TECHNICAL NOTE

Galilee Power Project

Project Code: Q163322 **Project Name:** Galilee Power Project

Dept: Transport Engineering

Date: 16 January 2020 **Version No.** 1

Authors: Andrew Tierney // Trish Robertson

Approver: John (Mac) Hulbert (RPEQ # 08902)

SUBJECT: **Response to TMR's Request for Further Information**

Introduction

GTA Consultants has been engaged by Arche Energy on behalf of Waratah Coal to provide specialist transport engineering technical guidance to assist in the development of the Galilee Power Project. This has resulted in the preparation of a Transport Impact Assessment (TIA) report (revision B, dated 16 October 2019) which included a detailed description of likely peak hour traffic movements, projected haul routes and an appropriate layout for the Capricorn Highway / Saltbush Road intersection. The anticipated traffic movements, inclusive of the Galilee Power Project, are provided in Attachment 1.

The technical advice, included herein, has been sought to assist in responding to issues raised by the Department of Transport and Main Roads (TMR) in the SARA pre-lodgement meeting held on Monday 18 November 2019. The Pre-lodgement Meeting Record '1910-13895 SPL' has been included in Attachment 2. This technical note responds to State Transport Infrastructure items raised, as follows:

- *Item 22: TMR stated that the proposed CHR(S) urban treatment is insufficient as it appears to be based on a deceleration length for an 80km/hr design speed limit and vehicle storage to accommodate a B-Double. In this instance, the design speed should be 110km/hr and storage should at minimum accommodate a Type 1 Road Train as per the proposed de-sulphuring solution.*
- *Item 23: The average amount of queued vehicles should be determined from a SIDRA analysis.*
- *Item 24: Although TMR have no issues with the proposed installation of boom gates, the report has not accounted for and demonstrated that vehicles can be safely stored between the rail crossing and state-controlled road.*

Item 22

The Capricorn Highway / Saltbush Road intersection concept design has been amended to accommodate a design speed of 110km/h. Additionally, the CHR(S) turn treatment has been designed to accommodate a deceleration length for a Type 1 Road Train. The amended concept design for the intersection has been included in Attachment 3.

The turn warrant assessment provided in GTA's TIA was completed using the more conservative major road traffic volume speed of greater than 100km/h. As such, the increase in design speed will not impact the completed turn warrant assessment. The referenced turn warrant assessment has been provided in Attachment 4.

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Item 23

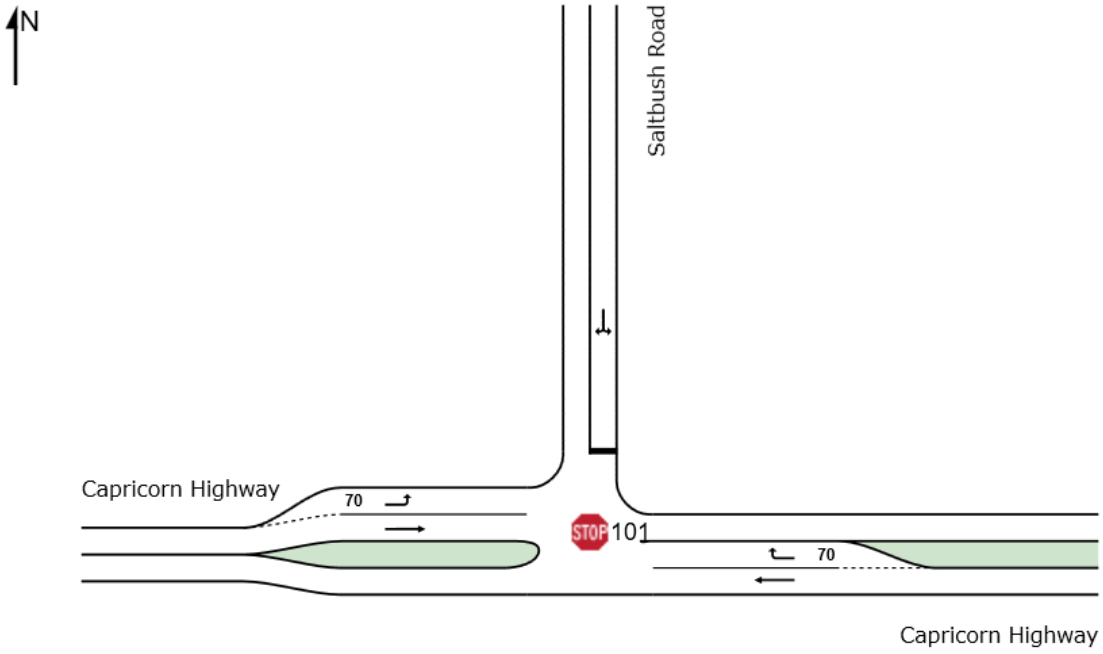
SIDRA analysis has been undertaken to ensure suitability of the intersection layout when subject to the anticipated traffic volumes. The assessment utilised the largest anticipated peak hour traffic volumes projected to use the Capricorn Highway / Saltbush Road intersection, corresponding with Option 3 of the flue gas desulphurisation (FGD) process. Detailed description of the haul movement options can be found in GTA's TIA.

The assessments have been completed for the design horizons detailed in the TIA report, which were determined with respect to the requirements of TMR's Guide to Traffic Impact Assessment and represent the critical design years for the Galilee Power Project. The critical design years are as follows:

- 2022 (Project Year 2): Peak construction phase of the Project
- 2023 (Project Year 3): Year of Opening for the Project and peak Project workforce
- 2032 (Project Year 12): 10-year design horizon from operations commencement of Project
- 2042 (Project Year 22): 20-year design horizon from operations commencement of Project

The SIDRA model corresponds with the concept design provided in Attachment 3 and is shown in Figure 1.

Figure 1: SIDRA Intersection Model Layout – Capricorn Highway / Saltbush Road



The proposed intersection layout is anticipated to perform well within acceptable service thresholds with regards to average delay, degree of saturation and 95th percentile queue lengths. Results of the assessment are shown in Table 1 with detailed outputs provided in Attachment 5.

Table 1: SIDRA Results – Capricorn Highway / Saltbush Road intersection

Year	Peak Period	Average Delay (s)	Degree of Saturation	95th Percentile Queue Length (m)
2022	AM	7	0.20	9
	PM	7	0.33	14
2023	AM	6	0.16	7

Year	Peak Period	Average Delay (s)	Degree of Saturation	95th Percentile Queue Length (m)
	PM	7	0.24	10
2032	AM	6	0.16	6
	PM	7	0.33	13
2042	AM	6	0.17	6
	PM	7	0.33	13

The SIDRA assessment of the Capricorn Highway / Saltbush Road intersection indicates that:

- the maximum 95th percentile queue length is not expected to exceed 14m;
- In the AM peak, the maximum queue length occurs in the right turn from the Capricorn Highway; and
- In the PM peak, the maximum queue length occurs in the Saltbush Road northern approach (i.e. turning traffic departing the Galilee Power Station site)

The resultant 95th percentile queue lengths will be will accommodated within the provided lane and storage arrangements as shown in the intersections concept design. In the event that FGD Option 1 or 2 proceeds, as detailed within GTA's TIA, it is anticipated to have a lesser traffic impact than Option 3, which was used as the basis of this assessment.

Item 24

The Capricorn Highway / Saltbush Road intersection concept design, as provided in Attachment 3, has been amended to accommodate the storage of a Type 1 Road Train between the vehicle stop line at the Capricorn Highway and the 'Central West System Rail Line' clearance line. The proposed distance of about 36m between these conflict points exceeds the projected 95th percentile queue for all design scenarios and provides adequate storage for the largest vehicle expected to use this section of road (i.e. Type 1 Road Train).

Attachments

Attachment 1 – Traffic Volumes

Attachment 2 – Pre-lodgement Meeting Record '1910-13895 SPL'

Attachment 3 – Capricorn Highway / Saltbush Road Intersection Concept Design

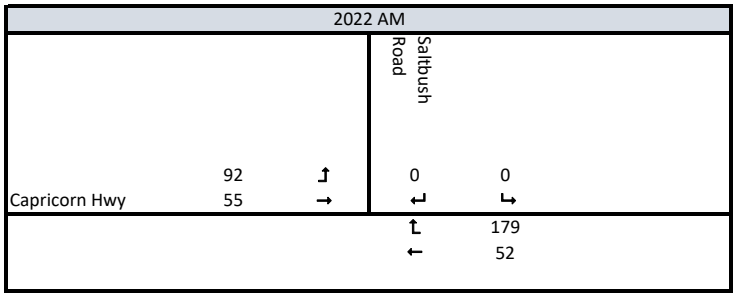
Attachment 4 – Turn Warrant Assessment

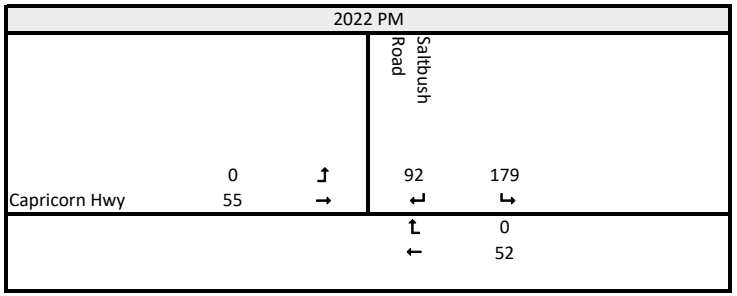
Attachment 5 - Detailed SIDRA Results

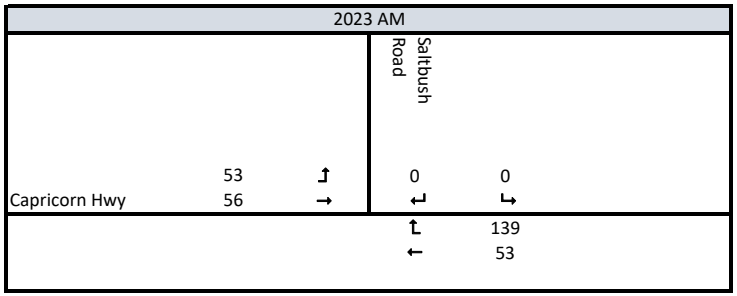
ATTACHMENT 1

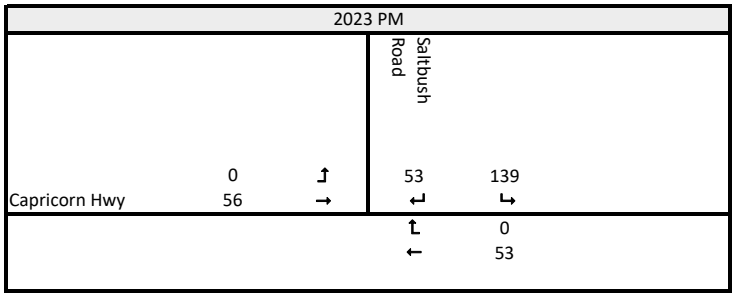
Traffic Volumes

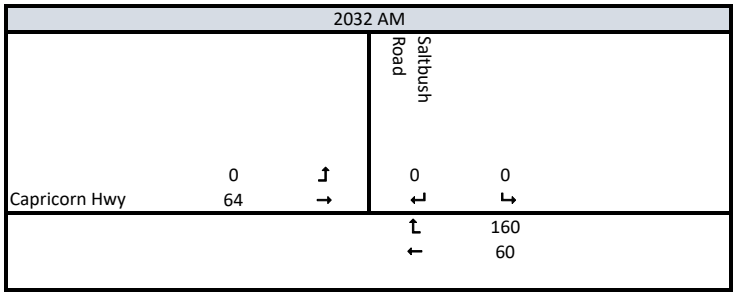
Attachment 1: Galilee Power Project - Capricorn Highway / Saltbush Road Traffic Movement Diagrams

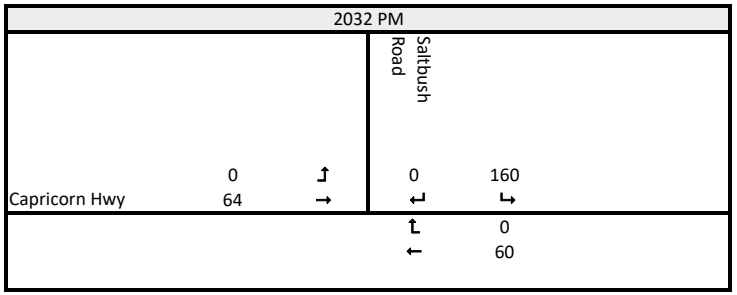


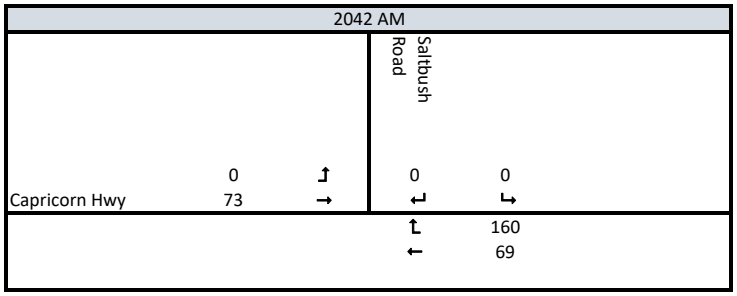


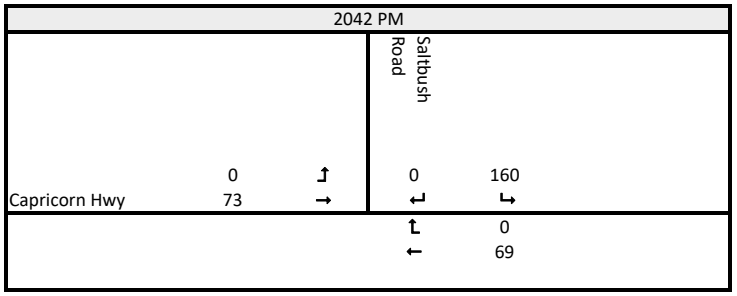












ATTACHMENT 2

Pre-lodgement Meeting Record '1910-13895 SPL'

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: 1910-13895 SPL

27 November 2019

Waratah Coal
C/- C J Feltham Town Planning
GPO Box 1538
BRISBANE QLD 4001
cjfeltham@bigpond.com

Attention: Mr Cameron Feltham

Dear Mr Feltham

Pre-lodgement meeting record

This pre-lodgement record provides a summary of the matters discussed at the pre-lodgement meeting in addition to providing further advice prepared subsequent to the meeting. This record provides advice regarding the likely major issues relevant to the development proposal to assist in the timely processing of a development application.

Reference information

Departmental role:	Referral agency
Departmental jurisdiction:	Schedule 10, Part 5, Division 4, Table 2, Item 1 Non-devolved environmentally relevant activities Schedule 10, Part 7, Division 3, Table 1, Item 1 Hazardous chemical facilities
Pre-lodgement meeting date:	18 November 2019

Meeting attendees:

Name	**Organisation**
Phil Joyce	Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP)
Felicity Tait	DSDMIP
Andrew Finch	DSDMIP
Clancy Mackaway	Department of Environment and Science (DES)
Rachel Copp	DES
Shoena Messner	Office of Industrial Relations (OIR) - Major Hazards
Chris Clague	Department of Agriculture and Fisheries (DAF)

DA Advisory Team (DAAT)
1 William Street
BRISBANE QLD 4000
PO Box 15009, CITY EAST QLD 4002

Anton DeKlerk	Department of Transport and Main Roads (DTMR)
Jason Giddy	DTMR
Megan Rosenberg	Department of Natural Resources, Mines and Energy (DNRME)
Erin Lee	DNRME
Myria Makras	DNRME
Lisa O'Brien	DNRME
Cameron Feltham	C J Feltham Town Planning
Andrew Murdoch	Arche Energy
Natasha MacIntosh	Orange Environmental
Nui Harris	Waratah Coal
Doug McCabe	Waratah Coal

Location details

Street address:	Monkland Road, Hobartville
Real property description:	Lot 2 on SP136836
Local government area:	Barcaldine Regional Council
Existing use:	Rural property known as "Monklands"
Relevant site history:	The site is rural and has been used for cattle grazing and has improvements generally associated with rural pursuits (fencing, yards, dwellings and workshops)

Details of proposal

Development type:	Material change of use
Development description:	Public Utility (1400MW Ultra Supercritical Coal Fired Power Station)

Supporting information

Drawing/report title	Prepared by	Date	Reference no.	Version/issue
Town planning report	C.J. Feltham Pty Ltd	October 2019	191030	FINAL A
Concept design	Phronis Consulting	October 2019	144-2 GA-DWG-0001 to 144-2 CI-DWG-0005	A/B
Transport impact assessment	GTA Consultants (QLD) Pty Ltd	16/10/19	Q163320	B
MNES fauna - emissions and noise assessments	Orange Environmental	September 2019	-	-
Air quality and greenhouse gas assessment	Katestone Environmental Pty Ltd	13 August 2019	D18047-4	0.0 (Draft)
Assessment and control of environmental noise emission	Acoustics RB Pty Ltd	1 September 2019	19-1042.R02	Draft

Galilee Power Project – Pre-lodgement discussion (PowerPoint presentation)	C.J. Feltham Pty Ltd	November 2019	-	-

Meeting minutes

Project overview

1. Cameron Feltham, Andrew Murdoch and Natasha MacIntosh provided an overview of the project and summary of the approvals pathway and assessment undertaken in preparation for the lodgement of a development application.
2. The 1,400 Megawatt (MW) ultra-supercritical (HELE — High Efficiency Low Emissions) power station is proposed 30km north-west of Alpha on Lot 2 on SP136836 (adjacent to the Galilee Coal Project (GCP) and near Adani's Charmichael Coal project).
3. Stage 1 is for a 700MW facility constructed by 2023/2024, to provide power for Galilee Basin and Bowen Basin growth.
4. Stage 2 proposes an additional 700MW by around 2029, to replace aging power sources, taking on the demand from the closure of other power stations in Queensland.
5. Barcaldine Shire Council is identified as the assessment manager for the development application under the *Planning Act 2016.* The State Assessment and Referral Agency (SARA) would be a referral agency for environmentally relevant activities and hazardous chemical facilities.
6. A separate application processes is proposed for the associated transmission line and it is yet to be decided if this will go through Powerlink.
7. The applicant's intention is to formally lodge the development application to Barcaldine Shire Council as the assessment manager by the end of November 2019.

Environmentally Relevant Activities

8. DES confirmed that the proposed development will require referral to the State Assessment and Referral Agency (SARA) for a number of environmentally relevant activities (ERA).
9. A development application for a concurrence ERA is also an application for an environmental authority and the assessment will be integrated during lodgement and assessment stages.
10. DES's technical services team was midway through a preliminary review of the material provided at the time of this pre-lodgement meeting
11. DES committed to providing clarification on the applicable ERA's subsequent and further detailed written advice/comments subsequent to the meeting. This has been incorporated into this response.

Hazardous chemical facilities

12. OIR stated that the proposed development is likely to be defined as a 'hazardous chemical facility', meaning a facility at which a prescribed hazardous chemical is present or likely to be present in a quantity that exceeds 10% of the chemical's threshold quantity under the Work Health and Safety Regulation, Schedule 15.
13. A development permit for a hazardous chemical facility will be required. The applicant will need to demonstrate compliance with State Code 21: Hazardous chemical facilities of the State Development Assessment Provisions (SDAP). A 'preliminary hazard report' will need to be prepared to demonstrate compliance with this state code.

14. OIR recommended that the applicant seek detailed advice prior to engagement of principal contractor/s.

Waterway Barrier works

15. DAF confirmed the development is located on waterways mapped moderate risk (amber) and low risk (green) according to the spatial data layer, Queensland waterways for waterway barrier works.
16. The proposed heavy vehicle road marked on Galilee Power Station, Concept Design Site, Layout Plan crosses the waterway mapped as moderate risk (amber).
17. The proposed site access road entering the site from the south via gate house and security is likely to cross a waterway outside of the 'MCU area' that is mapped low risk (green).
18. Dependant on the design of the crossings of these waterways they may either represent works that are:
    a. not waterway barrier works
    b. compliant with the 'Accepted Development Requirements' (ADR) for Operational Works that is constructing or raising waterway barrier works
    c. assessable development (requiring a development permit).
19. DAF confirmed the ADR allows for the construction of a culvert crossing in a moderate risk (amber) waterway.
20. The proposed spillway associated with the sediment dam is unlikely to represent a waterway barrier works. Further the spillway structure should be designed to not allow fish access into the sediment dam area as this is likely to cause entrapment.

State transport infrastructure

21. DSDMIP confirmed that Schedule 10, Part 9, Division 4, Table 1 Item 1 of the Planning Regulation 2017, in relation to State transport Infrastructure, would not apply if the development application is defined as a 'public utility' only under the local government's planning scheme.
22. DTMR stated that the proposed CHR(S) urban treatment is insufficient as it appears to be based on a deceleration length for a 80km/hr design speed limit and vehicle storage to accommodate a B-Double. In this instance, the design speed should be 110km/hr and storage should at minimum accommodate a Type 1 Road Train as per the proposed de-sulphuring solution.
23. The average amount of queued vehicles should be determined from a SIDRA analysis.
24. Although DTMR have no issues with the proposed installation of boom gates, the report has not accounted for and demonstrated that vehicles can be safely stored between the rail crossing and state-controlled road.

Clearing native vegetation

25. DNRME advised that if the proposed development is located within a Category X area and setback (for firebreaks and safety buffers distances) from the nearest Category A and Category B areas, referral to SARA for clearing native vegetation would not be required.
26. The firebreak/safety buffer distance is calculated as a width of 20 metres or 1.5 times the height of the tallest adjacent tree to the infrastructure, whichever is the greater.
27. It is recommended that measures are put in place to ensure that nearby Category A and Category B areas are not unintentionally disturbed during construction.

Water management and use

28. DNRME regulates the sustainable management and efficient use of water and other resources under the *Water Act 2000.*
29. Whilst there is a single water feature that is yet to be determined, the proposed footprint of the power station is not likely to interfere with any watercourses as defined under the *Water Act 2000.*
30. The supply of water for the project will require the appropriate approvals under the *Water Act 2000*.
31. While water that has been dewatered can be used for any purpose, DNRME noted that dewatering activities associated with the Galilee Coal Project will require authorisation in the form of an associated water licence.

Electricity planning and licensing

32. DNRME advised that a generation authority will be required to authorise the connection of the proposed generating plant to the transmission grid or a supply network under the *Electricity Act 1994.* DNRME encouraged the applicant to make contact with Energy Regulation team early in the process to discuss your requirements.
33. Any transmission lines or supply networks will also require an authorisation under the *Electricity Act 1994.* Depending on the nature of the infrastructure, a transmission authority or a distribution authority may be required. A transmission authority allows for the operation of a transmission grid and may also authorise the connection of the transmission grid to another transmission grid.
34. A distribution authority allows for the supply of electricity using a supply network within the distribution area stated in the authority.
35. If the applicant intends to own and operate the transmission and sub-transmission lines then the applicant is required to hold the relevant authority. If the transmission lines or supply network is to be owned and operated by a third party, the third party will be responsible for ensuring they hold the appropriate authorisation to operate the transmission lines.

It is considered that the above summary is an accurate record of the matters discussed at the pre-lodgement meeting.

The following information is provided as further advice prepared subsequent to the meeting:

Environmentally Relevant Activities

1. DES has identified a number of concerns, particularly in regard to information contained in the air assessment, management of ash waste products and a lack of detailed information pertaining to potential impacts to groundwater. The following advice is based on a preliminary review of the information provided and does not include advice on the of the fauna assessment or an in-depth review of the acoustic noise assessment.
2. ERAs likely to be applicable to the proposed development (preliminary advice only and may change on further review/assessment of the application):
    a. ERA 8 – Chemical storage – currently not applicable, however could change on further review of the application material
    b. ERA 14 – Electricity generation - applicable
    c. ERA 15: Fuel burning – not applicable, if being undertaken in another section
    d. ERA 16: Extractive and screening activities – applicable
    e. ERA 31: Mineral processing – not applicable, coal processed on the Galilee coal mine
    f. ERA 33: Crushing, milling, grinding or screening – not applicable if covered by ERA 16
    g. ERA 50: Mineral and bulk material handling – applicable due to stockpiling of coal
    h. ERA 57: Regulated waste transport – unlikely to be applicable as this is proposed on premises
    i. ERA 60: Waste disposal – applicable
    j. ERA 63: Sewage treatment – applicable
    k. ERA 64: Water treatment – not applicable

3. Other activities conducted onsite:
    a. The applicant should confirm all other activities that will be conducted as either part of, or ancillary to, the activity that will require the operator to hold an environmental authority to conduct an environmentally relevant activity.

4. Fugitive emissions to air:
    a. The submitted information suggests there are numerous locations where fugitive emissions to air may occur. These include coal transfer locations, conveyor belts, stockpiles and coal mills. There is the potential that the cumulative emissions from these fugitive sources may significantly impact on air quality.
    b. The information provided suggests that *"subject to detailed design, measures will be undertaken to address these sources."* Detail what these measures will entail and what other practices or process will be employed to minimise releases to air from these sources.
    c. Provide details of other potential fugitive emissions that may be associated or expected to be associated with any of the other environmentally relevant activities conducted onsite.
5. Point Source Emissions to Air:
    a. Further clarification is required on the modelling undertaken by Katestone Pty Ltd regarding the predicted impacts on air quality in the receiving environment:
        i. Emission rates and stack characteristics were determined from manufacturer's specifications supplied by the client. Provide additional details on the nature of this information. Include details of any defined Australian or International standard used to obtain this information.
        ii. Section 6.3 states that 'scrubber technology' will be installed to minimise emissions of SO_2. Provide further detail as to what this scrubber technology will entail. The information provided in the application should confirm what will be used.

iii. Elsewhere in the report reference is made to the addition of lime to produce saleable products such as gypsum. Provide details on whether there is sufficient lime available to meet this demand. Include alternate disposal options available if a commercial customer for this material cannot be found.
iv. Further information is required regarding Table 10 – Stack Characteristics and emissions data for the 1,400MW (2x 700MW) power station.
    1. The row 'power generated' indicates that an overload of 756MW or 100% load of 702MW have been modelled. Confirm that this is representative of both of the proposed power stations (i.e. 702MW x 2 stations = 1404MW) given that the 'table notes' section identifies that the two power station stacks were modelled as a single stack with an effective diameter.
        a. Clarify the purpose of conducting the model in this way. DES has concerns that there may be the potential that this may impact on the accuracy of the model.
        b. Confirm if the diameter of each stack is 4.95m or 9.9m.
    2. Provide further information as to why the predicted stack emission rate for the overload load is less than that at 100% load.
    3. Confirm that the exit temperature will remain constant at 120ºC regardless of the load.
    4. Confirm that the stack exhaust moisture content and oxygen content, NOx concentration and PM10 Concentration will remain constant regardless of the load.
    5. Provide further information that explains the predicted correlation between PM10 and PM2.5 at each of the modelled load.
v. Clarify what modelled load scenarios best represents the base load rate at which the power station is expected to operate.
vi. Confirm which modelled scenario best represents those times when generation is increased to meet spikes in demand.
vii. Detail what contribution other activities proposed to be undertaken as part of this activity have on the receiving air environment (i.e. releases of dust from concrete plant, odour from sewage treatment plant etc).
viii. Outline any additional point source emission contributions from the other activities proposed as part of the activity, which have been accounted for.
ix. Confirm whether fugitive emissions from the power station and other activities associated with the site have been accounted for in the model.

6. Stormwater Management:

    a. Provide detail that addresses how stormwater will be managed throughout the site, especially any areas where stormwaters or surface flows of stormwater may come into contact with contaminants (i.e. stockpiled material).
    b. If no contaminants are proposed to be released to waters, provide further detail regarding how this will be achieved.
    c. Detail what other potential sources of contaminants are associated with other proposed activities conducted either as part of, or ancillary to, the proposed power station.
    d. If releases to any waters are proposed, detail what release limits will be employed to ensure that environmental values in any receiving waters are protected or enhanced.

7. Surface waters:

    a. The area in which the proposed activity is located contains an unmapped tributary of Lagoon Creek. Additional information is required to confirm whether this unmapped tributary meets the definition of a defined waterway.

b. Provide details regarding the nature of this waterway, including quality of waters and any seasonal variations in water quality and flow rate. Outline the environmental values of the waterway and how these values will be protected or enhanced.
c. Mapping suggests the proposed site may be at risk of flooding. Additional detail is required on the frequency and duration of flood events that may impact the site and the risk these pose to the site. Additional detail is required on the measures proposed to be implemented to ensure that flood waters do not come into contact with sources of contaminants.

8. Groundwaters:

a. On review of the pre-lodgement material it does not appear that potential impacts to groundwater from the activities have been considered. Additional detail is required on the groundwater values in the area, potential risks to these from the proposed activity and the proposed measures to be implemented to mitigate/manage these potential impacts. The applicant should provide details of any investigations that have been undertaken regarding the proposed location of the activity and the potential to intercept any groundwater and discuss the findings of these investigations.
b. It is proposed to use waters extracted by the neighbouring coal mine. Provide details of the likely impact this extraction of groundwaters will have on standing water levels and bore pressures in any adjoining properties.
c. The area in which the activity is proposed is identified as having the potential to contain groundwater dependant ecosystems. Additional detail is required on the investigations that have been conducted to confirm the presence or absence of any groundwater dependant ecosystems. Details of the groundwater dependent ecosystems, potential risks to these environmental values and mitigation/management strategies to be implemented to protect these environmental values should be included in the application material.

9. Ash dam:

a. There is a significant area of disturbance proposed for the ash dam. Provide details of other means of disposing of boiler ash considered and why were these methods were determined to be not appropriate or suitable for the activity. For example, has disposal of the boiler ash to mine workings or mine voids been considered and if so, why were these methods of disposal considered not appropriate or suitable?
b. Provide details of any investigations conducted regarding the potential impact of the ash dam on groundwaters. Include details of the release of contaminants to groundwaters, the impact of the activity on standing water levels in groundwaters and the potential impact of the activity on bore pressure of groundwaters.
c. Liners are proposed as a means of containing the ash disposed of to the ash dams. Provided details on:
    i. the proposed construction and composition of these liners
    ii. measures to be put in place to ensure the integrity of the liners for the life of the ash dam and beyond.
d. The information provided to date indicates that the activity intends to rely on settling via sedimentation ponds to remove contaminants. Provide information on how other dissolved and other physio-chemical contaminants (i.e. dissolved metals, pH, conductivity, dissolved oxygen) of any waters will be removed or treated to levels that will not cause environmental harm to any receiving waters.
e. Outline what measures are proposed to protect the ash dam from extreme weather events, such as 1%AEP flood events.

10. Acoustic:
    a. Detail potential impacts from the noise generated by the activity on potentially sensitive receptors such as any worker accommodation for the proposed adjoining coal mine or any worker accommodation onsite.

Hazardous chemical facilities

11. The table of environmentally relevant activities on page 67 / Section 4.4 of the Town Planning Report includes the following chemicals listed in Schedule 15 of the Work Health and Safety Regulation, 2011:

Chemical	**Quantity, Tonnes**	**Schedule 15 Threshold Quantity, Tonnes**	**Quantity Ratio**
Ammonia	20	200	0.1
Hydrazine	20	200	0.1
		Aggregate Quantity Ratio (AQR)	0.2

12. The AQR is between 0.1 (10%) and 1 (100%) of major hazard facility (MHF) threshold and therefore the facility will be defined as a hazardous chemical facility (HCF).
13. No other chemicals listed in the table of ERAs are relevant to MHF / HCF requirements. However the other chemical listed are hazardous chemicals under Chapter 7 of the Work Health and Safety Regulation, 2011.
14. The 'Planning guideline State code 21: Hazardous chemical facilities' provides assistance in preparing supporting documentation to demonstrate compliance with the code, including the preparation of a preliminary hazard report.
15. The operator of the facility must notify as a Manifest Quantity Workplace as per Section 348 of the Work Health and Safety Regulation 2011. The operator of the facility must also notify the quantities of Schedule 15 chemicals under Section 537 of the Work Health and Safety Regulation 2011.
16. Further information about hazardous chemical notifications can be found at: https://www.worksafe.qld.gov.au/injury-prevention-safety/hazardous-chemicals/notifications-for-hazardous-chemicals.
17. Managing respirable dust hazards in coal-fired power stations Code of Practice 2018 provides guidance on the standards of health, safety and welfare required under work health and safety laws to identify and manage respirable dust hazards at coal-fired power stations

Waterway Barrier works

18. The applicant should refer to the following factsheets for more information on waterway barrier works:
    a. What is a waterway?
    b. What is a waterway barrier work?
    c. What is not a waterway barrier work?
19. The placement of temporary waterway barriers to facilitate construction of the road crossings may be conducted under DAF's Accepted development requirements for operational work that is constructing or raising waterway barrier works.
20. If any proposed temporary waterway barrier works cannot meet the accepted development requirements, this aspect of the works will need to be covered under the development approval.

21. Time limitations apply to all temporary waterway barriers in place under the ADR. If there is any possibility (e.g. due to weather) the barriers need to be in place for longer than the prescribed period under the ADR, the applicant is advised to include proposed temporary waterway barrier works in a development application.
22. If required, any application for a development permit for operational works involving constructing or raising waterway barrier works, will need to demonstrate compliance with State Code 18 of the SDAP.

State transport infrastructure

23. Tables 1.2, 2.1 and 5.7 within the Traffic Impact Assessment report appears to have an error in the 'Alpha' column as it states that there will be 48 rigids, 2 semis, 2 B-Doubles, 2 over sized vehicles, for a total of 44. It is believed that this should be read as a total of 54. This error may have been carried through into the road link and pavement impact assessments, and if so, should be corrected.
24. The submitted pavement impact assessment does not account for road trains even though these are listed as vehicles used for options 1 and 2 for the de-sulphuring process. Please amend accordingly.
25. The Safety Impact Assessment should discuss the safety implication of operation of the Salt Bush Road intersection, particularly during construction where the peak hour access movement is far higher than the peak hour background traffic. DTMR does not agree with the post mitigation risk assessment for hazardous goods and would expect the consequence to be at least hospitalisation, and risk rating M.
26. Due to the high volumes of turning traffic compared to background traffic, a traffic operation assessment of the intersection including SIDRA modelling to determine delays and queue lengths should be submitted. This may lead to a higher standard treatment than the proposed CHR(S).
27. An Australian Level Crossing Assessment Model (ALCAM) assessment should be undertaken for the affected railway crossing.

Clearing native vegetation - fencing

28. Clearing of Category B Least Concern vegetation for a property boundary fence line for a distance of 10m inside the property is exempt and does not require notification to the DNRME. Within Category X proponents can clear more than 10m.
29. Least Concern fence lines require no notification to the DNRME.
30. Fence lines that occur in Of Concern and Endangered vegetation require a notification to the DNRME.

Water management and use

31. An associated water licence authorises the taking of or interference with underground water in the area of a mining tenure, if the taking or interference happens during the course of, or results from, the carrying out of an authorised activity for the tenure. Should an associated water licence be issued for the dewatering activities associated with the Galilee Coal Project, the currency of the associated water licence will only be for the currency of the authorised activity; i.e. the taking of underground water cannot continue for the power station once dewatering (to allow the safe operating environment to mine the resource) ceases.
32. The proponent has not identified the total volume of water required for the mining operation that will be supplied by dewatering of the mine site. Clarification on the full volume of water required for the power station could be sourced from dewatering activities is sought. Alternative water supply options

may need to be explored if the power station water supply requirements exceed that which may be taken through dewatering and provided an associated water licence is issued.

33. The proposal is located within multiple Water Plan areas and Underground Water Areas. Please note that each Plan or Underground Water Area has specific rules relating to the specific type of water they regulate (ie. watercourse, overland flow or underground water). Therefore, should alternative water supply options be required, or the power station proposal change with regards to the taking or interfering with water or the placement or excavation of fill in a watercourse, the proponent is encouraged to contact the Water Management and Use team on 1800 822 100 or via email to centralwaterservice@dnrme.qld.gov.au to discuss any requirements under the *Water Act 2000.*

Electricity planning and licensing

34. DNRME has a generation authority application guideline and checklist to assist with the preparation of an application for a generation authority. This information is available on the following website links.
    a. Licencing framework webpage - https://www.business.qld.gov.au/industries/mining-energy-water/energy/electricity/regulation-licensing/licensing-framework
    b. Generation Authority guidelines - https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0017/306404/application-guide-generation-authority.pdf
    c. Generation Authority checklist – opens when the link is selected.

35. There are no specific guidelines or checklists relating to applying for a transmission authority or distribution authority and you are encouraged to contact Energy Regulation directly at energyregulation@dnrme.qld.gov.au to discuss your requirements prior to preparing an application.

For further information please contact Andrew Finch, Principal Planner, on 3452 7680 or via email DAAT@dsdmip.qld.gov.au who will be pleased to assist.

Yours sincerely

Felicity Tait
Manager

ATTACHMENT 3

Capricorn Highway / Saltbush Road Intersection Concept Design

CENTRAL WESTERN SYSTEM RAIL LINE

TIE BACK INTO EXISTING CARRIAGEWAY

1.0
3.2
3.2
1.0

CAPRICORN HIGHWAY

SALTBUSH ROAD

N

CONTINUES BELOW

5.0m
MINIMUM CLEARANCE FROM RAILWAY LEVEL CROSSING

36.5m
MAXIMUM DESIGN VEHICLE LENGTH (I.E. 36.2m TYPE I ROAD TRAIN)

THE NEED TO UPGRADE LEVEL CROSSING TO BOOM GATES IS SUBJECT TO ALCAM ASSESSMENT

1.5
8.0
1.5

CENTRAL WESTERN SYSTEM RAIL LINE

CAPRICORN HIGHWAY

RURAL BASIC LEFT-TURN TREATMENT (BAL) PER AUSTROADS PART 4A, SECTION 8.2.1

SALTBUSH ROAD

CHANNELISED T-JUNCTION - SHORT LANE TYPE (CHR(S)) PER AUSTROADS PART 4A, SECTION 7.5.2

CONTINUES FROM ABOVE

PROPOSED NEW LINE MARKING

PROPOSED NEW EDGE OF ROAD

7.0
3.2
1.0
13.5

1.0
3.2
3.2
3.2
1.0
31.0
3.2
1.0

70.0
105.0
35.0
TOTAL LENGTH OF AUXILIARY LANE INCLUDING TAPER, DIVERGE / DECELERATION AND STORAGE
TAPER

CENTRAL WESTERN SYSTEM RAIL LINE

SALTBUSH ROAD

CONTINUES FROM ABOVE

CAPRICORN HIGHWAY

TIE BACK INTO EXISTING CARRIAGEWAY

1.0
3.2
3.2
1.0

P:\Q16300-16399\Q163320 GALILEE POWER PROJECT\CAD\Q163320-02.DWG PLOTTED BY HENRY TRUONG ON 16/01/2020 AT 11:18

GTA consultants
www.gta.com.au

Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Adelaide	08 8334 3600
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED	H.TRUONG
DESIGN CHECK	A.TIERNEY
APPROVED BY	T.ROBERTSON
DATE ISSUED	08/01/19
CAD FILE NO.	Q163320-02.DWG

SCALE A3 0 5 10 20 1:1000

GALILEE POWER STATION PROJECT
CAPRICORN HIGHWAY / SALTBUSH ROAD INTERSECTION CONCEPT DESIGN - TYPE I ROAD TRAIN DESIGN VEHICLE (AERIAL IMAGE FROM QUEENSLAND GLOBE)

DRAWING NO. Q163320-SK02 SHEET 1 OF 2 ISSUE P1

CENTRAL WESTERN SYSTEM RAIL LINE

5.0m
MINIMUM CLEARANCE FROM
RAILWAY LEVEL CROSSING

SALTBUSH
ROAD

CAPRICORN HIGHWAY

SWEPT PATH KEY

VEHICLE CENTRE LINE

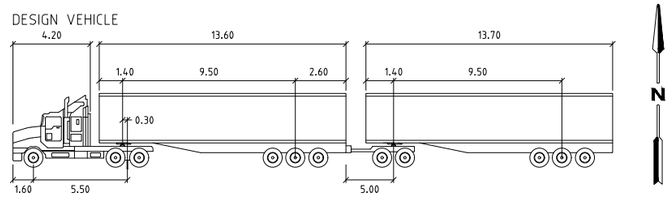
VEHICLE TYRE PATH

VEHICLE BODY PATH

500mm CLEARANCE
FROM VEHICLE BODY

ASSUMED SPEED 10km/h

DESIGN VEHICLE



A-DOUBLE (TYPE I ROAD TRAIN)

meters

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 23.4
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

CENTRAL WESTERN SYSTEM RAIL LINE

5.0m
MINIMUM CLEARANCE FROM
RAILWAY LEVEL CROSSING

SALTBUSH
ROAD

CAPRICORN HIGHWAY

GTAconsultants
www.gta.com.au

Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Adelaide	08 8334 3600
Perth	08 6169 1000

PRELIMINARY PLAN
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WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE. NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED H.TRUONG	DESIGN CHECK A.TIERNEY
APPROVED BY T.ROBERTSON	DATE ISSUED 08/01/19

SCALE A3 0 5 10 20 1:1000

CAD FILE NO. Q163320-02.DWG

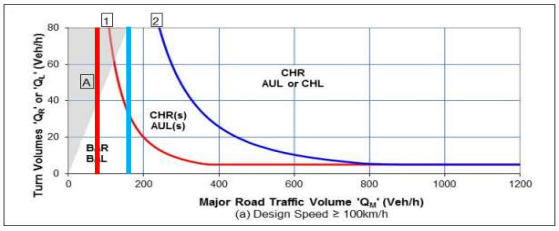
GALILEE POWER STATION PROJECT
CAPRICORN HIGHWAY / SALTBUSH ROAD INTERSECTION
SWEPT PATH ASSESSMENT

DRAWING NO. Q163320-SK02 SHEET 2 OF 2 ISSUE P1

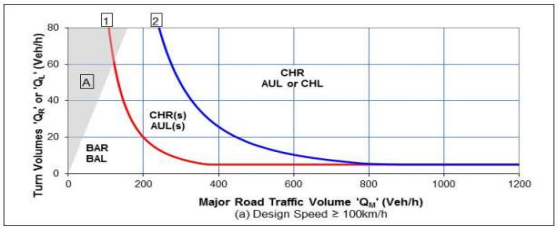
ATTACHMENT 4

Turn Warrant Assessment

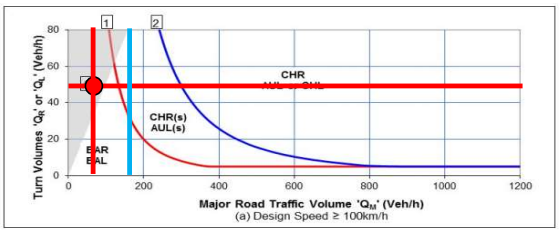
2022 AM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	92	179
Qm	55	199
Turn Treatment	BAL	CHR (s)



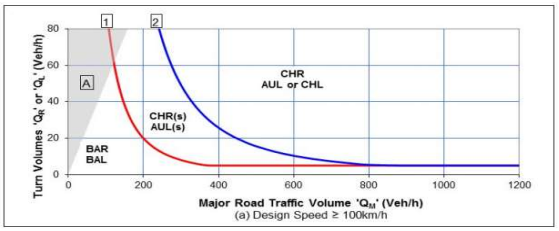
2022 PM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	0
Qm	55	107
Turn Treatment	NA	NA



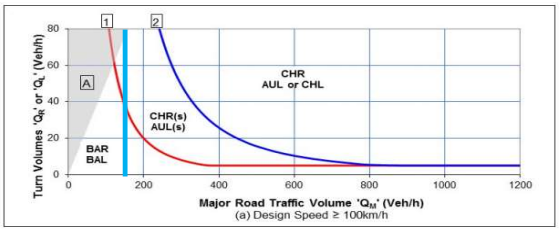
2023 AM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	53	139
Qm	56	162
Turn Treatment	BAL	CHR (s)



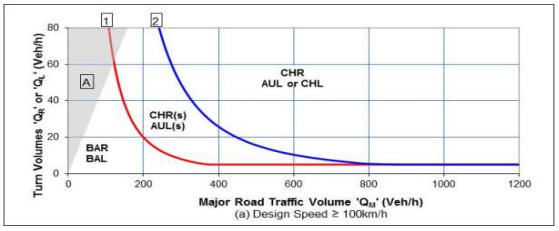
2023 PM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	0
Qm	56	109
Turn Treatment	NA	NA



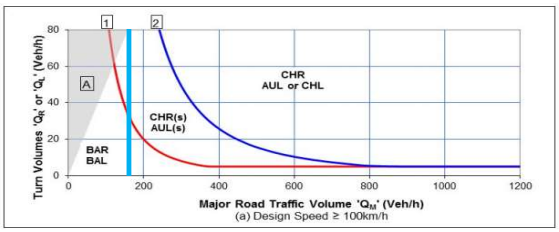
2032 AM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	160
Qm	64	124
Turn Treatment	NA	CHR (s)



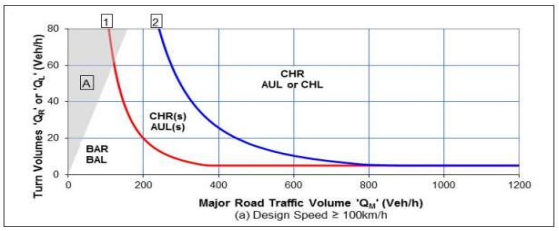
2032 PM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	0
Qm	64	124
Turn Treatment	NA	NA



2042 AM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	160
Qm	73	142
Turn Treatment	NA	CHR (s)



2042 PM	Left onto Saltbush Rd	Right onto Saltbush Rd
Ql/r	0	0
Qm	73	142
Turn Treatment	NA	NA



ATTACHMENT 5

Detailed SIDRA results

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2022 AM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	55	30.8	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	188	48.6	0.197	10.4	LOS B	0.9	8.8	0.34	0.68	0.34	59.8
Approach		243	44.6	0.197	8.0	NA	0.9	8.8	0.26	0.53	0.26	66.6
North: Saltbush Road												
7	L2	1	0.0	0.003	8.3	LOS A	0.0	0.1	0.21	0.88	0.21	59.8
9	R2	1	0.0	0.003	11.3	LOS B	0.0	0.1	0.21	0.88	0.21	59.7
Approach		2	0.0	0.003	9.8	LOS A	0.0	0.1	0.21	0.88	0.21	59.7
West: Capricorn Highway												
10	L2	97	0.0	0.052	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	58	30.9	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		155	11.6	0.052	5.1	NA	0.0	0.0	0.00	0.42	0.00	88.8
All Vehicles		400	31.6	0.197	6.9	NA	0.9	8.8	0.16	0.49	0.16	73.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2022 PM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	55	30.8	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	1	0.0	0.001	7.9	LOS A	0.0	0.0	0.16	0.61	0.16	63.4
Approach		56	30.2	0.034	0.2	NA	0.0	0.0	0.00	0.01	0.00	108.5
North: Saltbush Road												
7	L2	188	48.6	0.327	10.7	LOS B	1.6	14.3	0.26	0.92	0.26	50.3
9	R2	97	0.0	0.327	9.2	LOS A	1.6	14.3	0.26	0.92	0.26	55.7
Approach		285	32.1	0.327	10.2	LOS B	1.6	14.3	0.26	0.92	0.26	52.0
West: Capricorn Highway												
10	L2	1	0.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	58	30.9	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		59	30.4	0.036	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.2
All Vehicles		400	31.6	0.327	7.3	NA	1.6	14.3	0.19	0.66	0.19	61.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2023 AM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	56	30.2	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	146	61.9	0.155	10.5	LOS B	0.7	7.2	0.29	0.66	0.29	59.2
Approach		202	53.1	0.155	7.6	NA	0.7	7.2	0.21	0.48	0.21	67.8
North: Saltbush Road												
7	L2	1	0.0	0.003	8.3	LOS A	0.0	0.1	0.21	0.88	0.21	60.2
9	R2	1	0.0	0.003	10.6	LOS B	0.0	0.1	0.21	0.88	0.21	60.0
Approach		2	0.0	0.003	9.4	LOS A	0.0	0.1	0.21	0.88	0.21	60.1
West: Capricorn Highway												
10	L2	56	0.0	0.030	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	59	30.4	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		115	15.6	0.036	4.0	NA	0.0	0.0	0.00	0.32	0.00	92.8
All Vehicles		319	39.3	0.155	6.3	NA	0.7	7.2	0.13	0.43	0.13	75.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2023 PM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	56	30.2	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	1	0.0	0.001	7.9	LOS A	0.0	0.0	0.16	0.61	0.16	63.4
Approach		57	29.6	0.034	0.1	NA	0.0	0.0	0.00	0.01	0.00	108.5
North: Saltbush Road												
7	L2	146	61.9	0.241	11.3	LOS B	1.1	10.3	0.24	0.94	0.24	49.0
9	R2	56	0.0	0.241	9.0	LOS A	1.1	10.3	0.24	0.94	0.24	55.8
Approach		202	44.8	0.241	10.7	LOS B	1.1	10.3	0.24	0.94	0.24	50.7
West: Capricorn Highway												
10	L2	1	0.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	59	30.4	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		60	29.8	0.036	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.2
All Vehicles		319	39.3	0.241	6.8	NA	1.1	10.3	0.15	0.60	0.15	63.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2032 AM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	63	30.0	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	168	25.0	0.164	9.6	LOS A	0.7	6.0	0.35	0.68	0.35	61.1
Approach		232	26.4	0.164	7.0	NA	0.7	6.0	0.26	0.49	0.26	69.5
North: Saltbush Road												
7	L2	1	0.0	0.003	8.3	LOS A	0.0	0.1	0.23	0.87	0.23	59.9
9	R2	1	0.0	0.003	11.1	LOS B	0.0	0.1	0.23	0.87	0.23	59.8
Approach		2	0.0	0.003	9.7	LOS A	0.0	0.1	0.23	0.87	0.23	59.8
West: Capricorn Highway												
10	L2	126	0.0	0.068	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	67	31.3	0.042	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		194	10.9	0.068	5.3	NA	0.0	0.0	0.00	0.43	0.00	88.1
All Vehicles		427	19.2	0.164	6.3	NA	0.7	6.0	0.14	0.47	0.14	76.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2032 PM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	63	30.0	0.039	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	1	0.0	0.001	7.9	LOS A	0.0	0.0	0.17	0.61	0.17	63.4
Approach		64	29.5	0.039	0.1	NA	0.0	0.0	0.00	0.01	0.00	108.7
North: Saltbush Road												
7	L2	168	25.0	0.326	9.7	LOS A	1.6	12.5	0.29	0.90	0.29	52.8
9	R2	126	0.0	0.326	9.4	LOS A	1.6	12.5	0.29	0.90	0.29	55.6
Approach		295	14.3	0.326	9.6	LOS A	1.6	12.5	0.29	0.90	0.29	54.0
West: Capricorn Highway												
10	L2	1	0.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	67	31.3	0.042	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		68	30.8	0.042	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.3
All Vehicles		427	19.2	0.326	6.6	NA	1.6	12.5	0.20	0.63	0.20	64.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2042 AM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	73	30.4	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	168	25.0	0.166	9.7	LOS A	0.7	6.1	0.36	0.68	0.36	61.1
Approach		241	26.6	0.166	6.8	NA	0.7	6.1	0.25	0.48	0.25	70.5
North: Saltbush Road												
7	L2	1	0.0	0.003	8.4	LOS A	0.0	0.1	0.26	0.86	0.26	59.8
9	R2	1	0.0	0.003	11.4	LOS B	0.0	0.1	0.26	0.86	0.26	59.7
Approach		2	0.0	0.003	9.9	LOS A	0.0	0.1	0.26	0.86	0.26	59.7
West: Capricorn Highway												
10	L2	126	0.0	0.068	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	77	30.1	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		203	11.4	0.068	5.1	NA	0.0	0.0	0.00	0.41	0.00	88.9
All Vehicles		446	19.6	0.166	6.0	NA	0.7	6.1	0.14	0.45	0.14	77.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Capricorn Hwy& Saltbush Rd - 2042 PM Peak]

Galilee Power Station Project
Site Category: SCR Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Capricorn Highway												
5	T1	73	30.4	0.045	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
6	R2	1	0.0	0.001	8.0	LOS A	0.0	0.0	0.18	0.61	0.18	63.3
Approach		74	30.0	0.045	0.1	NA	0.0	0.0	0.00	0.01	0.00	108.8
North: Saltbush Road												
7	L2	168	25.0	0.333	9.8	LOS A	1.6	12.7	0.31	0.90	0.31	52.7
9	R2	126	0.0	0.333	9.7	LOS A	1.6	12.7	0.31	0.90	0.31	55.5
Approach		295	14.3	0.333	9.7	LOS A	1.6	12.7	0.31	0.90	0.31	53.9
West: Capricorn Highway												
10	L2	1	0.0	0.001	8.2	LOS A	0.0	0.0	0.00	0.67	0.00	79.7
11	T1	77	30.1	0.047	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	110.0
Approach		78	29.7	0.047	0.1	NA	0.0	0.0	0.00	0.01	0.00	109.4
All Vehicles		446	19.6	0.333	6.5	NA	1.6	12.7	0.20	0.60	0.20	65.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.