Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Electricity Generation and Retail Corporation T/A Synergy

Licence: L6637/1995/15

Registered office: Australia Place, 11th Floor
15-17 William St
PERTH WA 6000

ACN: -

Premises address: Collie 'A' Power Station
Boys Home Road
PALMER WA 6225
Being Part of Lot 3001 on Plan 51101

Issue date: 9 October 2014

Commencement date: 18 October 2014

Expiry date: 17 October 2036

Decision

Based on the assessment detailed in this document, the Department of Environment Regulation (DER) has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by: Jonathan Bailes
Manager Licensing (Process Industries)

Decision Document authorised by: Ed Schuller
Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

<table>
<tr><th colspan="4">Administrative details</th></tr>
<tr><td>Application type</td><td colspan="3">Works Approval ☐
New Licence ☐
Licence amendment ☒
Works Approval amendment ☐</td></tr>
<tr><td rowspan="5">Activities that cause the premises to become prescribed premises</td><td>Category number(s)</td><td colspan="2">Assessed design capacity</td></tr>
<tr><td>12</td><td colspan="2">1.2 million tonnes of coal per annual period</td></tr>
<tr><td>52</td><td colspan="2">340MWe per annual period</td></tr>
<tr><td>53</td><td colspan="2">95 000 tonnes per annual period</td></tr>
<tr><td>61</td><td colspan="2">1,862,000 tonnes per annual period</td></tr>
<tr><td>Application verified

Application fee paid</td><td colspan="3">Date: N/A

Date: N/A</td></tr>
<tr><td>Works Approval has been complied with

Compliance Certificate received</td><td colspan="3">Yes☐ No☐ N/A☒

Yes☐ No☐ N/A☒</td></tr>
<tr><td>Commercial-in-confidence claim</td><td colspan="3">Yes☐ No☒</td></tr>
<tr><td>Commercial-in-confidence claim outcome</td><td colspan="3"></td></tr>
<tr><td>Is the proposal a Major Resource Project?</td><td colspan="3">Yes☐ No☒</td></tr>
<tr><td>Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the Environmental Protection Act 1986?</td><td>Yes☒ No☐</td><td colspan="2">Referral decision No: 132 and 900
Managed under Part V ☐
Assessed under Part IV ☒</td></tr>
<tr><td>Is the proposal subject to Ministerial Conditions?</td><td>Yes☒ No☐</td><td colspan="2">Ministerial statement No: 146 and 394

EPA Report No: 472 and 777</td></tr>
</table>

Administrative details	
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☒ No☐ Department of Water consulted Yes ☐ No ☒ Amendment not associated with the discharge of waste into a designated area.
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒	
Is the Premises subject to any EPP requirements? Yes☐ No☒	

3 Executive summary of proposal and assessment

Collie A Power Station (Collie A) is a 340MWe, single generation unit; coal-fired thermal power station located approximately 10 km east of the town of Collie. The power station has been in operation since 1999 and is owned by Synergy. Electricity generated at this facility supplies customers via the South-West Interconnected System (SWIS).

Pre-crushed coal is delivered to Collie A via an overland conveyor from the Premier Coal Mine, approximately 6 km south-east. Coal is transferred from the stockpiles to the Power Block where it is fed into a boiler with low Nitrogen oxide (NOx) burners. Coal is burnt in the boiler with the resultant heat being used to heat circulating water to generate steam. High-pressure steam is then directed to a turbine hall to spin a single turbine which generates power. Steam exhausted from the turbine is cooled in a condenser and returned to the boiler for reuse.

The primary emissions of the exhaust gases include carbon monoxide (CO), carbon dioxide (CO2), sulfur dioxide (SO2), oxides of nitrogen (NOx) and particulate matter with minor emissions of metals and organics. Waste water is treated on site, and approximately 65% of the treated water is reused on site with the remainder being discharged via the 68 km underground ocean outfall pipeline north of the Leschenault Inlet. The water is discharged through a diffuser at a depth of 10 m approximately 710 m offshore.

Fly ash and bottom ash that is not removed offsite for beneficial use are discharged to the Ash Storage Dam on the premises. Fly ash is slurried with water and transported via a pipeline while bottom ash is collected and intermittently trucked to the Ash Storage Dam. Decant water from the Ash Storage Dam is collected in a lined pond and returned to the power station for reuse or treatment and disposal.

This decision document assesses the licensee's proposal to revise licence limits for discharge to surface water via the ocean outfall pipeline to allow alternative wastewater sources to be discharged via the pipeline. Current licence limits restrict water sources which can be used and disposed of by the power station. Changes to conditions consistent with the current DER licence format have also been described where required in the decision document. DER has considered whether the risk profile of other emissions and discharges from the premises has significantly changed as a result of the proposed amendment. No significant changes have occurred therefore DER has not amended any other conditions relating to emissions and discharges.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision, they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	L1.2.2(removed)	Previous condition L1.2.2 has been removed from the licence in accordance with DER policy.	General provisions of the *Environmental Protection Act 1986* *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Point source emissions to air	L2.2.2 L3.2.1, Table 3.2.1	The wording of condition 2.2.2 was inconsistent with the requirements specified in Table 2.2.2. The condition wording has been modified to clarify that the point source emission to air values stated in Table 2.2.2 are limits. In addition to this, the notification requirements in Table 4.3.1 have been updated to include notification of exceedances of the limits in Table 2.2.2. The monitoring method for PM_{10} and $PM_{2.5}$ in Table 3.2.1 (condition 3.2.1) has been modified from USEPA Method 201A to laser diffraction of sample collected via USEPA Method 5 or 17. This change was required due to the monitoring port being too small for the sample probe required to comply with USEPA Method 201A requirements. Laser diffraction of a collected particulate matter sample is a suitable alternative method for determination of the PM10 and $PM_{2.5}$ component of a dust sample.	Collie Power Station, Annual Audit Compliance Report, L6637/1995/15, 17 October 2014 – 30 June 2015

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Point source emissions to surface water including point source and ambient monitoring	L1.3.7 L2.3.1 – L2.3.4 L3.3.1 L3.5.2 (Tables 3.5.1 to 3.5.3)	Emission Description *Emission:* Point source emission of treated wastewater from Collie A power station via the ocean outfall pipeline. Wastewater comprises cooling tower blowdown, ash dam return water, reverse osmosis reject water, and water treatment waste which has been treated through a reverse osmosis plant. The premises is also able to accept waste brine from Bluewaters and Muja Power stations, Colltech, and the Synergy Central Water Receival Facility (CWRF) for discharge via the ocean outfall pipeline. *Impact:* Discharge of wastewater to the marine environment has the potential to cause contamination, changes to marine and sediment chemistry, and impact on marine fauna if not appropriately treated, discharged and monitored. *Controls:* Wastewater disposal from Collie A power station via the ocean outfall pipeline was assessed under part IV of the *Environmental Protection Act 1986*. Ministerial Statement 394 required the ocean outfall to be located in an area of low conservation value off the Leschenault Peninsula and for the Licensee to manage the discharge in accordance with an approved environmental management plan. Discharge limits and monitoring requirements were also placed on the wastewater disposal operation through this licence (conditions L2.3.2 and L3.3.1). In addition to monitoring of wastewater discharged, annual ambient water, sediment and biota monitoring in the vicinity of the marine outfall is carried out under the licence. The current marine monitoring program has been undertaken on an annual basis since 1999 when the ocean outfall pipeline was commissioned. The monitoring program includes control and impact monitoring locations identified when initial modelling was carried out as part of the environmental impact assessment for discharge to the marine environment. Risk Assessment: *Consequence:* Minor *Likelihood*: Possible *Risk Rating*: Moderate	Application supporting documentation Collie Power Station Environmental Management Plan, Transfield Worley Power Services, 2014 Australian and New Zealand guidelines for fresh and marine water quality – 2000 Ministerial Statement 394

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		Regulatory Controls: The licence specifies point source emission limits (2.3.2), targets (previous condition 2.3.3), and monitoring requirements (L3.3.1) for point source emissions to surface water via the ocean outfall pipeline. It also contains discharge specifications in conditions 2.3.3 and 2.3.4 to ensure the likelihood of discharge impacting on the marine environment is minimised. The licence included an emission target for total suspended solids (TSS). However, this has been removed in accordance with administrative changes implemented in DER. It is more appropriate for this target to act as in internal management tool to indicate when higher than typical TSS levels are occurring, which could indicate an issue with the water treatment system. TSS levels are generally below 20mg/L. The licensee has requested the emission limits in condition 2.3.2 be revised to allow greater flexibility in the use and disposal of water for power generation in the Collie region. The capacity to fully exploit alternative water sources in the Collie region is currently restricted by some of the limits on the discharge to surface water specified in the licence. The licensee has proposed the following changes to current discharge limits: • Increase the licence limit for cobalt from 0.1 mg/L to 0.23 mg/L; • Increase the licence limit for zinc from 0.5 mg/L to 1.6 mg/L; • Remove licence limits for common seawater ions including sulfate, sodium, chloride, calcium, magnesium and potassium; • Remove the licence limit for silica; and • Modify concentration-based limits for nutrients phosphate and nitrate to load based limits. Seawater ions The current emission limits were developed based on a combination of background seawater quality and the treatment capacity of the wastewater treatment system. The limits for common seawater ions were based on typical seawater quality and did not	

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		account for dilution. They are therefore set at or below background. Initial modelling and design of the ocean outfall diffuser predicted there would be a 100 fold dilution factor within a six-meter mixing zone of the diffuser. Current modelling indicates that the initial dilution factor is 229. The major seawater ions are not considered to be contaminants in the marine environment, and there are no marine ANZECC & ARMCANZ (2000) guidelines applicable. Given the low risk posed by these parameters and the lack of guidelines the limits have been removed from the licence. <u>Silica, cobalt, and zinc</u> The current licence limits for silica, cobalt and zinc have been based on the predicted quality of discharge water and the initial prediction of a 100 fold dilution factor within a six-meter mixing zone of the diffuser. The current limits are however lower than the trigger derived from the ANZECC & ARMCANZ (2000) guidelines. The background concentrations of these parameters are higher than the 99% species protection guideline, and therefore, the 95% species protection value has been used to calculate an appropriate limit. Current modelling indicates that the initial dilution factor is significantly higher than 100 and has been conservatively calculated as 229. The limits for cobalt and zinc have been increased in accordance with the recalculated dilution factor and based on ANZECC & ARMCANZ (2000) guidelines. This is summarised in the table below: **Parameter** / **ANZECC trigger (mg/L)** / **Background (mg/L)** / **Initial dilution** / **Revised trigger (mg/L)** / **Present limit (mg/L)** Cobalt / 0.001[1] / 0.00001[2] / 229 / 0.23 / 0.1 Zinc / 0.007 / 0.00015[2] / 229 / 1.6 / 0.5 Notes: 1. ANZECC & ARMCANZ (2000) 99% guideline is below background. 95% guideline adopted as recommended by EPA (2015) 2. From Table 13 of McAlpine et al. (2005) The limit for silica has been removed as silica is not considered to be a contaminant in the marine environment and there are is marine ANZECC & ARMCANZ (2000) guideline	

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		applicable. Other discharges from prescribed premises to the marine environment are not required to monitor for silica, and the licences do not contain limits for silica. <u>Nutrients</u> It is recognised that the overall load of nutrients entering the environment is more important that the concentration being discharged at any one time. The licensee has proposed that the current concentration limits are converted to load based daily limits, which have been calculated in accordance with the table below. Although the load limits correspond to an increase of the previous concentration limits, the revised loads are considered low risk, specifically, when comparing to other discharges to the same environment.	

Nutrient	Limit (mg/L)	Volume (ML/day)	Present load		Recommended limit	
			(kg/day)	(t/day)	(kg/day)	(t/day)
Phosphate	2	4.4	8.8	0.0088	17.6	0.017
Nitrate	5	4.4	22	0.022	44	0.044

<u>Monitoring</u>
The ambient marine monitoring program specified in condition L3.5.2 (Tables 3.5.1 to 3.5.3) remains on the licence to detect changes in the marine environment which may indicate an impact is occurring from the Collie A ocean discharge. The monitoring program has been occurring on an annual basis since 1999 and has not detected any significant changes which would indicate an impact is occurring. The current monitoring program includes targets for marine water quality which are based on ANZECC & ARMCANZ (2000) guideline trigger values for protection of 99% of species in a marine ecosystem. These targets have been removed from the licence in accordance with administrative changes implemented within DER. The targets should remain in the licensee's environmental management plan as internal triggers to detect and react to potential impacts from the wastewater discharge through comparison between control and impact site monitoring results.

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Residual Risk *Consequence:* Minor *Likelihood*: Possible *Risk Rating*: Moderate	
Fugitive emissions	L2.6.1 (removed)	The risk of fugitive dust has been reviewed as part of this licence amendment in line with administrative changes made within DER. Emission Description *Emission:* Dust emissions from coal transfer points, coal stockpiles, fly ash handling and storage, and open and trafficable areas. *Impact:* Dust emissions have the potential to reduce local air quality and have a nuisance impact on sensitive receptors outside the premises boundary. There is potential for minor reversible impact and local concern if dust emissions from the Premises are not managed appropriately. The surrounding area is predominantly State Forest, coal mining, and power generation activities, with the nearest sensitive receptor being more than 4.5 km from the power station. *Controls*: Dust management is described in the Transfield Worley Power Services (the power station operator), Environmental Management Plan and Dust Management Plan. Sprinkler systems are in place at the coal storage stockpile and ash storage dam for use as required. Trafficable areas are sealed or treated with water or other suppressants to minimise dust emissions from open areas and vehicle movements. Routine maintenance and housekeeping is undertaken to prevent accumulation of dust. Fly ash is transferred in a slurry form to the ash storage dam and residual moisture in the facility assists in reducing the likelihood of dust emissions. DER has no recent records of dust complaints relating to the premises. Risk Assessment *Consequence:* Insignificant *Likelihood*: Unlikely	General provisions of the *Environmental Protection Act 1986* Collie Power Station Environmental Management Plan, Transfield Worley Power Services, 2014 Transfield Worley Power Services, Collie Power Station, Dust Management Procedure, 2015

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Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Risk Rating: Low <u>Regulatory Controls</u> DER is satisfied that appropriate controls are in place to prevent and minimise fugitive emissions and therefore deems it appropriate to remove previous generic condition 2.6.1 relating to fugitive dust emissions from the operating licence. General provisions of the *Environmental Protection Act 1986* are sufficient to regulate this impact.	
Improvements	L4.1.1-L4.1.2 (removed)	Improvement Requirements IR1 to IR7 have been removed as part of this licence amendment as the licensee has provided the required information by the specified date of completion. Correspondence has been provided to the licensee advising of DER's review and assessment of the improvement conditions. No further improvements are required to be included on the licence as part of this amendment.	Muja Power Station SODAR Station in accordance with L4706/1972/17 Implementation Proposal Muja Power Station Ambient SO_2 monitoring sites in accordance with L4706/1972/17 Implementation Proposal Collie Power Station Continuous Emission Monitoring

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			Implementation Plan Collie Power Station Dust Management Procedure 2015 Collie Power Station – Department of Environment Regulation Refire Licence Requirements (IR5 & IR6)
Information	L4.2.1 L4.2.2 L4.3.1	**Reporting** A review of reporting requirements in condition 4.2.1has been undertaken resulting in table numbers being updated as appropriate and reporting parameters being described in further detail to ensure reporting requirements are clear. **Notification** Condition 4.3.1 has been amended to remove notification requirements in the event of failure or malfunction of pollution control equipment or environmental incidents, as this replicated the requirements of section 72 of the EP Act. Notification requirements in the event of a target exceedance have also been removed as the licence no longer specifies any targets.	NA
Licence Duration	-	The licence expiry date has been changed to October 2036 in accordance with the notice published on 29 April 2016 and DER Guidance Statement on Licence Duration.	DER website

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
22/08/2014	Proponent sent a copy of draft instrument	09/09/2014 – Meeting held between DER and Synergy to discuss the licence conditions and their implications. 14/09/2014 –Meeting between DER and Synergy to discuss licence conditions.	DER considered feedback provided by the proponent and incorporated changes where appropriate. DER formally responded to the proponent on issues raised.
25/02/2016	Office of the Environmental Protection Authority (OEPA) consulted on the regulation of the ocean outfall through Part IV of the *Environmental Protection Act 1986.*	OEPA recommended that matters related to emissions and discharges of waste should continue to be regulated under Part V of the *Environmental Protection Act 1986.*	N/A
Draft	Proponent sent a copy of draft instrument	No comments.	N/A

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High