

Janet Cumming

From: James Stewart <james.stewart@premiers.qld.gov.au>
Sent: Friday, 9 March 2018 12:27 PM
To: Adrian Mckay; Amani Kowero; David Larkings; Janet Cumming; Justin Carpenter; Michael Logan; Peter Kind; Raymond Bott; Reinier Mann; Richard Watts; simone.ventura@ehp.qld.gov.au; Sophie Dwyer; Suzanne Huxley; Suzanne Vardy; Tony Bradshaw
Cc: Michael Ross
Subject: FW: Amberley PFAS Investigation - Project Control Group Meeting - Wed 14 Feb 1.30pm [SEC=UNCLASSIFIED]
Attachments: Reference Figure_1a_SW_MaxPFOSValue_2016_2017.pdf

Surface water results for Amberley.

From: Glyde, Virginia MS [mailto:virginia.glyde@defence.gov.au] **On Behalf Of** PFASIM Amberley
Sent: Wednesday, 7 March 2018 3:52 PM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Cc: Buldo, Michael MR 1 <michael.buldo1@defence.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; 'Tony Bradshaw' <Tony.Bradshaw@ehp.qld.gov.au>; Leriche, Michael MR <michael.leriche@defence.gov.au>
Subject: RE: Amberley PFAS Investigation - Project Control Group Meeting - Wed 14 Feb 1.30pm [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James,

In response to your query below, I attach the figure that was distributed at the PCG meeting for discussion purposes. The figure is of preliminary Surface Water sample results from the project, and I would like to make note that as the project is in the early stages of receiving results and analysing them in context, it was clarified at the time of distribution and discussion that this figure was presented for illustrative purposes only. Further analysis will be undertaken with Groundwater, Sediment and Soil results, and in the context of other information being obtained by the consultant.

As you are aware, the Preliminary Sampling Program undertaken in 2016 (report available at <http://defence.gov.au/environment/pfas/Amberley/publications.asp>) presented PFAS detects in SW samples from the Bremer River and Warrill Creek, prompting the initiation of the Amberley detailed investigation.

We are happy to answer any queries the TWG might have on this figure.

Thank you
Virginia

Virginia Glyde

(Contractor to Defence)
Defence Project Manager - Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Monday, 26 February 2018 3:05 PM
To: PFASIM Amberley
Cc: Buldo, Michael MR 1; Justin Carpenter; Tony Bradshaw
Subject: RE: Amberley PFAS Investigation - Project Control Group Meeting - Wed 14 Feb 1.30pm [SEC=UNCLASSIFIED]

Good afternoon Virginia,

Queensland Government representatives who attended the Amberley PCG teleconference have expressed some interest in the results that CH2M discussed. It seems that the sampling shows that PFAS has moved into downstream surface waters to the lower Warrill Creek and Bremer River. We would be interested in taking a look at these results.

Are you able to send me through the results discussed by CH2M, along with a sampling map for our Technical Working Group to review?

If you have any queries please feel free to contact me.

Best regards,



James Stewart
 Policy Officer
 Environment Policy
 Department of the Premier and Cabinet
 P 07 3003 9487
 1 William Street, Brisbane QLD 4000
 PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
 Australia's campaign to stop violence against women

From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley
Sent: Tuesday, 13 February 2018 10:41 AM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Cc: Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Buldo, Michael MR 1 <michael.buldo1@defence.gov.au>
Subject: Amberley PFAS Investigation - Project Control Group Meeting - Wed 14 Feb 1.30pm [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hello James,

Tomorrow we will be hosting the first of the RAAF Base Amberley PFAS Investigation Project Control Group meetings. The meeting is scheduled for 1.30pm.

For your information, the following stakeholders will be in attendance by teleconference:

Ipswich City Council:

- Tiffany Rees, Project Officer, Environmental Management

Queensland Government Departments:

- Environment & Science: PFAS Project Team, Josh Brown, will be joined by Amani Kowero and Simone Ventura (tentative)
- Agriculture and Fisheries, Michael Ross, Strategy Co-ordination and Skills
- Natural Resources Mines and Energy, Guy Bignell, Senior Project Officer, Water Services, South Region
- Health, Bruce Morton, Manager Environmental Health, will be joined by Catherine Quagliotto & Ramu Beesabathini

The meeting will predominantly be a teleconference, led by the project team at Amberley. In the room at Amberley will be:

- Amberley Base Support Manager (acting), Christopher Hood
- Amberley Regional Environment and Sustainability Officer, Linda Oliver
- Defence PFASIM Regional Representative, Matthew Clarke
- Defence PFASIM Project Directors Michael Buldo and Michael Le Riche
- Defence PFASIM Project Manager Virginia Glyde
- CH2M / Jacobs, Project Manager Jeremy Wicks
- CH2M / Kommunikate, Stakeholder and Community Engagement Lead, Leslie Wapler
- Senversa, Technical Advisor, Vanessa Bryant

A few other project consultant team members will be listening on the teleconference. The CH2M Project Manager and Defence will lead the discussion.

This is the first of our regular PCG meetings, and the selection of attending stakeholders is largely based on those that provided regional support and attendance at the Community Walk In Session in November. If you have recommendations for additional or different members being involved going forward, please advise.

Thank you
Virginia

Virginia Glyde

(Contractor to Defence)
Defence Project Manager - Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

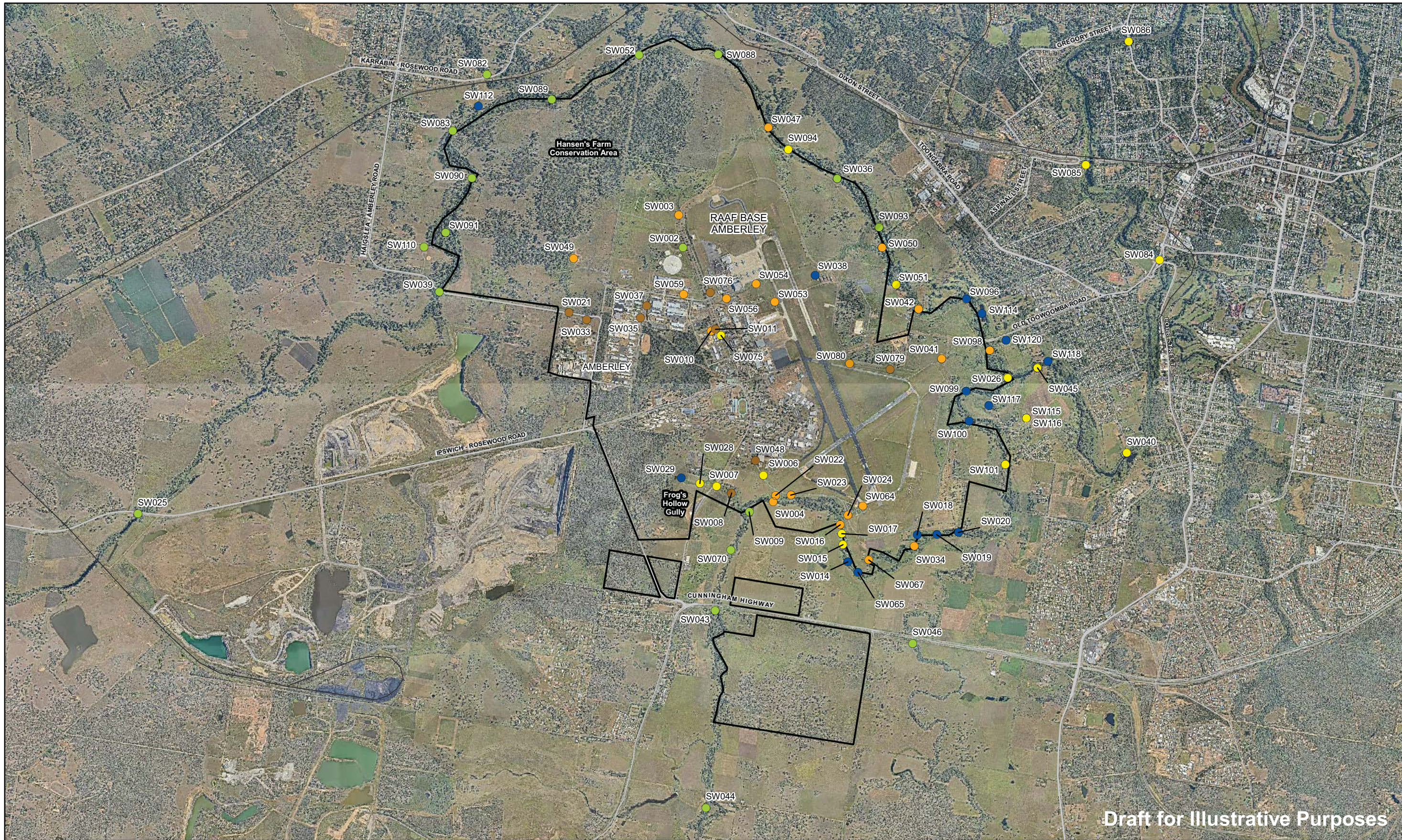
Department of Defence | Estate & Infrastructure Group
M: [REDACTED] E: virginia.glyde@defence.gov.au

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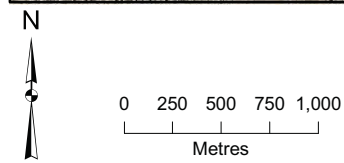
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Draft for Illustrative Purposes

Figure 1a
Maximum Recorded Value for PFOS (2016 - 2017)
Amberley PFAS Investigation
Department of Defence



Janet Cumming

Subject: Amberley PFAS Investigation PCG Meeting
Location: Conference Room in Building 737 (Defence PM/PD and Base Representatives only)

Start: Wed 21/03/2018 1:30 PM
End: Wed 21/03/2018 2:30 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Tentatively accepted

Organizer: Wicks, Jeremy/BNE

Good afternoon,

Please note the following for the PCG Meeting tomorrow.

AGENDA

- Project Update
- Off-Property Sampling
- DSI Report
- HHRA / ERA
- Project Programme
- Questions
- Proposed Date for next PCG Meeting

DIAL IN DETAILS

For those calling in to the meeting, please note the teleconference number below.

Phone: [REDACTED]

Participant Pin: [REDACTED]

IN PERSON ATTENDANCE AT RAAF AMBERLEY

For Defence PD and PM, and Base Representatives the Conference Room in Building 737 has been booked for the meeting.

Best regards

Jeremy Wicks
 Project Manager – RAAF Base Amberley PFAS Investigation
 M +61 [REDACTED]
 CH2M
 32 Cordelia Street
 South Brisbane QLD 4101
www.ch2m.com

Janet Cumming

From: Wicks, Jeremy/BNE <[REDACTED]>
Sent: Monday, 16 April 2018 11:58 AM
To: eigservicedelivery.ambbsm@defence.gov.au; robert.craig@defence.gov.au; christopher.hood1@defence.gov.au; matthew.clarke1@defence.gov.au; linda.oliver@defence.gov.au; virginia.glyde@defence.gov.au; michael.leriche@defence.gov.au; Cuttler, Jo/HML; Scott, Philippa/SYD; leslie@communicate.net.au; Vanessa Bryant; ian.batterley@senversa.com.au; Tiffany.Rees@ipswich.qld.gov.au; Amani.Kowero@des.qld.gov.au; tony.bradshaw@des.qld.gov.au; michael.ross@daf.qld.gov.au; guy.bignell@dnrm.qld.gov.au; Bruce Morton; Suzanne Huxley; Janet Cumming; Wicks, Jeremy J (JACOBS); Leslie Wapler; Ramu Beesabathini; Janet Cumming; BROWN Josh (DES); BIGNELL Guy; Wicks, Jeremy J (JACOBS)
Subject: Amberley PFAS Investigation - PCG Meeting #2 - Meeting Minutes from 21/3/18
Attachments: Amberley PCG Minutes 21_March_18_RevB.PDF

Good morning

Please find attached the meeting minutes from the PCG Meeting held on the 21 March 2018. The planned date for the next PCG Meeting is Thursday 26/4/18 at 13:30 pm. A Calendar invitation for this meeting will be sent separately.

Later today State and Local Government PCG representatives will receive a link from which the Amberley DSI SAQP and the Preliminary Biota Sampling SAQP can be downloaded. Please note these are not publicly released documents and are not to be distributed further. The documents are only to be used by PCG representatives for the purpose of discussing matters relating to the Amberley PFAS Investigation.

The password to download these documents is "Amberley854".

Best regards

Jeremy Wicks

Project Manager – RAAF Base Amberley PFAS Investigation

M +61 [REDACTED]

CH2M

32 Cordelia Street
 South Brisbane QLD 4101
www.ch2m.com

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Australian Government
Department of Defence
 Estate and Infrastructure Group

PFAS Environmental Investigation – RAAF Base Amberley
PROJECT CONTROL GROUP MEETING MINUTES

Administrative Details	
Date	21 March 2018
Time	1300h
Venue	Teleconference
Chair	Mick Le Riche
Minutes	CH2M
Attendees	<p>Tony Bradshaw / Josh Brown - Queensland Government Department of Environment & Science, Technical Support and Community Response, Regulatory Capability and Customer Service</p> <p>Michael Ross - Queensland Government Department of Agriculture and Fisheries, Strategy Coordination and Skills</p> <p>Guy Bignell - Queensland Government Department of Natural Resources, Mines and Energy, Water Services, South Region</p> <p>Ramu Beesabathini - Queensland Government Department of Health, Environmental Health</p> <p>Tiffany Rees - Ipswich City Council, Environmental Management</p> <p>Christopher Hood - RAAF Base Amberley, Base Support Manager (acting)</p> <p>Michael Le Riche - Defence PFASIM Project Director</p> <p>Virginia Glyde - Defence PFASIM Project Manager</p> <p>Jeremy Wicks - CH2M, Project Manager</p> <p>Philippa Scott - CH2M, Task Manager</p> <p>Leslie Wapler - CH2M, Stakeholder and Community Engagement Lead</p> <p>Apologies:</p> <p>Jo Cuttler - CH2M, Project Director</p> <p>Linda Oliver – RAAF Base Amberley, RESO</p> <p>Matt Clarke – Defence Regional Representative</p>

Meeting Minutes	
Agenda Item	Summary
Project Update	<p>Field work completed since 14 February 2018 has included:</p> <ul style="list-style-type: none"> • Groundwater monitoring wells: <ul style="list-style-type: none"> • sampling from wells • survey of monitoring wells • installation of groundwater level data loggers • Off-Property Sampling: <ul style="list-style-type: none"> • Sampling has been undertaken from: <ul style="list-style-type: none"> ▪ 5 private landowners ▪ 2 public owned property and tenanted for agricultural use ▪ Ipswich City Council (e.g. Road Reserve) • Sampling has been undertaken from

Meeting Minutes	
	<ul style="list-style-type: none"> ▪ soils within the flood plain ▪ surface water / sediment from water storage dams ▪ water bores <ul style="list-style-type: none"> • Off-Base and On-Base Sampling Programme as per SAQP is now largely complete
Upcoming Work	<ul style="list-style-type: none"> • Sampling - remainder of sample sites from private / public land • Groundwater monitoring / aquifer testing / groundwater gauging • Preliminary Biota Sampling (PBS) of Edible Fish Species: Heavy rain delayed the PBS which is now scheduled to be undertaken in the week commencing 02 April 2018. Aquatic ecologists have been watching water levels and flow data from the Bureau of Meteorology, and have recommended that sampling take place after a period of time (approximately 2 weeks) following a major flow event for safety purposes and to improve the likelihood of catching fish. Reporting to take place in May 2018. • DSI Report: Preparation of Detailed Site Investigation (DSI) Report is underway. Targeting submission to Defence in April, and submission to State at the end-May 2018.
Key sample results to date	<p>Summary: PFAS has been detected in off-property sample locations in the following media:</p> <ul style="list-style-type: none"> • soils within the flood plain • surface water / sediment from water storage dams • registered bores <p>Soils within the flood plain: PFAS detected in soils within the flood plain and located close to Bremer River and/or Warrill Creek</p> <ul style="list-style-type: none"> • four samples tested to date exceeded the Residential HSV (max conc. to date is PFOS/PFHxS 0.0954 mg/kg) (from agricultural property adjoining Warrill Creek) <p>Surface water / sediment from water storage dams: PFAS found in majority of samples</p> <ul style="list-style-type: none"> • PFAS in water exceeded drinking water guidelines in four of the water storage dams tested to date. • Maximum concentration observed is PFOS/PFHxS 0.14 µg/l • PFAS in water is believed to be derived from former flood events, and/or the filling of dams with water sources from the Bremer River or Warrill Ck. Source of PFAS to be considered in detail for the preparation of the DSI • Water Use Surveys and communication from landowners indicate that these surface water storage dams are not used for drinking. Some may be used for stock watering. <p>Water bores / monitoring wells</p> <ul style="list-style-type: none"> • PFAS found in one of the Off-Property registered bores investigated located near Warrill Creek and Bremer River with a concentration of PFOS/PFHxS 0.05 µg/l • PFAS <LOR in off-Base well located north of the Base near Karrabin Station • PFAS (PFOS/PFHxS) <LOR in off-Base monitoring wells with exception of one deeper well located south of the Base near Warrill Creek.
Human Health Risk Assessment	<ul style="list-style-type: none"> • HHRA Recommendation accepted by Defence • HHRA Methodology and SAQP Addendum has been submitted to Defence. <ul style="list-style-type: none"> • The SAQP Addendum is for further collection of off-Base data to inform HHRA. This will include further sampling of soil, sediment, groundwater/surface water, biota – edible, and biota used for grazing • Properties considered to be more susceptible to PFAS off the Base are those adjoining Bremer River and Warrill Creek with active/historical use of

Meeting Minutes	
	<p>groundwater / surface water. Higher sampling efforts would be undertaken at these Properties</p> <ul style="list-style-type: none"> • Properties considered to be of less susceptible to PFAS on the Property include land-bound properties with no active use of groundwater, and properties west of the Bremer River from the Base. Lower sampling efforts will be undertaken from these properties. • HHRA Workshop attended by Defence, TA and CH2M (20/3/18) <ul style="list-style-type: none"> • Workshop considered the proposed HHRA Methodology and further Off-Base data required to support the HHRA in the SAQP Addendum. • In summary the methodology and further off-Base sampling is supported by Defence and the Technical Advisor, and is being finalised over the next month (April-18).
Environmental Risk Assessment	<ul style="list-style-type: none"> • Defence has requested further information to support the recommendation on the ERA. • CH2M is preparing an updated ERA Recommendation to submit to Defence
Project Schedule	<ul style="list-style-type: none"> • Targeting end of July 2018 for completion of DSI
Discussion	<ul style="list-style-type: none"> • Q. (TB) Will the sampling program properly delineate contamination? • A. (JW) The HHRA would include further testing of soils, biota, water and sediment. The level of information will provide a lot more data on the type of PFAS present in off-property locations. In terms of delineating extent of contamination, the off-property work won't necessarily achieve that in full, however this may not be needed in this context of the HHRA. The delineation of contamination extents will be considered as part of the DSI and any data gaps will be noted. • Q. (TB) Would the sampling program properly delineate the plume? i.e. if the plume is going under a property that is not being investigated, is the plume being delineated? The NEPM requires delineation for current and future uses of groundwater. • A. (JW) The monitoring network currently in place is a combination of both registered bores and monitoring wells installed as part of the program. If the horizontal extent of the plume is not delineated, there may be a recommendation in the DSI to further delineate the extent of the plume. • B. Clarification: The DSI will describe where PFAS in groundwater has been delineated. Delineation of the plume will be undertaken to the extent required to inform the undertaking of the HHRA and ERA, and the RAAF Base Amberley PFAS Area Management Plan (PMAP). • Comment (TB) - Environmental values need to be looked at and the actual versus expected impact on them. • A. (ML) Defence is likely to accept the ERA recommendation. In terms of delineating the plume, in consistency with other PFAS projects, the plume will be delineated, however it will not be delineated in an extent that allows for the development of a RAP [Remediation Action Plan]. The requirement to delineate PFAS extents will arise out of final document which is the PFAS Area Management Plan. In terms of environmental and health impacts, the project will have an indication of size and direction of the plume. However, not enough detail will be available to prepare a RAP. If a RAP is to be prepared, further investigation works will be required to determine an extent where remediation can be planned. • B. Clarification: The DSI and ERA will describe and assess risk to environmental values in the receiving environment.

Meeting Minutes	
	<ul style="list-style-type: none"> • Comment (TB) - For Oakey, within the Investigation Area (IA) there are areas where PFAS is and where PFAS is not. • A. (ML) The DSI will assess if the source-pathway-receptor is complete or incomplete. It will look at where the PFAS plume is on the Base to manage. CH2M will be able to determine what the current size of the plume is, the direction it's moving and the range. • Comment (TB) - The receptors also includes values of groundwater where groundwater is used for different uses. • A. (ML) The ERA will identify environmental values that Defence needs to protect, not just what is restricted to the EPBC Act, but also identification of values the State/Local Authority has identified, and not just restricted to species level. • Q. (TB) Will the DSI look at precursors? • A. (JW) Yes, TOPA is considered. • Q. (TR) These questions might be resolved when the group has access to the proposed methodology for the HHRA and ERA. Will we get access to those? This will lead to provision of more confidence in the discussion. • A. (ML) These documents can be provided to this group after they have been reviewed and finalised. Documents that have been finalised to date are the DSI SAQP and the Preliminary Biota Sampling Program addendum. These will be supplied to this group with the minutes from this meeting. Please note these documents are not publicly available and are only to be used by PCG members for purposes relating to this project. Accordingly the documents are not for distribution.
Community Interactions	<p>Two key areas of focus:</p> <ol style="list-style-type: none"> 1. The coordination of sampling activities at times that suit the community. 2. The delivery of results letters related to the sampling activities. <p>The results letters are delivered in an information pack that includes letter, fact sheets, laboratory analysis certificates and the original access letter. Delivery is by hand in person, to give the community members a chance to discuss and ask questions. Currently six result letters have been delivered with three more being delivered this week. Three results letters are due next week. The community reaction in general is appreciative and positive. There has been acknowledgment that the pack of information is comprehensive, official and professional. The community has been appreciative of the transparency of what to expect and when. There is a strong understanding that the investigation is still in progress, that result letters are not an end point and there is still work to do. So far, we have not received many questions during the hand out of results letters and the questions are mostly focused on timing of what comes next and what's involved next, with interest on release of the DSI report. There has also commentary on the fact that the community wants to do its best to support the investigation with future works such as access for further sampling.</p>
Discussion	<ul style="list-style-type: none"> • Q. (RB) How many families are involved in this investigation and sampling? • A. (LW) Six letters have been prepared for six households with six more to deliver. There is a plan for approximately three more thereafter. • Q. (TR) Is it possible to receive a copy of the questions that have been asked of CH2M? It would be good to understand the community discussion that is happening.

Meeting Minutes	
	<ul style="list-style-type: none"> • A. (ML) A short briefing can be provided instead of a written summary. This is in order to maintain the confidence of community members who have called the hotline with questions. • Q. (MR) How many of the 12 currently planned properties that have results letters have been agricultural properties? With particular mention to the soil exceedance near the creek. • A. (JW) The investigation area includes a range of properties including commercial agricultural (grazing and production of cattle feed), and there are also a range of hobby farms which grow produce for personal consumption, and some also for the sale of produce grown. The property used for commercial agriculture which had an exceedance of the residential soil guideline is owned by a State authority and leased to a tenant. CH2M and Defence is meeting with the State authority next week to deliver the result letter. CH2M and Defence are expecting that an outcome of the meeting will be the authorisation to release the result letter to the tenant. • Q. (MR) Is that the only agricultural producer planned for receiving results letters? • A. (JW) Result letters are also being issued to a number of landowners (hobby farms) who grow produce for personal consumption, and some also for the commercial sale of the produce. These landowners also reside at the property. • Q. (MR) As part of the HHRA, will an understanding be gained of how contamination has made its way into the product being grown, eaten and sold? • A. (JW) Yes, correct. • Q. (RB) Can the Department of Health get a copy of these results? • A. (ML) Every fortnight the results are provided to the Department of Premier and Cabinet, who then forward them to the Queensland Government PFAS Technical Working Group (TWG). The departments attending this PCG meeting are represented on the TWG. PCG members can contact their departments TWG representative for a copy of these results. • B. (TB) Sophie Dwyer is the contact for Qld Health. • C. (ML) It is important to note that data provided to the department is yet to be validated and any questions about the data are to be directed to the project team in the first instance. • Q. (RB) One of the datasets we have, the report is in relation to rainwater tanks. When you go through the results, there are also results for hydrocarbons, are they also results for rainwater tanks? There is detection of benzene. • A. (JW) You are likely looking a QAQC sample. The only testing for water tanks was for PFAS and that was reported below detection. • B. (VG) This is why we send out the cover letter with results. If you have questions, please send back to the team. • C. (ML) To assist the QLD government in understanding the results, we will provide maps which show where samples have been collected (by providing the SAQP and the Preliminary Biota Sampling Addendum)
Proposed Date of Next PCG Meeting	<p>Thursday 26 April, 13:30.</p> <p>Going forward, meetings will be proposed for the last Wednesday of each month at 13:30. Wednesday 25 Apr is the ANZAC Day public holiday, hence the Thursday meeting date.</p>

Action Items			
Item #	Description	Owner	Due date
1	CH2M to provide ICC a briefing about questions raised by the community during the provision of results letters.	CH2M	27/4/18
2	CH2M to provide DSI SAQP and Preliminary Biota Sampling SAQP Addendum with the issue of these minutes	CH2M	20/4/18

Janet Cumming

From: Wicks, Jeremy J <[REDACTED]>
Sent: Monday, 16 April 2018 2:21 PM
To: Tiffany.Rees@ipswich.qld.gov.au; Amani.Kowero@des.qld.gov.au;
 tony.bradshaw@des.qld.gov.au; michael.ross@daf.qld.gov.au;
 guy.bignell@dnrm.qld.gov.au; Bruce Morton; Suzanne Huxley; Janet Cumming;
 Ramu Beesabathini; Janet Cumming; BROWN Josh (DES); BIGNELL Guy
Cc: PFASIM Amberley; Wicks, Jeremy/BNE (CH2M); Scott, Philippa/SYD (CH2M)
Subject: Amberley PFAS Investigation - DSI SAQP and Preliminary Biota Sampling SAQP Addendum

Hi

A link has been sent to the following persons for the download of the DSI SAQP and Preliminary Biota Sampling SAQP Addendum.

Tony Bradshaw - Queensland Government Department of Environment & Science	tony.bradshaw@des.qld.gov.au
Michael Ross - Queensland Government Department of Agriculture and Fisheries	michael.ross@daf.qld.gov.au
Guy Bignell - Queensland Government Department of Natural Resources	guy.bignell@dnrm.qld.gov.au
Ramu Beesabathini - Queensland Government Department of Health	Ramu.Beesabathini@health.qld.gov.au
Tiffany Rees - Ipswich City Council, Environmental Management	Tiffany.Rees@ipswich.qld.gov.au

Please note these are not publicly released documents and are not to be distributed further. The documents are only to be used by PCG representatives for the purpose of discussing matters relating to the Amberley PFAS Investigation.

The password to download these documents is "[REDACTED]".

Best regards

Jeremy Wicks | Jacobs | Senior Associate | ANZ Infrastructure & Environment | +61 7 3026 7526 | +61 [REDACTED]
 | [REDACTED] | www.jacobsskm.com

From: Wicks, Jeremy/BNE [mailto:[REDACTED]]
Sent: Monday, 16 April 2018 11:58 AM
To: eigsservicedelivery.ambbsm@defence.gov.au; robert.craig@defence.gov.au;
 christopher.hood1@defence.gov.au; matthew.clarke1@defence.gov.au; linda.oliver@defence.gov.au;
 virginia.glyde@defence.gov.au; michael.leriche <michael.leriche@defence.gov.au>; Cuttler, Jo/HML (CH2M)
 <[REDACTED]>; Scott, Philippa/SYD (CH2M) <[REDACTED]>; [REDACTED];
 Vanessa Bryant <[REDACTED]>
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 <[REDACTED]>; Leslie Wapler <[REDACTED]>; Ramu Beesabathini
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 <Josh.Brown@des.qld.gov.au>; BIGNELL Guy <Guy.Bignell@dnrme.qld.gov.au>; Wicks, Jeremy J
 <[REDACTED]>
Subject: Amberley PFAS Investigation - PCG Meeting #2 - Meeting Minutes from 21/3/18

Good morning

Please find attached the meeting minutes from the PCG Meeting held on the 21 March 2018. The planned date for the next PCG Meeting is Thursday 26/4/18 at 13:30 pm. A Calendar invitation for this meeting will be sent separately.

Later today State and Local Government PCG representatives will receive a link from which the Amberley DSI SAQP and the Preliminary Biota Sampling SAQP can be downloaded. Please note these are not publicly released documents and are not to be distributed further. The documents are only to be used by PCG representatives for the purpose of discussing matters relating to the Amberley PFAS Investigation.

The password to download these documents is "[REDACTED]".

Best regards

Jeremy Wicks

Project Manager – RAAF Base Amberley PFAS Investigation

M +61 [REDACTED]

CH2M

32 Cordelia Street

South Brisbane QLD 4101

www.ch2m.com

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Janet Cumming

From: Wicks, Jeremy J <[REDACTED]>
Sent: Tuesday, 24 April 2018 12:37 PM
To: Wicks, Jeremy/BNE; eigservicedelivery.ambbsm@defence.gov.au; robert.craig@defence.gov.au; christopher.hood1@defence.gov.au; matthew.clarke1@defence.gov.au; linda.oliver@defence.gov.au; virginia.glyde@defence.gov.au; michael.leriche; Cuttler, Jo/HML (CH2M); Scott, Philippa/SYD (CH2M); [REDACTED]; Tiffany.Rees@ipswich.qld.gov.au; Amani.Kowero@des.qld.gov.au; tony.bradshaw@des.qld.gov.au; michael.ross@daf.qld.gov.au; guy.bignell@dnrm.qld.gov.au; Bruce Morton; Suzanne Huxley; Janet Cumming; Leslie Wapler; Ramu Beesabathini; Janet Cumming; BROWN Josh (DES); BIGNELL Guy
Subject: Amberley PFAS Investigation - PCG Meeting #3 - Meeting Agenda
Attachments: RAAF Amberley PFAS Investigation - PCG Meeting 3 - Agenda.pdf

Good afternoon

Please find attached the agenda for the PCG Meeting this Thursday 26/4/18 at 13:30 pm.

Best regards

Jeremy Wicks

Project Manager – RAAF Base Amberley PFAS Investigation

M +61 [REDACTED]

CH2M

32 Cordelia Street
 South Brisbane QLD 4101
www.ch2m.com

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Australian Government
 Department of Defence
 Estate and Infrastructure Group

Environmental Investigation – RAA Base Amberley
R J CTC NTR LGR U M NTHLY M TING #3

AG NDA

Administrative Details	
Date	26 April 2018
Time	1.30 – 2.30 pm
Venue	Phone conference (Dial in)
Dial-in Details	Phone: [REDACTED] Participant Pin: [REDACTED]
Chair	Mick Le Riche
Minutes	Taken byCH2M

Invited Attendees	
Defence – PFAS	Mick Le Riche – Project Director Virginia Glyde – Project Manager
Defence – Base	AIRCDRE Ken Robinson - SADFO Christopher Hood - RAAF Base Amberley, Base Support Manager (acting) WGCDR Rosemary Dyke – ABXO SQNLDR Alex Smith - XO Linda Oliver – RAAF Base Amberley, RESO Matt Clarke – Defence Regional Representative
CH M	Jo Cuttler – Project Director Jeremy Wicks – Project Manager Leslie Wapler – Stakeholder and Community Engagement Philippa Scott – Task Manager
Queensland Government	Amani Kowero – Department of Environment & Science Tony Bradshaw – Department of Environment & Science Josh Brown – Department of Environment & Science Michael Ross – Department of Agriculture & Fisheries Guy Bignell – Department of Natural Resources, Mines and Energy Ramu Beesabathini – Department of Health Bruce Morton – Department of Health Dr Suzanne Huxley – Department of Health Dr Janet Cumming – Department of Health
Ipswich City Council	Tiffany Rees - Ipswich City Council

Agenda

tem 1	We me	air
tem 2	Amber ey PFAS Investigati n Overview	air
tem	Update n Pr je t investigati ns and Rep rting	H2M
tem 4	mmunity and Stake der engagement	H2M
tem 5	Pr je t Risks and Issues	air
tem 6	Any t er business	air

RTI RELEASE

Janet Cumming

Subject: Amberley PFAS Investigation PCG Meeting #3

Start: Thu 26/04/2018 1:30 PM
End: Thu 26/04/2018 2:30 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Wicks, Jeremy/BNE

Please note the following for the PCG Meeting.

AGENDA

- The agenda will be sent by email prior to the meeting

DIAL IN DETAILS

For those calling in to the meeting, please note the teleconference number below.

Phone: [REDACTED]

Participant Pin: [REDACTED]

IN PERSON ATTENDANCE AT RAAF AMBERLEY

For Defence PD and PM, and Base Representatives a further update will be provided with the room booked for the meeting.

Best regards

Jeremy Wicks
Project Manager – RAAF Base Amberley PFAS Investigation
M +61 [REDACTED]
CH2M
32 Cordelia Street
South Brisbane QLD 4101
www.ch2m.com

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Janet Cumming

From: Scott, Philippa/SYD <[REDACTED]>
Sent: Tuesday, 29 May 2018 9:22 AM
To: Wicks, Jeremy/BNE; eigservicedelivery.ambbsm@defence.gov.au; robert.craig@defence.gov.au; christopher.hood1@defence.gov.au; matthew.clarke1@defence.gov.au; linda.oliver@defence.gov.au; virginia.glyde@defence.gov.au; michael.leriche@defence.gov.au; Cuttler, Jo/HML; leslie@[REDACTED]; Vanessa Bryant; ian.batterley@[REDACTED]; Tiffany.Rees@ipswich.qld.gov.au; Amani.Kowero@des.qld.gov.au; tony.bradshaw@des.qld.gov.au; michael.ross@daf.qld.gov.au; guy.bignell@dnrm.qld.gov.au; Bruce Morton; Suzanne Huxley; Janet Cumming; Wicks, Jeremy J (JACOBS); Leslie Wapler; Ramu Beesabathini; Janet Cumming; BROWN Josh (DES); BIGNELL Guy; Clements, Luke/SYD; PFASIM Amberley; Eli Lao; Smith, Alexander SQNLDR
Subject: Amberley PFAS Investigation PCG Meeting #4
Attachments: RAAF Amberley PFAS Investigation - PCG Meeting 4 - Agenda.pdf; RAAF Amberley PFAS Investigation - PCG Meeting 3 - Minutes_Rev0.pdf

Good morning

Please find attached the agenda for the PCG Meeting #4 this Wednesday 30/5/18 at 13:30 pm.

The minutes from PCG Meeting #3 are also attached.

Best regards

Philippa Scott | Jacobs | Project Manager | Environmental Solutions | + 61.2.9432.9319 | + 61.[REDACTED] mobile
philippa.scott@jacobs.com | www.jacobs.com

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Australian Government
Department of Defence
 Estate and Infrastructure Group

PFAS Environmental Investigation – RAAF Base Amberley
PROJECT CONTROL GROUP MONTHLY MEETING #4

AGENDA

Administrative Details	
Date	30 April 2018
Time	1.30 – 2.30 pm
Venue	Phone conference (Dial in)
Dial-in Details	Phone: [REDACTED] Participant Pin: [REDACTED]
Chair	Mick Le Riche
Minutes	Taken by CH2M

Invited Attendees	
Defence – PFAS	Mick Le Riche – Project Director Virginia Glyde – Project Manager
Defence – Base	AIRCDRE Ken Robinson - SADFO Christopher Hood - RAAF Base Amberley, Base Support Manager (acting) WGCDR Rosemary Dyke – ABXO SQNLDR Alex Smith - XO Linda Oliver – RAAF Base Amberley, RESO Matt Clarke – Defence Regional Representative
CH2M	Jo Cuttler – Project Director Jeremy Wicks – Project Manager Leslie Wapler – Stakeholder and Community Engagement Philippa Scott – Task Manager
Queensland Government	Amani Kowero – Department of Environment & Science Tony Bradshaw – Department of Environment & Science Josh Brown – Department of Environment & Science Michael Ross – Department of Agriculture & Fisheries Guy Bignell – Department of Natural Resources, Mines and Energy Ramu Beesabathini – Department of Health Bruce Morton – Department of Health Dr Suzanne Huxley – Department of Health Dr Janet Cumming – Department of Health
Ipswich City Council	Tiffany Rees - Ipswich City Council

Agenda		
Item 1	Welcome	Chair
Item 2	Amberley PFAS Investigation Overview	Chair
Item 3	Update on Project investigations and Reporting	CH2M
Item 4	Community and Stakeholder engagement	CH2M
Item 5	Project Risks and Issues	Chair
Item 6	Any other business	Chair



Australian Government
Department of Defence
 Estate and Infrastructure Group

PFAS Environmental Investigation – RAAF Base Amberley
PROJECT CONTROL GROUP MONTHLY MEETING #3

AGENDA

Administrative Details	
Date	26 April 2018
Time	1.30 – 2.30 pm
Venue	Phone conference (Dial in)
Chair	Mick Le Riche
Minutes	Taken by CH2M

Attendees	
Defence – PFAS	Mick Le Riche – Project Director Virginia Glyde – Project Manager
Defence – Base	Christopher Hood - RAAF Base Amberley, Base Support Manager (acting)
CH2M	Luke Clements – Acting Project Director Jeremy Wicks – Project Manager Leslie Wapler – Stakeholder and Community Engagement Philippa Scott – Task Manager
Queensland Government	Tony Bradshaw – Department of Environment & Science Josh Brown – Department of Environment & Science Eli Lau – Department of Health Dr Suzanne Huxley – Department of Health Dr Janet Cumming – Department of Health David Larkin – Department of Health
Ipswich City Council	Tiffany Rees - Ipswich City Council

Meeting Minutes	
Agenda Item	Summary
Project Update	<ul style="list-style-type: none"> • Field Work Completed Since 26 April 18: <ul style="list-style-type: none"> ○ Groundwater monitoring wells: <ul style="list-style-type: none"> ▪ collection of data from groundwater level data loggers ▪ aquifer testing / groundwater gauging ▪ 2nd round of groundwater monitoring from off-property wells, and select on-property wells ○ Off-Property Sampling <ul style="list-style-type: none"> ▪ Sampling has been conducted on properties: <ul style="list-style-type: none"> • 2 public owned properties and tenanted for agricultural use • Ipswich City Council (e.g. Road Reserve) ▪ Sampling has been undertaken from <ul style="list-style-type: none"> • soils within the flood plain • monitoring wells ○ Off-Property and On-Property Sampling Program as per SAQP is now complete
Update on Project Investigations and Reporting	<ul style="list-style-type: none"> • Preliminary Biota Sampling <ul style="list-style-type: none"> ○ Field work completed from the 9-17 April 2018 ○ Fish species were caught from 6 sample sites. Methods used included: <ul style="list-style-type: none"> ▪ Traps ▪ Funnel traps ▪ Lines ▪ Cast nets ○ Edible fish caught / targeted in the programme include: <ul style="list-style-type: none"> ▪ Perch ▪ Eel ▪ Catfish ▪ Mullett ○ In addition to these species please also note the following other species caught/observed: <ul style="list-style-type: none"> ▪ 4 Bullrout (freshwater stonefish) were caught and returned ▪ Numerous turtles were captured (line, trap and funnel trap) and all returned to the water. ▪ Numerous dead freshwater mussel shells were identified at downstream locations. No live mussels were observed. ▪ Gambusia (mosquito fish) (introduced species) were observed in most locations. ▪ Prawn (3) at sample site S1 ○ Results are expected to be received by 4 May 18

	<p>Off-Property Sampling to Date</p> <ul style="list-style-type: none"> • Key sample result observations <ul style="list-style-type: none"> ○ No further update from PCG Meeting #2 ○ In summary PFAS has been detected in off-property sample locations in the following media: <ul style="list-style-type: none"> ▪ soils within the flood plain ▪ surface water / sediment from water storage dams ▪ registered bores <p>DSI Report</p> <ul style="list-style-type: none"> ○ Preparation of DSI Report underway ○ Targeting submission to Defence in early May, and submission to State in June 18 <p>HHRA / ERA</p> <p>HHRA</p> <ul style="list-style-type: none"> ○ HHRA Methodology and SAQP Addendum has been submitted to Defence and has been reviewed by the TA ○ An amended HHRA Methodology and SAQP Addendum has been submitted to Defence/TA and will be submitted to TWG/PCG once finalised. <p>ERA</p> <ul style="list-style-type: none"> ○ An amended ERA Recommendation has been submitted to Defence. Defence has accepted the recommendation. <p>Project Programme:</p> <ul style="list-style-type: none"> ○ Targeting end of July for the completion of DSI
<p>Community and Stakeholder engagement</p>	<p>Result Letters: Results letter delivery for sampling results currently available for release almost complete - has been main activity over past month</p> <ul style="list-style-type: none"> • Out of meetings scheduled to date: <ul style="list-style-type: none"> ○ 16 completed ○ 2 more occurring over the course of today / tomorrow ○ 2 did not take place due to residents being unavailable and results letters have instead been delivered via registered mail ○ Meetings include Ipswich City Council regarding a tenanted property and Economic Development Queensland regarding 2 tenanted properties • Summary of meetings held: <ul style="list-style-type: none"> ○ Varying levels of concern encountered, primarily with a focus on human health, commercial cattle sales and personal consumption of cattle / fruits and vegetables raised / grown on-property ○ However, residents in general have been very patient with the process and have been very good at accepting there are a number of steps involved and that they can't "jump to conclusions" - but residents remain keen to work through the steps as quickly as is feasible ○ Requirement to complete an HHRA is widely supported and residents have expressed willingness to facilitate access to their properties for this work to

	<p>occur</p> <ul style="list-style-type: none"> ○ Property value question has been raised twice to date: <ul style="list-style-type: none"> ▪ Generic impact on ability to sell a property ▪ Impact on ability to use a property for income generation purposes ○ Overall feedback on team communication has been positive - residents feel engaged, they understand what work has been done to date and what might be required in future and feel that the project team is being transparent around results and information <ul style="list-style-type: none"> ● HHRA sampling: <ul style="list-style-type: none"> ○ Once finalised, HHRA indicates we will be looking to sample at properties we have already sampled from as well as some new ones ○ Relationships already in place mean we are in a good position to be able to undertake this work quickly ○ Important to note though that our approach is very much to fit in and around what suits residents best, as opposed to making them “fit” our schedule ● Residents we are in frequent contact with are aware of our aim to present the DSI / HHRA at a CWIS in August ● Database in general will receive a “newsletter” style project update soon ● Also provided an in person briefing / project update to key personnel on Base.
Project Risks and Issues	None noted.
Discussion	<ul style="list-style-type: none"> ● C. (JB) Happy with the biota sampling. Noting that some of the species may be useful for ecological assessment – i.e. mosquito fish. ● C. (TB) Mosquito fish have been noted to contain PFOS in previous investigations. ● C. (DL) All samples from the HHRA need to be edible portions of fish that are consumed by people. ● A. (JW) Edible portions with skin on are assessed and the carcass is being retained for subsequent ecological assessment. ● A. (VG) Further detail is provided in the preliminary biota SAQP addendum, which was provided to the TWG. ● C. (TR) ICC appreciates the communication received to date.
Other Business	<ul style="list-style-type: none"> ● Timeframe for PCG 4 is Wednesday 30 May at 13:30.

From: [Ramu Beesabathini](#)
To: [Suzanne Huxley](#)
Subject: RE: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]
Date: Wednesday, 30 May 2018 11:59:35 AM
Attachments: [image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[image008.png](#)
[image009.png](#)
[image010.png](#)

Thanks Suzanne.

Kind Regards

Ramu Beesabathini

A/ Advanced Environmental Health Officer | Community and Rural | Public Health Unit

West Moreton Health

Goodna Community Health Service | 81 Queen Street/PO Box 188

GOODNA QLD 4300

07 38184700 | [REDACTED]

Ramu.Beesabathini@health.qld.gov.au

www.westmoreton.health.qld.gov.au



Caring Better Together



West Moreton Health acknowledges the Jagera, Yuggera and Ugarapul people, Traditional Owners of the land, and pays respect to Elders past, present and emerging.

From: Suzanne Huxley
Sent: Wednesday, 30 May 2018 11:58 AM
To: Ramu Beesabathini <Ramu.Beesabathini@health.qld.gov.au>
Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

Hi Ramu

Info re Amberley biota as discussed.

Regards

Suzanne

Dr Suzanne Huxley
 Senior Medical Officer
 Health Protection Branch
 Prevention Division
 Ph: 3328 9606

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 30 May 2018 11:20 AM
To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero

<Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann <Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>; simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw <Tony.Bradshaw@ehp.qld.gov.au>

Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review
[SEC=UNCLASSIFIED]

Hi Health, DAF,

These results contain elevated levels of PFAS in edible samples of fish fillet.

The report includes the following summary:

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



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Australia's campaign to stop violence against women

From: Leriche, Michael MR [<mailto:michael.leriche@defence.gov.au>]
Sent: Wednesday, 30 May 2018 11:05 AM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Cc: PFASIM Amberley <pfasim.amberley@defence.gov.au>; 'Wicks, Jeremy J (JACOBS)' <[REDACTED]>; 'Cuttler, Jo/HML' <[REDACTED]>
Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James

Attached for your information is Defence's initial review of the preliminary biota sampling data for the Amberley PFAS Investigation.

The initial review is marked "Draft" as the triplicate data has not been received.

The initial review will inform the report being prepared for the Preliminary Biota Sampling Program. All advice is draft in nature until Defence's Technical Advisor has reviewed the report for the Preliminary Biota Sampling Program. The report for the Preliminary Biota Sampling program will be provided to DPC/TWG once it has been reviewed by the Technical Advisor and cleared by Defence.

Please also note the perch sample which exceeded the trigger value was not included in the Initial Review as the sample result was based on the entire fish (due to small sample size) rather than an edible fish portion (eg. fillet).

The Amberley fortnightly report that you'll receive this week will also contain the preliminary biota results, including in an excel spreadsheet of results.

Happy to discuss.

Cheers
Mick

Mick Le Riche

Project Director
PFAS Investigation & Management Branch
Infrastructure Division

Janet Cumming

Subject: Amberley PFAS Investigation PCG Meeting #4
Start: Wed 30/05/2018 1:30 PM
End: Wed 30/05/2018 2:30 PM
Recurrence: (none)
Meeting Status: Accepted
Organizer: Wicks, Jeremy/BNE

Please note the following for the PCG Meeting.

AGENDA

- The agenda will be sent by email prior to the meeting

DIAL IN DETAILS

For those calling in to the meeting, please note the teleconference number below.

Phone: [REDACTED]

Participant Pin: [REDACTED]

IN PERSON ATTENDANCE AT RAAF AMBERLEY

For Defence PD and PM, and Base Representatives a further update will be provided with the room booked for the meeting.

Best regards

Jeremy Wicks
Project Manager – RAAF Base Amberley PFAS Investigation
M +61 [REDACTED]
CH2M
32 Cordelia Street
South Brisbane QLD 4101
www.ch2m.com

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From: [Suzanne Huxley](#)
To: [David Larkings](#)
Cc: [Janet Cumming](#)
Subject: FW: Availabilities week commencing 11 June.
Date: Thursday, 31 May 2018 1:16:00 PM
Attachments: [image001.png](#)
[image004.png](#)
[image007.png](#)
[image010.png](#)
[image012.png](#)
[image014.png](#)

Hi David

I have no specific concerns with the SAQP except that there is really nothing I can see relating to further seafood testing when it appears that there are some species with elevated PFAS. Janet has checked the planned key exposure pathways which she has said are OK though does question the need to assess the tracking of PFAS present in sediment and soil as this would not represent a particularly relevant human exposure pathway for a HHRA.

If you have any comments are you able to bundle them with the above for clearance by Sophie. I think James needs them by Monday.

Thanks

Suzanne

From: James Stewart [mailto:james.stewart@premiers.qld.gov.au]
Sent: Thursday, 31 May 2018 11:29 AM
To: Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>
Cc: Myra Thompson <Myra.Thompson@health.qld.gov.au>
Subject: RE: Availabilities week commencing 11 June.

Thanks Suzanne,

Who in health is reviewing the document?

Cheers,
James.

From: Suzanne Huxley [mailto:Suzanne.Huxley@health.qld.gov.au]
Sent: Thursday, 31 May 2018 11:28 AM
To: James Stewart <james.stewart@premiers.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>
Cc: Myra Thompson <Myra.Thompson@health.qld.gov.au>
Subject: RE: Availabilities week commencing 11 June.

Hi James

I am on leave from 4 June returning to work 18 June.

Regards

Suzanne

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Thursday, 31 May 2018 11:26 AM
To: Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>
Cc: Myra Thompson <Myra.Thompson@health.qld.gov.au>
Subject: Availabilities week commencing 11 June.

Hi everyone,

We're seeking availabilities for Suzanne, Janet, David and Sophie for a 1 hour teleconference to discuss your review of the Amberley HHRA SAQP.

Hoping to have this meeting week commencing 11 June.

We're looking for a few days and times for each of you so that we can arrange a time that suits everyone.

Best regards,
 James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 30 May 2018 1:31 PM
To: PFASIM Amberley
Cc: Leriche, Michael MR
Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

Hi Virginia,

We are on track for comments by 11 June.

I think that tentatively scheduling a teleconference would be appropriate.

I will seek some availabilities for week commencing 11 June if that is appropriate?

Kind regards,
James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
Australia's campaign to stop violence against women

From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley
Sent: Wednesday, 30 May 2018 1:08 PM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Cc: Leriche, Michael MR <michael.leriche@defence.gov.au>
Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James,

I hope you are well. I am reviewing an Amberley updated programme and just wanted to check in with you to see if the Amberley HHRA SAQP review was on track and underway with the TWG, and that we can still anticipate comments by 11 June? Also if there is an indication of whether a teleconference will be required or not.

Thank you
Ginni

Virginia Glyde

(Contractor to Defence)
 Defence Project Manager - Environmental Investigations
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
 M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: Glyde, Virginia MS **On Behalf Of** PFASIM Amberley
Sent: Wednesday, 16 May 2018 4:16 PM
To: 'James Stewart'
Cc: Leriche, Michael MR
Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thank you James.

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 16 May 2018 3:31 PM
To: PFASIM Amberley; 'virginia.glyde@rpsgroup.com.au'
Cc: Leriche, Michael MR
Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

Good afternoon Virginia,

I'm just confirming that I have received the report.

On behalf of the group I'd like to say thank you for the summary points – these will prove to be useful.

I'll contact you prior to submission to arrange a teleconference, if necessary.

Best regards,
 James.

From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley
Sent: Wednesday, 16 May 2018 2:13 PM
To: James Stewart <james.stewart@premiers.qld.gov.au>; PFASIM Amberley <pfasim.amberley@defence.gov.au>; 'virginia.glyde@rpsgroup.com.au' <virginia.glyde@rpsgroup.com.au>

Cc: Leriche, Michael MR <michael.leriche@defence.gov.au>

Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hello James,

Thank you for your confirmation of the review, it is appreciated.

I have uploaded the document to the secure link you provided.

A few summary points are below to 'set the scene' for the Amberley investigation status and to assist the TWG with their approach to reviewing this document.

- All sampling as per the DSI SAQP (reviewed and workshopped by the TWG Oct 17) and the Preliminary Biota (edible fish species) Sampling addendum (provided to the TWG for information Feb 18), has been completed
- Findings to date – in summary, PFAS has been detected in off-Base sample locations in the following media:
 - soils within the flood plain
 - surface water / sediment from water storage dams
 - registered bores
 - surface water from Warrill Creek and Bremer River
 - The water use survey and investigation has found that no one is using contaminated water sources for drinking
 - The water use survey results indicate river and creek water is being, or has been, used for irrigation and stock watering
- Please note Defence has provided approval for the consultant to commence with HHRA sampling as of last week. This timing is important for particular private properties that are noted to be growing produce with either current or historical use of PFAS impacted water. Sampling of that biota as soon as possible is required to catch what is left of the growing season.
- In addition to the point above, the process to gain approval for access to private properties can be lengthy so we have worked through that for prioritised properties. We do not consider the ongoing sampling as an issue for the review of this report by the TWG.

Following this report, the DSI report is expected to be submitted to the TWG in June. Defence are seeing a preliminary draft this week, and based on the initial review by us and the Technical Adviser, I will be able to confirm when we will send the DSI to TWG for review.

It is noted that you anticipate comments will on this HHRA SAQP will be provided to us by 11 June. If you could please also advise at an appropriate point whether you think a workshop will be required, and if so, when, that will be appreciated.

Please contact me if you need to discuss any of the above or need any further information.

Thank you
Virginia

Virginia Glyde

(Contractor to Defence)
Defence Project Manager - Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 16 May 2018 1:24 PM
To: PFASIM Amberley; virginia.glyde@rpsgroup.com.au
Cc: Leriche, Michael MR
Subject: RE: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

Hi Virginia,

The technical working group will provide a review of this document.

Queensland Health is tied up with the Bundaberg site, as well as with the Gladstone Ports investigations. To that end they will aim for a three week timeframe, give or take a few days.

I can confirm that we will have the review back to you by **Monday 11 June** if this is appropriate.

I have sent a separate OneNote folder to your RPS address. Let me know if this does not work and I will lower the security while you input the files.

Happy to discuss further if needed.

Thanks Virginia.

Kind regards,
James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



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From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley
Sent: Tuesday, 15 May 2018 2:39 PM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Cc: Leriche, Michael MR <michael.leriche@defence.gov.au>
Subject: RAAF Amberley PFAS Investigation HHRA SAQP draft [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hello James,

Further to the email exchange below, I now have the updated draft of the HHRA SAQP to provide for TWG review. I have prepared a cover email note for the submission, to provide context for the review.

Before sending that on I wanted to check in with you regarding TWG availability for the review, and approximate timeframes.

I will also need your assistance with a One Drive link to get the document to you, as the file size is about 14MB.

Please give me a call if you wish to discuss this further, otherwise, if you could please just let me know availability and timeframes, and copy the One Drive link to my RPS address virginia.glyde@rpsgroup.com.au that would be appreciated.

Thank you
Virginia

Virginia Glyde

(Contractor to Defence)
Defence Project Manager - Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] **E:** virginia.glyde@defence.gov.au

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]

Sent: Tuesday, 1 May 2018 11:42 AM
To: PFASIM Amberley
Cc: Leriche, Michael MR
Subject: RE: RAAF Amberley Economic Development Queensland property PFAS sampling
[SEC=UNCLASSIFIED]

Hi Virginia,

Thank you for the prompt response on this. You have answered my query.

I'll review the HHRA SAQP draft and get back to you if we have any further questions around timeframes.

Best regards,
James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002

From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley

Sent: Tuesday, 1 May 2018 11:38 AM

To: James Stewart <james.stewart@premiers.qld.gov.au>

Cc: Leriche, Michael MR <michael.leriche@defence.gov.au>

Subject: RE: RAAF Amberley Economic Development Queensland property PFAS sampling
[SEC=UNCLASSIFIED]

UNCLASSIFIED

Hello James,

Thanks for your email.

You are correct in that all DSI sampling is now complete, being the initial sampling round that informs what further sampling should be undertaken for the HHRA.

The HHRA SAQP that details further sampling to be undertaken, including properties owned and leased by EDQ, is the draft currently being revised prior to submission to TWG for review. I hope to have updated HHRA SAQP and subsequent dates for the HHRA Report by the end of this week.

Until I have the updated HHRA SAQP draft, I can't confirm exactly what sampling is intended for both of those properties for the HHRA. But I hope for this to be resolved by the end of this week. When you receive the draft, the sampling details will be in an appendix.

Any sampling undertaken on the EDQ properties, and other properties, will involve advance notice with an explanation and formal request for access to be signed by landowners. The signed access will be sighted by lessees when they are contacted to schedule access to the properties.

Timeframes depend largely on the availability of landowners and/or lessees, as we work around their schedules, rather than make them fit ours.

Regarding the ERA, Defence have just last week accepted the consultant's recommendation to undertake an ERA, so they are now drafting the methodology and SAQP. They are aware of some HHRA sampling that will also be of use to the ERA, so there are plans to use samples for two reporting purposes, and to undertake additional ERA sampling, in locations to be confirmed.

I hope that answers your query. Please advise if you need further information.

Thank you
Ginni

Virginia Glyde

(Contractor to Defence)
Defence Project Manager - Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Tuesday, 1 May 2018 11:03 AM
To: PFASIM Amberley
Cc: Leriche, Michael MR
Subject: RAAF Amberley Economic Development Queensland property PFAS sampling

Good morning Virginia,

I've just had an internal inquiry around land leased out by Economic Development Queensland in Amberley. The below inquiries are related to lot 4 (RP858136) and lot 18 (SP279423).

My understanding is that all sampling is now complete for both properties for the DSI. Can you please confirm?

If sampling is not completed, or if sampling is planned outside of the DSI, can you please advise me of the intended sampling program for these properties (scope and timeframe), noting that this may change if subsequent sampling is intended for the ERA/ HHRA.

In addition, are we still on track to receive the HHRA report in June?

Thanks Virginia.

Kind regards,
James.

James Stewart

Policy Officer

Environment Policy

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PO Box 15185, City East, QLD 4002



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From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley

Sent: Friday, 27 April 2018 2:53 PM

To: James Stewart <james.stewart@premiers.qld.gov.au>

Cc: Leriche, Michael MR <michael.leriche@defence.gov.au>

Subject: Amberley HHRA SAQP - draft for review on hold [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James,

I had planned to submit the draft Amberley HHRA SAQP to you this week for TWG review. Mick Le Riche and I have just had to make a contract related decision to pause this submission. CH2M will provide an updated submission date to us in the next week. Apologies for the late notice.

Once we have an updated schedule for this and other deliverables, we will update the TWG review schedule for Defence Queensland sites for your consideration.

Thank you

Virginia Glyde

(Contractor to Defence)

Defence Project Manager - Environmental Investigations

PFAS Investigation & Management Branch

Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] E: virginia.glyde@defence.gov.au

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RTI RELEASED

Janet Cumming

From: David Larkings
Sent: Friday, 1 June 2018 10:13 AM
To: Suzanne Huxley; Janet Cumming
Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]
Attachments: 690738_Preliminary Biota Sample Results_RevD.PDF

Hi Suzanne

Can you please look at this report before you go if you have time because we need to respond to it.

Preliminary testing of fish from Warrill Creek and the Bremer River near the Amberley Airforce Base has found PFAS above the FSANZ trigger levels in mullet catfish and eel fillets.

The report notes:

- For adults, elevated risks are calculated for mullet fillet (slightly elevated risks by 1.2 times in 1 of 2 samples only), catfish fillet (by around 3 times) and eel fillet (by around 2 to 5 times). Risks following the consumption of catfish fillet and liver are acceptable.
- These issues, along with concentrations of the other PFAS in biota samples and other relevant exposure pathways, will be considered as part of the Human Health Risk Assessment for Amberley.

A decision needs to be made on whether any action needs to be taken now based on the preliminary results, such as closing the fishery or advice to limit exposure. This may be something we need to discuss with the TWG and PHU.

The following points could be included in the response to:

Concern is raised about the elevated concentrations of PFAS in the fillets of catfish, mullet and perch caught as part of the preliminary biota sampling.

Support is given to further assessment of potential risks to recreational fishers as part of the HHRA. Further information should be obtained on what species are targeted by recreational fishers in the area and ensure that those species are sampled for PFAS concentrations in edible portions. The investigation should also identify whether there are any sub-groups of the population that may target species that may have higher levels of PFAS including eel, mullet and catfish.

The Department of Agriculture and Fisheries advised in October 2017, as part of the Queensland Government's response to the RAAF Base Amberley SAQP, that common target species for recreational fishers in the Bremer River and Warrill Creek include Australian bass, threadfin salmon, yellowfin bream, catfish, mullet and bull shark. DAF also advised that bass, golden perch and silver perch may be caught in Warrill Creek during flooding over the Moogerah Dam. It is unclear in the Initial Review of Preliminary Biota Sampling Results why other species were not included.

Regards
 David

From: James Stewart [mailto:james.stewart@premiers.qld.gov.au]
Sent: Wednesday, 30 May 2018 11:20 AM
To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero <Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann

<Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>;
 simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley
 <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw
 <Tony.Bradshaw@ehp.qld.gov.au>

Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

Hi Health, DAF,

These results contain elevated levels of PFAS in edible samples of fish fillet.

The report includes the following summary:

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
 James.



James Stewart
 Policy Officer
 Environment Policy
 Department of the Premier and Cabinet

P 07 3003 9487
 1 William Street, Brisbane QLD 4000
 PO Box 15185, City East, QLD 4002



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From: Leriche, Michael MR [<mailto:michael.leriche@defence.gov.au>]

Sent: Wednesday, 30 May 2018 11:05 AM

To: James Stewart <james.stewart@premiers.qld.gov.au>

Cc: PFASIM Amberley <pfasim.amberley@defence.gov.au>; 'Wicks, Jeremy J (JACOBS)'

<[REDACTED]>; 'Cuttler, Jo/HML' <[REDACTED]>

Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James

Attached for your information is Defence's initial review of the preliminary biota sampling data for the Amberley PFAS Investigation.

The initial review is marked "Draft" as the triplicate data has not been received.

The initial review will inform the report being prepared for the Preliminary Biota Sampling Program. All advice is draft in nature until Defence's Technical Advisor has reviewed the report for the Preliminary Biota Sampling Program. The report for the Preliminary Biota Sampling program will be provided to DPC/TWG once it has been reviewed by the Technical Advisor and cleared by Defence.

Please also note the perch sample which exceeded the trigger value was not included in the Initial Review as the sample result was based on the entire fish (due to small sample size) rather than an edible fish portion (eg. fillet).

The Amberley fortnightly report that you'll receive this week will also contain the preliminary biota results, including in an excel spreadsheet of results.

Happy to discuss.

Cheers
Mick

Mick Le Riche

Project Director
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group

M: [REDACTED] E: michael.leriche@defence.gov.au

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Janet Cumming

From: Janet Cumming
Sent: Monday, 4 June 2018 12:04 PM
To: Sophie Dwyer; HProt.corro
Subject: Amberley Fish

Sophie,

I have written up the assessment of the Amberley fish data, and Dave has checked it. Suzanne checked the calculations on Friday. Is it OK to send to James/Justin for circulation to the group before the meeting on Wednesday?

\\Herston-cl1_sc_data7\data7\HPB\SHARE\Incidents\PFAS\Defence\Amberley\Amberley fish assessment.docx

Thanks,

Janet



Dr Janet Cumming BSc (Hon) PhD (Griffith) MRSPH RACTRA

Advanced Environmental Health Scientist

Water Unit, Health Protection Branch, **Department of Health**

p: 07 3328 9346] | **m:** [REDACTED]

a: 15 Butterfield Street, Herston Qld 4006

w: Queensland Health **e:** janet.cumming@health.qld.gov.au



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Janet Cumming

From: David Larkings
Sent: Monday, 4 June 2018 12:51 PM
To: Janet Cumming; Sophie Dwyer
Subject: RE: Amberley Fish
Attachments: 690738_Preliminary Biota Sample Results_RevD.PDF

Hi Sophie and Janet

Our teleconference with DAF, DES and West Moreton PHU to discuss the high concentrations of PFAS in some fish from Warrill Creek and the Bremer River near Amberley base has been moved to 12:30 to 1:30 this Wednesday because some participants were not available.

I'm not sure if you want to circulate an agenda, but the main points for discussion could include:

- Introduction & background
- Assessment of the fish results (Janet)
- Management options:
 - Closure of the fishery
 - Is closure an option based on preliminary results and species collected?
 - Biosecurity Queensland role?
 - Signs
 - Pros and cons of signs?
 - Who responsible: Defence, Council?
 - Media release
 - Is a media release needed?
 - Who would be responsible?
 - Publication of advice on internet?
 - Does information on the results need to be published on the internet?
 - Who would be responsible? Defence?
- Advice to Defence?
- Communication with other agencies?
 - Ipswich City Council?
- Is another meeting required?

Regards
David

From: Janet Cumming
Sent: Monday, 4 June 2018 9:01 AM
To: David Larkings <David.Larkings@health.qld.gov.au>
Subject: Amberley Fish

Hi David,
 I've done the analysis and summery of the Amberley fish data.
<Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley\Amberley fish assessment.docx>
<Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley\Fish exposure model.xlsx>
 Cheers,
 Janet



Dr Janet Cumming BSc (Hon) PhD (Griffith) MRSPH RACTRA

Advanced Environmental Health Scientist

Water Unit, Health Protection Branch, **Department of Health**

p: 07 3328 9346] | **m:** [REDACTED]

a: 15 Butterfield Street, Herston Qld 4006

w: [Queensland Health](#) **e:** janet.cumming@health.qld.gov.au



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RTI RELEASED

David Larkings

From: David Larkings
Sent: Wednesday, 6 June 2018 10:38 AM
To: Janet Cumming; Sophie Dwyer; Tenille Fort; Justin Carpenter; Kahil Lloyd; Peter.Kind@daf.qld.gov.au; WATTS Richard J (Richard.Watts@daf.qld.gov.au); VENTURA Simone (Simone.Ventura@des.qld.gov.au); Ramu Beesabathini; Catherine A Quagliotto; CONNOR Andrew; Bruce Morton
Cc: David Larkings; EDHPU
Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review - teleconference 12:30pm Wed 6 June
Attachments: 690738_Preliminary Biota Sample Results_RevD.PDF; Amberley fish assessment.docx

Hi

Just confirming the teleconference to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley is on today (Wed 6/6/18) at 12:30pm.

Please find attached our assessment of the Amberley fish data and our recommendation for discussion at tomorrow's meeting. Also attached is the report from Defence with the fish sample results.

AGENDA

- Introduction & background
- Assessment of the fish results (Janet)
- Management options:
 - Closure of the fishery
 - Is closure an option based on preliminary results and species collected?
 - Biosecurity Queensland role?
 - Signs
 - Pros and cons of signs?
 - Who responsible: Defence, Council?
 - Media release
 - Is a media release needed?
 - Who would be responsible?
 - Publication of advice on internet?
 - Does information on the results need to be published on the internet?
 - Who would be responsible? Defence?
- Advice to Defence
- Communication with other agencies
- Is another meeting required?

Teleconference details:

Phone: [REDACTED]
 Participant code: [REDACTED]
 Host pin: [REDACTED]

Regards
David



David Larkings

Advanced Environmental Health Officer

Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | After hours oncall **m:** [REDACTED]

a: PO Box 2368 Fortitude Valley BC QLD 4006

w: Queensland Health | **e:** david.larkings@health.qld.gov.au



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-----Original Appointment-----

From: EDHPU

Sent: Friday, 1 June 2018 4:58 PM

To: EDHPU; Janet Cumming; Sophie Dwyer; David Larkings; Tenille Fort; justin.carpenter@premiers.qld.gov.au; Peter.Kind@daf.qld.gov.au; Richard.watts@daf.qld.gov.au; simone.ventura@ehp.qld.gov.au; Ramu Beesabathini; Catherine A Quagliotto; Andrew.Connor@des.qld.gov.au; Bruce Morton

Cc: BRADSHAW Tony (Tony.Bradshaw@des.qld.gov.au)

Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review

When: Wednesday, 6 June 2018 12:30 PM-1:30 PM (UTC+10:00) Brisbane.

Where: Teleconference

Good afternoon everyone

Please see teleconference details below to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley. The results are in attached report showing high PFAS concentration in some edible fish portions. We will also discuss some options for managing this issue.

Phone: [REDACTED]

Participant code: [REDACTED]

Host pin: [REDACTED]

If you have any questions, please give David Larkings a call on 3328 9328

Kind regards

Myra on behalf of Sophie Dwyer

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]

Sent: Wednesday, 30 May 2018 11:20 AM

To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero <Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann <Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>; simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw <Tony.Bradshaw@ehp.qld.gov.au>

Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

Hi Health, DAF,

These results contain elevated levels of PFAS in edible samples of fish fillet.

The report includes the following summary:

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
James.



James Stewart
Policy Officer
Environment Policy
Department of the Premier and Cabinet
P 07 3003 9487
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



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Level 7, 177 Pacific Highway
P.O. Box 632
North Sydney, NSW 2060
Australia
www.ch2m.com

Virginia Glyde
Defence Project Manager – Environmental Investigations
PFAS Investigation & Management Branch
Infrastructure Division

23 May 2018

Subject: Preliminary Biota Sampling Program – Initial Advice on Potential Human Health Risk

Dear Virginia,

CH2M has received the primary and duplicate results for the edible fish specimens caught for the Preliminary Biota Sampling Program (PBSP) between from the 9-17 April 2018. Triplicate data is to be issued by the National Measurement Institute (NMI) by the 30 May 2018.

The specimens were caught from seven samples sites (refer to Attachment 1) as per the *RAAF Base Amberley PFAS Investigation – Preliminary Biota Sampling Program, February 2018* (CH2M, 2018).

The analytical data is provided in Attachment 1 and includes the relevant trigger levels from *Perfluorinated chemicals in food* (FSANZ, 2017). The laboratory data is provided in Attachment 2. The analytical data was provided to our Lead Risk Assessor Jackie Wright (EnRiskS) who have undertaken an initial review of the data which is included in Attachment 1. The initial review is being provided in advance of the Draft Report on the PBSP and the Human Health Risk Assessment (HHRA) and as such only provides limited information. The Draft Report on the PBSP will be provided under CH2M cover and include the initial review from the Lead Risk Assessor and the factual data from the aquatic ecologists (Jacobs).

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Preliminary Biota Sampling Program – Initial Advice on Potential Human Health Risk
Page 2
23 May 2018

Yours faithfully,

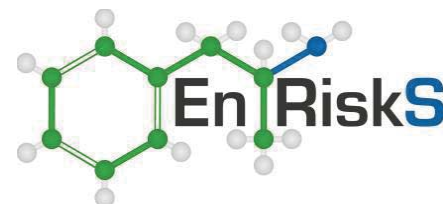
Jeremy Wicks
Project Manager

RTI RELEASE

Preliminary Biota Sampling Program – Initial Advice on Potential Human Health Risk
Page 3
23 May 2018

Attachment 1 EnRiskS Initial Review of Preliminary Biota Sampling Results

RTI RELEASE



23 May 2018

CH2M HILL Australia Pty Ltd
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Chatswood NSW 2067

Environmental Risk Sciences Pty Ltd
PO Box 2537
Carlingford Court NSW 2118

Phone: +61 2 9614 0297
Fax: +61 2 8215 0657
inquiry@enrisks.com.au

www.enrisks.com.au

Attention: Jeremy Wicks (Jeremy.Wicks@jacobs.com)

Initial Review of Preliminary Biota Sampling Results: RAAF BASE Amberley PFAS Investigation

1 Introduction

Environmental Risk Sciences Pty Ltd (enRiskS) has been engaged by CH2M HILL Australia Pty Ltd (CH2M) to provide an initial evaluation of the results of the preliminary biota sampling (PBS) program recently undertaken by CH2M. The PBS program is part of the works being undertaken as part of the detailed site investigation (DSI) of per- and polyfluoroalkyl substances (PFAS) at the Royal Australian Air Force (RAAF) Base Amberley (Amberley). The overall aim of the project is to assess the level of contamination and resulting potential risk to human health and the ecological environment posed by PFAS contamination from Amberley. The PBS program has been undertaken to provide data on concentrations of PFAS in finfish to support the assessment of human health risks.

Objectives

The objective of this letter is to provide an initial assessment of potential health risks to recreational fishers from concentrations of perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS) reported in fish and crustacean samples obtained during the PBS program.

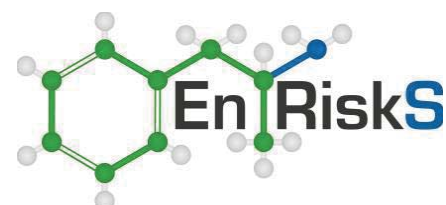
The assessment has considered human health risk issues associated with PFOS, PFOA and PFHxS concentrations in 22 biota samples obtained from 2 locations in Warrill Creek and 5 locations in the Bremer River. The assessment has not addressed exposures associated with any chemicals, any other media, or any environmental or ecological risk issues.

Risk issues associated with concentrations of other PFAS in PBS samples, PFAS in other media (including the consideration of potential risks from multiple exposures pathways) and environmental or ecological risk issues will be assessed as part of the Human Health Risk Assessment (HHRA) and Ecological Risk Assessment (ERA) for Amberley.

2 Review of PBS Results

As indicated above, biota samples were collected from 2 locations in Warrill Creek (S1 and S2) and 5 locations in the Bremer River (S3 to S7). The concentrations of PFOS + PFHxS reported in the biota samples from each location are summarised in **Table 1**. Sampling locations are shown on **Figure 1**.

With the exception of low concentrations of 1.2 µg/kg ww reported in one sample of eel liver from location S5, PFOA was not detected in biota samples. Concentrations of PFOA in the eel samples from location S5



were well below the FSANZ trigger level for PFOS in finfish and liver (41 µg/kg ww and 2,240 µg/kg ww respectively) (FSANZ 2017a). Given this, PFOA is not considered further in this initial evaluation.

It is also noted that concentrations of PFOS + PFHxS comprised 91-100% of the total PFAS concentration in biota samples. On this basis and given that these 2 PFAS are the risk drivers for PFAS HHRA, the consideration of PFOS + PFHxS is appropriate for this initial evaluation.

Table 1: Summary of PBS Results with FSANZ (2017) Trigger Levels (Primary & Duplicate Results)

Sampling Location	Reported PFOS + PFHxS Concentration (µg/kg wet weight)				
	Eel Fillet ¹	Eel Liver ¹	Other Finfish Fillet ¹	Other Finfish Liver ¹	Prawn ²
Warrill Creek					
S1	7.7 to 52	198.5	2.9	--	4.6
S2	77.7	336.7	--	--	--
Bremer River					
S7	62.2	380	12 to 71	--	--
S6	--	--	86.4	532.6	--
S3	--	--	101.8*	405	--
S4	195.4*	1,126	--	--	--
S5	172	953	24 to 43	33	--
Adopted screening guidelines (FSANZ)³					
Finfish (fillets or liver)	5.2	280	5.2	280	--
Crustaceans	--	--	--	--	65

Notes:

Shading indicates an exceedance of the adopted guideline value based on the maximum concentration.

1 = Individual sample.

2 = Composite sample.

3 = Ref. FSANZ (2017).

"--" = Indicates no data available

* Duplicate Result

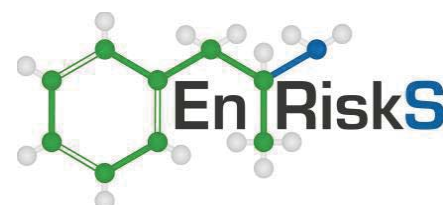
Review of **Table 1** indicates the following in relation to PFOS + PFHxS concentrations in biota:

- Concentrations of PFOS + PFHxS in eel fillet and other finfish fillet (catfish, mullet and perch) exceed the trigger level for finfish:
 - Concentrations in eel are approximately 1.5 to 40 times the trigger level
 - Concentrations in other finfish are approximately 2 to 20 times the trigger level
- Concentrations of PFOS + PFHxS in eel liver and other finfish liver (catfish and mullet) are generally higher than the concentrations in the fillets and also exceed the trigger level for fish liver:
 - Concentrations in eel liver are up to 4 times the trigger level
 - Concentrations in other finfish liver are approximately 1.5 to 2 times the trigger level
- Crustaceans (prawns; 1 composite sample) were only collected from location S1 in Warrill Creek and concentrations of PFOS + PFHxS in these prawns were below the FSANZ trigger level for crustaceans.

Overall, the data reviewed indicates that further assessment of potential risks to recreational fishers is required as part of the HHRA. In relation to potential risks to recreational fishers, site observations collected by CH2M during the PBS program suggest that recreational fishing is more likely to occur at locations S3 and S5 in the Bremer River (refer to **Figure 1**). Hence, further evaluation of potential risks to recreational fishers has been completed as part of this assessment (noting that all data will be assessed in the HHRA).

The comparison of the relevant data with the FSANZ trigger levels in **Table 1** assumes that 100% of a fisher's diet is finfish from the Bremer River.

If it is assumed that someone fishes at locations S3 and S5 on weekends only (104 days/year), and sources approximately 30% of their diet of finfish fillet or liver from the Bremer River, elevated risks are calculated



for children for finfish fillet at both locations (children are assumed not to eat liver) (FSANZ 2017b). Risks are calculated to be highest for eel (by around 5 to 13 times), followed by catfish and mullet (by around 1 to 7 times).

For adults, elevated risks are calculated for mullet fillet (slightly elevated risks by 1.2 times in 1 of 2 samples only), catfish fillet (by around 3 times) and eel fillet (by around 2 to 5 times). Risks following the consumption of catfish fillet and liver are acceptable. It is noted that the calculations for liver has been based on the consumption rate for liver adopted by FSANZ (2017b) which is 5 g or 1 liver¹, and this value has a degree of uncertainty. Consumption patterns for eel are also unknown. These issues, along with concentrations of the other PFAS in biota samples and other relevant exposure pathways, will be considered as part of the HHRA for Amberley.

Summary

In summary, concentrations of PFOS + PFHxS exceeding the FSANZ (2017) trigger levels for the consumption of finfish fillet and finfish liver have been reported in the majority of fillet and/or liver samples collected from eel, catfish and mullet samples obtained from the sample locations on the Bremer River and Warrill Creek.

If a reduced recreational fishing pattern is assumed, calculations for a fisher sourcing around 30% of their diet of finfish from these waterways indicated that exposure are elevated for children for all species sampled and for adults for mullet, catfish and eel fillet. The calculations for finfish liver are noted to have a high degree of uncertainty and consumption patterns for eel are also unknown. These issues, along with concentrations of the other PFAS in biota samples and other relevant exposure pathways, will be considered as part of the HHRA for Amberley.

3 Limitations

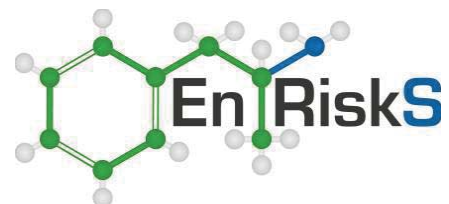
Environmental Risk Sciences Pty Ltd has prepared this report for the use of CH2M in accordance with the usual care and thoroughness of the consulting profession. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The methodology adopted, and sources of information used are outlined in this report. Environmental Risk Sciences Pty Ltd has made no independent verification of this information beyond the agreed scope of works and assumes no responsibility for any inaccuracies or omissions. No indications were found that information contained in information provided for use in this assessment was false.

This report was prepared in May 2018 and is based on the information provided and reviewed at that time. Environmental Risk Sciences Pty Ltd disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties. This report does not purport to give legal advice. Legal advice can only be given by qualified legal practitioners.

¹ https://ntepa.nt.gov.au/__data/assets/pdf_file/0011/473492/pfas_fish_report.pdf



4 Closure

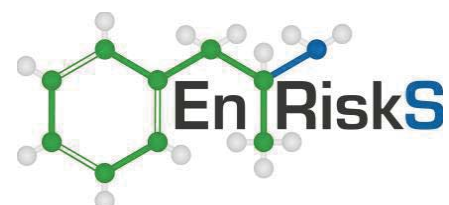
If you have any questions or need further information, please don't hesitate to contact me on [REDACTED]

Yours sincerely,

[REDACTED]

Environmental Risk Sciences Pty Ltd

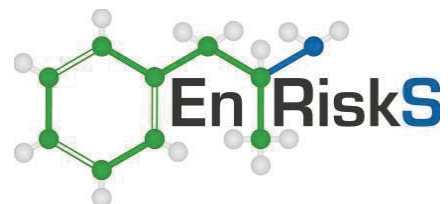
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5 References:

FSANZ 2017a, *Perfluorinated chemicals in food*, Food Standards Australia and New Zealand.
<<http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pfas-hbgv.htm#final>>.

FSANZ 2017b, *Supporting Document 2 Assessment of potential dietary exposure to perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS) occurring in foods sampled from contaminated sites*, Food Standards Australia and New Zealand, Commonwealth Department of Health.
<<http://www.health.gov.au/internet/main/publishing.nsf/Content/ohp-pfas-hbgv.htm>>.

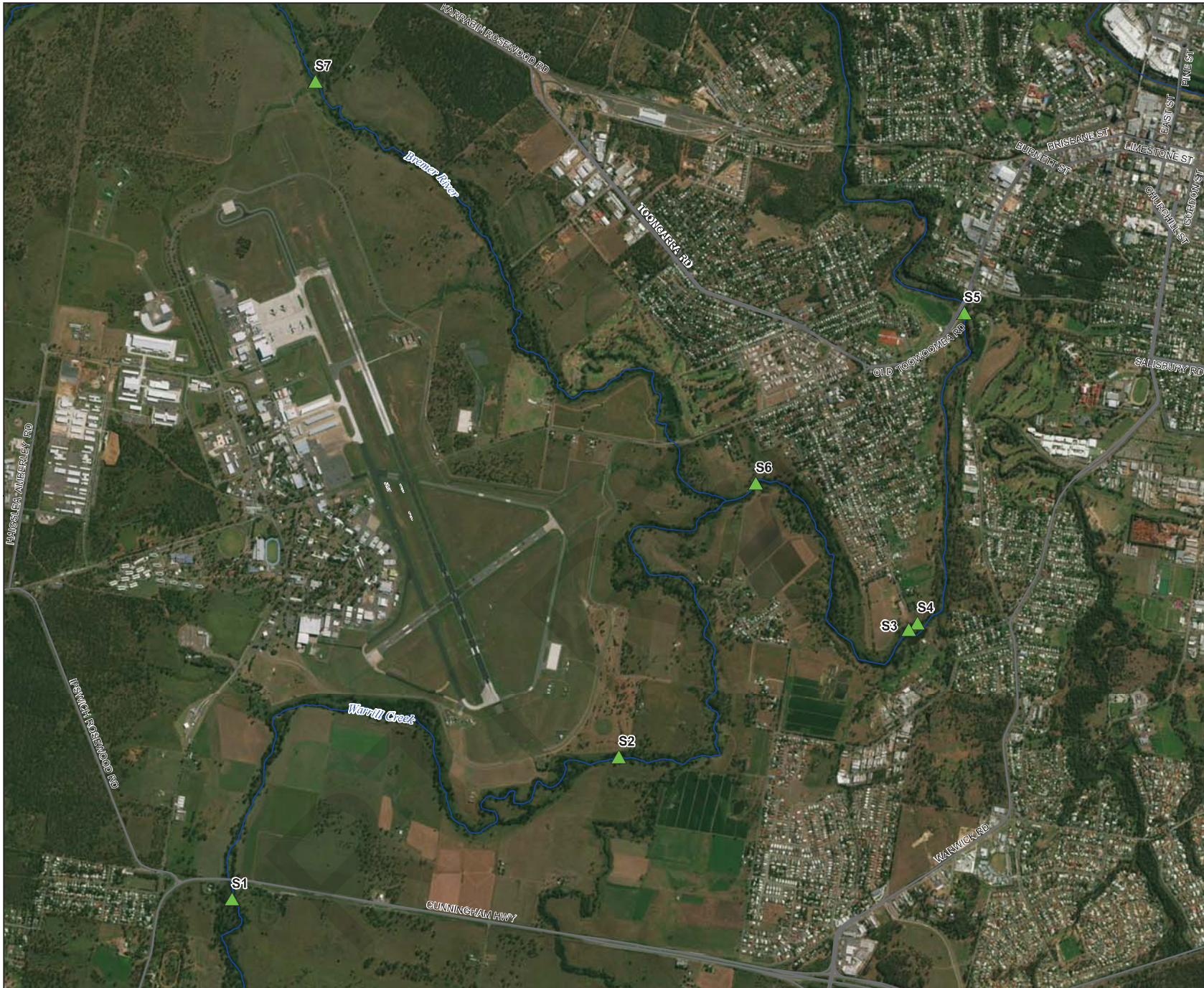


Attachment A

Figure 1

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FIGURE 1: Amberley Biota Survey Locations



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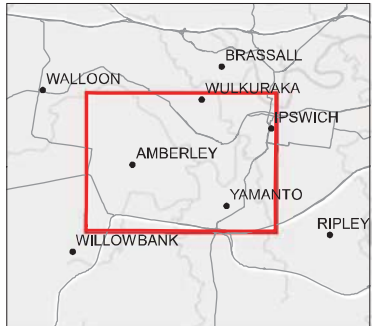
- ▲ Biota Survey Locations
- Major Road
- Watercourse

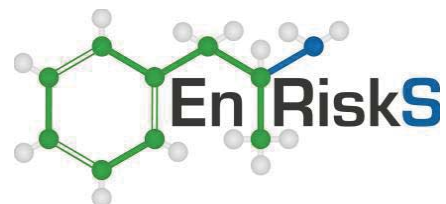
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Attachment B

Biota Sample Results Summary

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AMBERLEY PFAS INVESTIGATION - PRELIMINARY BIOTA SAMPLING DATA

Analyte (µg/kg)	S1 - 75CM EEL FILLET	S1 - 75CM EEL LIVER	S1 - PRAWN COMPOSITE	S1 - PERCH FILLET	S1 - EEL FILLET	S2 - EEL FILLET	S2 - EEL LIVER	S3 - CATFISH - FILLET	S3 - CATFISH - FILLET DUP	S3 - CATFISH - LIVER	S4 - EEL - FILLET	S4 - EEL - FILLET DUP	S4 - EEL - LIVER	S4 - EEL - LIVER DUP	S5 - MULLET 19/16CM FILLET	S5 - MULLET 19/16CM LIVER	S5 - MULLET FILLET	S5 - EEL 52CM FILLET	S5 - EEL 52CM LIVER	S6 - CATFISH 36CM FILLET	S6 - CATFISH 36CM LIVER	S7 - EEL 65CM - FILLET	S7 - EEL 65CM - LIVER	S7 - MULLET - COMPLETE	S7 - PERCH COMPLETE	
FSANZ Trigger Point PFOS+PFHxS	5.2	280	65	5.2	5.2	5.2	280	5.2	5.2	280	5.2	5.2	280	280	5.2	280	5.2	5.2	280	5.2	280	5.2	280	5.2	5.2	
FSANZ Trigger Point PFOA	41	2240	520	41	41	41	2240	41	41	2240	41	41	2240	2240	41	2240	41	41	2240	41	2240	41	2240	41	41	
Initial Weight (kg)	1.1		0.02	0.02	0.25	0.2		0.85			3.7				0.11		0.04	0.9		0.5		1.2		0.02	0.02	
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)																										
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	1.2	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	2.9	1.9	<0.5	<0.5	<0.5	0.6	11	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	
Perfluoroalkyl carboxylic acids (PFCA)																										
Perfluorobutanoic acid (PFBA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.2	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	4.2	<0.5	<0.5
Perfluorodecanoic acid (PFDA)	0.5	1	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	0.6	1.3	3.1	2.7	8.8	6.8	0.7	<0.5	<0.5	0.8	3.1	1.3	4.8	0.7	2.6	<0.5	0.9	
Perfluorododecanoic acid (PFDoDA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.5	0.6	1	2	1.9	1.6	4.2	3.4	0.8	0.6	0.7	1.2	3.1	1.5	4.1	0.5	1.4	<0.5	1.8	
Perfluoroheptanoic acid (PFHpA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluorohexanoic acid (PFHxA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluorononanoic acid (PFNA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.7	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	
Perfluorooctanoic acid (PFOA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluoropentanoic acid (PFPeA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluorotetradecanoic acid (PFTeDA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	0.8	0.9	1	2.9	2.7	<0.5	<0.5	<0.5	<0.5	0.8	0.6	2	<0.5	0.5	<0.5	<0.5	
Perfluorotridecanoic acid (PFTrDA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	0.7	0.6	2.1	1.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	1.1	<0.5	0.5	<0.5	<0.5	
Perfluoroundecanoic acid (PFUnDA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.9	1.6	1.6	1.6	4.1	3.9	1.1	0.7	0.8	1.1	2.7	1	2.9	0.7	2.2	<0.5	1.8	
Perfluoroalkyl sulfonamido substances																										
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	0.9	<0.5	<0.5	<0.5	*	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluorooctane sulfonamide (FOSA)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	
Perfluoroalkyl sulfonic acids (PFSA)																										
Perfluorobutanesulfonic acid (PFBS)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Perfluorodecanesulfonic acid (PFDS)	<0.5	1.7	<0.5	<0.5	<0.5	0.9	4.1	<0.5	1.3	1.6	3.6	1.2	16	13	1	1.2	0.9	3	3.8	1.2	5.5	1	4.2	<0.5	1.8	
Perfluoroheptanesulfonic acid (PFHpS)	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	0.5	1.3	0.7	1	6.1	6.3	<0.5	<0.5	<0.5	1.2	7	<0.5	1.2	<0.5	2.9	<0.5	<0.5	
Perfluorohexanesulfonic acid (PFHxS)	2	8.5	0.4	<0.3	0.4	2.7	6.7	1.3	1.8	5	4.5	5.4	26	30	<0.3	<0.3	<0.3	12	93	0.4	2.6	2.2	20	<0.3	<0.3	
Perfluorooctanesulfonic acid (PFOS)	50	190	4.2	2.9	7.3	75	330	76	100	400	170	190	1100	1000	43	33	24	160	860	86	530	60	360	12	71	
Perfluoropentanesulfonic acid (PFPeS)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5	<0.5	1	<0.5	<0.5	
PFASs Summations																										
Sum (PFHxS + PFOS)*	52	198.5	4.6	2.9	7.7	77.7	336.7	77.3	101.8	405	174.5	195.4	1126	1030	43	33	24	172	953	86.4	532.6	62.2	380	12	71	
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	52	198.5	4.6	2.9	7.7	77.7	336.7	77.3	101.8	405	174.5	195.4	1126	1030	43	33	24	172	954.2	86.4	532.6	62.2	380	12	71	
Sum of PFASs (n=28)*	52.5	202.4	4.6	2.9	8.2	78.6	348.5	77.9	106.1	414.1	187	205.1	1180.7	1072.7	47.5	35.5	26.4	179.9	-	92	554.7	65.1	400.1	12	78.2	
Sum of US EPA PFAS (PFOS + PFOA)*	50	190	4.2	2.9	7.3	75	330	76	100	400	170	190	1100	1000	43	33	24	160	861.2	86	530	60	360	12	71	
Sum of WA DER PFAS (n=10)*	52	198.5	4.6	2.9	7.7	77.7	337.6	77.3	101.8	405	174.5	195.4	1133.7	1033.1	43	33	24	172.6	967.5	86.4	533.1	62.2	384.2	12	71	

Notes

1. FSANZ (2017) Finfish All Proposed Trigger Point for Investigation - finfish (all) has been applied to all fish fillet samples, and complete fish samples
2. FSANZ (2017) Fish Liver Proposed Trigger Point for Investigation - has been applied to all fish live samples
3. FSANZ (2017) Crustacean Proposed Trigger Point for Investigation - has been applied to the prawn composite sample

Preliminary Biota Sampling Program – Initial Advice on Potential Human Health Risk
Page 4
23 May 2018

Attachment 2 – Laboratory Reports

RTI RELEASE SE

Certificate of Analysis

Jacobs Group (Australia) P/L QLD
 32 Cordelia St
 South Brisbane
 QLD 4101



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention: Jeremy Wicks

Report 597649-S-V2
 Project name PFAS BIOTA SURVEY
 Project ID IH142800
 Received Date May 10, 2018

Client Sample ID			S3 CATFISH - FILLET DUP Fish B18-My12225 Apr 11, 2018	S4 EEL - FILLET DUP Fish B18-My12226 Apr 11, 2018	S4 EEL - LIVER DUP Fish B18-My12227 Apr 11, 2018
Sample Matrix					
Eurofins mgt Sample No.					
Date Sampled					
Test/Reference	LOR	Unit			
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.7
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	0.6	2.7	6.8
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	0.9	1.6	3.9
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	1.0	1.6	3.4
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.5	ug/kg	< 0.5	0.6	1.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	< 0.5	1.0	2.7
13C4-PFBA (surr.)	1	%	126	119	41
13C5-PFPeA (surr.)	1	%	142	128	64
13C5-PFHxA (surr.)	1	%	127	122	64
13C4-PFHpA (surr.)	1	%	146	140	88
13C8-PFOA (surr.)	1	%	148	131	70
13C5-PFNA (surr.)	1	%	123	78	77
13C6-PFDA (surr.)	1	%	129	115	77
13C2-PFUnDA (surr.)	1	%	130	114	100
13C2-PFDoDA (surr.)	1	%	103	87	113
13C2-PFTeDA (surr.)	1	%	57	51	103
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	118	56	55
D3-N-MeFOSA (surr.)	1	%	50	38	INT

Client Sample ID			S3 CATFISH - FILLET DUP	S4 EEL - FILLET DUP	S4 EEL - LIVER DUP
Sample Matrix			Fish	Fish	Fish
Eurofins mgt Sample No.			B18-My12225	B18-My12226	B18-My12227
Date Sampled			Apr 11, 2018	Apr 11, 2018	Apr 11, 2018
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
D5-N-EtFOSA (surr.)	1	%	24	18	INT
D7-N-MeFOSE (surr.)	1	%	59	57	14
D9-N-EtFOSE (surr.)	1	%	61	56	10
D5-N-EtFOSAA (surr.)	1	%	106	133	130
D3-N-MeFOSAA (surr.)	1	%	116	105	157
Perfluoroalkyl sulfonic acids (PFASs)					
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	^{N09} 0.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	^{N09} 1.8	^{N09} 5.4	^{N09} 30
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	^{N09} 0.5	^{N09} 1.0	^{N09} 6.3
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 100	^{N09} 190	^{N09} 1000
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	1.3	1.2	13
13C3-PFBS (surr.)	1	%	132	125	90
18O2-PFHxS (surr.)	1	%	127	114	82
13C8-PFOS (surr.)	1	%	120	107	103
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.9
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.2
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	0.8
13C2-4:2 FTSA (surr.)	1	%	68	64	44
13C2-6:2 FTSA (surr.)	1	%	139	156	32
13C2-8:2 FTSA (surr.)	1	%	189	180	INT
PFASs Summations					
Sum (PFHxS + PFOS)*	0.5	ug/kg	101.8	195.4	1030
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	100	190	1000
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	101.8	195.4	1030
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	101.8	195.4	1033.1
Sum of PFASs (n=28)*	0.5	ug/kg	106.1	205.1	1072.7

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	May 10, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	May 10, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	May 10, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	May 10, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

RTI RELEASED

Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
 South Brisbane
 QLD 4101
Project Name: PFAS BIOTA SURVEY
Project ID: IH142800

Order No.:
Report #: 597649
Phone: 07 3026 7100
Fax:

Received: May 10, 2018 10:30 AM
Due: May 17, 2018
Priority: 5 Day
Contact Name: Jeremy Wicks

Eurofins | mgt Analytical Services Manager : [REDACTED]

Per- and Polyfluoroalkyl Substances (PFASs)

Sample Detail

Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						
Brisbane Laboratory - NATA Site # 20794						X
Perth Laboratory - NATA Site # 23736						
Internal Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
	S3A CATFISH - FILLET DUP	Apr 11, 2018		Fish	B18-My12225	X
	S3B EEL - FILLET DUP	Apr 11, 2018		Fish	B18-My12226	X
	S3B EEL - LIVER DUP	Apr 11, 2018		Fish	B18-My12227	X
Test Counts						3



Internal Quality Control Review and Glossary

General

- Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
- All soil results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

- Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/kg	< 0.5		0.5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 0.5		0.5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 0.5		0.5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 0.5		0.5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 0.5		0.5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 0.5		0.5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 0.5		0.5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorotridecanoic acid (PFTTrDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 0.5		0.5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 0.5		0.5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 0.5		0.5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 0.5		0.5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 0.5		0.5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 0.5		0.5	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 0.5		0.5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 0.5		0.5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 0.3		0.3	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 0.5		0.5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 0.3		0.3	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	103		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	102		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	104		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	108		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	114		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	94		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	105		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	99		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	75		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	117		50-150	Pass	
LCS - % Recovery						
Perfluoroalkyl sulfonamido substances						

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
Perfluorooctane sulfonamide (FOSA)	%	94	50-150	Pass			
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	110	50-150	Pass			
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	109	50-150	Pass			
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	103	50-150	Pass			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	109	50-150	Pass			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	90	50-150	Pass			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	109	50-150	Pass			
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSA)							
Perfluorobutanesulfonic acid (PFBS)	%	110	50-150	Pass			
Perfluoropentanesulfonic acid (PFPeS)	%	93	50-150	Pass			
Perfluorohexanesulfonic acid (PFHxS)	%	108	50-150	Pass			
Perfluoroheptanesulfonic acid (PFHpS)	%	104	50-150	Pass			
Perfluorooctanesulfonic acid (PFOS)	%	99	50-150	Pass			
Perfluorodecanesulfonic acid (PFDS)	%	102	50-150	Pass			
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	111	50-150	Pass			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	97	50-150	Pass			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	113	50-150	Pass			
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	114	50-150	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							
Perfluoroalkyl carboxylic acids (PFCA)							
				Result 1			
Perfluorobutanoic acid (PFBA)	B18-My12226	CP	%	103	50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-My12226	CP	%	104	50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-My12226	CP	%	101	50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-My12226	CP	%	102	50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-My12226	CP	%	106	50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-My12226	CP	%	107	50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-My12226	CP	%	102	50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-My12226	CP	%	100	50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-My12226	CP	%	93	50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-My12226	CP	%	48	50-150	Fail	
Perfluorotetradecanoic acid (PFTeDA)	B18-My12226	CP	%	123	50-150	Pass	
Spike - % Recovery							
Perfluoroalkyl sulfonamido substances							
				Result 1			
Perfluorooctane sulfonamide (FOSA)	B18-My12226	CP	%	92	50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-My12226	CP	%	111	50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-My12226	CP	%	90	50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-My12226	CP	%	108	50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-My12226	CP	%	110	50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-My12226	CP	%	89	50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-My12226	CP	%	106	50-150	Pass	
Spike - % Recovery							

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1				
Perfluorobutanesulfonic acid (PFBS)	B18-My12226	CP	%	98		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-My12226	CP	%	82		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-My12226	CP	%	93		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-My12226	CP	%	96		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-My12226	CP	%	52		50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-My12226	CP	%	96		50-150	Pass	
Spike - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-My12226	CP	%	112		50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-My12226	CP	%	96		50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-My12226	CP	%	107		50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-My12226	CP	%	120		50-150	Pass	

Comments

V2 - ID CHANGES AS PER CLIENT REQUEST.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[Redacted]

[Redacted]

[Redacted]

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
 South Brisbane
 QLD 4101
Project Name: PFAS BIOTA SURVEY
Project ID: IH142800

Order No.: IH142800
Report #: 595699
Phone: 07 3026 7100
Fax:

Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
North Laboratory - NATA Site # 23736								
Internal Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
S1 - 75CM EEL FILLET	Apr 09, 2018		Fish	B18-Ap30407		X	X	
S1 - 75CM EEL LIVER	Apr 09, 2018		Fish	B18-Ap30408			X	
S1 - PRAWN COMPOSITE	Apr 10, 2018		Fish	B18-Ap30409		X	X	
S1 - PERCH FILLET	Apr 10, 2018		Fish	B18-Ap30410		X	X	
S1 - PERCH LIVER	Apr 10, 2018		Fish	B18-Ap30411	X			
S1 - EEL	Apr 10, 2018		Fish	B18-Ap30412		X	X	



Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
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Project Name: PFAS BIOTA SURVEY
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Phone: 07 3026 7100
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Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail					CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794					X	X	X
North Laboratory - NATA Site # 23736							
	FILLET						
	S2 - COMPLETE	Apr 11, 2018		Fish	B18-Ap30413	X	
	S2 - EEL FILLET	Apr 11, 2018		Fish	B18-Ap30414		X
	S2 - EEL LIVER	Apr 11, 2018		Fish	B18-Ap30415		X
	S3 CATFISH - FILLET	Apr 11, 2018		Fish	B18-Ap30416		X
	S3 CATFISH - LIVER	Apr 11, 2018		Fish	B18-Ap30417		X
	S4 EEL - FILLET	Apr 11, 2018		Fish	B18-Ap30418		X
	S4 EEL -	Apr 11, 2018		Fish	B18-Ap30419		X



Company Name: Jacobs Group (Australia) P/L QLD
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 QLD 4101
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Project ID: IH142800

Order No.: IH142800
Report #: 595699
Phone: 07 3026 7100
Fax:

Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
North Laboratory - NATA Site # 23736								
	LIVER							
	S5 - MULLET 19/16CM FILLET	Apr 12, 2018		Fish	B18-Ap30420		X	X
	S5 - MULLET 19/16CM LIVER	Apr 12, 2018		Fish	B18-Ap30421			X
	S5 - MULLET FILLET	Apr 12, 2018		Fish	B18-Ap30422		X	X
	S5 - EEL 52CM FILLET	Apr 12, 2018		Fish	B18-Ap30423		X	X
	S5 - EEL 52CM LIVER	Apr 12, 2018		Fish	B18-Ap30424			X
	S6 - CATFISH 36CM FILLET	Apr 12, 2018		Fish	B18-Ap30425		X	X



Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
 South Brisbane
 QLD 4101
Project Name: PFAS BIOTA SURVEY
Project ID: IH142800

Order No.: IH142800
Report #: 595699
Phone: 07 3026 7100
Fax:

Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
S6 - CATFISH 36CM LIVER	Apr 12, 2018		Fish	B18-Ap30426			X	
S7 EEL 65CM - FILLET	Apr 12, 2018		Fish	B18-Ap30427		X	X	
S7 EEL 65CM - LIVER	Apr 12, 2018		Fish	B18-Ap30428			X	
S7 MULLET - COMPLETE	Apr 12, 2018		Fish	B18-Ap30429		X	X	
S7 - PERCH COMPLETE	Apr 12, 2018		Fish	B18-Ap30430		X	X	
Test Counts						2	14	22



CHAIN OF CUSTODY RECORD

Eurofins | mgt
 Sydney Lab
 Unit F3 Building F, 16 Mars Road, Lane Cove West, NSW 2066
 P +61 2 9500 8800
 E EuroSampleNSW@eurofins.com.au

Eurofins | mgt
 Brisbane Lab
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Eurofins | mgt
 Melbourne Lab
 2 Kingston Town Close, Oakleigh, VIC 3166
 P +61 3 8564 5000 F +61 3 8564 5090
 E EuroSampleVIC@eurofins.com.au

Company	Jacobs	Purchase Order	IH142800	Project Manager	Tom Koskela	Project Name	PFAS Biota Survey						
Address	32 Cordelia Street, South Brisbane, QLD, 4101	Eurofins mgt Quote No	171129JACQ	Project No	IH142800	Electronic Results Format	xls						
Contact Name	[Redacted]	Analysis (How: Where metals are requested please specify 'Total' or 'Filterable')	Extended PFAS suite	PREPARATION INSTRUCTIONS - Freshwater SPECIMEN	Complete organism	Filetted with skin and scales intact	Filetted with Skin only intact	Filled and skin removed	Cleaned Carcass	Liver	Other (Please specify with further instruction)	Email for Results	[Redacted]@jacobs.com
Contact Phone No	[Redacted]											Turn Around Requirements	<input type="checkbox"/> 1 DAY* <input type="checkbox"/> 2 DAY* <input type="checkbox"/> 3 DAY* <input checked="" type="checkbox"/> 5 DAY (Std.) <input type="checkbox"/> Other ()
Special Direction	PLEASE NOTE PREPARATION INSTRUCTION											Containers	Method of Shipment
Relinquished by (Signature)	[Signature]											<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal	Sample Comments / DG Hazard Warning
(Time / Date)	1:50 26/4/18												
No	Client Sample ID	Date	Matrix										
1	S1	9/4/18	Fish	X									eel x1 75cm
2	S1	10/4/18	Fish	X									prawns x3
3	S1	10/4/18	Fish	X									perch x2 size? composite
4	S1	10/4/18	Fish	X									eel x1
5	S2	11/4/18	U	X									prawn x1
6	S2	17/4/18	"	X									Eel x1
7	S3a	11/4/18	"	X									Catfish x1 @AQC split (sum I)
8	S3b	11/4/18	"	X									Eel x1 @AQC split (sum I)
9	S4	12/4/18		X									mullet 19cm/16cm
10	S4	17/4/18		X									mullet
11	S4	12/4/18		X									eel 52cm
12	S5	14/4/18		X									Catfish 36cm.
Laboratory Use Only	Received By	[Signature]	SYD BNE MEL PER ADL NEW DAR	Date	26/4/18	Time	2:00	Signature	[Signature]	Temperature	2.4		
	Received By		SYD BNE MEL PER ADL NEW DAR	Date	__/__/__	Time	__:	Signature		Report No			

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

Eurofins | mgt
Sydney Lab

Unit F3 Building F, 16 Mars Road, Lane Cove West, NSW 2066
P: +61 2 9500 8400
E: EuroSampleSyd@eurofins.com.au

Eurofins | mgt
Brisbane Lab

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Eurofins | mgt
Melbourne Lab

2 Kingston Town Close, Oakleigh, VIC 3186
P: +61 3 8564 5000 F: +61 3 8564 5000
E: EuroSampleVic@eurofins.com.au

Company	Jacobs	Purchase Order	IH142800	Project Manager	Tom Koskela	Project Name	PFAS Biota Survey	
Address	32 Cordelia Street, South Brisbane, QLD, 4101	Eurofins mgt Quote No	171129JACQ	Project No	IH142800	Electronic Results Format	xls	
Contact Name	[Redacted]	Analysis (Note: Where needed are requested: please specify "Toxin" or "Fillets") Extended PFAS suite	PREPARATION INSTRUCTIONS - Freshwater SPECIMEN	Complete organism	Filleted with skin and scales intact	Filleted with Skin only intact	Filleted and skin removed	
Contact Phone No	[Redacted]							Other (Please specify with further instruction)
Special Direction	PLEASE NOTE PREPARATION INSTRUCTION							
Relinquished by (Signature)	[Signature]							Containers
(Time / Date)	150 26.4.18	Large Ziplock Bags	<input type="checkbox"/> Courier (#) <input checked="" type="checkbox"/> Hand Delivered <input type="checkbox"/> Postal					
No	Client Sample ID	Date	Matrix					
1	56		Fish	X	X	X	eel 75cm	
2	56		Fish	X	X	X	Mullet	
3	56		Fish	X	X	X	Perch 10cm	
4			Fish					
5								
6								
7								
8								
9								
10								
11								
12								

Laboratory Use Only	Received By	SYD BNE MEL PER ADL NEW DAR	Date	__/__/__	Time	__:	Signature	Temperature
	Received By	SYD BNE MEL PER ADL NEW DAR	Date	__/__/__	Time	__:	Signature	Report No

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Sample Receipt Advice

Company name: **Jacobs Group (Australia) P/L QLD**

Contact name: [REDACTED]
 Project name: **PFAS BIOTA SURVEY**
 Project ID: **IH142800**
 COC number: **Not provided**
 Turn around time: **10 Day**
 Date/Time received: **Apr 26, 2018 2:00 PM**
 Eurofins | mgt reference: **595699**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
 - Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 2.4 degrees Celsius.
 - All samples have been received as described on the above COC.
 - COC has been completed correctly.
 - Attempt to chill was evident.
 - Appropriately preserved sample containers have been used.
 - All samples were received in good condition.
 - Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
 - Appropriate sample containers have been used.
 - Split sample sent to requested external lab.
 - Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

PLEASE NOTE AP30413 (1 X PRAWN - FILLET WITH SKIN AND SCALES INTACT) VOLUME TOO SMALL FOR ANALYSIS, SAMPLE ADDED TO AP30409 PRAWN COMPOSITE. AP30411 PERCH LIVER VOLUME TOO SMALL FOR ANALYSIS, CANCELLED.

Contact notes

If you have any questions with respect to these samples please contact:

[REDACTED] on Phone : or by e.mail: [REDACTED]@eurofins.com

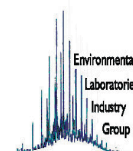
Results will be delivered electronically via e.mail to [REDACTED]@jacobs.com.

Note: A copy of these results will also be delivered to the general Jacobs Group (Australia) P/L QLD email address.



Environmental Laboratory NATA Accreditation
 Air Analysis Stack Emission Sampling & Analysis
 Water Analysis Trade Waste Sampling & Analysis
 Soil Contamination Analysis Groundwater Sampling & Analysis

38 Years of Environmental Analysis & Experience



Certificate of Analysis

Jacobs Group (Australia) P/L QLD
 32 Cordelia St
 South Brisbane
 QLD 4101



NATA Accredited
 Accreditation Number 1261
 Site Number 20794

Accredited for compliance with ISO/IEC 17025 – Testing
 The results of the tests, calibrations and/or
 measurements included in this document are traceable
 to Australian/national standards.

Attention:

Report **595699-S-V3**
 Project name PFAS BIOTA SURVEY
 Project ID IH142800
 Received Date Apr 26, 2018

Client Sample ID			S1 - 75CM EEL FILLET	S1 - 75CM EEL LIVER	S1 - PRAWN COMPOSITE	S1 - PERCH FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30407	B18-Ap30408	B18-Ap30409	B18-Ap30410
Date Sampled			Apr 09, 2018	Apr 09, 2018	Apr 10, 2018	Apr 10, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	0.5	1.0	< 0.5	< 0.5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotridecanoic acid (PFTTrDA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	54	50	47	53
13C5-PFPeA (surr.)	1	%	61	62	59	53
13C5-PFHxA (surr.)	1	%	76	73	72	77
13C4-PFHpA (surr.)	1	%	78	78	69	76
13C8-PFOA (surr.)	1	%	74	79	78	71
13C5-PFNA (surr.)	1	%	79	94	102	76
13C6-PFDA (surr.)	1	%	75	93	103	80
13C2-PFUnDA (surr.)	1	%	84	99	105	66
13C2-PFDoDA (surr.)	1	%	64	82	106	71
13C2-PFTeDA (surr.)	1	%	70	120	99	49
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	57	62	37	68
D3-N-MeFOSA (surr.)	1	%	29	33	10	29

Client Sample ID			S1 - 75CM EEL FILLET	S1 - 75CM EEL LIVER	S1 - PRAWN COMPOSITE	S1 - PERCH FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30407	B18-Ap30408	B18-Ap30409	B18-Ap30410
Date Sampled			Apr 09, 2018	Apr 09, 2018	Apr 10, 2018	Apr 10, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	39	45	21	37
D7-N-MeFOSE (surr.)	1	%	24	32	INT	22
D9-N-EtFOSE (surr.)	1	%	28	35	INT	20
D5-N-EtFOSAA (surr.)	1	%	141	158	167	95
D3-N-MeFOSAA (surr.)	1	%	118	120	162	104
Perfluoroalkyl sulfonic acids (PFSA)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	^{N09} 2.0	^{N09} 8.5	0.4	< 0.3
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	< 0.5	^{N09} 1.2	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 50	^{N09} 190	^{N09} 4.2	^{N09} 2.9
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	< 0.5	^{N09} 1.7	< 0.5	< 0.5
13C3-PFBS (surr.)	1	%	79	73	79	76
18O2-PFHxS (surr.)	1	%	77	79	62	69
13C8-PFOS (surr.)	1	%	83	119	118	91
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	82	96	67	81
13C2-6:2 FTSA (surr.)	1	%	129	45	98	100
13C2-8:2 FTSA (surr.)	1	%	142	133	145	130
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	52	198.5	4.6	2.9
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	50	190	4.2	2.9
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	52	198.5	4.6	2.9
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	52	198.5	4.6	2.9
Sum of PFASs (n=28)*	0.5	ug/kg	52.5	202.4	4.6	2.9
Initial Weight	0.01	kg	1.1	-	0.02	0.02

Client Sample ID			S1 - EEL FILLET	S2 - EEL FILLET	S2 - EEL LIVER	S3 CATFISH - FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30412	B18-Ap30414	B18-Ap30415	B18-Ap30416
Date Sampled			Apr 10, 2018	Apr 11, 2018	Apr 11, 2018	Apr 11, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			S1 - EEL FILLET	S2 - EEL FILLET	S2 - EEL LIVER	S3 CATFISH - FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30412	B18-Ap30414	B18-Ap30415	B18-Ap30416
Date Sampled			Apr 10, 2018	Apr 11, 2018	Apr 11, 2018	Apr 11, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.1	< 0.5
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.9	< 0.5
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.5	0.6
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	0.8	< 0.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.2	< 0.5
13C4-PFBA (surr.)	1	%	56	46	56	66
13C5-PFPeA (surr.)	1	%	60	49	63	69
13C5-PFHxA (surr.)	1	%	69	68	68	88
13C4-PFHpA (surr.)	1	%	62	64	63	93
13C8-PFOA (surr.)	1	%	57	58	61	86
13C5-PFNA (surr.)	1	%	60	62	61	94
13C6-PFDA (surr.)	1	%	52	55	50	80
13C2-PFUnDA (surr.)	1	%	47	52	41	68
13C2-PFDoDA (surr.)	1	%	55	57	45	72
13C2-PFTeDA (surr.)	1	%	36	33	28	45
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	55	60	52	47
D3-N-MeFOSA (surr.)	1	%	28	27	24	32
D5-N-EtFOSA (surr.)	1	%	36	37	31	38
D7-N-MeFOSE (surr.)	1	%	21	21	18	25
D9-N-EtFOSE (surr.)	1	%	23	22	18	25
D5-N-EtFOSAA (surr.)	1	%	63	64	62	92
D3-N-MeFOSAA (surr.)	1	%	68	68	61	98
Perfluoroalkyl sulfonic acids (PFSAAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	0.4	^{N09} 2.7	^{N09} 6.7	^{N09} 1.3
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	^{N09} 1.3	< 0.5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 7.3	^{N09} 75	^{N09} 330	^{N09} 76
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	< 0.5	^{N09} 0.9	^{N09} 4.1	< 0.5
13C3-PFBS (surr.)	1	%	75	79	72	91
18O2-PFHxS (surr.)	1	%	64	67	64	81
13C8-PFOS (surr.)	1	%	70	64	68	73

Client Sample ID			S1 - EEL FILLET	S2 - EEL FILLET	S2 - EEL LIVER	S3 CATFISH - FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30412	B18-Ap30414	B18-Ap30415	B18-Ap30416
Date Sampled			Apr 10, 2018	Apr 11, 2018	Apr 11, 2018	Apr 11, 2018
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.9	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	67	104	68	71
13C2-6:2 FTSA (surr.)	1	%	56	65	61	100
13C2-8:2 FTSA (surr.)	1	%	87	123	82	131
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	7.7	77.7	336.7	77.3
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	7.3	75	330	76
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	7.7	77.7	336.7	77.3
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	7.7	77.7	337.6	77.3
Sum of PFASs (n=28)*	0.5	ug/kg	8.2	78.6	348.5	77.9
Initial Weight	0.01	kg	0.25	0.20	-	0.85

Client Sample ID			S3 CATFISH - LIVER	S4 EEL - FILLET	S4 EEL - LIVER	S5 - MULLET 19/16CM FILLET
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30417	B18-Ap30418	B18-Ap30419	B18-Ap30420
Date Sampled			Apr 11, 2018	Apr 11, 2018	Apr 11, 2018	Apr 12, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	3.2	< 0.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.7	< 0.5
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	1.3	3.1	8.8	0.7
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	1.6	1.6	4.1	1.1
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	2.0	1.9	4.2	0.8
Perfluorotridecanoic acid (PFTeDA) ^{N15}	0.5	ug/kg	< 0.5	0.7	2.1	< 0.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	0.8	0.9	2.9	< 0.5
13C4-PFBA (surr.)	1	%	68	57	41	95
13C5-PFPeA (surr.)	1	%	74	76	47	76
13C5-PFHxA (surr.)	1	%	89	87	55	96
13C4-PFHpA (surr.)	1	%	92	98	84	99
13C8-PFOA (surr.)	1	%	90	104	62	117
13C5-PFNA (surr.)	1	%	96	98	114	129
13C6-PFDA (surr.)	1	%	76	95	70	111
13C2-PFUnDA (surr.)	1	%	69	87	72	109
13C2-PFDoDA (surr.)	1	%	77	67	129	121
13C2-PFTeDA (surr.)	1	%	48	56	122	90

Client Sample ID			S3 CATFISH - LIVER Fish B18-Ap30417 Apr 11, 2018	S4 EEL - FILLET Fish B18-Ap30418 Apr 11, 2018	S4 EEL - LIVER Fish B18-Ap30419 Apr 11, 2018	S5 - MULLET 19/16CM FILLET Fish B18-Ap30420 Apr 12, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.6	0.9
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	63	49	114	74
D3-N-MeFOSA (surr.)	1	%	28	42	35	31
D5-N-EtFOSA (surr.)	1	%	35	35	110	81
D7-N-MeFOSE (surr.)	1	%	21	45	31	42
D9-N-EtFOSE (surr.)	1	%	23	36	15	38
D5-N-EtFOSAA (surr.)	1	%	82	104	INT	68
D3-N-MeFOSAA (surr.)	1	%	91	105	161	73
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	^{N09} 5.0	^{N09} 4.5	^{N09} 26	< 0.3
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	1.3	0.7	6.1	< 0.5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 400	^{N09} 170	^{N09} 1100	^{N09} 43
Perfluorodecane sulfonic acid (PFDS) ^{N15}	0.5	ug/kg	1.6	^{N09} 3.6	^{N09} 16	^{N09} 1.0
13C3-PFBS (surr.)	1	%	93	90	70	87
18O2-PFHxS (surr.)	1	%	88	103	84	104
13C8-PFOS (surr.)	1	%	78	110	87	114
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	2.9	< 0.5
1H.1H.2H.2H-perfluorodecane sulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	1.6	< 0.5
1H.1H.2H.2H-perfluorododecane sulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	83	74	76	133
13C2-6:2 FTSA (surr.)	1	%	97	170	150	INT
13C2-8:2 FTSA (surr.)	1	%	113	171	186	76
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	405	174.5	1126	43
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	400	170	1100	43
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	405	174.5	1126	43
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	405	174.5	1133.7	43
Sum of PFASs (n=28)*	0.5	ug/kg	414.1	187	1180.7	47.5
Initial Weight	0.01	kg	-	3.7	-	0.11

Client Sample ID			S5 - MULLET 19/16CM LIVER Fish B18-Ap30421 Apr 12, 2018	S5 - MULLET FILLET Fish B18-Ap30422 Apr 12, 2018	S5 - EEL 52CM FILLET Fish B18-Ap30423 Apr 12, 2018	S5 - EEL 52CM LIVER Fish B18-Ap30424 Apr 12, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	1.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	1.2
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	1.2
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.8	3.1
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	0.7	0.8	1.1	2.7
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	0.6	0.7	1.2	3.1
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	0.8
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	0.8
13C4-PFBA (surr.)	1	%	30	64	68	51
13C5-PFPeA (surr.)	1	%	73	67	80	59
13C5-PFHxA (surr.)	1	%	95	87	107	94
13C4-PFHpA (surr.)	1	%	109	92	117	130
13C8-PFOA (surr.)	1	%	125	112	101	129
13C5-PFNA (surr.)	1	%	145	129	129	160
13C6-PFDA (surr.)	1	%	114	101	99	124
13C2-PFUnDA (surr.)	1	%	114	120	104	186
13C2-PFDoDA (surr.)	1	%	76	108	74	147
13C2-PFTeDA (surr.)	1	%	51	86	61	142
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	71	71	67	88
D3-N-MeFOSA (surr.)	1	%	32	16	47	16
D5-N-EtFOSA (surr.)	1	%	17	INT	32	45
D7-N-MeFOSE (surr.)	1	%	40	41	46	30
D9-N-EtFOSE (surr.)	1	%	34	35	37	21
D5-N-EtFOSAA (surr.)	1	%	134	181	106	129
D3-N-MeFOSAA (surr.)	1	%	108	143	92	126
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	3.9
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	< 0.3	< 0.3	^{N09} 12	^{N09} 93
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	1.2	7.0
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 33	^{N09} 24	^{N09} 160	^{N09} 860
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	^{N09} 1.2	^{N09} 0.9	^{N09} 3.0	^{N09} 3.8
13C3-PFBS (surr.)	1	%	92	83	104	101
18O2-PFHxS (surr.)	1	%	114	103	101	141
13C8-PFOS (surr.)	1	%	124	92	113	78

Client Sample ID			S5 - MULLET 19/16CM LIVER	S5 - MULLET FILLET	S5 - EEL 52CM FILLET	S5 - EEL 52CM LIVER
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30421	B18-Ap30422	B18-Ap30423	B18-Ap30424
Date Sampled			Apr 12, 2018	Apr 12, 2018	Apr 12, 2018	Apr 12, 2018
Test/Reference	LOR	Unit				
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	0.6	11
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	0.8
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	134	108	99	120
13C2-6:2 FTSA (surr.)	1	%	183	INT	185	73
13C2-8:2 FTSA (surr.)	1	%	INT	INT	154	119
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	33	24	172	953
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	33	24	160	861.2
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	33	24	172	954.2
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	33	24	172.6	967.5
Sum of PFASs (n=28)*	0.5	ug/kg	35.5	26.4	179.9	993.9
Initial Weight	0.01	kg	-	0.04	0.90	-

Client Sample ID			S6 - CATFISH 36CM FILLET	S6 - CATFISH 36CM LIVER	S7 EEL 65CM - FILLET	S7 EEL 65CM - LIVER
Sample Matrix			Fish	Fish	Fish	Fish
Eurofins mgt Sample No.			B18-Ap30425	B18-Ap30426	B18-Ap30427	B18-Ap30428
Date Sampled			Apr 12, 2018	Apr 12, 2018	Apr 12, 2018	Apr 12, 2018
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	4.2
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	0.6
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	1.3	4.8	0.7	2.6
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	1.0	2.9	0.7	2.2
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	1.5	4.1	0.5	1.4
Perfluorotridecanoic acid (PFTeDA) ^{N15}	0.5	ug/kg	< 0.5	1.1	< 0.5	0.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	0.6	2.0	< 0.5	0.5
13C4-PFBA (surr.)	1	%	75	65	91	50
13C5-PFPeA (surr.)	1	%	78	70	78	59
13C5-PFHxA (surr.)	1	%	114	98	120	54
13C4-PFHpA (surr.)	1	%	117	97	119	74
13C8-PFOA (surr.)	1	%	128	91	112	69
13C5-PFNA (surr.)	1	%	149	120	82	127
13C6-PFDA (surr.)	1	%	114	100	67	118
13C2-PFUnDA (surr.)	1	%	123	119	70	77
13C2-PFDoDA (surr.)	1	%	97	178	53	127
13C2-PFTeDA (surr.)	1	%	75	164	63	144

Client Sample ID			S6 - CATFISH 36CM FILLET Fish B18-Ap30425 Apr 12, 2018	S6 - CATFISH 36CM LIVER Fish B18-Ap30426 Apr 12, 2018	S7 EEL 65CM - FILLET Fish B18-Ap30427 Apr 12, 2018	S7 EEL 65CM - LIVER Fish B18-Ap30428 Apr 12, 2018
Sample Matrix						
Eurofins mgt Sample No.						
Date Sampled						
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	80	70	54	92
D3-N-MeFOSA (surr.)	1	%	38	12	42	22
D5-N-EtFOSA (surr.)	1	%	21	26	33	66
D7-N-MeFOSE (surr.)	1	%	38	22	40	43
D9-N-EtFOSE (surr.)	1	%	33	18	33	43
D5-N-EtFOSAA (surr.)	1	%	151	188	64	178
D3-N-MeFOSAA (surr.)	1	%	123	168	52	189
Perfluoroalkyl sulfonic acids (PFASs)						
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	1.0
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	0.4	^{N09} 2.6	^{N09} 2.2	^{N09} 20
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	< 0.5	1.2	< 0.5	2.9
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	86	^{N09} 530	^{N09} 60	^{N09} 360
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	^{N09} 1.2	^{N09} 5.5	^{N09} 1.0	^{N09} 4.2
13C3-PFBS (surr.)	1	%	108	102	108	94
18O2-PFHxS (surr.)	1	%	126	132	119	100
13C8-PFOS (surr.)	1	%	123	152	87	140
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	118	157	88	98
13C2-6:2 FTSA (surr.)	1	%	102	INT	164	48
13C2-8:2 FTSA (surr.)	1	%	75	INT	93	INT
PFASs Summations						
Sum (PFHxS + PFOS)*	0.5	ug/kg	86.4	532.6	62.2	380
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	86	530	60	360
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	86.4	532.6	62.2	380
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	86.4	533.1	62.2	384.2
Sum of PFASs (n=28)*	0.5	ug/kg	92	554.7	65.1	400.1
Initial Weight	0.01	kg	0.50	-	1.2	-

Client Sample ID			S7 MULLET - COMPLETE	S7 - PERCH COMPLETE
Sample Matrix			Fish	Fish
Eurofins mgt Sample No.			B18-Ap30429	B18-Ap30430
Date Sampled			Apr 12, 2018	Apr 12, 2018
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluoropentanoic acid (PFPeA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluorohexanoic acid (PFHxA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluoroheptanoic acid (PFHpA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluorooctanoic acid (PFOA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluorononanoic acid (PFNA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluorodecanoic acid (PFDA) ^{N11}	0.5	ug/kg	< 0.5	0.9
Perfluoroundecanoic acid (PFUnDA) ^{N11}	0.5	ug/kg	< 0.5	1.8
Perfluorododecanoic acid (PFDoDA) ^{N11}	0.5	ug/kg	< 0.5	1.8
Perfluorotridecanoic acid (PFTrDA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5
Perfluorotetradecanoic acid (PFTeDA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
13C4-PFBA (surr.)	1	%	106	101
13C5-PFPeA (surr.)	1	%	75	71
13C5-PFHxA (surr.)	1	%	111	110
13C4-PFHpA (surr.)	1	%	128	104
13C8-PFOA (surr.)	1	%	128	74
13C5-PFNA (surr.)	1	%	151	127
13C6-PFDA (surr.)	1	%	112	45
13C2-PFUnDA (surr.)	1	%	94	68
13C2-PFDoDA (surr.)	1	%	130	121
13C2-PFTeDA (surr.)	1	%	87	157
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA) ^{N11}	0.5	ug/kg	< 0.5	0.9
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
13C8-FOSA (surr.)	1	%	70	53
D3-N-MeFOSA (surr.)	1	%	INT	INT
D5-N-EtFOSA (surr.)	1	%	INT	71
D7-N-MeFOSE (surr.)	1	%	11	16
D9-N-EtFOSE (surr.)	1	%	INT	16
D5-N-EtFOSAA (surr.)	1	%	193	119
D3-N-MeFOSAA (surr.)	1	%	134	65
Perfluoroalkyl sulfonic acids (PFSA)				
Perfluorobutanesulfonic acid (PFBS) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
Perfluoropentanesulfonic acid (PFPeS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5
Perfluorohexanesulfonic acid (PFHxS) ^{N11}	0.3	ug/kg	< 0.3	< 0.3
Perfluoroheptanesulfonic acid (PFHpS) ^{N15}	0.5	ug/kg	< 0.5	< 0.5
Perfluorooctanesulfonic acid (PFOS) ^{N11}	0.3	ug/kg	^{N09} 12	^{N09} 71
Perfluorodecanesulfonic acid (PFDS) ^{N15}	0.5	ug/kg	< 0.5	^{N09} 1.8
13C3-PFBS (surr.)	1	%	109	110
18O2-PFHxS (surr.)	1	%	143	131
13C8-PFOS (surr.)	1	%	103	162

Client Sample ID			S7 MULLET - COMPLETE	S7 - PERCH COMPLETE
Sample Matrix			Fish	Fish
Eurofins mgt Sample No.			B18-Ap30429	B18-Ap30430
Date Sampled			Apr 12, 2018	Apr 12, 2018
Test/Reference	LOR	Unit		
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTSA) ^{N11}	0.5	ug/kg	< 0.5	< 0.5
1H,1H,2H,2H-perfluorododecanesulfonic acid (10:2 FTSA) ^{N15}	0.5	ug/kg	< 0.5	< 0.5
13C2-4:2 FTSA (surr.)	1	%	154	195
13C2-6:2 FTSA (surr.)	1	%	INT	INT
13C2-8:2 FTSA (surr.)	1	%	INT	INT
PFASs Summations				
Sum (PFHxS + PFOS)*	0.5	ug/kg	12	71
Sum of US EPA PFAS (PFOS + PFOA)*	0.5	ug/kg	12	71
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.5	ug/kg	12	71
Sum of WA DER PFAS (n=10)*	0.5	ug/kg	12	71
Sum of PFASs (n=28)*	0.5	ug/kg	12	78.2
Initial Weight	0.01	kg	0.02	0.02

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Apr 26, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Apr 26, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Apr 26, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Apr 26, 2018	180 Day
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Initial Weight	Brisbane	May 09, 2018	0 Day

Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
 South Brisbane
 QLD 4101
Project Name: PFAS BIOTA SURVEY
Project ID: IH142800

Order No.: IH142800
Report #: 595699
Phone: 07 3026 7100
Fax:

Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
North Laboratory - NATA Site # 23736								
Internal Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
S1 - 75CM EEL FILLET	Apr 09, 2018		Fish	B18-Ap30407		X	X	
S1 - 75CM EEL LIVER	Apr 09, 2018		Fish	B18-Ap30408			X	
S1 - PRAWN COMPOSITE	Apr 10, 2018		Fish	B18-Ap30409		X	X	
S1 - PERCH FILLET	Apr 10, 2018		Fish	B18-Ap30410		X	X	
S1 - PERCH LIVER	Apr 10, 2018		Fish	B18-Ap30411	X			
S1 - EEL	Apr 10, 2018		Fish	B18-Ap30412		X	X	



Company Name: Jacobs Group (Australia) P/L QLD
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Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail					CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794					X	X	X
North Laboratory - NATA Site # 23736							
	FILLET						
	S2 - COMPLETE	Apr 11, 2018		Fish	B18-Ap30413	X	
	S2 - EEL FILLET	Apr 11, 2018		Fish	B18-Ap30414		X
	S2 - EEL LIVER	Apr 11, 2018		Fish	B18-Ap30415		X
	S3 CATFISH - FILLET	Apr 11, 2018		Fish	B18-Ap30416		X
	S3 CATFISH - LIVER	Apr 11, 2018		Fish	B18-Ap30417		X
	S4 EEL - FILLET	Apr 11, 2018		Fish	B18-Ap30418		X
	S4 EEL -	Apr 11, 2018		Fish	B18-Ap30419		X



Company Name: Jacobs Group (Australia) P/L QLD	Order No.: IH142800	Received: Apr 26, 2018 2:00 PM
Address: 32 Cordelia St South Brisbane QLD 4101	Report #: 595699	Due: May 11, 2018
	Phone: 07 3026 7100	Priority: 10 Day
	Fax:	Contact Name: [REDACTED]
Project Name: PFAS BIOTA SURVEY		
Project ID: IH142800		

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
North Laboratory - NATA Site # 23736								
	LIVER							
	S5 - MULLET 19/16CM FILLET	Apr 12, 2018		Fish	B18-Ap30420		X	X
	S5 - MULLET 19/16CM LIVER	Apr 12, 2018		Fish	B18-Ap30421			X
	S5 - MULLET FILLET	Apr 12, 2018		Fish	B18-Ap30422		X	X
	S5 - EEL 52CM FILLET	Apr 12, 2018		Fish	B18-Ap30423		X	X
	S5 - EEL 52CM LIVER	Apr 12, 2018		Fish	B18-Ap30424			X
	S6 - CATFISH 36CM FILLET	Apr 12, 2018		Fish	B18-Ap30425		X	X



Company Name: Jacobs Group (Australia) P/L QLD
Address: 32 Cordelia St
 South Brisbane
 QLD 4101
Project Name: PFAS BIOTA SURVEY
Project ID: IH142800

Order No.: IH142800
Report #: 595699
Phone: 07 3026 7100
Fax:

Received: Apr 26, 2018 2:00 PM
Due: May 11, 2018
Priority: 10 Day
Contact Name: [REDACTED]

Eurofins | mgt Analytical Services Manager : [REDACTED]

Sample Detail						CANCELLED	Initial Weight	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794						X	X	X
Perth Laboratory - NATA Site # 23736								
S6 - CATFISH 36CM LIVER	Apr 12, 2018		Fish	B18-Ap30426			X	
S7 EEL 65CM - FILLET	Apr 12, 2018		Fish	B18-Ap30427		X	X	
S7 EEL 65CM - LIVER	Apr 12, 2018		Fish	B18-Ap30428			X	
S7 MULLET - COMPLETE	Apr 12, 2018		Fish	B18-Ap30429		X	X	
S7 - PERCH COMPLETE	Apr 12, 2018		Fish	B18-Ap30430		X	X	
Test Counts						2	14	22



Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	ug/kg	< 0.5		0.5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 0.5		0.5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 0.5		0.5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 0.5		0.5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 0.5		0.5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 0.5		0.5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 0.5		0.5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorotridecanoic acid (PFTTrDA)	ug/kg	< 0.5		0.5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 0.5		0.5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 0.5		0.5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 0.5		0.5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/kg	< 0.5		0.5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/kg	< 0.5		0.5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 0.5		0.5	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
Perfluoroalkyl sulfonic acids (PFsAs)						
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 0.5		0.5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 0.5		0.5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 0.3		0.3	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 0.5		0.5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 0.3		0.3	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 0.5		0.5	Pass	
Method Blank						
n:2 Fluorotelomer sulfonic acids (n:2 FTsAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 0.5		0.5	Pass	
LCS - % Recovery						
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)	%	96		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	105		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	95		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	98		50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	95		50-150	Pass	
Perfluorononanoic acid (PFNA)	%	96		50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	114		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	99		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	102		50-150	Pass	
Perfluorotridecanoic acid (PFTTrDA)	%	87		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	97		50-150	Pass	
LCS - % Recovery						
Perfluoroalkyl sulfonamido substances						

Test	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code		
Perfluorooctane sulfonamide (FOSA)	%	92	50-150	Pass			
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	102	50-150	Pass			
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	94	50-150	Pass			
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	%	107	50-150	Pass			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	91	50-150	Pass			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	94	50-150	Pass			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	97	50-150	Pass			
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSA)							
Perfluorobutanesulfonic acid (PFBS)	%	96	50-150	Pass			
Perfluoropentanesulfonic acid (PFPeS)	%	121	50-150	Pass			
Perfluorohexanesulfonic acid (PFHxS)	%	93	50-150	Pass			
Perfluoroheptanesulfonic acid (PFHpS)	%	92	50-150	Pass			
Perfluorooctanesulfonic acid (PFOS)	%	94	50-150	Pass			
Perfluorodecanesulfonic acid (PFDS)	%	54	50-150	Pass			
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	98	50-150	Pass			
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	102	50-150	Pass			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	87	50-150	Pass			
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	89	50-150	Pass			
Test	Lab Sample ID	QA Source	Units	Result 1	Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery							
Perfluoroalkyl carboxylic acids (PFCA)							
Perfluorobutanoic acid (PFBA)	B18-Ap30412	CP	%	94	50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30412	CP	%	93	50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30412	CP	%	95	50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30412	CP	%	93	50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30412	CP	%	93	50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30412	CP	%	93	50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30412	CP	%	107	50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30412	CP	%	96	50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30412	CP	%	94	50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30412	CP	%	68	50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30412	CP	%	98	50-150	Pass	
Spike - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	B18-Ap30412	CP	%	86	50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30412	CP	%	101	50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30412	CP	%	95	50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30412	CP	%	104	50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30412	CP	%	94	50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30412	CP	%	83	50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30412	CP	%	80	50-150	Pass	
Spike - % Recovery							

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroalkyl sulfonic acids (PFSA's)				Result 1				
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30412	CP	%	94		50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30412	CP	%	127		50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30412	CP	%	91		50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30412	CP	%	88		50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30412	CP	%	86		50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30412	CP	%	60		50-150	Pass	
Spike - % Recovery								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA's)				Result 1				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30412	CP	%	90		50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30412	CP	%	99		50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30412	CP	%	94		50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30412	CP	%	106		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1				
Perfluorobutanoic acid (PFBA)	B18-Ap30418	CP	%	100		50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30418	CP	%	94		50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30418	CP	%	109		50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30418	CP	%	90		50-150	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30418	CP	%	101		50-150	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30418	CP	%	92		50-150	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30418	CP	%	111		50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30418	CP	%	97		50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30418	CP	%	103		50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30418	CP	%	76		50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30418	CP	%	94		50-150	Pass	
Spike - % Recovery								
Perfluoroalkyl sulfonamido substances				Result 1				
Perfluorooctane sulfonamide (FOSA)	B18-Ap30418	CP	%	120		50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30418	CP	%	81		50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30418	CP	%	140		50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30418	CP	%	110		50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30418	CP	%	95		50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30418	CP	%	100		50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30418	CP	%	95		50-150	Pass	
Spike - % Recovery								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluoroalkyl sulfonic acids (PFASs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30418	CP	%	80			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30418	CP	%	95			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30418	CP	%	90			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30418	CP	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30418	CP	%	116			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30418	CP	%	92			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30418	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30418	CP	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30418	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30418	CP	%	104			50-150	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Perfluoroalkyl carboxylic acids (PFCA)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	B18-Ap30407	CP	ug/kg	0.5	0.5	2.0	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30407	CP	ug/kg	2.0	1.9	2.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30407	CP	ug/kg	50	47	6.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30407	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B18-Ap30423	CP	ug/kg	0.8	1.0	28	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30423	CP	ug/kg	1.1	1.1	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	B18-Ap30423	CP	ug/kg	1.2	1.3	6.0	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30423	CP	ug/kg	12	11	6.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30423	CP	ug/kg	1.2	1.1	3.0	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30423	CP	ug/kg	160	150	3.0	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30423	CP	ug/kg	3.0	2.9	3.0	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30423	CP	ug/kg	0.6	0.6	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30423	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	B18-Ap30427	CP	ug/kg	0.7	0.7	13	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	B18-Ap30427	CP	ug/kg	0.7	0.6	6.0	30%	Pass
Perfluorododecanoic acid (PFDoDA)	B18-Ap30427	CP	ug/kg	0.5	< 0.5	8.0	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Perfluoroalkyl sulfonic acids (PFSA)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	B18-Ap30427	CP	ug/kg	2.2	2.1	6.0	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	B18-Ap30427	CP	ug/kg	60	52	15	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	B18-Ap30427	CP	ug/kg	1.0	1.0	6.0	30%	Pass
Duplicate								
n:2 Fluorotelomer sulfonic acids (n:2 FTSA)				Result 1	Result 2	RPD		
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B18-Ap30427	CP	ug/kg	< 0.5	< 0.5	<1	30%	Pass

Comments

V3 - Ap30416 corrected following data review.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised By

[Redacted Signature]

[Redacted Signature]

[Redacted Signature]

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Company Name: Jacobs Group (Australia) P/L QLD	Order No.:	Received: May 10, 2018 10:30 AM
Address: 32 Cordelia St South Brisbane QLD 4101	Report #: 597649	Due: May 17, 2018
	Phone: 07 3026 7100	Priority: 5 Day
	Fax:	Contact Name: Jeremy Wicks
Project Name: PFAS BIOTA SURVEY		
Project ID: IH142800		
Eurofins mgt Analytical Services Manager : [REDACTED]		

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)	
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							X
North Laboratory - NATA Site # 23736							
Internal Laboratory							
no	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID		
	S3A CATFISH - FILLET DUP	Apr 11, 2018		Fish	B18-My12225	X	
	S3B EEL - FILLET DUP	Apr 11, 2018		Fish	B18-My12226	X	
	S3B EEL - LIVER DUP	Apr 11, 2018		Fish	B18-My12227	X	
Test Counts						3	



Ryan Gilbert

From: Wicks, Jeremy J <[REDACTED]>
Sent: Thursday, 10 May 2018 10:03 AM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: [EXTERNAL] Eurofins | mgt Test Results - Report 595699 : Site PFAS BIOTA SURVEY (IH142800)

Follow Up Flag: Follow up
Flag Status: Flagged

lh. 10/5/18 10:20 AM (10)

EXTERNAL EMAIL*

Hi [REDACTED]

As discussed please re-run the samples sent to NMI so there is a duplicate results for these samples to from Eurofins. This result will be in addition to the one received today.

Best regards

Jeremy Wicks | Jacobs | Senior Associate | ANZ Infrastructure & Environment | +61 7 3026 7526 | +61 4 [REDACTED] | [REDACTED]@jacobs.com | www.jacobsskm.com

From: [REDACTED]@eurofins.com]
Sent: Thursday, 10 May 2018 9:57 AM
To: Wicks, Jeremy J <[REDACTED]@jacobs.com>
Cc: [REDACTED]@jacobs.com>
Subject: RE: [EXTERNAL] Eurofins | mgt Test Results - Report 595699 : Site PFAS BIOTA SURVEY (IH142800)

Hi Jeremy,

I have corrected the missing result and will send through eh update for you. It is a non-detect.

With regards to the duplicates – I was under the impression that these were the samples with the “A” suffix. 1 catfish and 1 eel.

Ap30416

From these sample the triplicates were taken and sent to NMI. We were able to send “3A CATFISH FILLET”, “3B EEL FILLET” & “3B EEL LIVER” as triplicates based on enough processed volume.

Ap30418 Ap30419

Please let me know if I can provide further detail.

Kind Regards

[REDACTED]

Email [REDACTED]@Eurofins.com

From: Wicks, Jeremy J [mailto:[REDACTED]@jacobs.com]
Sent: Thursday, 10 May 2018 9:29 AM
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: [EXTERNAL] Eurofins | mgt Test Results - Report 595699 : Site PFAS BIOTA SURVEY (IH142800)

Good Evening,

Please find attached results and invoice for your project in the subject header. Sorry about the delay getting it through today.

Regards

Eurofins | mgt

1/21 Smallwood Place

Murarie QLD 4172

AUSTRALIA

Phone: [REDACTED]

Mobile: [REDACTED]

Email: [REDACTED]@eurofins.com

Website: environment.eurofins.com.au

[EnviroNote 1076 - PFAS Biota](#)

[EnviroNote 1074 - Passive Samplers for VOCs in Air](#)

Are you on TOP of PFASs? Find out more by reading Eurofins | mgt's Environote by clicking [here](#)

EnviroNote 1075 – for Eurofins | mgt Christmas Shutdown Dates, click [here](#)

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EnviroNote 1075 – for Eurofins | mgt Christmas Shutdown Dates, click [here](#)

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Are you on TOP of PFASs? Find out more by reading Eurofins | mgt's Environote by clicking [here](#)

EnviroNote 1075 – for Eurofins | mgt Christmas Shutdown Dates, click [here](#)

Sample Receipt Advice

Company name: **Jacobs Group (Australia) P/L QLD**

Contact name: **Jeremy Wicks**
 Project name: **PFAS BIOTA SURVEY**
 Project ID: **IH142800**
 COC number: **Not provided**
 Turn around time: **5 Day**
 Date/Time received: **May 10, 2018 10:30 AM**
 Eurofins | mgt reference: **597649**

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
 - Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 1 degrees Celsius.
 - All samples have been received as described on the above COC.
 - COC has been completed correctly.
 - Attempt to chill was evident.
 - Appropriately preserved sample containers have been used.
 - All samples were received in good condition.
 - Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
 - Appropriate sample containers have been used.
 - Split sample sent to requested external lab.
 - Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

██████████ on Phone : or by e.mail: ██████████@eurofins.com

Results will be delivered electronically via e.mail to Jeremy Wicks - ██████████

Note: A copy of these results will also be delivered to the general Jacobs Group (Australia) P/L QLD email address.

Amberley fish data

The results of fish sampling in Warrill Creek and Bremer River in the Amberley Investigation Area have been supplied by Depart of Defence (Table 1).

The consultants to the Department of Defence, enRisk, assessed exposure assuming consumption on weekends only (104 days/year) and 30% of finfish diet sourced from Bremer River. They calculated elevated risk for children consuming finfish fillet from both locations, and adults for mullet, catfish fillet and eel fillet. They assessed no risk from perch based on a single sample. enRisk also calculated risk for consumption of liver and found it acceptable (which is a moot point – who catches fish just to eat the liver?).

Table 1 Summary of fish data from Amberley Investigation Area. S1 and S2 are in Warrill Creek, while the remaining sites are in the Bremer River

Location	Species	PFOS=PFHxS (µg/kg)
S1	perch	2.9
S1	eel	7.7
S5	mullet	24
S5	mullet	43
S1	eel	52
S7	eel	62.2
S2	eel	77.7
S6	catfish	86.4
S3	catfish	89.55*
S5	eel	172*
S4	eel	184.95
	mean	72.9
	stdev	59.9
	Est 95th	192.7**

*Average of sample and duplicate

**Mean + 2SD (data not normally distributed)

QH assessment

For the two samples with duplicates, the two results were averaged, giving 11 fillet samples. Only edible portions (fillets) were included in this assessment. Liver results were not considered, and the fish were not speciated. The 11 results were assumed to be representative of the fish in the waterways being assessed. The mean and standard deviation for these samples were calculated. The mean + 2SD was greater than the maximum, indicating that the data is not normally distributed. Due to the small number of samples, three values chosen for the risk assessment were 70 µg/kg and 180 µg/kg, rounded from the mean and maximum respectively, and 130 µg/kg, the midpoint between the mean and max, representing a reasonable worst-case scenario. (Happy to consider any other method of selecting values).

Based on these assumptions, an adult reaches the TDI consuming 30% of finfish intake (1 serve per week) recreationally caught in the investigation area. In all other scenarios, the TDI is exceeded by a factor of at least 2, and as much as 20 (Table 2).

In our earlier assessments, it was estimated that a child would exceed the TDI when concentration in finfish reached 15 µg/kg, and an adult at 35 µg/kg, which is the case in Warrill Creek and the Bremer River.

Based on the available data, signage at the creek and river fishing spots should be considered. It is not appropriate to exclude perch from any restrictions, based on a single sample. Further sampling is planned as part of the human health risk assessment for Amberley, and this advice should be reviewed when that data becomes available.

Table 2 Exposure calculations for PFOS + PFHxS for fish caught in Warrill Creek and Bremer River in the Amberley investigation area.

Oral Ingestion - food or soil			Adult			Child		
Parameter		Units	avg	max	max	avg	max	max
Concentration	C	µg/Kg	70	130	180	70	130	180
Oral Absorption Factor	AoF	unitless	1	1	1	1	1	1
Ingestion Rate	IGR	Kg(fish)/serve	0.15	0.15	0.15	0.075	0.075	0.075
Exposure Frequency		serve/week	3	3	3	3	3	3
	EF	days/week	7	7	7	7	7	7
body weight	BW	kg	70	70	70	15	15	15
Intake 100%		µg/kg bw day	0.06	0.12	0.17	0.15	0.28	0.39
Intake 30%			0.02	0.04	0.05	0.05	0.08	0.12

From: [Bruce Morton](#)
To: [David Larkings](#); [Janet Cumming](#); [Sophie Dwyer](#); [Tenille Fort](#); [Justin Carpenter](#); [Kahil Lloyd](#); [Peter.Kind@daf.qld.gov.au](#); [WATTS Richard J \(Richard.Watts@daf.qld.gov.au\)](#); [VENTURA Simone \(Simone.Ventura@des.qld.gov.au\)](#); [Ramu Beesabathini](#); [Catherine A Quagliotto](#); [CONNOR Andrew EDHPU](#); [Suzanne Huxley](#)
Cc: [EDHPU](#); [Suzanne Huxley](#)
Subject: RE: Todays local media about PFAS - Thought I would share - Amberley Preliminary Biota Sampling Results - Defence Initial Review - teleconference 12:30pm Wed 6 June
Date: Wednesday, 6 June 2018 11:17:32 AM
Attachments: [Media 6 Jun 2018 NUGROW Accepting PFAS Waste.pdf](#)
[image007.png](#)
[image009.png](#)
[image010.png](#)
[image011.png](#)
[image012.png](#)
[image018.png](#)
[image002.png](#)

Hello All

Thought I would share this given the topic for discussion today. In todays Qld Times.

Bruce Morton

Director Public and Environmental Health | Community and Rural | Public Health Unit
West Moreton Health
 Goonda Community Health Service | 81 Queens Road GOODNA QLD 4300

07 38184700 | 
Bruce.Morton@health.qld.gov.au
www.westmoreton.health.qld.gov.au



West Moreton Health acknowledges the Jagera, Yuggera and Ugarapul people, Traditional Owners of the land, and pays respect to Elders past, present and emerging.

From: David Larkings
Sent: Wednesday, 6 June 2018 10:38 AM
To: Janet Cumming <Janet.Cumming@health.qld.gov.au>; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Tenille Fort <Tenille.Fort@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Kahil Lloyd <kahil.lloyd@premiers.qld.gov.au>; Peter.Kind@daf.qld.gov.au; WATTS Richard J (Richard.Watts@daf.qld.gov.au) <Richard.Watts@daf.qld.gov.au>; VENTURA Simone (Simone.Ventura@des.qld.gov.au) <Simone.Ventura@des.qld.gov.au>; Ramu Beesabathini <Ramu.Beesabathini@health.qld.gov.au>; Catherine A Quagliotto <Catherine.Quagliotto@health.qld.gov.au>; CONNOR Andrew <Andrew.Connor@des.qld.gov.au>; Bruce Morton <Bruce.Morton@health.qld.gov.au>
Cc: David Larkings <David.Larkings@health.qld.gov.au>; EDHPU <EDHPU@health.qld.gov.au>
Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review - teleconference 12:30pm Wed 6 June

Hi

Just confirming the teleconference to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley is on today (Wed 6/6/18) at 12:30pm.

Please find attached our assessment of the Amberley fish data and our recommendation for discussion at tomorrow's meeting. Also attached is the report from Defence with the fish sample results.

AGENDA

- Introduction & background
- Assessment of the fish results (Janet)
- Management options:
 - Closure of the fishery
 - Is closure an option based on preliminary results and species collected?
 - Biosecurity Queensland role?
 - Signs
 - Pros and cons of signs?
 - Who responsible: Defence, Council?
 - Media release
 - Is a media release needed?
 - Who would be responsible?
 - Publication of advice on internet?
 - Does information on the results need to be published on the internet?
 - Who would be responsible? Defence?
- Advice to Defence
- Communication with other agencies
- Is another meeting required?

Teleconference details:

Phone: 1300 303 945

Participant code: 316410

Host pin: 1067

Regards

David



David Larkings

Advanced Environmental Health Officer

Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | **After hours oncall m:** [REDACTED]

a: PO Box 2368 Fortitude Valley BC QLD 4006

w: Queensland Health | **e:** david.larkings@health.qld.gov.au



Queensland's health vision | *By 2026 Queenslanders will be among the healthiest people in the world.*

Queensland Health acknowledges the Traditional Owners of the land, and pays respect to Elders past, present and future.

-----Original Appointment-----

From: EDHPU
Sent: Friday, 1 June 2018 4:58 PM
To: EDHPU; Janet Cumming; Sophie Dwyer; David Larkings; Tenille Fort; justin.carpenter@premiers.qld.gov.au; Peter.Kind@daf.qld.gov.au; Richard.watts@daf.qld.gov.au; simone.ventura@ehp.qld.gov.au; Ramu Beesabathini; Catherine A Quagliotto; Andrew.Connor@des.qld.gov.au; Bruce Morton
Cc: BRADSHAW Tony (Tony.Bradshaw@des.qld.gov.au)
Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review
When: Wednesday, 6 June 2018 12:30 PM-1:30 PM (UTC+10:00) Brisbane.
Where: Teleconference

Good afternoon everyone

Please see teleconference details below to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley. The results are in attached report showing high PFAS concentration in some edible fish portions. We will also discuss some options for managing this issue.

Phone: [REDACTED]

Participant code: [REDACTED]

Host pin: [REDACTED]

If you have any questions, please give David Larkings a call on 3328 9328

Kind regards
 Myra on behalf of Sophie Dwyer

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 30 May 2018 11:20 AM
To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero <Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann <Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>; simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw <Tony.Bradshaw@ehp.qld.gov.au>
Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review
 [SEC=UNCLASSIFIED]

Hi Health, DAF,

These results contain elevated levels of PFAS in edible samples of fish fillet.

The report includes the following summary:

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
James.

James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002

Janet Cumming

Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review
Location: Teleconference

Start: Wed 6/06/2018 12:30 PM
End: Wed 6/06/2018 1:30 PM

Recurrence: (none)

Meeting Status: Accepted

Organizer: EDHPU
Required Attendees: Janet Cumming; Sophie Dwyer; David Larkings; Tenille Fort; justin.carpenter@premiers.qld.gov.au; Peter.Kind@daf.qld.gov.au; Richard.watts@daf.qld.gov.au; simone.ventura@ehp.qld.gov.au; Ramu Beesabathini; Catherine A Quagliotto; Andrew.Connor@des.qld.gov.au; Bruce Morton
Optional Attendees: BRADSHAW Tony (Tony.Bradshaw@des.qld.gov.au)

Good afternoon everyone

Please see teleconference details below to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley. The results are in attached report showing high PFAS concentration in some edible fish portions. We will also discuss some options for managing this issue.

Phone: [REDACTED]
Participant code: [REDACTED]

Host pin: [REDACTED]

If you have any questions, please give David Larkings a call on 3328 9328

Kind regards
Myra on behalf of Sophie Dwyer

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Wednesday, 30 May 2018 11:20 AM
To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero <Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann <Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>; simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw <Tony.Bradshaw@ehp.qld.gov.au>
Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

Hi Health, DAF,

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More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
James.



James Stewart
Policy Officer
Environment Policy
Department of the Premier and Cabinet

P 07 3003 9487
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
Australia's campaign to stop violence against women

Janet Cumming

From: David Larkings
Sent: Wednesday, 6 June 2018 10:38 AM
To: Janet Cumming; Sophie Dwyer; Tenille Fort; Justin Carpenter; Kahil Lloyd; Peter.Kind@daf.qld.gov.au; WATTS Richard J (Richard.Watts@daf.qld.gov.au); VENTURA Simone (Simone.Ventura@des.qld.gov.au); Ramu Beesabathini; Catherine A Quagliotto; CONNOR Andrew; Bruce Morton
Cc: David Larkings; EDHPU
Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review - teleconference 12:30pm Wed 6 June
Attachments: 690738_Preliminary Biota Sample Results_RevD.PDF; Amberley fish assessment.docx

Hi

Just confirming the teleconference to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley is on today (Wed 6/6/18) at 12:30pm.

Please find attached our assessment of the Amberley fish data and our recommendation for discussion at tomorrow's meeting. Also attached is the report from Defence with the fish sample results.

AGENDA

- Introduction & background
- Assessment of the fish results (Janet)
- Management options:
 - Closure of the fishery
 - Is closure an option based on preliminary results and species collected?
 - Biosecurity Queensland role?
 - Signs
 - Pros and cons of signs?
 - Who responsible: Defence, Council?
 - Media release
 - Is a media release needed?
 - Who would be responsible?
 - Publication of advice on internet?
 - Does information on the results need to be published on the internet?
 - Who would be responsible? Defence?
- Advice to Defence
- Communication with other agencies
- Is another meeting required?

Teleconference details:

Phone: [REDACTED]

Participant code: [REDACTED]

Host pin: [REDACTED]

Regards
David



David Larkings

Advanced Environmental Health Officer

Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | After hours oncall **m:** [REDACTED]

a: PO Box 2368 Fortitude Valley BC QLD 4006

w: Queensland Health | **e:** david.larkings@health.qld.gov.au



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-----Original Appointment-----

From: EDHPU

Sent: Friday, 1 June 2018 4:58 PM

To: EDHPU; Janet Cumming; Sophie Dwyer; David Larkings; Tenille Fort; justin.carpenter@premiers.qld.gov.au; Peter.Kind@daf.qld.gov.au; Richard.watts@daf.qld.gov.au; simone.ventura@ehp.qld.gov.au; Ramu Beesabathini; Catherine A Quagliotto; Andrew.Connor@des.qld.gov.au; Bruce Morton

Cc: BRADSHAW Tony (Tony.Bradshaw@des.qld.gov.au)

Subject: Amberley Preliminary Biota Sampling Results - Defence Initial Review

When: Wednesday, 6 June 2018 12:30 PM-1:30 PM (UTC+10:00) Brisbane.

Where: Teleconference

Good afternoon everyone

Please see teleconference details below to discuss the preliminary fish results for PFAS in Warrill Creek and the Bremer River near the RAAF Base Amberley. The results are in attached report showing high PFAS concentration in some edible fish portions. We will also discuss some options for managing this issue.

Phone: [REDACTED]

Participant code: [REDACTED]

Host pin: 1067

If you have any questions, please give David Larkings a call on 3328 9328

Kind regards

Myra on behalf of Sophie Dwyer

From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]

Sent: Wednesday, 30 May 2018 11:20 AM

To: Adrian Mckay <Adrian.Mckay@dnrm.qld.gov.au>; Amani Kowero <Amani.Kowero@des.qld.gov.au>; David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; Michael Logan <Michael.Logan@qfes.qld.gov.au>; Peter Kind <Peter.Kind@daf.qld.gov.au>; Raymond Bott <Raymond.bott@qfes.qld.gov.au>; Reinier Mann <Reinier.Mann@dsiti.qld.gov.au>; Richard Watts <Richard.Watts@daf.qld.gov.au>; simone.ventura@ehp.qld.gov.au; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; Suzanne Huxley <Suzanne.Huxley@health.qld.gov.au>; Suzanne Vardy <Suzanne.Vardy@dsiti.qld.gov.au>; Tony Bradshaw <Tony.Bradshaw@ehp.qld.gov.au>

Subject: FW: Amberley Preliminary Biota Sampling Results - Defence Initial Review [SEC=UNCLASSIFIED]

Hi Health, DAF,

These results contain elevated levels of PFAS in edible samples of fish fillet.

The report includes the following summary:

The initial review has considered the consumption of edible fish by adults and children where consumption makes up approximately 30% of their dietary intake (consumption of fish on weekends or 104 days per year). Based on the available data and the assumed dietary intake, the initial review indicates elevated risks for children and adults consuming eel, catfish and mullet.

More specific details on the assessment of human health risks associated with the consumption of biota from these waterways (including risk calculations) will be provided in the HHRA, along with the assessment of risks associated with other potential exposure pathways.

We recommend that this information be provided to the Department of Premier and Cabinet for appropriate consideration by the State. To assist with the HHRA it would be useful if the State could provide any available information on the frequency of consumption of edible aquatic organisms from these water ways.

Defence are advising us of these results as the relevant regulators. If further action is required (e.g. signage), then we may have to advise them as per any other regulator.

The main consideration would be if these levels change the standard fishing advise.

Thanks,
James.



James Stewart
Policy Officer
Environment Policy
Department of the Premier and Cabinet
P 07 3003 9487
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002

Janet Cumming

From: Janet Cumming
Sent: Wednesday, 6 June 2018 2:07 PM
To: Sophie Dwyer
Cc: Justin Carpenter; PFAS
Subject: Oakey/Amberley fish comparison.

Hi Sophie,

I've double checked the Oakey data, and the results are very similar to Amberley, although the species were different. The confusion arises from the results from Oakey being reported in mg/kg, and Amberley in µg/kg.

Oakey results:

Bony Bream	0.0076-0.081 mg/kg = 7.6-81 µg/kg
Golden Perch	0.048-0.25 µg/kg = 48-250 µg/kg
Carp	0.041-0.069 µg/kg = 41-69 mg/kg

The Oakey samples were collected before we wrote the protocol for testing for PFAS in fish for human health risk assessment, so I'm not sure if the Oakey data is whole fish or edible portions.

Regards,
Janet



Dr Janet Cumming BSc (Hon) PhD (Griffith) MRSPH RACTRA

Advanced Environmental Health Scientist

Water Unit, Health Protection Branch, **Department of Health**

p: 07 3328 9346] | **m:** [REDACTED]

a: 15 Butterfield Street, Herston Qld 4006

w: [Queensland Health](#) **e:** janet.cumming@health.qld.gov.au



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Janet Cumming

From: David Larkings
Sent: Thursday, 7 June 2018 4:08 PM
To: Janet Cumming
Subject: Amberly fish letter draft 7-6-18v2
Attachments: Amberly fish letter draft 7-6-18v2.docx

Hi Janet

Do you mind checking the attached letter before we provide it to Sophie?

It is saved in <Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley>.

I'm still working on the brief.

Thanks
David



Department of Health

Enquiries to: Sophie Dwyer
 Executive Director
 Health Protection Branch
 Telephone: (07) 332 89266
 Ref: CH0XXXXX

James McLachlan
 Director Investigations East
 PFAS Investigation & Management Branch
 Infrastructure Division
 Department of Defence

Email: James.McLachlan@defence.gov.au

Dear Mr McLachlan

I refer to an email dated 20 May 2018 from Mr Mick Le Riche, Project Director, PFAS Investigation & Management Branch in relation to preliminary biota sampling data for the Amberley PFAS investigation.

I very much appreciate the Department of Defence providing the test results for PFAS in fish caught in Warill Creek and the Bremer River close to RAAF Base Amberley, and for providing the initial review of the sampling results by Environmental Risk Science Pty Ltd (enRiskS).

Concern is raised about the elevated concentrations of PFAS in the fillets of catfish, mullet and perch caught as part of the preliminary biota sampling. Queensland Health has assessed the results and agree with the conclusion by enRiskS that there are elevated health risks for children and adults consuming mullet, catfish and eel caught in the investigation area. It is noted that all results (except one sample of perch) were significantly above the trigger levels for investigation developed by Food Standards Australia New Zealand, and that an adult would reach/exceed the tolerable daily intake if they were to consume one serve per week (approximately 30% of their diet of finfish fillet).

It is assumed that eel, catfish and mullet are not likely to be popular species for consumption by the general population but they may be targeted by sub-groups of the population and hence present a risk of exposure above the tolerable daily intake. Furthermore, at this stage, due to the limitations of the preliminary biota sampling program, it is not known if the concentrations of PFAS present in these species are representative of other species of fish that may be harvested from the investigation area.

The Department of Defence should consider undertaking a number of interim actions to protect public health, which can be reviewed when the human health risk assessment is finalised. It is recommended that the public be advised of the elevated levels of PFAS in the preliminary results and that as a precaution, while the matter is being more fully investigated, to not consume fish caught in the investigation area. However, fishing in the investigation area may continue on a catch and release basis.

Community messaging should acknowledge the recommended advice is of a precautionary nature while the human health risks are further investigated, and that infrequent consumption (every few

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months) of a meal of fish from the investigation area should not contribute significantly to the lifetime exposure of an individual to PFAS.

The Department of Defence, as the polluter and agency that commissioned the biota sampling program, should take the lead role in providing appropriate advice to the public and coordinating messaging. The Queensland Government, via the Department of Premier and Cabinet, can explore ways the Queensland Government can assist with providing appropriate advice to the public. This may include for example, the Department of Agriculture and Fisheries providing advice to fishers in the area via social media, inclusion of information on the Government's website, and Queensland Health providing advice to local medical practitioners.

The Department of Defence should consider facilitating the erection of warning signs on Warrill Creek and the Bremer River at locations where the public are likely to access these waterways for fishing.

Consideration should be given to extending the eligibility of the Australian Government Department Health voluntary blood testing program for PFAS to include individuals concerned about their exposure to PFAS that have a history of regular consumption of fish harvested in or close to the investigation area.

Comments on further testing of biota for human health risk assessment purposes will be provided separately in comments on the draft *RAAF Base Amberley PFAS Investigation – Human Health Risk Assessment Methodology and Further Off-Property Sampling Program*.

If you require any further information in relation to this matter, please contact Ms Sophie Dwyer, Executive Director, Health Protection Branch, Department of Health, on telephone (07) 332 89266 or via email at pfas@health.qld.gov.au.

Yours sincerely

Dr Jeannette Young PSM
**Chief Health Officer
and Deputy Director-General
Prevention Division**

/ /

Prepared by: David Larkings
(Author) Advanced Environmental Health Officer
Food Safety Standards and Regulation Unit
332 89328
7 June 2018

Cleared by: Sophie Dwyer
(Executive Director) Executive Director
Health Protection Branch
332 89266
June 2018

RTI RELEASE

Janet Cumming

From: Janet Cumming
Sent: Thursday, 7 June 2018 4:42 PM
To: David Larkings
Subject: RE: Amberly fish letter draft 7-6-18v2

David,

In the third last para

Consideration should be given to extending the eligibility of the Australian Government Department of Health voluntary blood testing program for PFAS...

Does DoD have any influence over the extension of the blood testing program? Isn't it run by DoH?

Janet

From: David Larkings
Sent: Thursday, 7 June 2018 4:08 PM
To: Janet Cumming <Janet.Cumming@health.qld.gov.au>
Subject: Amberly fish letter draft 7-6-18v2

Hi Janet

Do you mind checking the attached letter before we provide it to Sophie?

It is saved in <Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley>.

I'm still working on the brief.

Thanks
David

Janet Cumming

From: David Larkings
Sent: Thursday, 7 June 2018 4:57 PM
To: Sophie Dwyer
Cc: Janet Cumming; HProt.corro
Subject: RAAF Base Amberley - Draft letter to Defence and brief for checking
Attachments: Amberley fish_cho-brief-approval_6-6-18.docx; Amberly fish letter draft 7-6-18v2.docx; Amberley fish assessment V2.docx; 690738_Preliminary Biota Sample Results_RevD May18.PDF



Hi Sophie

Please find attached a draft letter and a draft brief in relation to the fish near RAAF Base Amberley. Do you mind checking them and letting me know of any changes you would like made.

They are saved in <Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley>

Regards
David



David Larkings

Advanced Environmental Health Officer

Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | **After hours oncall m:** [REDACTED]

a: PO Box 2368 Fortitude Valley BC QLD 4006

w: Queensland Health | **e:** david.larkings@health.qld.gov.au



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From: HProt.corro
Sent: Friday, 8 June 2018 12:10 PM
To: CHO CHO <CHO_CHO@health.qld.gov.au>
Cc: CHO ESO <CHO_ESO@health.qld.gov.au>; PFAS <PFAS@health.qld.gov.au>
Subject: URGENT - FW: RAAF Base Amberley - Draft letter to Defence and brief for clearing

Hi Ladies

Please see attached which has been cleared by Sophie Dwyer, ED HPB.

This requires urgent clearance by Dr Young today.

Kind regards
 Gail

From: David Larkings
Sent: Friday, 8 June 2018 11:46 AM
To: HProt.corro <HProt.corro@health.qld.gov.au>
Cc: David Larkings <David.Larkings@health.qld.gov.au>; Janet Cumming <Janet.Cumming@health.qld.gov.au>; Tenille Fort <Tenille.Fort@health.qld.gov.au>
Subject: RAAF Base Amberley - Draft letter to Defence and brief for clearing

Hi Sophie

Can you please consider clearing the attached revised brief and letter.

The letter includes changes suggested by Premier and Cabinet.

The files are saved in <Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley\Amberley preliminary biota sampling>.

Regards
 David



David Larkings

Advanced Environmental Health Officer
 Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | After hours oncall **m:** [REDACTED]
a: PO Box 2368 Fortitude Valley BC QLD 4006
w: Queensland Health | **e:** david.larkings@health.qld.gov.au



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From: David Larkings
Sent: Thursday, 7 June 2018 4:57 PM
To: Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>
Cc: Janet Cumming <Janet.Cumming@health.qld.gov.au>; HProt.corro <HProt.corro@health.qld.gov.au>
Subject: RAAF Base Amberley - Draft letter to Defence and brief for checking

Hi Sophie

Please find attached a draft letter and a draft brief in relation to the fish near RAAF Base Amberley. Do you mind checking them and letting me know of any changes you would like made.

They are saved in <Q:\HPB\SHARE\Incidents\PFAS\Defence\Amberley>

Regards

David



David Larkings

Advanced Environmental Health Officer

Food Safety Standards and Regulation, Health Protection Branch, **Department of Health**

p: 07 3328 9328 | **After hours oncall m:** [REDACTED]

a: PO Box 2368 Fortitude Valley BC QLD 4006

w: [Queensland Health](#) | **e:** david.larkings@health.qld.gov.au



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David Larkings

From: HProt.corro
Sent: Friday, 8 June 2018 1:14 PM
To: David Larkings
Subject: FW: CLEARED: URGENT - FW: RAAF Base Amberley - Draft letter to Defence and brief for clearing
Attachments: CH014211 - Per- and poly- fluoroalkyl substance contamination of fish caught near RAAF Base Amberley; CH014211 - Letter.pdf; CH014211 - Signed brief.pdf
Categories: Urgent

Hi David

FYI – this has now been cleared and sent.

Regards
Gail

From: CHO CHO
Sent: Friday, 8 June 2018 1:07 PM
To: HProt.corro <HProt.corro@health.qld.gov.au>
Subject: CLEARED: URGENT - FW: RAAF Base Amberley - Draft letter to Defence and brief for clearing

Hi Gail

Please find attached cleared brief and letter, signed by Dr Young, Chief Health Officer and Deputy Director-General, Prevention Division on 8 June 2018.

The letter has been emailed (attached) and originals have been sent to records.

Many thanks

Janine



Prevention Division Correspondence Team

Jess Burns, Briefings Officer – 3708 5196
 Katie Watts, Correspondence Officer – 3708 5195
 Madison Crofts, Correspondence Officer - 3708 5194
 Janine Tennant, Correspondence Officer - 3708 5193

Office of The Chief Health Officer and Deputy Director-General, Prevention Division, Department of Health

a: 33 Charlotte Street, Brisbane QLD 4000
w: Queensland Health | **e:** CHO_CHO@health.qld.gov.au



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Department of Health

Enquiries to: Sophie Dwyer
Executive Director
Health Protection Branch
Telephone: (07) 332 89266
Ref: CH014211

James McLachlan
Director Investigations East
PFAS Investigation and Management Branch
Infrastructure Division
Department of Defence

Email: James.McLachlan@defence.gov.au

Dear Mr McLachlan

I refer to an email dated 30 May 2018 from Mr Mick Le Riche, Project Director, per- and poly- fluoroalkyl substances (PFAS) Investigation and Management Branch in relation to preliminary biota sampling data for the Amberley PFAS investigation.

I very much appreciate the Department of Defence providing the test results for PFAS in fish caught in Warrill Creek and the Bremer River close to RAAF Base Amberley, and for providing the initial review of the sampling results by Environmental Risk Science Pty Ltd (enRiskS).

Concern is raised about the elevated concentrations of PFAS in the fillets of catfish, mullet and perch caught as part of the preliminary biota sampling. Queensland Health has assessed the results and agree with the conclusion by enRiskS that there are elevated health risks for children and adults consuming mullet, catfish and eel caught in the investigation area. It is noted that all results (except one sample of perch) were significantly above the trigger levels for investigation developed by Food Standards Australia New Zealand, and that an adult would reach the tolerable daily intake if they were to consume one serve per week (approximately 30 per cent of their diet of finfish fillet).

It is assumed that eel, catfish and mullet are not likely to be popular species for consumption by the general population but they may be targeted by sub-groups of the population and hence present a risk of exposure above the tolerable daily intake. It is also noted that the preliminary biota sampling program produced insufficient data to be able to draw conclusions about the concentration of PFAS in other species that are more likely to be consumed by the general population. As such, it is recommended that other suitable species be collected to inform the human health risk assessment. This advice is reflected in comments on the draft *RAAF Base Amberley PFAS Investigation – Human Health Risk Assessment Methodology and Further Off-Property Sampling Program*.

The Department of Defence should consider undertaking a number of interim actions to protect public health, which can be reviewed when the human health risk assessment is finalised. It is recommended that Defence advise the public as soon as practicable of the elevated levels of PFAS in the preliminary samples, and that as an interim precaution, people should not consume fish caught in the investigation area. However, fishing in the investigation area may continue on a catch and release basis.

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Community messaging should, at a minimum, inform affected stakeholders of the results, the recommended advice, and note that it is of a precautionary nature while the human health risks are fully investigated. It should also be noted that historic infrequent consumption (every few months) of a meal caught in the investigation area would not have any significant contribution to an individual's overall exposure to PFAS.

The Department of Defence, as the responsible polluter and agency that commissioned the biota sampling program, should take the lead role in providing appropriate advice to the public and coordinating messaging. The Queensland Government will assist Defence in providing health and other advice for use in Defence's communications, and can review any health messaging prior to dissemination to the public.

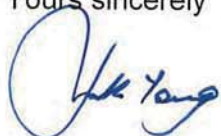
The Department of Defence should consider facilitating the erection of warning signs on Warrill Creek and the Bremer River at locations where the public are likely to access these waterways for fishing.

Consideration should be given to requesting the eligibility of the Australian Government Department of Health voluntary blood testing program for PFAS be extended to include individuals concerned about their exposure to PFAS that have a history of regular consumption of fish harvested in or close to the investigation area.

Comments on further testing of biota for human health risk assessment purposes will be provided separately in comments on the draft *RAAF Base Amberley PFAS Investigation – Human Health Risk Assessment Methodology and Further Off-Property Sampling Program*.

If you require any further information in relation to this matter, please contact Ms Sophie Dwyer, Executive Director, Health Protection Branch, Department of Health, on telephone (07) 3328 9266 or via email at pfas@health.qld.gov.au.

Yours sincerely



Dr Jeannette Young PSM
Chief Health Officer
and Deputy Director-General
Prevention Division

816118

Brief for Approval

Department RecFind No:	CH014211
Branch:	Health Protection
File Ref No:	

Requested by:

SUBJECT: Per- and poly-fluoroalkyl substance contamination of fish caught near RAAF Base Amberley

Recommendation/s

It is recommended that the Chief Health Officer and Deputy Director-General:

1. **Sign** the attached letter to the Department of Defence, which provides advice on the health risks of fish caught as part of the preliminary sampling program and recommends a number of interim actions be taken to minimise exposure of the public to per- and poly-fluoroalkyl substances in fish from the investigation area (Attachment 1).

APPROVED / NOT APPROVED

PLEASE DISCUSS



Dr Jeannette Young PSM

Chief Health Officer and Deputy Director-General, Prevention Division

Date:

8, 6, 18

Comments

Issue/s

1. High concentrations of per- and poly-fluoroalkyl substances (PFAS) have been detected in fish (eel, catfish and mullet) caught in Warrill Creek and the Bremer River close to RAAF Base Amberley. All results, except one sample of perch, were significantly above the trigger levels for investigation developed by Food Standards Australia New Zealand.
2. An initial expert evaluation of the results by a consultant working for the Department of Defence has concluded there are elevated risks for children and adults consuming mullet, catfish and eel (Attachment 2). Queensland Health has assessed the results and reached the same conclusion (Attachment 3). It should be noted that an adult reaches the tolerable daily intake consuming 30 per cent of their finfish intake (1 serve per week) caught in the investigation area.
3. The results, which were obtained as part of a preliminary sampling program, have not yet been released to the public.
4. There is no commercial fishing in the investigation area but there is recreational fishing. This includes both local fishers and day-trippers.
5. While eel, catfish and mullet are not likely to be popular species for consumption by the general population, it is not known at this stage whether these species are targeted in the area by any sub-groups of the population and hence at risk of exposure above the tolerable daily intake.

Department RecFind No:	CH014211
Branch:	Health Protection
File Ref No:	

6. Consideration may need to be given to offering free blood testing for PFAS to individuals concerned about their exposure to PFAS that have a history of regular consumption of fish harvested in or close to the investigation area. A request could be made to the Commonwealth Department of Health to extend the eligibility of their voluntary blood testing program for PFAS. The attached letter suggests the request be made by the Department of Defence.
7. The levels detected in the fish are comparable to those previously detected near Oakey. The strategies to minimise exposure to those at risk may be different to Oakey. There was a much higher community awareness of PFAS contamination in Oakey, Amberley has a much larger population and the waterways are more likely to be visited by fishers from outside the area. As such, compared to Oakey, it may be more appropriate for signage to be erected in the Amberley investigation area warning to not consume the fish. Alternative strategies may also be needed to advise fishers, such as social media and posts on internet fishing forums.
8. Comments on further testing of fish and other biota for human health risk assessment purposes will be provided separately to the Department of Defence in comments on the draft *RAAF Base Amberley PFAS Investigation – Human Health Risk Assessment Methodology and Further Off-Property Sampling Program*.

Vision

9. The development of food safety educational material is designed to safeguard the community from potential harm of illness caused by exposure to environmental hazards, diseases and harmful practices. This is a key strategy for promoting wellbeing of individuals and communities and ensuring availability of healthy choices, such as in the area of food.

Results of Consultation

10. A teleconference was held on 6 June 2018 with the Departments of Premier and Cabinet, Agriculture and Fisheries, and Environment and Science, and the West Moreton Public Health Unit. It was agreed that:
 - 10.1. suitable advice needs to be provided to the public that fishing should be catch and release only (no consumption);
 - 10.2. the Department of Defence be advised of the public health risks, that they should coordinate advice to the public of the risks and the need to avoid consuming fish from the investigation area including facilitating suitable signage aimed at fishers;
 - 10.3. West Moreton Public Health Unit would work with the Health Protection Branch to develop advice for local medical practitioners, and questions and answers for the public, and advise the West Moreton Chief Executive; and
 - 10.4. Agriculture and Fisheries may be able to assist by providing advice to fishers via social media and posts on internet fishing forums.

Resource Implications (including Financial)

11. Resources will be managed out of normal operational budgets.

Background

12. There has been historical use of Aqueous Firefighting Foam containing PFAS at RAAF Base Amberley.
13. The Department of Defence has commissioned a site investigation for RAAF Base Amberley, which will include a human health risk assessment.

Department RecFind No:	CH014211
Branch:	Health Protection
File Ref No:	

14. The samples were obtained by consultants for the Department of Defence as part of a preliminary sampling program that will help inform a detailed site investigation of RAAF Base Amberley. The results and an initial review by a risk assessor were provided to the Queensland Government in advance of the draft report on the Preliminary Biota Sampling Program and of the Human Health Risk Assessment and as such provides limited information.

Sensitivities

15. This issue is likely to attract media interest.

Attachments

16. Attachment 1: Draft letter to Department of Defence
Attachment 2: Letter from CH2M to the Department of Defence titled Preliminary Biota Sampling Program – Initial Advice on Potential Human Health Risks (includes an attached review of the results by enRiskS).
Attachment 3: Assessment of Amberly fish data by Health Protection Branch.

Department Contact Officer

Sophie Dwyer, Executive Director, Health Protection Branch on telephone 3328 9266 or mobile [REDACTED]

Author	Content verified by: (Executive Director)
David Larkings	Sophie Dwyer
Advance Environmental Health Officer	Executive Director Prevention Division
Food Safety Standards and Regulation	Health Protection Branch Prevention Division
3328 9328	3328 9266
	[REDACTED]
8 June 2018	8 June 2018

Assessment of Amberley fish data

The results of fish sampling in Warrill Creek and Bremer River in the Amberley Investigation Area have been supplied by Department of Defence (Table 1).

The consultants to the Department of Defence, enRisk, assessed exposure assuming consumption on weekends only (104 days/year) and 30% of finfish diet sourced from Bremer River. They calculated elevated risk for children consuming finfish fillet from both locations, and adults for mullet, catfish fillet and eel fillet. They assessed no risk from perch based on a single sample. enRisk also calculated risk for consumption of liver and found it acceptable (which is a moot point – who catches fish just to eat the liver?).

Table 1 Summary of fish data from Amberley Investigation Area. S1 and S2 are in Warrill Creek, while the remaining sites are in the Bremer River

Location	Species	PFOS=PFHxS (µg/kg)
S1	perch	2.9
S1	eel	7.7
S5	mullet	24
S5	mullet	43
S1	eel	52
S7	eel	62.2
S2	eel	77.7
S6	catfish	86.4
S3	catfish	89.55*
S5	eel	172*
S4	eel	184.95
	mean	72.9
	stdev	59.9
	Est 95th	192.7**

*Average of sample and duplicate

**Mean + 2SD (data not normally distributed)

Although the species are different, the concentrations are similar to those detected at Oakey

- Bony Bream 0.0076-0.081 mg/kg = 7.6-81 µg/kg
- Golden Perch 0.048-0.25 µg/kg = 48-250 µg/kg
- Carp 0.041-0.069 µg/kg = 41-69 mg/kg

QH assessment

For the two samples with duplicates, the two results were averaged, giving 11 fillet samples. Only edible portions (fillets) were included in this assessment. Liver results were not considered, and the fish were not speciated. The 11 results were assumed to be representative of the fish in the waterways being assessed. The mean and standard deviation for these samples were calculated. The mean + 2SD was greater than the maximum, indicating that the data is not normally distributed. Due

to the small number of samples, three values chosen for the risk assessment were 70 µg/kg and 180 µg/kg, rounded from the mean and maximum respectively, and 130 µg/kg, the midpoint between the mean and max, representing a reasonable worst-case scenario. (Happy to consider any other method of selecting values).

Based on these assumptions, an adult reaches the TDI consuming 30% of finfish intake (1 serve per week) recreationally caught in the investigation area. In all other scenarios, the TDI is exceeded by a factor of at least 2, and as much as 20 (Table 2).

In our earlier assessments, it was estimated that a child would exceed the TDI when concentration in finfish reached 15 µg/kg, and an adult at 35 µg/kg, which is the case in Warrill Creek and the Bremer River.

Based on the available data, signage at the creek and river fishing spots should be considered. It is not appropriate to exclude perch from any restrictions, based on a single sample. Further sampling is planned as part of the human health risk assessment for Amberley, and this advice should be reviewed when that data becomes available.

Assessment date 6 June 2018

Myra Thompson

From: Jeannette Young
Sent: Friday, 8 June 2018 1:23 PM
To: SDLO; Robert Hoge; Jasmina Joldic; news
Cc: Sophie Dwyer; CHO CHO
Subject: FW: CH014211 - Copy of brief - PFAS contamination
Attachments: CH014211 - Signed brief.pdf; CH014211 - Letter.pdf; ATTACHMENT 2_690738
_Preliminary Biota Sample Results_RevD May18.PDF; ATTACHMENT 3_Amberley fish
assessment.pdf

Categories: CC'd

FYI I am sending a letter to Department of Defence to ask them to warn people fishing near the base at Amberley that the people should not eat the fish due to the level of PFAS contamination. DPC is aware,

David Larkings

From: Glyde, Virginia MS <virginia.glyde@defence.gov.au> on behalf of PFASIM Amberley <pfasim.amberley@defence.gov.au>
Sent: Monday, 11 June 2018 3:25 PM
To: 'James Stewart'
Cc: 'Simon Beesley'; 'John White'; 'Adrian Mckay'; 'Amani Kowero'; David Larkings; Janet Cumming; 'Justin Carpenter'; 'Michael Logan'; 'Peter Kind'; 'Raymond Bott'; 'Reinier Mann'; 'Richard Watts'; 'simone.ventura@ehp.qld.gov.au'; Sophie Dwyer; Suzanne Huxley; 'Suzanne Vardy'; 'Tony Bradshaw'
Subject: RE: Queensland Government PFAS TWG Review of the Amberley HHRA SAQP [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thank you James,

We appreciate the time contributed by the reviewers. We will be in touch when we have considered the comments, to confirm the currently tentative teleconference, seek any clarifications and to provide a response.

Cheers
 Virginia

Virginia Glyde

(Contractor to Defence)
 Defence Project Manager - Environmental Investigations
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] **E:** virginia.glyde@defence.gov.au

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From: James Stewart [mailto:james.stewart@premiers.qld.gov.au]
Sent: Monday, 11 June 2018 2:12 PM
To: PFASIM Amberley; Leriche, Michael MR; Simon Beesley; John White; Adrian Mckay; Amani Kowero; David Larkings; Janet Cumming; Justin Carpenter; Michael Logan; Peter Kind; Raymond Bott; Reinier Mann; Richard Watts; simone.ventura@ehp.qld.gov.au; Sophie Dwyer; Suzanne Huxley; Suzanne Vardy; Tony Bradshaw
Cc: Glyde, Virginia MS
Subject: Queensland Government PFAS TWG Review of the Amberley HHRA SAQP
Importance: High

Good afternoon Virginia,

Please find attached our review of the RAAF Amberley HHRA SAQP for PFAS contamination.

If you have any questions please don't hesitate to contact me.

Kin regards,



James Stewart
 Policy Officer
Environment Policy
 Department of the Premier and Cabinet

P 07 3003 9487
 1 William Street, Brisbane QLD 4000
 PO Box 15185, City East, QLD 4002



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 Australia's campaign to stop violence against women

From: Glyde, Virginia MS [mailto:virginia.glyde@defence.gov.au] **On Behalf Of** PFASIM Amberley
Sent: Friday, 8 June 2018 4:40 PM
To: James Stewart <james.stewart@premiers.qld.gov.au>
Subject: RE: QLD Technical Working Group Availabilities week commencing 11 June. [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James,

Thanks for the update. Yes, we thought the biota results might affect the comments on the HHRA SAQP.

The Amberley team are never idle, an understatement perhaps, but I've managed to secure just a long weekend away at the end of next week.

Will hear further from you next week.

Have a great weekend.
 Virginia

Virginia Glyde

(Contractor to Defence)
 Defence Project Manager - Environmental Investigations
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
 M: [REDACTED] | E: virginia.glyde@defence.gov.au

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From: James Stewart [mailto:james.stewart@premiers.qld.gov.au]
Sent: Friday, 8 June 2018 3:06 PM

To: PFASIM Amberley

Subject: RE: QLD Technical Working Group Availabilities week commencing 11 June. [SEC=UNCLASSIFIED]

Hi Virginia,

Thank you for letting me know. I'll put out a date claimer now.

I understand that Queensland Health are updating their comments in light of the recent biota results found at Amberley.

Hope you enjoy your leave.

Kind regards,
James.



James Stewart

Policy Officer

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9487

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



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From: Glyde, Virginia MS [<mailto:virginia.glyde@defence.gov.au>] **On Behalf Of** PFASIM Amberley

Sent: Friday, 8 June 2018 3:02 PM

To: James Stewart <james.stewart@premiers.qld.gov.au>

Subject: RE: QLD Technical Working Group Availabilities week commencing 11 June. [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi James,

Our project team are available for the Friday 15 June timeslot after 2pm, if it is confirmed we do need a teleconference.

Our attendee's would be:

Mick Le Riche, Defence Project Director, michael.leriche@defence.gov.au

Jeremy Wicks, Jacobs Project Manager, [REDACTED]

Jo Cuttler, Jacobs Project Director, [REDACTED]

Jackie Wright, Risk Assessor [REDACTED]

I will be on leave that day, however the team attending provides appropriate coverage.

Thanks
Ginni

Virginia Glyde

(Contractor to Defence)
 Defence Project Manager - Environmental Investigations
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
 M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: Glyde, Virginia MS
Sent: Thursday, 7 June 2018 2:20 PM
To: 'James Stewart'
Subject: RE: QLD Technical Working Group Availabilities week commencing 11 June. [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thank you James,

I'll gather the teams availability and respond to those dates/times as soon as possible.

Cheers
 Virginia

Virginia Glyde

(Contractor to Defence)
 Defence Project Manager - Environmental Investigations
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
 M: [REDACTED] E: virginia.glyde@defence.gov.au

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From: James Stewart [<mailto:james.stewart@premiers.qld.gov.au>]
Sent: Thursday, 7 June 2018 1:35 PM
To: Glyde, Virginia MS
Cc: Leriche, Michael MR
Subject: QLD Technical Working Group Availabilities week commencing 11 June.

Hi Virginia,

Please find below availabilities for the TWG to discuss the Amberley HHRA.

Wednesday 13 June – 9-10am or 1.30-2.30pm
 Thursday 14 June – 9-10am
 Friday 15 June - any time before 1pm or after 2pm

At this stage I cannot say whether or not a teleconference will be needed. However I'll put in a 1hr date claimer at your convenience just in case.

Thanks Virginia,
James.



James Stewart
Policy Officer
Environment Policy
Department of the Premier and Cabinet
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Myra Thompson

From: MARKS Zhivana <Zhivana.Marks@des.qld.gov.au> on behalf of ESR <ESR@des.qld.gov.au>
Sent: Monday, 11 June 2018 4:49 PM
To: MERRICK Jamie; TRACEY Alena; ian.hutcheon@ministerial.qld.gov.au; Pamela Frost; Hannah Jackson; angus.sutherland@ministerial.qld.gov.au; DLO DES; Media DES; Sophie Dwyer; SDLO
Cc: ELLWOOD Dean; ESR
Subject: ESR ALERT – PFAS Defence Biota Investigations at Amberley
Attachments: CH014211 - Letter.pdf

ALERT CATEGORY:

- Stakeholder activity.

ALERT NAME:

- PFAS Defence Biota Investigations at Amberley

CUSTOMER DETAILS:

- Department of Defence
- Queensland Health

SUMMARY OF ISSUE/S:

- Defence engaged a consultant to undertake sampling of biota (fish and eels) at Warrill Creek and Bremer River as part of a wider investigation of PFAS contamination around RAAF Base Amberley.
- A small quantity of seafood results were provided to Queensland Government agencies last week.
- Queensland Health has analysed the results and: identified that current information shows high levels of PFAS in seafood inside the investigation area; reached a view that a single meal of seafood caught in the area would place an individual above their total daily intake of PFAS; and qualified these conclusions on the basis that the current sample size is too small – both in quantity and in types of species – to adequately inform a full risk assessment of local seafood consumption.
- Queensland Health has briefed the Chief Health Officer, who wrote to Defence on 8 June 2018 (attached) recommending that Defence:
 - inform the local community as soon possible of the results;
 - advise residents not to consume fish inside the investigation area until further testing can take place;
 - conduct further testing of other species to gain a better understanding of human health risks.
- A Defence Media release and communications actions are pending.
- Defence will liaise with the Department of Premier and Cabinet (DPC) and Queensland Health in developing this material.

POTENTIAL IMPACTS / RISKS:

- There is a risk of community concern given the presence of PFAS in biota at Warrill Creek and the Bremer River and pending cautionary advice not to eat fish caught in the investigation area.

CUSTOMER ACTIONS:

- Defence has provided results to the Queensland Government through DPC as the chair of the PFAS interdepartmental committee.

DEPARTMENT ACTIONS:

[HISTORICAL ACTIONS]

- DES does not have a direct regulatory role over Commonwealth Defence sites.
- DES contributes to review and feedback regarding Defence PFAS investigations through the Interdepartmental Committee and associated Technical Working Group.

[PLANNED ACTIONS]

- The Queensland Government expects the Department of Defence to lead community communications and engagement about its investigations.
- As a direct potential for community exposure exists, Queensland Health is leading Queensland Government communications with Defence on the matter.

KEY COMMUNICATION MESSAGES:

- Biota samples taken in Warrill Creek and the Bremer River adjacent to the Amberley Defence Base returned elevated levels of PFAS in fillets taken from catfish, mullet and perch.
- Queensland's Chief Health Officer has requested the Defence advise the community that, as a precautionary measure, people should not consume fish caught in the investigation area.
- The department is working with other agencies to provide advice on the matter.

CONTACT DETAILS:

- Name: Andrew Connor – Executive Director
- Phone number: 33306335
- Division: Environmental Services and Regulation

This email is an initial alert in respect of this matter.

If further advice or action is required, it will be communicated via normal channels such as a briefing note.

END



Zhivana Marks

Senior Program Officer

Office of the Deputy Director-General | Environmental Services & Regulation

Department of Environment and Science

P 07 3330 5561

400 George Street BRISBANE QLD 4000

GPO Box 2454, BRISBANE QLD 4001

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RTI RELEASE

Janet Cumming

From: James Stewart <james.stewart@premiers.qld.gov.au>
Sent: Thursday, 14 June 2018 8:23 AM
To: Sophie Dwyer; Janet Cumming; David Larkings
Cc: Justin Carpenter; Kahil Lloyd; Ben Armstrong
Subject: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]
Attachments: Facsheet (letter box drop, boat ramp and website).docx; Webpage.docx

Importance: High

Good morning Sophie,

Thank you to you and your team for help providing yesterday in reviewing the Amberley comms material.

DPC comms have drafted a factsheet (for a letter box drop) and a proposed webpage for Defence to use in their communications. The intention for these documents is that they are simple and tailored to the local audience rather than a scientific community.

I've made a few edits but would like to run the document by you for approval from a health perspective.

In an effort for Defence to do something today, we are hoping to have these documents to them this morning if possible.

Happy to discuss this further.

Best regards,
James.



James Stewart
 Policy Officer
Environment Policy
 Department of the Premier and Cabinet

P 07 3003 9487
 1 William Street, Brisbane QLD 4000
 PO Box 15185, City East, QLD 4002



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From: Justin Carpenter
Sent: Wednesday, 13 June 2018 6:39 PM
To: McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>; PFAS Comms <pfas.comms@defence.gov.au>
Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>; 'Sophie.Dwyer@health.qld.gov.au' <Sophie.Dwyer@health.qld.gov.au>; 'Andrew.Connor@des.qld.gov.au' <Andrew.Connor@des.qld.gov.au>; James Stewart <james.stewart@premiers.qld.gov.au>; Ben Armstrong <Ben.Armstrong@premiers.qld.gov.au>; Matthew Rigby

<matthew.rigby@premiers.qld.gov.au>

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Hello Luke

Thanks for this.

Attached are our suggestions for:

1. Factsheet – letterbox drop in local area, copy on the website, and if there's a spot at boat ramps to put some hard copies
2. Web content / FAQs – just web content written in their FAQ style, and easily added as a new 'Seafood' tab to <http://www.defence.gov.au/environment/pfas/Amberley/FAQs.asp>

I still need to confirm some aspects of this content across government (and will do so early tomorrow) but, as it is a significant rework, I thought I'd forward this on now to test the waters and keep things moving.

As you know our preference is for Defence put out media release and in regards to Queensland collaborating on this I can confirm that Health are still very happy to provide health advice or be cited (as per the attached e.g. "DoD recommend, on the basis for QH advice, to..."). I would appreciate Defence's further consideration of this proposal.

I will get back to you in regard to signage but expect that Defence will soon have a plan for this. How it is branded is, I think, a matter for Defence.

Additionally, I too appreciate your efforts to work collaboratively to provide advice to the community, and your recognition that this advice should be timely and credible.

Regards



Justin Carpenter

Acting Executive Director

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9316 M [REDACTED]

1 William Street, Brisbane QLD 4000

PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
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From: McLeod, Luke MR 1 [<mailto:luke.mcleod1@defence.gov.au>]

Sent: Wednesday, 13 June 2018 6:02 PM

To: Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; PFAS Comms <pfas.comms@defence.gov.au>

Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>; 'Sophie.Dwyer@health.qld.gov.au' <Sophie.Dwyer@health.qld.gov.au>; 'Andrew.Connor@des.qld.gov.au' <Andrew.Connor@des.qld.gov.au>; James Stewart <james.stewart@premiers.qld.gov.au>; Ben Armstrong <Ben.Armstrong@premiers.qld.gov.au>

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

For-Official-Use-Only

Justin,

Apologies for delay in responding to your email. As discussed Defence would intend to release the Fact Sheet (pdf document) and also the FAQs in a couple of ways. Upon reflection we would intend to issue a Fact Sheet and FAQ, via a letterbox drop to all residents and businesses within the investigation area. This would be complemented with the digital release of this information via the Defence PFAS website (www.defence.gov.au/environment/pfas). We have done this in a range of contexts across several site investigations to advise the community directly about investigations outcomes/findings/updates etc.

With regards to signage it would obviously be important that any non-local recreational fishers are similarly advised of the precautionary advice issued to not eat any fish caught in the river/creek. We would appreciate any advice you can provide which would facilitate this signage being erected in a manner consistent with normal practice. I can confirm that I will approve to fund signage erected to advise the community. I would however need to obtain departmental approval for any Defence-branded signage.

Thank you for your understanding on this matter and continuing to work collaboratively with Defence to ensure that the community is provided with timely and credible advice.

Regards

Luke McLeod

AS PFAS Investigation & Management
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group

M: [REDACTED]

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From: Justin Carpenter [<mailto:justin.carpenter@premiers.qld.gov.au>]

Sent: Wednesday, 13 June 2018 3:39 PM

To: PFAS Comms

Cc: McLachlan, James MR; McLeod, Luke MR 1; Lymburner, Amanda MS; Sophie.Dwyer@health.qld.gov.au; Andrew.Connor@des.qld.gov.au; James Stewart; Ben Armstrong

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Hello all

Just checking to see if these points can be clarified: documents provided (purpose) and other being produced – including draft media release for comment and web content, as well as an incite into the overall plan/timeframes.

Regards



Justin Carpenter
Acting Executive Director
Environment Policy
Department of the Premier and Cabinet
P 07 3003 9316 M [REDACTED]
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
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From: Justin Carpenter
Sent: Wednesday, 13 June 2018 11:23 AM
To: 'PFAS Comms' <pfas.comms@defence.gov.au>
Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>; Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>; 'Sophie.Dwyer@health.qld.gov.au' <Sophie.Dwyer@health.qld.gov.au>; 'Andrew.Connor@des.qld.gov.au' <Andrew.Connor@des.qld.gov.au>
Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Thanks for this Courtney

We are reviewing and will provide comment ASAP.

Just to clarify – the pdf document will form part of a fact sheet? Is there web content that is being prepared (other than the Q&As)?

Luke – following from our teleconference, and to re-iterate, we expect that Defence will lead active media on this and would like to provide comment on content as it is being prepared. This will, I hope, also help with our shared efforts to clarify roles and responsibilities.

Regards



Justin Carpenter
Acting Executive Director
Environment Policy
Department of the Premier and Cabinet
P 07 3003 9316 M [REDACTED]
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



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From: Parkinson, Courtney MISS [<mailto:courtney.parkinson@defence.gov.au>] **On Behalf Of** PFAS Comms
Sent: Wednesday, 13 June 2018 9:16 AM
To: Justin Carpenter <justin.carpenter@premiers.qld.gov.au>

Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>; PFAS Comms <pfas.comms@defence.gov.au>; Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>

Subject: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

For-Official-Use-Only

Good morning Justin,

Please find attached draft materials for review prior to the meeting this morning.

Many thanks,

Courtney Parkinson

A/Assistant Director – PFAS Communications
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] | E: courtney.parkinson@defence.gov.au

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DoD branded factsheet for letterbox drop (final presentation/layout at discretion of DoD Comms)

Health advice – Fish from the Bremer River and Warrill Creek

The Department of Defence is investigating PFAS contamination at RAAF Base Amberley and surrounding areas.

PFAS are a group of chemicals that have been used for a broad range of household and commercial purposes over the last 60 years, most commonly in firefighting foams.

As part of our ongoing investigation, in April 2018, we tested seafood in the Bremer River and Warrill Creek for PFAS.

At this time, we recommend you **do not consume** fish caught in the Bremer River or Warrill Creek near RAAF Base Amberley [until further testing takes place](#).

This is precautionary advice, based on preliminary test results, and we will keep the community and recreational fishers updated as our investigation progresses.

About PFAS exposure

If you have occasionally consumed fish from Bremer River or Warrill Creek in the past, you should **not** be concerned for your health.

Tolerable levels of PFAS for humans are measured using a lifetime daily intake. This means that while the PFAS levels in the tested fish were above recommended levels, you would need to be consuming PFAS contaminated fish daily, and over many years, to be considered at risk.

[In May 2018 an independent expert panel commissioned by the Federal Department of Health released a report which found that there is little or no evidence of adverse health effects caused by PFAS exposure, but further studies are needed. All health advice used is precautionary until further studies can take place.](#)

The investigation

The area under investigation is shown on the map below.

(insert map)

To date, we have tested mullet, catfish and eel. Further investigations will be carried out, including tests of other species of more popular edible fish.

Until this further testing is completed, the advice not to consume the fish from the Bremer River and Warrill Creek applies to **all** species.

Your health

Occasional consumption of fish from the investigation area in the Bremer River and Warrill Creek **does not** put you at risk.

The advice not to consume the fish is precautionary.

However, if you are still concerned about your health, you should consult your GP or call 13 HEALTH.

More information

For more information on the RAAF Amberley PFAS investigation, you can visit www.defence.gov.au/environment/pfas/Amberley/

For more information on PFAS generally, you can visit www.health.gov.au and search for 'PFAS'.

RTI RELEASED

<http://www.defence.gov.au/environment/pfas/Amberley/FAQs.asp>

Add tab: Seafood

Is it safe to eat seafood caught near RAAF Base Amberley?

As part of the ongoing [Human Health and Ecological Risk Assessment](#) at RAAF Base Amberley, seafood in the Bremer River and Warrill Creek was tested for PFAS.

The Department of Defence, on the advice of Queensland Health, recommends you **do not consume** fish caught in the Bremer River or Warrill Creek near RAAF Base Amberley.

However, if you have occasionally consumed fish from Bremer River or Warrill Creek in the past, you should **not** be concerned for your health.

Tolerable levels of PFAS for humans are measured using a lifetime daily intake. This means that while the PFAS levels in the fish were above recommended levels, you would need to be consuming PFAS contaminated fish daily, and over many years, to be considered at risk.

The recommendation to not consume the fish is precautionary while further investigations are conducted.

What areas of the Bremer River or Warrill Creek are affected?

The area under investigation is shown on the map below.

(insert map)

I have eaten fish from the Bremer River or Warrill Creek in the past. Am I at risk?

Occasional consumption of fish from the investigation area in the Bremer River and Warrill Creek **does not** put you at risk.

Given the levels of PFAS currently known to be present, you would need to have consumed a serve of fish from the Bremer River or Warrill Creek at least weekly for many years to even be considered possibly at risk.

I am still concerned about my health. Where can I go for more advice and should I be getting a blood test?

If you are concerned about your health, you should consult your GP or call 13 HEALTH (from within Queensland).

Information about PFAS is also available from the Australian Government Department of Health at www.health.gov.au (search 'PFAS').

You can ask your GP for a blood test, but it is important to know the limitations of blood testing. Health authorities do not recommend blood testing, because it won't help your GP give you specific advice in relation to PFAS, and only has value in terms of comparing your PFAS exposure to an average Australian.

What testing was completed?

A small sample of 22 fish was taken from the Bremer River and Warrill Creek between 9 and 17 April 2018. The fish were caught in 7 different locations across the investigation area (map above).

The fish samples were analysed, and results provided to Queensland Health.

Based on the results, Queensland Health's advice is that no fish caught in the investigation area should be consumed.

What species of fish were tested?

Mullet, catfish and eel were tested.

Further investigations will be carried out, including tests of other species of more popular edible fish.

Until this further testing is completed, the advice not to consume the fish from the Bremmer River and Warrill Creek applies to **all** species.

When will I be able to eat fish from the Bremmer River and Warrill Creek again?

It is too early in the investigation to say.

The advice not to consume fish from the Bremmer River and Warrill Creek is based on preliminary testing results, and further investigations are needed.

Further advice will be provided as the investigation progresses.

The Department of Defence aims to complete the [Human Health and Ecological Risk Assessment](#) by the end of September 2018.

What are you doing to inform recreational fishers and the wider community?

The Department of Defence will be erecting signage around the investigation area to alert fishers not to consume the fish.

Catch and release fishing is safe.

What if someone doesn't read this advice or see the signs, and eats contaminated fish?

Infrequent consumption of fish from the Bremmer River and Warrill Creek would not make a significant contribution to a person's overall exposure to PFAS.

The advice not to consume the fish is precautionary.

What about possible levels of PFAS in fish that migrate upstream and downstream?

DoD to indicate if further testing is planned, and when.

Is commercial fishing impacted?

There is no known commercial fishing along the Bremer River or Warrill Creek.

What are the health risks associated with PFAS?

In May 2018, an independent expert panel – commissioned by the Commonwealth Government – released a report finding there was little or no evidence that exposure to PFAS causes adverse human health effects.

However, laboratory tests show that the chemicals can accumulate or build-up in people, animals and the environment over time, so the best course of action is to minimise exposure.

Health authorities have been very precautionary in providing health advice, and have set acceptable health exposure criteria at very low levels. These health criteria were developed in April 2017 by the Federal Department of Health in collaboration with Food Standards Australia New Zealand (FSANZ).

They are calculated upon a lifetime of daily exposure at the maximum tolerable daily intake (TDI), so even when humans are exposed above the established health criteria they are generally not at risk unless it is a lifelong daily practice, such as sourcing a significant portion of your food from a contaminated source.

RTI RELEASED

David Larkings

From: HProt.corro
Sent: Thursday, 14 June 2018 4:59 PM
To: David Larkings; Janet Cumming; Tenille Fort
Subject: FW: INFO - ESR ALERT – PFAS Defence Biota Investigations at Amberley
Attachments: CH014211 - Letter.pdf

Remarks: Copy with JY

Hi

Please see attached as an FYI.

Regards
 Gail

From: CHO CHO
Sent: Thursday, 14 June 2018 4:31 PM
To: HProt.corro <HProt.corro@health.qld.gov.au>
Subject: INFO - ESR ALERT – PFAS Defence Biota Investigations at Amberley

Hi Gail,

FYI

Cheers,
 Jess



Prevention Division Correspondence Team

Jess Burns, Briefings Officer – 3708 5196
 Madison Crofts, Correspondence Officer - 3708 5194
 Janine Tennant, Correspondence Officer - 3708 5193

Office of The Chief Health Officer and Deputy Director-General, Prevention Division, Department of Health

a: 33 Charlotte Street, Brisbane QLD 4000
w: Queensland Health | **e:** CHO_CHO@health.qld.gov.au



Queensland's health vision | By 2026 Queenslanders will be among the healthiest people in the world.

Queensland Health acknowledges the Traditional Owners of the land, and pays respect to Elders past, present and future.

From: SDLO
Sent: Monday, 11 June 2018 5:50 PM
To: CHO CHO <CHO_CHO@health.qld.gov.au>
Subject: FW: ESR ALERT – PFAS Defence Biota Investigations at Amberley

Hi CHO - FYI

Kind regards,



Katie Watts

Briefings and Liaison Officer

Office of the Director-General, **Department of Health**

p: 07 3708 5984

a: 1 William Street Brisbane QLD 4000

w: Queensland Health | **e:** katie.watts@health.qld.gov.au



Queensland's health vision | *By 2026 Queenslanders will be among the healthiest people in the world.*

Queensland Health acknowledges the Traditional Owners of the land, and pays respect to Elders past, present and future.

From: MARKS Zhivana [<mailto:Zhivana.Marks@des.qld.gov.au>] **On Behalf Of** ESR

Sent: Monday, 11 June 2018 4:49 PM

To: MERRICK Jamie <Jamie.Merrick@des.qld.gov.au>; TRACEY Alena <Alena.Tracey@des.qld.gov.au>; ian.hutcheon@ministerial.qld.gov.au; Pamela Frost <Pamela.Frost@ministerial.qld.gov.au>; Hannah Jackson <Hannah.Jackson@ministerial.qld.gov.au>; angus.sutherland@ministerial.qld.gov.au; DLO DES <DLO.DES@des.qld.gov.au>; Media DES <Media@des.qld.gov.au>; Sophie Dwyer <Sophie.Dwyer@health.qld.gov.au>; SDLO <SDLO@health.qld.gov.au>

Cc: ELLWOOD Dean <Dean.Ellwood@des.qld.gov.au>; ESR <ESR@des.qld.gov.au>

Subject: ESR ALERT – PFAS Defence Biota Investigations at Amberley

ALERT CATEGORY:

- Stakeholder activity.

ALERT NAME:

- PFAS Defence Biota Investigations at Amberley

CUSTOMER DETAILS:

- Department of Defence
- Queensland Health

SUMMARY OF ISSUE/S:

- Defence engaged a consultant to undertake sampling of biota (fish and eels) at Warrill Creek and Bremer River as part of a wider investigation of PFAS contamination around RAAF Base Amberley.
- A small quantity of seafood results were provided to Queensland Government agencies last week.
- Queensland Health has analysed the results and: identified that current information shows high levels of PFAS in seafood inside the investigation area; reached a view that a single meal of seafood caught in the area would place an individual above their total daily intake of PFAS; and qualified these conclusions on the basis that the current sample size is too small – both in quantity and in types of species – to adequately inform a full risk assessment of local seafood consumption.
- Queensland Health has briefed the Chief Health Officer, who wrote to Defence on 8 June 2018 (attached) recommending that Defence:
 - inform the local community as soon possible of the results;
 - advise residents not to consume fish inside the investigation area until further testing can take place;

- conduct further testing of other species to gain a better understanding of human health risks.
- A Defence Media release and communications actions are pending.
- Defence will liaise with the Department of Premier and Cabinet (DPC) and Queensland Health in developing this material.

POTENTIAL IMPACTS / RISKS:

- There is a risk of community concern given the presence of PFAS in biota at Warrill Creek and the Bremer River and pending cautionary advice not to eat fish caught in the investigation area.

CUSTOMER ACTIONS:

- Defence has provided results to the Queensland Government through DPC as the chair of the PFAS interdepartmental committee.

DEPARTMENT ACTIONS:

[HISTORICAL ACTIONS]

- DES does not have a direct regulatory role over Commonwealth Defence sites.
- DES contributes to review and feedback regarding Defence PFAS investigations through the Interdepartmental Committee and associated Technical Working Group.

[PLANNED ACTIONS]

- The Queensland Government expects the Department of Defence to lead community communications and engagement about its investigations.
- As a direct potential for community exposure exists, Queensland Health is leading Queensland Government communications with Defence on the matter.

KEY COMMUNICATION MESSAGES:

- Biota samples taken in Warrill Creek and the Bremer River adjacent to the Amberley Defence Base returned elevated levels of PFAS in fillets taken from catfish, mullet and perch.
- Queensland's Chief Health Officer has requested the Defence advise the community that, as a precautionary measure, people should not consume fish caught in the investigation area.
- The department is working with other agencies to provide advice on the matter.

CONTACT DETAILS:

- Name: Andrew Connor – Executive Director
- Phone number: 33306335
- Division: Environmental Services and Regulation

This email is an initial alert in respect of this matter.

If further advice or action is required, it will be communicated via normal channels such as a briefing note.

END



Zhivana Marks

Senior Program Officer

Office of the Deputy Director-General | Environmental Services & Regulation

Department of Environment and Science

P 07 3330 5561

400 George Street BRISBANE QLD 4000

GPO Box 2454, BRISBANE QLD 4001



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RTI RELEASED

Myra Thompson

From: McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>
Sent: Thursday, 14 June 2018 6:52 PM
To: 'Justin Carpenter'; PFAS Comms
Cc: McLachlan, James MR; Lymburner, Amanda MS; Sophie Dwyer
Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]
Attachments: Draft warning signage (LMC Cleared).docx; Amberley newsletter with advice - updated (LMC Cleared).docx

Categories: CC'd

For-Official-Use-Only

Justin,

Further to our conversation earlier this afternoon please find attached cleared newsletter and signage associated with the issuing of health advice regarding the consumption of fish in the Bremmer river and Warrill creek.

For your consideration and comment.

We would intend, subject to your review, that signage posting at river and creek entry points and release electronically on our website would happen immediately with the letterbox drop to occur as quickly as logistics allow.

Regards

Luke McLeod

AS PFAS Investigation & Management
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group

M: [REDACTED]

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From: Justin Carpenter [mailto:justin.carpenter@premiers.qld.gov.au]
Sent: Wednesday, 13 June 2018 6:39 PM
To: McLeod, Luke MR 1; PFAS Comms
Cc: McLachlan, James MR; Lymburner, Amanda MS; 'Sophie.Dwyer@health.qld.gov.au';

'Andrew.Connor@des.qld.gov.au'; James Stewart; Ben Armstrong; Matthew Rigby
Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Hello Luke

Thanks for this.

Attached are our suggestions for:

1. Factsheet – letterbox drop in local area, copy on the website, and if there's a spot at boat ramps to put some hard copies
2. Web content / FAQs – just web content written in their FAQ style, and easily added as a new 'Seafood' tab to <http://www.defence.gov.au/environment/pfas/Amberley/FAQs.asp>

I still need to confirm some aspects of this content across government (and will do so early tomorrow) but, as it is a significant rework, I thought I'd forward this on now to test the waters and keep things moving.

As you know our preference is for Defence put out media release and in regards to Queensland collaborating on this I can confirm that Health are still very happy to provide health advice or be cited (as per the attached e.g. "DoD recommend, on the basis for QH advice, to..."). I would appreciate Defence's further consideration of this proposal.

I will get back to you in regard to signage but expect that Defence will soon have a plan for this. How it is branded is, I think, a matter for Defence.

Additionally, I too appreciate your efforts to work collaboratively to provide advice to the community, and your recognition that this advice should be timely and credible.

Regards



Justin Carpenter
 Acting Executive Director
 Environment Policy
 Department of the Premier and Cabinet
 P 07 3003 9316 M [REDACTED]
 1 William Street, Brisbane QLD 4000
 PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
 Australia's campaign to stop violence against women

From: McLeod, Luke MR 1 [mailto:luke.mcleod1@defence.gov.au]

Sent: Wednesday, 13 June 2018 6:02 PM

To: Justin Carpenter <justin.carpenter@premiers.qld.gov.au>; PFAS Comms <pfas.comms@defence.gov.au>

Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; Lymburner, Amanda MS

<amanda.lymburner@defence.gov.au>; 'Sophie.Dwyer@health.qld.gov.au' <Sophie.Dwyer@health.qld.gov.au>;

'Andrew.Connor@des.qld.gov.au' <Andrew.Connor@des.qld.gov.au>; James Stewart

<james.stewart@premiers.qld.gov.au>; Ben Armstrong <Ben.Armstrong@premiers.qld.gov.au>

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

For-Official-Use-Only

Justin,

Apologies for delay in responding to your email. As discussed Defence would intend to release the Fact Sheet (pdf document) and also the FAQs in a couple of ways. Upon reflection we would intend to issue a Fact Sheet and FAQ, via a letterbox drop to all residents and businesses within the investigation area. This would be complemented with the digital release of this information via the Defence PFAS website (www.defence.gov.au/environment/pfas). We have done this in a range of contexts across several site investigations to advise the community directly about investigations outcomes/findings/updates etc.

With regards to signage it would obviously be important that any non-local recreational fishers are similarly advised of the precautionary advice issued to not eat any fish caught in the river/creek. We would appreciate any advice you can provide which would facilitate this signage being erected in a manner consistent with normal practice. I can confirm that I will approve to fund signage erected to advise the community. I would however need to obtain departmental approval for any Defence-branded signage.

Thank you for your understanding on this matter and continuing to work collaboratively with Defence to ensure that the community is provided with timely and credible advice.

Regards

Luke McLeod

AS PFAS Investigation & Management
PFAS Investigation & Management Branch
Infrastructure Division

Department of Defence | Estate & Infrastructure Group

M:

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From: Justin Carpenter [<mailto:justin.carpenter@premiers.qld.gov.au>]

Sent: Wednesday, 13 June 2018 3:39 PM

To: PFAS Comms

Cc: McLachlan, James MR; McLeod, Luke MR 1; Lymburner, Amanda MS; Sophie.Dwyer@health.qld.gov.au;

Andrew.Connor@des.qld.gov.au; James Stewart; Ben Armstrong

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Hello all

Just checking to see if these points can be clarified: documents provided (purpose) and other being produced – including draft media release for comment and web content, as well as an incite into the overall plan/timeframes.

Regards



Justin Carpenter

Acting Executive Director

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9316 M [REDACTED]
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
Australia's campaign to stop violence against women

From: Justin Carpenter

Sent: Wednesday, 13 June 2018 11:23 AM

To: 'PFAS Comms' <pfas.comms@defence.gov.au>

Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>;

Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>; 'Sophie.Dwyer@health.qld.gov.au'

<Sophie.Dwyer@health.qld.gov.au>; 'Andrew.Connor@des.qld.gov.au' <Andrew.Connor@des.qld.gov.au>

Subject: RE: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

Thanks for this Courtney

We are reviewing and will provide comment ASAP.

Just to clarify – the pdf document will form part of a fact sheet ? Is there web content that is being prepared (other than the Q&As)?

Luke – following from our teleconference, and to re-iterate, we expect that Defence will lead active media on this and would like to provide comment on content as it is being prepared. This will, I hope, also help with our shared efforts to clarify roles and responsibilities.

Regards



Justin Carpenter

Acting Executive Director

Environment Policy

Department of the Premier and Cabinet

P 07 3003 9316 M [REDACTED]
1 William Street, Brisbane QLD 4000
PO Box 15185, City East, QLD 4002



Proudly working with White Ribbon to create a safer workplace
Australia's campaign to stop violence against women

From: Parkinson, Courtney MISS [<mailto:courtney.parkinson@defence.gov.au>] **On Behalf Of** PFAS Comms
Sent: Wednesday, 13 June 2018 9:16 AM
To: Justin Carpenter <justin.carpenter@premiers.qld.gov.au>
Cc: McLachlan, James MR <james.mclachlan@defence.gov.au>; McLeod, Luke MR 1 <luke.mcleod1@defence.gov.au>;
 PFAS Comms <pfas.comms@defence.gov.au>; Lymburner, Amanda MS <amanda.lymburner@defence.gov.au>
Subject: For review - draft factsheet and FAQs [DLM=For-Official-Use-Only]

For-Official-Use-Only

Good morning Justin,

Please find attached draft materials for review prior to the meeting this morning.

Many thanks,

Courtney Parkinson

A/Assistant Director – PFAS Communications
 PFAS Investigation & Management Branch
 Infrastructure Division

Department of Defence | Estate & Infrastructure Group
M: [REDACTED] **E:** courtney.parkinson@defence.gov.au

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RTI RELEASE

WARNING: ADVICE FROM QUEENSLAND HEALTH

Initial sampling of edible fish from the Bremer River and Warrill Creek undertaken as part of the RAAF Base Amberley PFAS Environmental Investigation have shown elevated concentrations of **PFAS** (per- and poly-fluoroalkyl substances).

As a interim precaution the Queensland Government recommends people should not eat fish caught in the Investigation Area.

Fishing in the Investigation Area may continue on a catch and release basis.

More information: www.qld.gov.au/PFAS or 1300 130 372





Investigation Update

In March 2017, Defence commenced a detailed environmental investigation at RAAF Base Amberley and the surrounding area to identify the nature and extent of per- and poly-fluoroalkyl substances (PFAS) in the environment and any potential exposure pathways to humans, plants and animals.

This newsletter provides an update on the investigation as well as a summary of common questions about the investigation.

Detailed Site Investigation

As part of the environmental investigation, a Detailed Site Investigation is being conducted which involves a comprehensive sampling program. The sampling for the Detailed Site Investigation has now been completed with the results currently undergoing analysis. A report is being prepared which will identify the source areas for PFAS, examine how and where PFAS has moved from those source areas, provide results from sampling and identify potential PFAS exposure pathways which require further sampling and analysis.

Human Health Risk Assessment

A Human Health Risk Assessment has commenced which will assess the exposure pathways to PFAS for people living, working and undertaking recreational activities within the Investigation Area.

It looks closely at potential exposure pathways and characterises the level of exposure risk, which is then compared against criteria recommended and/or adopted by state and federal regulatory agencies. If the exposure risk from a pathway is assessed as

being above acceptable levels, then precautions will be suggested to minimise future PFAS exposure.

Biota (fish, plants, fruits and vegetables) sampling for the HHRA is underway, and further groundwater, surface water, soil and sediment sampling will take place in coming months.

The possible build up of PFAS in fish from the Bremer River or Warrill Creek, and their subsequent human consumption, has also been identified as a potential exposure pathway to PFAS.

As a result, the preliminary sampling of specific edible fish species has recently been completed. Further information

Ecological Risk Assessment

An Ecological Risk Assessment will soon commence, the planned scope for this work is currently being developed.

An Ecological Risk Assessment assesses the potential risks of PFAS exposure to water and land-based plants and animals and their environment. It also considers the exposure risks for the accumulation of PFAS in birds and mammals through the consumption of plants and smaller creatures.

PFAS Management Area Plan

The best management and remediation options for a particular site are determined by site-specific factors, including hydrogeology, the type of contamination, and access.

At the end of the RAAF Base Amberley investigation, Defence will use all these findings to develop a PFAS Management Area Plan that is tailored to the unique conditions of the site.

Health advice – Fish from the Bremer River and Warrill Creek

In April 2018, as part of the Human health and Risk Assessment, initial testing for PFAS was conducted on seafood (mullet, catfish and eel) in the Bremer River and Warrill Creek ~~for PFAS~~. The results of this testing were provided to Queensland Health.

Based on an assessment of the results, Queensland Health advises that you ~~do~~ should **not** consume fish caught in the Bremer River or Warrill Creek near RAAF Base Amberley.

This interim advice is a precautionary approach to minimise potential PFAS exposure.

Further testing and analysis will be carried out as part of the Human Health Risk Assessment, including tests of other species of more popular edible fish.

Until this further testing is completed, the Queensland Health advice applies to all fish species.

This is precautionary advice, based on preliminary test results, and we will keep the community and recreational fishers updated as the investigation progresses.

About PFAS exposure

Queensland Health advise that you should not be concerned for your health if you have occasionally consumed fish from Bremer River or Warrill Creek in the past.

Tolerable levels of PFAS for humans are measured using a lifetime daily intake.

This means that while the PFAS levels in the tested fish were above recommended levels, you would need to be consuming PFAS contaminated fish daily, and over many years, to have elevated exposure levels.

Government Guidance

The Environmental Health Standing Committee (enHealth) of the Australian Health Protection Principal Committee (AHPPC) has released guidance statements relating to human health.

According to enHealth, there is currently no consistent evidence that exposure to PFOS and PFOA causes adverse human health effects. However, because these substances persist in humans and the environment, enHealth recommends that human exposure is minimised as a precaution.

Further information can be found via the Commonwealth Department of Health PFAS webpage and community information line:

Phone: 1800 941 180 **Web:** www.health.gov.au/pfas

The Investigation Area

The Investigation Area (below) defines the current extent of the investigation, focussed on the potential people, animals and environment that may be exposed to PFAS. The Investigation Area will be updated and amended as the investigation progresses and additional data becomes available.





Investigation Timeline

- - 🔍 Preliminary Site Investigation & Water Use Survey
Mar – May 2017
 - 🔍 Preparing Draft Sampling Plan
May – Oct 2017
 - 👤 Community Walk-in Session
Nov 2017
 - 📄 Detailed Site Investigation
Oct 2017 – Mid 2018
 - 📄 Human Health Risk Assessment
May 2018 – Late 2018
 - 📄 Ecological Risk Assessment
Jun 2018 – Late 2018
 - 📄 PFAS Management Area Plan
Late 2018
- *Dates may be subject to rescheduling

WE
ARE
HERE

Upcoming Community Engagement

Defence is committed to regularly updating the community throughout the investigation.

The Detailed Site Investigation and assessment reports are expected to be released publicly in the second half of 2018 and a Community Walk-in Session will be held to coincide with the release of the reports.

What are the Water Use Surveys used for?

As part of the investigation, information has been collected through a Water Use Survey to find out more about water use near RAAF Base Amberley. The survey results provide us with an understanding of groundwater and surface water use and have helped to determine what sampling needs to be conducted as part of the investigation.

How can people be exposed to PFAS?

PFAS are manufactured chemicals used in products that resist heat, oil, stains and water. The chemicals have been used in Australia and around the world in many common household products and specialty applications, including legacy firefighting foams used by Defence.

Exposure to PFAS can occur from eating or drinking PFAS impacted food, groundwater and surface water and through contact with a range of work environments and various common household products.

Common household products containing PFAS include non-stick cookware, fabric, furniture and carpet stain protection applications and food packaging.

At locations where PFAS contamination has been identified at higher levels, the main way people can be exposed is by drinking contaminated bore or surface water. Other ways include consuming home grown produce (such as eggs, milk, meat, fruit or vegetables) where contaminated water has been used or eating seafood caught in affected areas.

Contact the Project Team:

📞 1800 817 751 ✉️ amberley@ch2m.com.au

🌐 www.defence.gov.au/environment/pfas/amberley/

Media enquiries should be directed to Defence Media on (02) 6127 1999 or media@defence.gov.au



Bremer River near RAAF Base Amberley

