APPENDIX A
CROWN SPONSORSHIP

Government of South Australia
Department for Energy and Mining

Deputy Chief Executive

Level 4
11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Tel 08 8463 3000

ABN 83 768 683 934
dem.oce@sa.gov.au
www.energymining.sa.gov.au

Our Ref: DEMC24/F2024/001544

Mr Kevin Andersen
Manager, Power Development
AGL Energy Ltd
Level 24, 200 George St
Sydney NSW 2000

kandersen@agl.com.au

Dear Mr Anderson,

BARKER INLET POWER STATION STAGE 2 – CROWN SPONSORSHIP UPDATE

I refer to your correspondence of 26 September 2024 to the Chief Executive of the Department for Energy and Mining (DEM) regarding your request for an updated crown sponsorship support for the Barker Inlet Power Station (BIPS) Stage 2.

DEM notes the successful operation of Stage 1 of BIPS is providing generation capacity of 210MW to the South Australian energy market, following the granting of crown sponsorship under the former *Development Act 1993* for both BIPS 1 and BIPS 2 in September 2017.

DEM notes the Development Application (DA) was originally due to expire on 29 January 2025, however, on 15 August 2024 the Minister of Planning authorised an extension to the lapsing date to 29 January 2028 in accordance with the *Planning, Development and Infrastructure Act 2016* (PDI Act).

As it is understood, AGL Energy is seeking to apply for a variation to the DA under section 128 of the PDI Act to make a number of changes to the approved BIPS 2 project including to:

- enable the project to use either gas turbines or reciprocating engines (instead of reciprocating engines only as currently approved); and
- increase the proposed output of BIPS 2 to up to 280MW (instead of the currently approved 210MW).

DEM is supportive of AGL Energy's request for a variation to the DA of its Stage 2 BIPS and confirms this letter provides the updated crown sponsorship support for BIPS Stage 2. BIPS 2 is expected to play an ongoing important role in firming the existing renewable generation capacity on the South Australian network.

DEM notes that AGL Energy currently proposes that construction of BIPS 2 would commence in 2026 and the project would be operational by 2028.

I am advised that on 13 September 2024 the Office of Technical Regulator granted approval, with conditions to the proposed generator (as per the variation) and provided a certificate issuing compliance with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

DEM make no representations or gives no warranties in relation to the outcome of the development application extension or time that it takes to secure a planning outcome for the project.

It is AGL Energy's responsibility to obtain all other statutory approvals, licences and permits from relevant authorities, manage community expectations and to fund the project. The South Australian Government makes no commitment to purchase any product or service related to the project.

Yours sincerely

Benjamin Zammit
ACTING DEPUTY CHIEF EXECUTIVE

1 November 2024

APPENDIX B
DEVELOPMENT APPROVAL – EXTENSION OF TIME

2017/22029/01

Government of South Australia
Department for Housing and Urban Development

Level 10, 83 Pirie Street
Adelaide SA 5000

GPO Box 1815
Adelaide SA 5001

Telephone: 08 7133 2376
ABN 92 366 288 135

www.dhud.sa.gov.au

15 August 2024

AGL Energy Ltd
Level 24, 200 George Street
SYDNEY NSW 2000

Attention: Kevin Anderson
Email: kandersen@agl.com.au

Dear Mr Anderson

DA 010/V067/17 - Barker Inlet Power Station – Extension of time to complete

I refer to your correspondence dated 28 June 2024, in which you requested an extension of time to complete the development, originally approved by the delegate of the Minister for Planning on 29 January 2018. A period of seven years was allowed to complete both stages, with BIPS1 having been constructed and operating, but BIPS2 is still to be commenced.

AGL has requested an additional three years to complete the development.

Having carefully considered the matter, noting the work done to date in commencing the development (and the investment already made, both with BIPS1 and the new 250MW Torrens Island Battery development commissioned in 2023), I can advise that an additional 3-year extension of time has been approved to allow final completion.

Pursuant to r.108(3)(b) of the *Planning, Development and Infrastructure (General) Regulations 2017*, and as the delegate of the Minister for Planning, I have now determined that the revised operative date to fully complete the development is 29 January 2028.

If substantial commitment and progress has not been made by the revised expiration date, a further extension may not be granted, due to the time that will have elapsed since approval was first granted (which will then be ten years).

Should you have any enquiries in relation to this matter, please do not hesitate to contact Simon Neldner of this office on (08) 7133 2376 or email simon.neldner@sa.gov.au

Yours sincerely

Robert Kleeman
MANAGER, CROWN AND IMPACT ASSESSMENT
as delegate of the
MINISTER FOR PLANNING

APPENDIX C
CERTIFICATES OF TITLE

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Certificate of Title - Volume 6242 Folio 10

Parent Title(s) CT 6224/108

Creating Dealing(s) RTC 13332732

Title Issued 14/08/2020 **Edition** 2 **Edition Issued** 14/08/2020

Estate Type

FEE SIMPLE

Registered Proprietor

AGL BARKER INLET PTY. LTD. (ACN: 622 351 660)
OF L 24 200 GEORGE STREET SYDNEY NSW 2000

Description of Land

ALLOTMENT 1301 DEPOSITED PLAN 123497
IN THE AREA NAMED TORRENS ISLAND
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED EF ON D123497 EXPIRING ON 13/11/2044 OR PRIOR TERMINATION OF LEASE 13065180 (TG2 13099983)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED AT ON D123497 FOR THE TRANSMISSION OF TELECOMMUNICATION SIGNALS BY UNDERGROUND CABLE TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 12416751)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED LL ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 10650192)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9470347)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528574)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528577)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528578)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528579)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528580)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AN ON D123497 (TG 9696226)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AU ON D123497 (TG 8983784)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AZ ON D123497 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8983782)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AB ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AF ON D123497 (TG 9031528)

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TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED CC ON D123497 (TG 9031529)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED L ON D123497 (TG 8981505)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED M ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED R ON D123497 (TG 9031528)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED SS ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED J ON D123497 (TG 8983783)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED JJ ON D123497 (TG 8981507)

TOGETHER WITH FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED W ON D123497 (RTC 13332732)

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED AB ON D123497 (TG 9031527)

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED SS ON D123497 (TG 9031527)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED EE ON D123497 (TG 9031526)

Schedule of Dealings

NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

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REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 6242 Folio 11

Parent Title(s) CT 6224/108

Creating Dealing(s) RTC 13332732

Title Issued 14/08/2020 **Edition** 1 **Edition Issued** 14/08/2020

Estate Type

FEE SIMPLE

Registered Proprietor

AGL SA GENERATION PTY. LTD. (ACN: 081 074 204)
OF L 24 200 GEORGE STREET SYDNEY NSW 2000

Description of Land

ALLOTMENT COMPRISING PIECES 1302 AND 1402 DEPOSITED PLAN 123497
IN THE AREA NAMED TORRENS ISLAND
HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED EF ON D123497 EXPIRING ON 13/11/2044 OR PRIOR TERMINATION OF LEASE 13065180 (TG2 13099983)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8963672)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED AT ON D123497 FOR THE TRANSMISSION OF TELECOMMUNICATION SIGNALS BY UNDERGROUND CABLE TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 12416751)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED AV ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8963674)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B ON D123497 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8963673)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED DA ON D123497 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8963673)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED FFB ON D123497 (TG 9515267)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED GB ON D123497 (TG 10045717)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED GGC ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 12416751)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED HA ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8963675)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED K ON D123497 (TG 8981506)

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SUBJECT TO EASEMENT(S) OVER THE LAND MARKED LL ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 10650192)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED Q ON D123497 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (V 8963671)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED QQA ON D123497 (TG 10045715)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED SA ON D123497 (TG 9074533)

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED W ON D123497 (RTC 13332732)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9470347)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528574)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528577)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528578)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528579)

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED AN ON D123497 (TG 9528580)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AN ON D123497 (TG 9696226)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AU ON D123497 (TG 8983784)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AZ ON D123497 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8983782)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AB ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AF ON D123497 (TG 9031528)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED CC ON D123497 (TG 9031529)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED L ON D123497 APPURTENANT ONLY TO PIECE 1302 (TG 8981505)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED M ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED R ON D123497 (TG 9031528)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED SS ON D123497 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED J ON D123497 (TG 8983783)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED JJ ON D123497 (TG 8981507)

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED AB ON D123497 (TG 9031527)

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED SS ON D123497 (TG 9031527)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED EE ON D123497 (TG 9031526)

Schedule of Dealings

Dealing Number	Description
10045716	LEASE TO SOUTH EAST AUSTRALIA GAS PTY. LTD. (ACN: 096 437 900), APT SPV2 PTY. LTD. (ACN: 095 483 453), APT SPV3 PTY. LTD. (ACN: 095 483 462), ANP SEA GAS SPV2 PTY. LTD. (ACN: 099 332 368), ANP SEA GAS SPV3 PTY. LTD. (ACN: 099 332 395), REST

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	SEA GAS SPV2 PTY. LTD. (ACN: 099 332 331) AND REST SEA GAS SPV1 PTY. LTD. (ACN: 095 483 444) COMMENCING ON 01/07/2001 AND EXPIRING ON 30/06/2102 OF PORTION (A IN G419/2003)
13065180	LEASE TO ELECTRANET PTY. LTD. (ACN: 094 482 416) COMMENCING ON 14/11/2018 AND EXPIRING ON 13/11/2044 OF PORTION (AREA C IN F254336)
13099983	LEASE 13065180 IS TOGETHER WITH AN EASEMENT WITH LIMITATIONS EXPIRING ON 13/11/2044 OR PRIOR TERMINATION OF LEASE 13065180 (EF IN F254335)

Notations

Dealings Affecting Title NIL

Priority Notices NIL

Notations on Plan NIL

Registrar-General's Notes

PLAN FOR LEASE PURPOSES VIDE G419/2003
APPROVED FILED PLAN FOR LEASE PURPOSES FX254336
APPROVED FX254335

Administrative Interests NIL

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REAL PROPERTY ACT, 1886
South Australia

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Certificate of Title - Volume 6211 Folio 947

Parent Title(s) CT 6134/704, CT 6211/946

Creating Dealing(s) VE 12924583

Title Issued 15/08/2018 **Edition** 1 **Edition Issued** 15/08/2018

Diagram Reference

Estate Type

FEE SIMPLE

Registered Proprietor

GENERATION LESSOR CORPORATION
OF GPO BOX 1045 ADELAIDE SA 5001

Description of Land

ALLOTMENT COMPRISING PIECES 301 AND 401 DEPOSITED PLAN 55734
IN THE AREA NAMED TORRENS ISLAND
OUT OF HUNDREDS (ADELAIDE) AND HUNDRED OF PORT ADELAIDE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A ON F253058 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8963672)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED AE ON F253058 (TG 8998207)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED AF ON F253058 (TG 9031528)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B.DA.GC.U.V.W.Y AND Z ON F253058 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8963673)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED FFC ON F253058 (TG 9684156)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED GGB ON F253058 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 11630600)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED HH ON F253058 (TG 9101186)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED K ON F253058 (TG 8981506)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED KK ON F253058 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 10650194)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED N ON F253058 FOR WATER SUPPLY PURPOSES (V 8963671)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED Q ON F253058 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (V 8963671)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED QQ ON F253058 (TG 10490935)

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SUBJECT TO EASEMENT(S) OVER THE LAND MARKED S ON F253058 (TG 8998211)

SUBJECT TO EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED C AND X ON F253058 TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 8963674)

SUBJECT TO EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED UUA.VV.WW.YY AND ZZ ON F253058 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8963673)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED EB ON F253058 (TG 8983784)

SUBJECT TO RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED FFD ON F253058 TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (TG 8983782)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AAB ON F253058 (TG 8998206)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED AB.M AND SS ON F253058 FOR DRAINAGE PURPOSES (V 8963671)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED CC ON F253058 (TG 8998208)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED L ON F253058 APPURTENANT ONLY TO PIECE 301 (TG 8981505)

TOGETHER WITH EASEMENT(S) OVER THE LAND MARKED TA ON F253058 (TG 8998212)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED J ON F253058 (TG 8983783)

TOGETHER WITH EASEMENT(S) WITH LIMITATIONS OVER THE LAND MARKED JJ ON F253058 (TG 8981507)

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED AN ON F253058 (TG 9528577)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED AB AND SS ON F253058 (TG 9114327)

TOGETHER WITH RIGHT(S) OF WAY WITH LIMITATIONS OVER THE LAND MARKED EE ON F253058 (TG 9114321)

Schedule of Dealings

Dealing Number	Description
9270813	LEASE TO AGL SA GENERATION PTY. LTD. COMMENCING ON 7/6/2000 AND EXPIRING ON 6/6/2100 OF PORTION (TIPS A IN G22/2002) TOGETHER WITH THE EXISTING EASEMENTS AND RIGHTS OF WAY PURSUANT TO THE ELECTRICITY CORPORATIONS (RESTRUCTURING AND DISPOSAL) ACT 1999
9270814	LEASE TO AGL SA GENERATION PTY. LTD. COMMENCING ON 7/6/2000 AND EXPIRING ON 6/6/2100 OF PORTION (TIPS B IN G22/2002 TOGETHER WITH THE EXISTING EASEMENTS AND RIGHTS OF WAY PURSUANT TO THE ELECTRICITY CORPORATIONS (RESTRUCTURING AND DISPOSAL) ACT 1999
13065181	UNDERLEASE OF LAND IN LEASE 9270814 TO ELECTRANET PTY. LTD. (ACN: 094 482 416) COMMENCING ON 14/11/2018 AND EXPIRING ON 13/11/2044 OF PORTION (AREA C IN F254336)
13879270	UNDERLEASE OF LAND IN LEASE 9270813 TO ELECTRANET PTY. LTD. (ACN: 094 482 416) COMMENCING ON 16/06/2022 AND EXPIRING ON 01/01/2044 OF PORTION (AREA D IN F257737)

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	

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APPROVED G19/2022
PLAN FOR LEASE PURPOSES VIDE G22/2002
APPROVED FILED PLAN FOR LEASE PURPOSES FX254336
APPROVED FILED PLAN FOR LEASE PURPOSES FX257737
APPROVED FILED PLAN FOR LEASE PURPOSES FX59229
APPROVED FILED PLAN FOR LEASE PURPOSES FX59391

Administrative Interests NIL

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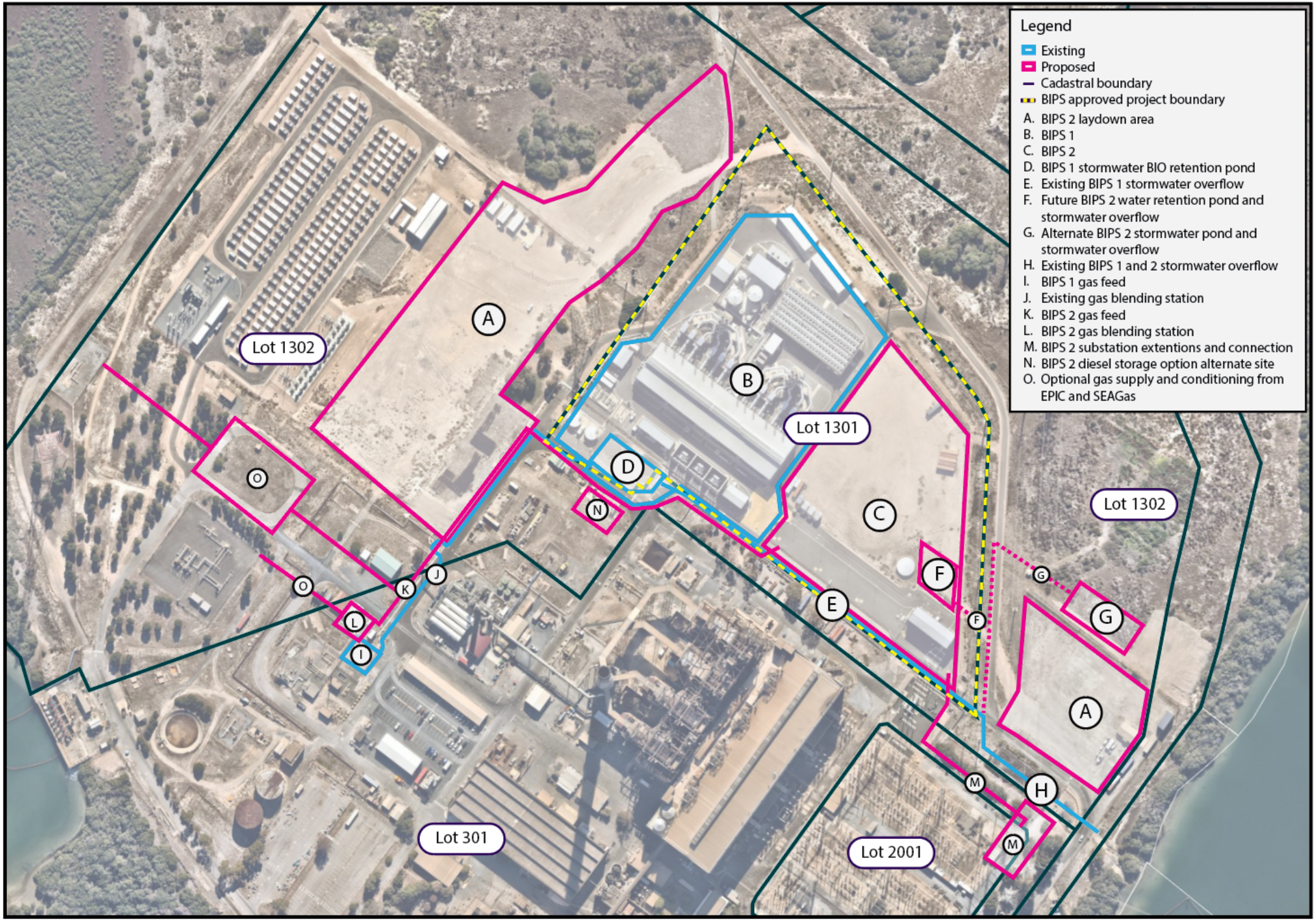
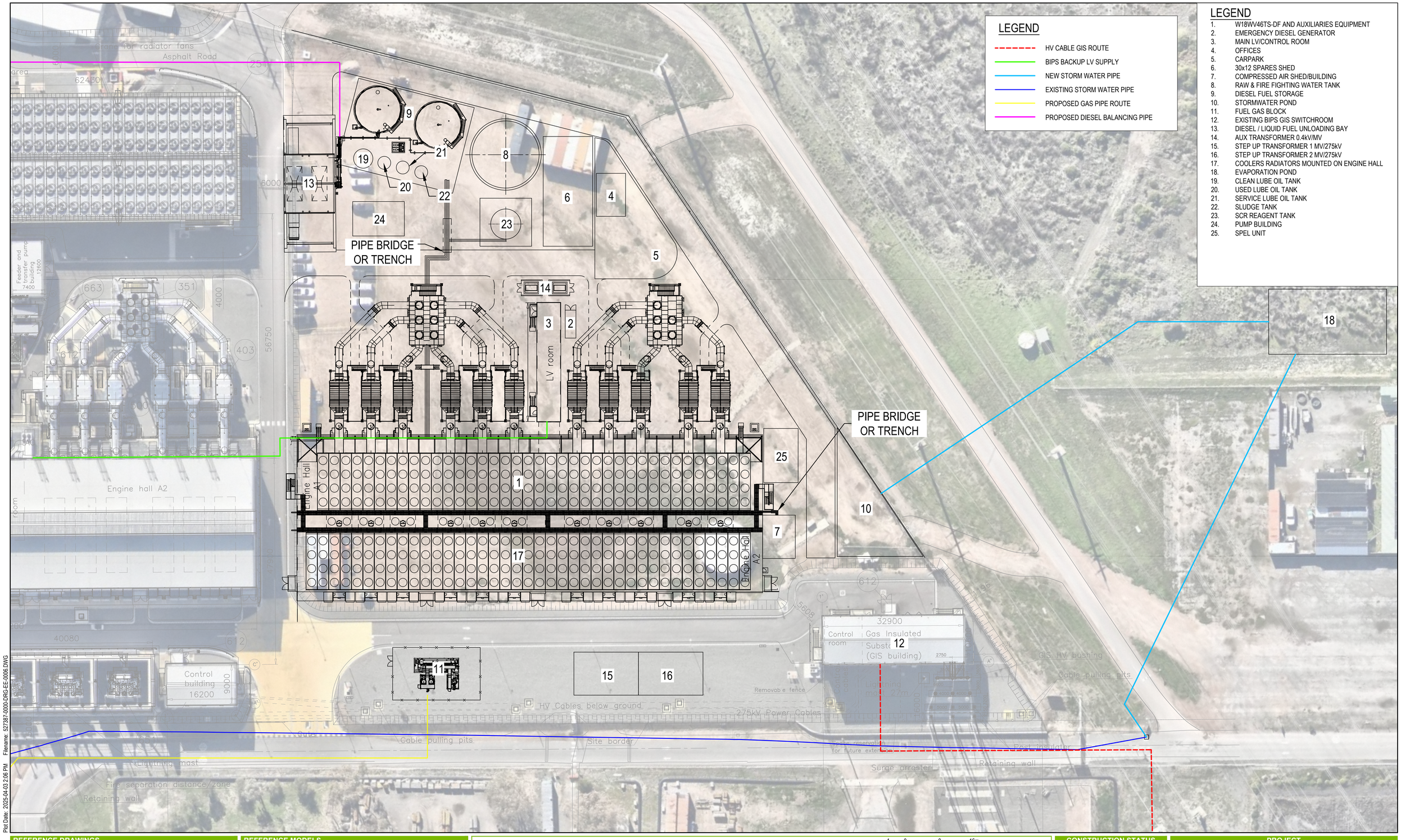
APPENDIX D
PROPOSAL PLANS


Legend
Existing
Proposed
Cadastral boundary
BIPS approved project boundary
A. BIPS 2 laydown area
B. BIPS 1
C. BIPS 2
D. BIPS 1 stormwater BIO retention pond
E. Existing BIPS 1 stormwater overflow
F. Future BIPS 2 water retention pond and stormwater overflow
G. Alternate BIPS 2 stormwater pond and stormwater overflow
H. Existing BIPS 1 and 2 stormwater overflow
I. BIPS 1 gas feed
J. Existing gas blending station
K. BIPS 2 gas feed
L. BIPS 2 gas blending station
M. BIPS 2 substation extentions and connection
N. BIPS 2 diesel storage option alternate site
O. Optional gas supply and conditioning from EPIC and SEAGas
Lot 1302
Lot 1301
Lot 1302
Lot 301
Lot 2001
N
0
50
100
m
1:800
AECOM



Plot Date: 2025-04-03 2:06 PM Filename: 527387-0000-DRG-EE-0006.DWG

All written dimensions take precedence over scaled dimensions.

REFERENCE DRAWINGS	REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
A.01	03/03/25	PRELIMINARY CONCEPT PLAN FOR REVIEW	A.01	D.JEFFERS	M.FERRARO	J.ADEYEYE	S.VADAPALLI

PREPARED BY

aurecon
www.aurecongroup.com

CERTIFICATION	No.	CERTIFIER	DATE

CLIENT

CLIENT DOCUMENT NUMBER	REV

Coordinate system GDA2020 Z54

Height datum AHD

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CONSTRUCTION STATUS
PRELIMINARY NOT FOR CONSTRUCTION

DRAWN BY
D.JEFFERS

DESIGNED BY
M.FERRARO

STATUS	CODE
	W1

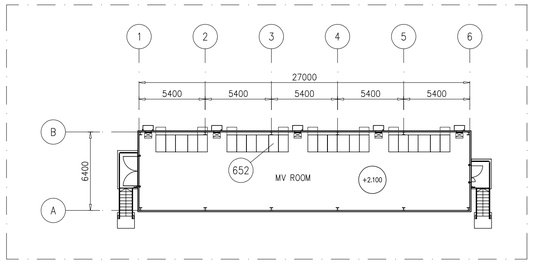
DOCUMENT STATE
WORK IN PROGRESS

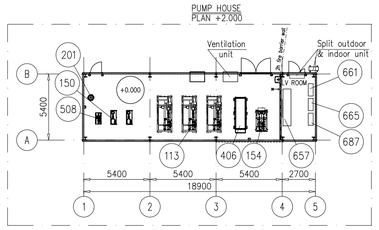
PROJECT
BARKER INLET POWER STATION STAGE 2 (BIPS2) EXPANSION

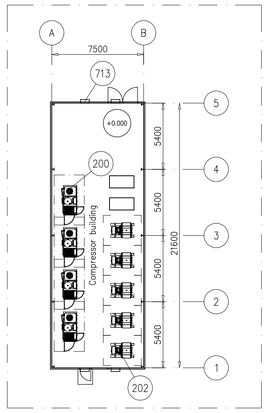
TITLE
W18WV46TS-DF GENERAL ARRANGEMENT

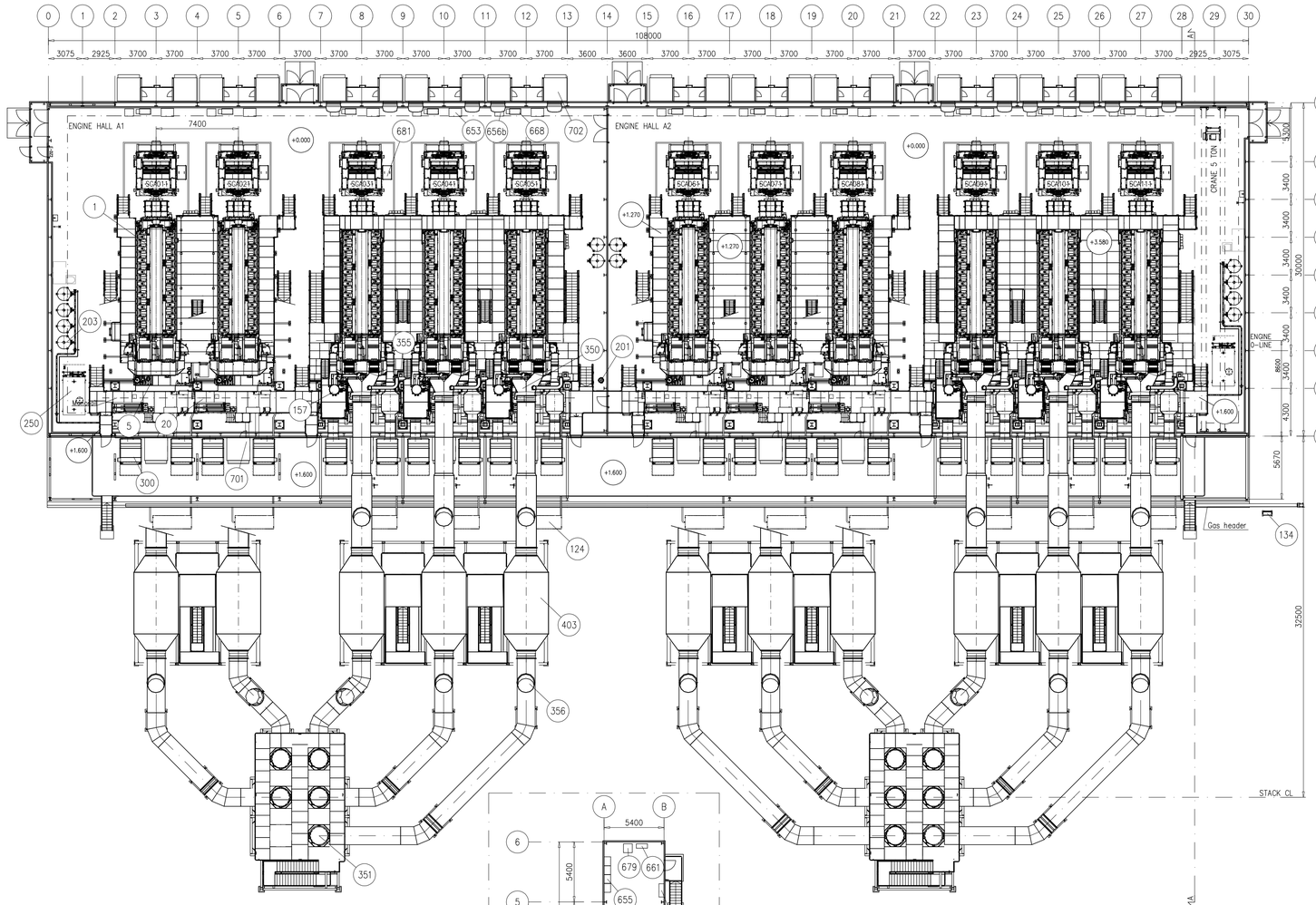
DOCUMENT CODE
527387-0000-DRG-EE-0006

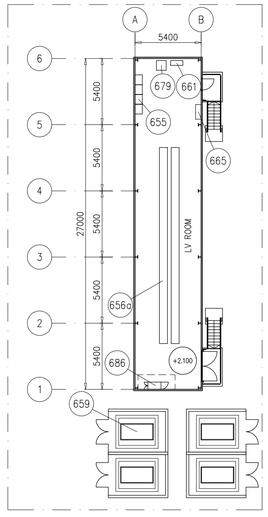
SCALE	SIZE	REFERENCE No.	REV
1:400	A1	EE-0006	A.01











ENGINE HALL

Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Incl. liquids	Mounting level (Floor level)
1	11	SCA	Engine generator set W18V46TS-DF		434531	+0.000
5	11	MOD	Engine Auxiliary Module			+0.000
20	11	MOD	Heating & Cooling Module			+0.000
157	11	QBF	Oil mist coalescer		–	+6.540
201	1	TCB	Instrument air bottle	0.5	130	+0.000
203	12	TSB	Starting air bottle	4.8	2023	+0.000
250	2	VBA	Maintenance water tank	10	11500	+0.000
300	22	NGA	Intake air filter		2096	+1.600
350	11	NHA	Exhaust gas module		–	–
355	11	NHA	Exhaust gas ventilation fan		278	+3.580
653	11	BAN	Neutral point cubicle			+0.000
656b	11	BFA	LV Switchgear			+0.000
668	11	CFE	Local control panel 1			+0.000
681	11		Capacitor			+0.000
701	11	EAA	Ventilation unit, aux. area	18	2100	+1.600
702	22	EAA	Ventilation unit, engine hall	18	–	+0.000

MV, LV AND COMPRESSOR BUILDING

Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Incl. liquids	Mounting level (Floor level)
200	4	TCA	Instrument and working air unit			+0.000
202	5	TSA	Starting air unit			+0.000
652	4	BAC	MV Switchgear			+2.100
655	4	BEY	DC–panel			+2.100
656a	2	BFA	LV Switchgear			+2.100
661	1	BLI	Lighting panel			+2.100
665	1	BLQ	Ventilation panel			+2.100
679	1		Office IT equipment			+2.100
686	1		Server rack		135	+2.100
713	4		Ventilation outlet fan			–

PUMP BUILDING

Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
113	3	PCA	LFO Feeder 3.0			±0.000
150	2	QAA	LO Unloading Pump Unit (clean)		264	±0.000
154	1	QAE	LO Transfer Pump Unit		665	±0.000
201	1	TCC	Instrument Air Bottle	0,27		±0.000
406	1	YAA	Urea unloading unit			±0.000
508	1	DDD	Sludge Transfer Pump Unit		177	±0.000
657	1	BFA	LV Switchgear			
661	1	BLI	Lighting Panel			
665	1	BLQ	HVAC panel			
687	1	BLQ	Process ventilation panel			

SITE AREA

Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Incl. liquids	Mounting level (Floor level)
124	11	ZAC	Fuel gas supply unit		1070	
134	1	–	Real–time gas analyzer		65	
251	77	VCA	Radiator NL2		6030	+16.620
252	11	VEA	Expansion vessel	1.2	1570	+17.800
351	11	NHA	Exhaust gas silencer		12560	
356	22	–	Rupture disk			
403	11	YBA	SCR			
500	3	DAD	Oily water collecting pit	2.5		
512	2	DAA	Control pit			
552	1	VBC	Treated water tank	10		
600	1	VFB	Fire/raw water tank	1000		
602	1	VFC	Fire pump station			
651	2	AET	Step–up transformer			
659	4	BFB	Station transformer			
663	1	BLM	Black starting unit			
703	22	EAB	Ventilation unit		2000	

PRELIMINARY

WÄRTSILÄ

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Energy Business

Master Layout

Engine hall, plan

Product: W18V46TS-DF | ASLY DRG: | AGL - BIPS 2.0 | Proj. no.

11 x W18V46TS-DF

MADE 30-Jan-2025 Hafiz Khan | Units: mm/kg | Based on Document: | Customer Document:

CHKD 03-Feb-2025 Rony Francis | Page No. 1/1 | Scale: 1:250 | Size: A1 | Doc. ID: DESA00028388 XX Rev.

APPD

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SITE AREA						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Incl. liquids	Mounting level (Floor level)
124	11	ZAC	Fuel gas supply unit		1070	
134	1	–	Real-time gas analyzer		65	
251	77	VCA	Radiator NL2		6030	+16.620
252	11	VEA	Expansion vessel	1.2	1570	+17.800
351	11	NHA	Exhaust gas silencer		12560	
356	22	–	Rupture disk			
403	11	YBA	SCR			
500	3	DAD	Oily water collecting pit	2.5		
512	2	DAA	Control pit			
552	1	VBC	Treated water tank	10		
600	1	VFB	Fire/raw water tank	1000		
602	1	VFC	Fire pump station			
651	2	AET	Step-up transformer			
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655	4	BEY	DC-panel			+2.100
656a	2	BFA	LV Switchgear			+2.100
661	1	BLI	Lighting panel			+2.100
665	1	BLQ	Ventilation panel			+2.100
679	1		Office IT equipment			+2.100
686	1		Server rack		135	+2.100
713	4		Ventilation outlet fan			–

PUMP BUILDING						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
113	3	PCA	LFO Feeder 3.0			±0.000
150	2	QAA	LO Unloading Pump Unit (clean)		264	±0.000
154	1	QAE	LO Transfer Pump Unit		665	±0.000
201	1	TCC	Instrument Air Bottle	0,27		±0.000
406	1	YAA	Urea unloading unit			±0.000
508	1	DDD	Sludge Transfer Pump Unit		177	±0.000
657	1	BFA	LV Switchgear			
661	1	BLI	Lighting Panel			
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ENGINE HALL						
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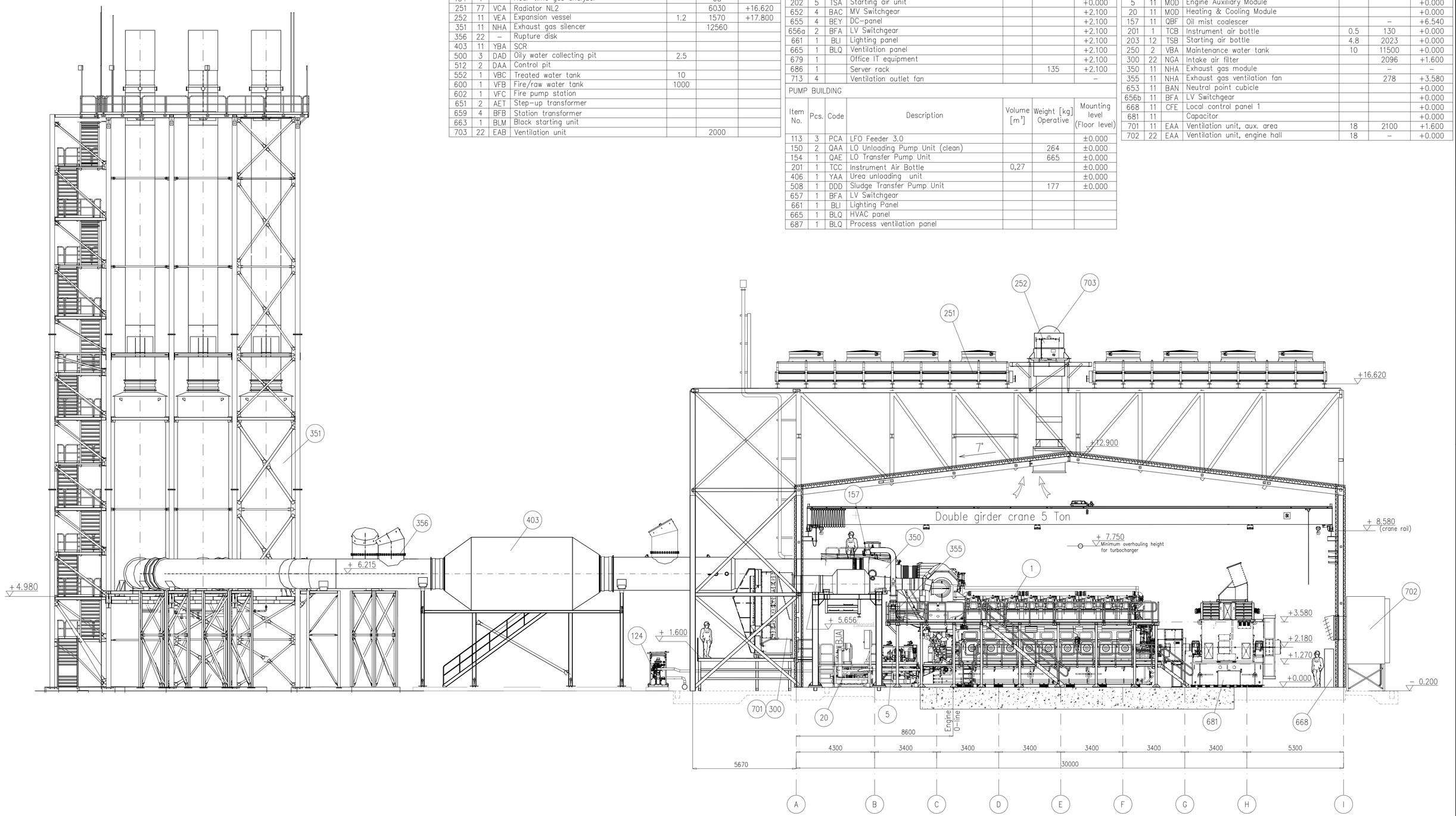
157	11	QBF	Oil mist coalescer		–	+6.540
201	1	TCB	Instrument air bottle	0.5	130	+0.000
203	12	TSB	Starting air bottle	4.8	2023	+0.000
250	2	VBA	Maintenance water tank	10	11500	+0.000
300	22	NGA	Intake air filter		2096	+1.600
350	11	NHA	Exhaust gas module		–	–
355	11	NHA	Exhaust gas ventilation fan		278	+3.580
653	11	BAN	Neutral point cubicle			+0.000
656b	11	BFA	LV Switchgear			+0.000
668	11	CFE	Local control panel 1			+0.000
681	11		Capacitor			+0.000
701	11	EAA	Ventilation unit, aux. area	18	2100	+1.600
702	22	EAA	Ventilation unit, engine hall	18	–	+0.000



SECTION A–A

PRELIMINARY

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Energy Business

WÄRTSILÄ

Master Layout

Engine hall, section

Product:	W18V46TS-DF	ACA	ASLY DRG:	AGL - BIPS 2.0	Proj. no.
				11 x W18V46TS-DF	
MADE	30-Jan-2025	Hafiz Khan	Units: mm/kg	Based on Document:	Customer Document:
CHKD	03-Feb-2025	Rony Francis	Page No. 1/1	Scale: 1:200 Size: A1	Doc. ID: DESA00028389 XX Rev.
APPD					

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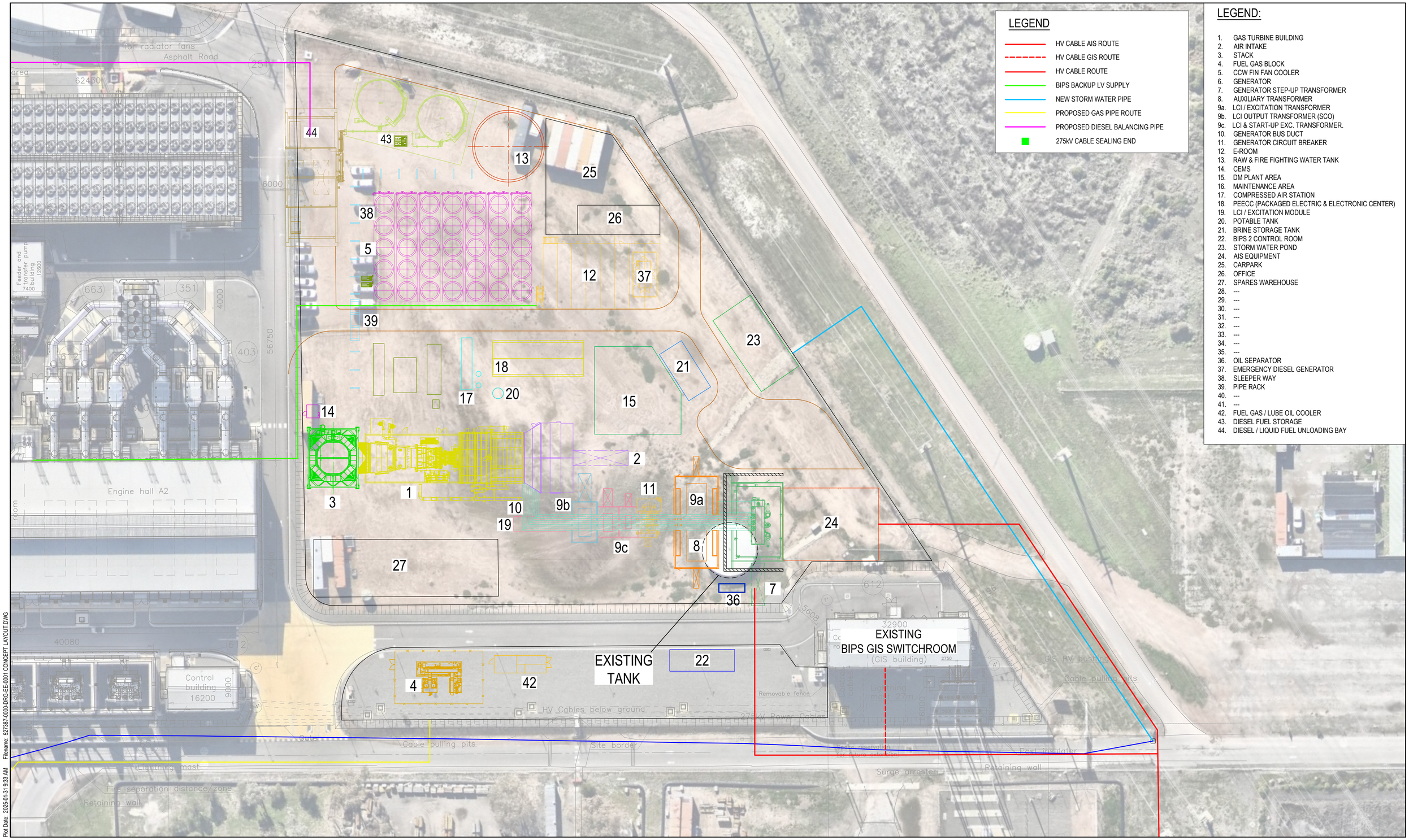

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REFERENCE DRAWINGS

REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
A.01	8/11/24	PRELIMINARY CONCEPT PLAN FOR REVIEW	A.01	A.SCHOLZ	M.FERRARO	J.ADEYEYE	A.THOMAS
A.02	20/01/25	UPDATED PROPOSED DIESEL PIPELINE ROUTE	A.02	D.JEFFERS	M.FERRARO	J.ADEYEYE	S.VADAPALLI
A.03	31/01/25	UPDATED LAYOUT	A.03	D.JEFFERS	M.FERRARO	J.ADEYEYE	S.VADAPALLI

1:400 4 0 8 16m

All written dimensions take precedence over scaled dimensions.

PREPARED BY

aurecon
www.aurecongroup.com

CERTIFICATION	No.	CERTIFIER	DATE

CLIENT

CLIENT DOCUMENT NUMBER	REV

Coordinate system GDA2020 Z54

Height datum AHD

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CONSTRUCTION STATUS

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWN BY A.SCHOLZ

DESIGNED BY M.FERRARO

STATUS	CODE
	W1

DOCUMENT STATE WORK IN PROGRESS

PROJECT

BARKER INLET POWER STATION
STAGE 2 (BIPS2) EXPANSION

TITLE

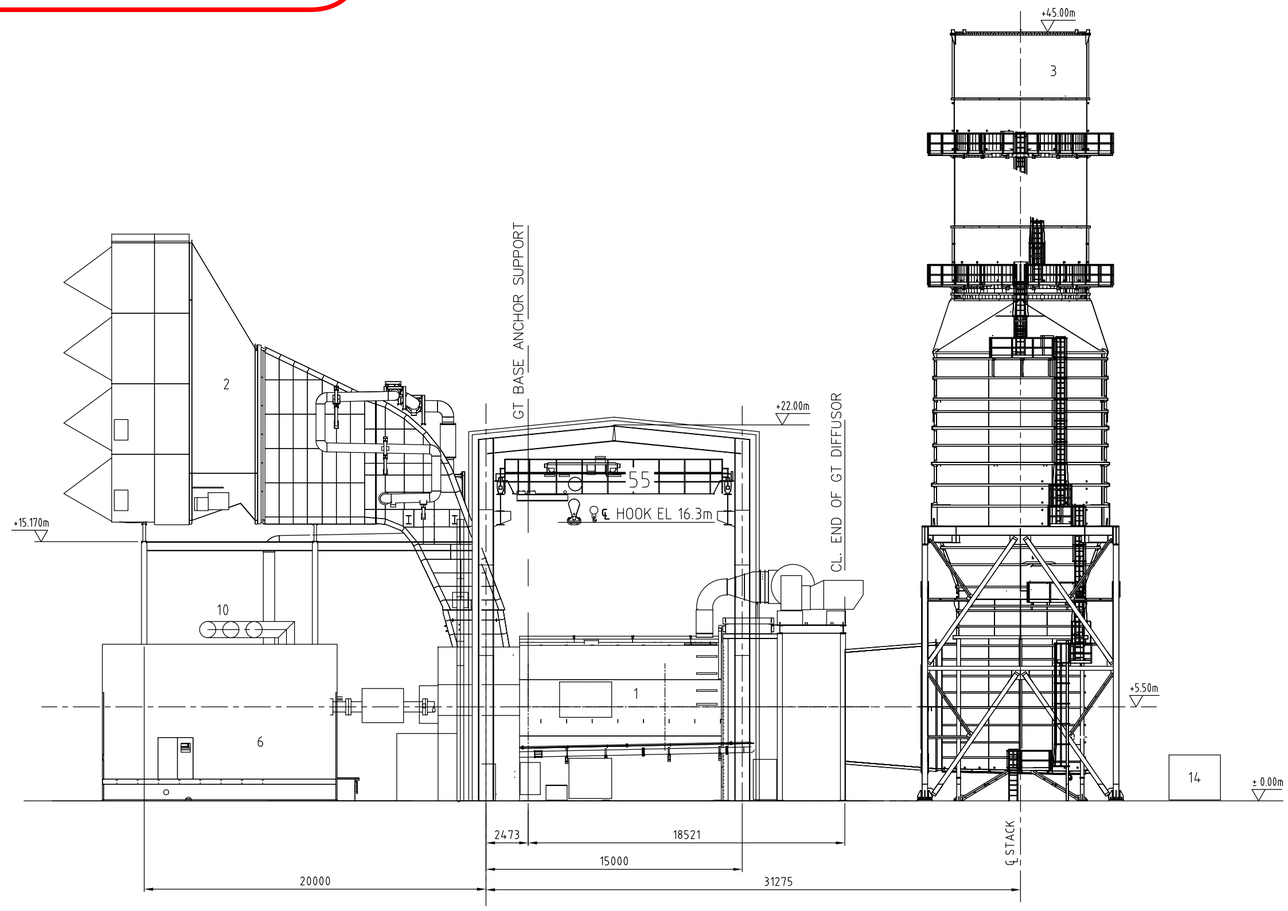
GENERAL ARRANGEMENT

DOCUMENT CODE

527387-0000-DRG-EE-0001

SCALE	SIZE	REFERENCE No.	REV
1:400	A1	EE-0001	A.03

TYPICAL



SCHNITT A–A

LEGEND:

	1	GAS TURBINE BUILDING
	2	AIR INTAKE
	3	STACK
×	4	FUEL GAS BLOCK
×	5	CCW FIN FAN COOLER
	6	GENERATOR
×	7	GENERATOR STEP-UP TRANSFORMER
×	8	AUXILIARY TRANSFORMER
×	9a	LCI / EXCITATION TRANSFORMER
×	9b	LCI OUTPUT TRANSFORMER (SCO)
×	9c	LCI & START-UP EXC.TRANSFORMER
	10	GENERATOR BUS DUCT
×	11	GENERATOR CIRCUIT BREAKER
×	12	E-ROOM
×	13	RAW & FIRE FIGHTING WATER TANK
	14	CEMS
×	15	FUEL GAS AREA
×	16	BLACK START DIESEL GENERATOR AREA
×	17	COMPRESSED AIR STATION
×	18	PEECC (PACKAGED ELECTRIC & ELECTRONIC CENTER)
×	19	LCI / EXCITATION MODULE

× NOT SHOWN ON THIS DRAWING

0 5 10 15 20m
Scale 1 : 250

Rev.	Rev. / Date	Created by	Checked by	Approved by	Description
A	2022-12-23	Yashraj Singh	S. Mukherjee	R. Morks	First Issue

Revision History

TYPICAL - FOR INFO ONLY

1x9F.04 Indoor

Project: REFERENCE				
Replaces	Derived from	Customer Code	KKS	
Responsible dept.: GPS/PSAE/AOP	Created by: Yashraj Singh	Checked by: S. Mukherjee	Approved by: R. Morks	
IPS Number: 1610753	Document Type: DRAWING	Scale: 1 : 250	Document Status: DRAFT	Format: A2
Legal Owner: GE Power	Title, Subtitle: GENERAL ARRANGEMENT POWER ISLAND SECTION		Identification number: ELA16358	
			Rev.: A / Date: 2022-12-23 / Lang.: E / Sheet: 1/1	

STATUS 2022-12-23

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THIS DRAWING IS NOT INTENDED FOR SCOPE DEMARCATION.

LEGEND

- HV CABLE GIS ROUTE
- BIPS BACKUP LV SUPPLY
- NEW STORM WATER PIPE
- EXISTING STORM WATER PIPE
- PROPOSED GAS PIPE ROUTE
- PROPOSED DIESEL BALANCING PIPE

LEGEND

1. GT UNIT AND AUXILIARIES EQUIPMENT
2. EMERGENCY DIESEL GENERATOR
3. MAIN LV ROOM
4. OFFICES
5. CARPARK
6. 30x12 SPARES SHED
7. COMPRESSED AIR SHED/BUILDING
8. RAW & FIRE FIGHTING WATER TANK
9. DIESEL FUEL STORAGE
10. DEMIN WATER TANK
11. WATER TREATMENT AREA
12. STORMWATER POND
13. FUEL GAS BLOCK
14. FUEL GAS/LUBE OIL COOLER
15. EXISTING BIPS GIS SWITCHROOM
16. DIESEL / LIQUID FUEL UNLOADING BAY
17. FIN FAN COOLERS
18. OILY WATER SEPARATOR

Crane for radiator fans
Asphalt Road
Feeder and transfer pump building 12000 7400
Engine hall A2
Control building 16200
Control room
Gas Insulated Substa (GIS building)
32900
2750
GIS HV bushing
Cable pulling pits
HV Cables below ground
275kV Power Cables
Removab e fence
Site border
Lightning mast
Fire separation distance/zone
Retaining wall
Surge arrester
Post insulator
Cable reservation for future extension
EXHAUST PLENUM GTA AXIS
62450
56750
47900
40080
56080
6000
4000
9000
27m

Plot Date: 2025-01-30 2:46 PM Filename: 527387-0000-DRG-EE-0004.DWG

REFERENCE DRAWINGS	REFERENCE MODELS

REV	DATE	REVISION DETAILS	REV	DRAWN	DESIGNED	VERIFIED	APPROVED
A.01	21/01/25	PRELIMINARY CONCEPT PLAN FOR REVIEW	A.01	D.JEFFERS	M.FERRARO	J.ADEYEYE	S.VADAPALLI

1:400 4 0 8 16m

All written dimensions take precedence over scaled dimensions.

PREPARED BY

aurecon
www.aurecongroup.com

CERTIFICATION	No.	CERTIFIER	DATE

CLIENT

CLIENT DOCUMENT NUMBER	REV

Coordinate system GDA2020 Z54
Height datum AHD

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CONSTRUCTION STATUS
PRELIMINARY NOT FOR CONSTRUCTION

DRAWN BY
D.JEFFERS

DESIGNED BY
M.FERRARO

STATUS	CODE
	W1

DOCUMENT STATE
WORK IN PROGRESS

PROJECT
BARKER INLET POWER STATION STAGE 2 (BIPS2) EXPANSION

TITLE
2 X 9E 04 GENERAL ARRANGEMENT

DOCUMENT CODE
527387-0000-DRG-EE-0004

SCALE	SIZE	REFERENCE No.	REV
1:400	A1	EE-0004	A.01

KEY PLAN

NOTE:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE NOTED.

REFERENCE DOCUMENTS :-

DRAWING NUMBER	TITLE
951200-08	GENERAL ARRANGEMENT - LM-XPRESS MAIN UNIT - REV. G

EQUIPMENT LIST:-

S.No	QTY	DESCRIPTION
1	6	LM6000 GAS TURBINE GENERATOR PACKAGE AND EXHAUST STACK
2	3	11.5/275KV 3 WINDING GENERATOR STEP UP TRANSFORMERS
3	1 SET	DEMINERALIZED WATER TREATMENT PLANT AND STORAGE TANK
4	3	LV POWER CONTROL AND LOCAL CONTROL ROOM

Rev.	Revision Date	Created by	Checked by	Approved by	Description
A	18/01/2024	D.DAY	R. ARUL	M. BENJAMIN	ISSUED FOR REVIEW

Revision History

Description Latest Revision :

Project: CLEANCO, AUSTRALIA

Cross Checked			
Department	Name	Date	Signature

Replaces	Scale	%		Document Code: –
Responsible dept.: –	Created by		Checked by	Approved by / Format: A0

Originator: GE POWER Gas Power Systems

Originator | Document Type | Document Status: PRELIMINARY

Title, Subtitle: PLANT LAYOUT 6 X LM6000 BIPS 2

Identification number: 1659562-LM6000-B

Rev.	Date	Lang.	Sheet
A	20-10-2023	En	1/1

GE Non-Public – (Class II) – NLR

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APPENDIX E
TREE ASSESSMENT

aecom.com

422 King William Street Adelaide SA 5000
M: 0408 715 005

5 May 2025

Our ref: 24ADL10154

AECOM
Level 18, 91 King William Street
Adelaide, Australia
T 1800 868 654

Attention: Tom Hateley

Dear Tom,

Barkers Inlet Power Station Amenity Tree Assessment

This letter details the results of an Amenity Tree Assessment undertaken by Eco Logical Australia (ELA) of the additional clearing required for the proposed variations to the approved Barkers Inlet Power Station (BIPS) located on Torrens Island, South Australia (the study area) for AGL (Figure 1). The study area is approximately 0.16 hectares and is mapped within the Native Vegetation Exempt area in accordance with the *Native Vegetation Act 1991* (NV Act), as such the variations proposed to the approved BIPS project to accommodate the updated design of the stage 2 BIPS (referred to as BIPS 2) is not subject to assessment under this act. Furthermore, the study area is located within the Regulated and Significant Tree Overlay in accordance with the *Planning, Development and Infrastructure Act 2016* (PDI Act) and the SA Planning and Design Code (the Code). Within the Planning and Design Code, Part 10 makes declarations for the purposes of the definition of regulated trees and the definition of significant trees under the PDI Act. ELA understands that AGL is lodging a Crown development application to vary development approval DA 010/V067/17 (Development Approval) granted on 29 January 2018 for the BIPS so as to accommodate the updated design of BIPS 2. This letter assess the additional clearing proposed as part of the variation to the approved BIPS project (Approved Project).

The variations proposed to the Approved Project relevantly include updates to the route of the underground cabling and a substation expansion which cannot avoid impacting the Tree Protection Zone (TPZ) of regulated and significant trees owing to site constraints. As a result, the proposed variation to the Development Approval will be required to assess the removal of the impacted trees.

Field investigation and results

A field investigation was undertaken by ELA Ecologist Lauren Heddle on 23 December 2024 to assess the presence of amenity vegetation, Significant or Regulated Trees and other ecological features within the study area. The study area was devoid of remnant native vegetation but did contain a number or large planted amenity trees of mixed provenance. As the study area is within the Regulated and Significant Tree overlay, all trees were assessed using a handheld tablet and a corrected GNSS Surveyor which provided spatial accuracy (within 1 m) to delineate and record spatially the following data for each amenity tree:

- Location
- Photo
- Tree species
- Date/Time
- Tree height
- Circumference at 1 m above ground level. Trunk diameter for single and multi-trunked individuals.

The circumference measurements were used to calculate the total circumference (m and mm), largest circumference (for multi-stemmed individuals) (m), average circumference (for multi-stemmed individuals) (mm) and diameter (m). These measurements were used in accordance with the definitions for the identification of Regulated and Significant Trees to determine which (if any) are Significant or Regulated. The definitions are in accordance with the *Planning, Development and Infrastructure (General) Regulations 2017 – Regulation 3F*:

- Regulated Tree:
  - a single trunk with a circumference of 1 metre or more - when measured 1 metre above natural ground level.
  - multiple trunks with a total circumference of 1 metre or more and an average circumference of 310 millimetres or more – when measured at 1 metre above natural ground level.
- Significant Tree:
  - a single trunk with a circumference of 2 metres or more measured at a point 1 metre above natural ground level.
  - multiple trunks with a total circumference of 2 metres or more and an average circumference of 625 millimetres or more when measured 1 metre above natural ground level.

The study area has previously been heavily cleared of native vegetation for construction and production of the AGL Power Station and as such only contains planted amenity trees and is devoid of native vegetation. The amenity trees recorded were in good condition and did not show signs of significant dieback.

A total of 43 individual amenity trees were recorded, all which are planted vegetation (Table 1, Table 2, Amenity trees recorded within the Study Area, Figure 2). Planted trees include *Casuarina glauca* (Swamp Sheoak), *Callistemon viminalis* (Weeping Bottlebrush) and *Melaleuca halmaturorum* (Swamp Paperbark). The understory stratum was dominated by exotic annual grasses.

One species recorded *Casuarina Glauca* (Swamp Oak) (Amenity Trees 1-22) is listed as a Declared Plant (Class 37) in South Australia under the LSA Act, see Appendix C:. Although some of these trees meet the size criteria for regulated trees (AT 18, AT19, AT20 & AT22) and significant trees (AT 4) as defined by the PDI Act, they are considered exempt from this declaration in accordance with 3F (4)-c of the *Planning, Development and Infrastructure (General) Regulations 2017* which states that:

- (4) Sub regulations (1) and (2) do not apply—
    - (c) to a tree belonging to a class of plants to which a declaration by the Minister under Part 9 Division 1 of the Landscape South Australia Act 2019 applies.

With the exclusion of *Casuarina glauca* individuals discussed earlier the study area was found to contain nine regulated trees (Table 1) that require application and approval by the Planning Commission following DA submission under the PDI Act.

The TPZ was calculated for each individual Amenity Tree and is the principal means for protecting trees on development sites (see Table 1, Amenity trees recorded within the Study Area and Figure 2). The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. To calculate the TPZ for each Amenity Tree the largest trunk for multi-stemmed individuals was used, along with the Diameter at Breast Height (DBH). The following formula was used to calculate the TPZ as per Section 3 in *AS 4970-2009 Protection of Trees on Development Sites:* TPZ = DBH x 12.

The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) x 12. Where DBH is the trunk diameter measured at 1.4 m above ground level (*AS 4970-2009*). As the proposed encroachment is greater than 10% of the TPZ, the project arborist must demonstrate that the trees would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods (as per Clause 3.3.4 in *AS 4970-2009*). The average trunk circumference (Amenity trees recorded within the Study Area) was only calculated for Amenity Trees which were multi-stemmed and had a total circumference of above 1 m, as these individuals had the possibility of being Regulated or Significant (as per the definition above from *AS 4970-2009*).

All Regulated Trees identified within the study area are summarised in Table 1, with information for all Amenity Trees shown in Table 2, Amenity trees recorded within the Study Area.

Table 1: Summary of Significant and Regulated Trees recorded within study area

Amenity Tree#	Species	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 31	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	2.10	Plate 12	-34.806105	138.5257652
AT 32	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	3.36	Plate 15	-34.806104	138.5258109
AT 33	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	2.29	Plate 10	-34.806176	138.5258125
AT 34	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	1.95	Plate 17	-34.806106	138.5256782
AT 35	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	2.52	Plate 3	-34.806117	138.5256905
AT 36	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	3.82	Plate 9	-34.806122	138.5256732
AT 37	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	2.29	Plate 11	-34.806184	138.5258308
AT 38	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	2.22	Plate 7	-34.80619	138.525821
AT 39	*Callistemon viminalis* (Weeping Bottlebrush)	Y - Regulated	3.02	Plate 1	-34.806185	138.5258219

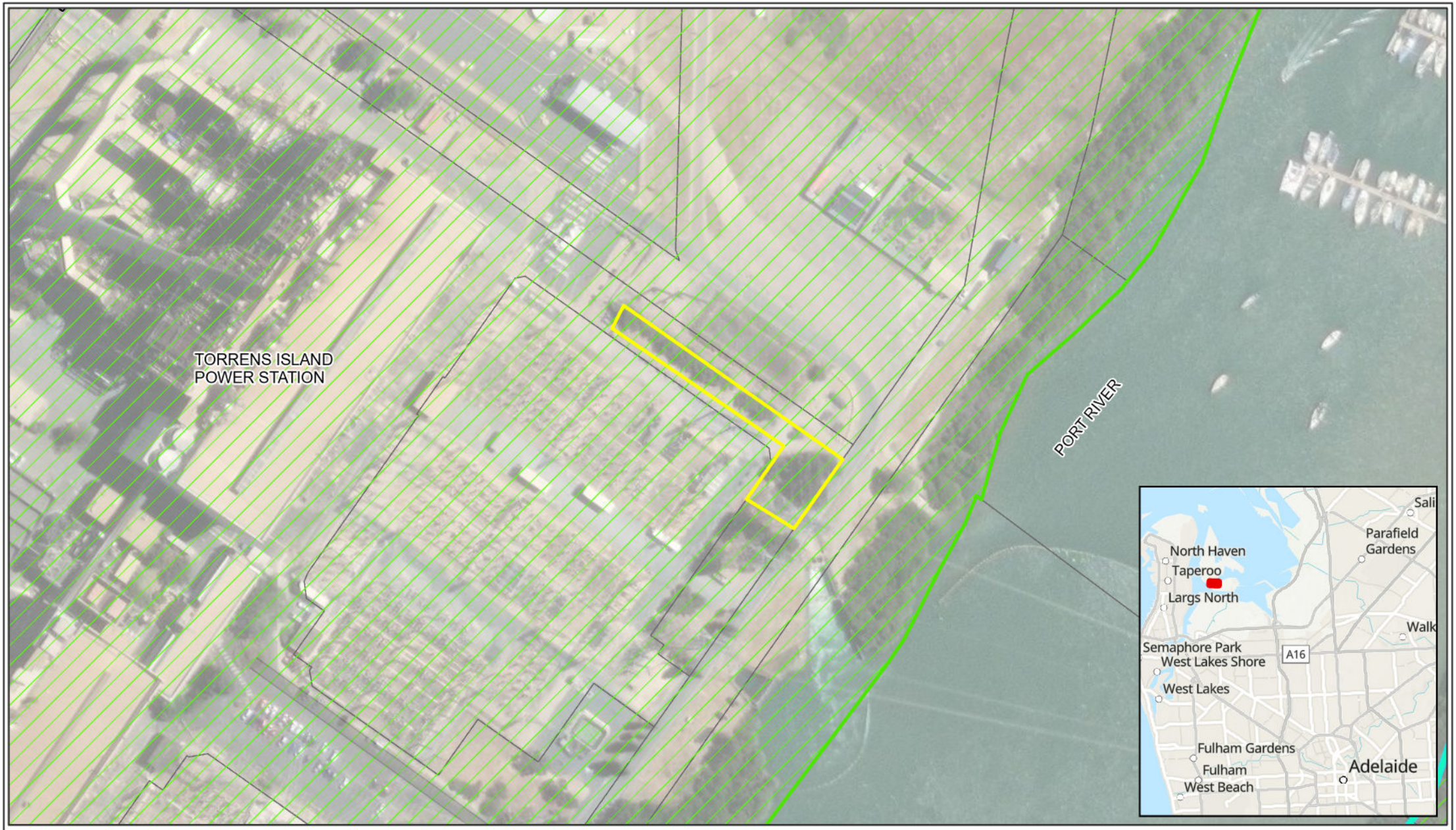

Figure 1 - Study Area

Study Area
Cadastre
NVA Exempt Land

0 15 30 60
Metres

Datum/Projection:
GDA 1994 MGA Zone 54
Project: 24ADL10154- AL Date: 1/16/2025

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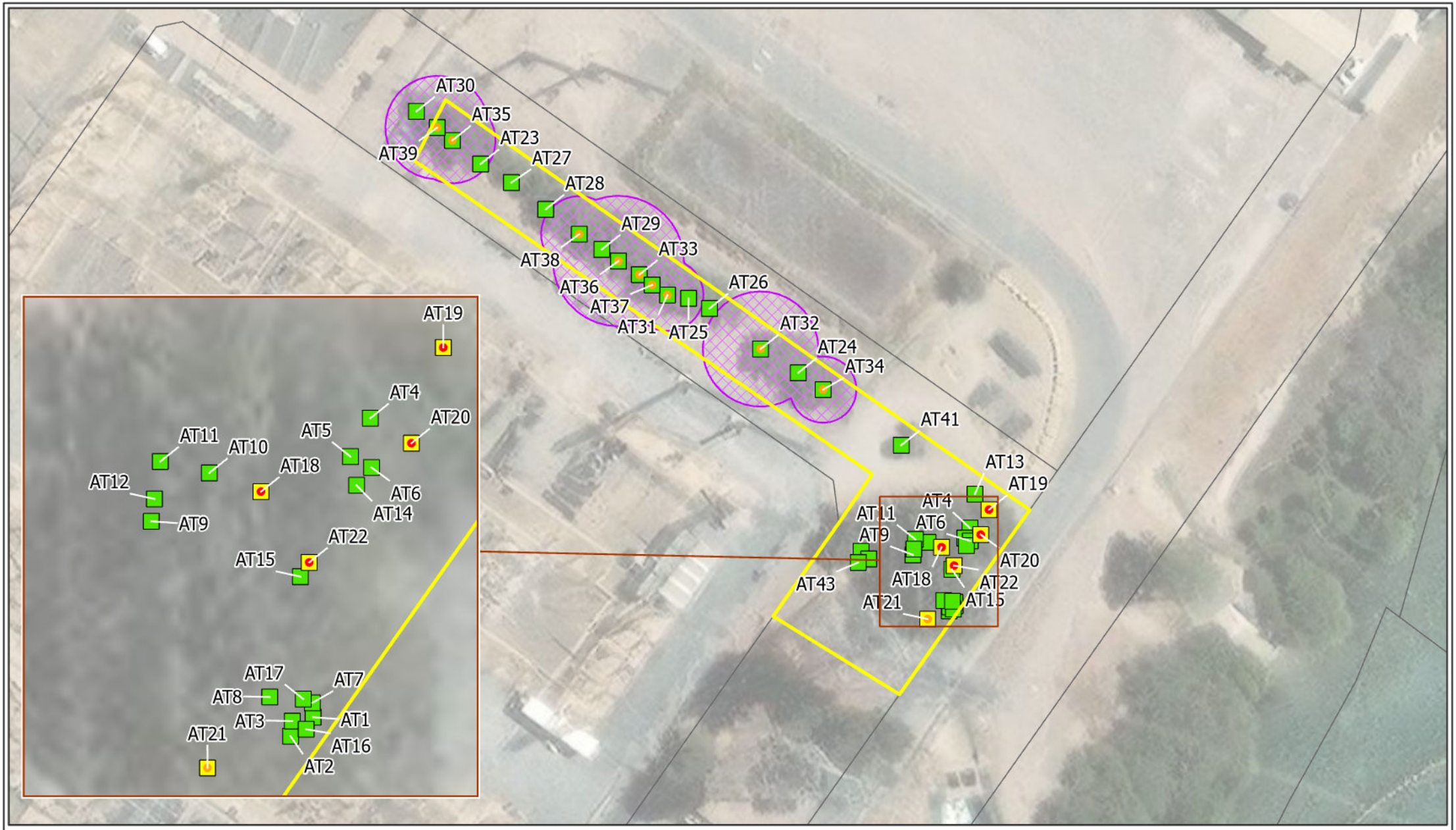

Figure 2 - Ecological features within the study area

- Study Area
- Cadastre
- Tree Protection Zone (Regulated/Significant Trees)
- Amenity Tree
- Amenity Tree (Regulated Tree - PDI Act / (General) Regulations 2017)
- Amenity Tree (Regulated - Exempt)
- Amenity Tree (Significant Tree - PDI Act / (General) Regulations 2017)
- Amenity Tree (Significant - Exempt)

0 5 10 20
Metres

Datum/Projection:
GDA 1994 MGA Zone 54
Project: 24ADL10154- AL Date: 1/17/2025

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Melaleuca halmaturorum (Swamp Paperbark) is native to South Australia (SA), Victoria (Vic) and Western Australia (WA), whereas *Casuarina glauca* (Swamp Sheoak) and *Callistemon viminalis* (Weeping Bottlebrush) are native to New South Wales (NSW) and *Callistemon viminalis* native to Queensland (QLD). However, all trees within the study area are planted which is evident by their linear row arrangement, proximity to the fence line and placement. Furthermore, the study area is outside the natural occurrence range for *Melaleuca halmaturorum* within SA which includes six major regions: Eyre Peninsula, Murray, Yorke Peninsula, Southern Lofty, Kangaroo Island and South-Eastern bioregions (Department of the Environment and Energy 2017). *Callistemon viminalis* (Weeping Bottlebrush) is a commonly cultivated species across SA, often used as a street tree or screening plant as it is extremely adaptable in cultivation and produces aesthetically pleasing red flowers. In the study area, it is likely to have been planted for amenity value and screening purposes. Within the study area it is evident that *Casuarina glauca* (Swamp Sheoak) has formed dense stands of trees due to their ability to sucker from their roots. This species has been widely planted across SA and is often cultivated as a street tree, to stabilise soil and across the agricultural zone for farm windbreaks and shelter. In the study area, it is likely to have been planted for amenity value and screening purposes.

Casuarina glauca is a declared species under the *Landscape South Australia Act 2019* (LSA Act) and was recorded within the study area. This species includes several biosecurity duties under the LSA Act for landowners within Green Adelaide Landscape Board region, comprising the following:

- Prohibited entry into the area
- Prohibited movement on public roads
- Prohibited sale of the plant
- Land owners to control the plant on their properties
- Recovery of control costs on adjoining road reserves

Discussion

The study area does not contain remnant native vegetation, nor does it warrant further assessment under the NV Act. The field investigation recorded nine regulated trees within the study area that will need to be assessed under DA.

The field investigation did not identify habitat for rated species or areas with high biodiversity value, therefore the proposed development will not result in impacts to native vegetation or threatened biota or their habitats.

High importance should be applied to *Casuarina glauca* (Swamp Sheoak), due to current size within and extending slightly outside the study area along the western roadside. ELA recommends complying with the LSA Act recommendations. As the LSA Act states that the movement of *Casuarina glauca* is prohibited on public roads, if the removal of this species is required it would be best to do so in two stages. ELA recommends this is completed by:

- Treating trees with an appropriate herbicide such as triclopyr (600g/L). Larger trees to be drilled and filled and smaller trees to be cut and swabbed.
- Removing dead trees offsite to a licenced green waste facility six to eight weeks after treatment. The six to eight week holding period ensures tree and root mass has died ensuring the patch can be felled and removed from site safely. The Green Adelaide Landscape Board does not provide any specific guidance on the allowed timelines for the removal of dead plant

material following poisoning. This advice was obtained from a Notice-of-Works for the *City of Marion* 2023 for a similar project removing *Casuarina glauca*.

If the removal of *Casuarina glauca* trees is not required for construction, ELA recommends these trees are managed to prevent further spread by following LSA Act recommendations of using herbicide such as triclopyr on suckers which can re-grow. This will require repeat control treatments.

Recommendations

The following recommendations have been made regarding the potential removal of planted amenity vegetation within the study area for the variations to the Approved Project:

- Assess updated project footprint and design to reduce and minimise potential impacts to regulated and significant trees.
- Seek approval for impacts to Regulated and significant trees as part of the proposed variation to the Development Approval under the PDI Act.

Following approval, the below may apply:

- Where excavation works occur for the proposed vegetation clearance and construction, root location and distribution should be identified through non-destructive investigation methods (pneumatic, hydraulic, hand digging etc) to minimise potential root impacts on trees being retained.
- Treat all state declared species with high importance on *Casuarina glauca* (Swamp Sheoak) recorded within the study area and in the area just outside along the roadside with herbicide and manual removal techniques, prior to construction. This process will require repeat treatments of suckering stems as this species will continue to sucker and spread if not controlled.

Regards,

Lauren Heddle
Ecologist

Appendix A: Amenity trees recorded within the Study Area

Table 2 Amenity Trees recorded within the Study Area

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 1	*Casuarina glauca* (Swamp Sheoak)	5	0.08	0.2, 0.25	0.45	0.25	Not calculated	N	0.95	Plate 27	-34.805517	138.5249978
AT 2	*Casuarina glauca* (Swamp Sheoak)	4	0.08	0.25	0.25	0.25	-	N	0.95	Plate 27	-34.805495	138.5249643
AT 3	*Casuarina glauca* (Swamp Sheoak)	4	0.16	0.1, 0.51	0.61	0.51	Not calculated	N	1.95	Plate 27	-34.805535	138.5250223
AT 4	*Casuarina glauca* (Swamp Sheoak)	4	0.07	0.21	0.21	0.21	-	N	0.80	Plate 22	-34.805568	138.5250678
AT 5	*Casuarina glauca* (Swamp Sheoak)	4	0.10	0.32	0.32	0.32	-	N	1.22	Plate 22	-34.805595	138.5251177

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 6	*Casuarina glauca* (Swamp Sheoak)	4	0.06	0.2	0.2	0.2	-	N	0.76	Plate 22	-34.805632	138.5251731
AT 7	*Casuarina glauca* (Swamp Sheoak)	5	0.10	0.3	0.3	0.3	-	N	1.15	Plate 27	-34.805667	138.5252273
AT 8	*Casuarina glauca* (Swamp Sheoak)	4	0.15	0.46	0.46	0.46	-	N	1.76	Plate 25	-34.805688	138.5252638
AT 9	*Casuarina glauca* (Swamp Sheoak)	5	0.14	0.45	0.45	0.45	-	N	1.72	Plate 24	-34.805705	138.5252907
AT 10	*Casuarina glauca* (Swamp Sheoak)	5	0.16	0.31, 0.51	0.82	0.51	Not calculated	N	1.95	Plate 24	-34.805724	138.5253245
AT 11	*Casuarina glauca* (Swamp Sheoak)	5	0.22	0.7	0.7	0.7	-	N	2.67	Plate 24	-34.805738	138.5253452

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 12	*Casuarina glauca* (Swamp Sheoak)	5	0.11	0.35	0.35	0.35	-	N	1.34	Plate 24	-34.805752	138.52537
AT 13	*Casuarina glauca* (Swamp Sheoak)	3	0.16	0.5	0.5	0.5	-	N	1.91	Plate 20	-34.805757	138.5254046
AT 14	*Casuarina glauca* (Swamp Sheoak)	4	0.14	0.45	0.45	0.45	-	N	1.72	Plate 22	-34.805772	138.5254388
AT 15	*Casuarina glauca* (Swamp Sheoak)	5	0.10	0.31	0.31	0.31	-	N	1.18	Plate 23	-34.805829	138.5255211
AT 16	*Casuarina glauca* (Swamp Sheoak)	4	0.08	0.25	0.25	0.25	-	N	0.95	Plate 27	-34.805862	138.5255821
AT 17	*Casuarina glauca* (Swamp Sheoak)	5	0.09	0.29	0.29	0.29	-	N	1.11	Plate 27	-34.805886	138.5256224

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 18	*Casuarina glauca* (Swamp Sheoak)	5	0.32	1, 0.3	1.3	**1**	**650**	N – AT (Regulated – **Exempt**)	3.82	Plate 24	-34.805964	138.5257487
AT 19	*Casuarina glauca* (Swamp Sheoak)	4	0.19	0.47, 0.6	1.07	**0.6**	**535**	N – AT (Regulated – **Exempt**)	2.29	Plate 19	-34.806054	138.5258905
AT 20	*Casuarina glauca* (Swamp Sheoak)	5	0.35	1.1	1.1	**1.1**	-	N – AT (Regulated – **Exempt**)	4.20	Plate 21	-34.806033	138.525868
AT 21	*Casuarina glauca* (Swamp Sheoak)	4	0.68	2.15	2.15	**2.15**	-	N – AT (Significant – **Exempt**)	8.21	Plate 28	-34.806088	138.5258758
AT 22	*Casuarina glauca* (Swamp Sheoak)	5	0.18	0.54, 0.55	1.09	**0.55**	**545**	N – AT (Regulated – **Exempt**)	2.10	Plate 23	-34.806079	138.5258585
AT 23	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.16	0.21, 0.51	0.72	0.51	-	N	1.95	Plate 4	-34.806092	138.5258496

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 24	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.13	0.12, 0.35, 0.42, 0.3, 0.19	1.38	0.42	276	N	1.60	Plate 16	-34.806096	138.5258585
AT 25	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.10	0.3, 0.3, 0.21, 0.25, 0.25, 0.25	1.56	0.3	260	N	1.15	Plate 13	-34.806102	138.5258519
AT 26	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.09	0.26, 0.2, 0.27	0.73	0.27	Not calculated	N	1.03	Plate 14	-34.806134	138.5258269
AT 27	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.11	0.36, 0.31	0.67	0.36	Not calculated	N	1.38	Plate 5	-34.806129	138.5258308
AT 28	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.11	0.22, 0.34, 0.19, 0.28	1.03	0.34	257.5	N	1.30	Plate 6	-34.806113	138.5257636
AT 29	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.12	0.37	0.37	0.37	-	N	1.41	Plate 8	-34.806097	138.525789

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 30	*Callistemon viminalis* (Weeping Bottlebrush)	2	0.03	0.1	0.1	0.1	-	N	0.38	Plate 2	-34.806092	138.5257681
AT 31	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.18	0.55, 0.25, 0.23, 0.41, 0.4	1.84	0.55	**368**	**Y - Regulated**	2.10	Plate 12	-34.806105	138.5257652
AT 32	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.28	0.32, 0.52, 0.88, 0.2	1.92	0.88	**480**	**Y - Regulated**	3.36	Plate 15	-34.806104	138.5258109
AT 33	*Callistemon viminalis* (Weeping Bottlebrush)	3.5	0.19	0.26, 0.41, 0.6, 0.32	1.59	0.6	**397.5**	**Y - Regulated**	2.29	Plate 10	-34.806176	138.5258125
AT 34	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.16	0.31, 0.21, 0.51, 0.26	1.29	0.51	**322.5**	**Y - Regulated**	1.95	Plate 17	-34.806106	138.5256782
AT 35	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.21	0.66, 0.33, 0.50, 0.36	1.85	0.66	**462.5**	**Y - Regulated**	2.52	Plate 3	-34.806117	138.5256905

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 36	*Callistemon viminalis* (Weeping Bottlebrush)	3.5	0.32	1, 0.45	1.45	**1**	**725**	**Y - Regulated**	3.82	Plate 9	-34.806122	138.5256732
AT 37	*Callistemon viminalis* (Weeping Bottlebrush)	3.5	0.19	0.52, 0.32, 0.6	1.44	0.6	**480**	**Y - Regulated**	2.29	Plate 11	-34.806184	138.5258308
AT 38	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.18	0.44, 0.29, 0.58, 0.13	1.44	0.58	**360**	**Y - Regulated**	2.22	Plate 7	-34.80619	138.525821
AT 39	*Callistemon viminalis* (Weeping Bottlebrush)	3	0.25	0.79, 0.37, 0.10, 0.52	1.78	0.79	**445**	**Y - Regulated**	3.02	Plate 1	-34.806185	138.5258219
AT 40	*Melaleuca halmaturorum* (Swamp Paperbark)	3	0.10	0.17, 0.09, 0.28, 0.25, 0.4, 0.22, 0.1, 0.32, 0.22	2.05	0.32	228	N	1.22	Plate 26	-34.806179	138.5258307
AT 41	*Melaleuca halmaturorum* (Swamp Paperbark)	2	0.07	0.05, 0.05, 0.22, 0.05, 0.21, 0.15, 0.2	0.93	0.22	Not calculated	N	0.84	Plate 18	-34.806188	138.5258277

Amenity Tree#	Species	Height (m)	DBH (m)	Circumference (m)	Total circumference (m)	Largest circumference (m)	Average circumference (mm) (multi-stemmed individuals)	Regulated or Significant	TPZ Radius (m)	Photo	Latitude	Longitude
AT 42	*Melaleuca halmaturorum* (Swamp Paperbark)	3	0.10	0.32, 0.1, 0.25, 0.24, 0.05, 0.31	1.27	0.32	212	N	1.22	Plate 26	-34.806177	138.5258268
AT 43	*Melaleuca halmaturorum* (Swamp Paperbark)	3	0.10	0.05, 0.05, 0.3	0.4	0.3	-	N	1.15	Plate 26	-34.806201	138.5257851

Appendix B: Photo Plates of Amenity trees

Plate 1
AT 39 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 2
AT 30 *Callistemon viminalis* (Weeping Bottlebrush).

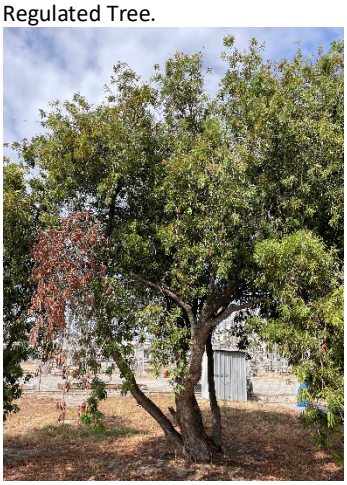

Plate 3
AT 35 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 4
AT 23 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 5
AT 27 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 6
AT 28 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 7
AT 38 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 8
AT 29 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 9
Callistemon viminalis (Weeping Bottlebrush). Regulated Tree.

Plate 10
AT 33 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 11
AT 37 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 12
AT 31 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 13
AT 25 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 14
26 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 15
AT 32 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

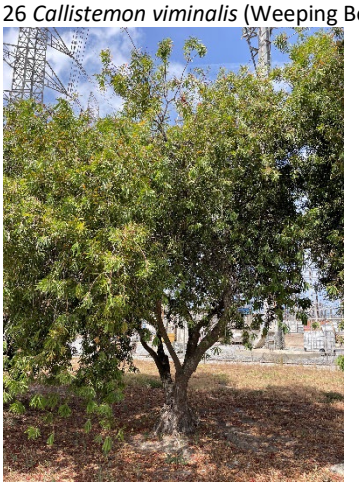

Plate 16
AT 24 *Callistemon viminalis* (Weeping Bottlebrush).

Plate 17
AT 34 *Callistemon viminalis* (Weeping Bottlebrush). Regulated Tree.

Plate 18
AT 41 *Melaleuca halmaturorum* (Swamp Paperbark).

Plate 19
AT 19 *Casuarina glauca* (Swamp Sheoak). Regulated tree - Exempt.

Plate 20
AT 13 *Casuarina glauca* (Swamp Sheoak).

Plate 21
AT 20 *Casuarina glauca* (Swamp Sheoak). Regulated tree - Exempt.

Plate 22
AT 4, 5, 6, 14 *Casuarina glauca* (Swamp Sheoak).

Plate 23
AT 15, 22 *Casuarina glauca* (Swamp Sheoak). AT 22 is a Regulated tree - Exempt.

Plate 24
AT 9, 10, 11, 12, 18 *Casuarina glauca* (Swamp Sheoak). AT 18 is a Regulated tree - Exempt.

Plate 25
AT 8 *Casuarina glauca* (Swamp Sheoak).

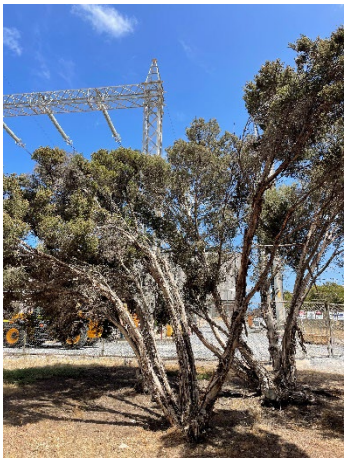

Plate 26
AT 40, 42, 43 *Melaleuca halmaturorum* (Swamp Paperbark).

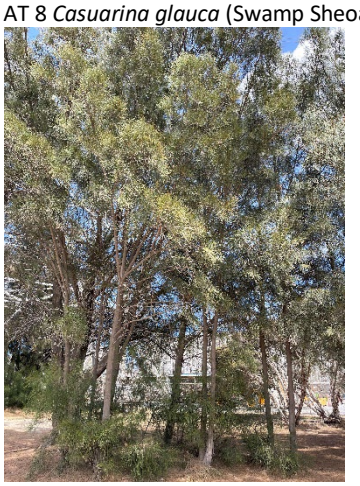

Plate 27
AT 1, 2, 3, 7, 16, 17 *Casuarina glauca* (Swamp Sheoak).

Plate 28
AT 21 *Casuarina glauca* (Swamp Sheoak). Significant Tree - Exempt.

Appendix C: Landscape South Australia act 2019 - List of Declared Plants

LANDSCAPE SOUTH AUSTRALIA ACT 2019

List of Declared Plants

PURSUANT to section 185(1) of the *Landscape South Australia Act 2019* (the Act), I, David Speirs MP, Minister for Environment and Water, declare provisions of the Act apply to specified plants in specified declared areas as follows:

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 1 *Alternanthera pungens* khaki weed *Alternanthera philoxeroides* alligator weed *Amelichloa brachychaeta* espartillo *Amelichloa caudata* broad-kernel espartillo *Cortaderia richardii* toe toe *Cuscuta campestris* golden dodder *Cuscuta planiflora* red dodder *Cuscuta suaveolens* Chilean dodder *Cuscuta*, all non-native species not specifically referred to in this schedule dodders *Equisetum* spp. horsetails (excluding dead shoots) *Gymnocoronis spilanthoides* Senegal tea plant *Jarava plumosa* plumerillo *Ludwigia peruviana* primrose willow *Nassella hyalina* cane needlegrass *Nassella tenuissima* Mexican feathergrass *Nassella trichotoma* serrated tussock *Orobanche* spp. (excluding *Orobanche cernua* var. *australiana* , *Orobanche minor* and *Orobanche ramosa*) broomrapes *Parkinsonia aculeata* parkinsonia *Parthenium hysterophorus* parthenium weed *Prosopis* spp. mesquite (excluding seasoned dry timber)	186(1)(2), 188(1)(2), 190(1)(2)(3), 192(1), 194	1	The whole of the State.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
Ranunculus sceleratus poison buttercup *Rubus laudatus* Bundy blackberry *Sagittaria montevidensis* giant arrowhead			
CLASS 2 *Cabomba caroliniana* cabomba *Egeria densa* leafy elodea *Eichhornia crassipes* water hyacinth *Elodea canadensis* elodea *Hydrocotyle ranunculoides* hydrocotyle *Lagarosiphon major* lagarosiphon *Myriophyllum spicatum* Eurasian water-milfoil *Sagittaria platyphylla* sagittaria, arrowhead *Salvinia* spp. salvinia *Stratiotes aloides* water soldier *Trapa natans* water caltrop	186(1)(2), 188(1)(2), 190(1)(2)(3), 192(1)	1	The whole of the State.
CLASS 3 *Orobanche ramosa* branched broomrape	186(1)(2), 188(1)(2), 190(1)(2)(3), 194 192(1) 192(2)	1	The whole of the State. The areas of the, Alinytjara Wilurara, Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, South Australian Arid Lands and Limestone Coast Regions. The area of the Murraylands and Riverland Region.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 4			
Nassella leucotricha Texas needlegrass	186(1)(2), 188(1)(2), 190(1)(2)(3), 192(1), 194	1	The whole of the State.
Nassella neesiana Chilean needlegrass	186(3)		The areas of the Green Adelaide, Hills and Fleurieu, and Murraylands and Riverland Regions.
CLASS 5			
Malvella leprosa alkali sida	186(1)(2), 188(1)(2), 192(1), 194	1	The whole of the State.
	190(1)(2)(3)		The areas of the Alinytjara Wilurara, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, South Australian Arid Lands, Murraylands and Riverland and Limestone Coast Regions.
CLASS 6			
Cirsium arvense perennial thistle	186(1)(2), 188(1)(2)	1	The whole of the State
Senecio jacobaea ragwort	190(1)(2)(3)		The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland and Limestone Coast Regions.
	192(1), 194		The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland and Limestone Coast Regions.
CLASS 7			
Vachellia nilotica subsp. *indica* prickly acacia	186(1)(2), 188(1)(2), 190(1)(2)(3)	1	The whole of the State.
	192 (1)		The areas of the Alinytjara Wilurara and South Australian Arid Lands Regions.
CLASS 8			
Orobanche minor clover broomrape	186(1)(2), 188(1)(2)	1	The whole of the State.
CLASS 9			
Bassia scoparia (excluding the cultivar 'Trichophylla') kochia	186(1)(2), 188(1)(2), 192(1), 194	2	The whole of the State.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 10 *Senecio madagascariensis* fireweed	186(1)(2), 188(1)(2) 192(1), 194	2	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland and Limestone Coast Regions.
CLASS 11 *Chorispora tenella* blue mustard *Cortaderia* (all species except *Cortaderia richardii)* pampas grasses	186(1)(2), 188(1)(2), 190(1)(2)(3), 192(2), 194	2	The whole of the State.
CLASS 12 *Hyparrhenia hirta* Coolatai grass	186(2), 188(1)(2), 190(1)(2)(3), 192(2), 194	2	The whole of the State.
CLASS 13 *Solanum elaeagnifolium* silverleaf nightshade	186(2), 188(1)(2), 192(2), 194 190(1)	2	The whole of the State. The area of the Limestone Coast Region.
CLASS 14 *Rhaponticum repens* creeping knapweed	186(2), 188(1)(2), 192(2), 194 190(1)	2	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland and Limestone Coast Regions.
CLASS 15 *Xanthium strumarium* Noogoora burr complex	186(1)(2), 188(1)(2), 192(2), 194 190(1)	2	The whole of the State. The area of the South Australian Arid Lands Region.
CLASS 16 *Peganum harmala* African rue	186(2), 188(1)(2), 192(2), 194	2	The whole of the State.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
	190(1)		The areas of the South Australian Arid Lands and Murraylands and Riverland Regions.
CLASS 17 *Cenchrus ciliaris* and *Cenchrus pennisetiformis* buffel grass	186(1)(2), 188(1)(2), 194 190(1)(2)(3) 192(1) 192(2)	2	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions. The areas of the Alinytjara Wilurara, Northern and Yorke, and South Australian Arid Lands Regions.
CLASS 18 *Chrysanthemoides monilifera* boneseed *Cylindropuntia* spp. cholla, Hudson pear and rope cactus *Opuntia* spp. (excluding spineless *Opuntia ficus-indica*) and *Tephrocactus* spp. prickly pear *Polygala myrtifolia* polygala	186(1)(2), 188(1)(2), 192(2), 194	2	The whole of the State.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 19 *Ambrosia* spp. perennial ragweed *Asparagus asparagoides* bridal creeper *Asparagus declinatus* bridal veil *Cenchrus longispinus* and *Cenchrus spinifex* innocent weed *Chondrilla juncea* skeleton weed *Lycium ferocissimum* African boxthorn *Oncosiphon suffruticosum* Calomba daisy *Reseda lutea* cutleaf mignonette *Silene vulgaris* bladder campion *Tribulus terrestris* caltrop *Ulex europaeus* gorse; furze *Xanthium spinosum* Bathurst burr	186(2), 188(1)(2), 192(2), 194	2	The whole of the State.
CLASS 20 *Asparagus scandens* asparagus fern	186(1)(2), 188(1)(2) 192(2), 194	2	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Murraylands and Riverland and Limestone Coast Regions.
CLASS 21 *Lepidium draba* hoary cress *Moraea flaccida* one-leaf Cape tulip *Moraea miniata* two-leaf Cape tulip	186(2), 188(1)(2), 192(2), 194	2	The whole of the State. The area of the Alinytjara Wilurara, Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 22			
Allium vineale field garlic	186(2), 188(1)(2)	2	The whole of the State.
	192(2)		The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
	194		The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 23			
Rubus fruticosus sp. agg. blackberry excluding a) any detached fruit b) the following cultivars when planted and maintained for domestic or commercial purposes under conditions approved by the Minister: i. 'Black Satin' ii. 'Dirksen Thornless' iii. 'Smoothstem' iv. 'Thornfree' v. 'Loch Ness' vi. 'Chester Thornless'	186(1)(2), 188(1)(2)	2	The whole of the State.
	192(2), 194		The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 24			
Rosa canina dog rose	186(2), 188(1)(2)	2	The whole of the State.
	192(2), 194		The areas of the Green Adelaide, Hills and Fleurieu, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 25			
Rosa rubiginosa sweet briar	186(2), 188(1)(2)	2	The whole of the State.
	192(2), 194		The areas of the Green Adelaide, Hills and Fleurieu, Murraylands and Riverland, and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 26			
Amsinckia spp. yellow burrweed	186(2), 188(1)(2)	2	The whole of the State.
Diplotaxis tenuifolia Lincoln weed (excluding plants grown as a commercial crop or in domestic vegetable gardens, and leaves or shoots harvested as a vegetable)	192(2), 194		The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
Genista linifolia flax-leaf broom			
Genista monspessulana Cape broom; Montpellier broom			
CLASS 27			
Olea europaea olive (not planted, used and maintained for domestic, public amenity or commercial purposes)	192(2)(3), 194	2	The whole of the State.
CLASS 28			
Anredera cordifolia Madeira vine	186(1)(2), 188(1)(2)	2	The whole of the State.
Asparagus aethiopicus ground asparagus (excluding the cultivar 'Myersii')			
Asparagus africanus ornamental asparagus			
Asparagus plumosus climbing asparagus fern			
Distichlis spicata 'Nypa Reclamation' and any cultivars of *Distichlis spicata* consisting of lines that include seedbearing individuals. distichlis			
Dolichandra unguis-cati cats claw creeper			
Hieracium aurantiacum orange hawkweed			
CLASS 29			
Austrocylindropuntia spp.	188(1)	2	The whole of the State.
CLASS 30			
Toxicodendron succedaneum rhus tree	186(1)(2), 188(1)(2), 192(1)	3	The whole of the State.
CLASS 31			
Toxicodendron radicans poison ivy	186(1)(2), 188(1)(2), 190(1)(2)(3), 192(1)	3	The whole of the State.
CLASS 32			

Plants	Provisions of Act Which are to Apply	Category	Declared Area
Oenanthe pimpinelloides water-dropwort	186(2), 188(1)(2), 192(2), 194 190(1)(2)(3)	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 33 *Trachyandra divaricata* dune onionweed	186(2), 188(1)(2) 192(1), 194	3	The whole of the State. The area of the Green Adelaide and Hills and Fleurieu Regions.
CLASS 34 *Eragrostis curvula* (excluding the cultivar 'Consol') African lovegrass	186(2), 188(1)(2), 192(2), 194	3	The whole of the State.
CLASS 35 *Crataegus monogyna* may; hawthorn	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu and Kangaroo Island Regions.
CLASS 36 *Crataegus sinaica* azarola	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu and Limestone Coast Regions.
CLASS 37 *Casuarina glauca* and *Casuarina obesa* swamp oak excluding the cultivars: 'CAS01' (marketed as Free Fall™) 'Cousin It'	186(1)(2), 188(1) 192(2), 194	3	The whole of the State. The area of the Green Adelaide and Hills and Fleurieu Regions.
CLASS 38 *Marrubium vulgare* horehound	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Alinytjara Wilurara, Eyre Peninsula, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 39			
Emex australis three-corner jack	186(1)(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Alinytjara Wilurara, Eyre Peninsula, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 40			
Echium plantagineum salvation Jane	186(2), 188(1)(2) 190(1) 192(2) 194	3	The whole of the State. The area of the Kangaroo Island Region. The areas of the Alinytjara Wilurara, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 41			
Cynara cardunculus wild artichoke (excluding plants grown as a commercial crop or in domestic vegetable gardens, and artichokes harvested for use as a vegetable)	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island and Northern and Yorke Regions.
CLASS 42			
Orbea variegata carrion flower	186(1)(2), 188(1)(2) 192(2)	3	The whole of the State. The areas of the Alinytjara Wilurara and Eyre Peninsula Regions.
CLASS 43			
Cenchrus setaceus fountain grass	186(1)(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Alinytjara Wilurara, Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Murraylands and Riverland, and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 44			
Cenchrus macrourus African feathergrass	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 45			
Cytisus scoparius English broom; Scotch broom	186(2), 188(1)(2) 190(1) 192(2). 194	3	The whole of the State. The area of the Kangaroo Island Region. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 46			
Euphorbia terracina false caper *Solanum linnaeanum* apple-of-Sodom	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, and Limestone Coast Regions.
CLASS 47			
Pinus halepensis Aleppo pine (not planted and maintained for amenity or commercial purposes)	186(2), 188(1) 192(2), 194	2	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Northern and Yorke, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 48			
Convolvulus arvensis field bindweed *Cyperus rotundus* nutgrass	186(2), 188(1)(2) 192(1), 194	3	The whole of the State. The area of any land in the State used for the extraction or removal of soil, loam, sand or gravel.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 49 *Tamarix parviflora* and *Tamarix ramosissima* tamarisks	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Northern and Yorke, South Australian Arid Lands and Murraylands and Riverland Regions.
CLASS 50 *Tamarix aphylla* athel pine	186(2),188(1)(2) 192 (2), 194	3	The whole of the State. The areas of any lands within 100 metres of a watercourse in the whole of the State.
CLASS 51 *Watsonia meriana* var. *bulbillifera* bulbil watsonia	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island, and Limestone Coast Regions.
CLASS 52 *Allium triquetrum* three-cornered garlic *Erica arborea* tree heath	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The area of the Green Adelaide and Hills and Fleurieu Regions.
CLASS 53 *Leptospermum laevigatum* coastal tea-tree excluding the cultivars ‘Fore Shore’ and ‘Shore Tuff’ *Silybum marianum* variegated thistle	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Kangaroo Island and Limestone Coast Regions.
CLASS 54 *Dipogon lignosus* dolichos pea	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 55 *Retama monosperma* and *Retama raetam* white weeping brooms	186(1)(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Alinytjara Wilurara, Eyre Peninsula, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 56 *Juncus acutus* spiny rush *Salix nigra* black willow *Salix fragilis* and *Salix rubens* crack willow *Salix calodendron, Salix caprea, Salix cinerea* and *Salix reichardtii* goat willows all hybrids between *Salix alba* and *Salix matsudana* matsudana hybrid willows	186(1)(2), 188(1)(2) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu, Murraylands and Riverland, and Limestone Coast Regions.
CLASS 57 *Zantedeschia aethiopica* arum lily (excluding cut flowering stems, and arum lilies planted and maintained more than 100m from any wetland or watercourse for domestic or commercial purposes)	186(2), 188(1) 192(2), 194	3	The whole of the State. The area of the Green Adelaide and Hills and Fleurieu Regions.
CLASS 58 *Acer negundo* box elder excluding the cultivar ‘Sensation’	188(1) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu and Murraylands and Riverland Regions
CLASS 59 *Fraxinus angustifolia* desert ash excluding the cultivar 'Raywood'	188(1) 192(2), 194	3	The whole of the State. The areas of the Green Adelaide, Hills and Fleurieu and Kangaroo Island Regions.
CLASS 60 *Erica baccans* berry heath (excluding cut flowering stems)	186(2), 188(1)(2) 192(2), 194	3	The whole of the State. The area of the Green Adelaide, Hills and Fleurieu and Limestone Coast Regions.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 61			
Gazania spp. gazania excluding the cultivars: 'Sugaja' (sold as Sunset Jane™) 'Sugamo' (sold as Montezuma™) 'GT20' (sold as Double Gold™)	186(1)(2), 188(1)(2) 192(2), 194	3	The whole of the State. The area of the Green Adelaide, Hills and Fleurieu and Limestone Coast Regions.
CLASS 62			
Alisma lanceolatum alisma	186(2), 188(1)(2)	3	The whole of the State.
Myriophyllum aquaticum parrot feather	192(2)		The areas of the Green Adelaide, Hills and Fleurieu and Murraylands and Riverland Regions.
CLASS 63			
Rhamnus alaternus Italian buckthorn	188(1)(2) 192(2) 194	3	The whole of the State. The areas of the Eyre Peninsula, Green Adelaide, Hills and Fleurieu, Kangaroo Island, Murraylands and Riverland, and Limestone Coast Regions. The area of the Limestone Coast Region.
CLASS 64			
Billardiera fusiformis and *Billardiera heterophylla* bluebell creepers	188(1)(2)	3	The whole of the State.
Pittosporum undulatum sweet pittosporum	192(2), 194		The areas of the Green Adelaide, Hills and Fleurieu, Kangaroo Island and Limestone Coast Regions.
CLASS 65			
Coprosma repens mirror bush (excluding any named cultivars)	188(1) 192(2)	3	The whole of the State. The area of Green Adelaide and Hills and Fleurieu Regions.
CLASS 66			
Bifora testiculata bifora	186(1)(2), 188(1)(2)	3	The whole of the State.
Galium tricornutum three-horned bedstraw	190(1)		The area of the Eyre Peninsula Region.

Plants	Provisions of Act Which are to Apply	Category	Declared Area
CLASS 67 *Arundo donax* giant reed	186(2), 188(1), 191(3)	2	The whole of the State.
CLASS 68 *Andropogon gayanus* gamba grass *Annona glabra* pond apple *Cryptostegia grandiflora* rubber vine *Hymenachne amplexicaulis* and *Hymenachne calamitosa* hymenachne *Jatropha gossypiifolia* bellyache bush *Lantana camara* common lantana *Matthiola longipetala* nightstock *Miconia* spp. miconia *Mimosa pigra* mimosa *Myagrum perfoliatum* muskweed *Striga* spp., excluding *Striga curviflora, Striga multiflora, Striga parviflora* and *Striga squamigera* witchweeds	186(1)(2), 188(1)(2)	3	The whole of the State.
CLASS 69 *Salix* subgenus *Caprisalix,* excluding *Salix calodendron, Salix caprea, Salix cinerea* and *Salix reichardtii* goat willows Salix subgenus Salix, excluding *Salix babylonica, Salix fragilis, Salix nigra, Salix pendulina, Salix rubens, Salix sepulcralis,* and all hybrids between *Salix alba* and *Salix matsudana* willows	188(1)	3	The whole of the State.

Dated: 23 July 2020

DAVID SPEIRS MP
Minister for Environment and Water

Legislative History

Issue	Date of Operation	Date Gazetted	Page No(s)
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Animals – Vary Class 16, in relation to deer	4 December 2020	4 December 2020	No. 93, 5547

APPENDIX F
AIR QUALITY ASSESSMENT

aecom.com

Barker Inlet Power Station - Stage 2 Variation

Air Quality Impact Assessment

PREPARED FOR

DATE
3 June 2025

REFERENCE
0748611

DOCUMENT DETAILS

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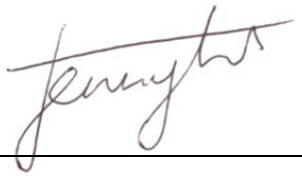
Barker Inlet Power Station - Stage 2 Variation

Air Quality Impact Assessment

0748611



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ACRONYMS AND ABBREVIATIONS

Acronym	Description
AD	Aeroderivative gas turbine (plant option)
ADO	Automotive Diesel Oil
Air EPP	Environment Protection (Air Quality) Policy 2016
AQIA	Air quality impact assessment
AQMS	Air quality monitoring station
AWS	Automatic weather station
BIPS	Barker Inlet Power Station
BIPS 1	Barker Inlet Power Station – Stage 1
BIPS 2	Barker Inlet Power Station – Stage 2
BoM	Bureau of Meteorology
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2-e	Carbon dioxide equivalent
DA	Development Approval
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DO	Distillate oil
E1	E-class gas turbine – Plant option 1 (150 MW)
E2	E-class gas turbine – Plant option 2 (200 MW)
F1	F-class gas turbine – Plant option 1 (280 MW)
F2	F-class gas turbine – Plant option 2 (330 MW)
GHG	Greenhouse gas
GHGA	Greenhouse gas assessment
GJ	Gigajoule
GW	Gigawatt
GWh	Gigawatt hour
HHV	Higher heating value
LHV	Lower heating value
mAGL	Metres (elevation) - above ground level
mAHD	Metres (elevation) - Australian height datum
MW	Megawatt
MW_{th}	Megawatt (thermal basis)
MWh	Megawatt hour
NCAR	National Centre for Atmospheric Research

Acronym	Description
NG	Natural gas
NO	Nitric Oxide
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
NO_x	Oxides of nitrogen
O_2	Oxygen
OLM	Ozone limiting method
PAHs	Polycyclic aromatic hydrocarbons
PEF	Potency equivalent factor
PM	Particulate matter
$PM_{2.5}$	Particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}	Particulate matter less than 10 microns in aerodynamic diameter
PS1	Plant Scenario 1 – BIPS 2 (modelled in isolation)
PS2	Plant Scenario 2 – BIPS 2 + BIPS 1
PS3	Plant Scenario 3 – BIPS 2 + BIPS 1 + TIPS B
RAAF	Royal Australian Air Force
RE	Reciprocating engine (plant option)
RFI	Request for information
SA EPA	South Australian Environment Protection Authority
SO_2	Sulphur dioxide
TIPS	Torrens Island Power Station
TIPS A	Torrens Island Power Station – A Station
TIPS B	Torrens Island Power Station – B Station
µg/m³	Micrograms per cubic metre
WRF	Weather Research and Forecast model (developed by US National Centre for Atmospheric Research)

EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM), was commissioned by AECOM Australia Pty Ltd (AECOM) to prepare an air quality impact assessment (AQIA) for the proposed variation of the existing Development Approval (DA) for the AGL Barker Inlet Power Station (BIPS). AGL are seeking to modify the DA to permit a wider range of plant options for Stage 2 of the BIPS (BIPS 2), including:

- to enable BIPS 2 to use either gas turbines or reciprocating engines (instead of reciprocating engines only as currently approved); and
- to increase the proposed output of BIPS 2 to up to 280 MW (instead of the currently approved 210 MW).

ERM (formerly Pacific Environment) prepared the initial BIPS air quality assessment that forms part of the existing DA (PEL, 2017a). Where relevant, this AQIA has been prepared to align with the PEL (2017a), whilst incorporating updates to the methodologies, including:

- Updated meteorological and background air quality datasets that reflect current state of practice and ambient air quality within the Adelaide airshed;
- Assessment against the updated nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) ambient air quality standards which are specified in the *Environment Protection (Air Quality) Policy 2016* (SA, 2023) ('the Air EPP'); and
- Changes to local emission sources, including the retirement of Torrens Island Power Station A (TIPS A), the reduced operation of Torrens Island Power Station B (TIPS B), and operation of BIPS 1.

ERM undertook a review of manufacturer emission data for a total of 6 plant options, inclusive of gas turbine and reciprocating engine technologies. This data was compiled to provide an emission inventory for sources considered in the variation.

Atmospheric dispersion modelling was performed for the 2023 calendar year using the CALPUFF dispersion model in a manner generally consistent with PEL (2017a) with the assumption of continuous operation of plant at full load.

Dispersion modelling included 3 plant scenarios compiled as per the following:

- Plant Scenario 1 (PS1): BIPS 2 (each fuel and plant option) modelled in isolation;
- Plant Scenario 2 (PS2): BIPS 2 (each fuel and plant option) operating concurrently with BIPS 1; and
- Plant Scenario 3 (PS3): BIPS 2 (each fuel and plant option) operating concurrently with BIPS 1 and TIPS B.

Predictions were compared against respective criteria outlined in the Air EPP, with the following key findings:

Nitrogen Dioxide (NO_2)

All predictions are compliant with the respective assessment criteria:

- A peak 1-hour sensitive receptor cumulative NO_2 prediction of 126 µg/m³ reported for distillate operation of the reciprocating engine plant option under Plant Scenario 3.

This concentration equates to 76% of the 164 µg/m³ criterion and is based on continuous operation of BIPS 1 and BIPS 2 on distillate fuel, and TIPS B operating on natural gas, with all plant operating at 100% of available plant load.

This represents a conservative basis for assessment given the intermittent operation of these facilities and use of natural gas, for which peak prediction was approximately 20 µg/m³ lower, and close to the existing ambient background concentrations.

- Annual average NO_2 predictions are low relative to criterion of 30 µg/m³, with maximum cumulative predictions less than half of the standard despite the assumption of continuous operation.

Particulate Matter

All predictions are compliant with the respective assessment criteria:

- A peak 24-hour sensitive receptor PM prediction of 3 µg/m³ was reported for distillate operation of the aeroderivative plant option for Plant Scenario 3. When added to the corresponding background $PM_{2.5}$ concentration, the cumulative prediction is compliant, equating to approximately half of the 25 µg/m³ criterion.

  It is noted that this scenario has been based on continuous operation of BIPS 1 and BIPS 2 on distillate fuel, and TIPS B operating on natural gas, with all plant operating at 100% of available plant load. This provides a conservative basis for assessment given the intermittent operation of these facilities and use of natural gas.
- Annual average $PM_{2.5}$ predictions are low relative to criterion of 8 µg/m³, with the various BIPS 2 plant options contributing a grid maximum of 0.1 µg/m³. Accordingly, the significance of BIPS 2 to annual average $PM_{2.5}$ concentrations is considered negligible. Annual average predictions for Plant Scenario 3 are also low, with maximum sensitive gridded receptor predictions equal to or less than 0.1 µg/m³, and thus complies with assessment criteria when existing background concentration is added.

Formaldehyde and other pollutants

- Formaldehyde predictions are compliant with the Air EPP 3-minute criterion of 44 µg/m³, with BIPS 2 contributing up to 52% of the criterion under natural gas operation. Predictions for all other plant options are an order of magnitude lower.
- Predictions for all other pollutants were low and compliant with the respective criteria.

Greenhouse gas emissions

Greenhouse gas emissions were estimated based on manufacturer data and generic assumptions around frequency of operation. Scope 1 greenhouse gas emissions have been estimated to range between approximately 200–300 kt CO_2-e per annum, at Scope 1 and Scope 1+3 emission intensities of 0.6 and 0.7 t/MWh (respectively). Operational emission intensity was estimated to be consistent among plant options, with the range in emissions arising from the range of estimated generation outputs (320-520 GWh per annum) as associated with the varying sizes of plant options that were assessed.

It is also noted that the plant options possess varying capabilities to accommodate blending of hydrogen into the fuel mix. Where this hydrogen is produced from renewable energy sources, this practice would offer opportunities to further reduce GHG emissions, both through a reduction in Scope 1 emissions, and avoidance of natural gas consumption and associated Scope 3 emissions.

Summary

Collectively, the analysis conducted within this assessment predicts compliance with Air EPP criteria and indicates that the potential for the variation to the Approved Project to accommodate the design updates for BIPS 2 to generate adverse air quality impacts is low and manageable through effective operation of the proposed plant.

Should AGL elect to progress the reciprocating engine option, it is recommended that emission performance for oxides of nitrogen and formaldehyde are reviewed to assess consistency of the designed emission performance with the assumptions of this analysis, which has assumed performance equivalent to that of BIPS 1. As constructed, BIPS 1 includes selective catalytic reduction and oxidation catalysts for control of these emissions.

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM), has been commissioned by AECOM Australia Pty Ltd (AECOM) on behalf of AGL Energy Limited (AGL) to prepare an air quality impact assessment (AQIA) for the proposed variation of the existing Development Approval (DA) for the Barker Inlet Power Station (BIPS).

This report provides an assessment of potential air quality impacts associated with the variation as based on the *Environment Protection (Air Quality) Policy 2016* (SA, 2023), 'the Air EPP and relevant methodologies provided in the South Australian Environment Protection Authority (SA EPA) Guideline *Environment Protection Authority – Ambient Air Quality Assessment* (SA EPA, 2016),'the air quality assessment guideline'.

1.1 PROJECT OVERVIEW

The existing DA was granted in 2018 and permits construction and operation of the BIPS in two stages (BIPS 1 and BIPS 2), with each stage comprising 12 reciprocating engines and an electrical output of 210 MW. BIPS Stage 1 (BIPS 1) was commissioned in late 2019 and is now operational. AGL are seeking to vary the DA to permit a wider range of plant options for BIPS 2, including the option to utilise either gas turbines or reciprocating engines (instead of reciprocating engines only as currently approved) and the proposed increased capacity of up to 280MW. The potential impacts of these changes on ambient air quality and greenhouse gas emissions requires assessment as part of the variation and is the subject of this AQIA.

ERM (formerly Pacific Environment) prepared the initial BIPS air quality assessment that forms part of the existing BIPS approval (PEL, 2017a). Where relevant, this AQIA has been prepared to align with the PEL (2017a), whilst incorporating updates to the methodologies, including:

- Updated meteorological and background air quality datasets that reflect current state of practice and ambient air quality within the Adelaide airshed;
- Assessment against updated nitrogen dioxide (NO_2) and sulphur dioxide (SO_2) ambient air quality standards which are specified in the Air EPP; and
- Changes to local emission sources, including the retirement of Torrens Island Power Station A (TIPS A), the reduced operation of Torrens Island Power Station B (TIPS B), and operation of BIPS 1.

1.2 SCOPE OF WORKS

ERM has undertaken the following scope in preparation of this AQIA:

- Completion of a review of existing ambient air quality and meteorological monitoring data from the last 5 years. This review will characterise the local air quality performance and trends, with nomination of a representative calendar year for dispersion modelling;
- Preparation of a region-specific meteorological dataset using the US National Centre for Atmospheric Research (NCAR) Weather Research and Forecasting (WRF) meteorological model. The outputs of this model will be processed using the CALWRF utility, for application in the CALMET meteorological pre-processor;
- Preparation of an emission inventory for the proposed BIPS 2 plant options, operating on natural gas and diesel fuels including:
    - Reciprocating engine-based plant; and

  - Gas turbine-based plant.
- CALPUFF atmospheric dispersion modelling of the updated BIPS 2 plant options in conjunction with existing AGL sources, including TIPS B and BIPS 1;
- Assessment of model predictions against relevant air quality standards. Model predictions will be provided as discrete receptor tables and contour isopleths;
- Preparation of a summary of greenhouse gas emission performance of the modification; and
- Preparation of a technical report documenting the applied methodologies and assessment findings (this AQIA report).

2. REGULATORY FRAMEWORK

2.1 AMBIENT AIR ASSESSMENT CRITERIA

The assessment of potential impacts associated with the variation has been undertaken in accordance with the Air EPP and relevant methodologies provided in the air quality assessment guideline.

These references include air quality criteria for the following pollutants, as assessed in PEL (2017a):

- Nitrogen Dioxide (NO_2);
- Carbon monoxide (CO);
- Sulphur Dioxide (SO_2);
- Particulate matter less than 10 microns in aerodynamic diameter (PM_{10});
- Particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$);
- Formaldehyde;
- Benzene; and
- Polycyclic aromatic hydrocarbons (PAHs).

These pollutants represent key indicators in the context of air emission sources associated with the project:

It is noted that for the combustion sources considered in this assessment, all particulate matter is effectively less than 2.5 microns in aerodynamic diameter. Accordingly, $PM_{2.5}$ emissions and ambient air quality predictions are also equal to those for PM_{10}. The air quality criteria relevant to this assessment are presented as maximum concentrations in Schedule 2 of the Air EPP. **Table 2-1** presents these criteria.

TABLE 2-1 AIR EPP ASSESSMENT CRITERIA

Pollutant	Averaging Period	Criterion (µg/m³)
NO_2	1 hour	164
	Annual	30
CO	1 hour	31,240
	8 hours	11,250
SO_2	1 hour	290
	24 hours	60
PM_{10}	24 hours	50
$PM_{2.5}$	24 hours	25
	Annual	8
Formaldehyde	3 minutes	44
Benzene	3 minutes	58
	Annual	10
PAHs	3 minutes	0.8
	Annual	0.0003

2.2 SOURCE EMISSION LIMITS

The SA EPA regulates air emission sources in South Australia. Schedule 4 of the Air EPP provides in-stack emission limits that are relevant to plant options considered in this AQIA and are presented in **Table 2-2** .

TABLE 2-2 AIR EPP SCHEDULE 4 – IN-STACK EMISSION LIMITS

Pollutant	Activity	Fuel Type	Emission Limit (mg/m^3)	Reference Conditions
NO_x	Power generation of 250 MW or greater	-	700	7% O_2
	Gas turbines for power generation of 10 MW or greater	Gaseous fuel	70	15% O_2
		Liquid fuel	150	

3. EXISTING ENVIRONMENT

This section provides a summary of the existing environment inclusive of climate, meteorology and ambient air quality.

3.1 CLIMATE

The Adelaide region features a mediterranean climate, characterised with cold to mild to wet winters and warm to hot dry summers. Most of the region's rainfall occurs from mid-autumn to mid-spring (April to October), which coincides with southern Australia's wet season. Rainfall can be unreliable and infrequent from late spring to early autumn (November to March) (BoM, 2023).

Long-term climate statistics are available from Bureau of Meteorology (BoM) Parafield automatic weather station (AWS) (Station #023013). The peak mean daily temperature of 30°C is recorded in January, with the lowest daily temperatures (Minimum: 6°C, Maximum: 15°C) occurring in July. The highest mean rainfall occurs in July, whilst the minimum rainfall occurs in February.

Table 3-1 presents a summary of monthly climate statistics recorded at the BoM Parafield Airport AWS between the years 1929 – 2023.

TABLE 3-1 SUMMARY OF CLIMATE STATISTICS FOR THE BOM PARAFIELD AIRPORT AWS

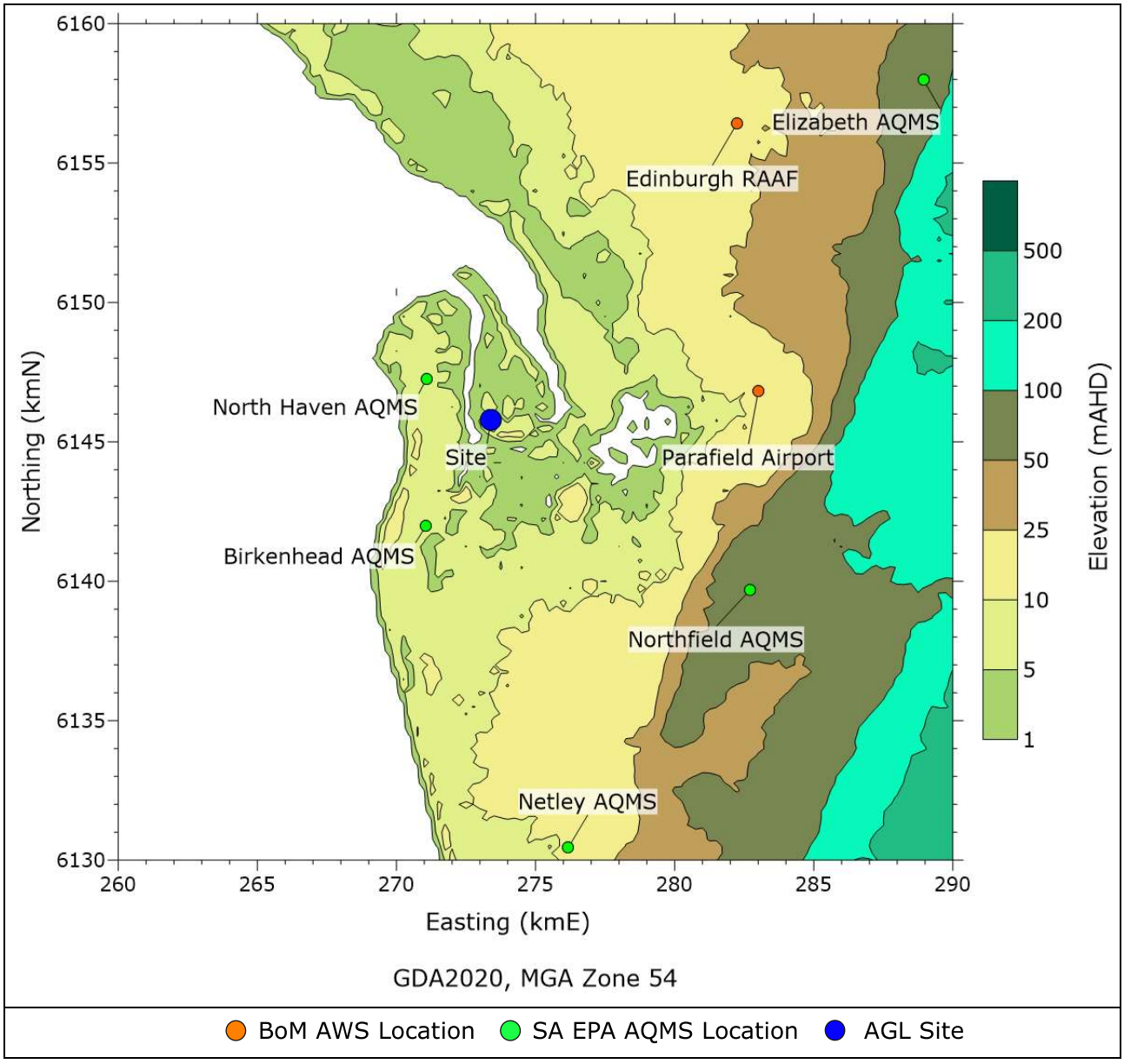
Parameter	Month												Annual	Year Start	Year End
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Mean Temperature															
Daily maximum (°C)	30	29	27	23	19	16	15	16	19	22	26	28	23	1939	2024
Daily minimum (°C)	16	16	15	12	9	7	6	7	8	10	13	15	11	1939	2024
Rainfall															
Mean (mm)	21	18	22	38	48	54	58	53	44	40	27	25	447	1929	2024
Median (mm)	15	10	11	35	46	49	51	53	41	35	23	17	-	n/a	n/a
Mean raindays	2	2	3	5	7	8	9	9	7	6	4	3	63	1929	2024
9 am Observations (mean)															
Temperature (°C)	22	22	20	17	14	11	10	11	14	17	19	21	16	1954	2010
Relative humidity (%)	50	52	56	62	74	83	82	76	68	58	54	51	64	1954	2010
Wind speed (km/h)	16	14	13	13	12	12	14	15	17	19	18	17	15	1939	2010
3 pm observations (mean)															
Temperature (°C)	29	29	26	22	18	15	14	16	18	21	25	26	22	1954	2010
Relative humidity (%)	34	35	38	44	56	66	65	60	56	46	39	38	48	1954	2010
Wind speed (km/h)	24	24	22	20	18	19	20	22	23	24	24	24	22	1939	2010

3.2 TERRAIN AND METEOROLOGY

SA EPA undertake ambient air quality monitoring at several locations in the region, including the Birkenhead, Elizabeth, Netley, North Haven and Northfield air quality monitoring stations (AQMS). In addition, BoM undertake continuous meteorological monitoring at a number of locations, including the Edinburgh Royal Australian Air Force (RAAF), Parafield Airport and Adelaide Airport[1] weather stations. **Figure 3-1** shows the location of each of these stations relative to surrounding terrain.

The Site is located at approximately 3 mAHD, similar to the nearest AQMS location, North Haven and closest receptors located on the Le Fevre peninsula to the west.

FIGURE 3-1 LOCATION OF METEOROLOGICAL AND AMBIENT AIR QUALITY MONITORING LOCATIONS RELATIVE TO TERRAIN



[1] Adelaide Airport is located south of Figure 3-1 domain.

Figure 3-2 through **Figure 3-3** illustrate the annual and seasonal wind distributions recorded by the Edinburgh RAAF, North Haven and Northfield BoM AWS locations, for data collected between 2019 and 2023. As shown in these figures, the most frequent winds occur from the northeast and southwest, with the northeasterlies persisting through the colder seasons and southwesterlies during the warmer seasons. Parafield Airport and Adelaide Airport feature more variability in wind direction throughout the year, although align with dominant wind directions featured at Edinburgh RAAF.

Figure 3-4 provides a wind roses for daytime and overnight winds. These figures illustrate that winds during the day are noticeably stronger than overnight, with a greater proportion of south-easterly winds during daytime conditions, as consistent with convective processes associated with elevated terrain to the east.

Additional annual and seasonal wind roses are provided in **Appendix A**.

FIGURE 3-2 DISTRIBUTION OF WINDS AT NEARBY BOM STATIONS (2019 – 2023)

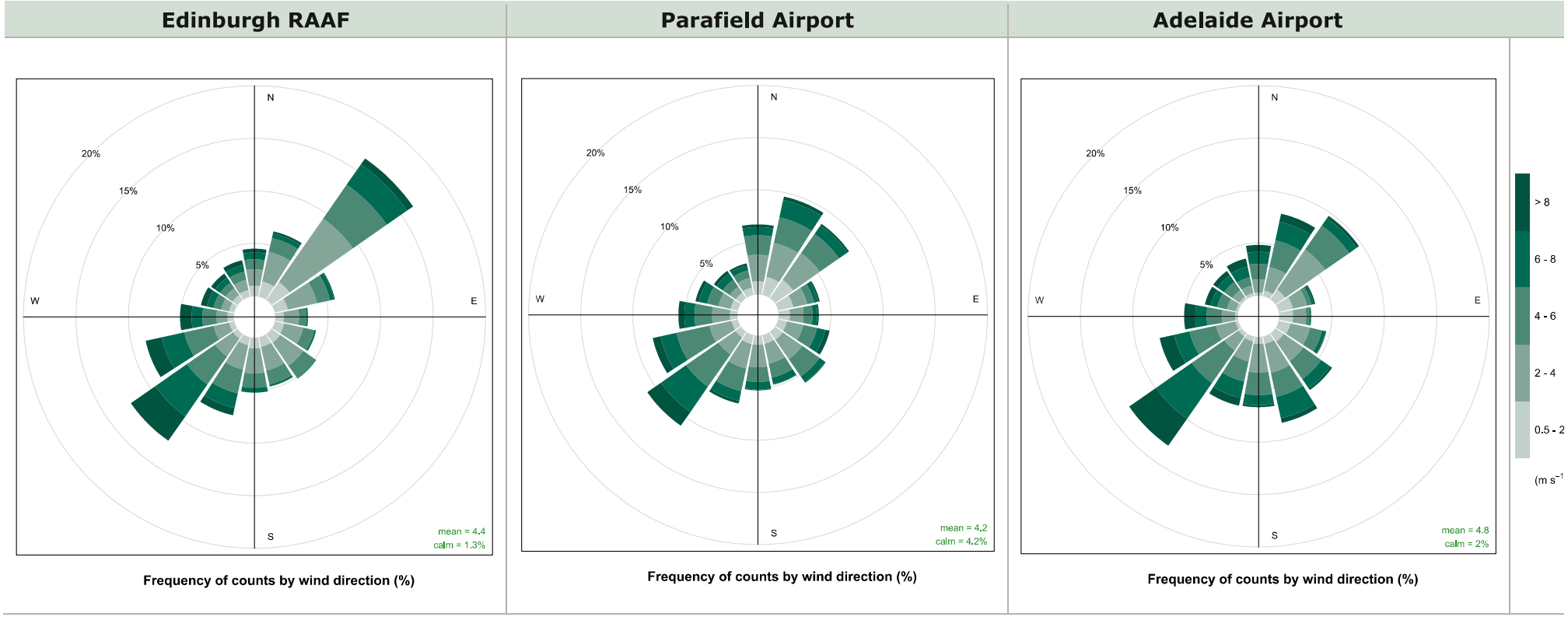


FIGURE 3-3 SEASONAL DISTRIBUTION OF WINDS AT NEARBY BOM STATIONS (2019 – 2023)

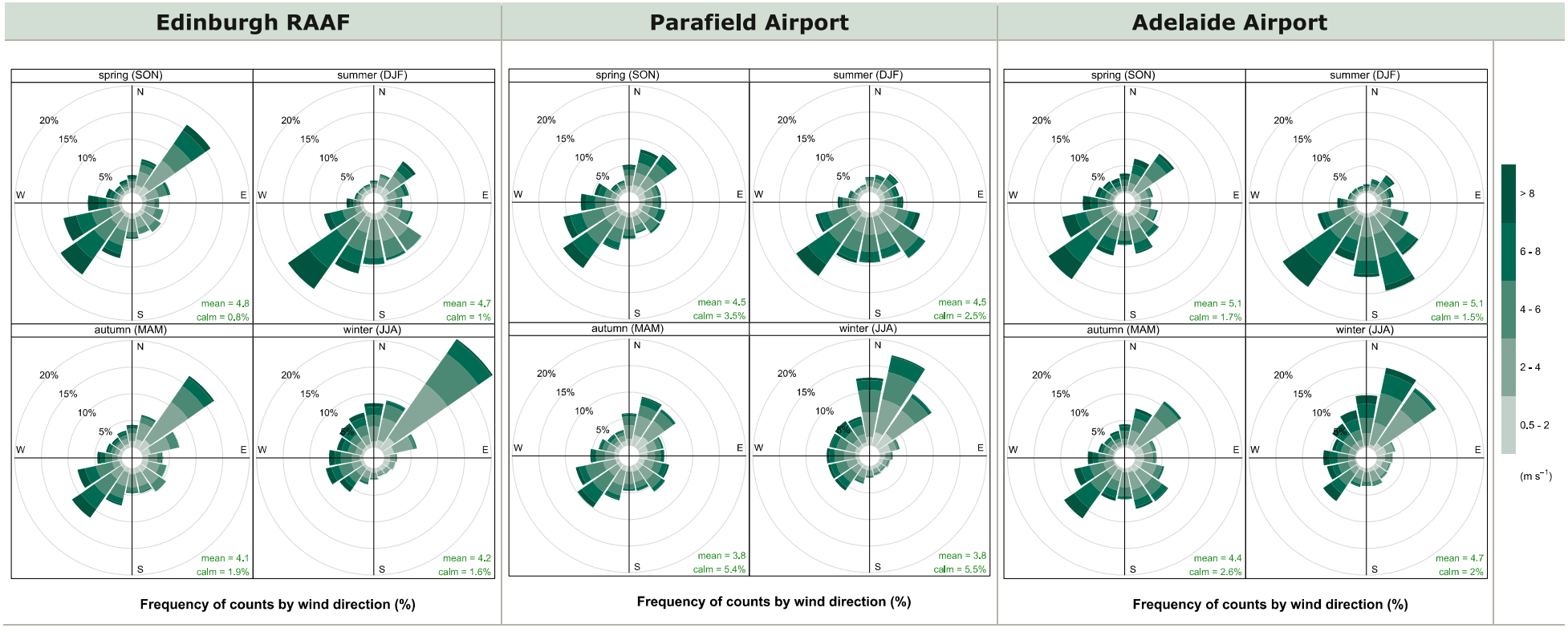
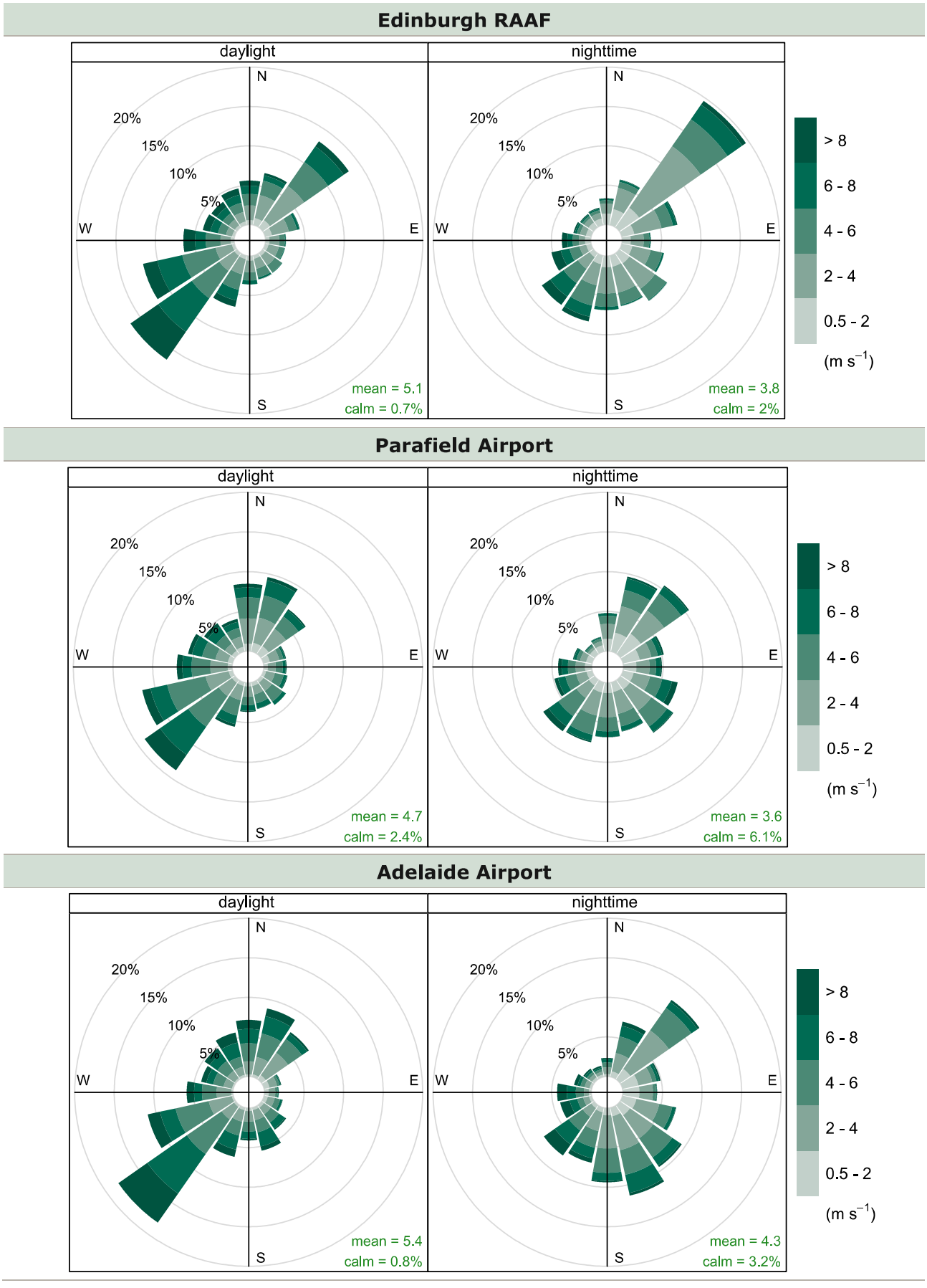


FIGURE 3-4 DIURNAL DISTRIBUTION OF WINDS AT NEARBY BOM STATIONS (2019 – 2023)



3.3 EXISTING AMBIENT AIR QUALITY

SA EPA collect ambient air monitoring data at a range of locations around the Adelaide region. Given the buoyant nature of emissions from thermal power generation, peak impacts have the potential to occur at areas of some distance from the source (e.g. 5 - 10 km), within an extent of Adelaide that includes several AQMS locations.

A summary of the ambient air quality data for selected sites are provided in the following sections.

The data indicate that generally air quality for the Adelaide metropolitan region is good. Exceedances of the SA EPA air quality criteria are typically limited to particulate matter (PM_{10} and $PM_{2.5}$), with regional PM_{10} sources (dust storms, bushfires etc.) being the dominant contributor to these exceedances.

3.3.1 NITROGEN DIOXIDE (NO_2)

Table 3-2 presents a summary of NO_2 concentrations recorded between 2019 and 2023, with the 5-year maximum 1-hour average being reported at North Haven in 2023. This concentration is equal to half of the criterion. The annual average NO_2 concentrations are commonly around 10 µg/m³, which is equal to one third of the annual average criterion.

TABLE 3-2 SUMMARY OF NO_2 CONCENTRATION STATISTICS (µg/m³)

Year	Maximum 1-Hour			Annual		
	Elizabeth	North Haven	Northfield	Elizabeth	North Haven	Northfield
2019	62	70	72	8	10	12
2020	-	66	70	-*	10	11
2021	-	70	74	-*	10	11
2022	-	62	62	-*	9	8
2023	62	82	66	6	10	11
Criterion	***164***			***30***		

Note: *Not reported due to limited annual data capture (<30%).

3.3.2 CARBON MONOXIDE (CO)

Background CO concentrations measured at the Adelaide CBD AQMS. Reported concentrations are low, as shown in **Table 3-3**:

- The maximum 1-hour CO background was reported in 2023 and is 1% of the SA EPA assessment criterion of 31,240 µg/m³.
- The maximum 8-hour background was reported in 2019 and is 2% of the SA EPA assessment criterion of 11,250 µg/m³.

TABLE 3-3 SUMMARY OF CO MONITORING STATISTICS (µg/m^3)

Year	Maximum 1-Hour	Maximum 8-hour
2019	218	154
2020	141	87
2021	253	134
2022	130	84
2023	309	123
Criterion	***31,240***	***11,250***

3.3.3 SULPHUR DIOXIDE (SO_2)

Table 3-4 presents a summary of key SO_2 statistics between 2019 and 2023. As shown in these data, measured SO_2 background concentrations of are typically low relative to the SA assessment criteria. Reductions in recent years are primarily a result of regulation of sulphur content in transport fuels. In 2020, regional sulphur emissions were further reduced with a seven-fold reduction in the permissible sulphur content in shipping fuels, being reduced from 3.5% to 0.5% on a mass basis (IMO, 2024). Since this time, peak 1-hour and 24-hour measurements have been equal to approximately 10% of respective criteria.

TABLE 3-4 SUMMARY OF SO_2 MONITORING STATISTICS (µg/m^3)

Year	Maximum 1-hour	24-Hour Maximum
2019	83	28
2020	26	6
2021	3	3
2022	17	8
2023	14	9
Criterion	***290***	***60***

3.3.4 PARTICULATE MATTER AS $PM_{2.5}$ AND PM_{10}

Background concentrations for PM_{10} and $PM_{2.5}$ have been sourced from the North Haven AQMS as shown in **Table 3-5**.

TABLE 3-5 SUMMARY OF $PM_{2.5}$ AND PM_{10} MONITORING STATISTICS (µg/m^3)

Year	$PM_{2.5}$				PM_{10}			
	24-Hour			Annual Average	24-Hour			Annual Average
	Maximum	90th Percentile	70th Percentile		Maximum	90th Percentile	70th Percentile	
2019	**35**	10	6	5.9	**94**	36	24	22
2020	**27**	8	5	4.8	**56**	27	18	16
2021	18	8	6	5.0	**111**	24	17	15
2022	10	7	5	4.3	41	21	15	13
2023	9	6	5	3.8	49	20	15	13
Criterion	***25***	***-***	***-***	***8***	***50***	***-***	***-***	***-***

Notes: **Bold** values indicate an elevated reading above the relevant criterion. Such exceedances arise due to a range of factors, inclusive of regional events such as dust storm and bushfire activity.

4. ASSESSMENT METHODOLOGY

This section summarises the methodology used to perform the air quality impact assessment. It covers the meteorological modelling methods, emission estimation and dispersion modelling.

4.1 METEOROLOGICAL DATASET

Meteorological and air quality trends for the last 5 years have been reviewed, with nomination of 2023 as an assessment year that contains meteorological patterns that are consistent with long-term trends. Meteorological modelling has been conducted to obtain representative meteorological fields for the 2023 calendar year (refer **Appendix A**).

The US National Centre for Atmospheric Research (NCAR) Weather Research and Forecasting Model (WRF version 4.2.1) has been used to generate hourly three-dimensional meteorological fields for 2023. WRF is a widely used 3-dimensional model that contains non-hydrostatic dynamics and a range of physical parameterizations for planetary boundary layer, atmospheric and surface radiation, land-surface, microphysics, and cumulus convection (Skamarock, et al., 2019). The WRF outputs have then been used in CALMET, the meteorological pre-processor for the CALPUFF dispersion model.

Further detail of this process can be found in **Appendix A**.

4.2 ASSESSMENT SCENARIOS

The assessment has considered a total of 36 emission scenarios inclusive of the following:

- Three plant scenarios, inclusive of combinations of BIPS2 and adjacent generation assets;
- Six plant design options, inclusive of five gas turbine options and a reciprocating engine option; and
- Two fuels options: natural gas (NG) and distillate oil (DO).

Further detail of these scenarios has been provided in the following.

4.2.1 PLANT SCENARIOS

Three plant scenarios have been compiled to assess compliance of the various plant options proposed for BIPS 2. Since completion of PEL (2017a), AGL has commissioned BIPS 1, which comprises of 12 reciprocating engines with a total capacity of 210 MW and decommissioned TIPS A. Three out of the four generation units at TIPS B are currently operational with a total capacity of 600 MW.

These sources have been included in the following plant scenarios:

- **Plant Scenario 1 (PS1):** BIPS 2 (each plant option) modelled in isolation.
  - *Provides context on incremental impacts associated with sources proposed as part of the variation.*
  - *Assesses compliance of the various BIPS 2 plant options when operated in isolation of other AGL generation plants.*
- **Plant Scenario 2 (PS2):** BIPS 2 operating concurrently with BIPS 1.
  - *Assesses compliance of the various BIPS 2 plant options when operated concurrently with BIPS 1 at its maximum capacity of 210 MW.*
- **Plant Scenario 3 (PS3)**: BIPS 2 operating concurrently with both BIPS 1 and TIPS B.

- *Assesses compliance of the various BIPS 2 plant options when operated concurrently with BIPS 1 and TIPS B at its current maximum load (3 x 200 MW units).*

All scenarios have assumed that emissions occur on a continuous basis, with all respective plant operating at full load. In reality, BIPS 2, BIPS 1 and TIPS B are anticipated to operate on an intermittent basis in response to electricity market demand. Accordingly, this approach is considered conservative, especially in the estimation of potential air quality impacts for averaging periods of greater than 1-hour (e.g 24-hour and annual averages).

Table 4-1 provides a summary of these scenarios and associated electrical output (MW).

TABLE 4-1 SUMMARY OF PLANT SCENARIOS

Plant Scenario	Generation Source			Output Range* (MW)
	BIPS 2	BIPS 1	TIPS B	
PS1	✓			200 - 330
PS2	✓	✓		410 - 540
PS3	✓	✓	✓	1,010 – 1,140

Note: *Range across various BIPS 2 plant options. Approval is sought for up to 280 MW of generation capacity. Options assessed range up to 330 MW.

It is noted that PS3 provides an assessment of worst-case cumulative impacts from operations at TIPS and BIPS, with a combined electrical output of approximately 1,000 MW across the three facilities. Closure of TIPS B is planned for 2026, hence regular operation of all 3 facilities is expected to limited. Noting this, the inclusion of TIPS B also provides an assessment of potential cumulative impacts with other combustion sources in the region, noting that the relative proximity of TIPS B to BIPS 2 provides a conservative representation of potential cumulative impacts with other power generation facilities in the region that are more distant from BIPS 2. Wider treatment of potential cumulative impacts with other regional sources has also been addressed through the incorporation background monitoring data, as outlined in **Section 4.6** and **Section 4.7**.

4.2.2 PLANT OPTIONS

AGL are currently in the process of reviewing and selecting the generation plant for use at BIPS 2. This includes a number of plant options, which are summarised in **Table 4-2**.

TABLE 4-2 SUMMARY OF PLANT OPTIONS

Option ID	Generator Type	Combustion Technology	Unit Output (MW)	Number of Units	Capacity (MW)[1]
E1	Gas Turbine	E-Class	150	2	300
E2			200	1	200
F1		F-Class	280	1	280
F2			330	1	330
AD		Aeroderivative	140	2[2]	280
RE	Reciprocating Engine	Dual Fuel	25	10[3]	250

Note: [1]Approval is sought for up to 280 MW of generation capacity. Options assessed range up to 330 MW.

[2] Each unit comprises two gas turbine generators.

[3]Reciprocating engine option may alternatively comprise 12 smaller units possessing a similar total output. 10 unit option has been quantitatively assessed.

4.2.3 FUEL TYPES

AGL are proposing to use either natural gas or distillate oil fuel in BIPS 2. It is noted that distillate oil will comprise commercially available Automotive Diesel Oil (ADO) that meets the *Fuel Quality Standards (Automotive Diesel) Determination 2019* (AG, 2019), inclusive of a fuel sulphur content of less than 10 mg/kg. Each fuel type has been modelled separately, with the following assumptions for cumulative plant scenarios (PS2 and PS3):

- BIPS 1 is firing on distillate fuel when BIPS 2 is firing distillate fuel; and
- TIPS B operation is limited to natural gas.

4.3 EMISSION ESTIMATION

Emission parameters and emission rates have been compiled for the modelled plant options based on a range of information sources including:

- Generic plant layouts;
- Manufacturer performance specifications;
- The US EPA AP-42 emission factor database (US EPA, 2006);
- Fuel specifications for pipeline gas and automotive diesel (AEMO, 2017);(AG, 2024);
- Emission testing for BIPS 1 (which is operational); and
- Existing estimates documented in PEL (2017a).

Table 4-3 provides a summary of the various assumptions and methods applied in preparation of the emission inventory. Further detail of the emission estimates is provided in the following sections.

TABLE 4-3 BASIS OF EMISSION ESTIMATES

<table>
<tr><th rowspan="2">Option / Source ID</th><th rowspan="2">Fuel</th><th colspan="7">Basis of Emission Estimates</th></tr>
<tr><th>NO_x</th><th>CO</th><th>SO_2</th><th>PM</th><th>Formaldehyde</th><th>Benzene</th><th>PAHs</th></tr>
<tr><td rowspan="2">E1</td><td>Natural Gas</td><td rowspan="8">Manufacturer specification</td><td>Manufacturer specification</td><td rowspan="10">Mass balance based on fuel specification
(refer Section 4.3.4)</td><td rowspan="6">Manufacturer specification (filterable),
AP-42 (condensables)</td><td rowspan="6">AP-42</td><td rowspan="10">AP-42</td><td rowspan="10">AP-42*</td></tr>
<tr><td>Distillate Oil</td><td>Typical performance specification</td></tr>
<tr><td>E2</td><td>Natural Gas</td><td rowspan="6">Manufacturer specification</td></tr>
<tr><td></td><td>Distillate Oil</td></tr>
<tr><td>F1</td><td>Natural Gas</td></tr>
<tr><td></td><td>Distillate Oil</td></tr>
<tr><td>F2</td><td>Natural Gas</td></tr>
<tr><td></td><td>Distillate Oil</td></tr>
<tr><td>AD</td><td>Natural Gas</td><td colspan="2" rowspan="2">Typical performance specification</td></tr>
<tr><td></td><td>Distillate Oil</td></tr>
<tr><td rowspan="2">RE</td><td>Natural Gas</td><td>BIPS 1 Spec</td><td rowspan="2">Manufacturer specification</td><td rowspan="2">Assuming 20 mg/Nm³, dry, 7% O_2 (filterable) PM**, AP-42 (condensables)</td><td>Scaled from BIPS 1</td></tr>
<tr><td>Distillate Oil</td><td>Scaled from BIPS 1 (NG:DO NO_x ratio)</td><td>AP-42</td></tr>
<tr><td rowspan="2">BIPS 1</td><td>Natural Gas</td><td colspan="2" rowspan="2">Maximum testing results</td><td colspan="3" rowspan="2">PEL (2017a)</td><td>PEL (2017)</td></tr>
<tr><td>Distillate Oil</td><td>AP-42*</td></tr>
<tr><td>TIPS B</td><td>Natural Gas</td><td colspan="7">Scaled from PEL (2017a) 100% load figures to reflect 3 units in operation.</td></tr>
</table>

Notes:

*AP-42 emission factors used in conjunction with B(a)P TEQ conversion factors.

**BIPS 1 in-stack PM concentrations observed to be at or less than (<) the limit of reporting (LOR) in 24 stack tests, which assuming ½ the LOR for all <LOR results, equates to an average concentration of 2 mg/Nm³ (dry, 7% O_2).

'Typical performance specifications' have been adopted where plant specific data was not available.

4.3.1 STACK LOCATIONS

Indicative stack locations have been compiled for each plant option assuming generic plant layouts located within the BIPS 2 area. Adjustment to these parameters is expected to occur with selection of the preferred plant option and progression of the detailed design. Such changes may arise from detailed consideration of spatial requirements, and/or adoption of alternative vendor options. By example, it is noted that reciprocating engine option is expected to comprise between 10-12 individual generators. This modelling has assumed a design of 10 generators, however, the installation of 12 generators possessing a similar total output and emission performance is not anticipated to materially influence ambient air quality outcomes.

In addition, the influence of design or location changes within the generator yard area are unlikely to be material when considered in the context of source-receptor distances which span several kilometres.

4.3.2 OXIDES OF NITROGEN (NO_x) AND CARBON MONOXIDE (CO)

NO_x and CO emissions have been based on manufacturer's data in the majority of cases, and generic emission performance elsewhere. Reciprocating engine natural gas NO_x emissions have been based on the NO_x performance attained for BIPS 1 with distillate emissions assumed to vary by the ratio.

4.3.3 PARTICULATE MATTER, BENZENE, FORMALDEHYDE AND PAHS

US EPA AP-42 emission factors have been adopted where manufacture specific information was not available, as is the case for benzene, formaldehyde, PAHs and the condensable PM fraction. A summary of these factors is provided in **Table 4-4**. It is noted that manufacturer emission data for PM is limited to filterable particulate. Accordingly, PM emissions have been estimated based on manufacturer's data for the filterable fraction, supplemented by the US EPA AP-42 PM emission factors, (which represent an average of test data), for the condensable fraction. These fractions have been added to provide a total particulate matter emission rate.

The use of oxidation catalysts on the reciprocating engines is anticipated to provide a reduction of condensable material through oxidation of soluble organic fraction PM (MECA, 2015), thus resulting in a reduction against the uncontrolled emission factors featured in the US EPA (2006). As a conservative measure, this effect has not been incorporated into the emission estimation.

TABLE 4-4 ADOPTED US EPA AP-42 EMISSION FACTORS (LB/MMBTU)

Substance	Gas Turbine Options		Reciprocating Engine Option	
	Natural Gas	Distillate Oil	Natural Gas [b]	Distillate Oil [c]
$PM_{2.5}$, PM_{10} (condensable)	$4.70E \times 10^{-03}$	$7.20E \times 10^{-03}$	$9.91E \times 10^{-03}$	$7.70E \times 10^{-03}$
Benzene	1.20×10^{-05}	5.50×10^{-05}	4.40×10^{-04}	7.76×10^{-04}
Formaldehyde	7.10×10^{-04}	2.80×10^{-04}	N/A	
PAHs (B[a]P TEQ)[d]	9.00×10^{-07} [e]	5.00×10^{-06} [e]	1.67×10^{-07}[d]	1.39×10^{-04}[d]

Notes:

(a) US EPA (2006) – 3.1 Stationary Gas Turbines

(b) US EPA (2006) – 3.2 Natural Gas Reciprocating Engine (4SLB) values adopted in absence of dual-fuel factors.

(c) US EPA (2006) – 3.4 Large Stationary Diesel and All Dual-Fuel Reciprocating Engines.

(d) PAH value converted to B(a)P equivalent using the Potency Equivalent Factors (PEFs) from the NSW Approved Methods (Table 7.2c)

(e) In absence of speciated PAHs or B(a)P TEQ, emission factor estimated as Total PAHs minus naphthalene.

N/A – Not Applicable: Emission estimate based on BIPS 1 emission rate scaled by relative output (25 / 17.5 MW). It is noted that BIPS 1 used an oxidation catalyst to achieve this performance.

4.3.4 SULFUR DIOXIDE

SO_2 emission factors have been estimated based on conservation of mass principles, assuming the complete oxidation of fuel-bound sulfur into SO_2. Fuel-bound sulfur content has been defined by the following relevant fuel specifications:

- (AEMO, 2017) *Gas Quality Guidelines*, (Network notification threshold adopted); and
- (AG, 2019) *Fuel Quality Standards (Automotive Diesel) Determination 2019*, (Fuel standard maximum value adopted).

Table 4-5 and **Table 4-6** provide detail of the derivation of fuel-specific SO_2 emission factors for natural gas and distillate operation (respectively).

TABLE 4-5 FUEL-SPECIFIC SO_2 EMISSION FACTOR FOR NATURAL GAS

Parameter	Value	Units	Source / Basis
Sulfur content	50	mg/m³@15°C, 1 atm.	(AEMO, 2017)
Gas density	0.755	kg/m³	(AGL, 1995)
Sulfur content	66.2	mg/kg	Calculated
Energy density	51.4	MJ/kg	(AGL, 1995)
Sulfur content	1.29	mg/MJ	Calculated
SO_2 emissions	2.57	g/GJ	

AGL 1995, Natural Gas Technical Data Handbook, AGL 1995.

TABLE 4-6 FUEL-SPECIFIC SO_2 EMISSION FACTOR FOR DISTILLATE OIL

Parameter	Value	Units	Source / Basis
Energy density	45.6	MJ/kg (HHV)	(DCCEEW, 2023)
Sulfur content	10.0	mg/kg	(AG, 2019)
	0.22	mg/MJ (HHV)	Calculated
SO_2 emissions	0.44	g/GJ (HHV)	

4.3.5 EMISSION INVENTORY

- **Table 4-7** presents a summary of modelled emission parameters adopted for the various BIPS 2 plant options and existing BIPS 1 and TIPS B sources.
- **Table 4-8** presents emission calculations and applied emission factors for each pollutant, plant option and fuel.
- **Table 4-9** presents a summary of modelled emission rates.

TABLE 4-7 SUMMARY OF MODELLED EMISSION PARAMETERS

Option / Source ID	Source	Easting (kmE)*	Northing (kmN)*	Stack Height (mAGL)	Effective Diameter (m)	Exit Velocity (m/s) NG / DO	Exit Temp. (K) NG / DO	Base Elevation (mAHD)
BIPS 2 Plant Options								
E1	Stack A	273.564	6145.964	40.0	5.5	41 / 41	823 / 823	3.4
	Stack B	273.593	6145.944	40.0	5.5	41 / 41	823 / 823	
E2	Stack A	273.561	6145.922	35.0	6.5	40 / 40	821 / 796	
F1	Stack A	273.550	6145.972	42.0	7.0	43 / 43	898 / 898	
F2	Stack A	273.550	6145.972	38.0	7.9	38 / 38	872 / 872	
AD	Stack A	273.538	6145.949	18.7	5.7	28 / 27	712 / 717	
	Stack B	273.530	6145.938	18.7	5.7	28 / 27	712 / 717	
	Stack C	273.572	6145.926	18.7	5.7	28 / 27	712 / 717	
	Stack D	273.563	6145.914	18.7	5.7	28 / 27	712 / 717	
RE	Cluster A (4 stacks)	273.545	6145.878	30.5	3.4	31 / 35	626 / 547	
	Cluster B (3 stacks)	273.579	6145.925	30.5	2.94	31 / 35	626 / 547	
	Cluster C (3 stacks)	273.593	6145.945	30.5	2.94	31 / 35	626 / 547	
Existing Sources (Included in Plant Scenarios 2 and 3)								
BIPS 1	Cluster 1 (6 stacks)	273.450	6136.004	30.0	3.9	29 / 31	651 / 627	3.0
	Cluster 2 (6 stacks)	273.500	6145.969	30.0	3.9	29 / 31	651 / 627	
TIPS B	Multi-flue stack	273.363	6145.771	160	7.3	16.4 / -	627 / -	

Note: * Indicative location based on generic plant layouts - subject to change as part of detailed design.

TABLE 4-8 DETAILED EMISSION CALCULATIONS

Parameter	E1		E2		F1		F2		AD		RE		Units
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
Exhaust Flow Calculation													
Output*	150	150	200	200	280	280	330	330	70	70	25	25	MW
Thermal Efficiency	36.9%	36.9%	36.2%	34.5%	38.2%	38.2%	38%	38%	39.7%	37.0%	48.0%	42.6%	% (LHV)
	33.6%	35.2%	32.9%	32.9%	34.8%	36.4%	35%	36%	36.1%	35.2%	43.6%	40.5%	% (HHV)
Fuel Consumption	447	426	608	609	805	769	949	906	194	199	57	62	MW_{th} (HHV)
Reference Oxygen 'REF'	15%										7%		% (dry basis)
F-Factor**	2.34E-07	2.47E-07	2.34E-07	2.47E-07	2.34E-07	2.47E-07	2.34E-07	2.47E-07	2.34E-07	2.47E-07	2.35E-07[1]	2.47E-07	dscm/J @ 0% O_2
	0.772	0.815	0.772	0.815	0.772	0.815	0.772	0.815	0.772	0.815	0.329	0.346	Nm^3/MJ dry @ REF% O_2
Exhaust Flow	345	348	470	496	622	627	733	739	150	162	19	21	Nm^3/s dry @ REF O_2
Emission Concentrations													
NO_x	25	42	25	73	15	42	25	73	25	42	171	-[4]	ppmvd @ REF% O_2
	51	86	51	150	31	86	51	150	51	86	350[2]	-[4]	mg/Nm^3, dry, REF% O_2
CO	30	30	80	80	30	30	80	80	50	22	364	56	ppmvd @ REF% O_2
	38	38	100	100	38	38	100	100	62	28	455	70	mg/Nm^3, dry, REF% O_2
PM (Filterable)	5	10	5	10	5	10	5	10	10	20	5	20[3]	mg/Nm^3, dry, REF% O_2
Emission Factors													
PM (Condensable)	2.25	3.45	2.25	3.45	2.25	3.45	2.25	3.45	2.25	3.45	4.74	3.68	g/GJ (HHV)
Benzene	0.006	0.026	0.006	0.026	0.006	0.026	0.006	0.026	0.006	0.026	0.21	0.37	
Formaldehyde	0.340	0.134	0.340	0.134	0.340	0.134	0.340	0.134	0.340	0.134	-[4]	0.04	
PAHs[5] as B(a)P TEQ	4.31E-04	2.39E-03	4.31E-04	2.39E-03	4.31E-04	2.39E-03	4.31E-04	2.39E-03	4.31E-04	2.39E-03	7.99E-05	3.10E-04	
SO_2	2.57	0.44	2.57	0.44	2.57	0.44	2.57	0.44	2.57	0.44	2.46[1]	0.44	

Notes: *Approval is sought for up to 280 MW of generation capacity. Options assessed range up to 330 MW.
**USEPA (2023)
[1]Assumed to incorporate a blend of 95% natural gas with 5% (pilot) diesel.
[2]Assumed equivalent to BIPS 1 performance.
[3]Generic assumption based on BIPS 1 test data with margin provided to account for variability.
[4]Manufacturer specification not used - emissions scaled from PEL(2017a).
[5]AP-42 emission factors used in conjunction with B(a)P TEQ conversion factors.

TABLE 4-9 SUMMARY OF MODELLED EMISSION RATES

Option / Source ID	Fuel	Emission Rate (g/s per individual stack)						
		NO_x	CO	SO2	PM	Formaldehyde	Benzene	PAHs
E1	Natural Gas	17.7	12.9	1.15	2.73	0.15	2.6E-03	1.9E-04
	Distillate Oil	29.9	13.0	0.19	4.95	0.06	0.01	1.0E-03
E2	Natural Gas	24.1	47.0	1.56	3.72	0.21	3.5E-03	2.6E-04
	Distillate Oil	74.3	49.6	0.27	7.06	0.08	0.02	1.5E-03
F1	Natural Gas	19.1	23.3	2.07	4.92	0.27	4.6E-03	3.5E-04
	Distillate Oil	54.0	23.5	0.34	8.92	0.10	0.02	1.8E-03
F2	Natural Gas	37.6	73.3	2.44	5.80	0.32	5.5E-03	4.1E-04
	Distillate Oil	110.5	73.9	0.40	10.51	0.12	0.02	2.2E-03
AD	Natural Gas	7.7	9.3	0.50	1.93	0.07	1.1E-03	8.4E-05
	Distillate Oil	13.9	4.5	0.09	3.92	0.03	5.2E-03	4.8E-04
RE	Natural Gas	6.6	8.6	0.14	0.37	0.18	0.01	4.6E-06
	Distillate Oil	9.4	1.5	0.03	0.65	2.3E-03	0.02	1.9E-05
BIPS 1	Natural Gas	22.5	3.3	0.65	1.3	0.76	0.19	2.3E-06
	Distillate Oil	30.5	2.5	0.06	4.6	0.01	0.08	6.7E-05
TIPS B	Natural Gas	167.3	10.35	0.428	5.48	0.05	1.5E-03	5.3E-04

Note: All emission sources modelled on a continuous basis for all hours of the model run.

4.4 BUILDING DOWNWASH

Aerodynamic wakes are produced as air travels over irregular objects such as building structures. Within these wakes, there is a high level of turbulence and vertical mixing. In instances where exhaust plumes interact with these wakes, pollutants can be mixed downward to ground level, producing locally elevated concentrations, and otherwise reducing the scale of plume rise at distances downwind of the source. Within dispersion modelling, this effect is referred to as building downwash.

For this study, emission sources were screened for potential interaction with building wakes, where wakes extend:

- by a distance of 5 x L from the leeward edge of a wake producing structure, where L is the lesser of the structure height or the projected structure width.
- to a height of 2.5 times the height of the structure.

The proposed site layouts for BIPS 2 power generation options feature a range of stack heights (18.7 – 42 mAHD) and various building orientations within the zone of influence. The RE option has been nominated for visual representation with the current site layout, including the BIPS 1 generator hall and TIPS B building, presented in **Figure 4-1**.

It should be noted that the plant design will vary as it progresses, and this approach allows downwash effects to be incorporated.

FIGURE 4-1 VISUAL REPRESENTATION OF MODEL SOURCES (RED) AND BUILDING DOWNWASH STRUCTURES (BLUE VOLUME)

4.5 BACKGROUND MONITORING DATA

The background pollutant concentrations have been referenced from the monitoring data sources outlined in **Section 3.4**. Data from the year 2023 has been applied as consistent with the meteorological dataset. This is with the exception of $PM_{2.5}$ and PM_{10}, which has adopted the 5-year maximum statistics, in order to allow for variability in background between wet and dry years, noting that conditions in 2023 were wetter than those observed in 2019.

Table 4-10 provides a summary of the adopted background data.

TABLE 4-10 SUMMARY OF ADOPTED BACKGROUND DATA (µg/m³)

Pollutant	Averaging Period	Adopted Background Concentration	SA EPA Criterion
NO_2	1-hour	Time-varying	164
	Annual	11	30
CO	1-hour	309	31,240
	8-hour	123	11,250
SO_2	1-hour	14	290
	24-hour	9	60
$PM_{2.5}$	24-hour	10[1,2]	25
	Annual	5.9[2]	8
PM_{10}	24-hour	36[1,2]	50
Formaldehyde	3-minutes	n/a	44
Benzene	3-minutes	n/a	58
	Annual	n/a	10
PAHs	3-minutes	n/a	0.8
	Annual	n/a	0.0003

Notes: n/a – Pollutant assessed on an incremental basis. [1] 90th percentile, [2] Maximum over the past 5 years.

4.6 NO_2 CONVERSION

Oxides of nitrogen (NO_x) are emitted primarily as nitric oxide (NO) and NO_2. At the point of emission, NO_x will primarily comprise NO which has the ability to be progressively oxidised to NO_2 by atmospheric ozone over periods in the time scale of hours. Given that NO_2 is the principal species in terms of potential human health effects, a method for the estimation of NO_2 conversion is required.

For this assessment, the Ozone Limiting Method (OLM) has been used to estimate NO_2 concentrations, as this allows a conservative representation of conversion.

In its default form, the OLM assumes that 10% of the NO_x emissions occur as NO_2, with the remaining NO being converted over to NO_2 until all of the ambient ozone is consumed. In this respect, the conversion is limited by the availability of ozone. Equation 4-1 provides the basis for the OLM calculation applied in this assessment:

$$NO_2tot = \{0.1 \times NO_xp\} + minimum\{[0.9 \times NO_xp] \; or \; [(46/48) \times O_3bg]\} + NO_2bg$$

EQUATION 4-1

Where: NO_2tot = total NO_2 concentration inclusive of project and background (µg/m³)

NO_xp = predicted NO_x concentration (µg/m³)

O_3bg = measured background ozone concentration (µg/m³)

NO_2bg = background NO_2 concentration (µg/m³)

The OLM calculations were performed on an hourly basis for each hour of the model run. Hourly NO_2 predictions were processed using the OLM in conjunction with corresponding hourly ozone and NO_2 background data.

Background concentrations have been compiled as paired ozone and NO_2 data from hourly monitoring data from a combination of SA EPA AQMS locations, including, Elizabeth, North Haven and Northfield. The following approach:

- North Haven AQMS (located to the west of the site) has been used when winds were blowing from the easterly directions;
- Northfield (located to the southeast of the site) has been used when winds were blowing from the northwestern quadrant; and
- Elizabeth (located to the northeast of the site) has been used when winds were blowing from the southwestern quadrant.
- North Haven data has been used when data from other stations is missing.

This approach provides an hourly background dataset that prioritises data from downwind locations, and thus best incorporates cumulative impacts from other sources within the region. Using this approach, the ozone and NO_2 data were both 99.9% complete for the year 2023 (8,749 out of 8,760 hours).

4.7 MODEL RECEPTORS

Receptors have been assigned within the model to provide points at which model concentration outputs are generated. The model has used both gridded and discrete receptors as consistent with PEL (2017a), and include the following:

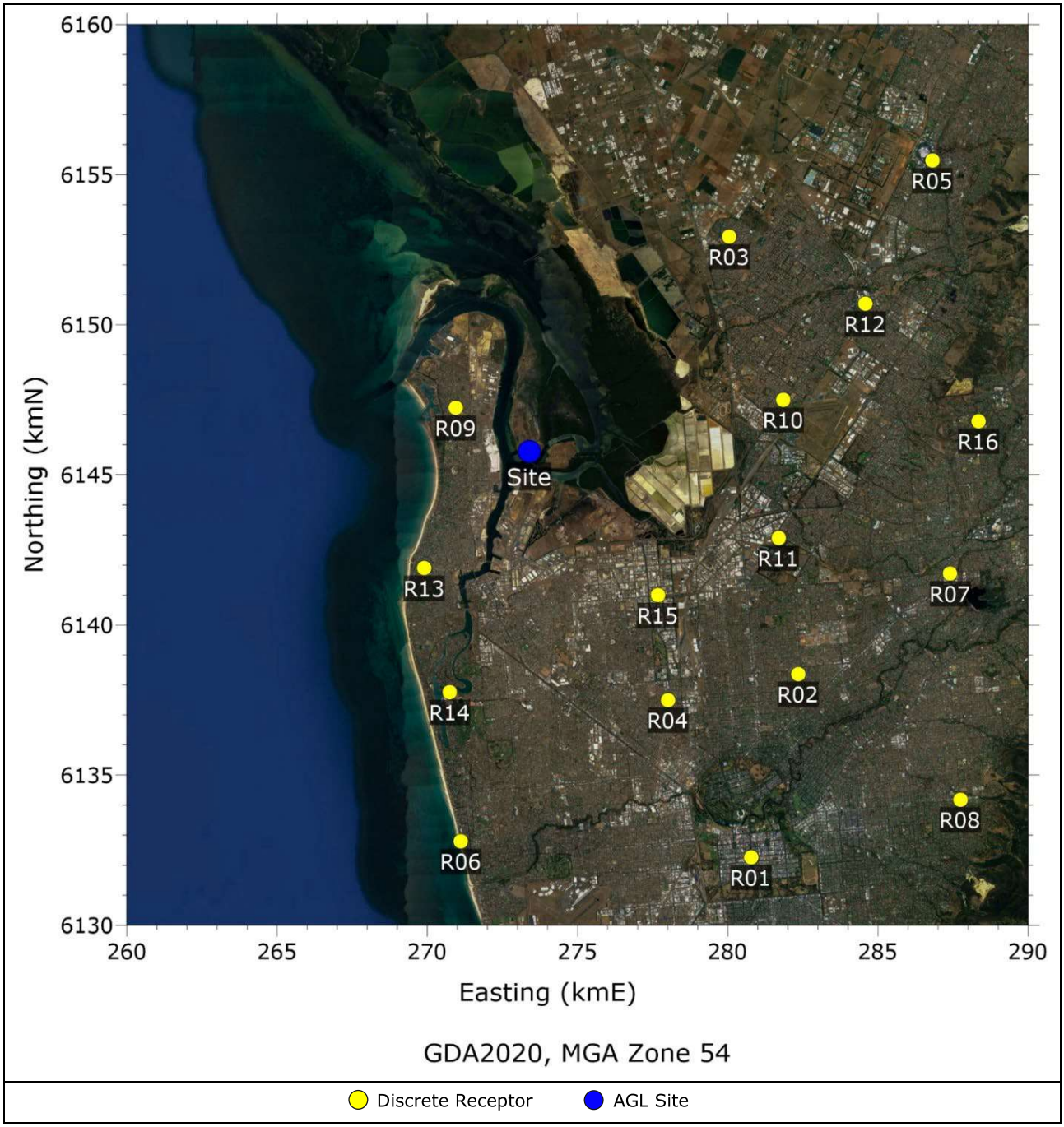
- Gridded receptors have been included at 250 metre resolution on a 30 km x 30 km receptor grid equating to a total of 14,641 gridded receptors. This domain is considered adequate for the capture of peak model predictions; and
- 16 discrete receptors have been allocated to suburbs across the gridded modelling domain.

Table 4-11 provides a summary of modelled discrete receptor locations, while **Figure 4-2** shows the gridded receptor domain extent and discrete receptor locations.

TABLE 4-11 SUMMARY OF MODELLED SUBURBAN DISCRETE RECEPTOR LOCATIONS

Receptor ID	Location (GDA2020, Zone 54)		Base Elevation (mAHD)
	Easting (kmE)	Northing (kmN)	
R01	280.771	6132.259	60
R02	282.341	6138.363	64
R03	280.048	6152.935	13
R04	278.009	6137.500	15
R05	286.808	6155.468	41
R06	271.118	6132.798	6
R07	287.402	6141.710	105
R08	287.739	6134.181	131
R09	270.945	6147.231	8
R10	281.852	6147.498	14
R11	281.688	6142.895	25
R12	284.576	6150.698	40
R13	269.900	6141.889	11
R14	270.746	6137.758	7
R15	277.676	6140.990	7
R16	288.350	6146.787	188

FIGURE 4-2 AERIAL IMAGE SHOWING GRIDDED RECEPTOR DOMAIN EXTENT AND DISCRETE RECEPTOR LOCATIONS



4.8 PREDICTIONS FOR SUB-HOURLY AVERAGING PERIODS

The assessment of formaldehyde, benzene and PAHs requires estimation of pollutant concentrations over 3-minute averaging periods.

Hourly averaged model predictions have been converted to 3-minute averaging periods using the power law conversion provided in the EPA Victoria draft guideline *Guidance notes for using the regulatory air pollution model AERMOD in Victoria* (EPAV, 2013). This conversion accounts for fluctuations in pollutant levels within the larger averaging period and is provided in Equation 4-2.

$$C_{n\,min} = C_{1\,hour} \times (60/n)^{0.2}$$

EQUATION 4-2

Where: $C_{n\,hour}$ = 1-hour average prediction
$C_{n\,min}$ = n minute average prediction

5. ASSESSMENT RESULTS

The dispersion modelling results have been processed to allow comparison against respective air quality impact assessment criteria. Model results have been shown in tabulated form and as contour isopleths across the 30 km x 30 km gridded modelling domain.

Predictions have been classified as:

- **Incremental**: The predicted contribution from the modelling outputs; and
- **Cumulative**: The sum of model predictions and regional background concentrations (which are time-varying in the case of NO_2).

Assessment criteria for NO_2, CO, SO_2, PM_{10} and $PM_{2.5}$ apply on a cumulative basis. All results are presented in units of µg/m³.

Results Tables

The results tables have been compiled to show:

- Predictions at each of the 16 discrete receptor locations;
- Maximum gridded receptor predictions, inclusive of all gridded receptors except those located overwater; and
- In some cases, PS1 and PS3 contour isopleths have been reviewed to identify the maximum sensitive gridded receptor prediction (shown in square brackets). This refinement excludes predictions that may occur on the AGL site or nearby vacant land.

Contour Isopleths

Noting the range of plant options, plant scenarios, pollutants, averaging periods and cumulative and incremental statistics, contour isopleths of modelling results have been limited to the following plant scenarios PS1 and PS3, inclusive of the following:

- Maximum 1-hour Incremental NO_2;
- Maximum 1-hour Cumulative NO_2;
- Maximum 24-hour incremental $PM_{2.5}$; and
- Maximum 3-minute incremental formaldehyde (reciprocating engine option).

This approach provides an opportunity to differentiate between various predictions, whilst also understanding the spatial characteristics of worst-case modelling predictions.

It is noted that annual average $PM_{2.5}$ contours have not been provided due to all BIPS 2 incremental contributions being less than or equal to 0.1 µg/m³, even with the assumption of continuous operation.

5.1 NITROGEN DIOXIDE (NO_2)

Table 5-1 to **Table 5-3** present the incremental NO_2 predictions for each plant scenario. Total NO_x predictions have been shown in brackets within these results.

Table 5-4 to **Table 5-6** present the maximum 1-hour cumulative NO_2 predictions (i.e. inclusive of background) for each plant scenario, with assessment against relevant impact assessment criteria for all scenarios. Gridded receptor predictions for PS1 and PS3 have been reviewed to identify the maximum cumulative prediction at a sensitive location (shown in square brackets).

Table 5-7 to **Table 5-9** present the annual average NO_2 predictions for each plant scenario, with assessment against relevant impact assessment criteria.

Figure 5-1 to **Figure 5-6** present the PS1 maximum 1-hour average incremental NO_2 results for each plant option. **Figure 5-7** to **Figure 5-12** present the PS3 maximum 1-hour average cumulative NO_2 results.

It is noted that cumulative 1-hour NO_2 predictions have included a time-varying background. In many scenarios, the peak predictions are equal to the peak background concentration of 82 µg/m³, indicating minimal impact at a given receptor during the time at which the peak background concentration was reported in conjunction with lower cumulative impacts for all other hours of the model run.

All NO_2 predictions are within respective assessment criteria:

- A peak 1-hour sensitive receptor cumulative NO_2 prediction of 126 µg/m³ reported for distillate operation of the reciprocating engine plant option under Plant Scenario 3.

  This concentration equates to 76% of the 164 µg/m³ criterion and is based on continuous operation of BIPS 1 and BIPS 2 on distillate fuel, and TIPS B operating on natural gas, with all plant operating at 100% of available plant load.

  This represents a conservative basis for assessment given the intermittent operation of these facilities and use of natural gas, for which peak prediction was approximately 20 µg/m³ lower, and close to the existing ambient background concentrations.
- Annual average NO_2 predictions are low relative to criterion of 30 µg/m³, with maximum cumulative predictions less than half of the standard despite the assumption of continuous operation.

TABLE 5-1 MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 1 (BIPS 2) (µg/m³)

Receptor	E1		E2		F1		F2		AD		RE	
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO
R01	6 (6)	10 (10)	4 (4)	12 (12)	2 (2)	6 (6)	8 (8)	23 (24)	13 (13)	24 (24)	31 (45)	36 (66)
R02	9 (9)	16 (16)	3 (3)	9 (9)	2 (2)	6 (6)	9 (9)	26 (28)	20 (20)	36 (37)	36 (47)	41 (65)
R03	8 (8)	13 (13)	4 (4)	14 (14)	2 (2)	6 (6)	8 (8)	23 (24)	18 (18)	23 (43)	31 (32)	46 (46)
R04	11 (11)	18 (18)	4 (4)	13 (13)	2 (2)	6 (6)	12 (12)	22 (37)	21 (21)	30 (39)	44 (92)	51 (131)
R05	3 (3)	5 (5)	2 (2)	5 (5)	1 (1)	3 (3)	5 (5)	14 (14)	9 (9)	17 (17)	30 (30)	46 (46)
R06	8 (8)	13 (13)	5 (5)	13 (16)	4 (4)	10 (10)	8 (8)	21 (24)	16 (16)	19 (30)	42 (86)	57 (122)
R07	5 (5)	8 (8)	3 (3)	9 (9)	2 (2)	5 (5)	10 (10)	29 (29)	11 (14)	20 (24)	36 (74)	39 (110)
R08	3 (3)	5 (5)	2 (2)	7 (7)	2 (2)	5 (5)	8 (8)	23 (23)	7 (7)	12 (12)	29 (29)	38 (43)
R09	17 (17)	28 (28)	13 (13)	30 (39)	6 (6)	18 (18)	24 (24)	70 (70)	27 (27)	49 (49)	49 (87)	63 (186)
R10	10 (10)	17 (17)	4 (4)	14 (14)	2 (2)	6 (6)	10 (10)	29 (29)	19 (24)	23 (45)	24 (31)	34 (43)
R11	8 (8)	13 (13)	4 (4)	12 (12)	2 (2)	7 (7)	8 (8)	25 (25)	16 (16)	30 (31)	34 (50)	40 (68)
R12	5 (5)	9 (9)	4 (4)	12 (12)	4 (4)	11 (11)	6 (6)	19 (19)	34 (36)	36 (62)	30 (30)	41 (43)
R13	6 (6)	10 (10)	3 (3)	8 (8)	2 (2)	5 (5)	8 (10)	24 (29)	18 (31)	31 (56)	39 (95)	54 (133)
R14	9 (9)	13 (15)	6 (6)	13 (17)	4 (4)	12 (12)	8 (25)	23 (72)	18 (23)	33 (42)	44 (75)	58 (115)
R15	10 (10)	16 (16)	6 (6)	17 (18)	2 (2)	7 (7)	11 (12)	30 (36)	17 (18)	28 (41)	54 (94)	57 (120)
R16	4 (4)	7 (7)	3 (3)	10 (10)	2 (2)	6 (6)	12 (12)	24 (36)	16 (16)	25 (25)	25 (25)	36 (36)
Maximum by Receptor Type												
Discrete	17 (17)	28 (28)	13 (13)	30 (39)	6 (6)	18 (18)	24 (24)	70 (70)	34 (36)	49 (49)	54 (94)	63 (186)
Gridded*	64 (64)	84 (108)	42 (42)	95 (118)	24 (24)	66 (66)	44 (44)	94 (130)	59 (59)	88 (88)	101 (135)	111 (200)

Notes: Total NO_x (i.e. NO_x as NO_2) predictions have been shown in brackets.

*Maximum over land gridded receptor prediction, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-2 MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 2 (BIPS 2 + BIPS 1) (µg/m³)

Receptor	E1		E2		F1		F2		AD		RE	
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO
R01	17 (17)	24 (24)	17 (17)	24 (24)	17 (17)	24 (24)	17 (17)	24 (24)	17 (17)	29 (30)	32 (56)	36 (81)
R02	18 (18)	24 (24)	18 (18)	24 (24)	18 (18)	24 (24)	18 (18)	26 (28)	23 (23)	36 (37)	36 (48)	41 (65)
R03	21 (21)	30 (30)	17 (17)	31 (31)	16 (16)	22 (22)	18 (18)	33 (33)	23 (26)	34 (50)	33 (38)	46 (50)
R04	18 (22)	25 (32)	15 (20)	21 (29)	15 (20)	21 (28)	15 (22)	25 (37)	24 (27)	31 (43)	44 (95)	51 (134)
R05	9 (9)	12 (14)	9 (9)	12 (12)	9 (9)	12 (12)	9 (9)	14 (14)	11 (12)	17 (20)	34 (34)	48 (51)
R06	13 (18)	16 (28)	13 (15)	14 (30)	13 (14)	14 (25)	13 (15)	21 (29)	16 (18)	22 (30)	42 (86)	57 (122)
R07	9 (9)	12 (12)	8 (8)	12 (12)	8 (8)	10 (10)	10 (10)	29 (29)	11 (15)	20 (25)	36 (74)	39 (111)
R08	7 (7)	10 (10)	7 (7)	10 (10)	7 (7)	10 (10)	8 (8)	23 (23)	9 (9)	17 (17)	29 (29)	38 (43)
R09	38 (40)	40 (52)	38 (40)	39 (52)	38 (40)	39 (52)	38 (40)	73 (73)	39 (50)	60 (72)	65 (100)	67 (186)
R10	23 (23)	36 (36)	18 (18)	33 (33)	14 (14)	21 (21)	18 (18)	33 (33)	23 (24)	36 (45)	34 (44)	47 (61)
R11	14 (14)	20 (20)	13 (13)	18 (18)	13 (13)	18 (18)	13 (13)	29 (29)	19 (20)	34 (34)	34 (50)	40 (68)
R12	11 (11)	16 (16)	8 (9)	13 (13)	8 (8)	13 (13)	9 (9)	22 (22)	34 (36)	36 (62)	36 (36)	50 (50)
R13	16 (16)	21 (21)	16 (16)	21 (21)	16 (16)	21 (21)	16 (16)	24 (29)	21 (31)	31 (56)	39 (104)	54 (144)
R14	16 (20)	16 (30)	16 (16)	16 (33)	16 (16)	16 (27)	18 (25)	26 (72)	19 (24)	33 (42)	44 (78)	58 (119)
R15	17 (20)	23 (30)	16 (16)	23 (31)	15 (15)	20 (20)	17 (17)	30 (36)	19 (22)	29 (46)	54 (94)	57 (120)
R16	25 (25)	34 (34)	25 (25)	34 (34)	25 (25)	33 (33)	27 (27)	39 (42)	28 (28)	39 (39)	36 (36)	49 (49)
Maximum by Receptor Type												
Discrete	38 (40)	40 (52)	38 (40)	39 (52)	38 (40)	39 (52)	38 (40)	73 (73)	39 (50)	60 (72)	65 (100)	67 (186)
Gridded*	137 (203)	144 (290)	131 (192)	145 (278)	124 (192)	142 (245)	102 (192)	136 (245)	103 (193)	136 (249)	113 (248)	137 (341)

Notes: Total NO_x (i.e. NO_x as NO_2) predictions have been shown in brackets.

*Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-3 MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 3 (BIPS 2 + BIPS 1 + TIPS B) (µg/m³)

Receptor	E1		E2		F1		F2		AD		RE	
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO
R01	26 (26)	29 (30)	23 (23)	29 (31)	22 (22)	25 (25)	21 (21)	24 (25)	22 (22)	29 (30)	32 (56)	36 (81)
R02	24 (24)	27 (27)	22 (22)	28 (28)	22 (22)	26 (26)	24 (24)	32 (32)	24 (24)	36 (37)	36 (48)	41 (65)
R03	41 (50)	42 (60)	40 (47)	42 (60)	40 (44)	41 (52)	40 (48)	49 (62)	41 (52)	42 (64)	43 (62)	54 (74)
R04	26 (34)	31 (40)	27 (31)	34 (41)	25 (29)	28 (34)	28 (28)	37 (37)	25 (30)	33 (43)	44 (95)	51 (134)
R05	22 (22)	25 (25)	20 (20)	24 (24)	20 (20)	23 (23)	21 (21)	27 (27)	22 (22)	25 (25)	34 (34)	48 (51)
R06	23 (39)	32 (49)	20 (37)	28 (52)	20 (35)	24 (46)	20 (36)	30 (51)	20 (40)	26 (51)	42 (86)	57 (122)
R07	21 (21)	24 (24)	20 (20)	23 (23)	20 (20)	22 (22)	20 (20)	29 (29)	21 (21)	23 (25)	36 (74)	39 (111)
R08	18 (18)	20 (20)	18 (18)	20 (20)	18 (18)	19 (19)	18 (18)	23 (23)	18 (18)	21 (21)	29 (29)	38 (43)
R09	67 (102)	73 (114)	67 (93)	80 (119)	67 (88)	79 (93)	80 (86)	84 (131)	65 (110)	69 (131)	66 (100)	69 (186)
R10	39 (39)	45 (45)	36 (36)	45 (45)	34 (34)	39 (39)	35 (35)	41 (41)	41 (41)	52 (52)	47 (51)	56 (68)
R11	27 (27)	33 (33)	26 (26)	33 (33)	24 (24)	28 (28)	28 (28)	45 (45)	35 (35)	50 (50)	34 (50)	40 (68)
R12	29 (31)	30 (36)	29 (29)	30 (34)	29 (29)	30 (33)	29 (29)	33 (35)	34 (36)	36 (62)	38 (39)	50 (51)
R13	42 (42)	44 (49)	37 (37)	41 (41)	37 (37)	40 (40)	37 (37)	39 (39)	44 (46)	45 (57)	44 (108)	54 (147)
R14	24 (44)	27 (55)	21 (41)	26 (57)	20 (39)	23 (51)	22 (40)	27 (72)	23 (44)	33 (57)	44 (78)	58 (119)
R15	33 (33)	38 (41)	31 (31)	39 (42)	31 (31)	35 (35)	38 (38)	57 (57)	34 (35)	38 (46)	54 (94)	57 (120)
R16	25 (25)	34 (34)	25 (25)	34 (34)	25 (25)	33 (33)	27 (27)	39 (49)	28 (28)	39 (39)	36 (36)	49 (49)
Maximum by Receptor Type												
Discrete	67 (102)	73 (114)	67 (93)	80 (119)	67 (88)	79 (93)	80 (86)	84 (131)	65 (110)	69 (131)	66 (100)	69 (186)
Gridded*	142 (249)	149 (330)	140 (232)	150 (322)	140 (217)	147 (268)	138 (208)	141 (245)	138 (216)	141 (255)	139 (251)	143 (341)

Notes: Total NO_x (i.e. NO_x as NO_2) predictions have been shown in brackets.

*Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-4 MAXIMUM 1-HOUR AVERAGE CUMULATIVE NO_2 PREDICTIONS– PLANT SCENARIO 1 (BIPS 2) ($\mu g/m^3$)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	82 (All results)												**82**
R02													
R03													
R04													
R05													
R06													
R07													
R08													
R09													
R10													
R11													
R12													
R13													
R14													
R15													
R16													
Maximum by Receptor Type													
Discrete	82 (All results)												**82**
Gridded*	82	90	82	101	82	82	84	98	86	92	107	126	**126**
Criterion													***164***

Note: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-5 MAXIMUM 1-HOUR AVERAGE CUMULATIVE NO_2 PREDICTIONS– PLANT SCENARIO 2 (BIPS 2 + BIPS 1) (µg/m^3)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	82 (All results)												**82**
R02													
R03													
R04													
R05													
R06													
R07													
R08													
R09													
R10													
R11													
R12													
R13													
R14													
R15													
R16													
Maximum by Receptor Type													
Discrete	82 (All results)												**82**
Gridded*	143	150	137	151	130	148	108	142	109	142	119	143	**151**
Criterion													***164***

Note: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-6 CUMULATIVE MAXIMUM 1-HOUR AVERAGE NO_2 PREDICTIONS – PLANT SCENARIO 3 (BIPS 2 + BIPS 1 + TIPS B) ($\mu g/m^3$)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R02	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R03	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R04	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R05	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R06	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R07	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R08	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R09	82	82	82	82	82	82	82	87	82	82	82	82	**87**
R10	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R11	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R12	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R13	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R14	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R15	82	82	82	82	82	82	82	82	82	82	82	82	**82**
R16	82	82	82	82	82	82	82	82	82	82	82	82	**82**
Maximum by Receptor Type													
Discrete	82	82	82	82	82	82	82	87	82	82	82	82	**87**
Gridded*	148 [89]	155 [91]	147 [89]	156 [93]	146 [87]	154 [91]	144 [87]	147 [94]	144 [89]	147 [93]	145 [105]	149 [126]	**[126]**
Criterion													***164***

Notes: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.
Maximum gridded sensitive receptor predictions shown in square brackets.

TABLE 5-7 ANNUAL AVERAGE NO_2 PREDICTIONS – PLANT SCENARIO 1 (BIPS 2) (µg/m^3)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.3	0.4	**0.4**
R02	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.3	0.4	**0.4**
R03	0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	0.2	0.6	0.9	**0.9**
R04	0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	0.3	0.1	0.3	0.5	0.6	**0.6**
R05	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	0.1	0.2	0.3	**0.3**
R06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.3	0.4	**0.4**
R07	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.1	0.2	0.2	**0.2**
R08	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.1	0.1	0.1	0.2	**0.2**
R09	0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	0.2	0.1	0.3	0.7	1.0	**1.0**
R10	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	0.2	0.4	0.6	**0.6**
R11	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.1	0.1	0.2	0.3	0.4	**0.4**
R12	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.3	0.4	**0.4**
R13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.1	0.3	0.6	0.8	**0.8**
R14	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.5	0.6	**0.6**
R15	0.1	0.1	<0.1	0.1	<0.1	0.1	0.1	0.3	0.2	0.3	0.5	0.7	**0.7**
R16	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.2	0.2	0.3	**0.3**
Maximum by Receptor Type													
Discrete	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.3	0.2	0.3	0.7	1.0	**1.0**
Gridded*	0.5	0.8	0.3	0.8	0.1	0.4	0.1	0.3	0.2	0.4	1.3	1.8	**1.8**
Assessment Against Criterion													
Background													10.8
Maximum Cumulative													12.6
Criterion													***30***

Note: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-8 ANNUAL AVERAGE NO_2 PREDICTIONS – PLANT SCENARIO 2 (BIPS 2 + BIPS 1) ($\mu g/m^3$)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.5	**0.5**
R02	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.4	0.2	0.3	0.4	0.5	**0.5**
R03	0.3	0.5	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.6	0.9	1.2	**1.2**
R04	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.5	0.3	0.4	0.6	0.8	**0.8**
R05	0.1	0.2	0.1	0.2	0.1	0.2	0.1	0.3	0.2	0.3	0.3	0.5	**0.5**
R06	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.3	0.3	0.5	**0.5**
R07	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	**0.3**
R08	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.3	**0.3**
R09	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.4	0.3	0.5	0.9	1.2	**1.2**
R10	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.6	0.8	**0.8**
R11	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.6	**0.6**
R12	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.4	0.5	**0.5**
R13	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.3	0.2	0.4	0.7	0.9	**0.9**
R14	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.2	0.4	0.5	0.7	**0.7**
R15	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.5	0.3	0.5	0.7	0.9	**0.9**
R16	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.3	0.3	0.5	**0.5**
Maximum by Receptor Type													
Discrete	0.3	0.5	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.6	0.9	1.2	**1.2**
Gridded*	2.9	3.6	2.8	3.7	2.7	3.4	2.6	3.3	2.7	3.4	3.1	3.9	**3.9**
Assessment Against Criterion													
Background													10.8
Maximum Cumulative													14.7
Criterion													***30***

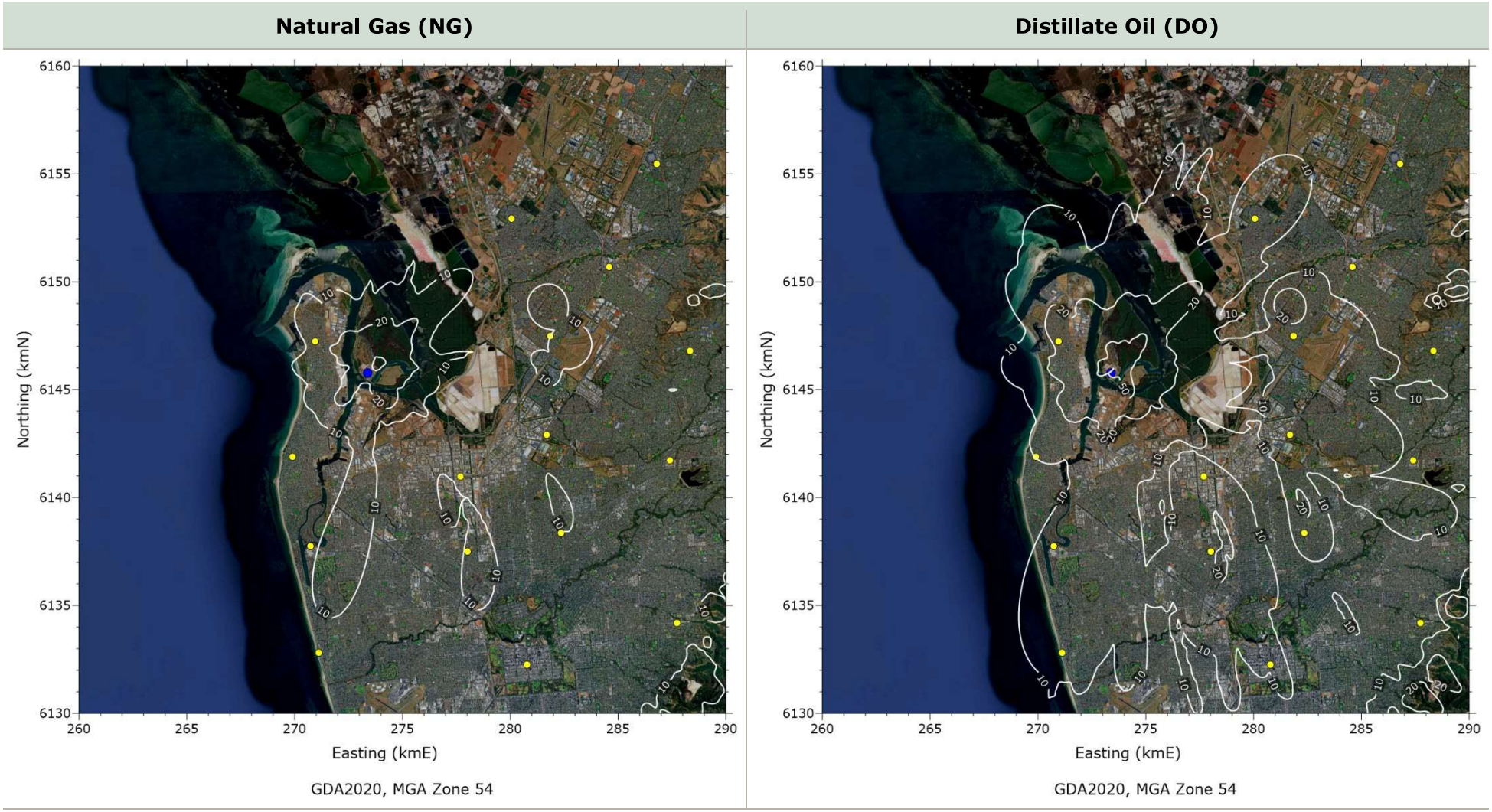
Note: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.

TABLE 5-9 ANNUAL AVERAGE NO_2 PREDICTIONS – PLANT SCENARIO 3 (BIPS 2 + BIPS 1 + TIPS B) (µg/m^3)

Receptor	E1		E2		F1		F2		AD		RE		Max. All Scenarios
	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	NG	DO	
R01	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.4	0.5	0.6	**0.6**
R02	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.6	0.4	0.5	0.6	0.7	**0.7**
R03	0.6	0.8	0.6	0.8	0.6	0.7	0.6	0.8	0.7	0.9	1.2	1.5	**1.5**
R04	0.4	0.5	0.4	0.5	0.4	0.4	0.5	0.7	0.5	0.6	0.8	1.0	**1.0**
R05	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.5	0.6	**0.6**
R06	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	0.4	0.5	**0.5**
R07	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.4	0.5	**0.5**
R08	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.3	0.3	0.4	**0.4**
R09	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.6	0.5	0.7	1.1	1.4	**1.4**
R10	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.8	1.0	**1.0**
R11	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.5	0.6	0.7	**0.7**
R12	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.5	0.4	0.5	0.6	0.7	**0.7**
R13	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	0.3	0.5	0.8	1.0	**1.0**
R14	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.5	0.6	0.8	**0.8**
R15	0.5	0.6	0.5	0.6	0.5	0.5	0.5	0.8	0.6	0.8	1.0	1.2	**1.2**
R16	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.5	0.4	0.5	0.5	0.6	**0.6**
Maximum by Receptor Type													
Discrete	0.6	0.8	0.6	0.8	0.6	0.7	0.6	0.8	0.7	0.9	1.2	1.5	**1.5**
Gridded*	3.3 [0.7]	4.0 [0.8]	3.2 [0.7]	4.0 [0.8]	3.2 [0.6]	3.8 [0.8]	3.1 [0.7]	3.7 [0.8]	3.2 [0.8]	3.8 [1.0]	3.6 [1.3]	4.3 [1.7]	**[1.7]**
Assessment Against Criterion													
Background													10.8
Maximum Cumulative													12.5
Criterion													***30***

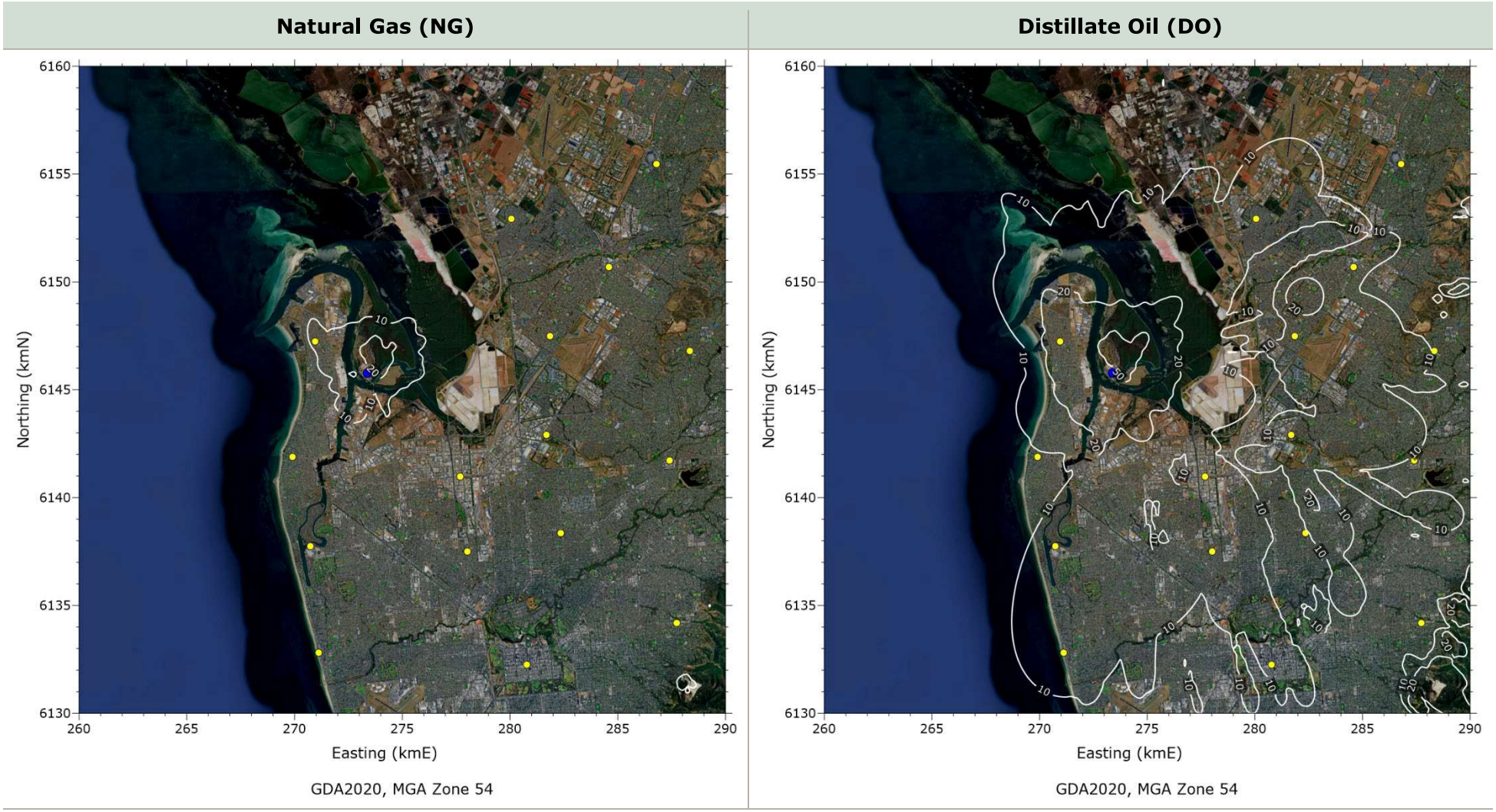
Notes: *Maximum gridded receptor prediction over land, inclusive of the site and other areas where sensitive receptors may not be present.
Maximum gridded sensitive receptor predictions shown in square brackets.

FIGURE 5-1 PLANT OPTION E1: MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 1 (BIPS 2) (µg/m^3)



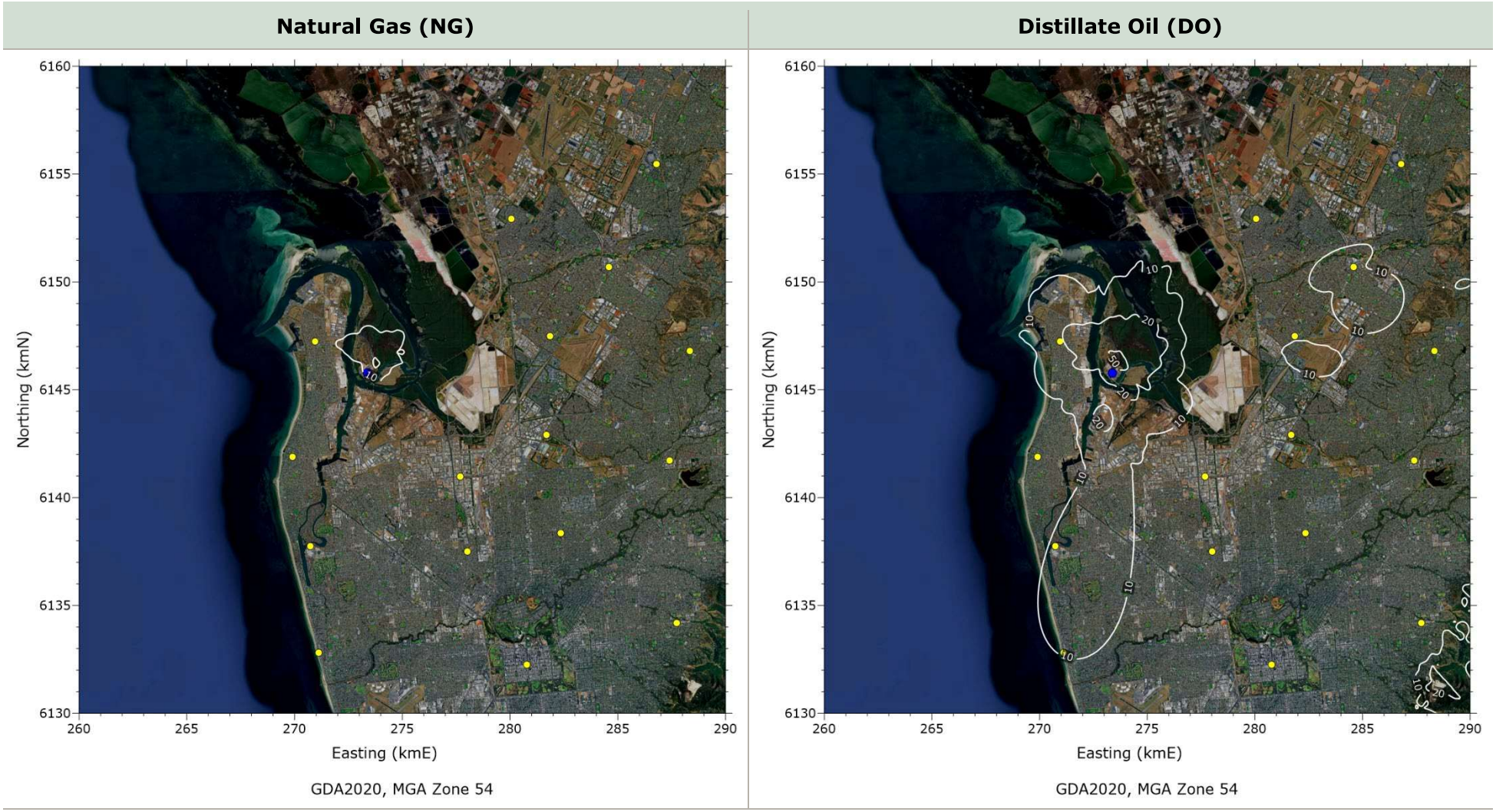
Notes: Contour levels 10, 20, 50 µg/m^3. Cumulative criterion: 164 µg/m^3.

FIGURE 5-2 PLANT OPTION E2: MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 1 (BIPS 2) (µg/m^3)



Notes: Contour levels 10, 20, 50 µg/m^3. Cumulative criterion: 164 µg/m^3.

FIGURE 5-3 PLANT OPTION F1: MAXIMUM 1-HOUR AVERAGE INCREMENTAL NO_2 PREDICTIONS – PLANT SCENARIO 1 (BIPS 2) (µg/m^3)



Notes: Contour levels 10, 20, 50 µg/m^3. Cumulative criterion: 164 µg/m^3.