

# Attachment I

## Peer Review Report B





**INDEPENDENT PEER REVIEW – REPORT B**  
Viva Energy Gas Terminal Project  
Supplementary environment effects statement

05 August 2024

Prepared for:  
Department of Transport and Planning

Project Number:  
304501302\_R02

## Independent Peer Review – REPORT B

<b>Rev.</b>	<b>Description</b>	<b>Author</b>	<b>Date</b>	<b>Quality Check</b>	<b>Date</b>	<b>Independent Review</b>	<b>Date</b>
1	Draft		12 July24		12 July 24		12 July24
2	Final		5 Aug 24		05 Aug 24		05 Aug 24
3							



## Independent Peer Review – REPORT B

The conclusions in the Report titled Independent Peer Review Report B are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Department of Transport and Planning (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.



## Table of Contents

<b>GLOSSARY.....</b>	<b>II</b>
<b>1 INTRODUCTION.....</b>	<b>1</b>
1.1 General .....	1
1.2 Scope of Work.....	1
1.3 Limitations to Scope of Work .....	2
<b>2 MINISTER’S DIRECTIONS.....</b>	<b>3</b>
<b>3 REVIEW OF TECHNICAL REPORT A: SUPPLEMENTARY MARINE ENVIRONMENT IMPACT ASSESSMENT .....</b>	<b>6</b>
3.1 Viva Energy’s response (Step 3).....	6
3.2 Hydrodynamics and modelling .....	6
3.3 Marine biology and ecology .....	7
<b>4 REVIEW OF TECHNICAL REPORT B: SUPPLEMENTARY THREATENED AND MIGRATORY BIRDS IMPACT ASSESSMENT .....</b>	<b>8</b>
<b>5 CONCLUSION AND RECOMMENDATIONS.....</b>	<b>9</b>
<b>6 REFERENCES.....</b>	<b>10</b>

### LIST OF APPENDICES

APPENDIX A HYDRODYNAMICS

APPENDIX B MARINE BIOLOGY AND ECOLOGY

APPENDIX C BIRDS



## Glossary

EES	Environment Effects Statement
FSRU	Floating Storage and Regasification Unit
IAC	Inquiry and Advisory Committee
LNG	Liquefied Natural Gas
SEES	Supplementary Environment Effects Statement



# 1 Introduction

## 1.1 General

Viva Energy Gas Australia Pty Ltd (Viva Energy) is planning to develop a floating gas terminal using a ship known as a floating storage and regasification unit (FSRU). The FSRU would be permanently moored at Refinery Pier in Corio Bay, Geelong. The FSRU would store liquefied natural gas (LNG) received from visiting LNG carriers and regasify the LNG as required to meet residential, industrial, and commercial customer demand. The FSRU would convert the LNG back into a gaseous state by heating the LNG using seawater (CEE, 2024).

As part of the project the existing Refinery Pier will be extended to create a new berth and a seawater transfer pipe connecting the seawater discharge points on the FSRU to the existing refinery seawater intake will be constructed. The reuse of the FSRU seawater discharge, which is colder than the ambient seawater, as cooling water within the refinery provides potential synergies and efficiencies. The potential discharge of colder water and the use of chlorine to prevent marine growth in the seawater circulating system, among a range of issues, requires an assessment of the potential environmental impact of the project.

An Environment Effects Statement (EES) was prepared and considered by an Inquiry and Advisory Committee (IAC). The Minister for Planning's Directions (Minister's Directions) for the Viva Energy Gas Terminal Project (the Project) Environment Effects Statement (EES) dated 6 March 2023 required that a Supplementary Environmental Effects Statement (SEES) be prepared for the project by Viva Energy, in accordance with sections 5 and 8C(2) of the Environment Effects Act 1978. The SEES is required before the Minister can complete her assessment of the project's environmental effects in accordance with the Minister's Directions and to inform decision making.

A Supplementary Statement Study Program for the project was developed by Viva Energy in response to Item 1 of the 'Procedures to be applied to the Supplementary Statement' as documented in the Minister's Directions, which require Viva Energy to develop a study to inform the Supplementary Statement. These directions include aspects of the marine environment and Stantec Australia Pty Ltd has been appointed as independent peer reviewers for the numerical modelling, marine ecology and bird aspects of the SEES.

## 1.2 Scope of Work

This report has been prepared under a contract between Stantec Australia Pty Ltd and the Department of Transport and Planning entitled Agreement for the: *Provision of Independent Peer Review of Hydrodynamic Modelling and Marine Ecology Impact Assessment for Viva Energy Gas Terminal Project Supplementary Environment Effects Statement*. The section of this contract relevant to this report states that the contractor (Stantec) will:

- i. Review and verify whether:
  - a. existing conditions assessment is accurate and comprehensive in relation to the values relevant to the assessment;





## Independent Peer Review – REPORT B

### 1 Introduction

- b. the regional hydrodynamic modelling calibration is sound and the model reflects observed current and tide data;
  - c. the list of threatened and migratory bird species potentially impacted by the project is sound;
  - d. the revised nearfield modelling enables a better understanding of the effect of the FSRU on dispersion of marine discharges from the FSRU;
  - e. re-runs of the wastewater discharge modelling, entrainment modelling and sediment transport modelling provide for a better understanding of the potential environmental effects of the project;
  - f. the impact assessment methodology is sound; and
  - g. conclusions drawn in the impact assessment reports are sound.
- ii. Recommend alternative methods and data sources, where the methods and data sources adopted are not considered appropriate or robust.
  - iii. Identify further work or investigations, if required, for a more complete and robust impact assessment.
  - iv. Where required, provide written advice on the need for and scope of any additional independent peer reviews of studies outside of its specialist expertise or any other matters referred to it by DTP.
  - v. Document the approach taken, findings of, and any recommendations and conclusions from the independent peer review of the draft supplementary EES documentation relevant to the above point (vi) in a concise Peer Review Report B.

### 1.3 Limitations to Scope of Work

Stantec's review is based on the following limitations:

- The peer review was limited to the information presented in the SEES. Stantec did not undertake a detailed review of the previous EES.
- The review focussed on whether the technical reports adequately addressed the Minister's Directions only.
- The peer review was undertaken based on the information presented in the technical reports and provided to us by Viva Energy.



## **2 Minister’s Directions**

The Minister's Directions for the SEES contain twelve recommendations for further work. The recommendations listed below are the ones relevant to the subject matter of this peer review.

### **Recommendation 1**

Undertake further survey work to better establish the existing environment and the impacts of existing wastewater discharges from the refinery to enable better understanding of Project impacts. The survey work should:

- a. Cover intertidal, littoral and subtidal habitats that could potentially be affected by the project, including the Ramsar site
- b. Update seagrass mapping to include the intertidal zone and information on the different seagrass species
- c. Be carried out over a period of at least 12 months before construction or dredging starts, with a minimum of four sampling runs (one in each season) to address seasonal variability
- d. Establish a better baseline for monitoring during and after the project to confirm predicted outcomes on shoreline and benthic communities, including seagrasses and macroalgae.

### **Recommendation 2**

Refine calibration of the regional hydrodynamic model so that it more accurately reproduces observed water levels, currents, tidal range and tidal exchange in Corio Bay. Consider:

- a. The selection of the most appropriate wind data
- b. More detailed horizontal resolution to represent the Hopetoun and North Channels more accurately
- c. More detailed vertical resolution to represent discharge plumes in shallow waters more accurately
- d. The effects of the presence of the Floating Storage Regasification Unit (FSRU) on currents
- e. Peer review of the model calibration.

### **Recommendation 3**

Re-run the wastewater discharge modelling with revised inputs based on the refined hydrodynamic model. Consider:

- a. Revising the nearfield modelling of discharges from the diffuser to address the matters raised by Dr McCowan in his written evidence (D75)



## **Independent Peer Review – REPORT B**

### **2 Minister’s Directions**

- b. The IAC’s recommended default guideline values (DGV) for chlorine discharges (7.2 microgram per litre in Corio Bay generally, including the Project area; 2.2 microgram per litre at the Ramsar site).

#### **Recommendation 4**

Consider undertaking further targeted investigations into the effects of existing chlorine discharges from the refinery to confirm likely project impacts resulting from chlorination by-products, including measurement of chlorination by-product concentrations in:

- a. Seawater
- b. Biota that have high susceptibility to contamination.

#### **Recommendation 5**

Re-run the entrainment modelling with revised inputs based on the refined hydrodynamic model.

#### **Recommendation 6**

Re-run the sediment transport modelling with revised inputs based on the refined hydrodynamic model. Consider including a ‘worst-case’ scenario for sediment fractions and settling rates which includes the largest expected proportions of fine and very fine materials that have the slowest expected settling velocities.

#### **Recommendation 7**

Undertake further assessment of dredging impacts on seagrass based on:

- a. The revised sediment transport modelling
- b. Revised light thresholds of 10 percent to 20 percent surface irradiance (20 percent surface irradiance should be applied to any sediment plumes that extend to the Port Phillip Bay (western shoreline) and Bellarine Peninsular Ramsar Site)
- c. The updated seagrass mapping (Rec. 1b)

#### **Recommendation 8**

Confirm the EES conclusion that dredging will not impact the Ramsar site after considering:

- a. The revised marine modelling
- b. The revised assessment of impacts on seagrass

#### **Recommendation 9**

Undertake further assessment of impacts on threatened and migratory bird species by:

- a. Establishing a complete list of threatened and migratory bird species that could potentially be affected by the project (and consider including the black swan)
- b. Having the list peer reviewed



**Independent Peer Review – REPORT B**  
**2 Minister’s Directions**

- c. Undertaking further analysis of the targeted shorebird surveys, to determine whether the surveyed sites individually or collectively support enough individuals of any particular migratory bird species to be an important site for that species in Australia or the East Asian-Australasian Flyway
- d. Considering the revised marine modelling.



### 3 Review of Technical Report A: Supplementary marine environment impact assessment

The peer review process followed a number of steps:

1. Viva Energy prepared a draft “Technical Report A: Supplementary marine environment impact assessment” in March 2024 (hereafter, Technical Report A – V1).
2. The Stantec review team provided written comments on Technical Report A - V1 in an Excel based comments register.
3. Viva Energy provided an updated draft “Technical Report A: Supplementary marine environment impact assessment” in June 2024 (hereafter, Technical Report A – V2) as well as responses to Stantec’s comments in the Excel based comments register.
4. Stantec reviewed Technical Report A - V2 and provided further comments which are summarised in this report.
5. Viva Energy will reply to this report in their final Technical Report.

The detailed Excel based comments register from the review team, as well as Viva Energies responses are provided as appendices to this report, Appendix A for the hydrodynamics, Appendix B for the marine ecology, and Appendix C for the birds.

#### 3.1 Viva Energy’s response (Step 3)

Technical Report A - V1 was prepared and reviewed by Stantec in March 2024. Viva Energy responded to the reviewers' comments and issued Technical Report A – V2 in June 2024 (Viva Energy, 2024). Stantec’s review and commentary on Technical Report A - V2 is presented below. The detailed comments from the review team are included in the appendices to this report.

#### 3.2 Hydrodynamics and modelling

The information presented in Technical Report A – V2 in relation to hydrodynamics and modelling, in particular recommendations 1a, 2a, 2b, 2c, 2d, 3a, 3b and 6, along with the response to comments recorded in the peer-review comments register, see Appendix A, is not completely satisfactory. The technical work underlying the report appears to be satisfactory with the changes to the modelling providing improved and satisfactory simulations. However the presentation and explanation of this work is not considered acceptable and does not sufficiently demonstrate that the model is adequate. In particular the peer review has found that the revised report does not sufficiently demonstrate:

- The most appropriate wind data has been used in the model (Ministers Directions, Recommendation 2 a)
- Whilst a peer review of the model calibration has been undertaken (Ministers Directions Recommendation 2 e), Stantec’s review indicates that there is insufficient information presented in the report to confirm the adequacy of the model that has been applied. Specific examples include:



## Independent Peer Review – REPORT B

### 3 Review of Technical Report A: Supplementary marine environment impact assessment

- No time series comparisons between measured and modelled currents have been provided.
- The measured temperature profiles appear noisy and unrealistic, indicating that the measurements collected to support the modelling may be erroneous or require further processing

The original review generated a number of comments on Section 4 of the Technical Report A – V1 and this section has been significantly rewritten. It proved impractical to try and verify the proponent's response to individual comments and thus a full separate review of this section was undertaken "from scratch". This review is also included in Appendix A. Technical Report A – V2 has addressed many of the concerns from the original review of Technical Report A – V1, however Technical Report A – V2 still contains a number of typos and errors and a recommendation of the peer review is for Viva Energy to review and update the report to address these.

### 3.3 Marine biology and ecology

In Stantec's review of the Supplementary Statement Study Program (Stantec Peer Review Report A), some concerns were raised about the proposed study program which persist in the review of Technical Report A.

An on-going concern is the lack of detail and definition of the statistical methods used in the analysis of the biological data. There are detailed comments in the reviews in Appendix B, but some examples demonstrate the issue:

Despite a reviewer's comment to Technical Report A - V1, the results in section 3.5 of Technical Report A - V2 lack the appropriate level of analytical detail and associated explanation for a modern environmental impact assessment, which was the focus of the original comment.

There appears to be a lack of concern with statistical issues, as exemplified in the response to comment 76 in the review of Technical Report A - V1 where a request for information on the confidence limits of some quoted values was dismissed. The review of Technical Report A - V2 offers simple ways in which this could be addressed.

It is Stantec's recommendation that without further details on the statistical measures used in the analysis we are unable to confirm whether the assessment adequately addresses recommendations 1d, 7c and 8b of the Ministers Direction's.



## **4 Review of Technical Report B: Supplementary threatened and migratory birds impact assessment**

All the comments raised in the review of Technical Report B - V1 have been addressed and considered closed.

Some minor typographical issues have been noted in Technical Report B - V2 (refer to comments 32-37 in Appendix C).



## **5 Conclusion and Recommendations**

In the scope of work for this review, a series of findings and recommendations were developed. These are:

1. The assessment of existing conditions is accurate and comprehensive in relation to the values relevant to the assessment in Technical Report A and B. However it is recommended that the statistical analysis of the monitoring results presented in Technical Report A be more clearly explained.
2. The regional hydrodynamic modelling calibration is sound, and the model reflects observed current and tide data, however a number of potential discrepancies were identified and it is recommended that additional comparisons between modelled and measured data be made in the final report to further quantify the models calibration metrics;
3. The list of threatened and migratory bird species potentially impacted by the project and presented in Technical Report B is sound.
4. The revised nearfield modelling enables a better understanding of the effect of the FSRU on dispersion of marine discharges from the FSRU.
5. The re-runs of the wastewater discharge modelling, entrainment modelling and sediment transport modelling provide for a better understanding of the potential environmental effects of the project.
6. The impacts assessment methodology presented in Technical Report A appears sound, however there is insufficient detail on the statistical methods to fully assess the results. It is recommended that Technical Report B be updated to include further details on the statistical methods used in the analysis.
7. Conclusions drawn in the impact assessment in Technical Reports A and B are sound, however there is insufficient detail on the statistical methods presented in Technical Report A to fully assess the results. It is recommended that the conclusions drawn from Technical Report A be revised, if required, based on any updated statistical analysis carried out when revising the report.





## **6 References**

CEE Consulting Environmental Engineers (2024a) Viva Energy Gas Terminal Project Supplementary Statement Technical Report A: Supplementary Marine Environment Impact Assessment – v1 (05 March 2024)

CEE Consulting Environmental Engineers (2024b) Viva Energy Gas Terminal Project Supplementary Statement Technical Report A: Supplementary Marine Environment Impact Assessment – v2 (04 June 2024)

AECOM (2024a) Technical Report B: Supplementary threatened and migratory birds impact assessment – V1 (03 April 2024)

AECOM (2024b) Technical Report B: Supplementary threatened and migratory birds impact assessment – V2 (04 June 2024)



# APPENDICES



## Appendix A Hydrodynamics

### Peer-review comments register



## Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register

Round 2 Comment categories													
Document	Technical Report A: Supplementary marine environment impact assessment				Comment categories	Response categories		Original comment satisfactorily addressed					
Comments					4	Critical Issue	Accepted - change made.	Original comment satisfactorily addressed but requires minor revision or further consideration					
Organisatio	Stantec				3	Immediate Issue	Closed - no change made.	Original comment not satisfactorily addressed; Response disputed					
					2	Discussion Item	For further discussion.	New comment/query					
					1	Suggestion/editorial change							
Reviewer					Proponent					Reviewer (Round 2)			
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date
1	V1	Table of Contents	The Appendices are not listed.	10/04/2024	1		Agree- Appendices are now listed in Table of Contents	V2	Table of contents	24/04/2024	Accepted		24/06/2024
2	V1	Sect 3.3.2	The timing of the temperature surveys is not clear. The second sentence in the section says "daily and/or weekly measurements". Immediately after Table 3-1, measurements are "each month". App A3 states "six surveys were made at monthly intervals". There is no statement of the actual dates of surveys, just the month and year. For transparency and completeness, the dates should be stated.	10/04/2024	1		Agree- actual dates of temperature surveys listed in report  This has been clarified in section 3.4.2. The daily/months measurments are taken on a continuous basis by Viva and the results used to confirm the discharge arrangements have not changed since the EES. The CEE plume surveys were conducted on a monthly basis and the dates have been added to Section 3.4.3.	V2	3.4.2	24/04/2024	"each month from July 2023 to January 2024" is minimal explanation and barely sufficient temporal coverage.		24/06/2024
3	V1	Table 3-1	Need to make it clear that the percentages quoted are percent les (I assume)	10/04/2024	1		Agree-Text changed to percentiles	V2	Table 3-1	24/04/2024	Accepted		24/06/2024
4	V1	Sect 3.3.2 Definition of DGV for temperature	Various temperatures and statistics are quoted without reference. Figure 3-2 is stated as "Evidence for Temperature DGV in Corio Bay". This is far from sufficient. The origin of the quoted statistics is required.	10/04/2024	3		Agree- Source of temperature data listed. Figure title changed to examples of temperature variation in Corio Bay. Figure 3-2 is a model output which has been verified against monitored temperature fluctuations by CEE during the EES.	V2	3.4.2	24/04/2024	Accepted		24/06/2024
5	V1	Figure 3-4	Text on figure is not clear "3 deg C in 3.6 hrs" should read (I think) 3 deg C reached after 3.6 hours. Similarly for chlorine.	10/04/2024	1		Agree-Text changed as suggested	V2	Figure 3-4	24/04/2024	Accepted		24/06/2024
6	V1	Section 4.3.2 "Differences in simulated plumes" Section 4.3.3	The discussion and figures provides no evidence for the CALMET wind fields being superior, other than the results are in between the alternative wind fields and only one temperature case is shown. This section should at least refer to the following section 4.4 when, presumably, the CALMET winds are used in the updated model (if not, why not?) although this is not stated. The updated wind field is part of the model upgrade and thus the improved reproduction of the currents is important. The first paragraph of sect 4.3.3, should refer to Figure 4-5 ? otherwise it makes statements about current speeds which are not supported by the figure. There is no truth - just three versions and the chlorine values are indirect at best.	10/04/2024	3		The Calmet file is marginally better than the Geelong wind file in reproducing currents. The agreement between modelled and measured plumes is satisfactory for the purpose of modelling, noting that the temperature plumes with the project are much smaller than the existing plumes while the chlorine plumes would remain the same.	V2	4.5	24/04/2024	See separate review		24/06/2024
7	V1	Section 4.4.1 second paragraph	The paragraph is contradictory. The 1 m vertical resolution is clearly not "sufficient to resolve the dilution and transport of thermal plumes" since "the depths of model cells are typically less than 1m". It is also stated elsewhere that the plume is typically 0.5 m deep.	10/04/2024	3		The cell depth is 0.5 m from the surface to 4 m depth, and the top cell is generally only partially full due to the rise and fall of the tide. The cell depth is considered satisfactory to represent the measured extent and dilution of the plumes.	V2		24/04/2024	See separate review		24/06/2024
8	V1	sentence prior to Figure 4-12	This sentence is not easy to read, reword.	10/04/2024	1		Agree - Text changed	V2	Figure 4-12	24/04/2024	See separate review		24/06/2024
9	V1	Table 4-2	This table does not have sufficient information to be useful and seems irrelevant. The reader should not have to read another report to make sense of it.	10/04/2024	4		Agree - Table provides an example of the small differences observed in the sensitivity tests. Text has been added to reference and explain the table.	V2	Table 4-2	24/04/2024	See separate review		24/06/2024
10	V1	Text between Figure 4-12 and Table 4-2	This text is irrelevant as it refers to a previous model, not the one under consideration in this section.	10/04/2024	4		text changed	V2	Section 4.4	24/04/2024	See separate review		24/06/2024

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register										Round 2 Comment categories			
Document	Technical Report A: Supplementary marine environment impact assessment				Comment categories	Response categories				Original comment satisfactorily addressed			
Comments					4 Critical Issue	Accepted - change made.				Original comment satisfactorily addressed but requires minor revision or further consideration			
Organisatio	Stantec				3 Immediate Issue	Closed - no change made.				Original comment not satisfactorily addressed; Response disputed			
					2 Discussion Item	For further discussion.				New comment/query			
					1 Suggestion/editorial change								
Reviewer					Proponent					Reviewer (Round 2)			
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date
11	V1	Section 4.4.1 overall.	The relevance of this section is questionable - if it is to remain, it must be rewritten to better explain what it is trying to say and to make it relevant and understandable as a stand-alone document without requiring knowledge of previous reports.	10/04/2024	4		Agreed - text changed to make plots and tables understandable without reading Hydronumerics report. Explanation added.	V2	Section 4.5	24/04/2024	See separate review		24/06/2024
12	V1	Figure 4-13	Requires a scale for the bathymetry colours	10/04/2024	3		Agree - Scale added	V2	Figure 4-7	24/04/2024	Accepted		24/06/2024
13	V1	Task 2c	First mention of AEM3D - needs definition/explanation	10/04/2024	2		Agree - AEM3D deleted	V2	Task 2c	24/04/2024	Accepted		24/06/2024
14	V1	Figure 4-15	This figure is somewhat misleading. The temperature in the model is not a relatively smooth curve as shown in the figure, but rather a series of steps, as is often shown for bathymetry in models, and is presented in Figure 4-21	10/04/2024	3		Agree- figure re-plotted	V2	Figure 4-9	24/04/2024	Accepted		24/06/2024
15	V1	Section 4.4.3 Simulated currents paragraph 3	Second sentence text "flowing south-west to north-west" should be "flowing in directions between the south west and the north-west". Present text is not clear.	10/04/2024	1		Agree-Text changed	V2	Section 4.7	24/04/2024	See separate review		24/06/2024
16	V1	Figure 4-19	Consider including only one speed scale but at a larger size so that it is legible.	10/04/2024	1		Agree-Changed  When re-structuring this section it was determined that these current rose figures provided an overly technical review of the model verification that was potentially confusing to the reader and so they were removed and summarised in Section 4.7.1. The plots showed that the simulated currents were similar to observed. These plots are still available in the HydroNumerics Report.	V2	Figure 4-19	24/04/2024	See separate review		24/06/2024
17	V1	Figure 4-20	Add a comment as to why summer only has +1 and +2 m ASB while in winter there is +1, +2 and +3 m ASB Comment on speed scale as for Figure 4-19	10/04/2024	1		Agree-Changed  When re-structuring this section it was determined that these current rose figures provided an overly technical review of the model verification that was potentially confusing to the reader and so they were removed and summarised in Section 4.7.1. The plots showed that the simulated currents were similar to observed. These plots are still available in the HydroNumerics Report.	V2	Figure 4-20	24/04/2024	See separate review		24/06/2024
18	V1	Figure 4-22	Requires a distance scale for comparison with Figure 4-21	10/04/2024	1		Figure 4-12 has been amended to include maps with 500 m grids, which are consistent with the scales in Figure 4-11.	V2	Figure 4-12	24/04/2024	See separate review		24/06/2024

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register										Round 2 Comment categories			
Document	Technical Report A: Supplementary marine environment impact assessment				Comment categories	Response categories				Original comment satisfactorily addressed			
Comments					4 Critical Issue	Accepted - change made.				Original comment satisfactorily addressed but requires minor revision or further consideration			
Organisatio	Stantec				3 Immediate Issue	Closed - no change made.				Original comment not satisfactorily addressed; Response disputed			
					2 Discussion Item	For further discussion.				New comment/query			
					1 Suggestion/editorial change								
Reviewer					Proponent					Reviewer (Round 2)			
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date
19	V1	Figure 4-23	Area of plots too great to see plume in sufficient detail to make any reliable judgement regarding model performance. Text describing each panel is illegible, requires larger font or additional description in caption.	10/04/2024	1		Partly agree, but it is a compromise between showing big plumes in the figure, which could mislead the reader to think there are large plumes extending over much of Corio Bay, which is not the case. Case Lable on figure removed  Slightly larger and higher res images with additional notations were provided in the updated report compared to the images that were in the report reviewed by Stantec.	V2	Figure 4-12	24/04/2024	See separate review		24/06/2024
20	V1	Section 4.5 Para 2, 1st dot point	The text implies that the FSRU was represented in the original modelling for the EES, it is understood that the original modelling did not include the FSRU. See comment on Section 4.5.1	10/04/2024	1		Agree - text changed	V2	Section 4.9	24/04/2024	See separate review		24/06/2024
21	V1	Section 4.5.1	Following from previous comment, there is no mention of modelling the FSRU in the original modelling.	10/04/2024	1		Agree - text changed	V2	Section 4.9	24/04/2024	See separate review		24/06/2024
22	V1	Figure 4-24 and 4-25	Caption does not agree with labelling on the plots. Plots are described as "top left clockwise" but appear to be presented "from left to right by row from the top". Panels should be labelled "a), b), etc.	10/04/2024	1		Agree - text changed	V2	Figure 4-14 and figure 4-15	24/04/2024	See separate review		24/06/2024
23	V1	Section 4.5.3	This section appears to only address the effect of the FSRU on currents in conjunction with the diffuser in operation, although this is not very clear. Recommendation 2d states "The effects of the presence of the Floating Storage Regasification Unit (FSRU) on currents." This must include effects without the diffuser operating. The final paragraph refers to results without reference - this appears to refer to information presented in part in Figure 5-3. If so, it should be referenced.	10/04/2024	4		Agree - text changed  This comment was addressed by including additional images into the current comparisons so that there is now existing, FSRU only and FSRU and diffuser so that both with and without the diffuser is included. Further, the reference to chlorine and temperature plumes sizes has been removed and are discussed further in the report were more appropriate.	V2	Section 4.9	24/04/2024	See separate review		24/06/2024
24	V1	Section 4.7 3rd paragraph	The claim that "the modified model could reproduce sea level, tidal exchange, currents, and the thermal plumes accurately." is too strong. The word "accurately" should be replaced with "satisfactorily". The representation of thermal plumes is not accurate, but fit for purpose.	10/04/2024	1		Agree - text changed	V2	Section 4.11	24/04/2024	See separate review		24/06/2024
25	V1	Section 4.6	Peer review - There is no separate peer review of Hydronumerics (2024) as it is included verbatim in this report and the forgoing comments apply to both reports. As such, review comments are presented here & not in a separate register.	10/04/2024			Noted, no change required	V2		24/04/2024	See separate review		24/06/2024
26	V1	Section 5.3.1 Diffuser geometry	Confirmation of the direction of the discharge ports. Are they all directed towards the FSRU or do they alternate along the difuser (a common practice)	10/04/2024	2		Agree - text added to say all diffuser ports point to the south	V2	Section 5.3.1 Diffuser geometry	24/04/2024	Accepted		24/06/2024

## Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register

Round 2 Comment categories													
Document	Technical Report A: Supplementary marine environment impact assessment				Comment categories	Response categories		Original comment satisfactorily addressed					
Comments					4 Critical Issue	Accepted - change made.		Original comment satisfactorily addressed but requires minor revision or further consideration					
Organisatio	Stantec				3 Immediate Issue	Closed - no change made.		Original comment not satisfactorily addressed; Response disputed					
					2 Discussion Item	For further discussion.		New comment/query					
					1 Suggestion/editorial change								
Reviewer					Proponent					Reviewer (Round 2)			
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date
27	V1	Section 5.3.3 Regional hydrodynamic model	It is inferred, but does not appear to be stated, that the vertical resolution of the model below -4 m is 1 m. This seems low when looking at a gap of about 1.5 m under the FSRU at worst.	10/04/2024	2		Inspection of the model results shows that the plume is denser than the ambient seawater and spreads and thins to be in the lower 1 m deep cell. Therefore it is reasonably well represented by the model.	V2		24/04/2024	Accepted		24/06/2024
28	V1	Figure 5-5	Caption should specify "median temperature rise". Scale of plot too large and colour very similar to land making identification difficult.	10/04/2024	1		Figure removed	V2	Figure 5-5	24/04/2024	Accepted, however section 5.3.6, para 2 and para 3 both refer to summer - para 3 should be winter?		24/06/2024
29	V1	Figure 5-6	Text on plots illegible. Different colour scale to Fig 5-5 makes comparison difficult. Scale of plot too large and colour very similar to land making identification difficult.	10/04/2024	1		Figure removed	V2	Figure 5-6	24/04/2024	Accepted		24/06/2024
30	V1	Figure 5-7	Text on plots illegible. Scale of plot too large and colour very similar to land making identification difficult.	10/04/2024	1		Figure removed	V2	Figure 5-7	24/04/2024	Accepted		24/06/2024
31	V1	Section 6	Section not reviewed. See 'Aq Ecol - MLS' tab for this review.	10/04/2024			Noted, no change required	V2		24/04/2024			24/06/2024
32	V1	Section 7.3 Results of re-run Entrainment modelling for Ramsar site.	Last paragraph compares results with and without the FSRU. Was the mass flux into the FSRU intake accounted for in the model as this may impact on the low current-speeds and hence the entrainment. The reduced entrainment may be the result of flow around the hull which will be reduced by the intake of water by the vessel.	10/04/2024	2		For the case modelled, the diluted discharge plume has 20 times the flow into the diffuser. It is very difficult to remove mass and momentum in an interior cell and the model does not attempt to do this. The 5% of missing flow locally is acknowledged but is very minor in relation to the total flow under and around the FSRU.	V2		24/04/2024	Accepted, however a "model cannot do it" is not a good reason. Many models include this function as "source and sink"		24/06/2024
33	V1	Section 7.3 Results of re-run Entrainment modelling for seagrass zone	No comparison with entrainment from the original modelling	10/04/2024	1		The text states that " In Table 10-3 of Technical Report A: Marine environment impact assessment (CEE 2022) of the EES, the estimated entrainment into the refinery intake was 0.12%. Thus, there has been no change in the refinery entrainment with the refinement of the regional model."	V2		24/04/2024	Accepted		24/06/2024
34	V1	Section 7.3 Results of re-run Entrainment modelling for seagrass zone	Second sentence after Figure 7-6 is not complete.	10/04/2024	3		Agree - text changed	V2	Section 7.5	24/04/2024	Unable to confirm this change.		24/06/2024
35	V1	Section 8.2 second dot point	"large bucket dredge" better described as "large backhoe dredge"	10/04/2024	1		Text has been removed.	V2	8.3	24/04/2024	Accepted		24/06/2024
36	V1	Section 8.3.1 Characteristics of the sediment	1st paragraph, reference to Figure 6-4 is incorrect, should be 8-4. If there is geotechnical report, it should be referenced. Map with locations of boreholes would be useful, but not essential.	10/04/2024	1		Figure reference changed to Figure 8-4.	V2	8.4.3	24/04/2024	Accepted		24/06/2024

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register																
Document	Technical Report A: Supplementary marine environment impact assessment					Comment categories	Response categories					Round 2 Comment categories				
Comments						4 Critical Issue	Accepted - change made.					Original comment satisfactorily addressed				
Organisatio	Stantec					3 Immediate Issue	Closed - no change made.					Original comment satisfactorily addressed but requires minor revision or further consideration				
						2 Discussion Item	For further discussion.					Original comment not satisfactorily addressed; Response disputed				
						1 Suggestion/editorial change						New comment/query				
Reviewer					Proponent					Reviewer (Round 2)						
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date			
37	V1	Section 8.2.2 4th dot point	"Channel Dredging Program" in the last sentence should be "Channel Improvement Program" (?)	10/04/2024	1		Agree - text changed	V2	8.3	24/04/2024	Accepted		24/06/2024			
38	V1	Section 8.3.3 Previous Measurements During Dredging	Channel Dredging Program in the last sentence should be "Channel Improvement Program" (?)  Paragraph after dot points, suggested "peak SS of 18 mg/L at the surface" does not agree with quoted NTU values, should be sea bed?	10/04/2024	1		Agree - text changed	V2	8.4	24/04/2024	Accepted		24/06/2024			
39	V1	Figure 8-9	Caption is not clear, needs to make it clear that it is the L&T parameters in the CEE model.	10/04/2024	1		Agree - Caption changed. Note that results are presented for the L&T sediment parameters in the L&T model (Figure 8-10) and the L&T parameters in the CEE model (Figure (8-9)). Both comparisons show that the CEE model results are similar to those of the L&T verification model.	V2	Figure 8-10	24/04/2024	Accepted		24/06/2024			
40	V1	Figure 8-10	Not clear what is being presented. Is it the results from the L&T model with the optimised parameters or the CEE model with L&T optimised parameters? This figure highlights the need to write this section with more care identifying when L&T parameters are used and in which model and when (if at all) it is the L&T model results.	10/04/2024	3		Agree - text changed. Note that results are presented for the L&T sediment parameters in the L&T model (Figure 8-10) and the L&T parameters in the CEE model (Figure (8-9)). Both comparisons show that the CEE model results are similar to those of the L&T verification model.	V2	8.4.11	24/04/2024	There is a significant difference between the lower panels of Figure 8-10 between the March and June versions. Former labelled "EES Sediment Model (2022)", latter "CEE Refined Model", neither are particularly close to the upper panel.		24/06/2024			
41	V1	Section 8.3.3 Slower Settling Rate	Last paragraph requires reference for VRCA tests.	10/04/2024	1		Agree - reference added	V2	8.4.12, Figure 8-1	24/04/2024	Accepted		24/06/2024			
42	V1	Section 8.4	No mention of increased natural background turbidity during storms.  A number of conclusions about impact on sea grass of elevated turbidity without reference to Section 9 where this is discussed in some detail.	10/04/2024	1		Agree - text changed  The report no longer specifically refers to a 'storm event' but to the worst case situation being a time with a higher proportion of fine sediment with slower settling rates. The conclusions of the worst case scenario has been included in the conclusions.	V2	Section 8,5	24/04/2024	Accepted		24/06/2024			
43	V1	Section 9.3.1 fourth paragraph	Omits mention of the Channel Improvement Program 1996-1997, mentioned later, but not in the initial list.	10/04/2024	1		Agree - text changed	V2	9.4.1	24/04/2024	Accepted		24/06/2024			
44	V1	Section 9.3.1 Amount of material to be dredged	Is the dredging and backfilling of the pipeline trench included in the modelling and turbidity considerations?	10/04/2024	2		No as the design of the pipeline and trench have not been finalised and are subject to a subsequent MACA approval. A different dredging method may be used (certainly not a large backhoe dredger). The work may be carried out in stages, with sediment dredged in one section being used as backfill on an adjacent stage. Total sediment volume for the trench is approximately 5,000 m3 which 1 % of berth volume of sediment.	V2		24/04/2024	Accepted		24/06/2024			



**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register													
Document		Technical Report A: Supplementary marine environment impact assessment			Comment categories		Response categories			Round 2 Comment categories			
Comments					1 Critical Issue		Accepted - change made.			Original comment satisfactorily addressed			
Organisatio		Stantec			3 Immediate Issue		Closed - no change made.			Original comment satisfactorily addressed but requires minor revision or further consideration			
					2 Discussion Item		For further discussion.			Original comment not satisfactorily addressed; Response disputed			
					11 Suggestion/editorial change					New comment/query			
Reviewer					Proponent					Reviewer (Round 2)			
ID	Report /Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response	Report/Chapter Revision	Response Section/ location	Response Date	Reviewer Comment	Discuss with agency/reviewer prior to next revision (Yes/No)	Comment Date
45	V1	Section 9.3.1 Light sources for seagrasses	Confusion (typo?) between PFFD and PDDF	10/04/2024	1		Acronym for photosynthetic photon flux density. Text changed to PPF <sub>D</sub> .	V2	9.4.1	24/04/2024	Accepted		24/06/2024
46	V1	Section 9.3.2 Converting suspended solids to light level	Confusion between "K" and "k"	10/04/2024	1		Agree - Text changed - 'K' changed to 'k'	V2	9.4.2	24/04/2024	Sentence after Fig 9-5 has "K" Next para has K <sub>d</sub> (subscript d) next equation has exponent (- k d)  Needs correction		24/06/2024
47	V1	Figure 9.8	Horizontal axis not labelled. Not clear what is being plotted	10/04/2024	3		X-axis is a cumulative percentage of cover at depth. Plot updated with X-axis label	V2	Figure 9-6	24/04/2024	Text in first para section 9.4.3.3 related to figure is not clear.		24/06/2024
48	V1	Figure 9.9	Horizontal axis not labelled. Not clear what is being plotted	10/04/2024	3		X-axis is a cumulative percentage of cover at depth. Plot updated with X-axis label	V2	Figure 9-7	24/04/2024	Text referring to Fig 9-7 not clear - is reference to "sparse" meant to be "medium"?		24/06/2024
49	V1	Section 10.3.2 3rd dot point	"Aermet" should be "CALMET" (?)	10/04/2024	1		Agree - text changed	V2	10.5	24/04/2024	Text does not appear in Section 10.5		24/06/2024
50	V1	Section 11	References re not alphabetical and a number of duplicate entries. Also inconsistent formatting.	10/04/2024	1		Agree - reference list updated	V2	Section 12	24/04/2024	Inconsistent formatting		24/06/2024
51	V1	Appendices	NOT REVIEWED BY THIS REVIEWER	10/04/2024			Noted, no change required	V2		24/04/2024	The hydrodynamics modelling report was not reviewed in the original version since it was identical to the main report. However since there have been significant changes in version 2, the question of a rewritten hydrodynamics report remains. Has this report been updated?		24/06/2024

Viva Energy Gas Terminal Project Supplementary EES - Document Comments Register												
Document title:		Technical Report A: Supplementary marine environment impact assessment				Comment categories			Response categories			
Comments by:						4 Critical Issue			Accepted - change made.			
Organisation:		Stantec				3 Immediate Issue			Closed - no change made.			
						2 Discussion Item			For further discussion.			
		Review of V2 Section 4				1 Suggestion/editorial change						
Reviewer						Proponent						
Comment ID	Reviewer Name	Report/Chapter Revision	Report Section/ location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response Category	Response	Report/Chapter Revision	Response Section/ location	Response Date
0	xxxx	V1	(i.e. s3.2, para 3)	General comment on document	24/05/2023	3	xxxx	Accepted - change made.				
1		V2	Section 4.1	Not a summary of original EES findings, but a summary of the work undertaken, maybe heading needs to be changed, or proper summary provided	24/06/2024	3						
2		V2	Section 4.3	Recommendation 2d, as quoted in section 2 above: "The effects of the presence of the Floating Storage Regasification Unit (FSRU) on currents". No mention of diffuser plume flows.	24/06/2024	3						
3		V2	Section 4.4	Not a background to EES, but an outline of the selection of wind fields for input to the model	24/06/2024	3						
4		V2	Section 4.5	Repeats much of section 4.4	24/06/2024	3						
5		V2	Section 4.5.1, para 5, last sentence.	First mention of Calmet - no context - not meaningful.	24/06/2024	3						
6		V2	Figure 4-3	Figures 4-2 and 4-3 are intended to demonstrate the difference in model results using differing wind fields. Since (as I understand it) the chlorine concentrations are derived from a relationship to the water temperature, in this context, Figure 4-3 provides no new information not already included in Figure 4-2 .	24/06/2024	2						
7		V2	Section 4.5.4, first para	It is implied that Figure 4-5, a plot of plumes, was used to conclude that Calmet (note typo in text) is the most representative. This figure does not provide that information and a side by side of measured and modelled would be useful.	24/06/2024	3						
8		V2	Fig 4-5	What is the time basis for this plot - is it an average over some time, or a specific time. Without this information, it is not meaningful.	24/06/2024	3						
9		V2	Section 4.6.2	Figure 4-7 and accompanying text should be included in this section to make the grid extents clear.	24/06/2024	3						
10		V2	Fig 4-6	axes should be labelled as modelled and measured.	24/06/2024	4						
11		V2	Section 4.7.1	A time-series comparison of measured and modelled currents would demonstrate the correct representation of the tidal and wind-driven flows. The lack of such comparison is concerning. The statements in para 3 require some evidence.	24/06/2024	4						

Viva Energy Gas Terminal Project Supplementary EES - Document Comments Register												
Document title:			Technical Report A: Supplementary marine environment impact assessment				Comment categories			Response categories		
Comments by:							4 Critical Issue			Accepted - change made.		
Organisation:			Stantec				5 Immediate Issue			Closed - no change made.		
							2 Discussion Item			For further discussion.		
			<b>Review of V2 Section 4</b>				1 Suggestion/editorial change					
Reviewer						Proponent						
12	V2	Figure 4-8	The noise in the measured temperature profiles raises issues, possibly related to the instrument resolution. The measurements are not physically reasonable. If an instrument resolution, then it would be acceptable to smooth them to yield a physically realistic profile. However, the variation in the "step" between adjacent values suggests there may be some other factor. This figure requires explanation.	24/06/2024	4							
13	V2	Figure 4-9	No mention of the time of this profile (tide level, wind conditions etc.	24/06/2024	3							
14	V2	Section 4.7.2.1, last sentence	Reference to "subsequent sections below" appears incorrect. There does not appear to be any further mention of sea level.	24/06/2024	4							
15	V2	Section 4.8 , para 1 and Figs 4-11 and 4-12	Figure 4-11 shows a range of measured plume to be compared with Fig 4-12 from model results. If both are "generated on the same tide and wind conditions focusing on incoming to high tide with southerly winds" why such a range of shapes and which of the modelled results relate to which measurements. The report should specify the inputs used or that they matched specific times. Otherwise it could be taken that random model results which looked like one or another of the measurements have been presented. This does not demonstrate model performance.	24/06/2024	4							
16	V2	Fig 13	Given that the chlorine values are inferred from temperatures and that Fig -11 and 4-12 show a range of temperature plumes, which one was selected for Fig 4-13 - why? Very specific statements are made about plume extent, while the evidence from the temperature is that there is a range of temperature plumes.	24/06/2024	4							
17	V2	Figure 4-14 and 4-15	What is the reason for using a 4 hour average for the current vectors. If it is intended to remove tides, then a 12 hour average would be relevant. Four hours would seem to only include part of the tidal cycle.	24/06/2024	4							
18	V2	Section 4.10	The peer review has been undertaken, but is not complete. The editing of this section includes significant changes. Have these changes been included in a revised report on the modelling? Such a report has not been separately reviewed.	24/06/2024	4							

## Appendix B Marine biology and ecology

### Peer-review comments register



**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register																
Document					Response categories					Round 2 Comment categories						
Aquatic Ecology Review					Accepted - change made.					Original comment satisfactorily addressed						
Comments by: Stanlec					Closed - no change made.					Original comment satisfactorily addressed but requires minor revision or further consideration						
					For further discussion.					Original comment not satisfactorily addressed; Response disputed						
										New comment/query						
Reviewer (Round 1)					Proponent (Round 1)					Reviewer (Round 2)						
Comment ID	Reviewer Name - All	Report/Chapter Revision	Report Section/ location	Reviewer Comment	Comment Category	Response Category	Response	Report/Chapter Revision	Response Section/ location	Response Date	Comment ID	Reviewer Name	Comment Date	Report/Chapter Revision	Report Section/ location	Reviewer Comment
1		V1	All	No page numbering	3	Accepted - change made.	Page numbers have been included	V2	General	24/04/2024	1		18/06/2024	V2		Original comment satisfactorily addressed
2		V1	Frontpiece?	No frontpiece - add publication details (suggest move "version history") to frontpiece and add a brief description of the cover photograph	1	Accepted - change made.	Brief description of cover photograph added beneath the version history, under the table of contents.	V2	General	24/04/2024	2		18/06/2024	V2		Original comment satisfactorily addressed
3		1	PDF page 9	Paragraph 1: Refer to Minister's Directions at Section 2 (PDF pp 21-22). Suggest that The Minister's Directions should be referred to as a table.	1	Accepted - change made.	Text changed. Table title added	V2	Section 2	24/04/2024	3		18/06/2024	V2		Original comment satisfactorily addressed
4		V1	Nowhere in report	No Executive summary provided: this should address specifically the Minister's Directions & how each of these was addressed. If included in the next draft, the Exec Summary should be reviewed	4	Accepted - change made.	A summary of the directions and findings of the Supplementary Studies is now provided in a foreword to the report. The foreword and summary is included in a separate tab of this peer review.	V2	Foreword	24/04/2024	4		18/06/2024	V2		Foreword - Summary of Supplementary Marine Studies' section has been reviewed. Comments and suggested edits have been inserted in the section in the V2 PDF provided.
5		V1	TOC	Appendix A1, A2 and Technical Memo 3 not in TOC	1	Accepted - change made.	References to appendices have been removed	V2	General	24/04/2024	5		18/06/2024	V2		Original comment satisfactorily addressed
<b>RECOMMENDATION #1, TASK 1b: UPDATED SEAGRASS MAPPING</b>																
		Chapter 3									5a		18/06/2024	V2 - Chapter 3	3.5	Where is 3.5.1? (QA issue)
6		3.4.1	PDF page 33, para 14, line 6	Typo - "patters" should be "patterns"	1	Accepted - change made.	Accepted - change made.	V2	3.5	24/04/2024	6		18/06/2024	V2 - Chapter 3	3.5.2, p 3-30, last line	Original comment satisfactorily addressed
7			PDF page 34, Figure 3-7	Figure is of questionable relevance as it is nowhere near the area of interest	2	Closed - no change made.	Figure 3-7 shows the year-to-year variation in seagrass cover at St Leonards and Bellarine Bank in Port Phillip Bay. Both sites are in the vicinity of Corio Bay with the same species of seagrass.				7		18/06/2024	V2 - Chapter 3	3.5.2, p 3-31	Ok, but "Both sites are in the vicinity of Corio Bay with the same species of seagrass" is important context that could (should) be added to the sentence preceding the figure (now Fig 3-6) to highlight its specific relevance. Suggest amending the existing sentence on p 3-31 to: 'Fig 3-6 shows an example at (...), in the vicinity of Corio Bay and with the same species of seagrass, where there has been (...).'
8		3.4.2	PDF page 34, para 1, line 1	Clarify which of the "previous sections" are being referred to	2	Accepted - change made.	Reference to previous sections removed.	V2	3.5	24/04/2024	8		19/06/2024	V2 - Chapter 3	3.5.3, p 3-32	Original comment addressed. However, there is clearly a problem with section referrals here, and possibly elsewhere in this report. The second and third paragraphs of 3.5.3 refer to seagrass sampling results in sections 3.4.3 and 3.4.4 respectively, which are clearly incorrect section referrals. Suggest spending the necessary time and effort on basic reporting QA for the entire report.
9			PDF page 35, para 2	No detail on the type of statistical analysis undertaken	4	Accepted - change made.	Text changed to "A statistical analysis was undertaken using the two sided t-test to examine whether there is a difference in seagrass cover in the area of the discharge plumes compared to seagrass cover in the Ramsar site".	V2	3.5	24/04/2024	9		19/06/2024	V2 - Chapter 3	3.5.3, p 3-32	The wording in the response cell here is perfectly OK (although very light on detail) and has been inserted in the location relating directly to this comment (i.e., 3.5.3). I'm hoping to see more about how the stats were executed in following sections. However, a shorter version of this sentence present underneath Table 3-1 on page 3-22 contains unsatisfactorily ambiguous wording and needs to be worded like the sentence in the response cell here. The wording on p 3-22: "The two-sided t-test was used at the 0.05 significance level to examine whether there was a significant difference in seagrass cover in the two areas", is not clear. That is, "...to examine whether there was a significant difference in seagrass cover in the two areas" is quite ambiguous as to what is being compared against what, while the sentence in the response cell here is relatively unambiguous in that sense. Suggest copying the sentence in 3.5.3 and replacing the inferior sentence on p 3-22 with it to improve clarity.
											9a		19/06/2024	V2 - Chapter 3	3.5.3, p 3-32, last sentence	"Examples of the results of the analysis for winter 2023 are presented below for the intertidal and subtidal zones." Please insert a section referral (and reword), as it's not clear from the wording what is being referred to. If it's the results in section 3.5.4, those results contain winter, spring and summer of, presumably, 2023, not just winter.
10		3.4.3	PDF page 36 Figure 3-8	The caption identifies "seasonal variation", however, the labelling indicates confounding of season with year. Variation at different time scales is a major issue and needs to be factored into the baseline design. What were the actual (day) dates of each photo?	3	Accepted - change made.	This figure has been removed from the report.	V2	3.5	24/04/2024	10		19/06/2024	V2 - Chapter 3	3.5.3	Original comment satisfactorily addressed
11			PDF pages 38-39, Figure 3-9	Despite the presence of extensive seagrass beds (intertidal and subtidal) very close to the wharf and dredge, there seems to be very limited baseline monitoring there. Please show the location of the W1 - W5 on Fig 3-9 - it provides a better context with the overlay of seagrasses	3	Closed - no change made.	There are no intertidal seagrass close to the wharf - the coast near the W1 discharge is rock walls. The subtidal seagrass close to the wharf are small patches as the depth (light limitation) and the effects of ship movements restrict growth.				11		19/06/2024	V2 - Chapter 3	3.5.4.1, p 3-35, Fig 3-7.	Please somehow indicate the location of the W1 - W5 discharges on Fig 3-7 - it provides a clearer context with the overlay of seagrasses. This would be a very useful and informative overlay and shouldn't take much effort.

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document			Comment categories			Response categories			Round 2 Comment categories				
Aquatic Ecology Review			Accepted - change made.			Accepted - change made.			Original comment satisfactorily addressed				
Comments by:			Critical Issue			Closed - no change made.			Original comment satisfactorily addressed but requires minor revision or further consideration				
Organisation: Stanlec			Immediate Issue			For further discussion.			Original comment not satisfactorily addressed; Response disputed				
			Discussion Item						New comment/query				
			Suggestion/editorial change										
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)					
12	PDF Page 38, paras 9 & 10	Blake <i>et al.</i> 2012 - Not in list of references. It may be Hirst <i>et al.</i> (2012). Notwithstanding the close affinity among variables, I recommend that all variables be measured during the baseline period.	3	Closed - no change made.	Agree, the reference is Hirst, Ball & Blake (2012). Their paper states that "A single principal component summarized variance expressed in seagrass cover, length and stem/shoot density because variables are highly correlated (P<0.001). A single principal component explained 90% of the variance in these three seagrass variables for the shallow subtidal plots, 82% of variance for the deep subtidal plots and 88% of variance for the intertidal plots. The high level of variance explained by a single principal component is due to high correlation between seagrass variables". The implications of this published finding for seagrass is that morphological measurements are not essential and do not represent value for money.  Overall, and as previously discussed, Recommendation 1b in the Minister's Directions is to 'undertake further survey work to better establish the existing environment and the impacts of existing wastewater discharges from the refinery to enable a better understanding of Project impacts. The survey work should update seagrass mapping to include the intertidal zone and information on the different seagrass species'. The objective of what we have proposed for Task 1b is to update the seagrass mapping in the intertidal, littoral and subtidal zones of the existing discharge plumes and at suitable reference sites in the Ramsar zone. That is, the objective of this task is to update the seagrass mapping in the project area to better characterise existing conditions and demonstrate that there is no impact as a result of existing discharges. We believe that the proposed methodology is appropriate for characterising the existing wastewater discharges from the refinery which have been ongoing for over 60 years.	12	19/06/2024	V2 - Chapter 3	3.5.2.1, p 3-34	Must concede that the original comment satisfactorily addressed in terms of justifying the covering of a minimum scope required as interpreted from the Minister's Directions, and considering the Hirst reference and, unfortunately, environmental risk vs. project economics. However, the response is not necessarily agreed with in terms of satisfactory scope for baseline data collection for seagrass beds in the context of adherence to the precautionary principle. Impacts on seagrass health may manifest as a reduction in bed condition that may not result in short or medium-term decrease in % cover, but might inherently decrease the habitat value of the seagrass bed to associated faunal assemblages (e.g., decrease in leaves per shoot or increase in epiphyte growth, which has been barely addressed in any quantitative detail at all - 3.5.4.3). So, agree to disagree.			
13	PDF page 38, para 3, line 2	Clarify text - " <i>Broad-leaf muelleri</i> "	1	Accepted - change made.	Accepted - change made.	V2	3.5	24/04/2024	13	19/06/2024	V2 - Chapter 3	3.5.4.1, p 3-35, paragraph 2	Original comment satisfactorily addressed
14	PDF page 40, para 2	MPB and "bioturbidity organisms" (=benthos?) - any data in support of this?	2	Accepted - change made.	Reference to (CEE, 2022) added.	V2	3.5	24/04/2024	14	19/06/2024	V2 - Chapter 3	3.5.4.1, p 3-36, paragraph 1	Original comment satisfactorily addressed
15	PDF page 40, para 3, line 1	"Usually" are there any data in support of this? E.g. Frequency within seasons, years?	2	Accepted - change made.	Thickness of plumes is described in Section 3-3. This reference has been included. Vertical temperature profiles were measured at many points in the plumes.	V2	3.5	24/04/2024	15	19/06/2024	V2 - Chapter 3	3.5.4.1, p 3-36, paragraph 2	Original comment satisfactorily addressed
16	PDF page 40, para 7 & 8	Understanding "consistency" is useful, but there may be interactive effects that are related to discharge but are not consistent. Consistency should be tested for, but inconsistency should also be considered.	2	Closed - no change made.	The study is examining the effects of seawater temperature and chlorine in the plumes on seagrass cover. A consistent response is expected to higher temperature and chlorine stress (which are linked).	16	19/06/2024	V2 - Chapter 3	3.5.5, p 3-39, paragraph 3	Original comment addressed to a degree, although there are some problems with how this has been framed. First, that is a question, and strictly not a true hypothesis per se. Second, "consistent change" could refer to either direction of change, rate of change, extent of change, or all three, which, to Marcus's point, may involve interactions with other environmental factors (including discharge-related) and each other. It can be (and is) inferred from the explanatory text below the question that the question should be framed as two separate questions: 1) 'Is there a consistent direction of change in seagrass condition related to the refinery discharges?'; and if so, 'Is there a gradient in degree of change with distance from the discharge points?'. Associated hypotheses would be: 1) There will be detectable change in a consistent direction (i.e., positive OR negative) for all discharge points but not at reference sites; and 2) There will be a detectable negative gradient in degree of change with increasing distance from the discharge points. The null hypothesis (that will be tested via the stats) would be no change or consistent direction of change, and no detectable gradient in change with distance from the discharge point, respectively. Suggest simply reframing the question(s) to include the necessary complexities explained above.			

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Comment categories		Response categories				Round 2 Comment categories				
Aquatic Ecology Review				Accepted - change made.		Accepted - change made.				Original comment satisfactorily addressed				
Comments by:				Critical Issue		Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration				
Organisation: Stanlec				Immediate Issue		For further discussion.				Original comment not satisfactorily addressed; Response disputed				
				Discussion Item						New comment/query				
				Suggestion/editorial change										
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)						
17		PDF pp 41-53	Problems as identified previously with categorical nature of data and limited (or no) inferential statistical analyses, confidence limits, etc.	4	Closed - no change made.	The methodology involved measuring seagrass cover and frequency at many points in each zone (with three repetitions) and determining whether or not the seagrass cover in the discharge zone is the same or different from the seagrass cover in the Ramsar Zone.  This included using ANOVA and T-tests to compare the two zones which showed that in both the intertidal range and subtidal range there was no significant difference in cover.  The purpose of the methodology was to determine if there was a difference in seagrass cover and frequency where the existing discharges are located compared to reference sites in the Ramsar Zone. The methods was fit for purpose and it was determined that there was no significant difference caused by the refinery discharges.  text changed in report in section 3.4.3 to make it more clear  Recommendation 1b in the Minister's Directions is to 'undertake further survey work to better establish the existing environment and the impacts of existing wastewater discharges from the refinery to enable a better understanding of Project impacts. The survey work should update seagrass mapping to include the intertidal zone and information on the different seagrass species'. The objective of what we have proposed for Task 1b is to update the seagrass mapping in the intertidal, littoral and subtidal zones of the existing discharge plumes and at suitable reference sites in the Ramsar zone. That is, the objective of this task is to update the seagrass mapping in the	3.5	17	19/06/2024	V2 - Chapter 3	3.5.4, p 3-40 to 3-48	The original reviewer's comment, which is unfortunately very valid, has not been addressed in the slightest by the response, which is of great concern, so I'll try to be as helpful as I can. What these results in 3.5 lack is an appropriate level of analytical detail and associated explanation for the modern EIA, which was the focus of the original comment. The response does not address this other than to basically quote existing report methodology and results text (note that the broad sampling design seems OK; it is the data processing/analysis/presentation that is clearly amiss). Declaring that the "methods was (sic) fit for purpose" is a self-assessment that is not supported by the insufficient (and frankly unacceptable) level of presentation of data analysis methods and results in the report. By way of example, while a "two-sided" (i.e., two-tailed) t-test is pretty straightforward (although n is important but not clearly indicated), simply stating that an ANOVA was done without explaining (or presenting in results) its structure (single factor or multifactorial; fixed or random factors; levels in factors; interaction terms; degrees of freedom; any pooling; etc.), is insufficient reporting in the extreme for a report of this scope. There are some (actually, plenty of) very good examples in the grey consultancy literature of how these types of seagrass studies should be done and reported on. It's simply not up to acceptable, best-practice standards, in my opinion/experience. Section 3.5.4.8 provides the most compelling evidence to support this conclusion: "When all the point survey results for the three seasons are combined, the seasonal pattern for seagrass cover at the intertidal sites is shown in Figure 3-17." is nonsensical text. Further, given we know there are almost always seasonal fluctuations in seagrass cover in shallow water environments, why not have season as a factor in the ANOVA? If the ANOVA is simply one factor with two levels (Discharge and Reference), then it's essentially structurally a two-tailed t-test anyway. Suggest that some help navigating all of this may be required, as text in the proposed Baseline Surveys section seems to demonstrate a better understanding.		
18		PDF page 41, para 4, lines 3-5	How was ground-truthing achieved and what was ground-truthed?	2	Closed - no change made.	Ground truthing on survey lines 1 to 3 were achieved by direct observation at low tide. Ground truthing on lines 4 and 5 were achieved by diver observation (at points) and from towed video camera images.		18	19/06/2024	V2 - Chapter 3	3.5	Where is 3.5.5? (QA Issue)	Original comment satisfactorily addressed	
19		PDR Page 42/3 Fig. 3-13	What is the area (e.g. m2) actual or approximate of habitat under each graphed bar; and how many measures (1 or more?) were assessed under each of the bars? This applies to all similar graphs in this chapter.	2	Closed - no change made.	The text states (On page 5-35) that seagrass cover was then assessed by experienced scientists in a 2 m by 2 m area at each point. This corresponds to about 100 m2 to 160 m2 per line. Overall, seagrass cover was assessed and recorded on approximately 2800 m2 in the discharge zone and the same area in the Ramsar zone.		19	19/06/2024	V2 - Chapter 3	3.5.3, p 3-32, paragraphs 5 & 7; and Figure 3-13 on p 3-40	Original comment basically satisfactorily addressed, but suggest amending the Figure caption to: "Figure 3-13. Seagrass cover in 2m x 2m area survey points along Intertidal Line 2 for W4 and WS Discharges - Winter" to improve clarity and negate the potential need for flicking back to the methods section. Apply to all such figures. More explanatory info directly associated with a figure is better than not enough.		
20	3.5	PDF pages 54 - 62	Proposed baseline surveys - The baseline proposed focuses on potential impacts of dredging. Is there a baseline proposed for the discharge during operation?	3	Closed - no change made.	The objective of Task 1c/1d is to provide a baseline for monitoring during and after project construction to confirm predicted environmental outcomes. It is not required to incorporate sampling during operation of the project. As mentioned in the study program, Task 1c/1d will not form part of the Supplementary Statement. These tasks will be carried out 12-months prior to the commencement of dredging or construction to provide the most accurate and representative baseline for project monitoring during and after construction. The detailed baseline monitoring is scheduled to occur in the 12 months before dredging to avoid having a gap (which could be many months) between the end of the monitoring and the start of dredging. This task will form part of the secondary approvals process (Marine and Coastal Act Consent).		20	19/06/2024	V2 - Chapter 3	3.5 / 3.6? Top of p 3-50 (QA Issue)	I assume this heading should be 3.6 and subsequent sub-sections following suit? (QA Issue)	In interpreting from the response that the answer to the original reviewer's question is 'no'. That is, ongoing monitoring of potential impacts on seagrass from post-construction (or 'operational') discharges is not part of the scope of this report, and that only potential dredging-related impacts on seagrass during and post-construction are the focus of the baseline sampling. If this is indeed the case, then the original comment has been satisfactorily addressed.	
21	3.5.1	PDF page 54, para 2, lines 2-3	I strongly recommend undertaking 2 surveys per season (i.e. 8 surveys) for the baseline period, to provide a measure of within-season variability, for at least some of the key monitoring tasks	2	Closed - no change made.	There is continuous monitoring of light and turbidity, which are key factors for seagrass. There are two surveys proposed during the period of dredging. No further surveys during dredging are proposed.		21	19/06/2024	V2 - Chapter 3	p 3-50, paragraph 3	Original comment satisfactorily addressed. However, baseline sampling is by far the most important sampling phase for detecting during or post-dredging impacts. Given this, I strongly agree in principle with the original comment. While commonly not possible due to delays in approvals and associated, frantic post-approval commencement of construction works, maximising the duration, frequency and spatial coverage of baseline sampling effort represents good value for money in terms of applying the precautionary approach to detecting impacts. More baseline data leads to a greater statistical ability to detect any impacts that may arise, facilitating a faster response in terms of reactionary mitigation measures.		
22		PDF page 55, para 6 line 3	Replace "measurement" with "monitoring"	1	Accepted - change made.	Accepted - change made.	V2	3.5	24/04/2024	22	19/06/2024	V2 - Chapter 3	p 3-51, paragraph 8	Original comment satisfactorily addressed
23		PDF page 55, para 7 line 2	Replace "basis" with "basin"	2	Accepted - change made.	Accepted - change made.	V2	3.5	24/04/2024	23	19/06/2024	V2 - Chapter 3	p 3-51, paragraph 9	Original comment satisfactorily addressed

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Comment categories		Response categories				Round 2 Comment categories			
Aquatic Ecology Review				Accepted - change made.		Accepted - change made.				Original comment satisfactorily addressed			
Comments by: Stanlec				Critical Issue		Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration			
				Immediate Issue		For further discussion.				Original comment not satisfactorily addressed; Response disputed			
				Discussion Item						New comment/query			
				Suggestion/editorial change									
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)					
24	Figure 3-23	Change date for Viva dredging on the graph to 2025 (or 2026)? Note, once the approvals for the baseline are given and the 1 year field program is completed, there would then be a period of several months of data analysis & reporting & further approvals before dredging began. This is likely to mean that dredging would not commence until 2026 at the earliest.	4	Accepted - change made.	Reference to year removed and replaced with "proposed"	V2	Figure 3-20	24/04/2024	24	19/06/2024	V2 - Chapter 3	p 3-52, Fig 3-20	Original comment satisfactorily addressed
25	PDF page 57, para 2, line 1	Change "will" to "can"	4	Accepted - change made.	Accepted - change made.	V2	3.5.2	24/04/2024	25	19/06/2024	V2 - Chapter 3	p 3-54, paragraph 8	Original comment satisfactorily addressed
26	PDF page 58 - Heading	Suggest a short paragraph discussing what needs to be done for the Dredging baseline vs requirements for a baseline for the operational phase of the project (and when the latter would commence)	1	Closed - no change made.	The objective of Task 1c/1d is to provide a baseline for monitoring during and after project construction to confirm predicted environmental outcomes. It is not required to incorporate sampling during operation of the project. As mentioned in the study program, Task 1c/1d will not form part of the Supplementary Statement. These tasks will be carried out 12-months prior to the commencement of dredging or construction to provide the most accurate and representative baseline for project monitoring during and after construction. The detailed baseline monitoring is scheduled to occur in the 12 months before dredging to avoid having a gap (which could be many months) between the end of the monitoring and the start of dredging. This task will form part of the secondary approvals process (Marine and Coastal Act Consent).				26	19/06/2024	V2 - Chapter 3	p 3-55, heading	Original comment generally addressed. However, what absolutely needs to be specifically stated in the heading at the top of p 3-55 is that it refers to baseline monitoring for dredging impacts only. So, suggest amending heading to 'Proposed Methodology for Baseline Monitoring for Detection of Dredging Impacts'. This clarity leaves no confusion over whether it is designed for operational discharge impacts or not.
									26a	19/06/2024	V2 - Chapter 3	p 3-55, paragraph 2	Change "operational" to "dredging-related" here, and anywhere else where "operational" has been unintentionally misleadingly used to refer to dredging-specific monitoring.
27	PDF page 58-59	Light & NTU monitoring - discuss the following: - Deploy sensors closer to dredge footprint and over seagrass habitat on either side of the existing wharf (particularly in seagrasses deeper than 1 m - see Fig 3-10 - confirm if silt curtain(s) to be used - check loggers fortnightly - take secchi depths at all sites: 3 replicate measures per site & time. This will integrate water clarity through the water column, not just at the 1 m depth as specified.	2	Accepted - change made.	Additional discussion included around the use of loggers and Secchi depth measurements. One silt curtain recommended in EES as a mitigation measure. However the focus of this monitoring is on seagrass in the Ramsar site.	V2	3.5.2	24/04/2024	27	19/06/2024	V2 - Chapter 3	p 3-55	Original comment satisfactorily addressed
28	PDF page 58-59	There is no specification of how the data would be analysed statistically	3	Accepted - change made.	Accepted - A description of data analysis was added under Table 3-11. The paragraph has been expanded to provide more clarity.	V2	3.5.2	24/04/2024	28	19/06/2024	V2 - Chapter 3	p 3-58, paragraph 1	Original comment satisfactorily addressed. The level of detail is OK here given that this is a proposal as opposed to actual analysis of data.
29	PDF page 58 - Fig 3-25	Amend figure caption (3-25) to incorporate non-sensor sampling (e.g. infauna, MPB)	3	Accepted - change made.	Accepted - change made.	V2	Figure 3-22	24/04/2024	29	19/06/2024	V2 - Chapter 3	p 3-55, Fig 3-22	Original comment satisfactorily addressed
30	PDF page 58 - Fig 3-25	It is unclear why there are no sampling sites within the Ramsar?	3	Closed - no change made.	The sampling points are just before the boundary of the Ramsar site, as that is the focus of the baseline monitoring.				30	19/06/2024	V2 - Chapter 3	p 3-55	So, the implicit assumption here is, then, that any 'impacts' detected around the outside boundary of the RAMSAR site represent/indicate a confirmed impact on that given indicator within the RAMSAR site. There's no other interpretation possible given the purpose of the sampling.
31	PDF page 59	Re toxic algal blooms - it is likely to be more prudent to sample sediments in the proposed dredge basin for cysts of toxic dinoflagellates which would help identify the risk of a bloom, rather than wait for a bloom to happen.	2	Accepted - change made.	Accepted - change made.	V2	3.5.2	24/04/2024	31	19/06/2024	V2 - Chapter 3	p 3-56	Original comment satisfactorily addressed
32	PDF page 59	Baseline seagrass surveys: - Seagrasses should be surveyed 2x per season to avoid confounding survey time with season (i.e. minimum of 8 surveys for the baseline) - Consider sampling seagrasses within the Ramsar - Select sites to sample seagrasses much closer to the dredging area and at appropriate control sites - Describe the method used by Plake and Ball (2001). - It may not be necessary to harvest leaves for leaf length - this could be done in the field. Suggest that at the start of the baseline a short experiment could be done to compare field measurements using a ruler with harvested leaves.	2	Accepted - change made.	It may be useful to duplicate the monthly sampling during dredging in the baseline study, if the time of dredging is known. However, this may not be the case. The Blake and Ball categories are now included in the text. The Ramsar site seagrass is the focus of monitoring - but in any event, the model shows that there is a relatively flat pattern of increased turbidity in north Corio Bay (on average over 14 days). Measuring leaf length at a small number of sites during dredging is unlikely to be as effective as measuring seagrass cover at approximately 2000 sites over 5 depths.	V2	3.5.2	24/04/2024	32	19/06/2024	V2 - Chapter 3	p 3-56	Original comment satisfactorily addressed



**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Comment categories		Response categories				Round 2 Comment categories			
Aquatic Ecology Review				Accepted - change made.		Accepted - change made.				Original comment satisfactorily addressed			
Comments by:				Critical Issue		Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration			
Organisation: Stanlec				Immediate Issue		For further discussion.				Original comment not satisfactorily addressed; Response disputed			
				Discussion Item						New comment/query			
				Suggestion/editorial change									
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)					
33	PDF page 59	No mention of infauna sampling although it is shown at sampling sites in Figs 3-25 & 3-26. Infauna should be sampled as part of the baseline within the proposed dredge basin before and after dredging (not during), with appropriate spatial controls. This should incorporate searches for exotic species, such as <i>Sabella</i> . No methods are specified, e.g. number of samples per site, use of diver cores or grab (van veen grab from a boat), sieve size, preservation, taxonomic resolution, etc.	2	Accepted - change made.	Infauna sampling is listed in Tables 3-10 and 3-11. Extra text has been added above Figure 3-24 regarding infauna sampling.	V2	3.5.2	24/04/2024	33	19/06/2024	V2 - Chapter 3	p 3-57	Original comment satisfactorily addressed
34	PDF page 59	Baseline algae - how would the data be analysed for cover?	2	Closed - no change made.	The same dense-moderate-sparse-absent classification as used for seagrass cover, as detailed in Section 3.4.2 and Section 3.4.3, would be used for the baseline algal surveys.				34	19/06/2024	V2 - Chapter 3	p 3-56, last sentence	Original comment addressed, but please add this useful detail into the sentence/paragraph under the Baseline Algal Surveys heading at the bottom of page 3-56.
35	PDF page 59	Microphytobenthos (MPB). It is unclear why this work would be necessary given the relatively small size of the dredge basin relative to Corio Bay.	2	Accepted - change made.	Agree, MBP deleted	V2	3.5.2	24/04/2024	35	19/06/2024	V2 - Chapter 3	p 3-56, bottom of page	Original comment satisfactorily addressed
36	PDF page 59	The baseline period does not appear to incorporate sampling for the operational phase of the project, but focuses entirely on the dredging. Thus, it would be necessary to have a further baseline period prior to commencement of the discharges	2	Closed - no change made.	The objective of Task 1c/1d is to provide a baseline for monitoring during and after project construction to confirm predicted environmental outcomes. It is not required to incorporate sampling during operation of the project. As mentioned in the study program, Task 1c/1d will not form				36	19/06/2024	V2 - Chapter 3	p 3-56	Original comment satisfactorily addressed, given the assumptions I've made in my reviewer comment associated with Comment ID 20 above.
37	PDF page 60 - Table 3-8	<ul style="list-style-type: none"> <li>- Long seagrass tow - appears to be only 1 long tow as shown on Figs 3-25 &amp; 3-26. Would it make sense to have 2 parallel tows?</li> <li>- Seagrass lengths - see comments above re proximity to dredging, and timing increased to fortnightly</li> <li>- Chl_a - have sites closer to dredging? How many replicate samples would be taken per site?</li> <li>- MPB sampling - is this really necessary. If so, how many replicate samples per site?</li> <li>- Light - samples closer to dredging? Control locations? Sample replication?</li> <li>- NTU - sites closer to the dredging? Sample replication?</li> <li>- Infauna - sites closer, further details required as identified above.</li> </ul>	4	Accepted - change made.	<p>There was a 3 km long seagrass tow in 2022 and it was repeated in 2023. It is proposed to repeat the same path in the baseline surveys. There are over 10,000 images per tow to analyse.</p> <ul style="list-style-type: none"> <li>- There is a Chl-a close to the dredging.</li> <li>- MPB removed.</li> <li>- Light site added closer to dredging footprint.</li> <li>- Light monitoring is placed along the boundary of the Ramsar Zone to ensure that the requirement of 20% available light is maintained. Control not required.</li> <li>- NTU site added closer to dredging footprint.</li> <li>- 3 infauna sites close to dredging.</li> </ul> <p>Light and NTU will be logged continuously and so replicates are not required. Infauna will be sampled with triplicates for replication and Chl-a will be an integrated sample</p>	V2	Section 3.5	24/04/2024	37	19/06/2024	V2 - Chapter 3	p 3-57	Original comment satisfactorily addressed
38	PDF Page 60, para below table	PAR and TSS have not been described previously - what methods would be used, sampling sites, data analysis, etc.?	2	Accepted - change made.	<p>Further detail on PAR included under Light and NTU monitoring.</p> <p>Unsure why TSS is mentioned. The baseline surveys prior to dredging measure light and NTU not TSS. Page 3-51 discusses light and NTU monitoring in detail.</p> <p>Text added to clarify TSS is not monitored in the suggested baseline monitoring as light and NTU are being measured directly.</p>	V2	Section 3.5.1	24/04/2024	38	19/06/2024	V2 - Chapter 3	p 3-57	Original comment satisfactorily addressed
39	PDF Page 61, Table 3-9	See previous comments - where doe PAR and TSS come in?	2	Accepted - change made.	<p>Further detail on PAR included under Light and NTU monitoring.</p> <p>Unsure why TSS is mentioned. The baseline surveys prior to dredging measure light and NTU not TSS. Page 3-51 discusses light and NTU monitoring in detail.</p> <p>Text added to clarify TSS is not monitored in the suggested baseline monitoring as light and NTU are being measured directly.</p>	V2	Section 3.5.1	24/04/2024	39	19/06/2024	V2 - Chapter 3	p 3-57	Original comment satisfactorily addressed

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Comment categories		Response categories				Round 2 Comment categories				
Aquatic Ecology Review				Accepted - change made.		Accepted - change made.				Original comment satisfactorily addressed				
Comments by: Stanlec				Critical Issue		Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration				
				Immediate Issue		For further discussion.				Original comment not satisfactorily addressed; Response disputed				
				Discussion Item						New comment/query				
				Suggestion/editorial change										
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)						
40		Section 3.5 - all	Baseline as described is almost exclusively for monitoring the dredging is for dredging. What is the baseline for construction and operation of the facility?	2	Closed - no change made.		The objective of Task 1c/1d is to provide a baseline for monitoring during and after project construction to confirm predicted environmental outcomes. It is not required to incorporate sampling during operation of the project. As mentioned in the study program, Task 1c/1d will not form part of the Supplementary Statement. These tasks will be carried out 12-months prior to the commencement of dredging or construction to provide the most accurate and representative baseline for project monitoring during and after construction. The detailed baseline monitoring is scheduled to occur in the 12 months before dredging to avoid having a gap (which could be many months) between the end of the monitoring and the start of dredging. This task will form part of the secondary approvals process (Marine and Coastal Act Consent).			40	19/06/2024	V2 - Chapter 3	Proposed Baseline Surveys sections	Original comment satisfactorily addressed, given the assumptions I've made in my reviewer comment associated with Comment ID 20 above.
		Chapter 6	<b>RECOMMENDATION 4, TASK 4: ADDITIONAL MUSSEL TESTING</b>											
41		PDF page 104 S6.1 Overview, para 5, lines 5-7	Did the urchins occur in places where the plume was fully mixed to the seafloor? That is, where urchins live?	2	Closed - no change made.		Yes, the urchins assessed as part of the EES occurred in places where the plume was fully mixed to the seafloor. In 2023, the urchins were mostly in the Ramsar site.			41	19/06/2024	V2 - Chapter 6	Section 6.2, p 6-26	Original comment satisfactorily addressed
42		6.2 Tasks, dot pt 1	Was the plume present at the depth of the mussel deployment, i.e. very close to the substratum? Was the overall water depth similar at all sites of deployment?	2	Accepted - change made.	V2	The mussel deployments were to monitor CBP in the plume and in Corio Bay. Mussels were deployed from 0.5 to 1 m from the surface, depending on the tide.	6.3	24/04/2024	42	19/06/2024	V2 - Chapter 6	Section 6.3, p 6-27	Original comment satisfactorily addressed
43		General comment	Put scientific name (presumably <i>Mytilus edulis</i> ) in the text at first mention	1	Accepted - change made.	V2	Text added	6.3	24/04/2024	43	19/06/2024	V2 - Chapter 6	Section 6.3, p 6-27	Original comment satisfactorily addressed
44		S 6.3.2, PDF Page 105, 1st para in section, line 2	The first sentence is incorrect in that mussels are being used as a surrogate for marine life, and only one species is being used as a test organism. The sentence should be reworded to reflect this.	2	Accepted - change made.	V2	First sentence removed as it was unnecessary.	6.4.2	24/04/2024	44	19/06/2024	V2 - Chapter 6	Section 6.4.3, p 6-31	Original comment satisfactorily addressed
45		6.3, S6.3.1, PDF Page 105, lines 1-5	Please confirm if these mussels were naturally occurring at the collection sites. Also, it would be useful to have a figure showing all the collection sites that were sampled in 2021 (without having to refer to CEE 2022.	2	Accepted - change made.	V2	Yes, mussels are present naturally on marine structures in Corio Bay and Port Phillip Bay. Figure 6-1 updated with 2021 collection sites.	Figure 6-1	24/04/2024	45	19/06/2024	V2 - Chapter 6	Section 6.4.2, p 6-30	Original comment partially addressed, but please simply insert 'naturally occurring' between "when" and "mussels" in the third line of the first paragraph in 6.4.2 to fully address the comment in the form of a constructive amendment.
46		PDF Figure 6-1, PDF page 106	It would be useful to show the sample sites used in 2021, including controls - this could be done on the existing figure or presented as a separate figure.	1	Accepted - change made.	V2	Figure 6-1 updated with earlier sites.	Figure 6-1	24/04/2024	46	19/06/2024	V2 - Chapter 6	Section 6.4.3, p 6-31, Fig 6-1	Original comment satisfactorily addressed
47		PDF Pages 105-106, Fig 6-1 + text.	This figure should include an overlay of the plume and the source(s) of discharge - Were mussels deployed at any control locations in 2023? - Were any mussels collected from the mussel farm at the start and end of the deployment period and analysed? - Were any translocation controls considered or included in the study? - Were any measures made on physical features of the mussels, e.g., change in the weight of soft tissues? - Was consideration given to potential uptake at different times of the year, other than late winter-spring (2021) or spring (2023)? - Please confirm if the samples from each site were composited. If so, then there was no replication of samples from each site, therefore no measure of potential within and therefore among sites.	2	Accepted - change made.	V2	Control locations are the sites distant from the plumes. Mussels from the farm and from both site deployments were retained for further analysis and two duplicates were analysed. As there was no evidence of detectible contamination in any mussel sample, further analyses were not required. All mussels were checked and alive at the beginning and end of each deployment. Discharge of chlorine occurs every day, and mussels grow throughout the year. Three mussels from each site were composited for the analysis. As all results are zero, the need for further analysis is questionable.  Overall, Recommendation 4 required further targeted investigations into the effects of existing chlorine discharges from the refinery to confirm likely project impacts resulting from chlorination by-products. Whilst there may be alternative study methodologies that could satisfactorily provide the further assessment required by the Minister's Directions we have demonstrated that what was undertaken is also capable of addressing the requirements of the Minister's Directions. As there were no contaminants detected in either the original EES or this supplementary statement, it is considered that the objective of this recommendation for further work has been addressed.	6.4.2	24/04/2024	47	19/06/2024	V2 - Chapter 6	Sections 6.4.3 & 6.4.4, p 6-31 & 6-32	Original comment partially addressed re: sampling methodology, but I agree with the original reviewer's first comment... an overlay of the plume and the source(s) of discharge would be a useful addition to Fig 6.1

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document			Comment categories			Response categories			Round 2 Comment categories				
Aquatic Ecology Review			Accepted - change made.			Accepted - change made.			Original comment satisfactorily addressed				
Comments by:			Critical Issue			Closed - no change made.			Original comment satisfactorily addressed but requires minor revision or further consideration				
Organisation: Stanlec			Immediate Issue			For further discussion.			Original comment not satisfactorily addressed; Response disputed				
			Discussion Item						New comment/query				
			Suggestion/editorial change										
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)					
48	6.3.3, PDF page 106, Results, para 1.	The conclusions are limited due to the limitations identified above.	1	Closed - no change made.	The conclusion is that no sample of live mussels taken from Corio Bay showed evidence of CBP at a detectible level.			48	20/06/2024	V2 - Chapter 6	Section 6.4.4, p 6-32, Para 1	Original comment satisfactorily addressed	
49	6.3.3 Table 6-1	This table is virtually unreadable and should retyped with a larger font	3	Accepted - change made.	Table 6-1 has been updated	V2	Table 6-1	24/04/2024	49	20/06/2024	V2 - Chapter 6	Section 6.4.4, p 6-32, Table 6-1	Original comment satisfactorily addressed
50	6.3.3, para 3	Did NCOOS (2024) test specifically for the chlorine and chlorine by-products associated with discharges typical of that occurring in Corio Bay? (I understand it was all just inferred)	2	Closed - no change made.	It is not known whether NCOOS explored for CBP, however the point being made was that mussel watch is a well-established procedure, used to explore for lots of contaminants.				50	20/06/2024	V2 - Chapter 6	Section 6.4.4, p 6-32, Para 3	Original comment satisfactorily addressed
51	6.3.6, para 4	Are you sure mussels are native to Corio Bay, as evidence suggests that mussels have been spread worldwide by shipping? Suggest their status be confirmed with the Museum.	2	Closed - no change made.	Mussels are present naturally on marine structures in Corio Bay and Port Phillip Bay. This is the basis by which they are considered to be native by this study.				51	20/06/2024	V2 - Chapter 6	Section 6.4.4, p 6-32, Para 4	The Atlantic blue mussel ( <i>Mytilus edulis</i> ) is only 'native' to the northern hemisphere but is "naturally occurring" in Australian waters. This species is most certainly NOT native to Corio Bay and the basis for the response demonstrates fabricated false logic. There is a closely related mussel species that is native to Australian waters - <i>Mytilus planulatus</i> . If we aren't sure of the species in Corio Bay, then it would be most accurate (and prudent) to state that they are 'naturally occurring', rather than assuming they are native, because they may or may not be native in the usual scientific definition of the word in this context. On this basis, simply change "native" to 'naturally occurring', as the former might be wrong, while the latter can't be.
52	General	Are there any recommendations for mussel deployment and analysis once the Viva project is operational - in order to validate the predictions being made now?	2	Closed - no change made.	There are currently no plans for mussel deployment and analysis once the Viva project is operational. The analysis undertaken is considered appropriate to address the recommendation for further assessment in the Minister's Directions. As there were no contaminants detected in either the first or the second mussel deployment studies, the further testing of mussels for the possibility of contamination at Portarlington is not a high priority.				52	20/06/2024	V2 - Chapter 6		Original comment satisfactorily addressed
Chapter 7				<b>RECOMMENDATION 5: REFINE ENTRAINMENT PREDICTIONS</b>									
53	General comment	Has anyone ever looked at entrainment before in relation to the existing intake? If not, there may be important impacts that could now be addressed.	1	Closed - no change made.	We are not aware of anyone previously looking into entrainment at the existing intake.				53	20/06/2024	V2 - Chapter 7		Original comment generally addressed. The reviewer(s) assume that a specific search for such information has been done and nothing was discovered.
54	7	7.3, 7.3.1, PDF page 113	2	Closed - no change made.	The procedure and findings are set out in Section 10.5 of EES marine environment study.				54	20/06/2024	V2 - Chapter 7	Section 7.4.1, p 7-36	Original comment satisfactorily addressed
55	PDF page 114 Fig 7-1	Please clarify what the +/- % numbers signify?	1	Accepted - change made.	Mean plus and minus a standard deviation. Description added above Figure 7-1.	V2	Figure 7-1	24/04/2024	55	20/06/2024	V2 - Chapter 7	Section 7.4.1.2, p 7-36	Original comment satisfactorily addressed
56	PDF page 114 Fig 7-2	Delete "Example of" and add scientific name (e.g. <i>Engraulus australis</i> )	1	Accepted - change made.	Accepted - change made.  Scientific name was added at the start of Section 6.2. Name also added to the map figure caption for further clarity.	V2	Figure 7-2	24/04/2024	56	20/06/2024	V2 - Chapter 7	Section 7.4.1.2, p 7-37	Original comment satisfactorily addressed
57	PDF page 115 para 4, 5, 7, 3.2	Hydrodynamics (2024) should be made available for review	2	Accepted - change made.	Report will be available for review	V2	General	24/04/2024	57	20/06/2024	V2 - Chapter 7		I'm not sure how to confirm this, so I'll leave this for somebody else to check
58	PDF page 115, S7.3.3, para 2	What depth were the water samples from, e.g. surface? Bottom? Through the water column (e.g. obliquely)? At the depth of the proposed intake(s)?	2	Accepted - change made.	Sample depths were 0.2 m below surface, Text added.	V2	7.4.3	24/04/2024	58	20/06/2024	V2 - Chapter 7	Section 7.4.2, p 7-38, Para 3	Original comment satisfactorily addressed
59	PDF page 115, S7.3.3, para 2	Were any replicate water samples taken? It seems that this component was very limited	4	Closed - no change made.	Agreed, the eDNA test was the first known study of fish species in Corio Bay. It was undertaken to expand information on the fish species present and their likely breeding locations. Two sets of water samples were collected in two separate weeks.  Recommendation 5 involved re-running the entrainment model with the refined hydrodynamic model. Whilst there may be alternative study methodologies that could satisfactorily provide the further assessment required by the Minister's Directions, we have demonstrated that what was undertaken is also capable of addressing the requirements of the Minister's Directions. With what was assessed in the original EES and with what has been undertaken in the supplementary statement, potential impacts to entrainment have been addressed.				59	24/06/2024	V2 - Chapter 7	Section 7.4.2, p 7-38, Para 2	Original comment addressed to some degree, although I agree that this component is limited in its scope (particularly temporally), which should be fully addressed. Reviewer comment 61 below indirectly highlights a major limitation in this methodology in terms of temporal scope (see below). Strongly suggest that a caveat sentence be inserted somewhere in this section that acknowledges that the results of the eDNA are only indicative of: 1) which species spawned at some location and time in and/or up-current from the sampling site(s); and 2) which species spawned at the specific time of year that the sampling was done. Species not spawning eggs in the month or two around the sampling events would not be expected to be detected.

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document			Comment categories			Response categories			Round 2 Comment categories		
Aquatic Ecology Review			Accepted - change made.			Accepted - change made.			Original comment satisfactorily addressed		
Comments by:			Critical Issue			Closed - no change made.			Original comment satisfactorily addressed but requires minor revision or further consideration		
Organisation: Stanlec			Immediate Issue			For further discussion.			Original comment not satisfactorily addressed; Response disputed		
			Discussion Item						New comment/query		
			Suggestion/editorial change								
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)			
60	PDF page 115, S7.3.3, para 2	Which eDNA Primer(s) was (were) used?	3	Closed - no change made.	eDNA primers from the Monash University DNA library were used	60	24/06/2024	V2 - Chapter 7	Section 7.4.2, p 7-38, Para 2	This original reviewer's comment (which is delivered in time-efficient prompt style) requires the reviser to clarify the information in the report, not simply provide a conversational answer in this comments register. By way of example here as to how such comments should be addressed: 'The DNA was extracted, identified (using primers held in the Monash University DNA library) and counted at Monash University.'	
61	PDF page 115, S7.3.3, para 2	Was any attempt made to compare data among sites or times of sampling?	4	Closed - no change made.	No attempt was made to compare data among sites or times of sampling given that it is expected that fish swim widely in the Bay  Recommendation 5 involved re-running the entrainment model with the refined hydrodynamic model. Whilst there may be alternative study methodologies that could satisfactorily provide the further assessment required by the Minister's Directions, we have demonstrated that what was undertaken is also capable of addressing the requirements of the Minister's Directions. With what was assessed in the original EES and with what has been undertaken in the supplementary statement, potential impacts to entrainment have been addressed.	61	24/06/2024	V2 - Chapter 7	Section 7.4.2, p 7-38, Para 2	This response is, unfortunately, way too dismissive and does not sufficiently address the reviewer comment, which is very valid. There is, however, a simple fix. As emphasised above, there is a major limitation in this methodology in terms of temporal scope and therefore completeness of the resulting species list. Strongly suggest that a caveat sentence be inserted somewhere in this section that acknowledges that the results of the eDNA are only indicative of: 1) which species spawned at some location and time in and/or up-current from the sampling site(s); and 2) which species spawned at the specific time of year that the sampling was done. Species not spawning eggs in the month or two around the sampling events would not be expected to be detected.	
62	General Comment	Comments: The eDNA component is probably fatally flawed and cannot be relied upon to provide meaningful information for the project.	4	Closed - no change made.	The eDNA test was undertaken to expand information on the fish species present and their likely breeding locations. It achieved this objective.  Recommendation 5 involved re-running the entrainment model with the refined hydrodynamic model. Whilst there may be alternative study methodologies that could satisfactorily provide the further assessment required by the Minister's Directions, we have demonstrated that what was undertaken is also capable of addressing the requirements of the Minister's Directions. With what was assessed in the original EES and with what has been undertaken in the supplementary statement, potential impacts to entrainment have been addressed.	62	24/06/2024	V2 - Chapter 7	Section 7.4.2 & 7.4.3, p 7-38 - 7-39	The original reviewer's comment is 100% correct and the flaws stand out like a bright beacon. See comments above. There is a very simple fix.... Insert a caveat sentence or two (as per above suggestions) so that the reader gets a true understanding of the temporal limitations associated with the sampling schedule. Absence of eDNA evidence is not evidence of species absence, particularly when only a 4% window of only one full year has been sampled.	
63	Dispersion Modelling	This section is based on computer simulations of dispersal of neutrally-buoyant, passive particles "released" from various selected points around Corio Bay. Superficially useful, they do not incorporate active swimmers (e.g. developed fish larvae). It is unclear whether the particles are released at different depths and tides, which could influence where they end up.	2	Accepted - change made.	Particles were released at four times (high tide, half ebb, low tide and half flood), and the average entrainment result reported. Entrapment of swimming larvae and fish is addressed separately in the EES and was not part of the Ministers Directions for this supplementary study.	63	24/06/2024	V2 - Chapter 7	Section 7.5	Original comment satisfactorily addressed	
64	Attraction & Impingement issues	One issue that was not addressed in this chapter was the likelihood of larvae being attracted to the intake via the intake current. Many fish are attracted to currents as they can provide a "free ride" until they enter the intake port and then die. This is not addressed in the dispersion modelling. Also, fish may aggregate around floating objects such as algae (e.g. <i>Phyllospora</i> sp. which have gas filled "bubbles" and may be carried up to the intake screens. Large jellyfish, such as <i>Catostylus mosaicus</i> are weak swimmers and may be impinged against intake screens. This can compromise the operation of the screens and, importantly from an ecological perspective, bring larval fish directly into the intake currents. These matters have not been considered in the report.	2	Closed - no change made.	Entrapment was reviewed in the EES and appropriate mitigation measures were defined. Viva report that very small quantities of fish are captured by the seawater intake screens - mostly seaweed.  Recommendation 5 involved re-running the entrainment model with the refined hydrodynamic model. Whilst there may be alternative study methodologies that could satisfactorily provide the further assessment required by the Minister's Directions, we have demonstrated that what was undertaken is also capable of addressing the requirements of the Minister's Directions. With what was assessed in the original EES and with what has been undertaken in the supplementary statement, potential impacts to entrainment have been addressed.	64	24/06/2024	V2 - Chapter 7	Section 7.5	While the original comment has been satisfactorily addressed according to the assertion that entrapment was assessed as being a negligible issue in the past and the new modelling suggests that would be negligible change to that, the original reviewer's comment represents useful information that would be a relevant and constructive addition to the conclusion/discussion text. And for free.	
RECOMMEND N 7			CHAPTER 9: REC'n. #7, TASK 4: ASSESSING DREDGING IMPACTS ON SEAGRASS								

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Response categories				Round 2 Comment categories						
Aquatic Ecology Review				Accepted - change made.				Original comment satisfactorily addressed						
Comments by:				Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration						
Organisation: Stanlec				For further discussion.				Original comment not satisfactorily addressed; Response disputed						
								New comment/query						
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)						
65	9	PDF pp 145, Sec 9.3.1, Task 7,	It would be useful to identify the depth of the channel(s) dredged before dredging (i.e. mean depth, min & max depths). Suggest these are summarised in a table.	4	Closed - no change made.	The proposed dredging footprint and volume is summarised in Section 8.3.2, Figure 8-3.				65	24/06/2024	V2 - Chapter 9	Sections 9.4.1.1 & 9.4.1.2	I'm not sure what the original reviewer comment was referring to.... Pre-dredging seabed depths prior to the previous dredging instances, or the current pre-dredging depths. I interpret that the response is attempting to address the latter, directing the reader to section "8.3.2" (actually 8.4.2). However, I notice that the wording in section 8.4.2 (which was in the "Dredging footprint and volume" of section 8.3.1 in V1) has been amended to delete reference to a predicted "6 m to 9 m excavation below the existing seabed" for the berth and "excavation of up to 3 m below the existing seabed" for the turning circle. This information (irrespective of its accuracy) would allow an estimate of the pre-dredging seabed depths (i.e., 4.1 - 7.1 m, and 6.7 - 9.7 m depth of existing seabed, respectively). This is information that I think would be relevant in (and noticeably absent from) section 9.4.1. Why was the deleted information deleted? Was it a guess? If so, fair enough to delete. In any case, I suggest amending the wording of 9.4.1.2 to include some reliable depth info; e.g., "As context, the project would involve dredging 490,000 m3 of sediment to provide a new berth (dredged to ~13.1 m seabed depth) and turning circle (dredged to ~12.7 m seabed depth)." This is the same info as in 8.4.2, but appropriately and helpfully re-presented in 9.4.1.2. What's the harm in putting it in "for context"? Or alternatively, insert "refer to Section 8.4.2 for details" at the end of that sentence so the reader knows where to go to get the depth info.
66		PDF p 146 Figure 9-1	Viva is obviously not previous dredging - amend caption to reflect that Viva is planned/proposed.	2	Accepted - change made.	This figure has been removed.	V2	Section 9	24/04/2024	66	24/06/2024	V2 - Chapter 9	9.4.1.1	Original comment satisfactorily addressed
67		PDR, p147, Para 5	There should be a plan showing existing bathymetry within and around the dredge footprint BEFORE & AFTER proposed dredging. This should include the location of the trench and placement of trench sediment and, preferably, the distribution of seagrasses at the appropriate scale.	1	Closed - no change made.	The focus is on predicting suspended solids and turbidity during dredging. The seabed depths obviously vary during dredging. Section 8.3.2 provides an overview of the proposed dredging footprint and volume with a figure of the extent of proposed dredging.				67	24/06/2024	V2 - Chapter 9	Section 9.4.3.6	First, "The focus is on predicting suspended solids and turbidity during dredging.".... yes, AND sedimentation/accretion, which can smother seagrass. The content of 9.4.3.6 addresses the issue of sedimentation/accretion to a satisfactory degree. However, re: "The accretion rate on seagrass beds is from zero to 3 mm....": that is not a "rate" (p 9-79 para 5). A rate is per day, per year, etc. Is this a total cumulative accretion amount instead? Second, I agree with the original reviewer that a visual aid in the form of a map showing accretion rates and distribution of seagrass would be a useful thing to pull all of that information together.
68	general comment re dredging		Apart from light penetration, has there been an assessment made of potential changes to hydrodynamics/wave action on the shoreline resulting from increasing water depth in the dredge basin? If so, a summary of that assessment should be included in this chapter. If not, why not?	4	Closed - no change made.	Corio Bay is a small shallow enclosed bay with low wave heights generated locally by winds. The proposed dredging will not alter the wave climate on the north shore or the Ramsar site. Subsequently, this has not been considered as part of this assessment.  Recommendation 6 of the Minister's Directions required re-running the sediment transport model with the refined regional hydrodynamic model and Recommendation 7 of the Minister's Directions involved assessing impacts to seagrass based on the revised modelling, light thresholds and seagrass mapping. What has been undertaken in this technical study is considered to have addressed the recommendations for further work by the Minister's Directions.				68	24/06/2024	V2 - Chapter 9		The question has not been sufficiently addressed by the response. The question was: "...has there been an assessment made of potential changes to hydrodynamics/wave action on the shoreline resulting from increasing water depth in the dredge basin? If so, a summary of that assessment should be included in this chapter. If not, why not?". The response answers this directly, but provides no indication of where this information can be found in the report. "The proposed dredging will not alter the wave climate on the north shore or the Ramsar site." Where (in the report) is the information that supports/demonstrates this assertion? At the very least, please provide direction as to where that info can be found. If there is no info in the report, why not? If there is info..... put in a reference to the section in this dredging section.
69		PDF p 144 ff.	A detailed of light methodology is not within my area of expertise, so comments are generalised	2	Closed - no change made.	Noted, no changes made.				69	24/06/2024	V2 - Chapter 9		Original comment satisfactorily addressed
70		PDF p 151, para 3, line 1	Insert the word "modelled" between "where" and "suspended"	2	Accepted - change made.	This section has been removed and is instead discussed in Section 8.4.10	V2	8.4.10	24/04/2024	70	24/06/2024	V2 - Chapter 9		Original comment satisfactorily addressed
71		PDF page 152, Figs 9-3 & 9-4	- these figures should show the distribution of seagrasses in relation to the plumes. - There is a substantial area of seagrass outside the Ramsar and well within the plumes (refer Figure 3-9); and on either side of the existing wharf. Shouldn't this warrant monitoring during the baseline and dredging? - Close to the western shoreline the water shallows and the surface and seabed plumes would likely merge. How would this affect the modelled concentration(s) of suspended solids?	3	Accepted - change made.	Section 9.4.2 demonstrates that to maintain healthy seagrass in outside of the Ramsar Zone there must be at least 10% available light. The available light was calculated by converting NTU using appropriate equations from the Victorian Dredging Guidelines. It was concluded that based on the modelled TSS values there will be available light (14 - 18%) and thus, meets the requirement.  Figure 9-4 and 10-1 added to show seagrass distribution in relation to sediment plume	V2	Figure 9-4, Figure 10-1	24/04/2024	71	24/06/2024	V2 - Chapter 9	9.4.3 & 10.4.3	Original comment satisfactorily addressed
72		PDF Page 159, paras 2 & 3	Mention of infauna monitoring - no description was found in this report. It is mentioned in Report B in the context of sedimentation, but not mortality due to the dredging itself.	2	Closed - no change made.	Infauna studies were conducted as part of the EES and details can be found in Section 5.16 the marine environment EES report.				72	24/06/2024	V2 - Chapter 9	9.4.3.6	Original comment satisfactorily addressed

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document				Response categories				Round 2 Comment categories			
Aquatic Ecology Review				Accepted - change made.				Original comment satisfactorily addressed			
Comments by:				Closed - no change made.				Original comment satisfactorily addressed but requires minor revision or further consideration			
Organisation: Stanlec				For further discussion.				Original comment not satisfactorily addressed; Response disputed			
								New comment/query			
Reviewer (Round 1)				Proponent (Round 1)				Reviewer (Round 2)			
73	9.4 Conclusions	PDF Page 162	The detailed assessment of dredging impacts to seagrasses focuses on potential harm to seagrasses in the Ramsar, with little assessment of impacts to seagrasses much closer to the proposed dredging operation. Given the high conservation status of seagrasses, specific consideration should be given to beds proximal to monitoring beds closer to the dredging. Consideration should also be given to potential changes in wave action and currents that may occur due to the changing bed profile resulting from dredging.	3	Closed - no change made.	The proposed dredging program would not involve the removal of seagrass beds. This is informed by seagrass mapping undertaken in the EES and in this supplementary statement. Thus seagrass is more likely to be impacted by an increase in turbidity during dredging and a reduction in available light. Both of these impact pathways have been assessed.  A focus of the Ministers Directions is on seagrass in the Ramsar site. Thus the analysis of effects focusses on seagrass in the Ramsar site. The supplementary report acknowledges that marginal seagrass (close to light limitation and near the dredging) may suffer a setback in growth (but this is not the protected species). The great majority of seagrass in Corio Bay will be unaffected (or perhaps as in the Channel Deepening Project, will experience slightly better growth). The proposed dredging will not alter the wave climate on the north shore or the Ramsar site.	73	24/06/2024	V2 - Chapter 9	9.5	Original comment satisfactorily addressed if the sole "focus of of the Ministers Directions is on seagrass in the Ramsar site." If the Ramsar site seagrass is not the sole focus, but is a main focus, or just a focus, then at least some attention should be given to all seagrass beds nearby to the proposed dredging works irrespective of whether the species is protected or not given the habitat value (I would have thought). As long as this is all acknowledged somewhere, which I suspect it is to varying degrees, then that's fine.
Chapter 10				RECOMMENDATION 8 - CONFIRM EES CONCLUSIONS							
74	S10.3, Task 8	PDF page 164, dot points 1, 2 & 4	Temperature and chlorine measurements - relevant to dredging?	2	Closed - no change made.	Temperature and chlorine measurements were undertaken as part of Recommendation 1 and were found to not impact the Ramsar site. Recommendation 8 revolves around confirming that dredging would not impact the Ramsar site with consideration to the revised marine modelling and the revised assessment of impacts on seagrass.	74	24/06/2024	V2 - Chapter 10	10.4, p 10-83	Original comment satisfactorily addressed. Well, it appears that the dot points regarding temp and chlorine have actually been removed, so I guess the response category should have been classified green - Accepted, change made.
75		PDF page 164, dot points 1, 2 & 4	Temperature and chlorine measurements - relevant to dredging?	2	Closed - no change made.	Temperature and chlorine measurements were undertaken as part of Recommendation 1 and were found to not impact the Ramsar site. Recommendation 8 revolves around confirming that dredging would not impact the Ramsar site with consideration to the revised marine modelling and the revised assessment of impacts on seagrass.	75	24/06/2024	V2 - Chapter 10	10.4, p 10-83	Ditto
76		PDF page 165, Table 10.1	Are confidence limits available for NTU and PAR?, if so, please include	2	Closed - no change made.	NTU and PAR are variable over time - as illustrated in Figure 9-5. It is not considered necessary to include confidence limits.	76	24/06/2024	V2 - Chapter 10	10.4, p 10-84, Table 10.1	Response does not answer the reviewer's question. And, who considers it unnecessary to include estimates of variability around means if available? I don't accept that at all. First, if the values provided in Table 10-1 are indeed averages, then this must be clearly worded in the table caption (e.g., Previous Average Turbidity and Light Attenuation Measurements for Corio Bay, or similar). Second, if the source (Provis 2009) calculated estimates of variability associated with those averages and they are available in that source material, they should be included with the averages in Table 10-1. Third, if the averages in Table 10-1 have been calculated by the authors of this current report, then calculated measures of variability should be included. Finally, if the source data are averages only (with no associated measures of variability), then the reviewer's comment could have been responded to by simply stating that confidence limits or standard errors were not available.

## Appendix C Birds

Peer-review comments register



**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

<b>Document title:</b>	Tech B Bird Impact	<b>Comment categories</b>	<b>Response categories</b>
<b>Comments by:</b>		3 Critical Issue	Accepted - change made
<b>Organisation:</b>	Stantec	5 Immediate issue	Closed - no change made
		2 Discussion item	For further discussion
		1 Suggestion/Editorial change	

Reviewer [Round 1]				Proponent [Round 1]				Reviewer [Round 2]				Proponent [Round 2]										
Comment ID	Reviewer Name	Report/Chapter/Revision	Report Section/Location	Reviewer Comment	Comment Date	Comment Category	Respondant's Name	Response Category	Response	Report/Chapter/Revision	Response Section/Location	Response Date	Response	Response Date	Open/Closed (Reviewer to update)	Respondant's Name	Response Category	Response	Report/Chapter/Revision	Response Section/Location	Response Date	
1	V1	s1.2, sentence 6		please add scientific name after common name of a species is first used in text, then refer to common name thereafter	24/03/2024	3		Accepted - change made	Scientific name added	Technical Report B	Section 4.1.2	28/03/2024	Acknowledged	04/04/2024	Closed							
2	V1, Chapter 4	s4.1.4		I have noted that many of these sorts of reports only appraise the VBA and PMST. I would strongly suggest that BirdLife Australia's Bird data also be appraised as I recall there are records from that database that may not reach the VBA. I would suggest that BirdLife Australia be consulted to check if all of their Bird data / Atlas records are in the VBA. If not, the 5km search area buffer be provided so they can send a full list of bird records; you could then extract the migratory and threatened bird species from that list to ensure any records are not missed.	24/03/2024	2		Closed - no change made	Searches completed for supplementary EES are consistent with the approach applied in the original EES.  Noted that the BirdLife Australia database is another datasource that can be used but was not considered necessary based on the list obtained through the VBA search. However, a brief search of their dataset with the same 5km radius did not add any threatened or migratory species to the list. Inclusion of a search of the BirdLife Australia database would not change the list of species considered and would be an approach that was inconsistent with the original EES.		n/a	n/a	Acknowledged: no additional species noted from search of that database. For future EES works on other projects this database probably should be considered.	04/04/2024	Closed							
9	V1, Chapter 4	s4.1.4		Also, regarding database searches I am a bit concerned that some of the key published and unpublished reference works to the birds in the project area and vicinity are not mentioned. I understand this can be difficult as many of these are consultant reports but I have checked the bird list provided by AECOM and added any additional migratory and threatened birds that occur or potentially at Point Wilson Explosives Ordnance Area (PWEOA) based on additional references (see comment). I suggest adding these reference and perhaps a few others that are available to AECOM as additional sources of data.	24/03/2024	2		Closed - no change made	Noted. Likelihood of occurrence lists are typically generated based on database outputs. Context on likelihood can be provided based on additional information but a detailed literature review is not usually undertaken unless there is a uncertainty on likelihood of occurrence and additional context is required. Many unpublished references are not always available in the public domain. Point Wilson is >10 km from the project and outside the area considered as the offsite environment (5km).		n/a	n/a	n/a	Accepted provisionally, if there were specific and published relevant works on the avifauna of the study area they may have been useful. For example, Rogers et al. (2010) published a major article on shorebird movements in Port Phillip Bay and it included the vicinity of Sites 3-4. In the present study, this work includes some useful information relevant to the EES and Technical Report (e.g. see page 22: <a href="https://www.researchgate.net/publication/295072391_Local_movements_of_shorebirds_and_high-resolution_mapping_of_shorebird_habitat_in_the_Port_Phillip_Bay_Western_Shoreline_and_Bellarine_Peninsula_Ramsar_Site#fullTextContent">https://www.researchgate.net/publication/295072391_Local_movements_of_shorebirds_and_high-resolution_mapping_of_shorebird_habitat_in_the_Port_Phillip_Bay_Western_Shoreline_and_Bellarine_Peninsula_Ramsar_Site#fullTextContent</a> ).	04/04/2024	Open		Accepted - in progress	Rodgers was reviewed when preparing EES Technical Report D but it was felt at the time that the value of the Ramsar site was sufficiently documented. Acknowledge the reference could have been cited in Section 5 when describing the Ramsar site and in Section 5.1.3.3, when describing Avalon Beach/Avalon Saltworks but that section was more about broad descriptions of areas not specifically for particular ecological values. Rodgers et al. 2010 refers to Avalon Beach but does not provide a great deal of information on either other than it is a major roost and shoreline a major feeding site for shorebirds. Working added to Section 4.2.6.	V2	Section 4.2.6	16/05/2024
4	v1	s4.1.4.2		Could we define what is meant by "recent times". I would suggest records in the past 5-10 years. I note in Table 3 "recent" is described as <30 years which I feel may be a bit too long a period; changes in status and abundance of many birds in Australia (including shorebirds such as Curlew Sandpiper) have occurred in the past 15-20 years.	24/03/2024	2		Accepted - change made	Definition of 'present' updated. No longer has reference to 'recent times' as the likely category covers that (recent records are <30 years). 'Present' category is about species being confirmed present in the study area.	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
5	v1	s4.1.4.2, Table 3		Honeyeaters and Corvids are Passerines. I suggest perhaps, perhaps something like "grassland, shrubland, woodland and forest birds including many bird Orders such as Passeriformes"	24/03/2024	3		Accepted - change made	Updated.	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
6	v1	s4.1.5.2		update numbers in accordance with any changes in species list and likelihoods	24/03/2024	3		Accepted - change made	Updated to include Rufous Fantail	Technical Report B	Section 4.1.5.1 Section 4.1.5.3	28/03/2024	Acknowledged	04/04/2024	Closed							
7	v1	Table 8, Raptors		Eastern Osprey: in rationale comment change from "likely to occur in offsite..." to "potentially occurs in offsite..." to be consistent with likelihood rating.	24/03/2024	3		Accepted - change made	Updated.	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
8	v1	Table 8, Shorebirds		Common Sandpiper: consider change rationale comments revise to reflect rather wide range of aquatic and coastal habitats they occur in (they are not fully reliant on extensive tidal flats for foraging). I have recorded them foraging in drainage channels, tidal channels, on lake and saltpan margins etc. but they are rather uncommon in this region.	24/03/2024	2		Accepted - change made	Updated	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
9	v1	Table 8, Shorebirds		Greater Sandplover status (Likely offsite) seems a bit inconsistent with absence of VBA records since 1996 and that Lesser Sandplover (with two records, albeit last in 1979) is given a Possible status of offsite. I suggest consider as "Possible" offsite for both species and correct rationale comment to "may occur...". I recorded Lesser Sandplover at PWEOA in January 2021 but they have declined in Port Phillip Bay in past decades.	24/03/2024	2		Accepted - change made	Likelihood adjusted to possible	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
10	v1	Table 8, Shorebirds		Latham's Snipe given number of records and rather wide variety of aquatic terrestrial and near-coastal areas known to occur in change to "Likely" offsite and in rationale comments.	24/03/2024	3		Accepted - change made	Likelihood adjusted to likely	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
11	v1	Table 8, Shorebirds		Common Greenshank possibly "Present" offsite; there are regular and recent records from the general region including west of PWEOA (open obs).	24/03/2024	2		Accepted - change made	Likelihood adjusted to present	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
12	v1	Table 8, Waterbirds		Eastern Great Egret: agree with likelihood offsite but in rationale comments states "habitat in Terminal component unsuitable" which is not consistent with "Possible" rating; consider revising Terminal likelihood?	24/03/2024	2		Closed - no change made	Possible rating is for the terrestrial pipeline not the terminal, have added words for clarity. Terminal has rating of unlikely as the habitat is unsuitable. The habitat along the shoreline of Co Lo Bay is suitable and the species has been recorded there so the rating for marine (offsite) is present.		n/a	n/a	Acknowledged	04/04/2024	Closed							



**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Document title:		Tech B Bird Impact				Comment categories			Response categories													
Comments by:		Stantec				3	Critical Issue	Accepted - change made.														
Organisation:		Stantec				2	Immediate Issue	Closed - no change made.														
					2	Discussion Item	For further discussion.															
					1	Suggestion/Editorial change																
Reviewer [Round 1]					Proponent [Round 1]					Reviewer [Round 2]			Proponent [Round 2]									
Comment ID	Reviewer Name	Report/Chapter/Section/Revision	Report Section/Location	Reviewer Comment	Comment Date	Comment Category	Respondant Name	Response Category	Response	Report/Chapter/Section/Revision	Response Category/Location	Response Date	Response	Response Date	Open/Closed (Reviewer to update)	Respondant Name	Response Category	Response	Report/Chapter/Section/Revision	Response Category/Location	Response Date	
13		v1	Table 8, Waterbirds	Crested Tern: are there no VBA records in past 30 years?	24/03/2024	3		Accepted - change made.	Crested Tern Incorrectly had no IAMBA label in the TREATY column in the VBA data. The missing data caused the resultant summary table to discount the species. VBA records now added to table. Likelihood updated for marine (offsite) environment to Present also to be consistent with the rationale.	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
14		v1	Table 8, Terrestrial and non-aquatic birds	Suggest inclusion of Red-chested Button-quail <i>Turnix pyrrhorox</i> (Endangered FFG Act). I have recorded this species at PWEA and would consider it "possible" to occur in the grassland areas within the 5km buffer (offsite); check VBA records also.	24/03/2024	3		Closed - no change made.	Red-chested Button-quail has not been recorded on the VBA within 5 km of the Project Area and is therefore not identified on the list of species in keeping with the method. PWEA is >10 km from the Project. The offsite environment part of the study area relates to the marine environment and habitats linked to the marine environments (intertidal habitats etc) and not the terrestrial environments (grasslands) of the offsite environment. The definition of the study area is provided in Section 3.2 which now realises was not provided in the peer review document.	Technical Report B	n/a	n/a	Acknowledged	04/04/2024	Closed							
15		v1	Table 8, Terrestrial and non-aquatic birds	Yellow Wagtail: would suggest revising to "Possible" offsite: has been recorded within past 10 years or so at Western Treatment Pond and could occur around lake, San margins in the wider area.	24/03/2024	2		Closed - no change made.	Unlikely fits with no VBA records within 5km of the Project. Rare, vagrant visitor around Port Phillip and Project Area not really preferred habitat. Unlikely remains appropriate.	n/a	n/a	n/a	Acknowledged	04/04/2024	Closed							
16		v1	Table 8, Terrestrial and non-aquatic birds	Rufous Fantail: suggest revising to "Possible" offsite: they occur in the wider area (including on PWEA) in autumn migration including in grassland, woodland, parkland and garden areas.	24/03/2024	3		Accepted - change made.	Likelihood and rationale updated.	Technical Report B	Appendix A	28/03/2024	Acknowledged	04/04/2024	Closed							
17		v1	Table 8, Terrestrial and non-aquatic birds	Consider Cape Barren Goose as "Potential" offsite: her checking VBA records	24/03/2024	2		Closed - no change made.	Cape Barren Goose is not listed as threatened or migratory under the EPBC Act or FFG Act and is therefore not a species that fits within the scope for Ministers Direction 9a.	n/a	n/a	28/03/2024	Acknowledged	04/04/2024	Closed							
18		v1	Executive Summary	Remove site 3T and add Site 5 to second paragraph from "Recommendation 9c - shorebird survey..." (see note edit in pdf file); site 3T considered nationally important for Sharp-tailed Sandpiper according to paragraph 1.	14/04/2024	3		Accepted - change made.	Removed site 3T from sentence as correct re nationally important in paragraph 1. Site 5 is outside the Ramsar boundary so have instead made some other adjustments to the paragraph to be clearer.	V2	Executive Summary	16/05/2024	Acknowledged	10/06/2024	Closed							
19		v1	Section 1.3.4, p. 4	add pier extension as relevant activity relating to migratory birds etc.	14/04/2024	2		Accepted - change made.	Added and reworded.	V2	Section 1.3.4.	16/05/2024	Acknowledged	10/06/2024	Closed							
20		v1	throughout	very minor spelling or punctuation errors: see sticky notes.	14/04/2024	3		Accepted - change made.	Updated.	V2	Throughout	16/05/2024	Acknowledged	10/06/2024	Closed							
21		v1	Table 8	could the column widths or cell / text formats be altered so scientific names are not broken up?	14/04/2024	2		Accepted - change made.	Table formatted.	V2	Appendix A	16/05/2024	Acknowledged	10/06/2024	Closed							
22		v1	Section 4.2.6	see sticky note comment that relates to published work on shorebirds at former Avon Saltworks and adjacent coastline (low-tide foraging area): see my comment no. 3 above for source (Rogers et al., 2010). Mean summer shorebird counts at this site since 2001 are stated by Rogers et al. as 3200 birds (species combined) with over 8800 as a maximum (this would presumably be mainly Sharp-tailed Sandpiper, Red-necked Stilt and Curlew Sandpiper). This would suggest the 2000 individual count criterion may be relevant at this site for certain shorebird species and it is even possible the 1% of the EAF population criterion (i.e. internationally important area) could be met at certain times (e.g., at least 850 Sharp-tailed Sandpipers). More detailed inspection of the original count data at Avon Saltworks would be needed to confirm this, but it is worth mentioning the site may have more significance than indicated in this Technical Report B. Nonetheless, based on the impact assessment this site is unlikely to be impacted by the development.	14/04/2024	2		Accepted - change made.	This technical report is about analysing the shorebird data collected in the EES shorebird surveys and no other sources of information. Reference to Rogers et al. 2010 has been incorporated in wording update.	V2	Section 4.2.6	16/05/2024	Acknowledged	10/06/2024	Closed							
23		v1	Section 4.2.7, paragraph 2	change to 0.1% (rather than 0.01%)	14/04/2024	3		Accepted - change made.	Corrected.	V2	Section 4.2.7	16/05/2024	Acknowledged	10/06/2024	Closed							
24		v1	Section 4.3.5.2, Figures 4.5-4.6	is it worth showing a figure with the extent and distribution of seagrass meadow to support the comment?	14/04/2024	2		Accepted - change made.	Figure included.	V2	4.3.5.2	23/05/2024	Acknowledged	10/06/2024	Closed							
25		v1	Section 5.1.1.1	change comment on swifts loafing in trees to "may on rare occasions loaf or roost in trees"	14/04/2024	2		Accepted - change made.	Updated.	V2	Section 5.1.1.1	16/05/2024	Acknowledged	10/06/2024	Closed							
26		v1	Section 5.1.1.1	any detail on trees to be removed: are they native and naturally occurring or nectar-producing? if this information is provided elsewhere please state the source.	14/04/2024	2		Accepted - change made.	Wording updated.	V2	Section 5.1.1.1	16/05/2024	Acknowledged	10/06/2024	Closed							

**Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register**

Viva Energy Gas Terminal Project Supplementary EES - Peer Review Comments Register																				
Document title:				Tech B Bird Impact				Comment categories				Response categories								
Comments by:				Stantec				4 Critical Issue 5 Immediate Issue 2 Discussion Item 1 Suggestion/Editorial change				Accepted - change made Closed - no change made For further discussion								
Reviewer [Round 1]					Proponent [Round 1]					Reviewer [Round 2]					Proponent [Round 2]					
Commen ID	Reviewer Name	Report/Chapter/Section/Revision	Report Section/Location	Reviewer Comment	Comment Date	Comment Category	Respondants Name	Response Category	Response	Report/Chapter/Section/Revision	Response Category	Response Date	Response	Response Date	Open/Closed (Reviewer to Update)	Respondants Name	Response Category	Response	Report/Chapter/Section/Revision	Response Date
27		v1	Section 5.1.1.3	Suggest some caution around comments on localised movements within Port Phillip Bay; that Roger et al. (2010) reference is important here. Suggest possible rewording along lines of: "there is a paucity of data concerning utilisation of Corio Bay for localised movements of shorebirds and seabirds, but published evidence based on radio-tracking of shorebirds (Rogers et al. 2010) suggests shorebirds are relatively site faithful and show relatively little regular, longer distance movements between key foraging and roosting areas in Port Phillip Bay"	14/04/2024	2		Accepted - change made.	Noted and agree with suggested wording. However, have now included a figure for context which illustrates the area that may be affected by lights/poll and have updated the wording which removes the need to include this information.	V2	Section 5.1.1.1	16/05/2024	Acknowledged	10/06/2024	closed					
28		v1	Section 6.0, paragraph 5	Suggest as early as mid-spring to late summer as times to avoid if practicable for the noisiest periods of work (e.g. piling activities)	14/04/2024	2		Accepted - change made.	Updated.	V2	Section 6	16/05/2024	Acknowledged	10/06/2024	closed					
29		v1	References	cannot find reference to McMahon et al. (in WAMS 2017)	14/04/2024	3		Accepted - change made.	McMahon et al. added to references	V2	References	16/05/2024	Acknowledged	10/06/2024	closed					
32		V2	Section 1.4.4	point for construction of the pipeline (3km above ground, 4km below) should be shown as a separate dot point? It gets a bit lost when not shown as a separate dot point.	10/06/2024	3														
33		V2	Section 4.2.6	correct spelling for lead author is "Rogers" for reference (not Rodgers)...please correct throughout.	10/06/2024	3														
34		V2	Section 4.2.7, first sentence page 11	correct spacing between "(2022a) and Appendix A...."	10/06/2024	3														
35		V2	Section 4.3.5.1, page 20	format title font etc. for Figure 4-7 to be consistent with other figures	10/06/2024	3														
36		V2	Section 5.1.1.2, second sentence	add coma after "However, human activity..."; might be worth a little final check over document for small grammatical and spacing errors just to be perfect.	10/06/2024	3														
37		V2	Section 5.1.1.3	two references cited in text (Weistan et al. 1995; Agness et al 2009) are not cited in References at end.	10/06/2024	3														

**Viva Energy Gas Terminal Project**  
**Supplementary Environment Effects Statement**

**Response to Stantec Peer Review**



**Consulting Environmental Engineers**

**August 2024**

## **1. Summary of Response**

The peer review report submitted by Stantec in August 2024 contained six conclusions and recommendations on the marine studies report. Several positive comments were made:

- The assessment of existing conditions is accurate and comprehensive in relation to the values relevant to the assessment.
- The regional hydrodynamic modelling calibration is sound, and the model reflects observed current and tide data.
- The revised nearfield modelling enables a better understanding of the effect of the FSRU on dispersion of marine discharges from the FSRU.
- The re-runs of the wastewater discharge modelling, entrainment modelling and sediment transport modelling provide for a better understanding of the potential environmental effects of the project.
- The impacts assessment methodology presented in Technical Report A appears sound.
- Conclusions drawn in the impact assessment in Technical Report A are sound.

Two items for improvement were identified. It was recommended that the statistical analysis of the monitoring results presented in Technical Report A be more clearly explained, and it was recommended that additional comparisons between the regional model predictions and measured data be made in the final report to further quantify the model's calibration metrics. In response, Technical Report A has been revised to address these two items. The updated report is now considered to satisfy all requirements.

## 2. Statistical Analysis of Monitoring Data

The statistical analysis for the comparison of seagrass cover in the discharge zone compared to the reference zone (in the Ramsar Site) has been revised to address the reviewer’s comments. The analysis has been clarified by deleting any reference to seasonal change or consistent change. There are simply six measurements of seagrass cover in the discharge zone to compare with six measurements of seagrass cover in the reference zone.

The two-sided t-test was used to determine whether the seagrass cover in the discharge cover was the same or different from the seagrass cover in the reference site. The updated text for the comparison of intertidal seagrass cover and subtidal seagrass cover in the two zones is provided on the following pages. Note that the figure and table numbers match those used in the updated supplementary marine studies report.

Chapter 6 of the supplementary report presents results from an analysis of mussels in Corio Bay for chlorine byproducts. Mussels were deployed at seven sites in north Corio Bay where the discharge plumes from the refinery occur. The mussels were retrieved after four weeks and analysed for four trihalomethanes, six haloacetic acids and two bromophenols (all potential chlorine by-products). All compounds were below the limit of laboratory detection and therefore at very low levels. As all results had effectively zero detectible concentration, no statistical analysis was required.

A further question in the Stantec review is Comment 76 where confidence limits for published PAR and NTU measurements were requested to be included. The published data were the average turbidity (NTU) and light attenuation (PAR) measurements published by Provis in 2009 from multiple measurements made before dredging (Nov 1995 to Jan 1997), during dredging (Jan 1997 to Feb 1998) and after dredging (Feb 1998 to Oct 1998) in Corio Bay (1998). The program included monthly measurements at 33 stations.

**Table 10-1. Previous Average Turbidity and Light Attenuation Measurements**

Location	Turbidity, NTU			PAR Attenuation, m <sup>-1</sup>		
	Before	During	After	Before	During	After
Inner Harbour	0.8	2.8	0.8	0.34	0.42	0.33
North Shore	0.4	0.7	0.5	0.35	0.34	0.30
Outer Harbour	0.7	1.3	0.6	0.33	0.30	0.27
Stingaree Bay	0.4	1.0	0.5	0.37	0.38	0.43

Source: Provis, 2009

The publication in 2009 by Provis does not provide confidence limits and standard errors, and therefore they cannot be provided in the 2024 CEE report.

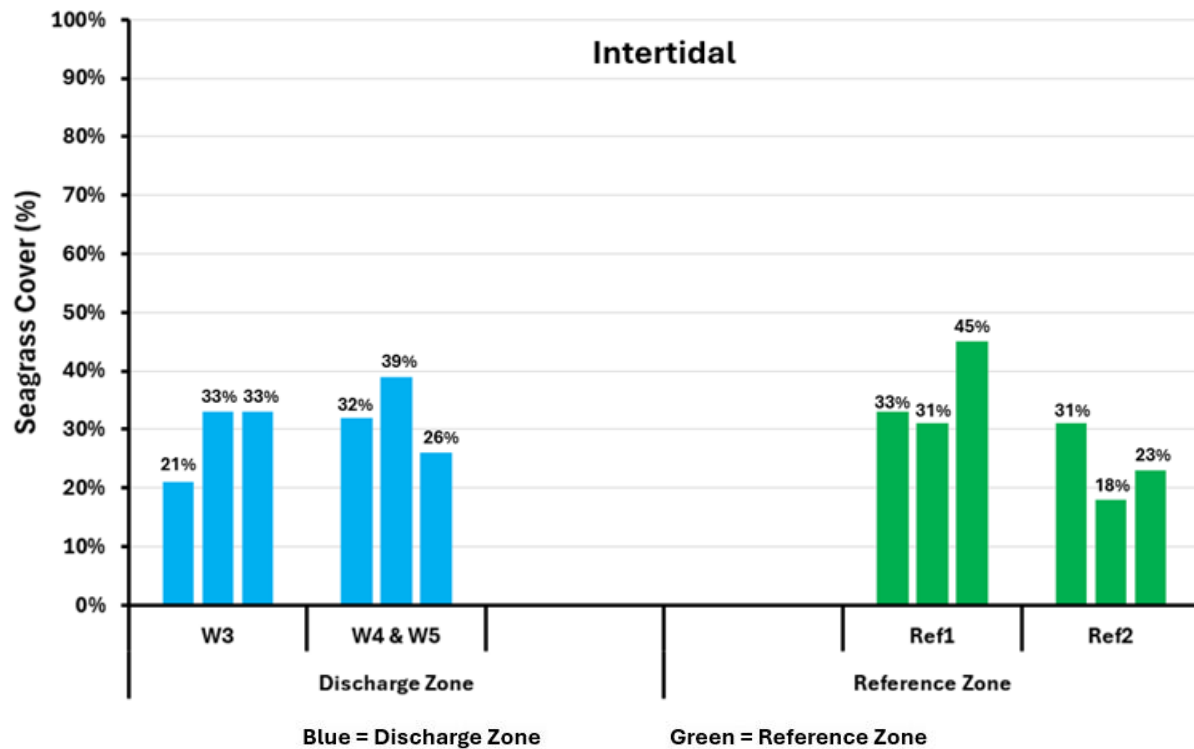
Note that the historical measurements show higher turbidity during dredging with a return to baseline levels after dredging concluded. The average PAR data show higher light attenuation during dredging at the closest site to the dredge (Inner Harbour) but very little change at the more distant monitoring sites.

2.1 Comparison of Seagrass Cover in Discharge Zone and Reference Zone

2.1.1 Intertidal Sites (2023)

Figure 3-17 shows the data for the intertidal seagrass cover measured in the discharge zone (blue columns) and the intertidal seagrass cover measured in the reference zone (green columns). Although there was variability from month to month, the average seagrass cover in the discharge zone of 31 % over the measurement period was about the same as the average seagrass cover in the reference zone of 30 %.

Figure 3-17. Comparison of Cover in Intertidal Discharge and Reference Zones



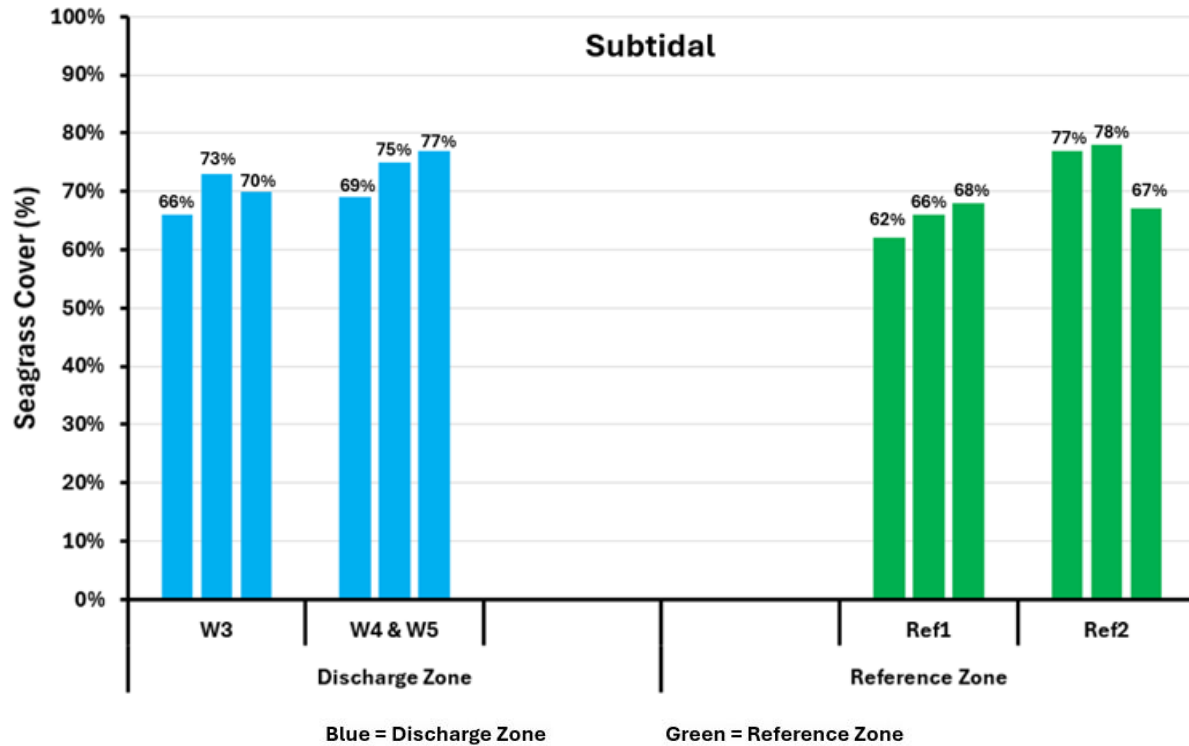
The two-sided t-test is used to determine whether there is a significant difference between the seagrass cover in the two zones. The 6 cover measurements in the discharge zone (Mean = 31, SD = 6.3) were compared to the 6 cover measurements in the reference zone (Mean = 30, SD = 9.3). The two-sided t value is 0.11. The p-value is 0.92. Degrees of freedom = 10. The difference in seagrass cover is not significant at  $p < .05$ .

The intertidal seagrass in the discharge zone is immersed in the discharge plumes during high tides, but the t-test analysis shows there is no significant effect on seagrass cover – with neither more seagrass or less seagrass. It is concluded that the discharge plumes do not have a significant impact on intertidal seagrass cover.

2.1.2 Subtidal Sites (2023)

Figure 3-18 shows the data for the subtidal seagrass cover measured in the discharge zone (blue columns) and the subtidal seagrass cover measured in the reference zone (green columns). The average seagrass cover in the discharge zone of 72 % is slightly higher than the average seagrass cover in the reference zone of 68 %.

Figure 3-18. Comparison of Cover in Subtidal Discharge and Reference Zones



The two-sided t-test is used to determine whether there is a significant difference between the seagrass cover in the two zones. The 6 cover measurements in the discharge zone (Mean = 72, SD = 4.1) are compared to the 6 cover measurements in the reference zone (Mean = 68, SD = 5.7). The two-sided t value is 1.22. The p-value is 0.25. Degrees of freedom = 10. The difference in seagrass cover is not significant at  $p < .05$ .

Even though the subtidal seagrass in the discharge zone is in the discharge plumes most of the time, there is no significant change in seagrass cover – with neither more seagrass or less seagrass. It is concluded that the discharge plumes do not have a significant impact on subtidal seagrass cover.

As discussed in Section 3.5.2.1, Hirst et al. (2012) state that seagrass cover may be the most useful proxy for seagrass health under a range of circumstances because it is strongly correlated with seagrass length, stem/shoot density and canopy structure.

### 3. Comparisons on Hydrodynamic Predictions and Measurements

The Stantec review reported that the marine supplementary report does not sufficiently demonstrate that :

- the most appropriate wind data has been used in the model.

There is insufficient information presented in the report to confirm the adequacy of the model that has been applied. Specific examples include:

- no time series comparisons between measured and modelled currents have been provided.
- the measured temperature profiles appear noisy and unrealistic, indicating that that the measurements collected to support the modelling may be erroneous or require further processing

In response, the text in the supplementary marine report describing the regional model has been updated to highlight the information that was suggested to be missing. The updated text for comparing the hydrodynamic model predictions with tide height, currents and plume length is presented in the following pages.

Figure 4-4 compares frequency distribution of predicted and measured current speeds for the three wind files. There is little difference between the currents predicted by the refined model and measured currents using either the Geelong wind file (as used in the 2022 EES) or the compromise Calmet wind file (as used in the 2024 supplementary marine studies).

A time series comparison of predicted and measured current speeds for was already in the supplementary marine studies report (Figure 4-8). The reviewers must have missed seeing it. The model reproduced the measured current speeds and direction well (and is reproduced on the following page).

The diagram showing measured temperature profiles in the supplementary report showed multiple vertical profiles on the same figure, which gave the appearance of noisy data. This diagram has been changed to show each measured and predicted temperature profile separately, which makes the comparison of predicted and measured vertical profiles easier.

The model provides a detailed representation of the surface layers in 0.5 m layers which meets the Minister's recommendation 2c. It is shown in Chapter 4 of the supplementary report that the model predictions satisfactorily match field measurements of:

1. Tide height over time;
2. Current speed over time;
3. Frequency distribution of current speeds; and
4. Length, width and extent of temperature plumes from the existing discharges;
5. Vertical temperature distribution over the depth.

Section 8 of the supplementary report demonstrates that the distribution of suspended solids predicted by the model from dredging in Corio Bay provides a reasonable match to the reported extent of suspended solids in a previous dredging program in Corio Bay. It is concluded that the model is fit for purpose.

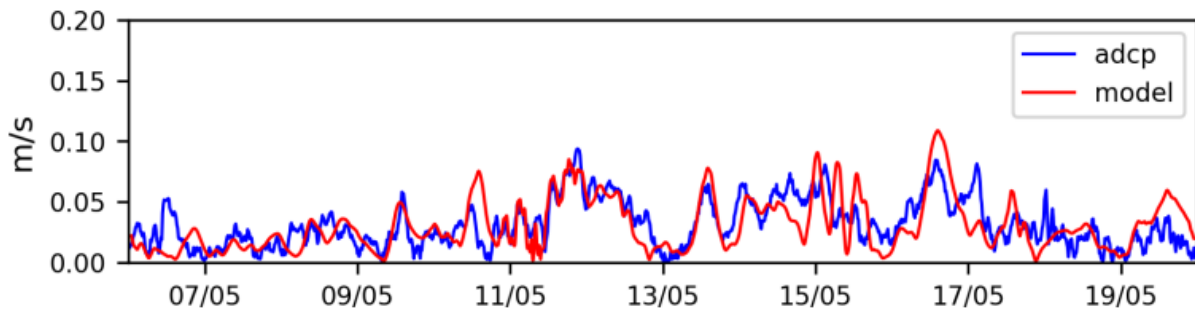
### 3.1 Comparison of Predicted and Measured Currents

The predicted currents from the refined model with finer horizontal and vertical scales were compared to the ADCP current data collected during the EES. Note that the measured currents are mostly weak, in the range of 0.02 m/s to 0.07 m/s and the accuracy is the ADCP in weak currents is  $\pm 0.01$  m/s.

A comparison between the 1-hour predicted and measured current roses and time series during the summer 2019-2020 ADCP deployment showed that the refined model reproduced the measured current speeds and directions satisfactorily (Hydronumerics, 2024).

As an example, a time series comparison of measured and modelled currents is provided in Figure 4-8. The refined model reproduces the measured current speeds and direction from the winter 2021 ADCP deployment to a satisfactory degree.

**Figure 4-8. Comparison of Measured and Modelled Currents**



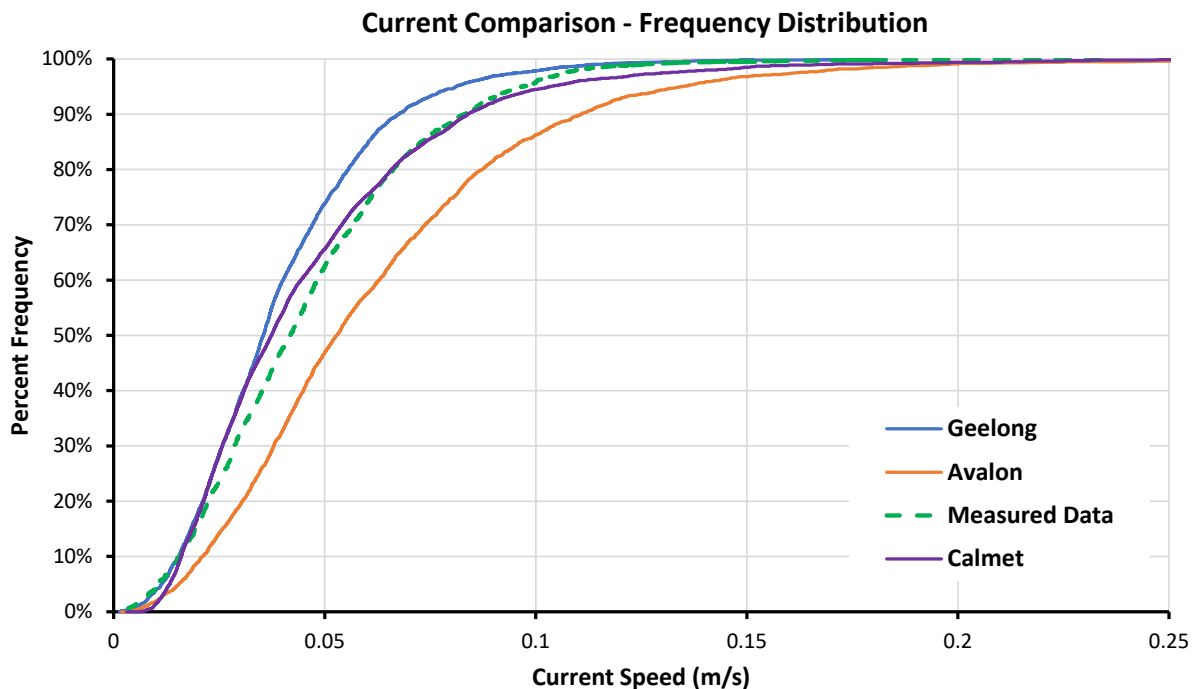


### 3.2 Selection of the Appropriate Wind File

The wind file preferred for use in the Supplementary was selected from a consideration of: (1) predicted versus measured current speeds; and (2) predicted versus measured temperature contours and extent of temperature plumes.

Figure 4-2 compares the predicted current speed distributions using the three wind files with the measured current speeds (dashed green line) for the northern current meter location. The currents predicted using Calmet winds (purple line) show the best fit to the measured current speeds. The currents predicted using the Geelong winds (blue line) are similar to those for the Calmet winds in the lower half of the range, but slower than the measurements from 3 to 11 cm/s. The currents predicted using the Avalon winds (orange line) result in current speeds substantially higher than the measured currents.

Note that the difference between the predicted currents and measured currents using the Calmet wind file are within 0.01 m/s of the measured currents – which is within the accuracy of the measurement of the current meter of +/-0.01 m/s.



**Figure 4-2. Comparison of Predicted and Measured Current Speeds**

Figure 4-3 in the supplementary report shows the temperature plumes predicted using the Geelong and Avalon winds; Figure 4-4 shows the chlorine plumes predicted using the Geelong and Avalon winds and Figure 4-5 shows the temperature and chlorine plumes predicted using the Calmet winds. The plumes predicted using the Geelong and Calmet winds are similar while the plumes predicted using the Avalon winds are significantly shorter and weaker.

The plumes predicted using Calmet winds best match the measured plumes, as shown in Section 4-8.

**3.3 Time Series Comparison of Measured and Modelled Currents**

As noted above, a time series comparison of predicted and measured current speeds for was included in the supplementary marine studies report (as Figure 4-8). The reviewers must have missed seeing it. The model reproduced the measured current speeds and direction well (and is reproduced in Section 3-1 of this response).

### 3.4 Comparison of Predicted and Measured Temperature Profiles

The noise in the plotted vertical temperature profiles was caused by (1) multiple profiles on the same plot and (2) movement of the vessel when taking measurements caused a spread of temperature values. Extra processing has removed the spread, and the vertical profiles are now presented individually.

Vertical temperature profiles were measured in the discharge plumes during the field studies. A comparison of the measured vertical profiles with the predicted vertical profiles in the plume from the W1 discharge is shown in Figure 4-9. At Site 8, near the mouth of the W1 discharge, the plume occupies the water depth of 1.6 m with a relatively uniform temperature distribution at 5.3°C above ambient. The model predicts a very similar temperature and vertical profile.

At Site 11, in deeper water further from the discharge, the buoyant plume has lifted off the seabed and is spreading as a thin (0.5 m deep) layer at 3°C above ambient. At Site 16, in 3 m deep water even further from the discharge, the buoyant plume has lifted off the seabed and is spreading as a thin (0.5 m deep) layer at 2°C above ambient. The model predicts very similar temperature levels and vertical profiles.

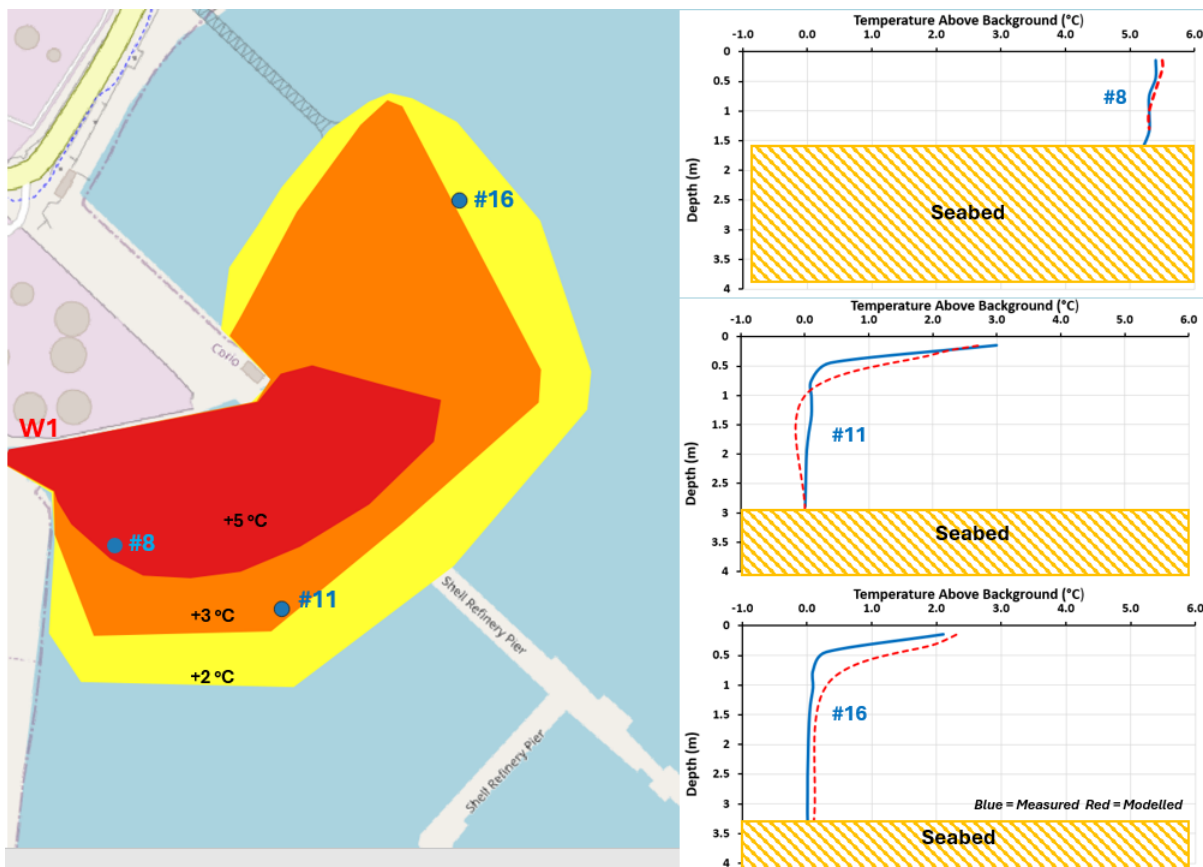
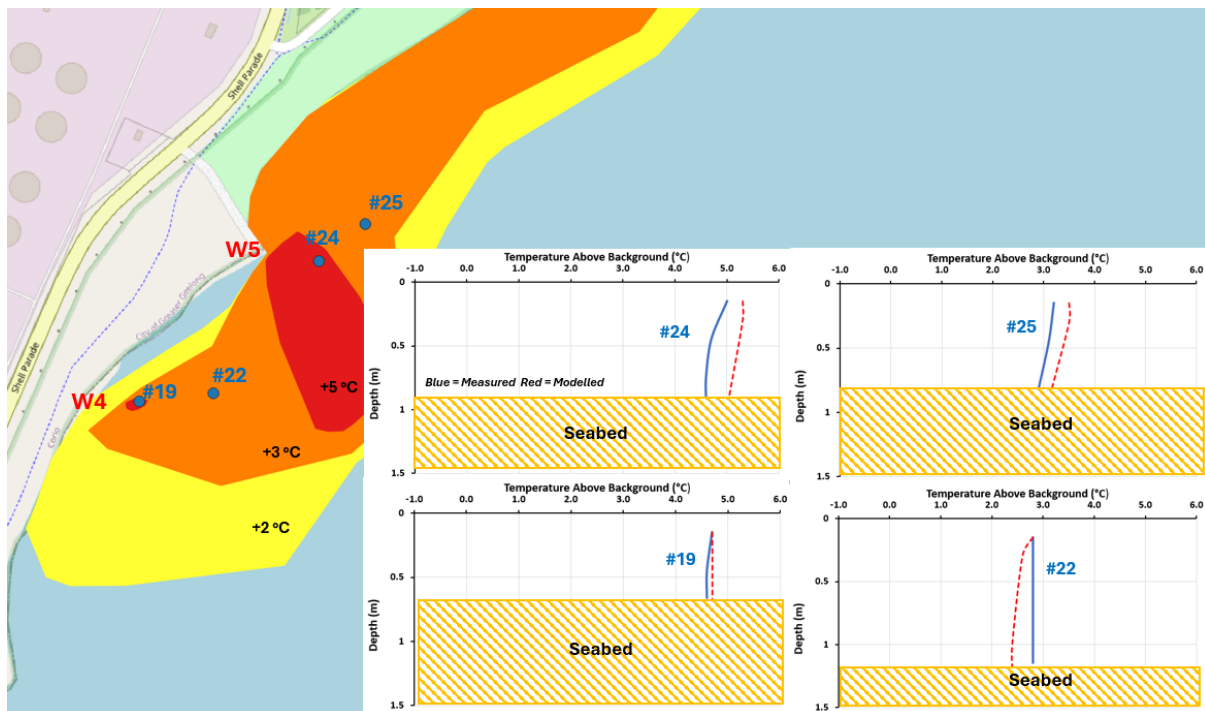


Figure 1-9 Measured Temperature Profiles Offshore from W1

A comparison of the measured vertical profiles with the predicted vertical profiles in the plume from the W4 and W5 discharges is shown in Figure 4-10. This plume remains in shallow water near the shoreline, and the plume occupies the layer at a relatively uniform temperature. The model predicts the temperature at 0.25 m and 0.75 m depth, which allows the vertical temperature distribution of the plume to be seen.

At Site 24, near the W5 discharge, the plume occupies the water depth of 1 m with a relatively uniform temperature distribution at 5°C above ambient. The model predicts a similar temperature and vertical profile.

Similar vertical profiles are apparent further north at Site 25, where the temperature rise is about 3°C and there is a slight vertical variation. Further south at Site 22, the plume is in 0.7 m water depth, at around 4.7°C above ambient, with a small temperature decrease with depth. At Site 19, the plume is in 1.2 m water depth, at around 2.8°C above ambient, with a small temperature decrease with depth. The model predicts very similar temperature levels and vertical profiles.



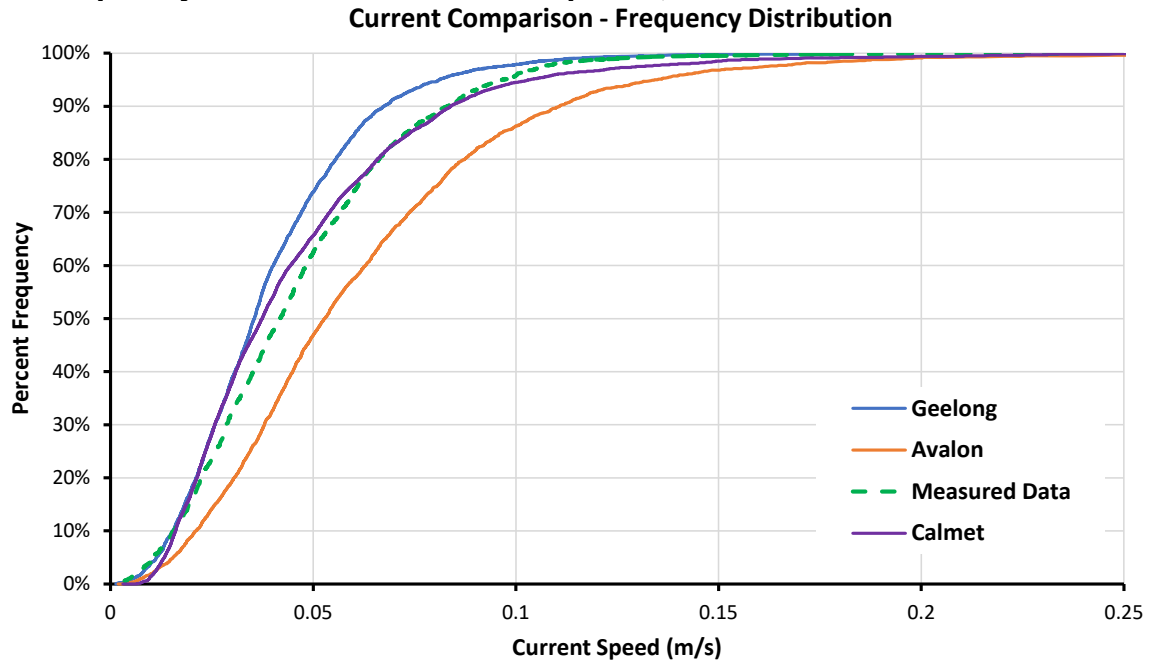
**Figure 1-10 Simulated Vertical Temperature Gradients Offshore from W1**

The measured plumes indicate that the thermal plumes (to 2°C above ambient) extend from the discharge points up to approximately 300 m offshore and 500 to 600 m along the shoreline. Typically, the plumes travel alongshore to the north with the prevailing currents, and are trapped in shallow waters so that the mixing of the plume is inhibited, leading to an elongation to the north.

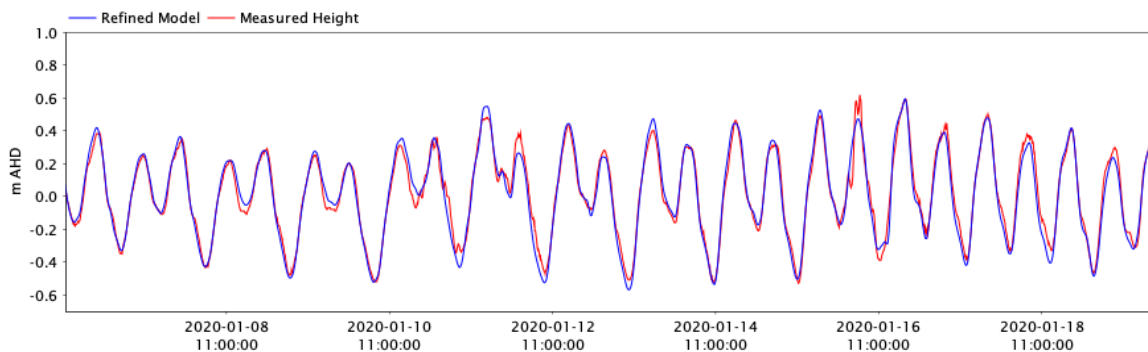
## 4. Summary of Comparison of Predictions with Measurements

The model predictions satisfactorily match field measurements of:

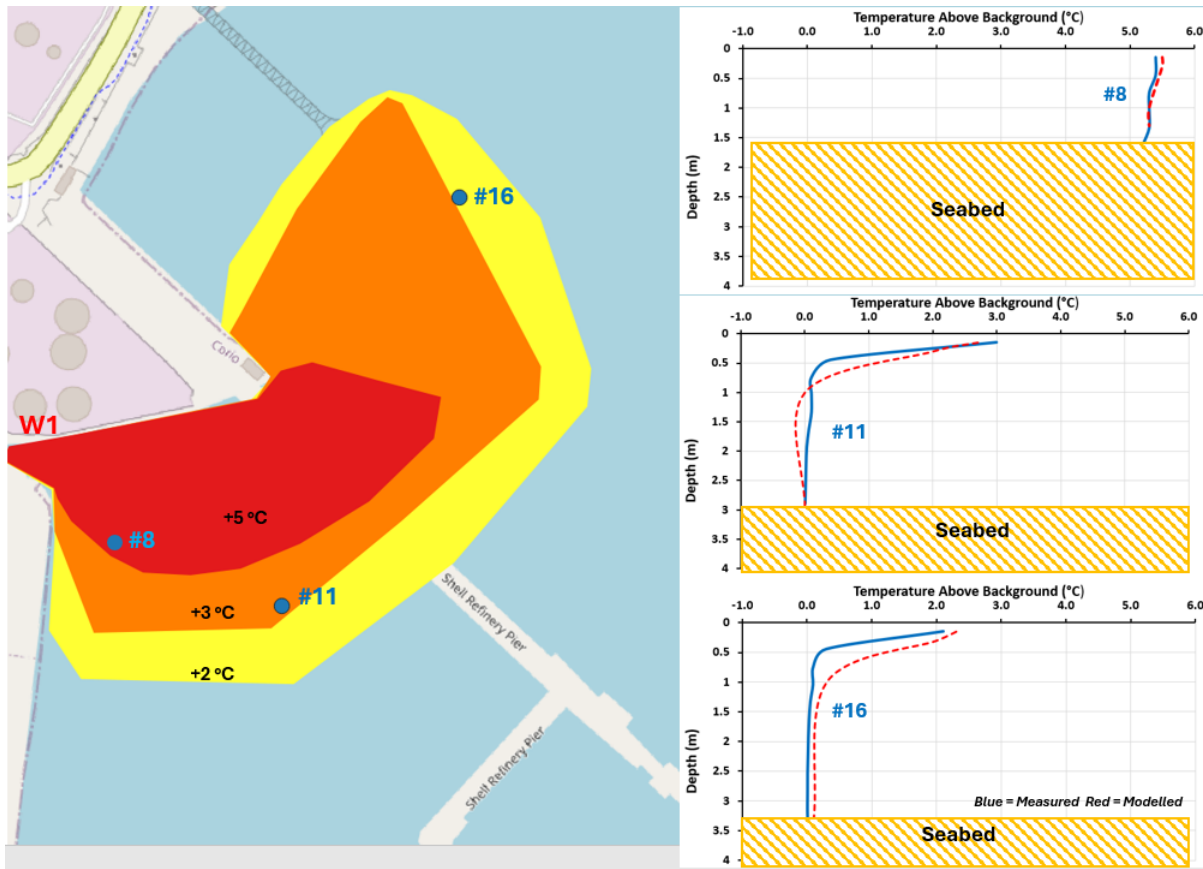
### 1. Frequency distribution of current speeds;



### 2. Tide height over time

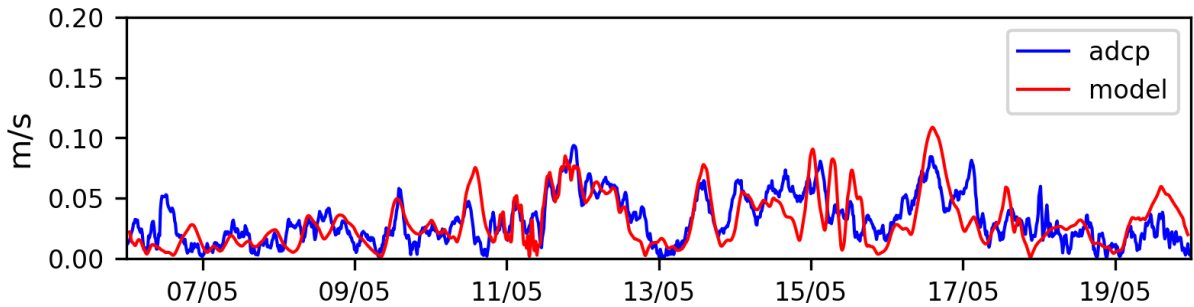


**3. Vertical temperature distribution over the depth**



*Measured temperature profiles are in blue; Predicted profiles are in red*

**4. Current speed over time**



**5. Length, width and extent of temperature plumes**

Figure 4-11 shows the 2023 temperature measurements in the existing plumes and Figure 4-12 shows the thermal plumes simulated by the model under comparable conditions. Both were generated with the same tide and wind conditions in the model as during the day of field measurements. Plumes were measured as described in Section 3.4.

The comparison of the sets of images illustrate that the model reproduces plumes similar to the observed shape, temperature difference and extent of the plumes along the refinery shoreline.

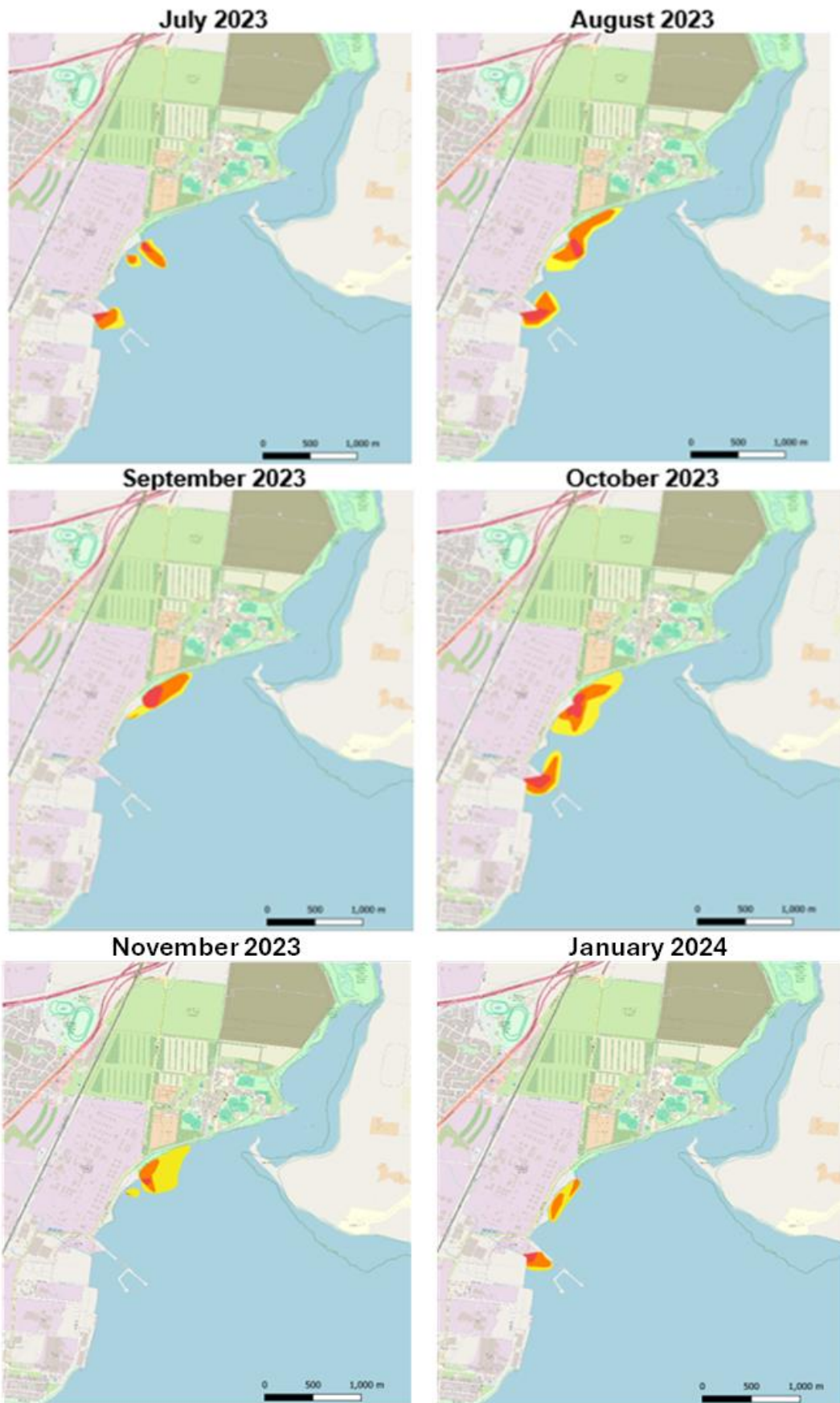


Figure 4-11. Measured Plume Temperature Contours – July 2023 to Jan 2024

(Red = +5°C, Orange = +3°C, Yellow = +2°C) – Source: CEE 2024



Note: Contours show increment above ambient

Figure 1-1. Predicted Temperature Plumes Using Refined Model

Table 4-3 shows the average area of each of the temperature contours for the measured plumes and modelled plumes. The table shows that both the measured and modelled temperature plumes are similar in size with the measured 2 and 3 degree plumes being slightly bigger in the measurements and the 5 degree contour being slightly bigger in the model.

Table 4-3. Average Measured and Modelled Plume Area

Plume Type	+2°C	+3°C	+5°C
Measured	20 ha	12 ha	3 ha
Modelled	18 ha	10 ha	5 ha

Overall, the refined model is fit for the purpose of predicting the extent of plumes from the refinery discharges.





