
0.00	0.00	0.00	0.00
SRCGROUP	STCK1	STCK1	
SRCGROUP	STCK10	STCK10	
SRCGROUP	STCK11	STCK11	
SRCGROUP	STCK12	STCK12	
SRCGROUP	STCK13	STCK13	
SRCGROUP	STCK14	STCK14	
SRCGROUP	STCK15	STCK15	
SRCGROUP	STCK16	STCK16	
SRCGROUP	STCK17	STCK17	

```

SRCGROUP STCK18 STCK18
SRCGROUP STCK19 STCK19
SRCGROUP STCK20 STCK20
SRCGROUP STCK21 STCK21
SRCGROUP STCK3 STCK3
SRCGROUP STCK4 STCK4
SRCGROUP STCK5 STCK5
SRCGROUP STCK6 STCK6
SRCGROUP STCK7 STCK7
SRCGROUP STCK8 STCK8
SRCGROUP STCK9 STCK9
SRCGROUP ALL
SO FINISHED
**
*****
****
** AERMOD Receptor Pathway
*****
****
**
**
RE STARTING
  INCLUDED GSP.rou
RE FINISHED
**
*****
****
** AERMOD Meteorology Pathway
*****
****
**
**
ME STARTING
  SURFFILE ..\6866_Run6a_6Feb2015.SFC
  PROFFILE ..\6866_Run6a_6Feb2015.PFL
  SURFDATA 0 2013
  UAIRDATA 54321 2013
  SITEDATA 1 2013
  PROFBASE 10.0 METERS
ME FINISHED
**
*****
****
** AERMOD Output Pathway
*****
****
**
**
OU STARTING
  RECTABLE ALLAVE 1ST
  RECTABLE 1 1ST

```



POSTFILE 1 ALL UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK1 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK10 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK11 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK12 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK13 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK14 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK15 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK16 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK17 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK18 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK19 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK20 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK21 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK3 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK4 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK5 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK6 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK7 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK8 UNIFORM  
GSP.AD\POSTPRO.POS 31  
POSTFILE 1 STCK9 UNIFORM  
GSP.AD\POSTPRO.POS 31  
\*\* Auto-Generated Plotfiles  
PLOTFILE 1 ALL 1ST  
GSP.AD\01H1GALL.PLT 52  
PLOTFILE 1 STCK1 1ST  
GSP.AD\01H1G001.PLT 53  
PLOTFILE 1 STCK10 1ST  
GSP.AD\01H1G002.PLT 54  
PLOTFILE 1 STCK11 1ST  
GSP.AD\01H1G003.PLT 55

PLOTFILE 1 STCK12 1ST  
GSP.AD\01H1G004.PLT 56  
PLOTFILE 1 STCK13 1ST  
GSP.AD\01H1G005.PLT 57  
PLOTFILE 1 STCK14 1ST  
GSP.AD\01H1G006.PLT 58  
PLOTFILE 1 STCK15 1ST  
GSP.AD\01H1G007.PLT 59  
PLOTFILE 1 STCK16 1ST  
GSP.AD\01H1G008.PLT 60  
PLOTFILE 1 STCK17 1ST  
GSP.AD\01H1G009.PLT 61  
PLOTFILE 1 STCK18 1ST  
GSP.AD\01H1G010.PLT 62  
PLOTFILE 1 STCK19 1ST  
GSP.AD\01H1G011.PLT 63  
PLOTFILE 1 STCK20 1ST  
GSP.AD\01H1G012.PLT 64  
PLOTFILE 1 STCK21 1ST  
GSP.AD\01H1G013.PLT 65  
PLOTFILE 1 STCK3 1ST  
GSP.AD\01H1G014.PLT 66  
PLOTFILE 1 STCK4 1ST  
GSP.AD\01H1G015.PLT 67  
PLOTFILE 1 STCK5 1ST  
GSP.AD\01H1G016.PLT 68  
PLOTFILE 1 STCK6 1ST  
GSP.AD\01H1G017.PLT 69  
PLOTFILE 1 STCK7 1ST  
GSP.AD\01H1G018.PLT 70  
PLOTFILE 1 STCK8 1ST  
GSP.AD\01H1G019.PLT 71  
PLOTFILE 1 STCK9 1ST  
GSP.AD\01H1G020.PLT 72  
OU FINISHED  
\*\*  
\*\*\*\*\*  
\*\*\*\*  
\*\* Project Parameters  
\*\*\*\*\*  
\*\*\*\*  
\*\* PROJCTN CoordinateSystemUTM  
\*\* DESCPTN UTM: Universal Transverse  
Mercator  
\*\* DATUM World Geodetic System 1984  
\*\* DTMRGN Global Definition  
\*\* UNITS m  
\*\* ZONE -50  
\*\* ZONEINX 0  
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