Submitter No.	**1840**	Issue Reference:	**9001 / 4038**
Submitter Type	Council	TOR Category	**Cumulative Impacts** / Social
Name	**Barcaldine Regional Council**	Relevant EIS Section	Volume 1, Chapter 5, Cumulative impacts section

DETAILS OF THE ISSUE

Refers to the cumulative impacts assessment section of the EIS (Volume 1, Chapter 5):

- Table 2 lists projects and status
- The proposed 'Townsville model' community fund is not seen to be the best model for the Galilee region and further consultation with regional councils is required, and
- Any community fund to mitigate cumulative impacts needs to be based on local/regional needs and led by local community representation in placement and distribution of funds through governing body.

PROPONENT RESPONSE

As outlined in the *SIMP*, Sections 5.1 and 6.1 (see *Appendices – Volume 2* of this SEIS), Waratah Coal recommends that Galilee Basin proponents make financial contributions to an Infrastructure Fund and a Community Development Fund, both aiming to improve infrastructure and services in Alpha.

Submitter No.	**1840**	Issue Reference:	**9003 / 4039**
Submitter Type	Council	TOR Category	**Cumulative Impacts** / Social
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.5

DETAILS OF THE ISSUE

Cumulative Impact Assessment misses social and economic impacts of local infrastructure and services and local council abilities to service the projects, both in terms of approvals and ongoing management.

How will the project address labour shortages in the region? Main issues will be housing, inadequate infrastructure, this could be highlighted now. There is a lack of Council skills and funds to cope with the regional growth.

The proponent and Queensland Government can now attempt to identify cumulative effects from the various projects proposed in the region and provide a strategy to help the local communities assess process, manage and cope with the developments. BRC request the Coordinator-General to assist council in reviewing policy, conducting planning, and developing strategies to address the cumulative impacts.

PROPONENT RESPONSE

As described in the *SIMP*, Section 5.1 (see *Appendices – Volume 2* of this SEIS), Waratah Coal would prefer to address the cumulative social and economic impacts by using the proposed Galilee Basin Cumulative Social Impact Assessment (CSIA) Roundtable to prepare and implement a development plan for Alpha, with financial contributions from the Galilee Basin proponents, rather than initiate additional research. The development plan would address housing and infrastructure, including affordable housing for non-mining employees/families.

To help overcome capacity constraints within the Barcaldine Regional Council, Council could appoint a Fund Manager or Project Officer to assist in the planning, management and administration of the proposed Infrastructure and Community Funds. The costs associated with this position could be met from the Community Fund.

Submitter No.	419	Issue Reference:	12018 / 4000
Submitter Type	Government	TOR Category	Air Quality / **Cumulative Impacts**
Name	**DERM**	Relevant EIS Section	Section 2.2.6, Cumulative Impacts

DETAILS OF THE ISSUE

Predicted impacts in other EIS reports were not considered in predicting cumulative impacts. Section 2.2.6 stated that no EIS reports were available (in 2010) for Alpha Coal, Kevin's Corner and South Galilee Coal Projects, and their impacts would therefore not be assessed. This no longer correct as the Alpha Coal EIS has been published. The cumulative air quality assessment should be updated accordingly.

PROPONENT RESPONSE

Based on the comments received in submissions and consequential revisions to emission estimates for the Galilee Coal Project, the air quality model has been revised to incorporate the following changes:

- Revision to emission estimates for Galilee Coal Project:
  - Inclusion of emission estimates for the crushers and associated sizing equipment. Please refer to Issue Reference 12007 for further details
  - Reduction in emissions from the dragline resulting from lowering the dragline drop height from 33m to 6m, in line with industry best practice. Please refer to the response to Issue 12011 for further details, and
  - Specifically including emission estimates for $PM_{2.5}$ from vehicle exhaust. Please refer to Issue Reference 12005 for further details.
- Inclusion of background particulate matter emission sources – surrounding proposed mines:
  - Inclusion of emission estimates for the Alpha Coal Mine and Kevin's Corner coal mine in a cumulative impact assessment model.

Revised emission estimates for Year 19 of the project are summarised in Table 1. Shaded cells indicate revised emission estimates included in the reassessment. $PM_{2.5}$ emissions from each source were estimated using source-specific $PM_{2.5}$:TSP ratios sourced from either the United States Environmental Protection Agency (USEPA AP42 documents) or the California Air Resources Board (CARB PM Size distributions).

Table 1: Revised Emission Estimation Rates for the Galilee Coal Project

Source of emissions			Year 19 Emissions (kg/year)					PM2.5 Scaling Factor (PM2.5/TSP)	Revised Air Quality Assessment		
			Original Air Quality Assessment		Revised Air Quality Assessment				% of total TSP	% of total PM10	% of total PM2.5
			TSP	PM10	TSP	PM10	PM2.5				
Open-cut mines	Scrapers	OCM pits	459,725	148,570	459,725	148,570	48,271	0.105 [i]	3%	3%	4%
	Truck shovels/truck excavators[a]	DL1	45,879	21,699	45,879	21,699	872	0.019 [j]	3.8%	4.8%	0.8%
		DL2	116,782	55,235	116,782	55,235	2,219	0.019 [j]			
		DL3	175,173	82,852	175,173	82,852	3,328	0.019 [j]			
		DL4	166,832	78,907	166,832	78,907	3,170	0.019 [j]			
	Blasting	OCMs	46,577	24,220	46,577	24,220	1,397	0.03 [j]	0.4%	0.5%	0.1%
	Drilling	OCMs	184,868	97,134	184,868	97,134	5,546	0.03 [j]	1%	2%	0%
	Draglines	All dragline systems	5,380,505	2,313,617	1,631,433	701,516	27,734	0.017 [j]	12%	14%	2%
	Bulldozers	OCM pits	1,191,360	280,320	1,191,360	280,320	125,093	0.105 [j]	9%	6%	10%
	Hauling – overburden	DL1	221,936	54,912	221,936	54,912	6,794	0.03 [k]	18%	12%	6%
		DL2	564,928	139,776	564,928	139,776	17,294	0.03 [k]			
		DL3	847,392	209,664	847,392	209,664	25,941	0.03 [k]			
		DL4	807,040	199,680	807,040	199,680	24,705	0.03 [k]			
	Waste dumping	DL1	45,879	21,699	45,879	21,699	3,286	0.072 [l]	3.8%	4.8%	2.9%
		DL2	116,782	55,235	116,782	55,235	8,364	0.072 [l]			
		DL3	175,173	82,852	175,173	82,852	12,546	0.072 [l]			
		DL4	166,832	78,907	166,832	78,907	11,949	0.072 [l]			
	Coal excavating/ loading	OCMs	612,503	98,475	612,503	98,475	43,868	0.072 [l]	5%	2%	4%
	Hauling – coal	DL1	329,800	81,600	329,800	81,600	10,096	0.03 [k]	10%	6%	3%
		DL2	232,800	57,600	232,800	57,600	7,127	0.03 [k]			
		DL3	407,400	100,800	407,400	100,800	12,471	0.03 [k]			
		DL4	291,000	72,000	291,000	72,000	8,908	0.03 [k]			
	Coal handling/sizing	OCM sizing stations	227,383[b]	96,951[b]	321,168 [c]	131,466 [c]	23,003	0.072 [l]	2.4%	2.6%	1.9%
	Bulldozers	OCM sizing stations	208,382	66,427	208,382	66,427	21,880	0.105 [j]	1.6%	1.3%	1.8%
	Reject coal dumping	OCM pits	160,000	67,200	160,000	67,200	11,459	0.072 [l]	1.2%	1.3%	0.9%

Table 1: Continued

Source of emissions			Year 19 Emissions (kg/year)					$PM_{2.5}$ Scaling Factor ($PM_{2.5}$/TSP)	Revised Air Quality Assessment		
			Original Air Quality Assessment		Revised Air Quality Assessment				% of total TSP	% of total PM_{10}	% of total $PM_{2.5}$
			TSP	PM_{10}	TSP	PM_{10}	$PM_{2.5}$				
Underground mines	Coal handling/sizing	UGM sizing stations	24,644 [d]	11,656 [d]	198,387 [e]	76,114 [e]	14,209	0.072 [l]	1.5%	1.5%	1.2%
	Bulldozers	UGM sizing stations	118,749	37,854	118,749	37,854	12,469	0.105 [j]	0.9%	0.8%	1.0%
	Wind erosion – coal stockpiles	UGM drift stockpiles	27,471	13,736	27,471	13,736	3,297	0.12 [m]	0.2%	0.3%	0.3%
	Vents	UGMs	90,824	62,441	90,824	62,441	9,082	0.10 [n]	0.7%	1.2%	0.7%
CHPP and stockpiles	Coal loading/ reclaiming[f]	Raw coal stockpiles	15,334	7,253	15,334	7,253	1,098	0.072 [l]	0.1%	0.1%	0.1%
	Wind erosion – coal stockpiles	Raw coal stockpiles	38,894	19,447	38,894	19,447	4,667	0.12 [m]	0.3%	0.4%	0.4%
	Coal loading/ reclaiming[g]	Product coal stockpiles	10,953	5,181	10,953	5,181	784	0.072 [l]	0.08%	0.10%	0.1%
	Wind erosion – coal stockpiles	Product coal stockpiles	29,434	14,717	29,434	14,717	3,532	0.12 [m]	0.2%	0.3%	0.3%
	Coal loading/ reclaiming[h]	Reject coal stockpiles	6,572	3,108	6,572	3,108	471	0.072 [l]	0.05%	0.06%	0.04%
	Wind erosion – coal stockpiles	Reject coal stockpiles	18,922	9,461	18,922	9,461	2,271	0.12 [m]	0.1%	0.2%	0.2%
	Bulldozers	CHPP	208,382	66,427	208,382	66,427	21,880	0.105 [j]	1.6%	1.3%	1.8%
Wind erosion of exposed areas	Wind erosion – recently disturbed exposed areas	OCMs	510,000	255,000	510,000	255,000	61,200	0.12 [m]	4%	5%	5.0%
	Wind erosion – not recently disturbed exposed areas	OCMs	1,232,500	616,250	1,232,500	616,250	147,900	0.12 [m]	9%	12%	12.0%
	Wind erosion	Out of pit waste dumps	844,066	422,033	844,066	422,033	101,288	0.12 [m]	6%	8%	8.2%
All	Diesel vehicle exhaust	All diesel engines	Not estimated	Not estimated	393,393	383,952	380,411	0.97 [o]	3%	8%	30.9%
Total Emissions			**16,359,675**	**6,130,895**	**13,271,523**	**5,001,718**	**1,231,880**		**100%**	**100%**	**100%**

Notes for Table 1:

a DL1–4 refers to dragline systems 1–4.

b Emission factors presented are the sum of emission factors for 'trucks dumping coal' and 10 x 'miscellaneous transfer' to account for all steps of material handling at OCM sizing stations. Refer to Section 2.2.3.6, Volume 5, Appendix 18 Air Quality Assessment (of the original EIS).

c Revised emission estimates are the sum of emission factors for 'trucks dumping coal' and 7 x miscellaneous transfer to account for material handling at OCM sizing stations (Refer to Section 2.2.3.6, Volume 5, Appendix 18 Air Quality Assessment (of the original EIS) for the emission estimation methodology). Also included are emissions for a primary crusher and associated screen, a secondary crusher and associated screen and a tertiary crusher and associated screen (please refer to the response to Issue Reference 12007 for further details).

d Emission factors presented are the sum of 5 x 'miscellaneous transfer' emission factors to account for all steps of material handling at UGM sizing stations. Refer to Section 2.2.3.6, Volume 5, Appendix 18 Air Quality Assessment (of the original EIS).

e Revised emission estimates are the sum of emission factors for 3 x miscellaneous transfer to account for miscellaneous material handling at OCM sizing stations (Refer to Section 2.2.3.6, Volume 5, Appendix 18 Air Quality Assessment (of the original EIS) for the emission estimation methodology). Also included are emissions for a secondary crusher and associated screen, and a tertiary crusher and associated screen (please refer to the response to Issue Reference 12007 for further details).

f,g Emission factors presented are the sum of 2 x 'miscellaneous transfer' emission factors to account for coal loading and reclaiming. Refer to Section 2.2.3.8 Volume 5, Appendix 18 Air Quality Assessment (of the original EIS).

h Emission factors presented are the sum of 3 x 'miscellaneous transfer' emission factors to account for coal loading, reclaiming and loading to haul trucks. Refer to Section 2.2.3.8 (of the original EIS).

i Source: USEPA AP42 Chapter 11.9 (assumed to be the same as a bulldozer).

j Source: USEPA AP42 Chapter 11.9 (of the original EIS).

k Source: USEPA AP42 Chapter 13.2.2 (of the original EIS).

l Source: USEPA AP42 Chapter 13.2.4 (of the original EIS).

m Source: CARB (2012) – Windblown dust, California Emission Inventory and Reporting System (CEIDARS).

n Assumed ratio.

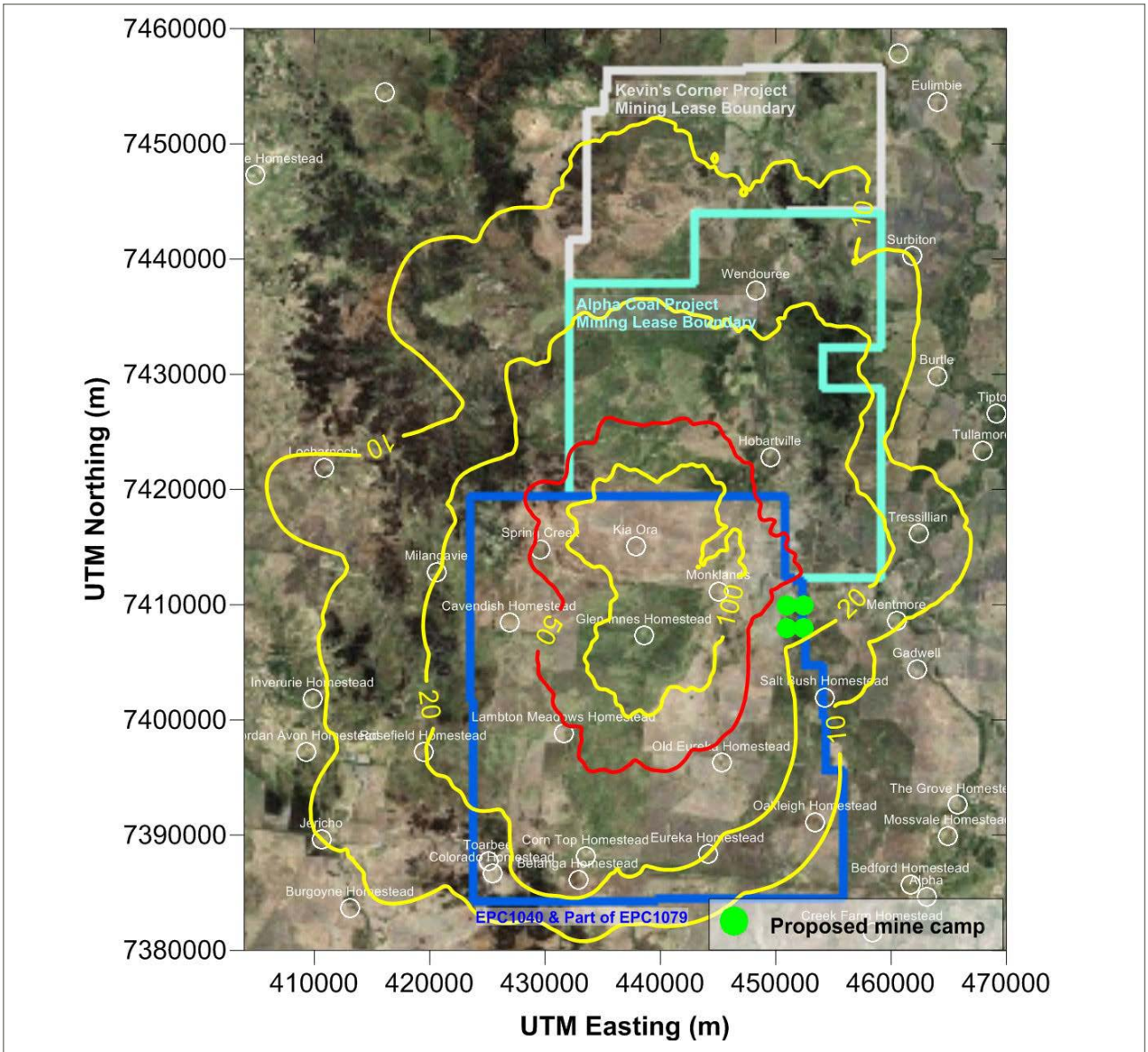
o CARB (2012) – liquid fuel combustion, California Emission Inventory and Reporting System (CEIDARS). TSP emissions are estimated based on the estimated $PM_{2.5}$ emissions and the CARB $PM_{2.5}$:TSP ratio for liquid fuel combustion of 96.7%. PM_{10} emissions are estimated based on the estimated PM_{10} emissions and the CARB PM_{10}:TSP ratio for liquid fuel combustion of 97.6%.
For further detail on the emission estimation technique for $PM_{2.5}$ from diesel combustion please refer to the response to Issue Reference 12005.

The revised emission estimates were included in a revised air quality model for the Galilee Coal Project using the same model set-up as previously assessed.

The air quality modelling results for the mine emissions only are shown in the following figures:

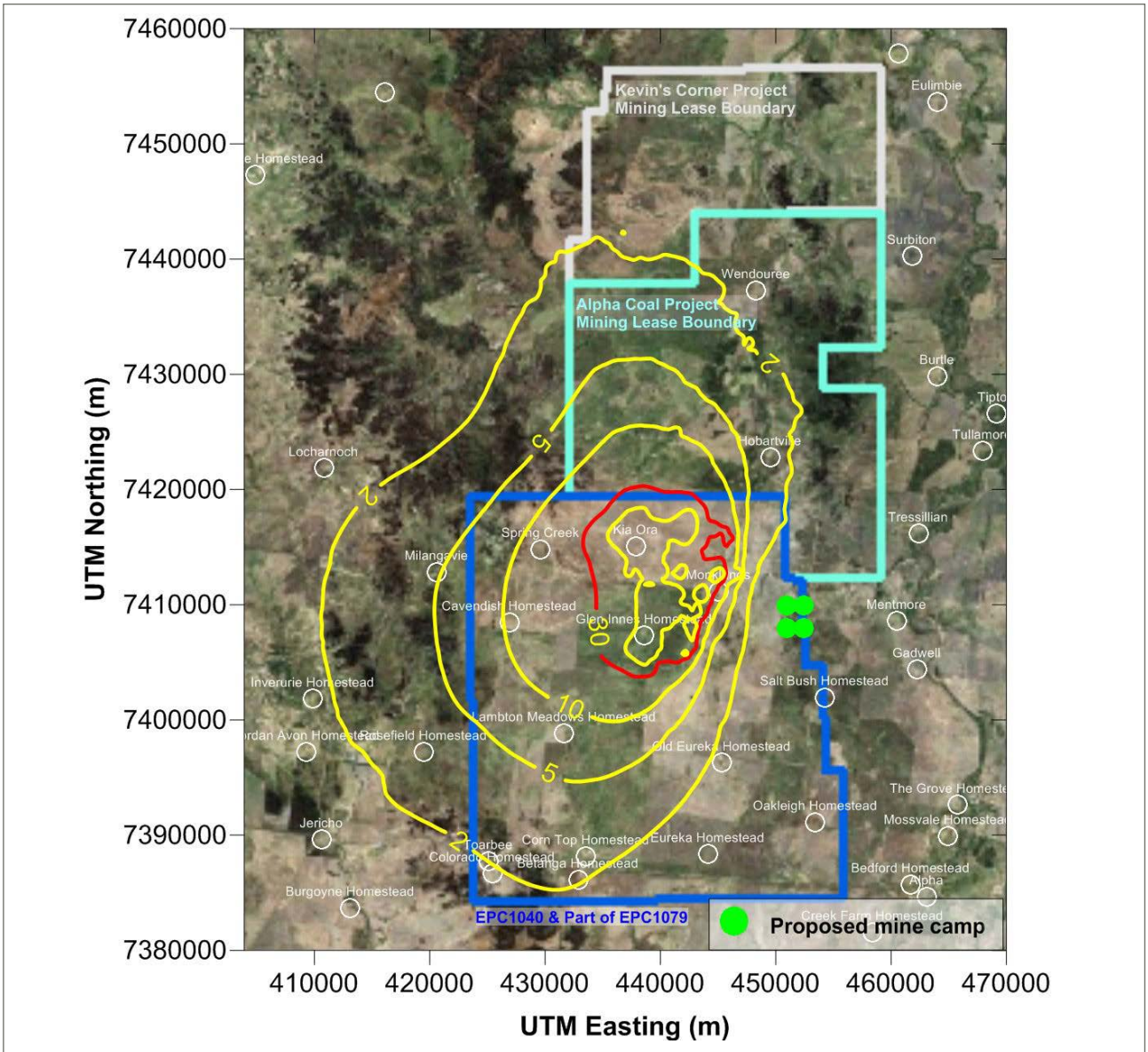
- Maximum 24-hour PM_{10} ground level concentrations (Figure 1)
- Annual average PM_{10} ground level concentrations (Figure 2)
- Annual average TSP ground level concentrations (Figure 3)
- Maximum 24-hour $PM_{2.5}$ ground level concentrations (Figure 4)
- Annual average $PM_{2.5}$ ground level concentrations (Figure 5), and
- Average monthly dust deposition (Figure 6).

Figure 1: Predicted maximum 24-hour ground-level concentrations of PM_{10} – Year 19 – maximum mine emissions



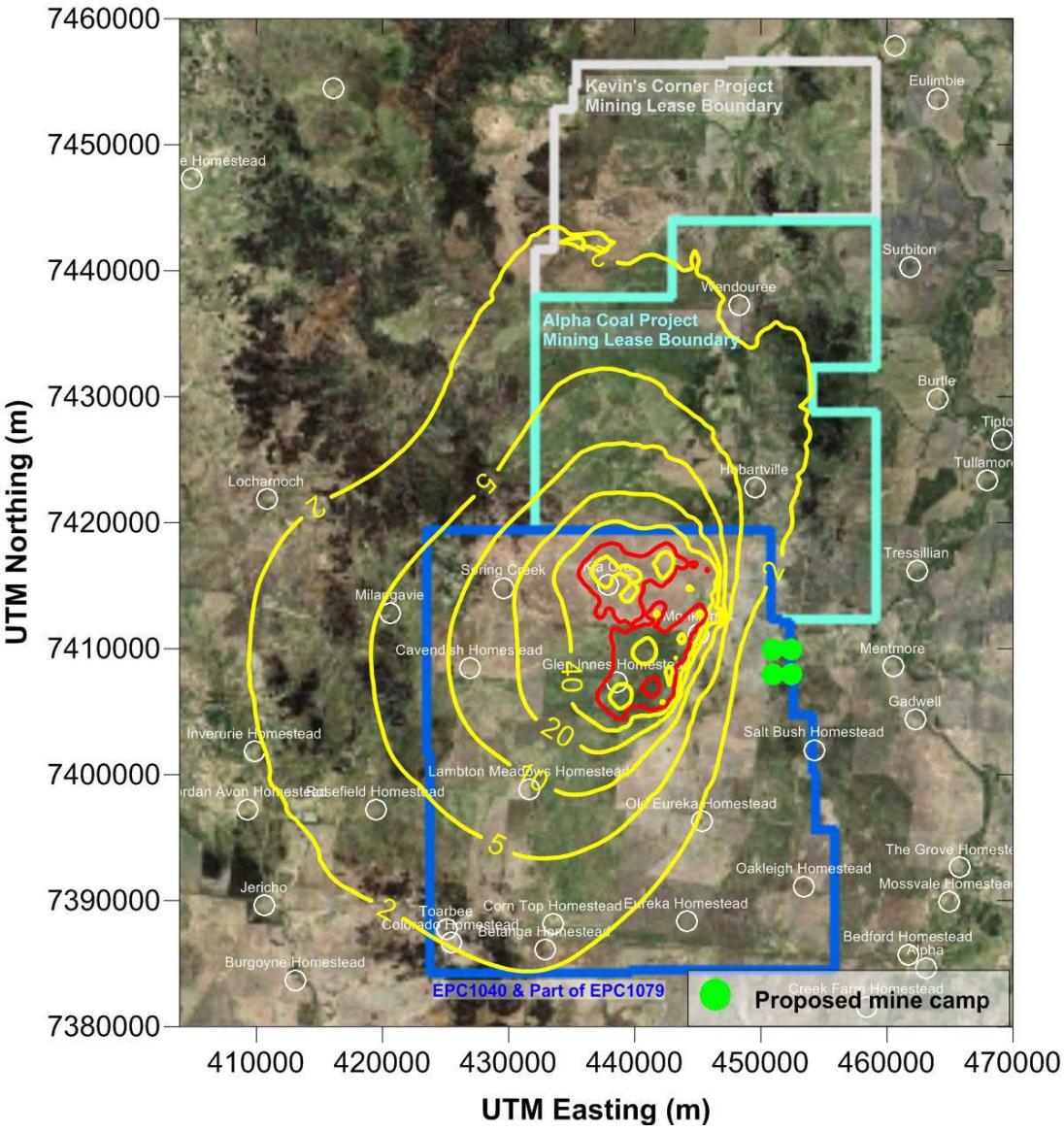
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 50µg/m³**	TAPM Generated	J Weidmann

Figure 2: Predicted annual average ground-level concentrations of PM_{10} – Year 19 – maximum mine emissions



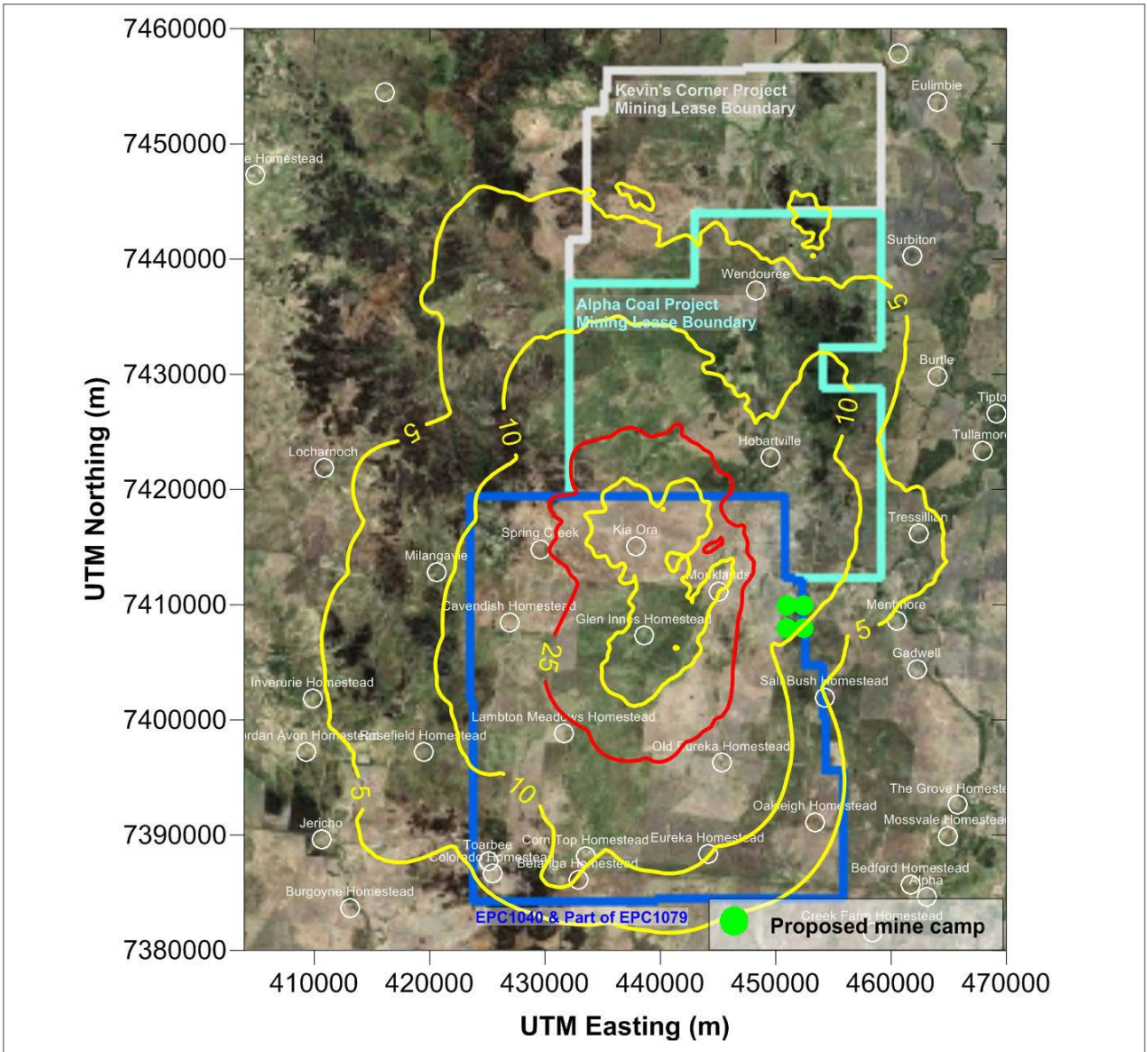
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 30µg/m³**	TAPM Generated	J Weidmann

Figure 3: Predicted annual average ground-level concentrations of TSP – Year 19 – maximum mine emissions



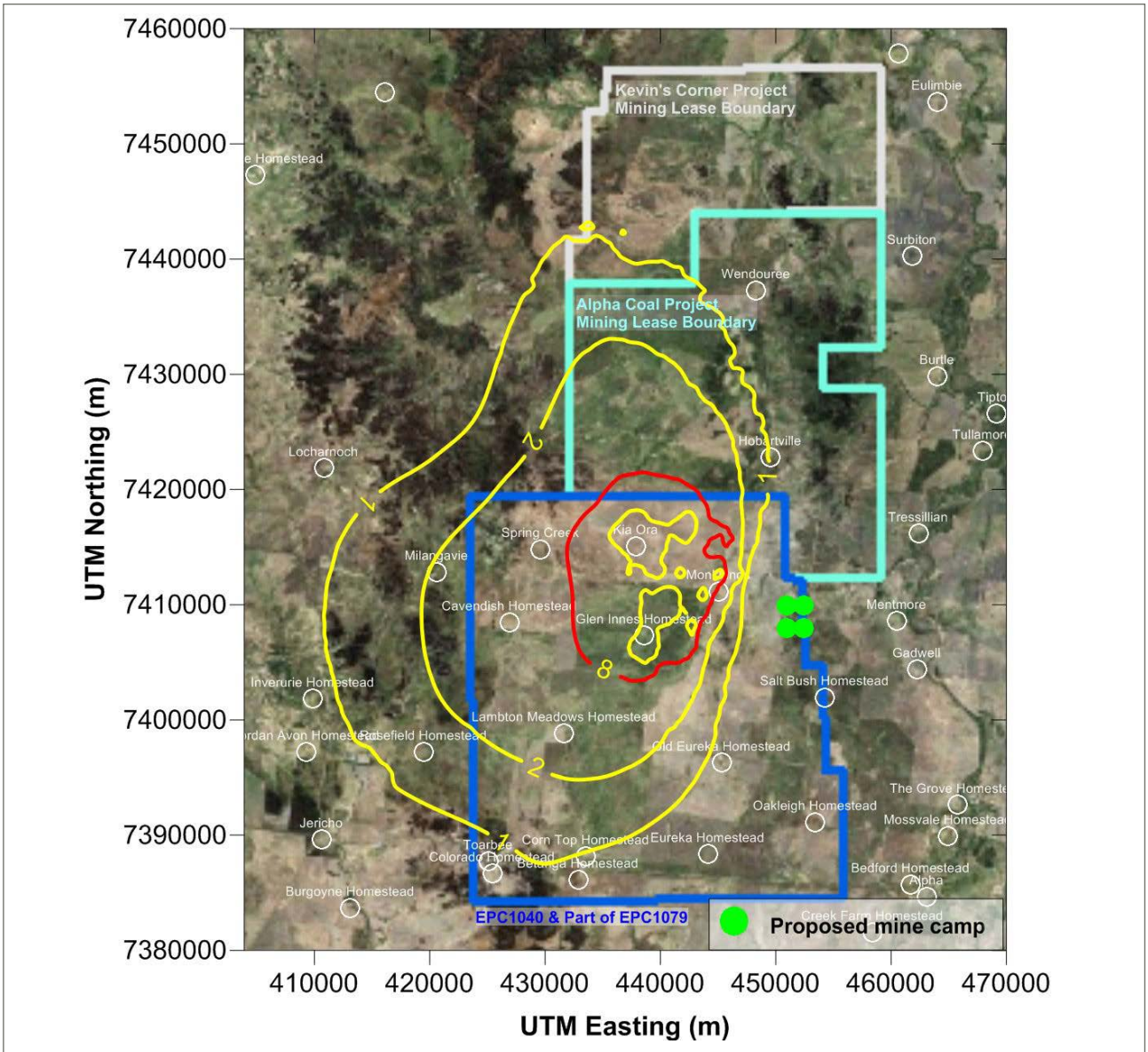
Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 90µg/m³**	TAPM Generated	J Weidmann

Figure 4: Predicted maximum ground-level concentrations of $PM_{2.5}$ – Year 19 – maximum mine emissions



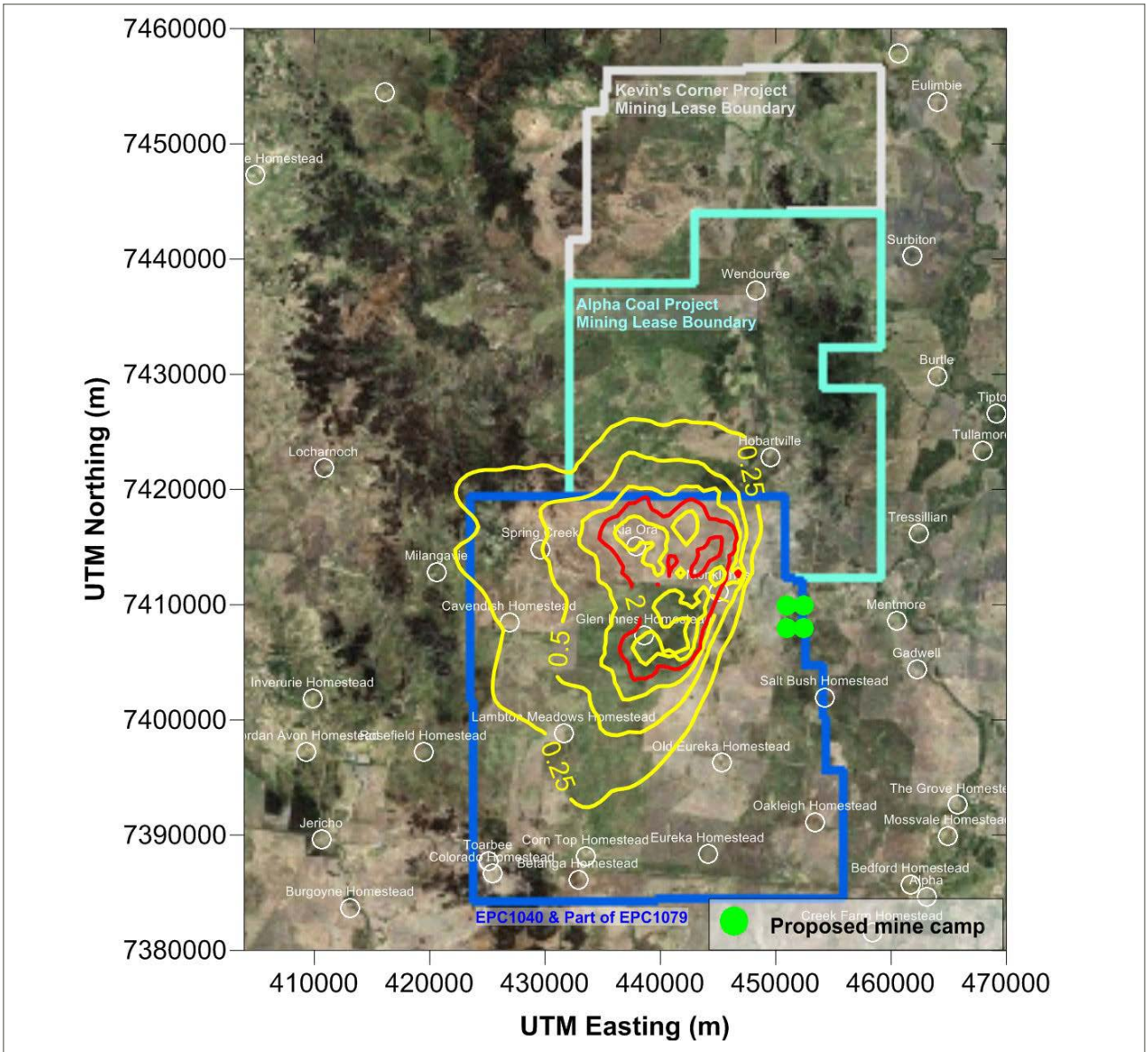
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 25µg/m³**	TAPM Generated	J Weidmann

Figure 5: Predicted annual average ground-level concentrations of $PM_{2.5}$ – Year 19 – maximum mine emissions



Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 8µg/m³**	TAPM Generated	J Weidmann

Figure 6: Predicted annual average dust deposition rates – Year 19 – maximum mine emissions



Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP (Dust deposition)	Galilee Coal Project	Project emissions (Year 19) – maximum emissions	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	g/m²/month	**2 g/m²/month (project only)**	TAPM Generated	J Weidmann

Cumulative air quality impact assessment

A cumulative air quality assessment was conducted using estimated emission rates for the proposed Alpha Coal Mine and the proposed Kevin's Corner Coal Mine located immediately to the north of the Galilee Coal Project (at the time of assessment no information was available for the Carmichael Coal Mine or the South Galilee Coal Project).

Estimated emission rates for TSP and PM_{10} were sourced from the following:

- Report – *Alpha Coal Mine Project Air Quality Assessment* – Model Refinements – Report prepared for Hancock Coal Pty Ltd – 21 May 2012 (URS, 2012) *http://hancockcoal.com.au/index.cfm?objectid=7D6BCEBA-1372-5CE6-24482707D66C29AF*, and
- Report – *Air Quality Assessment for the Kevin's Corner EIS Project* – Report prepared for Hancock Coal Pty Ltd – 6 April 2011 (URS, 2011).

In order to model worst case cumulative impacts that best coincide with the worst case impacts for the Galilee Coal Project the following operational years were chosen for Alpha coal mine and Kevin's Corner coal mine:

- Alpha Coal Mine – Year 20, and
- Kevin's Corner – Year 25.

It is estimated that these years would most closely coincide with Year 19 emissions from the Galilee Coal Project and are also considered to be representative of worst case impacts from both surrounding proposed mines.

Estimated emissions (TSP, PM_{10}) for Year 20 operations at the Alpha Coal Mine are presented in Table 2.

Table 2: Modelled emissions for Alpha Coal Mine – Year 20

Emission Source Name	Estimated emissions (kg/year) year 20		Temporal variation
	TSP	PM_{10}	
Topsoil – Disturbance and Rehabilitation	65,264	32,632	Wind dependent
Overburden & In-Pit – IPCC	103,520	51,760	Wind dependent
Overburden & In-Pit – Drilling and Blasting	323,075	167,999	Constant
Overburden & In-Pit – Dragline	2,148,381	343,741	Wind dependent
Overburden & In-Pit – FEL of Overburden into Trucks	15,828	7,439	Constant
Overburden & In-Pit – Transport of Overburden to Dumps	5,444,220	1,361,055	Constant
Overburden & In-Pit – Truck Dumping at Overburden Dumps	1,388,364	499,811	Constant
Overburden & In-Pit – FEL coal trucks	276,765	132,847	Constant
Overburden & In-Pit – Dozers	136,738	35,552	Constant
Overburden & In-Pit – Graders	33,091	14,891	Constant
ROM Activities – Processing	0	0	Constant
ROM Activities – Truck Dumping at ROM	193,312	81,191	Constant
ROM Activities – FEL at ROM	55,352	26,569	Constant
ROM Activities – Dozer hours Coal at ROM total	18,752	5,438	Constant
ROM Activities – Wind Erosion from Stockpiles	1,458	729	Wind dependent
ROM to CHPP Conveyor – Conveyors	832	416	Wind dependent
ROM to CHPP Conveyor – Miscellaneous Transfer Points	8,966	4,214	Constant
CHPP Activities – Processing	5,359	2,090	Constant
CHPP Activities – FEL at CHPP	16,606	7,971	Constant
CHPP Activities – Dozer Hours Coal at CHPP	376	109	Constant
CHPP Activities – Loading Stockpiles	21,286	9,153	Constant
CHPP Activities – Unloading from Stockpiles	10,851	4,666	Constant
CHPP Activities – CHPP Conveyors	80	40	Wind dependent
CHPP Activities – Miscellaneous Transfer Points	1,734	815	Constant
CHPP Activities – Wind Erosion from Stockpiles	15,464	7,732	Wind dependent
Main Haul Roads – Transport of Coal to ROM	2,582,464	645,616	Constant
Main Haul Roads – Transport of Rejects to Dumps	0	0	Constant
Tailing Storage Facility – Wind Erosion	25,358	12,679	Wind dependent
Total Estimated Emissions:	**12,893,496**	**3,457,155**	

Source: Report – *Alpha Coal Mine Project Air Quality Assessment – Model Refinements* – Report prepared for Hancock Coal Pty Ltd – 21 May 2012 (URS, 2012).

Estimated emissions (TSP, PM_{10}) for Year 25 operations at the Kevin's Corner coal mine are presented in Table 3.

Table 3: Modelled emissions for Kevin's Corner Coal Mine – Year 25

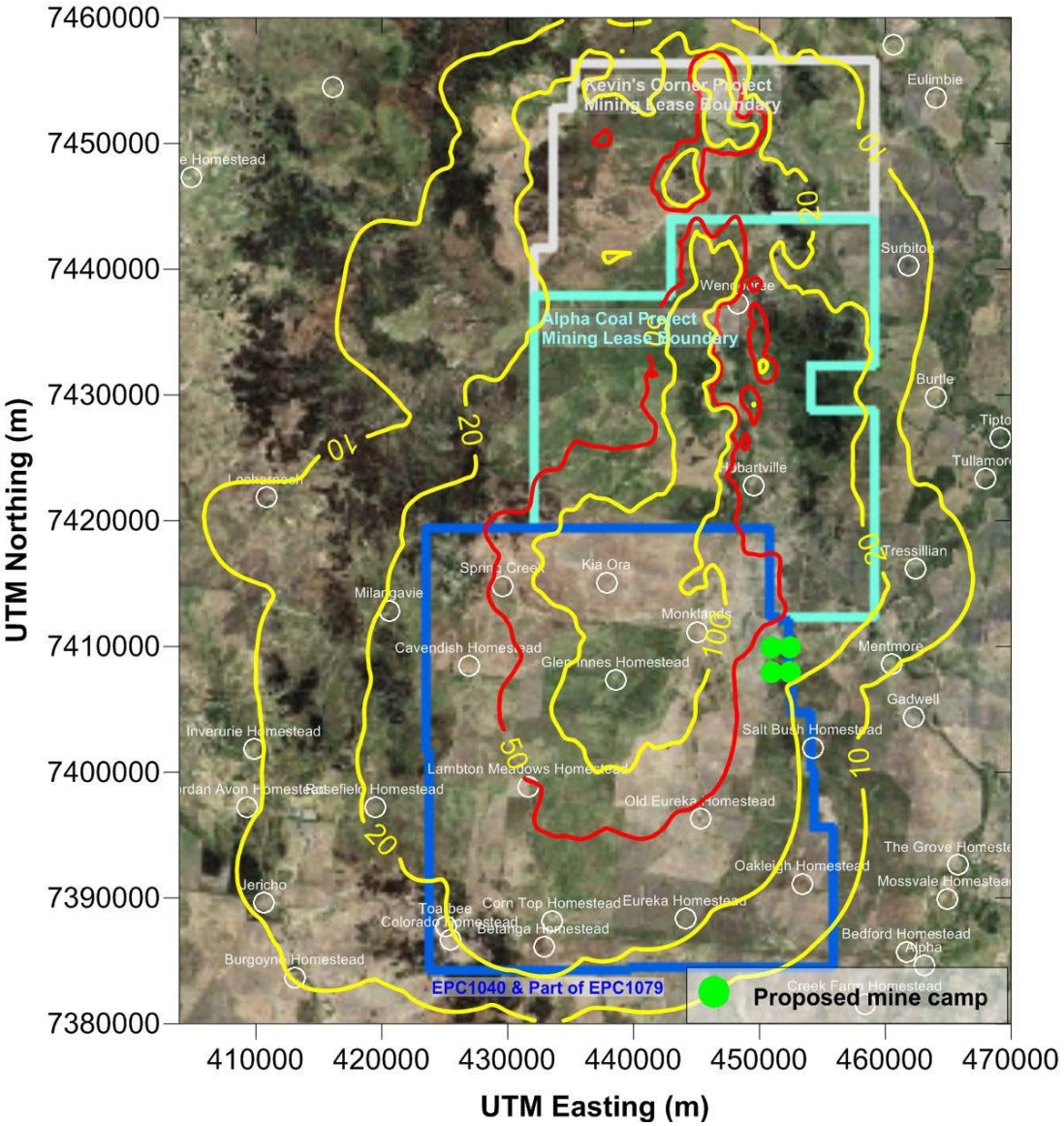
Emission Source Name	Estimated emissions (kg/year) year 25		Temporal variation
	TSP	PM_{10}	
Disturbance & rehabilitation	28,277	14,139	Wind dependent
Drilling and blasting	9,573	4,981	Constant
Dragline operation	1,818,745	294,442	Constant
FEL of overburden into trucks	34,977	16,543	Constant
Transport of overburden to trucks (level 2 watering)	883,365	193,509	Constant
Truck dumping at overburden dumps	861,788	361,951	Constant
FEL of coal trucks	359,479	172,827	Constant
Dozers	300,181	73,761	Constant
Graders	728,085	194,589	Constant
Wind erosion from pits	37,932	37,932	Wind dependent
Wind erosion from overburden stockpiles	215,942	107,971	Wind dependent
Processing	–	–	Constant
Truck dumping at ROM	175,042	38,240	Constant
Dozer – coal at ROM (total)	83,994	48,408	Constant
Coal conveyors	323	128	Wind dependent
Conveyor transfer points	91,059	43,069	Constant
Coal processing	173,442	68,375	Constant
Loading of coal stockpiles	22,270	10,067	Constant
Misc transfer points	60,691	28,705	Wind dependent
Wind erosion from stockpiles	6,163	3,082	Wind dependent
Transport of coal to ROM (level 2 watering)	552,923	103,710	Constant
Transport of rejects to dumps (level 2 watering)	92,912	30,655	Constant
Wind erosion from tailings storage facility	112,128	56,064	Wind dependent
Total (kg/year)	**6,649,291**	**1,903,148**	

Source: Report – *Air Quality Assessment for the Kevin's Corner EIS Project* – Report prepared for Hancock Coal Pty Ltd – 6 April 2011 (URS, 2011).

The air quality modelling results for the cumulative impact assessment are shown in the following figures:

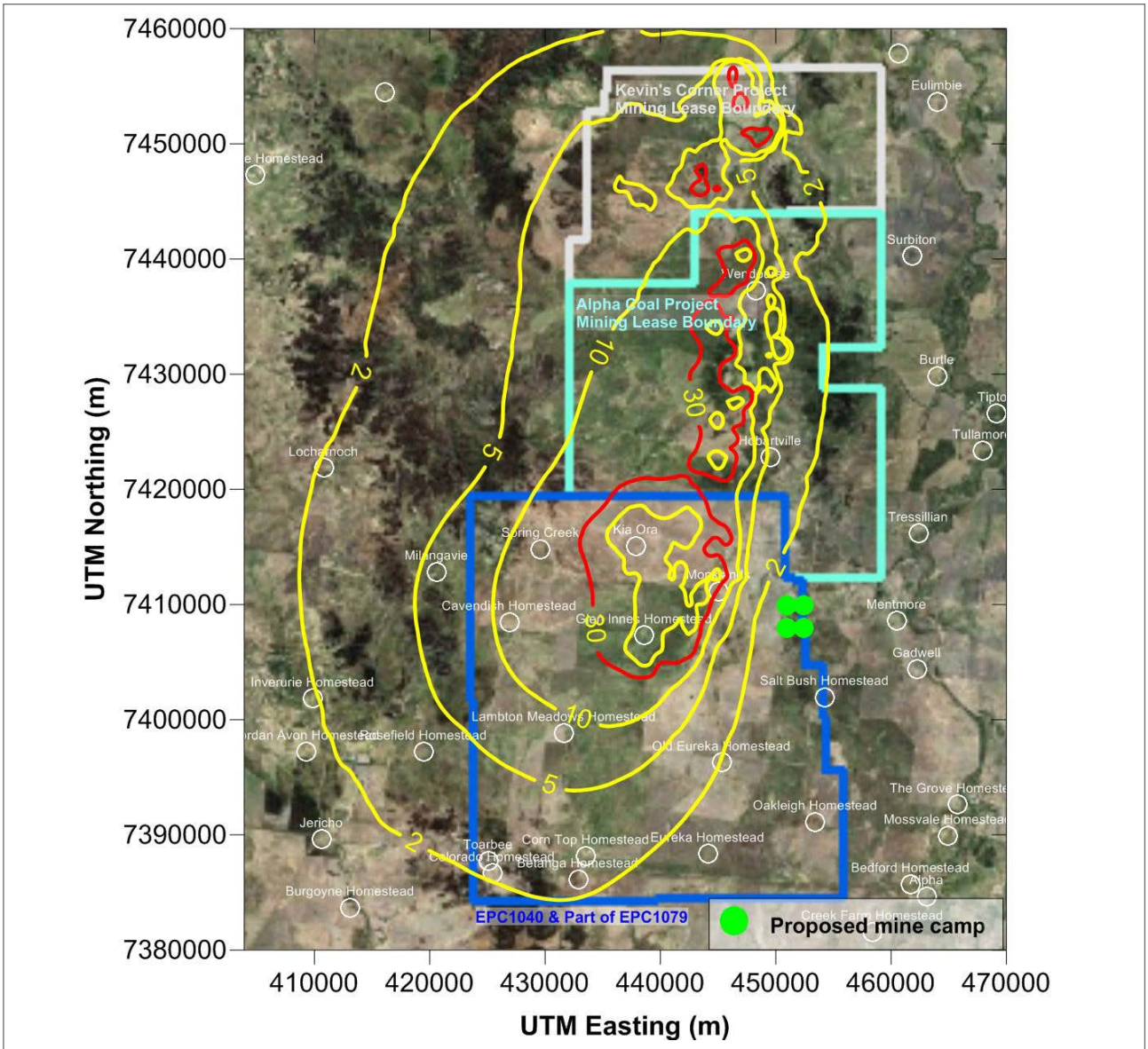
- Maximum 24-hour PM_{10} ground level concentrations (Figure 7)
- Annual average PM_{10} ground level concentrations (Figure 8)
- Annual average TSP ground level concentrations (Figure 9)
- Maximum 24-hour PM2.5 ground level concentrations (Figure 10)
- Annual average PM2.5 ground level concentrations (Figure 11), and
- Average monthly dust deposition (Figure 12).

Figure 7: Cumulative air quality impact assessment – Predicted maximum 24-hour ground-level concentrations of PM_{10} – Year 19 – maximum mine emissions



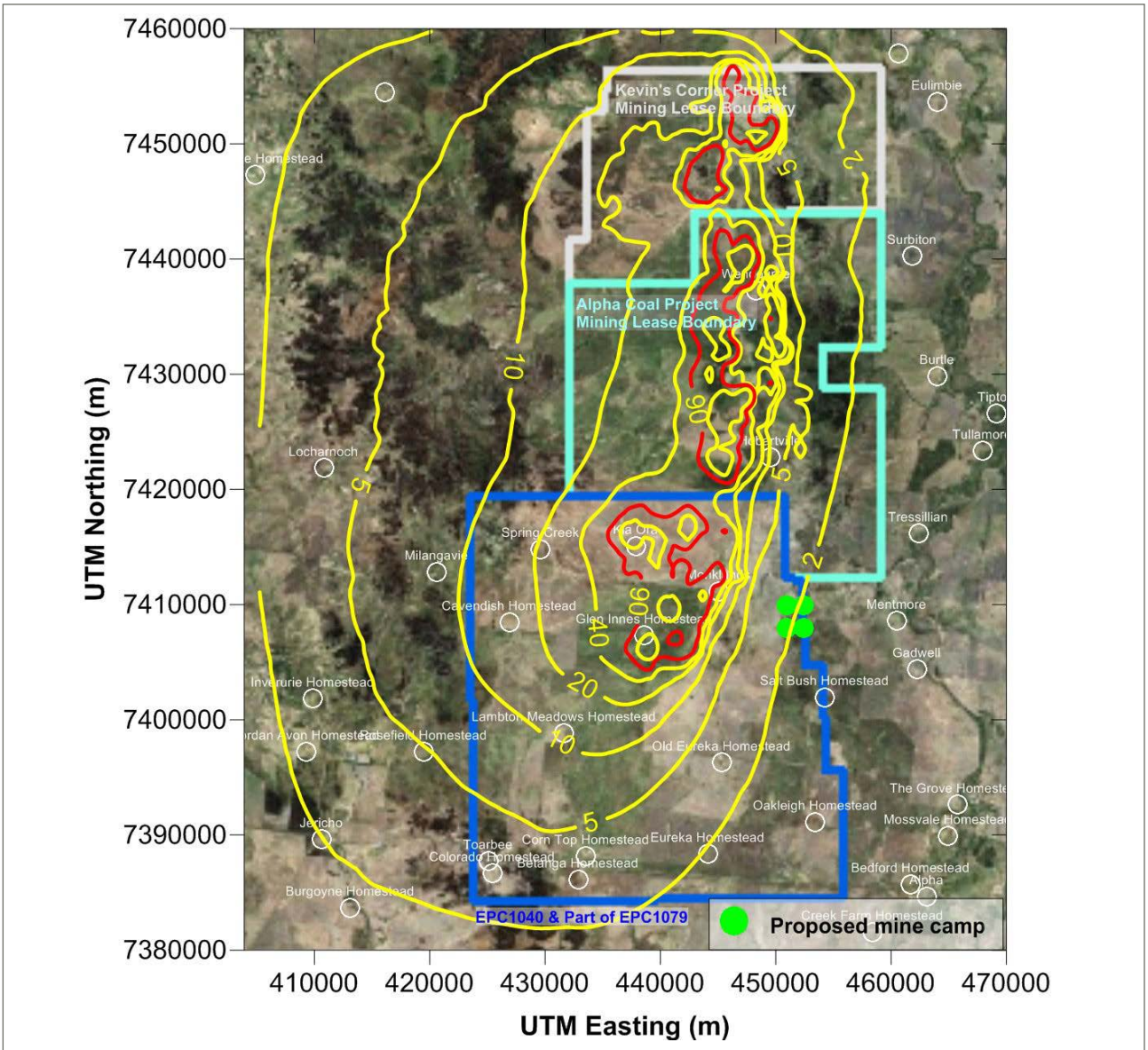
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 50µg/m³**	TAPM Generated	J Weidmann

Figure 8: Cumulative air quality impact assessment – Predicted annual average ground-level concentrations of PM_{10} – Year 19 – maximum mine emissions



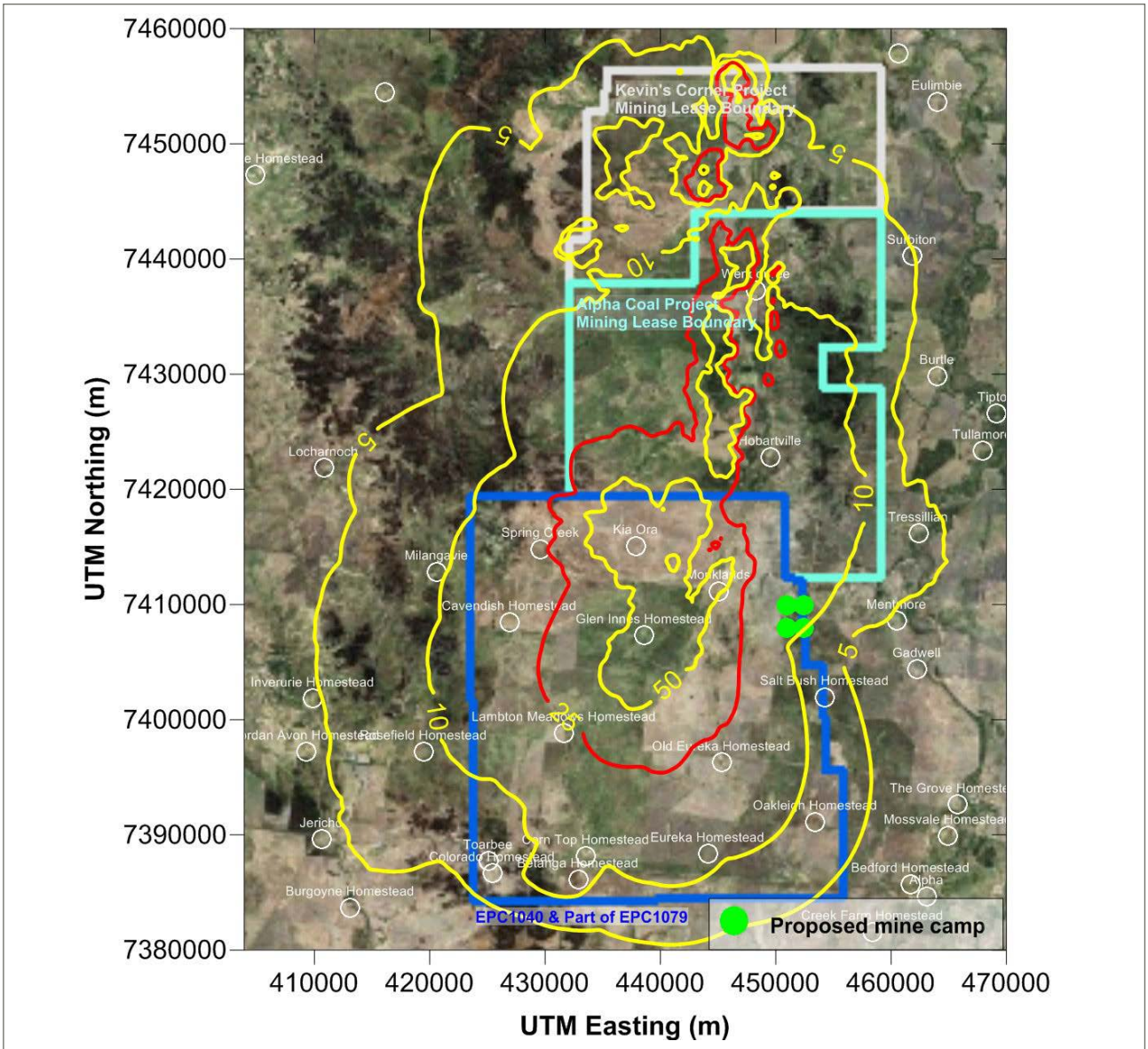
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 30µg/m³**	TAPM Generated	J Weidmann

Figure 9: Cumulative air quality impact assessment Predicted annual average ground-level concentrations of TSP – Year 19 – maximum mine emissions



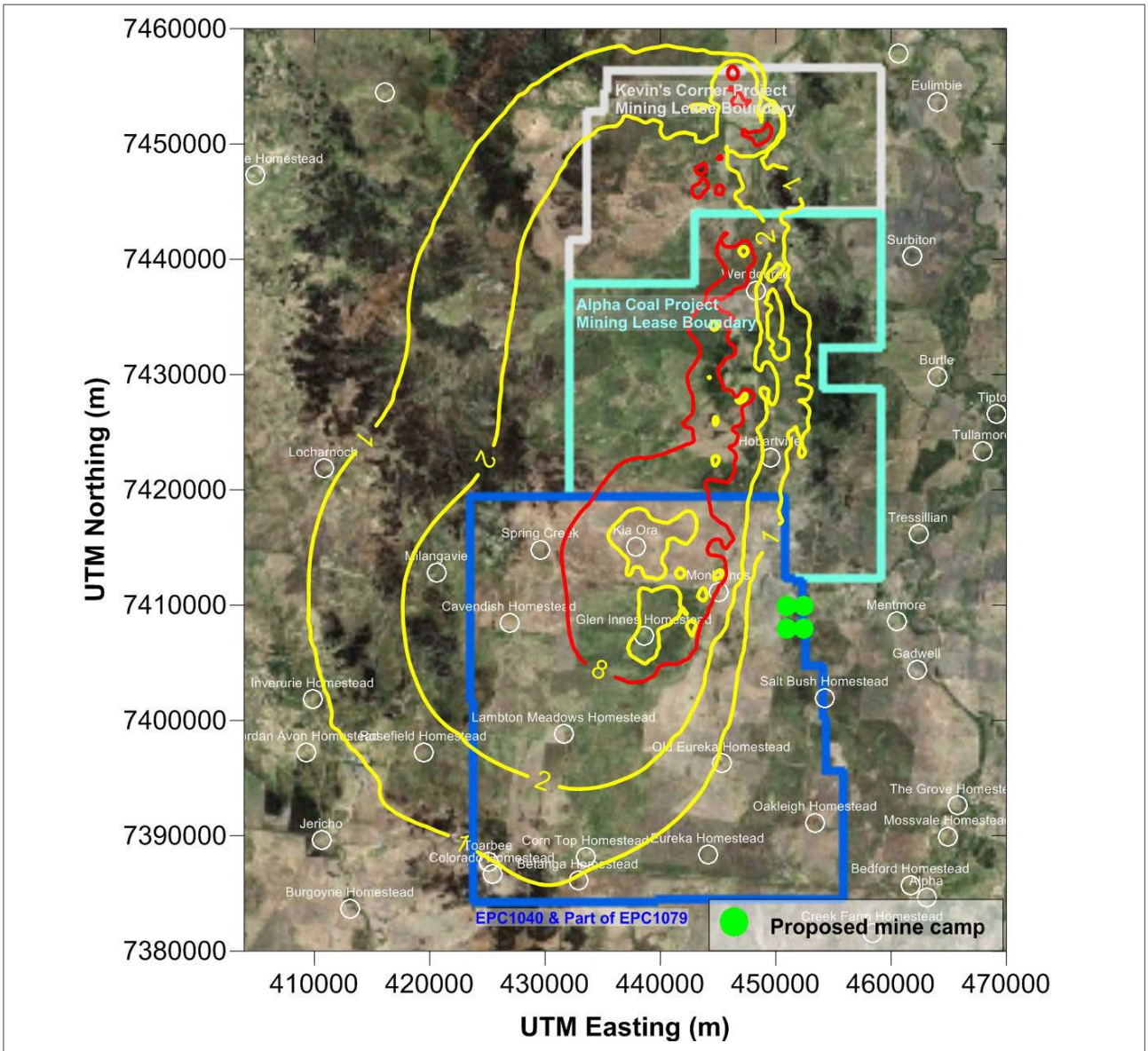
Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 90µg/m³**	TAPM Generated	J Weidmann

Figure 10: Cumulative air quality impact assessment – Predicted maximum ground-level concentrations of $PM_{2.5}$ – Year 19 – maximum mine emissions



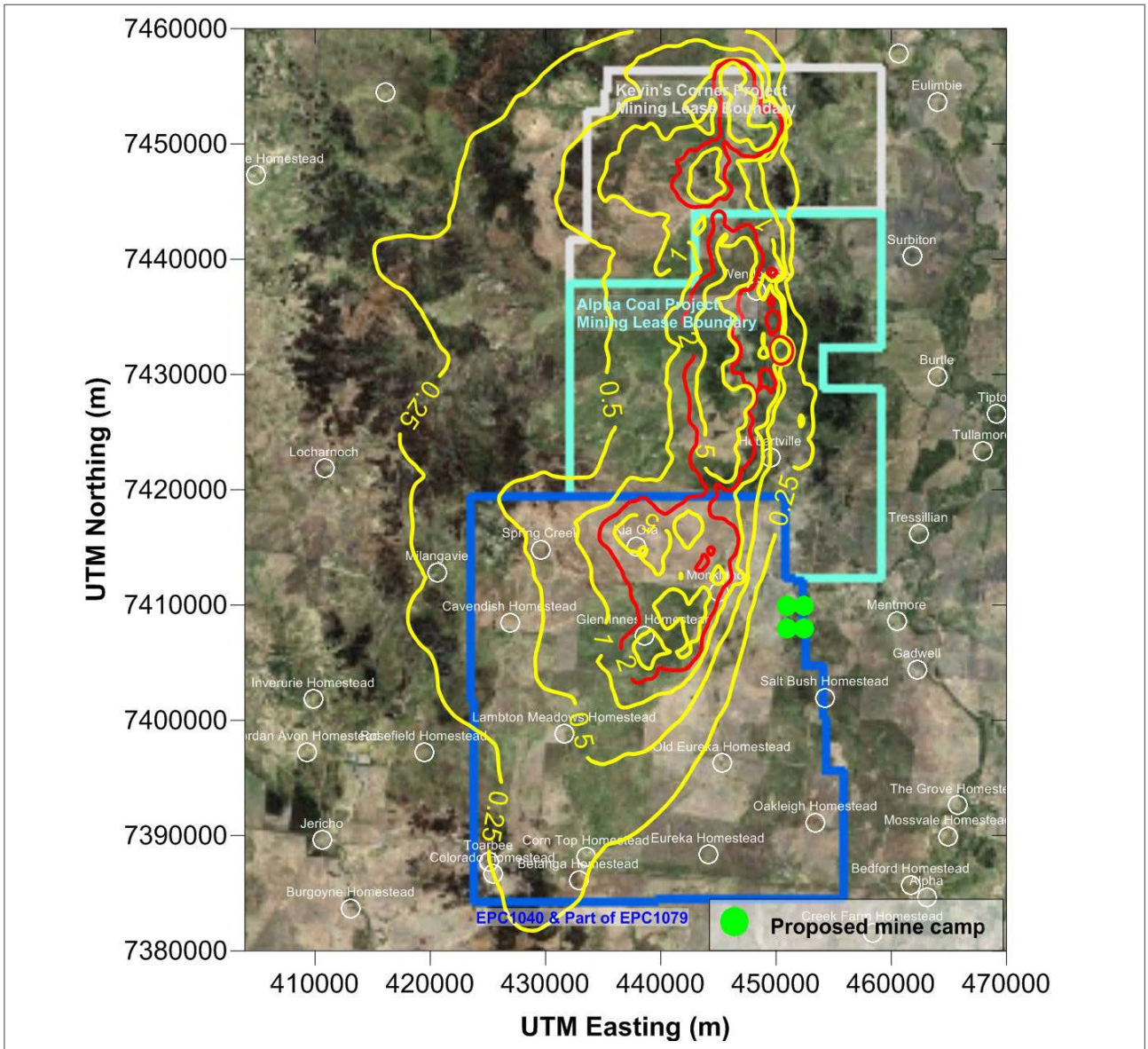
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 25µg/m³**	TAPM Generated	J Weidmann

Figure 11: Cumulative air quality impact assessment – Predicted annual average ground-level concentrations of $PM_{2.5}$ – Year 19 – maximum mine emissions



Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	µg/m³	**EPP (Air) = 8µg/m³**	TAPM Generated	J Weidmann

Figure 12: Cumulative air quality impact assessment – Predicted annual average dust deposition rates – Year 19 – maximum mine emissions



Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP (Dust deposition)	Galilee Coal Project	Project emissions (Year 19) – maximum emissions and maximum emissions for the proposed Alpha coal mine and Kevin's Corner coal mine	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
CALPUFFv6	g/m²/month	**2 g/m²/month (project only)**	TAPM Generated	J Weidmann

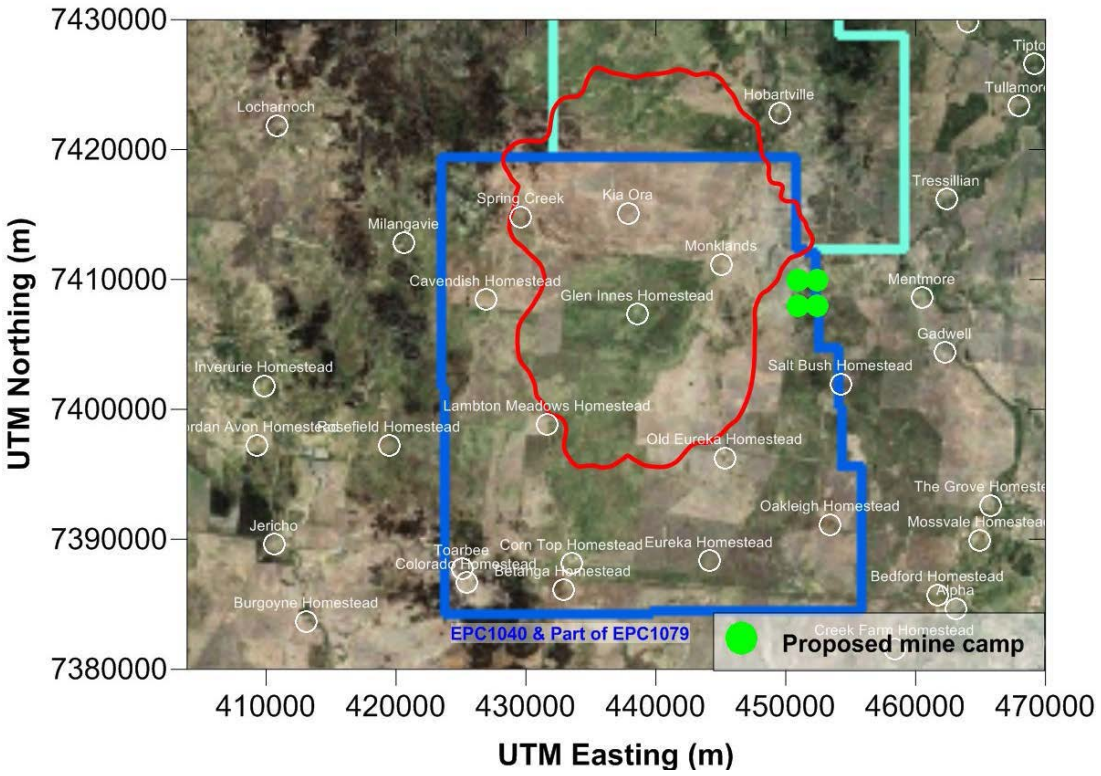
Analysis of Results

Based on the air quality modelling results and recommended acquisition criteria presented in Table 10 at Issue Reference 12014 (in Part C – 06 – Air Quality), the following sensitive receptors will be acquired or relocated by the Galilee Coal Project in order to avoid significant air quality impacts:

- Kia Ora;
- Monklands
- Spring Creek, and
- Glen Innes Homestead (Bimblebox Nature Reserve).

The affected sensitive receptors are shown in Figure 13.

Figure 13: Map of sensitive receptors and recommended acquisition criteria



The next highest air quality impacts are predicted for Lambton Meadows homestead, Hobartville and the Cavendish homestead.

Predicted daily PM_{10} concentrations for each receptor are shown in Figure 14, Figure 15 and Figure 16.

Figure 14: Predicted 24-hour PM_{10} concentration at Lambton Meadows homestead (cumulative impact)

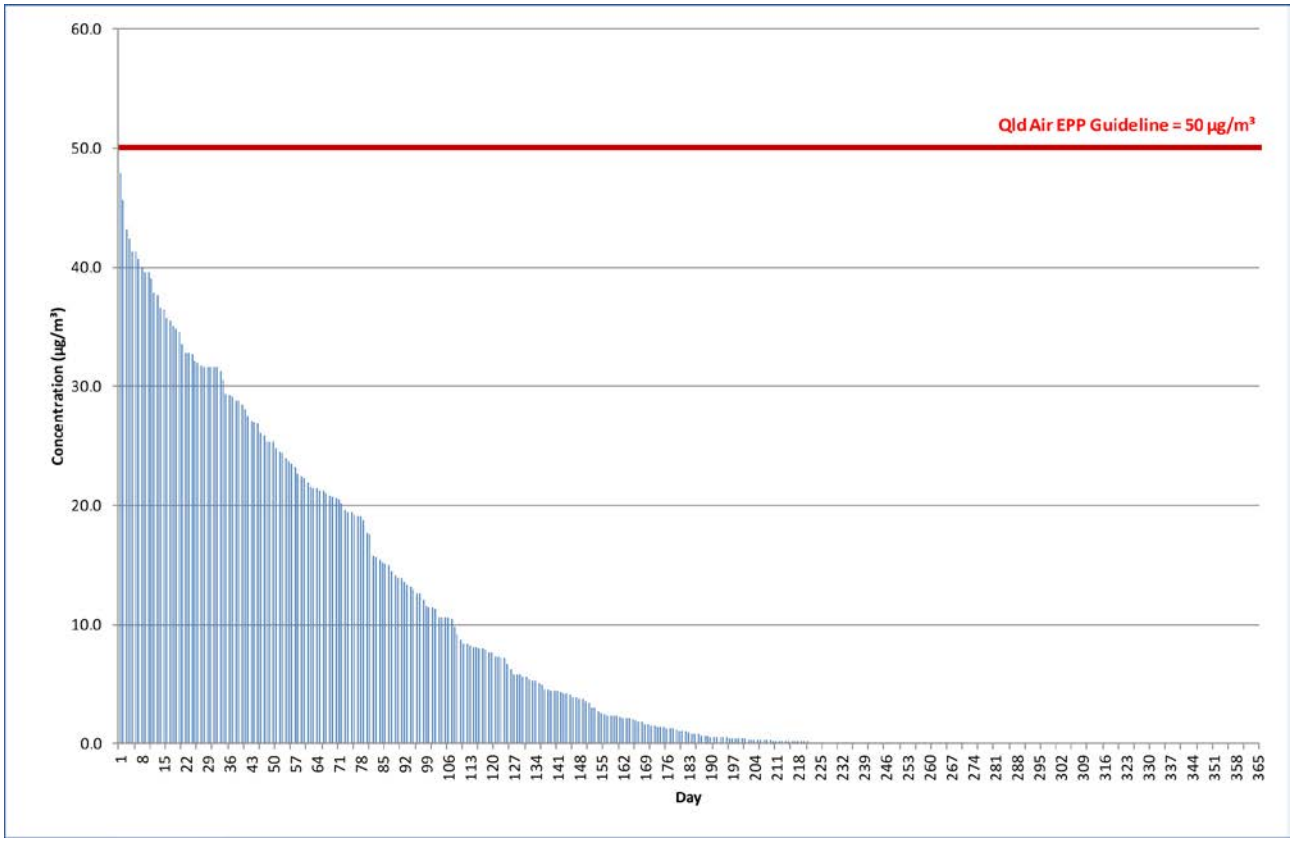


Figure 15: Predicted 24-hour PM_{10} concentration at Hobartville (cumulative impact)

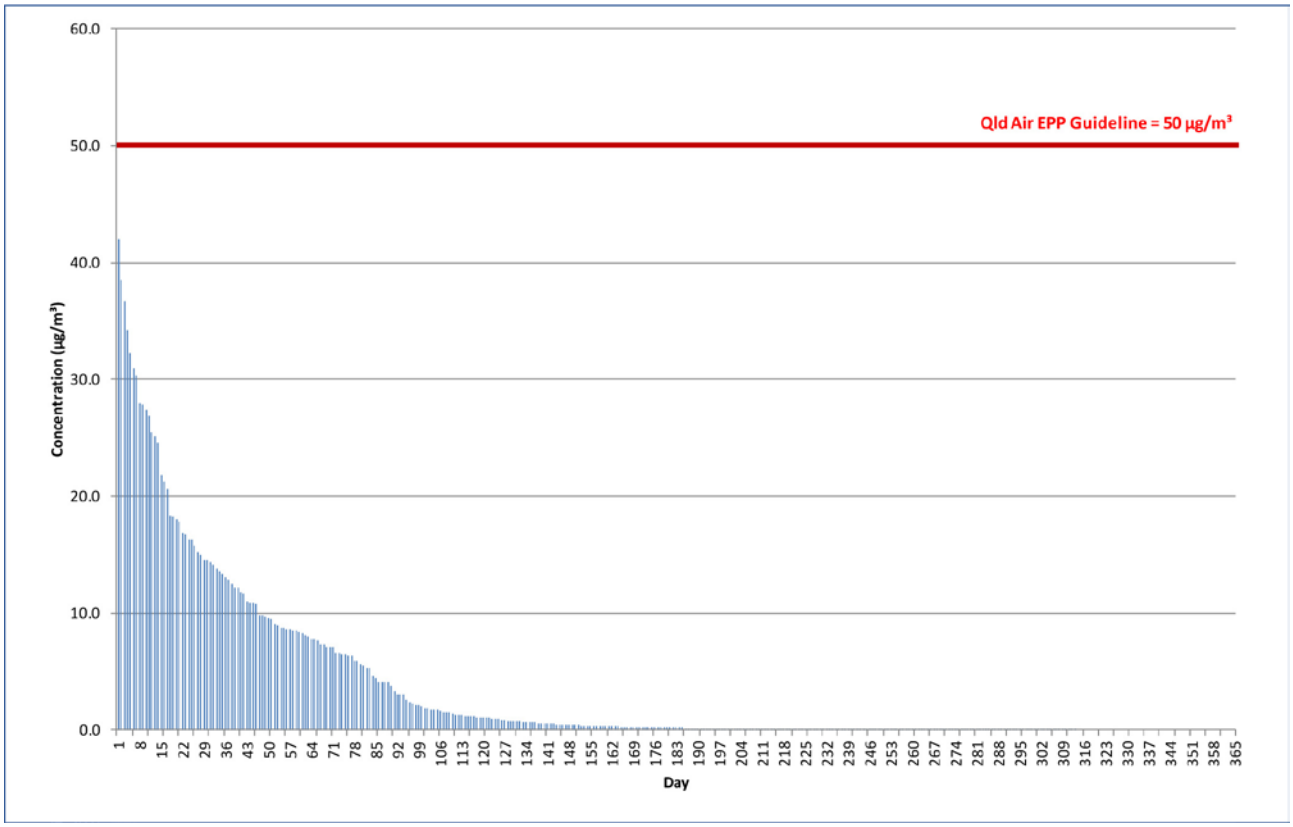
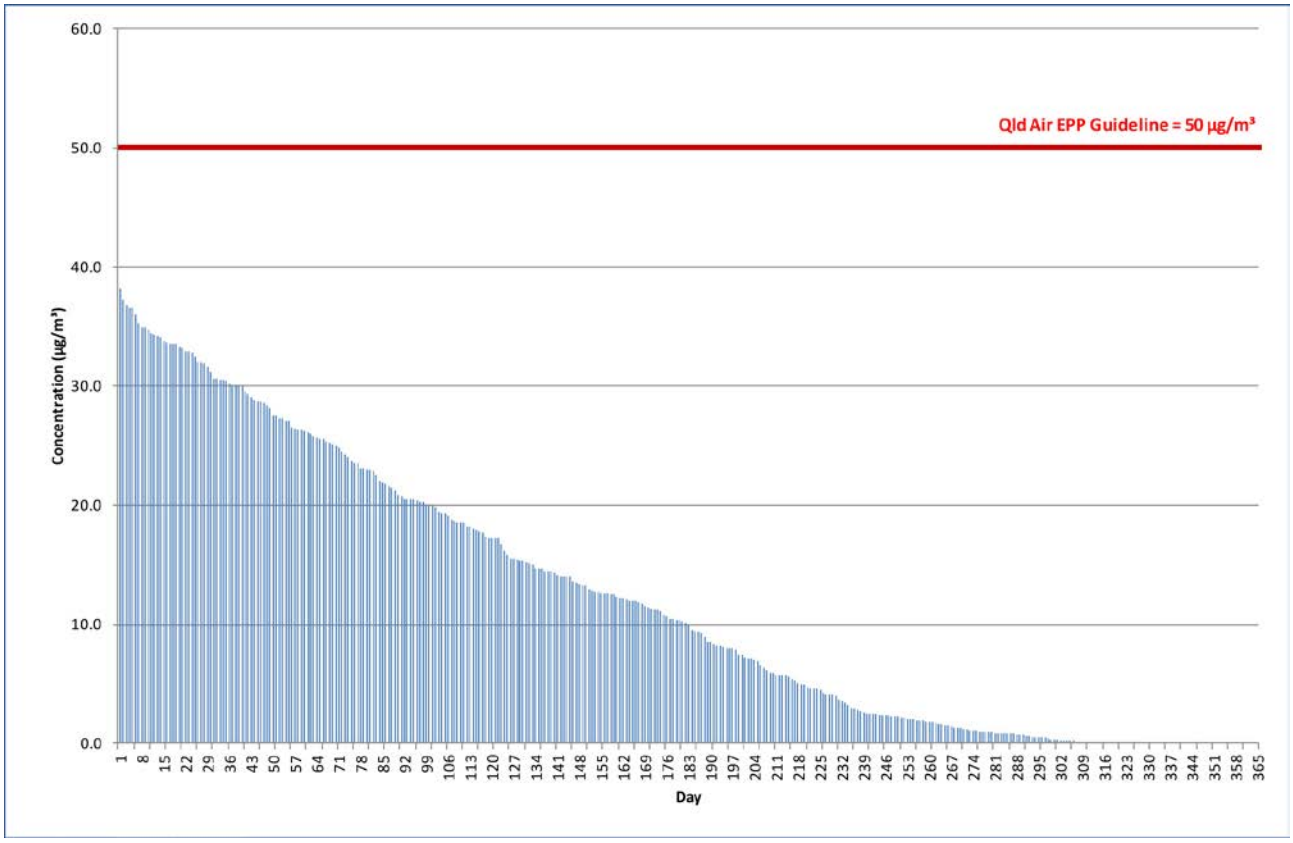


Figure 16: Predicted 24-hour PM_{10} concentration at Cavendish (cumulative impact)



The cumulative impact air quality model which includes maximum emissions from the Galilee Coal Project, Year 20 emissions from Alpha coal mine and Year 25 emissions from Kevin's Corner coal mine shows that air quality levels at these sensitive receptors is within Queensland air quality criteria.

However, it is important to note that background concentrations are not incorporated into the air quality modelling results for the cumulative air quality model. Background air quality was not incorporated into the cumulative air quality model as the model includes maximum emissions from the Galilee Coal Project, and the proposed Alpha and Kevin's Corner coal mines. During Year 19 of operation these emissions are estimated to account for over 95% of total particulate matter emission in the region. Elevated background events may occur on occasion due to regional events such as dust storms and bushfires. However, it is not possible to predict the occurrence of dust storms and bushfires accurately or meaningfully in a localised air quality model. For example, the 2009 dust storms experienced over much of eastern Australia were generated in South Australia and were transported through NSW and Queensland.

Furthermore, the *National Environment Protection (Ambient Air Quality) Measure* (Air NEPM) uses the 6th highest 24-hour PM_{10} concentration in order to compare monitoring results to relevant air quality criteria. The Air NEPM 24-hour air quality guideline is consistent with the air quality criterion used in this air quality assessment. However, using the 6th highest concentration under the Air NEPM for monitoring results was designed to eliminate the reporting of elevated monitored levels due to natural events, such as bushfires and dust storms. Recently, the Air NEPM was reviewed. A recommendation from the review was that the reporting of the 6th highest concentration is removed from the Air NEPM and that all elevated ambient air quality levels events due to natural events are excluded from reporting and from comparison to the Air NEPM air quality guideline. Therefore, by including the large majority of particulate matter emissions in the region in the cumulative air quality model, and using the 1st highest predicted 24-hour PM_{10} concentration, the model is considered to be representative of the cumulative impact from the surrounding mines in the region.

It is expected that on-going air quality monitoring at sensitive receptors will be required in order to manage air quality impacts on an on-going basis as part of a reactive air quality management plan. That plan will incorporate continuous air quality monitoring adjacent to sensitive receptors. Additional emission controls such as increased road watering and modifying operations is recommended when high particulate matter concentrations are recorded at sensitive receptors. More detail on the preliminary air quality monitoring plan is provided in the response to Issue Reference 12026 in Chapter 6 – Air Quality.

Submitter No.	**786**	Issue Reference:	**4013**
Submitter Type	NGO	TOR Category	**Cumulative Impacts**
Name	**Greenpeace**	Relevant EIS Section	

DETAILS OF THE ISSUE

The rail corridor enables other projects in the Galilee Basin hence the cumulative impacts of other projects in the wider Galilee Basin should be considered in the climate change assessment for the project.

No assessment of cumulative impacts such as new power infrastructure, water supply pipeline, wastewater treatment facilities, fibre optic telecommunications etc. that are being developed to service the Galilee Coal Project and others.

These impacts should be considered as part of the cumulative impacts of the Galilee Coal Project.

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

The terms of reference requires the consideration of Scope 1 (direct emissions from sources within the boundary of the facility as a result of the facilities activities) and Scope 2 (emissions from production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility). This work was presented within the EIS.

Cumulative impacts of ancillary infrastructure that will be used by, but not developed by, this project, such as the water supply pipeline, will be the subject of assessment under their own environmental impact assessment processes.

Submitter No.	**779**	Issue Reference:	**4014**
Submitter Type	Individuals	TOR Category	**Cumulative Impacts**
Name	**Names withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

- Need for fully independent, comprehensive assesment
- Cumulative impact assessment methodology not explained properly
- No assessment of the cumulative impacts of shipping on the GBR.

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

As port components are not part of this project, there is no requirement for Waratah Coal to consider the cumulative impacts of shipping on the GBR. The Galilee Coal Project will utilise port components that will be the subject of assessments by others, and hence those assessments will consider the cumulative impacts of shipping on the GBR.

Submitter No.	**493, 517, 671, 685, 694, 696, 699, 711, 712, 726, 783, 1255**	Issue Reference:	**4015, 4016, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 6003, 6004, 6005, 6006, 6007, 6008, 6009, 6010, 6011, 6012, 6013, 6014, 8000, 8001, 8002, 8003, 8004, 8005, 8006, 8007, 8008, 8009, 8010, 8011**
Submitter Type	Individuals	TOR Category	**Cumulative Impacts**
Name	**Names withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

- Changes in water courses due to subsidence
- Impacts from dust, noise, floodlighting, increases in traffice and population
- Impacts from all mines on regional water supplies such as impacts on local hydrology
- Declaration of a cumulative management area should be a condition of approval.

PROPONENT RESPONSE

Subsidence

Waratah Coal aims to minimise the potential impact of subsidence that may result from longwall mining undertaken by its operation and proactively manage subsidence impacts that may result from its underground operations. This includes the prevention and management of impacts as well as monitoring to provide early identification of impacts.

More specifically, the objectives of the Subsidence Management Strategy are to:

- Outline the monitoring and measurement protocols
- Establish responsibilities for the management of subsidence related issues during and immediately following under-mining
- Satisfy the applicable regulatory requirements for subsidence management across the Waratah Coal Project
- Justify the relevance, suitability and adequacy of the proposed mine layout and mine sequence with respect to subsidence related issues
- Establish management priorities and detail the proposed mitigation/remediation and management measures. This includes presenting contingency plans / procedures, and
- Detail the review and reporting protocols.

Subsidence Management Process, Structure and Organisation

Waratah Coal's overall approach to subsidence management includes the following:

- Design to reduce surface impacts – Mine design is such to reduce the potential impact to public safety, the natural environment and built features
- Identify and manage environmental risks – specialist studies (including subsidence) are prepared to identify potential impacts to public safety, the natural environment and built features
- Measure baseline information – Background data is established for the surface above the proposed mining area, this will include the establishment of subsidence monitoring points
- Monitor the effects of mining – Continued monitoring of data for the surface above the proposed mining area, including subsidence monitoring points
- Regularly assess and interpret monitoring – Monitoring data is analysed to identify any variances
- Re-assess impacts – Where variances are identified that are greater than predictions, additional assessment of impacts is undertaken
- Identify and implement remedial actions – If additional assessment indicates greater impacts, then remedial action may be required. Stakeholder consultation will be undertaken in determining and implementing remedial actions, as required
- Implement remedial actions – In the event that any surface impacts due to subsidence are noted, appropriate remediation and/or mitigation measures will be implemented in consultation with appropriate stakeholders, and
- Provide regular progress reports – Progress reports will be provided to relevant parties in accordance with reporting conditions outlined in approval documentation.

Surface changes due to longwall mining are dependent on the amount of surface subsidence, determined by factors such as overlying strata geology, the longwall block width, the seam height extracted, and the depth of cover. Subsidence impacts on the surface include the formation of tension cracks and in flat areas internal drain way subsidence troughs can form.

Types of remedial works for these impacts may include ripping, re-compacting and seeding of all tension cracks and reshaping any internally draining areas to be externally draining by the construction of contour drains and topsoiling and seeding any disturbed areas. These works will extend to blanketing and compacting of some water courses post-subsidence, preventing inflow of runoff into underground mining areas and maintain environmental surface flows. Materials which have been investigated for use in compacted blankets include silty alluvium and clay. Some re-alignment of water courses and minor earthworks will be necessary, but the work done so far allows these activities to be well planned prior to subsidence in any particular area. The natural fall of the mining area drains freely to the north and is sufficient to minimise the events of subsidence troughs. In the flatter areas, reshaping of any internally draining areas to be externally draining will be done by the construction of contour drains and appropriate rehabilitation measures.

On the cessation of subsidence in any one area and completion of remedial works, it is planned that the land will be returned to grazing and original land activities. Yield trials will verify the maintenance of original land productions.

The project area surface stratigraphy contains cohesive Quaternary alluvial and Tertiary sands, clays and laterites which are self-healing to tensile surface fracturing. Surface tension cracks which form in cohesionless creek bed alluvium and Recent Colluvium are self-healing and readily infill. Open tension cracks in surface clays need to be ripped and compacted.

Surface subsidence caused by longwall mining will be managed through Subsidence and Decommissioning and Rehabilitation Management Plans (refer to *Longwall Mining Subsidence Report* in *Appendices – Volume 2* of this SEIS).

Dust, noise, floodlights and increases in traffic and population

Impacts from dust, noise, floodlights and increases in traffic and population are addressed in Chapters 10, 11, 13 and 16 of Volumes 2 and 3 of the EIS, and further addressed in the Air Quality and Greenhouse Gas, Noise and Vibration, Terrestrial Ecology, Traffic and Transport, and Social Impact Assessment chapters (and associated appendices) of this SEIS.

Regional water supplies

Water balance modelling of the final underground and open cut mining operations has been undertaken to identify the potential maximum impact of the mine on stream flows in waterways downstream of the mine (refer to the *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS). This modelling indicates that the mean annual stream flow in Lagoon Creek at the downstream boundary will decrease by a maximum of 12% as a result of underground mine subsidence and capture and re-use of runoff in open cut pits and dams. This is a worst case scenario based on the final mine landform and assuming that no mitigation of longwall mining subsidence occurs. Management strategies have been identified that will significantly reduce the impact of the underground mining component of the project on downstream stream flows.

The nearest existing surface water extraction licenses downstream of the Lagoon Creek discharge from the mine are located on the Belyando River near the confluence with the Suttor River. The impact of the mine on stream flows at these water extraction points will be negligible given the significantly larger catchment area and stream volumes in the Belyando River system compared to the Lagoon Creek system.

Cumulative Management Area

Declaration of a Cumulative Management Area is a matter for the State and Federal Government. Refer to Issue Reference 4027 for information related to the proposed Cumulative Impact Assessment (CIA).

Submitter No.	**496, 741, 762, 24, 695**	Issue Reference:	4027, 4028, 4029, 4030, 4034
Submitter Type	NGO & Individual	TOR Category	**Cumulative Impacts**
Name	**Wildlife Preservation (Society of QLD); Agforce Qld; Birds Australia; Individuals names withheld**	Relevant EIS Section	

DETAILS OF THE ISSUE

Inadequate cumulative impact assessment of all Galilee Basin projects on water resources, flora and fauna, agriculture and community.

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken that addresses water ecology, land use and social values. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	4031
Submitter Type	Government	TOR Category	Cumulative Impacts
Name	DERM	Relevant EIS Section	

DETAILS OF THE ISSUE

The EIS does not adequately address cumulative impacts of the project. Further information is required to address cumulative impacts in accordance with section 7 of the Terms of Reference (TOR). A whole of region process is required to address cumulative environmental impacts from multiple developments. This is a requirement for decision making under the *Environmental Protection Act 1994* (EP Act).

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	4032
Submitter Type	Government	TOR Category	Cumulative Impacts
Name	DERM	Relevant EIS Section	

DETAILS OF THE ISSUE

As the Galilee Basin has not previously been developed this is an early opportunity to address the management of cumulative impacts, including those on water quality, nature conservation, weed management and the potential for consolidation of transport and infrastructure corridors.

The EIS should investigate and propose solutions for limiting the cumulative environmental impacts from multiple projects within the Galilee basin.

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken within the Galilee Basin. For the mine component of the Project, the assessment included five mines in the Galilee Basin, as well as potential consequential ancilliary infrastructure:

- Galilee Coal Mine Project (ie. this project)
- South Galilee Coal Project
- Alpha Coal Project Mine Component
- Kevin's Corner Project
- Carmichael Coal Project Mine Component
- Galilee Basin Power Station
- Powerlink Power Transmission Line, and
- Sunwater Moranbah to Alpha Pipeline.

The *Updated Cumulative Impact Assessment* is contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	419	Issue Reference:	4033 / 3000
Submitter Type	Government	TOR Category	**Cumulative Impacts**
Name	**DERM**	Relevant EIS Section	Volume 1, Overview – Cumulative impacts section 5.4.3.2 (p70)

DETAILS OF THE ISSUE

The EIS does not adequately address the potential impacts of the project in maintaining bioregional corridors and connectivity within and across bioregions. Section 5.4.3.2 of the EIS only considers the potential cumulative impacts associated with ML70425 and ML70426. This section should also consider the potential cumulative impacts associated with Waratah Coal Pty Ltd's 233,894.89003 ha MDL and Adani Mining Pty Ltd 22,865.0291ha MLA 70441.

The EIS cumulative impacts section should be revised to include an adequate assessment of the potential impacts of all projects in the region including, Waratah Coal Pty Ltd and Adani Mining Pty Ltd (MLA 70441) projects. The EIS should address the potential impacts on the bioregional corridors and the connectivity within and across bioregions. It should also propose appropriate mitigation strategies which will maintain landscape connection within the bioregion and across bioregions.

PROPONENT RESPONSE

A revised Cumulative Impact Assessment has been undertaken that assesses the South Galilee Coal Project, the Galilee Coal Project (ie. this project), the Alpha Coal Project, Kevin's Corner and the Carmichael Coal Project. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	417	Issue Reference:	4037
Submitter Type	Council	TOR Category	**Cumulative Impacts** / Economy / Social
Name	**Isaac Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

The EIS needs to reflect the cumulative impacts of numerous proposed mining operations in the vicinity with a focus on the triple bottom line being economic, environmental and social outcomes. There needs to be action taken on a broad spectrum cumulative study contributed to by the mining industry, which establishes the base line effects being experienced by the Rural and Urban Community of Isaac Regional Council.

PROPONENT RESPONSE

An updated Cumulative Impact Assessment has been undertaken. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**6015 / 6043 / 4035 / 4108 / 2000 / 2023 / 17013**
Submitter Type	Government	TOR Category	**Cumulative Impacts** / Nature Conservation (Freshwater Aquatic)
Name	**DERM**	Relevant EIS Section	Chapter 5, Cumulative Impact Assessment Table 6 – Mine Cumulative Impact: land use (p7) and Table 10 Mine Cumulative Impact surface water and aquatic ecology (p69) – Creek Diversions

DETAILS OF THE ISSUE

Both of these tables list creek diversions with a High (9) impact rating however through mitigation strategies under the EM plan and conditions of approval this is subsequently rated as 6 (Medium).

There is no supporting documentation within the EIS on how the proponent intends to design or undertake rehabilitation of the diversion channel to enable the Department to consider whether this rating is appropriate or could be achieved.

In addition, there is insufficient information within the EIS to determine the impacts of the proposed diversion on the downstream watercourse, or proposed infrastructure on the downstream mining lease, or to assess the impacts of the possible reduction in contributing catchment to the watercourse as a result of the ponding of water within subsided panels.

Suggested Solution

The EIS and EM plan should clearly identify the impacts of the proposed diversion within their mining lease to be able to demonstrate that there will be no impacts from the diversions or other infrastructure off lease.

The EIS and EM plan should detail the impact of the mine on the changes to the catchment flows whether from the diversion, subsidence (ponding) or the proposed dam on Tallarenha Creek.

The EIS should provide sufficient information regarding the design of the diversion and its rehabilitation to demonstrate that this rating is appropriate.

PROPONENT RESPONSE

Concept design of the proposed creek diversions has been undertaken (refer to the *Mine Site Creek Diversion and Flooding* report contained in *Appendices – Volume 2* of this SEIS) in accordance with Bowen Basin River Diversions, Design and Rehabilitation Criteria[1] and Watercourse Diversions – Central Queensland Mining Industry[2] As a part of this design, geomorphic assessment of the existing creeks to be diverted has been undertaken. This assessment has allowed the geomorphic features to be replicated as part of the diversion works. Features include maintained stream length, bed slope, meander radius, capacity and instream benching. The location and extent of the proposed diversions is detailed in Figure 17.

1 ACARP (2002) *Bowen Basin River Diversions, Design and Rehabilitation Criteria*, Australian Coal Association Research Program.

2 DERM (2011) *Watercourse Diversions – Central Queensland Mining Industry*. Department of Environment and Resource Management.

Figure 17: Concept of mine site creek diversions

Hydraulic modeling has also been undertaken (refer to the *Mine Site Creek Diversion and Flooding* report contained in *Appendices – Volume 2* of this SEIS) to assess the hydraulic performance of the diversions, the results of which indicate compliance with the velocity, stream power and shear stress limits specifed by DERM, though there are some very localised minor deviations for velocity which will be mitigated through appropriate scour protection or planting. The results of the hydraulic modelling also demonstrate that changes in flood behaviour such as velocity, inundation depth and extent are limited to within the mine lease area.

Additional aquatic ecosystem assessments have been undertaken, including an assessment of the potential impacts of the mining activities on aquatic ecosystems. Potential impacts on water quality and aquatic ecosystems relating to activities associated with the project are provided in the *Aquatic Ecology and Water Quality Monitoring Study* contained in *Appendices – Volume 2* of this SEIS). A Water Quality Monitoring Program for the mine has also been completed and is provided in the *Appendices – Volume 2* of this SEIS.

Water balance modelling of the final underground and open cut mining operations has been undertaken to identify the potential maximum impact of the mine on stream flows in waterways downstream of the mine (refer to the *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS). This modelling indicates that the mean annual stream flow in Lagoon Creek at the downstream boundary will decrease by a maximum of 12% as a result of underground mine subsidence and capture and reuse of runoff in open cut pits and dams. This is a worst case scenario based on the final mine landform and assuming that no mitigation

of longwall mining subsidence occurs. Management strategies have been identified that will significantly reduce the impact of the underground mining component of the project on downstream stream flows.

A rehabilitation plan for the project components will be prepared and will include the rehabilitation of the diverted creek and specification of riparian habitats. The use of locally propagated native flora species is recommended where practicable to maintain habitat characteristics and prevent the spread of weed and pest flora species.

The Final Rehabilitation and Decommissioning Plan for the site will identify the closure actions required for the various surface water management structures including the watercourse diversions. At this stage, it is considered that the diversions would remain (Section 1.3 of the existing EIS); given the operational life of the project, the diversions will be functioning as natural watercourses by closure, hence re-establishment of the original watercourse could potentially result in additional impact downstream.

See also the *Draft Mine EM Plan* contained in *Appendices – Volume 2* of this SEIS.

Submitter No.	**419**	Issue Reference:	**6016 / 4036**
Submitter Type	Government	TOR Category	**Cumulative Impacts**
Name	**DERM**	Relevant EIS Section	Chapter 9 Surface Water Resources, Section 9.5, Potential impacts (p63)

DETAILS OF THE ISSUE

The EIS contains no information on the impact of water use for mine and the isolation of the mine area from catchment in terms of reduced runoff.

The EIS should include an assessment of the cumulative impact in terms of reduction of flow from the catchment due to extraction, capture within storages and reduction of catchment area due to isolation of the mine footprint from the catchment in terms of the impact on the water resource of the basin.

PROPONENT RESPONSE

Water balance modelling of the final underground and open cut mining operations has been undertaken to identify the potential maximum impact of the mine on stream flows in waterways downstream of the mine (refer to the *Surface Water Impact Assessment of Longwall Mining Subsidence* report contained in *Appendices – Volume 2* of this SEIS). This modelling indicates that the mean annual stream flow in Lagoon Creek at the downstream boundary will decrease by a maximum of 12% as a result of underground mine subsidence and capture and re-use of runoff in open cut pits and dams. This is a worst case scenario based on the final mine landform and assuming that no mitigation of longwall mining subsidence occurs. Management strategies have been identified that will significantly reduce the impact of the underground mining component of the project on downstream stream flows.

The nearest existing surface water extraction licenses downstream of the Lagoon Creek discharge from the mine are located on the Belyando River near the confluence with the Suttor River. The impact of the mine on stream flows at these water extraction points will be negligible given the significantly larger catchment area and stream volumes in the Belyando River system compared to the Lagoon Creek system.

Submitter No.	**668**	Issue Reference:	**11000**
Submitter Type	NGO	TOR Category	**Cumulative Impacts**
Name	**Road Accident Action Group (RAAG)**	Relevant EIS Section	Appendix 21, 3.6

DETAILS OF THE ISSUE

- The cumulative effect of this mine and other Galilee Basin mines on the Peak Downs Highway during construction and during mine life have not been assessed.
- At particular risk is the grade of the Eton Range at 12%, this freight bottleneck is recognised by state and federal government, realignment studies almost completed, but no funding on the horizon.

PROPONENT RESPONSE

Please refer to Section 4 of the *Traffic Engineering Report* in *Appendices – Volume 2* of this SEIS.

Submitter No.	**1840**	Issue Reference:	**17014**
Submitter Type	Council	TOR Category	**Cumulative Impacts** / Social / Economy
Name	**Barcaldine Regional Council**	Relevant EIS Section	1.8

DETAILS OF THE ISSUE

The EIS process – " ... the nature and extent of potential direct and indirect environment, social, and economic impacts..." Please provide the adequate assessment data so that the impacts can be assessed. Particularly, groundwater, hydraulic studies, availability of offset prioritised areas, extent of soil impacts on potential land form.

PROPONENT RESPONSE

A revised Cumulative Impact Assessment has been undertaken. See the *Updated Cumulative Impact Assessment* contained in the *Appendices – Volume 2* of this SEIS.

Submitter No.	**417**	Issue Reference:	**19118**
Submitter Type	Council	TOR Category	Waste / **Cumulative Impacts**
Name	**Isaac Regional Council**	Relevant EIS Section	

DETAILS OF THE ISSUE

The EIS document should address the process of disposal of additional solid and sewerage waste waters from the operation and the likely increase in the volume of this waste in the region through cumulative effects.

PROPONENT RESPONSE

An *Updated Cumulative Impact Assessment* (CIA) has been undertaken for the project. See report contained in the *Appendices – Volume 2* of this SEIS.

Refer to Issue Reference 19017 (in Part C – 18 – Environmental Management Plan) for more information regarding sewerage management.