

Permit Groundwater Quality Assessment

BKP Waste, Casbrook Park, Timsbury, Romsey



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Contract No./Report Type: 21-027/GW
Produced for BKP Waste & Recycling Ltd

AG Geo-Consultants Ltd

Report Title
Permit Groundwater Quality Assessment

Project	Project No./Report Type
BKP Waste, Casbrook Park, Timsbury, Romsey	21-027/GW

Client Name
BKP Waste & Recycling Ltd

Issue Date/Version	Status	Comments, Description of Amendments
10 th February 2023	Final	-

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Specialist In Land Condition (SiLC) No. A1201 Qualified Person (QP), No.086 (CL:AIRE Definition of Waste, Industry Code of Practice, DoWCoP)

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Permit Groundwater Quality Assessment
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Executive Summary

Client	BKP Waste & Recycling Ltd																								
Site and Location	BKP Waste, Casbrook Park, Timsbury, Romsey Approximate postcode = SO51 0PG (436008E,124884N)																								
Client Brief	Assessment of groundwater quality for their environmental permit.																								
History of Site & Surroundings	The history of the entire BKP site is important, because the historic landfill lying adjacent (and under the site) could cause the chemical concentrations in soils under the site, rather than the permitted site operations having caused such. The entire BKP site is currently a (mostly) hard covered, waste management and recycling site. Historic landfills surround the site in all directions. The site history is: <u>The Entire BKP Site</u> Part of <i>Casbrook Common</i> until before 1942, when a small sand pit appears on the SW end of the site. By 1959 the site is much it's current site/shape, but contains a pond in the very SW and further encroachment of sand quarrying into the NW edge of the site. The pond was infilled as were sand mined areas on site, and further buildings added over the years. The upper yard used to be a timber yard and some of the ground there contains much sawdust and wood waste. <u>In the Surroundings</u> Farmland and Casbrook Common until before 1942, whereupon 2 sand pits appear to the east. By 1959 most of the land to the east & to the NW is sand pits. Over the years these are all filled in (as landfill sites).																								
Hydrogeology & Hydrology	• Watercourses: (Drainage?) Ditches appear to lie near /along the NE and NW site edges. A lake and stream lie 200-250m SE of the site. Another lake lies to the SW. • Aquifers: Secondary 'A' Aquifer • Groundwater: has lain at ~4m to 8.2m depth below various parts of the site over the years. Groundwater flow directions appear to have been SSE, WSW and SSE, which makes the flow directions towards two separate off-site lakes.																								
Groundwater Contamination	• Given that groundwater flow directions appear to be towards lakes, then laboratory test results were compared to Freshwater EQS. • Well BH104 could not be located during this recent monitoring (and so water from it could not be sampled and tested) and a new replacement well that we installed was unable to reach groundwater. • The results are summarised as follows.<table><tr><th>Determinants</th><th>Mayer 2018 Findings</th><th>Our 2023 Findings</th></tr><tr><td>Manganese</td><td>Elevated</td><td>Elevated</td></tr><tr><td>TPH</td><td>Elevated in BH101 & BH102</td><td>No elevated results in BH101-BH103</td></tr><tr><td>Cyanide</td><td>Elevated in BH104</td><td>BH104 not tested. Other results not elevated</td></tr><tr><td>Cadmium</td><td>Elevated in BH101</td><td>No elevated results in BH101-BH103</td></tr><tr><td>COD</td><td>Elevated in BH104</td><td>BH104 not tested. Other results not elevated</td></tr><tr><td>Ammoniacal Nitrogen</td><td>Not tested</td><td>Elevated in all of BH101-BH103.</td></tr><tr><td colspan="3">All other determinants were below the EQS limits, have no EQS limit, or were below the LODs.</td></tr></table> • These results might not be important in the EA's eyes and given the adjacent landfill, then (all of) the concentrations might not even derive from our site.	Determinants	Mayer 2018 Findings	Our 2023 Findings	Manganese	Elevated	Elevated	TPH	Elevated in BH101 & BH102	No elevated results in BH101-BH103	Cyanide	Elevated in BH104	BH104 not tested. Other results not elevated	Cadmium	Elevated in BH101	No elevated results in BH101-BH103	COD	Elevated in BH104	BH104 not tested. Other results not elevated	Ammoniacal Nitrogen	Not tested	Elevated in all of BH101-BH103.	All other determinants were below the EQS limits, have no EQS limit, or were below the LODs.		
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All other determinants were below the EQS limits, have no EQS limit, or were below the LODs.																									

This is only a summary and should not be read in isolation from the main text.

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1 Introduction

1.1 Introduction and Brief

AG Geo-Consultants Ltd (AGGC) were commissioned by and on behalf of *BKP Waste & Recycling Ltd* (the Client) to undertake a groundwater quality assessment as required by their environmental permit. This is a site known as BKP Waste, Casbrook Park, Timsbury, Romsey, SO51 0PG (the "Site").

The client requires an assessment of groundwater quality for their *environmental permit*.

1.2 Scope of Works

The Environment Agency required the following in relation to the site permits.

Periodic monitoring shall be carried out at least once every 5 years for groundwater, unless such monitoring is based on a systematic appraisal of the risk of contamination. If you have the ability to take groundwater samples, and compare to results from previous analysis, this should be continued at the frequency suggested in the permit condition.

Our proposed work scope, which was agreed with the client was:

- Visit site and sample groundwater from the wells.
- Undertake laboratory testing and report findings.

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1.3 Limitations

Until all invoices associated with the production of this report have been paid in full, then it remains the property of AGGC and not the client, and AGGC do not grant legal reliance upon it to satisfy (or remove) planning permission conditions, or to be used for engineering design, etc.

This report is provided for the benefit only of the party to whom it is addressed and their advisors. No other developer or party may use it without our express written permission (i.e. reassignment). We do not accept responsibility to any other third party for the whole or any part of the contents and we exercise no duty of care in relation to this report to any third party.

Where intrusive investigations have been completed, information, comments and opinions given in this report are based on the ground conditions encountered during the site work and on the results of laboratory and field tests performed during the investigation. However, subsoils are inherently variable and hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent in the data reviewed as part of this assessment. In particular, it should be noted that groundwater levels vary due to seasonal and other effects and may at times differ to those measured during the investigation.

This assessment has been based to some extent on data acquired from Third Parties. This data has been accepted as correct and has not been subjected to any additional validation.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any other regulatory authorities for approval.

2 Background Data

2.1 Previous Investigations

Four previous ground investigations have been undertaken on site as follows:

1. A **Ground Investigation Report for a Bunded Tank Storage Area, BKP Recycling, Romsey**, by Soil Safe, Ref SS0017G, Rev A, dated 29/04/21.
2. **Phase 1 Desk Study Report at Casbrook Park, Bunny Lane, Timsbury, Romsey, SO51 0PG**, by Meyer for BKP Waste & Recycling Ltd, Ref 73303.001, Dated 26/06/18. This is incorrectly titled and actually is also primarily a **geoenvironmental investigation**.

4no. cable percussion boreholes (BH101-104) and 9no. dynamic sample holes (WS101-109) were formed.
3. **Phase 2 Ground Investigation**, for BKP Waste, Casbrook Park, Timsbury, Romsey, by ourselves, 14th July 21. Ref. 21-027. 10no. dynamic sample holes (DS1-DS10) were formed.
4. **Upper Yard Baseline (soil) Contamination Investigation**, for BKP Waste, Casbrook Park, Timsbury, Romsey, by ourselves, 6th February 2023. Ref. 21-027/BL. 7o. dynamic sample holes (DS11-DS17) were formed.

As part of investigation (2), Mayer installed 4no. monitoring wells (BH101-BH104) and undertook chemical testing of the groundwater. Test results are contained in Appendix C.

During our investigation (3) we monitored groundwater levels in the Meyer wells (see Section 4).

As part of investigation (4) we installed a new well (DS17) which was to replace BH104 which was considered to be lost. DS17 was formed using a dynamic sampling rig and the hole terminated at 4.35m depth in natural very dense sands. At 4.35m depth, the well was therefore shallower than we had hoped and no groundwater flowed into the 4.35m deep hole during formation. During that investigation we found 3no. monitoring wells which were not from the above investigations. They have been called BHa, BHb and BHc.

All well locations are shown in Appendix A.

A historic water well exists on site with a log showing a structure to 5m depth and then "greensands" to 11m depth. It's location is currently unknown.

2.2 Site History

The history of the entire BKP site is important, because the historic landfill lying adjacent (and under the site) could cause the chemical concentrations in soils under the site, rather than the permitted site operations having caused such.

The entire BKP site is currently a (mostly) hard covered, waste management and recycling site. Historic landfills surround the site in all directions. The site history is:

The Entire BKP Site

Part of *Casbrook Common* until before 1942, when a small sand pit appears on the SW end of the site. By 1959 the site is much its current site/shape, but contains a pond in the very SW and further encroachment of sand quarrying into the NW edge of the site. The pond was infilled as were sand mined areas on site, and further buildings added over the years. The **upper yard** used to be a timber yard and some of the ground there contains much sawdust and wood waste.

In the Surroundings

Farmland and Casbrook Common until before 1942, whereupon 2 sand pits appear to the east. By 1959 most of the land to the east & to the NW is sand pits. Over the years these are all filled in (as landfill sites).

2.3 Hydrogeology & Hydrology

Watercourses: (Drainage?) Ditches appear to lie near /along the NE and NW site edges. A lake and stream lie 200-250m SE of the site. Another lake lies to the SW.

Aquifers: Secondary 'A' Aquifer.

3 Sampling & Testing

3.1 Monitoring

1no. visit was made to site on the 24th January 2023. Our well DS17 was found to be dry and Mayer well BH104 and the new BHa, could not be found by the technician. The locations of wells BHb and BHc have not been provided to us at the time of this report and so sampling from them was not achieved.

Water was therefore sampled from Meyer wells BH101, BH102 and BH103. Groundwater levels were measured, and results are contained in Section 4.

Groundwater samples were obtained using low flow techniques, for potential laboratory testing.

Our and Meyer's low flow sampling data is given in Appendix D.

3.2 Sample Collection and Laboratory Analysis

Samples obtained during the investigation were subjected to a range of chemical testing at appropriate UKAS accredited laboratories.

3no. groundwater samples were obtained from completed wells and were analysed for:

Table 3.1 Groundwater Sample Tests

Testing:	Number of Samples Tested
TPHCWG, speciated PAH, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, pH, Hardness, sulphate.	3
VOC target suite.	3
SVOC target suite.	3
Total phenols.	3
Chemical Oxygen Demand (COD).	3
Ammoniacal nitrogen.	3
Chloride.	3
Sulphur.	3
Sulphide.	3
Cyanide (total).	3
PCBs.	3

All water samples were collected using clean equipment and placed directly into clean containers provided by the laboratory.

The chemical laboratory test results are presented in Appendix B.

During the Meyer investigation, they tested for similar contaminants in BH101, BH102 and BH104 (see Appendix C).

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4 Groundwater

Groundwater observations to date are as follows:

Table 4.1 Groundwater Observations

	Approximate Ground Levels (mOD)							
	BH101	BH102	BH103	BH104	DS17	BHa	BHb	BHc
mOD=	36.2	34.7	38.5	40.3	40.1	?	?	?
	Water Depths (mbegl)[mOD]#							
Date	BH101	BH102	BH103	BH104	DS17	BHa	BHb	BHc
1 st June 2018	4.63 [31.57]	4.08 [30.62]	7.0 [31.5]	8.23 [32.07]	-	-	-	-
June 2022	5.5 [30.7]	5.0 [29.7]	4.0 ## [34.5]	6.5 [33.8]	-	-	-	-
24 th Jan 2023	4.36 [31.84]	3.59 [31.11]	6.7 [31.8]	Not found	Dry (>4.95) [<35.15]	Not found	#	#

#: the locations of these were not known until after the January 2023 monitoring.

##: this groundwater depth measurement appears to have incorrectly considered groundwater level to be higher than it actually was.

The above readings (ignoring ##) suggest groundwater flow directions of SSE, WSW and SSE, which makes the flow directions towards two separate off-site lakes.

5 Assessment of Contamination

5.1 Results

Groundwater samples have been collected from wells and tested for a range of contaminants.

Because the nearest critical receptor is a freshwater feature (rather than nearby abstractions from the underlying aquifer), then the results of groundwater tests are compared against the Environmental Quality Standards (EQS) for freshwater systems (from the Water Framework Directive) and EA publications, etc.

Table 5.1 AGGC Groundwater Results (Bold and/or highlight shows exceedances)

Analyte	Results Range	Freshwater EQS					
Hardness (mg/l)	1200 to 3400	-					
Arsenic (ug/l)	0.23 – 0.39	50					
Boron (ug/l)	130 -1000	-					
Barium (ug/l)	30 -130	-					
Beryllium (ug/l)	<1.0	-					
Cadmium (ug/l)	<0.11	≤0.08	0.08	0.09	0.15	0.25	
(Hardness=)	(***)	<40	40-<50	50-<100	100-<200	>=200	
Cobalt (ug/l)	1.5 - 2.2	-					
Chromium (total) (ug/l)	<0.5 – 0.74	3.4 (assumed CrVI)					
Copper (ug/l)	<0.5	1	6	10	28		
(Hardness=)	(***)	0-50	50-100	100-250	>250		
Manganese (ug/l)	200 - 1700	123 bioavailable					
Molybdenum (ug/l)	<0.2 – 1.8	-					
Nickel (ug/l)	3.7 - 15	20					
Lead (ug/l)	<0.5	7.2					
Antimony (ug/l)	<0.5	-					
Selenium (ug/l)	<0.5 – 0.57	-					
Tin (ug/l)	<0.5	-					
Vanadium (ug/l)	<0.5	-					
Zinc (ug/l)	<0.5 – 3.2	8	50	75	125		
(Hardness=)	(***)	0-50	50-100	100-250	>250		
Mercury (ug/l)	<0.01	0.05					
Benzene (ug/l)	<1	10					
Toulene (ug/l)	<1	50					
EthylBenzene (ug/l)	<1	20					
Xylene (ug/l)	<2	30					
MTBE (ug/l)	<1	-					
Total Petroleum Hydrocarbons (TPH)(mg/l)	<0.01	0.01					
Naphthalene (ug/l)	<0.01	2.4					
Acenaphthylene (ug/l)	<0.01	5.8					
Acenaphthene (ug/l)	<0.01	5.8					
Fluorene (ug/l)	<0.01	2.1					
Phenanthrene (ug/l)	<0.01	3					
Anthracene (ug/l)	<0.01	0.1					
Fluoranthene (ug/l)	<0.01	0.1					
Pyrene (ug/l)	<0.01	0.04					
Benzo(a)Anthracene (ug/l)	<0.01	0.018					

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Chrysene (ug/l)	<0.01	0.01
Benzo(b)fluoranthene (ug/l)	<0.01	0.03
Benzo(k)fluoranthene (ug/l)	<0.01	0.03
Benzo(a)Pyrene (ug/l)	<0.01	0.05
Indeno(123-cd)Pyrene (ug/l)	<0.01	0.002
Dibenzo(ah)Anthracene (ug/l)	<0.01	0.01
Benzo(ghi)Perylene (ug/l)	<0.01	0.002
Trichloroethene (ug/l)	<1	10
Tetrachloroethene (ug/l)	<1	10
1,1,1-Trichloroethane (ug/l)	<1	100
1,1,2-Trichloroethane (ug/l)	<10	400
Carbon tetrachloride (Tetrachloromethane)(ug/l)	<1	12
1,2-Dichloroethane	<2	10
Vinyl chloride (Chloroethene)(ug/l)	<1	-
Trihalomethanes	<3	-
Chloroform (Trichloromethane)(ug/l) (One of the trihalomethanes included above)	<1	2.5
All other VOCs	<LOD	-
All other SVOCs	<LOD	-
PCBs (ug/l)	<0.01	-
Phenol (ug/l)	<0.5	7.7
Cyanide (mg/l)	<0.05	0.001
Sulphate (mg/l)	43 - 200	400
Sulphur (mg/l)	14 - 67	-
Sulphide (mg/l)	<0.05	-
Chloride (mg/l)	36 - 580	-
COD (mg O ₂ /l)	44 - 52	125 and 250 #
Ammoniacal Nitrogen (mg/l)	0.86 - 14	0.26/0.39

LOD = limit of detection. #: compliance and maximum limits for wastewater treatment works discharges

Table 5.2 Meyer Groundwater Results (Bold and/or highlight shows exceedances)

Analyte	Results Range	Freshwater EQS					
Hardness (mg/l)	-	-					
Arsenic (ug/l)	0.4 - 0.7	50					
Boron (ug/l)	210 - 830	-					
Barium (ug/l)	-	-					
Beryllium (ug/l)	-	-					
Cadmium (ug/l) (Hardness=)	<0.02 – 0.3 (***)	≤0.08	0.08	0.09	0.15	0.25	
		<40	40-<50	50-<100	100-<200	>=200	
Cobalt (ug/l)	-	-					
Chromium (total) (ug/l)	0.5 – 1.2	3.4 (assumed CrVI)					
Copper (ug/l) (Hardness=)	2.7 – 4.5 (***)	1	6	10	28		
		0-50	50-100	100-250	>250		
Manganese (ug/l)	370 - 2700	123 bioavailable					
Molybdenum (ug/l)	-	-					
Nickel (ug/l)	5.7 - 17	20					
Lead (ug/l)	<0.2 – 0.5	7.2					
Antimony (ug/l)	-	-					
Selenium (ug/l)	1.6 – 7.2	-					
Tin (ug/l)	-	-					

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Vanadium (ug/l)	-	-
Zinc (ug/l)	3.3 - 34	8 50 75 125
(Hardness=)	(***)	0-50 50-100 100-250 >250
Mercury (ug/l)	<0.05	0.05
Benzene (ug/l)	<1	10
Toulene (ug/l)	<1	50
EthylBenzene (ug/l)	<1	20
Xylene (ug/l)	<1	30
MTBE (ug/l)	<1	-
Total Petroleum Hydrocarbons (TPH)(mg/l)	<0.02 -1.41	0.01
Naphthalene (ug/l)	<0.01	2.4
Acenaphthylene (ug/l)	<0.01	5.8
Acenaphthene (ug/l)	<0.01 – 0.28	5.8
Fluorene (ug/l)	<0.01- 0.43	2.1
Phenanthrene (ug/l)	<0.01	3
Anthracene (ug/l)	<0.01	0.1
Fluoranthene (ug/l)	<0.01	0.1
Pyrene (ug/l)	<0.01	0.04
Benzo(a)Anthracene (ug/l)	<0.01	0.018
Chrysene (ug/l)	<0.01	0.01
Benzo(b)fluoranthene (ug/l)	<0.01	0.03
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Dibenzo(ah)Anthracene (ug/l)	<0.01	0.01
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Trichloroethene (ug/l)	<1	10
Tetrachloroethene (ug/l)	<1	10
1,1,1-Trichloroethane (ug/l)	<1	100
1,1,2-Trichloroethane (ug/l)	<1	400
Carbon tetrachloride (Tetrachloromethane)(ug/l)	<1	12
1,2-Dichloroethane	<1	10
Vinyl chloride (Chloroethene)(ug/l)	<1	-
Trihalomethanes	<3	-
Chloroform (Trichloromethane)(ug/l) (One of the trihalomethanes included above)	<1	2.5
All other VOCs	<1	-
All other SVOCs	<LOD except some PAHs	
PCBs (ug/l)	<0.14	-
Phenol (ug/l)	<10	7.7
Cyanide (mg/l)	<0.001 – 0.037	0.001
Sulphate (mg/l)	41.9 - 276	400
Sulphur (mg/l)	-	-
Sulphide (mg/l)	<0.005	-
Chloride	-	-
COD (mg O2/l)	92 – 1200	125 and 250 #
Ammonia as NH3 (mg/l)	8.8-27.6	-

LOD = limit of detection.

#: compliance and maximum limits for wastewater treatment works discharges

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Both we and Mayer found **Manganese concentrations** to be elevated above the considered 123ug/l limit. This might not be important in the EA's eyes and given the adjacent landfill, the concentrations might not even derive from our site.

In 2018 Mayer found **TPH concentrations** in BH101 and BH102 that exceeded the EQS limits. Our 2023 testing found no elevated TPH.

Similarly, Mayer found **Cyanide concentrations** in BH104 that exceeded the EQS limits. Our 2023 testing found no elevated cyanide (albeit we did not locate and test water from BH104).

The Mayer failed to test groundwater hardness and so the EQS limit for **Cadmium** is unknown. Looking at our hardness test results, then the Cadmium EQS is likely to be 0.25ug/l, which was exceeded in BH101 with a result of 0.3ug/l. Our 2023 testing found no elevated Cadmium.

Mayer found **COD concentrations** in BH104 that exceeded the EQS limits. Our 2023 testing found no elevated COD (albeit we did not locate and test water from BH104).

Mayer tested for Ammonia as NH₃, but there is no EQS limit for such. We tested for **Ammoniacal Nitrogen** and all 3no. results were elevated above the EQS limits. These results will be due entirely to the adjacent landfill materials and not made ground under, nor chemicals processed by, our site.

Some of the testing had LODs that were higher than the EQS limits. It is assumed that results for those determinants are not significant.

Given the adjacent landfill, then all of the elevated concentrations **might not even derive from our site**.

5.2 Conclusion

The results are summarised as follows.

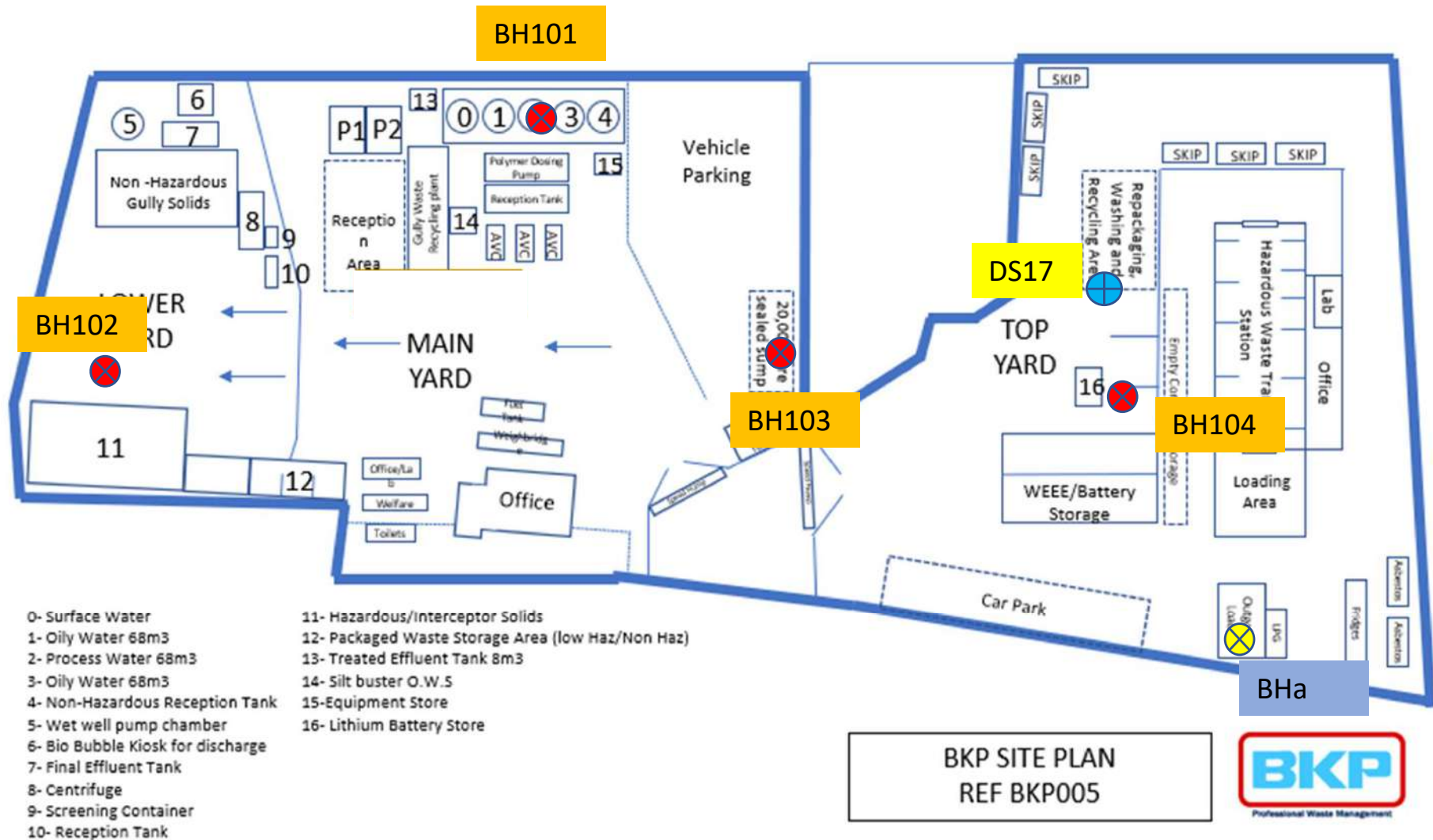
Determinants	Mayer 2018 Findings	Our 2023 Findings
Manganese	Elevated	Elevated
TPH	Elevated in BH101 & BH102	No elevated results in BH101-BH103
Cyanide	Elevated in BH104	BH104 not tested. Other results not elevated
Cadmium	Elevated in BH101	No elevated results in BH101-BH103
COD	Elevated in BH104	BH104 not tested. Other results not elevated
Ammoniacal Nitrogen	Not tested	Elevated in all of BH101-BH103.
All other determinants were below the EQS limits, have no EQS limit, or were below the LODs.		

These results might not be important in the EA's eyes and given the adjacent landfill, then (all of) the concentrations might not even derive from our site.

Appendices

- A. Monitoring Well Locations
- B. AGGC Chemical Laboratory Results
- C. Meyer's Chemical Laboratory Results
- D. AGGC & Meyer Low Flow Sampling Parameters

Appendix A



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Appendix B



Amended Report

Report No.:	23-02442-2		
Initial Date of Issue:	03-Feb-2023	Date of Re-Issue:	09-Feb-2023
Client	AG Geo-Consultants Ltd		
Client Address:	58 Church Road Bishopton Bristol BS7 8SE		
Contact(s):	Andre Gilleard		
Project	BKP Romsey		
Quotation No.:	Q23-29893	Date Received:	26-Jan-2023
Order No.:		Date Instructed:	26-Jan-2023
No. of Samples:	3		
Turnaround (Wkdays):	11	Results Due:	09-Feb-2023
Date Approved:	09-Feb-2023		
Approved By:			

Details: Stuart Henderson, Technical Manager

Results - Water

Project: BKP Romsey

Client: AG Geo-Consultants Ltd	Chemtest Job No.:				23-02442	23-02442	23-02442
Quotation No.: Q23-29893	Chemtest Sample ID.:				1579894	1579895	1579896
	Sample Location:				BH101	BH102	BH103
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				4.36	3.59	6.70
	Bottom Depth (m):				8.71	7.37	8.00
	Date Sampled:				24-Jan-2023	24-Jan-2023	24-Jan-2023
	Time Sampled:				13:45	12:15	10:22
Determinand	Accred.	SOP	Units	LOD			
pH	U	1010		N/A	6.4	6.5	6.7
Chemical Oxygen Demand	U	1100	mg O2/l	10	44	52	48
Chloride	U	1220	mg/l	1.0	66	580	36
Ammoniacal Nitrogen	U	1220	mg/l	0.050	5.4	14	0.86
Sulphur	N	1220	mg/l	1.0	20	67	14
Sulphate	U	1220	mg/l	1.0	59	200	43
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Sulphide	U	1325	mg/l	0.050	< 0.050	< 0.050	< 0.050
Total Hardness as CaCO3	U	1270	mg/l	15	1800	3400	1200
Arsenic (Dissolved)	U	1455	µg/l	0.20	0.35	0.23	0.39
Boron (Dissolved)	U	1455	µg/l	10.0	250	1000	130
Barium (Dissolved)	U	1455	µg/l	5.00	130	110	30
Beryllium (Dissolved)	U	1455	µg/l	1.00	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Cobalt (Dissolved)	U	1455	µg/l	0.50	1.8	2.2	1.5
Chromium (Dissolved)	U	1455	µg/l	0.50	0.54	< 0.50	0.74
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Manganese (Dissolved)	U	1455	µg/l	0.50	720	1700	200
Molybdenum (Dissolved)	U	1455	µg/l	0.20	0.36	1.8	< 0.20
Nickel (Dissolved)	U	1455	µg/l	0.50	5.2	15	3.7
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Antimony (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	0.57
Tin (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Vanadium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	µg/l	2.5	3.2	< 2.5	< 2.5
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: BKP Romsey

Client: AG Geo-Consultants Ltd	Chemtest Job No.:				23-02442	23-02442	23-02442
Quotation No.: Q23-29893	Chemtest Sample ID.:				1579894	1579895	1579896
	Sample Location:				BH101	BH102	BH103
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				4.36	3.59	6.70
	Bottom Depth (m):				8.71	7.37	8.00
	Date Sampled:				24-Jan-2023	24-Jan-2023	24-Jan-2023
	Time Sampled:				13:45	12:15	10:22
Determinand	Accred.	SOP	Units	LOD			
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: BKP Romsey

Client: AG Geo-Consultants Ltd	Chemtest Job No.:				23-02442	23-02442	23-02442
Quotation No.: Q23-29893	Chemtest Sample ID.:				1579894	1579895	1579896
	Sample Location:				BH101	BH102	BH103
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				4.36	3.59	6.70
	Bottom Depth (m):				8.71	7.37	8.00
	Date Sampled:				24-Jan-2023	24-Jan-2023	24-Jan-2023
	Time Sampled:				13:45	12:15	10:22
Determinand	Accred.	SOP	Units	LOD			
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: BKP Romsey

Client: AG Geo-Consultants Ltd	Chemtest Job No.:				23-02442	23-02442	23-02442
Quotation No.: Q23-29893	Chemtest Sample ID.:				1579894	1579895	1579896
	Sample Location:				BH101	BH102	BH103
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				4.36	3.59	6.70
	Bottom Depth (m):				8.71	7.37	8.00
	Date Sampled:				24-Jan-2023	24-Jan-2023	24-Jan-2023
	Time Sampled:				13:45	12:15	10:22
Determinand	Accred.	SOP	Units	LOD			
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010

Results - Water

Project: BKP Romsey

Client: AG Geo-Consultants Ltd	Chemtest Job No.:				23-02442	23-02442	23-02442
Quotation No.: Q23-29893	Chemtest Sample ID.:				1579894	1579895	1579896
	Sample Location:				BH101	BH102	BH103
	Sample Type:				WATER	WATER	WATER
	Top Depth (m):				4.36	3.59	6.70
	Bottom Depth (m):				8.71	7.37	8.00
	Date Sampled:				24-Jan-2023	24-Jan-2023	24-Jan-2023
	Time Sampled:				13:45	12:15	10:22
Determinand	Accred.	SOP	Units	LOD			
Fluorene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010	< 0.010	< 0.010
Total Of 16 PAH's	N	1800	µg/l	0.20	< 0.20	< 0.20	< 0.20
PCB 28	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 52	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 118	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 153	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 138	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 180	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easily liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N-dimethyl-p-phenylenediamine.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1460	Mercury low-level in Waters by AFS	Mercury	Atomic Fluorescence Spectrometry, with collimated UV source, wavelength 253.7 nm.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44 Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com

AG Geo-Consultants Ltd

Appendix C



James Cooper
Mayer Environmental
Transport Avenue
Brentford
Middlesex
TW8 9HA

t: 020 8847 3637
f: 020 8847 3638
e: Mayer

i2 Analytical Ltd,
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-87596

Project / Site name:	BKP Waste and Recycling (01.06.18)	Samples received on:	04/06/2018
Your job number:	73303.001	Samples instructed on:	04/06/2018
Your order number:	017245	Analysis completed by:	11/06/2018
Report Issue Number:	1	Report issued on:	11/06/2018
Samples Analysed:	3 water samples		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.



Analytical Report Number: 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Your Order No: 017245

Lab Sample Number				973427	973428	973429		
Sample Reference				BH101	BH102	BH104		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/06/2018	01/06/2018	01/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	6.5	6.7	6.7		
Electrical Conductivity at 20 °C	µS/cm	10	ISO 17025	1100	4300	2100		
Total Cyanide (Low Level)	mg/l	0.001	ISO 17025	< 0.001	< 0.001	0.037		
Sulphate as SO ₄	mg/l	0.045	ISO 17025	47.0	276	41.9		
Sulphide	mg/l	0.005	NONE	< 0.005	< 0.005	< 0.005		
Total Phosphate as P	mg/l	0.02	ISO 17025	0.17	< 0.02	0.03		
Ammonia as NH ₃	mg/l	0.015	ISO 17025	8.838	19.06	27.65		
Nitrate as N	mg/l	0.01	ISO 17025	0.14	0.13	0.94		
Nitrate as NO ₃	mg/l	0.05	ISO 17025	0.64	0.59	4.16		
Alkalinity	mgCaCO ₃ /l	3	ISO 17025	640	900	900		
Chemical Oxygen Demand (Total)	mg/l	2	ISO 17025	150	92	1200		

Total Phenols

Total Phenols (monohydric)	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010		
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	0.28	< 0.01		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	0.43	< 0.01		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	0.71	< 0.16		
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Heavy Metals / Metalloids

Arsenic (dissolved)	mg/l	0.00015	ISO 17025	0.0004	0.0005	0.0007		
Boron (dissolved)	mg/l	0.01	ISO 17025	0.21	0.83	0.22		
Cadmium (dissolved)	mg/l	0.00002	ISO 17025	0.0003	< 0.00002	0.00005		
Chromium (dissolved)	mg/l	0.0002	ISO 17025	0.0012	0.0005	0.0009		
Copper (dissolved)	mg/l	0.0005	ISO 17025	0.0027	0.0045	0.0037		
Iron (dissolved)	mg/l	0.004	ISO 17025	3.4	1.2	0.18		
Lead (dissolved)	mg/l	0.0002	ISO 17025	0.0003	< 0.0002	0.0005		
Manganese (dissolved)	mg/l	0.00005	ISO 17025	2.5	2.7	0.37		
Mercury (dissolved)	mg/l	0.00005	ISO 17025	< 0.00005	< 0.00005	< 0.00005		
Nickel (dissolved)	mg/l	0.0005	ISO 17025	0.017	0.013	0.0057		
Selenium (dissolved)	mg/l	0.0006	ISO 17025	0.0016	0.0072	0.0037		
Zinc (dissolved)	mg/l	0.0005	ISO 17025	0.034	0.0085	0.0033		



Analytical Report Number: 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Your Order No: 017245

Lab Sample Number				973427	973428	973429		
Sample Reference				BH101	BH102	BH104		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/06/2018	01/06/2018	01/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	140	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	150	190	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	1300	220	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	1400	540	< 10		

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	35	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	41	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	86	< 10		



Analytical Report Number: 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Your Order No: 017245

Lab Sample Number				973427	973428	973429		
Sample Reference				BH101	BH102	BH104		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/06/2018	01/06/2018	01/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Vinyl Chloride	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
Trichlorofluoromethane	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
1,1-Dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p & m-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Tri bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
o-Xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
n-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,3-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,4-Dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Hexachlorobutadiene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		



Analytical Report Number: 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Your Order No: 017245

Lab Sample Number				973427	973428	973429		
Sample Reference				BH101	BH102	BH104		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/06/2018	01/06/2018	01/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	0.28	< 0.01		
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Fluorene	µg/l	0.01	ISO 17025	< 0.01	0.43	< 0.01		
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Hexachlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01		



Analytical Report Number: 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Your Order No: 017245

Lab Sample Number				973427	973428	973429		
Sample Reference				BH101	BH102	BH104		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/06/2018	01/06/2018	01/06/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

PCBs by GC-MS

PCB Congener 28	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 52	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 101	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 118	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 138	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 153	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		
PCB Congener 180	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02		

PCBs by GC-MS

Total PCBs	µg/l	0.14	NONE	< 0.14	< 0.14	< 0.14		
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Alkalinity in Water	Determination of Alkalinity by discrete analyser (colorimetry). Accredited matrices: SW, PW, GW.	In house method based on MEWAM & USEPA Method 310.2.	L082-PL	W	ISO 17025
Ammonia as NH ₃ in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chemical Oxygen Demand in Water (Total)	Determination of total COD in water by reflux oxidation with acidified K ₂ Cr ₂ O ₇ followed by colorimetry. Accredited matrices: SW, PW, GW.	HACH DR/890 Colorimeter Procedures Manual (48470-22) (Ref 0170.2)	L065-PL	W	ISO 17025
Electrical conductivity at 20°C of water	Determination of electrical conductivity in water by electrometric measurement. Accredited Matrices SW, GW, PW	In-house method	L031-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewater & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
PCB's By GC-MS in water	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L028-PL	W	NONE
pH at 20°C in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in leachate by extraction in dichloromethane followed by GC-MS.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

Iss No 18-87596-1 BKP Waste and Recycling (01.06.18) 73303.001

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The results included within the report are representative of the samples submitted for analysis.

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Analytical Report Number : 18-87596

Project / Site name: BKP Waste and Recycling (01.06.18)

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphide in water in mg l	Determination of sulphide in water by ion selective electrode.	In-house method	L029-PL	W	NONE
Total Phosphate as P in water	Determination of ortho phosphate in water by addition of ammonium molybdate, potassium antimonyl tartrate and ascorbic acid followed by colorimetry. Accredited matrices: SW, PW, GW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref
BH101		W	18-87596	973427	c	Ammonia as NH3 in water	L082-PL
BH101		W	18-87596	973427	c	Ammoniacal Nitrogen as N in water	L082-PL
BH101		W	18-87596	973427	c	Electrical conductivity at 20oC of water	L031-PL
BH101		W	18-87596	973427	c	pH at 20oC in water (automated)	L099-PL
BH102		W	18-87596	973428	c	Ammonia as NH3 in water	L082-PL
BH102		W	18-87596	973428	c	Ammoniacal Nitrogen as N in water	L082-PL
BH102		W	18-87596	973428	c	Electrical conductivity at 20oC of water	L031-PL
BH102		W	18-87596	973428	c	pH at 20oC in water (automated)	L099-PL
BH104		W	18-87596	973429	c	Ammonia as NH3 in water	L082-PL
BH104		W	18-87596	973429	c	Ammoniacal Nitrogen as N in water	L082-PL
BH104		W	18-87596	973429	c	Electrical conductivity at 20oC of water	L031-PL
BH104		W	18-87596	973429	c	pH at 20oC in water (automated)	L099-PL

Test Deviation code
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AG Geo-Consultants Ltd

Appendix D

SUMMARY OF GROUNDWATER MONITORING RESULTS

Client : GRG
Report Date : June 2018
Job Details : Baseline Ground Investigation

Our Ref : 73303.001
Page : 1 of 1

Sample Reference:				BH101	BH102	BH103	BH104
Date Monitored:				01.06.18	01.06.18	01.06.18	01.06.18
Parameter	Units	Method	LOD				
Initial Groundwater Level	m bgl		0.01	4.63	4.08	7.00	8.23
Depth of Well	m bgl		0.01	8.77	7.73	8.00	8.77
Groundwater Level Corrected for AOD	m		0.01	35.23	34.98	36.36	34.93
pH	pH units	Probe	0.01 (+/- 0.1*)	6.33	6.60	NR	NR
Temperature (T)	°C	Probe	0.1 (+/- 0.5*)	13.47	13.54	NR	NR
Electrical Conductivity (EC)	µs/cm	Probe	0.01 (+/- 3 %*)	1,312.10	5,153.30	NR	NR
Oxygen Reduction Potential (ORP)	mV	Probe	1 (+/- 10*)	-22.8	-48.2	NR	NR
Rugged Dissolved Oxygen (RDO)	mg/l	Probe	0.01 (+/- 0.3*)	1.88	0.66	NR	NR
Time Interval Between Probe Readings†	seconds		1.0	71	104	NR	NR
Number of Probe Readings			1.0	12	6	NR	NR
Comments	-		-	Yellowish brown. Low to moderate sediment. Turbid.	Yellowish brown. Low to moderate sediment. Turbid.	Could not remove monitoring well cover.	Yellow silty/sandy high sediment. Turbid.
Sample Collected	-		-	Yes [1]	Yes [1]	Yes [1]	Yes [1]
Approximate Volume Purged Before Sampling	litres		-	3.124	1.2875	NR	0
Approximate Final Flow Rate	litres/minute		0.10	0.24	0.15	NR	NR
Approximate Length of HDPE Tube‡	m		0.10	7	6	NR	NR
Approximate Depth of HDPE Tube Intake	m bgl		0.10	7	6	NR	NR
Final Groundwater Level	m bgl		0.10	4.86	4.18	NR	NR
Total Drawdown of Groundwater in Well	cm		0.10	0.23	0.10	NR	NR
Plain Piping Installation (top to bottom)	m bgl		0.10	0-6	0-5	0-5	0-7
Slotted Piping Installation (top to bottom)	m bgl		0.10	6-9	5-8	5-8	7-9
Screen Length of Well	m		0.10	3	3	3	2

LOD limit of detection m bgl metres below ground level *Stabilisation limits

pH, T, EC, ORP and RDO readings recorded using a smarTROLL™ MP probe (serial no. 495431) and 90ml flow through cell. Samples collected once three consecutive probe readings of all five parameters had stabilised.

†The time interval between probe readings is calculated as the turnover of the total system based on the pumping rate ((volume of flow through cell + volume of HDPE tube) / approximate flow rate).

Monitoring wells purged and sampled using a peristaltic pump. ‡Inner diameter of HDPE tube: 0.6cm

[1] 2 x 300ml glass bottles. 2 x 40ml glass vials [2] Parameter did not stabilise within the stabilisation limits

[3] Water sample collected using a bailer due to minimal water within the well. Groundwater was not purged prior to sampling.



Groundwater Monitoring

Sampling Record Sheet

CLIENT AG Geo Consultants
 DATE 24/01/2023
 WEATHER Overcast then sunny

SITE BKP Romsey
 TIME On: 09:45 Off: 15:00
 MONITORING PERSONNEL Hazel Alabaster

Monitoring Location	Time	DTL m	DTB m	End m	EC mS/cm	Temp C	pH	Purge Volume L	Odour description	Sediment description	Oil/grease visible	Colour description	Turbidity description	Comments
BH101	13:45:00	4.36	8.71	4.4	1070.7	12.22	5.44	3	None	Low	None	Yellow/brown	Medium	
BH102	12:15:00	3.59	7.37	3.68	2737.4	11.38	5.71	3.5	None	Medium	None	Grey/clear	High	
BH103	10:22:00	6.7	8	6.72	733.0	9.86	5.16	2	None	Low	None	Yellow	Medium	
BH104	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Could not locate so not monitored or sampled
BHA	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Could not locate so not monitored or sampled
DS17	10:13:00	Dry	4.95	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	No sample taken as borehole dry