Date : 15/01/2020 2:07:43 PM
From : "WEISE Tom"
To : sch4p4(6) Personal information @cleanaway.com.au"
Cc : "GREENWOOD Angela"
Subject : APP0046216 - Cleanaway New Chum Cell 3B1 - Query
Attachment : image001.png;image002.png;image003.png;

Hi sch4p4(6) Personal i

Thank you for taking the time earlier today to discuss the application for Cleanaway New Chum's Cell 3B1 (APP0046216). The following points have been raised by my Team Leader, Angela Greenwood (CC'd) following a review of the information provided:

- Application is to amend the current EA EPPR00445713, with the intent of:
  "Including Cell 3B into EA condition W2 as a double-lined landfill cell. The amendment is to recognise the current cell construction works which will line this area, allowing 3B1 to be recognised as a double-lined landfill cell for waste acceptance purposes."
- The application lists the construction of sub-cell 3B1 to be over the existing sediment pond;
- The sediment pond is currently conditioned and noted within *Figure 1* of the EA;
- With the information provided, there did not appear to be evidence of *how* the sediment pond would be relocated to another area on site. There is concern that in approving 3B1 and the amendment under APP0046216, that this would approve an area that is not yet suitable for use;
- It was mentioned earlier on the phone that there is currently another application going through Council regarding relocating the sediment pond;
- If it is the case that there is another application, would merging the two amendments at a later date (once approval given by Council) be a viable option;
- Without further information on the relocation of the conditioned sediment pond, the amendment application, as it stands, may not be approved.

Should you have any queries, please do not hesitate to contact myself or Angela Greenwood (07 3330 5616).

Kind Regards,

Tom

Queensland Government

Tom Weise
Senior Environmental Officer
Waste & Contaminated Land Assessment
Waste Operations| Waste & Recovery
Department of Environment and Science

P: 07 3330 5643
Level 7, 400 George Street, Brisbane QLD 4000
GPO Box 2454, Brisbane QLD 4001



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Date : 16/08/2019 3:28:55 PM
From : sch4p4(6) Personal in
To : "PFAS Project Team"
Cc : "GREENWOOD Angela"
Subject : Cleanaway - New Chum update
Attachment : image003.png;

Hi Simone,

As discussed regarding Cleanaway New Chum, we have requested, and are awaiting quotes for the biota and risk assessment works as discussed on Tuesday. To provide some comfort that we understand the priority as discussed, Epic Environmental were requested to progress this scope following our meeting on Tuesday, and I understand that we are waiting for sub-contractor quotes to finalise this process - which are expected next week.

To compliment this, we also had an environmental monitoring program scheduled to occur at the site next week. Following Tuesdays discussion I have expanded this sampling program, and Epic will collect and submit water samples for PFAS (both the full 28 compounds, and TOP Assay) for all accessible and suitable locations.

I had hoped to have more details of the program locked in before speaking to you, hence the lateness of the phone call. However, I will keep the communications open with a regular update on this matter, and will provide a proposed program of works once this is finalised.

Thank you again for your time on Tuesday. And if you need anything further on this in the meantime, please don't hesitate to contact me.

Warm Regards,

sch4p4(6) Pe
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Tel: sch4p4(6) Pe Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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Making a sustainable future possible

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File Note

File Reference: 101/0018196

Date: 17/07/2020

File Name: Cleanaway New Chum EPPR00445713

Subject (Detail): Teams meeting summary File Note

Teams meeting between Angela Greenwood and Avril Francis of DES Waste Assessment team and sch4p4(6) sch4p4(6) Personal information of Cleanaway on 17 July 2020 re pre-lodgement meeting summary.

Q1 and Q2 - Jan2020 amendment only considered Cell 3B1 and sediment pond relocation. it did not consider Cell 3B2 and leachate pond relocation. Therefore, cell 3B2 and leachate pond relocation requires an amendment by application with evidence from Council that the leachate pond relocation has Council approval/within existing approved DA landfill footprint.

Q3 - Current EE requires no release from the sediment basins, so new release point will need to consider that and a sediment pond before Void 10. As Void 10 has connection with receiving environment. So release direct to Void 10 not appropriate.

Recommend discussing what options are available with Nadene Perry of the Compliance team about disposing of regulated waste on site, as presently the EA does not authorise disposal to the New Chum landfill.

Q4 - Changed from ERA60(2)(h) to ERA60 (1)(d) is an increase in AES score, and a concurrence ERA. Therefore, MCU required as per Schedule 10, Part 5, Division 2 of the Planning Regulation. Because new ERA is not lower than the current ERA. Extract from Planning Regulation:

Assessable development—material change of use for an environmentally relevant activity

(1)A material change of use of premises for an environmentally relevant activity is assessable development, if the activity is a concurrence ERA (the ***relevant ERA***).
(2)However, subsection (1) does not apply if—
(a)an environmental authority to carry out a concurrence ERA has been approved for the premises; and
(b)the relevant ERA and concurrence ERA are to be carried out under the environmental authority; and
(c)the relevant ERA has a lower aggregate environmental score than the concurrence ERA

Cleanaway asked if limit for PFAS in soil/day cover could be applied to current EA, like it is in the new EA (EA0001935) that is not yet effective. Discussed the differences between Environmental Protection Regulation 2019 changes to regulated waste and PFAS result of 0ug/L from 1 July 2019 versus model conditions for ERA 60 that still contain PFAS in contaminated soil and not updated to reflect changes is regulated waste information from EP Reg. ERA 60 model conditions were used to draft Cleanaway's new EA.

Note: It appears some discrepancy now exists that between regulated waste limit of 0ug/L for PFAS versus PFAS limit is soil as day cover that may need to be rectified before EA comes effective (if at all depending on outcome of appeal underway with ICC).

Date: 17/07/2020

Published by DES Disclosure Log RTI Act 2009

Author: **Angela Greenwood**
Position: Senior Environmental Officer
Unit/Office: Waste Assessment
Phone: 3330 5616

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RTI Act 2009

File Note

File Reference: 101/0018196

Date: 02/11/2020

File Name: Cleanaway Solid Waste Pty Ltd – EPPR00445713 and EA0001935

Subject (Detail): Notes from Surface Water Discussion – New Chum Landfill

The client, Cleanaway Solid Waste Pty Ltd, approached the department via the Ipswich Compliance team with regards to arranging a meeting to discuss potential releases of PFAS-contaminated water from their site during the upcoming wet season.

This meeting was held on Monday 2/11/2020 via Teams, with the intent being to discuss the current and proposed surface water management for the site as well as any potential changes to the associated Environmental Authorities.

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Meeting Attendees:

Person	Organisation
sch4p4(6) Personal in	Cleanaway
sch4p4(6) Person	Cleanaway
sch4p4(6) Person	Cleanaway (Tonkin)
Nadene Perry	DES – Ipswich Compliance
Sinead Summerville	DES – Ipswich Compliance
Sarah Rowe	DES – OAT
William Inonda	DES – OAT
Kate Carlish	DES – Waste Assessment
Tony Bradshaw	DES – PFAS Technical Support

Current Surface Water Management

Cleanaway's current surface water management strategy is based off working through the hierarchy. The focus has been the separation of waters, ensuring any water that has been in contact with waste or the active landfill cells is diverted into the leachate collection system. All other surface waters are captured and diverted into the sediment basins (inclusive of those cells with interim capping).

Final capping is being progressed on a number of the inactive cells to minimise the intrusion of stormwater (cell 1 completed, cell 5 in progress). The resource recovery area is also bunded to separate this from the other stormwater catchment.

Prior to the wet season commencing (end of August, start of September), Cleanaway undertook sediment removal within their stormwater catchment system, including the HE sediment basin and the stormwater drains. Such sediment is currently being stored in a bund in one of the lined cells until it can be assessed and appropriately utilised. They are still intending to add the Rembind aggregate into the drainage channels. It was noted that Cleanaway should ensure they include some manner of measuring the effectiveness of the Rembind – such as measuring the contact/retention time or some measure of the organic content of the waters coming into contact with it.

An amendment application for the current EA is being drafted to include basin 1 as an authorised discharge point. The intent of this amendment will be to provide more control over the movement of water around the site and to be able to operate the water bodies separately. The concentrations of contaminants within the water bodies on site differ, so Cleanaway are seeking the ability to manage the water bodies differently where needed.

The resource recovery area and the active landfill area is where the sediment basin water (which has minor PFAS contamination) is used for dust suppression, so the reuse of that PFAS water is reduced and restricted to where it will be captured against within the leachate system. The Void 10 water is currently being used for the other operational areas of the site for dust suppression, which has some PFAS contamination but has the lowest concentration.

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Proposed Surface Water Management

Cleanaway have begun investigating onsite treatment options for the PFAS impacted water so that they can reuse more on site. Possible operators who can undertake this treatment have been engaged and have had experience in treating PFAS (e.g. Enviropacific at the Sunshine Coast airport).

The approach may be to establish a trial plant on site, using minimal volumes which are sufficient to allow for a proof of performance. The timeframe is likely nominated to be a 1 month trial. Cleanaway may run the trial for the treatment of both surface waters and leachate, so as to take advantage of having the equipment on site at this time.

Cleanaway queried whether any additional ERAs would be required in order to undertake this treatment on site. It was advised that an additional ERA would not be required – the description for ERA 55 Other waste reprocessing or treatment is based on a facility that receives and treats wastes. It is not designed to capture in-situ treatment of waste at the site where it is generated.

Following the storms which impacted the area over the weekend (Saturday 31/10/2020), the levels within the water bodies on site are as follows:

- HES Basin – approximately 50%
- Basin 1 – ‘low’, expected to be less than 20%
- Perched pond – still has freeboard available.

The site is not yet at the capacity where discharges to surface waters would be required. Cleanaway are prioritising the use of waters from the perched pond in order to reduce its level.

A site visit at the New Chum landfill is scheduled for next Tuesday 10/11/2020 with Ipswich Compliance and the Odour Abatement Taskforce due to attend.

Cleanaway also flagged a need to discuss further aspects of the new EA for the New Chum Landfill with the Waste Assessment team. However, it is considered best for this discussion to occur outside of this general meeting.

Date: **03/11/2020**

sch4p4(6) Personal

Author: **Kate Carlish**

Position: Senior Environmental Officer

Unit/Office: Waste Assessment

Phone: 07 3330 5736

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RTI Act 2009

Date : 6/07/2020 2:26:30 PM
From : "HAWAS Olga"
To : "GREENWOOD Angela" , "Waste and Contaminated Land Assessment"
Cc : "FRANCIS Avril" , "BLANCHARD Scott"
Subject : FW: Cleanaway - New Chum (EPPR00445713) request for pre-lodgement discussion
Attachment : CWY New Chum.pdf;image003.png;image001.png;

Angela
Cleanaway New Chum.

Olga Hawas
Principal Environmental Officer
Waste Assessment
Waste Operations I Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5540
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Monday, 6 July 2020 10:20 AM
To: PALM
Cc: HAWAS Olga
Subject: Cleanaway - New Chum (EPPR00445713) request for pre-lodgement discussion

Good Morning PALM,
Please find attached a pre-lodgement application for our New Chum facility (EPPR00445713) for advice on an amendment prior to drafting the application.
I would be happy to discuss via a teams meeting if this is most appropriate.
Warm Regards,

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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Application form

OFFICIAL USE ONLY

DATE RECEIVED

FILE REF

PROJECT REF

COMPLETE FORM ☐

ENTERED BY [SIGNATURE]

DATE

Application for pre-lodgement services

Important information for applicants

The Department of Environment and Science (the department) encourages clients to request a pre-lodgement meeting prior to formal application. Pre-lodgement meetings are a service made available by the department to discuss early concepts (pre-design) to determine the feasibility of the proposed project or in order to seek direction and advice on whether a proposed application will meet the legislative application requirements. This service can improve the quality of applications and may reduce delays and un-anticipated problems associated with applications.

This form should **not** be used for pre-lodgement for development applications proposed to be made under the *Planning Act 2016*. Pre-lodgement for these applications must be arranged through the Department of State Development, Manufacturing, Infrastructure and Planning, go to www.statedevelopment.qld.gov.au for more information.

Commercial and confidential information must be marked clearly. All information supplied on or with this application form may be disclosed publicly in accordance with the *Right to Information Act 2009* and the *Evidence Act 1977*.

GUIDE

1. The 'applicant' is the persons, or registered legal entity (not a business trading name) intending to carry out the activity and in whose name the applicable permits or licences are to be issued.
2. If the applicant is a registered entity, enter name and title of the principal contact person for the application (e.g. John Jones, Managing Director).
3. Please make sure the contact details provided are those by which you can be contacted on a daily basis.

Applicant details

1 Name of applicant

FULL NAME OF INDIVIDUAL OR ORGANISATION NAME

CLEANAWAY SOLID WASTE PTY LTD

2 ABN/ACN

ABN/ACN (IF APPLICABLE)

55 120 175 635

3 Contact person

FULL NAME

sch4p4(6) Personal informa

POSITION TITLE (IF APPLICABLE)

Senior Environmental Business Partner - QLD

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RTI Act 2009

4 Address and contact details

FULL POSTAL ADDRESS 172 Crockford Street, Northgate, QLD 4013	
PHONE [redacted]	FAX [redacted]
MOBILE sch4p4(6) Pe	EMAIL sch4p4(6) Persona@cleanaway.com.au

Application details

5 What does the proposed application relate to?

- ☒ Environmentally relevant activity (ERA) →
  - ☒ Prescribed ERA
  - ☐ Resource activities
    - ☐ Petroleum
    - ☐ Geothermal
    - ☐ Greenhouse gas storage
    - ☒ Mining:
      - ☐ Coal
      - ☒ Mineral
      - ☐ Gemstone
- ☐ Heritage
- ☐ Coastal
- ☐ Wildlife
- ☐ Other → [redacted]
- ☐ Unsure

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6 Description

Briefly describe the proposal including any options being considered. Please indicate where there is scope for project modification. Technical reports or other planning work may be helpful in resolving issues about feasibility. Briefly describe the processes of your project as they relate to energy and water use and waste outputs and any other environmental issues that may be affected by the project. Attach any relevant information.

DESCRIPTION

New Chum Facility

1. Landfill layout. Last amendment was for Cell 3B (listed on W2 - acceptance table) - received Jan 2020. Noting the amendment was for part of cell 3b1 (but noted in the table as 3B). When we receive works approval for the remainder of the cell, we will submit this documentation for completeness - do we need to submit this as an amendment?

2. Landfill changes. Noting the above cell subsection (3b2) will require the relocation of the leachate ponds, and additional stormwater infrastructure has now been built on site (relevant permits received (SW), pending (leachate)). As such we want to submit an updated figure to ensure this infrastructure is shown correctly in the EA.

3. IF we wanted to add a discharge point to the EA (for the new surface water basins), what information is required for this? Noting the new Basins are currently designed to flow to the current discharge point "Final Sedimentaion Basin before Void 10", but could be diverted via overland flow directly to Void 10. Therefore Void 10 would remain the interface between the site and the receiving environment.

4. As discussed at the time of the Landform Redesign application, we are keen to understand how and what information would be needed to change the ERA from the current ERA 60 (2)(h), for mixed general waste and limited reg waste, to ERA 60 (1)(d). And what this amendment process would entail (likely to be minor or major, trigger community consultation, etc). Noting:

- change in AES from 107 to 119

7 Proposed site location(s)

Describe project location (and relevant tenure) or proposed project location(s). Give as much information as possible to accurately locate the site(s), such as maps with contextual or boundary lines on plan or GPS boundary co-ordinates. Include surrounding areas and attach any relevant information.

DESCRIPTION

Existing Landfill Facility, located at 100 Chum Street, New Chum, QLD

Including Lots 227 on SP103913 and Lot 268 on SP103913

8 Does the proposed application relate to an existing environmental authority or environmental authorities?

☒ Yes → The environmental authority number and details may be found on the existing environmental authority or quoted in other correspondence received from the administering authority.

ENVIRONMENTAL AUTHORITY NUMBER(S)

EPPR00445713

☐ No

Rele

9 Environmental offsets

Determine if any prescribed environmental matters—matters of State environmental significance (MSES)[1] are known to exist at the proposed project site, or on nearby land/tenure. The environmental reporting online tool[2] identifies many, but not all MSES. If significant residual impacts to any prescribed environmental matters are proposed, an environmental offset may be required under the *Environmental Offsets Act 2014*[3].

Are any MSES known to exist on the proposed project site or nearby land/tenure?

☐ Yes → Will the proposed activities impact any known MSES?

- ☐ Yes
- ☐ No

☒ No

Declaration

I understand that all information supplied on or with this application form may be disclosed publicly in accordance with the *Right to Information Act 2009* and the *Evidence Act 1977*.

APPLICANT'S NAME	APPLICANT'S POSITION
sch4p4(6) Personal information	Senior Env Business Partner - Qld
APPLICANT'S SIGNATURE sch4p4(6) Personal	DATE 3/7/20

Applicant checklist

☑ Application form completed and signed

N/A Question 6: Relevant information attached (if applicable)

N/A Question 7: Relevant information attached (if applicable)

Please return your completed application form and any attachments to:

Permit and Licence Management
Department of Environment and Science
GPO Box 2454
Brisbane QLD 4001

OR

Email: palm@des.qld.gov.au

Enquiries:
Phone: 1300 130 372 (select option 4)
Fax. (07) 3330 5875

Privacy statement

The Department of Environment and Science (the department) is committed to protecting the privacy, accuracy and security of your personal information in accordance with the *Information Privacy Act 2009*. The department is collecting the information on this form to tailor pre-lodgement services to best facilitate your application. This information will only be accessed by authorised employees within the department and will not be disclosed to any other parties unless authorised or required by law. For queries about privacy matters please email privacy@des.qld.gov.au or telephone: 13 QGOV (13 74 68).

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Date : 15/10/2020 4:15:40 PM
From : "CARLISH Kate"
To : sch4p4(6) Personal ir
Cc : "HAWAS Olga"
Subject : RE: Cleanaway New Chum - EPPR00445713 and EA0001935
Attachment : image001.png;image002.png;image003.png;

Hi sch4p4(6

Thank you for sending through your email in relation to the surface water release points associated with EA0001935.

It's acknowledged that Cleanaway intended for both release points associated with the current permit EPPR00445713 to remain applicable once the new EA comes into effect.

Both release points were included within the initial draft water conditions for the new permit, however changes were made in the final stage review of the permit document and the application timeframes did not allow for sufficient time to provide such changes to Cleanaway for review prior to issuing the final permit document.

Condition WT5 is included within the EA to allow for the release of waters collected from outside of the landfill facility from release point "LPD 1 - North-west corner HES basin" in accordance with the surface water release limits described within Table 2. Advice regarding the suitability of these release limits was provided by the water technical specialist within DES (which align with the WQOs for Six Mile Creek from EPP Water and the PFAS NEMP).

Condition WT3 was added to the EA during the final stage review of the permit. It was originally combined within what is now condition WT4, so it was provided within the draft water conditions, just not as a stand alone condition.

WT3	No releases of contaminants from the **landfill facility** are authorised to **waters** until: a. a minimum of eight (8) surface water monitoring samples, collected as part of a surface water monitoring program and the associated monitoring requirements have been met; and b. locally-derived water quality limits have been developed based on the monitoring samples required in a) above; and c. those locally-derived water quality limits are approved by the **administering authority**.

Landfill facility is defined within the EA as land and structures at the site approved used for the disposal of solid waste. It is understood that the release point "LPD 2 – final sedimentation pond prior to Void 10" captures 'dirty' stormwater from across the landfill facility prior to discharging into Void 10. The water technical specialist within DES identified current uncertainty regarding the state of contaminants on site which may be captured by these 'dirty' stormwater flows, and so there is a need to undertake a more detailed assessment of the risks and manage potential impacts to the receiving environment prior to continuing to allow such waters to discharge into Void 10 and subsequently Six Mile Creek.

Therefore, the only release point added to the EA is the release point outside of the landfill facility (LPD 1) until more data is obtained regarding the contaminants within the landfill facility.

In order for Cleanaway to be authorised to release waters from the release point "LPD 2 – final sedimentation pond prior to Void 10", it is my understanding that the surface water monitoring required by condition WT3 will have to be carried out first, including the development of locally-derived water quality limits and the subsequent review and approval of such water quality limits by DES. I believe that Cleanaway would need to provide further detail to characterise the quality of the 'dirty' stormwater captured within the landfill facility – and if the water does not meet the locally-derived water quality limits determined within condition WT3, then Cleanaway may need to propose some sort of treatment that these waters will undertake prior to being released.

Providing the EA is still 'granted-not effective' once the requirements of condition WT3 have been addressed, then it should be appropriate for an administrative amendment to be carried out on EA0001935 to add the new release point with its associated surface water release limits. It could potentially need to be included as a separate condition if the contaminants limits are different from the authorised release point LPD 1, and also to clearly demonstrate that LPD 2 releases waters captured within the landfill facility.

I hope this provides some further clarity with regards to the release point associated with EA0001935. Please let me know if you have any further queries. I will be offline tomorrow, but back in the office on Monday.

Kind Regards,

Queensland Government

Kate Carlish
Senior Environmental Officer
Waste Assessment
Waste Operations | Waste, Development and Southeast Compliance
Department of Environment and Science

P 07 3330 5736
Level 7, 400 George Street, Brisbane QLD 4000
GPO Box 2454, Brisbane QLD 4000

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Wednesday, 7 October 2020 2:30 PM

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To: HAWAS Olga; CARLISH Kate
Subject: RE: Cleanaway New Chum - EPPR00445713 and EA0001935

Thank you Olga,

Kate – attached is a letter with some further reference/ comments on this process (including the report where the details of this discharge point was noted in the application material). I drafted this letter to submit to instigate the amendment process in the hopes this was the path to take.

sch4p4(6) Personal information but given the urgency of this matter, I will check my emails periodically and respond with anything further you need on this matter sch4p4(6) Personal information

Thanks in advance
sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Per
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au



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From: HAWAS Olga <Olga.Hawas@des.qld.gov.au>
Sent: Wednesday, 7 October 2020 2:16 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: CARLISH Kate <kate.carlish@des.qld.gov.au>
Subject: RE: Cleanaway New Chum - EPPR00445713 and EA0001935

Good afternoon sch4p4(

I allocated to Kate Carlish to check the assessment process to confirm that the second release point was omitted in error. Once confirmed, we can correct the error through amendment by agreement or correction for clerical or formal error.

If you have any further questions please do not hesitate to contact me.

Best regards



Olga Hawas
Principal Environmental Officer
Waste Assessment
Waste Operations I Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5540
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Tuesday, 6 October 2020 10:45 AM
To: HAWAS Olga
Subject: Cleanaway New Chum - EPPR00445713 and EA0001935

Good Morning Olga,

In relation to our New Chum facility:

Under the current EA (EPPR00445713) condition WT1 and Figure 1 (page 24), we have 2 release points approved for surface water:

- HES pond on Chum Street; and
- Final sedimentation basin prior to Void 10 (which releases to Void 10 and Six Mile Creek.

The future EA (EA0001935) condition WT5, only lists 1 release point (LPD-1 north west corner of HES basin). It missed the second release point completely.
In relation to this, I note:

- The criteria listed in this EA is relevant to Six Mile Creek, and therefore was built into the EA to approve discharge from the second release point to the receiving environment;
- To support this, please find attached the "EA conditions (CWY) Enviro" which is our review of the EA conditions submitted to SARA on the 29th Aug 2019 – and the relevant email trail providing this to SARA. This clearly lists both release points, and the subsequent co-ordinates – with us noting that both release points are required for this EA.

Noting the above criteria relating to the receiving environment from this second release point, I expect in the rush to close this EA application

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process out this comment was missed, which led to the subsequent secondary location being missed also. As such, can you advise me how I get this future EA (EA0001935) amended to add this already approved discharge location in.

I assume this will be noted as an administrative change only, please let me know if I need to provide anything other than what I have attached here to the application for this clarification.

I am hoping to submit this today / tomorrow, or as soon as I receive your response on how to best progress this.

Warm Regards

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au



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Date : 7/10/2020 2:30:11 PM
From : sch4p4(6) Personal i
To : "HAWAS Olga" , "CARLISH Kate"
Subject : RE: Cleanaway New Chum - EPPR00445713 and EA0001935
Attachment : New Chum (EA0001935) Amendment (Rev 0).pdf;image005.png;image006.png;image002.png;

Thank you Olga,

Kate attached is a letter with some further reference/ comments on this process (including the report where the details of this discharge point was noted in the application material). I drafted this letter to submit to instigate the amendment process in the hopes this was the path to take.

sch4p4(6) Personal information but given the urgency of this matter, I will check my emails periodically and respond with anything further you need on this matter sch4p4(6) Personal information .

Thanks in advance

sch4p4(6) Pe
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Pers@cleanaway.com.au | www.cleanaway.com.au



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From: HAWAS Olga <Olga.Hawas@des.qld.gov.au>
Sent: Wednesday, 7 October 2020 2:16 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: CARLISH Kate <kate.carlish@des.qld.gov.au>
Subject: RE: Cleanaway New Chum - EPPR00445713 and EA0001935

Good afternoon sch4p4(6

I allocated to Kate Carlish to check the assessment process to confirm that the second release point was omitted in error. Once confirmed, we can correct the error through amendment by agreement or correction for clerical or formal error.

If you have any further questions please do not hesitate to contact me.

Best regards



Olga Hawas
Principal Environmental Officer
Waste Assessment
Waste Operations I Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5540
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Tuesday, 6 October 2020 10:45 AM
To: HAWAS Olga
Subject: Cleanaway New Chum - EPPR00445713 and EA0001935

Good Morning Olga,

In relation to our New Chum facility:

Under the current EA (EPPR00445713) condition WT1 and Figure 1 (page 24), we have 2 release points approved for surface water:

- HES pond on Chum Street; and
- Final sedimentation basin prior to Void 10 (which releases to Void 10 and Six Mile Creek.

The future EA (EA0001935) condition WT5, only lists 1 release point (LPD-1 north west corner of HES basin). It missed the second release point completely.
In relation to this, I note:

- The criteria listed in this EA is relevant to Six Mile Creek, and therefore was built into the EA to approve discharge from the second release point to the receiving environment;
- To support this, please find attached the EA conditions (CWY) Enviro which is our review of the EA conditions submitted to SARA on the 29th Aug 2019 and the relevant email trail providing this to SARA. This clearly lists both release points, and the subsequent co-

ordinates with us noting that both release points are required for this EA.

Noting the above criteria relating to the receiving environment from this second release point, I expect in the rush to close this EA application process out this comment was missed, which led to the subsequent secondary location being missed also. As such, can you advise me how I get this future EA (EA0001935) amended to add this already approved discharge location in.

I assume this will be noted as an administrative change only, please let me know if I need to provide anything other than what I have attached here to the application for this clarification.

I am hoping to submit this today / tomorrow, or as soon as I receive your response on how to best progress this.

Warm Regards

sch4p4(6) Pe
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au



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7 October 2020

Solid Waste – Post Collections
Cleanaway Solid Waste Pty Ltd
ABN: 55 120 175 635

100 Chum Street
New Chum QLD 4303
Australia
P +61 7 3816 2166

Permit and Licence Management
Department of Environment and Heritage Protection
GPO Box 2454
Brisbane QLD 4001

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To Whom It May Concern,

Application for an Amendment for Cleanaway's New Chum future Environmental Authority, EA0001935

Please find this letter containing the details and supporting information for the amendment for the Cleanaway Solid Waste Pty Ltd (CSW) New Chum not in effect Environmental Authority EA0001935 (EA).

The intent of this amendment is to include the secondary release point into the EA which we believe was missed off the document in the rush to finalise the conditions during the SARA run process in 2019.

Details to support this amendment are provided in the following sections.

1. Amendment Details

Under the current Environmental Authority for the site (EPPR00445713) there are two discharge points approved:

1. High efficiency sediment basin on Chum Street (HES Basin); and
2. Final sedimentation basin prior to Void 10.

These are noted in condition WT1 and shown on Figure 1 of EPPR00445713.

Both of these discharge points were included in the landform redesign application, for example, the *Addendum to the Stormwater Management Plan* (GHD, June 2019), describes both Lawful Discharge Points (LPD) in Attachment A, item 7 as:

- LPD 1 - North west corner existing HES Basin; and
- LPD 2 – Perched Dam.

This is both consistent with the current approved discharge points, and an integral part of the design for the stormwater management system on site.

It is noted that the criteria listed in the future EA, condition WT5, are relevant for the receiving environment of Six Mile Creek. The only release point at site that releases into Six Mile Creek is LPD 2, which is currently not included in the EA. Based on the inclusion of the relevant criteria, it is our understanding that this second release point was intended to be included.

It is further noted that during the final stages of the EA development, the second LPD being missed from the EA was noted by Cleanaway, and this LPD was requested to be included. Cleanaway were

not given a second opportunity to review the EA prior to it being executed, and therefore this LPD was missed off the final version. For completeness, the email where Cleanaway provided comments back to SARA (dated 29th August 2019), and the subsequent marked up water conditions are included as Attachment 1[1].

Cleanaway also acknowledge that towards the end of the review period all parties (SARA, Cleanaway and DES) were under time pressures to finalise the EA and DA. It is noted that the water conditions were provided for initial review on the 29th August, comments were provided by Cleanaway same day, and the EA finalised by 10th September 2019.

It is noted that there has been a delay between realising of the missing LPD from the document and the subsequent amendment. Cleanaway had originally intended to amend the EA post the current legal Appeal process that is underway, as there are several other items to be discussed further. However, it was noted this week that it would be preferential to amend the EA to include this LDP for the Appeal to transparently ensure that all parties were aware that the intent is that discharge to Six Mile Creek is approved (if and where all criteria are met as per the EA conditions).

2. Conclusion

In summary, the proposed amendment is considered administrative only – it is not seeking anything new or outside the application material already submitted and the intended conditions of the finalised EA. The amendment will not result in an increase in scale or intensity of the activities, an increase in emissions, nor will it result in a change to the footprint of the current disturbance. There are no changes to financial assurance, as no activities are being amended which trigger a financial assurance review.

We would be okay with progressing this amendment as either an amendment by agreement, or as a clerical correction or formal error process, whichever is easiest from DES's perspective.

The following documentation is attached in support of this application:

- Attachment 1 – Cleanaway correspondence to SARA and marked up comments on water conditions (dated 19th August 2019)

If you require any additional information, or clarification on this application, please do not hesitate to contact me.

Yours sincerely

sch4p4(6) Personal info

Senior Environmental Business Partner – QLD

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[1] Noting the comments against condition WT4 flagging both discharge points being required and providing the co-ordinates of both discharge locations.

Attachment 1 – Cleanaway correspondence to SARA and marked up comments on water conditions (dated 19th August 2019)

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From: sch4p4(6) Per
To: Isaac Harslett
Cc: sch4p4(6) Per Ursula McInnes; sch4p4(
Subject: EA Conditions (CWY) Enviro.docx
Date: Thursday, 29 August 2019 3:14:40 PM
Attachments: EA Conditions (CWY) Enviro.docx

Hi Isaac

Please see attached preliminary comments on the water conditions.

As discussed we may provide additional comments by Monday that we are still working on now.

Regards

sch4p4

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Proposed Draft Cleanaway Water Conditions

Agency interest: Water	
Condition number	**Condition**
WT1	Other than as permitted within this environmental authority, contaminants must not be released to **waters**.
WT2	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any **waters** as a result of the authorised activities, except as permitted under the conditions of this environmental authority.
WT3	No releases of contaminants from the **landfill facility** are authorised to **waters,** until a minimum of eight (8) surface water monitoring samples, collected as part of a surface water monitoring program and the associated monitoring requirements have been met, prior to commencement of waste deposition within the **landfill facility**. The exception to this is where surface water meets the criteria as set out in WT3. A surface water monitoring program must include: a) the design and implementation of a **Receiving Environment Monitoring Program** to monitor the waters of Six Mile Creek to achieve the following aims: i. to identify EPP (Water) 2009 water quality objectives and aquatic macroinvertebrate assemblages within the Six Mile Creek receiving environment; ii. to develop locally-derived water quality limits for electrical conductivity and all contaminants of concern applicable in Six Mile Creek in accordance with the Queensland Waste Quality Guidelines (2009 or most recent update) and the monitoring parameters listed in d) below; and iii. locally-derived water quality limits are to be approved by the **administering authority**, prior to commencement of waste deposition within the **landfill facility**. b) include monitoring locations upstream and downstream of the discharge points and at a minimum the monitoring locations defined in Figure 2 in Appendix A; c) surface monitoring samples collected prior to the commencement of waste deposition in the **landfill facility** must be no less than two (2) months between sample events and no more than four (4) months between sampling events; and d) monitoring of at least the following parameters: i. pH (pH units) ii. Electrical Conductivity (µs/cm) iii. Dissolved Oxygen (mg/L) iv. Suspended Solids (mg/L) v. Total Organic Carbon (mg/L) vi. Ammonia as N (mg/L) vii. Nitrate as N (mg/L) viii. Total Nitrogen (TN) and Total Phosphorus (TP) (mg/L) ix. Sulfate (mg/L) x. Alkalinity (bicarbonate and carbonate) (mg/L) xi. Total Dissolved Solids (TDS) (mg/L) xii. Total Suspended Solids (TSS) (mg/L) xiii. Biological Oxygen Demand (BOD) (mg/L) xiv. Chemical Oxygen Demand (COD) (mg/L) xv. Total and dissolved metals (aluminium, arsenic, barium, cadmium, chromium, cobalt,

Commented [DP1]: Where we meet the release criteria as identified in WT4 why can't this water be released to the environment?

For example, if we install a temporary or permanent treatment plant that treats the surface water to meet the most stringent "stormwater" criteria, with a robust testing regime, why are we not able to release this water?

This "no release" is considered unreasonable with the stipulated restrictions above (i.e. if release is suitable for stormwater meeting these conditions, it is also suitable for surface waters, with the responsibility falling to us to show how we meet these).

Commented [GA2]: This figure is noted as Figure A2.1 from the GHD concept design report and will be copied into the appendix of the EA.

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copper, lead, manganese, mercury, nickel, zinc) (mg/L)

xvi. **PFAS compounds***

xvii. Total fluorinated organic compounds** (mg/L).

Note: *For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay.

**For monitoring of fluorinated organic compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan.

Associated monitoring requirements

1. Monitoring must be in accordance with the methods prescribed in the current edition of the **administering authority's** *Water Quality Sampling Manual.*
2. Samples must be taken using representative samples.
3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives/limits relevant to the particular water quality characteristic.
4. All monitoring devices must be correctly calibrated and maintained.

WT4

The only contaminants to be released to surface **waters,** which flows to Six Mile Creek, are stormwater runoff waters from areas outside of the **landfill facility** and are not likely to be contaminated with **leachate** or stormwater that has come into contact with waste materials in accordance with *Table 1 - Surface water release limits*~~*Table 1 - Surface water release limits*~~ and the associated monitoring requirements.

Table 1 - Surface water release limits

Release Point Description (GDA94 decimal degrees) *			**Quality characteristic (units)**	**Limit**	**Limit Type**	**Minimum Monitoring Frequency**
Name	Latitude	Longitude				
LPD 1 - North-west corner existing HES basin LPD 2 – final sedimentation pond prior to Void 10			pH	6.5 - 8.5	Range	Prior to release, and daily thereafter during release
			Dissolved Oxygen	>80%	Minimum	
			Turbidity	<50 NTU	Maximum	
			Electrical Conductivity (µS/cm)	1500	Maximum	
			Sulfate (SO_4) (mg/L)	1000	Maximum	
			Ammonia as N (µg/L)	900	Maximum	
			Nitrate as N (µg/L)	700	Maximum	

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Commented [DP3]: GPS co-ordinates for **both discharge points** were provided to the Department for 2017 amendment as follows:

HES "chum street" Sediment pond: S27° 36' 36.1" E 152° 49' 50.1"

Final sedimentation basin to void 10: S27° 37' 03.5" E 152° 50' 24.7"

Both discharge points are shown in current EA table – and provided in the attached figure for completeness. Neither of these discharge points are changing under the current application.

Commented [DP6]: Please clarify - 80% of what?

Commented [GA4]: Cleanaway to provide co-ordinates for LPD 1.

Commented [DP5R4]: See above for **BOTH** required licence discharge points.

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				Total Nitrogen (TN) and Total Phosphorus (TP) (µg/L)	500 (TN) 50 (TP)	Maximum		
				Total Dissolved Solids (TDS) (mg/L)	1000	Maximum		
				Total Suspended Solids (TSS) (mg/L)	6	Maximum		
				Biochemical Oxygen Demand (BOD) (mg/L)	15	Maximum		
				Chemical Oxygen Demand (COD) (mg/L)	40	Maximum		
				Total and dissolved Aluminium (µg/L)	55	Maximum		
				Total and dissolved Arsenic (µg/L)	13	Maximum		
				Total and dissolved Cadmium (µg/L)	0.2	Maximum		
				Total and dissolved Chromium (µg/L)	1	Maximum		
				Total and dissolved Cobalt (µg/L)	90	Maximum		
				Total and dissolved Copper (µg/L)	1.4	Maximum		
				Total and dissolved Iron (µg/L)	300	Maximum		

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				Total and dissolved Lead (µg/L)	3.4	Maximum	
				Total and dissolved Manganese (µg/L)	1900	Maximum	
				Total and dissolved Mercury (µg/L)	0.2	Maximum	
				Total and dissolved Nickel (µg/L)	11	Maximum	
				Total and dissolved Zinc (µg/L)	8	Maximum	
				Total fluorinated organic compounds* (mg/L)	-		
				PFAS Compounds** as per condition WT13	0.00023 µg/L (PFOS) 19 µg/L (PFOA)	Maximum	

Note: *For monitoring of fluorinated organic compounds, monitoring must be undertaken in accordance with the latest version of the PFAS National Environmental Management Plan.

** For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay.

Associated monitoring requirements

1. Monitoring must be in accordance with the methods prescribed in the current edition of the **administering authority's** *Water Quality Sampling Manual.*
2. Samples must be taken using representative samples.
3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives/limits relevant to the particular water quality characteristic.
4. Monitoring must be undertaken during a release as per the frequency stated.
5. All monitoring devices must be correctly calibrated and maintained.
6. All metals and metalloids must be measured as total (unfiltered) and dissolved (filtered). Trigger levels for metal/metalloids apply if dissolved results exceed trigger.
7. For any monitoring results of surface water found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS).

Commented [DP7]: Given the trigger values apply where dissolved results exceed trigger – please remove the reference to "total" within the table.

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WT5	Stormwater sediment basins and collection devices on site must, at a minimum, retain the stormwater runoff from **disturbed areas**, generated by (up to and including) a **24 hour storm event with an average recurrence interval of 1 in 10 years**.
WT6	Any release of stormwater must be conducted in a way and at a rate that does not cause: a) re-suspension of particles; or b) erosion of bed or banks of receiving waters; or c) landscape damage; or d) ponding of the water; or e) vegetation damage.
WT7	The **groundwater monitoring program** required by condition G11 must be designed, carried out and periodically reviewed and updated by an **appropriately qualified person(s)**. The **appropriately qualified person(s)** must have appropriate qualifications and experience in the fields of hydrology and groundwater monitoring programs to be able to competently make recommendations about these matters.
WT8	The **groundwater monitoring program** required by condition G11, must be ~~implemented~~ progressed prior to the first deposition of waste to the **landfill facility** and must include but not necessarily be limited to: a) identification of the aquifer(s) and geological unit for which each **groundwater monitoring bore** will be monitored; b) the collection of a minimum of eight (8) groundwater monitoring sample events prior to the first deposition of waste to the **landfill facility**; c) groundwater monitoring sample events prior to the first deposition of waste to the **landfill facility** must be no less than two (2) months between sample events and no more than four (4) months between sampling events; d) identification of groundwater quality limits for parameters that are associated with the potential or actual contaminants held on the site. The groundwater quality limits must be derived using the latest version of the **administering authority's** guideline *Using Monitoring Data to Assess Groundwater Quality and Potential Environmental Impacts*. Sufficient baseline sampling must be undertaken in groundwater monitoring wells in accordance with the above mentioned guideline to establish groundwater quality limits, prior to the first deposition of waste to the **landfill facility**; e) identification of triggers that are suitable for early detection of contaminant releases at the site. The triggers must be derived using the latest version of the **administering authority's** guideline *Using Monitoring Data to Assess Groundwater Quality and Potential Environmental Impacts*. Sufficient baseline sampling must be undertaken in groundwater monitoring wells in accordance with the above mentioned guideline to establish trigger concentration levels, prior to the first deposition of waste to the **landfill facility**; f) the derived contaminant groundwater quality limits and trigger values identified in d) and e) above, along with an explanation of the methodology used to calculate the contaminant values, must be provided to the **administering authority** for approval prior to the first deposition of waste to the **landfill facility**; g) installation of background **groundwater monitoring bores** where groundwater quality will not have been affected by the site's activities authorised under this environmental authority to use as reference sites for determining impacts; h) installation of **groundwater monitoring bores** that: a. are within formations potentially affected by the activities authorised under this environmental authority (i.e. within the potential area of impact);

Commented [DP8]: As discussed during last meeting - this is unreasonable given it would force the operations to close where 8 monitoring events are not completed prior to the works needing to commence.

Note the parameters below include additional parameters than currently undertaken, or asked to be undertaken by the Dept to date therefore this will require 8 NEW monitoring rounds – as well as monitoring well installation as per below conditions.

I would also argue that at no time was this assessment discussed for anything other than PFAS – which is being managed outside of this EA and approval process with the PFAS team as an immediate action.

Commented [DP9]: We have already agreed to adopt the precautionary published criteria in the interim relating to groundwater. As such, we attest that stating the site specific criteria need to be developed prior to this activity being undertaken is not consistent with the previous conversation.

The criteria have been provided in the GHD hydrogeological assessment report (May 2019) on the table of groundwater results.

This would ensure the Dept precautionary process is satisfied until we have finalised the site specific criteria under the required assessment.

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<table>
<tr><td></td><td>
b. provide for the early detection of negative impacts in the immediate vicinity of potential contaminant sources, prior to reaching groundwater dependent ecosystems, site boundaries, landholder's active groundwater bores, or water supply bores;
c. provide for the early detection of negative impacts prior to reaching migration pathways to other formations (i.e. faults, areas of unconformities known to connect two or more formations);
d. establishes quality of groundwater down-gradient of any potential leakage of contaminants to groundwater from the premises to which this environmental authority relates; and
e. as a minimum are the groundwater monitoring bores depicted in Figure 2 of Appendix A.
i) monitoring of groundwater at each background groundwater monitoring bore and groundwater monitoring bore at least quarterly for the trigger parameters identified in point d) above and Table 2 below;
j) groundwater trigger action response procedures for when water quality limits and trigger levels identified in point d) and (e) above trigger the early detection of seepage of contaminants, or upon becoming aware of any monitoring results that indicate potential groundwater contamination; and
k) a rationale detailing the program conceptualisation including assumptions, determinations, monitoring equipment, sampling methods and data analysis.
</td></tr>
<tr><td>WT9</td><td>The locations of wells and groundwater monitoring facilities that comprise the groundwater monitoring program must be given with horizontal coordinates of such facilities accurate to 1.0 metre.</td></tr>
<tr><td>WT10</td><td>On any occasion that samples are obtained, the holder of the environmental authority must measure and record standing groundwater levels in metres, accurate to 0.001 metres. The elevation of the reference point, relative to Australian Height Datum, for use in any groundwater level measurement must be determined to an accuracy of 0.005 metres.</td></tr>
<tr><td>WT11</td><td>Measurements of groundwater levels must be undertaken prior to any disturbance by sampling, and must be reported as the depth in metres from the established reference point to the water surface within the bore.</td></tr>
<tr><td>WT12</td><td>The groundwater monitoring program must be undertaken for, at least, the water quality characteristics in accordance with Table 2- Groundwater monitoring parameters and the associated monitoring requirements.
Table 2 - Groundwater monitoring parameters
<table>
<tr><th>Quality Characteristic</th><th>Unit of Measure</th><th>Monitoring Frequency</th></tr>
<tr><td>pH, dissolved oxygen, electrical conductivity, redox potential and temperature</td><td>pH, µS/cm, mV °C</td><td rowspan="7">Quarterly</td></tr>
<tr><td>Standing Water Level</td><td>m AHD</td></tr>
<tr><td>Total Organic Carbon</td><td>mg/L</td></tr>
<tr><td>Total Dissolved Solids</td><td>mg/L</td></tr>
<tr><td>Calcium</td><td>mg/L</td></tr>
<tr><td>Magnesium</td><td>mg/L</td></tr>
<tr><td>Potassium</td><td>mg/L</td></tr>
</table>
</td></tr>
</table>

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	Sodium	mg/L	
	Chloride	mg/L	
	Sulphate	mg/L	
	Fluoride	mg/L	
	Alkalinity (Carbonate and Bicarbonate)	mg/L	
	Ammonia	mg/L	
	Nitrate and nitrite	mg/L	
	Total phosphorus	mg/L	
	Aluminium	mg/L	
	Arsenic	mg/L	
	Barium	mg/L	
	Cadmium	mg/L	
	Chromium	mg/L	
	Cobalt	mg/L	
	Lead	mg/L	
	Copper	mg/L	
	Iron	mg/L	
	Manganese	mg/L	
	Mercury	mg/L	
	Nickel	mg/L	
	Zinc	mg/L	
	Phenols	mg/L	
	Petroleum Hydrocarbons	mg/L	
	Monoaromatic Hydrocarbons (Benzene, Toluene, Ethylbenzene and xylene)	mg/L	
	Organochlorine and Organophosphate Pesticides	mg/L	
	Chlorinated Compounds	mg/L	
	Polycyclic Aromatic Hydrocarbons	mg/L	
	PFAS Compounds* as per condition WT13	µg/L	
	Total fluorinated organic compounds** (mg/L).	µg/L	

Note: *For monitoring of PFAS compounds, monitoring must be undertaken in accordance with the PFAS National Environmental Management Plan and using low level trace analysis, under both standard analysis and total oxidisable precursor assay.

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	For monitoring of total fluorinated organic compounds, monitoring must be undertaken in accordance with the latest version of the PFAS National Environmental Management Plan. **Associated monitoring requirements *1.* Monitoring must be in accordance with the methods prescribed in the current edition of the **administering authority's** *Water Quality and Sampling Manual*. 2. Samples must be representative of the groundwater quality within the well. 3. All determinations must employ analytical practical quantification limits sufficiently low enough to enable comparisons to be made against water quality objectives / limits relevant to the water quality characteristic. 4. Monitoring must be undertaken as per the frequency stated. 5. All monitoring devices must be correctly calibrated and maintained. 6. For any monitoring results of **groundwater** found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS).
WT13	The surface water and groundwater monitoring program must include: a) determination of **PFAS compounds** low level trace analysis, under both standard analysis and total oxidisable precursor assay; b) determination of total organic fluorine content; c) for characterising leachate and any surface water or groundwater found to contain more that 50% additional PFAS present on a molar basis or organic fluorine content compared to the standard analysis, qualitative compound identification by liquid chromatography quadrupole time of flight mass spectrometry (LC-QToF-MS); d) compliance with quality assurance and quality control measures, including those advised in the PFAS National Environmental Management Program; and e) measurement of PFAS concentrations in sediments in any water storages or surface waters found materially affected by PFAS potentially release from the premises.

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Commented [DP10]: Not sure what this intent is, have requested clarification from DES

Commented [DP11]: Wording does not make sense, not sure what the intent is.

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Definitions

PFAS means Per- and Poly-Fluoroalkyl Substances.

PFAS Compounds means the PFAS sub-classes outlined in Appendix A of the most recent edition of the PFAS National Environmental Management Plan.

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Appendix A - Figures

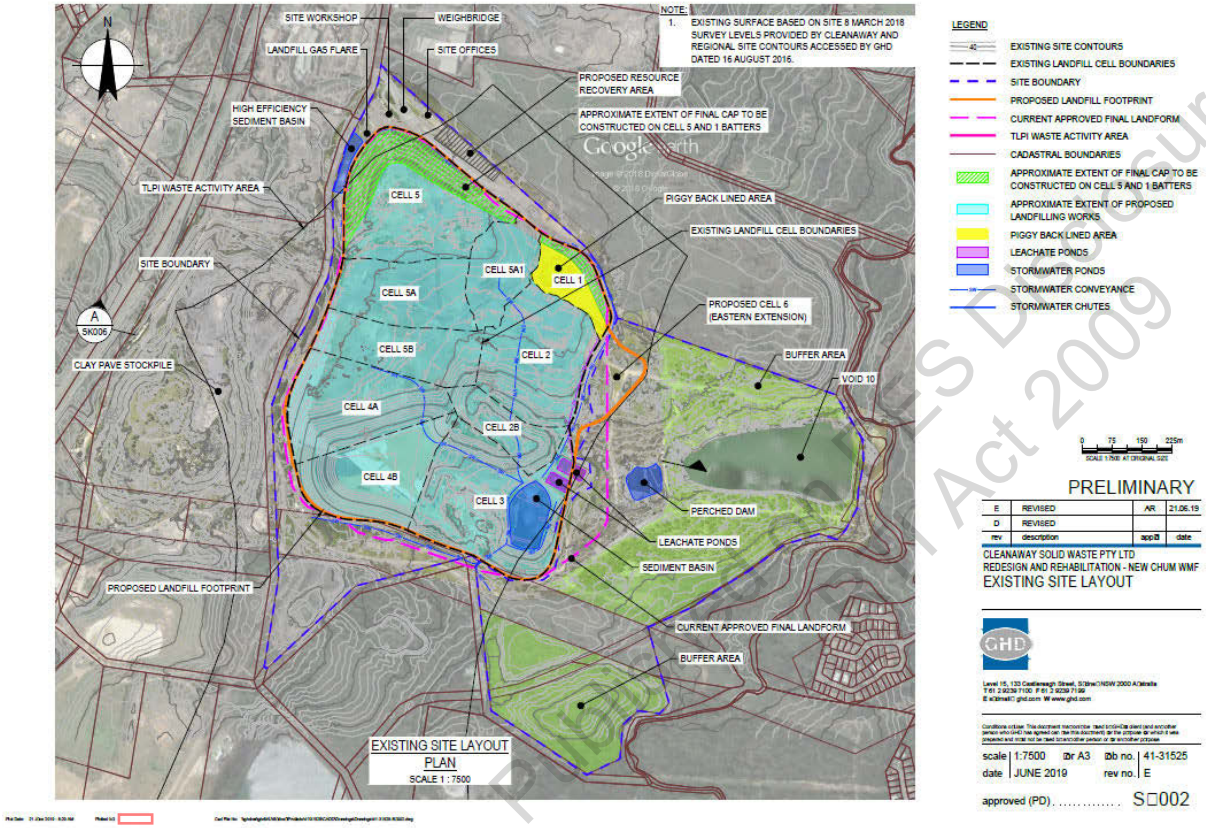


Figure 1: Existing landfill footprint with proposed lateral and vertical extension and associated infrastructure.

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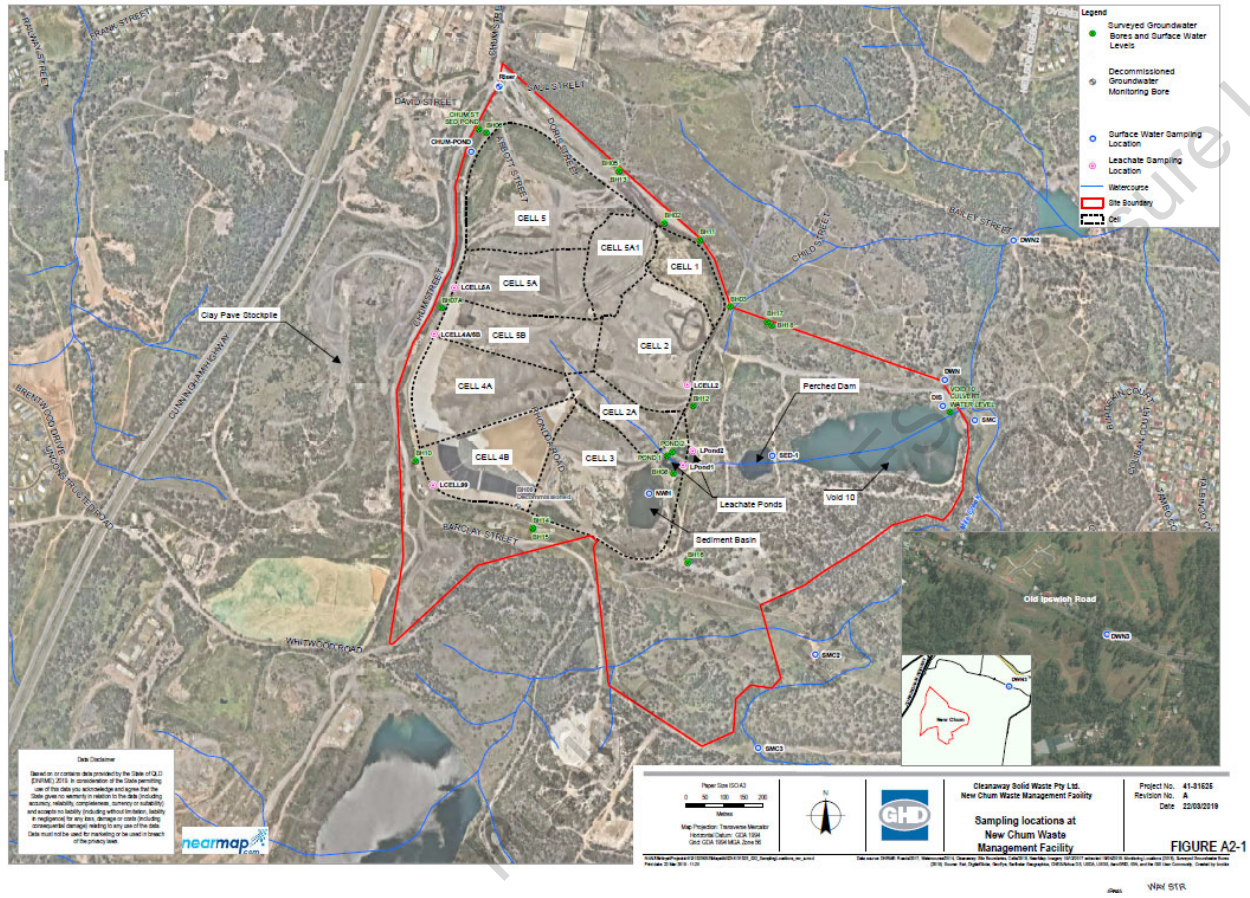


Figure 2 Sampling locations and groundwater monitoring bores.

Exposure Log

Date : 16/01/2020 1:14:11 PM
From : sch4p4(6) Personal i
To : "GREENWOOD Angela"
Subject : RE: sch4p4(6) Person **shared the folder "Cell 3B1 - sed pond approval" with you.**
Attachment :
image001.png;image002.png;image003.png;image004.png;image006.png;image007.jpg;image005.png;image008.png;image012.jpg;
Thanks Angela,

And thank you for pushing through with my responses!

Talk soon

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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From: GREENWOOD Angela <Angela.Greenwood@des.qld.gov.au>
Sent: Thursday, 16 January 2020 12:55 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: WEISE Tom <Tom.Weise@des.qld.gov.au>
Subject: RE: sch4p4(6) Pers shared the folder "Cell 3B1 - sed pond approval" with you.

Thanks sch4p4(6

I acknowledge we have received the drawings related to the sediment pond approval from Council. The delegate has made the assessment level decision and the notice should have come through to you via Connect, I have attached it as well in case it didn't come through via Connect.

Apologies for the last minute rush with that one. We will be in touch again shortly as we finalise the assessment and EA conditions.

Thanks

Queensland Government

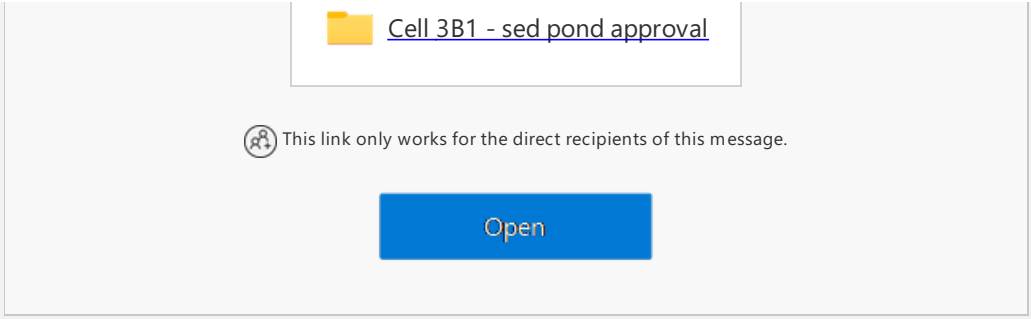
Angela Greenwood
A/Team Leader (Assessment)
Waste and Contaminated Land Assessment
Waste Operations I Waste and Recovery
Department of Environment and Science

P 07 3330 5616
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Thursday, 16 January 2020 12:16 PM
To: GREENWOOD Angela; WEISE Tom
Subject: sch4p4(6) Pers shared the folder "Cell 3B1 - sed pond approval" with you.

sch4p4(6) Personal informatio **shared a folder with you**

Here's the folder that sch4p4(6) Person shared with you.



Microsoft

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Date : 16/01/2020 12:54:35 PM
From : "GREENWOOD Angela"
To : sch4p4(6) Personal
Cc : "WEISE Tom"
Subject : RE: sch4p4(6) Perso **shared the folder "Cell 3B1 - sed pond approval" with you.**
Attachment :
DOC00441602.pdf;image001.png;image013.png;image014.png;image015.png;image016.png;image017.png;image018.jpg;

Thanks sch4p4(6

I acknowledge we have received the drawings related to the sediment pond approval from Council. The delegate has made the assessment level decision and the notice should have come through to you via Connect, I have attached it as well in case it didn't come through via Connect.

Apologies for the last minute rush with that one. We will be in touch again shortly as we finalise the assessment and EA conditions.

Thanks

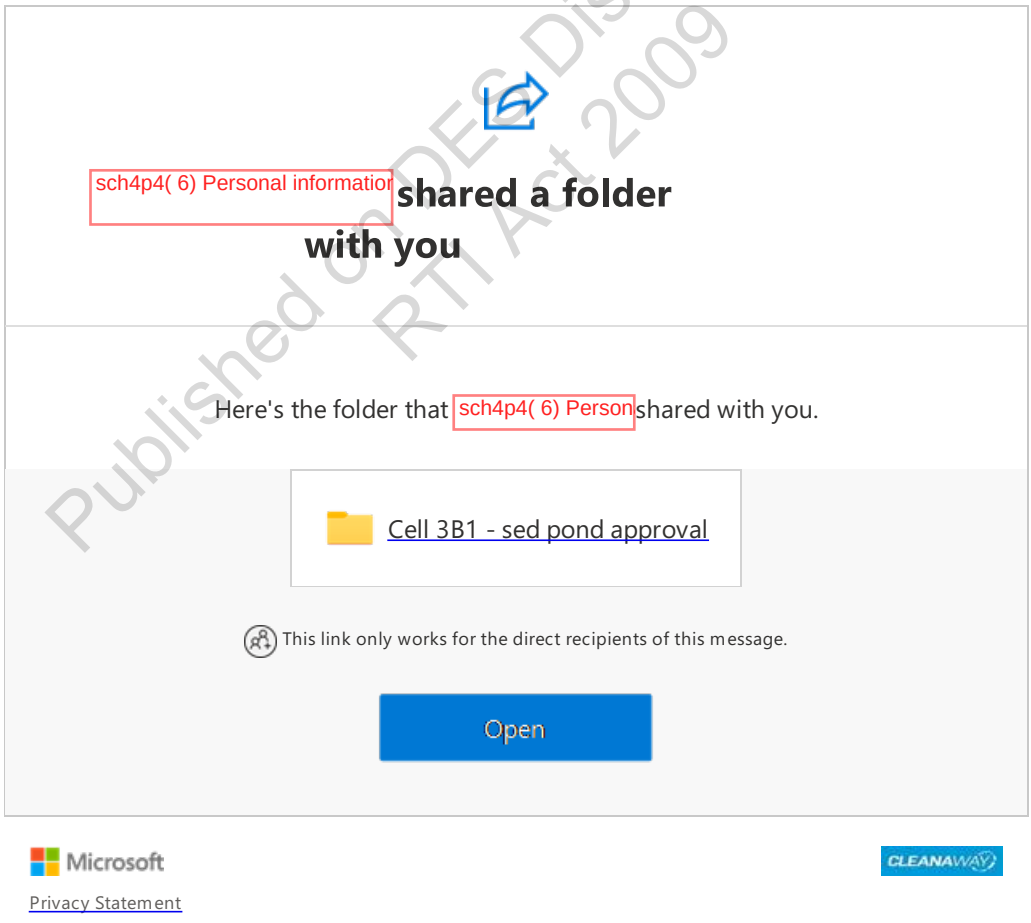
Queensland Government

Angela Greenwood
A/Team Leader (Assessment)
Waste and Contaminated Land Assessment
Waste Operations I Waste and Recovery
Department of Environment and Science

P 07 3330 5616
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Thursday, 16 January 2020 12:16 PM
To: GREENWOOD Angela; WEISE Tom
Subject: sch4p4(6) Pers shared the folder "Cell 3B1 - sed pond approval" with you.



Notice
Environmental Protection Act 1994

Assessment level decision

This statutory notice is issued by the administering authority to advise you under section 229 of the Environmental Protection Act 1994 whether your proposed amendment to an environmental authority is a major or minor amendment.

To: CLEANAWAY SOLID WASTE PTY LTD
Level 4 441 St Kilda Rd
MELBOURNE
VIC 3004
Australia

Email: sch4p4(6) Perso@cleanaway.com.au

ATTN: sch4p4(6) Person(environmental Business Partner)

Our reference: APP0046216

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Assessment level decision

1. **Application details**

   The application to amend environmental authority EPPR00445713 was received by the administering authority on 18/12/19.

   The application reference number is: APP0046216

   Land description: Lot 268/SP103913,
   Lot 227/SP103913

2. **Decision**

   The administering authority has considered the abovementioned application and is writing to inform you that the assessment level decision for this application is that the proposed amendment to the environmental authority is a minor amendment.

   The administering authority will, within 10 business days of this notice being given, decide to either approve or refuse your application.

Should you have any questions about the notice, please contact Department of Environment and Science on the details provided below.

Sally Thomas
Department of Environment and Science
Delegate of the administering authority
Environmental Protection Act 1994

Enquiries:
Waste and Contaminated Land Assessment
Department of Environment and Science
Phone: 1300 130 372
Email: palm@des.qld.gov.au

Date issued: 16 January 2020

Date : 15/07/2020 10:43:55 AM
From : "GREENWOOD Angela"
To : sch4p4(6) Personal in
Cc : "FRANCIS Avril"
Subject : RE: EPPR00445713: Pre-lodgement meeting
Attachment : image001.png;image002.png;

Hi sch4p4(6

No problem, I completely understand what it is like to catch up on all the emails sch4p4(6) Perso

I will send you a Team meeting calendar invite for Friday shortly.

Regards,

Angela Greenwood
Senior Environmental Officer
Waste Assessment
Waste Operations | Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5616
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Wednesday, 15 July 2020 10:36 AM
To: GREENWOOD Angela
Cc: FRANCIS Avril
Subject: RE: EPPR00445713: Pre-lodgement meeting

Thanks Angela,

Friday at 11am would be great for me – sch4p4(6) Personal information so appreciate the alternative time.

Teams is great – assuming that is your preference.

Warm Regards

sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Pers@cleanaway.com.au | www.cleanaway.com.au

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From: GREENWOOD Angela <Angela.Greenwood@des.qld.gov.au>
Sent: Wednesday, 15 July 2020 10:05 AM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: FRANCIS Avril <Avril.Francis@des.qld.gov.au>
Subject: RE: EPPR00445713: Pre-lodgement meeting

Hi sch4p4(6

sch4p4(6) Personal information

Avril and I can catch up at 2pm today if that works for you. Otherwise we are also free this Friday between 11am to 1pm or 2-3pm if that suits you better.

Regards,

Angela Greenwood
Senior Environmental Officer
Waste Assessment
Waste Operations | Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5616
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Wednesday, 15 July 2020 9:01 AM
To: GREENWOOD Angela
Cc: HAWAS Olga; FRANCIS Avril
Subject: RE: EPPR00445713: Pre-lodgement meeting

Good Morning Angela,

Apologies – sch4p4(6) Personal information so apologise for the delay in responding.

I could squeeze in a catch up today at 2pm if that would work – otherwise it would need to be Friday or next week.

Hope to find a time that works for us all soon.

sch4p4(6) Pe
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Per
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

Please consider the environment before printing this email.

From: GREENWOOD Angela <Angela.Greenwood@des.qld.gov.au>
Sent: Friday, 10 July 2020 4:41 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: HAWAS Olga <olga.hawas@des.qld.gov.au>; FRANCIS Avril <Avril.Francis@des.qld.gov.au>
Subject: EPPR00445713: Pre-lodgement meeting

Hi sch4p4(6)

Thank you for your recent pre-lodgement meeting request for EA EPPR00445713. Further to our discussion earlier today please find outlined below some meeting options to discuss the pre-lodgement further.

- Tuesday 14 July 2020, 2-3pm.
- Wednesday 15 July 2020 anytime between 10am and 3pm.
- Thursday 16 July 2020 anytime between 10am and 12pm.

Attending on behalf of Department of Environment and Science will be myself and either Olga Hawas or Avril Francis from the Waste Assessment team.

Once you confirm your preferred date and time for the meeting I will send you a calendar invite using Teams.

Regards,

Angela Greenwood
Senior Environmental Officer
Waste Assessment
Waste Operations | Waste, Development & Southeast Compliance
Department of Environment and Science

P 07 3330 5616
Level 7 400 George Street BRISBANE QLD 4000
GPO Box 2454 BRISBANE QLD 4001

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Date : 8/01/2021 3:51:57 PM
From : sch4p4(6) Persona
To : "PERRY Nadene"
Cc : "ROWE Sarah" , "BRADSHAW Tony" , sch4p4(6) Person**, "SUMMERVILLE Sinead" , "CARLISH Kate" , "SMALL Dana"**
Subject : RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020
Attachment : image005.png;image007.png;image010.png;image012.png;image013.png;image015.png;image016.jpg;image017.png;image020.png;image022.png;image023.png;image024.jpg;image025.png;image026.png;

Hi Nadene,

See responses to your email dated 5 January noting that I can provide further information if necessary as personnel involved in the water treatment trial return to work next week.

An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below
The reuse/disposal hierarchy has been drafted and submitted to Cleanaway for review. I will be meeting with Tonkin next week to discuss further and follow up as per sch4p4(6) Fresponse to discuss with yourself prior to progressing with an amendment

A response to my email dated 16 December 2020, highlighted in yellow below
I will follow up next week when people involved in the trial return to work and will respond by end of next week (15 Jan).

An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.
Apologies for any confusion, I have confirmed with site personnel that a meeting was held with ICC prior to Christmas to discuss the trial and Cleanaway has provided a response to their queries. Cleanaway is currently awaiting a response from ICC with respect to approvals to undertake the trial. Arcadis who will be undertaking the trial will return to site next week (after the lockdown).
The trial will not commence until approvals have been obtained. I will provide notification to you prior to commencement.

If you have any further questions or wish to discuss, please do not hesitate to contact me.

sch4p4(6) P
Environmental Business Partner

343 Bowhill Rd, Willawong, QLD 4110
Tel: sch4p4(6) Pe Mob: sch4p4(6) Pe
E: sch4p4(6) P@cleanaway.com.au | www.cleanaway.com.au



Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 5 January 2021 4:50 PM
To: sch4p4(6) Personal informatio@cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe sch4p4(6) Pe@cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; CARLISH Kate <kate.carlish@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(

Thanks for your time on the phone this afternoon, as discussed I am following up on the correspondence between Cleanaway and the department in December 2020 (see emails below). In particular, I am seeking the following information from Cleanaway:

1. An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below;
2. A response to my email dated 16 December 2020, highlighted in yellow below; and
3. An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.

Please provide the information requested no later than **5pm on Friday 8 January 2021**.

I understand from our conversation today that you are relatively new to the PFAS matters at the site, as sch4p4(was primarily handling PFAS up until this point, and that you would like to discuss the history of the matters with the department to ensure you are across the complexities of the issues. As discussed, I will look to arrange a meeting between yourself and the relevant DES officers to assist in this regard at this stage it is intended that this will occur on Friday 8 January 2021, depending on the availability of the relevant officers (to be confirmed).

I have also attached for your reference the amended notice requesting additional information regarding the EE, which was issued to Cleanaway on 20 July 2020 as discussed, the addendum environmental evaluation report, including the further information required under

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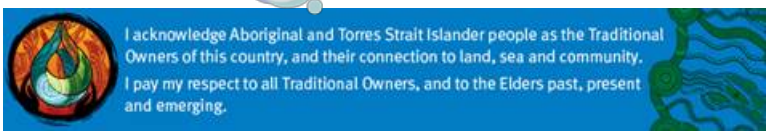
requirements 1 to 17 of the attached notice, must be submitted to the department on or before **Friday 19 February 2021**.

If you have any questions regarding the information requested or the attached notice please do not hesitate to contact me.

Cheers,

Nadene Perry
A/Compliance Delivery Manager
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

P: 07 3894 8153
Level 4 / 117 Brisbane Street, Ipswich QLD 4305
PO Box 2578, North Ipswich QLD 4305



From sch4p4(6) Personal information @cleanaway.com.au>
Sent: Friday, 18 December 2020 8:30 AM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

I can confirm that the below will be included in the Arcadis analytical suite initially. Where we receive repeated results showing non detect or that specific contaminants are not of concern we intend to limit the analytical suite accordingly.

Warm Regards

sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Per
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Thursday, 17 December 2020 12:57 PM
To: sch4p4(6) Personal information cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Per sch4p4(6) Per@cleanaway.com.au>; sch4p4(6) Personal informati@cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Further to my email below, I have reviewed the contaminants and allowable leaching contaminant levels listed in your EA, and note that the EA contains limits for the following contaminants that do not appear to be included in the WTP analysis that you provided (attached):

- Antimony
- Barium
- Total MAH
- Benz(c)phenanthrene
- Dibenz(a,h)pyrene
- Dimethylbenz(a)anthracene
- M-cresol

- O-cresol
- P-cresol
- Carbon tetrachloride
- 1,2 Dichloroethane
- 1,1 Dichloroethane
- Chlorobenzene (total)
- Lindane
- Toxaphene
- 2,4-D
- 2,4-DB
- 2,4,5-T
- MCPA
- Carbaryl
- Carbofuran
- Atrazine
- Simazine
- Chlorophenol – noting that 2-chlorophenol is listed in the WTP analysis
- Bromide – noting that bromine is listed in the WTP analysis
- Trichlorophenol – noting that 2.4.6-trichlorophenol and 2.4.5-trichlorophenol are listed in the WTP analysis.

When we were discussing the trial treatment plant with the Arcadis representatives on site, Cleanaway and Arcadis stated that the trial would be assessed against all relevant environmental release criteria including the EA and trade waste release limits. It was highlighted during this discussion that the treated effluent from the treatment process must meet all relevant criteria in addition to treating the PFAS contamination. Could you please confirm if Cleanaway intend to analyse the treated effluent from the trial treatment plant for all of the contaminants listed in the EA?

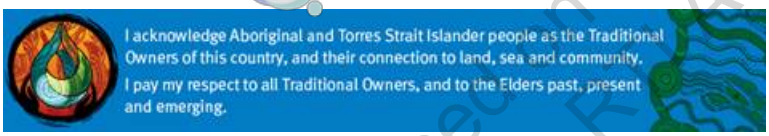
Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

P: 07 3894 8153
Level 4 / 117 Brisbane Street, Ipswich QLD 4305
PO Box 2578, North Ipswich QLD 4305

connect make the move



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From: PERRY Nadene
Sent: Wednesday, 16 December 2020 12:18 PM
To: sch4p4(6) Perso
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6)

Thank you for providing the information requested, the department will review this in due course and if there are any additional questions I'll let you know.

The department is also interested in understanding the financial investment required to remedy PFAS contamination on the premises, could you please provide some details as to the costs Cleanaway have/will incur as follows:

a. Installation costs for the trial treatment plant;
b. Operational costs for the trial treatment, including sampling and analysis costs; and
c. Approximate cost for the installation and operation of the permanent treatment plant, noting that this will likely be dependent on the outcomes of the trial and may only be indicative at this point in time.

If there are any issues or questions please let me know.

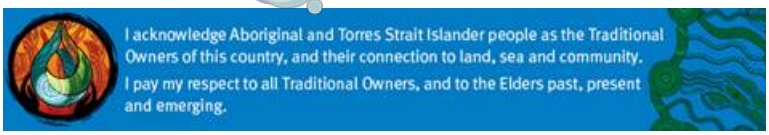
Cheers,

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

P: 07 3894 8153
Level 4 / 117 Brisbane Street, Ipswich QLD 4305
PO Box 2578, North Ipswich QLD 4305

Queensland Government

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Monday, 14 December 2020 3:47 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informatic
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

As discussed, please see the attachments as promised.

Warm Regards

sch4p4(6) Perso
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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From: sch4p4(6) Persona
Sent: Friday, 11 December 2020 4:07 PM
To: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pers
sch4p4(6) Pers@cleanaway.com.au>; sch4p4(6) Personal informatic@cleanaway.com.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Good Afternoon Nadene,

Please find the responses to your ☐further information requested☐ as follows:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
  Please refer to the attachment ☐*2020.10.26_Leachate Treatment Trial Arcadis DES v1.pdf*☐.

- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
  Please refer to the attachment ☐*WTP Analysis*☐, *noting that as we progress through the trial this list will be reviewed and refined as appropriate.*

- Details as to how and where the wastes from the treatment plant will be managed and disposed.
  There are three primary waste streams that will be managed and disposed of (refer to attached ☐*Process Flow Diagram*☐)
  1. Waste gas will be destroyed in an ozone destruction vessel. Dischargeable gases will be safely vented to atmosphere and monitored appropriately.
  2. Waste liquid concentrate will be stored on site in a 22kL poly tank. The concentrate will be periodically removed off site to a destruction facility (likely Renex).
  3. Treated leachate will be stored on site for testing and then discharged into the existing leachate recirculation trenches.
  4. Solid waste streams (comprising of spent resin, GAC, solid filter cartridges and used sample containers), these will also be sent to an off site to a destruction facility (likely Renex).

  We are currently progressing the review of disposal / reuse options for treated leachate / surface water on site (including irrigation of

vegetation, reuse as dust suppression etc.).
Noting we are currently drafting the reuse/disposal hierarchy as it applies to our current EA and will be providing this to yourself for agreement of proposed reuse / discharge / disposal, and prior to progressing an amendment with the assessment team. On this I note:

- Condition G11 (2) allows recirculation through the landfill unit, but (3) requires agreement with the administering authority for offsite disposal, discharge and reuse on site.
- Condition A5 would restrict the onsite reuse of this treated liquid as dust suppression, which would require an EA amendment.

I hope to come back to you in the next few weeks with the initial details of this hierarchy for discussion.

- An update as to when and where the trial treatment plant is likely to be installed and operational on site.

Please find below a summary of the WWTP trial project:

Treatment Selection

- As discussed with DES at our preliminary meeting on 10 November 2020, the preferred treatment technology for treating PFAS and multiple other parameters in stormwater and PFAS contaminated leachate is ozofractionation, supplied by Arcadis/Evocra,. This technology was preferred following a robust feasibility assessment conducted by Cleanaway.
- Arcadis has a rental unit currently situated in Yatala (QLD) which can treat 50-100kL/day of influent. This is the best, most immediate solution to prove concept, aid in the height rise application, as well as start alleviating the leachate surplus currently on Site.
- This system has been used and proven at both Brisbane Airport and Hobart Airport to treat PFAS contaminated dirty water. In both examples, the technology was able to meet stringent discharge target, similar to what we are targeting at New Chum.

Progress Update

Friday 27 November 2020:

- lined treatment pad with bund construction completed, including an additional gravel pad area for parking and equipment laydown.
- Evocra/Arcadis operations staff inducted to Cleanaway New Chum site.

Week starting Monday 30 November 2020:

- Hazard and Operability Study (HAZOP) workshop held with key representatives form Cleanaway, Arcadis and Evocra.
- Mobilisation of primary treatment equipment. Two 40 high cube shipping containers delivered to site (containing all necessary treatment apparatus), position on bunded area and unpacked.
- Installation of acoustic shielded generator, and electrical works undertaken.
- Poly tanks delivered to site, located on treatment pad/bund.
- Leachate ring main extended to treatment trial pad, and return main installed to enable discharge to existing leachate recirculation trenches.

Monday 7 December

- Ongoing set up (plumbing and electrical installation activities).
- Site process review with Cleanaway engineering personnel.

Scheduled Activities

- Completion of site setup and mobilisation activities by Thursday 10 December 2020.
- Commissioning activities to commence with clean (potable) water on Friday 18th December 2020.

At present the scheduled start date to commence the leachate trial is after the above commissioning which is noted for Friday 18th December 2020. The trial is intended to extend for one month (noting two weeks down time over the Christmas break).

Location of the trial plant is as follows.



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- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
  We are working with Ipswich City Council (ICC) to ensure all necessary approvals required are received for the trial and permanent solutions, we have also engaged our external town planner to provide us assistance with this process.
  We currently have a meeting scheduled to discuss this further with ICC next week, noting that they are fully aware of the above works and progress. The trial start date as noted above is currently scheduled for the 18th Dec, but this is based on receiving written confirmation from ICC prior to this date.

  As discussed with DES during the inspection there is no requirement for an ERA or an EA amendment on situating the trial or permanent treatment plants. However, as noted in the 3rd dot point response above, we understand we need agreement from the administering authority prior to offsite discharge or disposal or on-site reuse, and in some cases (i.e. using this for dust suppression) this will require an EA amendment prior to commencing. Further conversations / correspondence will be provided to this end.

- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?
  The full-scale treatment plant is included in the above discussions regarding ICC and with our town planners, so at this stage timeframes for approvals have not been confirmed. However, we are targeting installation of the permanent facility by mid-2021.

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
  In addition to the treatment plant, the onsite PFAS impacted surface waters are being used for dust suppression activities across the lined and operational areas of the site (i.e. the RRA and landfill) to reduce the volumes of water stored on the site.

- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.
  We note that the previous correspondence around flocc indicated that we were waiting on further advice from the Department regarding the regulated status of this waste (noting the discussion included the Department discussing this with the greater waste industry and the metal recyclers directly), following which we would apply the final determination to our waste acceptance process. I further note that post the inspection the exposed area of flocc waste has since been covered with earthen material, and re communication to the team regarding what constitutes suitable cover material has occurred.
  Relating to the Department's current strategy that all material that contains any trace of PFAS is considered to be PFAS waste, we are currently in discussions with Kathrin Sherman, Clair Andersen and Adam Cradick from the Department relating to what is reasonable and fair in terms of classification of various waste types and what sampling is practical in these situations. We are not looking for a reason to not proactively adopt this new path forward, however this is a bigger issue than our site alone. For example, are all general waste landfills and transfer stations (including putrescible municipal landfills) being asked to analyse and limit their acceptance based on PFAS concentrations? Has this requirement to show each load of construction and demolition waste to be PFAS free been communicated to the waste industry and all the generators specifically including municipal collections?
  Cleanaway will continue to monitor and adopt all reasonable and practicable best practice processes. And as we progress the discussion with the Department (noting the first discussion was Tuesday 8th Dec) we will as a company adopt the reasonable outcomes of this collaboration to lead the journey to stronger waste compliance in Queensland. However, we request patience while this discussion occurs and the outcomes agreed on.

If you need further information, please don't hesitate to contact me

Warm Regards
sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pers
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au



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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 8 December 2020 5:12 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; INONDA William <William.Inonda@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6)

Apologies for the delay in getting back to you about this one, please see below a summary of the information discussed during our site visit on 10 November 2020, and a list of further questions/information requested.

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Summary

- Cleanaway are proposing to engage Arcadis to carry out a trial treatment process to treat PFAS contamination in surface water and leachate using an OCRA Process including polishing with resins at the end of the process; at the time of the meeting, it was anticipated that the trial plant would be installed within one month (early- to mid-December).
- Once Arcadis have been formally engaged, commissioning of the trial treatment plant will take approx. two weeks, and the trial itself will be conducted over a minimum of 30 days to optimise the system. The pad where it is to be located on site is currently being prepared and will be bunded.
- Arcadis are yet to determine if surface water and leachate will be treated as separate or mixed streams during the trial.
- The trial treatment plant will produce three outputs – waste, treated water and solids. Waste fractions can be run back through the treatment plant for a second run/pass and this has been found to be beneficial in other applications.
- As part of the analysis of the efficacy of the treatment process, Cleanaway will need to ensure that not only PFAS is treated, but also ensure all other parameters (e.g. metals and nutrients) meet relevant discharge limits. Analysis for PFAS will include standard suite and TOP Assay.
- The trial plant will continue to operate on the site while a larger treatment plant is commissioned for long term use.
- The need for ensuring that water balance calculations and an assessment of the incoming waste streams in terms of PFAS contamination was agreed to be important to the success of both the trial and the long-term treatment and reduction of PFAS contamination in surface water and leachate at the site.
- The need for Cleanaway to have in place contingency plans to ensure PFAS-contaminated water is not discharged from site during the wet season, other than relying solely on the treatment plant(s), was also discussed and agreed.
- During the site tour, it was noted that shredder floc from the automotive industry is used as day cover. PFAS is used in many vehicle components including seats, carpets, seals, brake pads, etc. The PFAS NEMP also lists surface treatments including polishing, cleaning, stain and water protection products, lubricants, hydraulic fluids, tubing, oil pan, head gaskets, sealant, wire and cabling, fire retardant and metal plating applications as potential sources of PFAS in vehicles.
  (source: https://www.michiganchemistry.com/assets/2018-Conference/PFAS%20Update%20-%20AECOM.pdf and PFAS NEMP Table B2 pp.106-107).
- The department is concerned that the shredder floc from Sims Metal may be an ongoing contributor to the PFAS contamination on the site. In addition, the department has previously corresponded with Cleanaway in late 2017 and early 2018 about the receipt of shredder floc onto the site, as it may be considered a regulated waste *Environmental Protection Regulation 2019* due to the presence of various other contaminants.
- The department is concerned that construction and demolition waste may also be an ongoing contributor to the PFAS contamination at the site. PFAS is used in the construction industry including tile and stone coatings, paints, varnishes, sealants, other architectural coatings for films, facades and infrastructure, rigid foams, silicone rubber, thread sealant tapes and pastes and PPE (source: PFAS NEMP Table B2 pp.106-107) .
- Cleanaway have confirmed that the –high risk– PFAS contaminated water from the perched pond is used for dust suppression in the tip face and the RRAs as these drain to the leachate system, and that –low risk– PFAS-contaminated water in Void 10 is used for dust suppression on site in areas that drain to the stormwater runoff system.
- The Rembind is to be used in the concrete drain that flows into –Chum Pond–.

Further information requested:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
- Details as to how and where the wastes from the treatment plant will be managed and disposed.
- An update as to when and where the trial treatment plant is likely to be installed and operational on site.
- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?
- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.

Could you please provide the information requested by 5.00pm on Friday 11 December 2020? I tried to call a couple of times this afternoon but couldn–t catch you, if there are any issues or questions please let me know – please note that my phone number has changed, the new one is 07 3894 8153.

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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Date : 11/01/2021 5:47:44 PM
From : "PERRY Nadene"
To : sch4p4(6) Persona
Cc : "ROWE Sarah" , "BRADSHAW Tony" , "SUMMERVILLE Sinead" , "CARLISH Kate" , "SMALL Dana" , "HAWAS Olga" , "WEISE Tom"
Subject : RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020
Attachment : Cleanaway New Chum - PFAS SMP Update (Environmental Evaluation (EE) Notice STAT 1414);RE: DES comments on interim EE report;image001.png;image003.png;image006.jpg;image008.png;image009.png;image019.jpg;image002.png;image004.png;image010.png;image011.png;image013.png;image014.png;image016.png;image018.png;

Hi sch4p4(6

Thank you for your time this afternoon, please see below a summary of the PFAS matters discussed:

- As previously discussed, Cleanaway (CWY) are to provide the addendum EE report to the department on or before **Friday 19 February 2021**.
- You confirmed that Epic Environmental are aware of this upcoming deadline, and are progressing with development of the report; in addition, the latest round of PFAS sampling was completed in December and will be included in the addendum report as required.
- We briefly discussed the timeline of the progress of the EE report to date, including the provision of the interim EE report to the department on 21 October 2020 – for your reference, I have attached the department's comments on the interim report, which were provided to CWY on 17 November 2020.
- We discussed the regular PFAS site management plan (SMP) updates CWY have previously provided to the department, the most recent having been received in August 2020, and the need to provide another update (see actions 1 and 2 below).
- You confirmed that, while the trial water treatment plant and associated bunding and hardstand have been commissioned and potable water commissioning tests completed, the trial itself will not commence until appropriate approvals have been obtained from Ipswich City Council (ICC) (see action 3 below).
- Currently you anticipate it may be up to a month before the trial commences; in this time, CWY will prepare for and arrange a pre-lodgement meeting with the department to discuss the proposed amendments to the EA (the application for pre-lodgement should be sent via PALM but CC'd to Olga and Kate).
- Going forward, sch4p4(6) Personal information ; once your new colleague commences in the role, they will become the main point of contact between CWY and DES.

PFAS-related actions arising from this meeting:

1. DES to provide the previous (August 2020) PFAS SMP update received by the Department to assist you to follow up on latest updates – **complete** (please see correspondence attached);
2. CWY to provide a progress update for the PFAS SMP – **to be completed by 5pm 15 January 2021**;
3. CWY to notify the department when ICC approvals have been obtained, and when the trial water treatment project commences.
4. CWY to initiate pre-lodgement meeting with DES for the proposed EA amendments.

If you have any further questions about today's meeting or the information above, please don't hesitate to contact me.

Cheers,

Nadene Perry
A/Compliance Delivery Manager
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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PO Box 2578, North Ipswich QLD 4305

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From: sch4p4(6) Personal information cleanaway.com.au>
Sent: Friday, 8 January 2021 3:52 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) P; SUMMERVILLE Sinead; CARLISH Kate; SMALL Dana
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

See responses to your email dated 5 January noting that I can provide further information if necessary as personnel involved in the water treatment trial return to work next week.

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An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below
The reuse/disposal hierarchy has been drafted and submitted to Cleanaway for review. I will be meeting with Tonkin next week to discuss further and follow up as per sch4p4(6 response to discuss with yourself prior to progressing with an amendment

A response to my email dated 16 December 2020, highlighted in yellow below
I will follow up next week when people involved in the trial return to work and will respond by end of next week (15 Jan).

An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.
Apologies for any confusion, I have confirmed with site personnel that a meeting was held with ICC prior to Christmas to discuss the trial and Cleanaway has provided a response to their queries. Cleanaway is currently awaiting a response from ICC with respect to approvals to undertake the trial. Arcadis who will be undertaking the trial will return to site next week (after the lockdown).
The trial will not commence until approvals have been obtained. I will provide notification to you prior to commencement.

If you have any further questions or wish to discuss, please do not hesitate to contact me.

sch4p4(6) Per
Environmental Business Partner

343 Bowhill Rd, Willawong, QLD 4110
Tel: sch4p4(6) Pe Mob: sch4p4(6) Per
E sch4p4(6) P @cleanaway.com.au | www.cleanaway.com.au



Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 5 January 2021 4:50 PM
To sch4p4(6) Personal informatio @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Per sch4p4(6) Per @cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; CARLISH Kate <kate.carlish@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Thanks for your time on the phone this afternoon, as discussed I am following up on the correspondence between Cleanaway and the department in December 2020 (see emails below). In particular, I am seeking the following information from Cleanaway:

1. An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below;
2. A response to my email dated 16 December 2020, highlighted in yellow below; and
3. An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.

Please provide the information requested no later than **5pm on Friday 8 January 2021**.

I understand from our conversation today that you are relatively new to the PFAS matters at the site, as sch4p4(was primarily handling PFAS up until this point, and that you would like to discuss the history of the matters with the department to ensure you are across the complexities of the issues. As discussed, I will look to arrange a meeting between yourself and the relevant DES officers to assist in this regard – at this stage it is intended that this will occur on Friday 8 January 2021, depending on the availability of the relevant officers (to be confirmed).

I have also attached for your reference the amended notice requesting additional information regarding the EE, which was issued to Cleanaway on 20 July 2020 – as discussed, the addendum environmental evaluation report, including the further information required under requirements 1 to 17 of the attached notice, must be submitted to the department on or before **Friday 19 February 2021**.

If you have any questions regarding the information requested or the attached notice please do not hesitate to contact me.

Cheers,

Queensland Government

Nadene Perry
A/Compliance Delivery Manager
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Environmental Services and Regulation
Department of Environment and Science

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Friday, 18 December 2020 8:30 AM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

I can confirm that the below will be included in the Arcadis analytical suite initially. Where we receive repeated results showing non detect or that specific contaminants are not of concern we intend to limit the analytical suite accordingly.

Warm Regards

sch4p4(6) Perso
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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Making a sustainable future possible

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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Thursday, 17 December 2020 12:57 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Per sch4p4(6) Pers@cleanaway.com.au>; sch4p4(6) Personal informatio@cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Further to my email below, I have reviewed the contaminants and allowable leaching contaminant levels listed in your EA, and note that the EA contains limits for the following contaminants that do not appear to be included in the WTP analysis that you provided (attached):

- Antimony
- Barium
- Total MAH
- Benz(c)phenanthrene
- Dibenz(a,h)pyrene
- Dimethylbenz(a)anthracene
- M-cresol
- O-cresol
- P-cresol
- Carbon tetrachloride
- 1,2 Dichloroethane
- 1,1 Dichloroethane
- Chlorobenzene (total)
- Lindane
- Toxaphene
- 2,4-D
- 2,4-DB
- 2,4,5-T
- MCPA
- Carbaryl
- Carbofuran
- Atrazine

- Simazine
- Chlorophenol – noting that 2-chlorophenol is listed in the WTP analysis
- Bromide – noting that bromine is listed in the WTP analysis
- Trichlorophenol – noting that 2.4.6-trichlorophenol and 2.4.5-trichlorophenol are listed in the WTP analysis.

When we were discussing the trial treatment plant with the Arcadis representatives on site, Cleanaway and Arcadis stated that the trial would be assessed against all relevant environmental release criteria including the EA and trade waste release limits. It was highlighted during this discussion that the treated effluent from the treatment process must meet all relevant criteria in addition to treating the PFAS contamination. Could you please confirm if Cleanaway intend to analyse the treated effluent from the trial treatment plant for all of the contaminants listed in the EA?

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
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From: PERRY Nadene
Sent: Wednesday, 16 December 2020 12:18 PM
To: sch4p4(6) Perso
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Thank you for providing the information requested, the department will review this in due course and if there are any additional questions I'll let you know.

The department is also interested in understanding the financial investment required to remedy PFAS contamination on the premises, could you please provide some details as to the costs Cleanaway have/will incur as follows:

a. Installation costs for the trial treatment plant;
b. Operational costs for the trial treatment, including sampling and analysis costs; and
c. Approximate cost for the installation and operation of the permanent treatment plant, noting that this will likely be dependent on the outcomes of the trial and may only be indicative at this point in time.

If there are any issues or questions please let me know.

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Monday, 14 December 2020 3:47 PM

To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informati
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

As discussed, please see the attachments as promised.

Warm Regards

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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Please consider the environment before printing this email.

From: sch4p4(6) Perso
Sent: Friday, 11 December 2020 4:07 PM
To: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe
sch4p4(6) Pe@cleanaway.com.au>; sch4p4(6) Personal informatio@cleanaway.com.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Good Afternoon Nadene,

Please find the responses to your "further information requested" as follows:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
  Please refer to the attachment "*2020.10.26_Leachate Treatment Trial Arcadis DES v1.pdf*".

- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
  Please refer to the attachment "*WTP Analysis*", *noting that as we progress through the trial this list will be reviewed and refined as appropriate.*

- Details as to how and where the wastes from the treatment plant will be managed and disposed.
  There are three primary waste streams that will be managed and disposed of (refer to attached "*Process Flow Diagram*").
  1. Waste gas will be destroyed in an ozone destruction vessel. Dischargeable gases will be safely vented to atmosphere and monitored appropriately.
  2. Waste liquid concentrate will be stored on site in a 22kL poly tank. The concentrate will be periodically removed off site to a destruction facility (likely Renex).
  3. Treated leachate will be stored on site for testing and then discharged into the existing leachate recirculation trenches.
  4. Solid waste streams (comprising of spent resin, GAC, solid filter cartridges and used sample containers), these will also be sent to an off site to a destruction facility (likely Renex).

  We are currently progressing the review of disposal / reuse options for treated leachate / surface water on site (including irrigation of vegetation, reuse as dust suppression etc.).
  Noting we are currently drafting the reuse/disposal hierarchy as it applies to our current EA and will be providing this to yourself for agreement of proposed reuse / discharge / disposal, and prior to progressing an amendment with the assessment team. On this I note:
  - Condition G11 (2) allows recirculation through the landfill unit, but (3) requires agreement with the administering authority for offsite disposal, discharge and reuse on site.
  - Condition A5 would restrict the onsite reuse of this treated liquid as dust suppression, which would require an EA amendment.

  I hope to come back to you in the next few weeks with the initial details of this hierarchy for discussion.

- An update as to when and where the trial treatment plant is likely to be installed and operational on site.
  Please find below a summary of the WWTP trial project:
  Treatment Selection
  - As discussed with DES at our preliminary meeting on 10 November 2020, the preferred treatment technology for treating PFAS and multiple other parameters in stormwater and PFAS contaminated leachate is ozofractionation, supplied by Arcadis/Evocra,. This technology was preferred following a robust feasibility assessment conducted by Cleanaway.
  - Arcadis has a rental unit currently situated in Yatala (QLD) which can treat 50-100kL/day of influent. This is the best, most immediate solution to prove concept, aid in the height rise application, as well as start alleviating the leachate surplus currently on Site.
  - This system has been used and proven at both Brisbane Airport and Hobart Airport to treat PFAS contaminated dirty water. In

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both examples, the technology was able to meet stringent discharge target, similar to what we are targeting at New Chum.

Progress Update

Friday 27 November 2020:

- lined treatment pad with bund construction completed, including an additional gravel pad area for parking and equipment laydown.
- Evocra/Arcadis operations staff inducted to Cleanaway New Chum site.

Week starting Monday 30 November 2020:

- Hazard and Operability Study (HAZOP) workshop held with key representatives form Cleanaway, Arcadis and Evocra.
- Mobilisation of primary treatment equipment. Two 40' high cube shipping containers delivered to site (containing all necessary treatment apparatus), position on bunded area and unpacked.
- Installation of acoustic shielded generator, and electrical works undertaken.
- Poly tanks delivered to site, located on treatment pad/bund.
- Leachate ring main extended to treatment trial pad, and return main installed to enable discharge to existing leachate recirculation trenches.

Monday 7 December

- Ongoing set up (plumbing and electrical installation activities).
- Site process review with Cleanaway engineering personnel.

Scheduled Activities

- Completion of site setup and mobilisation activities by Thursday 10 December 2020.
- Commissioning activities to commence with clean (potable) water on Friday 18th December 2020.

At present the scheduled start date to commence the leachate trial is after the above commissioning which is noted for Friday 18th December 2020. The trial is intended to extend for one month (noting two weeks down time over the Christmas break).

Location of the trial plant is as follows.



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- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?

  We are working with Ipswich City Council (ICC) to ensure all necessary approvals required are received for the trial and permanent solutions, we have also engaged our external town planner to provide us assistance with this process.
  We currently have a meeting scheduled to discuss this further with ICC next week, noting that they are fully aware of the above works and progress. The trial start date as noted above is currently scheduled for the 18th Dec, but this is based on receiving written confirmation from ICC prior to this date.

  As discussed with DES during the inspection there is no requirement for an ERA or an EA amendment on situating the trial or permanent treatment plants. However, as noted in the 3rd dot point response above, we understand we need agreement from the administering authority prior to offsite discharge or disposal or on-site reuse, and in some cases (i.e. using this for dust suppression) this will require an EA amendment prior to commencing. Further conversations / correspondence will be provided to this end.

- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?

  The full-scale treatment plant is included in the above discussions regarding ICC and with our town planners, so at this stage timeframes for approvals have not been confirmed. However, we are targeting installation of the permanent facility by mid-2021.

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
  In addition to the treatment plant, the onsite PFAS impacted surface waters are being used for dust suppression activities across the lined and operational areas of the site (i.e. the RRA and landfill) to reduce the volumes of water stored on the site.

- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.
  We note that the previous correspondence around flocc indicated that we were waiting on further advice from the Department regarding the regulated status of this waste (noting the discussion included the Department discussing this with the greater waste industry and the metal recyclers directly), following which we would apply the final determination to our waste acceptance process. I further note that post the inspection the exposed area of flocc waste has since been covered with earthen material, and re communication to the team regarding what constitutes suitable cover material has occurred.
  Relating to the Department's current strategy that all material that contains any trace of PFAS is considered to be PFAS waste, we are currently in discussions with Kathrin Sherman, Clair Andersen and Adam Cradick from the Department relating to what is reasonable and fair in terms of classification of various waste types and what sampling is practical in these situations. We are not looking for a reason to not proactively adopt this new path forward, however this is a bigger issue than our site alone. For example, are all general waste landfills and transfer stations (including putrescible municipal landfills) being asked to analyse and limit their acceptance based on PFAS concentrations? Has this requirement to show each load of construction and demolition waste to be PFAS free been communicated to the waste industry and all the generators specifically – including municipal collections?
  Cleanaway will continue to monitor and adopt all reasonable and practicable best practice processes. And as we progress the discussion with the Department (noting the first discussion was Tuesday 8th Dec) we will as a company adopt the reasonable outcomes of this collaboration to lead the journey to stronger waste compliance in Queensland. However, we request patience while this discussion occurs and the outcomes agreed on.

If you need further information, please do not hesitate to contact me

Warm Regards
sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pe
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 8 December 2020 5:12 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; INONDA William <William.Inonda@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6)

Apologies for the delay in getting back to you about this one, please see below a summary of the information discussed during our site visit on 10 November 2020, and a list of further questions/information requested.

Summary

- Cleanaway are proposing to engage Arcadis to carry out a trial treatment process to treat PFAS contamination in surface water and leachate using an OCRA Process including polishing with resins at the end of the process; at the time of the meeting, it was anticipated that the trial plant would be installed within one month (early- to mid-December).
- Once Arcadis have been formally engaged, commissioning of the trial treatment plant will take approx. two weeks, and the trial itself will be conducted over a minimum of 30 days to optimise the system. The pad where it is to be located on site is currently being prepared and will be bunded.
- Arcadis are yet to determine if surface water and leachate will be treated as separate or mixed streams during the trial.
- The trial treatment plant will produce three outputs – waste, treated water and solids. Waste fractions can be run back through the treatment plant for a second run/pass and this has been found to be beneficial in other applications.
- As part of the analysis of the efficacy of the treatment process, Cleanaway will need to ensure that not only PFAS is treated, but also ensure all other parameters (e.g. metals and nutrients) meet relevant discharge limits. Analysis for PFAS will include standard suite and TOP Assay.
- The trial plant will continue to operate on the site while a larger treatment plant is commissioned for long term use.
- The need for ensuring that water balance calculations and an assessment of the incoming waste streams in terms of PFAS contamination was agreed to be important to the success of both the trial and the long-term treatment and reduction of PFAS contamination in surface water and leachate at the site.
- The need for Cleanaway to have in place contingency plans to ensure PFAS-contaminated water is not discharged from site during the wet season, other than relying solely on the treatment plant(s), was also discussed and agreed.

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- During the site tour, it was noted that shredder floc from the automotive industry is used as day cover. PFAS is used in many vehicle components including seats, carpets, seals, brake pads, etc. The PFAS NEMP also lists surface treatments including polishing, cleaning, stain and water protection products, lubricants, hydraulic fluids, tubing, oil pan, head gaskets, sealant, wire and cabling, fire retardant and metal plating applications as potential sources of PFAS in vehicles.
  (source: https://www.michiganchemistry.com/assets/2018-Conference/PFAS%20Update%20-%20AECOM.pdf and PFAS NEMP Table B2 pp.106-107).
- The department is concerned that the shredder floc from Sims Metal may be an ongoing contributor to the PFAS contamination on the site. In addition, the department has previously corresponded with Cleanaway in late 2017 and early 2018 about the receipt of shredder floc onto the site, as it may be considered a regulated waste *Environmental Protection Regulation 2019* due to the presence of various other contaminants.
- The department is concerned that construction and demolition waste may also be an ongoing contributor to the PFAS contamination at the site. PFAS is used in the construction industry including tile and stone coatings, paints, varnishes, sealants, other architectural coatings for films, facades and infrastructure, rigid foams, silicone rubber, thread sealant tapes and pastes and PPE (source: PFAS NEMP Table B2 pp.106-107) .
- Cleanaway have confirmed that the 'high risk' PFAS contaminated water from the perched pond is used for dust suppression in the tip face and the RRAs as these drain to the leachate system, and that 'low risk' PFAS-contaminated water in Void 10 is used for dust suppression on site in areas that drain to the stormwater runoff system.
- The Rembind is to be used in the concrete drain that flows into 'Chum Pond'.

Further information requested:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
- Details as to how and where the wastes from the treatment plant will be managed and disposed.
- An update as to when and where the trial treatment plant is likely to be installed and operational on site.
- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?
- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.

Could you please provide the information requested by 5.00pm on Friday 11 December 2020? I tried to call a couple of times this afternoon but couldn't catch you, if there are any issues or questions please let me know – please note that my phone number has changed, the new one is 07 3894 8153.

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

P: 07 3894 8153
Level 4 / 117 Brisbane Street, Ipswich QLD 4305
PO Box 2578, North Ipswich QLD 4305

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Date : **14/08/2020 10:23:57 AM**
From : sch4p4(6) Person
To : **"PERRY Nadene"**
Cc : **"SHERIDAN Ellyse" , "ESR - Ipswich"**
Subject : **Cleanaway New Chum - PFAS SMP Update (Environmental Evaluation (EE) Notice STAT 1414)**
Attachment : **New Chum PFAS SMP (14.08.20).pdf;BC190085.02-NewChum_PFAS_Results-Jul20.pdf;image003.png;**

Good Morning Nadene,

Please find attached the New Chum PFAS Site Management Program Update, and the tabulated results for the latest monitoring round (June).

If you need anything further please don't hesitate to contact me sch4p4(6) Personal information

Warm Regards.

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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Topic		Actions	Status	Indicative Timeframe	KPIs
Defining legacy water versus low impact water	1-1	**Definition and delineation of low impact versus legacy water to allow management solutions to be identified** Legacy water – on-site surface water known to be impacted with PFAS above 0.05ug/L (legacy water on-site has a total PFOS concentration ranging from 0.05 - 0.14ug/L). For the purposes of this definition, the following will be considered "legacy water": ○ water from the Sediment Basin (incl. decommissioning dewatering) ○ water within the Perched Pond (pre completion of PFAS SMP action 3) ○ water within Chum Street Basin (pre completion of PFAS SMP action 3) Low impact water – onsite water that has not been in contact with legacy water, or that has a concentration less than 0.05ug/L*. This includes: ○ Surface water in the new Basins (post completion of PFAS SMP action 3) ○ Water within Void 10 (noting max PFOS concentration is 0.02 ug/L) ○ Surface water captured in Chum St Pond (post completion of PFAS SMP Action 3). It is noted that current leachable concentrations in sediment and silts as assessed on site are also less than this concentration. ** It is noted that the 0.05ug/L concentration was adopted as this is less than Drinking water criteria for PFOS, and lower than the legacy water concentrations.* *It is noted the discharge criteria remains at 0.00023ug/L. However, we acknowledge that this is impractical to adopt as an onsite criteria at the outset of this management strategy. As such, this criteria is considered interim only, noting that as the PFAS SMP actions are progressed the surface water concentrations are expected to decrease, and this criteria will also be revised accordingly.*	Complete	12 June 2020	N/A
Separation and Reduction of Legacy Water	2-1	**Separation of legacy water storage from low impact water storage** Separation of legacy water with low impact water has been achieved through the construction and management of our new surface water basins on site (Basin 1 and Basin 2). As such, separation and delineation of the legacy water compared to low impact water has been achieved at the site, and therefore the risk of offsite discharge of the legacy water is greatly reduced.	Complete	1 July 2020	Management of legacy water on site without release to the environment

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Topic	Actions		Status	Indicative Timeframe	KPIs
	2-2	**Transition to restricted use of legacy water on site** Transition across to only use legacy water on lined areas of the landfill, all other operational areas will use low impact water.	Complete	31 July 2020	Reduction in volume of legacy water stored at the site
Site Works	3-1	**Desktop review of onsite surface water catchments to identify areas for PFAS rectification and management** A desktop review of the surface water catchments was completed, with the identified rectification, separation and remediation works identified and detailed below in Actions 3-2 and 3-3.	Complete	26 June 2020	N/A
	3-2	**Works on Chum Street Basin catchment, including:** a) Removal of any residual silt and sediment from basin and drains (identified in Env Rpt as impacted with low level PFAS). b) Installation of additional velocity and sediment check controls within drains. This is aimed at: o minimising PFAS impacted sediments reaching basin (noting sediments within basins have the potential for longer contact time with water, therefore leachability risk increases). o slowing water to increase contact time at rock checks to assist with passive control. c) The addition of passive PFAS removal aggregate[1] within these rock checks, or within gabion type basket structures behind rock checks (to be defined). d) The addition of passive PFAS aggregate at overland flow discharge point of Chum Street Basin. This would force any discharge of this basin to flow through this aggregate as a last line of defence. e) Cell 5 batter final capping progressed. This capping has been designed to minimise and slow runoff, as well as by overlaying new materials under the new water regime will minimise any pre-existing impact.	Underway *See note 1 at end of Document*	Jul – Sep 2020	Reduction in mass of PFAS in Chum Street Basin.

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[1] Noting the product currently being investigated is Rembind + Aquagate. This is an aggregate coated with Rembind, a product which has been proven to effectively bind with PFAS. This would be used as a trial initially to determine if suitable for this site and concentration. Considered here as a "polishing" control, rather than a treatment, given that the success of the absorption will be based on contact time. We do note that this product has been successful in lab treatment trials by the supplier for up to 60 ug/L where a life expectancy of 12 months was noted (noting the legacy water at New Chum contains less than 1 ug/L).

Topic		Actions	Status	Indicative Timeframe	KPIs
	3-3	**Site works on main catchment (noting all operational areas are managed through the leachate system) including:** This is primarily managed through the new Surface water Basins on site, and the stormwater drains created for this purpose. a) As per 3-2, additional rock checks and passive PFAS aggregate controls to be added to drains, inflow and overflow points of Basin 1. b) Review of licenced discharge point, noting this is currently located on a legacy water basin, to determine if this should be changed to Basin 1. c) Cell 1 batter final capping is being progressed. This capping has been designed to minimise and slow runoff, as well as by overlaying new materials under the new water regime will minimise any pre-existing impact.	Underway *See note 2 at end of Document*	Jul – Sep 2020	Mass of PFAS in Basin 1 to be established, then reduced.
Groundwater	4-1	Completion of sediment pond in-filling (part of Cell construction works). Breaks the link between surface water and groundwater at site	Underway	TBD	Complete in-fill works
	4-2	**Leachate sample - Cell 1 drilling** Based on the potential source of unlined historical cells, additional information is required to determine if Cell 1 is contributing to groundwater impact. • a historical riser was located in the SW corner of Cell 1. Under further investigation, the pipe was identified as capped at approx. 10m bgl, annulus around riser appears to go to a depth of 16.2m (with refusal on sand). • a leachate bore was installed within the unlined Cell 1 (completed on 25th June 2020). Sampling was completed the week of 29th June, noting a sample of liquid was obtained from within this bore (from initial review liquid had similar colour, odour and visual characteristics of leachate). Analysis is being progressed.	***Completed*** Underway *See note 3 at end of Document*	***30 July 2020*** 30 October 2020	***Leachate bore installed in Cell 1.*** Sampling of leachate and characterisation assessment.
	4-3	**Additional GW bores – 4 agreed wells** Based on the previous PFAS Environmental Rpt (3 April 2020) data gaps identified areas where additional Groundwater bores were required to assist with characterisation. A program for well installation works was included in the addendum monitoring plan (as finalised 3 June 2020). • Installation works were completed between 22nd June to 26th June 2020. • 4 monitoring locations (BH19, BH20, BH21 and BH22) successfully installed. Installation report to be included in addendum Environmental Rpt, with monitoring data.	Completed *See note 4 at end of Document*	30 June 2020	Bores installed as proposed

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Topic	Actions		Status	Indicative Timeframe	KPIs
	4-4	**Offsite NE GW Well – IF REQUIRED** A data gap identified relates to the offsite movement of impacted groundwater to the NE of the site. For context, due to difficulties obtaining approval to drill in neighbouring site, it was discussed and agreed to progress (4-2) and (4-3) initially, where these do not provide sufficient evidence to rule out connection between groundwater and the historic unlined Cell 1, we will then further review options.	TBD (based on 4.2 additional works)	TBD	TBD
	4-5	**Mitigation measures for impact to GW – IF REQUIRED** Where either 4-2, 4-3 or 4-4 determines that leachate in Cell 1 is contributing to PFAS within groundwater in proximity of the site the following will be completed: • notification to the Department of findings within 5 business days of finalising the characterisation assessment. • reasonable and practicable mitigation measures will be determined for discussion with the Department.	TBD – based on results of above	TBD	TBD
Solids management	5-1	**Sediments and Silt Management** Where solids are required to be disturbed through this program of works, a review is required to ensure the appropriate disposal / management strategies are employed. <u>Sediments and Silts from stormwater drains and basins</u> Where silt and sediment removal from the stormwater drains and basins is required under the PFAS SMP, the material must be: • managed to minimise spread or distribution of the solids during works. • where temporary on-site stockpiling is required, this is to be undertaken in accordance with the PFAS NEMP (version 2.0).	Underway	Oct 2020	N/A
	5-2	**Waste acceptance review** A review of waste acceptance procedures and incoming waste streams received at this site to: • identify PFAS impacted waste streams which may have presented a past potential source of PFAS. • based on the above waste review, a review of the current waste acceptance procedures will be undertaken to minimise acceptance of PFAS contaminated waste streams where practicable.	Underway	31 Aug 2020	Updated waste acceptance procedures

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Topic		Actions	Status	Indicative Timeframe	KPIs
Documentation	6-1	**SBMP update** All works completed under this PFAS SMP will be transferred to the Site Based Management Plan (SBMP) where appropriate (i.e. on-going management is required, definitions adopted long terms for the site, etc.). This is likely to occur at the end of this PFAS SMP, or at least post the completion of 3-2, 3-3.	Pending	16 Oct 2020	Updated SBMP
	6-2	**PFAS SMP report** A summary of the PFAS SMP works completed will be compiled into a report and provided to the Department as proof of completion. It is noted, this report will include: • the updated waste acceptance procedures (action 5-2). • the updated SBMP (action 6-1). • reporting against the KPI's. • acknowledge where some of the above management measures are on-going (i.e. the passive treatment and clean up of the surface water and subsequent reduction in PFAS mass in Chum Street Basin).	Pending	30 Oct 2020	
	6-3	**PFAS SMP Updates** This table will be provided to the Dept monthly during the program (Aug and Sep), and included in the final PFAS SMP Report (see action 6-2)	***Complete*** Underway	***14 Aug 2020*** 18 Sep 2020 30 Oct 2020	

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NOTES:

1. Relevant to 3-2: Works on Chum Street Basin catchment have commenced, with quotes and logistics of basin de silting works being progressed. Discussions have continued with Rembind regarding the aggregate for passive treatment, and Cell 5 batter final capping works have progressed (noting devegetation and batter profiling works have been completed to date).

2. Relevant to 3-3: Works on the main catchment is progressing, with rock checks having been added to the current drains, a pre-lodgement meeting has been held with the Department's assessment team regarding what is required to change the licences discharge (currently being considered internally), and Cell 1 batter final capping works have progressed (noting devegetation, batter profiling being completed and the HDPE liner in the process of being laid).

3. Relevant to 4-2: The leachate riser was successfully installed within Cell 1 as part of the drilling program (see note 4 below for dates). An initial sample was collected and analysed – results for this sample are provided with this report (see note 4 below). Based on our initial sample we note:

- The level within the Cell 1 riser was 38.6m AHD. Water levels in surrounding groundwater monitoring wells is between 14.5 and 19.8m AHD. Noting Cell 1 levels are approximately 15-20m above the groundwater table in the immediate area.

- The hydrochemistry of the leachate based on the initial sample is distinctly different from surrounding groundwater. In short, generally there is no correlation been observed between PFAS in Cell 1 and PFAS in surrounding groundwater wells. The PFAS within leachate in Cell 1 is considered to be most comparable to contact water samples previously collected (in both concentrations and composition).
- For completeness - it is noted that there were precursor compounds identified in Cell 1 leachate.

However, given the multiple actions which are reliant on the characterisation assessment, and at present this being based on a single sample, we are going to progress as follows:

  - Additional sample of Cell 1 riser in the September monitoring round (including precursor assessment).
  - Hydraulic testing to be completed during the September round on new wells to confirm hydraulic conductivity at the site.
  - A characterisation assessment of Cell 1 leachate compared to surrounding groundwater which be provided with the RFI interim report in October. This will include an initial discussion on mitigation measure if and where required.

4. Relevant to 4-3: The 4 additional groundwater bores (BH19, BH20, BH21 and BH22) were installed between 22nd and 26th June 2020, in locations at or close to those agreed with the Department in our previous discussions. Monitoring results for the June monitoring event are provided with this update for the Department's reference.

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Epic File: BC190085.01
Site: New Chum Waste Management Facility - 100 Chum Street, New Chum
Client: Cleanaway Solid Waste Pty Ltd
Event: Jun-20

Epic Environmental Pty Ltd
Level 6, 193 North Quay, Brisbane QLD 4000

Table T1: PFAS Analytical Results

Sample Date	Sample Duplicate	Sample Number	Material Type	Analysis	Total Organic Fluorine (TOF) (µg/L)	Perfluoroalkyl Sulfonic Acids (PSA) (µg/L)									Perfluoroalkyl Carboxylic Acids (PCA) (µg/L)											Perfluoroalkyl Sulfonamides (µg/L)							Fluorotelomer Sulfonic Acids (FSA) (µg/L)				Total PFAS (µg/L)
						PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFPNS	PFPrS	PFOS & PFHxS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Total PFAS
PFAS NEMP Freshwater - 99% Species Protection (high conservation value systems)					-	-	-	-	-	0.00023	-			-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Freshwater - 95% Species Protection (slightly to moderately disturbed systems)					-	-	-	-	-	0.13	-			-	-	-	-	-	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Drinking Water					-	-	-	0.07	-	0.07	-			0.07	-	-	-	-	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS NEMP Health Based Guidance Values - Recreational Water					-	-	-	0.7	-	0.7	-			0.7	-	-	-	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Level of Reporting (µg/L)) - Standard Analysis					0.1	0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.001	0.005	0.001	0.001	0.005
Laboratory Level of Reporting (µg/L)) - TOPA					-	0.002	0.002	0.002	0.002	0.002	0.002	-	-	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
BH02																																					
29-Jun-20	-	BH02	Groundwater	Standard	< 0.5	< 0.001	< 0.001	< 0.001	< 0.001	0.0004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
29-Jun-20	-	BH02	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH03																																					
29-Jun-20	-	BH03	Groundwater	Standard	< 0.05	< 0.001	< 0.001	< 0.001	< 0.001	0.0007	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
29-Jun-20	-	BH03	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH05A																																					
29-Jun-20	-	BH05A	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
29-Jun-20	-	BH05A	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	0.0200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0100	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH06																																					
01-Jul-20	-	BH06	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
01-Jul-20	-	BH06	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH10																																					
01-Jul-20	-	BH10	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	0.0120	0.002	0.0030	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0050
01-Jul-20	-	BH10	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH11																																					
29-Jun-20	-	BH11	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	0.001	0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
29-Jun-20	-	BH11	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH12																																					
29-Jun-20	-	BH12	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	0.0004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
29-Jun-20	-	BH12	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH15																																					
02-Jul-20	-	BH15	Groundwater	Standard	< 0.5	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	0.0360	< 0.001	< 0.001	0.0360
02-Jul-20	-	BH15	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH16																																					
02-Jul-20	-	BH16	Groundwater	Standard	< 0.5	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
02-Jul-20	-	BH16	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH18																																					
01-Jul-20	-	BH18	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
01-Jul-20	-	BH18	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH19																																					
02-Jul-20	-	BH19	Groundwater	Standard	< 0.5	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	0.0010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	0.0060	< 0.001	< 0.001	0.0070
02-Jul-20	-	BH19	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH20																																					
02-Jul-20	-	BH20	Groundwater	Standard	< 0.5	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
02-Jul-20	-	BH20	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH21																																					
01-Jul-20	-	BH21	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	0.0110	< 0.001	< 0.001	0.0111
01-Jul-20	-	BH21	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BH22																																					
01-Jul-20	-	BH22	Groundwater	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
01-Jul-20	-	BH22	Groundwater	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
BASIN-1																																					
02-Jul-20	-	BASIN-1	Surface Water	Standard	< 0.1	0.0100	0.003	0.024	0.016	0.17	< 0.001	< 0.001	0.0030	0.194	0.0720	0.041	0.0260	0.011	0.041	0.011	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.4320
02-Jul-20	-	BASIN-1	Surface Water	TOPA	-	< 0.01	< 0.01	0.04	< 0.01	0.15	< 0.01	< 0.01	< 0.01	0.19	0.1000	0.04	0.0400	0.01	0.04	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	0.4300
CHUM POND																																					
30-Jun-20	-	CHUM POND	Surface Water	Standard	< 0.1	0.0190	0.006	0.03	0.006	0.062	< 0.001	< 0.001	0.0090	0.092	0.0700	0.049	0.0360	0.016	0.021	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.3350
30-Jun-20	-	CHUM POND	Surface Water	TOPA	-	0.0200	< 0.01	0.03	< 0.01	0.07	< 0.01	< 0.01	< 0.01	0.1	0.0600	0.05	0.0500	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	0.3200
DIS																																					
30-Jun-20	-	DIS	Surface Water	Standard	< 0.1	0.0100	0.002	0.008	< 0.001	0.013	< 0.001	< 0.001	0.0040	0.021	0.0230	0.012	0.0090	0.003	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0890
30-Jun-20	-	DIS	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.02	< 0.05	< 0.01	0.0100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
DWN																																					
30-Jun-20	-	DWN	Surface Water	Standard	< 0.1	0.0100	0.002	0.008	< 0.001	0.015	< 0.001	< 0.001	0.0040	0.023	0.0250	0.012	0.0090	0.004	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0940
30-Jun-20	-	DWN	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.02	< 0.05	0.01	0.0100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
DWN2/DWN2A																																					
30-Jun-20	-	DWN2A	Surface Water	Standard	< 0.05	0.0090	0.002	0.008	< 0.001	0.012	< 0.001	< 0.001	0.0030	0.02	0.0220	0.012	0.0090	0.003	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0840
30-Jun-20	-	DWN2A	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.02	< 0.05	< 0.01	0.0100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
DWN3																																					
30-Jun-20	SQA3/SQA4	DWN3	Surface Water	Standard	< 0.05	0.0100	0.002	0.008	< 0.001	0.0098	< 0.001	< 0.001	0.0040	0.0178	0.0220	0.009	0.0090	0.003	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0808
30-Jun-20	SQA3/SQA4	DWN3	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
NWH																																					
30-Jun-20	-	NWH	Surface Water	Standard	< 0.1	0.0200	0.004	0.021	0.003	0.036	< 0.001	< 0.001	0.0080	0.057	0.0630	0.019	0.0220	0.007	0.011	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.2160
30-Jun-20	-	NWH	Surface Water	TOPA	-	0.0100	0.02	0.02	< 0.01	0.03	< 0.01	< 0.01	< 0.01	0.05	< 0.05	0.02	0.0200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	0.1200
SED-1																																					
30-Jun-20	SQA1/SQA2	SED-1	Surface Water	Standard	< 0.1	0.0230	0.005	0.025	0.008	0.087	< 0.001	< 0.001	0.0090	0.112	0.0800	0.036	0.0320	0.01	0.016	0.004	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.3240
30-Jun-20	SQA1/SQA2	SED-1	Surface Water	TOPA	-	0.0200	< 0.01	0.03	< 0.01	0.1	< 0.01	< 0.01	< 0.01	0.13	0.0800	0.03	0.0400	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	0.3200
SMC																																					
30-Jun-20	-	SMC	Surface Water	Standard	<0.5	0.0090	0.002	0.007	< 0.001	0.011	< 0.001	< 0.001	0.0030	0.018	0.0220	0.01	0.0090	0.003	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0800
30-Jun-20	-	SMC	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	0.0200	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
SMC2																																					
30-Jun-20	-	SMC2	Surface Water	Standard	< 0.1	< 0.001	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.005	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	< 0.005
30-Jun-20	-	SMC2	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
SMC4																																					
30-Jun-20	-	SMC4	Surface Water	Standard	<0.05	0.0020	< 0.001	0.003	< 0.001	0.0063	< 0.001	< 0.001	< 0.001	0.0093	< 0.005	0.003	0.0040	0.002	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0233
30-Jun-20	-	SMC4	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
SMC5																																					
30-Jun-20	-	SMC5	Surface Water	Standard	< 0.1	< 0.001	< 0.001	< 0.001	< 0.001	0.0019	< 0.001	< 0.001	< 0.001	0.0019	0.0090	< 0.001	0.0030	< 0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0149
30-Jun-20	-	SMC5	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
SMC6																																					
30-Jun-20	-	SMC6	Surface Water	Standard	< 0.1	0.0020	< 0.001	0.004	< 0.001	0.011	< 0.001	< 0.001	< 0.001	0.015	< 0.005	0.002	0.0020	0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0250
30-Jun-20	-	SMC6	Surface Water	TOPA	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.1
LPOND2																																					
30-Jun-20	-	LPOND2	Leachate	Standard	< 0.1	13.0000	2.8	10	0.43	3	< 0.001	< 0.001	3.6000	13	21.0000	5.9	7.6000	1.3	0.91	0.061	0.008	0.0010	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0560	0.9900	< 0.001	< 0.001	70.6560
30-Jun-20	-	LPOND2	Leachate	TOPA	-	11.0000	2.6	19	0.73	2.2	< 0.01	< 0.01	4.0000	21.2	23.0000	6.3	12.0000	1.5	0.95	0.07	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	83.3600
LCell1																																					
15-Jul-20	-	LCell1	Leachate	Standard	< 0.1	0.0020	< 0.001	0.005	0.002	0.015	< 0.001	< 0.001	< 0.001	0.02	0.0070	0.006	0.0060	0.003	0.009	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.001	< 0.005	< 0.001	< 0.001	0.0570
15-Jul-20	-	LCell1	Leachate	TOPA	-	0.0200	< 0.01	0.07	0.02	0.15	< 0.01	< 0.01	< 0.01	0.22	0.1400	0.1	0.0800	0.05	0.1	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	0.7500

NOTES:
- 1 Analyte exceeds the PFAS NEMP Freshwater 99% Species Protection
- 1 Analyte exceeds the PFAS NEMP Freshwater 95% Species Protection
- 1 Analyte exceeds the PFAS NEMP Health Based - Drinking Water
- 1 Analyte exceeds the PFAS NEMP Health Based - Recreational Water

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Date : **20/11/2020 3:24:59 PM**
From : sch4p4(6) Persona
To : **"PERRY Nadene"**
Cc : **"ROWE Sarah"**
Subject : **RE: DES comments on interim EE report**
Attachment : **image004.png;image009.png;image011.jpg;image001.png;image003.png;image005.png;**

Thanks Nadene,

We will ensure we take this into consideration for the next monitoring round and in providing context in the final report as required.

Warm Regards

sch4p4(6) Perso
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 17 November 2020 1:54 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>
Subject: DES comments on interim EE report

Hi sch4p4(

Just following up on our conversation this morning, please see below some comments from our Water Sciences team about the interim EE report received on 21 October 2020:

1. Surface water: Monitoring results show PFOS concentrations at SMC4 lower than concentrations observed at SMC. On Figure 3 of the report, SMC4 is analysed as an adjacent monitoring point, and not an upstream one.
   From the plan, and the observed concentrations, SMC4 is located upstream from Void-10. It is important to understand whether or not contamination (likely through overflow of the pond) from the site could impact the creek water quality at SMC4. This will support the definition of an appropriate monitoring network for long-term ongoing monitoring.

2. Groundwater and leachate contamination:
   Leachate analysis from Cell 1 shows PFOS concentrations above the 99% species protection value. It seems that the groundwater quality mostly impacted on site are at bores BH3 and BH12 which could be linked to leachate contamination.
   Clarification may also be required about whether or not Cell 2B is lined and if it could be a potential source of contamination as well.
   Depending on the cause of groundwater contamination, Cleanaway will have to define and implement appropriate management measures.

3. Potential offsite impacts to groundwater as stated in page 17 do not seem obvious based on the observed concentrations.

4. Sampling events: in a few occasions, it seems that technical issues prevented groundwater sampling to occur (see Table 6). When possible, we recommend to fix the technical issue in a timely manner and sample when it s fixed (even if it is a few days after the scheduled date) and not wait for the next sampling event three months later.

I did just try to call you to, as we only discussed item 4 on the phone this morning, but I didn t catch you - if you have any questions regarding the additional items, please don t hesitate to contact me.

Cheers,

Queensland Government

Nadene Perry
A/Team Leader
Energy, Extractive and Southwest Compliance | Ipswich
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Date : 15/01/2021 2:50:57 PM
From : sch4p4(6) Persona
To : "PERRY Nadene"
Cc : "ROWE Sarah" , "BRADSHAW Tony" , "SUMMERVILLE Sinead" , "CARLISH Kate" , "SMALL Dana" , "HAWAS Olga" , "WEISE Tom"
Subject : RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020
Attachment : New Chum PFAS SMP (15.01.21).docx;image005.png;image007.png;image008.png;image012.png;image017.jpg;image025.jpg;image001.png;image002.png;image003.png;image004.png;image006.png;image010.png;image011.png;image013.png;image014.png;

Hi Nadene,

See attached updated PFAS SMP for New Chum.

Let me know if you have any questions.

sch4p4(6) Pe
Environmental Business Partner

343 Bowhill Rd, Willawong, QLD 4110
Tel: sch4p4(6) Pe Mob: sch4p4(6) Pe
E: sch4p4(6) P@cleanaway.com.au | www.cleanaway.com.au



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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Monday, 11 January 2021 5:48 PM
To: sch4p4(6) Personal informatio@cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; CARLISH Kate <kate.carlish@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>; HAWAS Olga <olga.hawas@des.qld.gov.au>; WEISE Tom <Tom.Weise@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Thank you for your time this afternoon, please see below a summary of the PFAS matters discussed:

- As previously discussed, Cleanaway (CWY) are to provide the addendum EE report to the department on or before **Friday 19 February 2021**.
- You confirmed that Epic Environmental are aware of this upcoming deadline, and are progressing with development of the report; in addition, the latest round of PFAS sampling was completed in December and will be included in the addendum report as required.
- We briefly discussed the timeline of the progress of the EE report to date, including the provision of the interim EE report to the department on 21 October 2020 for your reference, I have attached the department's comments on the interim report, which were provided to CWY on 17 November 2020.
- We discussed the regular PFAS site management plan (SMP) updates CWY have previously provided to the department, the most recent having been received in August 2020, and the need to provide another update (see actions 1 and 2 below).
- You confirmed that, while the trial water treatment plant and associated bunding and hardstand have been commissioned and potable water commissioning tests completed, the trial itself will not commence until appropriate approvals have been obtained from Ipswich City Council (ICC) (see action 3 below).
- Currently you anticipate it may be up to a month before the trial commences; in this time, CWY will prepare for and arrange a pre-lodgement meeting with the department to discuss the proposed amendments to the EA (the application for pre-lodgement should be sent via PALM but CC'd to Olga and Kate).
- Going forward, sch4p4(6) Personal information once your new colleague commences in the role, they will become the main point of contact between CWY and DES.

PFAS-related actions arising from this meeting:

1. DES to provide the previous (August 2020) PFAS SMP update received by the Department to assist you to follow up on latest updates **complete** (please see correspondence attached);
2. CWY to provide a progress update for the PFAS SMP **to be completed by 5pm 15 January 2021**;
3. CWY to notify the department when ICC approvals have been obtained, and when the trial water treatment project commences.
4. CWY to initiate pre-lodgement meeting with DES for the proposed EA amendments.

If you have any further questions about today's meeting or the information above, please don't hesitate to contact me.

Cheers,

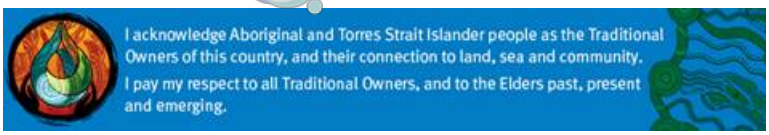
Nadene Perry
A/Compliance Delivery Manager
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Environmental Services and Regulation
Department of Environment and Science

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From: sch4p4(6) Personal informatio@cleanaway.com.au>
Sent: Friday, 8 January 2021 3:52 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) P; SUMMERVILLE Sinead; CARLISH Kate; SMALL Dana
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

See responses to your email dated 5 January noting that I can provide further information if necessary as personnel involved in the water treatment trial return to work next week.

An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below
The reuse/disposal hierarchy has been drafted and submitted to Cleanaway for review. I will be meeting with Tonkin next week to discuss further and follow up as per sch4p4(6) response to discuss with yourself prior to progressing with an amendment

A response to my email dated 16 December 2020, highlighted in yellow below
I will follow up next week when people involved in the trial return to work and will respond by end of next week (15 Jan).

An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.
Apologies for any confusion, I have confirmed with site personnel that a meeting was held with ICC prior to Christmas to discuss the trial and Cleanaway has provided a response to their queries. Cleanaway is currently awaiting a response from ICC with respect to approvals to undertake the trial. Arcadis who will be undertaking the trial will return to site next week (after the lockdown).
The trial will not commence until approvals have been obtained. I will provide notification to you prior to commencement.

If you have any further questions or wish to discuss, please do not hesitate to contact me.

sch4p4(6) Pe
Environmental Business Partner

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E: sch4p4(6) P@cleanaway.com.au | www.cleanaway.com.au

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Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 5 January 2021 4:50 PM
To: sch4p4(6) Personal informatio@cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe sch4p4(6) Pers@cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; CARLISH Kate <kate.carlish@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4

Thanks for your time on the phone this afternoon, as discussed I am following up on the correspondence between Cleanaway and the department in December 2020 (see emails below). In particular, I am seeking the following information from Cleanaway:

1. An update as to Cleanaway's review of disposal/reuse options for treated leachate/surface water on site as per the email to the department dated 11 December 2020, highlighted in green below;

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2. A response to my email dated 16 December 2020, highlighted in yellow below; and
3. An update as to the progress of the trial water treatment plant, noting that you have verbally confirmed today that the relevant approvals for the trial have been obtained from Ipswich City Council and that the trial is likely to commence next week.

Please provide the information requested no later than **5pm on Friday 8 January 2021**.

I understand from our conversation today that you are relatively new to the PFAS matters at the site, as sch4p4(was primarily handling PFAS up until this point, and that you would like to discuss the history of the matters with the department to ensure you are across the complexities of the issues. As discussed, I will look to arrange a meeting between yourself and the relevant DES officers to assist in this regard at this stage it is intended that this will occur on Friday 8 January 2021, depending on the availability of the relevant officers (to be confirmed).

I have also attached for your reference the amended notice requesting additional information regarding the EE, which was issued to Cleanaway on 20 July 2020 as discussed, the addendum environmental evaluation report, including the further information required under requirements 1 to 17 of the attached notice, must be submitted to the department on or before **Friday 19 February 2021**.

If you have any questions regarding the information requested or the attached notice please do not hesitate to contact me.

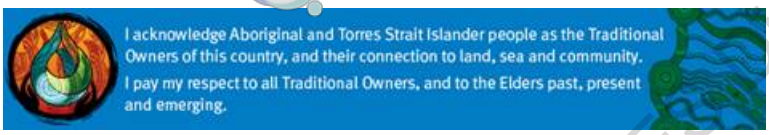
Cheers,

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Friday, 18 December 2020 8:30 AM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat; SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

I can confirm that the below will be included in the Arcadis analytical suite initially. Where we receive repeated results showing non detect or that specific contaminants are not of concern we intend to limit the analytical suite accordingly.

Warm Regards

sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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E sch4p4(6) Pers@cleanaway.com.au | www.cleanaway.com.au

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From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Thursday, 17 December 2020 12:57 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe sch4p4(6) Pe@cleanaway.com.au>; sch4p4(6) Personal informatio@cleanaway.com.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6)

Further to my email below, I have reviewed the contaminants and allowable leaching contaminant levels listed in your EA, and note that the EA contains limits for the following contaminants that do not appear to be included in the WTP analysis that you provided (attached):

- Antimony
- Barium
- Total MAH
- Benz(c)phenanthrene
- Dibenz(a,h)pyrene
- Dimethylbenz(a)anthracene
- M-cresol
- O-cresol
- P-cresol
- Carbon tetrachloride
- 1,2 Dichloroethane
- 1,1 Dichloroethane
- Chlorobenzene (total)
- Lindane
- Toxaphene
- 2,4-D
- 2,4-DB
- 2,4,5-T
- MCPA
- Carbaryl
- Carbofuran
- Atrazine
- Simazine
- Chlorophenol – noting that 2-chlorophenol is listed in the WTP analysis
- Bromide – noting that bromine is listed in the WTP analysis
- Trichlorophenol – noting that 2.4.6-trichlorophenol and 2.4.5-trichlorophenol are listed in the WTP analysis.

When we were discussing the trial treatment plant with the Arcadis representatives on site, Cleanaway and Arcadis stated that the trial would be assessed against all relevant environmental release criteria including the EA and trade waste release limits. It was highlighted during this discussion that the treated effluent from the treatment process must meet all relevant criteria in addition to treating the PFAS contamination. Could you please confirm if Cleanaway intend to analyse the treated effluent from the trial treatment plant for all of the contaminants listed in the EA?

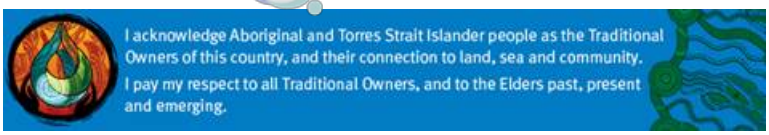
Cheers,

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From: PERRY Nadene
Sent: Wednesday, 16 December 2020 12:18 PM
To: sch4p4(6) Perso
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informati SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Thank you for providing the information requested, the department will review this in due course and if there are any additional questions I'll let you know.

The department is also interested in understanding the financial investment required to remedy PFAS contamination on the premises, could you please provide some details as to the costs Cleanaway have/will incur as follows:

a. Installation costs for the trial treatment plant;

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b. Operational costs for the trial treatment, including sampling and analysis costs; and
c. Approximate cost for the installation and operation of the permanent treatment plant, noting that this will likely be dependent on the outcomes of the trial and may only be indicative at this point in time.

If there are any issues or questions please let me know.

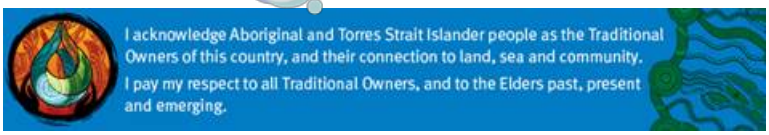
Cheers,

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Monday, 14 December 2020 3:47 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informatic
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

As discussed, please see the attachments as promised.

Warm Regards

sch4p4(6) Per
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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From: sch4p4(6) Perso
Sent: Friday, 11 December 2020 4:07 PM
To: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe sch4p4(6) Pers@cleanaway.com.au>; sch4p4(6) Personal informatic@cleanaway.com.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Good Afternoon Nadene,

Please find the responses to your "further information requested" as follows:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
  Please refer to the attachment "*2020.10.26_Leachate Treatment Trial Arcadis DES v1.pdf*".

- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
  Please refer to the attachment "*WTP Analysis*", noting that as we progress through the trial this list will be reviewed and refined as appropriate.

- Details as to how and where the wastes from the treatment plant will be managed and disposed.
  There are three primary waste streams that will be managed and disposed of (refer to attached "*Process Flow Diagram*").

1. Waste gas will be destroyed in an ozone destruction vessel. Dischargeable gases will be safely vented to atmosphere and monitored appropriately.
2. Waste liquid concentrate will be stored on site in a 22kL poly tank. The concentrate will be periodically removed off site to a destruction facility (likely Renex).
3. Treated leachate will be stored on site for testing and then discharged into the existing leachate recirculation trenches.
4. Solid waste streams (comprising of spent resin, GAC, solid filter cartridges and used sample containers), these will also be sent to an off site to a destruction facility (likely Renex).

We are currently progressing the review of disposal / reuse options for treated leachate / surface water on site (including irrigation of vegetation, reuse as dust suppression etc.).
Noting we are currently drafting the reuse/disposal hierarchy as it applies to our current EA and will be providing this to yourself for agreement of proposed reuse / discharge / disposal, and prior to progressing an amendment with the assessment team. On this I note:

- Condition G11 (2) allows recirculation through the landfill unit, but (3) requires agreement with the administering authority for offsite disposal, discharge and reuse on site.
- Condition A5 would restrict the onsite reuse of this treated liquid as dust suppression, which would require an EA amendment.

I hope to come back to you in the next few weeks with the initial details of this hierarchy for discussion.

- An update as to when and where the trial treatment plant is likely to be installed and operational on site.

Please find below a summary of the WWTP trial project:

Treatment Selection

- As discussed with DES at our preliminary meeting on 10 November 2020, the preferred treatment technology for treating PFAS and multiple other parameters in stormwater and PFAS contaminated leachate is ozofractionation, supplied by Arcadis/Evocra,. This technology was preferred following a robust feasibility assessment conducted by Cleanaway.
- Arcadis has a rental unit currently situated in Yatala (QLD) which can treat 50-100kL/day of influent. This is the best, most immediate solution to prove concept, aid in the height rise application, as well as start alleviating the leachate surplus currently on Site.
- This system has been used and proven at both Brisbane Airport and Hobart Airport to treat PFAS contaminated dirty water. In both examples, the technology was able to meet stringent discharge target, similar to what we are targeting at New Chum.

Progress Update

Friday 27 November 2020:

- lined treatment pad with bund construction completed, including an additional gravel pad area for parking and equipment laydown.
- Evocra/Arcadis operations staff inducted to Cleanaway New Chum site.

Week starting Monday 30 November 2020:

- Hazard and Operability Study (HAZOP) workshop held with key representatives form Cleanaway, Arcadis and Evocra.
- Mobilisation of primary treatment equipment. Two 40 high cube shipping containers delivered to site (containing all necessary treatment apparatus), position on bunded area and unpacked.
- Installation of acoustic shielded generator, and electrical works undertaken.
- Poly tanks delivered to site, located on treatment pad/bund.
- Leachate ring main extended to treatment trial pad, and return main installed to enable discharge to existing leachate recirculation trenches.

Monday 7 December

- Ongoing set up (plumbing and electrical installation activities).
- Site process review with Cleanaway engineering personnel.

Scheduled Activities

- Completion of site setup and mobilisation activities by Thursday 10 December 2020.
- Commissioning activities to commence with clean (potable) water on Friday 18th December 2020.

At present the scheduled start date to commence the leachate trial is after the above commissioning which is noted for Friday 18th December 2020. The trial is intended to extend for one month (noting two weeks down time over the Christmas break).

Location of the trial plant is as follows.

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- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
  We are working with Ipswich City Council (ICC) to ensure all necessary approvals required are received for the trial and permanent solutions, we have also engaged our external town planner to provide us assistance with this process.
  We currently have a meeting scheduled to discuss this further with ICC next week, noting that they are fully aware of the above works and progress. The trial start date as noted above is currently scheduled for the 18th Dec, but this is based on receiving written confirmation from ICC prior to this date.

  As discussed with DES during the inspection there is no requirement for an ERA or an EA amendment on situating the trial or permanent treatment plants. However, as noted in the 3rd dot point response above, we understand we need agreement from the administering authority prior to offsite discharge or disposal or on-site reuse, and in some cases (i.e. using this for dust suppression) this will require an EA amendment prior to commencing. Further conversations / correspondence will be provided to this end.

- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?
  The full-scale treatment plant is included in the above discussions regarding ICC and with our town planners, so at this stage timeframes for approvals have not been confirmed. However, we are targeting installation of the permanent facility by mid-2021.

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
  In addition to the treatment plant, the onsite PFAS impacted surface waters are being used for dust suppression activities across the lined and operational areas of the site (i.e. the RRA and landfill) to reduce the volumes of water stored on the site.

- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.
  We note that the previous correspondence around flocc indicated that we were waiting on further advice from the Department regarding the regulated status of this waste (noting the discussion included the Department discussing this with the greater waste industry and the metal recyclers directly), following which we would apply the final determination to our waste acceptance process. I further note that post the inspection the exposed area of flocc waste has since been covered with earthen material, and re communication to the team regarding what constitutes suitable cover material has occurred.
  Relating to the Department's current strategy that all material that contains any trace of PFAS is considered to be PFAS waste, we are currently in discussions with Kathrin Sherman, Clair Andersen and Adam Cradick from the Department relating to what is reasonable and fair in terms of classification of various waste types and what sampling is practical in these situations. We are not looking for a reason to not proactively adopt this new path forward, however this is a bigger issue than our site alone. For example, are all general waste landfills and transfer stations (including putrescible municipal landfills) being asked to analyse and limit their acceptance based on PFAS concentrations? Has this requirement to show each load of construction and demolition waste to be PFAS free been communicated to the waste industry and all the generators specifically including municipal collections?
  Cleanaway will continue to monitor and adopt all reasonable and practicable best practice processes. And as we progress the discussion with the Department (noting the first discussion was Tuesday 8th Dec) we will as a company adopt the reasonable outcomes of this collaboration to lead the journey to stronger waste compliance in Queensland. However, we request patience while this discussion occurs and the outcomes agreed on.

If you need further information, please don't hesitate to contact me

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Warm Regards
sch4p4(6) Pers
Senior Environmental Business Partner

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Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 8 December 2020 5:12 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; INONDA William <William.Inonda@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Apologies for the delay in getting back to you about this one, please see below a summary of the information discussed during our site visit on 10 November 2020, and a list of further questions/information requested.

Summary

- Cleanaway are proposing to engage Arcadis to carry out a trial treatment process to treat PFAS contamination in surface water and leachate using an OCRA Process including polishing with resins at the end of the process; at the time of the meeting, it was anticipated that the trial plant would be installed within one month (early- to mid-December).
- Once Arcadis have been formally engaged, commissioning of the trial treatment plant will take approx. two weeks, and the trial itself will be conducted over a minimum of 30 days to optimise the system. The pad where it is to be located on site is currently being prepared and will be bunded.
- Arcadis are yet to determine if surface water and leachate will be treated as separate or mixed streams during the trial.
- The trial treatment plant will produce three outputs – waste, treated water and solids. Waste fractions can be run back through the treatment plant for a second run/pass and this has been found to be beneficial in other applications.
- As part of the analysis of the efficacy of the treatment process, Cleanaway will need to ensure that not only PFAS is treated, but also ensure all other parameters (e.g. metals and nutrients) meet relevant discharge limits. Analysis for PFAS will include standard suite and TOP Assay.
- The trial plant will continue to operate on the site while a larger treatment plant is commissioned for long term use.
- The need for ensuring that water balance calculations and an assessment of the incoming waste streams in terms of PFAS contamination was agreed to be important to the success of both the trial and the long-term treatment and reduction of PFAS contamination in surface water and leachate at the site.
- The need for Cleanaway to have in place contingency plans to ensure PFAS-contaminated water is not discharged from site during the wet season, other than relying solely on the treatment plant(s), was also discussed and agreed.
- During the site tour, it was noted that shredder floc from the automotive industry is used as day cover. PFAS is used in many vehicle components including seats, carpets, seals, brake pads, etc. The PFAS NEMP also lists surface treatments including polishing, cleaning, stain and water protection products, lubricants, hydraulic fluids, tubing, oil pan, head gaskets, sealant, wire and cabling, fire retardant and metal plating applications as potential sources of PFAS in vehicles.
  (source: https://www.michiganchemistry.com/assets/2018-Conference/PFAS%20Update%20-%20AECOM.pdf and PFAS NEMP Table B2 pp.106-107).
- The department is concerned that the shredder floc from Sims Metal may be an ongoing contributor to the PFAS contamination on the site. In addition, the department has previously corresponded with Cleanaway in late 2017 and early 2018 about the receipt of shredder floc onto the site, as it may be considered a regulated waste *Environmental Protection Regulation 2019* due to the presence of various other contaminants.
- The department is concerned that construction and demolition waste may also be an ongoing contributor to the PFAS contamination at the site. PFAS is used in the construction industry including tile and stone coatings, paints, varnishes, sealants, other architectural coatings for films, facades and infrastructure, rigid foams, silicone rubber, thread sealant tapes and pastes and PPE (source: PFAS NEMP Table B2 pp.106-107) .
- Cleanaway have confirmed that the –high risk– PFAS contaminated water from the perched pond is used for dust suppression in the tip face and the RRAs as these drain to the leachate system, and that –low risk– PFAS-contaminated water in Void 10 is used for dust suppression on site in areas that drain to the stormwater runoff system.
- The Rembind is to be used in the concrete drain that flows into –Chum Pond–.

Further information requested:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
- Details as to how and where the wastes from the treatment plant will be managed and disposed.
- An update as to when and where the trial treatment plant is likely to be installed and operational on site.
- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment

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plant? Also, what are the timeframes for obtaining such approvals?

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.

Could you please provide the information requested by 5.00pm on Friday 11 December 2020? I tried to call a couple of times this afternoon but couldn't catch you, if there are any issues or questions please let me know – please note that my phone number has changed, the new one is 07 3894 8153.

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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I acknowledge Aboriginal and Torres Strait Islander people as the Traditional Owners of this country, and their connection to land, sea and community.
I pay my respect to all Traditional Owners, and to the Elders past, present and emerging.

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Topic	Actions		Status	Indicative Timeframe	KPIs
Defining legacy water versus low impact water	1-1	**Definition and delineation of low impact versus legacy water to allow management solutions to be identified** Legacy water – on-site surface water known to be impacted with PFAS above 0.05ug/L (legacy water on-site has a total PFOS concentration ranging from 0.05 - 0.14ug/L). For the purposes of this definition, the following will be considered "legacy water": ○ water from the Sediment Basin (incl. decommissioning dewatering) ○ water within the Perched Pond (pre completion of PFAS SMP action 3) ○ water within Chum Street Basin (pre completion of PFAS SMP action 3) Low impact water – onsite water that has not been in contact with legacy water, or that has a concentration less than 0.05ug/L*. This includes: ○ Surface water in the new Basins (post completion of PFAS SMP action 3) ○ Water within Void 10 (noting max PFOS concentration is 0.02 ug/L) ○ Surface water captured in Chum St Pond (post completion of PFAS SMP Action 3). It is noted that current leachable concentrations in sediment and silts as assessed on site are also less than this concentration. ** It is noted that the 0.05ug/L concentration was adopted as this is less than Drinking water criteria for PFOS, and lower than the legacy water concentrations.* *It is noted the discharge criteria remains at 0.00023ug/L. However, we acknowledge that this is impractical to adopt as an onsite criteria at the outset of this management strategy. As such, this criteria is considered interim only, noting that as the PFAS SMP actions are progressed the surface water concentrations are expected to decrease, and this criteria will also be revised accordingly.*	Complete	12 Jun 2020	N/A
Separation and Reduction of Legacy Water	2-1	**Separation of legacy water storage from low impact water storage** Separation of legacy water with low impact water has been achieved through the construction and management of our new surface water basins on site (Basin 1 and Basin 2). As such, separation and delineation of the legacy water compared to low impact water has been achieved at the site, and therefore the risk of offsite discharge of the legacy water is greatly reduced.	Complete	1 Jul 2020	Management of legacy water on site without release to the environment

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Topic		Actions	Status	Indicative Timeframe	KPIs
	2-2	**Transition to restricted use of legacy water on site** Transition across to only use legacy water on lined areas of the landfill, all other operational areas will use low impact water.	Complete	31 Jul 2020	Reduction in volume of legacy water stored at the site
Site Works	3-1	**Desktop review of onsite surface water catchments to identify areas for PFAS rectification and management** A desktop review of the surface water catchments was completed, with the identified rectification, separation and remediation works identified and detailed below in Actions 3-2 and 3-3.	Complete	26 Jun 2020	N/A
	3-2	**Works on Chum Street Basin catchment, including:** a) Removal of any residual silt and sediment from basin and drains (identified in Env Rpt as impacted with low level PFAS). b) Installation of additional velocity and sediment check controls within drains. This is aimed at: o minimising PFAS impacted sediments reaching basin (noting sediments within basins have the potential for longer contact time with water, therefore leachability risk increases). o slowing water to increase contact time at rock checks to assist with passive control. c) The addition of passive PFAS removal aggregate[1] within these rock checks, or within gabion type basket structures behind rock checks (to be defined). d) The addition of passive PFAS aggregate at overland flow discharge point of Chum Street Basin. This would force any discharge of this basin to flow through this aggregate as a last line of defence. e) Cell 5 batter final capping progressed. This capping has been designed to minimise and slow runoff, as well as by overlaying new materials under the new water regime will minimise any pre-existing impact.	Underway *See note 1 at end of Document*	Jul – Feb 2021	Reduction in mass of PFAS in Chum Street Basin.

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[1] Noting the product currently being investigated is Rembind + Aquagate. This is an aggregate coated with Rembind, a product which has been proven to effectively bind with PFAS. This would be used as a trial initially to determine if suitable for this site and concentration. Considered here as a "polishing" control, rather than a treatment, given that the success of the absorption will be based on contact time. We do note that this product has been successful in lab treatment trials by the supplier for up to 60 ug/L where a life expectancy of 12 months was noted (noting the legacy water at New Chum contains less than 1 ug/L).

Topic		Actions	Status	Indicative Timeframe	KPIs
	3-3	**Site works on main catchment (noting all operational areas are managed through the leachate system) including:** This is primarily managed through the new Surface water Basins on site, and the stormwater drains created for this purpose. a) As per 3-2, additional rock checks and passive PFAS aggregate controls to be added to drains, inflow and overflow points of Basin 1. b) Review of licenced discharge point, noting this is currently located on a legacy water basin, to determine if this should be changed to Basin 1. c) Cell 1 batter final capping is being progressed. This capping has been designed to minimise and slow runoff, as well as by overlaying new materials under the new water regime will minimise any pre-existing impact.	Underway *See note 2 at end of Document*	Jul – Feb 2021	Mass of PFAS in Basin 1 to be established, then reduced.
Groundwater	4-1	Completion of sediment pond in-filling (part of Cell construction works). Breaks the link between surface water and groundwater at site	Underway	TBD	Complete in-fill works
	4-2	**Leachate sample - Cell 1 drilling** Based on the potential source of unlined historical cells, additional information is required to determine if Cell 1 is contributing to groundwater impact. • a historical riser was located in the SW corner of Cell 1. Under further investigation, the pipe was identified as capped at approx. 10m bgl, annulus around riser appears to go to a depth of 16.2m (with refusal on sand). • a leachate bore was installed within the unlined Cell 1 (completed on 25th June 2020). Sampling was completed the week of 29th June, noting a sample of liquid was obtained from within this bore (from initial review liquid had similar colour, odour and visual characteristics of leachate). Analysis is being progressed.	***Completed*** Underway *See note 3 at end of Document*	***30 July 2020*** 30 October 2020	***Leachate bore installed in Cell 1.*** Sampling of leachate and characterisation assessment.
	4-3	**Additional GW bores – 4 agreed wells** Based on the previous PFAS Environmental Rpt (3 April 2020) data gaps identified areas where additional Groundwater bores were required to assist with characterisation. A program for well installation works was included in the addendum monitoring plan (as finalised 3 June 2020). • Installation works were completed between 22nd June to 26th June 2020. • 4 monitoring locations (BH19, BH20, BH21 and BH22) successfully installed. Installation report to be included in addendum Environmental Rpt, with monitoring data.	Completed *See note 4 at end of Document*	30 June 2020	Bores installed as proposed

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Topic		Actions	Status	Indicative Timeframe	KPIs
	4-4	**Offsite NE GW Well – IF REQUIRED** A data gap identified relates to the offsite movement of impacted groundwater to the NE of the site. For context, due to difficulties obtaining approval to drill in neighbouring site, it was discussed and agreed to progress (4-2) and (4-3) initially, where these do not provide sufficient evidence to rule out connection between groundwater and the historic unlined Cell 1, we will then further review options.	TBD (based on 4.2 additional works)	Feb 2021 Review monitoring results; report due end of Jan 2021	TBD
	4-5	**Mitigation measures for impact to GW – IF REQUIRED** Where either 4-2, 4-3 or 4-4 determines that leachate in Cell 1 is contributing to PFAS within groundwater in proximity of the site the following will be completed: • notification to the Department of findings within 5 business days of finalising the characterisation assessment. • reasonable and practicable mitigation measures will be determined for discussion with the Department.	TBD – based on results of above	TBD	TBD
Solids management	5-1	**Sediments and Silt Management** Where solids are required to be disturbed through this program of works, a review is required to ensure the appropriate disposal / management strategies are employed. <u>Sediments and Silts from stormwater drains and basins</u> Where silt and sediment removal from the stormwater drains and basins is required under the PFAS SMP, the material must be: • managed to minimise spread or distribution of the solids during works. • where temporary on-site stockpiling is required, this is to be undertaken in accordance with the PFAS NEMP (version 2.0).	Completed	Oct 2020	N/A
	5-2	**Waste acceptance review** A review of waste acceptance procedures and incoming waste streams received at this site to: • identify PFAS impacted waste streams which may have presented a past potential source of PFAS. • based on the above waste review, a review of the current waste acceptance procedures will be undertaken to minimise acceptance of PFAS contaminated waste streams where practicable.	Underway	1 Feb 2021	Updated waste acceptance procedures

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Topic		Actions	Status	Indicative Timeframe	KPIs
Documentation	6-1	**SBMP update** All works completed under this PFAS SMP will be transferred to the Site Based Management Plan (SBMP) where appropriate (i.e. on-going management is required, definitions adopted long terms for the site, etc.). This is likely to occur at the end of this PFAS SMP, or at least post the completion of 3-2, 3-3.	Underway With Operations to review	29 Jan 2021	Updated SBMP
	6-2	**PFAS SMP report** A summary of the PFAS SMP works completed will be compiled into a report and provided to the Department as proof of completion. It is noted, this report will include: • the updated waste acceptance procedures (action 5-2). • the updated SBMP (action 6-1). • reporting against the KPI's. • acknowledge where some of the above management measures are on-going (i.e. the passive treatment and clean up of the surface water and subsequent reduction in PFAS mass in Chum Street Basin).	Pending	Feb 2021	
	6-3	**PFAS SMP Updates** This table will be provided to the Dept monthly during the program (Aug and Sep), and included in the final PFAS SMP Report (see action 6-2)	***Complete*** ***Complete*** ***Complete*** Underway	***14 Aug 2020*** ***18 Sep 2020*** 30 Oct 2020 15 Jan 2021	

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NOTES:

1. Relevant to 3-2: Works on Chum Street Basin catchment have progressed as follows:
    - Desilting works completed on drains and basin
    - Cell 5 batter final capping works have progressed
    - Discussions have continued with Rembind regarding the aggregate for passive treatment
    - Rembind trial proposed to be undertaken end of Jan now that Cell final capping works completed;
    - Cell 5 final capping works completed and hydromulched 14/01/21
2. Relevant to 3-3: Works on main catchment have progressed as follows:
    - Rock checks and hydro mulching completed on a number of drains / berms and structures within this catchment
    - Cell 1 batter final capping works have been completed with vegetation well-established with good coverage

a pre-lodgment meeting has been held with the Department's assessment team regarding what is required to change the licences discharge (currently being considered internally)

3. Relevant to 4-2: The leachate riser was successfully installed within Cell 1 as part of the June drilling program (see note 4 below for dates). An initial sample was collected and analysed (July 2020), and based on this sample it was noted:

- The level within the Cell 1 riser was 38.6m AHD. Water levels in surrounding groundwater monitoring wells is between 14.5 and 19.8m AHD. Noting Cell 1 levels are approximately 15-20m above the groundwater table in the immediate area.
- The hydrochemistry of the leachate based on the initial sample is distinctly different from surrounding groundwater. In short, generally there is no correlation been observed between PFAS in Cell 1 and PFAS in surrounding groundwater wells. The PFAS within leachate in Cell 1 is considered to be most comparable to contact water samples previously collected (in both concentrations and composition).
- For completeness - it is noted that there were precursor compounds identified in Cell 1 leachate.

Additional works were noted as required, including the additional sample. This has since been collected, and the characterisation assessment of Cell 1 leachate compared to surrounding groundwater will be provided with the RFI interim report in October. This will include an initial discussion on mitigation measure if and where required.

4. Relevant to 4-3: The 4 additional groundwater bores (BH19, BH20, BH21 and BH22) were installed between 22nd and 26th June 2020, in locations at or close to those agreed with the Department in our previous discussions. Monitoring results for the June monitoring event were provided with the previous update for the Department's reference.

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Date : 18/12/2020 1:01:07 PM
From : "PERRY Nadene"
To : sch4p4(6) Personal
Cc : "ROWE Sarah" , "BRADSHAW Tony" , sch4p4(6) Personal information **, "SUMMERVILLE Sinead" , "CARLISH Kate"**
Subject : RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020
Attachment : image001.png;image006.png;image009.jpg;image010.png;image017.jpg;image002.png;image008.png;image011.png;image014.png;image015.png;image016.png;image018.png;image019.png;

Hi sch4p4(6

It is my understanding that Cleanaway do not require an additional ERA for the PFAS water treatment plant(s). Cleanaway are not receiving PFAS contaminated water from any off-site source, and the treatment process is considered to be part of carrying out the ERAs that you are already licensed to carry out at the premises.

I've included Kate from the waste assessment team in this email to keep her in the loop, as I know the two of you have been in contact in the last couple of months about other EA amendments.

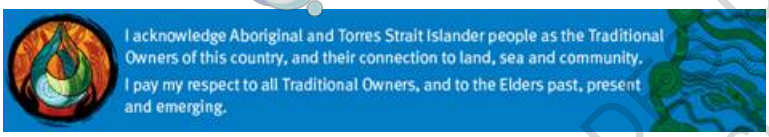
Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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Level 4 / 117 Brisbane Street, Ipswich QLD 4305
PO Box 2578, North Ipswich QLD 4305

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From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Thursday, 17 December 2020 1:47 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Thanks Nadene,

We will confirm with Arcadis and come back to you on the below.

Are you able to confirm our discussion at the site inspection and earlier discussions that an ERA is not required for the treatment plant (trial and permanent) at site, and that this is considered ancillary to current operations. I note on this that the reuse and discharge aspects of the treatment of leachate / surface water will require some additional discussion and potential amendments to the current EA conditions.

Thanks in advance

sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
Mob: sch4p4(6) Pel
E: sch4p4(6) Per@cleanaway.com.au | www.cleanaway.com.au

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Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Thursday, 17 December 2020 12:57 PM

To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe
sch4p4(6) Pers@cleanaway.com.au>; sch4p4(6) Personal informatic@cleanaway.com.au>; SUMMERVILLE Sinead
<Sinead.Summerville@des.qld.gov.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6)

Further to my email below, I have reviewed the contaminants and allowable leaching contaminant levels listed in your EA, and note that the EA contains limits for the following contaminants that do not appear to be included in the WTP analysis that you provided (attached):

- Antimony
- Barium
- Total MAH
- Benz(c)phenanthrene
- Dibenz(a,h)pyrene
- Dimethylbenz(a)anthracene
- M-cresol
- O-cresol
- P-cresol
- Carbon tetrachloride
- 1,2 Dichloroethane
- 1,1 Dichloroethane
- Chlorobenzene (total)
- Lindane
- Toxaphene
- 2,4-D
- 2,4-DB
- 2,4,5-T
- MCPA
- Carbaryl
- Carbofuran
- Atrazine
- Simazine
- Chlorophenol – noting that 2-chlorophenol is listed in the WTP analysis
- Bromide – noting that bromine is listed in the WTP analysis
- Trichlorophenol – noting that 2.4.6-trichlorophenol and 2.4.5-trichlorophenol are listed in the WTP analysis.

When we were discussing the trial treatment plant with the Arcadis representatives on site, Cleanaway and Arcadis stated that the trial would be assessed against all relevant environmental release criteria including the EA and trade waste release limits. It was highlighted during this discussion that the treated effluent from the treatment process must meet all relevant criteria in addition to treating the PFAS contamination. Could you please confirm if Cleanaway intend to analyse the treated effluent from the trial treatment plant for all of the contaminants listed in the EA?

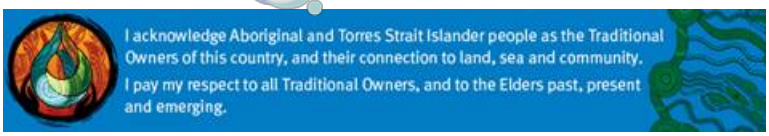
Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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From: PERRY Nadene
Sent: Wednesday, 16 December 2020 12:18 PM
To: sch4p4(6) Perso
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informat SUMMERVILLE Sinead
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(6

Thank you for providing the information requested, the department will review this in due course and if there are any additional questions I'll

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let you know.

The department is also interested in understanding the financial investment required to remedy PFAS contamination on the premises, could you please provide some details as to the costs Cleanaway have/will incur as follows:

a. Installation costs for the trial treatment plant;
b. Operational costs for the trial treatment, including sampling and analysis costs; and
c. Approximate cost for the installation and operation of the permanent treatment plant, noting that this will likely be dependent on the outcomes of the trial and may only be indicative at this point in time.

If there are any issues or questions please let me know.

Cheers,

Queensland Government

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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I acknowledge Aboriginal and Torres Strait Islander people as the Traditional Owners of this country, and their connection to land, sea and community.
I pay my respect to all Traditional Owners, and to the Elders past, present and emerging.

From: sch4p4(6) Personal information @cleanaway.com.au>
Sent: Monday, 14 December 2020 3:47 PM
To: PERRY Nadene
Cc: ROWE Sarah; BRADSHAW Tony; sch4p4(6) Personal informati
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi Nadene,

As discussed, please see the attachments as promised.

Warm Regards

sch4p4(6) Pers
Senior Environmental Business Partner

172 Crockford Street, Northgate QLD 4013 Australia
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E: sch4p4(6) Pers@cleanaway.com.au | www.cleanaway.com.au

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From: sch4p4(6) Perso
Sent: Friday, 11 December 2020 4:07 PM
To: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; sch4p4(6) Pe sch4p4(6) Per@cleanaway.com.au>; sch4p4(6) Personal informatio@cleanaway.com.au>
Subject: RE: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Good Afternoon Nadene,

Please find the responses to your "further information requested" as follows:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
  Please refer to the attachment *"2020.10.26_Leachate Treatment Trial Arcadis DES v1.pdf"*.

- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.

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Please refer to the attachment *"WTP Analysis", noting that as we progress through the trial this list will be reviewed and refined as appropriate.*

- Details as to how and where the wastes from the treatment plant will be managed and disposed.

  There are three primary waste streams that will be managed and disposed of (refer to attached "*Process Flow Diagram*").

  1. Waste gas will be destroyed in an ozone destruction vessel. Dischargeable gases will be safely vented to atmosphere and monitored appropriately.
  2. Waste liquid concentrate will be stored on site in a 22kL poly tank. The concentrate will be periodically removed off site to a destruction facility (likely Renex).
  3. Treated leachate will be stored on site for testing and then discharged into the existing leachate recirculation trenches.
  4. Solid waste streams (comprising of spent resin, GAC, solid filter cartridges and used sample containers), these will also be sent to an off site to a destruction facility (likely Renex).

  We are currently progressing the review of disposal / reuse options for treated leachate / surface water on site (including irrigation of vegetation, reuse as dust suppression etc.).
  Noting we are currently drafting the reuse/disposal hierarchy as it applies to our current EA and will be providing this to yourself for agreement of proposed reuse / discharge / disposal, and prior to progressing an amendment with the assessment team. On this I note:
    - Condition G11 (2) allows recirculation through the landfill unit, but (3) requires agreement with the administering authority for offsite disposal, discharge and reuse on site.
    - Condition A5 would restrict the onsite reuse of this treated liquid as dust suppression, which would require an EA amendment.

  I hope to come back to you in the next few weeks with the initial details of this hierarchy for discussion.

- An update as to when and where the trial treatment plant is likely to be installed and operational on site.

  Please find below a summary of the WWTP trial project:

  <u>Treatment Selection</u>
    - As discussed with DES at our preliminary meeting on 10 November 2020, the preferred treatment technology for treating PFAS and multiple other parameters in stormwater and PFAS contaminated leachate is ozofractionation, supplied by Arcadis/Evocra,. This technology was preferred following a robust feasibility assessment conducted by Cleanaway.
    - Arcadis has a rental unit currently situated in Yatala (QLD) which can treat 50-100kL/day of influent. This is the best, most immediate solution to prove concept, aid in the height rise application, as well as start alleviating the leachate surplus currently on Site.
    - This system has been used and proven at both Brisbane Airport and Hobart Airport to treat PFAS contaminated dirty water. In both examples, the technology was able to meet stringent discharge target, similar to what we are targeting at New Chum.

  <u>Progress Update</u>

  Friday 27 November 2020:
    - lined treatment pad with bund construction completed, including an additional gravel pad area for parking and equipment laydown.
    - Evocra/Arcadis operations staff inducted to Cleanaway New Chum site.

  Week starting Monday 30 November 2020:
    - Hazard and Operability Study (HAZOP) workshop held with key representatives form Cleanaway, Arcadis and Evocra.
    - Mobilisation of primary treatment equipment. Two 40' high cube shipping containers delivered to site (containing all necessary treatment apparatus), position on bunded area and unpacked.
    - Installation of acoustic shielded generator, and electrical works undertaken.
    - Poly tanks delivered to site, located on treatment pad/bund.
    - Leachate ring main extended to treatment trial pad, and return main installed to enable discharge to existing leachate recirculation trenches.

  Monday 7 December
    - Ongoing set up (plumbing and electrical installation activities).
    - Site process review with Cleanaway engineering personnel.

  <u>Scheduled Activities</u>
    - Completion of site setup and mobilisation activities by Thursday 10 December 2020.
    - Commissioning activities to commence with clean (potable) water on Friday 18th December 2020.

  At present the scheduled start date to commence the leachate trial is after the above commissioning which is noted for Friday 18th December 2020. The trial is intended to extend for one month (noting two weeks down time over the Christmas break).

  Location of the trial plant is as follows.

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- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?

  We are working with Ipswich City Council (ICC) to ensure all necessary approvals required are received for the trial and permanent solutions, we have also engaged our external town planner to provide us assistance with this process.
  We currently have a meeting scheduled to discuss this further with ICC next week, noting that they are fully aware of the above works and progress. The trial start date as noted above is currently scheduled for the 18th Dec, but this is based on receiving written confirmation from ICC prior to this date.

  As discussed with DES during the inspection there is no requirement for an ERA or an EA amendment on situating the trial or permanent treatment plants. However, as noted in the 3rd dot point response above, we understand we need agreement from the administering authority prior to offsite discharge or disposal or on-site reuse, and in some cases (i.e. using this for dust suppression) this will require an EA amendment prior to commencing. Further conversations / correspondence will be provided to this end.

- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment plant? Also, what are the timeframes for obtaining such approvals?

  The full-scale treatment plant is included in the above discussions regarding ICC and with our town planners, so at this stage timeframes for approvals have not been confirmed. However, we are targeting installation of the permanent facility by mid-2021.

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.

  In addition to the treatment plant, the onsite PFAS impacted surface waters are being used for dust suppression activities across the lined and operational areas of the site (i.e. the RRA and landfill) to reduce the volumes of water stored on the site.

- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.

  We note that the previous correspondence around flocc indicated that we were waiting on further advice from the Department regarding the regulated status of this waste (noting the discussion included the Department discussing this with the greater waste industry and the metal recyclers directly), following which we would apply the final determination to our waste acceptance process. I further note that post the inspection the exposed area of flocc waste has since been covered with earthen material, and re communication to the team regarding what constitutes suitable cover material has occurred.
  Relating to the Department's current strategy that all material that contains any trace of PFAS is considered to be PFAS waste, we are currently in discussions with Kathrin Sherman, Clair Andersen and Adam Cradick from the Department relating to what is reasonable and fair in terms of classification of various waste types and what sampling is practical in these situations. We are not looking for a reason to not proactively adopt this new path forward, however this is a bigger issue than our site alone. For example, are all general waste landfills and transfer stations (including putrescible municipal landfills) being asked to analyse and limit their acceptance based on PFAS concentrations? Has this requirement to show each load of construction and demolition waste to be PFAS free been communicated to the waste industry and all the generators specifically – including municipal collections?
  Cleanaway will continue to monitor and adopt all reasonable and practicable best practice processes. And as we progress the discussion with the Department (noting the first discussion was Tuesday 8th Dec) we will as a company adopt the reasonable outcomes of this collaboration to lead the journey to stronger waste compliance in Queensland. However, we request patience while this discussion occurs and the outcomes agreed on.

If you need further information, please don't hesitate to contact me

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Warm Regards
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Please consider the environment before printing this email.

From: PERRY Nadene <Nadene.Perry@des.qld.gov.au>
Sent: Tuesday, 8 December 2020 5:12 PM
To: sch4p4(6) Personal information @cleanaway.com.au>
Cc: ROWE Sarah <Sarah.Rowe@des.qld.gov.au>; SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>; BRADSHAW Tony <Tony.Bradshaw@des.qld.gov.au>; INONDA William <William.Inonda@des.qld.gov.au>; SMALL Dana <Dana.Small@des.qld.gov.au>
Subject: PFAS summary and request for information - Cleanaway site visit 10 November 2020

Hi sch4p4(

Apologies for the delay in getting back to you about this one, please see below a summary of the information discussed during our site visit on 10 November 2020, and a list of further questions/information requested.

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Summary

- Cleanaway are proposing to engage Arcadis to carry out a trial treatment process to treat PFAS contamination in surface water and leachate using an OCRA Process including polishing with resins at the end of the process; at the time of the meeting, it was anticipated that the trial plant would be installed within one month (early- to mid-December).
- Once Arcadis have been formally engaged, commissioning of the trial treatment plant will take approx. two weeks, and the trial itself will be conducted over a minimum of 30 days to optimise the system. The pad where it is to be located on site is currently being prepared and will be bunded.
- Arcadis are yet to determine if surface water and leachate will be treated as separate or mixed streams during the trial.
- The trial treatment plant will produce three outputs – waste, treated water and solids. Waste fractions can be run back through the treatment plant for a second run/pass and this has been found to be beneficial in other applications.
- As part of the analysis of the efficacy of the treatment process, Cleanaway will need to ensure that not only PFAS is treated, but also ensure all other parameters (e.g. metals and nutrients) meet relevant discharge limits. Analysis for PFAS will include standard suite and TOP Assay.
- The trial plant will continue to operate on the site while a larger treatment plant is commissioned for long term use.
- The need for ensuring that water balance calculations and an assessment of the incoming waste streams in terms of PFAS contamination was agreed to be important to the success of both the trial and the long-term treatment and reduction of PFAS contamination in surface water and leachate at the site.
- The need for Cleanaway to have in place contingency plans to ensure PFAS-contaminated water is not discharged from site during the wet season, other than relying solely on the treatment plant(s), was also discussed and agreed.
- During the site tour, it was noted that shredder floc from the automotive industry is used as day cover. PFAS is used in many vehicle components including seats, carpets, seals, brake pads, etc. The PFAS NEMP also lists surface treatments including polishing, cleaning, stain and water protection products, lubricants, hydraulic fluids, tubing, oil pan, head gaskets, sealant, wire and cabling, fire retardant and metal plating applications as potential sources of PFAS in vehicles.
  (source: https://www.michiganchemistry.com/assets/2018-Conference/PFAS%20Update%20-%20AECOM.pdf and PFAS NEMP Table B2 pp.106-107).
- The department is concerned that the shredder floc from Sims Metal may be an ongoing contributor to the PFAS contamination on the site. In addition, the department has previously corresponded with Cleanaway in late 2017 and early 2018 about the receipt of shredder floc onto the site, as it may be considered a regulated waste *Environmental Protection Regulation 2019* due to the presence of various other contaminants.
- The department is concerned that construction and demolition waste may also be an ongoing contributor to the PFAS contamination at the site. PFAS is used in the construction industry including tile and stone coatings, paints, varnishes, sealants, other architectural coatings for films, facades and infrastructure, rigid foams, silicone rubber, thread sealant tapes and pastes and PPE (source: PFAS NEMP Table B2 pp.106-107) .
- Cleanaway have confirmed that the 'high risk' PFAS contaminated water from the perched pond is used for dust suppression in the tip face and the RRAs as these drain to the leachate system, and that 'low risk' PFAS-contaminated water in Void 10 is used for dust suppression on site in areas that drain to the stormwater runoff system.
- The Rembind is to be used in the concrete drain that flows into 'Chum Pond'.

Further information requested:

- A copy of the Arcadis presentation regarding the proposed treatment plant.
- The list of analytes proposed to be sampled in the untreated leachate/water (influent/inputs) and treated water (effluent/output) throughout the trial.
- Details as to how and where the wastes from the treatment plant will be managed and disposed.
- An update as to when and where the trial treatment plant is likely to be installed and operational on site.
- Has Cleanaway obtained all necessary approvals for the installation and operation of the trial treatment plant such as from Ipswich City Council?
- Presuming the trial treatment plant is a success, what approvals are required for the installation and operation of a full-scale treatment

plant? Also, what are the timeframes for obtaining such approvals?

- Details as to any additional measures Cleanaway propose to take to ensure PFAS-contaminated water is not released from the site, in addition to the treatment plant.
- Results of any sampling data that Cleanaway have used to determine the quality of all wastes received at the site for disposal, and in particular for shredder floc and construction and demolition waste, in order to classify them as general waste as opposed to regulated waste in the *Environmental Protection Regulation 2019*.

Could you please provide the information requested by 5.00pm on Friday 11 December 2020? I tried to call a couple of times this afternoon but couldn't catch you, if there are any issues or questions please let me know – please note that my phone number has changed, the new one is 07 3894 8153.

Cheers,

Nadene Perry
Senior Environmental Officer
Energy, Extractive and Southwest Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science

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Queensland Government

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I acknowledge Aboriginal and Torres Strait Islander people as the Traditional Owners of this country, and their connection to land, sea and community.
I pay my respect to all Traditional Owners, and to the Elders past, present and emerging.

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