Sunrise Mine

Modification Assessment
(DA 374-11-00 MOD 4)

September 2018

Cover photo

Sunrise Mine Site, provided by Clean TeQ Holdings Ltd

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Executive Summary

Clean TeQ Holdings Limited (Clean TeQ) is proposing to modify its development consent for the Sunrise Project, an approved nickel cobalt scandium mine near Fifield in the Central West region of NSW.

The project was originally approved in 2001 and comprises several components located in three local government areas:

- an open cut mine and processing facility in the Lachlan local government area (LGA);
- a limestone quarry and a rail siding in the Parkes LGA;
- a borefield near the Lachlan River in the Forbes LGA; and
- ancillary infrastructure including an accommodation camp and a water supply pipeline and natural gas pipeline.

The project was physically commenced in 2006 with partial development of the borefield. However, further development of the project was suspended due to unfavourable economic conditions, and construction of the mine and other project components has yet to commence.

However, demand for nickel and cobalt has grown significantly and Clean TeQ is now planning to progress development of the mine to meet this demand.

Clean TeQ has identified a number of opportunities to improve the efficiency of the project and is proposing to modify the project accordingly. Key elements of the proposal include changes to the mineral processing facility and mine layout, an additional supply of limestone from third party suppliers, and a diversification of the mine's water supply to include surface water from the Lachlan River.

In the nearly 20 years that has elapsed since the development consent was granted, there have been a number of changes to Government policy and standards relating to the regulation of mines. The Department has considered these changes in its assessment of the modification.

Submissions

The Department received 51 submissions on the proposal including 10 submissions from government authorities and 41 submissions from special interest groups and the general public. Most (36) of the public submissions objected to or raised concerns about the proposal.

None of the government authorities object to the proposal, with the exception of Forbes Shire Council, which objects to the proposed surface water extraction from the Lachlan River due to its potential impacts on water supply to agricultural land users.

The three key issues raised in public submissions are the increase in traffic, particularly through the small town of Trundle, gaseous emissions from the processing plant, and potential impacts to other water users. Other issues raised included air quality, noise, hazards, surface water and groundwater, and social and economic issues.

A number of submissions raised concerns about the project more broadly, including issues that are not directly related to the proposed changes in the current modification application. The Department notes that all of these issues were comprehensively assessed by the Department in the assessment and determination of the original project and/or subsequent modifications. Nevertheless, the Department has provided further commentary on some of these issues in this report, particularly in relation to groundwater drawdown at the borefield.

Traffic

To reduce overall vehicle movements, Clean TeQ has amended the proposal to use higher capacity trucks and shuttle buses. The Department's assessment found that, although there would be an increase in heavy vehicle movements through Trundle, the overall traffic volumes (trucks and cars) would be lower than the approved project, and well below the capacity of the road network.

The Department and the Roads and Maritime Services consider that the modified project would not result in significant traffic, safety, hazard, amenity or socio-economic impacts in Trundle or the surrounding area subject to the implementation of some intersection upgrades.

Air Quality

The air quality assessment indicates that the modified project would comply with applicable air quality criteria for all gaseous pollutants and particulates (dust) during all stages of the project, and the Department and the EPA consider that the modification would not increase the air quality impacts of the project.

However, the Department has recommended that Clean TeQ be required to undertake an air emissions verification study to confirm there would be no exceedances of gaseous pollutants, and to undertake real time monitoring of emissions within the stack.

Noise

Operational noise levels from the modified project are predicted to be up to 2 dB(A) higher at some properties near the mine and limestone quarry. This is primarily due to revised modelling rather than any proposed changes to operations.

The Department and the EPA consider that Clean TeQ cannot reasonably and feasibly reduce noise further. However, importantly, the NSW *Voluntary Land Acquisition and Mitigation Policy* (2014) and the *Noise Policy for Industry* (2017) characterise increases of 0-2 dB as negligible and generally not discernible.

Consequently, the Department and EPA consider that the noise increases would be unlikely to result in significant impacts and has recommended that the noise criteria be revised to reflect the predicted noise. This recommendation also includes the introduction of contemporary sleep disturbance noise limits.

Water Supply

The proposed addition of a water treatment plant would significantly reduce the water demand associated with the project by reducing raw water use at the processing facility. Almost half (1,451 ML/year) of the project's overall water demand (3,135 ML/year) would be supplied by the water treatment plant. This supply would be supplemented by groundwater supply from the approved borefield (Clean TeQ has existing entitlements equivalent to 3,154 ML/year), and the proposed surface water supply from the Lachlan River (approximately 350 ML/year).

The proposed surface water extraction from the Lachlan River is consistent with the Department of Industry's recommendations for the project to diversify its external water supply options beyond just the borefield. However, any extraction of this water would be subject to Clean TeQ acquiring the appropriate water entitlement on the water market, in accordance with the rules of the relevant Water Sharing Plan.

The assessment concluded that the proposed extraction of surface water from the Lachlan River would be relatively minor and unlikely to significantly affect other water users.

Summary

The Department considers that the modification would not significantly increase the traffic, air quality or noise impacts of the project. The Department considers that the modification would reduce the overall demand for water and that there would be no increased impacts on other water users.

The Department also found that other potential impacts associated with the proposed modification are not significant and can be effectively managed through the existing and recommended strict conditions of consent.

The project has a projected capital cost of approximately $1.77 billion, and would employ up to 1,000 people during construction and 300 people during operations. It would also generate up to $2.8 billion in royalties and taxes and provide ongoing flow on benefits to the local and regional communities.

Clean TeQ has also agreed to enter into a Voluntary Planning Agreement with the three Councils. Under the terms of this agreement, Clean TeQ would make annual community enhancement contributions to the Councils totalling $400,000, and would also contribute $340,000 per year to Councils for road maintenance.

The Department notes that it has now been almost 20 years since the project was approved and the lack of progress in developing the project has created a sense of uncertainty and concern in the local community. While the development consent was physically commenced in 2006 with partial development of the borefield, the project was then suspended due to unfavourable economic conditions.

However, demand for nickel and cobalt (particularly for use in the context of renewable energy), and scandium (for use in metal alloys) has grown significantly in recent years. Since CleanTeq acquired the mine in 2014, it has undertaken a full feasibility study of the project and publicly confirmed its economic viability.

The Department considers that the proposed modification would improve the overall viability of the project and make it more likely that the significant socio-economic benefits of the project are realised. Consequently, the proposed modification is in the public interest and is approvable subject to the imposition of the recommended conditions of consent.

Contents

1. Introduction

1.1 Preamble

The Sunrise Project (formerly known as the Syerston Project) is an approved nickel cobalt scandium mine located approximately 4.5 kilometres (km) north-west of Fifield and 45 km north-east of Condobolin in the Central West Region of NSW (see **Figure 1**).

The development is operated by Clean TeQ Sunrise Pty Ltd (Clean TeQ).

1.2 Approved Project

The development was originally approved by the then Minister for Urban Affairs and Planning on 23 May 2001, and has since been modified five times.

The project includes five key components:

1. An open cut mine and processing facility, with associated infrastructure, including waste emplacements, a tailings storage facility, evaporation ponds and surge dam.
2. A limestone quarry and limestone processing facility located approximately 20 km south east of the mine. Crushed limestone from the quarry would be transported by truck from the quarry to the mine.
3. A rail siding located approximately 25 km south east of the mine. Metal products produced at the mine and consumables materials used in the processing plant would be transported by rail to/from the rail siding, and by truck between the rail siding and the mine site.
4. A borefield and water supply pipeline to supply water to the mine.
5. A natural gas pipeline to supply gas to generate electricity at the mine processing facility.

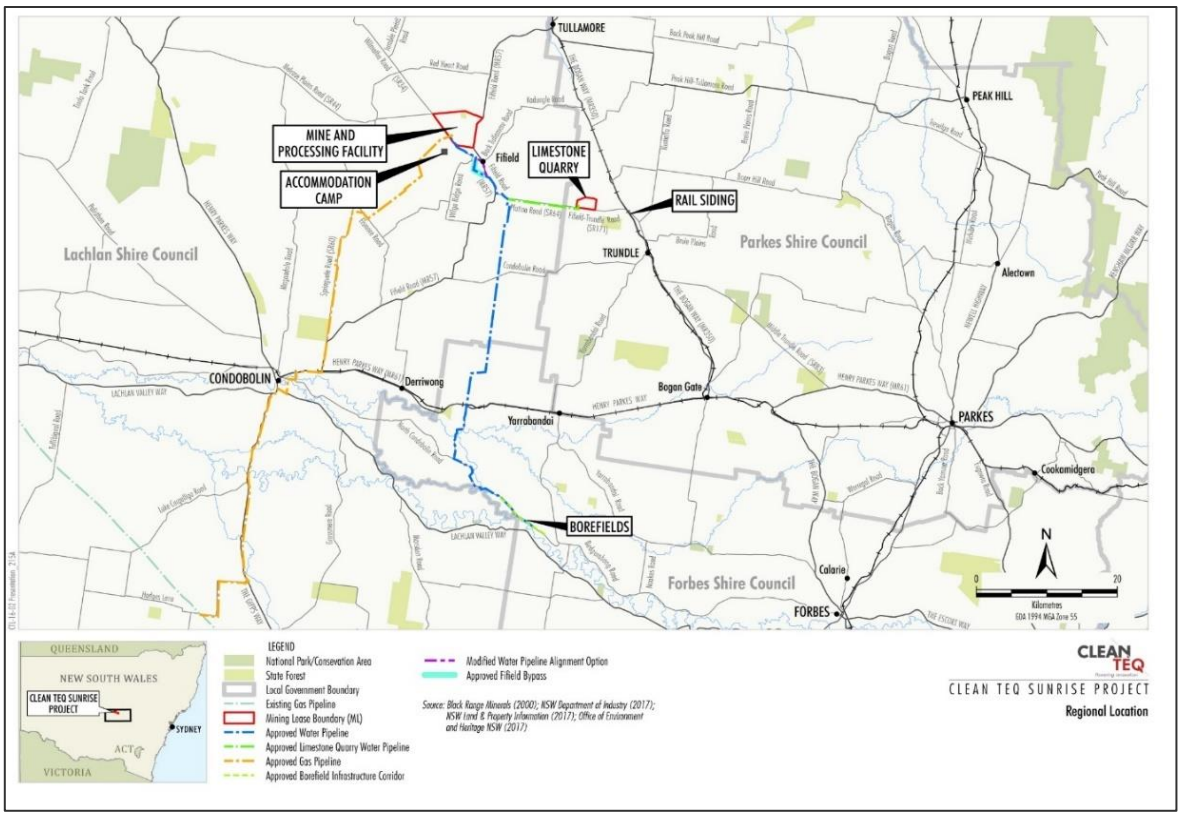

Figure 1 | Project Components

1.3 Project Setting

The mine, processing facility and gas pipeline are located in the Lachlan local government area (LGA), the limestone quarry and rail siding are located in the Parkes LGA, and the borefield is located in the Forbes LGA (see **Figure 1**). The water pipeline traverses the Lachlan and Forbes LGAs.

The communities most affected by the project are the residents surrounding the mine and quarry sites, the landowners around the borefield, and the residents of Fifield and Trundle.

The project is located within a rural landscape, where the dominant land use is agriculture, principally grazing and cropping. The village of Fifield is located approximately 4.5 km to the south east of the mine site.

Mineral exploration and mining have been conducted in the area since the 1860s, with gold, platinum, tin and magnesite mining. More recently, exploration focus has shifted to concentrate on enriched elements, including nickel, cobalt and scandium.

Demand for nickel and cobalt (particularly for use in lithium-ion batteries), and scandium (used in aluminium alloys and specialist products such as vapour lamps) has grown significantly, with growth expected to continue. Clean TeQ is now planning to progress development of the mine to meet the projected growth.

1.4 Project Commencement

The consent was physically commenced in 2006 with partial development of the borefield, but further development of the project was suspended due to unfavourable economic conditions, and construction of the mine and other project components has yet to commence.

However, since CleanTeq acquired the mine in 2014, it has undertaken a full feasibility study of the project and publicly confirmed its economic viability. CleanTeq's feasibility investigations have led to four modification applications over the past two years.

The five approved modifications to the original project include:

- MOD 1 – approved in 2005, involving an increase in the processing rate ('autoclave feed rate'), limestone quarry extraction rate and changes to the ore processing operations;
- MOD 2 – approved in 2006, involving a reconfiguration of the borefield;
- MOD 3 – approved in 2017, involving mining and processing of scandium in addition to nickel and cobalt, and developing the mine in two stages:
- Initial Production Phase – focusing on scandium extraction and involving development of the mine and processing facility, water supply pipeline and borefield only;
- Full Production Phase – involving the full development of the project including the limestone quarry, gas pipeline and rail siding;
- MOD 5 – approved in 2017, involving minor changes to the hazard study requirements; and
- MOD 6 – approved in May 2018, involving relocation of the workers accommodation camp from the mine site to a property located approximately 4 km to the south of the mine.

MOD 4 is the subject of this assessment and involves a number of changes to the mine layout and processing and water supply infrastructure, which Clean TeQ has identified would improve the efficiency of the project.

2. Proposed Modification

Clean TeQ is proposing to undertake mining in a more selective manner to target higher-grade ore in the early part of the Full Production Phase of the project. The proposal would not amend the Initial Production Phase, with the exception of alterations to water supply (see below).

The proposal does not involve any increase in the mining or processing rate, however the higher grade ore feed would require an increase in sulphuric acid use for processing. The additional sulphuric acid would require a corresponding increase in limestone for acid neutralisation. This in turn would produce a greater volume of tailings, which would necessitate a larger tailings storage facility (TSF).

While the water treatment plant would reduce project water demand, Clean TeQ is also proposing to supplement its water supply security at the mine with licensed extraction of surface water from the Lachlan River. This would involve the construction of a pump station and connecting infrastructure (underground pipeline, access road and electricity transmission line) near the Lachlan River to pump water extracted from the river to the approved borefield transfer station, for transfer to the mine site.

Other aspects of the proposed modification include the use of blasting at the mine, the relocation of some infrastructure on the mine site (within the approved disturbance area), and changes to the road transport routes.

A summary of the key components of the approved project and the proposed modification is provided in **Table 1.** Changes to project layout are shown on **Figure 2**, and a full description of the proposal is provided in Clean TeQ's Environmental Assessment (EA) (see **Appendix B**).

Table 1 | Summary of approved and modified project

Component	Approved Project	Proposed Modification
Mining Method	• Open cut mining	• Unchanged, however ore would be mined selectively to initially increase the processing facility ore feed grade
Mine Surface Facilities	• Construction of surface facilities within the approved surface development area	• Relocation of some infrastructure components inside the approved surface development area to avoid potential resource sterilisation and improve operational efficiency
Mineral Processing	• Autoclave feed rate of up to 2.5 million tonnes per annum (Mtpa) • Processing facility consists of counter current decantation or Resin-In-Pulp (RIP) circuit/metals recovery	• Autoclave feed rate unchanged • RIP circuit only. No counter current decantation circuit • Addition of crystalliser to allow production of ammonium sulphate from waste stream
Product	• Up to 180 tpa of scandium oxide • Up to 40,000 tpa of nickel and cobalt metal equivalents as either sulphide or sulphate precipitate products	• No change to scandium oxide production • Up to 40,000 tpa of nickel and cobalt metal equivalents, as sulphate precipitate products only • Up to 100,000 tpa of ammonium sulphate

Limestone Supply	• Development of limestone quarry to extract up to 790,000 tpa of limestone	• No changes to limestone quarry • Increased demand for limestone to 990,000 tpa • Up to 560,000 tpa of limestone to be sourced from third party suppliers
Reagent Production	• Up to 700,000 tonnes per annum (tpa) of sulphuric acid would be produced in the sulphuric acid plant • Hydrogen sulphide, hydrogen and nitrogen would be produced in the processing facility	• Sulphuric acid demand and production would increase to 1,050,000 tpa • Hydrogen sulphide, hydrogen and nitrogen would no longer be produced in the processing facility
Tailings	• Waste deposited in the tailings storage facility and evaporation ponds	• Increased tailings storage facility capacity to hold increased tailings volume • The size of the evaporation ponds would decrease due to the increase in water recycling
Surface Water Management	• Permanent and temporary structures to control runoff from the construction and operational areas while diverting upstream water around these areas	• Changes to the site water management system to reflect the modified layout • Addition of water treatment plant within processing facility to increase process water recycling and minimise make-up water demand
Water Supply	• Development of borefield and water pipelines to the mine	• Addition of licensed surface water extraction from the Lachlan River • Relocation of transfer station and realignment of infrastructure corridor between borefield and transfer station • Borefield unchanged • Alternative water pipeline alignment through Fifield village. The alternative route would be used if the Fifield road bypass (the approved route of the pipeline) is not constructed
Materials Transport	• Transport of inputs and products via road and rail	• Changes to approved transport sources, frequencies, routes and transport method
Blasting	• Approved at the limestone quarry only	• To be undertaken at the mine and the quarry
Power supply	• On-site 34 Megawatt (MW) gas power plant • Diesel standby generators	• Reduction in gas demand as additional sulphuric acid production would generate additional steam for power generation • Increased capacity of standby diesel generators for times when the sulphuric acid plant is not operating
Road Upgrades	• Road upgrades in accordance with development consent and VPAs with Councils	• Minor changes to reflect changes to project transport requirements

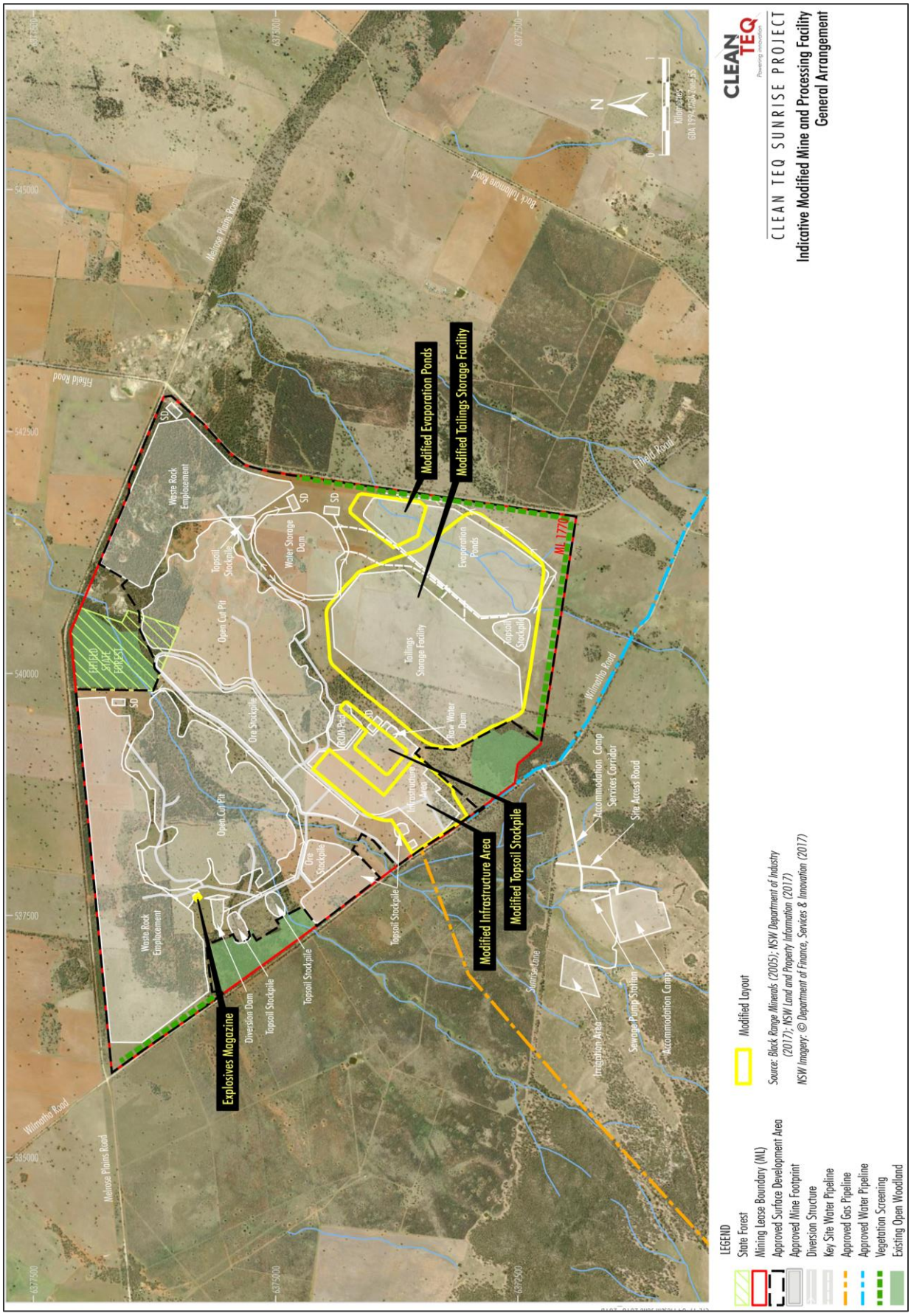

Figure 2 | Mine and Processing Facility – General Layout

3. Statutory Context

3.1 Scope of Modification

The project was originally approved under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). However, as the modification request was lodged prior to 1 March 2018, under Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2018*, the project is classified as a transitional Part 3A project, and the modification can be assessed under the former section 75W of the EP&A Act.

The Department is satisfied that the application can be characterised as a modification under section 75W of the EP&A Act as the proposal would not change the key elements of the project (including mining methods or production rate), and would not significantly increase the environmental impacts of the approved project.

3.2 Consent Authority

Under section 75W of the EP&A Act, the Minister for Planning is the approval authority for the modification application. However, under Minister's delegation of 14 September 2011, the Independent Planning Commission (the Commission) must determine the proposal because Forbes Shire Council objected to the proposal and there were 25 or more public submissions in the nature of objections.

4. Engagement

4.1 Exhibition

The Department publicly exhibited the application and accompanying EA from 24 October 2017 until 11 November 2017.

During the public exhibition period, the Department:

- advertised the exhibition of the application in the Parkes Champion Post, Forbes Advocate and Condobolin Lachlander;
- made the application and accompanying documentation available on its website, at the Nature Conservation Council, and at the offices of Lachlan Shire Council, Parkes Shire Council and Forbes Shire Council; and
- consulted with Lachlan Shire Council, Parkes Shire Council, Forbes Shire Council and key government agencies.

4.2 Department's Engagement

Following the exhibition period, the Department visited the project site, held community information sessions in Fifield and Trundle, and met with all three local Councils to better understand the concerns and issues raised in submissions.

The Department also continued to engage with community and Council representatives throughout the assessment process to ensure that all of the community's concerns have been comprehensively considered.

A summary of the Department's key engagement activities is summarised in Error! Reference source not found..

Table 2 | Summary of Department's community engagement

Date	Description
5 March 2018	• Visit to project site and surrounds to understand impacts
6 March 2018	• Meeting with Lachlan and Forbes Shire Councils
7 March 2018	• Public information sessions in Fifield and Trundle • Meeting with Parkes Shire Council
6-7 March 2018	• Meetings with all three Councils
26 March 2018	• Telephone meeting with community representatives
11 May 2018	• Telephone meeting with community representative and Clean TeQ
21 June 2018	• Telephone meeting with representative of Councils
1 August 2018	• Telephone meeting with community representatives
27 August 2018	• Attended Community Consultative Committee meeting

4.3 Summary of Submissions

In response to the exhibition, the Department received a total of 54 submissions on the proposal, including:

- 10 from public authorities; and
- 44 from special interest groups and the general public.

None of the public authorities objected to the proposed modification, with the exception of Forbes Shire Council. Most (39) of the submissions from the public and special interest groups objected or raised concerns in relation to the proposal.

A summary of the issues raised in submissions is provided below. Full copies of the submissions are provided in **Appendix C**.

Public Authorities

The **Division of Resources and Geoscience (DRG)** (within the Department) did not raise any issues, but noted the general requirements for a mining lease.

The **Resource Regulator** (also within the Department) recommended a small number of changes and additions to the hazard-related conditions of the existing consent to align with current legislation and guidelines.

The **Environment Protection Authority (EPA)** did not raise any concerns regarding noise, blasting or air quality. However, it did recommend Clean TeQ be required to to undertake real time air quality monitoring, and to verify that the final design of the processing plant would comply with emissions levels prescribed in the *Protection of the Environment Operations (Clean Air) Regulation 2010*. The Department has included these conditions in the proposed modified consent.

The EPA also requested additional information with regard to potential surface and groundwater pollution, including information on water pollution risks and the drainage and seepage collection systems for the TSF. It also noted that the proposal to pump seepage water to the TSF decant pond or evaporation pond would require that these facilities are appropriately lined.

Following additional information provided by Clean TeQ, the EPA confirmed that it had no further comments on the proposed modification.

The **Department of Industry (DoI)** (including Crown Lands and Water and Department of Primary Industry) initially requested additional assessment of potential saline seepage from the TSF and impacts to freshwater fish from the proposed surface water pump station. Following receipt of this information from Clean TeQ, DoI did not raise any concerns.

DoI also made recommendations in relation to:

- ensuring rehabilitation returns soil and land classification to the same level (or better) as the existing capability; and
- ensuring all works within watercourses or waterfront land are carried out in accordance with the *Guidelines for Controlled Activities on Waterfront Land (2012)* and *Managing Urban Stormwater: Soils and Construction (2004)*.

The **Office of Environment and Heritage (OEH)** initially noted that the proposal would result in an additional 0.31 hectares of native vegetation clearing and that this should be appropriately offset. However, following additional information provided by Clean TeQ in the RTS, OEH accepts that the vegetation is heavily degraded and that an offset for this minor amount of vegetation clearing is not warranted.

The **Roads and Maritime Services (RMS)** did not raise any significant traffic-related issues associated with the proposal, subject to Clean TeQ:

- upgrading the intersection of Henry Parkes Way and Middle Trundle Road to a Channelised Right Short [CHR(s)] turn lane, in accordance with a Works Authorisation Deed (WAD);
- providing and maintaining appropriate sight distances at all intersections that form part of the heavy and light vehicle access routes;
- obtaining a Road Occupancy Licence (ROL) as required; and
- preparing and implementing a detailed Transport Management Plan in consultation with RMS and the applicable Councils.

The **Rural Fire Service (RFS)** did not raise any significant bushfire-related issues associated with the proposal, subject to Clean TeQ undertaking the following:

- preparing and implement a Fire Management Plan (FMP) in consultation with RFS;
- providing a 20 metre defendable space between operational areas and bush fire hazard; and
- providing 65 appropraite fittings to water supply points in locations agreed in the FMP.
- The Department notes that the consent already requires Clean TeQ to develop bushfire management procedures in consultation with the RFS.

Lachlan Shire Council noted that it is engaging with Clean TeQ in relation to a voluntary planning agreement (VPA) to provide contributions for the repair and maintenance of local roads, and community enhancement. It also noted that it is seeking an agreement with Clean TeQ regarding the road upgrade works required under the consent.

Clean TeQ and the three councils have since agreed to the general terms of a VPA for the modified project.

Parkes Shire Council does not object to the proposal, but recommended that materials should be transported on national, state, regional and then local roads in that order of priority.

Council also initially raised concerns that Middle Trundle Road (a local road) could be used as a short cut by heavy vehicles between Parkes and the mine. However, the modification would only increase the number of trucks on that road by approximately 8 per day, and Council has since agreed to the terms of the VPA that includes contributions for maintenance of Middle Trundle Road .

Forbes Shire Council objects to the proposal, on the grounds that the proposed extraction of surface water from the Lachlan River would adversely impact water supply to agricultural land users within the Forbes LGA. Council

questioned whether surface water extraction from the river was necessary, given that the proposed water treatment plant would reduce the project's water demands. Council recommended that an assessment be undertaken to quantify the impact on the Shire's agricultural industry.

This matter has been addressed in **Section 5.4** of this report.

Community and Interest Groups

The 44 submissions from special interest groups and the general public were received mainly from residents and businesses/organisations in the areas surrounding the mine and processing facility, limestone quarry, borefield and in particular, from stakeholders in Trundle.

Most (39) of the submissions objected to or raised concerns about the proposal and/or the wider project. Five submissions were supportive of the proposal, citing the socio-economic benefits of the project to the region and the manageable environmental impacts.

The key issue raised in submissions objecting to the proposal related to the increase in traffic, particularly in regard to the potential impacts on road and pedestrian safety and the effects of the increased traffic on business and tourism in Trundle.

In contrast, some of the submissions in support of the proposal considered that the concerns about traffic through Trundle were overstated and that the concerns raised could be adequately managed.

In response to the Trundle traffic-related issues, Clean TeQ made some changes to the proposal, including committing to the use of shuttle services for workers and higher capacity trucks to transport limestone to the mine. These measures are discussed in more detail in **Section 5.1** below.

In addition to the traffic issues, submissions also raised concerns about:

- air quality, including:
  - dust and emissions from blasting and extraction;
  - emissions from the processing plant;
  - adequacy of the dispersion modelling and baseline data;
  - unproven nature of the processing technology;
  - assumptions used for greenhouse gas production calculations; and
  - potential for acid rain;
- noise, including noise from blasting and pit operations;
- hazards associated with the transport and use of hazardous materials, and the potential impacts on emergency services;
- water, including:
  - changes to surface flows over the mine site potentially affecting the collection of runoff and flood flows on neighbouring properties;
  - groundwater impacts including drawdown and potential contamination via seepage from tailings; and
  - impacts on Lachlan River water supplies;
- social and economic issues, including:
  - inadequacy of acquisition provisions;
  - inadequate consultation; and
  - inadequate off-site monitoring.

A breakdown and summary of the key issues raised by the general public and special interest groups is provided in **Figure 3**.

The issues raised in submissions have been considered by the Department in its assessment of the proposal. A summary of this assessment is provided in **Section 5** of this report.

It is noted that a number of the issues raised in submissions relate to the project more broadly and are not directly related to the proposed modification. These include concerns about groundwater drawdown at the borefield, impacts on land values, and the potential impacts of the project on accommodation (price and availability) and essential services in the nearby towns.

While important, these issues are not material to the modification and were comprehensively assessed by the Department in the assessment and determination of the original project and/or subsequent modifications.

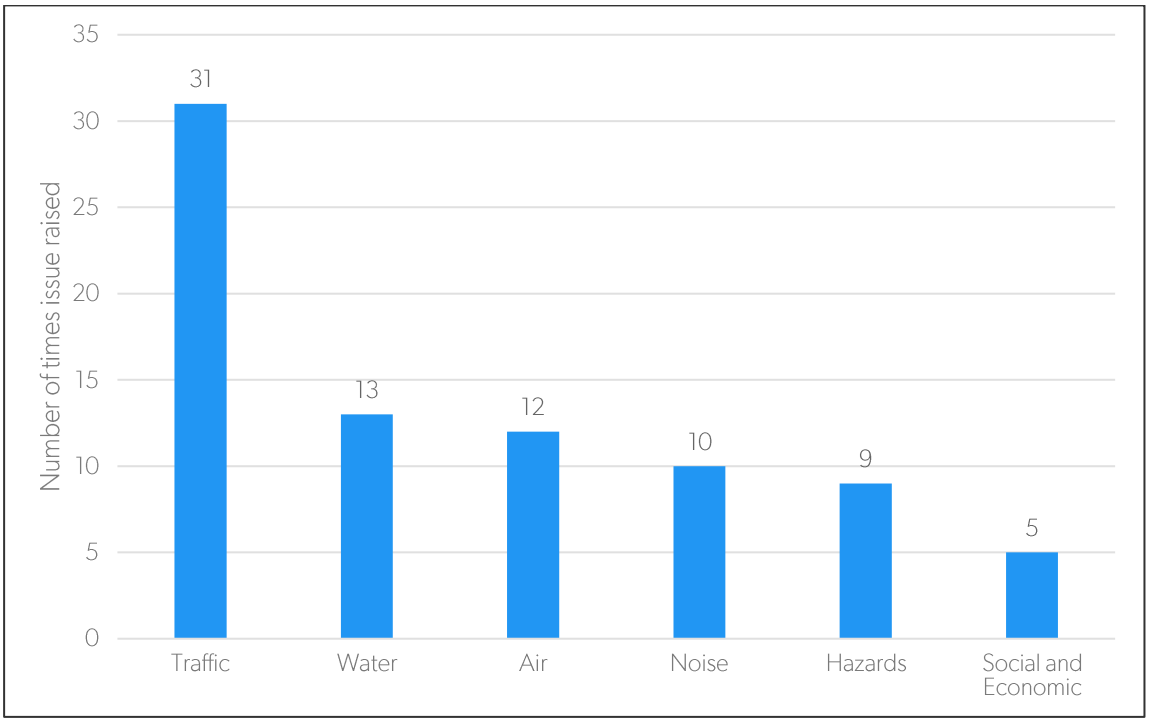

Figure 3 | Key Issues Raised in Public Submissions

4.4 Response to Submissions

Clean TeQ provided its response to the issues raised in submissions in February 2018, and has also provided additional information in response to the Department's requests for information. The Response to Submissions (RTS) and additional information is provided in **Appendix D.**

5. Assessment

In assessing the merits of the proposed modification, the Department has considered the:

- existing conditions of consent for the project;
- modification application and supporting information;
- agency and public submissions on the application and Clean TeQ's responses to submissions; and
- requirements of the EP&A Act and Regulations and applicable environmental planning instruments and guidelines.

5.1 Traffic

The proposed modification involves changes to the transport routes and traffic volumes. Many of the submissions from the community raised concerns about traffic impacts, particularly through the town of Trundle, and the Department considers this to be one of the key potential issues associated with the modification.

The EA includes a specialist traffic assessment undertaken by GTA Consultants, which assesses the traffic and transport-related impacts of the proposed modification. In response to issues raised in submissions, the RTS includes an additional assessment focusing on traffic-related impacts in Trundle, also undertaken by GTA Consultants.

Traffic Generation

The proposed modification would increase total traffic volumes associated with the project. Most of this increase would be to light vehicle numbers. Heavy vehicle numbers associated with the project would increase only marginally (by 2.4% overall).

However, the proposal would change some of the transport routes used by project traffic and consequently the increase in heavy vehicles numbers would be more significant on some roads. This would be accompanied by a reduction of heavy vehicle traffic on other roads. In particular, there would be fewer trucks travelling between Condobolin and the mine site, but more trucks travelling between Parkes and the mine site.

A comparison of predicted total traffic generation for the approved project and the modified project is presented in the following table.

Table 3 | Project-related total traffic generation (average daily vehicle trips)

Type	Light Vehicles (per day)	Heavy Vehicles (per day)	Total (per day)
Approved Project	263	207	470
Modified Project	424	212	636
Percentage Change	**61.2%**	**2.4%**	**35.3%**

Note: At Full Production Phase. The proposal would not affect the Initial Production Phase traffic.

Light vehicle trips are predicted to increase significantly. However, this increase is primarily a result of more conservative assumptions used in the assessment in relation to private vehicle movements. The total workforce is not expected to increase as a result of the modification.

The changes to the heavy vehicles traffic would primarily be caused by the transport of up to 560,000 tpa of limestone from third party suppliers (located on the Bogan Way and Henry Parkes Way east of Bogan Gate), and an increase in the sulphur transport from the rail siding to the mine (from 260,000 tpa to 350,000 tpa).

The increased truck movements associated with these changes would in part be offset by reductions in transport of some materials (including limestone from the project quarry). Further, the proposed ammonium sulphate production is not expected to increase heavy vehicle movements, as it would be backloaded on trucks transporting sulphur between the rail siding and the mine.

The changes to project-generated heavy vehicles numbers on key routes to and from the mine site are shown in **Table 4**. The main transport route between Parkes and the mine is depicted in **Figure 4**.

Table 4 | Heavy vehicle numbers on key routes

Source/Destination	Approved Project	Modified Project	Percentage Change
Parkes/Sydney	34	90	165%
Condobolin	49	8	-84%
Newcastle	0	4	-
Rail Siding	34	54	59%
Quarry	90	56	-38%
Total	**207**	**212**	**2.4%**

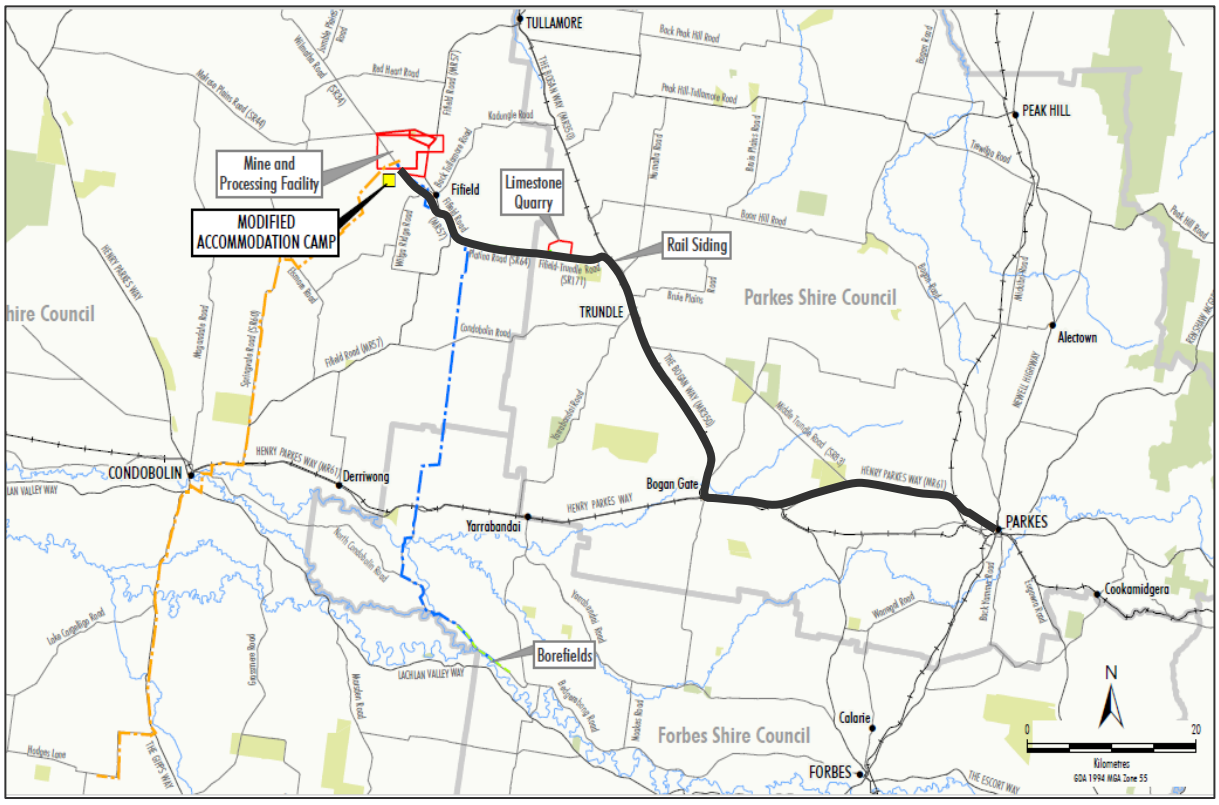

Figure 4 | Main Heavy Vehicle Transport Route

Traffic Impacts

The modification would increase the total traffic associated with the project and re-distribute the traffic over the road network. However, the overall increase in heavy vehicle numbers would be minor.

The traffic assessment found that the daily and peak hour traffic generated by the modified project would be relatively low, and well below the capacity of the road network. All roads and key intersections were predicted to operate at a good Level of Service (LoS), with no significant safety issues.

The RMS did not raise any significant concerns about the traffic increases associated with the proposal, but recommended that the intersection of Henry Parkes Way and Middle Trundle Road be upgraded to provide a Channelised Right Short [CHR(s)] turn lane in Henry Parkes Way prior to the commencement of construction. Whilst Clean TeQ considered that a Basic Right (BAR) turn treatment would be adequate at this intersection, the RMS has reiterated that a CHR(s) treatment is warranted given the potential for poor visibility conditions when in use by project traffic (inc. fog and darkness), and the traffic characteristics including a mix of light and heavy traffic using the intersection.

The Department agrees and has recommended conditions in this regard.

Trundle Traffic-Related Impacts

Trundle is a small town in the Parkes LGA with a population of approximately 700. Forbes Street, which forms part of The Bogan Way, traverses the middle of the town (see **Figure 5**). The Bogan Way is a regional road connecting rural towns and localities with Parkes to the south-east, and is a RMS-approved road train route. The road generally has a posted speed limit of 100km/h, reducing to 50km/h along Forbes Street in Trundle. There is also a 40km/h school zone at the southern end of Trundle near Trundle Central School.

Forbes Street has a single travel lane in each direction, however the street is noted for the its unusual width which, at 60 metres, makes it one of the widest main streets in the country. The wide main street is one of the key social and cultural focuses of the town, and is used for events such as the ANZAC Day march and annual ABBA Festival.

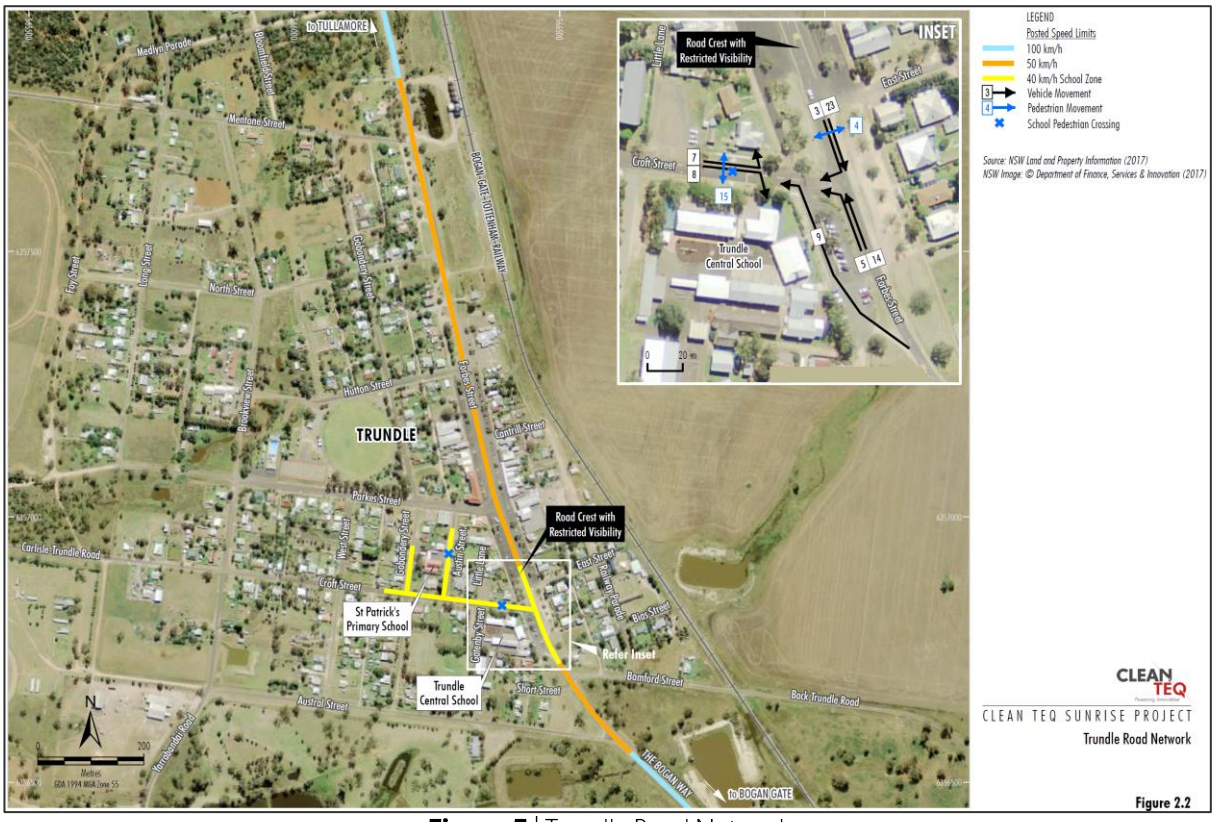

Figure 5 | Trundle Road Network

Many of the public submissions raised concerns about increased traffic through Trundle and its surrounds, and the resultant impacts on pedestrian safety (especially for school children and the elderly), town character and amenity (by way of noise and dust), tourism and local festivals (especially the ABBA Festival), heritage structures, hazards, flooding, movement of farm machinery and stock, and conflicts with rail level crossings.

Some submissions called for a bypass of Trundle (similar to the Fifield bypass potentially required for the approved project), and/or that higher capacity trucks are used to reduce truck numbers, or that rail options be considered.

However, some submissions in support of the proposal, including one from the Principal of Trundle Central School, believe that the concerns are overstated and that the impacts are manageable and outweighed by the benefits that the project would bring to the town.

In 2017, daily traffic volumes on The Bogan Way just north of Trundle averaged 431 vehicles on weekdays. On an average day heavy vehicles make up about 20% of the total traffic volumes (i.e. about 85 trucks on an average day). However, this varies with the seasons and increases to an average of 103 heavy vehicles a day in the highest month (May) .

CleanTeQ's original assessment indicated that the proposal would not result in significant traffic-related impacts in Trundle. However, in response to the concerns raised in submissions, Clean TeQ committed to operating higher capacity trucks to transport limestone to the mine. This would reduce the number of project-related trucks from 90 per day to 70 per day through Trundle. Clean TeQ also committed to operating shuttle bus services to transport employees to and from Parkes, Forbes and Condobolin to the mine to reduce the total number of vehicles through Trundle.

A comparison of the traffic generation in Trundle for the approved project and the modified project, as originally proposed in the EA, and with the additional mitigation measures, is presented in the following table.

Table 5 | Project-related trundle traffic generation (vehicles per day)

Vehicle Type	Approved Project	Modified Project, as originally proposed	Modified Project, with additional mitigation
Light	188	256	70
Heavy	34	90	70
Shuttle	-	-	6
Total	**222**	**346**	**146**

As indicated in the table, the proposed additional mitigation measures would:

- reduce project-related light vehicle traffic through Trundle to less than half of the approved project (from 188 vehicles to 70 vehicles a day);
- reduce total project-related traffic through Trundle to levels well below that of the approved project (from 222 vehicles to 146 vehicles a day); and
- reduce project-related truck movements through Trundle to 70 trucks a day, from the 90 trucks a day originally proposed in the EA.

When added to the existing traffic, the proposed project-related truck traffic through Trundle (i.e. 70 vehicles a day) would be equivalent to approximately 155 heavy vehicle movements a day, or an average of one every 9 minutes. By comparison, the project as approved would increase heavy vehicle movements (project + existing) to an average of approximately 119 vehicles a day, or one every 12 minutes.

Although the modified project would increase the existing traffic, the traffic levels are still relatively low in absolute terms, and are unlikely to result in significant traffic, safety, hazard, amenity or socio-economic impacts in Trundle, subject to the implementation of appropriate mitigation measures. The RMS and Parkes Shire Council have not raised any significant concerns regarding the traffic volumes through the town.

Alternative Transport Options

Notwithstanding the above, the key reason for the increased heavy vehicle traffic through Trundle is the delivery of limestone (from third party suppliers) through the town during operations. Following the RTS, the Department requested Clean TeQ to provide additional consideration of options for reducing heavy vehicle haulage.

Clean TeQ's response is provided in **Appendix E.** A summary of the options and the relevant considerations is presented in **Table 6**.

Table 6 | Consideration of options for reducing heavy vehicle traffic

Option	Consideration
Alternative processing methods to reduce demand for limestone	• The high-pressure acid leach processing methodology is used by all other nickel-cobalt projects with a similar ore types, and Clean TeQ contends that it is the only proven commercially viable processing methodology available to leach nickel, cobalt and scandium from the ore. • In this regard, the Department accepts that there are limited opportunities for alternative processing methods that would reduce or eliminate the need for limestone.
Justification for selective mining (which increases the demand for limestone)	• The proposed selective mining would allow a higher grade of ore to be sent to the processing facility. This would reduce processing costs (by reducing the demand for sulphuric acid), maximise the recovery of nickel, cobalt and scandium and allow the project to reach its approved maximum metal production rate earlier in the mine life. • The Department considers the proposed selective mining would facilitate the potential extraction of the State significant nickel cobalt scandium resource at the site and improve the economic viability of the project and the subsequent socio-economic benefits associated with the approved project.
Justification for sourcing limestone from third party suppliers rather than the project quarry (which would limit heavy vehicle use to a much shorter route)	• The limestone available from third-party suppliers is of a higher quality (i.e. has a higher calcium carbonate content with a higher neutralising capacity) than that available from the project quarry. To make up for the lower quality limestone at its own quarry, Clean TeQ would have to increase limestone supply to approximately 1,200,000 tpa. This would represent a 52% increase in limestone used at the mine instead of the proposed 25% increase. • This would have a number of adverse flow-on impacts, including increasing the size of the quarry, increasing the amenity impacts (e.g. noise and dust) associated with the quarry, increasing total traffic (by mass), reducing operational efficiency of the processing facility, increasing water use, and increasing required tailing storage facility size and capacity. • The Department considers that these consequential impacts are not insignificant, and that third-party supply of limestone is reasonable given the available supplies in the region and the acceptable road network impacts associated with this supply.
Consideration of the use of rail transport for third party limestone supplies to remove heavy vehicles from the roads	• Transporting the limestone by rail would remove the trucks from Henry Parkes Way and the Bogan Way but not from other roads, as the limestone would still need to be transported via road from the project rail siding to the mine. • Rail transport would require considerable additional rail infrastructure and would also likely result in a number of other adverse impacts. The Department does not consider that the significant additional costs this would incur would be reasonable.

The Department accepts that there are limited opportunities for reducing or eliminating the need for high quality limestone or reducing the number of heavy vehicle movements further without materially affecting the approved project and/or causing other adverse impacts.

Trundle Bypass

The Trundle bypass routes as suggested in some public submissions would divert project-related heavy vehicle traffic from the regional road network (i.e. The Bogan Way) onto local roads. Clean TeQ's Trundle traffic assessment includes consideration of these routes, noting that the roads are not suitable for heavy vehicle traffic and would require significant upgrades to make them suitable.

RMS did not raise concerns about the traffic on The Bogan Way, and Parkes Shire Council supports the use of regional roads in preference to local roads.

The Department considers that the relatively low traffic volumes through Trundle do not warrant bypassing of Forbes Street, and that the regional road network including Forbes Street (an RMS-approved road train route) is adequate to accommodate the relatively low traffic volumes. A bypass would also result in additional impacts on local residents along the bypass route.

Recommended Conditions

The existing consent requires Clean TeQ to prepare and implement a detailed Traffic Management Plan for the project, in consultation with the relevant roads authorities. The existing conditions include a number of relevant requirements for ensuring that traffic through Trundle (and other areas) is appropriately managed, including requirements for Clean TeQ to:

- detail approved transport routes and ensure drivers adhere to these routes;
- monitor and report on traffic volumes;
- coordinate/stagger truck movements to minimise impacts;
- ensure truck loads are covered at all times;
- minimise potential conflict with rail services and school bus services, including through radio communications;
- ensure travelling stock access and right of way; and
- implement a range of measures to minimise safety and hazard risks and respond to emergencies.

To further mitigate traffic-related impacts on Trundle and other areas, the Department has recommended some additional requirements for the Traffic Management Plan, including requirements for Clean TeQ to:

- monitor and report on limestone supplied from third party suppliers;
- ensure high capacity trucks are used for limestone and other material transport;
- provide employee shuttle bus services to and from regional centres including Parkes, Forbes and Condobolin;
- minimise disruption to community events and festivals, in consultation with event organisers;
- implement reasonable and feasible measures to minimise amenity impacts to local communities, including minimising night time truck movements and compression braking in urban areas as far as practicable; and
- manage potential disruptions due to flood events and other emergencies.

The additional traffic assessment in the RTS also recommended a number of minor road upgrades that could be undertaken to improve pedestrian and vehicular safety in Trundle, including modified kerb extension treatments and speed reduction warning signs on the approaches to the town. The Department has recommended conditions requiring Clean TeQ to implement the recommended upgrades in consultation with Parkes Shire Council.

Conclusion

The modification would increase the number of heavy vehicles on some roads, particularly between Parkes and the mine site. These changes are largely the result of a re-distribution of the traffic rather than a significant increase in truck numbers. Most of the proposed transport route comprises State and regional roads, and the Department considers that these roads have sufficient capacity to handle the additional volume of traffic.

The modification would also increase the number of heavy vehicles travelling through Trundle. The Department considers that absolute vehicle numbers would still be relatively low, and that the modification would not significantly increase the safety or amenity impacts on the community in Trundle.

Clean TeQ is already required to upgrade a number of roads and intersections for the approved project, in accordance with VPAs with all three Councils. With these upgrades, and with the implementation of the conditions recommended above, the Department considers that the modification would not adversely affect road safety.

5.2 Air Quality

The key changes to air emissions associated with the proposed modification are gaseous emissions generated by the processing facility, and fugitive dust (or particulate matter) generated during open cut mining. Other aspects of the proposed modification are not expected to result in significant air quality impacts. Blasting-related impacts are addressed separately below.

Air Quality Modelling

Numerous community submissions raised concerns about the accuracy of the air quality modelling and the suitability of the baseline data that underpins the air quality impact assessment.

The EA includes a detailed air quality impact assessment undertaken by Ramboll Environ, to assess the potential air quality impacts associated with the modified project. The assessment modelled emissions from the mine site for four representative years of mining, consistent with the air quality assessment undertaken for the approved project. Dispersion modelling was used to predict ground level concentrations for key pollutants at surrounding private and mine-owned receivers.

The air quality assessment followed guidelines recommended in the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*. The data is based on the nearest available relevant datasets. The EPA and the Department accept that the baseline data that was collected is suitable and appropriate for the purposes of modelling potential air quality impacts.

Gaseous Emissions

Clean TeQ proposes to adopt the Resin-in-Pulp processing method for the project, rather than the counter current decantation circuit processing method. Both methods have already been assessed and approved for the project.

A number of submissions from the general public raised concerns about the unproven nature of the Resin-in-Pulp processing technology. However, the Department notes that Clean TeQ has successfully operated a large-scale pilot plant in Perth, West Australia that uses the Resin-in-Pulp processing method.

The use of Resin-in-Pulp processing without the counter current decantation circuit would mean that production of hydrogen sulphide, hydrogen and nitrogen would no longer be needed, and three of the approved stack emission sources would be removed from the project, namely the 'extraction fan over sulphide filter vent', the 'flare stack' and the 'hydrogen reformer stack'.

However, more sulphuric acid would be required to leach additional nickel, cobalt and scandium from the higher-grade ore. The increased sulphuric acid production would increase the sulphur dioxide emission rates from parts of the mine processing facility.

The levels of all gaseous emissions are predicted to be well below the applicable health and amenity based criteria at all off-site sensitive receivers, and at the property boundary, during all stages of the project. For all emissions, levels were found to be less than 50% of the applicable criteria at sensitive receiver locations.

The maximum predicted concentrations at receiver locations are shown in the following table, and a representative contour plot for sulphuric acid is shown on **Figure 6**.

Table 7 | Predicted maximum gaseous concentrations at receiver locations

Pollutant	Averaging Period	Predicted Maximum ($\mu g/m^3$)	Criteria ($\mu g/m^3$)
Nitrogen dioxide (NO2)	1-hr average	97.9	246
	Annual average	1.9	62
Sulphur dioxide (SO2)	1-hr average	38.4	570
	24-hr average	7.6	228
	Annual average	0.7	60
Carbon monoxide (CO)	1-hr average	38.5	30,000
	8-hr average	14.1	10,000
Sulphuric acid mist (H2SO4)	1-hr average (99.9th %ile)	8.1*	18
Volatile organic compounds	1-hr average (99.9th %ile)		
- Benzene		0.9*	29
- 1,3-butadiene		0.8*	40

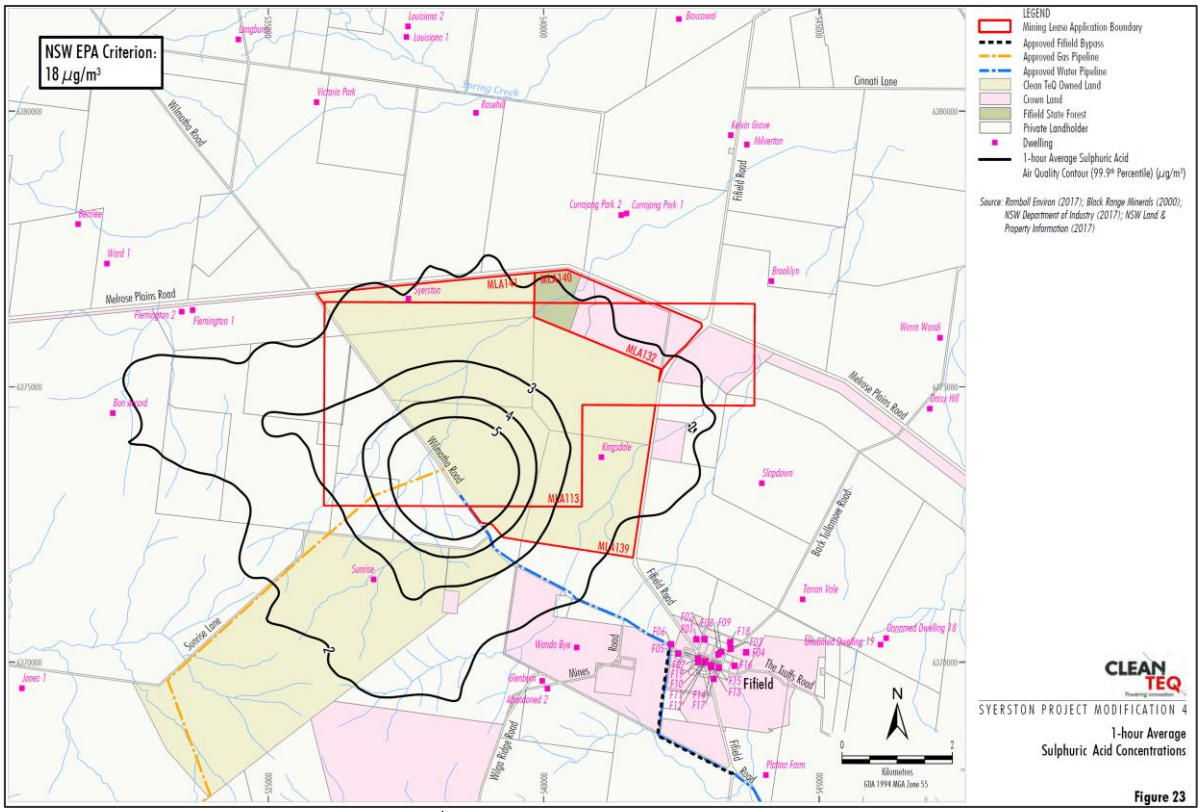

Figure 6 | Predicted Sulphuric Acid Concentrations

The Department notes that while SO_2 emissions from the sulphuric acid plant stack would increase, overall SO_2 emissions from the processing facility would decrease (from 59.2 to 53.2 grams per second).

The Department and the EPA accept that Clean TeQ's air quality assessment demonstrates that the mine would comply with all applicable criteria for gaseous emissions.

The Department also notes that there are a number of standard regulatory requirements for ensuring industrial facilities comply with relevant gaseous concentration limits. These include the requirement for facilities that discharge gaseous emissions to obtain an Environmental Protection Licence (EPL) prior to any such discharge, and to demonstrate that the final design of the plant would comply with relevant discharge limits.

In accordance with the EPA's recommendations, the Department has also included a condition requiring Clean TeQ to prepare an air quality verification report that confirms the sulphuric acid plant and power generation facility stack emission discharges will comply with the relevant requirements of the *Protection of the Environment Operations (Clean Air) Regulation 2010*.

Finally, the Department has recommended that the Air Quality Management Plan includes a monitoring program that includes real time monitoring of air quality and supports proactive and reactive air quality management strategies.

Acid Rain

Submissions raised concerns about the potential for acid rain. Acid rain is a rare phenomenon generally only associated with regions with significant densities of industrial development with the regional air shed receiving high levels of SO_2 and oxides of nitrogen (such as large, uncontrolled coal-fired power generation).

There is currently no evidence of acid rain occurring in NSW, even in heavy industrial areas. Given the low volume of SO_2 and NO_2 emissions from the project, the Department considers that an acid rain event is highly unlikely.

Dust

Dust levels are predicted to remain below applicable EPA criteria for all privately-owned and mine owned receivers, during all stages of the project. Dust levels over surrounding agricultural lands are also not predicted to change significantly from the approved project.

The Department considers that the project as modified is unlikely to result in any significant dust-related impacts on the surrounding community, and that the existing conditions of consent are adequate to appropriately manage dust-related issues. These include requirements for Clean TeQ to comply with applicable criteria, and to prepare and implement a detailed Air Quality Management Plan and Air Quality Monitoring Program for the project.

The Department has recommended changes to the air quality criteria to be consistent with contemporary EPA criteria, which include a more stringent standard for annual average PM_{10}, as well as criteria for $PM_{2.5}$.

Conclusion

The Department considers that the modified project would comply with all relevant criteria for both gaseous emissions and dust.

The Department also considers that actual gaseous emissions from the processing plant can be verified through the air quality audit following construction of the processing plant, and by continuous monitoring of in-stack emissions.

The existing conditions of consent require Clean TeQ to prepare an air quality management plan that includes a monitoring program and measures to ensure compliance with the air quality criteria. With the implementation of this plan, the Department considers that both gaseous emissions and dust can be identified and appropriately managed.

5.3 Water

The key potential impacts to water from the modification are associated with the proposed extraction of water from the Lachlan River, and potential for pollution of ground or surface waters from seepage from the enlarged Tailings Storage Facility (TSF).

The modification does not propose to change the extent or depth of the approved open cut mining pits, and accordingly there would be no significant changes to groundwater drawdown or inflows, or impacts on groundwater supplies to groundwater users in the area surrounding the mine.

The modification also does not propose changes to the extraction of water from the borefield. Nevertheless, the impacts on surrounding bores from the extraction of water from the borefield was raised as a key issue in a number of submissions, particularly from the community around the borefield, and the Department has addressed these concerns below.

Water Demand

The proposed water treatment plant would have significant benefits in reducing the total water demand associated with the project. The plant would reduce water use at the mine processing facility by recycling up to 1,451 ML/year of water from the TSF.

The borefield would continue to be the primary source of external water supply. Other key water supplies would include the collection of run-off and pit inflows from the mine site (in accordance with harvestable rights provisions), as well as the proposed supplemental supply of surface water extraction from the Lachlan River.

Licensing

One of the key issues raised in submissions is about the potential impacts on other water users resulting from the extraction of water, both from the Lachlan River and the borefield.

Submissions also raised concerns about the accuracy of the original groundwater modelling undertaken for the project. In particular, submissions from landowners near the borefield noted the findings of the independent expert commissioned by the Department during its assessment of the original project, which identified that the groundwater model could not reliably determine the long-term impacts on groundwater users.

It is important to note that there have been significant legislative changes since the original environmental assessment was undertaken for the project, and the extraction of water is now regulated under the *Water Management Act 2000* (WM Act) and the relevant Water Sharing Plans.

Water Sharing Plans ensure that all water users have equal access rights, all water users are protected from excessive extraction and all water users are afforded water allocations based on regional water availability, groundwater levels, water quality changes, aquifer integrity, river conditions and the health of dependent ecosystems.

To achieve this level of protection, Water Sharing Plans utilise water entitlements to cap total water extraction across the region (i.e. cumulative impacts), and water allocations to cap annual individual bore extraction (i.e. impacts on individual users).

Water entitlements, known as Water Access Licences (WALs), are ongoing rights to receive an annual share of available water within a particular water source. Commercial users such as irrigators and industry may purchase WALs on a regulated water market that has clear trading and access rules.

Landholders may extract water from aquifers underlying their land for stock and domestic purposes without obtaining a licence. The Water Sharing Plans protect these basic landholder rights to the water by estimating the water requirements for these users.

The actual volume of water that can be taken by any water user in any year is determined through an Available Water Determination (AWD), which is given effect by a statutory water order. The AWD is made at least once per year, and is dependent on a range of factors including water storage levels, rivers flow and catchment conditions. The AWDs allocate water to stock and domestic users and to licensed water users based on the size of the individual entitlements and licence category.

Water Extraction from the Lachlan River

The proposed surface water extraction from the Lachlan River is intended to increase water supply security for the project by diversifying supply sources and reducing reliance and pressures on groundwater supplies. Clean TeQ has nominally identified a potential extraction of up to 350 ML/year from this water source.

As discussed above, Clean TeQ would be required to purchase the necessary water entitlements under the WM Act. The company has identified that, based on recent AWDs, a 350 ML/year share of water would represent a very small proportion (approximately 0.6%) of the available (general security) water licences on the market.

In dry years, under a different AWD, a 350 ML/year share could represent a much more significant proportion of the available shares (about 50%). Under this scenario, it would be very unlikely that Clean TeQ would be able to acquire this share on the open market.

DoI did not raise any concerns about the proposed surface water extraction, apart from some recommended measures to minimise impacts to waterfront land and fisheries at the pump site, which are already included in the existing consent. Indeed, in its submission on the previous modification (Mod 3), DoI recommended that Clean TeQ consider alternative water supplies such as surface water extraction from the Lachlan River, to improve its overall water supply security.

Forbes Shire Council has objected to the proposal on the grounds that the proposed extraction of surface water from the Lachlan River would adversely impact water supply to agricultural land users within the Forbes LGA. However, the Department considers that the proposed extraction of water is consistent with the framework established under the MW Act and Water Sharing Plans discussed above.

The Department notes that Clean TeQ's water balance indicates that adequate water supply for the project may be able to be achieved through the borefield and the water treatment plant, and that the proposed supply from the Lachlan River is unlikely to be required during most project stages. Although the Department accepts Clean TeQ's objective to diversify its water supply sources, it has recommended conditions requiring Clean TeQ to use recycled water and water collected on site in preference to water from the borefield or the Lachlan River.

Water Extraction from the Borefield

Although the extraction of water from the borefield is approved in principle by the development consent, Clean TeQ is still required to hold the necessary water entitlements in the same way as any other irrigator, farming enterprise or other water user.

Clean TeQ holds 3,154 shares in the Upper Lachlan Alluvial Groundwater Source, which is currently equivalent to 3,154 ML/year. However, as discussed above, the actual volume of water that Clean TeQ could extract would be determined by the number of WALs held and the annual water allocation. Clean TeQ would also be required to adhere to the same rules and requirements, including extraction volumes and cease to pump rules as other water users in the area.

The Department considers that the water extraction from the borefield would be consistent with the framework established under the WM Act, and that impacts on other water users would be regulated by the rules of the Water Sharing Plan.

Groundwater Seepage

The main potential for change to groundwater resources is associated with the potential for increased seepage from the enlarged TSF, which would be increased to accommodate the increased tailings volume. The community raised concerns about seepage and the potential impacts on downstream receivers.

The EA includes a specialist water assessment undertaken by Golder Associates. At the request of DoI, Clean TeQ also engaged Coffey Services Australia (Coffey) to undertake a more detailed analysis of potential seepage from the TSF. The Department and DoI consider the revised groundwater impact assessment is adequate and appropriate for assessing the impacts of seepage.

The TSF is proposed to be increased in capacity from 46.4 million cubic metres (Mm^3), to 62.7 Mm3, and increased in area from 217 ha to 310 ha.

The EPA's *Environmental Guidelines Solid Waste Landfills 2016*, which applies to the design of TSFs, mandates two key engineering controls to ensure that any seepage from the TSF is minimised: a low permeability liner to prevent seepage, and a drainage system that channels seepage to collection sumps for disposal.

The existing conditions require the TSF to be designed and constructed to meet best practice low permeability standards (i.e. $< 1 \times 10^{-9}$ m/s). Notwithstanding this, the assessment indicates that a relatively small amount of seepage from the TSF would occur (less than 2.4 L/s for the clay lined TSF), with horizontal seepage potentially migrating up to 400 m outside of the mine site boundary.

To intercept potential horizontal seepage through the embankment, interception drains would be installed in the TSF embankment. With the implementation of the interception drains and low permeability liner, TSF seepage would be reduced by approximately 97%, to approximately 0.42 L/s.

The existing groundwater in the area covered by the proposed TSF has a low yield and salinity ranging between 3,000 and 14,000 mg/L. The groundwater is categorised as being of 'fair to poor stock quality'. The nearest registered groundwater bores are approximately 2.8 kilometres from the site boundary and 5 kilometres from the TSF. Any seepage from the TSF would be neutral but saline (approximately 28,000 mg/L) with elevated levels of magnesium, chlorine and sodium.

The Department considers that only small or negligible vertical or lateral seepage outflows are likely to occur from the TSF over the life of the project. Further, the seepage would be directed towards the open cut pits, which would act as a groundwater sink.

Importantly, the Department and DoI consider that the modified TSF would comply with the NSW *Aquifer Interference Policy*, as it is not expected to lower the beneficial use category of the groundwater within 40 metres of the activity. Consequently, the modification would not impact any privately-owned groundwater bores or groundwater dependent ecosystems.

Notwithstanding, the DoI recommended that the groundwater management plan for the project include specific downgradient groundwater monitoring for the TSF and water storage dam. The Department notes that the existing conditions already require such measures, as well as requirements for the TSF to be appropriately lined. However, the Department has clarified the conditions to provide specific reference to the proposed seepage interception system.

Surface Water Structures

The Department received a late representation from a special interest group concerned about the adequacy of the proposed clean water diversion channels during high rainfall events.

Clean TeQ has confirmed that the diversion channels would be designed to carry the 100 year peak flood flow, and that the flood characteristics would be determined in accordance with the Commonwealth of Australia 2016 guideline, *Australian Rainfall and Runoff: A Guide to Flood Estimation.* This guideline describes the processes for estimating flood characteristics specifically for the purpose of infrastructure design.

The guideline is also supported by online tools for determining rainfall intensity, frequency and duration using data from the Australian Bureau of Meteorology's (BOM). The BOM data includes site specific rainfall estimates based on a minimum of 30 years of data.

The conditions of consent also require Clean TeQ to install a meteorological station in the vicinity of the mine site. The Department notes that this meteorological station must be installed prior to carrying out any development, whereas the diversion channels are unlikely to be constructed for at least two years. Given this, the meteorological station could provide local rainfall data to supplement the BOM data.

The Department and DoI consider that suitable and accurate data would be available for determining local rainfall characteristics and estimating flood probabilities and that this data can be used in the final design of the clean water diversion channels.

The Department has recommended that the conditions be amended to explicitly require the diversion channels to be designed for a 100 year flood, which is the standard engineering design for these type of facilities.

The Department notes that the existing conditions require Clean TeQ to prepare a Water Management Plan that includes a detailed description of the water management systems on site, including the clean water diversion systems. The Water Management Plan must demonstrate that the design of the diversion channels achieves the performance criteria and must be prepared in consultation with DoI, and be approved by the Secretary prior to the commencement of construction.

Conclusion

The Department considers that the extraction of water from the Lachlan River would allow Clean TeQ to diversify its water supply. The Department considers that Clean TeQ would be required to purchase the appropriate entitlement to the water, and this would be subject to availability on the water market.

The Department is also satisfied that the approved extraction of groundwater from the borefield is consistent with the framework established under the WM Act, and that impacts on other water users would be regulated by the rules of the Water Sharing Plan.

In relation to potential pollution of waters from seepage from the TSF, the Department considers that, subject to the appropriate engineering controls, seepage would be negligible.

With regard to the clean water diversions, the Department considers that the recommended conditions would ensure the structures are designed for the 100 year peak flood event, and that the appropriate data and guideline is available to estimate this event.

5.4 Noise and Blasting

The key changes to the approved project with the potential to affect construction and operational noise impacts associated with the project are the modifications to the mine and processing facility.

Noise and Blasting Assessment

The EA includes a noise and blasting assessment undertaken by Renzo Tonin and Associates, which includes updated modelling of the construction and operational noise impacts at the mine and processing facility, with reference to the NSW *Interim Construction Noise Guideline* and the NSW *Industrial Noise Policy 2000*. (The *Noise Policy for Industry* was released in 2017, however the *Industrial Noise Policy* continues to apply to the project). A conservative project specific noise level (PSNL) criteria of 35 dB(A) was adopted for all privately-owned residences.

The assessment modelled one construction and three operational scenarios representing worst case operations. Preliminary modelling indicated that, in the absence of any mitigation, noise levels at privately-owned residences could exceed the PSNL criteria by up to dB(A) under adverse meteorological conditions (i.e. Category F temperature inversion conditions) at night.

Accordingly, the assessment included consideration of reasonable and feasible mitigation measures to reduce these exceedances. Based on this consideration, the following operational mitigation measures were adopted in the modelling for night time operations under adverse meteorological conditions:

- ceasing overburden emplacement on the north-eastern waste rock emplacement; and
- ceasing operation of a drill in the eastern pit and an intermittently operated plant item near the mine.

Construction and Operational Noise Predictions

With the adoption of the abovementioned mitigation measures, noise emissions from the project would comply with the applicable noise criteria at most privately-owned receivers. However, noise levels at 8 residences on 7 properties around the mine site are still predicted to be up to 2 dB(A) higher than the PSNL, and up to 2 dB(A) higher than the approved noise limits.

A comparison of the predicted worst-case noise levels with the approved noise levels is presented in the following table (with exceedances shown in bold). A representative worst-case noise contour is shown on **Figure 7**.

Table 8 | Comparison of predicted and approved noise at privately-owned receiver locations (exceedances shown in bold)

Location and Receiver ID	Day LAeq (15 minute)		Evening LAeq (15 minute)		Night LAeq (15 minute)	
	Approved	Predicted	Approved	Predicted	Approved	Predicted
Currajong Park (2 residences)	35	**37**	39	37	40	37
Abandoned 2	35	35	35	**36**	35	**36**
Glenburn	35	35	35	**36**	35	**36**
Brooklyn	35	**36**	35	35	35	35
Rosehill	35	35	35	**36**	35	**36**
Slapdown	35	35	35	**36**	35	**36**
Wanda Bye	35	35	35	**37**	35	**37**
All other privately-owned residences	35	35	35	35	35	35

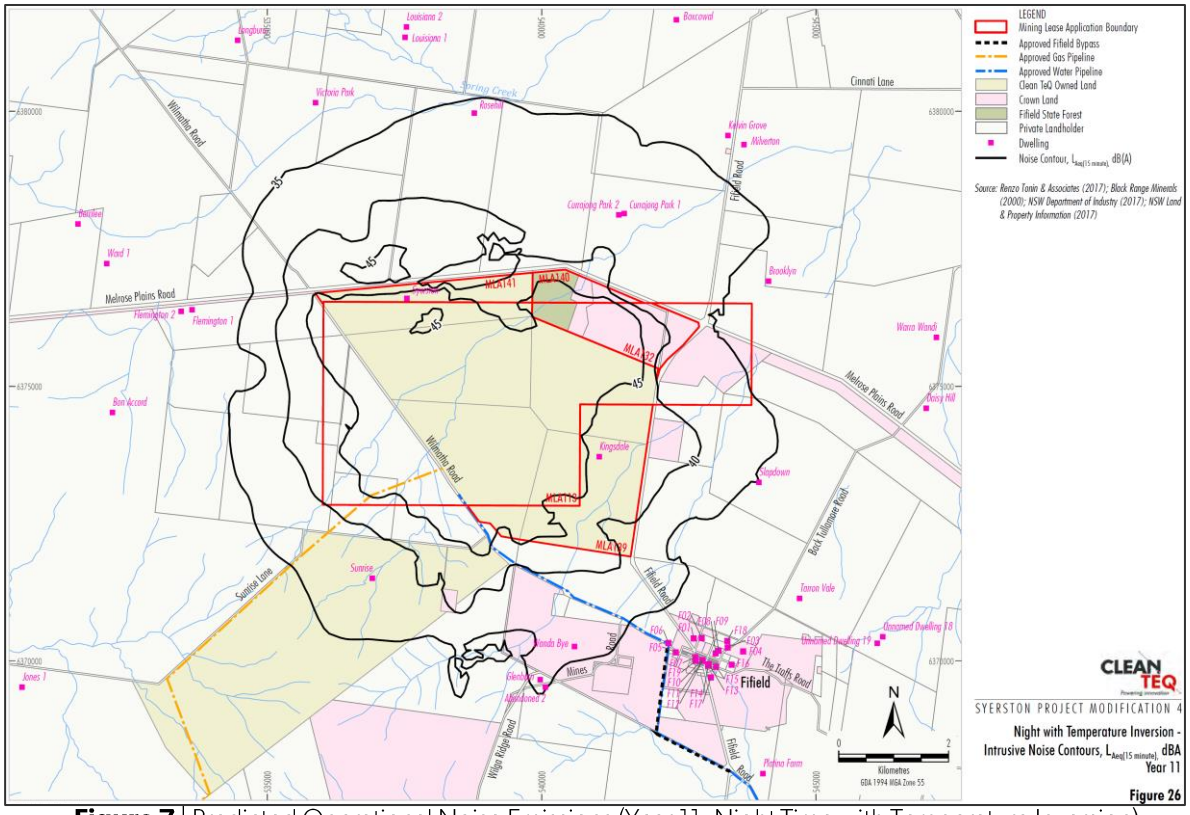

Figure 7 | Predicted Operational Noise Emissions (Year 11, Night Time with Temperature Inversion)

There are also changes predicted to noise impacts at a residence near the limestone quarry (Moorelands), which is now predicted to be 37 dB(A) during the evening instead of 35 dB(A), and 35 dB(A) instead of 42 dB(A) during the day.

The modified project would comply at all sensitive receivers with the amenity criteria of 40 dB(A) and with the sleep disturbance criteria of 45 dB(A) set out in the *Industrial Noise Policy*.

The predicted changes to the noise levels are largely a consequence of improved noise modelling techniques rather than any changes in work practices that would increase noise generation on the sites.

Although the predicted noise levels would exceed the intrusiveness noise criteria at some properties, the increase is very small. The *NSW Voluntary Land Acquisition and Mitigation Policy* (2014) and the *Noise Policy for Industry (2017)* characterise increases of 0-2 dB(A) as negligible and generally not discernible to the average listener.

The Department also notes that, although it does not strictly apply, the *NSW Noise Policy for Industry* (2017) sets a threshold for potential impact of 40 dB(A) during the daytime. Daytime noise levels are predicted to be below this level at all receivers.

The Department and EPA accept that Clean TeQ has implemented all reasonable and feasible measures to mitigate noise emissions associated with the modified project.

Given that noise level increases of 2 dB(A) are barely discernible to most people, and also that the project would comply with the relevant amenity and sleep disturbance criteria, the Department and the EPA consider that the modification is unlikely to result in any significant noise impacts at residences.

Consequently, the Department has recommended that the noise criteria be revised to reflect the predicted noise. The Department has also recommended that contemporary sleep disturbance noise limits be set in the conditions, and that Clean TeQ be required to implement the proposed noise mitigation measures.

The Department considers that the conditions already require Clean TeQ to prepare a Noise Management Plan that must include noise monitoring and management measures, and that no further changes are required in this regard.

Traffic Noise

The noise assessment includes consideration of road noise at six representative locations, including:

- The Bogan Way north of Trundle;
- Fifield Road north of Platina Road;
- Fifield-Trundle Road west of The Bogan Way;
- Platina Road east of Fifield Road;
- Wilmatha Road west of Slee Street; and
- Slee Street in Fifield.

In response to concerns raised in submissions, Renzo Tonin prepared a supplementary road noise assessment in accordance with the *NSW Road Noise Policy 2011*, which considered traffic noise within the township of Trundle (Forbes Street).

The assessment indicates that the traffic associated with the project would comply with the relevant traffic noise criteria at all receivers, based on the forecast total traffic volumes (i.e. traffic associated with the modified project as well as all other non-project traffic).

Notwithstanding, the existing consent conditions require Clean TeQ to effectively manage traffic noise emissions as part of a detailed noise management plan.

Blasting

The proposed modification involves the introduction of limited blasting at the mine, in addition to the existing approved blasting at the limestone quarry. Blasting would be undertaken for overburden and ore material that is not able to be efficiently ripped and excavated by mobile equipment. Clean TeQ estimates that blasting would occur on average 3 days a week during such periods, with blasting occurring during the day time period. Blast sizes would be relatively small at approximately 380 kg maximum instantaneous charge (MIC).

A blasting assessment was undertaken in accordance with the *Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibrations*. The assessment indicates that blasts would comply with the applicable overpressure and ground vibration criteria for all blasting during daylight hours on Monday to Saturday. A small number of exceedances would occur for the more stringent criteria for blasting on Sundays and public holidays, or for night blasting. No significant fly rock (rock projectile) or blast fume impacts are expected, subject to best practice management of blasting operations.

The EPA did not any raise concerns about blasting impacts.

The Department has recommended conditions requiring Clean TeQ to restrict blasting to Monday to Saturdays only, with no blasting on Sundays or public holidays unless required for emergency purposes. The Department has also recommended conditions restricting blasting to between 9am to 5pm, to provide respite to neighbours during the morning and late afternoon periods.

Conclusion

Operational noise levels from the modified project are predicted to be up to 2 dB(A) higher at some properties near the mine and limestone quarry. This is primarily due to revised modelling rather than any proposed changes to operations.

Given that noise increases of 2 dB(A) are barely discernible to most people, and also that noise levels would be substantially below the amenity criteria for a rural area, the Department and the EPA consider that the increase would be unlikely to result in significant impacts. Further, the Department and the EPA accept that Clean TeQ has considered all reasonable and feasible measures to reduce noise. Therefore, the Department has recommended that the noise criteria be revised to reflect the predicted noise.

While the Department considers that the modified project is unlikely to exceed the sleep disturbance criteria at any receivers, it has also recommended that contemporary sleep disturbance criteria be included in the revised noise limits at all receivers.

In relation to traffic and blasting, the Department considers that traffic noise would comply with relevant traffic noise criteria at all receivers, while blasting could comply with all applicable overpressure and ground vibration criteria if restricted to daylight hours on Mondays to Saturdays.

The Department is satisfied that the existing conditions already require Clean TeQ to effectively monitor, manage and report on noise emissions as part of a detailed noise management plan, and that in the event of any exceedance, Clean TeQ would be required to adjust operations to comply.

5.5 Environmental Management

Some submitters raised concerns about environmental monitoring and management for the broader project, including noise, blasting, air quality and water quality/quantity monitoring, and contingencies in the event of exceedances of the accepted environmental criteria. In particular, some neighbours are concerned that the requirements to prepare various management plans and acquisition rights for neighbouring landowners were removed from the conditions in Modification 3.

In relation to the removal of management plans as part of Modification 3, the Department notes that the number of management plans was reduced by consolidating and removing duplication and inconsistencies in the requirements. Clean TeQ is still required to prepare a number of management plans and strategies to describe how key aspects of the project will be managed. Most of these plans/strategies must be prepared in consultation with one or more regulatory agency, and must be approved by the Secretary.

In relation to environmental management and monitoring, the Department is committed to ensuring the conditions are robust and comprehensive enough to protect the community and the environment.

Clean TeQ is required to comply with the noise, blasting and air quality criteria, and a number of water management performance measures in the development consent.

However, the conditions also include a number of monitoring and reporting requirements that ensure that any exceedances are identified and the appropriate regulatory body notified.

The conditions require Clean TeQ to (amongst other things):

- prepare and implement comprehensive monitoring programs and management plans to monitor performance against these limits;
- publicly report on these monitoring results;
- notify authorities of any exceedances or incidents;
- undertake annual performance reviews;
- undertake three-yearly independent environmental audits; and
- commission independent reviews at the request of landowners who believe that Clean TeQ is exceeding the relevant criteria.

In addition, it is important to note that mines in NSW are very strictly regulated under a range of legislation, not just the development consent.

Most relevantly, Clean TeQ would be required to obtain an Environment Protection License (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act). In addition to performance limits, the EPL would include a number of monitoring and performance criteria in relation to noise, blasting, air emissions, and water quality. The EPA also has a broad range of powers under the POEO Act in relation to monitoring, reporting and notification of activities under this licence.

In relation to acquisition provisions, there are a number of important reasons behind the Department's decision to remove these provisions as part of Modification 3, and not to re-instate the provisions for this modification.

Firstly, as outlined in Sections 5.2 and 5.4 above, apart from very minor exceedances of the noise limits at a relatively small number of receivers, the development as modified is predicted to comply with applicable noise, blasting and air quality criteria.

Secondly, in accordance with the *Voluntary Land Acquisition and Mitigation Policy (VLAMP),* contemporary approvals for mining projects only include land acquisition provisions where a project is predicted to exceed the applicable acquisition criteria. It is important that the relevant policies are applied consistently to all projects.

Thirdly, the Department is legally constrained in its assessment of the modification and must ensure that any additional conditions of consent are relevant to the scale and nature of the proposed modification. In this instance, the Department has not found any additional impacts from the proposed modification that would warrant the inclusion of acquisition criteria.

Finally, the environmental criteria and performance measures in the development consent are strict limits. In the event of any exceedance of these limits, the mine would be required to adjust its operations to comply. Any exceedance of the limits would constitute a potential breach of the consent and would be subject to investigation and potential enforcement measures. These measures could include the issue of penalty notices (with fines of up to $15,000), stop work orders, or legal prosecution with penalties of up to $5 million. The removal of the acquisition conditions are not intended to permit or make allowances for non-predicted exceedances.

5.6 Other Issues

The Department considers that other issues associated with the proposed modification are relatively minor and/or can be effectively managed in accordance with the existing conditions of consent. A summary of the Department's consideration is provided in the following table.

Table 9 | Consideration of other issues

Issue	Consideration	Recommended Conditions
Hazards	• The EA includes a Preliminary Hazard Analysis (PHA) undertaken by Pinnacle Risk Management. The analysis identified the key potential risk events associated with the proposed modification with the potential for off-site impact as: • decomposition of explosives (ammonium nitrate) to be used in blasting; • loss/leakage/spillage of ammonia; and • uncontrolled release of sulphur dioxide or sulphur trioxide. • The risks associated with each of these hazards were assessed in accordance with *Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis'* and found to comply with the applicable criteria at off-site receiver locations and at the property boundary. Associated risks, including societal risk,	• Lachlan Shire Council to be consulted in preparation of the Emergency Plan • The Emergency Plan to be consistent with the following publications: – Hazardous Industry Planning Advisory Paper No. 1, 'Industry Emergency

	cumulative risk, propagation risk, transport risk and environmental risk were also found to be acceptable. • The Department's specialist hazards unit reviewed the PHA and considers that all significant hazards that may lead to off-site impacts have been identified, and that appropriate safeguards and controls have been identified to address the risks from these hazards. • The existing consent requires Clean TeQ to prepare and implement a number of detailed hazard and safety studies and plans prior to construction and/or commissioning of the project, including a: – Fire Safety Study; – Final Hazard Analysis; – Construction Safety Study; – Hazard and Operability Study; – Transport of Hazardous Materials Study; – Emergency Plan; and – Safety Management System. • The Department has recommended a small number of changes and additions to these hazard-related conditions to align with current legislation and guidelines.	Planning Guidelines'; – Code of Practice for Emergency Planning at Mines (NSW Resources Regulator); and – Work Health and Safety (Mines and Petroleum Sites) Act 2013 Regulations; • The Safety Management System to include hazardous chemicals as a principle mining hazard
Biodiversity	• The proposed additional surface development has been designed to minimise the need for clearing of native vegetation. In this regard: • the modified borefield is located in an existing cleared paddock, and would not require any native vegetation clearing; • the additional surface water extraction infrastructure has been located to avoid the need for clearing of any mature native trees, including River Red Gums on the Lachlan River; and • the alternative water pipeline alignment option would be located within cleared areas of the applicable road corridors, and avoid the need for clearing of any trees or identified endangered ecological communities. • The only additional native vegetation clearing comprises approximately 0.31 hectares of regenerating River Red Gum vegetation within the surface water extraction infrastructure corridor. • OEH accepts that the vegetation is heavily degraded and that an offset for this minor amount of vegetation clearing is not warranted. • The Department agrees and considers that the proposed modification is unlikely to result in any significant biodiversity impacts. • The Department has recommended conditions requiring Clean TeQ to ensure that the surface water extraction infrastructure is constructed in accordance with applicable DoI guidelines to avoid impacts on waterfront land and fisheries.	• Surface water extraction infrastructure to be constructed in accordance with applicable DoI guidelines to avoid impacts on waterfront land and fisheries
Heritage	• The proposed modification involves a relatively small area of additional surface development, including disturbance required for the surface water extraction infrastructure, small changes to the borefield layout, and the water pipeline alignment option. • The EA includes a specialist Aboriginal Cultural Heritage Assessment for the additional disturbance areas, undertaken by Landskape. The assessment was undertaken in accordance with applicable OEH guidelines and in consultation with 7 Registered Aboriginal Parties (RAP) who registered an interest in the assessment of the proposal. • The assessment, including detailed survey of the additional disturbance areas with the RAPs, did not identify any Aboriginal sites or objects within or near the areas, or any other significant Aboriginal values that would be affected by the proposal. Further, no historic heritage items have been identified within the additional disturbance areas. • The existing consent requires Clean TeQ to prepare and implement a detailed Heritage Management Plan for the project in consultation with	• No changes to the conditions

	OEH, the Condobolin Local Aboriginal Land Council and the Wiradjuri Branch of the NSW Aboriginal Land Council. The Department considers that no further conditions are necessary in this regard.	
Land and Agricultural Resources	• The proposed modification involves minor disturbance of approximately 1.6 hectares of existing agricultural land (dryland cropping) for the proposed surface water extraction infrastructure, and a small area of road reserve for the proposed water pipeline alignment option. • These additional surface disturbance areas are unlikely to result in any significant loss of agricultural capacity in the region or impacts on land resources, subject to the implementation of standard soil management practices. • As outlined in Section 5.3, the proposed extraction of a relatively small amount of surface water from the Lachlan River is unlikely to significantly affect agricultural water supplies and is consistent with the open trading of water under the Water Management Act 2000.	• Recycled water and water collected on site to be used in preference to water from the borefield or the Lachlan River.
Greenhouse Gases (GHG)	• The EA includes a specialist GHG assessment undertaken by Ramboll Environ. The assessment indicates that the proposed modification would generate average annual direct (or 'Scope 1') GHG emissions of approximately 324,000 tonnes of CO2-equivalent per year, and approximately 26,000 tonnes CO2-equivalent of indirect 'Scope 3' emissions. • The direct emissions represent approximately 0.2% of NSW's total GHG emissions, and are unlikely to materially contribute to climate change. The existing conditions require Clean TeQ to minimise GHG emissions associated with the development. Clean TeQ is also required to assess and report GHG emissions under the Commonwealth's National Greenhouse and Energy Reporting System.	• No changes to the conditions
Visual Amenity	• The proposed modification is unlikely to result in significant changes to the visual impacts associated with the approved project, although it would result in some minor changes associated with the: – increased area of the tailings storage facility (as outlined in Section 5.3, this would in part be offset by a reduction in the evaporation pond area); – increased height of the tailings storage facility (from 310m to 314m AHD); and – relocation of some mine infrastructure and other project elements. • These changes are unlikely to result in any significant change to visual impacts at receiver locations, given the distance to the sensitive receivers (approximately 1.5 kilometres to the nearest residence), intervening topography and existing vegetation. • To minimise visual impacts from receivers and nearby roads, Clean TeQ is proposing to establish vegetation screens along parts of the southern, eastern and western boundaries of the mine site (see **Figure 2**). • The Department has recommended conditions requiring Clean TeQ to plant these screens, which supplements the existing conditions that require Clean TeQ to minimise the visual and lighting impacts associated with the development.	• Establish vegetation screens within 3 years of commencement of construction
Socio-Economics	• The proposed modification is unlikely to result in significant changes to the social and/or economic effects of the approved project as a whole. However, by enabling the selective mining of higher grade material in the early years of the project, the economic viability of the project increases. This means that the project is more likely to proceed, which in turn means that the significant socio-economic benefits associated with the longstanding project are more likely to be realised. • As outlined in Section 4, a number of residents of Trundle and the surrounding area raised concerns about increased traffic movements (particularly heavy vehicle movements) through the small town of Trundle. This issue is addressed in Section 5.1. As outlined in that section, Clean TeQ has committed to a number of measures to reduce traffic-related impacts on Trundle, including using shuttle services to transport workers to and from the mine, and using higher capacity trucks. With these measures, and other	• No changes to the conditions

	measures recommended by the Department, the Department believes that socio-economic issues associated with transport through Trundle can be effectively managed. • Since exhibition of the EA and submission of the RTS, Clean TeQ and the three Councils (Lachlan, Parkes and Forbes) have agreed to the terms of a revised VPA for the project. • Under the terms of this VPA Clean TeQ must pay for a number of specific road and intersection upgrades. In addition, the VPA provides for Clean TeQ to make a number of other contributions to Councils, including annual contributions of $400,000 to the Councils for community enhancement (50% to Lachlan Shire Council and 25% each to Parkes and Forbes Shire Councils), and $340,000 for road maintenance.	
Waste	• The proposed modification would not significantly change the types or volumes of waste associated with the approved project.	• No changes to the conditions

6. Recommended Conditions

The Department has prepared a Notice of Modification (see **Appendix A**), as well as a consolidated version of the development consent as modified (see **Appendix B**). The Department has recommended a number of amendments to the development consent to facilitate the modification.

As discussed in section 5, the Department has also recommended a number of changes or additional conditions to mitigate potential impacts associated with the modification and/or to address some of the concerns raised in submissions and during the Department's consultation with the community.

The Department has consulted with the relevant agencies in preparing the conditions.

The key proposed amendments are summarised in the table below.

Table 9 | Summary of key recommended amendments to the conditions

Condition	Recommended Amendments
Noise	• Updates to the limits to reflect the predicted noise. • Introduction of limits on $L_{A1\ (1\ minute)}$ noise levels at night (sleep disturbance criteria). • A requirement for the Noise Management Plan to include noise reduction measures.
Air Quality	• The introduction of annual and 24 hour $PM_{2.5}$ limits. • A requirement for the Air Quality Management Plan to include an air quality monitoring program that includes real time air quality monitoring (including continuous in stack emissions monitoring) and supports proactive and reactive air quality management strategies. • A requirement for Clean TeQ to provide an Air Quality Verification Report to the EPA that confirms the sulphuric acid plant and power generation facility stack emission discharges will comply with the prescribed concentrations contained in the *Protection of the Environment Operations (Clean Air) Regulation 2010* and best practice emission concentrations.
Water	• The requirement for the clean water diversion infrastructure to be designed, constructed and maintained to convey the 100 year peak flood event. • A requirement to install a seepage interception system in the TSF embankments in accordance with Dam Safety Committee guidelines. • A requirement to prioritise the use of recycled water and water collected on site over the use of water from the borefield or Lachlan River.
Traffic	• A requirement to include the following matters in the Traffic Management Plan: – monitoring and reporting on the amount of metal sulphate precipitate, scandium oxide and ammonium sulphate to be transported from the mine; – the use of shuttle buses and high capacity trucks; – measures to minimise the disruption to community events and festivals and to consult with event organisers; and – measures to minimise amenity impacts to the community
Visual	• The requirement to establish vegetation screens around the mine site.
Other	• Revised terms of the VPA with Councils. • A requirement to consultation with Lachlan Shire Council in the preparation of the Emergency Plan • A requirement to notify the relevant Council in the event of any incidents.

Clean TeQ has reviewed the revised conditions and does not object to the proposed amendments.

7. Evaluation

The Department has assessed the modification application, EA, submissions on the proposal and Clean TeQ's responses to these submissions, in accordance with the objects of the EP&A Act and the principles of ecologically sustainable development. The Department has also consulted extensively with the three Councils and the community and carefully considered the issues raised during this ongoing consultation.

Based on this assessment, the Department considers that the key issues are associated with the increased number of heavy vehicles, particularly through Trundle, the extraction of water from the Lachlan River, and noise and air quality at residences surrounding the mine.

Although the modified project would increase the number of heavy vehicles on some roads, the Department considers that traffic levels would still be well below the capacity of these roads, and the roads and key intersections would be able to operate at a good Level of Service.

While there would be additional heavy trucks travelling through Trundle, the Department considers that the traffic is unlikely to result in significant safety, hazard, amenity or socio-economic impacts in the town, and a bypass around the town is not warranted.

The Department considers that the proposed extraction of water from the Lachlan River is relatively minor and would allow Clean TeQ to diversity its water sources. Further, the proposed water treatment plant has the potential to significantly reduce the overall amount of water needed for the project.

The modification would increase noise levels at eight properties around the mine by up to 2 dB(A). However, increases of this magnitude are generally not discernible and the Department considers that there would be no significant additional impacts at any of these residences.

Although the modification would increase the SO_2 emissions from the sulphuric acid plant stack, total SO_2 emissions from the processing facility would decrease. The levels of SO_2, all other gaseous pollutants, and dust would be well below the applicable health and amenity criteria at all off-site receivers, and the Department considers that would be no significant air quality impacts from the modification. Nevertheless, as a precautionary measure, the Department has recommended that an air quality verification report be required to confirm that the gaseous emissions from the final design of the processing plant would comply with all relevant criteria.

The Department considers that all other impacts associated with the proposal are unlikely to be significant, and can be effectively managed through the existing and proposed conditions of approval. These conditions include Clean TeQ to monitor both noise and air emissions, including continuous monitoring of in stack emissions and real time monitoring of emissions at ground level.

Department considers that the proposed modification represents a reasonable amendment to the approved project. The modification would provide a number of benefits, including:

- increasing the efficiency of the project;
- introducing an additional product (ammonium sulphate) for beneficial use;
- significantly reducing external water use; and
- reducing overall traffic volumes through Trundle.

The project has a projected capital cost of approximately $1.77 billion, and would employ up to 1,000 people during construction and 300 people during operations. It would also generate approximately $2.8 billion in royalties and taxes, contribute $740,000 in direct payments to Councils, and provide ongoing flow on benefits to the local and regional communities.

The Department considers that the modification would improve the overall viability of the project and make it more likely that the significant socio-economic benefits of the project are realised.

Given these findings, the Department considers that the proposed modification is approvable, subject to the recommended amendments to the conditions of consent (see **Appendix F**).

This assessment report is hereby presented to the Independent Planning Commission for determination.

Recommended by:

21/9/18

Clay Preshaw
Director
Resource and Energy Assessments

Recommended by:

24/9/18.

Mike Young
A/Executive Director
Resource Assessments and Business Systems

Appendices

Appendix A – List of Documents

The Department has considered the:

- existing conditions of consent for the project;
- modification application and supporting environmental assessment;
- agency and public submissions on the application;
- Response to submissions report;
- Agency comments on the response to submissions report and draft conditions;
- requirements of the EP&A Act and Regulations and applicable environmental planning instruments and guidelines.
- letters from Clean TeQ dated:
  - 6 March 2018;
  - 17 May 2018
  - 22 May 2018;
  - 24 May 2018; and
  - 29 June 2018
- emails from Clean TeQ dated:
  - 12 December 2017; and
  - 30 August 2018.

Appendix B –Environmental Assessment

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929

Appendix C – Submissions

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929

Appendix D – Submissions Report

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929

Appendix E – Clean TeQ's Consideration of Alternative Transport Options

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929

Appendix F – Consolidated Consent

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929

Appendix G – Notice of Modification

See website at http://www.majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=8929