



DOC19/987361

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Dear Ms Symington

18 November 2019

By Electronic Mail

Revised Response to Submissions (RTS) for Viva Energy Clyde Western Area Remediation Project (SSD 9302).

The Environment Protection Authority ("EPA") is writing to the Department of Planning Industry and Environment ("DPIE") in reply to your email dated 23 October 2019 in relation to the revised response to submissions report ("revised RTS") for the proposed Viva Energy Clyde Western Area Remediation Project that was received by EPA on 23 October 2019 (*Viva Energy Clyde Western Area Remediation Project, Response to Submissions Report, AECOM, October 2019*).

AECOM prepared the Revised RTS on behalf of Viva Energy Australia Pty Ltd ("the proponent") for the Western Area Remediation Project to support the State Significant Development Application under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Background

The Environment Impact Statement (*Viva Energy Clyde Western Area Remediation Project, Environmental Impact Statement, AECOM, January 2019*) ("EIS") for the Viva Energy Clyde Western Area Remediation project was placed on public exhibition from 7 February 2019 to 6 March 2019.

On 6 March 2019, the EPA provided comments to DPIE in relation to the project.

On 7 May 2019 a meeting was held between all relevant parties, including EPA, the proponent, AECOM and DPIE to discuss all the matters raised in the EPA's letter dated 6 March 2019.

On 4 July 2019, EPA's Contaminated Sites area was sent the original response to submissions (*Viva Energy Clyde Western Area Remediation Project, Response to Submissions Report, AECOM, July 2019*) ("the original RTS") to address the advice and recommendations the EPA identified in the letter dated 6 March 2019 and the discussion held during the meeting on 7 May 2019. The original RTS was sent through to EPA's Metropolitan Branch who are coordinating EPA's response on 16 July 2019.

On 2 August 2019 the EPA sent a letter to DPIE in response to the RTS. The letter included a number of recommended conditions, and also identified a number of concerns about the adequacy of the assessment and mitigation measures.

On 13 August 2019 the EPA met with the proponent, DPIE and AECOM to discuss the concerns the EPA had raised, and it was agreed that a revised RTS would be submitted.

On 23 October 2019 DPIE provided the revised RTS. The EPA has reviewed the revised RTS and has now determined that it has sufficient information to provide recommended conditions for this project to proceed. The recommended conditions include the recommended conditions outlined in EPA's letters dated 6 March 2019 and 2 August 2019, and a number of new conditions as a result of the Revised RTS. The recommended conditions can be found in Attachment C.

Assessment of the Revised RTS

The EPA has reviewed the revised RTS and notes the following key matters that have been considered in relation to air quality and groundwater. These matters have formed the basis for the recommended conditions provided in Attachment C.

Air Quality

Commitment to enclosure for parts of the project have been made, however the criteria in which they would be implemented has been limited to soils containing benzene

The proponent has made a commitment to using Emission Control Enclosure (ECE) for storage and pre-treatment of soils, however the commitment is limited to consideration of benzene concentrations within soils. The EPA notes that there are other principal air toxics which have been reported in soil concentration data. The current commitment does not appear to give consideration to other principal air toxics, or material that maybe highly odorous or contain other air toxics.

Revised assessment of 24-hour average PM10 and PM2.5 incorporating proposed mitigation measures, predicts reduced ground level concentrations (GLCs)

The revised RTS presents additional assessment for 24-hour average PM10 and PM2.5, based on proposed mitigation measures for the crushing and screening plant. The additional assessment predicts reductions in predicted ground level concentrations (GLCs). It is noted that exceedances of 24-hour average PM2.5 and PM10 are predicted, however based on the incremental concentrations, they could be managed through the implementation of the proposed Air Quality Management Plan. Where emission control enclosures are implemented, as informed during the detailed design phase for the project, particulate matter contributions from the project could be further reduced.

Revised assessment predicts reduced odour impacts at neighbouring industrial/commercial receptors

The revised RTS presents additional assessment for odour based on proposed reduction in excavation areas and proposed application of a foam suppressant to excavation pits outside operating hours. The EPA advises that whilst the revised assessment outcomes could theoretically be achieved, it would be reliant on diligence and oversight on the implementation of the management measure (foam suppressant). As such where appropriate diligence and oversight is not implemented there is a risk of odour impacts.

It would be the EPA's preference that excavation of highly odorous material be conducted within an enclosure, as this would remove the reliance on diligence and oversight with the implementation of a foam suppressant.

Recommended conditions of approval could manage residual risks of potential air quality impacts.

With consideration of the above, the EPA advises that the conditions of approval as outlined in Attachment C could manage residual risks associated with the project. This includes a condition that all contaminated material must be handled, processed, treated and stored inside an emission control enclosure, unless otherwise agreed in writing by the EPA.

Further details on the EPA's review of the air assessment are outlined in **Attachment A**

Groundwater

The EPA considers that the revised RTS has satisfactorily addressed previously submitted groundwater recommendations.

The 2018 sampling results indicate that concentrations of dissolved phase constituents (DPC's) are gradually increasing, particularly in the south west. This correlates with the known increased concentration trends of bores in the south west area. The additional information provided indicates plume instability in the direction of Duck River. As a result, groundwater will need to continue to be monitored as a result of the program.

The EPA will continue to participate in the review of the proposed groundwater remediation program, review of monitoring results, as well as contribute advice or review to ongoing detailed remediation plans.

Hydrogeological

In August 2019, the EPA raised concern that the assessment of the groundwater concentration trends was reliant on information not provided in the EIS and original RTS. The EPA was not able review the statistical analyses of Mann-Kendall plots, with which the proponent is dependent on for justifying an efficient groundwater remediation program, as these were not provided with the project submission.

The EPA notes that the provided groundwater quality data in the revised RTS contains the requested trend analysis. Analysis of the trend data correlates to the findings presented over the project determination timeframe.

The EPA therefore recommends that no further information relating to concentration trends is required.

Natural Attenuation and existing groundwater impacts

In August 2019, the EPA was not able to provide adequate comments in relation to the extension of impacts, due to information on the report or test not being presented in the EIS or Remediation Action Plan (RAP). At that time, the EPA recommended that a new Mandell-Kendall test be provided.

As noted above, the provided groundwater quality in the revised RTS contains the trend analysis requested by the EPA and analysis of the trend data correlates to the findings presented over the project determination timeframe.

Clarification on plume changes and trends

The original RTS stated that the statistical analysis of the groundwater data set would continue to be undertaken using the Mann-Kendall procedure as part of the routine groundwater monitoring program. As the information relating to this was not provided in the original RTS, there was no opportunity for the EPA to review groundwater trend analyses or provide advice or comments for plume changes and trends.

The provided groundwater quality in the revised RTS now contains the requested trend analysis. Analysis of the trend data correlates to the findings presented over the project determination timeframe.

Contamination assessment

In August 2019, the EPA noted that its concern that *"if the preferred natural attenuation processes are not making substantial progress within a reasonable timeframe one or more alternative remediation technologies to treat the LNAPL and dissolved phase hydrocarbon impacted groundwater will be introduced"*, had not been addressed.

The EPA now notes that the addition of the requested trend analyses in the revised RTS (Appendix I of the groundwater monitoring report), demonstrates that the proposed remediation project is predicted to efficiently treat and process impacted groundwater.

The EPA recommends that a Detailed Remediation Action Plan must be developed should the project be approved, which will also contain alternate treatment methods should unprecedented changes to groundwater conditions occur during the project. This has been included as a recommended condition as outlined in Appendix C

Further details on the EPA's review of groundwater are outlined in Attachment B.

The EPA can meet with DPIE at a mutually convenient time to discuss our recommended conditions and comments. Should you require any further information please contact Christine Mitchell on (02) 9995 5732.

Yours sincerely



Jacqueline Ingham
Unit Head Sydney Industry
Environment Protection Authority

Enc: Attachment A: Further Details of EPA's Air Assessment

Attachment B: Further Details of EPA's Groundwater Assessment

Attachment C: Recommended Conditions of Approval

Attachment A – Further Detail of EPA’s Air Assessment

Issue 1 - Fugitive emission management utilising enclosures

The EPA notes that the revised RTS advises:

- That the proponent has made a commitment to using Emission Control Enclosure (“ECS”) for storage and pre-treatment of soils. The commitment to the use of enclosures has been made “*for soils with a bulk concentration exceeding the HSL-D criteria for benzene*”;
- The ECE would be erected adjacent to the DTD where soils that are to be treated by the plant would be stored and pre-treated prior to remediation;
- The ECE would also contain the stabilisation plant and would be used to store and pre-treat material that is to be stabilised; and
- The ECE may also be used to store ‘higher risk’ soils that cannot either be quickly transported offsite or cannot be placed directly into a biopile.

With consideration of the above the EPA notes:

- Notes that no justification for the selection criteria in which implementation of the ECS would be made has been provided;
- Considers that final design and implementation of the commitment should give consideration to (but not necessarily be limited to)
 - o EPA policy position as per the *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* is that “*Principal toxics air pollutants must be minimised to the maximum extent achievable through the application of best-practice process design and/or emission controls*”;
 - o Waste classification of the contaminated material to be remediated

The EPA notes that soil concentration data presented in Appendix C of the Conceptual RAP¹ provided as part of the publicly exhibited EIS provides soil concentration data for other principal air toxics. A summary of the principal air toxics and the maximum soil concentrations from Appendix C of the Conceptual RAP are presented in Table 1.

Table 1 – Summary of principal air toxics within soil

Principal air toxic	Maximum soil concentration (mg/kg)
Arsenic	220
Benzene	2.7
Cadmium	11
Chromium (VI)	8,800
Nickel	5,900
Polycyclic Aromatic Hydrocarbons	5.6

The EPA notes the commitment to an ECS does not appear to have considered other principal air toxics which have been reported within soil concentration data presented in the EIS. Additionally, the commitment does not give consideration to material that maybe highly odorous, or material that may contain other toxic compounds, specifically noting that the revised RTS largely refers to contamination as total hydrocarbons or as hydrocarbon ranges.

The EPA understands final remediation design and contractor selection is still to be undertaken during the design phase of the project. As such the EPA considers that final remediation design must give a more detailed consideration to the implementation of emission control enclosures.

Issue 2 – The assessment provided during public exhibition predicts the potential for odour impacts at neighbouring receptors

¹ *Viva Energy Clyde Western Area Remediation Project – Appendix C Conceptual Remedial Action Plan*, prepared by AECOM Australia Pty Ltd dated 21 January 2019

The revised RTS presents a revised assessment of potential odour impacts, including revised dispersion modelling. Appendix F of the revised RTS presents the additional assessment work undertaken. Appendix F of the revised RTS:

- Advises that odour emissions from exposed excavation area contribute over 70% of odour emissions from the project, as per the odour assessment presented as Appendix E of the EIS;
- Presents revised assessment of potential odour impacts, including revised dispersion modelling which is based on:
 - A reduction in excavation areas, from 2,500 m² (50 m x 50 m) to 900 m² (30 m x 30 m), with a revised total maximum exposed area of 1,800 m².
 - A 90% control efficiency for odour emissions to represent the proposed application of a foam suppressant between the hours of 6 pm to 7 am daily.
- States that *"A control efficiency of 90% has been assumed given the large surface area of the excavations. Research suggest odour suppressants can reduce odour emissions by up to 99% (Kittle and Schmidt 2004), however given the large area requiring suppressant, a less effective control factor of 90% was assumed to allow for an element of uncertainty"*

The EPA notes that the revised dispersion modelling predicts odour concentrations up to 2 Odour Units (OU) at neighbouring receptors.

The EPA advises that the assessment outcomes are based on the theoretical 90% control efficiency being achieved via a management measure (foam application). The effectiveness of the management measure is highly dependent on the rigor and diligence of implementation. There is potential for significant difference between the assumed theoretical control efficiency and the actual control efficiency that would be achieved in practice for the project. Specifically noting that there is other literature which presents control efficiencies as low as 33 % (Kittle and Schmidt 1991)². That's not to say that high control efficiencies cannot be achieved, but that achieving a high degree of control on an ongoing basis requires more diligence and oversight.

With consideration to the comments provided in Issue 1 and Issue 2 above, the EPA recommends:

- Prior to construction the proponent provides further detail on the final remediation method design and implementation, including a demonstration that final remediation design is consistent with best practice;
- A condition of approval requiring that all contaminated material handling and processing be undertaken in an emission control enclosure, unless otherwise approved by the EPA; and
- Upon final remediation design and contractor engagement the proponent can apply for EPA approval to use alternative emission controls for parts of the project. This would need to be supported by robust justification, with consideration of, but not necessarily limited to:
 - Principal air toxics
 - Waste classification of any material that is proposed to be handled without an Emission Control Enclosure (ECE).

The EPA has provided Conditions of Approval encapsulating the above recommendations in Attachment C.

Issue 3 - The assessment provided during public exhibition predicts exceedances of the PM₁₀ (24 hour) and PM_{2.5} (24 hour) impact assessment criteria

The revised RTS presents revised assessment of PM₁₀ (24-hour average) and PM_{2.5} (24-hour average). The assessment is presented in Appendix G. The revised assessment:

- Accounts for proposed reduction in exposed excavation areas, and hence revised emission estimates for particulates;

² Technical memorandum Evaluation of Volatile Organic Compound Emission Control of RUSMAR AC-900L and AC-900 Foam using the surface emission isolation flux chamber, November 4 1991.

- Accounts for an enclosure on the screen with water sprays placed on the outlet. A control efficiency of 90% has been applied in estimating particulate emissions; and
- Accounts for a particulate filter for the mobile crushing plant, with a control efficiency of 99% being applied.

The revised modelling includes the following assumptions:

- A total volume of 35,200 m³ of contaminated soil was assumed to be screened; and
- Approximately 10% of the maximum hourly throughput of contaminate soil through the DTD would require crushing prior to treatment.

The EPA considers that based on the additional assessment information and the proposed enclosure for DTD feed material, the EPA interprets the mitigation measures as being a commitment to conduct all screening and crushing of contaminated material with the proposed DTD enclosure. This could achieve the theoretical control efficiencies adopted as the basis for the revised assessment. Table 2 below provides a summary of predicted incremental ground level concentrations (GLCs) presented in the revised RTS. Analysis of additional exceedances predicted are summarised within Table 3.

Table 2 – Summary of 24-hour average PM₁₀ and PM_{2.5} predicted GLCs

Pollutant	AQIA submitted during Public Exhibition		Appendix G of response to submissions	
	Incremental GLC	No of additional exceedances	Incremental GLC	No of additional exceedances
PM ₁₀	43.9	20	20.1	2
PM _{2.5}	4.4	3	2.8	2

Table 3 – Summary of additional exceedances for 24-hour PM₁₀ and PM_{2.5}

Pollutant	Background (ug/m ³)	Project Increment GLC (ug/m ³)	Cumulative GLC (ug/m ³)
PM ₁₀	47.9	3.2	51.1
	47.2	3.6	50.8
PM _{2.5}	24.7	1.1	25.8
	22.7	2.7	25.4

The EPA notes that the additional assessment predicts reduced impacts for 24-hour PM₁₀ and PM_{2.5} when accounting for the additional mitigation measures proposed. The residual additional exceedances of cumulative 24-hour PM₁₀ and PM_{2.5} are noted to be largely due to background concentrations which account for up to 96% of the predicted cumulative GLCs.

Additionally, the revised RTS also advises that an Air Quality Management Plan (AQMP) would be developed for the project and would include a reactive management component that includes “*Continuous pollutant monitoring system during Stage 2 to 4 for PM₁₀ and PM_{2.5}. The monitoring system would be used to record hourly particulate concentration 24 hours per day to provide an early warning of potential criteria exceedances which may enable works to be scaled back or stopped potentially prevent and exceedance of a criteria*”

Attachment B – Further Details of EPA’s Groundwater Assessment

Additional Information

The below Mann-Kendall analyses below (figure 1) are the described exceptions to the decreasing to stable trends highlighted throughout the remediation project. These trends have been identified by the proponent, but “are not considered to represent a risk to human health or offsite ecological receptors”.

Review of all submitted Mann-Kendall trends reveal there have been recent sampling results with increasing concentrations, particularly at boundary bores adjacent to Duck River (figure 2). This indicates the possible spread of DPC’s away from the elevated concentrated area. Though impact to ecological receptors are minimal, it is worth noting that the results of trend analysis over a specific timeframe may skew based on historical sampling and analysis interpolation. Figure 3 shows the bores with a known increased concentration trend, versus bores with recent increases in DPC results.

Supporting Information

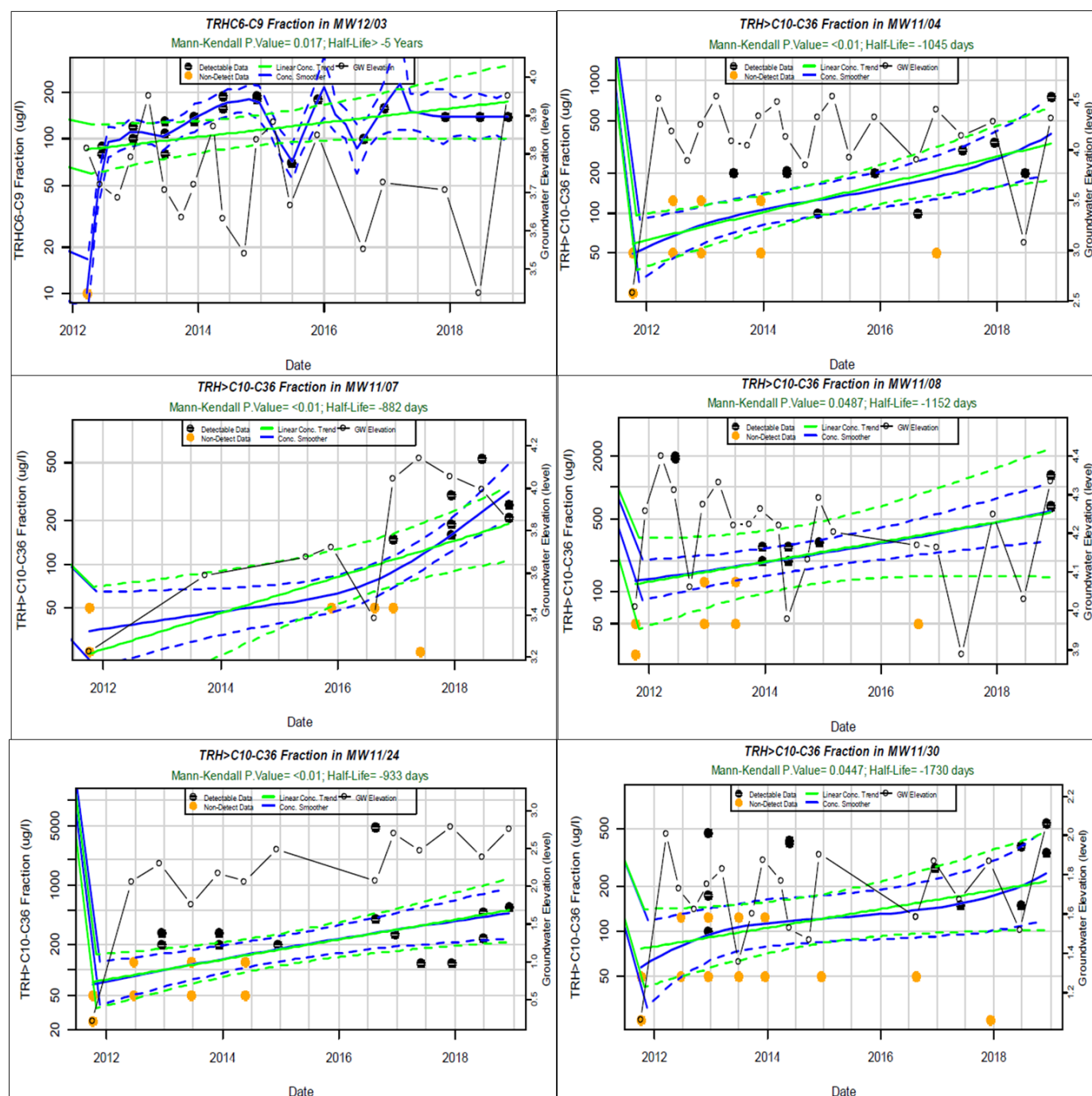


Figure 1. Dissolved Phase Constituents with statistically increasing trends as identified in the Q4 2018 Groundwater Monitoring Report. These six trend analyses are from bores located in the south west portions of the project site.

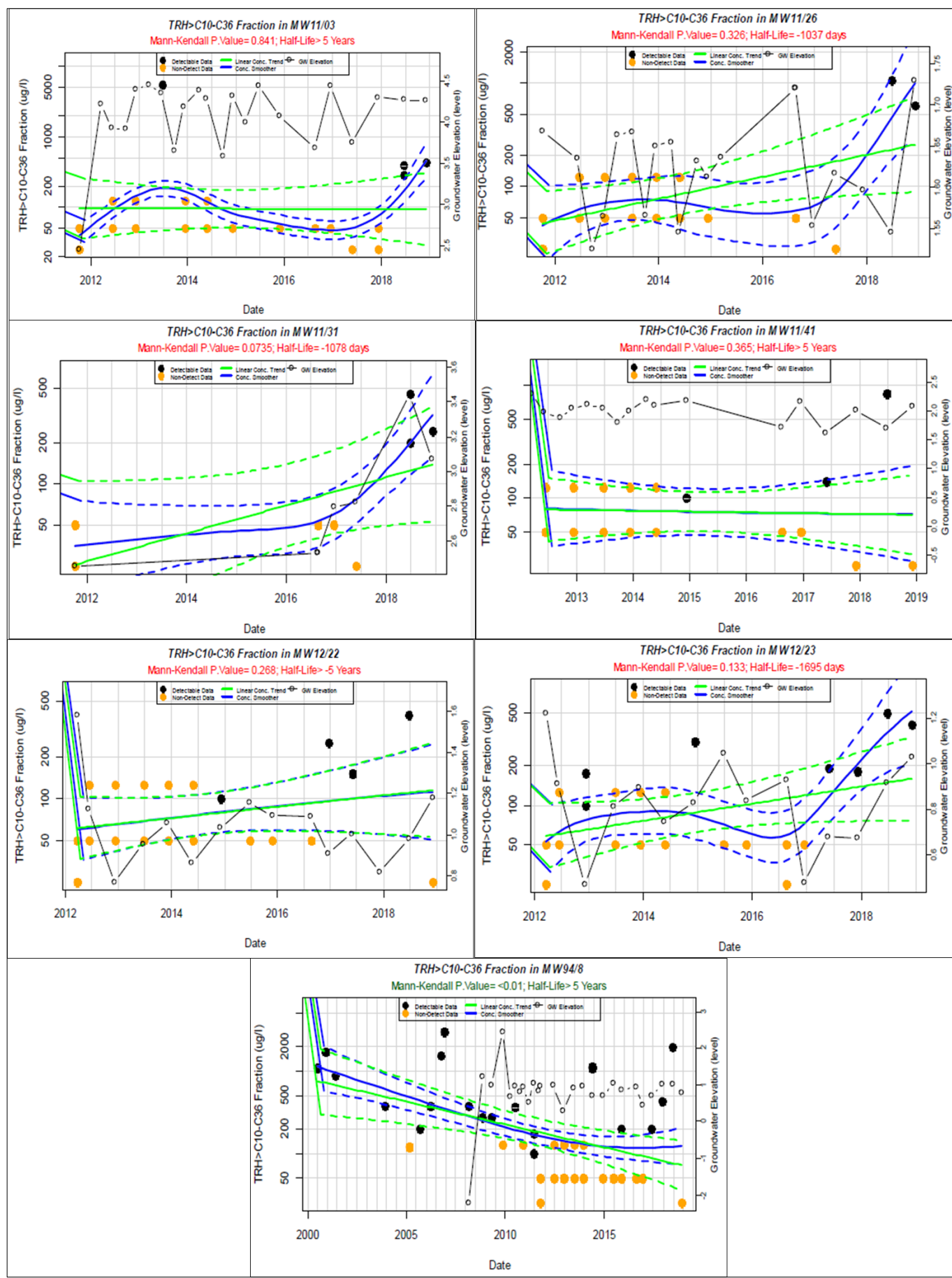


Figure 2. Dissolved Phase Constituents with TRH recent increased DPC concentrations over the last year.

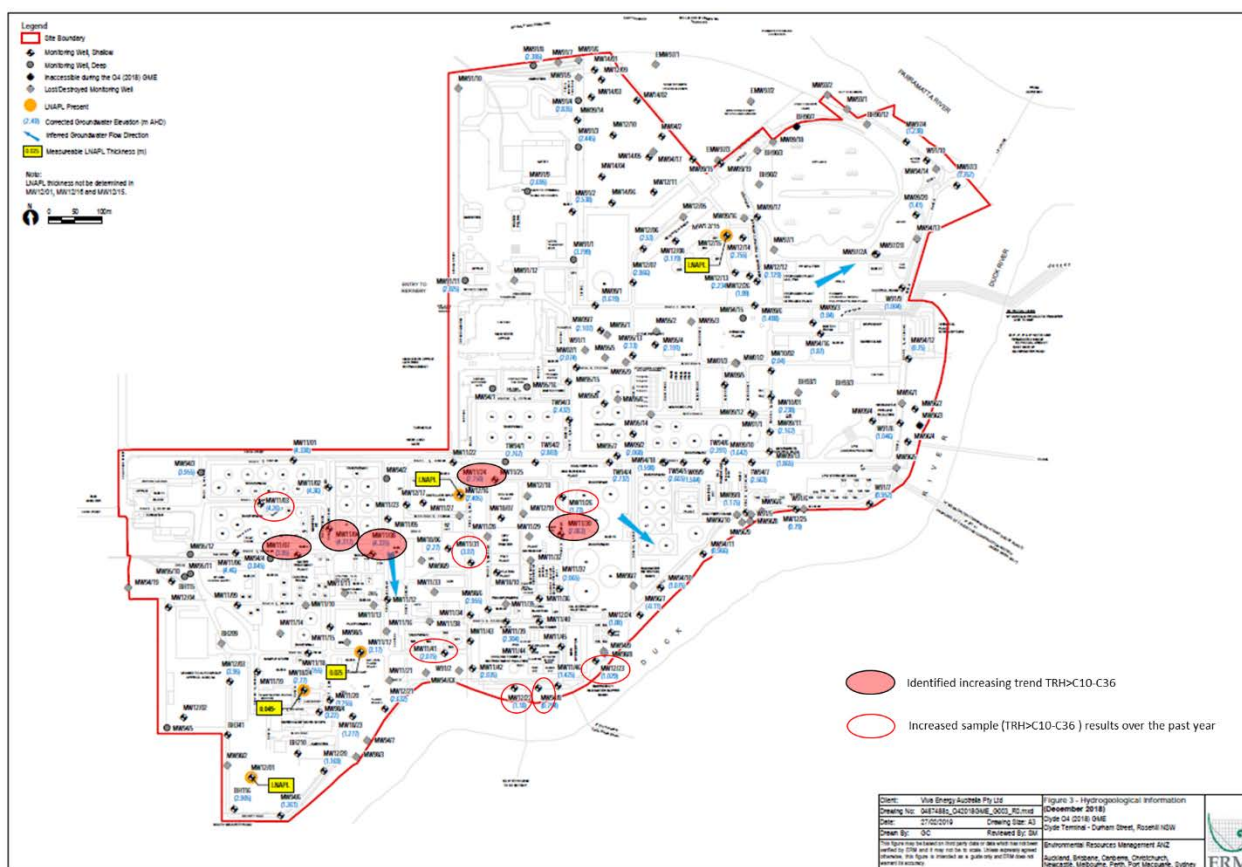


Figure 3. Location of increased DPC trends versus recently sampled bores with increased result.

Attachment C – Recommended Conditions of Approval

Viva's Clyde terminal is currently regulated under Environment Protection Licence 570 (the licence). A licence variation amendment to the licence will be required if the project is approved. The amendment will include variations to limits, operating, storage, monitoring and reporting requirements. Most of the changes cannot yet be detailed and will be subject to the findings and recommendations of a number of environmental reports that will need to be prepared prior to and during the project.

It is recommended that the Proponent contact the EPA prior to the commencement of the project to ensure that all relevant environmental management reports have been submitted and any associated changes to the licence made.

To assist in this process, the EPA requests that the following recommended conditions be included in the planning consent.

Air Quality

1. Prior to the commencement of project construction, the proponent must submit a *remediation air emission control proposal* report (the report) to the EPA. The report must include, as a minimum:
 - a) Detailed description of final selected remediation methodology.
 - b) Proposed emission control and management measures to be implemented for each part of the final remediation methodology, and material processing (including excavation, material classification, material handling, material treatment and material storage).
 - c) Benchmarking of final emission control and management measures proposed in (b) with best practice process design and emission control.
 - d) Robust justification for any part of the remediation process (a and b) that is not proposed to be conducted in an emission control enclosure.
2. All contaminated material must be handled, processed, treated and stored inside an emission control enclosure, unless otherwise agreed in writing by the EPA. Any approval sought by the proponent should give consideration, but not necessarily be limited to:
 - a) The outcomes of the final remediation action plan, supporting remedial site investigations and the *remediation air emission control proposal* report
 - b) The potential for emissions of principal air toxics
 - c) Waste classification of material that is proposed to be handled, processed, treated or stored outside of an emission control enclosure

For the purpose of this condition, emission control enclosure means: An enclosure designed operated and maintained under negative pressure and serviced by an emission control system agreed to by the EPA.

3. The proponent must prepare and implement an Air Quality Management Plan (the AQMP) for the proposed remediation. The AQMP must include:
 - a) Proactive and reactive management strategies
 - b) Key performance indicators for emissions controls and management measures
 - c) Monitoring method(s), including location, frequency and duration
 - d) Response mechanism
 - e) Responsibilities for demonstrating and reporting against key performance indicators
 - f) Record keeping
 - g) Compliance reporting

Water Management

4. Prior to commencement of operation, the applicant must prepare a Discharge Impact Assessment (DIA).

The DIA must:

 - a) be prepared by a suitably experienced and qualified person/s;
 - b) include a characterisation of the quality of discharge in terms of the concentrations and loads of all pollutants present at non-trivial levels including typical and worst-case conditions (this should be based on a risk assessment of the expected sources of pollutants);

- c) provide details of the practical measures that will be implemented to minimise pollution and mitigate potential impacts;
 - d) assess the impact of discharges on the environmental values of the receiving waterway with reference to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guideline values for slightly to moderately disturbed ecosystems; and
 - e) where relevant, identify practical measures to address identified impacts.
5. The DIA must be submitted to the EPA prior to the commencement of operation.
6. Operation of the project must not commence until the EPA has reviewed the DIA and provided written approval that the proposal can proceed.

Note: The EPA will review and may vary the existing licence discharge criteria, monitoring and other conditions subject to the DIA.

Hydrogeological

7. The Proponent must develop a Groundwater Monitoring and Management Plan (GMMP) to be included in the Detailed Remediation Action Plan. The GMMP must be prepared in consultation with the Department of Industry — Water, the EPA and the NSW EPA accredited site auditor. The GMMP should:
- a) detail ongoing monitoring practices as remediation progresses
 - b) include threshold for water quality impacts, considering baseline and ongoing monitoring data that is collected
 - c) detail trigger levels to identify any unprecedented changes in groundwater quality or stand water levels
 - d) outline associated response plans for the detection of unprecedented monitoring results
 - e) outline mitigation and management options should harmful impacts be identified
 - f) measures to identify, respond and report on groundwater conditions that may have the potential to create unacceptable risk to the Duck River receptors
 - g) assess how applied mitigation measures have reduced impacts using observed monitoring
 - h) ongoing monitoring that verifies anticipated natural attenuation of groundwater
 - i) annual report requirements of groundwater impacts from the remediation project.
8. A copy of the finalised GMMP must be approved by the NSW EPA accredited site auditor and must be provided to the EPA prior to the remediation activities commencing.
9. Any updates to the GMMP must be provided to the EPA throughout the project
10. The Proponent must submit an annual report to the EPA on the remediation processes that:
- a) identifies the effectiveness of the program since the commencement of remediation activities and its ongoing implementation
 - b) includes a review of other methods of remediation should the program options be unsuccessful or ineffective.
11. The Detailed Remediation Action Plan must contain alternate treatment methods that will be implemented should unprecedented changes to groundwater conditions occur during the project.

Contamination

12. The Proponent must engage an EPA accredited site auditor to issue a Section B site audit statement or statements confirming that the premises can be made suitable for the relevant use/s if the premises is remediated and managed in accordance with the Detailed Remediation Action Plan or any plan and reports submitted relevant to contaminated land matters.

Waste

13. The importation of contaminated soil to the premises will only be permitted under the project approval, if an appropriate resource recovery order and exemption can be obtained for use of that contaminated soil at the Premises

14. No contaminated soil is to be imported to the premises, unless the EPA has provided written confirmation that an appropriate resource recovery order and exemption will be provided.
15. A Waste Management Sub Plan will be required to be prepared, as part of the detailed Remediation Action Plan.

Noise

16. The proposed noise mitigation measures outlined in the EIS must to be implemented throughout the project.

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