

Notice

Environmental Protection Act 1994

Clean-up Notice

This clean-up notice is issued by the administering authority pursuant to section 363H of the Environmental Protection Act 1994 to advise you of a decision requiring you to take the stated action in regard to a contamination incident.

BP Bulwer Island Pty Ltd (ACN 008 422 115) cc. Australian Terminal Operations Management Pty Ltd
C/o BP Australia Pty Level 17, 717 Bourke Street Level 3, 22 Albert Road
DOCKLANDS, VIC, 3008 SOUTH MELBOURNE VIC 3205

By email: Stephanie.Williams@se1.bp.com
Mark.Murrie@se1.bp.com
kristine.taylor@se1.bp.com

By email: ben.baigrie@australianterminals.com

Your reference: BP Product Terminal

Our reference: C-CPLO-100001699 E-100185161

~~22 July 2022~~ ~~19 September 2022~~ 9 June 2023

Take notice: that under section 363H of the *Environmental Protection Act 1994* (the Act) a clean-up notice is issued to BP Bulwer Island Pty Ltd (ACN 008 422 115) (BP/you) by the administering authority. The administering authority is the Chief Executive of the Department of Environment and Science (the department).

The clean-up notice is issued in respect to the activities of BP Australia Pty Ltd at the BP Product Terminal and Product Wharf on land described as lot 846 SP135226, lot 1226 SP120289, lot 1253 SP213119 and lot 1254 SP213119, situated at 305 Tingira Street, Pinkenba, QLD 4008 (the premises/BP Product Terminal).

This notice was originally issued on 22 July 2022 and amended on 19 September 2022. New text in the amended notice is shown as underlined and deleted text is shown as strikethrough. The notice issued on 19 September 2022, remained in force until the issue of this amended notice.

A. Grounds

The clean-up notice is issued on the following grounds:

1. Pursuant to section 363G of the Act, the administering authority reasonably believes that you are a prescribed person for a contamination incident.
2. The contamination incident involves:
 - a) contamination of the environment that the administering authority is satisfied has caused, or is likely to cause, serious or material environmental harm; and
 - b) the carrying out of an activity on contaminated land and a change in the condition of contaminated land that the administering authority is satisfied has caused, or is likely to cause, the land or any other land to become contaminated land.

Notice

The facts and circumstances forming the basis for these grounds are:

Premises

3. The premises is the BP Product Terminal and Product Wharf on land described as Lot 846 SP135226, Lot 1226 on SP120289, Lot 1253 SP213119 and 1254 SP213119 situated at 305 Tingira Street, Pinkenba, Queensland (the premises/BP Product Terminal).
4. Lot 846 SP135226 is listed on the Queensland Government Environmental Management Register (EMR Site ID: 35920) for petroleum product or oil storage. The following hazardous contaminants are listed: Phase Separated Hydrocarbons, Dissolved Phase Hydrocarbons, Heavy Metals (nickel and lead).
5. Within lot 846 SP135226 is an area that is the subject of the hydrocarbon investigation and remediation by BP, which is shaded in yellow marked 'ATOM Terminal Operations under the EA' in Attachment A of this notice.
6. Lot 1226 SP120289 is listed on the Queensland Government Environmental Management EMR Register EMR Site ID 205992) for abrasive blasting - carrying out abrasive blast cleaning (other than cleaning in fully enclosed booths) or disposing of abrasive blasting material.
7. Lot 1254 SP213119 is listed on the Queensland Government Environmental Management EMR Register EMR Site ID 205993) for abrasive blasting - carrying out abrasive blast cleaning (other than cleaning in fully enclosed booths) or disposing of abrasive blasting material.
8. Schedule 4 of the Act defines contaminated land as land contaminated by a hazardous contaminant; and land includes— (a) the airspace above land; and (b) land that is, or is at any time, covered by waters; and (c) waters.

Prescribed Person:

9. You (BP Bulwer Island Pty Ltd) are a currently registered Australian propriety and limited company (ACN 008 422 115) as defined under section 45A9(1) of the Commonwealth Corporations Act 2001.
10. The premises was under your operational control when it was operated by you as a fuel terminal between approximately 1967 and January 2017. You operated the premises under previous company names Amoco Australia Limited, BP Oil Distribution Limited and BP Refinery (Bulwer Island).
11. Your current lease of the premises commenced in 2010 from the State of Queensland, Department of Natural Resources who administer the *Land Act 1994*.
12. The premises has a history of Light Non-Aqueous Phase Liquid (LNAPL) contamination since 2009.
13. Prior to 2018, the primary source of contamination was associated with historical leaks and spills during bulk hydrocarbon transport and storage at the premises. This contamination included crude oil or heavy fuel oil, a degraded diesel fuel and possible mixture of degraded kerosene, as advised from analytical results in 2010.
14. In January 2017 environmental authority EPPR00928613 (the EA) was transferred from BP to Australian Terminal Operations Management Pty Ltd (ATOM). ATOM is the current operator and

currently undertakes hydrocarbon storage and handling activity on behalf of BP (under the EA). As such, BP is considered the owner of the contaminant.

15. It is understood that several third parties also hold different tenure interests in the premises (including over Lot 846 in some instances). These are:
 - a. Origin, Puma and Lowes Transport sublease different parts of Lot 846 for use for various bulk storage, terminal, logistics and other purposes; and
 - b. Origin, Puma, Ampol and Elgas variously have hydrocarbon and high-pressure pipelines traversing the premises with associated easement rights.
16. On 20 September 2019, in becoming aware of a change of condition of contaminated land ATOM submitted a notification of environmental harm under sections 320 – 320G of the Act (the notification), that an increase in the volume and appearance of groundwater contamination was observed during gauging of groundwater monitoring wells at the premises.
17. Groundwater monitoring in July 2019 and September 2019 identified some changing characteristics of the LNAPL plume. LNAPL was observed in 14 monitoring wells on one or more gauging events: BPT36, BPT37, BPT38, BPT52 (26/09/19), BPT54 (20/09/19), BPT59 (12/09/19), BPT81, BPT82, BPT84, BPT85, BPT87, BPT89, BPT90, and BPT91. These 2019 results represented an increase in the LNAPL plume area and plume thickness (to a maximum of 2.127 metres in BPT91), compared to 2018 data; LNAPL extent within various bores and thicknesses in 2019..
18. There was concurrently an increase in volatile organic compound (VOC) vapours detected at well heads which indicated an increase in volatile hydrocarbon fractions within the plume. These changing LNAPL characteristics indicated a different product source than previously observed was supplementing the existing historic hydrocarbon plume.
19. Subsequent investigations confirmed there has been no known event or incident, or any identified product loss which could explain this change to contamination as extensive integrity testing of all infrastructure in proximity to the contamination area, including complete exposure and examination of all piping running through the contamination area, and pressure testing of this piping has not identified any leak or indication of product release.
20. Since the EA transfer to ATOM, it is understood that BP has been engaged in site transitional activities including extensive earthworks and the cutting and removal of underground oily hydrocarbon / oily water piping.
21. As the investigations outcomes to date did not identify a cause associated with ATOM's operation, or other site infrastructure BP is therefore a prescribed person for the incident(s).
22. You are a prescribed person for the contamination incident/s pursuant to section 363G of the Act because:
 - a) at the time of the incident/s you were the person in control of the contaminants (petroleum hydrocarbons and PFAS products) which were stored at the premises as you held the EA until January 2017, to carry out environmentally relevant activities at the premises;
 - b) as a result of investigations to determine the source of the contamination, there has been no evidence that ATOM were responsible for contamination incident/s;
 - c) therefore, you caused or permitted the incident to happen, by failing to contain the petroleum products in storage and/or transfer activities when you carried out activities at the premises as the

occupier and/or owner of the premises from at least 1 December 1994 to 18 January 2017 when the EA was transferred;

- d) any storage of petroleum products and foams containing PFAS at the premises was conducted by you or on your behalf; and
- e) at the time of the incident/s you were the 'owner' of the place at which the incident happened. Pursuant to definitions in Schedule 4 of the Act, the owner of land held under a lease, licence or permit —is the person who holds the lease, licence or permit.

Contamination Incident/s

- 23. The department reasonably believes that a contamination incident/s has occurred resulting in contamination of the groundwater underlying the site with LNAPL, dissolved phase hydrocarbons and PFAS at the premises.
- 24. LNAPL and dissolved phase hydrocarbons are hazardous contaminants under the Act due their toxicity in aquatic environments.
- 25. PFAS compounds in groundwater at the premises and PFAS characteristics of environmental persistence and propensity to bio-magnify and bio-accumulate in plants animals and people are also hazardous contaminants.
- 26. On 30 September 2019 you obtained samples of LNAPL from nine wells for characterisation analysis by CSIRO. CSIRO reported that all samples included hydrocarbons in the gasoline and weathered diesel range. The gasoline range hydrocarbon fractions (C4-C11) varied in relative abundance between samples, with the highest proportions detected in samples BPT36, BPT91 and BPT90. In all the samples, the dominant compound detected within this C4-C11 fraction range was iso-octane, with the distribution consistent with being sourced from Avgas and possibly weathered gasoline.
- 27. The LNAPL characterisation noted that the proportion of isooctane to methylcyclohexane within samples varied between wells, and suggested the LNAPL may have resulted from different sources or multiple release events.
- 28. Observations in the September 2019 Groundwater Monitoring Event (GME) indicated the Phase separated hydrocarbons (PSH) had become less viscous. A report titled 'Groundwater Monitoring Well Installation Program – December 2019, product terminal and Wharf Facility 305 Tingira Street, Pinkenba QLD 4008' dated 20 June 2020 version 02 (Insite, 2020), reported on page 2 that based on a tier 1 assessment no unacceptable impacts were likely based on the subsurface conditions providing a level of plume containment, and contingent on continued PSH removal activities at the premises.
- 29. The department is satisfied that a release of product (similar to Avgas) has occurred on the premises causing a change in the condition of the contaminated land.
- 30. Previous groundwater investigations have identified the presence of contamination at the premises and leaks in various tanks and infrastructure previously installed at the premises, which include 'Groundwater Monitoring Event February 2009, BP Bulwer Island Refinery, BP Terminal and Leased Properties, Pinkenba QLD, 29 April 2009, OTEK (OTEK, April 2009); and 'Report for BP Product Terminal Pinkenba Extent Assessment Tingira Street, Pinkenba', May 2010, GHD (GHD, May 2010).
- 31. OTEK, 2009 reported that PSH with apparent thicknesses of 35 mm and 48 mm were detected in Monitoring Wells BPT-26 and AGC-5, respectively. These wells are located approximately 60 m apart along the foreshore of the Brisbane River in the southern area of the BP Terminal.

32. GHD, May 2010 reported that historical total petroleum hydrocarbons (TPH) impact has been detected in groundwater monitoring wells present at the premises, predominantly in the area of storage tanks PT4 and PT6. PSH were detected at six well locations in the vicinity of the premises oil/water separator and the portion of land between AST PT12 and the Brisbane River. The thickness of the PSH detected in monitoring wells varied between 0.005 m to 0.279 m when measured during a groundwater gauging event conducted during December 2009.
33. GHD, 2010 reported that the Leeder Consulting fingerprint analysis report indicated that the PSH detected in groundwater monitoring wells BPT36 and BPT38 was likely to be a mixture of highly degraded diesel and degraded kerosene and estimated that the PSH has been in the subsurface environment at the premises for between twenty five and thirty five years (30 +/- 5 years).
34. A number of tank storage failures and remedial works to tanks were outlined in GHD, May 2010 (on page 4) (reportedly provided by BP):
- (i) that above ground storage tank (AST) PT8 was inspected in 2009 and two holes (3 mm and 5 mm) were present, which were subsequently covered with fibreglass lining as a temporary measure until a new tank floor was installed in late 2009; and
 - (ii) New tank floors were installed in tank PT5 in 1996; and
 - (iii) A lining failure on the base of the slop oil tank (PT11) was detected in 2006 and it was noted that the tank was subsequently refurbished and painted.
35. The department is satisfied that the contamination incident(s) have caused or is likely to cause, serious or material environmental harm, in the form of LNAPL and dissolved TPH contamination of the underlying groundwater on the premises.
36. The department is further satisfied that the environmental harm is ongoing as it reasonably believes that the groundwater that is contaminated at the premises may be acting as a contamination source potentially affecting surface waters, and therefore satisfies section 363F (b) that the incident has caused or is likely to cause other land to become contaminated land (noting above land includes waters).
37. As part of the activity of operating a fuel product terminal, keeping, and maintaining fire-fighting equipment and products on site was required. Whilst the premises history reporting has been incomplete, based on departmental records it is likely fire-fighting foams containing per- and polyfluoroalkyl substances (PFAS) were kept and used at the premises. PFAS were also widely used in petroleum products, and PFAS contaminated groundwater is also present at the premises.
38. On 25 June 2021, the department advised you in correspondence that it had identified data gaps associated with PFAS sources at the premises and the site's history and onsite foam storage, including:
- (i) information reported by you advised sum of PFAS of 3.35 µg/L within pre-treated groundwater extracted from the premises, contained in CLA statement 002 (dated 3 August 2020); and
 - (ii) departmental file data reveals foam storage at the premises as follows:
 - a. BP operations plan dated 25/09/2006 (see section 13) outlines fire foam systems installed at the tanks and wharf at the Product Terminal (described in the plan to be located 1 km up river from the refinery site) including the following descriptions of those systems:
 - For the tanks 'from the Fire Pump room, individual foam lines connect to the tanks. Two foam compound tanks 1350 litres and 2270 litres) supply foam to two educators located on the discharge of the diesel driven fire water pump'.
 - For the product terminal wharf 'the wharf is protected by 3 hydrant points, and a turret monitor with foam capability. The foam is educed from two semi bulkers' and "additional

fire water is available via a 500 mm line which allows fire appliances to take suction from 3 points at the roadside, to supply river water for fire fighting purposes'; and

- b. BP Correspondence dated 9 September 2013 including quantities and types of fire fighting foams held at BP sites in Brisbane that hold an EA, and attachments including the BP refinery (Bulwer island) Pty Ltd CMER strategic ERP 3 Tank fires dated 22/07/2013 and the following listed foam stocks at 26-08-2013 for the product terminal:
- 2 x 1000 l IBC of Thunderstorm
 - 2 x 3500 litres of AFFF
 - 10 x 20 l AFFF
39. You have discounted the premises as a potential PFAS source on the basis that AFFF was not known to be used at the premises and that the PFAS is likely ambient, however the department's PFAS ambient monitoring program includes background sum of PFAS results within the Brisbane River (including a site at Lytton (6.4 km from mouth of the river) in the vicinity of 305 Tingira Street, Pinkenba. The sum of PFAS in the Brisbane River Lytton site was orders of magnitude less than PFAS level of extracted groundwater at the premises of 3.35 µg/L. A full copy of the report is available at <https://www.qld.gov.au/environment/pollution/management/disasters/investigation-pfas/monitoring-program-report>.
40. On 17 August 2021 the department issued a Section 451 notice under the Act to obtain relevant information and reports including in relation to any PFAS investigations at the premises. The information provided to date confirms there has been limited PFAS site investigation at the Product Terminal.
41. On 30 December 2021 you provided 'Factual Report on 2020/2021 Groundwater Monitoring Events at Bulwer Island Facility and Product Terminal and Wharf, Pinkenba, Queensland' dated 20 December 2021 by AECOM (AECOM factual report) containing results of PFAS sampled at select wells across the premises. The groundwater results are summarised against relevant screening criteria in Table 1 below (exceedances highlighted in yellow). Sum of PFAS results range from 0.023 µg/L to 17.6 µg/L April .May 2021 and 0.336 µ-11.1 µg/L in October 2021.

Table 1 – Maximum detected groundwater results

Environmental Value	PFAS	Guideline/ Reference Value µg/L	Product Terminal groundwater µg/L								
			BPT55 20/10/21	BPT56 20/10/21	BPT79 20/10/21	BT112 20/10/21	BTP113 20/10/21	BPT91 28/4/21	BPT111 20/10/21	up gradient BPT118 28/4/21	up gradient BPT01 20/10/21
Recreational contact with waters (e.g. children playing in creek) ^{Note 1}	PFOS + PFHxS	2	0.712	1.52	1.08	5.08	4.82	14.0	1.05	0.381	0.11
	PFOA	10	0.124	<0.0005	<0.0005	0.835	0.27	0.351	0.312	0.0546	0.0146
Aquatic ecosystem protection ^{Note 2}	PFOS	0.00023	0.613	0.53	0.328	1.74	2.03	8.99	0.67	0.0824	0.0435
	PFOA	19	0.124	<0.0005	<0.0005	0.835	0.27	0.351	0.312	0.0546	0.0146
Ecological Heath Protect against secondary poisoning in avian fauna ^{Note 3}	PFOS	< 0.001	0.613	0.53	0.328	1.74	2.03	8.99	0.67	0.0824	0.11
Ecological Heath Protect against secondary poisoning in mammals ^{Note 3}	PFOS	< 0.001	0.613	0.53	0.328	1.74	2.03	8.99	0.67	0.0824	0.11

- Note 1: National Health and Medical Research Council, Guidance on Per and Polyfluoroalkyl substances (PFAS) in Recreational Water, Commonwealth of Australia 2019.
- Note 2: HEPA (2020) Table 5 water quality objectives for PFOS and PFOA. 99% species protection level to account for bioaccumulation.
- Note 3: HEPA (2020) Table 5 water quality objectives for PFOS and PFOA. 99% species protection level to account for bioaccumulation. HEPA (2020) also states “A point-in-time water concentration of PFAS below an LOR of 0.001 µg/L should not be assumed to mean that there is minimal risk to aquatic ecosystems and does not mean that there is no need to sample aquatic biota. The recommended approach is to sample and analyse aquatic biota to account for bioaccumulation and comparison with relevant criteria”. HEPA (2020) further indicates...“for PFAS, bioaccumulation in aquatic species cannot currently be predicted based on water concentrations. This is evident from site assessment data, where bioaccumulation in fish tissues has been measured, despite water concentrations being at the laboratory detection limits. Therefore, to consider risks as a result of bioaccumulation, direct measurement of aquatic biota is the preferred approach where exposure pathways and sensitive receptors (ecological and/or human) exist”. Acknowledging there are limitations of the study, a survey of tissue concentrations in Queensland estuaries has measured concentrations of PFAS in aquatic prey organisms of mammalian and avian predators (e.g. worms, prawns, fish) and reported PFOS concentrations in a variety of biota in excess of HEPA (2020) PFOS + PFHxS guideline values for wildlife diet, at the following water concentrations in a southeast Queensland estuary, Range PFOS µg/L (0.0007-0.0033) Median PFOS 0.0017 µg/L. See Baddiley BL, Munns T, Braun C and Vardy S 2020. Queensland Ambient PFAS Monitoring Program 2019-2020. Brisbane: Department of Environment and Science, Queensland Government, specifically page 35, also Tables 15 and 17. https://www.qld.gov.au/data/assets/pdf_file/0026/157436/qld-pfas-monitoring-program-2019-2020.pdf.

42. PFAS reported in bores BTP118 and BTP01 (inferred to be upgradient based on groundwater gradient contours), are two orders of magnitude less than the most down gradient bore (BTP56), indicating contribution from sources on the premises, which doesn't support that PFAS is either solely offsite, nor the assertion that PFAS is ambient in groundwater, as per point 39.

43. To adequately characterise PFAS from modern Aqueous film forming foams (AFFF) sources Total Oxidizable Precursor (TOP) Assay is necessary, consistent with requirements of ASC NEPM and PFAS National Environmental Management Plan Version 2.0 – January 2020 National Chemicals Working Group of the Heads of EPAs Australia and New Zealand (HEPA, 2020). No TOP Assay results were reported.
44. The AECOM factual report includes results from the Brisbane River from samples obtained on 28 April 2021 from the seawall adjacent to the premises, ranging from Sum of PFAS 0.0116 – 0.0289, PFOS and PFHxS of 0.0057 – 0.0229 ug/L, and PFOS 0.0034 – 0.0203. These exceed the PFAS levels reported by the department under the PFAS ambient monitoring program, and are considered (when compared to up-gradient premises levels) to show an impact from the premises which requires investigation.
45. Monitoring presence of PFAS in groundwater and stormwater discharging from the site, to demonstrate that prescribed water contaminants (PFAS is a prescribed water contaminant under Schedule 10 of the Environmental Protection Regulation 2019), are being managed such that all PFAS stays in place and is not likely to discharge from the premises (see section 440 ZG of the EP Act).
46. PFAS contamination can be environmentally significant due to its persistence, mobility and, for some PFAS, toxicity and potential for bioaccumulation in plants and animals (HEPA 2020).
47. The department is satisfied that a release of PFAS has occurred on the premises causing the premises to become contaminated land (as established in Table 1). The department is further satisfied that the environmental harm is ongoing as it reasonably believes that the groundwater that is contaminated on the premises may act as a secondary contamination source to surface waters (also defined as land) of the Brisbane River directly adjoining the premises. It is noted that groundwater in proximity of the pump house exhibits a significant tidal influence up to 0.85 metre.
48. The department is satisfied that there has been a change in the condition of contaminated land, namely the land has become contaminated land due to PFAS contamination present in groundwater, which may potentially leach into surface waters.
49. Further, the department is satisfied that there has been a change in the condition of contaminated land, namely the land has become contaminated with a volatile crude oil product which has leached into groundwater and potentially surface waters.
50. Based on available information, the contamination appears to be the result of multiple incidents associated with historical release(s) in the 90's, apparent storage tank(s) failures and interceptor leaks identified in 2009), and an unidentified release of a more volatile product contributing to the LNAPL, observed since 2019.

Environmental harm

51. The department considers crude products and Avgas to be a contaminant pursuant to the Act (for example, refer the Act s.11 and *Environmental Protection Regulation 2008* schedule 9 item 1 and item 13).
52. A historic LNAPL plume has been persistently observed in groundwater at the premises since 2010 in the vicinity of the former separator, with LNAPL variously observed in wells BPT26, BPT35, BPT36, BPT37, BPT38, BPT39, BPT53, BPT59, and BPT91 (see attachment 2).
53. The extent of the contamination is not trivial or negligible in nature, extent or context.

54. Total petroleum hydrocarbon mixtures are also toxic to aquatic life (refer ANZECC 2000 water quality guidelines, section 8.3.7). This causes environmental harm to aquatic ecosystem value and ecological health.
55. Ecological health is an environmental value under the EP Act that may be adversely affected by release of PFAS into the environment, including for example, bioaccumulation through food chains to aquatic and terrestrial organisms.
56. Aquatic ecosystems is a scheduled environmental value that may be adversely affected by release of PFAS into the environment, including for example, acute and chronic impacts to aquatic organisms.
57. Human consumer is a scheduled environmental value that may be adversely affected by release of PFAS into the environment, including for example contamination of food.
58. Water concentrations of PFAS that would be protective of human consumption of seafood are very low, in the part per billion range. For example, trigger points developed by Food Standards Australia New Zealand (FSANZ) for PFOS + PFHxS concentration in fin fish (i.e. 5.2 micrograms/kg) are low and fish have been found to bio-accumulate PFOS from the water column/environment
59. Under the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (Water Wetland EPP) section 6 and *Environmental Protection Act 1994* section 9, environmental values are protected. The prescribed environmental values (EV)s of groundwater and surface water including the Brisbane River are found in: https://environment.des.qld.gov.au/data/assets/pdf_file/0027/87624/brisbane-est-ev-2010.pdf. The following environmental values are scheduled in the area in which the premises are located:
 - i. Protection of an aquatic ecosystem (for groundwater surface water interactions)
 - ii. Irrigation (for gardens and food crops) (groundwater)
 - iii. Farm supply/use (for non-potable domestic use) (groundwater)
 - iv. Stock water (for groundwater abstracted from bores) (groundwater)
 - v. Human consumer (for groundwater interacting with surface waterways)
 - vi. Primary recreation (for groundwater expressing to surface waterways, used to fill pools or for sprinkler play)
 - vii. Secondary recreation (for groundwater discharged to waterways)
 - viii. Drinking water (groundwater)
 - ix. Cultural and spiritual values (for groundwater discharged to waterways).
60. The Water Wetland EPP prescribes that where groundwater interacts with surface waters, groundwater quality should not compromise identified EVs and Water Quality Objectives (WQOs) for those waters. Groundwater impacts have been identified in groundwater adjacent to the Brisbane River, within bores on the premises confirmed to be tidally influenced. DES acknowledges that beneficial uses of groundwater are not applicable to the current use of the premises.
61. The environmental harm is considered serious environmental harm in that:
 - a. it is not trivial or negligible in nature, extent or context; or
 - b. it will result in costs of more than the threshold amount (\$50 000) being incurred in taking appropriate action to (i) prevent or minimise the harm; and (ii) rehabilitate or restore the environment to its condition before the harm.
62. The cost required for remediation of petroleum hydrocarbons in the groundwater underlying the premises constitutes a contamination incident that has caused material and potentially serious environmental harm for the purposes of section 363F of the Act.

63. On 29 July 2020 you submitted a Remediation Action Plan (RAP) to the department outlining a proposed remediation system (groundwater extraction and treatment by Multiphase Extraction and Granulated Activated Carbon (GAC treatment), and irrigation of the treated groundwater at the premises.
64. On 23 November 2021 you provided an updated RAP titled Remediation Action Plan titled "Product Terminal & Wharf, 305 Tingira Street PINKENBA QLD 4008, November 2021", to include additional sampling and monitoring for the irrigation area and effluent monitoring.
65. You have commenced remedial activities in accordance with the RAP, however the ongoing management of these activities, including monitoring of co-contaminants (PFAS) and associated risks are not adequately addressed in the RAP, neither are data gaps associated with potential presence of acid sulphate soils and dewatering groundwater, nature and extent of contamination at the premises, high rate irrigation risks and the associated risks of further environmental harm as a result of the contamination incident/s. The RAP may need to be revised to address any issues identified following further investigations to fill data gaps.
66. The department is satisfied you are the prescribed responsible person for the contamination incident and that it is reasonable to require you to take action to develop and implement a remediation plan that further assesses the nature and extent of environmental harm, and to rehabilitate or restore the environment because of the contamination incident/s, and to keep the department informed about the actions taken under this notice.

B. Requirements

You are required to do the following:

1. By **5 August 2022** you must engage a **suitably qualified person(s) (SQP)** and **Contaminated Land Auditor (CLA)** to undertake the requirements of this clean-up notice and undertake reporting in accordance with *Table A Reporting Requirements*.

Table A Reporting Requirements

Reporting requirements	Timing of report submitted to the department – including review comments by CLA
Sampling and Analysis Quality Plan (SAQP) investigations (Requirement 5)	30 November 2022 <u>30 June 2023</u> <u>31 July 2023</u>
Validation monitoring program (LNAPL and dissolved phase hydrocarbons) (Requirement 6)	21 October 2022
Annual Monitoring reports – LNAPL dissolved phase hydrocarbons remediation activities (Requirement 7)	21 October 2022 and annually thereafter
Validation report - LNAPL and dissolved phase hydrocarbons (Requirement 8)	15 April 2025 <u>2 February 2026</u>

2. From the date of this notice, you must continue to implement the RAP. Where there is any conflict between the RAP and the requirements of this notice, the requirements of this notice takes precedence.
3. Monitoring the components of the remedial activities described at the frequency and for the parameters must be carried out in accordance with *Table B: Monitoring Requirements* and the associated notes.

Table B: Monitoring Requirements

Frequency	Description / Components	Analytes / Parameters
Continuous	MPE Vapour Monitoring System (VMS)	Lower Explosive Limit (LEL), Air Flow and Temperature (automatic)
	Continuous monitoring groundwater network	Data logging of groundwater levels
Weekly	Treated Water	Field test (pH, EC, TDS), Sampling (BTEXN/TRH/total lead/PFAS) ¹ Discharge volume (meter reading)
	Remediation extraction wells and selected surrounding observations wells ²	Gauging ³
Quarterly	Groundwater in water reuse area	Gauging ³ , Sampling ⁸
Bi-annual	LNAPL wells	Transmissivity ⁷

	Groundwater well network ^{3A}	Gauging ³ ; Water Quality Parameters ⁴ ; Sampling ⁵ ; MNA ⁶
	Soil in Water reuse area	Sampling ⁹
Annual	LNAPL compositional changes	LNAPL samples

Notes:

1. Weekly in accordance with Table 5.2 of the RAP.
2. Weekly monitoring must include gauging sentinel wells adjacent to the eastern site boundary (BPT40 – BPT43, BPT58, BPT64 – BPT66, BPT70, and BPT94).
3. Gauging: Radius of Influence, depth to water, depth to PSH, visual check with bailer with notes on hydrocarbon odours and sheens, and well head vapours (ppm);
- 3A. The biannual GME program must be documented in a separate SAQP and in accordance with Requirement 6 of this notice.
4. Water Quality Parameters: dissolved oxygen (DO), redox potential (Eh), pH, temperature, electrical conductivity (EC) and total dissolved solids (TDS);
5. Sampling: BTEXN / TRH (silica gel), and total lead.
6. MNA parameters: hydrocarbon utilising bacteria (HUBs), Ferrous Iron, Sulphate, Nitrate, Manganese, and Methane, in selected transects.
7. LNAPL transmissivity testing to be conducted on a selection of wells where LNAPL >0.15m apparent thickness.
8. Wells under the water reuse area (BPT01, BPT55, BPT56, BPT57, BPT79, BPT111, BPT112, BPT113, BPT115, and a well to the east (see data gap requirement 4 i.b.)) to be sampled for BTEXN, TRH, dissolved lead, PFAS, EC, pH, cations and chloride concentrations.
9. Soil (topsoil and subsoil) at sufficient locations in the water reuse area (at least 4) is to be sampled for BTEXN, TRH, lead, PFAS, pH, EC, cation exchange capacity and exchangeable sodium percentage.

Sampling Analysis Quality Plan (SAQP) – data gap investigations

4. By ~~30 September 2022~~ **30 November 2022**, you must develop and implement a SAQP to investigate potential migration pathways of all contaminants of potential concern at the premises (whole of lots 846 SP135226, 1226 SP120289, 1253 SP213119 and 1254 SP213119), including:
 - i. Review of site history and existing hydrogeological information to identify any data gaps, including
 - a. Installation of groundwater data loggers to evaluate the extent of cone of depression in groundwater during extraction, and groundwater levels in the irrigation area; and
 - b. Installation of a groundwater bore to the east of irrigation area, to evaluate any changes to groundwater flow directions; and
 - c. Intrusive investigations to determine whether sand lenses are present within the seawall that may act as intermittent pathways for LNAPL / PFAS to migrate; and
 - ii. Investigate whether Potential Acid Sulphate Soils (PASS) are present to at least 1 metre below any cone of depression associated with groundwater extraction for remediation; and
 - iii. Characterise PFAS present in groundwater and soils (including TOP assay) to determine the source of PFAS and potential migration pathways from the premises, including:
 - a. a description of bore depths, screening levels and substrate to demonstrate the suitability of the groundwater wells selected to characterise PFAS; and

- b. wells to monitor groundwater quality in the vicinity of the pump house, where tidal influence on groundwater at the premises is a potential contaminant migration pathway; and
 - c. a comparison of groundwater monitoring results against the PFAS NEMP; and
 - d. a conceptual site model to present an understanding of the site environmental system and the potential risks to human health and the environment associated with identified contaminants of potential concern (CoPC).
- iv. You must complete all field work and investigations required by the SAQP by **30 March 2023**.
5. By ~~30 November 2022~~ ~~30 June 2023~~ **31 July 2023**, you must provide a report to the department on the SAQP data gap investigations.

Validation monitoring program - LNAPL and dissolved phase hydrocarbons

6. By **21 October 2022**, you must develop and implement a validation monitoring program for the area(s) shaded in yellow marked 'ATOM Terminal Operations under the EA' in Attachment A, to assess the efficacy of multi-phase extraction (MPE) effected under the RAP, to ensure sufficient data is available to meet requirement 7 of this notice. The validation monitoring program must include:
- i. An assessment of remediation efficacy against the following remedial objectives:
 - a. Ongoing protection of the environmental values as described in the Water Wetland EPP of the receiving environment beyond the boundary of the premises, including
 - (i) the lowest practicable TPH limit of reporting (LOR); or
 - (ii) direct toxicity assessment approach consistent with the Australian Water Quality Guideline 2018 according to a procedure / test protocol, including derivation process of the guidance values, as agreed to in writing by the Department; and
 - b. Risk to human health, is at acceptable levels as described in NEPM Schedule B4: Guidelines on Site Specific Health Risk Assessment Methodology.
 - ii. Six monthly monitoring to validate achievement of remedial objectives that includes but is not limited to:
 - a. Monitored natural attenuation (MNA) assessments utilising data obtained from the groundwater monitoring; and
 - b. assessment of residual LNAPL and dissolved phase hydrocarbon (DPH) plume stability, reductions in apparent LNAPL thicknesses, DPH concentration trends and comparison against health and ecological criteria, including criteria in requirement 6i.a.(i) or 6i.a.(ii) above; and
 - c. sufficient well locations and monitoring to delineate the extent of the contamination and assess risks to human health and the environment, including PFAS including sentinel bores adjacent to the Brisbane River (targeting potential migration pathways including sand lenses and / or tidally influenced groundwater (and any other identified potential migration pathways)); and
 - d. a method of detecting any changes in the spatial distribution of the contamination plume;
 - e. a comparison of groundwater monitoring results against the Groundwater Investigation Levels (GILs) for fresh waters and Health Screening Levels (HSLs) for the relevant land use setting, listed in Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 NEPM guidelines and PFAS NEMP and
 - f. requirements 6ii.a. to e. are to be included in the methodology for reporting on the groundwater remediation monitoring program as part of the annual report in requirement 7.

Annual Monitoring reports – LNAPL / dissolved hydrocarbon remediation activities

7. By **21 October 2022**, you must provide an annual monitoring report in respect of the management of remedial activities for the area(s) shaded in yellow marked 'ATOM Terminal Operations under the EA' in Attachment A, from 1 August 2021– 31 July 2022, and annually thereafter. The annual monitoring report must include the following at a minimum:
- i. groundwater monitoring results and an evaluation of the changes in contaminant concentrations (TPH, BTEXN) in the area identified as being impacted by the release of contaminants; and
 - ii. an evaluation of whether monitored natural attenuation is an appropriate remediation methodology and where residual contamination poses, or may pose a risk to the current or proposed future use of the site, and or the environmental values of Brisbane River provide an assessment for further alternative active remediation measures, and/or whether contingency actions are required; and
 - iii. recommendations for any changes or inclusions to improve the validation monitoring program and or the remediation approach; and
 - iv. keeping records of irrigation dates and location of irrigation activities at the premises; and
 - v. results of monitoring conducted in accordance with *Table B: Monitoring Requirements*.

Validation Report - LNAPL / dissolved hydrocarbon remediation

8. By ~~15 April 2025~~ **2 February 2026**, you must provide a Validation Report for the area(s) shaded in yellow marked 'ATOM Terminal Operations under the EA' in Attachment A, that includes but is not limited to:
- i. a description of all surface and subsurface infrastructure located at 'ATOM Terminal Operations under the EA' in attachment A, including details of the location, size and type of the infrastructure; and
 - ii. a description of the surrounding area of the 'ATOM Terminal Operations under the EA' in Attachment A including a description of each of the following in the surrounding area—
 - a. all environmentally sensitive areas; and
 - b. the location of all water, watercourses and wetlands; and
 - c. the location of all stormwater drainage; and
 - d. all uses of the premises, including uses that may affect the safety of the premises or cause environmental harm; and
 - e. all activities carried out that may affect the safety of the premises or cause environmental harm; and
 - iii. the contamination levels recorded on the land associated with 'ATOM Terminal Operations under the EA' in attachment A, before and after the remediation work was carried out; and
 - iv. verification that the MPE system implemented under the 'RAP' has met remediation objectives stated in requirement 6i.; and
 - v. an evaluation of whether monitored natural attenuation is an appropriate remediation methodology; and
 - vi. where residual contamination poses, or may pose a risk to the current or proposed future use of the site, and or the environmental values of Brisbane River, provide an assessment of further alternative active remediation measures; and
 - vii. recommendations for future management options and obtain and report on views provided by the owner of the premises in respect of the residual contamination and future management options; and
 - viii. the extent to which the assessment of the area(s) shaded in yellow marked 'ATOM Terminal Operations under the EA' in Attachment A is in accordance with the contaminated land NEPM.

Notifications

9. You must notify the department within 24 hours of becoming aware of any monitoring result that indicates an increased risk of actual or potential environmental harm being caused.
10. Within 24 hours of becoming aware of any acute health and/ or safety risks, you must notify the department and any persons likely to be adversely affected by the release of contaminants, about relevant risks and measures to avoid those risks until any relevant remediation is conducted.

Quality Assurance requirements

11. All reports provided to the department related to the requirements must include:
 - i. all results, measurements and data undertaken or collected as part of the investigations and/or used to inform the reports. (Note: If deemed suitable by the SAQP, all on-site data, including previous investigation data, collected by you and your consultants may be used to support the investigations, determinations and reports); and
 - ii. detail of the relevant legislative, regulatory and technical criteria on which the determinations have been based; and
 - iii. the required determinations, describing exactly what has been assessed and the precise nature of each determination; and
 - iv. the relevant data and facts on which the determinations have been based, the source of that material, and the efforts made to obtain all relevant data and facts; and
 - v. the reasoning on which the determinations have been based using the relevant data and facts, and the relevant criteria; and
 - vi. a quality assurance assessment to ensure information used is fit for purpose.
12. All determinations of the quality of contaminants released must be performed by a person possessing appropriate experience and qualifications to perform the required measurements.
13. Records must be kept of the results of all determinations and monitoring carried out under this clean-up notice for a period of at least five (5) years.
14. Wherever practical, all samples must be analysed by a NATA accredited laboratory for the analytical suite performed.
15. The analytical data on all media (soil and water) must include results for sampling to determine total organic fluorine, total oxidisable precursor (TOP) assay, and the suite of 20 to 28 standard fluorinated organic compounds by liquid chromatography-mass spectrometry (LC/MS/MS) available from commercial laboratories).
16. You must ensure the investigations and remedial activities are conducted in accordance with
 - i. The Act; and
 - ii. Environmental Protection (Water and Wetland Biodiversity) Policy 2019; and
 - iii. Queensland Water Quality Guidelines (2009) — see <https://qldgov.softlinkhosting.com.au:443/liberty/OpacLogin?mode=BASIC&openDetail=true&corporation=DERM&action=search&queryTerm=uuid%3D%22f17470cdac1304070024d1dd8c54f3fd%22&operator=OR&url=%2Fopac%2Fsearch.do>; and
 - iv. Monitoring and Sampling Manual Environmental Protection (Water) Policy 2009, Version 2, June 2018, see — https://environment.des.qld.gov.au/_data/assets/pdf_file/0031/89914/monitoring-sampling-manual-2018.pdf; and

- v. National Environmental Protection (Assessment of Site Contamination) Measure 1999, amended 2013 — see [National Environment Protection \(Assessment of Site Contamination\) Measure 1999 \(legislation.gov.au\)](http://legislation.gov.au) ; and
- vi. PFAS National Environmental Management Plan, *Version 2.0*, Heads of EPA Australia and New Zealand 2020' (HEPA 2020) <https://www.environment.gov.au/system/files/resources/2fadf1bc-b0b6-44cb-a192-78c522d5ec3f/files/pfas-nemp-2.pdf> ; and
- vii. National Acid Sulfate Soils Guidance (2018) (ASS guidelines) and include the latest versions of the Queensland Sampling Guidelines (Ahern, Ahern, & Powell, Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland, 1998), Laboratory Methods Guidelines (Ahern, McElnea, & Sullivan, 2004) and Legislation and Policy Guide (Dear, Moore, Dobos, Watling, & Ahern, 2002). <https://www.publications.qld.gov.au/dataset/cf17fb49-0ea5-4dee-82c9-32e09bf1eab5/resource/6d880993-4b80-45e3-9110-5c24fa7a7e75/download/queensland-ass-management-guideline-2014.pdf>

17. Where any potential conflict exists the Act and subordinate legislation takes precedence. If there is conflict and uncertainty with respect to the hierarchy of the remaining documents, you should document that conflict, list the uncertainty, and consult with the department with respect to the issue.

18. Submissions to the department must be made in writing to:

ESComplianceBrisbaneMoreton@des.qld.gov.au; OR

Environmental Services and Regulation – Brisbane/Moreton Compliance
Department of Environment and Science
PO BOX 808 Caboolture Queensland 4510.

Definitions

'Contaminated Land Auditor' (CLA) as required by and in accordance with Chapter 12 Part 3 of the EP Act. For further information about the requirements of a CLA, refer to the Qld Government website at <https://www.qld.gov.au/> (using 'contaminated land auditor' as the search term).

'contaminated land NEPM' means the Environment Protection (Assessment of Site Contamination) Measure 1999, made by the National Environment Protection Council under the *National Environment Protection Council Act 1994 (Commonwealth) amended 2013*.

'Increased risk' for the purpose of this notice material change in extent or nature of contamination that you become aware of that causes or threatens environmental harm greater than, more extensive than, or of a difference from that previously identified.

'LNAPL' and **'phase separated hydrocarbons'** have the same meaning for the purpose of this notice.

'Measures' have the broadest interpretation and includes plant, equipment, physical objects, monitoring, procedures, actions, directions and competency.

'Monitored Natural Attenuation' means natural attenuation is demonstrated by a reduction in hydrocarbon mass and concentration over time, the presence of biodegradation by-products and the presence of hydrocarbon utilising bacteria.

'NATA' means National Association of Testing Authorities.

'PFAS' means per and polyfluoroalkyl substances and includes perfluoroalkyl acid precursor compounds and their intermediates.

'PFAS NEMP or HEPA (2020)' means the 'PFAS National Environmental Management Plan Version 2.0', Heads of EPA Australia and New Zealand 2020', or a later version of this document endorsed by the Queensland government.

'RAP' means the updated RAP titled 'Remediation Action Plan titled "Product Terminal & Wharf, 305 Tingira Street PINKENBA QLD 4008, November 2021', revision 5.

'Records' include breach notifications, written procedures, analysis results, monitoring reports and monitoring programs required under a condition of this EPO and the EP Act.

'Review comments by CLA' means reviewed and comments provided by an approved Contaminated Land Auditor (CLA) that the monitoring and reporting is in accordance with site specific risks, relevant quality assurance and in alignment with appropriate legislation and guidance.

'Suitably qualified person' (SQP) means

- For assessment of land that is contaminated or is suspected of being contaminated, the person must be a SQP pursuant to Section 549 of the EP Act; and
- a person or persons who has demonstrated professional qualifications, training, skills or experience relevant to PFAS and can give authoritative assessment, advice and analysis to performance relative to the subject matter using the relevant protocols, standards, methods or literature.

'Waters' includes river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water natural or artificial water course, bed and bank of any waters, dams, non-tidal, or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater runoff, and groundwater and any part thereof

Note:

- The requirements of the clean-up notice take effect immediately upon service of the notice.
- This notice remains in force until further notice from the administering authority.

C. Appeal rights

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act. Internal review of the decision to issue a clean-up notice is not available. If you are dissatisfied with the decision to issue this clean-up notice, you may apply to the relevant court for a stay of the decision to issue the clean-up notice.

A person who is dissatisfied with the decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the decision.

A person whose interests are or would be adversely affected by a decision of the department may also be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

For further information about reviews and appeals see the information sheet – Internal review and appeal to the Planning and Environment Court ([ESR/2015/1572](#)) available on the Queensland Government website at www.qld.gov.au, using the publication number (ESR/2015/1742) as a search term.

You may have other legal rights or obligations and should seek your own legal advice.

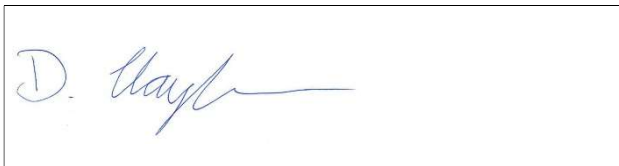
D. Penalties

Failing to comply with a clean-up notice is an offence unless you have a reasonable excuse.

- The maximum penalty for a corporation for wilfully contravening a clean-up notice is 31,250 penalty units, totalling \$ 4,492,187.
- The maximum penalty for a corporation contravening a clean-up notice is 22,500 penalty units, totalling \$ 3,234,375.

If you do not comply with the clean-up notice, an authorised person may also take any of the actions stated in the notice and the department may recover from you the costs incurred in taking the actions.

Should you have any queries in relation to the notice, please contact Leonie Clough, Principal Environmental Officer on telephone number (07) 5316 8404.



Signature

~~22 July 2022~~
~~19 September 2022~~
9 June 2023

Date

Dayna Claybourn
Manager (Compliance)
Delegate of the Chief Executive
Department of Environment and Science
Environmental Protection Act 1994

Enquiries:
Brisbane Moreton Compliance Centre
Department of Environment and Science
Ph: (07) 5316 8404
Email: ESComplianceBrisbaneMoreton@des.qld.gov.au

Attachment A: Part of Lot 846 SP135226 (shaded in yellow marked 'ATOM Terminal Operations under the EA').

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