

Appendix R – Registered Bore Summary

Summary of Registered Bores

The Northern Territory Government Bore Data Warehouse (<http://nrmaps.nt.gov.au>) identifies 298 boreholes / bores that have been drilled within a 2km radius of the site. Of these boreholes, approximately 150 are located on-site or hydraulically down-gradient of the site.

Of the 298 boreholes surrounding the site, 100 have yield information recorded in the database. The distribution of yield information for these boreholes / bores, assigned according to geological formation, is presented in Table R-1. Over half of the boreholes / bores with yield information are assigned to the Burrell Creek Formation, with recorded yields for the water bearing zones of between 0.01 and 7.0L/s, averaging 2.2L/s. Limited yield information is available for the remaining boreholes / bores assigned to the Quaternary and Lower Cainozoic aged unconsolidated sediments and the Bathurst Island Formation. Accordingly, caution should be exercised in characterising the yields for these units from this limited data set.

Table R-1: Distribution of yield information to assigned geological formations.

Assigned Geological Formation	Number of Boreholes / Bores	Recorded Yield		
		Minimum (L/s)	Maximum (L/s)	Average (L/s)
Quaternary age sediments	12	0.01	4.0	0.8
Cainozoic age sediments	7	0.01	3.0	0.9
Cainozoic age sediments / Bathurst Island Formation	3	0.30	0.5	0.4
Bathurst Island Formation	7	0.01	5.0	2.2
Bathurst Island Formation / Burrell Creek Formation	8	0.50	10.0	3.1
Burrell Creek Formation	54	0.01	7.0	2.2

Table R-2 presents the recorded purpose of the boreholes / bores drilled on and surrounding the site. Up to 46% of the boreholes / bores have been drilled for investigation and monitoring purposes, while 29% were drilled for production uses. The remaining boreholes / bores do not have any information concerning their purpose recorded. Generally, the boreholes / bores drilled for production purposes target deeper formations (with an average completion depth of 41m) compared to those drilled for investigation and monitoring purposes (averaging 16m depth).

Table R-2: Purpose of boreholes/bores on and surrounding Darwin RAAF Base

Borehole / Bore Purpose	Number of Boreholes / Bores	Completion Depth		
		Minimum (m)	Maximum (m)	Average (m)
Production	87	2	140	41
Investigation / Monitoring	137	4	71	16
Not recorded / Unknown	74	5	47	21

Details for the 87 production bores have been summarised in the Table below. Bores are shaded to indicate whether they were:

- Known or considered likely to have been destroyed
- Unlikely to be still in use if existing
- Possibly in current use (being investigated)
- Confirmed to be in use – sample collected.

BORE_NO	PURPOSE	Yield (L/S)	Completion Date	Completion Depth (m)	Drill Depth (m)	Water level (m)	Test Date	On-site	Screen / Pump Test From (m)	Screen / Pump Test To (m)	Screened Lithology or Lithology Subjected to Yield Testing	Inferred Formation Subjected to Yield Testing	Location in Relation to Site	Stratigraphy Supplied	Comments
RN000042	Production	0.63	5/07/1944	52.40	59.50	12.20	5/07/1944	N	N/a	N/a	Gravel and clay	Bathurst Formation / Burrell Creek Formation	North of site	N	Perforated screens at 24.4m. Assumed to be destroyed/inactive due to age and location.
RN000099	Production	1.20	17/08/1944	54.30	59.50	13.70	17/08/1944	N	N/a	N/a	N/a	Unknown	North of site	N	No drilling information. Assumed to be destroyed/inactive due to age and location.
RN000113	Production	5.00	27/04/1944	21.90	41.10	10.60	27/04/1944	N	N/a	N/a	Sandy schist quartz	Burrell Creek Formation	Downgradient	N	No screen / perforation information; pump level at 22.9m. Assumed to be destroyed/inactive due to age and location.
RN000130	Production	2.50	3/08/1944	67.00	67.00	9.10	3/08/1944	N	N/a	N/a	Grey schist, ironstone gravel, quartz pebbles	Burrell Creek Formation	North of site	N	Yield tested at 63.7 to 64.7m?. Former army bore. Site is now housing commission
RN000216	Production	1.87	28/11/1943	52.50	53.90	14.60	28/11/1943	N	42.92	53.9	Sandstone with gravel seams and sand	Burrell Creek Formation	South of site	N	Bottom length of 10.98m perforated. Assumed to be destroyed/inactive due to age and location.
RN000217	Production	1.65	Unknown	NR	0.00	0.00	Unknown	N	40	51.2	Slate with ironstone gravel	-	South of site	-	Old Army bore. Assumed to be destroyed/inactive due to age and location.
RN000241	Production	1.81	22/04/1944	59.20	61.90	7.30	22/04/1944	N	39.9	51.8	Limonitic slate	Burrell Creek Formation	South of site	N	Assumed to be destroyed/inactive due to age and location.
RN000283	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	43	48	White clay with ironstone gravel	-	North of site	-	Old army bore. Assumed to be destroyed/inactive due to age and location.
RN000327	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	On-site	-	Assumed to be destroyed/inactive due to age and location.
RN000329	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	Southeast of site	-	Assumed to be destroyed/inactive due to age and location.
RN000378	Production	2.25	10/06/1944	NR	54.90	1.80	10/06/1944	N	N/a	N/a	Clay and schist	Burrell Creek Formation	North of site	N	No borehole construction details. Assumed to be destroyed/inactive due to age and location.
RN000383	Production	0.75	25/10/1944	45.80	81.70	13.70	25/10/1944	N	N/a	N/a	Schist	Burrell Creek Formation	North of site	N	Perforated screens at 17.67m. Assumed to be destroyed/inactive due to age and location.
RN000385	Production	1.25	12/08/1944	28.70	33.60	0.00	12/08/1944	N	N/a	N/a	N/a	Unknown	North of site	N	Assumed to be destroyed/inactive due to age and location.
RN000386	farming	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	Immediately north of site	-	Old army bore. Destroyed in 1982.
RN000387	Production	1.25	27/07/1944	52.20	54.30	12.20	27/07/1944	N	N/a	N/a	Quartz, schist	Burrell Creek Formation	North of site	N	Assumed to be destroyed/inactive due to age and location.
RN000793	Production	0.94	1/07/1944	NR	51.70	9.10	1/07/1944	N	N/a	N/a	Schist and shale	Burrell Creek Formation	North of site	N	No borehole construction details. Assumed to be destroyed/inactive due to age and location.
RN000794	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	North of site	-	Old army bore. Assumed to be destroyed/inactive due to age and location.
RN001395	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	Southeast of site	-	Assumed to be destroyed/inactive due to age and location.
RN001716	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	Northwest of site	-	Assumed to be destroyed/inactive due to age and location.
RN001721	Production	0.00	26/04/2017	NR	43.50	0.00	Unknown	N	-	-	-	-	North of site	N	Very old. McCoppins Bore. Assumed to be inactive due to age and location
RN001722	Production	0.00	26/04/2017	NR	5.80	0.00	Unknown	N	-	-	-	-	North of site	N	Site is now apartment block. Assumed to be inactive due to age and location.
RN001723	Production	0.00	26/04/2017	NR	11.90	0.00	Unknown	N	-	-	-	-	North of site	N	Assumed to be inactive due to age and location
RN001741	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	North of site	N	Noted as Mc Gregor's Bore with EC of 1,940 in 1958. Assumed to be inactive due to age and location.
RN001759	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	Southeast of site	-	Assumed to be destroyed/inactive due to age and location.
RN001780	Production	0.63	11/01/1959	NR	46.30	2.40	11/01/1959	N	N/r	N/r	N/a	Unknown	West of site	N	Borehole construction unclear. Assumed to be destroyed/inactive due to age and location.
RN001932	Production	1.16	1/04/1960	56.60	56.60	4.50	1/04/1960	N	N/a	N/a	Brown sandstone, clay, siltstone and slate	Burrell Creek Formation	South of site	N	Darwin Showgrounds
RN001954	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	East of site	-	Assumed to be destroyed/inactive due to age and location.
RN001997	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	East of site	-	Assumed to be destroyed/inactive due to age and location.
RN002497	Production	1.87	14/04/1961	30.00	31.10	5.70	14/04/1961	N	N/a	N/a	Shale, slate, clay	Burrell Creek Formation	North west of site	N	Yield tested at 10m? Currently apartments. Assumed to be destroyed/inactive due to age and location.
RN002573	Production	1.50	29/05/1961	NR	35.20	9.10	29/05/1961	N	N/a	N/a	Sandy slate	Burrell Creek Formation	North west of site	N	Assumed to be destroyed/inactive due to age and location. Borehole construction unclear; yield tested at 7.3m
RN002574	Production	1.25	5/06/1961	18.30	38.70	8.90	5/06/1961	N	N/a	N/a	Sandy slate	Burrell Creek Formation	North west of site	N	Casing to 18.2m. Assumed to be destroyed/inactive due to age and location.
RN003190	Production	0.00	26/04/2017	51.82	51.82	0.00	Unknown	N	-	-	-	-	Southeast of site	Y	Darwin Showgrounds
RN003796	Production	0.00	19/06/1963	NR	40.70	6.10	Unknown	N	-	-	-	-	Southwest of site	-	Site has been redeveloped. Assumed lost.
RN004797	Production	3.00	18/04/1962	91.50	112.20	5.60	18/04/1962	N	N/a	N/a	Shale	Burrell Creek Formation	East of site	-	Bottom length perforated
RN004999	farming	0.00	10/08/1965	NR	14.00	7.90	10/08/1965	N	-	-	-	-	Southeast of site	-	-
RN005310	Production	0.00	15/02/1962	11.10	80.80	2.40	15/02/1962	N	-	-	-	-	South of site	-	Installed for Carba Iceworks in 1966. Currently Bestbar Reinforcements
RN005320	Production	0.00	21/02/1966	12.20	12.20	0.00	21/02/1966	N	-	-	-	-	Southwest of site	-	-
RN005397	Production	0.00	15/05/1905	6.40	6.40	0.00	Unknown	N	-	-	-	-	West of site	-	Too shallow, unlikely to be viable for production.
RN005768	Production	0.50	1/06/1967	NR	42.70	29.30	1/06/1967	N	N/r	N/r	Schist, sandstone	Burrell Creek Formation	North of site	N	Was Nightcliff Hotel, is redeveloped as Jape Homemaker Village. Bore assumed lost.
RN005939	Production	1.12	20/10/1967	29.00	34.40	16.80	20/10/1967	N	28.3	34.4	Schist	Burrell Creek Formation	North of site	N	Was Nightcliff Hotel, is redeveloped as Jape Homemaker Village. Bore assumed lost.
RN006156	Production	0.00	10/07/1968	61.00	61.00	9.40	10/07/1968	N	-	-	-	-	Southeast of site	-	-
RN006563	Production	3.80	15/05/1969	18.30	70.10	9.10	15/05/1969	N	N/a	N/a	Claystone, siltstone	Bathurst Formation / Burrell Creek Formation	North of Rapid Creek	Y	Open borehole from 18.2m; airlift pump test across Bathurst and Burrell Ck Formation?
RN007119	Production	0.00	26/04/2017	NR	0.00	0.00	Unknown	N	-	-	-	-	South of site	-	Shady Glade Caravan Park
RN007776	Production	0.63	26/09/1971	2.40	3.00	1.20	26/09/1971	N	2.1	2.7	Log illegible	Unknown	North of site	N	-
RN007779	Production	0.75	2/10/1971	2.70	2.70	1.20	2/10/1971	N	N/a	N/a	N/a	Unknown	North of site	N	Borelog illegible
RN008160	Production	0.90	28/07/1973	9.50	79.00	0.00	28/07/1973	N	N/a	N/a	Grey and black shale	Burrell Creek Formation	South of site	Y	Casing of 9.5m; airlift yield test
RN009269	Production	0.00	1/01/1973	NR	24.60	0.00	1/01/1973	N	-	-	-	-	Immediately to North of site	-	-
RN009270	Production	0.00	1/01/1973	NR	36.80	4.80	1/01/1973	N	-	-	-	-	Immediately to North of site	-	-
RN009271	Production	0.00	1/01/1973	NR	27.40	0.00	1/01/1973	N	-	-	-	-	Immediately to North of site	-	-
RN009272	Production	0.00	26/04/2017	8.53	0.00	0.00	1978?	N	-	-	-	-	Immediately to North of site	-	Golf Course. In 1978 pumped at 5000g/hr for 12hrs/day.
RN009303	?Irrigation	0.01	1/09/1976	NR	13.10	3.40	1/09/1976	N	N/r	N/r	Siltstone	Burrell Creek Formation	North of site and Rapid Creek	N	Assumed to be bore SAMPLED as 1302_PB04
RN020326	Production	3.00	18/06/1980	56.50	56.50	1.50	18/06/1980	N	49.9	56.5	Quartz sand and pebbles	Burrell Creek Formation	North of site	N	Airlift during pumping
RN020327	Production	3.00	6/06/1980	13.00	65.00	1.50	6/06/1980	N	N/a	N/a	Phyllite	Burrell Creek Formation	North of site	Y	Casing to 13m; airlift at 46m
RN020328	Production	1.00	12/06/1980	11.00	51.00	1.00	12/06/1980	N	N/r	N/r	Shale and quartz	Burrell Creek Formation	North of Rapid Creek and site	Y	Bore cased to 11m; yield testing at 25m. Jingili Water Gardens
RN020329	Production	3.00	13/06/1980	13.00	65.00	0.00	13/06/1980	N	N/a	N/a	Grey micaceous shale	Burrell Creek Formation	East of site	N	Borehole cased to 13m; yield tested at 24m
RN020331	Production	3.00	26/06/1980	41.00	75.00	0.00	26/06/1980	N	35	41	White clay and quartz pebble	Burrell Creek Formation	North of site	N	Airlift during pumping
RN020543	Production	1.00	25/03/1981	22.00	86.10	4.00	25/03/1981	N	20	22	Brown clay and brown siltstone	Bathurst Formation / Burrell Creek Formation	East of site	N	Multiple screens and perforations
RN020639	Production	5.50	29/04/1981	61.60	61.60	0.00	29/04/1981	N	30.3	48.53	Siltstone	Burrell Creek Formation	South of site	Y	Installed for Essential Services. Currently Granite Transformations/ Readycut Screens and doors/ AKC NT
RN021528	Production	0.00	11/06/1982	4.80	8.00	0.00	Unknown	N	-	-	-	-	Immediately North of site	-	-
RN021748	Production	0.00	23/09/1982	7.00	7.00	0.00	23/09/1982	N	N/a	N/a	-	-	West of site	-	Tropicus Industrial Park. Too shallow, unlikely to be viable for production.
RN021749	Production	0.40	23/09/1982	7.10	7.10	0.00	23/09/1982	N	N/a	N/a	-	-	West of site	-	Too shallow, unlikely to be viable for production.
RN023380	Production	0.00	13/09/1984	4.80	4.80	0.00	Unknown	N	-	-	-	-	Immediately east of site	-	-
RN025623	Production	0.25	2/03/1988	NR	110.00	0.00	2/03/1988	N	N/a	N/a	Siltstones	Burrell Creek Formation	East of site	N	6m of casing; yield tested during drilling at 55m
RN026136	Production	1.80	10/11/1988	33.00	33.10	6.00	10/11/1988	N	6 and 23	8 and 27	Clay and laterite and siltstone	Burrell Creek Formation	North of site	N	Multiple screens. The recorded yield is for the 22-27m section of screen.
RN026137	Production	2.00	11/11/1988	13.00	33.10	0.00	11/11/1988	N	5	7	Clay	Quaternary age sediments	North of site	N	-
RN026855	Production	4.50	27/08/1989	76.00	76.00	11.50	27/08/1989	N	24 and 60	48 and 61	Shale / Siltstone	Burrell Creek Formation	North of Rapid Creek	Y	Borehole decommissioned; 2 perforation intervals; unclear where value of 4.5L/s is sourced
RN027600	Production	1.50	5/04/1991	6.00	52.00	0.00	5/04/1991	N	32	52	Siltstone, quartz and shales	Burrell Creek Formation	South of site	N	6m casing. Installed for Besser Bricks in 1991. Currently is Northline Freight Management.

BORE_NO	PURPOSE	Yield (L/S)	Completion Date	Completion Depth (m)	Drill Depth (m)	Water level (m)	Test Date	On-site	Screen / Pump Test From (m)	Screen / Pump Test To (m)	Screened Lithology or Lithology Subjected to Yield Testing	Inferred Formation Subjected to Yield Testing	Location in Relation to Site	Stratigraphy Supplied	Comments
RN027850	Production	2.15	2/10/1991	54.30	54.60	5.00	2/10/1991	N	36.3	48.3	Siltstone and shale	Burrell Creek Formation	North of site and Rapid Creek	N	Airlift during drilling at 36m
RN028668	Production	0.42	1/06/1988	6.00	6.00	4.90	1/06/1988	N	N/r	N/r	Laterite	Cainozoic sediments	East of site	N	No borehole screening information supplied
RN031291	Production	0.75	30/11/1996	84.00	92.00	7.50	30/11/1996	N	72	84	Siltstone	Burrell Creek Formation	East of site	N	-
RN032078	Production	1.00	18/11/1998	140.00	140.00	24.00	18/11/1998	N	N/a	N/a	Schist	Burrell Creek Formation	East of site	N	Airlift at 78m
RN032471	Production	1.50	3/10/2000	60.00	60.00	8.00	3/10/2000	N	30	42	Weathered siltstone?	Burrell Creek Formation	Immediately to West of site	N	Airlift at 35m for 3 hours. Bagot Community
RN033030	Production	10.00	25/04/2001	25.70	25.70	5.30	25/04/2001	N	21.33	25.43	Quartz gravel and coarse sand	Bathurst Formation / Burrell Creek Formation	East of site	N	-
RN033178	Production	1.50	14/11/2001	81.00	81.00	9.00	14/11/2001	N	62	79	Sandstone	Burrell Creek Formation	East of site	N	Airlift at 58m
RN033945	Production	4.00	28/11/2003	37.90	38.30	38.00	28/11/2003	N	32.9	36.9	Quartz, gravels, coarse brown sand	Quaternary age sediments	North of Rapid Creek	N	SAMPLED - 1302_PB06
RN034089	Production	3.00	25/06/2004	30.00	30.00	5.00	25/06/2004	N	27	30	Brown clays, quartz and sandstone	Bathurst Formation	East of site	N	Airlift during drilling at 24m
RN034840	Production	6.00	26/09/2005	30.00	30.00	12.00	26/09/2005	N	26	28	Sand	Burrell Creek Formation	East of site	N	-
RN036708	Production	3.00	5/07/2009	54.00	54.00	6.00	5/07/2009	N	43	48	Shales	Burrell Creek Formation	East of site	Y	Airlift during drilling at 42m. SAMPLED - 1302_PB02
RN036737	Production	1.50	24/07/2009	28.00	28.00	12.00	24/07/2009	N	24	28	Grey shales	Burrell Creek Formation	North of site	N	Airlift at 23 m. SAMPLED - 1302_PB07
RN038735	Production	0.75	12/08/2014	66.00	66.00	8.00	12/08/2014	N	60	61.6	Brown shale	Burrell Creek Formation	East of site	Y	Airlift at 60m. SAMPLED - 1302_PB03
RN020825	NR	0.01	19/01/1982	NR	3.50	0.40	19/01/1982	N	N/r	N/r	Grey shale with white clay	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN020826	NR	0.01	20/01/1982	NR	4.40	0.70	20/01/1982	N	N/r	N/r	Clay and grey shale	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN020827	NR	0.01	20/01/1982	NR	4.00	1.00	20/01/1982	N	N/r	N/r	Laterite (fill), ironstone pebbles, shale, mudstone, clays	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN020828	NR	0.01	20/01/1982	NR	5.50	0.80	20/01/1982	N	N/r	N/r	Shale, mudstone and clay	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN020829	NR	0.01	20/01/1982	NR	3.00	1.10	20/01/1982	N	N/r	N/r	Laterite, mudstone and shale	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN020830	NR	0.01	21/01/1982	NR	3.00	0.70	21/01/1982	N	N/r	N/r	Laterite (fill), white clay, grey shale	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)
RN021149	None	0.01	21/01/1982	NR	3.00	0.20	21/01/1982	N	N/r	N/r	Laterite and shale	Quaternary age sediments	West of site	N	Oval on Richardson Drive. Borehole backfilled; investigation only, no yield test (seep only)

Legend

	Not available or likely to exist
	Low priority - unlikely to be in use
	Possible- current use being investigated
	Confirmed use - Sample collected

Appendix S – Non-PFAS Assessment

Assessment Criteria

Assessment Framework

This subsection described the environmental legislation and investigation guidelines relevant to conducting contamination assessment on the site and surrounds.

Commonwealth legislation

The *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM) provides a nationally consistent framework for identification and investigation of contaminated sites and is given effect by individual legislation and guidelines in each state and territory.

The NEPM sets out the approach to assessment of a site from desktop review, through to quantitative risk assessment. Guidance schedules cover standard sampling and analysis techniques, data interpretation and quality review, and exposure settings for assessment of risk to human health or ecology. Health and ecological investigation levels are provided for some contaminants, under specific landuse scenarios. A framework is described to support derivation of risk based levels, where default investigation levels are not provided, or the exposure settings is not relevant.

Northern Territory Legislation

The Northern Territory EPA requires contaminated sites that pose or threaten to pose serious or material environmental harm as defined in the *Waste Management and Pollution Control Act* ("the Act") to be assessed in accordance with the requirements for environmental audits in the Act. The NT EPA requires assessment of site contamination to be conducted in accordance with the NEPM.

The Water Act is the primary piece of legislation that governs water resource regulation and management in the Northern Territory. The objective of the Act is "to provide for the investigation, allocation, use, control, protection, management and administration of water resources". Under the Water Act, beneficial uses can be declared for specific water bodies and water quality objectives are established to describe the water quality targeted to protect the relevant beneficial uses.

Beneficial uses of surface waters have been define for Darwin Harbour and its marine reaches, and Rapid Creek freshwater reaches and include, Cultural (recreation and aesthetics) and Environment (habitat for plants and animals). *Water Quality Objectives for the Darwin Harbour* (DNR 2010) indicates that guideline values for toxicants should be sourced from ANZECC&ARMCANZ (2000) Guidelines and that health related indicators should be sourced from the NT Department of Health and Families recreational guidelines and/or relevant National guideline values.

Screening Values

Soil

The relevant land uses at the site are considered to be open space and commercial/industrial. Other sensitive uses may also occur, including child care or residential, and therefore a conservative health based screening value associated with residential use has been proposed, but without consideration of home-grown produce. Where available, values for recreational settings have been provided for context. The ecological setting of the site is predominantly consistent with urban residential or open space environment, although some areas adjacent to Rapid Creek or in Marrara Swamp may be considered areas of ecological significance.

Screening values have been primarily sourced from:

- NEPC (2013) National Environment Protection (Assessment of site contamination) Measure 1999, as amended in 2013.

Where criteria for specific analytes are not listed in Australian guidelines, alternative criteria have been adopted.

The proposed Soil Assessment Criteria are summarised in S1.

Table S1 - Soil assessment criteria (mg/kg)

Contaminant	Maintenance of Ecosystems ¹		Human Health ²	
	Areas of Ecological Significance	Residential / Public Open Space	Residential	Recreational
Arsenic (III)	40	100	100	300
Cadmium	NE	10 ³	20	90
Copper	20	60	6,000	17,000
Chromium (III)	60	190	12,000 ⁴	12,000 ⁴
Iron	NE	NE	5,500 ⁴	5,500 ⁴
Lead	470	1,100	300	600
Manganese	NE	220 ⁵	3,800	19,000
Mercury	NE	NE	40	80
Nickel	15	15	400	1,200
Zinc	25	55	7,400	30,000
Carcinogenic PAHs (BaP TEQ)	NE	NE	3	3
Benzo(a)pyrene	0.7	0.7	NE	NE
Total PAHs	NE	NE	300	300
Benzene	10	50	0.5 ⁷	NL ⁷
Toluene	10	85	160 ⁷	NL ⁷
Ethylbenzene	1.5	70	55 ⁷	NL ⁷
Xylenes	10	105	40 ⁷	NL ⁷
Naphthalene	10	170	3 ⁷	NL ⁷
TPH >C6 – C10 less BTEX	125	180	45 ⁷	NL ⁷
TPH >C10 - C16 less naphthalene	25	120	110 ⁷	NL ⁷
TPH >C16 – C34	NE	300	4,500 ⁶	5,300 ⁶
TPH >C34 – C40	NE	2,800	6,300 ⁶	7,400 ⁶
1,4-Dioxane	NE	NE	5.3 ⁴	NE

* Low reliability value

NE = Not Established

NL = Not Limiting

1. NEPC (2013), Ecological Investigation Levels

2. NEPC (2013) Health Investigation Levels

3. CCME (2013) Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health

4. US EPA (2016) Regional Screening Levels for Soil (Threshold Hazard Quotient 0.1)

5. US EPA (2005) Ecological Soil Screening Levels (ECO-SSLs)

6. Friebel and Nadebaum (2011), Health screening levels of petroleum hydrocarbons, HSLs direct soil contact
7. NEPM (2013) Health Screen Level for Vapour Intrusion, sand, 0m to <1m soil depth

Groundwater

The primary environmental values of groundwater that have been considered for this investigation include non-potable domestic use, irrigation and ecosystem protection. Further discussion of each of these environmental values and the screening criteria adopted to evaluate potential risks to these values are discussed below.

Non-potable domestic

Non-potable domestic use can include a range of uses, some of which include the opportunity for ingestion of water. Therefore as a precautionary approach, drinking water guidance values have been applied. Where contamination is identified above these screening values, then further assessment of exposure potential can be used to refine the assessment of risk.

Screening values have been sourced from:

- NHMRC (2011) – Australian Drinking Water Guidelines 6, updated November 2016
- WHO (2011) Guidelines for Drinking-Water Quality, 4th Edition, World Health Organization

Irrigation

Contaminants can present risks through irrigation use by different mechanisms, including adverse impact on plant growth, incidental human exposure during irrigation and human health or ecological impact due to accumulation in consumed plants. Where irrigation specific guidelines are available for a contaminant, they will be applied. Otherwise, primary contact recreation values will be applied to conservatively consider incidental human exposure.

Screening values have been sourced from:

- ANZECC&ARMCANZ (2000) Australian Water Quality Guidelines for Fresh and Marine Waters - Long-term irrigation value
- NHMRC (2008) - Guidelines for Managing Risks in Recreational Waters

Ecosystem protection (Habitat for plants and animals)

The water quality objectives of Darwin Harbour (DNR 2010) indicate a protection level of 95% of species is appropriate for selection of screening value. However, where a contaminant is bio-accumulative a higher level of protection (99%) should be considered. Whilst Darwin harbour is a marine water body, groundwater at the site and where it emerges is considered to be freshwater, and groundwater results have principally been compared against freshwater ecosystem protection criteria.

Screening values have been sourced from:

- ANZECC&ARMCANZ (2000) Australian Water Quality Guidelines for Fresh and Marine Waters

Groundwater screening values have been adopted from the appropriate guidelines to assess if the site precludes any of the beneficial uses requiring protection. Primary reference has been made to the listed guidelines, however, where no specific criteria are available, alternative criteria have been adopted. A selection of the proposed Groundwater Assessment Criteria are summarised in Table S2.

Table S2 - Proposed groundwater assessment criteria ($\mu\text{g/L}$)

Contaminant	Maintenance of Ecosystems (Modified Ecosystems) ¹		Irrigation ³	Non-potable Domestic
	Marine ¹	Freshwater ²		
Arsenic (III)	2.3 ⁵	24	100	10
Cadmium	5.5	0.2	10	2
Copper	1.3	1.4	200	1,000 *
Chromium (III)	27	3,300	100 ⁹	50 ¹⁰
Iron	NE	300,000	200	300 *
Mercury	0.1	0.06	2	1
Lead	4.4	3.4	2,000	100
Manganese	80 ⁶	1900	200	100 *
Nickel	7	11	200	20
Zinc	15	8.0	2,000	3,000 *
Benzene	500	950	10 ⁴	1
Toluene	180 ⁵	180 ⁵	25 ^{*4}	25 *
Ethylbenzene	5 ⁵	5 ⁵	3 ^{*4}	3 *
o-Xylene	350 ⁵	350 ⁵	20 ^{*4}	20 *
m-Xylene	75 ⁵	75 ⁵		
p-Xylene	200 ⁵	200 ⁵		
Naphthalene	50	16	NE	17 ⁶
TPH C6 – C10 less BTEX	NE	94 ¹¹	NE	300 ⁷
TPH >C10 - C16 less naphthalene	NE	160 ¹¹	NE	100 ⁷
TPH >C16 – C34	NE	600 ¹¹	NE	90 ⁷
TPH >C34 – C40	NE	NE	NE	90 ⁷
1,4-Dioxane	NE	NE	500 ⁸	50 ⁸

* Aesthetics value

NE = Not Established

1. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Marine – slightly to moderately modified ecosystems)

2. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Freshwater – slightly to moderately modified ecosystems)

3. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Long-term irrigation value)

4. NHMRC (2008) Guidelines for Managing Risks in Recreational. Adopted value is 10 times the Australian Drinking Water Guidelines (NHRMC, 2011), unless specified otherwise

5. Low reliability trigger value

6. US EPA (2016) Regional Screening Levels for Tap Water –(Threshold Hazard Quotient 0.1).

7. WHO (2005) Guidelines for Petroleum Products in Drinking Water

8. WHO (2017) Guidelines for Drinking Water Quality, 4th Edition

9. Reflects total chromium.

10. As chromium (VI).

11. RIVM (2004) Screening risk concentration (ecological). Environmental risk limits for Mineral oil (Total Petroleum Hydrocarbons)

Surface Water

Surface water criteria have been adopted from the appropriate guidelines to assess if the site precludes any of declared beneficial uses of surface waters. Primary reference has been made to the guidelines, however, where no specific criteria are available, alternative criteria have been adopted. Surface Water Screening Criteria are summarised in Table S3.

Table S3 - Surface Water Screening Criteria

Contaminant	Maintenance of Ecosystems (Modified Ecosystems) ¹		Recreation ³
	Marine ¹	Freshwater ²	
PFOS	0.29 (99%) 7.8 (95%)	0.000023 (99%) ⁴ 0.13 (95%)	0.7 ⁸
PFHxS	NE	NE	
PFOA	3,000 (99%) 8,500 (95%)	19 (99%) ³ 220 (95%)	5.6 ⁸
Arsenic (III)	2.3 ⁴	24	100
Cadmium	0.7	370	20
Copper	1.3	1.4	1,000 *
Chromium (III)	10	3,300	50 ⁶
Iron	NE	300,000	300 *
Mercury	0.1	0.06	10
Lead	4.4	3.4	1,000
Manganese	80 ⁵	1900	100 *
Nickel	7	11	200
Zinc	15	8.0	3,000 *
Benzene	500	950	10
Toluene	180 ⁴	180 ⁴	25 *
Ethylbenzene	5 ⁴	5 ⁴	3 *
o-Xylene	350 ⁴	350 ⁴	20 *
m-Xylene	75 ⁴	75 ⁴	
p-Xylene	200 ⁴	200 ⁴	
Naphthalene	50	16	NE
1,4-Dioxane	NE	NE	500 ⁵

* Aesthetics value

NE = Not Established

1. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Marine – slightly to moderately modified ecosystems)

2. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Freshwater – slightly to moderately modified ecosystems)

3. NHMRC (2008) Guidelines for Managing Risks in Recreational Waters. Adopted value is 10 times the Australian Drinking Water Guidelines (NHRMC, 2011), unless specified otherwise

4. Low reliability trigger value

5. WHO (2017) Guidelines for Drinking Water Quality, 4th Edition

6. As chromium (VI).

Sediment

Contaminants in sediment on site represent a potential on-going source of contamination to surface water, and present direct contact exposure to onsite flora and fauna.

Sediment in onsite drains will be screened against the soil screening values presented above. Where elevated concentrations were identified based on comparison to soil screening values or based on relative concentrations, investigation of potential for leaching has been undertaken to quantify the potential for contamination of surface waters. Where leachability was assessed, the results were

screened against the relevant water screening levels, as an indicator of the potential for soils or sediments to impact surface water or groundwater quality.

Investigation Results

Non-PFAS Contamination

In addition to the investigation of PFAS at the site, analysis for various other potential contaminants was also undertaken in soils, sediment, groundwater and surface water.

Soils

Soils were analysed for various nominated non-PFAS analytes as defined in the project brief and Technical memo 1652034-060-M-Rev2 including:

- Total recoverable hydrocarbons, benzene, toluene, ethyl benzene, xylenes,
- Polycyclic aromatic hydrocarbons,
- Organochlorine pesticides, organophosphorus pesticides, herbicides,
- Volatile and semi-volatile organic compounds and
- Metals (arsenic, cadmium, total chromium, copper, lead, mercury, nickel and zinc).

Results from the soil sampling for non-PFAS analytes have been collated into Tables 4 and 5.

The majority of results for other contaminants were either below the laboratory reporting limits, or below adopted screening criteria for protection of human health or ecosystems. Where the results exceeded the adopted screening criteria, they have been discussed below.

Hydrocarbons

A single location at former fuel farm 4 (NT0205), location BH188 at a depth of 1.0m below the ground reported elevated concentrations of total recoverable hydrocarbons fractions C6-C10 (less BTEX) of 68 mg/kg (above the human-health residential screening criteria of 45 mg/kg), and C10-C16 (less naphthalene) of 3,300 mg/kg (above the human health and ecological screening criteria of 110mg/kg and 120 mg/kg respectively). However, the area of the site where these impacts were noted is a non-residential area, and the concentrations are below the adopted human health-recreational screening criteria. Hydrocarbon odours were noted to be present in soils to a depth of at least 2.0m below the ground at this location. Surrounding locations BH189 (north), BH190 (north-west) and BH192 (west) did not report indications of hydrocarbon impacts (either in laboratory results or from field observations). These impacts were in the vicinity of former fuel farm 4 (NT0205).

Metals

Concentration of metals (including arsenic, chromium, copper, lead, manganese, nickel and zinc) exceeded the adopted screening criteria for protection of ecosystems (both areas of ecological significance and residential/open space) at various locations across the site. The concentration of lead also exceeded the adopted human health screening criteria at one location. Concentrations of iron is naturally high in the ferruginous soils ranging from 1,800 to over 200,000mg/kg.

Arsenic

Arsenic was reported in 14 shallow and deep soil sampling locations (from a total of 379 samples analysed) at concentrations above the adopted EIL (40 mg/kg) across the site, with concentrations ranging between <2 to 75 mg/kg. A grouping of concentrations of elevated arsenic exceeding the adopted EIL in shallow soils was observed at the Former RAAF fire station. The rest of the results were scattered across the base with no apparent correlation. No concentrations of arsenic exceeded the adopted health screening criteria.

Chromium

Concentrations of total chromium ranged from 5.3 to 420 mg/kg in shallow and deep soil samples across the site. Concentrations of total chromium at 278 (out of 379 sampling locations) exceeded the adopted EILs for protection of areas of environmental significance, and residential/open space areas. The wide-spread distribution of elevated concentrations of total chromium suggests that the chromium may be naturally elevated in the soils in the region. No concentrations of chromium exceeded the adopted health screening criteria.

Copper

Concentrations of copper ranged from <5 to 190 mg/kg mg/kg in shallow and deep soil samples across the site. Concentrations of total chromium at 38 (out of 379 sampling locations) exceeded the adopted EILs for protection of areas of environmental significance, and residential/open space areas. A grouping of concentrations of elevated copper exceeding the adopted EIL in shallow soils was observed at the Former RAAF fire station. The rest of the results were scattered across the base with no apparent correlation. No concentrations of copper exceeded the adopted health screening criteria.

Lead

Concentrations of lead ranged from <5mg/kg to 6,300 mg/kg, with two soil samples exceeding the adopted screening criteria for health (and one exceeding the EIL). The two locations, MW160_0.0m – (6,300 mg/kg) near the golf-course and BH207_0.0 (410 mg/kg) in the NT0241 Former Fire Training ground, are likely associated with minor isolated lead impacts and not indicative of significant lead contamination.

Nickel

Concentrations of nickel ranged from <5 to 100 mg/kg mg/kg in shallow and deep soil samples across the site. Concentrations of nickel at 39 (out of 379 sampling locations) exceeded the adopted EILs for protection of areas of environmental significance, and residential/open space areas. Nickel appears to be naturally elevated at depths greater than 2m (up to at least 8m below the ground surface), with occasional shallow soil samples scattered across the site reporting concentrations of nickel above the adopted EILs. No concentrations of Nickel exceeded the adopted health screening criteria.

Zinc

Concentrations of zinc ranged from <5 to 500 mg/kg mg/kg in shallow soil samples across the site. Concentrations of zinc at 204 (out of 379 sampling locations) exceeded the adopted EILs for protection of areas of environmental significance, and residential/open space areas. The elevated concentrations of zinc appear to be limited to shallow surface samples spread across the site, but with shallow soils at the Former RAAF Fire Station uniformly reporting elevated concentrations of zinc above the adopted EILs. The zinc at this location is likely associated with shallow fill soils. No concentrations of Zinc exceeded the adopted health screening criteria.

Sediment

Sediment samples from within various drainage channels and streams were analysed for various other potential contaminants including Total recoverable hydrocarbons, benzene, toluene, ethyl benzene, xylenes, polycyclic aromatic hydrocarbons, organochlorine pesticides, organophosphorus pesticides, herbicides, volatile and semi-volatile organic compounds and metals (arsenic, cadmium, total chromium, copper, iron, lead, manganese, mercury, nickel and zinc). Results from the sediment sampling for other potential contaminants have been collated into Tables 11 and 12.

The majority of results for other contaminants were either below the laboratory reporting limits, or below adopted screening criteria for protection of human health or ecosystems. Exceptions were noted for chromium, copper, iron, manganese, nickel and zinc, with concentrations measured in sediments similar to those in surrounding soils, suggesting that the sediments within the drains and streams do not appear to be concentrating metals and other (non PFAS) contaminants present in soils at the site.

Groundwater

Groundwater samples from various bores across the site (and offsite) were analysed for various nominated non-PFAS analytes as defined in the project brief and Technical memo 1652034-060-M-Rev2 including:

- groundwater quality parameters (including cations and anions, nitrogen compounds, pH, sulfate and total organic carbon);
- total recoverable hydrocarbons, benzene, toluene, ethyl benzene, xylenes;
- polycyclic aromatic hydrocarbons;
- organochlorine pesticides;
- volatile and semi-volatile organic compounds;
- 1,4-dioxane; and,
- metals (arsenic, cadmium, total chromium, copper, iron, lead, manganese, mercury, nickel and zinc).

Results of the groundwater sampling for non-PFAS analytes have been collated into Tables 22c and 22d.

The analytical results have been compared against screening criteria protective of the relevant environmental values for groundwater uses at the site including irrigation, non-potable domestic and ecosystem protection. The majority of the groundwater results for potential contaminants are below the adopted screening criteria or below the laboratory reporting limits.

The reporting limits of the laboratory for TRH C16-C34, C34-C40, and Chloroform were marginally above the adopted screening criteria for evaluating risks to non-potable domestic water use. When considering the use of groundwater for non-potable domestic use, it is considered that a dilution factor can be applied to the concentrations as the anticipated use of water for these purposes would likely only be from such things as swimming pools, and ancillary domestic water use (i.e. watering). As per the guidance provided in NHMRC (2013) a dilution factor of 0.1 has been applied to the screening criteria to account for reduced water ingestion likely to occur under these uses, and as a consequence, the laboratory reporting limits are subsequently below the amended criteria.

Further discussion of the various potential contaminants that exceed the various adopted groundwater quality screening criteria is provided below.

Table S4 – Summary of Non-PFAS Groundwater Analytical Results (µg/L)

Contaminant	Concentration range (µg/L)	Comparison Criteria		
		Irrigation ²	Non-Potable Domestic ⁷	Maintenance of Ecosystems (freshwater) ¹
Ethylbenzene	<1 - 65	3⁵	3⁵	5³
Xylenes	<3 - 430	20⁵	20⁵	350^{*3}
Naphthalene	<1 - 100	NCA	17⁴	16
TRH F1	<20 – 1300	NCA	300⁶	94⁸
TRH F2	<10 – 280,000	NCA	100⁶	160⁸
TRH-F3	<100 – 7,200	NCA	90⁶	600⁸
TRH-F4	<100 – 3,100	NCA	90⁶	600⁸
2-methylnaphthalene	<5 - 320	NCA	36^{5,4}	NCA
Isopropyl-benzene	<1 - 63	NCA	450	30
1,2,4-trimethylbenzene	<1 – 450	NCA	150	NCA
1,3,5-trimethylbenzene	<1 - 190	NCA	120	NCA
Chloroform	<5 - 45	NCA	2.2⁴	370
Arsenic	<1 – 159	100	10	24
Cadmium	<0.1 – 1.1	10	2	0.2
Copper	<1 – 230	200	1000	1.4
Nickel	<1 – 140	200	20	11
Zinc	<5 - 270	2000	3000	8

Table Notes

* Criteria for o-xylene

1. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Freshwater – slightly to moderately modified ecosystems)
2. ANZECC (2000) Australian Water Quality Guidelines for Fresh and Marine Waters (Long-term irrigation value)
3. Low reliability trigger value
4. US EPA (2016) Regional Screening Levels for Tap Water –(Threshold Hazard Quotient 0.1).
5. NHMRC (2008) Guidelines for Managing Risks in Recreational. Adopted value is 10 times the Australian Drinking Water Guidelines (NHRMC, 2011), unless specified otherwise
6. WHO (2005) Guidelines for Petroleum Products in Drinking Water
7. NHMRC (2011) Australian Drinking Water Guidelines
8. RIVM (2004) Screening risk concentration (ecological). Environmental risk limits for Mineral oil (Total Petroleum Hydrocarbons)

NCA – No Criteria Available

Bold – indicates screening criteria exceeded

The majority of hydrocarbon impacts (including TRH and MAHs) were associated with former fuel storage areas. Isolated occurrences of chloroform were noted to be present in some wells with no clear pattern suggesting a potential source for this contaminant, with the exception of two wells south of the Ordinance Loading Areas (OLAs).

The distribution of metals concentrations in groundwater that exceeded the adopted screening criteria did not suggest any pattern or direct source of metals impact to groundwater at the site. Concentrations of zinc appear to be spread across the site at similar concentrations suggesting the measured concentrations in groundwater are reflective of regional groundwater conditions, rather than an indication of anthropogenic impacts to groundwater.

Appendix T – Important Information About Your Coffey Environmental Report

Important information about your Coffey Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept apprised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statutes and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such

assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced 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.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.