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IP 0001/12

GREEN SKIP SERVICES LTD

BASELINE MONITORING METHOD STATEMENT

Version 3: September 2017

Report Reference:

En-Sure Ltd, 2017. IP 0001/12: Green Skip Services Ltd: Baseline Monitoring Method Statement (Version number: 3). San Gwann, September 2017; vi + 63 pp. + 3 Appendices.

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Quality Assurance

Green Skip Services Ltd
Baseline Monitoring Method Statement
September 2017

Report for: Green Skip Services ltd

Revision Schedule

Rev	Date	Details	Prepared by	Reviewed by	Approved by
00	May 2017	Submission to client	**Rachel Decelis** Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
01	May 2017	Submission to ERA	**Rachel Decelis** Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director
02	Sept. 2017	Updated following feedback from ERA	**Rachel Decelis** Consultant	**Rachel Xuereb** Director	**Adrian Mallia** Managing Director

File ref: \\Adi-fs1\en-sure_Completed Projects\Contamination studies\Monitoring\ES_GSK002 - Greenskips land contamination MS\Method Statement\Method Statement FNL_FNL.docx

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CONTENTS

FIGURES

TABLES

APPENDICES

METHOD STATEMENT

Introduction

1. This method statement outlines the proposed methodology for baseline monitoring at Green Skips Services Ltd, as requested by the Environment and Resources Authority (ERA) as part of the IPPC application for the facility (IP 0001/12). Green Skips Services Ltd is hereinafter referred to as the "Applicant".

2. The facility, hereinafter referred to as the "Scheme", comprises a waste management facility for the storage and processing of inert, non-hazardous and hazardous waste. The site, located at Magħtab l/o Naxxar (**Figure 1**) has been in operation since around 1997. It is currently regulated by Environmental Permits WM004/07 and WM003/07. The Applicant has applied for an IPPC permit with ERA, which would replace these Environmental Permits.

Terms of Reference

3. Section B.1.4.1 of the IPPC application form requires the submission of:

> *A site report, providing a history of the site (including current and past uses) and describing the condition of the site of that part of the installation in respect of which you are applying for a permit, and, in particular, identifying any substance in, on or under the land which may constitute a pollution risk. A baseline report assessing the state of the groundwater and land may also be required by the Authority.*

4. In respect of the baseline report, the requirements in the Industrial Emissions (Integrated Pollution Prevention and Control) Regulations (Legal Notice 10 of 2013 as amended, S.L. 549.77) apply:

> *Regulation 5 (1): An application for a permit shall include a description of the following:*
>
> *(d) the conditions of the site of the installation;*
>
> *(e) where applicable, a baseline report in accordance with regulation 16(2);*
>
> *Regulation 16 (2): Where the activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013.*

The baseline report shall contain the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for under sub-regulation (3).

The baseline report shall contain at least the following information:

(a) information on the present use and, where available, on past uses of the site;

(b) where available, existing information on soil and groundwater measurements that reflect the state at the time the report is drawn up or, alternatively, new soil and groundwater measurements having regard to the possibility of soil and groundwater contamination by those hazardous substances to be used, produced or released by the installation concerned.

Where information produced pursuant to other national or European Union law fulfils the requirements of this sub-regulation, that information may be included in, or attached to, the submitted baseline report.

In the preparation of the baseline report, the operator shall take into account any guidance published by the European Commission on the content of the baseline report.

(3) (a) Upon definitive cessation of the activities, the operator shall assess the state of soil and groundwater contamination by relevant hazardous substances used, produced or released by the installation. Where the installation has caused significant pollution of soil or groundwater by relevant hazardous substances compared to the state established in the baseline report referred to in sub-regulation (2), the operator shall take the necessary measures to address that pollution so as to return the site to that state. For that purpose, the technical feasibility of such measures may be taken into account.

(b) Without prejudice to paragraph (a), upon definitive cessation of the activities, and where the contamination of soil and groundwater at the site poses a significant risk to human health or the environment as a result of the permitted activities carried out by the operator before the permit for the installation is updated for the first time after 7 January 2013 and taking into account the conditions of the site of the installation established in accordance with regulation 5(1)(d), the operator shall take the necessary actions aimed at the removal, control, containment or reduction of relevant hazardous substances, so that the site,

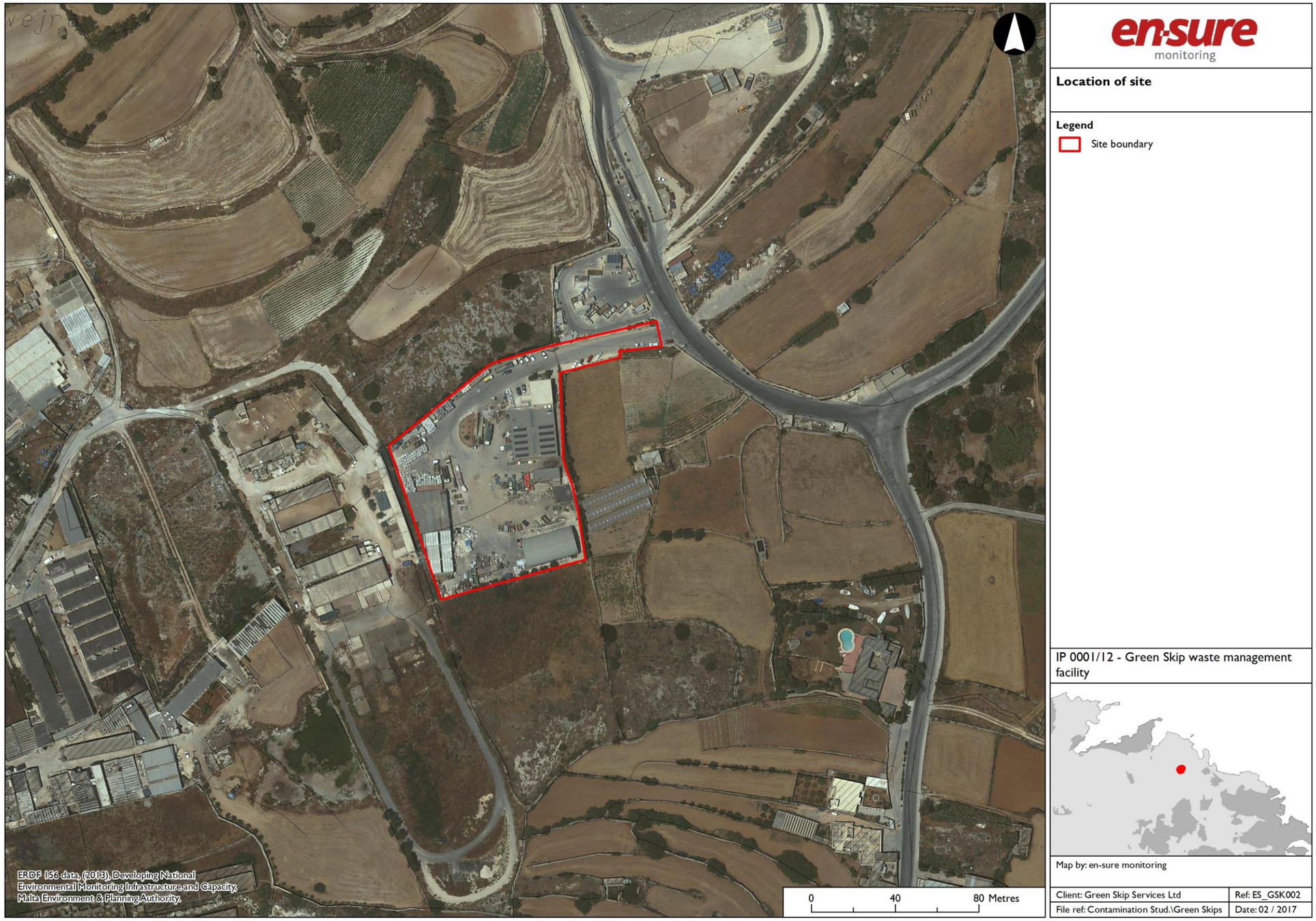
taking into account its current or approved future use, ceases to pose such a risk.

5. In October 2016, ERA also provided the following feedback on the IPPC application:

> *During the initial review of the IPPC application, the operator had been informed that a baseline report would be required as part of the IPPC permit. In view of the site history and recently issued European Guidance under the IED (attached), a baseline report for land and groundwater assessment is immediately required.*

6. The European Commission guidance on preparing baseline reports referred to in ERA's communication is Communication 2014/C 136/03.

Figure 1: Site location



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Description of the Site and the Surroundings

Location

7. The Scheme site covers an area of approximately 7,800 m^2 (this area includes a 1 m buffer for landscaping around the site) and is located in Ta' l-Imriekeb, Ramla Road, Magħtab l/o Naxxar, as shown in **Figure 1**.

History

8. The history of the Scheme site and its surroundings has been obtained through a review of available documentation, information provided by the Applicant, and a site visit held on 25th April 2017.

9. The survey sheet for the area (early 1900s) shows the Scheme site and its surroundings as agricultural / garrigue and largely unbuilt.

10. The 1957 and 1967 aerial photos also show the Scheme site and its surroundings as largely agricultural.

11. The Scheme site is seen to still be agricultural in the 1978 aerial photo, however, an area north of the site is seen to be disturbed; this area corresponds to the Magħtab dump, which was in operation from 1977[1] to 2004[2]. The Magħtab dump used to accept all of Malta's wastes (including hazardous waste[3]) and was not engineered.

12. The 1988 aerial photo (**Figure 2**) shows the Scheme site as still being agricultural; in addition to the Magħtab dump, terraced fields are seen to the north of the site, and buildings had been constructed to the west and south of the Scheme site by this time. The 1994 aerial photo shows a similar scenario.

13. The Environmental Planning Statement (EPS) prepared for the Scheme in 1996[4] (prior to construction of the Scheme) states that at the time most of the site was covered by bare earth, with intermittent large quantities of stone rubble and other waste. The EPS also notes that the site was being used as a parking area for refuse tipping containers (skips) and vehicles, and dumping of waste on the ground (including black bags, construction rubble and industrial waste) was also noted at the time. There was also one agricultural field within the site boundary.

14. The original planning permit for the Scheme site (PA 04322/94: *Development of site into a service yard for re-cycling, reclamation of waste and related facilities such as offices, maintenance workshops etc.*) was granted in 1996, and the Scheme

[1] Environment Protection Department *State of the Environment Report 1998* https://www.mepa.org.mt/soer1998.
[2] MEPA *The Environment Report 2008* https://www.mepa.org.mt/ter.
[3] The SOER, for instance, mentions lead-acid batteries, electro-plating slurries, and iron and metal from the Drydocks.
[4] Rust Environmental & Advanced Industrial Systems Ltd (1996) *Maghtab Sorting Yard: Environmental Planning Statement (Final Report).*

started operation in late 1997 / early 1998. An aerial photo of the site and its surroundings from 1998 is shown in **Figure 3**.

15. The Applicant reports that originally only skips were accepted at the Scheme site, containing mixed waste from industry and households; such waste would typically be non-hazardous.

16. Around 2004, the Scheme site started accepting hazardous waste; the Applicant reports that this was stored inside the hazardous waste sheds prior to removal from site. The shed floors were already concreted at the time; historic aerial photos also indicate that three of the sheds had been roofed by 2008, and that the remaining three sheds had been roofed by 2012.

17. The aerial photo from 2004 shows the entrance to the Magħtab waste management complex close to the Scheme site. Within the Magħtab complex, the Żwejra engineered waste storage facility for the disposal of municipal solid waste largely operated from 2004 to 2006[5], replacing the former Magħtab dump. The Żwejra facility was then largely replaced by the Għallis engineered landfill for the disposal of non-hazardous, non-inert and municipal solid waste. Both sites are regulated by IPPC permits (IP 0001/05/B and IP 0001/06/B), which also control the nature of the waste permitted to enter the site and the management of landfill gases, which are treated using flares or combusted in a combined heat and power (CHP) plant, with emissions being monitored[5].

18. Following its closure, the Magħtab dump was rehabilitated through the installation of a Regenerative Thermal Oxidiser (RTO) to treat most of the gases generated, and a Reverse Osmosis (RO) plant to treat contaminated water; emissions to air from the RTO are monitored, and treated second-class water from the RO plant is used for irrigation and dust suppression on site. The slopes were then capped and the dumpsite planted, a water culvert and a water reservoir were constructed, and silt ponds and reed beds were formed to collect and polish rain water[5].

19. The 2008 photo shows a similar scenario to the previous one; the Magħtab Civic Amenity site (adjoining the northeastern boundary of the Scheme site) had also started operations by then[2]. The Civic Amenity site accepts bulky household waste, domestic hazardous waste and recyclable materials for temporary segregated storage, and is regulated by Environmental Permit EP 006/09/E (first issued in 2007). Amongst others, the permit addresses site containment and requires that all liquid waste be stored in bunded areas.

20. The Malta North Mechanical and Biological Treatment Plant was also commissioned in 2016[5] as part of the Magħtab waste management complex, and aims to treat household municipal solid waste, bulky waste (both household and commercial) and animal manure.

[5] Wasteserv *Maghtab Environmental Complex* https://www.wasteservmalta.com/maghtab.

Surrounding Land Uses

21. The current land uses covering an area of approximately 250 m around the Scheme site are shown in **Figure 4**.

Figure 2: 1988 aerial photo

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1988 aerial photo

Legend

Site boundary

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 02 / 2017

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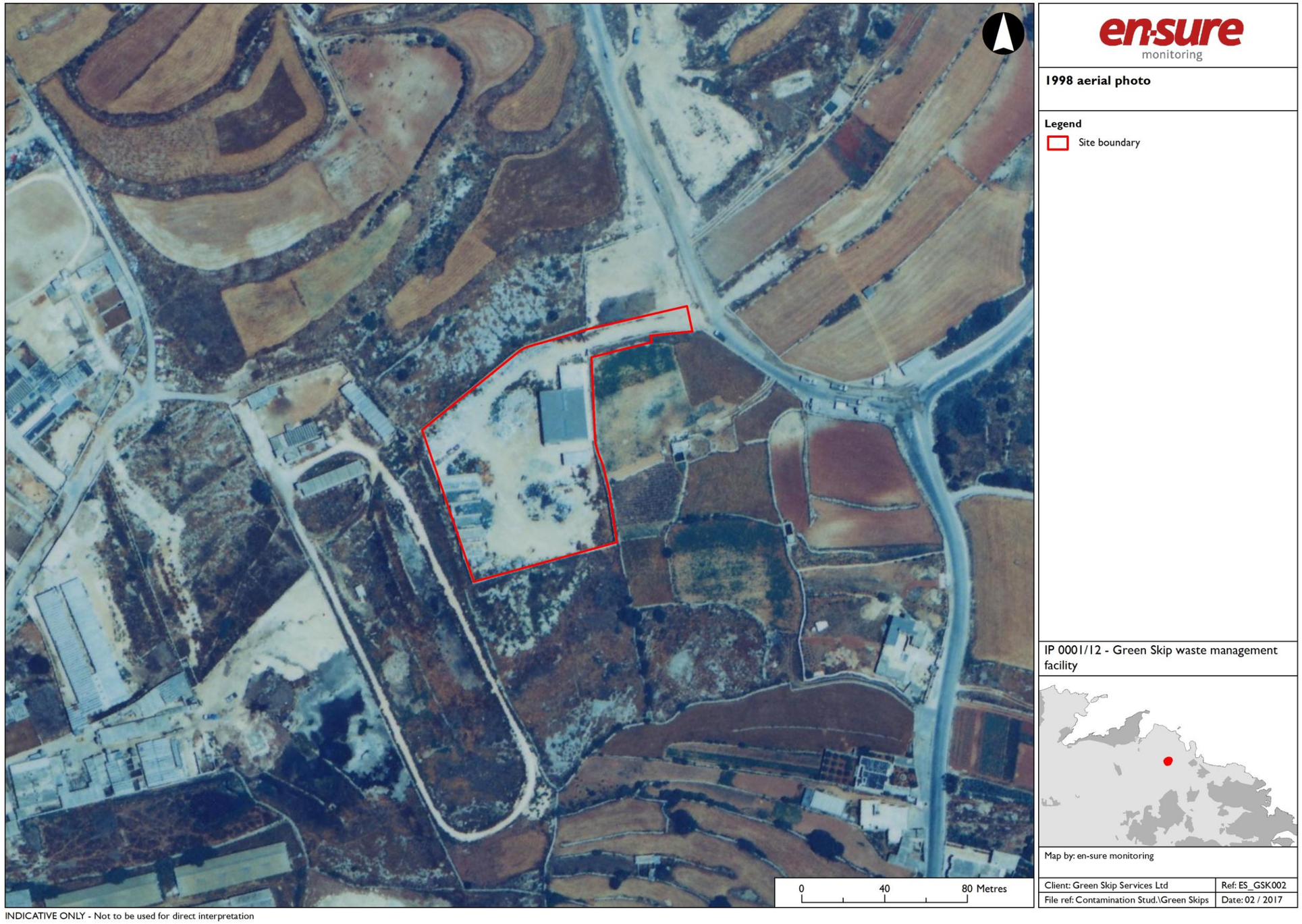
Figure 3: 1998 aerial photo



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1998 aerial photo

Legend

Site boundary

IP 0001/12 - Green Skip waste management facility

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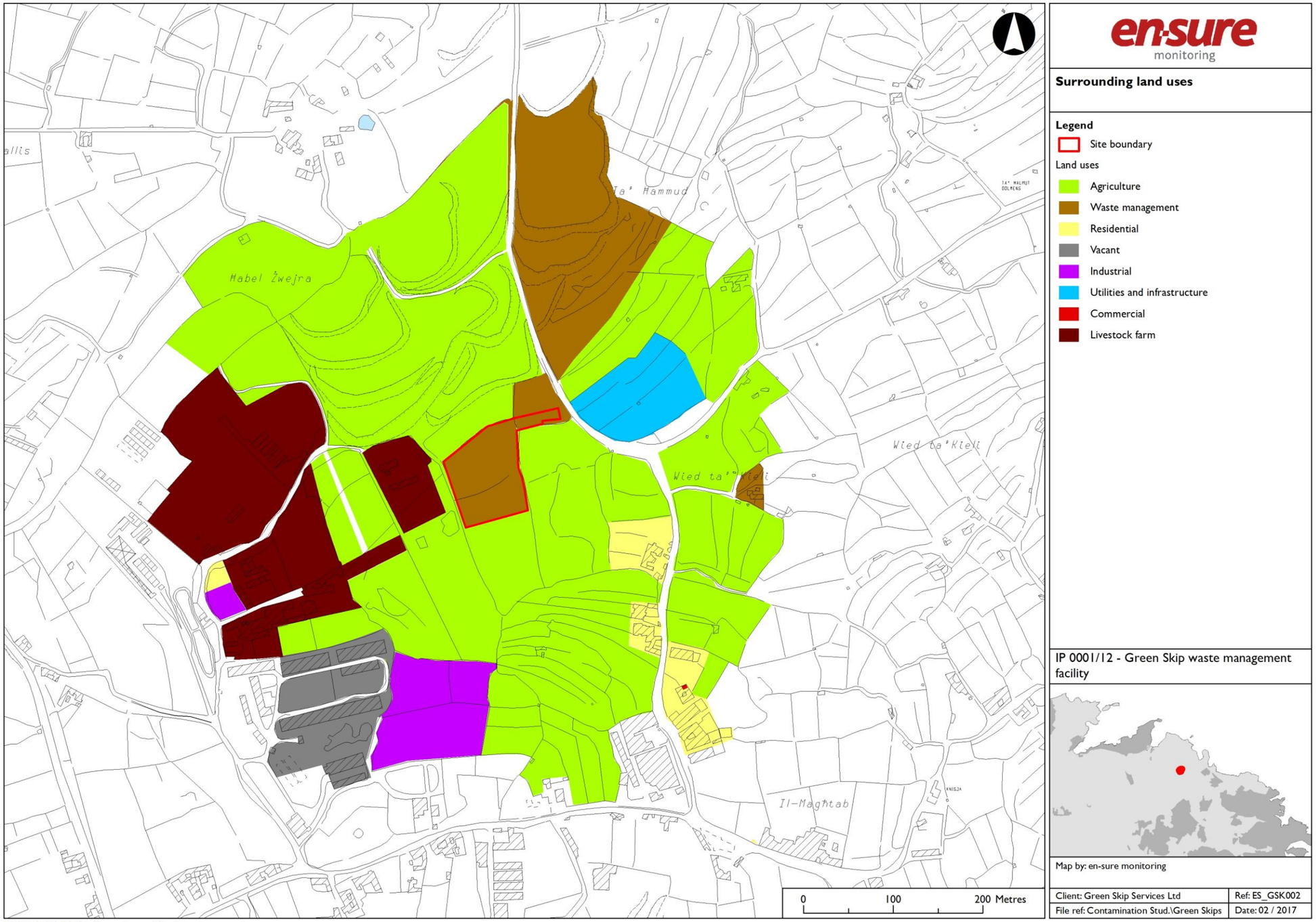
Figure 4: Surrounding land uses



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22. The predominant land uses in the surrounding area are agricultural (**Figure 5**) and livestock farming.

Figure 5: Agricultural land

23. The Magħtab Environmental Complex (a waste management facility including landfills and a mechanical-biological treatment plant; **Figure 6**) and other waste management facilities (including the WasteServ Civic amenity site; **Figure 7**) are found to the north and east of the site.

Figure 6: Magħtab Environmental Complex

Figure 7: Civic amenity site

24. The Maghtab Terminal Station for the electricity interconnector link to Sicily is located to the east of the Scheme site.

25. There are also some industrial uses (construction and vehicle storage) in the area.

Description of the Scheme

26. The current layout of the Scheme is shown in **Figure 8**. A detailed description of the activities on site (including mitigation) is included in the IPPC application submitted for the Scheme; these are summarised below.

Incoming Waste

27. The Scheme is authorised to receive a range of waste, both non-hazardous and hazardous, as shown in **Appendix 1**. However, the wastes typically accepted can be grouped in the categories shown in **Table 1**.

Table 1: Typical wastes accepted

Non-hazardous / inert	Hazardous
Paper and cardboard	Chemical and industrial waste, including solvents, chemicals and sludges
Glass	Oil sludges
Wood	Laboratory chemicals
Metal	Expired medicines
Plastics	Cytotoxic waste
Mixed waste	Batteries and accumulators
Household waste	Waste Electrical and Electronic Equipment (WEEE)
Bulky waste	Asbestos
Textiles	Gases (including refrigerants and aerosols)

Non-hazardous / inert	Hazardous
Sewage & other non-hazardous sludge	Gas (e.g. LPG) cylinders
Inert & non-hazardous construction and demolition waste	

28. Clinical waste and animal by-products are also accepted by the Scheme; however, these are typically transported directly from the waste generator to the receiving facility without entering the Scheme site.

29. The Scheme also aims to accept spent smoke detectors and alarms (which contain very low levels of radioactivity). However, none have been accepted to date.

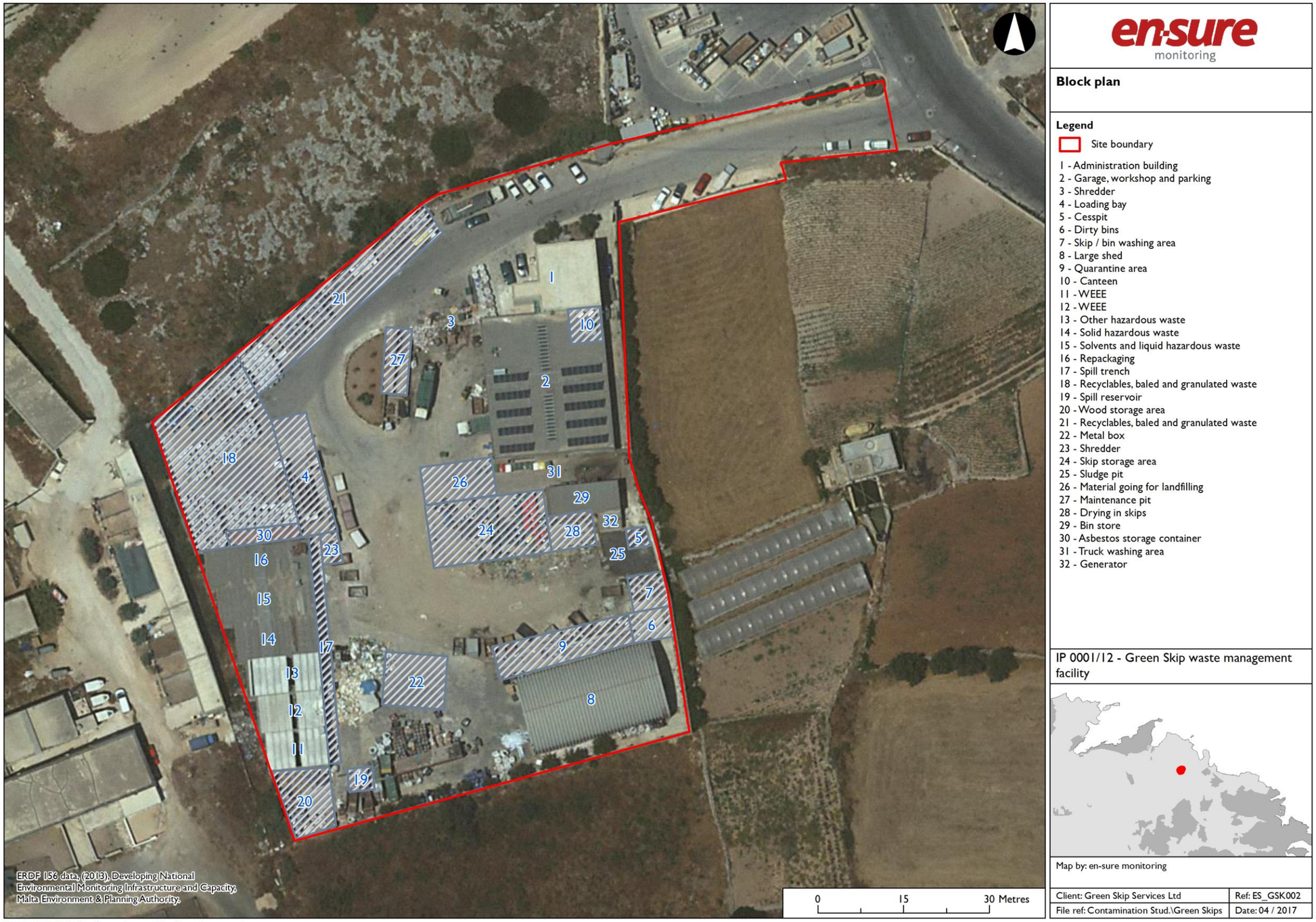
30. Additionally, earlier plans for processing end-of-life vehicles and crushing fluorescent tubes have been shelved.

31. Incoming containers of non-hazardous recyclable waste are first placed in the quarantine area (area 9) and then sorted manually by workers inside the shed in area 8, following which the waste is baled (area 8), shredded (in area 3 or 23) or granulated as required (area 8).

32. Sewage sludge is dried by pressing in area 25; this sludge is non-hazardous.

33. Storage of cardboard, plastic, baled metal, wood, and any other baled / granulated waste occurs in areas 18 and 21. Storage of wood also occurs in area 20. Metals are stored in a metal box and aluminium skip in area 22 (although this box is often placed in a different location), and glass as well as clean skips are stored in area 24. Shredded non-hazardous waste destined for landfilling is stored in area 26.

Figure 8: Scheme layout



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Block plan

Legend

Site boundary

1 - Administration building
2 - Garage, workshop and parking
3 - Shredder
4 - Loading bay
5 - Cesspit
6 - Dirty bins
7 - Skip / bin washing area
8 - Large shed
9 - Quarantine area
10 - Canteen
11 - WEEE
12 - WEEE
13 - Other hazardous waste
14 - Solid hazardous waste
15 - Solvents and liquid hazardous waste
16 - Repackaging
17 - Spill trench
18 - Recyclables, baled and granulated waste
19 - Spill reservoir
20 - Wood storage area
21 - Recyclables, baled and granulated waste
22 - Metal box
23 - Shredder
24 - Skip storage area
25 - Sludge pit
26 - Material going for landfilling
27 - Maintenance pit
28 - Drying in skips
29 - Bin store
30 - Asbestos storage container
31 - Truck washing area
32 - Generator

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

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34. Hazardous waste is mainly handled and stored in the hazardous waste sheds (**Figure 9**), as outlined in **Table 2**.

Figure 9: Hazardous waste sheds

Table 2: Hazardous waste shed areas

Area number (as shown in Figure 8)	Type of waste stored / handled
11	WEEE storage
12	WEEE dismantling and storage (batteries are not dismantled)
13	Hazardous waste not stored in areas 14 and 15, including any material incompatible with waste stored in areas 14 and 15 Packaging of smoke detectors in cardboard packaging Gas cylinders containing refrigerants
14	Solids, e.g. sludges storage Storage and labelling of solid cytotoxic waste (no repackaging is carried out)
15	Solvents and liquids storage Storage and labelling of liquid cytotoxic waste (no repackaging is carried out)
16	Repackaging of hazardous industrial waste (to meet storage requirement or for space saving)

35. PCB- or asbestos-containing waste may be accepted by the Scheme, however, no processing occurs on site (other than overpacking / double-bagging where necessary). Asbestos is stored in a shipping container in area 30 (**Figure 10**).

Figure 10: Shipping container for asbestos

36. Occasionally hazardous waste is shredded; this could include off-spec products such as electronics, counterfeit / confidential WEEE, and contaminated packaging.

37. There is no chemical processing of waste. Only physical processes (such as shredding, drying and dismantling), and packing are carried out.

Associated Activities

38. The Scheme carries out vehicle and equipment maintenance in the garage (area 2), in the maintenance pit (area 27), or for fixed equipment, directly in place.

39. The garage floor is concreted and a bund strip (as shown in **Figure 11**) will be installed at the entrance to create a bund.

Figure 11: Bund strip

40. The maintenance pit (**Figure 12**) is also concreted, however, the sides are currently constructed of masonry; these are to be sealed shortly. Oily liquids and stains were noted inside the maintenance pit during the site visit.

Figure 12: Maintenance pit

41. The Scheme also operates a diesel generator (in area 32), used to supply additional electricity when the main shredder is in use.

42. The principal hazardous raw materials stored on site are fuels and oils; information on storage and containment measures is presented in **Table 3**.

Table 3: Raw materials

Type	Used in	Maximum quantity stored	Area where stored	Containment
Diesel	Generator	1 m^3	2	Concrete bund
Diesel	Generator	<1 m^3	32 (generator day tank)	Bund in generator room (will be rendered impermeable) Spill tray
Diesel	Vehicles	2.5 m^3	28	Double skinned container enclosed in a metal frame (to be installed shortly)
Oils / lubricants	Vehicles / equipment	1.5 m^3	2	Spill trays, concreted floor

43. During the site visit, oily stains were noted inside the generator room (**Figure 13**) and in the garage around the oil storage area (**Figure 14**).

Figure 13: Oily stains in the generator room

Figure 14: Oil storage area in the garage

44. Skips and bins are power washed in area 7, and truck washing is carried out in area 31.

Emissions to Air

45. The only stationary combustion plant on site is the diesel generator.

46. The Scheme operates two shredders – a main shredder (area 3) and a secondary shredder used less frequently (once to twice a week) for the production of non-hazardous animal bedding (area 23). Both shredders are located outdoors. Dust emissions from the main shredder (**Figure 15**) are reduced by covering the shredder with a shading cover. Additionally, shredding is avoided on very windy days, and only coarse shredding is carried out.

Figure 15: Main shredder

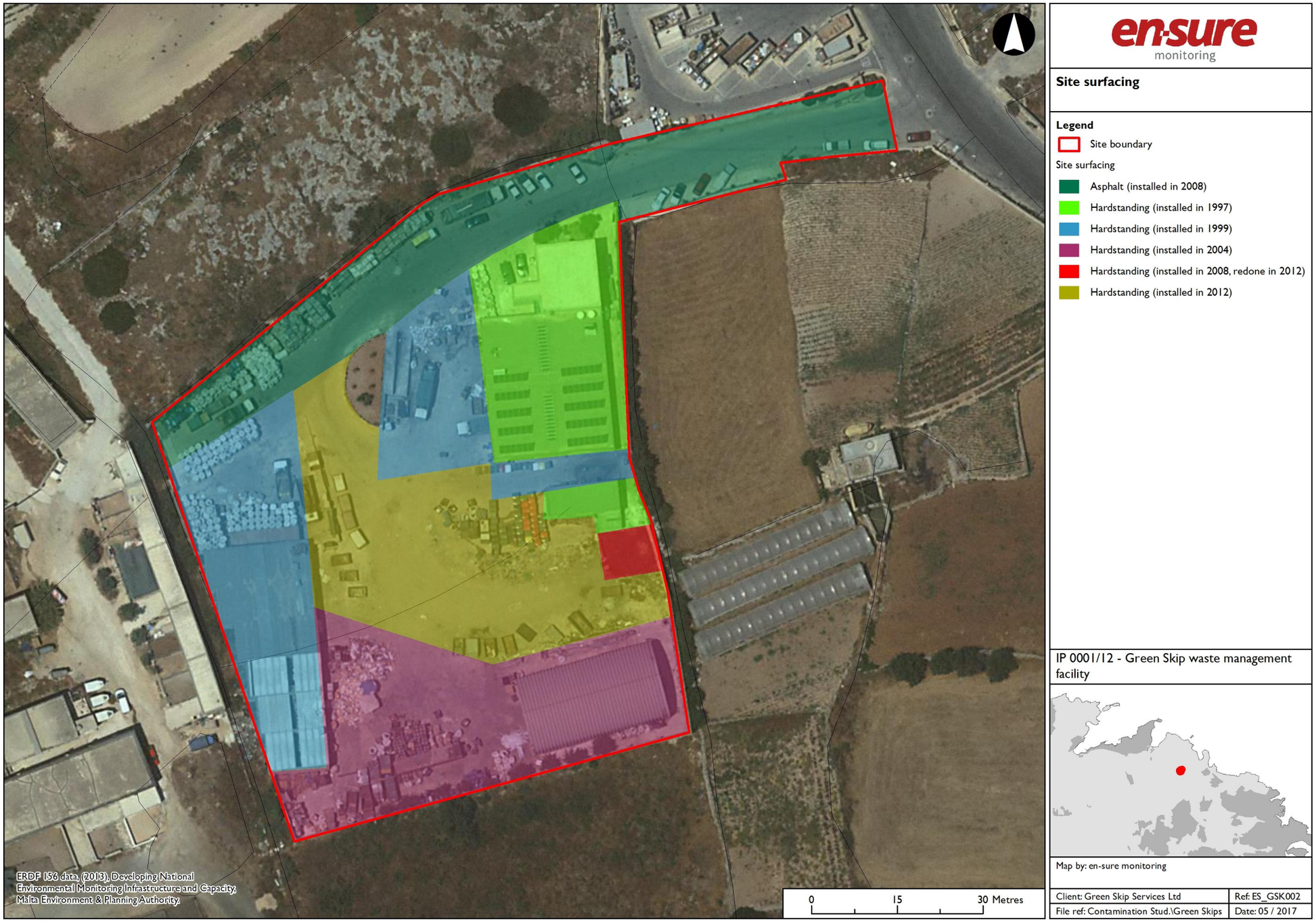
47. Some fugitive VOC emissions may also be released during repackaging of solvents, which is carried out in the hazardous waste sheds. However, repackaging is avoided where possible. Additionally, the liquid is transferred by directly connecting pipes that create a tight seal.

48. The Applicant reports that no burning / incineration has been carried out on site, and this is also not planned for the future.

Surface Water and Wastewater Management

49. Most of the site is concreted, with the exception of an area at the north of the site which is asphalted. **Figure 16** indicates the site surfacing arrangements, including approximate dates of installation of the respective surface, as indicated by the Applicant. The installation of reinforced concrete hardstanding commenced in 1997 with the start of operations, and was completed in 2012; the concrete is approximately 10 – 15 cm thick. Additionally, the concrete hardstanding installed in 2012 included a fibre additive to provide added strength.

Figure 16: Site surfacing



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50. The asphalted area is used as a road and for storage of non-hazardous waste, with some parking of vehicles noted. Some oily stains were noted in this area during the site visit (**Figure 17**).

Figure 17: Oily stains in asphalted area

51. The hazardous waste sheds have a concrete floor and are roofed, with a hooded gap in the roof to allow ventilation (the plastic hood for some of the sheds will be extended to ensure there is no ingress of rainwater into the shed).

52. A concreted channel (area 17) runs through the length of the entrance to the hazardous waste sheds; the channel has been tested and confirmed to be impermeable[6]. It incorporates two bunds of 250 L each (excluding the channel volume, of 1.5 m^3), which have also been confirmed to be impermeable[6]. The channel is covered by a raised metal sheet (**Figure 18**) to allow intake of spills from the shed but prevent ingress of rainwater. Additionally, bund strips (as shown in **Figure 11**) will be installed at the entrance to the sheds to enable spills to be contained before they reach the spill channel. The shed walls (**Figure 19**) will also be sealed to ensure there are no leaks from the sides in case of a spill.

[6] MTS (2013) *Leak Tightness Survey Report.*

Figure 18: Covered spill channel

Figure 19: Hazardous shed walls

53. ERA's latest inspection reports (28th February 2017 and 18th October 2016) indicate that some storage of hazardous waste (including liquid waste and WEEE) is carried out in the open yard, outside the hazardous waste sheds. The Applicant reports that action is being taken to export this waste, thus reducing the need for outdoor storage in the future.

54. Surface water from the open yard is collected in drains (**Figure 20**) and received in an underground reservoir, as shown in **Figure 21**. A filter and oil-water separator will also be installed shortly to treat surface water prior to being received in the reservoir.

Figure 20: Surface water drains

55. In its inspection report, ERA also noted that not all oil drums inside the maintenance garage had drip trays. As mentioned, oily stains were also observed in this area during the site visit; however, the area has a concrete floor, which would be expected to limit the downward transfer of pollutants.

56. Since the Scheme site is not connected to the sewer, sanitary waters from the offices are received in a lined cesspit (area 5), which has also been confirmed to be impermeable[6]. This cesspit also receives non-hazardous effluent from the sewage sludge drying pit (in area 25), which also has impermeable flooring, and from bin and truck washing.

57. Clean rainwater from the office roof is collected in an underground well (also shown in **Figure 22**).

58. During the site visit, oily stains were noted in several areas of the site, including the open yard, the hazardous waste sheds, the asphalted area, the garage, and the generator room. The site surfacing was also noted to be damaged in several areas, however, the Applicant reports that maintenance is planned to repair these areas.

Figure 21: Block plan showing surface water collection

Geo-Environment

59. The geological map of Malta suggests that the exposed rock formation at the site is Lower Coralline Limestone (Xlendi member) (**Figure 22**).

60. The groundwater at the Scheme site is the Mean Sea Level Aquifer; this aquifer is a lens-shaped water body reaching some 2.5 m above sea level in central Malta and thinning out to zero thickness at the coastline. The groundwater at the Scheme site is found at a depth of around 22 to 24 m below the current land surface. As a result, even if the land becomes contaminated with a release from the Scheme, some attenuation of contaminants is expected, considering that there is a considerable depth of rock before the material is able to reach the groundwater, provided there are no direct routes to groundwater (such as fissures and boreholes).

61. There are several private groundwater boreholes in the vicinity of the site, as shown in **Figure 23**, and no public boreholes[7].

Existing Monitoring Data

62. Groundwater monitoring was carried out in 1995 as part of the EPS for the Scheme; a sample was taken from a borehole around 40 m east of the site (at around 20 m depth, i.e. at the mean sea level aquifer, which is the same groundwater body that lies beneath the Scheme site). The results are presented in **Table 4**.

Table 4: Groundwater monitoring results (1995 data)

Analyte	Concentration
Conductivity	9.89 mS/cm
pH	7.4
Temperature	14.6 ^{o}C
Dissolved oxygen	16.9 mg/L
Total hardness	1,350 mg/L as $CaCO_3$
Nitrate	76 mg/L (86 mg/L when corrected for seawater intrusion)
Chloride	3,150 mg/L
Phosphate	0.25 mg/L
Ammonium	<0.5 mg/L
Total iron	0.2 mg/L

63. The EPS concludes that the water is groundwater brackish (as evidenced by the chloride content), which limits the use of the water to irrigation, and then only if diluted by rainwater, and that it is not suitable for drinking water purposes (due to exceedances of limits for specific conductivity, hardness, chlorides, and nitrates). The EPS also notes that iron content is high, and suggests that leaching of scrap metal from the Magħtab dump may be the cause; it was noted that the dump may also have been contributing towards elevated levels of heavy metals, pesticides and Total Organic Carbon, although these parameters were not tested. The report also suggests that the spreading of pig slurry at adjacent farms was

[7] George Cassar (Malta Resources Authority), email dated 24th February 2017.

contributing to the high nitrate values; the groundwater was noted to be oxygen-saturated.

64. The EPS also notes that the direction and velocity of groundwater flow in Malta are difficult to determine. In general, the flow would tend to be from the centre of the island towards the coast; however, underground channels could be transporting groundwater (and contaminants) in the opposite direction.

65. Additionally, studies from 1998[8] in the Baħar ic-Cagħaq coastal area indicate high levels of heavy metals (including lead) in sediments, particularly after rainfall, suggesting that the Magħtab dump at the time leached pollutants into the surrounding environment.

66. The most recent available Annual Environmental Report (AER) for the Għallis non-hazardous engineered landfill was also reviewed. Relevant extracts from the report and the locations of the monitoring points mentioned below are included in **Appendix 2**.

67. Monitoring of gas samples from one leachate monitoring point and one groundwater monitoring borehole for the year 2015 revealed the presence of:

- Dioxins and furans: Octachlorodibenzo-p-dioxin was detected in boreholes BH 2 and LCP 5 at concentrations of 0.0036 ng/m^3 and 0.0028 ng/m^3 respectively; 2,3,7,8-tetrachlorodibenzofuran was found at concentrations of 0.0006 ng/m^3 and 0.0008 ng/m^3 respectively. The remaining dioxins and furans were below the detection limit of <0.0001 ng/m^3.
- Certain PAHs, detected in LCP 5 at up to 2 µg/m^3; and
- Arsenic, detected in BH 2 (the concentration was 0.19 µg/m^3).

68. Elevated zinc concentrations (up to 136 µg/L) were also detected in one set of coastal water samples in the vicinity of the landfill; however, the remaining parameters appear to be similar to those in background locations. Elevated lead concentrations were also detected in some sediment samples (including background samples); this was attributed in the AER to fishing operations rather than the landfill.

69. Groundwater monitoring at and around the landfill revealed exceedances of the control and / or trigger levels for ammoniacal nitrogen, arsenic and cadmium in some samples (although values were variable).

70. Control and / or trigger levels for arsenic, cadmium, chromium, copper, nickel, lead, ammoniacal nitrogen and chloride were exceeded in most landfill leachate samples. This is attributed to the leachate being mostly recirculated rather than treated, resulting in concentration of the leachate contaminants over time.

[8] MEPA *The Environment Report 2008* https://www.mepa.org.mt/ter.

71. Rainwater samples taken from the surface of the landfill also indicate an exceedance of the control / trigger levels for ammoniacal nitrogen, arsenic, cadmium, nickel and lead in some or all samples.

72. Soil monitoring in the surroundings indicated elevated tin concentrations in some of the samples (up to 65 mg/kg annual average), although the AER notes that this is not necessarily due to landfill operations. Elevated concentrations of sulphur were also detected in soil as well as phosphorous in crops; both elements were attributed in the AER to farming practices.

Figure 22: Geology

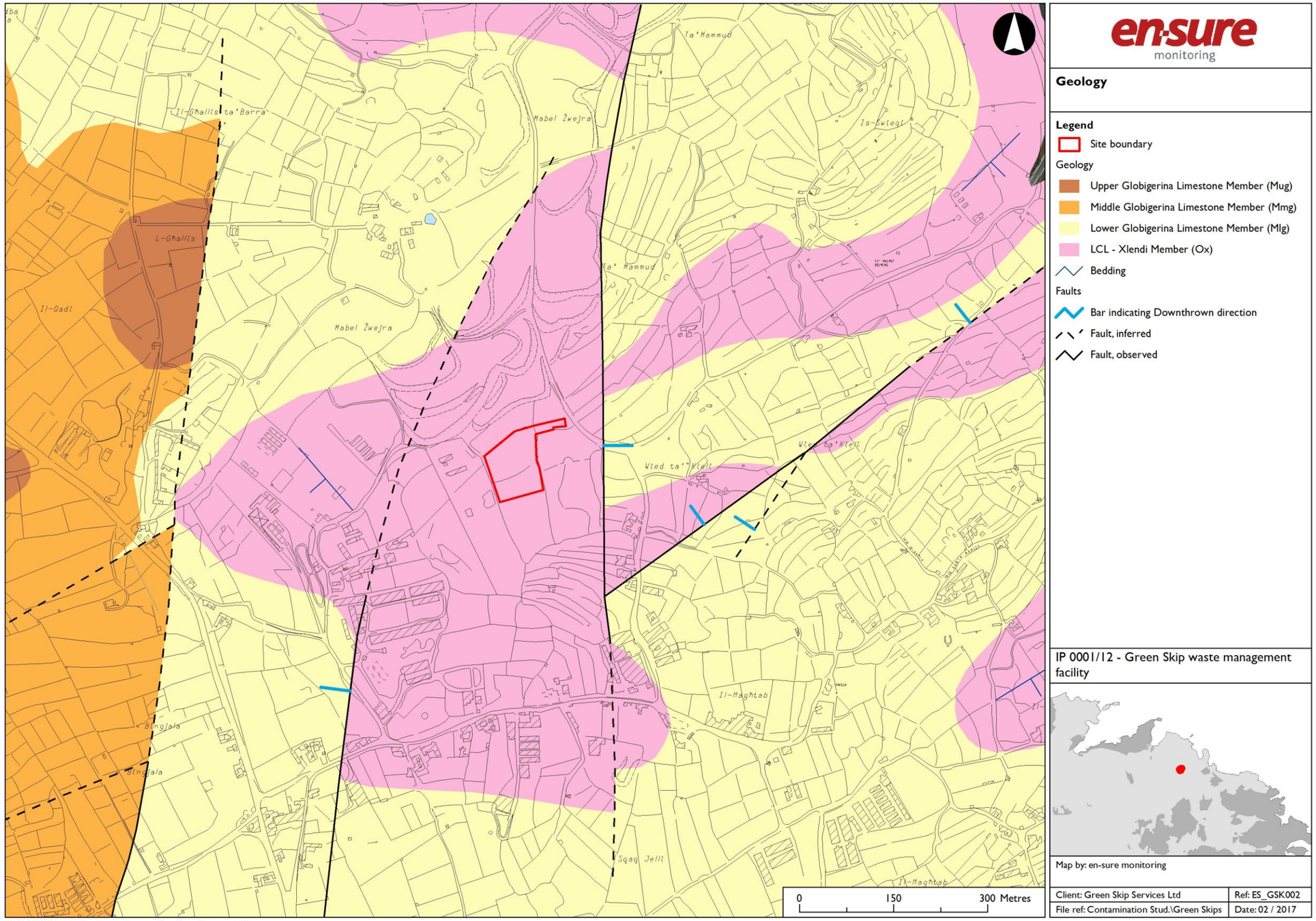
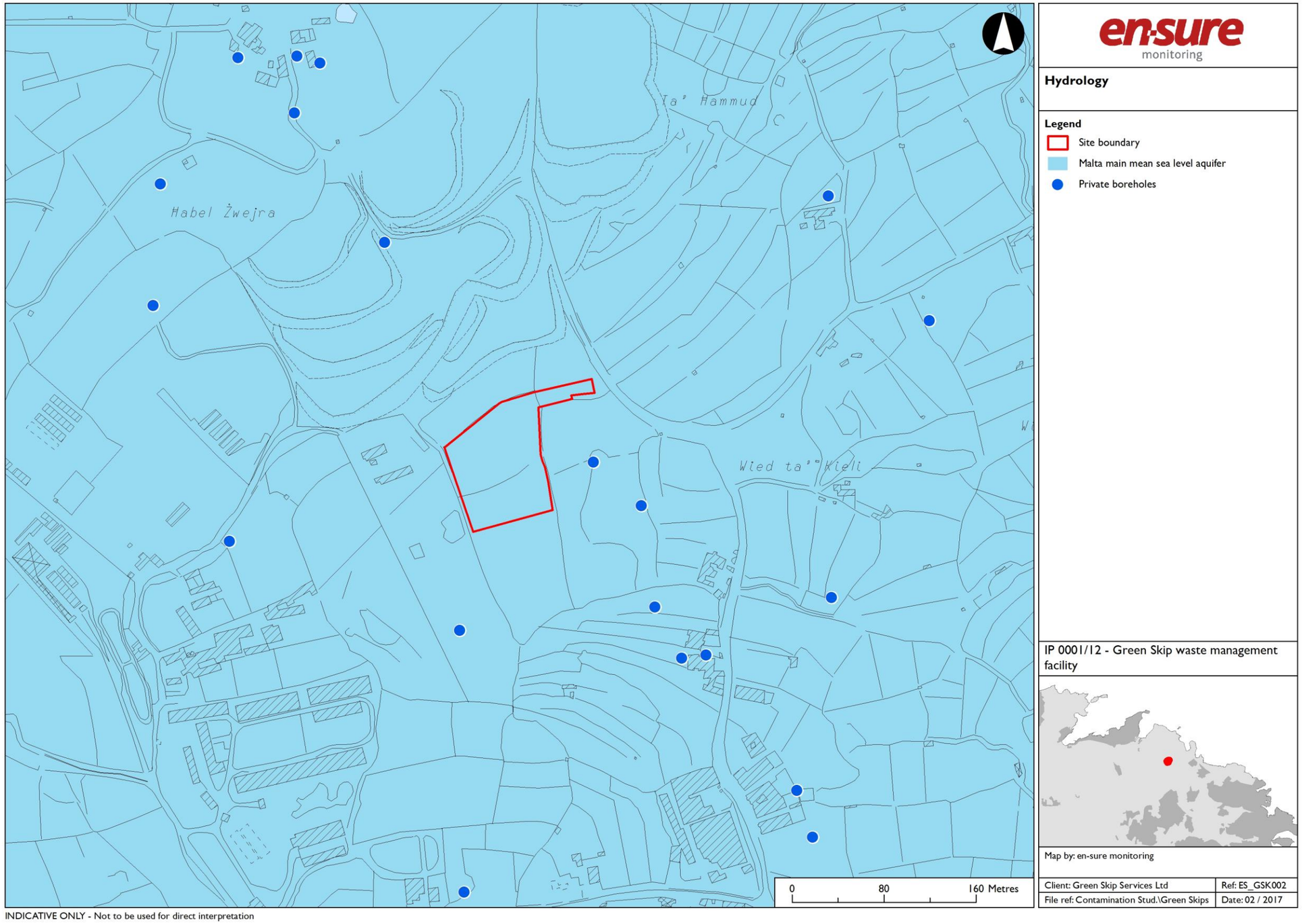


Figure 23: Hydrology



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Pollutant Linkages

73. **Table 5** identifies the principal potential source-pathway-receptor linkages for land and groundwater contamination at the site. These linkages cover emissions from historical activities that occurred at the site, releases from surrounding activities, and emissions from Scheme operation. The presence of mitigation measures is not considered in this table; it is noted, however, that some of the activities identified did not include sufficient mitigation to prevent land / groundwater mitigation.

74. Environmental risk occurs when there is a means by which a hazard can result in a deleterious impact on the surrounding environment, i.e. receptors. The presence of a hazard alone does not constitute a risk. A risk is only present if there is a pathway which links the source (hazard) to the receptor. This is known as the source-pathway-receptor linkage.[9] If any of the three elements are absent then there is no complete linkage and thus no unacceptable risk to the environment.

75. With regard to releases from the Scheme, it is noted that gases (such as refrigerants and aerosols) are not relevant to land and groundwater contamination at the Scheme site, and have therefore not been included in these pollutant linkages.

76. Additionally, since radioactive waste has never been accepted at the Scheme site to date, and only low-level radioactive waste is proposed to be accepted (and is expected to be in small quantities), radioactive emissions are not included in the pollutant linkages considered.

[9] Defra (2002) *Groundwater Protection Code: Petrol Stations and other Fuel Dispensing Facilities involving Underground Storage Tanks* http://www.adlib.ac.uk/resources/000/082/529/groundwater_petrol_code.pdf.

Table 5: Pollution pathway identification

Source	Pathway	Receptor	Potential sources of land / groundwater contamination[10]		
			Scheme operation	**Historical activities on site (prior to operation of the Scheme)**	**Surrounding activities**
Spill / release of hazardous waste / substances, potentially containing: • metals • organic substances (e.g. petroleum hydrocarbons, PAHs, PCBs, other VOCs) • acids / alkalis • asbestos	Direct contamination; permeable strata above water table; rainwater runoff; used extinguishant; landfill leachate	Land Groundwater	• Spills during storage / processing of hazardous waste (particularly in the sheds, but also including the outdoor yard which until 2012 had no hardstanding) • Spills during maintenance activities (particularly in the garage and maintenance pit) • Spills / drips during storage of diesel and oils in the garage • Leak of diesel from the generator day tank • Drips from vehicles (including on the asphalted road, which is not impermeable)	• Dumping of industrial and (mixed) black bag waste	• Leachate from / seepage of hazardous waste deposited in Magħtab dump; • Leachate / seepage Għallis & Żwejra (non-hazardous) engineered landfills; • Uncontained spills of liquid hazardous waste from the Magħtab Civic Amenity site
Emissions to air, including: • metals • PAHs • dioxins / furans • other volatile organic compounds (VOCs) • asbestos	Air dispersion (particularly in the prevailing wind direction); wet precipitation	Land Groundwater	• Granulation (indoors) / shredding (outdoors in area 3) of hazardous waste (e.g. WEEE, contaminated packaging) • Fugitive emissions from solvent repackaging • Potential handling of asbestos-containing material mixed with construction waste	n/a	• Landfill hotspots arising in the Magħtab dump, and the Għallis & Żwejra engineered landfills[11] • Release of asbestos fibres from handling of mixed construction waste at the Magħtab dump

[10] The identification of these sources does not consider the presence of mitigation, which reduces risk levels.
[11] The routine generation of landfill gas (methane) is not considered, since methane is gaseous, and is also being combusted.

Source	Pathway	Receptor	Potential sources of land / groundwater contamination[10]		
			Scheme operation	**Historical activities on site (prior to operation of the Scheme)**	**Surrounding activities**
Release of effluent with high nutrient load	Permeable strata above water table; rainwater runoff; used extinguishant; landfill leachate	Groundwater[12]	• Leak of sewage / non-hazardous sludge from drying areas • Seepage / spills of other wastes (non-hazardous / hazardous)	• Run-off from agricultural land (natural / artificial fertilisers may have been used) • Dumping of waste (including black bags and industrial waste)	• Run-off from agricultural land (natural / artificial fertilisers could be used) • Leak of animal manure from Malta North Mechanical & Biological treatment Plant • Leachate from the Magħtab dump, and the Għallis & Żwejra engineered landfills • Improper storage of manure from livestock farms

[12] Groundwater is the main relevant receptor for such effluent, since these parameters degrade the quality of groundwater.

Monitoring Methodology

Aim

77. The aim of the analytical programme is to assess baseline levels of pollutants, to enable a quantified comparison to be made with the contamination levels upon decommissioning.

78. Since no excavation is proposed, waste hazard and acceptance testing are not relevant to this monitoring programme.

Sampling Strategy

79. With regard to land monitoring, since the purpose of the baseline assessment is to enable a comparison of the current condition of the land with that upon definitive cessation of activities, a targeted sampling strategy is proposed that takes into account the location of the Scheme activities involving potential release of hazardous substances.

80. It is, however, proposed that areas where hardstanding was installed most recently (in 2012) are avoided, to avoid damaging the new hardstanding. Other areas where the hardstanding is older are preferred since these are already damaged in places, and repairs are already planned.

81. Initially land monitoring will be carried out from cores on site taken at the surface and at depths of 1 m and 2 m. However, material from 3 m depth will be sampled and will be kept in the event that ERA requires further testing following the analysis of contaminants at shallower depths (notably the samples at 2 m depth).

82. Additionally, given that potential sources of groundwater contamination have been identified (which could contaminate the same groundwater body lying beneath the Scheme site), baseline groundwater monitoring is also proposed.

83. It is suggested that the existing groundwater borehole located closest to the site be used for sampling, since this will sample the same groundwater body underlying the Scheme site, and avoids drilling a new borehole to the aquifer. It is noted that no recent monitoring data seems to be available from this borehole.

Analytical Programme

84. **Table 6** presents a proposed list of analytes proposed for the baseline testing and a rationale for their inclusion, based on the potential pollutant linkages identified in **Table 5**. The reference to potential sources of contamination in **Table 6** does not consider the mitigation measures in place; however, as mentioned, some of the activities identified have not included sufficient mitigation to prevent land / groundwater mitigation.

Table 6: Proposed analytes

Analyte	Included?				Rationale	Potential sources of site contamination		
	Land (surface)	Land (1 m)	Land (2 m)	Groundwater		Scheme operation	Historical activities on site	Surrounding activities
Total petroleum hydrocarbons (TPH): C10-C40, C35-C40, total	✓	✓	✓	✓	Main constituents of fuels, oils, coolants, lubricants, solvents, sludges, and other industrial waste.	✓		✓
Total Organic Carbon (TOC)	✓	✓	✓	✓	Indicator of biodegraded organic matter / hydrocarbon content.	✓		✓
BTEX (benzene, toluene, ethylbenzene, xylene)	✓	✓	✓	✓	Fuel additives; components of certain industrial waste.	✓		✓
Methyl tert-butyl ether (MTBE)	✓	✓	✓	✓	Formerly used as an anti-knocking agent, to improve the octane rating of fuel, and as a solvent.	✓		✓
PAHs[13]	✓	✓	✓	✓	Components of fuel, lubricating oil, and certain industrial waste.	✓		✓
PCBs[14]	✓	✓	✓	✓	PCBs were formerly used in transformer cooling oils; PCB-containing waste may be accepted by the Scheme.	✓		✓
Chlorinated aliphatic hydrocarbons[15]	✓	✓	✓	✓	May be constituents of industrial waste (used as solvents, cleaners, and degreasing agents).	✓		✓
Halogenated aliphatic hydrocarbons[16]	✓	✓	✓	✓	May be constituents of industrial waste (used as solvents, degreasing agents, pesticides and chemical intermediates).	✓		✓

[13] 16 US EPA PAHs, as follows: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b/k)fluoranthene, benzo(ghi)perylene, chrysene, dibenzo(ah)anthracene, fluoranthene, fluorene, indeno(123-cd)pyrene, naphthalene, phenanthrene, pyrene.
[14] EC7 congeners: BZ#28, BZ#52, BZ#101, BZ#118, BZ#138, BZ#153, BZ#180.
[15] Chloromethane, dichloromethane, vinyl chloride monomer, 1,2-dichloroethane, 1,1-dichloroethylene, 1,2-dichloropropane, 1,1,2-trichloroethane, 1,1,2-trichloroethylene, 1,2,3-trichloropropane, 1,1,2,2-tetrachloroethane, tetrachloroethylene.

Analyte	Included?				Rationale	Potential sources of site contamination		
	Land (surface)	Land (1 m)	Land (2 m)	Groundwater		Scheme operation	Historical activities on site	Surrounding activities
Cyanide (total)	✓	✓	✓	✓	Component of lubricating oil; may be present in certain types of industrial waste.	✓		✓
Metals: As, Ba, Be, Cd, Co, Cr, Cr VI, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Sn, Tl, V, Zn	✓	✓	✓	✓	Certain metals are / used to be components of fuels, lubricating oils, batteries, WEEE, and industrial waste. Landfill leachate contains high quantities of some metals.	✓	✓	✓
Asbestos	✓	✓	✓	✓	Asbestos is accepted on site, and may also be mixed in with construction waste.	✓		✓
Dioxins & furans[17]	✓ (two sampling points)	×	×	✓	May be generated in landfills; detected in very low concentrations (<0.01 ng/m^3) during landfill monitoring, therefore due to dispersion it is unlikely that these would lead to significant surface and sub-surface land contamination at the Scheme site, and therefore limited monitoring is reasonable. Such contaminants may travel laterally in groundwater.			✓
pH	×	×	×	✓	Acids / alkalis are accepted on site. pH is not relevant to land contamination assessment.	✓		
Conductivity	×	×	×	✓	An indicator of the quantity of materials dissolved in groundwater (not relevant to land contamination assessment).	✓		✓

[16] Bromoform, 1,2-dibromoethane, bromodichloromethane.

[17] 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8-Heptachlorodibenzofuran, 1,2,3,4,7,8,9-Heptachlorodibenzofuran, 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin, 1,2,3,4,7,8-Hexachlorodibenzofuran, 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin, 1,2,3,6,7,8-Hexachlorodibenzofuran, 1,2,3,7,8,9-Hexachlorodibenzo-pdioxin, 1,2,3,7,8,9-Hexachlorodibenzofuran, 1,2,3,7,8-Pentachlorodibenzo-p-dioxin, 1,2,3,7,8-Pentachlorodibenzofuran, 2,3,4,6,7,8-Hexachlorodibenzofuran, 2,3,4,7,8-Pentachlorodibenzofuran, 2,3,7,8-Tetrachlorodibenzo-p-dioxin, 2,3,7,8-Tetrachlorodibenzofuran, Octachlorodibenzo-p-dioxin, Octachlorodibenzofuran.

Analyte	Included?				Rationale	Potential sources of site contamination		
	Land (surface)	Land (1 m)	Land (2 m)	Groundwater		Scheme operation	Historical activities on site	Surrounding activities
Nitrate	×	×	×	✓	Component of sewage, agricultural run-off, and animal manure. Landfill ammoniacal control / trigger levels exceeded in some samples.	✓	✓	✓
Phosphate	×	×	×	✓	Component of sewage, agricultural run-off, and animal manure.	✓	✓	✓
Chemical Oxygen Demand (COD)	×	×	×	✓	Sewage, agricultural run-off, animal manure and landfill leachate contribute to high COD levels. COD is an indicator of the concentration of inorganic and organic contaminants, and therefore groundwater quality (not relevant to land contamination assessment).	✓	✓	✓
Chloride	×	×	×	✓	Component of landfill leachate (control / trigger levels exceeded). Groundwater in the area is brackish.			✓

Sampling Points

85. The proposed sampling points are shown in **Figure 24**. In accordance with ERA guidance on other projects, five sampling points are proposed to ensure adequate site representation. The sampling locations have been selected to correspond to areas where pollutant linkages may exist or have existed, as described in **Table 7**.

Table 7: Sampling points

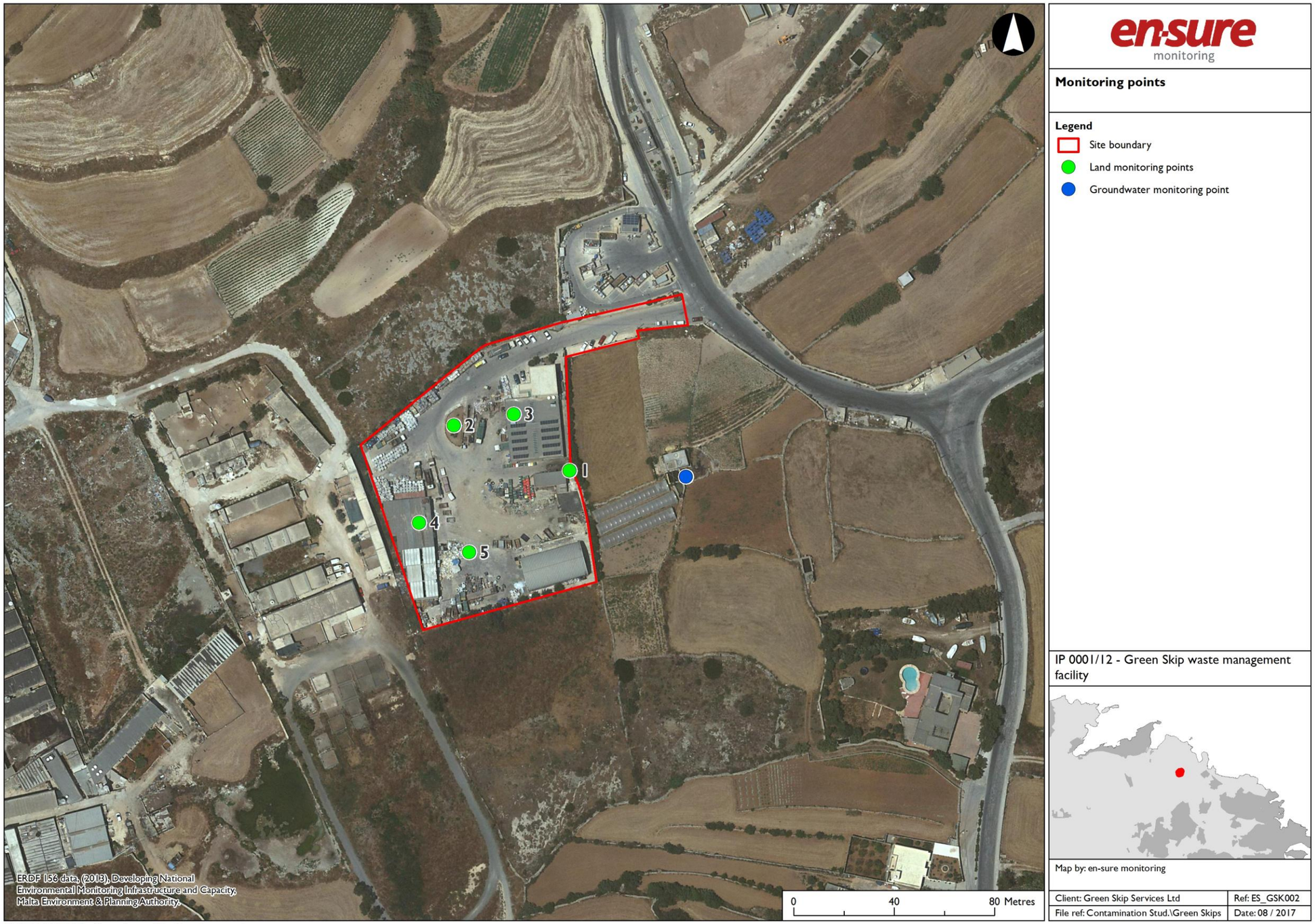
Receptor	Point Ref.	Coordinates (Stripped UTM)	Rationale
Land	1	49592.570, 77467.678	As requested by ERA, this point is located close to the generator room (oily stains noted), the cesspit (which receives only non-hazardous sanitary effluent and non-hazardous effluent from the sewage sludge drying pit) and the sewage sludge drying pit (sewage sludge is non-hazardous)
Land	2	49546.525, 77485.571	As requested by ERA, this sampling point is located on the area of soil adjacent to the maintenance pit, since ERA has observed evidence of past spills in this area, and various waste is stored in the vicinity
Land	3	49570.332, 77489.954	Garage (oily stains noted)
Land	4	49532.601, 77446.906	Inside hazardous waste shed
Land	5	49552.540, 77435.249	Open yard (some storage of hazardous waste has been carried out in this area)
Groundwater	-	49638.952, 77465.168	Nearest groundwater borehole

86. International guidance[18,19] recommends that land samples are taken at three depths to determine whether there has been any vertical distribution of pollutants. Therefore the first sample will be taken from the surface, the second at 1 m depth, and the third at 2 m depth. As requested by ERA, samples will also be taken at 3 m depth, so that if high levels of contamination are found in the 2 m samples, analysis of the 3 m samples can be carried out without repeating the sampling. The 3 m samples will be retained in glass jars until the results for the shallower samples are received. Once the results are reviewed, should ERA require testing of the 3 m samples, these samples will also be sent for analysis.

87. With regard to groundwater samples, it is proposed that two samples are taken – one during the dry season and one during the wet season, so as to capture periodic fluctuations in concentrations of analytes due to the presence or lack of rainfall.

[18] Environmental Protection Department (2011) *Practice Guide for Investigation and Remediation of Contaminated Land* http://www.epd.gov.hk/epd/english/environmentinhk/waste/guide_ref/contaminated_land.html.
[19] Ministry for the Environment (2011) *Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils* http://www.mfe.govt.nz/publications/land-hazards/contaminated-land-management-guidelines-no-5-site-investigation-and.

Figure 24: Proposed sampling points



en-sure monitoring

Monitoring points

Legend

- Site boundary
- Land monitoring points
- Groundwater monitoring point

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 08 / 2017

INDICATIVE ONLY - Not to be used for direct interpretation

Sampling Methods

Land Sampling

88. Land investigations will be conducted in accordance with BS 4019: 1993: *Rotary core drilling equipment*, and *BS 5930: 2015: Code of practice for ground investigations*. Sampling will be supervised by a chemist.

89. The sampling point will be cleared and the core sample drilled using a drill rig fitted with a core barrel. This technique is preferred over an auger due to the presence of concrete and hard rock at the site, and requires water to be used as a circulation fluid. The drill rig to be used is registered with the Malta Resources Authority (MRA) according to the Registration of Drilling Rigs Regulations (SL 545.06).

90. Core samples will be broken using a mallet and stored in jars; the sample size will be of approximately 500 g. A small portion of each sample will also be placed in a vial immediately upon sampling, and chilled. The vial will be used by the lab for testing of volatile substances.

91. All samples will be photographed, labelled, and logged before being sent to the laboratory. Additionally, a record will be kept of any visual or olfactory evidence of contamination (e.g. stains, hydrocarbon odours).

92. After each of the five points has been sampled, the drill rig will be moved to a wash-down area and cleaned using a power wash. Voids will be backfilled using the remaining part of the core not sent for analysis, and the surface will be resealed by the Applicant. The resealing method will involve opening an area of around 40 cm around the hole, placing a membrane, and resurfacing with the previously installed material (i.e. concrete, or asphalt for point 1).

Groundwater Samples

93. Sampling will be carried out by the owner of the borehole, under supervision of a chemist.

94. The pump will first be run for some time to purge the well and enable a fresh sample to be taken, then a groundwater sample will be pumped out.

95. The sample size will be approximately 2 L. Samples will be stored in plastic jars and a small portion will also be placed in a vial and chilled. The vial will be used by the lab for testing of volatile substances.

96. Samples will be labelled and logged before being sent to the laboratory.

Analysis

97. Samples will be delivered for analysis at a UK laboratory accredited to ISO 17025 as well as for certain specific tests as indicated in **Table 8** and **Table 9**. A copy of the laboratory's certification schedule is included in **Appendix 3**.

98. Delivery will take place by courier within two working days of sampling, although typically this will be done within 12-24 hours. The samples will be kept chilled during transport.

99. The 3 m samples will be retained locally in glass jars (chilled) for possible later analysis.

Land Samples

100. **Table 8** presents the proposed methodology for analysis and associated standard limits of detection. The laboratory uses in-house methods for analysis based on international reference standards.

Table 8: Methods for analysis of land samples

Analyte	Analytical methodology	Reference standard[20]	Limit of detection	Test-specific accreditation
Total petroleum hydrocarbons	GC-FID	EPA Method 8015B, Revision 2; TNRCC Method 1006	1 mg/kg	No
Total Organic Carbon	Oxidation - Infra Red	MCERTS guidance note 7, ISO 10694:1995	0.1%	No
BTEX	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/kg	Yes (soil)
MTBE	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/kg	Yes (soil)
PAHs	GC-MS	EPA Method 8270, Revision C	0.1 mg/kg	Yes (soil)
PCBs	GC-MS (HR) / GC-MS (SIR)	EPA Method 8082 Revision C; EPA Method 8082; EPA Method 1668, Revision A	0.5 µg/kg	Yes (soil)
Chlorinated aliphatic hydrocarbons	GC-MS (Headspace)	EPA Method 8260, Revision B	5 µg/kg (dichloromethane: 100 µg/kg)	No
Halogenated aliphatic hydrocarbons	GC-MS (Headspace)	EPA Method 8260, Revision B	5 µg/kg	No
Cyanide (total)	Colorimetry	DOE Methods for the Examination of Waters and Associated Materials, published by HMSO (1988) (equivalent to EPA 9014)	1 mg/kg	Yes (soil)

[20] The laboratory uses a documented in-house method based on the analytical methodology identified in the table. The in-house method refers to the international standards referred to in this table.

Analyte	Analytical methodology	Reference standard[20]	Limit of detection	Test-specific accreditation
Metals: As, Ba, Be, Cd, Co, Cr, CrVI, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Sn, Tl, V, Zn	ICP-OES	MEWAM (ISBN 0117516155), HMSO 1981, APHA-AWWA-WPCF (1992, 18th Ed.)	1 mg/kg: As, Ba, Cd, Cr, CrVI, Cu, Hg, Mn, Ni, Pb, Zn 2 mg/kg: Be, Sn 10 mg/kg: Co, Mo, Se, Sb, Tl, V	Yes (soil)
Asbestos	Polarised light microscopy	HSG248	Presence / absence; if asbestos is detected the quantification test has a LoD of 0.001%	Yes (soil)
Dioxins & furans	GC-MS (HR)	EPA Method 1613	1.0 ng/kg TEQ	Yes (soil)

101. The samples taken will be analysed for all the analytes in **Table 8**, with the exception of dioxins and furans. As discussed in **Table 6**, dioxins and furans will be tested for only in the surface samples taken from two monitoring points (points 2 and 5). These locations have been selected since they are outdoor areas and therefore more likely to receive aerial pollutants from the landfill. Point 2 is the outdoor monitoring point closest to the landfill, and point 5 is located further away.

102. The dioxin and furan results will then be reviewed to determine whether further testing of the other samples for these analytes is required. The remaining samples will therefore be retained by the laboratory until ERA confirms whether further testing is required.

Groundwater Testing

103. **Table 9** presents the proposed methodology for analysis and associated standard limits of detection. The laboratory uses in-house methods for analysis based on international reference standards.

Table 9: Methods for analysis of groundwater samples

Analyte	Analytical methodology	Reference standard[21]	Limit of detection	Test-specific accreditation
Total petroleum hydrocarbons	GC-FID	EPA Method 8015B, Revision 2; TNRCC Method 1006	0.01 mg/L	Yes (C10-C35) No (C35-C40)
Total Organic Carbon	Oxidation - Infra Red	APHA-AWWA-WEF (1995) Part 5310; EN 1484:1987	1 mg/L	Yes
BTEX	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/L	Yes

[21] The laboratory uses a documented in-house method based on the analytical methodology identified in the table. The in-house method refers to the international standards referred to in this table.

Analyte	Analytical methodology	Reference standard[21]	Limit of detection	Test-specific accreditation
MTBE	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/L	Yes
PAHs	GC-MS (SIR)	EPA Method 8270, Revision C	0.01 µg/L	Yes
PCBs	GC-MS (HR)	EPA Method 8082 Revision C; EPA Method 8082; EPA Method 1668, Revision A	0.05 µg/L	Yes
Chlorinated aliphatic hydrocarbons	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/L (dichloromethane: 50 µg/L)	Yes (except for dichloromethane)
Halogenated aliphatic hydrocarbons	GC-MS (Headspace)	EPA Method 8260, Revision B	1 µg/L	Yes
Cyanide (total)	Colorimetry	DOE Methods for the Examination of Waters and Associated Materials, published by HMSO (1988) (equivalent to EPA 9014); APHA-AWWA-WEF (1992) Part 4500	0.05 mg/L	Yes
Metals (dissolved except for Sn and Tl): As, Ba, Be, Cd, Co, Cr, CrVI, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Sn, Tl, V, Zn	ICP-MS (filtered) Sn, Tl: ICP-OES	MEWAM (ISBN 0117516155), HMSO 1981; APHA-AWWA-WPCF (1992, 18th Ed.); US EPA 6020; US EPA Method 200.8; US EPA 1638.	As: 0.2 µg/L Ba, Co, Cr, Mo, Mn, Ni, Sb: 1 µg/L Cd: 0.02 µg/L CrVI: 3 µg/L Cu, Se: 0.5 µg/L Be, Hg: 0.05 µg/L Pb: 0.3 µg/L Sn: 0.01 mg/L Tl: 0.04 mg/L V, Zn: 2 µg/L	Yes
Asbestos	Polarised light microscopy (filtered sample)	HSG248	Presence / absence; if asbestos is detected the quantification test has a LoD of 0.001%	Yes
Dioxins & furans	GC-MS (HR)	EPA Method 1613	0.5 ng/L TEQ	Yes
pH	Probe	BS 1377-3:1990; HMSO (1978); APHA & AWWA (1989)	n/a	Yes
Electrical conductivity	Probe	n/a	10 µS/cm	No

Analyte	Analytical methodology	Reference standard[21]	Limit of detection	Test-specific accreditation
Nitrate	Discrete analyser	HMSO (1981)	0.5 mg/L	Yes
Phosphate	Discrete analyser	HMSO (1981)	0.5 mg/L	Yes
COD	Colorimetry	APHA-AWWA-WEF (1992), 18th Ed	5 mg/L	No
Chloride	Discrete analyser	HMSO (1981)	1 mg/L	Yes

104. Following analysis, all samples will be appropriately disposed of by the laboratory in accordance with regulations.

Laboratory Quality Assurance and Quality Control (QA / QC)

105. The laboratory maintains several QA/QC procedures, including:

- Multi-point calibration with authentic standards (with defined minimum performance characteristics);
- Analysis of control samples within each analytical batch, such as independent standards, matrix spikes or reference materials;
- Analysis of reagent / method blanks within each analytical batch;
- Ongoing quality assurance through the use of control charts in conjunction with warning and action limits for the QC sample data; and
- Participation in external proficiency testing and inter-laboratory schemes.

Assessment of Results

106. The baseline monitoring data will be reviewed to establish the concentration of each pollutant in different areas, and will be retained by the Applicant for comparison upon decommissioning of the Scheme.

107. This assessment will also be used to determine, in consultation with ERA, whether analysis of the 3 m land samples is necessary.

Appendix 1: Permitted waste

Schedule 1

Complete List of Permitted Waste on Site

19 12 01	Paper and Cardboard
19 12 02	Ferrous Metal
19 12 03	Non Ferrous metal
19 12 04	Plastic and rubber
19 12 05	Glass
19 12 06*	Wood containing dangerous substances
19 12 07	wood other than those mentioned in 19 12 06
19 12 08	Textiles
19 12 09	Minerals (e.g. Sand, stones)
19 12 10	Combustible waste (refuse derived fuel)
19 12 12	Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
20 01 01	Paper and Cardboard
20 01 02	Glass
20 01 08	Biodegradable kitchen and canteen waste
20 01 11	Textiles
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 23*	Discarded equipment containing chlorofluorocarbons
20 01 33*	Batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries
20 01 35*	Discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components
20 01 38	Wood other than that mentioned in 20 01 37
20 01 39	Plastics
20 01 40	Metals
20 02 02	Soil and stones
20 03 01	Mixed municipal waste
20 03 02	Waste from markets

Schedule 1
Complete List of Permitted Waste on Site

This facility is authorised to accept waste under all EWC codes of waste as published by Commission Decision 2000/532/EC as amended subsequently from time to time

EWC codes not accepted on site include the following:

02 01 02	Animal-tissue waste (wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing)
02 02 02	Animal-tissue waste (wastes from the preparation and processing of meat, fish, other foods of animal origin)
16 01 04	End of life vehicles
16 04	Waste Explosives
18 01 02	Body parts and organs including blood bags and blood preserves
20 03 01	Mixed municipal waste

Appendix 2: 2015 AER for the Għallis landfill

Annual Environmental Report 2015

Ghallis Non-Hazardous Waste Landfill

S2.1 Introduction

IPPC Permit Number	**IP 0001/06/B**
Reporting Year	**2015**
Name and location of Site	**GHALLIS NON-HAZARDOUS WASTE LANDFILL** **GHALLIS L/O NAXXAR**
Brief description of activities at the site	**Disposal of non-hazardous waste**

S2.2 Environment Management System

Please attach a supporting document with the following:

		Tick (✓)
1.	Company Schedule of environmental objectives and targets;	NA
2.	Environmental Management Programme report (for the reporting year);	NA
3.	Environmental Management Programme proposal (for the following year);	NA
4.	European Pollutant Release and Transfer Register Report (as per Condition 9.10.9).	✓

S2.4 Monitoring Data

The revised Environmental Monitoring Programme compiled by ADi Associates Environmental Consultants and as approved by MEPA, namely '*Monitoring Plan for the Non-Hazardous Waste Landfill at Ghallis*', was implemented for the year 2015.

Landfill Gas Monitoring – Surface Emissions

Table 4.1 of the Monitoring Plan for the Non-Hazardous Waste Landfill at Ghallis

Point Identification Number	**0**

Parameter	**Unit**	**Previous year average**	**Current Year Average**
Methane (flammable gas vapours)	mg/l	*28.48*	24.72
Methane flux	g/m^2s	*N/A*	N/A
H2S	ppm	*0.40*	0.32
CO2	%	*0.02*	0.02
General ground description		*dry*	dry

Point Identification Number	1

Parameter	Unit	Previous year average	Current Year Average
Methane (flammable gas vapours)	mg/l	*66.23*	61.83
Methane flux	g/m^2s	*N/A*	N/A
H2S	ppm	*1.09*	0.84
CO2	%	*0.04*	0.03
General ground description		*dry*	dry

Point Identification Number	3

Parameter	Unit	Previous year average	Current Year Average
Methane (flammable gas vapours)	mg/l	*8.83*	7.90
Methane flux	g/m^2s	*N/A*	N/A
H2S	ppm	*0.20*	0.11
CO2	%	*0.01*	0.01
General ground description		*dry*	dry

Point Identification Number	4

Parameter	Unit	Previous year average	Current Year Average
Methane (flammable gas vapours)	mg/l	*12.31*	9.96
Methane flux	g/m^2s	*N/A*	N/A
H2S	ppm	*0.14*	0.06
CO2	%	*0.01*	0.005
General ground description		*dry*	dry

Landfill Gas Monitoring – Surface Emissions – Interpretation

No assessment levels as per Table 4.1 in Environmental Monitoring Programme

Landfill Gas Monitoring – Ground Water Monitoring Boreholes

Table 1 of the Monitoring Plan for the Non-Hazardous Waste Landfill at Ghallis

Point Identification No.	**BH 1**
Location	**Close to inert material**

Parameters	CH4 (%)	CO2 (%)	O2 (%)	Pressure Diff. (mb)	Temp. (ºC)	Flow (l/hr)
Previous Year Average	0.06	0.03	20.14	0	20.74	0
Current Year Average	0.025	0.025	20.23	0	21.40	0

Point Identification No	**BH 2**
Location	**Close to inert material**

Parameters	CH4 (%)	CO2 (%)	O2 (%)	Pressure Diff. (mb)	Temp. (ºC)	Flow (l/hr)
Previous Year Average	0.025	0.013	20.14	0.013	20.16	0
Current Year Average	0.025	0.025	20.03	0	23.68	0

Point Identification No	BH 4
Location	Close to Cow farm

Parameters	CH4 (%)	CO2 (%)	O2 (%)	Pressure Diff. (mb)	Temp. (ºC)	Flow (l/hr)
Previous Year Average	0.05	0.03	19.99	0.03	20.60	0
Current Year Average	0.05	0.025	20.1	0.025	22.90	0

Landfill Gas Monitoring – Ground Water Monitoring Boreholes- Interpretation

None of the values exceed the assessment levels as listed in Table 4.1: Landfill Gas Monitoring in the Environmental Monitoring Programme

Landfill Gas Monitoring – Leachate collection points

Table 4.1 of the Monitoring Plan for the Non-Hazardous Waste Landfill at Ghallis

LCP 1			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.09*	0.05
Carbon monoxide	ppm	*1.25*	1
Carbon dioxide	%	*N/A*	0.08
Oxygen	%	*20.06*	20.13
Hydrogen sulphide	ppm	*1.88*	1.25
Atmospheric pressure	Pa/Bar	*1013.63*	1012.75
Temperature	^{o}C	*20.13*	21.28
Flow	m^3/h	*0.48*	0.37

LCP 2			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.11*	0.13
Carbon monoxide	ppm	*1.38*	1
Carbon dioxide	%	*N/A*	0.08
Oxygen	%	*20.21*	20.15
Hydrogen sulphide	ppm	*1.38*	1.25
Atmospheric pressure	Pa/Bar	*1013.88*	1013
Temperature	^{o}C	*20.35*	21.63
Flow	m^3/h	*0.34*	0.26

LCP 3			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.08*	0.025
Carbon monoxide	ppm	*0.88*	0.50
Carbon dioxide	%	*N/A*	0.05
Oxygen	ppm	*20.08*	20.30
Hydrogen sulphide	ppm	*1.25*	0.75
Atmospheric pressure	Pa/Bar	*1013.75*	1013.50
Temperature	^{o}C	*20.03*	21.48
Flow	m^3/h	*0.21*	0.28

LCP 4			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.05*	0.1
Carbon monoxide	ppm	*1.13*	1
Carbon dioxide	%	*N/A*	0.075
Oxygen	%	*20.09*	20.05
Hydrogen sulphide	ppm	*0.38*	0.25
Atmospheric pressure	Pa/Bar	*1013.88*	1012.75
Temperature	^{o}C	*19.51*	22.83
Flow	m^3/h	*0.32*	0.49

LCP 5			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.1*	0.1
Carbon monoxide	ppm	*1.25*	1.25
Carbon dioxide	%	*N/A*	0.05
Oxygen	%	*20*	20.33
Hydrogen sulphide	ppm	*1.75*	1.25
Atmospheric pressure	Pa/Bar	*1014*	1012.75
Temperature	^{o}C	*21.05*	22.5
Flow	m^3/h	*0.36*	0.39

LCP 6			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.16*	0.15
Carbon monoxide	ppm	*0.75*	0.75
Carbon dioxide	%	*N/A*	0.1
Oxygen	%	*20.14*	19.98
Hydrogen sulphide	ppm	*1.63*	1.50
Atmospheric pressure	Pa/Bar	*1014*	1012.75
Temperature	^{o}C	*21.65*	23.55
Flow	m^3/h	*0.93*	0.69

LCP 7			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.1*	0.1
Carbon monoxide	ppm	*1.5*	1
Carbon dioxide	%	*N/A*	0.05
Oxygen	%	*20.23*	20.1
Hydrogen sulphide	ppm	*1.25*	1.50
Atmospheric pressure	Pa/Bar	*1013.75*	1012.75
Temperature	^{o}C	*21.69*	23.50
Flow	m^3/h	*0.6*	0.57

LCP 8			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.08*	0.15
Carbon monoxide	ppm	*1.75*	1.75
Carbon dioxide	%	*N/A*	0.1
Oxygen	%	*20.26*	20.18
Hydrogen sulphide	ppm	*2*	1.75
Atmospheric pressure	Pa/Bar	*1013.88*	1013
Temperature	^{o}C	*22*	23.8
Flow	m^3/h	*0.41*	0.89

LCP 9			
Parameter	**Concentration (Annual Average)**		
	Unit	**Previous year**	**Current year**
Methane	%	*0.18*	0.15
Carbon monoxide	ppm	*1.75*	2
Carbon dioxide	%	*N/A*	0.08
Oxygen	%	*20.05*	19.98
Hydrogen sulphide	ppm	*2.38*	2.25
Atmospheric pressure	Pa/Bar	*1014.75*	1013
Temperature	^{o}C	*22.46*	24.35
Flow	m^3/h	*1.15*	0.91

Landfill Gas Monitoring – Leachate collection points – Interpretation

None of the results exceed the assessment levels as listed in Table 4.1: Landfill Gas Monitoring in the Environmental Monitoring Programme

Gas samples from one leachate monitoring point and one groundwater monitoring borehole

			Annual session	
Analyte	**Analytical Method**	**Units of measure**	**BH 2**	**LCP 5**
METHANE	UNI EN ISO 6974-3:2005	%p	<0.01	<0.01
CARBON MONOXIDE (CO)	UNI EN ISO 6974-3:2006	%p	<0.01	<0.01
CARBON DIOXIDE (CO2)	UNI EN ISO 6974-3:2007	%p	<0.01	<0.01
OXYGEN (O2)	UNI EN ISO 6974-3:2008	%p	20.64	20.44
HYDROGEN (H2)	UNI EN ISO 6974-3:2009	%p	<0.01	<0.01
MERCAPTANS	ASTM D5504-08	ppmol		
Methanethiol			<0.10	<0.10
Ethanetiol			<0.10	<0.10
1-Propanethiol			<0.10	<0.10
Butanethiol			<0.10	<0.10
CARBON DISULPHIDE (CS2)	ASTM D5504-08	ppmol	<0.10	<0.10
DIMETHYL DISULPHIDE $(CH_3)_2S_2$	ASTM D5504-08	ppmol	<0.10	<0.10
HYDROGEN SULPHIDE (H2S)	ASTM D5504-08	ppmol	109.28	8.13
POLYCHLORINATED DIBENZO-PARA-DIOXINS (PCDDS)	EPA TO-9A:1999	ng/m3		
2,3,7,8-TetraChlorDibenzo-p-Dioxin (TCDD)			<0.0001	<0.0001
1,2,3,7,8-PentaChloroDibenzo-p-Dioxin (PeCDD)			<0.0001	<0.0001

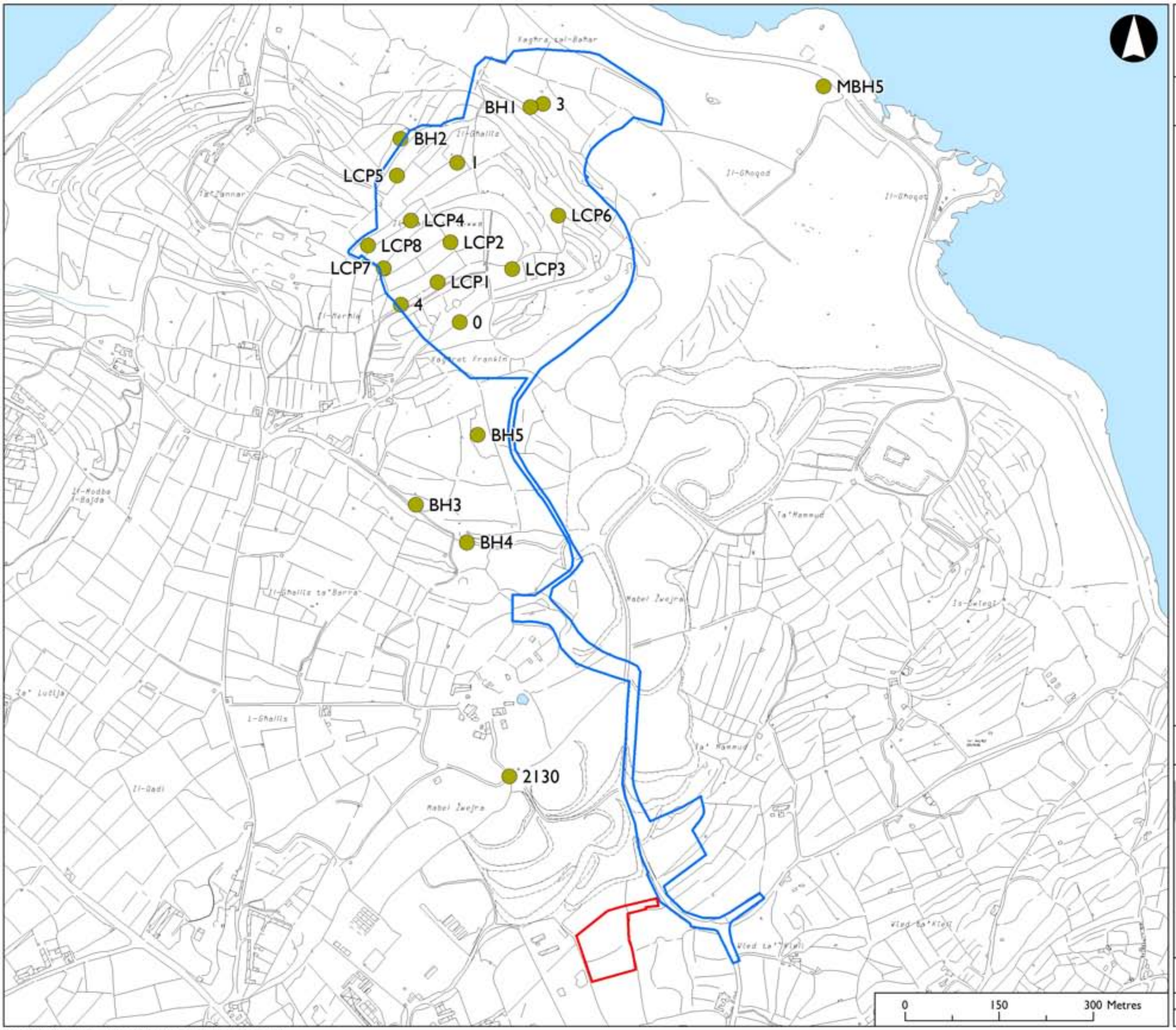
1,2,3,4,7,8-HexaChloroDibenzo-p-Dioxin (HxCDD)			<0.0001	<0.0001
1,2,3,4,7,9-HexaChloroDibenzo-p-Dioxin (HxCDD)			<0.0001	<0.0001
1,2,3,6,7,8-HexChloroDibenzo-p-Dioxin (HxCDD)			<0.0001	<0.0001
1,2,3,4,6,7,8-HeptaChloroDibenzo-p-Dioxin(HpCDD)			<0.0001	<0.0001
OctaChloroDibenzo-p-Dioxin (OCDD)			0.0036	0.0028
POLYCHLORINATED DIBENZOFURANS (PCDFs)	EPA TO-9A:1999	ng/m3		
2,3,7,8-TetraChloroDibenzoFuran (TCDF)			0.0006	0.0008
1,2,3,7,8-PentaChloroDibenzoFuran (PeCDF)			<0.0001	<0.0001
2,3,4,7,8-PentaChloroDibenzoFuran (PeCDF)			<0.0001	<0.0001
1,2,3,4,7,8-HexaChloroDibenzoFuran (HxCDF)			<0.0001	<0.0001
1,2,3,6,7,8-ExaChloroDibenzoFuran (HxCDF)			<0.0001	<0.0001
2,3,4,6,7,8-ExaChloroDibenzoFuran (HxCDF)			<0.0001	<0.0001
1,2,3,7,8,9-HexaChloroDibenzoFuran (HxCDF)			<0.0001	<0.0001
1,2,3,4,6,7,8-HeptaChloroDibenzoFuran (HpCDF)			<0.0001	<0.0001
1,2,3,4,7,8,9-HeptaChloroDibenzoFuran (HpCDF)			<0.0001	<0.0001
OctaChloroDIbenzoFuran (OCDF)			<0.0001	<0.0001
Sum of polychlorinated dibenzo-pdioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) expressed in I-TEQ	EPA TO-9A:1999 + NATO CCMS TEF 1988	ng/m3	<0.01	<0.0001
PAHs	NIOSH 5515	µg/m3		

Acenaphthene			<0.50	<0.50
Acenaphthylene			<0.50	<0.50
Anthracene			<0.50	1.01
Benzo(a)anthracene			<0.50	<0.50
Benzo(b,k)fluoranthene			<0.50	<0.50
Benzo(g,h,i)perylene			<0.50	<0.50
Benzo(a)pyrene			<0.50	<0.50
Chrysene			<0.50	<0.50
Dibenzo(a,h)anthracene			<0.50	<0.50
Fluoranthene			<0.50	1.82
Fluorene			<0.50	2
Indeno[1,2,3-cd]pirene			<0.50	<0.50
Naphtalene			<0.50	<0.50
Phenanthrene			<0.50	1.24
Pyrene			<0.10	<0.10
PCBs	EPA TO-9A:1999	mg/m3		
ALDEHYDES	EPA TO11 A	µg/m3		
Ethanal			<1	<1
Methanal (formaldehyde)			<1	<1
VOLATILE ORGANIC COMPOUNDS	EPA TO17 A:1999	µg/m3		

Benzene			<1	<1
Toluene			<1	<1
Styrene			<1	<1
Xylene			<1	<1
1,1 Dichloroethane			<1	<1
ARSENIC		µg/m3	0.19	<0.10
MERCURY		µg/m3	<0.30	<0.30

Gas samples – Interpretation

No assessment levels as per Table 4.1 in Environmental Monitoring Programme



en-sure monitoring

Landfill gas monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

Notes:
LCP 1 - LCP8: these boreholes are also used for leachate monitoring.
BH1 - BH5, 2130 & MBH5: these boreholes are also used for groundwater monitoring.

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

INDICATIVE ONLY - Not to be used for direct interpretation

Coastal waters Monitoring – Quarterly analysis

Parameters	Units	Coastal Waters Monitoring Locations 1											
		Location A				Location B				Location E			
		Previous Year		Current Year		Previous Year		Current Year		Current Year		Previous Year	
		Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Dissolved oxygen	%	***99.75***	***104.48***	33.33	33.05	***110.95***	***106.55***	33.63	33.18	***115.5***	***117***	32	34.25
Temperature	^{o}C	***21.38***	***21.27***	22.43	22.30	***20.985***	***20.97***	22.7	22.4	***26.92***	***26.77***	22.48	22.08
pH		***N/A***	***N/A***	8.02	8.03	***N/A***	***N/A***	8.06	8.05	***N/A***	***N/A***	8.07	8.1
Conductivity	µS/cm	***N/A***	***N/A***	53550	55700	***N/A***	***N/A***	55450	54600	***N/A***	***N/A***	54650	54800
TOC	mg/l	***N/A***	***N/A***	18	19	***N/A***	***N/A***	18	17	***N/A***	***N/A***	17	<0.1
Ammoniacal nitrogen	mg/l	***N/A***	***N/A***	1.3	1.1	***N/A***	***N/A***	0.7	0.86	***N/A***	***N/A***	1.8	1.9
Phenol index	mg/l	***N/A***	***N/A***	<0.05	<0.05	***N/A***	***N/A***	<0.05	<0.05	***N/A***	***N/A***	<0.05	<0.05
Cadmium	µg/l	***<0.1***	***<0.1***	<0.025	<0.025	***<0.1***	***<0.1***	<0.025	<0.025	***n.d.***	***n.d.***	<0.025	<0.025
Lead	µg/l	***<0.1***	***<0.1***	<0.1	<0.1	***<0.1***	***<0.1***	<0.1	<0.1	***n.d.***	***n.d.***	<0.1	<0.1
Nickel	µg/l	***4.87***	***3.98***	1.89	1.11	***4.52***	***4.95***	2.29	3.04	***5.75***	***9.13***	7.2	12
Mercury	µg/l	***n.d.***	***n.d.***	<0.05	<0.05	***n.d.***	***n.d.***	<0.05	<0.05	***n.d.***	***n.d.***	<0.05	<0.05
Arsenic	µg/l	***22.4***	***21.8***	<0.14	<0.14	***26.4***	***26.5***	<0.14	<0.14	***16.09***	***18.47***	7.11	9.12
Chromium	µg/l	***26.23***	***23.2***	8.80	9.5	***20.27***	***27.09***	11.10	12.08	***49***	***53.55***	55.9	56.8
Copper	µg/l	***6.47***	***8.91***	6.47	6.91	***8.82***	***9.16***	7.88	11.07	***8.06***	***10.1***	9.49	8.70

Zinc	µg/l	***19.78***	***12.5***	25.30	13.4	***11.33***	***950.89***	13	14.52	***12.9***	***13.2***	136.47	82.17
Fluoride	mg/l	***1.15***	***1.03***	1.99	1.71	***1.15***	***1.03***	2.02	1.77	***2.23***	***1.52***	2.26	1.53
Chloride	mg/l	***N/A***	***N/A***	26000	26681	***N/A***	***N/A***	26963	26397.5	***N/A***	***N/A***	26200	26741.50

Parameters	**Units**	**Coastal Waters Monitoring Locations 2**							
		Location C (Background)				**Location D (Background)**			
		Previous Year		**Current Year**		**Previous Year**		**Current Year**	
		Surface	**Bottom**	**Surface**	**Bottom**	**Surface**	**Bottom**	**Surface**	**Bottom**
Dissolved oxygen	%	***125.4***	***117.3***	35.1	35.05	***98.95***	***106.45***	34.08	34.05
Temperature	^{o}C	***21.4***	***20.9***	22.18	22.03	***21.21***	***21.07***	22.4	22.35
pH		***N/A***	***N/A***	7.94	7.96	***N/A***	***N/A***	8.02	8.06
Conductivity	µS/cm	***N/A***	***N/A***	54200	54400	***N/A***	***N/A***	54400	54350
TOC	mg/l	***N/A***	***N/A***	19	16	***N/A***	***N/A***	13	<0.1
Ammoniacal nitrogen	mg/l	***N/A***	***N/A***	0.3	0.8	***N/A***	***N/A***	0.32	<0.01
Phenol index	mg/l	***N/A***	***N/A***	<0.05	<0.05	***N/A***	***N/A***	<0.05	<0.05
Cadmium	µg/l	***<0.1***	***<0.1***	<0.025	<0.025	***<0.1***	***<0.1***	<0.025	<0.025
Lead	µg/l	***<0.1***	***<0.1***	<0.1	<0.1	***<0.1***	***<0.1***	<0.1	<0.1
Nickel	µg/l	***7.78***	***23.11***	2.17	5.41	***15.06***	***13.54***	4.8	8.81

Mercury	µg/l	***n.d.***	***n.d.***	<0.05	<0.05	***n.d.***	***n.d.***	<0.05	<0.05
Arsenic	µg/l	***19.8***	***22.2***	<0.14	<0.14	***17.69***	***20.21***	6.36	7.13
Chromium	µg/l	***34.39***	***27.67***	11.33	25.7	***50.7***	***63.2***	24.7	59.3
Copper	µg/l	***27.25***	***11.78***	8.31	9.58	***20.95***	***12.25***	11.03	17.06
Zinc	µg/l	***1081.65***	***34.05***	15.90	18.7	***19.6***	***21.83***	15.07	19.1
Fluoride	mg/l	***1.25***	***1.22***	1.88	1.79	***1.61***	***1.50***	2.88	2.63
Chloride	mg/l	***N/A***	***N/A***	26440.5	25850	***N/A***	***N/A***	26575.5	26481.5

Note: As from Quarter 3, the parameters marked in blue in the above tables are being analysed as per Table 11.1 of the updated Monitoring Programme. In view of this, no data is available for the previous year.

Coastal waters Monitoring – Annual analysis

Parameters	Units	Coastal Waters Monitoring Locations 1											
		Location A				Location B				Location E			
		Previous Year		Current Year		Previous Year		Current Year		Current Year		Previous Year	
		Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Iron	µg/l	***N/A***	***N/A***	6.8	<0.1	***N/A***	***N/A***	<0.1	<0.1	***N/A***	***N/A***	15.17	<0.1
Sulphate	mg/l	***3195***	***2935***	3096	3186	***3195***	***2935***	3106	2998	***2858.38***	***2537***	3490	3230
Sodium	mg/l	***N/A***	***N/A***	12391	13043	***N/A***	***N/A***	12691	13031	***N/A***	***N/A***	12560	13336
Potassium	mg/l	***N/A***	***N/A***	499	548	***N/A***	***N/A***	501	515	***N/A***	***N/A***	493	566
Magnesium	mg/l	***N/A***	***N/A***	298	333	***N/A***	***N/A***	323	318	***N/A***	***N/A***	277	323
Calcium	mg/l	***N/A***	***N/A***	471	539	***N/A***	***N/A***	503	540	***N/A***	***N/A***	499	530
Barium	µg/l	***N/A***	***N/A***	11.85	<0.1	***N/A***	***N/A***	79.3	<0.1	***N/A***	***N/A***	69.26	<0.1
Molybdenum	µg/l	***N/A***	***N/A***	<1	<1	***N/A***	***N/A***	<1	<1	***N/A***	***N/A***	<1	<1
Antimony	µg/l	***N/A***	***N/A***	<0.5	<0.5	***N/A***	***N/A***	<0.5	<0.5	***N/A***	***N/A***	<0.5	<0.5
Selenium	µg/l	***N/A***	***N/A***	<0.9	<0.9	***N/A***	***N/A***	<0.9	<0.9	***N/A***	***N/A***	<0.9	<0.9
Dioxins & Furans	µg/l	***<0.1***	***<0.1***	<0.1	<0.1	***<0.1***	***<0.1***	<0.1	<0.1	***n.d.***	***n.d.***	<0.1	<0.1

Parameters	Units	Coastal Waters Monitoring Locations 2			
		Location C (Background)		Location D (Background)	
		Current Year		Current Year	
		Surface	Bottom	Surface	Bottom
Iron	µg/l	<0.1	<0.1	76	<0.1
Sulphate	mg/l	3130	3682	3420	3560
Sodium	mg/l	13150	12956	12510	13002
Potassium	mg/l	533	668	591	550
Magnesium	mg/l	366	370	299	300
Calcium	mg/l	519	535	520	550
Barium	µg/l	<0.1	12.4	<0.1	<0.1
Molybdenum	µg/l	<1	<1	<1	<1
Antimony	µg/l	<0.5	<0.5	<0.5	<0.5
Selenium	µg/l	<0.9	<0.9	<0.9	<0.9
Dioxins & Furans	µg/l	<0.1	<0.1	<0.1	<0.1

Note: As from Quarter 3 the above parameters are being analysed on an annual basis as per Table 11.1 of the updated Monitoring Programme. In view of this, no data is available for the previous year.

Sediment Monitoring – Annual analysis

Parameter	Unit	Sediment Monitoring locations									
		Location A		Location B		Location C (Background)		Location D (Background)		Location E	
		Previous year	Current year	Previous year	Current year	Previous year	Current year	Previous year	Current year	Previous year	Current year
Granulometry[1]	% w/w	***33.29***	14.29	***33.25***	14.28	***15.29***	14.28	***19.42***	14.28	***14.21***	14.29
Total Organic Carbon	mg/Kg	***N/A***	0.58	***N/A***	0.65	***N/A***	0.44	***N/A***	0.71	***N/A***	0.78
Ammoniacal Nitrogen	mg/Kg	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Chloride	mg/Kg	***N/A***	<1	***N/A***	<1	***N/A***	<1	***N/A***	<1	***N/A***	<1
Fluoride	mg/Kg	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Phenol index	mg/Kg	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Iron	mg/Kg	***N/A***	402	***N/A***	980.2	***N/A***	804.4	***N/A***	6121	***N/A***	835.6
Sulphate	mg/Kg	***N/A***	168.5	***N/A***	181.4	***N/A***	132.3	***N/A***	140.7	***N/A***	169.4
Sodium	mg/Kg	***N/A***	12080	***N/A***	11240	***N/A***	10462	***N/A***	9820	***N/A***	11363

[1] Expressed as mean sediment grain size

Potassium	mg/Kg	***N/A***	846	***N/A***	826	***N/A***	792	***N/A***	1092	***N/A***	856
Magnesium	mg/Kg	***N/A***	15500	***N/A***	14920	***N/A***	15164	***N/A***	11750	***N/A***	14835
Calcium	mg/Kg	***N/A***	298900	***N/A***	288570	***N/A***	292650	***N/A***	355100	***N/A***	290727
Arsenic	mg/Kg	***1.76***	1.9	***1.96***	3.1	***2.49***	2.2	***2.28***	2.9	***<1***	2.1
Barium	mg/Kg	***N/A***	6.6	***N/A***	6.8	***N/A***	7.2	***N/A***	10.4	***N/A***	9.6
Cadmium	mg/Kg	***0.16***	<0.07	***0.14***	<0.07	***0.217***	<0.07	***0.28***	<0.07	***<1***	<0.07
Chromium	mg/Kg	***8.54***	3.3	***9.01***	6.4	***6.34***	2.8	***11***	13.6	***16.43***	7.2
Copper	mg/Kg	***1.73***	2.1	***1.67***	1.5	***1.38***	1.4	***5.33***	6.1	***50.05***	2
Mercury	mg/Kg	***<0.01***	<0.1	***<0.01***	<0.1	***<0.01***	<0.1	***<0.01***	<0.1	***<1***	<0.1
Molybdenum	mg/Kg	***N/A***	7.5	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Nickel	mg/Kg	***1.13***	0.79	***0.74***	1.1	***1.46***	0.92	***2.46***	4.7	***<1***	4.9
Lead	mg/Kg	***6.81***	39.5	***7.54***	5.6	***37.96***	3.4	***88***	361	***<1***	9.4
Antimony	mg/Kg	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Selenium	mg/Kg	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1	***N/A***	<0.1
Zinc	mg/Kg	***6.14***	4.3	***7.74***	2.9	***9.05***	3.6	***8.99***	12.8	***20.99***	6.1
Dioxins & Furans	µg/Kg	***0.0005***	<0.001	***0.0008***	<0.001	***0.0003***	<0.001	***0.0004***	<0.001	***<0.01***	<0.001

Note: **As from Quarter 3, the parameters marked in blue in the above tables are being analysed as per Table 11.2 of the updated Monitoring Programme. In view of this, no data is available for the previous year.**

Coastal Waters and Sediment - Interpretation

For the seawater results there was an overall lowering of values when compared to the previous year results. For the quarterly analysis, the average levels of zinc recorded from both the surface and bottom water samples collected from Station E exceeded previous levels reported. However as can be observed from the raw data sheet attached, there is only one instant (i.e. during Quarter 4) where the results were much higher than normal resulting in a higher overall average as highlighted above. For the annual analysis, the level of iron recorded from the surface water sample collected from Location D is quite high when compared with the results obtained during the same year. Though zinc and iron have been detected in moderate quantities occasionally, the presence of these elements is not uncommon. Their levels vary according to uptake (as micronutrients) and recycling by biota.

For the remaining seawater parameters, locations A, B and E are similar or lower than the background locations (C and D) and hence this shows that there is no significant impact of the landfill's operations on the coastal environment.

The same applies for sediments results; all the locations are similar or lower than the background locations except for levels of lead recorded from Locations A and D. These results were verified and reconfirmed by the laboratory since the presence of lead is not normal. It was concluded that its presence could be due to lost fishing line lead weights that deposit on the seabed sediment.

en-sure monitoring

Coastal waters and sediment monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

C
B
A
E
D
Mellieħa
Xemxija
San Pawl il-Bahar
Salini
Salini
Burmarrad
Bahar ic-Caghaq
Bahar ic-Caghaq
Pembroke
Swieqi
San Giljan
Gharghur
Naxxar
Mosta
Mosta
Bidnija
Żebbiegħ
Mgarr
0 1 2 Kilometres

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

INDICATIVE ONLY - Not to be used for direct interpretation

Groundwater Monitoring – Quarterly analysis

		BH1		BH2		BH4		2130		2041	
Parameter	**Unit**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**
pH	/	***7.43***	7.55	***7.48***	7.28	***7.38***	7.55	***6.9***	7.3	***7.15***	7.13
Conductivity	µS/cm	***14360***	10530.67	***2747.75***	2676.67	***2806.75***	1991.25	***3410***	7130	***7855***	5805
Water level	m	***N/A***	42.08	***N/A***	36.2	***N/A***	52.43	***N/A***	N/A	***N/A***	N/A
Total organic Carbon	mg/l	***70.47***	6.68	***38.85***	6.93	***53.05***	6.3	***52.5***	6.4	***42.8***	10.2
Ammoniacal Nitrogen	mg/l	***<0.4***	3.75	***<0.4***	0.85	***<0.4***	0.9	***<0.4***	<0.01	***<0.4***	<0.01
Chloride	mg/l	***3164.33***	3830.8	***701.25***	2521.925	***728.5***	450.85	***863***	1874.15	***2118.25***	1658.45
Fluoride	mg/l	***<0.1***	<0.05	***0.207***	<0.05	***0.27***	<0.05	***0.1***	<0.05	***<0.1***	<0.05
Phenol index	mg/l	***<0.005***	<0.05	***<0.005***	<0.05	***<0.005***	<0.05	***<0.005***	<0.05	***<0.005***	<0.05
Arsenic	mg/l	***0.019***	0.0047	***0.0031***	0.00175	***0.0029***	0.0015	***0.0049***	0.0038	***0.0093***	0.0059
Cadmium	µg/l	***<0.001***	0.46	***<0.001***	0.64	***<0.001***	0.4	***<0.001***	<0.025	***<0.001***	<0.025
Chromium	mg/l	***0.005***	0.0068	***0.0064***	0.0093	***0.0059***	0.0032	***0.011***	0.0018	***0.0095***	0.0015
Copper	mg/l	***0.023***	0.0034	***0.0042***	0.059	***0.0043***	0.0057	***0.025***	<0.0003	***0.0113***	0.014
Nickel	mg/l	***0.009***	0.0034	***0.0057***	0.0024	***0.0055***	0.0015	***0.012***	0.0047	***0.0131***	0.0011
Lead	mg/l	***0.0014***	0.012	***<0.001***	0.016	***<0.001***	0.009	***<0.001***	0.0007	***<0.001***	0.01

Groundwater Monitoring – Annual analysis

		BH1		BH2		BH4		2130		2041	
Parameter	**Unit**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**
Iron	mg/l	***0.043***	1.07	***0.022***	0.502	***0.038***	0.3	***0.051***	0.076	***0.026***	0.099
Sulphate	mg/l	***370.67***	1560.2	***86.85***	115	***96.68***	94.6	***104.67***	510.3	***233.5***	529.4
Sodium	mg/l	***1902.67***	230.6	***387***	250.2	***385.75***	160.5	***502.33***	620.3	***1128.75***	440.5
Potassium	mg/l	***95***	19.5	***9.85***	4.9	***11.85***	3.7	***29.4***	40.7	***39.23***	26.5
Magnesium	mg/l	***244***	210.1	***45.18***	27.4	***48.88***	23.5	***69.93***	100.6	***147***	131.5
Calcium	mg/l	***205.33***	41.51	***117.3***	5.53	***114.75***	54.76	***138.77***	53.27	***259.75***	56.45
Barium	µg/l	***22.37***	26.5	***13.93***	21.2	***15.55***	21.5	***27***	24.7	***14.93***	24.4
Mercury	µg/l	***<0.001***	<0.05	***<1***	<0.05	***<1***	<0.05	***<1***	<0.05	***<1***	<0.05
Molybdenum	µg/l	***2.3***	<1	***<1***	<1	***<1***	<1	***<1***	7.1	***<1***	13.2
Antimony	µg/l	***<1.5***	<0.5	***<1.5***	<0.5	***<1.5***	<0.5	***<1.5***	<0.5	***<1.5***	<0.5
Selenium	µg/l	***<2***	<0.9	***8***	0.95	***<2***	<0.9	***<2***	<0.9	***<2***	<0.9
Zinc	µg/l	***39***	19.3	***26.8***	45.5	***29.2***	24.6	***<20***	16.4	***339***	148.8

Groundwater Monitoring - Interpretation

Overall there was a lowering of values when compared to the previous year results. However as per Table 8.1 of the Environmental Monitoring Programme there were also exceedances for the following quarterly parameters:

- Control levels and/or trigger levels for Ammoniacal Nitrogen for boreholes BH1, BH2 and BH4.
- Control levels and/or trigger levels for Arsenic for borehole BH 1.
- Control levels and/or trigger levels for Cadmium for boreholes BH1, BH2 and BH4.

As can be observed from the raw data sheet attached, in most cases there is only one instant (mostly during Quarter 1) where the results were higher than normal. This resulted in a higher overall average whereas for the remaining quarters the levels of these parameters were below the respective instrumental limits of detection.

Since no clear source of contamination was identified, groundwater will continue to be monitored in the coming year in order to determine whether there is a decrease or increase in the exceeding contaminants. Should there be an increase, the site operations will be reviewed and action taken to control the breach in the trigger level, if applicable.

The same applies for the annual parameters where there was an overall decrease from previous year results. As per Table 8.1 no control or trigger levels are specified for the annual parameters.

en-sure monitoring

Groundwater monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

MBH5
BH1
BH2
BH5
BH3
BH4
2130
2041
00574

0 150 300 Metres

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

INDICATIVE ONLY - Not to be used for direct interpretation

Leachate Monitoring

In 2015, no leachate was found when sampling in leachate collection points (LCP) 1 - 3, 5 and 7, hence no analysis was carried out.
LCP 4 was inaccessible throughout the year due to continuous work carried out in the same area and hence no sampling and analysis were carried out.

LCP 6

Parameter	Unit	Previous Year Average	Quarterly Average
Arsenic	mg/l	***0.27***	0.33
Cadmium	mg/l	***0.017***	0.008
Chromium	mg/l	***1.23***	1.14
Copper	mg/l	***0.096***	0.092
Nickel	mg/l	***0.44***	0.54
Lead	mg/l	***0.34***	0.61
Ammoniacal nitrogen	mg/l	***5196.5***	3340.5
Chloride	mg/l	***5670.25***	8724.5
Fluoride	mg/l	***<0.1***	<0.01
Phenol index	mg/l	***263***	<0.05
pH	/	***8.13***	8.4
Conductivity	µS/cm	***43800***	41178
Total organic Carbon	mg/l	***19840.25***	16130
Water level	m	***21.5***	19

Parameter	Unit	Previous Year Average	Yearly Average
Barium	µg/l	***139***	<0.01
Mercury	µg/l	***0.83***	<0.6
Molybdenum	µg/l	***28.8***	<0.05
Antimony	µg/l	***65***	<0.01
Selenium	µg/l	***122***	<0.01
Zinc	µg/l	***201***	<0.01
Sulphate	mg/l	***185***	<0.01
Iron	mg/l	***54.36***	<5000
Sodium	mg/l	***4966***	<0.05
Potassium	mg/l	***3815***	<0.05
Magnesium	mg/l	***289***	<0.05
Calcium	mg/l	***98.7***	<0.05

LCP 8

Parameter	Unit	Previous Year Average	Quarterly Average
Arsenic	mg/l	***0.6***	0.26
Cadmium	mg/l	***0.019***	0.025
Chromium	mg/l	***1.73***	1.66
Copper	mg/l	***2.41***	0.27
Nickel	mg/l	***0.98***	0.57
Lead	mg/l	***0.71***	1.18
Ammoniacal nitrogen	mg/l	***4884***	3718
Chloride	mg/l	***5789***	7023.25
Fluoride	mg/l	***<0.10***	1.18
Phenol index	mg/l	***254***	<0.05
pH	/	***8.01***	8.7
Conductivity	µS/cm	***37450***	31661.75
Total organic Carbon	mg/l	***20344.5***	12345
Water level	m	***17***	15

Parameter	Unit	Previous Year Average	Yearly Average
Barium	µg/l	***540***	<0.01
Mercury	µg/l	***1.5***	<0.6
Molybdenum	µg/l	***25***	<0.05
Antimony	µg/l	***52***	<0.01
Selenium	µg/l	***114***	<0.01
Zinc	µg/l	***8180***	<0.01
Sulphate	mg/l	***2395***	<0.01
Iron	mg/l	***225.05***	<5000
Sodium	mg/l	***5388***	<0.05
Potassium	mg/l	***3838***	<0.05
Magnesium	mg/l	***594***	<0.05
Calcium	mg/l	***2224***	<0.05

LCP 9

Parameter	Unit	Previous Year Average	Quarterly Average
Arsenic	mg/l	***0.34***	0.49
Cadmium	mg/l	***0.006***	0.008
Chromium	mg/l	***1.38***	1.30
Copper	mg/l	***0.6***	5.33
Nickel	mg/l	***0.97***	0.86
Lead	mg/l	***0.29***	0.67
Ammoniacal nitrogen	mg/l	***5547***	4879.25
Chloride	mg/l	***7017.25***	8689.25
Fluoride	mg/l	***<0.10***	<0.01
Phenol index	mg/l	***47.3***	<0.05
pH	/	***7.45***	8.53
Conductivity	µS/cm	***25120***	22318
Total organic Carbon	mg/l	***20322***	13671
Water level	m	**-**	**-**

Parameter	Unit	Previous Year Average	Yearly Average
Barium	µg/l	***44.3***	<0.01
Mercury	µg/l	***0.36***	<0.01
Molybdenum	µg/l	***25.7***	<0.05
Antimony	µg/l	***28.1***	<0.01
Selenium	µg/l	***82.6***	<0.01
Zinc	µg/l	***1052***	<0.01
Sulphate	mg/l	***46***	<0.01
Iron	mg/l	***9.79***	<5000
Sodium	mg/l	***1990***	<0.05
Potassium	mg/l	***1498***	<0.05
Magnesium	mg/l	***105***	<0.05
Calcium	mg/l	***6.6***	<0.05

Leachate Monitoring - Interpretation

Overall there was a lowering of values when compared to the previous year results. However in all the Leachate monitoring points, the control and/or trigger levels specified in Table 7.1 in the Environmental Monitoring Programme have been exceeded for the following parameters:

- Arsenic (except for LCP 8)
- Cadmium (LCP 8 only)
- Chromium
- Copper
- Nickel (except for LCP 8)
- Lead
- Ammoniacal Nitrogen
- Chloride

The leachate in Ghallis is only partly treated through the Reverse Osmosis plant, with the majority being re-circulated. It is therefore expected that the contamination within the leachate being monitored is exceeding the control and trigger levels. Other than that since the same leachate is being re-circulated there, in some cases there is an increase of concentration over time.

Moreover, given that some samples were collected after several weeks of lack of heavy rainfall some of the wells dried up; in fact most of these leachate collection points had water levels at the deep ends of the wells hence there was not enough rainfall to permeate through the ground to dilute leached pollutants.

en-sure monitoring

Leachate monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

LCP5
LCP4
LCP6
LCP8
LCP2
LCP7
LCP3
LCP1

0 150 300 Metres

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

INDICITIVE ONLY - Not to be used for direct interpretation

Surface Water Monitoring – Quarterly analysis

		SW1		SW2		SW3	
Parameter	**Units**	**Previous year Average**	**Current year Average**	**Previous year Average**	**Current year Average**	**Previous year Average**	**Current year Average**
pH	/	***8.6***	7.75	***8.35***	7.23	***8.5***	7.5
Conductivity	µS/cm	***204.5***	5664.75	***867.5***	6977	***204.5***	1673
Total Organic Carbon	mg/l	***1.8***	12.1	***1.4***	16.8	***1.6***	20.7
Ammoniacal Nitrogen	mg/l	***0.03***	6.67	***0.07***	8.27	***0.43***	6.03
Chloride	mg/l	***16.4***	1227.2	***210.9***	1568.3	***20.1***	291.1
Fluoride	mg/l	***0.15***	<0.05	***0.21***	<0.05	***0.16***	<0.05
Phenol index	mg/l	***N/A***	<0.05	***N/A***	<0.05	***N/A***	<0.05
Arsenic	mg/l	***<0.001***	0.01	***<0.001***	0.018	***<0.001***	0.011
Cadmium	µg/l	***<0.1***	<0.025	***<0.1***	<0.025	***<0.1***	0.78
Chromium	mg/l	***<0.001***	0.013	***<0.001***	0.0089	***<0.001***	0.0106
Copper	mg/l	***0.006***	0.08	***0.012***	0.076	***<0.001***	0.055
Nickel	mg/l	***n.d.***	0.19	***0.002***	0.15	***0.002***	0.073
Lead	mg/l	***<0.001***	0.005	***<0.001***	0.013	***<0.001***	0.008

Surface water Monitoring – Annual analysis

		SW1		SW2		SW3	
Parameter	**Units**	**Previous year Average**	**Current year Average**	**Previous year Average**	**Current year Average**	**Previous year Average**	**Current year Average**
Iron	mg/l	***0.035***	0.47	***0.052***	0.523	***0.035***	0.199
Sulphate	mg/l	***4.95***	140.5	***25.95***	146.8	***5.9***	49.2
Sodium	mg/l	***9.5***	38.7	***84.1***	41.4	***12.2***	21.5
Potassium	mg/l	***2***	11.2	***4.75***	20.4	***2.7***	8.3
Magnesium	mg/l	***2***	8.3	***11.2***	11.5	***2.7***	6.6
Calcium	mg/l	***21.3***	9.15	***41.65***	72.62	***24.45***	9.52
Barium	µg/l	***6.5***	35.6	***11***	103.1	***9***	191.6
Mercury	µg/l	***<0.05***	<0.05	***<0.05***	<0.05	***<0.05***	<0.05
Molybdenum	µg/l	***<1***	6.6	***<1***	20.4	***<1***	15.7
Antimony	µg/l	***<0.1***	0.96	***<0.1***	1.7	***<0.1***	14.2
Selenium	µg/l	***<0.1***	<0.9	***<0.1***	<0.9	***<0.1***	<0.9
Zinc	µg/l	***13***	12.4	***38.5***	39.2	***23.5***	36.4

Surface water monitoring interpretation

The surface water results show that there was an overall increase in the values reported when compared to the previous year results. As per Table 9.1 of the Environmental Monitoring Programme the control and/or trigger levels have been exceeded for the following parameters:

- Ammoniacal Nitrogen
- Arsenic
- Cadmium (for SW 3 only)
- Nickel
- Lead (for SW 2 only)

The surface water samples are very subjective due to their nature in itself. For example; Ammoniacal Nitrogen in water which in essence is a reflection of the level of ammonia present, varies due to various factors. While actual rain water is not expected to have any, the detected presence would be a result of dissolution into the puddles from ammonia already present on the ground or from any fresh airborne deposits directly into the puddles. The same applies for the other parameters listed. Moreover, the locations of the sampled puddles were closed but not identical hence one cannot exclude the factor location. Some traces might have been present in a certain location compared to another location which did not have at the time of sampling resulting in higher average values. Due to the lack of appropriate fixed collection points it is difficult to collect surface water leading to the possible contamination of the sampling equipment with landfill material collected with the run-off.

Another possibility is the commencement of farming in the adjacent land mainly the addition of fertilizers (natural and/or artificial) or soil churning. Wind would easily transport ‘contaminated’ topsoil dust onto the landfill contributing to higher values.

As per the above, no clear source of contamination was identified, surface water will continue to be monitored in the coming year in order to determine whether there is a decrease or increase in the exceeding contaminants. Should there be an increase, the site operations will be reviewed and action taken to control the breach in the trigger level, if applicable.

en-sure monitoring

Surface water monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

SW1

SW2

SW3

0 150 300 Metres

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

INDICATIVE ONLY - Not to be used for direct interpretation

Crops											
Parameters	**Units**	**A**		**B**		**C**		**D**		**E**	
		Previous Year Average	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**
Nitrogen	%	***0.47***	0.29	***0.46***	0.31	***0.48***	0.32	***0.49***	0.39	***0.6***	0.3
Phosphorus	mg/kg	***8900***	3700	***4750***	3215	***4400***	3730	***2700***	3655	***1600***	3955
Potassium	mg/kg	***11000***	3775	***10080***	4315	***7700***	3970	***15900***	3910	***7700***	4100
Fluoride	mg/kg	***2.55***	<0.1	***1.65***	<0.1	***1.45***	<0.1	***1.6***	<0.1	***1.6***	<0.1
Sulphate	mg/kg	***3400***	185.95	***2693.5***	188.25	***3557.5***	227.95	***3138.5***	270.25	***3604***	195.55
Cyanide	mg/kg	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1
Mercury	mg/kg	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005
Cadmium	mg/kg	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005	***<0.1***	<0.005
Lead	mg/kg	***4***	0.79	***9.5***	0.41	***8.5***	0.17	***13.5***	0.51	***5***	0.54
Nickel	mg/kg	***10***	0.49	***10.5***	0.31	***5***	0.17	***5***	0.44	***5***	0.32
Arsenic	mg/kg	***1***	0.37	***1.2***	0.42	***1.3***	0.55	***0.8***	0.81	***<0.1***	0.5
Chromium	mg/kg	***11***	0.39	***20.5***	0.32	***7***	0.22	***8.5***	0.3	***6.5***	0.49
Copper	mg/kg	***6***	3.64	***6.5***	3.5	***6***	1.55	***6.5***	3.94	***5***	3.72
Zinc	mg/kg	***65***	13.3	***34.5***	15.3	***45***	10.19	***62***	19.48	***68.5***	22.25
Tin	mg/kg	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1	***<0.1***	<0.1

Boron	mg/kg	***7.9***	5.2	***6.65***	2.2	***8.5***	0.6	***6.6***	1.1	***3.45***	1.1
Polychlorinated Biphenyls (PCBs)	mg/kg	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001
Polyaromatic Hydrocarbons (PAHs)	mg/kg	***0.04***	<0.003	***0.03***	<0.003	***0.03***	<0.003	***0.03***	<0.003	***0.04***	<0.003
Volatile aromatic hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.005	***<0.01***	<0.0005	***<0.01***	<0.005
Volatile halogenated Hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.005
Dioxins and Furans	µg/kg	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001
Naphthalene	mg/kg	***0.04***	<0.003	***0.03***	<0.003	***0.03***	<0.003	***0.03***	<0.003	***0.04***	<0.003

Soil – taken at 15cm depth											
Parameters	**Units**	**A**		**B**		**C**		**D**		**E**	
		Previous Year Average	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**	**Previous Year Average**	**Current Year Average**
Nitrogen	%	***0.23***	0.16	***0.25***	0.18	***0.23***	0.14	***0.23***	0.17	***0.22***	0.17
Phosphorus	mg/kg	***900***	32.73	***900***	142.40	***400***	196	***1050***	119.57	***900***	110.57
Potassium	mg/kg	***3500***	89.43	***4100***	105.27	***3800***	140.43	***3930***	93.80	***2700***	73.83
Fluoride	mg/kg	***1.67***	<2	***1.2***	<2	***1.37***	<2	***0.997***	<2	***0.85***	<2
Sulphate	mg/kg	***80.2***	214.87	***90.2***	248.80	***74.53***	230.6	***65.28***	190.50	***56.4***	211.50
Cyanide	mg/kg	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2
Mercury	mg/kg	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5
Cadmium	mg/kg	***0.51***	0.93	***0.51***	0.99	***0.57***	1.1	***0.74***	0.89	***0.84***	0.69
Lead	mg/kg	***66.25***	12.97	***25.6***	14.50	***18.9***	46.1	***142.25***	57.57	***24.53***	24.97
Nickel	mg/kg	***17.25***	13.01	***19.5***	15.60	***21.33***	20.53	***20.78***	19.03	***23.58***	16.33
Arsenic	mg/kg	***13.33***	7.37	***10.85***	7.57	***9.6***	10.07	***9.43***	11.83	***10.43***	8.5
Chromium	mg/kg	***30.75***	17.8	***33.2***	22.27	***37.25***	31.20	***39.28***	28.57	***35.38***	25.8
Copper	mg/kg	***20.35***	9.1	***14.5***	13.53	***12.75***	16.1	***25.5***	21.57	***19.45***	19.43
Zinc	mg/kg	***98***	30.07	***79***	48.63	***53.5***	76.1	***199.95***	97.43	***60.25***	76.17
Tin	mg/kg	***2.35***	6.2	***2.55***	7.50	***1.75***	5.73	***3.53***	65.3	***2.83***	6.83
Boron	mg/kg	***17.95***	7.87	***15.75***	7.70	***17.4***	8.2	***24.2***	4.05	***19.23***	8.15
Polychlorinated Biphenyls (PCBs)	mg/kg	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001	***0.08***	<0.001	***<0.005***	<0.001

Polyaromatic Hydrocarbons (PAHs)	mg/kg	***0.28***	0.021	***0.01***	<0.003	***<0.01***	3.45	***0.38***	0.29	***0.01***	<0.003
Volatile aromatic hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005
Volatile halogenated Hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005
Dioxins and Furans	µg/kg	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001
Naphthalene	mg/kg	***0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003

Soil – taken at 30cm depth											
		A		B		C		D		E	
		Previous Year Average	Current Year Average	Previous Year Average	Current Year Average	Previous Year Average	Current Year Average	Previous Year Average	Current Year Average	Previous Year Average	Current Year Average
Nitrogen	%	***0.22***	0.15	***0.24***	0.17	***0.23***	0.14	***0.22***	0.16	***0.2***	0.16
Phosphorus	mg/kg	***700***	31.77	***900***	136.23	***522***	188.13	***700***	115.1	***860***	106.97
Potassium	mg/kg	***3720***	83.70	***4000***	97.07	***3596***	125.80	***3780***	90.53	***2940***	76.33
Fluoride	mg/kg	***1.57***	<2	***1.2***	<2	***1.19***	<2	***1.3***	<2	***0.85***	<2
Sulphate	mg/kg	***77.55***	208.7	***120.88***	257.33	***75.38***	234.17	***74.75***	185.80	***72.63***	203.8
Cyanide	mg/kg	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2	***<0.1***	<0.2
Mercury	mg/kg	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5	***<0.1***	<0.5
Cadmium	mg/kg	***0.49***	0.96	***0.51***	0.56	***0.7***	1.1	***0.795***	1.08	***0.56***	0.85
Lead	mg/kg	***50.65***	11.57	***26.25***	9.73	***25***	62.4	***97.75***	50.03	***22.48***	23.93
Nickel	mg/kg	***18.63***	13.57	***1***	13.2	***21.3***	20.6	***24.75***	18.7	***20.33***	20.37
Arsenic	mg/kg	***11.75***	6.23	***8.9***	8	***9.58***	9.77	***10.73***	10.37	***9.18***	10.83
Chromium	mg/kg	***32.75***	16.73	***35.68***	17.90	***37.8***	28.83	***45.5***	29.7	***34.15***	29.97
Copper	mg/kg	***19.1***	8.43	***16.35***	9.5	***12.43***	14.3	***22.2***	21.83	***14***	21.07
Zinc	mg/kg	***96***	27.93	***63.25***	34.1	***53.1***	67.1	***152.25***	107.27	***62.25***	83.1
Tin	mg/kg	***2.33***	6.05	***3.65***	7.8	***1.8***	22.15	***3.5***	26.9	***2.4***	6.60
Boron	mg/kg	***19.28***	7.23	***18.95***	6.47	***17.9***	3.75	***23.63***	3.8	***20.57***	6.1
Polychlorinated Biphenyls (PCBs)	mg/kg	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001	***<0.005***	<0.001

Polyaromatic Hydrocarbons (PAHs)	mg/kg	***0.37***	0.02	***0.01***	0.055	***0.017***	0.29	***0.496***	0.06	***0.012***	<0.003
Volatile aromatic hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005
Volatile halogenated Hydrocarbons	mg/kg	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005	***<0.01***	<0.0005
Dioxins and Furans	µg/kg	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001	***<0.1***	<0.001
Naphthalene	mg/kg	***<0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003	***<0.01***	<0.003

Agriculture and Soils Monitoring - Interpretation

As stated in the Environmental Monitoring Programme, no control or trigger levels are proposed at this stage. It is however recommended that the data be reviewed annually to identify trends, not only in the values of contaminants in soil and crops, but also in their spatial distribution, taking into account weather conditions; in particular winds and rainfall patterns, and other potential sources of contamination.

Results for crops show that all the values reported in 2015 were similar or lower to the values reported in 2014 except for phosphorus. The presence of phosphorus is considered normal in plants since it is an essential element. The origin of this parameter is natural but greatly augmented by soil supplements added by farmers to aid in crop growth. It is to be noted that crops were only sampled during Q1 and Q2 since no crops were found during the subsequent quarters.

The same applies for soil results which were similar to the previous year results except for certain parameters mainly sulphate and tin. Levels of sulphate were quite similar between top and bottom sample. The presence of sulphate is considered normal and is greatly affected by farming practices such as addition of soil supplements and soil churning. Levels of tin were low in most samples but rather elevated in the bottom sample at Site C and the top and bottom samples at Site D however as can be seen in the attached raw data sheet, there is only one instant (i.e. during Quarter 3) where the reported values were much higher than normal resulting in a higher overall average as highlighted above. This occurrence seems to point to at a recent contamination at time of monitoring or to a much localized contamination since barely any tin had been detected in previous sampling sessions.

Any increases reported cannot be attributed to landfill activities only since several other factors such as; aerial deposition of dust and air-borne contaminants from vehicle emissions and the presence of livestock farms surrounding the sampling areas could affect the results obtained.

en-sure monitoring

Agriculture and crops monitoring points

Legend

- Site boundary
- Ghallis landfill site
- Monitoring point

IP 0001/12 - Green Skip waste management facility

Map by: en-sure monitoring

Client: Green Skip Services Ltd	Ref: ES_GSK002
File ref: Contamination Stud.\Green Skips	Date: 04 / 2017

0 150 300 Metres

INDICATIVE ONLY - Not to be used for direct interpretation

Appendix 3: Laboratory certification

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

1549

Accredited to ISO/IEC 17025:2005

Scientific Analysis Laboratories Ltd (trading as Concept Life Sciences- Analytical Services)

Issue No: 087 **Issue date:** 26 April 2017

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Testing performed by the Organisation at the locations specified

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Hadfield House Hadfield Street Old Trafford Manchester M16 9FE	**Local contact** Mrs. Jeanette Abbott Tel: +44 (0)161 874 2400 Fax: +44 (0)161 874 2404 E-Mail: salsales@salltd.co.uk Website: www.salltd.co.uk	Environmental Analysis, Air, Food and Feed Analysis	A
Address 3 Crittal Drive Springwood Industrial Estate Braintree Essex CM7 2RT	**Local contact** Ms Louise Tanous Tel: +44 (0)1376 328646 Fax: +44 (0)1376 552923 E-Mail: salsales@salltd.co.uk Website: www.salltd.co.uk	Environmental Analysis	B
Address Unit 2 The Links Bar Hill Cambridge CB23 8UD	**Local contact** Contact: Ms Louise Tanous Tel: +44 (0)1954 782791 Fax: +44 (0)1954 782183 E-Mail: salsales@salltd.co.uk Website: www.salltd.co.uk	Microbiological (Food and Process Waters) Nutrition Analysis Pesticide Residue Analysis	C
Address 69A Killyman Street Moy Co Tyrone Northern Ireland BT71 7EA	**Local contact** Mrs K A Simpson Tel: +44 (0)28 8778 9599 Fax: +44 (0)28 8778 9552 E-Mail: salsales@salltd.co.uk Website: www.salltd.co.uk	Microbiological (Food, Milk and Process Waters)	D
Address 16 Langlands Place Kelvin South Business Park East Kilbride Glasgow G75 0YF	**Local contact** Contact: Mrs Y Croft Tel: +44 (0)1355 573340 Fax: +44 (0)1355 573341 E-Mail: scotsales@salltd.co.uk Website: www.salltd.co.uk	Environmental Analysis	E

Schedule of Accreditation
issued by
United Kingdom Accreditation Service
2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

UKAS TESTING
1549

Accredited to
ISO/IEC 17025:2005

Scientific Analysis Laboratories Ltd (trading as Concept Life Sciences - Analytical Services)

Issue No: 087 **Issue date**: 26 April 2017

Testing performed by the Organisation at the locations specified

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
STACK GASES FLY ASH SOILS SEDIMENTS (liquid and solid matrix) VEGETATION EFFLUENT DUST CHEMICALS WATERS - SURFACE WATER, GROUND WATER and POTABLE WATER (Non-Regulatory) BIOLOGICAL MATERIALS including mussels and blood FOODS (Fatty Materials and Edible Oils)	<u>Chemical Tests</u> Poly Chlorinated Dibenzo-p-Dioxins (PCDD): 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD Poly Chlorinated Dibenzo Furans (PCDF): 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Documented In-House Method Organic MSOP1 based on USEPA Method 1613 and US Federal Register Method 23, Volume 56, No 30 (Feb 13, 1991) using Gas Chromatography - High Resolution Mass Spectrometry (GC-MS) and labelled internal standards	A
STACK GASES, FLY ASH SOILS, SEDIMENTS (liquid and solid matrix), VEGETATION, EFFLUENT DUST, CHEMICALS WATERS - SURFACE WATER, GROUND WATER and POTABLE WATER (Non-Regulatory) BIOLOGICAL MATERIALS including mussels and blood FOODS (Fatty Materials and Edible Oils) MECHANICAL OILS	Poly Chlorinated Biphenyls (PCBs): EC7 PCBs: Trichloro, BZ #28 Tetrachloro, BZ #52 Pentachloro, BZ#101 Pentachloro, BZ #118 Hexachloro, BZ #153 Hexachloro, BZ #138 Heptachloro, BZ #180	Documented In-House Method MSOP11 based on USEPA Method 8082 using Gas Chromatography - High Resolution Mass Spectrometry and labelled internal standards	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
STACK GASES FLY ASH SOILS SEDIMENTS (liquid and solid matrix) VEGETATION EFFLUENT DUST CHEMICALS WATERS - SURFACE WATER, GROUND WATER and POTABLE WATER (Non-Regulatory) BIOLOGICAL MATERIALS including mussels and blood FOODS (Fatty Materials and Edible Oils)	Poly Chlorinated Biphenyls (PCBs) (cont'd): Who 12 PCBs: Pentachloro, BZ #105 Pentachloro, BZ #114 Pentachloro, BZ #118 Pentachloro, BZ #123 Hexachloro, BZ #156 Hexachloro, BZ #157 Hexachloro, BZ #167 Heptachloro, BZ #189 Tetrachloro, BZ#81 Tetrachloro, BZ#77 Pentachloro, BZ#126 Hexachloro, BZ#169 Total PCB (Tri-Hepta)	Documented In-House Method MSOP11 based on USEPA Method 8082 using Gas Chromatography - High Resolution Mass Spectrometry and labelled internal standards	A
STACK GASES AMBIENT AIR SOILS SEDIMENTS (liquid and solid matrix) VEGETATION EFFLUENT WATERS - SURFACE WATER, GROUND WATER and POTABLE WATER (Non-Regulatory) BIOLOGICAL MATERIALS including mussels and blood FOODS (Fatty Materials and Edible Oils)	Semi-Volatile Organic Compounds (SVOC) with boiling points between 180 - 550 ^{o}C ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual compounds they can analyse using this method.***	Methods Developed and Validated according to In-House Method GSOP12. Using one or more of the following techniques: Solvent Desorption GC-MS Direct Injection GC-MS (With or Without Prior Extraction) SIR/SIM/Scanning GC-MS TOF GC-MS TD-GC-TOF-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
STACK GASES AMBIENT AIR SOILS SEDIMENTS (liquid and solid matrix) VEGETATION EFFLUENT WATERS - SURFACE WATER, GROUND WATER and POTABLE WATER (Non-Regulatory) BIOLOGICAL MATERIALS including mussels and blood FOODS (Fatty Materials and Edible Oils)	Volatile Organic Compounds (VOC) with boiling points between -50 to 220 ^{o}C ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual compounds they can analyse using this method.***	Methods Developed and Validated according to In-House Method GSOP12. Using one or more of the following techniques: Purge and Trap GC-MS Solvent Desorption GC-MS Thermal Desorption GC-MS Direct Injection GC-MS (With or Without Prior Extraction) SIR/SIM/Scanning GC-MS TOF GC-MS TD-GC-TOF-MS	A
Edible Oils	Polynuclear Aromatic Hydrocarbons Benzo(a) pyrene Benz (a) anthracene Benzo (b) fluoranthene Benzo (k) fluoranthene Chrysene Dibenzo (ah) anthracene Benzo (ghi) perylene Indeno (123cd) pyrene	Documented In-House Method MSOP12-30 using solvent extraction and GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS, SEDIMENTS (Liquid and Solid Matrix), WATERS Raw and Potable (Non-Regulatory)	Polynuclear Aromatic Hydrocarbons (EPA 16): Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo (a) pyrene Indeno (123cd) pyrene Dibenzo (ah) anthracene Benzo (ghi) perylene Total PAH (Sum of 16 Above)	Documented In-House Method MSOP12A using GC-MS	A
	Phenols (Speciated): Phenol 2-Methylphenol (o-Cresol) 3/4-Methylphenol (m+p-Cresol) 2,6-Dimethylphenol (Xylenol) 2,5-Dimethylphenol (Xylenol) 2,3-Dimethylphenol (Xylenol)	Documented In-House Method MSOP12B using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS, SEDIMENTS (Liquid and Solid Matrix), WATERS Raw and Potable (Non-Regulatory) (cont'd)	Chemical Tests (cont'd) Semi-Volatile Organic Compounds EPA 625 Suite: Phenol Bis (2-chloroethyl) ether 2-Chlorophenol 1,3-Dichlorobenzene Nitrobenzene Isophorone 1,4-Dichlorobenzene 1,2-Dichlorobenzene Bis (2-chloroisopropyl) ether 2-Methylphenol 3/4 Methylphenol Hexachloroethane 2-Nitrophenol 2,4-Dimethylphenol Bis (2-chloroethoxy) methane 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline (p) Hexachlorobutadiene 4-Chloro, 3-methylphenol 2-Methylnaphthalene Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 2-Nitroaniline Dimethyl phthalate 2,6-Dinitrotoluene Acenaphthylene Acenaphthene 3-Nitroaniline (m) Dibenzofuran 2,4-Dinitrotoluene Diethyl phthalate Fluorene 4-Chlorophenylphenyl ether	Documented In-House Method MSOP12E using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS, SEDIMENTS (Liquid and Solid Matrix), WATERS Raw and Potable (Non-Regulatory) (cont'd)	Chemical Tests (cont'd) Semi-Volatile Organic Compounds (cont'd) EPA 625 Suite: 4-Nitroaniline Azobenzene 4-Bromophenylphenyl ether Hexachlorobenzene Pentachlorophenol Phenanthrene Anthracene Carbozole Dibutyl phthalate Fluoranthrene Pyrene Butyl benzyl phthalate Benzo (a) anthracene Chrysene Bis (2-ethylhexyl) phthalate Di-octyl phthalate Benzo (b) fluoranthrene Benzo (k) fluoranthrene Benzo (a) pyrene Indeno (123cd) pyrene Dibenz (ah) anthracene Benzo (ghi) perylene	Documented In-House Method MSOP12E using GC-MS	A
	Volatile Organic Compounds EPA 624 Suite: Dichlorodifluoromethane Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethylene Methylene Chloride 1,1-Dichloroethane Trans-1,2-Dichloroethylene MTBE 2,2-Dichloropropane cis-1,2-Dichloroethylene Bromochloromethane	Documented In-House Method MSOP12I and MSOP12J using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS, SEDIMENTS (Liquid and Solid Matrix), WATERS Raw and Potable (Non-Regulatory) (cont'd)	Chemical Tests (cont'd) Volatile Organic Compounds (cont'd) EPA 624 Suite: Chloroform 1,1,1-Trichloroethane Carbon Tetrachloride 1,1-Dichloropropene Benzene 1,2-Dichloroethane Trichloroethylene 1,2-Dichloropropane Dibromomethane Bromodichloromethane cis-1,3-Dichloropropene Toluene trans-1,3-Dichloropropene 1,1,2-Trichloroethane Tetrachloroethylene 1,3-Dichloropropane Chlorodibromomethane 1,2-Dibromomethane Chlorobenzene 1,1,1,2-Tetrachloroethane Ethylbenzene m+p-Xylene o-Xylene Stryene Bromoform Isopropylbenzene 1,1,2,2-Tetrachloroethane Bromobenzene 1,2,3-Trichloropropane Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert-Butylbenzene 1,2,4-Trimethylbenzene sec-Butylbenzene p-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene	Documented In-House Method MSOP12I and MSOP12J using GCMS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS, SEDIMENTS (Liquid and Solid Matrix), WATERS Raw and Potable (Non-Regulatory) (cont'd)	Volatile Organic Compounds (cont'd) EPA 624 Suite: 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene Tertiary Amyl Methyl Ether	Documented In-House Method MSOP12I and MSOP12J using GCMS	A
SOILS	Organochlorine Pesticides: Alpha-HCH HCB Gamma-HCH (Lindane) Beta-HCH Heptachlor Aldrin Isodrin Heptachlor Epoxide Cis-Chlordane Trans-Chlordane Alpha-Endosulphan p,p-DDE Dieldrin Endrin p,p-DDD p,p-DDT	Documented In-House Method MSOP12C using GC-MS	A
	Dichlorvos Mevinphos Trifluralin Dimethoate Diazinon Pirimiphos-Methyl Malathion Fenitrothion Chlorpyrifos Parathion Clofenvinfos Carbofenthion Azinphos Methyl	Documented In-House Method MSOP12D using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS, LEACHATES, EFFLUENTS, GROUND WATER and POTABLE WATER (Non-Regulatory), FILTERS (non stack emissions)	Trace elements (heavy metals): ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual elements they can analyse using this method.***	Procedures Manual Inorganic MSOPIN16 Using ICP-MS and ICP-OES analysis	A
LEACHATES, SOILS, SLUDGES and SEDIMENTS WATERS, Raw and Potable (Non-Regulatory) WASTE WATERS, Treated and Untreated, Industrial and Domestic Waste	Chemical Tests	Documented In-House Methods based on Methods for the Examination of Water and Associated Materials (MEWAM), Department of the Environment Standing Committee Analysts and Standard Methods for the Examination of Water and Wastewater, American Public Health Association - American Water Works Association - Water Pollution Control Federation, (APHA-AWWA-WPCF) 1989, 17th Edition and 1992, 18th Edition	
	Total and speciated petroleum hydrocarbons	Documented In-House Method MSOP6 using GC-FID	A
LEACHATES, WATERS, Raw and Potable (Non-Regulatory) WASTE WATERS, Treated and Untreated, Industrial and Domestic Waste	Ammonia	Procedure Manual (Inorganic) MSOPIN14 based on MEWAM ISBN 0117516139, HMSO 1981 by Spectrophotometry	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)	Documented In-House Methods based on Methods for the Examination of Water and Associated Materials (MEWAM), Department of the Environment Standing Committee Analysts and Standard Methods for the Examination of Water and Wastewater, American Public Health Association - American Water Works Association - Water Pollution Control Federation, (APHA-AWWA-WPCF) 1989, 17th Edition and 1992, 18th Edition	
LEACHATES SOILS, SLUDGES and SEDIMENTS WATERS, Raw and Potable (Non-Regulatory) WASTE WATERS, Treated and Untreated, Industrial and Domestic	pH	Procedures Manual (Inorganic) MSOPIN19 based on BS 1377:Part 3:1990, MEWAM ISBN 0117514284, HMSO 1978, and, APHA-AWWA-WPCF 1992, 18th Edition	A
LEACHATES and GROUNDWATER	Phenols (Monohydric)	Procedures Manual (Inorganic) MSOPIN24 based on APHA-AWWA-WPCFM Part 5530 using continuous flow colorimetric analysis	A
	Cyanide (Total and free)	Procedures Manual (Inorganic) MSOPIN24 based on ISO 14403:2002, APHA-AWWA-WPCFM Part 4500 continuous flow colorimetric analysis	A
Soils	Speciated Petroleum Hydrocarbons - Aromatic/Aliphatic Split: banding, including: >C10-C12, >C12-C16, >C16-C21, >C21-C35	Documented In-House Method MSOP6 using 2 –Dimensional GC/FID	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)	Documented In-House Methods based on Methods for the Examination of Water and Associated Materials (MEWAM), Department of the Environment Standing Committee Analysts and Standard Methods for the Examination of Water and Wastewater, American Public Health Association - American Water Works Association - Water Pollution Control Federation, (APHA-AWWA-WPCF) 1989, 17th Edition and 1992, 18th Edition	
LEACHATES, SOILS, SLUDGES and SEDIMENTS WATERS, Raw and Potable (Non-Regulatory) WASTE WATERS, Treated and Untreated, Industrial and Domestic FILTERS STACK GAS ABSORBTION SOLUTIONS	METALS: Aluminium Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Tin Vanadium Zinc	Procedures Manual (Inorganic) MSOPIN18 based on MEWAM ISBN 0117516155, HMSO 1981, and, APHA-AWWA-WPCF 1992, 18th Edition by Inductively Coupled Plasma Optical Emission Spectrometry	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)	Documented In-House Methods based on Methods for the Examination of Water and Associated Materials (MEWAM), Department of the Environment Standing Committee Analysts and Standard Methods for the Examination of Water and Wastewater, American Public Health Association - American Water Works Association - Water Pollution Control Federation, (APHA-AWWA-WPCF) 1989, 17th Edition and 1992, 18th Edition	
WATERS, Potable (Non-Regulatory) and Ground LEACHATES, Landfill and Prepared	METALS: Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel Selenium Vanadium Zinc	Procedures Manual (Inorganic) MSOPIN23 using ICP-MS	A
LEACHATES (Soils and Landfill), SURFACE WATER and GROUNDWATER	Ammonia Chloride Chromium VI Fluoride Nitrate Nitrite Phosphate Sulphate Total Oxidisable Nitrogen	Procedures Manual (Inorganic) MSOPIN15 by colorimetric analysis	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)	Documented In-House Methods based on Methods for the Examination of Water and Associated Materials (MEWAM), Department of the Environment Standing Committee Analysts and Standard Methods for the Examination of Water and Wastewater, American Public Health Association - American Water Works Association - Water Pollution Control Federation, (APHA-AWWA-WPCF) 1989, 17th Edition and 1992, 18th Edition	
WATERS, Raw, Potable (Non-Regulatory), LEACHATES (prepared soil leachates)	Total Organic Carbon	Documented In-House Method SAL Organic MSOP13 based upon Part 5310, APHA-AWWA-WEF 1995 and EN 1484:1987 by High Temperature Catalytic Combustion and Infrared	A
FRUIT JUICE	Vitamin C Content	In house method MSOPIN27 by Titration	A
Ash	METALS: Antimony Arsenic Cadmium Chromium Cobalt Copper Lead Manganese Mercury Molybdenum Nickel Tin Thalluim Vanadium Zinc	Procedures Manual (Inorganic) MSOPIN18 based on MEWAM ISBN 0117516155, HMSO 1981, and, APHA-AWWA-WPCF 1992, 18th Edition by Inductively Coupled Plasma Optical Emission Spectrometry	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	<u>Chemical Tests</u>	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	Phenols (Monohydric)	Procedures Manual (Inorganic) MSOPIN24 based on APHA-AWWA-WPCFM Part 5530 using continuous flow colorimetric analysis	A
	Cyanide (Total and free)	Procedures Manual (Inorganic) MSOPIN24 based on ISO 14403:2002, APHA-AWWA-WPCFM Part 4500 continuous flow colorimetric analysis	A
	pH	Procedures Manual (Inorganic) MSSOIN19 based on BS 1377:Part 3:1990, MEWAM ISBN 011 751 428 4, HMSO 1978, and APHA-AWWA-WPCF 1992, 18th Edition	A
	Polynuclear Aromatic Hydrocarbons: Naphthalene Acenaphthylene Acenaphthene Fluorene Phenathrene Anthracene Benz(a)anthracene Chrysene	Documented In-House Generic Method MSOP12A using GC-MS SIM	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Poly Chlorinated Biphenyls (PCBs):		A
Soils	IUPAC No 28 52 101 118 153 138 180	Documented In-House Method MSOP11 based on USEPA Method 8082 using Gas Chromatography - High Resolution Mass Spectrometry and labelled internal standards	
Soils	Poly Chlorinated Biphenyls (PCBs): IUPAC No 28 52 101 118 138 153 180	Documented In-House Method GSOP12K by GCMS	A
Soils	Total and speciated Petroleum Hydrocarbons: (C_{10} - C_{35}) Also banding, including: C10-C12, >C12-C16, >C16-C21, >C21-C35	Documented In-House Method MSOP6 using GC-FID	A
Soils	Total and speciated Petroleum Hydrocarbons - Aromatic/Aliphatic Split: (C10 - C35) Also banding, including: C10-C12, >C12-C16, >C16-C21, >C21-C35	Documented In-House Method MSOP6 using GC-FID	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
Soils	Speciated PetroleumHydrocarbons - Aromatic/Aliphatic Split: banding, including: >C10-C12, >C12-C16, >C16-C21, >C21-C35	Documented In-House Method MSOP6 using 2 –Dimensional GC/FID	A
	METALS: Arsenic Cadmium Chromium Cobalt Copper Lead Manganese Mercury Molybdenum Nickel Selenium Tin Vanadium Zinc	Procedures Manual (Inorganic) MSOPIN18 based on MEWAM ISBN 0117516155, HMSO 1981, and, APHA-AWWA-WPCF 1992, 18th Edition by Inductively Coupled Plasma Optical Emission Spectrometry	A
	Volatile Organic Compounds (VOC): Dichlorodifluoromethane Vinyl Chloride Chloroethane Trichlorofluoromethane 1,1-Dichloroethene MTBE Trans-1,2-Dichloroethene 1,1-Dichloroethane Cis-1,2-Dichloroethene Chloroform Bromochloromethane 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon Tetrachloride	Documented In-House Method MSOP12J using GC-MS Scan	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Volatile Organic Compounds (VOC) (cont'd): 1,2-Dichloroethane Benzene 1,2-Dichloropropane Trichloroethene Bromodichloromethane Dibromomethane Cis-1,3-dichloropropene Toluene Trans-1,3-Dichloropropene 1,1,2-Trichloroethane 1,3-Dichloropropane Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-Tetrachloroethane Ethyl Benzene m,p-Xylene o-Xylene Bromoform Isopropylbenzene n-Propylbenzene Bromobenzene 1,3,5-Trimethylbenzene Tert-Butylbenzene 1,2,4-Trimethylbenzene Sec-Butylbenzene p-Isopropyltoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Tertiary Amyl Methyl Ether	Documented In-House Method MSOP12J using GC-MS Scan	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Semi-Volatile Organic Compounds (SVOC): Phenol Bis (2-chloroethyl) ether 2-Chlorophenol 1,3-Dichlorobenzene Nitrobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Bis (2-chloroisopropyl) ether 2-Methylphenol 3/4 Methylphenol Bis (2-chloroethoxy) methane 1,2,4-Trichlorobenzene Naphthalene Hexachlorobutadiene 4-Chloro, 3-methylphenol 2-Methylnaphthalene 2-Chloronaphthalene 2-Nitroaniline Acenaphthene Dibenzofuran 2,4-Dinitrotoluene Fluorene 4-Chlorophenylphenyl ether 4-Bromophenylphenyl ether Hexachlorobenzene Phenanthrene Dibutyl phthalate Fluoranthrene Pyrene Benz (a) anthracene Chrysene Bis (2-ethylhexyl) phthalate Di-octyl phthalate Benzo (b) fluoranthrene Benzo (k) fluoranthrene Benzo (a) pyrene Indeno (123cd) pyrene	Documented In-House Method MSOP12E using GC-MS Scan	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Semi-Volatile Organic Compounds (SVOC) (cont'd): Dibenz (ah) anthracene Benzo (ghi) perylene	Documented In-House Method MSOP12E using GC-MS Scan	A
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES, AMBIENT AIR and PROCESS AIR	Sensory Test	Documented In-House Methods based on the following national, international and other recognised standards	
	Odour concentration measurement including sample pre-dilution	BS EN 13725:2003 by dynamic olfactometry (Organic Procedures MSOP16)	A
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - AMBIENT AIR	Chemical Tests		
Molecular Sieve Tubes	Nitrous Oxide (N_2O)	Documented In-House Method MSOP12R using Thermal desorption and GC-MS	A
PUF/Filter Samples	Polynuclear Aromatic Hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(ghi)perylene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Dibenz(ah)anthracene Fluoranthrene Fluorene	Documented In-House Method MSOP12Z using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - AMBIENT AIR (cont'd)	Chemical Tests (cont'd)		
PUF/Filter Samples (cont'd)	Polynuclear Aromatic Hydrocarbons (cont'd): Indeno(123cd)pyrene Naphthalene Phenanthrene Pyrene	Documented In-House Method MSOP12Z using GC-MS (cont'd)	A
Tenax tubes	BTEX: Benzene EthylBenzene Meta/Para-Xylene Ortho-Xylene Toluene Naphthalene	Documented In-House Method MSOP12_27 Thermal Desorption/GC- MS	A
Thermal Desorption Tubes	C5-C16 Aliphatic TPH C5-C16 Aromatic TPH	Documented in house method using ATD/GC/MS using in house MSOP12_27	A
Anasorb C300 Passive Sampling Tubes	Mercury	MDHS 16/2 using CV-AFS analysis (Inorganic Procedures MSOPIN22)	A
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES & AMBIENT AIR	Chemical Tests		
Carbon tubes	Siloxanes: Hexamethyldisiloxane Hexamethylcyclotrisiloxane Octamethyltrisiloxane Octamethylcyclotetrasiloxane Decamethyltetrasiloxane Decamethylcyclopentasiloxane	Documented In-House Method MSOP12S using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES & AMBIENT AIR (cont'd)	Chemical Tests (cont'd)		
Carbon tubes	Speciated VOC's: Pentane Isopropyl alcohol Methyl acrylate Chloroform Tetrahydrofuran Cyclohexane Carbon tetrachloride 2-Methoxy ethanol Heptane Trichloroethylene Ethylacrylate Methylcyclohexane Octane Tetrachloroethylene Nonane Styrene Cyclohexanone Decane Dodecane	Documented In-House Method MSOP12Q using GC-MS	A
Carbon tubes	Dichloromethane (DCM)	Documented In-House Method MSOP12T using GC-MS	A
Carbon Tubes	Arsenic	Documented in House method MSOPIN18 using ICP-OES	A
Treated XAD tubes	Aldehydes: Formaldehyde Acetaldehyde Acrolein Butyraldehyde Isobutyraldehyde Crotonaldehyde Isovaleraldehyde Hexanal Heptanal Furfural Valeraldehyde	Documented In-House Method MSOP12U using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES & AMBIENT AIR (cont'd)	Chemical Tests (cont'd)		
DNPH Treated Silica Gel Tubes	Acetaldehyde Benzaldehyde Butyraldehyde Crotonaldehyde Formaldehyde Isovaleraldehyde Valeraldehyde	Documented in house method SOP 19 using HPLC	A
TENAX tubes	BTEX/VOC: Benzene Styrene Naphthalene Ethanol Acetone Hexane MEK Ethyl Acetate Isobutanol Isopropylacetate Butanol 1-Methoxy-2-propanol MIBK MTBE Toluene Butyl Acetate Ethylbenzene 1-Methoxy-2-propyl acetate m+p Xylene o-Xylene 1,3,5-Trimethlbenzene 1,2,4-Trimethylbenzene 1,2,3-Trimethylbenzene	Documented In-House Methods MSOP12G using GC-MS	A
Treated XAD tubes (phosphoric acid treated)	Triethylamine	Documented In-House Method MSOP12X using GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES & AMBIENT AIR	Chemical Tests (cont'd)		
XAD tubes	Polynuclear Aromatic Hydrocarbons (EPA 16): Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Flouranthene Pyrene Benz (a) anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo (a) pyrene Indeno (123cd) pyrene Diben (ah) anthracene Benzo (ghi) perylene Phenols: Phenol 2-Methylphenol (o-Cresol) 3/4-Methylphenol (m+p-Cresol) 2,6-Dimethylphenol (Xylenol) 2,5-Dimethylphenol (Xylenol) 2,3-Dimethylphenol (Xylenol) Cresol Xylenol	Documented In-House Method MSOP12P using GC-MS	A
Orbo34 Activated Carbon Tubes	Hydrogen Sulphide (as Sulphate)	Documented in house method MSOPIN30 using Ion Chromatography	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES	Chemical Tests		
Sorbent tubes (Carbon)	Total Petroleum Hydrocarbons	Documented In-House Method SAL MSOP6 using GC FID	A
Sorbent tubes (Carbon)	Volatile Organic compounds Benzene Toluene Ethyl benzene m,p and o Xylene Ethanol Acetone MTBE Hexane Ethyl acetate Isobutanol Isopropyl acetate Butanol 1-Methoxy-2-propanol MIBK Butyl acetate 1-Methoxy-2-propyl acetate 1,3,5-Trimethyl benzene 1,2,4-Trimethyl benzene 1,2,3-Trimethyl benzene	PD CEN/TS 13649:2014 using solvent extraction and GC MS analysis (MSOP12F)	A
FILTERS - MCE	Chemical Tests		
MCE Filters (25mm), GFA Filters (25mm), Surface Swabs	Lactose, Manitol	Documented in house MSOP18 using Ion chromatography	A
FILTERS - MCE	Sum of phenanthrene carboxylic acids [colophony]	Documented In-House Method MSOP12O using GC-MS	A
ADSORBENT BADGES	Chemical Tests		
	Sevoflurane Halothane Isoflurane	MSOP12N by GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
LANDFILL GASES	<u>Chemical Tests</u>		
Composite sorbent tube (tenax, carbon and molecular sieve)	1-pentene 1,1-dichloroethane Dichloroethylene 1,2-dichloroethylene 1,3-butadiene 1-propanethiol Benzene Chloromethane Carbon tetrachloride Dimethyl sulphide n-butyl mercaptan Trichloroethylene Vinyl chloride monomer	Documented In-House Method MSOP12Y using GC-MS	A
	<u>Physical Test</u>		
COLLECTION SUBSTRATES (Filters), I.O.M CASSETTES and PUF's, including EMFAB filters	Particulate Weights	Documented in House Method SAL Organic MSOP14 (Based on MDHS 14-4)	A
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES	<u>Physical Tests</u>	Documented In-House Methods based on the following national, international and other recognised standards	
Filter Papers and Rinse Solutions	Weighing of Particulate Matter	Documented In-House Method SAL Organic MSOP14 to BS EN 13284-1:2002, MID 13284-1	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES	Chemical Tests	Documented In-House Methods based on the following national, international and other recognised standards	
Impinger solutions (Toluene) Filters (coated with 1-(2-methoxyphenyl) piperazine)	Isocyanates: 1,6-hexamethylene diisocyanate 2,4-toluene diisocyanate 2,6-toluene diisocyanate 4,4'-methylene(bis) phenylisocyanate isophorone diisocyanate dicyclohexylmethane diisocyanate	HSE MDHS 25/3 using HPLC analysis (MSOP 15)	A
Impinger Solutions (sodium hydroxide)	Fluoride Chloride Nitrite Nitrate Bromide Phosphate Sulphate	US EPA Method 26 using Ion Chromatography analysis (Inorganic Procedures MSOPIN11)	A
Impinger Solutions (water)	Fluoride Chloride Nitrite Nitrate Bromide Phosphate Sulphate	Ion Chromatography analysis by Inorganic Procedures MSOPIN11	A
Impinger Solutions (water)	Hydrogen Chloride	BS EN 1911:2010 using Ion Chromatography analysis (Procedures Manual Inorganic MSOPIN11)	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Impinger Solutions (sodium hydroxide)	Hydrogen Fluoride	BS ISO 15713:2006 (modified) using Ion Chromatography analysis (Procedures Manual Inorganic MSOPIN11)	A
Impinger Solutions (hydrogen peroxide)	Sulphur Dioxide	BS EN 14791:2005 using Ion Chromatography analysis (Procedures Manual Inorganic MSOPIN11)	A
Impinger Solutions (sulphuric acid)	Ammonia	In-house method using colorimetric analysis (Procedures Manual Inorganic MSOPIN14)	A
Filters Probe rinses (nitric acid) Impinger Solutions (nitric acid/hydrogen peroxide)	Trace elements (heavy metals): Arsenic, Antimony, Cadmium, Cobalt, Chromium, Copper, Manganese, Nickel, Lead, Thallium, Vanadium, Beryllium	BS EN 14385:2004 Using microwave and HF digestion followed by: ICP-MS analysis (Procedures Manual Inorganic MSOPIN21)	A
Filters Probe rinses (nitric acid) Impinger Solutions (nitric acid/hydrogen peroxide)	Trace elements (heavy metals): ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual elements they can analyse using this method.***	BS EN 14385:2004 Using microwave and HF digestion followed by: ICP-MS analysis (Procedures Manual Inorganic MSOPIN16)	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Filters probe rinses (nitric acid) Impinger Solutions (nitric acid/hydrogen peroxide, sulphuric acid/potassium permanganate, nitric acid/potassium dichromate)	Trace elements (heavy metals): Arsenic, Antimony, Beryllium, Cadmium, Cobalt, Chromium, Copper, Manganese, Mercury, Nickel, Lead, Thallium, Vanadium	MID 14385 (BS EN 14385:2004, BS EN 13211:2001 and BS EN 1483:2007) Using microwave and HF digestion followed by: ICP-MS analysis (Procedures Manual Inorganic MSOPIN21)	A
Filters Probe rinses (nitric acid) Impinger Solutions (sulphuric acid/potassium permanganate, nitric acid/potassium dichromate)	Trace elements (heavy metals): Mercury	BS EN 13211:2001 (BS EN 1483:2007) Using microwave and HF digestion followed by: AFS analysis (Procedures Manual Inorganic MSOPIN22)	A
Filters Probe and impinger rinses (acetone, toluene, hexane and water) XAD-2 resin trap	Polycyclic aromatic hydrocarbons (PAHs): Naphthalene Acenaphthylene Acenapthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benz(a)anthracene Chrysene Benzo (b) fluoranthene Benzo (k) fluoranthene Benzo (a) pyrene Indeno (1,2,3-cd) pyrene Dibenz (a,h) anthracene Benzo (ghi) perylene Benzo(b)naphtho (2,1-D)-thiophene Benzo(c) phenanthrene Retene	BS ISO 11338-2:2003 Extraction followed by GCMS analysis (Organic Procedures MSOP12K)	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
Filters Probe and impinger rinses (acetone, toluene, hexane and water) XAD-2 resin trap (cont'd)	Polycyclic aromatic hydrocarbons (PAHs): (cont'd) Cyclopenta (cd) pyrene Benzo (j) fluoranthene Benzo (e) pyrene Perylene Anthanthrene Dibenzo (a,i) pyrene Dibenzo (a,l) pyrene Dibenzo (a,e) pyrene Dibenzo (a,h) pyrene Cholanthrene	BS ISO 11338-2:2003 Extraction followed by GCMS analysis (Organic Procedures MSOP12K) (cont'd)	A
Filters Probe and impinger rinses (toluene, acetone and water) XAD-2 resin trap	Polychlorinated biphenyls (PCBs): PCB #28 PCB #52 PCB # 77 PCB # 81 PCB #101 PCB #105 PCB #114 PCB #118 PCB #123 PCB # 126 PCB #138 PCB #153 PCB #156 PCB #157 PCB #167 PCB #169 PCB #180 PCB #189	BS EN 1948-4:2010,and A1:2013 Extraction followed by GCHRMS analysis (Organic Procedures MSOP1 and MSOP11 and MSOP20)	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ATMOSPHERIC POLLUTANTS AND EFFLUENTS - STACK GAS SAMPLES (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods based on the following national, international and other recognised standards	
	Poly Chlorinated Dibenzo-p-Dioxins (PCDD): 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD	BS EN 1948-2:2006 and BS EN 1948-3;2006 Extraction followed by GCHRMS analysis (Organic Procedures MSOP1)	A
	Poly Chlorinated Dibenzo Furans (PCDF): 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF		A
Solid Recovered Fuels, Refuse Derived Fuels and Biomass	Moisture Content	In house method MSOPIN26 based on BS EN 15414-3:2011 by Gravimetry	A
	Ash Content	In house method MSOPIN26 based on BS EN 15403:2011 by Gravimetry	A
	Gross Calorific Value Net Calorific Value	In house method MSOPIN26 based on BS EN 15400:2011 by Bomb Calorimetry	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ANIMAL FEEDING STUFFS	Trace elements (heavy metals): ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual elements they can analyse using this method.***	Procedures Manual Inorganic MSOPIN16 Using ICP-MS analysis	
	Poly Chlorinated Dibenzo-p-Dioxins (PCDD): 2,3,7,8-TCDD 1,2,3,7,8-PeCDD 1,2,3,6,7,8-HxCDD 1,2,3,4,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,6,7,8-HpCDD OCDD	Documented In-House Method MSOP12W using accelerated Solvent Extraction and HR-GC-MS	A
	Poly Chlorinated Dibenzo Furans (PCDF): 2,3,7,8-TCDF 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDF	Documented In-House Method MSOP12W using accelerated Solvent Extraction and HR-GC-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ANIMAL FEEDING STUFFS (cont'd)	Chemical Tests (cont'd)		
	Poly Chlorinated Biphenyls (PCBs): Who 12 PCBs: Tetrachloro, BZ#77 Tetrachloro, BZ#81 Pentachloro, BZ #105 Pentachloro, BZ #114 Pentachloro, BZ #118 Pentachloro, BZ #123 Pentachloro, BZ#126 Hexachloro, BZ #156 Hexachloro, BZ #157 Hexachloro, BZ #167 Hexachloro, BZ#169 Heptachloro, BZ #189	Documented In-House Method MSOP12W using accelerated Solvent Extraction and HR-GC-MS	A
Mineral Animal Feeds	Fluoride	Procedures Manual MSOPIN25 by ISE	A
Animal Feeds Mineral Origin	Mercury	Procedures Manual (Inorganic) MSOPIN22 In house method Mercury by CV-AFS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ANIMAL FEEDING STUFFS	Chemical Tests (cont'd)		
Animal Feed and Edible Products	Arsenic Barium Beryllium Bismuth Cadmium Cobalt Chromium Mercury Molybdenum Nickel Lead Selenium Antimony Tin Thallium Vanadium	In house method MSOPIN16 using ICPMS analysis	A
Animal Feedstuffs, Compound Feed and Mineral Feed	Alpha HCH HCB Beta HCH Gamma HCH Heptachlor Aldrin Isodrin Heptachlor Epoxide Trans-Chlordane Cis-Chlordane Endosulphan I p,p-DDE Dieldrin Endrin p,p-DDD Endosulphan II p,p-DDT	In house method MSOP12-28 using GCMS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
HUMAN BODY FLUIDS	Chemical Tests	Documented In-House Methods	
Urine	Mercury	Procedures Manual Inorganic MSOPIN22 Using AFS analysis	A
Urine	Benzene metabolite s-phenylmercapturic acid [SPMA]	Documented In-House Method MSOP12V using GC-MS	A
Urine	Isocyanate Metabolites: 1,6-hexamethylenediamine, 4,4-methylenedianiline 2,6-toluenediamine 2,4-toluenediamine isophoronediamine	Documented In-House Method MSOP12-31 using GC-MS	A
	Chemical Tests and Physical Tests		
SOILS SEDIMENTS EFFLUENT SAMPLING MEDIA FOODSTUFF SURFACE, GROUND and POTABLE WATER (non regulatory)	Semi-Volatile Organic Compounds (SVOC) with boiling points between 180 - 550 °C ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual gaseous compounds they can analyse using this method.***	Methods developed and validated under a flexible scope according to In-House Method GSOP12 Using GC-MS	B
	Volatile Organic Compounds (VOC) with boiling points between -50 to 220 °C ***The organisation holds a flexible scope of accreditation for these tests. Please contact the organisation for details of the individual gaseous compounds they can analyse using this method.***	Methods developed and validated under a flexible scope according to In-House Method GSOP12 Using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL	Chemical Tests and Physical Tests	Documented In-House Procedures	
	Semi-Volatile Organic Compounds (SVOC): 2,4-dinitrotoluene 2-methyl phenol 3-nitroaniline 4-chloroanaline 4-nitroaniline acenaphthylene carbazole dibutyl phthalate naphthalene phenanthrene 1,2,4-trichlorobenzene 1,2-diclorobenzene 1,3-dichlorobenzene 1,4-dichlorobenzene 2,4-dichlorophenol 2,6-dinitrotoluene 2-chlorophenol 2-chloronaphthalene 2-methyl naphthalene 2-nitroaniline 3/4 methyl phenol 4-bromophenyl phenyl ether 4-chloro, 3-methyl phenol 4-chlorophenylphenyl ether acenaphthene anthracene azobenzene benzo (a) anthracene benzo(a) pyrene benzo(b) fluoranthene benzo(ghi) perylene (total benzo(b)fluoranthene & benzo(k) fluoranthene) bis (2-chloroisopropyl) ether bis (2-chloroethoxy) methane bis (2-chloroethyl) ether chrysene di-octyl phthalate dibenz(ah) anthracene dibenzofuran	In-House Method BSOP12E using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Procedures	
	Semi-Volatile Organic Compounds (SVOC) cont'd: diethyl phthalate dimethyl phthalate fluorene hexachlorobenzene hexachlorobutadiene hexachloroethane indeno(123cd)pyrene isophorone nitrobenzene phenol	In-House Method BSOP12E using GC-MS	B
	Polynuclear Aromatic Hydrocarbons (Total sum of EPA 16)	Documented In-House Method BSOP12E using GC-MS	B
	Metals, acid extractable: Aluminium Barium Beryllium Magnesium Manganese Molybdenum Mercury Selenium Sodium Strontium Thallium Tin Titanium Vanadium	BSOPIN27 Hotblock digestion followed by ICP-OES	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Procedures	SOIL
	pH	BSOPIN05 by pH Meter	B
	Extractable Petroleum Hydrocarbons (EPH) C_{10}-C_{40} Also banding, including: C10-C12, >C12-C16, >C16-C21, >C21-C35 And C10-C20, >C20-C30, >C30-C40	BSOP6 Microwave Solvent Extraction followed by GC-FID	B
	Volatile Organic Compounds (VOC's): Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethene Dichloromethane MTBE (methyl-tert, butyl Ether) Trans-1,2-Dichloroethene 1,1-Dichloroethane Cis-1,2-Dichloroethene 2,2-Dichloropropane Chloroform Bromochloromethane 1,1,1-Trichloroethane 1,2,3-Trimethylbenzene 1,1-Dichloropropene Carbon Tetrachloride 1,2-Dichloroethane Benzene 1,2-Dichloropropane Trichloroethene Bromodichloromethane Dibromomethane Cis-1,3-dichloropropene Toluene Trans-1,3-Dichloropropene	BSOP12J using Headspace GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Procedures	
	Volatile Organic Compounds (VOC's): (cont'd) 1,1,2-Trichloroethane 1,3-Dichloropropane Tetrachloroethene Dibromochloromethane 1,2-Dibromoethane Chlorobenzene 1,1,1,2-Tetrachloroethane Ethyl Benzene m,p-Xylene o-Xylene Styrene Bromoform Isopropylbenzene 1,1,2,2-Tetrachloroethane 1,2,3-Trichloropropane n-Propylbenzene Bromobenzene 1,3,5-Trimethylbenzene Tert-Butylbenzene 1,2,4-Trimethylbenzene Sec-Butylbenzene p-Isopropyltoluene 2-Chlorotoluene 4-Chlorotoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene TAME (tert-amyl methyl ether) m/p-ethyl Toluene 2-ethyl Toluene	BSOP12J using Headspace GC-MS	B
	Oxidisable Sulphate	BSOPIN27 Calculation based on total sulphur and total sulphate	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Procedures	
	PCB EC7 Congeners PCB#28 2,4,4'-Trichlorobiphenyl PCB#52 2,2',5,5'-Tetrachlorobiphenyl PCB#101 2,2',4,5,5'-Pentachlorobiphenyl PCB#118 2,3',4,4',5-Pentachlorobiphenyl PCB#138 2,2',3,4,4',5'-Hexachlorobiphenyl PCB#153 2,2',4,4',5,5'-Hexachlorobiphenyl PCB#180 2,2',3,3',5,5',6'-Heptachlorobiphenyl	BSOP12K using GCMS	B
	Phenols: Phenol 2,3-dimethylphenol 2,5-dimethylphenol 2,6-dimethylphenol	GSOP12A using GCMS	B
	Polynuclear Aromatic Hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(ghi)Perylene Benzo(b)Fluoranthene Chrysene Dibenzo(ah)Anthracene Fluoranthene Fluorene Indeno(123-cd)Pyrene Naphthalene Phenanthrene Pyrene Coronene	GSOP12A using GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	Cyanide (total, free and complex – by calculation) Monohydric phenols (Total)	BSOPIN24 using Continuous Flow Analyser	B
	Loss on Ignition	BSOPIN31 by Gravimetry	B
	pH	BSOPIN05 by pH Meter	B
	Metals: Arsenic Cadmium Chromium Cobalt Copper Lead Nickel Zinc	BSOPIN27 Hotblock digestion followed by ICP-OES	B
	Sulphate, water soluble (2:1)	BSOPIN28 by ICP-OES	B
	Total Sulphate	BSOPIN27 by hotblock digestion and ICP-OES	B
	Total Sulphur	BSOPIN27 by hotblock digestion and ICP-OES	B
	Thiocyanate	BSOPIN02 by Colorimetry	B
	Extractable Petroleum Hydrocarbons (EPH) C_{10}-C_{40}	BSOP6 Microwave Solvent Extraction followed by GC-FID	B
	Semi-Volatile Organic Compounds (SVOC): 1,2,4-trichlorobenzene 1,2-dichlorobenzene 1,3-dichlorobenzene	In-House Method BSOP12E using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Semi-Volatile Organic Compounds (SVOC): (cont'd) 1,4-dichlorobenzene 2,4-dichlorophenol 2,6-dinitrotoluene 2-chlorophenol 2-chloronaphthalene 2-methyl naphthalene 2-nitroaniline 3/4 methyl phenol 4-bromophenyl phenyl ether 4-chloro, 3-methyl phenol 4-chlorophenylphenyl ether acenaphthene anthracene azobenzene benzo (a) anthracene benzo(a) pyrene benzo(b) fluoranthene benzo(ghi) perylene (total benzo(b)fluoranthene and benzo(k) fluoranthene) bis (2-chloroisopropyl) ether bis (2-chloroethoxy) methane bis (2-chloroethyl) ether chrysene di-octyl phthalate dibenz(ah) anthracene dibenzofuran diethyl phthalate dimethyl phthalate fluorene hexachlorobenzene hexachlorobutadiene hexachloroethane indeno(123cd)pyrene isophorone nitrobenzene phenol	In-House Method BSOP12E using GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Volatile Organic Compounds (VOC's): Vinyl Chloride Trichlorofluoromethane 1,1-Dichloroethene MTBE (methyl-tert, butyl Ether) Trans-1,2-Dichloroethene 1,1-Dichloroethane Cis-1,2-Dichloroethene 2,2-Dichloropropane Chloroform Bromochloromethane 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon Tetrachloride 1,2-Dichloroethane Benzene 1,2-Dichloropropane Trichloroethene Bromodichloromethane Dibromomethane Cis-1,3-dichloropropene Toluene Trans-1,3-Dichloropropene Tetrachloroethylene Dibromochloromethane Chlorobenzene Ethyl Benzene m,p-Xylene o-Xylene Styrene Isopropylbenzene n-Propylbenzene Bromobenzene 1,3,5-Trimethylbenzene Tert-Butylbenzene 1,2,4-Trimethylbenzene	BSOP12J using Headspace GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Volatile Organic Compounds (VOC's) (cont'd): Sec-Butylbenzene p-Isopropyltoluene 2-Chlorotoluene 4-Chlorotoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene TAME (tert-amyl methyl ether) m/p-ethyl Toluene 2-ethyl Toluene	BSOP12J using Headspace GC-MS	B
	Phenols: Cresols Phenol Resorcinol Xylenols Trimethyl phenols	BSOP235 using HPLC-electrochemical detector	B
	PCB EC7 Congeners PCB#28 2,4,4'-Trichlorobiphenyl PCB#52 2,2',5,5'-Tetrachlorobiphenyl PCB#101 2,2',4,5,5'-Pentachlorobiphenyl PCB#118 2,3',4,4',5-Pentachlorobiphenyl PCB#138 2,2',3,4,4',5'-Hexachlorobiphenyl PCB#153 2,2',4,4',5,5'-Hexachlorobiphenyl PCB#180 2,2',3,3',5,5',6'-Heptachlorobiphenyl	BSOP12K using GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOIL (cont'd)	Chemical Tests and Physical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil (cont'd)	
	Phenols: Phenol 2,3-dimethylphenol 2,5-dimethylphenol 2,6-dimethylphenol	GSOP12A using GCMS	B
	Polynuclear Aromatic Hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(ghi)Perylene Benzo(b)Fluoranthene Chrysene Dibenzo(ah)Anthracene Fluoranthene Fluorene Indeno(123-cd)Pyrene Naphthalene Phenanthrene Pyrene	GSOP12A using GCMS	B
	Coronene	GSOP12A using GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS	Chemical Tests	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified.	
WATERS, ground water and potable water (non regulatory)	Thiocyanate	BSOPIN02 by Colorimetry	B
	Alkalinity	BSOPIN04 by Titrimetry	B
	Conductivity	BSOPIN03 by Conductivity Meter	B
WATERS ground water, pure water, potable water (non regulatory) and prepared soil leachate	Metals: Aluminium Antimony Arsenic Barium Beryllium Bismuth Cadmium Cobalt Chromium Copper Iron Lead Manganese	BSOPIN27 by ICP-OES	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
WATERS ground water, pure water, potable water (non regulatory) and prepared soil leachate (cont'd)	Metals: (cont'd) Molybdenum Nickel Phosphorus Selenium Thallium Titanium Vanadium Zinc	BSOPIN27 by ICP-OES	B
Landfill leachates, WATERS, ground water and potable water (non regulatory)	Calcium Magnesium Potassium Sodium	BSOPIN29 by ICP-OES	B
Landfill leachate and prepared soil leachates, Potable water (non-regulatory), deionised water, groundwater, surface water and waste water (industrial effluent)	Metals: Arsenic Aluminium Barium Beryllium Boron Cadmium Cobalt Chromium Copper Iron Mercury Manganese Molybdenum Nickel Lead Antimony	BSOPIN32 by ICP-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Landfill leachate and prepared soil leachates, Potable water (non-regulatory), deionised water, groundwater, surface water and waste water (industrial effluent) (cont'd)	Metals: (cont'd) Selenium Tin Vanadium Zinc	BSOPIN32 by ICP-MS	B
	Total Hardness by calculation	BSOPIN29 by calculation	B
Groundwater and potable water (non regulatory)	pH	BSOPIN05 by pH Meter	B
Landfill leachates	pH Alkalinity Conductivity	BSOPIN05 by pH Meter BSOPIN04 by Titrimetry BSOPIN03 by Conductivity Meter	B B B
De-ionised water, Tap Water (non-regulatory), Ground water, Surface Water, Waste Water, Landfill Leachate, Prepared Soil Leachate	Ammonia Chloride Hexavalent Chromium Fluoride Nitrate (by calculation) Nitrite Total Oxidised Nitrogen Phosphate Sulphate	GSOPIN15 by Selective Chemistry Analyser	B
Tap water (non-regulatory), Process Water, Waste Water (Trade Effluent), Landfill leachate, Prepared soil Leachate, Groundwater, and Surface water	Cyanide ((total,free, and Complex – by calculation) Monohydric phenols (Total)	BSOPIN24 using Continuous Flow Analyser	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Groundwater	Extractable Petroleum Hydrocarbons (EPH) C_{10}-C_{40} Also banding, including: C10-C12, >C12-C16, >C16-C21, >C21-C35 And C10-C20, >C20-C30, >C30-C40	BSOP6 Liquid to Liquid Extraction using Dichloromethane followed by GC-FID	B
Pure water, potable water (non regulatory), ground water, landfill leachate and prepared leachate	Total Organic Carbon (TOC) Dissolved Organic Carbon (DOC)	BSOP13 by TOC analyser	B
Groundwater	Polyaromatic hydrocarbons (PAHs): Acenaphthylene Acenaphthene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(ghi)perylene Benzo(k)fluoranthene Chrysene Dibenz(ah)anthracene Fluoranthrene Fluorene Indeno(123cd)pyrene Naphthalene Phenanthrene Pyrene	BSOP12A by GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Groundwater (cont'd)	Semi-Volatile Organic Compounds (SVOC's): Bis(2-chloroethyl)ether 2-Chlorophenol 1,3-Dichlorobenzene Nitrobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Bis(2-chloroisopropyl)ether Hexachloroethane Isophorone 2-Nitrophenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol 1,2,4-Trichlorobenzene Naphthalene 4-Chloroaniline Hexachlorobutadiene 4-Chloro, 3-methylphenol 2-Methylnaphthalene 2-Chloronaphthalene 2-Nitroaniline Dimethylphthalate 2,6-Dinitrotoluene Acenaphthylene Acenaphthene 3-Nitroaniline Dibenzofuran 2,4-Dinitrotoluene Diethylphthalate Fluorene 4-Chlorophenylphenylether 4-Nitroaniline Azobenzene 4-Bromophenylphenylether	BSOP12E by GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Groundwater (cont'd)	Semi-Volatile Organic Compounds (SVOC's) (cont'd): Bis-(2 ethylhexyl) phthalate Hexachlorobenzene Phenanthrene Anthracene Carbazole Dibutylphthalate Fluoranthrene Pyrene Butylbenzylphthalate Benzo(a)anthracene Chrysene Dioctylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(123cd)pyrene Dibenz(ah)anthracene Benzo(ghi)perylene	BSOP12E by GC-MS	B
	PCB EC7 Congeners PCB#28 2,4,4'-Trichlorobiphenyl PCB#52 2,2',5,5'-Tetrachlorobiphenyl PCB#101 2,2',4,5,5'-Pentachlorobiphenyl PCB#1182,3',4,4',5 Pentachlorobiphenyl PCB#138 2,2',3,4,4',5'-Hexachlorobiphenyl	BSOP12 K using GCMS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Groundwater (cont'd)	Semi-Volatile Organic Compounds (SVOC's) (cont'd): PCB#153 2,2',4,4',5,5'-Hexachlorobiphenyl PCB#180 2,2',3,3',5,5',6'-Heptachlorobiphenyl	BSOP12E by GC-MS	B
Potable water (non regulatory), Ground Water and prepared leachate	Volatile Organic Compounds (VOC's): Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane Chloromethane (CTD) 1,1-Dichloroethene Dichloromethane MTBE (methyl-tert, butyl Ether) Trans-1,2-Dichloroethene 1,1-Dichloroethane Cis-1,2-Dichloroethene 2,2-Dichloropropane Chloroform Bromochloromethane 1,1,1-Trichloroethane Bromochloromethane 1,1,1-Trichloroethane 1,1-Dichloropropene Carbon Tetrachloride 1,2-Dichloroethane Benzene 1,2-Dichloropropane Trichloroethene	BSOP12J by Headspace GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Procedures based on/incorporating published procedures in the HMSO series 'Methods for the Examination of Waters and Associated Materials', (MEWAM), referenced by the ISBN number and year. Any additional or alternative reference is identified. (cont'd)	
Potable water (non regulatory), Ground Water and prepared Leachate (cont'd)	Volatile Organic Compounds (VOC's): (cont'd) Chloromethane Dibromochloromethane Chlorobenzene Ethyl Benzene m,p-Xylene o-Xylene Styrene Isopropylbenzene n-Propylbenzene Bromobenzene 1,2,3-Trimethylbenzene 1,3,5-Trimethylbenzene Tert-Butylbenzene 1,2,4-Trimethylbenzene Sec-Butylbenzene p-Isopropyltoluene 2-Chlorotoluene 4-Chlorotoluene 1,3-Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,3-Trichlorobenzene TAME (tert-amyl methyl ether) m/p-ethyl Toluene 2-ethyl Toluene Toluene Trans-1,3-Dichloropropene 1,1,2-Trichloroethane 1,3-Dichloropropane Tetrachloroethene Cis-1,3-dichloropropene	BSOP12J by Headspace GC-MS	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods based on 'Methods for Examination of Water and Associated Materials 'MEWAM' Department of the Environment Standing Committee of Analysts identified and the Methods of the American Public Health Association - American Water Works Association - Water Pollution Control Federation (APHA-AWWA-WPCF) identified by method number	
Potable water (non regulatory), Ground Water and prepared Leachate (cont'd)	Volatile Organic Compounds (VOC's): (cont'd) Bromodichloromethane Dibromomethane	BSOP12J by Headspace GC-MS	B
LEACHATES WATERS, raw and clean WASTE WATERS, treated and untreated, industrial and domestic	Chemical Oxygen Demand	EKSOPIN59, Laboratory Procedures Method based on MEWAM ISBN 0117519154, HMSO 1986 by spectrophotometry	E
	Total Suspended Solids	EKSOPIN60, Laboratory Procedures Method based on MEWAM ISBN 0117511957X, HMSO 1980 by gravimetry	E
LEACHATES, SLUDGES SOILS WATERS, raw and clean WASTE WATERS, treated and untreated, industrial and domestic waste (cont'd)	Phenols (monohydric)	EKSOPIN51 Laboratory Procedures Manual based on MEWAM ISBN 0117516171, HMSO 1981 by spectrometry	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
WATERS Clean water, ground water Prepared Leachate Landfill leachate	Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Lead Manganese Mercury Molybdenum Nickel Antimony Selenium Tin Vanadium Zinc	EKSOPIN61 Laboratories Procedures Manual using ICP-MS	E
SOILS, SLUDGES and SEDIMENTS	Boron (water soluble) Sulphate (water soluble)	EKSOPIN56 Laboratories Procedures Manual. Documented in-house method using ICP-OES	E
LEACHATES, SOILS, SLUDGES and SEDIMENTS, WATERS, Raw and Clean, WASTEWATERS, Treated and Untreated, Industrial and Domestic, FILTERS	Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Nickel Selenium Tin Vanadium Zinc	EKSOPIN56 Laboratories Procedures Manual based on MEWAM ISBN 0117516155, HMSO 1981 and APHA-AWWA-WPCF 1992, 18th Edition by ICP-OES	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS, SLUDGES and SEDIMENTS, Filters	Aluminium	EKSOPIN56 Laboratories Procedures Manual based on MEWAM ISBN 0117516155, HMSO 1981 and APHA-AWWA-WPCF 1992, 18th Edition by ICP-OES	E
SOILS, SLUDGES and SEDIMENTS	Semi-Volatile Organic Compounds (SVOC): 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2-Chloronaphthalene 2-Chlorophenol 2-methyl phenol 2-Methylnaphthalene 2-Nitroaniline 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dimethylphenol 2,4-Dinitrotoluene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2,6-Dinitrotoluene 3-Nitroaniline 3/4-Methylphenol 4-Bromophenyl phenylether 4-Chloro-3-methylphenol 4-Chloroaniline 4-Chlorophenyl phenylether 4-Nitroaniline	Documented in-house method EKSOP12E using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS, SLUDGES and SEDIMENTS (cont'd)	Chemical Tests (cont'd) Semi-Volatile Organic Compounds (SVOC): (cont'd) Acenaphthene Acenaphthylene Anthracene Azobenzene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(b)Fluoranthene Benzo(k)Fluoranthene Benzo(ghi)Perylene Bis (2-chloroethoxy) methane Bis (2-chloroethyl) ether Bis (2-chloroisopropyl) ether Bis (2-ethylhexyl)phthalate Butyl benzylphthalate Carbazole Chrysene Di-n-butylphthalate Di-n-octylphthalate Dibenzo(ah)Anthracene Dibenzofuran Diethyl phthalate Dimethyl phthalate Fluoranthene Fluorene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachloroethane Indeno(123-cd)Pyrene Isophorone Naphthalene Nitrobenzene Pentachlorophenol Phenanthrene Phenol Pyrene	Documented in-house method EKSOP12E using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS, SLUDGES and SEDIMENTS (cont'd)	Phenols: 2-methyl phenol 2,3-dimethylphenol 2,5-dimethylphenol 2,6-dimethylphenol 3/4-methylphenol Phenol	Documented in-house method EKSOP12B using GC-MS	E
	Polynuclear Aromatic Hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(ghi)Perylene Benzo(b)Fluoranthene Benzo(k)Fluoranthene Chrysene Dibenzo(ah)Anthracene Fluoranthene Fluorene Indeno(123-cd)Pyrene Naphthalene Phenanthrene Pyrene Total PAH (SUM of 16 above)	Documented in-house method EKSOP12A using GC-MS	E
GROUND WATER, SURFACE WATER and EFFLUENT	Semi-Volatile Organic Compounds (SVOC): 1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,3-Dichlorobenzene 1,4-Dichlorobenzene 2-Chloronaphthalene 2-Chlorophenol 2-methyl phenol 2-Methylnaphthalene 2-Nitroaniline 2-Nitrophenol 2,4-Dichlorophenol 2,4-Dimethylphenol	Documented in-house method EKSOP12E using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
GROUND WATER, SURFACE WATER and EFFLUENT (cont'd)	Chemical Tests (cont'd) Semi-Volatile Organic Compounds (SVOC): (cont'd) 2,4,Dinitrotoluene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2,6-Dinitrotoluene 3-Nitroaniline 3/4-Methylphenol 4-Bromophenyl phenylether 4-Chloro-3-methylphenol 4-Chloroaniline 4-Chlorophenyl phenylether 4-Nitroaniline Acenaphthene Acenaphthylene Anthracene Azobenzene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(b)Fluoranthene Benzo(k)Fluoranthene Benzo(ghi)Perylene Bis (2-chloroethoxy) methane Bis (2-chloroethyl) ether Bis (2-chloroisopropyl) ether Bis (2-ethylhexyl)phthalate Butyl benzylphthalate Carbazole Chrysene Di-n-butylphthalate Di-n-octylphthalate Dibenzo(ah)Anthracene Dibenzofuran Diethyl phthalate Dimethyl phthalate Fluoranthene Fluorene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclopentadiene Hexachloroethane	Documented in-house method EKSOP12E using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
GROUND WATER, SURFACE WATER and EFFLUENT (cont'd)	Semi-Volatile Organic Compounds (SVOC): (cont'd) Indeno(123-cd)Pyrene Isophorone Naphthalene Nitrobenzene Pentachlorophenol Phenanthrene Phenol Pyrene	Documented in-house method EKSOP12E using GC-MS	E
	Phenols: 2-methyl phenol 2,3-dimethylphenol 2,5-dimethylphenol 2,6-dimethylphenol 3/4-methylphenol Phenol	Documented in-house method EKSOP12B using GC-MS	E
	Polynuclear Aromatic Hydrocarbons: Acenaphthene Acenaphthylene Anthracene Benzo(a)Anthracene Benzo(a)Pyrene Benzo(ghi)Perylene Benzo(b)Fluoranthene Benzo(k)Fluoranthene Chrysene Dibenzo(ah)Anthracene Fluoranthene Fluorene Indeno(123-cd)Pyrene Naphthalene Phenanthrene Pyrene Total PAH (SUM of 16 above)	Documented in-house method EKSOP12A using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
GROUND WATER, SURFACE WATER and EFFLUENT (cont'd)	Speciated Petroleum Hydrocarbons Volatile (VPH) Band [C5 – C10] Total VPH: C5 to C10 (aliphatic and aromatic inclusive) Banded aliphatic fraction: >C5 to C6 >C6 to C7 >C7 to C8 >C8 to C10 >C5 to C10 Banded aromatic fraction: >C6 to C7 >C7 to C8 >C8 to C10 >C6 to C10	Documented in-house method EKSOP12I using headspace GC-MS	E
GROUND WATER, SURFACE WATER and WASTE WATERS, treated and untreated, industrial and domestic SOILS and SEDIMENTS	Speciated Petroleum Hydrocarbons Non-Volatile (EPH) Band [C10 – C35] Total EPH: C10 to C35 (aliphatic and aromatic inclusive)	Documented in-house method EKSOP100 using solvent extraction and GC-FID	E
GROUND WATER, SURFACE WATER and EFFLUENT	Banded aliphatic fraction: >C10 to C12 >C12 to C16 >C16 to C21 >C21 to C35 >C10 to C35 Banded aromatic fraction: >C10 to C12 >C12 to C16 >C16 to C21 >C21 to C35 >C10 to C35	Documented in-house method EKSOP100 using solvent extraction and GC-FID	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS and WATERS (Groundwaters and Leachates)	Chemical Tests (cont'd) Volatile Organic Compounds EPA 624 Suite: Dichlorodifluoromethane Chloromethane Vinyl Chloride Bromomethane Chloroethane Trichlorofluoromethane 1,1-Dichloroethylene Methylene Chloride 1,1-Dichloroethane Trans-1,2-Dichloroethylene MTBE 2,2-Dichloropropane cis-1,2-Dichloroethylene Bromochloromethane Chloroform 1,1,1-Trichloroethane Carbon Tetrachloride 1,1-Dichloropropene Benzene 1,2-Dichloroethane Trichloroethylene 1,2-Dichloropropane Dibromomethane Bromodichloromethane cis-1,3-Dichloropropene Toluene trans-1,3-Dichloropropene 1,1,2-Trichloroethane Tetrachloroethylene 1,3-Dichloropropane Chlorodibromomethane 1,2-Dibromomethane Chlorobenzene 1,1,1,2-Tetrachloroethane Ethylbenzene m+p-Xylene o-Xylene Stryene Bromoform Isopropylbenzene 1,1,2,2-Tetrachloroethane	Documented In-House Method EKSOP12I using Headspace GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS and WATERS (Groundwaters and Leachates) (cont'd)	Chemical Tests (cont'd) Volatile Organic Compounds EPA 624 Suite (cont'd): Bromobenzene 1,2,3-Trichloropropane Propylbenzene 2-Chlorotoluene 1,3,5-Trimethylbenzene 4-Chlorotoluene tert -Butylbenzene 1,2,4 -Trimethylbenzene sec -Butylbenzene p -Isopropyltoluene 1,3 -Dichlorobenzene 1,4-Dichlorobenzene n-Butylbenzene 1,2-Dichlorobenzene 1,2-Dibromo-3-chloropropane 1,2,4-Trichlorobenzene Hexachlorobutadiene Naphthalene 1,2,3-Trichlorobenzene	Documented In-House Method EKSOP12I using Headspace GC-MS	E
SOILS	Chemical Tests Organochlorine Pesticides: Alpha-HCH Beta-HCH Gamma-HCH (Lindane) HCB Heptachlor Heptachlor Epoxide Aldrin Isodrin Dieldrin Endrin Cis-Chlordane Trans-Chlordane Alpha-Endosulphan p,p-DDE p,p-DDD	Documented In-House Method EKSOP12C using GC-MS	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
SOILS (cont'd)	Organophosphorus Pesticides: Dichlorvos Mevinphos Omethoate Trifluralin Dimethoate Diazinon Pirimiphos-Methyl Malathion Fenitrothion Chlorpyrifos Parathion Clofenvinphos Carbofenthion Azinphos Methyl	Documented In-House Method EKSOP12D using GC-MS	E
LEACHATES SOILS, SLUDGES and WATERS, raw and clean	Total Cyanide	EKSOPIN53, Laboratory Procedures Manual by distillation and colorimetry	E
WASTE WATERS, treated and untreated, industrial and domestic	Easily Liberated Cyanide	EKSOPIN53, Laboratory Procedures Manual by distillation and colorimetry	E
WATERS, raw and clean WASTE WATERS, treated and untreated, industrial and domestic	Total Organic Carbon (TOC)	Documented In-House method EKSOP13 by TOC Analyser	E
De-ionised water, Tap Water (non-regulatory), Ground water, Surface Water, Waste Effluent Water, Landfill Leachate, Prepared Soil Leachate	Ammonia Chloride Hexavalent Chromium Fluoride Nitrate Nitrite Total Oxidised Nitrogen Phosphate Sulphate Alkalinity	GSOPIN15 by Selective Chemistry Analyser	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
	Chemical Tests (cont'd)		
LEACHATES SOILS, SLUDGES and SEDIMENTS WATERS, raw and clean WASTE WATERS, treated and untreated, industrial and domestic	pH	EKSOPIN54 Laboratory Procedures Manual based on BS 1377:Part 3:1990, MEWAM, ISBN 0117514284, HMSO 1978 and APHA-AWWA-WPCF 1992, 18th Edition	E
SOILS and Groundwater	PCB EC7 Congeners	Documented in house method EKSOP12_29 by GCMS Analysis	E
	PCB#28 2,4,4'-Trichlorobiphenyl PCB#52 2,2',5,5'-Tetrachlorobiphenyl PCB#101 2,2',4,5,5'-Pentachlorobiphenyl PCB#118 2,3',4,4',5-Pentachlorobiphenyl PCB#138 2,2',3,4,4',5'-Hexachlorobiphenyl PCB#153 2,2',4,4',5,5'-Hexachlorobiphenyl PCB#180 2,2',3,3',5,5',6'-Heptachlorobiphenyl		
SOILS (only)	Chemical Tests	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	pH	EKSOPIN54, Laboratory Procedures Manual based on BS 1377:Part 3:1990, MEWAM, ISBN 0117514284, HMSO 1978 and APHA-AWWA-WPCF 1992, 18th Edition	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS (only) (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	Arsenic Beryllium Cadmium Chromium Cobalt Copper Lead Nickel Zinc	EKSOPIN56 Laboratories Procedures Manual based on MEWAM ISBN 0117516155, HMSO 1981 and APHA-AWWA-WPCF 1992, 18th Edition by ICP-OES	E
	PCB EC7 Congeners PCB#28 2,4,4'-Trichlorobiphenyl PCB#52 2,2',5,5'-Tetrachlorobiphenyl PCB#101 2,2',4,5,5'-Pentachlorobiphenyl PCB#118 2,3',4,4',5-Pentachlorobiphenyl PCB#138 2,2',3,4,4',5'-Hexachlorobiphenyl PCB#153 2,2',4,4',5,5'-Hexachlorobiphenyl PCB#180 2,2',3,3',5,5',6'-Heptachlorobiphenyl	Documented in house method EKSOP12_29 by GCMS Analysis	E

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
DAIRY	Chemical Tests		
Raw milk	Tests for Composition and Somatic cells	Documented In-house Method NIMILKSOP 60 using CombiScope	D
	Butterfat Protein Lactose Somatic Cell Count		
FOOD, FOOD PRODUCTS and ENVIRONMENTAL SWABS	Microbiological Tests	In-house Documented Methods	D
	Enumeration		
	Aerobic Colony Count	NISOPM01 using spread plate technique on Plate count agar at 30 °C for 72 hrs.	D
	Bacillus cereus (presumptive)	NISOPM08 using BACARA chromogenic agar spread plate with incubation at 37°C for 24 hrs.	D
	E coli (β Glucuronidase positive)	NISOPM26 based on BS ISO 16649-1:2001 and BS ISO 16649-2:2001	D
	Coagulase positive staphylococci	NISOPM07 based on ISO 6888-1:1999 using latex agglutination	D
	Pseudomonas spp (presumptive)	NISOPM32 – based on BS EN ISO 13720:2010 using spread plate	D

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOOD and FOOD PRODUCTS	Microbiological Tests	In-house Documented Methods	
	Detection		
	E. coli 0157 (presumptive)	NISOPM05 based on BS EN ISO 16654:2001 using IMS	D
	Enumeration		
	Listeria spp including *Listeria monocytogenes*	NISOPM33 based on BS EN ISO 11290-2:1997+ A1:2004. Confirmation and Identification using Microgen biochemical gallery	D
	Clostridium perfringens (presumptive)	NISOPM27 based on BS EN ISO 7937:2004	D
	Moulds	NISOPM22 based on BS ISO 21527-1:2008	D
	Yeasts	NISOPM22 based on BS ISO 21527-1:2008	D
FOOD, FOOD PRODUCTS, ANIMAL FEEDINGSTUFFS and ENVIRONMENTAL SWABS	Detection		
	Salmonella spp	NISOPM02 based on BS EN ISO 6579:2002 + A1:2007 Confirmation using Microgen biochemical gallery and serology	D
	Listeria spp including *Listeria monocytogenes*	NISOPM10 based on BS EN ISO 11290-1:1997+ A1:2004. Confirmation and Identification using Microgen biochemical gallery	D
FOOD, FOOD PRODUCTS, ANIMAL FEEDINGSTUFFS, ENVIRONMENTAL SWABS and MILK	Enumeration		
	Coliforms *(*presumptive)	NISOPM34 based on BS ISO 4832:2006 using pour plate method	D
	*Enterobacteriaceae (*presumptive)	NISOPM35 based on BS ISO 21528-2:2004 using pour plate method	D

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
ENVIRONMENTAL (BOOT) SWABS, CHICKBOX LINERS, FAECES, DUST	Microbiological Tests Detection	In-house Documented Methods	
	Salmonella spp (presumptive)	NISOPM24 based on BS EN ISO 6579:2002+A1:2007 using MSRV for the purposes of testing under The Control of Salmonella in Poultry Scheme Order (NI) 2008 with specific reference to EC 2160/2003 and The Control of Salmonella in Broiler Flocks Scheme Order (NI) 2009	D
FOOD, FOOD PRODUCTS, ENVIRONMENTAL SWABS, ANIMAL FEEDING STUFFS, MILK, CASING, COMPOST AND ANIMAL BY-PRODUCTS	Detection *Salmonella* spp (presumptive)	NISOPM36 based on BS EN ISO 6579:2002 + A1:2007 using VIDAS UP Salmonella (Afnor Bio 12/32-10/11). For non-regulatory purposes.	D
FOOD, FOOD PRODUCTS, ENVIRONMENTAL SWABS, MILK, CASING AND COMPOST	*Listeria* spp including *Listeria monocytogenes*	NISOPM37 based on BS EN ISO 11290-1:1996+A1:2004 using VIDAS UP Listeria (Afnor Bio 12/33-05/12)	D
FOOD, FOOD PRODUCTS, CASING AND COMPOSTS	*E.coli 0157 (*presumptive)	NISOPM38 based on BS EN ISO 16654:2001 using VIDAS UP E.Coli including H7 (Afnor Bio 12/25-05/09)	D
WATER (Potable, bottled, Borehole and Process Waters)	Microbiological Tests Enumeration	In-house Documented Methods	
	Coliforms & *E coli* (presumptive)	NISOPM13 based on 'The Microbiology of Drinking Water 2009', Part 4A	D
	Clostridium perfringens (presumptive) and sulphite reducing clostridia	NISOPM20 based on 'The Microbiology of Drinking Water 2010', Part 6	D

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATER (Potable, bottled Borehole and Process Waters) (cont'd)	Microbiological Tests (cont'd)	In-house Documented Methods	
	Enterococci (presumptive)	NISOPM19 based on 'The Microbiology of Drinking Water 2012', Part 5A	D
	TVC (aerobic colony count) at 22 ^{o}C and 37 ^{o}C	NISOPM21 based on 'The Microbiology of Drinking Water 2012', Part 7A	D
FOODS and FOODSTUFFS	Chemical Tests	Documented In-House Methods	
	Detection and quantification of Pesticides, pesticide breakdown products and other organic compunds applied to or contaminating foodstuffs.	Methods developed and validated according to in house method CSOPP600 using one or more of the following techniques; solvent extraction, SPE and/or liquid-liquid extraction clean-up with an endpoint of GC MS/MS or LC MS-MS	
		CSOPP603, and CSOPP611 including the use of a Flexible Scope Protocol (See tables 1 -6 below for details - NB: The list may not be exhaustive as the Flexible Scope Protocol allows for the inclusion of additional compounds subject to the laboratory meeting the validation criteria specified in the Protocol)	C
SOFT FRUIT, VEGETABLES, ALLIUMS and CITRUS FRUIT	Dithiocarbamates	CSOPP604 by GC/FPD	C
ONIONS	Maleic Hydrazide	CSOPP602 by LC MS-MS	C
FRUITS	Chlormequat & Mepiquat	CSOPP606 by LC MS-MS	C
- Nuts, cereals and cereal products, dried fruit, seeds	Mycotoxins, as below: Aflatoxins B_1, B_2, G_1, G_2	CSOPP605 using LC-MS/MS	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS and FOODSTUFFS (cont'd)	Chemical Tests (cont'd)	Documented In-House Methods	
Animal Feeds and Feeding Stuffs –Cereals, Maize, Oil Seed Meals and Compound Feed	Multi-Residue Mycotoxin Screen: Aflotoxins B1,B2,G1,G2 Fumonisins B1, B2, B3 Ochratoxin A Deoxynivalenol Acetyl – Deoxynivalenol HT-2 T-2 Zearalenone	CSOPP609 Solvent extraction, immuno-affinity clean-up, analysis by LC-MSMS	C
Soft Fruit, Vegetable and Citrus	Ethephon	Documented In-House Method CSOPP607 by LCMS/MS	C
Soft Fruit, Vegetable, Allium, Citrus, High oil content, Milk	Perchlorate Chlorate	Documented In-House Method CSOPP608 by LCMS/MS	C
Fruits, Vegetables, Dried Products, High Oil commodities and Cereals	Glyphosate Glufosinate Methyl amino Phosphoric Acid	Documented in house method CSOPP610 using LCMSMS	C
FOODS and FOOD PRODUCTS	Chemical and Physical Tests	Documented In-House Methods:	
- Foods in general	Ash	Method CSOPNut001 based on BS 4401-1:1998 by gravimetry	C
	Moisture Dry Matter	Method CSOPNut006 based on BS 4401-3:1997 by drying oven and gravimetry	C
	Moisture by vacuum	Method CSOPNut010 by vacuum oven and gravimetry	C
	Fat (total)	Method CSOPNut004 by NMR	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS and FOOD PRODUCTS (cont'd)	Chemical and Physical Tests (cont'd)	Documented In-House Methods:	
- Foods in general	Fatty Acid Composition/profile - Saturated fatty acids - Monounsaturated fatty acids - Polyunsaturated fatty acids - Trans fatty acids - Omega 3 fatty acids - Omega 6 fatty acids	Method CSOPNut003 by GC-FID	C
	Sugars (Glucose, Fructose, Lactose, Sucrose and Maltose) Individually and/or as sum of sugars	Method CSOPNut013 by Ion Chromatography	C
	Nitrogen/Protein	Method CSOPNut007 by Dumas	C
	Dietary fibre	Method CSOPNut002 based on AOAC 991.43	C
	Sodium Sodium expressed as salt (NaCl)	Method CSOPNut012 by flame photometry	C
	Chloride Chloride expressed as Salt	Method CSOPNut011 by chloride meter	C
	pH	Method CSOPNut009 based on BS 4401-9:1975 and BS 770-5:1976 by pH meter	C
	Water activity	Method CSOPNut015 using Aqualab dew point a_w meter	C
Food and Food Products, Wine	Sulphur dioxide	Method CSOPNut016 using optimised Monier-Williams method, based on AOAC 990.28	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS and FOOD PRODUCTS (cont'd)	Chemical and Physical Tests (cont'd)	Documented In-House Methods:	
- Meats and meat products	Hydroxyproline	Method CSOPNut005 based on ISO 3496:1994 by spectrophotometry	C
	Collagen	Calculation based on Hydroxyproline	C
	Connective tissue (Wet Fat Free)	Calculation based on Hydroxyproline	C
	Nitrate/Nitrite KNO_2/KNO_3 $NaNO_2$/$NaNO_3$	Method CSOPNut008 based on BS EN ISO 12014-4:2005 using Ion Chromatography with conductivity and/or UV detection	C
- Vegetable and vegetable products	Nitrate/Nitrite	Method CSOPNut008 based on BS 12014-2:1997 using Ion Chromatography with conductivity and/or UV detection	C
Food and Food Products	Calculations: Carbohydrate: - available, - total, - starch	Method CSOPNut014 by difference by difference by difference	C
	Energy kJ Energy kcal Fat in Dry Matter	based on EC1169/2011 Food Information for Customers by calculations	
	Salt Content in aqueous phase	By calculation: CSOPNut014 based on FDA Guide to Inspection of Low Acid Canned Food 7	C
	Apparent Fat Free Meat Content Apparent Lean Meat Content Apparent Total Meat Content Non meat Nitrogen	By Calculation: Method CSOPNut014 based on Stubbs and More Method using Generic (Average) or specific Nitrogen Factor by calculations	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS and FOOD PRODUCTS (cont'd)	Chemical and Physical Tests (cont'd)	Documented In-House Methods:	
	Apparent EC Meat Content:	By Calculation: Method CSOPNut014 based on the Stubbs and More Method, the Meat Products Regulation 2003 and EC2000/101	C
	Apparent Meat Content (fat free) Total meat Content ExcessConnective Tissue Excess Fat Connective Tissue (Collagen/Meat Protein)	Method CSOPNut014 Clitravi Method,Based on the Meat Products Regulation 2003 and EC2000/101 factor by calculation using Hydroxyproline correction	C
	Total Meat Content of Whole Product	Method CSOPNut014 Based on Method by separation and calculation	C
	Apparent Total Fish Content	By Calculation: Method CSOPNut014 based on Stubbs and More Method	C
	Added water - Stubbs and More	By Calculation: Method CSOPNut014 based on a modified Stubbs and More Method	C
	Added water - Danish Method	By Calculation: Method CSOPNut014 based on the Danish Method	C
	Added water - German Method	By Calculation: Method CSOPNut014 based on the German Method	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS and FOOD PRODUCTS and ENVIRONMENTAL SWABS	Detection and Quantification of Allergens	Documented In-House Methods:	
Foods / processed foods (excluding fermented products e.g. beer, soy sauce) and Extracts from Swabs	Determination of: Gliadin Gluten	Documented In-House Method CSOP FMB01 using R-Biopharm Ridascreen Gliadin kit (R5 Mendez ELISA).	C
Food and Food products and Environmental Swabs	Almond/Mandel	CSOP FMB02 using R-Biopharm Ridascreen®FAST ELISA kit..	C
	Soya	CSOP FMB03 using R-Biopharm Ridascreen®FAST ELISA kit..	C
	Mustard	CSOP FMB04using R-Biopharm Ridascreen®FAST ELISA kit..	C
	Peanut	CSOP FMB05 using R-Biopharm Ridascreen®FAST ELISA kit..	C
	Casein	CSOP FMB06 using R-Biopharm Ridascreen®FAST ELISA kit..	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS, DAIRY and FOOD PRODUCTS and ENVIRONMENTAL SWABS	Microbiological Tests Isolation and enumeration of:	Documented In-House Methods	
- Foods in general and environmental swabs	Coliforms (presumptive) incubation at 37 °C	Method CSOPMicro02 using plate count based on BS EN ISO 4832:2006	C
- Dairy products and environmental swabs	Coliforms (presumptive) incubation at 30 °C	Method CSOPMicro02 using plate count based on BS EN ISO 4832:2006	C
- Foods in general, dairy products and environmental swabs	Aerobic colony count incubation at 30 °C for 48 h	Method CSOPMicro01 using plate count	C
	Aerobic colony count incubation at 30 °C for 72 h	Method CSOPMicro01 using plate count based on BS EN ISO 4833-1:2013	
- Foods in general, dairy products and environmental swabs (cont'd)	Enterobacteriaceae (presumptive)	Method CSOPMicro03 using plate count based on BS ISO 2158-2:2004	C
	E coli (ß-glucuronidase positive)	Method CSOPMicro04 using selective medium, based on BS ISO 16649-2:2001	C
	Coagulase positive staphylococci, including *Staph. aureus*:	Method CSOPMicro05: using plate count based on BS EN ISO 6888-1:1999 Confirmation using Staphytect kit	C
	Yeasts (samples with aW >0.95)	Method CSOPMicro13 based on BS ISO 21527-1:2008	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS, DAIRY and FOOD PRODUCTS and ENVIRONMENTAL SWABS (cont'd)	Microbiological Tests (cont'd) Isolation and enumeration of:	Documented In-House Methods	
- Foods in general, dairy products and environmental swabs (cont'd)	Moulds (samples with aW >0.95)	Method CSOPMicro13 based on BS ISO 21527-1:2008	C
	Detection of:		
swabs (cont'd)	*Listeria spp* including *Listeria monocytogenes*	Method CSOPMicro18 using enrichment & plate count based on BS EN ISO 11290-1:1996 + A1:2004 Confirmation and Identification using Microgen biochemical profile	C
	Listeria spp including *Listeria monocytogenes*	Method CSOPMicro20 using Solus ELISA with confirmation using agars ALOA or ALOA & PALCAM (customer specified) and Identification using Microgen biochemical profile	C
	Salmonella spp	Method CSOPMicro19 using enrichment and plating based on BS EN ISO 6579:2002 + A1:2007 Confirmation using Microgen biochemical profile and serology Method CSOPMicro21 using Solus ELISA with confirmation using XLD, BGA or XLD, BGA & SM2 chromogenic agar (customer specified) and identification using Microgen biochemical profile and serology	C
	Thermotolerant *Campylobacter spp* Isolation and enumeration of:	Method CSOPMicro22 based on BS EN ISO 10272-1:2006	C
	Pseudomonas spp (presumptive)	Method CSOPMicro10 based on BS EN ISO 13720:2010 and BS EN ISO 11059:2009	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
FOODS, DAIRY and FOOD PRODUCTS and ENVIRONMENTAL SWABS (cont'd)	Microbiological Tests (cont'd) Isolation and enumeration of: (cont'd)	Documented In-House Methods	
swabs (cont'd)	*Bacillus cereus* (presumptive)	Method CSOPMicro35 using MYP agar based on BS EN ISO 7932:2004	C
	Bacillus cereus (presumptive)	Method CSOPMicro06 using BACARA chromogenic agar	C
FOODS, DAIRY and FOOD PRODUCTS	Microbiological Tests (cont'd) Isolation and enumeration of:	Documented In-House Methods	
	Clostridium perfringens (presumptive)	Method CSOPMicro07 based on BS EN ISO 7937:2004	C
	Lactic Acid Bacteria (presumptive)	Method CSOPMicro09 based on BS EN ISO 15214:1998	C
	E coli (ß-glucuronidase positive) Isolation and enumeration of:	Method CSOPMicro11 using selective medium, based on BS ISO 16649-1:2001	C
	Listeria spp including *Listeria monocytogenes*	Method CSOPMicro23 using enrichment and plate count based on BS EN ISO 11290-2:1998 Confirmation and Identification using Microgen biochemical profile	C

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS - Drinking, potable and process (non-regulatory)	Microbiological Tests	Documented In-House Methods based on the Microbiology of Drinking Water (MDW)	C
	Total Viable Count at 22 °C	Method CSOPMicro24 using pour plate method based on MDW Part 7:2012	C
	Total Viable Count at 37 °C	Method CSOPMicro25 using pour plate method based on MDW Part 7:2012	C
	Coliforms and *E coli*	Method CSOPMicro26 using Colilert based on MDW Part 4d:2009	C
	Pseudomonas aeruginosa (presumptive)	Method CSOPMicro27 using membrane filtration based on MDW Part 8:2010	C
	Sulphite Reducing Clostridia:	Method CSOPMicro28 using membrane filtration based on MDW Part 6:2010	C
	Enterococci (presumptive)	Method CSOPMicro29 using membrane filtration based on MDW Part 5:2012	C
END			

Table 1
MRPS Suite by CSOPP603 LCMSMS

Analyte	Soft Fruit	Vegetable	Allium	Citrus
2-(1-Naphthyl)acetamide	x	x		
3-hydroxycarbofuran	x	x		x
6-Benzyladenine	x	x	x	x
Acephate	x	x		x
Acetamiprid	x	x		x
Acibenzolar-S-methyl	x	x	x	x
Aldicarb	x	x		x
Aldicarb sulphone	x	x		x
Aldicarb sulphoxide	x	x		x
Aminocarb	x	x	x	x
Azinphos ethyl	x	x		x
Azinphos methyl	x	x		x
Bendiocarb	x	x	x	x
Butralin	x	x	x	x
Carbaryl	x	x	x	x
Carbendazim	x	x	x	x
Carbetamide	x	x		x
Carbofuran	x	x		x
Carpropamid	x		x	x
Chinomethionat	x		x	x
Chlorfluazuron	x	x	x	x
Chloridazon	x	x		
Chlorotoluron	x	x		x
Chlorpropham	x	x	x	x
Clofentezine	x	x	x	x
Clothianidin	x	x		x
Cyanazine	x	x	x	x
Cycluron	x	x	x	x
Cymoxanil	x	x		x
Demeton	x	x		
Demeton-s-methyl	x	x		x
Demeton-s-methyl sulphone	x	x		
Desmedipham	x	x		
Dicrotophos	x	x	x	x
Diethofencarb	x	x		x
Diflubenzuron	x	x		x
Dimefuron	x	x		
Dimethoate	x	x		x
Diniconazole	x	x	x	x
Dioxacarb	x	x		
Disulfoton sulfoxide	x	x		x
Disulfoton sulphone	x	x		
Diuron	x	x		

Analyte	Soft Fruit	Vegetable	Allium	Citrus
DMSA	x	x	x	x
DMST	x	x	x	x
Dodemorph	x	x	x	x
Dodine	x	x		x
Emamectin	x	x	x	x
Ethidimuron	x	x		x
Ethiofencarb	x	x		
Ethiofencarb sulfone	x	x		
Ethiofencarb sulfoxide	x	x		
Ethiprole	x	x	x	x
Ethirimol	x	x		x
Fenamiphos sulfone	x	x		x
Fenamiphos sulfoxide	x	x	x	
Fenazaquin	x	x	x	x
Fenhexamid	x	x		x
Fenoxycarb	x	x		x
Fenpropidin	x	x	x	x
Fenpropimorph	x	x	x	x
Fenpyroximate	x	x	x	x
Fenuron	x	x		x
Flonicamid	x	x	x	x
Flufenoxuron	x	x	x	x
Fluometuron	x	x	x	x
Fluopicolide	x	x	x	x
Fluorochloridone	x	x		
Fluoxastrobin	x	x		x
Flurtamone	x	x	x	x
Flutriafol	x	x	x	x
Fuberidazole	x	x	x	x
Furathiocarb	x	x	x	x
Hexythiazox	x	x	x	x
Imazalil	x	x	x	x
Imibenconazole	x		x	x
Imidacloprid	x	x	x	x
Indoxacarb	x	x	x	x
Iprovalicarb	x	x	x	x
Isoprocarb	x	x		
Isoproturon	x	x	x	x
Isoxaben	x	x		
Karbutilate	x	x	x	x
Linuron	x	x		x
Lufenuron	x	x	x	x
Malaoxon	x	x	x	x
Mandipropamid	x	x		
Mefenacet	x	x		
Metamitron	x	x	x	x
Metconazole	x	x	x	x

Analyte	Soft Fruit	Vegetable	Allium	Citrus
Methabenzthiazuron	x	x		x
Methamidophos	x	x	x	x
Methiocarb	x	x		x
Methiocarb sulfone	x	x		
Methiocarb Sulfoxide	x	x		
Methomyl	x	x	x	x
Methoxyfenozide	x	x	x	x
Metobromuron	x	x		x
Metoxuron	x	x		x
Monocrotophos	x	x		x
Monolinuron	x	x	x	x
Monuron	x	x	x	x
Neburon	x	x		x
Nitenpyram	x	x	x	x
Omethoate	x	x	x	x
Oxadiargyl	x	x		x
Oxamyl	x	x		x
Oxycarboxin	x	x		
Pencycuron	x	x		x
Phenmedipham	x	x		
Phorate sulfone	x	x		
Phorate sulfoxide	x	x		
Phosmet	x	x		
Phosphamidon	x	x	x	x
Phoxim	x	x		
Pirimicarb	x	x	x	x
Pirimicarb desmethyl	x	x	x	x
Prochloraz	x	x		x
Promecarb	x	x		x
Propamocarb	x	x	x	x
Propaquizafop	x	x	x	x
Propargite	x	x		
Propoxur	x	x		
Pyrifenox	x	x	x	x
Rotenone	x	x		x
Spinosad	x	x		x
Spirodiclofen	x		x	x
Spiromesifen	x	x	x	x
Spiroxamine	x	x	x	x
Tebufenozide	x	x	x	x
Teflubenzuron	x	x		x
Temephos	x	x		
Thiabendazole	x	x	x	x
Thiacloprid	x	x	x	x
Thiazafluron	x	x	x	x
Thiodicarb	x	x	x	x
Tridemorph	x	x	x	x

Analyte	Soft Fruit	Vegetable	Allium	Citrus
Trifloxysulfuron	x	x	x	x
Triflumuron	x	x		x
Triticonazole	x	x	x	x
Vamidothion	x	x	x	x
Vernolate	x	x	x	x
Zoxamide	x	x	x	x

END OF TABLE 1

Table 2

MRPS Suite by CSOPP603 LCMS/MS

Accredited (x)

Full Testname	Nut	Dried Fruit
2-(1-Naphthyl)acetamide	X	X
3-hydroxycarbofuran	X	X
6-Benzyladenine	X	X
Acephate	X	X
Acetamiprid	X	X
Acibenzolar-S-methyl	X	X
Aldicarb	X	X
Aldicarb sulphone	X	X
Aldicarb sulphoxide	X	X
Aminocarb	X	X
Azinphos ethyl	X	X
Azinphos methyl		X
Azoxystrobin	X	X
Bendiocarb	X	X
Butralin	X	X
Carbaryl	X	X
Carbendazim	X	X
Carbetamide	X	X
Carbofuran	X	X
Carpropamid	X	X
chlorantraniliprole	X	X
Chlorbromuron	X	X
Chlorfluazuron	X	X
Chloridazon	X	X
Chlorotoluron	X	X
Chlorpropham	X	
Clofentezine	X	X
Clothianidin	X	X
Cyanazine	X	X
Cyazofamid		X
Cycluron	X	X
Cymoxanil	X	X
Cythioate	X	X
Demeton		X
Demeton-s-methyl sulphone	X	X

Full Testname	Nut	Dried Fruit
Desmedipham	X	X
Dicrotophos	X	X
Diethofencarb	X	X
Diflubenzuron	X	X
Dimefuron	X	X
Dimethoate	X	X
Diniconazole	X	X
Dinotefuran		X
Dioxacarb	X	X
Disulfoton sulfoxide	X	X
Disulfoton sulphone	X	X
Diuron	X	X
DMSA	X	X
DMST	X	X
Dodemorph	X	X
Emamectin	X	X
Ethidimuron	X	X
Ethiofencarb	X	X
Ethiofencarb sulfone	X	X
Ethiofencarb sulfoxide	X	X
Ethiprole	X	X
Ethirimol	X	X
Fenamiphos sulfone	X	X
Fenamiphos sulfoxide	X	X
Fenazaquin	X	X
Fenchlorphos oxon	X	X
Fenhexamid	X	X
Fenoxycarb		X
Fenpropidin	X	X
Fenpropimorph	X	X
Fenpyroximate	X	X
Fenthion Sulphone		X
Fenthion Sulphoxide	X	X
Fenuron	X	X
Flonicamid	X	X
Fluazinam		X
Flufenoxuron	X	
Fluometuron	X	X
Fluopicolide	X	X

Full Testname	Nut	Dried Fruit
Fluorochloridone	X	X
Fluoxastrobin		X
Flurtamone	X	X
Flutriafol	X	X
Forchlorfenuron	X	X
Fuberidazole	X	X
Furathiocarb	X	X
Hexythiazox	X	X
Imazalil	X	X
Imidacloprid	X	X
Indoxacarb	X	X
Iprovalicarb	X	X
Isoprocarb	X	X
Isoproturon	X	X
Isoxaben	X	X
Karbutylate	X	X
Linuron	X	X
Lufenuron	X	
Malaoxon	X	X
Mandipropamid	X	X
Mefenacet	X	X
Metamitron	X	X
Metconazole	X	X
Methabenzthiazuron	X	X
Methamidophos	X	X
Methiocarb	X	X
Methiocarb sulfone	X	X
Methiocarb Sulfoxide	X	X
Methomyl	X	X
Methoxyfenozide	X	X
Metobromuron	X	X
Metoxuron		X
Monocrotophos	X	X
Monolinuron	X	X
Monuron	X	X
Neburon	X	X
Nitenpyram	X	
Novaluron	X	
Omethoate	X	X

Full Testname	Nut	Dried Fruit
Oxamyl	X	X
Oxycarboxin	X	X
Pencycuron	X	X
Phenmedipham	X	X
Phorate sulfone	X	X
Phorate sulfoxide	X	X
Phosmet	X	X
Phosphamidon	X	X
Phoxim	X	X
Pirimicarb	X	X
Pirimicarb desmethyl	X	X
Prochloraz	X	X
Promecarb		X
Propamocarb	X	X
Propaquizafop	X	X
Propargite	X	X
Propoxur	X	X
Pyrifenox	X	X
Rotenone	X	X
Spinosad	X	X
Spirodiclofen	X	X
Spiromesifen		X
Spirotetramat	X	X
Spiroxamine	X	X
Tebufenozide	X	X
Teflubenzuron	X	
Temephos	X	
Terbufos sulfone	X	X
Terbufos sulfoxide	X	X
Thiabendazole	X	X
Thiacloprid	X	X
Thiazafluron	X	X
Thidiazuron	X	X
Thiodicarb	X	X
Thiofanox	X	X
Tridemorph		X
Trifloxysulfuron		X
Triflumuron	X	X
Triforine	X	X

Full Testname	Nut	Dried Fruit
Triticonazole	X	X
Vamidothion	X	X
Vernolate	X	X
Zoxamide	X	X

END OF TABLE 2

Table 3
MRPS Suite by CSOPP603 LCMSMS

Analyte	Cereal 603	Feed 603	Analyte	Cereal 603	Feed 603
2-(Naphthyl)acetamide	x	x	Imazalil	x	x
6-Benzyladenine	x	x	Imibenconazole	x	x
Acephate	x	x	Iprovalicarb	x	x
Acetamiprid	x	x	Isoprocarb	x	
Aldicarb sulfone	x	x	Isoproturon	x	x
Aldicarb sulfoxide	x	x	Isoxaben	x	
Aminocarb	x	x	Karbutylate	x	x
Azinphos ethyl	x		Malaoxon	x	
Azoxystrobin		x	Mandipropamid	x	x
Bendiocarb	x		Mefenacet	x	x
Butralin	x	x	Metamitron	x	x
Carbaryl	x		Metconazole	x	x
Carbetamide	x	x	Methabenzthiazuron	x	x
Carbofuran	x	x	Methamidophos	x	x
Carpropamid	x	x	Methiocarb	x	
Chlorantraniliprole		x	Methiocarb sulfone	x	x
Chlorfluazuron	x		Methiocarb sulfoxide	x	x
Chlorotoluron	x	x	Methomyl	x	
Clothianidin	x		Methoxyfenozide	x	
Cyanazine	x	x	Metoxuron	x	x
Cyazofamid	x	x	Monocrotophos	x	x
Cymoxanil	x		Monolinuron	x	
Cythioate	x		Monuron	x	x
Demeton-s-methyl sulfone	x	x	Neburon	x	x
Desmedipham	x	x	Nitenpyram	x	
Dicrotophos	x		Novaluron	x	
Diethofencarb	x		Omethoate	x	x
Dimefuron	x	x	Oxamyl	x	x
Dimethoate	x	x	Oxycarboxin	x	x
Diniconazole	x	x	Pencycuron	x	x
Dinotefuran	x	x	Phenmedipham	x	x
Dioxacarb	x	x	Phosmet	x	

Analyte	Cereal 603	Feed 603	Analyte	Cereal 603	Feed 603
Disulfoton sulfoxide	x		Phosphamidon	x	
Diuron	x	x	Pirimicarb	x	x
Dodemorph	x	x	Pirimicarb desmethyl	x	x
Dodine	x		Prochloraz	x	x
Emamectin benzoate		x	Promecarb	x	
Ethidimuron	x	x	Propamocarb	x	
Ethiprole		x	Propaquizafop	x	
Ethirimol	x	x	Pymetrozine	x	x
Fenamiphos sulfone	x	x	Pyrifenox	x	x
Fenamiphos sulfoxide	x	x	Rotenone	x	
Fenazaquin	x		Spirodiclofen	x	x
Fenchlorphos oxon		x	Spiromesifen	x	
Fenhexamid		x	Spirotetramat	x	x
Fenoxycarb	x	x	Spiroxamine	x	x
Fenpropidin		x	Tebufenozide	x	x
Fenpropimorph	x		Terbufos sulfone	x	
Fenpyroximate	x	x	Terbufos sulfoxide	x	
Fenthion sulfoxide	x	x	Thiabendazole	x	x
Fenuron	x	x	Thiacloprid	x	x
Flonicamid	x	x	Thiazafluron	x	x
Fluazinam	x		Thidiazuron	x	
Fluometuron	x	x	Thiofanox	x	
Fluopicolide	x		Trichlofon	x	
Flurtamone	x	x	Trifloxysulfuron	x	x
Flutriafol I	x	x	Triflumuron	x	
Forchlorfenuron	x		Triflusulfuron methyl	x	
Fosthiazate	x	x	Triticonazole	x	x
Fuberidazole	x	x	Vamidothion	x	x
Furathiocarb	x	x	Vernolate	x	
Hexythiazox	x		Zoxamide	x	x

END OF TABLE 3

Table 4

MRPS Suite by CSOPP611 GCMS/MS

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
Acetochlor	X	X	X	X	X
Aclonifen	X	X	X	X	X
Alachlor	X	X	X	X	X
Aldrin	X	X	X	X	X
Ametryn	X	X	X	X	X
Atraton	X	X	X	X	X
Atrazine	X	X	X	X	X
Azaconazole	X	X	X	X	X
Azobenzene	X	X	X	X	
Azoxystrobin	X	X	X	X	X
Benalaxyl	X	X	X	X	X
Benfluralin	X	X		X	X
BHC-alpha (benzene hexachloride)	X	X	X	X	X
BHC-beta	X	X	X	X	X
BHC-delta	X	X	X	X	X
BHC-gamma (lindane, gamma HCH)	X	X	X	X	X
Bifenthrin	X	X	X	X	X
Bitertanol	X	X	X	X	X
Boscalid	X	X	X	X	X
Bromacil	X	X	X	X	X
Bromophos	X	X	X	X	X
Bromophos-ethyl	X	X	X	X	X
Bromopropylate	X	X	X	X	X
Bromuconazole	X	X	X	X	X
Bupirimate	X	X	X	X	
Buprofezin (z isomer)	X	X	X	X	X
Butachlor	X	X	X	X	X
Cadusafos	X	X	X	X	X
Carbophenothion	X	X		X	X
Carboxin	X	X	X	X	
Carfentrazone-ethyl	X	X	X	X	
Chlordane-cis & trans (alpha & gamma)	X	X	X	X	X
Chlordimeform	X	X	X	X	X
Chlorfenapyr	X	X	X	X	X
Chlorfenson	X	X	X	X	
Chlorfenvinphos	X	X	X	X	X
Chlormephos	X	X	X	X	X
Chlorobenzilate	X	X	X	X	X

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
Chloropropylate	X	X	X	X	X
Chlorpropham	X	X	X	X	X
Chlorpyrifos	X	X	X	X	X
Chlorpyrifos Methyl	X	X	X	X	X
Chlorthiophos	X	X	X	X	X
Clodinafop-propargyl	X	X	X	X	X
Clomazone	X	X	X	X	X
Cloquintocet-mexyl	X	X	X	X	X
Coumaphos	X	X	X	X	X
Cyflufenamid	X	X	X	X	
Cyfluthrin I - IV	X	X	X	X	X
Cyhalothrin (lambda & gamma)	X	X	X	X	X
Cypermethrin I - IV	X	X	X	X	X
Cyproconazole	X	X	X	X	X
Cyprodinil	X	X	X	X	X
DCPA (Dacthal, Chlorthal-dimethyl)	X	X	X	X	X
DDD-p,p'	X	X	X	X	X
DDE-p,p'	X	X	X	X	
DDT-p,p'	X		X	X	
Deltamethrin	X	X	X	X	X
Desmetryn	X	X	X	X	X
Dialifos	X	X	X	X	X
Diazinon	X	X	X	X	X
Dichlofenthion	X	X	X	X	X
Dichlorvos	X	X	X	X	
Diclobutrazol	X	X	X	X	X
Dicloran (Dichloran)	X	X	X	X	X
Dieldrin	X	X	X	X	X
Difenoconazol	X	X	X	X	X
Diflufenican	X	X	X	X	X
Dimethenamid	X	X	X	X	X
Dimethomorph	X	X	X		X
Dimoxystrobin	X	X	X	X	X
Diphenamid	X	X	X	X	X
Diphenylamine	X	X	X	X	X
Disulfoton	X	X	X	X	X
Edifenphos	X	X	X	X	X
Endosulfan I (alpha isomer)	X	X	X	X	X
Endosulfan II (beta isomer)	X	X	X	X	X
Endosulfan sulfate	X	X	X	X	X
Endrin	X	X	X	X	X
EPN	X	X	X	X	X
Epoxiconazole	X	X	X	X	X

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
EPTC	X	X	X	X	X
Etaconazole	X	X	X	X	X
Ethion	X	X	X	X	X
Ethofumesate	X	X	X	X	X
Ethoprophos (Ethoprop)	X	X	X	X	X
Etofenprox (Ethofenprox)	X	X	X	X	X
Etoxazole	X	X	X	X	X
Etrimfos	X	X	X	X	X
Famphur	X	X	X	X	X
Fenamidone	X	X	X	X	X
Fenamiphos (Phenamiphos)	X	X	X	X	X
Fenarimol	X	X	X	X	X
Fenbuconazole	X	X	X	X	X
Fenchlorphos	X	X	X	X	X
Fenhexamid	X	X	X	X	X
Fenitrothion	X	X		X	X
Fenpiclonil*	X	X	X	X	X
Fenpropathrin	X	X	X	X	X
Fenson	X	X	X	X	X
Fensulfothion	X	X	X	X	X
Fenthion	X	X	X	X	X
Fenvalerate	X	X	X	X	X
Fipronil	X	X	X	X	
Flamprop-isopropyl	X	X	X	X	X
Fluazifop-p-butyl	X	X	X	X	X
Flucythrinate	X	X	X	X	X
Fludioxonil	X	X	X	X	X
Flufenacet	X	X	X	X	X
Flumetralin	X	X	X	X	X
Flumioxazin	X	X	X	X	X
Flumorph	X	X	X	X	X
Fluopyram	X	X	X	X	X
Fluquinconazole	X	X	X	X	X
Fluroxypyr-l-methylheptyl	X	X	X	X	X
Flusilazole	X	X	X	X	X
Flutolanil	X	X	X	X	
Fluvalinate-tau	X	X	X	X	X
Fluxopyroxad	X	X	X	X	X
Furalaxyl	X	X	X	X	X
Haloxyfop-2-ethoxy-ethyl	X	X	X	X	X
Haloxyfop-methyl	X	X	X	X	X
Heptachlor exo-epoxide (isomer B)	X	X	X	X	X
Heptachlor-endo-epoxide (isomer A)	X	X	X	X	X

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
Heptenophos	X	X	X	X	X
Hexachlorobenzene	X	X	X	X	
Hexaconazole	X	X	X	X	
Hexazinone	X	X	X	X	X
Imazalil	X	X	X	X	X
Iodofenphos (Jodfenphos)	X		X	X	X
Iprodione	X	X	X	X	X
Isazofos (Miral, Isazophos)	X	X	X	X	X
Isocarbophos	X	X	X	X	X
Isodrin	X	X	X	X	
Isofenphos	X	X	X	X	X
Isofenphos-methyl	X	X	X	X	X
Isomethiozin	X	X	X	X	X
Isoprothiolane	X	X	X	X	X
Isopyrazam	X	X	X	X	X
Isothiazoline (Octhilinone)	X	X		X	X
Kresoxim-methyl	X	X	X	X	X
Lenacil	X	X	X	X	X
Leptophos	X	X	X	X	X
Malathion	X	X	X	X	X
MCPA-thioethyl	X	X	X	X	X
Mecarbam	X	X	X	X	X
Mepanipyrim	X	X	X	X	X
Mephosfolan	X	X	X	X	X
Mepronil	X	X	X	X	X
Metazachlor	X	X	X	X	X
Methacrifos	X	X	X	X	X
Methidathion	X	X	X	X	X
Methoxychlor, p,p'-	X	X	X	X	X
Metolachlor	X	X	X	X	X
Metrafenone	X	X	X	X	X
Metribuzin	X	X	X	X	
Mevinphos (Phosdrin)	X	X	X	X	X
Mirex	X		X	X	
Molinate	X	X	X	X	X
Myclobutanil	X	X	X	X	X
Napropamide	X	X	X	X	X
Nitrofen	X	X	X	X	X
Nitrothal-isopropyl	X	X		X	X
Nuarimol	X	X	X	X	X
Ofurace	X	X	X	X	X
Orysastrobin	X	X	X	X	X
Oxadiazon	X	X	X	X	X

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
Oxadixyl	X	X	X	X	X
Oxyfluorfen	X	X	X	X	X
Paclobutrazol	X	X	X	X	X
Parathion	X	X		X	
Parathion-methyl	X	X		X	
Penconazole	X	X	X	X	X
Pendimethalin (Penoxaline)	X	X		X	X
Pentachloroaniline	X	X	X	X	X
Permethrin	X	X	X	X	X
Pethoxamid	X	X	X	X	
Phenothrin	X	X	X	X	X
Phenthoate	X	X	X	X	X
Phenylphenol, 2-	X	X	X	X	X
Phorate	X	X	X	X	X
Phosalone	X	X	X	X	X
Phosfolan	X	X	X	X	X
Phosmet	X	X	X	X	X
Picoxystrobin	X	X	X	X	X
Pirimicarb	X	X	X	X	X
Pirimiphos-ethyl	X	X	X	X	X
Pirimiphos-methyl	X	X	X	X	X
Pretilachlor	X	X	X	X	X
Prochloraz		X	X	X	X
Procymidone	X	X	X	X	X
Profenofos	X	X	X	X	X
Prometon	X	X	X	X	X
Prometryn	X	X	X	X	X
Pronamide (Propyzamide)	X	X	X	X	X
Propachlor	X	X	X	X	X
Propanil (DCPA)	X	X	X	X	X
Propargite	X	X	X	X	X
Propazine	X	X	X	X	X
Propham	X	X	X	X	X
Propiconazole I & II	X	X	X	X	X
Proquinazid	X	X	X	X	X
Prosulfocarb	X	X	X	X	X
Prothiofos	X	X	X	X	X
Pyraflufen-ethyl	X	X	X	X	X
Pyrazophos	X	X	X	X	X
Pyridaben	X	X	X	X	X
Pyridaphenthion	X	X	X	X	X
Pyrimethanil	X	X	X	X	X
Pyriproxyfen	X	X	X	X	X

Analyte	Soft Fruit	Vegetable	Allium	Citrus	High Oil
Quinalphos	X	X	X	X	X
Quinoxyfen	X	X	X	X	
Quintozene	X	X	X	X	X
Quizalofop-ethyl	X	X	X	X	X
Secbumeton	X	X	X	X	X
Silafluofen	X	X	X	X	X
Simazine	X	X	X	X	X
Simeconazole	X	X	X	X	X
Sulfallate	X	X	X	X	X
Sulfentrazone	X	X	X	X	X
Sulprofos	X	X	X	X	X
Tebuconazole	X	X	X	X	X
Tebufenpyrad	X	X	X	X	X
Tebupirimfos	X	X	X	X	X
Tecnazene (TCNB)	X	X	X	X	X
Tefluthrin, cis-	X	X	X	X	X
Terbacil	X	X	X	X	X
Terbufos	X	X	X	X	X
Terbumeton	X	X	X	X	X
Terbuthylazine	X	X	X	X	X
Terbutryn	X	X	X	X	X
Tetrachlorvinphos, E-isomer	X	X	X	X	X
Tetraconazole	X	X	X	X	X
Tetradifon	X	X	X	X	X
Tetramethrin	X	X	X	X	X
Tetrasul	X	X	X	X	
Thiobencarb (Benthiocarb)	X	X	X	X	X
Thiometon	X	X	X	X	X
Tolclofos-methyl	X	X	X	X	X
Triadimefon	X	X	X	X	X
Triadimenol	X	X	X	X	X
Triallate (Tri-allat)	X	X	X	X	X
Triazophos	X	X	X	X	X
Trichlorophenol, 2,4,6- (Prochloraz metabolite)	X	X	X	X	X
Trietazine	X	X	X	X	X
Trifloxystrobin	X	X	X	X	X
Trifluralin	X	X		X	X
Vinclozolin	X	X	X	X	X

END OF TABLE 4

Table 5

MRPS Suite by CSOPP611 GCMS/MS ctd

Accredited (X)

Full Testname	Dried Fruit	Nut	
2,4,6-Trichlorophenol	X	X	
2-Methyl-4,6-dinitrophenol	X		
2-Phenylphenol		X	
Acetochlor	X	X	
Aclonifen	X	X	
Acrinathrin	X	X	
Alachlor	X	X	
Aldrin	X	X	
Ametryn	X	X	
Atraton	X	X	
Atrazine	X	X	
Azaconazole	X	X	
Azobenzene	X	X	
Azoxystrobin	X	X	
Benalaxyl	X	X	
Benfluralin	X	X	
Bifenox	X	X	
Bifenthrin	X	X	
Bitertanol	X	X	
Boscalid	X	X	
Bromacil	X	X	
Bromophos	X	X	
Bromophos-Ethyl	X	X	
Bromopropylate	X	X	
Bromuconazole		X	
Bupirimate	X	X	
Buprofezine	X	X	
Butachlor	X	X	
Cadusafos	X	X	
Captan			
Carbaryl	X	X	
Carbophenothion	X	X	
Carboxine	X		

Full Testname	Dried Fruit	Nut	
Carfentrazone Ethyl	X	X	
Chlorbenzilate	X	X	
Chlordane (sum of cis and trans isomers)	X	X	
Chlordimeform		X	
Chlorfenapyr	X	X	
Chlorfenson	X		
Chlorfenvinphos	X	X	
Chlormephos	X	X	
Chloropropylate	X	X	
Chlorothalonil	X		
Chlorpropham	X	X	
Chlorpyrifos	X	X	
Chlorpyrifos methyl	X	X	
Chlorthal Dimethyl	X	X	
Chlorthiophos	X	X	
Clodinafop propargy	X	X	
Clomazone	X	X	
Cloquintocet mexyl	X	X	
Coumaphos	X	X	
Cyflufenamid	X	X	
Cyfluthrin	X	X	
Cypermethrin	X	X	
Cyproconazole	X	X	
Cyprodinil	X	X	
Deltamethrin	X	X	
Desmetryn	X	X	
Dialifos	X	X	
Diazinon	X	X	
Dichlobenil		X	
Dichlofenthion	X	X	
Dichlorvos	X	X	
Diclobutrazol	X	X	
Dicloran	X	X	
Dieldrin		X	
Difenoconazole	X	X	
Diflufenican	X	X	
Dimethenamid	X	X	
Dimethomorph	X	X	

Full Testname	Dried Fruit	Nut	
Dimoxystrobin	X	X	
Diphenamid	X	X	
Diphenylamine	X	X	
Disulfoton	X	X	
Edifenphos	X	X	
Endosulphan alpha	X	X	
Endosulphan beta	X	X	
Endosulphan sulphate	X	X	
Endrin		X	
Epn	X	X	
Epoxiconazole	X	X	
EPTC	X	X	
Etaconazole	X	X	
Ethion	X	X	
Ethofumesate	X	X	
Ethoprophos	X	X	
Etofenprox	X	X	
Etoxazole	X	X	
Etrimfos	X	X	
Famoxadone	X	X	
Famphur	X	X	
Fenamidone	X	X	
Fenamiphos	X	X	
Fenarimol	X	X	
Fenbuconazole	X	X	
Fenchlorphos	X	X	
Fenhexamid	X	X	
Fenitrothion	X	X	
Fenpropathrin	X	X	
Fenson	X	X	
Fensulfothion	X	X	
Fenthion	X	X	
Fenvalerate	X	X	
Fipronil	X	X	
Flamprop isopropyl	X	X	
Fluazifop-P-Butyl	X	X	
Flucythrinate	X	X	
Fludioxonil	X	X	

Full Testname	Dried Fruit	Nut	
Flufenacet	X	X	
Flumetralin	X	X	
Flumioxazin	X	X	
Flumorph	X	X	
Fluopyram	X	X	
Fluquinconazole	X	X	
Fluroxypyr-1-methylheptyl ester	X	X	
Flusilazole	X	X	
Flutolanil	X	X	
Fluxapyroxad	X	X	
Furalaxyl	X	X	
Haloxyfop etotyl	X	X	
Haloxyfop Methyl	X	X	
Heptachlor epoxide	X	X	
Heptachlor exo Epoxide		X	
Heptenophos	X	X	
Hexachlorobenzene	X	X	
Hexachlorocyclohexane (alpha)	X	X	
Hexachlorocyclohexane (beta)	X	X	
Hexachlorocyclohexane (delta)	X	X	
Hexaconazole	X	X	
Hexazinone	X	X	
Imazalil		X	
Iodofenphos	X	X	
Iprodione	X	X	
Isazofos	X	X	
Isocarbophos	X	X	
Isodrin		X	
Isofenphos	X	X	
Isofenphos Methyl	X	X	
Isomethiozin	X	X	
Isoprothiolane	X	X	
Isopyrazam	X	X	
Isothiazolinone		X	
Kresoxim Methyl	X	X	
Lambda Cyhalothrin	X	X	
Lenacil	X	X	
Leptophos	X	X	

Full Testname	Dried Fruit	Nut	
Lindane	X	X	
Malathion	X	X	
MCPA-thioethyl	X	X	
Mecarbam	X	X	
Mepanipyrim	X	X	
Mephosfolan	X	X	
Mepronil	X	X	
Metalaxyl	X		
Metazachlor	X	X	
Methacrifos	X	X	
Methidathion	X	X	
Methoxychlor	X	X	
Methyl Paraoxon	X	X	
Metolachlor	X	X	
Metrafenone	X	X	
Metribuzin		X	
Mevinphos	X	X	
Molinate		X	
Myclobutanil	X	X	
Napropamide	X	X	
Nitrofen	X	X	
Nitrothal isopropyl	X	X	
Nuarimol	X	X	
o,p'-DDT	X		
Ofurace	X	X	
Orysastrobin	X	X	
Oxadiazon	X	X	
Oxadixyl	X	X	
Oxyfluorfen	X	X	
p,p-DDD	X	X	
p,p-DDE	X	X	
p,p-DDT	X	X	
Paclobutrazol	X	X	
Paraoxon	X		
Parathion	X	X	
Parathion methyl	X	X	
Penconazole	X	X	
Pendimethalin	X	X	

Full Testname	Dried Fruit	Nut	
Pentachloroaniline	X	X	
Permethrin	X	X	
Pethoxamid	X	X	
Phenothrin	X	X	
Phenthoate	X	X	
Phorate	X	X	
Phosalone	X	X	
Phosfolan	X	X	
Phosmet	X	X	
Picoxystrobin	X	X	
Piperonyl Butoxide		X	
Pirimicarb	X	X	
Pirimiphos Ethyl	X	X	
Pirimiphos methyl	X	X	
Pretilachlor	X	X	
Prochloraz	X	X	
Procymidone	X	X	
Profenofos	X	X	
Prometon	X	X	
Prometryn	X	X	
Propachlor	X	X	
Propanil	X	X	
Propargite	X	X	
Propazine	X	X	
Propham	X	X	
Propiconazole	X	X	
Propyzamide	X	X	
Proquinazid	X	X	
Prosulfocarb	X	X	
Prothiofos	X	X	
Pyraflufen ethyl	X	X	
Pyrazophos	X	X	
Pyridaben	X	X	
Pyridaphenthion	X	X	
Pyrimethanil	X	X	
Pyriproxyfen	X	X	
Quinalphos	X	X	
Quinoxyfen	X	X	

Full Testname	Dried Fruit	Nut	
Quintozene	X	X	
Quizalofop-ethyl	X	X	
Secbumeton	X	X	
Silafluofen	X	X	
Simazine	X	X	
Simeconazole	X	X	
Sulfallate	X	X	
Sulfentrazone	X		
Sulprofos	X	X	
Tau-Fluvalinate	X	X	
Tebuconazole	X	X	
Tebufenpyrad		X	
Tebupirimiphos	X	X	
Tecnazene	X	X	
Tefluthrin	X	X	
Terbacil	X	X	
Terbufos	X		
Terbumeton	X	X	
Terbuthylazine	X	X	
Terbutryn	X	X	
Tetrachlorvinphos	X	X	
Tetraconazole	X	X	
Tetradifon	X	X	
tetraethyl dithiopyrophosphate	X	X	
Tetramethrin	X	X	
Thiobencarb	X	X	
Thiometon	X	X	
Tolclofos methyl	X	X	
Triadimefon	X	X	
Triadimenol	X	X	
Triallate	X	X	
Triazophos	X	X	
Trietazine		X	
Trifloxystrobin	X	X	
Trifluralin	X	X	
Vinclozolin	X	X	

End of Table 5

Table 6
MRPS Suite by CSOPP611 GCMS/MS ctd

Analyte	Cereal 611	Feed 611	Analyte	Cereal 611	Feed 611
1,4-Dimethylnaphthalene	x		Dichlorvos	x	
Acetochlor	x	x	Diclobutrazol	x	x
Aclonifen	x	x	Dicloran (Dichloran)	x	x
Acrinathrin	x		Dieldrin	x	x
Alachlor	x	x	Difenoconazol	x	x
Aldrin	x	x	Diflufenican	x	x
Ametryn	x	x	Dimethenamid	x	x
Anthraquinone	x	x	Dimethomorph	x	
Atraton	x	x	Dimoxystrobin	x	x
Atrazine	x	x	Dinoterb	x	
Azaconazole	x	x	Diphenamid	x	x
Azobenzene	x		Diphenylamine	x	
Azoxystrobin	x		Disulfoton	x	x
Benalaxyl	x	x	Edifenphos	x	x
Benfluralin	x		Endosulfan I (alpha isomer)	x	x
BHC-alpha (benzene hexachloride)	x	x	Endosulfan II (beta isomer)	x	x
BHC-beta	x	x	Endosulfan sulfate	x	x
BHC-delta	x	x	Endrin	x	x
BHC-gamma (Lindane, gamma HCH)	x	x	EPN	x	
Bifenox	x		Epoxiconazole	x	x
Bifenthrin	x	x	EPTC	x	x
Bitertanol	x		Etaconazole	x	x
Boscalid	x	x	Ethion	x	x
Bromacil	x		Ethofumesate	x	x
Bromophos	x	x	Ethoprophos (Ethoprop)	x	x
Bromophos-ethyl	x	x	Etofenprox (Ethofenprox)	x	
Bromopropylate	x	x	Etoxazole	x	x
Bromuconazole	x	x	Etrimfos	x	x
Bupirimate	x	x	Famoxadone	x	

Buprofezin (Z-isomer)	x	x	Famphur	x	x
Butachlor	x	x	Fenamidone	x	x
Cadusafos	x	x	Fenamiphos (Phenamiphos)	x	x
Carbaryl	x		Fenarimol	x	x
Carbophenothion	x		Fenbuconazole	x	x
Carboxin	x		Fenchlorphos	x	x
Carfentrazone-ethyl	x	x	Fenhexamid	x	x
Chlordane-cis & trans (alpha & gamma)	x	x	Fenitrothion	x	x
Chlordimeform	x	x	Fenpiclonil	x	x
Chlorethoxyfos	x		Fenpropathrin	x	x
Chlorfenapyr	x	x	Fenson	x	x
Chlorfenson	x	x	Fensulfothion	x	
Chlorfenvinphos	x	x	Fenthion	x	x
Chlormephos	x	x	Fenvalerate	x	
Chlorobenzilate	x	x	Fipronil	x	x
Chloropropylate	x	x	Fipronil sulfone	x	x
Chlorpropham	x	x	Flamprop-isopropyl	x	
Chlorpyrifos	x	x	Fluazifop-p-butyl	x	x
Chlorpyrifos Methyl	x	x	Flucythrinate	x	
Chlorthion		x	Fludioxonil	x	x
Chlorthiophos	x	x	Flufenacet	x	
Clomazone	x	x	Flumetralin	x	x
Cloquintocet-mexyl	x	x	Flumorph	x	
Coumaphos	x		Fluopyram	x	x
Cyflufenamid	x	x	Fluquinconazole	x	x
Cyfluthrin I-IV	x		Fluroxypyr-1-methylheptyl	x	x
Cyhalothrin (lambda & gamma)	x		Flusilazole	x	x
Cypermethrin I-IV	x		Flutolanil	x	x
Cyproconazole	x	x	Fluvalinate-tau	x	
Cyprodinil	x	x	Fluxopyroxad	x	x
DCPA (Dacthal, Chlorthal-dimethyl)	x	x	Fonofos	x	x
DDD-p,p'	x	x	Furalaxyl	x	x
DDE-p,p'	x	x	Haloxyfop-2-ethoxy-ethyl	x	x
DDT-p,p'	x	x	Haloxyfop-methyl	x	x
DEET (Diethyl-m-Toluamide, N,N-)	x	x	Heptachlor	x	
Desmetryn	x	x	Heptachlor exo-epoxide (isomer B)	x	x

Dialifos	x		Heptachlor-endo-epoxide (isomer A)	x	x
Diazinon	x	x	Heptenophos	x	x
Dichlofenthion	x	x	Hexachlorobenzene	x	x
Dichlorobenzonitrile, 2,6- (Dichlobenil)	x	x	Hexaconazole	x	x
Hexazinone	x	x	Prometryn	x	x
Imazalil	x	x	Pronamide (Propyzamide)	x	
Indoxacarb	x	x	Propachlor	x	x
Iodofenphos (Jodfenphos)	x	x	Propanil (DCPA)	x	x
Iprodione	x	x	Propargite	x	
Isazofos (Miral, Isazophos)	x	x	Propazine	x	x
Isocarbophos	x	x	Propetamphos	x	x
Isodrin	x	x	Propham	x	
Isofenphos	x	x	Propiconazole I & II	x	x
Isofenphos-methyl	x	x	Proquinazid	x	x
Isomethiozin	x	x	Prosulfocarb	x	x
Isoprothiolane	x	x	Prothiofos	x	x
Isopyrazam	x	x	Pyraflufen-ethyl	x	x
Isothiazoline (Octhilinone)	x	x	Pyrazophos	x	
Kresoxim-methyl	x	x	Pyridaben	x	x
Lenacil	x	x	Pyridaphenthion	x	x
Leptophos	x	x	Pyrimethanil	x	x
Malathion	x	x	Pyriproxyfen	x	x
MCPA-thioethyl	x	x	Quinalphos	x	
Mecarbam		x	Quinoxyfen	x	x
Mepanipyrim	x	x	Quintozene	x	x
Mephosfolan	x	x	Quizalofop-ethyl	x	x
Mepronil	x	x	S421 (Octachlorodipropyl ether)	x	x
Metalaxyl (Mefenoxam)	x	x	Secbumeton	x	x
Metazachlor	x	x	Silafluofen	x	x
Methacrifos	x	x	Simeconazole	x	x
Methidathion	x		Sulfallate	x	x
Methoxychlor, p,p'-	x	x	Sulfentrazone	x	x
Metolachlor	x	x	Sulfotep	x	x
Metrafenone	x	x	Sulprofos	x	x
Metribuzin	x	x	Tebuconazole	x	x
Mirex	x		Tebufenpyrad	x	x

Molinate	x	x	Tebupirimfos	x	x
Myclobutanil	x	x	Tecnazene (TCNB)	x	x
Napropamide	x		Tefluthrin, cis-	x	x
Nitrofen	x	x	Terbacil	x	x
Nitrothal-isopropyl	x	x	Terbufos	x	x
Nuarimol	x	x	Terbumeton	x	x
Ofurace	x	x	Terbuthylazine	x	x
Orysastrobin	x		Terbutryn	x	x
Oxadiazon	x	x	Tetrachlorvinphos, E-isomer	x	x
Oxadixyl	x	x	Tetraconazole	x	x
Oxyfluorfen	x	x	Tetradifon	x	x
Paclobutrazol	x	x	Tetramethrin	x	
Parathion	x	x	Tetrasul	x	
Parathion-methyl	x	x	Thiobencarb (Benthiocarb)	x	x
Penconazole	x	x	Thiometon	x	x
Pendimethalin (Penoxaline)		x	Tolclofos-methyl	x	x
Pentachloroaniline	x	x	Triadimefon	x	x
Pentanochlor (Solan, CMMP)	x	x	Triadimenol	x	x
Permethrin	x	x	Triallate (Tri-allat)	x	x
Pethoxamid	x	x	Triazamate	x	x
Phenothrin	x		Triazophos	x	
Phenthoate	x	x	Trichlorophenol, 2,4,6- (Prochloraz metabolite)	x	x
Phorate	x	x	Trietazine	x	x
Phosalone	x		Trifloxystrobin	x	
Phosfolan	x	x	Trifluralin	x	
Phosmet	x		Vinclozolin	x	x
Picoxystrobin	x	x			
Piperonyl butoxide	x				
Pirimicarb	x	x			
Pirimiphos-ethyl	x	x			
Pirimiphos-methyl	x	x			
Pretilachlor	x	x			
Prochloraz	x	x			
Procymidone	x	x			
Profenofos	x	x			
Prometon	x				

END OF TABLE 6