

Phase 1 Land Contamination Risk Assessment

for

**Demolition of an existing single
storey house and erection of part
single / part two storey 3**

bedroom single dwelling house

on the site of

62 Wolseley Road

London N8 8RP

Date: December 2015

Status:

Final Report

Reference:

01094 – Rich – Haringey

Date:

16/12/2015

EXECUTIVE SUMMARY

The site is currently an over grown plot with a derelict building in the north west.

The building onsite should be subject to an asbestos survey and removal prior to demolition.

Based on the information contained in this report, it is the opinion of Castledine & Co that the site represents a moderate to low risk with respect to the proposed development.

It is likely that the site can be made suitable for the proposed use and given the small size of the development it is recommended that remediation in line with section 11.0 is undertaken. The need for remediation may be removed if further investigation in line with section 10.0 is undertaken.

A watching brief should be had during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material) development should stop and Castledine & Co should be contact to determine if further assessment or changes to the remediation scheme are required.

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1.0 QUALITY ASSURANCE

Castledine & Co. confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine & Co. would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine & Co.

Kevin Castledine

(Proprietor)

2.0 LIMITATIONS

The conclusions and recommendations made in this report are limited to those based on the findings of the investigation. Where comments are made based on information obtained from third parties, Castledine & Co. assumes that all third party information is true and correct. No independent action has been undertaken to validate the findings of third parties. The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at the time.

This survey has not included asbestos within existing structures, invasive plant species or any elements unconnected with potential ground contamination at the site. If required, such surveys should be undertaken by suitably accredited organisations.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

3.0 INTRODUCTION

Castledine & Co. have been appointed by Stephen Rich to undertake a Phase 1 Desk study on 62 Wolseley Road London N8 8RP

4.0 SCOPE

Castledine & Co. have prepared this report for the sole use and reliance of Stephen Rich and his appointees for the purpose of ensuring compliance with:

- paragraphs 120 and 121 of the NPPF,
- part C1 of the building regulations.
- Condition 8 of London Borough of Haringey planning permission reference HGY/2013/0460

<http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=266996#>

8. Before development commences other than for investigative work:
 - a) A desktop study shall be carried out which shall include the identification of previous uses, potential contaminants that might be expected, given those uses, and other relevant information. Using this information, a diagrammatical representation (Conceptual Model) for the site of all potential contaminant sources, pathways and receptors shall be produced. The desktop study and Conceptual Model shall be submitted to the Local Planning Authority. If the desktop study and Conceptual Model indicate no risk of harm, development shall not commence until approved in writing by the Local Planning Authority.
 - b) If the desktop study and Conceptual Model indicate any risk of harm, a site investigation shall be designed for the site using information obtained from the desktop study and Conceptual Model. This shall be submitted to, and approved in writing by, the Local Planning Authority prior to that investigation being carried out on site. The investigation must be comprehensive enough to enable:- " a risk assessment to be undertaken, " refinement of the Conceptual Model, and " the development of a Method Statement detailing the remediation requirements. The risk assessment and refined Conceptual Model shall be submitted, along with the site investigation report, to the Local Planning Authority.
 - c) If the risk assessment and refined Conceptual Model indicate any risk of harm, a Method Statement detailing the remediation requirements, using the information obtained from the site investigation, and also detailing any post remedial monitoring shall be submitted to, and approved in writing by, the Local Planning Authority prior to that remediation being carried out on site. Where remediation of contamination on the site is required completion of the remediation detailed in the method statement shall be carried out and a report that provides verification that the required works have been carried out, shall be submitted to, and approved in writing by the Local Planning Authority before the development is occupied.
- Reason To ensure the development can be implemented and occupied with adequate regard for environmental and public safety.

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine & Co.

The report consists of a preliminary risk assessment in accordance with BS10175:2011+A1:2013 and CLR11 “Model Procedures for the Management of Land Contamination”.

The objectives of the report are:-

- To assess historical activities at the site with respect to their potential impact on the site environment.
- To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities.
- To assess historical and current surrounding land use in relation to known or potential off site contamination issues that may impact on the subject site and
- To develop a preliminary conceptual site model (CSM).

5.0 SITE DESCRIPTION

The site is situated in the London borough of Haringey at National Grid 529766,188607 and is approximately 0.03ha in area.

The site is currently an overgrown plot with a boarded up building in the north west corner. Site is strewn with rubbish consisting of chipboard, plastic, pile of tyres, plastic garden furniture, and pallets

Photos of the site are present in Appendix C

6.0 REGULATORY AUTHORITY AND OTHER ENVIRONMENTAL DATA

An environmental search listing historical and environmental factors likely to affect the property has been reviewed.

The most pertinent information is summarised in the following sections. A copy is presented in appendix A.

Additional geological and hydrological data was obtained from the British Geological Survey.

6.1 HYDROLOGICAL

6.1.1 AQUIFER

6.1.1.1 SUPERFICIAL GEOLOGY

No records available

6.1.1.2 BEDROCK GEOLOGY

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

6.1.2 ABSTRACTIONS AND PRIVATE WATER SUPPLIES

None within 250m

6.1.3 SOURCE PROTECTION ZONE

Not in a source protection source

6.1.4 GROUNDWATER VULNERABILITY AND SOIL LEACHING POTENTIAL

None Aquifer

6.1.5 POTENTIAL SURFACE WATER

None within 250m

6.1.6 DISCHARGE CONSENTS

None within 250m

6.2 PERMITTED PROCESSES

ID	Distance (m)	Direction	NGR	Description	
4	132	N	529782 188750	Address:	Shell Hornsey, 93-113 Park Road, Hornsey, London, N8 8JN
				Process:	Petrol Station
				Status:	Current Permit
				Permit	Type: Part B
				Enforcement:	No Enforcement Notified
				Date of Enforcement:	No Enforcement Notified
				Comment:	No Enforcement Notified

6.3 POLLUTION INCIDENTS

None within 250m

6.4 RADIOACTIVE SUBSTANCES REGISTRATIONS

None within 250m.

6.5 WASTE**6.5.1 LICENSED WASTE MANAGEMENT FACILITIES (LOCATIONS)**

None within 250m

6.5.2 REGISTERED LANDFILL SITES

None within 250m

6.5.3 REGISTERED WASTE TREATMENT OR DISPOSAL SITES

None within 250m

6.6 HAZARDOUS SUBSTANCES

None within 250m

6.7 ECOLOGICAL RECEPTORS

None within 250m

6.8 SOILS AND GEOLOGY

"Contains British Geological Survey materials © NERC 2015" obtained from <http://www.bgs.ac.uk/data/mapViewers/home.html> under the [Open Government Licence](#)

6.8.1 SUPERFICIAL DEPOSITS

None recorded onsite

6.8.2 BEDROCK

London Clay Formation - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 34 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

6.8.3 COAL MINING

Not in a coal mining area

6.8.4 NON-COAL MINING

No non-coal mining areas within 50m

6.8.5 RADON

The property is not in a Radon Affected Area, as less than 1% of properties are above the Action Level.. No radon protective measures are necessary as described in publication BR211:2015 by the Building Research Establishment

6.9 AERIAL PHOTOGRAPHY

Aerial photography shows the following

6.9.1 BING

Site is scrub land. Dirt to the south green vegetation to the north. Site is surrounded by residential properties.

It appears to be domestic garages to the south

6.9.2 GOOGLE MAPS

Site is scrub land. Dirt to the south green vegetation to the north.

Site is surrounded by residential properties.

A blue object is shown in the southern half of the site.

It appears to be domestic garages to the south

6.9.3 GOOGLE EARTH

20 images are held in the historic imagery dataset. Dates are in the format year / month / date

6.9.3.1 1945/??/??

Image is black and white and very low resolution. Exact date image was taken is unknown

No detail can be discerned regarding site.

Site is surrounded by housing

6.9.3.2 1999/09/09

Site is scrub land. Dirt to the south green vegetation to the north.

Site is surrounded by residential properties.

A car is parked in the southern half of site.

It appears to be domestic garages to the south

6.9.3.3 2002/07/28

Image is low resolution no detail regarding site can be discerned

6.9.3.4 2002/08/28

Image is low resolution no detail regarding site can be discerned

6.9.3.5 2002/??/??

Exact date image was taken is unknown

Site is scrub land. Dirt to the south green vegetation to the north.

Site is surrounded by residential properties.

A car is parked in the southern half of site

It appears to be domestic garages to the south

6.9.3.6 2005/07/14

Image is low resolution no detail regarding site can be discerned

6.9.3.7 2005/09/02

Image is low resolution

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.3.8 2006/09/10

Image is low resolution

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.3.9 2006/09/15

Image is low resolution

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.3.10 2006/??/??

Exact date image was taken is unknown

Image is grainy

A blue car is parked on the southern half of site

Site to the south appears to be garages

6.9.3.11 2007/08/26

Image is low resolution

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.3.12 2010/06/27

Exact date image was taken is unknown

Image is grainy

A white car is parked and an unidentified object are shown on the southern half of site

Site to the south appears to be garages

6.9.3.13 2011/02/14

Image is very low resolution. No detail of the site can be discerned

6.9.3.14 2011/03/19

Image is very dark and low resolution. No detail regarding site can be discerned

6.9.3.15 2011/07/01

Image is obscured by cloud

6.9.3.16 2011/08/03

Image is low resolution

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.3.17 2011/10/01

Image is very low resolution. No detail of the site can be discerned

6.9.3.18 2012/08/02

Image is obscured by cloud

6.9.3.19 2013/07/19

Site is scrub land. Dirt to the south green vegetation to the north.

Several objects are present near the southern boundary of the site.

Site is surrounded by residential properties.

A car is parked in the southern half of site

It appears to be domestic garages to the south with 2 cars parked there

6.9.3.20 2015/06/04

Image is low resolution

Site appears to be overgrown scrubland

Garages and a parked car on site to the south

Several objects (unidentified) are present near southern boundary

6.9.4 MAPBOX

Site appears to be dirt scrubland

Garages and a parked car on site to the south

6.9.5 ENVIRONMENTAL SEARCH

Image taken 2013/04/28

Site is a vacant plot several unidentified objects are shown near the southern boundary.

6.10 GOOGLE STREET VIEW

No useful image sets present.

6.11 HISTORIC MAPPING

The following historic maps have been reviewed as part of this assessment. Castledine and Co. do not hold a license for the reproduction and/or distribution of this data.

Map	Onsite	Offsite
OS Town Plan: London LONDON 1850 1:5280	Site is part of a larger field	Maynard Street is shown to the east
OS County Series MIDDLESEX 1863- 1894 1:2500	Site is part of a larger fields	Maynard street is now labelled as Park Road. it is lined with terraced housing A property to the south east is labelled boathouse
OS County Series MIDDLESEX 1876 1:10560	No discernable change	No discernable change
OS Town Plan: Hornsey, MIDDLESEX 1894 1:528	Site is part of open space	Houses are now present immediately to the east. Tree lined road is shown to the south A school is shown to the south east.
OS Town Plan: London, LONDON 1895 1:1056	No discernable change	No discernable change
OS County Series LONDON 1896 1:10560	No discernable change	No discernable change
OS County Series LONDON 1896 1:2500	No discernable change	No discernable change
OS County Series MIDDLESEX 1896 1:10560	No discernable change	No discernable change
OS County Series MIDDLESEX (partial) 1913-1914 1:2500	Site is part of area marked as Tennis Ground. Banking is present.	No discernable change
OS County Series LONDON 1920 1:10560	No discernable change	No discernable change
OS County Series MIDDLESEX (partial) 1935 1:2500	Site is part of a small site	Land marked as Tennis grounds in earlier maps is now housing Land between site and road now has a building shown on it.

Map	Onsite	Offsite
OS County Series ESSEX 1946 1:10560	Site is part of a larger open space to the west. A linear feature is shown adjacent to Wolseley Road	No discernable change
OS Plan 1951-1962 1:10560	No discernable change from OS County Series MIDDLESEX (partial) 1935 1:2500	No discernable change
OS Plan 1951-1955 1:1250	Several buildings are shown on site	Land to the south appears to be marked as 6 garages
OS Plan 1952-1955 1:2500	No discernable change	No discernable change
OS Plan 1958-1966 1:10560	Buildings are not shown onsite	No discernable change
OS Plan 1966-1972 1:1250	Several buildings are shown on site	No discernable change
OS Plan (partial) 1967-1968 1:10560	No discernable change	No discernable change
OS Plan (partial) 1970 1:2500	No discernable change	No discernable change
OS Plan 1975-1976 1:10000	No discernable change	No discernable change
OS Plan (partial) 1978-1980 1:1250	No discernable change	No discernable change
OS Plan 1990-1996 1:10000	Single building is shown onsite	No discernable change

6.12 CURRENT LAND USE DATA

ID	Distance (m)	Direction	Company	Activity	Category
1	70	E	Mastic Man	Construction Completion Services	Construction Services
2	94	NE	Practical Car & Van Rental	Vehicle Hire and Rental	Hire Services
3	94	NE	Palace Motors Ltd	Vehicle Repair, Testing and Servicing	Repair and Servicing
4a	135	N	Shell Hornsey Park Road	Petrol and Fuel Stations	Road and Rail
5a	135	N	Shell Hornsey Park Road	Petrol and Fuel Stations	Road and Rail

ID	Distance (m)	Direction	Company	Activity	Category
6	137	E	Rocco Borghese Chandeliers	Lampshades and Lighting	Consumer Products
7	153	NE	Jordan Andrews Ltd	Construction Completion Services	Construction Services
8	175	NE	Rare Basic	Office and Shop Equipment	Industrial Products
9	183	W	Wilmann Structural & Building Design Ltd	Structural Engineers	Engineering Services
10	189	NE	Works	Unspecified Works Or Factories	Industrial Features
11	204	E	Solomon Upholstery Retro	Furniture	Consumer Products
12	214	E	Audio Engineering Ltd	Recording Studios and Record Companies	IT, Advertising, Marketing and Media Services
13	225	E	Jealous	Plate Makers, Print Finishers and Type Setters	IT, Advertising, Marketing and Media Services
14	233	NW	Chimney	Chimneys	Industrial Features
15	242	E	Electricity Sub Station	Electrical Features	Infrastructure and Facilities

6.13 PETROL AND FUEL SITES

ID	Distance [m]	Direction	Address	Status
16	115	N	Shell Hornsey Park Road, 93-113, Park Road, Park Road, Crouch End, London, Greater London, N8 8JN	Open

6.14 HISTORICAL PETROL AND FUEL SITE DATABASE

None within 250m

6.15 POTENTIAL CONTAMINATIVE LAND USES IDENTIFIED ON MAPPING

ID	Distance [m]	Direction	Use	Date
1A	214	SE	Boat House	1869
2A	214	SE	Boat House	1879
3	244	NW	Hospital	1920

6.16 HISTORICAL TANK DATABASE

None within 250m

6.17 HISTORICAL ENERGY FACILITIES

ID	Distance(m)	Direction	Use	Date
15E	237	E	Electricity Substation	1979
16E	237	E	Electricity Substation	1972

6.18 HISTORICAL GARAGE AND MOTOR VEHICLE REPAIR DATABASE

ID	Distance(m)	Direction	Use	Date
52N	94	N	Garage	1977
53N	94	N	Garages	1950
54N	94	N	Garage	1966
55N	95	N	Garage	1969
56N	96	N	Garage	1992
57N	96	N	Garage	1993
58N	97	N	Garage	1991

6.19 POTENTIALLY INFILLED LAND

ID	Distance(m)	Direction	Use	Date
59O	163	NW	Pond	1965
60O	163	NW	Pond	1974
61O	163	NW	Pond	1996
62O	163	NW	Pond	1958
63P	173	SE	Water Body	1869
64P	173	SE	Water Body	1879
65Q	213	SE	Pond	1869
66Q	213	SE	Pond	1879

6.20 PLANNING HISTORY

This information is taken from the London Borough of Haringey planning website

<http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet> . . As no mapping search was available on the website a simple address search of the surrounding address was conducted..

Reference	Address	Proposal	Hyperlink
HGY/2011/1386	62 Wolseley Road London N8 8RP London	Conservation Area Consent for demolition of an existing single storey house and erection of part single part two storey 3 bedroom single dwelling house.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=245256
HGY/2011/1385	62 Wolseley Road London N8 8RP	Demolition of an existing single storey house and erection of part single part two storey 3 bedroom single dwelling house (AMENDED PLANS)	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=244705
HGY/2006/0433	52 Wolseley Road London N8 8RP London	Tree works to include works to 1 x Horse Chestnut.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=134319
HGY/2004/2448	54 Wolseley Road London N8 8RP London	Creation of a vehicular crossover to a classified road	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=40983
HGY/2004/1993	54 Wolseley Road London N8 London	Creation of vehicular crossover to a classified road.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=39767
HGY/2002/1556	54 Wolseley Road London N8 8RP London	Construction of vehicular crossover to allow vehicular parking on front garden.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=30019
HGY/1998/1450	54 Wolseley Road London N8 8RP London	Erection of ground floor rear conservatory. (Amended proposal).	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=14985

Reference	Address	Proposal	Hyperlink
HGY/1998/0706	54 Wolseley Road London N8 8RP London	Erection of ground floor rear conservatory.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=14342
HGY/1997/0715	54 Wolseley Road London N8 8RP London	Formation of loft conversion involving erection of rear dormer window and installation of velux window to front elevation.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=12446
HGY/1997/0216	64 Wolseley Road London N8 London	Details pursuant to Condition 5 (materials) attached to planning permission HGY/42089 for the erection of a single storey dwelling house.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=11977
HGY/1996/1450	54 Wolseley Road London N8 8RP London	Formation of roof extension involving the erection of rear and flank dormer windows and installation of two velux windows to front elevation.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=11598
HGY/1996/1146	64 Wolseley Road London N8 London	Removal of epicormic shoots to 16 foot, crown thinning by 20% and removal of deadwood to 3 Horse Chestnuts and 3 Limes.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=11306
HGY/1996/0499	62 Wolseley Road London N8 8RP London	Details pursuant to Conditions 2 & 3, regarding foundations and excavation for services, attached to planning application HGY/42089 for erection of one dwelling.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=10675
HGY/1993/0089	Land R/O 60 Wolseley Road London N8 London	Conservation Area Consent for change of use to single storey one bedroomed dwelling including minor external alterations and provision of two car parking spaces with associated landscaping.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=5838
HGY/1993/0077	Land R/O 60 Wolseley Road London N8 London	Change of use to single storey one bedroomed dwelling including minor external alterations and provision of two car parking spaces with associated landscaping.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=5827
OLD/9999/6137	62 Wolseley Road N8	1/5/96 Details pursuant to Condition 2, regarding foundations and excavation for services, attached to planning application HGY/42089 for erection of one dwelling.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118700

Reference	Address	Proposal	Hyperlink
OLD/1977/1444	Land Adj. 60 Wolseley Road N8	17/5/77 Use as service and repair work shops for scientific instruments with an office.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118697
OLD/1976/1511	Land Adj. 60 Wolseley Road N8	22/9/76 Change of use from meeting room to builders office & yard.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118696
OLD/1975/1477	Land Adj. 60 Wolseley Road N8	Change of use from meeting room to doctors or dentist surgery or clinic.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118695
OLD/1969/0949	Land Adj. 60 Wolseley Road N8	Demolition of existing shed and erection of small meeting room. (Details)	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118694
OLD/1969/0948	Land Adj. 60 Wolseley Road N8	Demolition of existing sheds and erection of small meeting room.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118693
OLD/1969/0947	Land Adj. 60 Wolseley Road N8	Erection of christian meeting hall with car parking area.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118692
OLD/1968/1007	Land Adj. 60 Wolseley Road N8	Erection of christian meeting hall with car parking area.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118691
OLD/1949/0776	58 Wolseley Road N8	Erection of a conservatory.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118690
OLD/1973/1967	56 Wolseley Road N8	Erection of single storey rear extension & conversion into two self-contained flats.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118689
OLD/1976/1510	50 Wolseley Road N8	19/7/76 Erection of a front porch and a single storey rear extension.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=118681

Reference	Address	Proposal	Hyperlink
HGY/2015/2044	14 Tivoli Road London N8 8RE	Erection of rear ground floor extension	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=283198
HGY/2015/0607	12 Tivoli Road London N8 8RE	Erection of rear ground floor extension	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=279797
HGY/2012/1207	2 Tivoli Road London N8 8RE	Alteration of roof from hip to gable and formation of rear dormer (Householder Application)	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=260192
HGY/2012/0019	20 Tivoli Road London N8 8RE	Erection of rear dormer window with insertion of 2 x rooflights to front and 1 x rooflight to rear	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=252709
HGY/2011/1520	6 Tivoli Road London N8 8RE	Erection single storey rear extension	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=246425
HGY/2011/1521	4 Tivoli Road London N8 8RE	Erection of single storey rear extension	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=246385
HGY/2011/1417	4 Tivoli Road London N8 8RE	Erection of roof extension	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=245185
HGY/2003/2081	6 Tivoli Road London N8 8RE London	Installation of rear dormer window.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=34799
HGY/2002/0908	14 Tivoli Road London N8 8RE London	Installation of rear roof dormer to provide additional bedroom.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=28761
HGY/2001/1166	12 Tivoli Road London N8 8RE London	The erection of dormer window and velux window to the rear to facilitate a loft conversion.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=25575

Reference	Address	Proposal	Hyperlink
HGY/2000/1604	18 Tivoli Road London N8 8RE London	Erection of a rear dormer window.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=22885
HGY/2000/0696	18 Tivoli Road London N8 8RE London	Erection of rear dormer window.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=16769
OLD/1958/0611	2 Tivoli Road N8	A garage.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=108912
HGY/2014/3318	2 Glasslyn Road London N8 8RH	Replacement of existing conservatory with new orangery-style extension and new window to rear elevation	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=277901
HGY/2010/2135	8 Glasslyn Road London N8 8RH London	Formation of rear dormer and installation of two velux rooflights to front roofslope/rear roofslope to create a loft conversion.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=227562
HGY/2009/1486	6A Glasslyn Road London N8 8RH London	Erection of single storey rear / side extension (revised scheme).	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=203982
HGY/2009/1485	4 Glasslyn Road London N8 8RH London	Erection of single storey rear / side extension (revised scheme).	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=203980
HGY/2009/0344	4 Glasslyn Road London N8 8RH London	Erection of single storey rear side extension.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=195819
HGY/2009/0278	6A Glasslyn Road London N8 8RH London	Erection of single storey rear side extension.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=195882
HGY/2006/1288	8 Glasslyn Road London N8 8RH London	Erection of rear dormer window	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=139866

Reference	Address	Proposal	Hyperlink
HGY/2004/1065	6 Glasslyn Road London N8 8RH	Erection of a single storey rear conservatory extension and alterations to rear elevation.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=37308
HGY/1999/1092	4 Glasslyn Road London N8 8RH London	Erection of dormer window to rear roof slope.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=20769
HGY/1999/0002	10 Glasslyn Road London N8 8RH London	Erection of ground floor rear extension.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=18589
HGY/1998/0167	10 Glasslyn Road London N8 8RH London	Erection of 2 velux windows to front elevation and 3 velux windows to rear elevation to facilitate loft conversion.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=13695
HGY/1996/0158	2 Glasslyn Road London N8 8RH London	Erection of ground floor side conservatory extension.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=10343
OLD/1989/0465	2 Glasslyn Road London N8 8RH London	3/5/89 Erection of rear dormer window with velux rooflights in the front and side elevation to facilitate loft conversion.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=58534
OLD/1982/0428	10 Glasslyn Road N8	17/5/82 Conversion into two self-contained flats.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=58541
OLD/1961/0240	6 Glasslyn Road N8	Conversion into two flats.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=58538
OLD/1976/0327	2 Glasslyn Road N8	8/11/76 Erection of a garage.	http://www.planningservices.haringey.gov.uk/portal/servlets/ApplicationSearchServlet?PKID=58533

7.0 POLLUTANT LINKAGE ASSESSMENT

The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

The following sections discuss all the identified potential on and off site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors from the data gained from the desk study. At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

Three impact potentials exist for any given site, these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

7.1 SOURCES

The following potential sources of contamination have been identified.

7.1.1 ONSITE

- Garages
- Unknown storage
- residential use of the site
- possible builders office/yard
- made ground

7.1.2 OFFSITE

- Made ground
- Electrical Substations
- Garage

7.2 PATHWAYS

A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development are identified as follows:

- Ingestion;
- Skin contact;
- Inhalation;
- Plant uptake,
- Direct contact by buried structures;
- Leaching of soluble contamination into groundwater

7.3 RECEPTORS

Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

- Human Health
 - Current users of the site;
 - Future users of the site;
 - Users of neighbouring sites;
 - Construction workers; and
 - Services personnel working in trenches.
- Construction Materials
- Buried concrete, which may be affected by high concentrations of sulphate and/or low pH, in the soils and groundwater underlying the site; and
- Buried water pipes.
- Controlled Waters
- Ecological Receptors
- Flora and fauna using the proposed development

8.0 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) is a hypothesis of the nature and sources of contamination, potential receptors that may be the recipient of contamination arising from those sources and any pathways that may exist. It creates a plausible source-pathway-receptor pollutant linkage (hazard), set within the context of the ground and proposed end use of the site.

8.1 PRELIMINARY CONCEPTUAL SITE MODEL

Site is currently an overgrown plot with a boarded up building in the north west corner. Site is strewn with rubbish consisting of chipboard, plastic, pile of tyres, plastic garden furniture, and pallets

The presence of historic buildings on site, historic banking shown on historic maps presents the possibility of made ground on site. Any made ground may not be suitable for retention on human health grounds.

The use of the as garages/storage may have led to contamination of the site.

No sources of substantial ground gas were identified in the vicinity. Any small amounts of made ground in the vicinity are unlikely to produce substantial volumes of ground gas and in line with CL:AIRE RB17 A Pragmatic Approach to Ground Gas Risk Assessment. The protection already offered by a modern building regulations compliant building is sufficient to mitigate the minimal risk.

TABLE 1. SUMMARY OF SIGNIFICANT POLLUTION LINKAGES

Contaminant	Pathway	Receptor	Comments	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Contaminated Soils	Direct Ingestion & Direct Contact	Site Workers		Lw	Md	M/L	Site workers to wear appropriate PPE for health and safety reasons
Contaminated Soils	Inhalation of Dust	Site Workers		Lw	Md	M/L	
Contaminated Soils	Direct Ingestion & Direct Contact	End Users		Lw	Md	M/L	
Contaminated Soils	Inhalation of Dust	End Users		Lw	Md	M/L	
Contaminated Soils	Direct Ingestion	Flora and Fauna		Lw	Md	M/L	
Contaminated Soils	Vertical and lateral migration	Controlled Waters		Lw	Md	M/L	
Contaminated Soils	Direct contact	Services		Lw	Md	M/L	

Contaminant	Pathway	Receptor	Comments	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Ground Gases (Methane and CO ₂)	Vertical and lateral migration	End Users & Building Envelope		UI	Md	L	
Volatile and Semi-volatile Organic Compounds	Vertical and lateral migration	End Users & Building Envelope		Lw	Md	M/L	
Radon	Vertical and lateral migration	End Users & Building Envelope		UI	Md	L	

KEY:

Probability of pollutant linkage Hi = Highly likely, Li = Likely, Lw = Low Likelihood, UI = Unlikely

Consequence Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor,

Overall Risk VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

Based on the preliminary CSM for the site, an environmental risk assessment has been undertaken. A simple matrix can provide a consistent basis for decision making. It should be used with caution, recognising the over-simplification that it will normally represent. The probability and consequences are defined according to parameters relevant to the situation; the boundaries of risk acceptability (and tolerability, where relevant) indicated on the matrix provided in Table 2, can be tailored to the factors influencing the significance of the risk. Individual situations are mapped onto the matrix to provide a ready and consistent indication of their acceptability or tolerability.

TABLE 2. RISK CLASSIFICATION MATRIX

		Consequence			
		Severe (Sv)	Medium (Md)	Mild (Mi)	Minor (Mr)
Probability	High (Hi)	Very high risk	High risk	Moderate Risk	Moderate/ Low Risk
	Likely (Li)	High risk	Moderate Risk	Moderate/Lo w Risk	Low Risk
	Low Likelihood (Lw)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely (UI)	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

These attributes are evaluated qualitatively against individual hazard assessments to determine the likelihood of a given hazard occurring. The risk evaluations for each plausible pollutant linkage are given in the last three columns of Table 1. Based on the previous activities that have taken place adjacent to the site, the pollution linkage assessment combined with the historical and topographical knowledge of the site has indicated that these activities represent a low risk to human health set in the context of the proposed development.

TABLE 3. CLASSIFICATION OF RISK

Very high risk (Vh)	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (Hi)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate risk (Md)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk (Lw)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk (VI)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

9.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Based on the information contained in this report, it is the opinion of Castledine & Co that the site represents a Moderate to Low risk with respect to the proposed development.

The Building on site should be subject to an asbestos survey and removal by appropriately qualified personal prior to demolition.

It is likely that the site can be made suitable for the proposed use and given the small size of the development **it is recommended that remediation in line with section 11.0** is undertaken. The need for remediation **may be** removed if further investigation in line with section 10.0 is undertaken.

This should be Discussed with the Local Planning Authority / Local council Contaminated Land Officer

10.0 FURTHER ENVIRONMENTAL INVESTIGATION

It is not envisaged that further testing is required however if further testing is chosen then the following is recommended.

At least 4 samples from near surface samples in proposed soft landscaping areas to be tested for the following

- metal and metalloids (Arsenic, Cadmium, Chromium (Total), Hex Chromium, Lead, Mercury, Nickel, Copper, Zinc)
- Speciated PAH's (Speciated USEPA 16)
- pH
- asbestos screen
- if visual and olfactory evidence suggest the presence of hydrocarbons testing for Speciated Hydrocarbons (TPHCWG)

This should be Discussed with the Local Planning Authority / Local council Contaminated Land Officer

11.0 REMEDIAL ACTIONS AND VERIFICATION

The following remediation of soft landscaping is recommended

1. The Building on site should be subject to an asbestos survey and removal by appropriately qualified personal prior to demolition.
2. Capping of soft-landscaping areas with a minimum of 600mm of clean material. Prior to the placement of material it should be tested in line with Guidance And Good Practice Verification Of Cover Systems – Testing Criteria For Subsoil And Topsoil, page 10, NHBC Technical Extra Note Issue 8 Nov 2012.

(<http://www.nhbc.co.uk/NHBCPublications/LiteratureLibrary/Technical/TechnicalExtra/filedownload.48980,en.pdf>). The chemical testing criteria are presented in Appendix D.

The suitability of the soil should be confirmed with the **Local Planning Authority** prior to its importation.

All transfer notes and/or receipts for the soil should be retained.

The thickness of the soil placed will require evidence either via photographs during its placement or by digging of post placement verification trial holes

3. A watching brief should be had during the course of demolition, site clearance and construction works for any obvious contamination (e.g. oil spillage in ground, buried waste, possible asbestos containing material) development should stop and Castledine & Co should be contact to determine if further assessment or changes to the remediation scheme are required.

12.0 REFERENCES**12.1 LEGISLATION AND REGULATIONS****12.1.1 ACTS**

- [1] Environmental Protection Act 1990, Part IIA: inserted by Environment Act 1995, Section 57. See Environment Act 1995 for text of Part IIA.

12.1.2 PLANNING REGULATIONS

- [2] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI1999/No.293
- [3] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 SI2000/No.2867

12.1.3 CONTAMINATED LAND REGULATIONS

- [4] The Contaminated Land (England) Regulations 2000. SI2000/No.227
- [5] The Contaminated Land (England) (Amendment) Regulations 2001 SI2001/No.663
- [6] The Contaminated Land (England) Regulations 2006 SI2006/No.1380

12.2 STATUTORY GUIDANCE

- [7] Department of Environment, Food and Rural Affairs. 2012. *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance*. Department of Environment, Food and Rural Affairs
- [8] Communities and local Government, 2012: National Planning Policy Framework.

12.3 BRITISH STANDARDS

- [9] BS 5930:1999 Code of practice for site investigations
- [10] BS 10175:2011+A1:2013 Investigation of potentially contaminated sites - Code of practice
- [11] BS 8485:2015 bs 8485 - 2015 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings
- [12] BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

12.4 NON STATUTORY TECHNICAL GUIDANCE**12.4.1 ENVIRONMENT AGENCY**

- [13] Cassella Stranger, 2002. Model Procedures for the Management of Contaminated Land, Contaminated Land Report (CLR) 11, Department for Environment, Food, and Rural Affairs.

12.4.2 CIRIA PUBLICATIONS

- [14] Wilson, S., Oliver, S., Mallett, H., Hutchings, H., and Card, G.. 2007, *C 665 Assessing risks posed by hazardous ground gases to buildings* London: Construction Industry Research and Information Association
- [15] Mallett, H., Cox, L., Wilson, S. and ,Corban M... 2014, *C 735 Good practice on the testing and verification of protection systems for buildings against hazardous ground gases* London: Construction Industry Research and Information Association

12.4.3 CL:AIRE

- [16] Card G, Wilson S, Mortimer S. 2012. *A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17.* CL:AIRE, London, UK. ISSN 2047- 6450 (Online)

13.0 APPENDICES

APPENDIX A

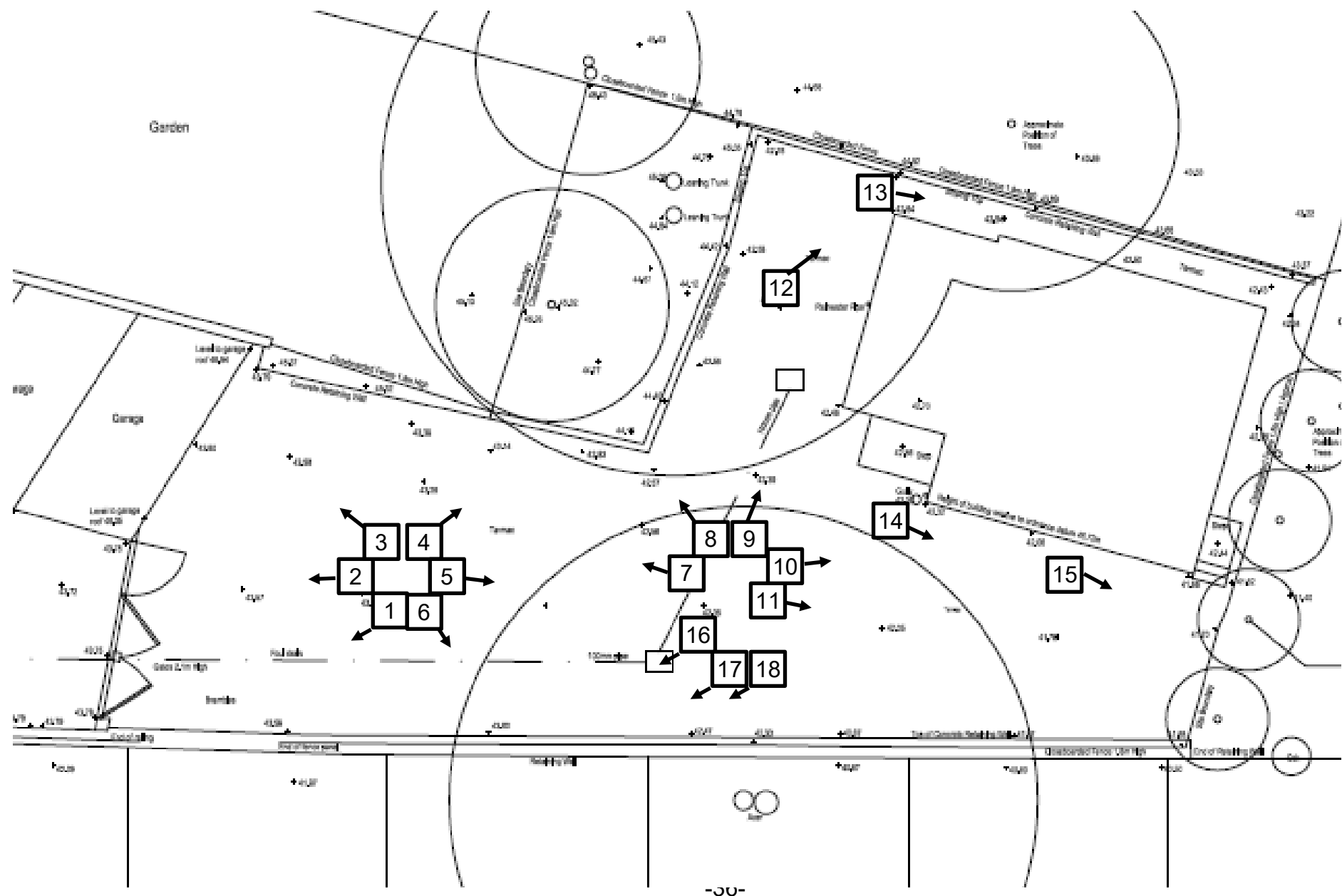
ENVIRONMENTAL SEARCH

APPENDIX B

PROPOSED AND CURRENT SITE PLANS

APPENDIX C

SITE PHOTOS AND LOCATIONS



1.



2.



3.



4.



5.



6.



7.



8.



9.



10.



11.



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16.



17.



18.



APPENDIX D SOIL SCREENING CRITERIA

Contaminant	Source of GAC	Human Health Generic Assessment Criteria (mg/kg)																	
		residential without plant uptake (1%SOM)	residential without plant uptake (2.5%SOM)	residential without plant uptake (6%SOM)	residential with plant uptake (1%SOM)	residential with plant uptake (2.5%SOM)	residential with plant uptake (6%SOM)	allotments (1%SOM)	allotments (2.5%SOM)	allotments (6%SOM)	commercial (1%SOM)	commercial (2.5%SOM)	commercial (6%SOM)	POSresi (1%SOM)	POSresi (2.5%SOM)	POSresi (6%SOM)	POSpark (1%SOM)	POSpark (2.5%SOM)	POSpark (6%SOM)
Default Suite																			
Arsenic	SGV report + CLEA 1.06	35	35	35	32	32	32	43	43	43	640	640	640	79	79	79	170	170	170
Beryllium	LQM/CIEH + CLEA 1.06	51	51	51	51	51	51	55	55	55	420	420	420	93	93	93	670	670	670
Boron	LQM/CIEH + CLEA 1.06	1000	1000	1000	290	290	290	45	45	45	190000	190000	190000	21000	21000	21000	46000	46000	46000
Cadmium	SGV report + CLEA 1.06	85	85	85	11	11	11	1.9	1.9	2	230	230	230	120	120	120	560	560	560
Chromium (III)	LQM/CIEH + CLEA 1.06	630	630	630	630	630	630	15000	15000	15000	8800	8800	8800	1500	1500	1500	27000	27000	27000
Chromium (VI)	LQM/CIEH + CLEA 1.06	4.3	4.3	4.3	4.3	4.3	4.3	2.2	2.2	2.2	35	35	35	7.7	7.7	7.7	220	220	220
Copper	LQM/CIEH + CLEA 1.06	6200	6200	6200	2300	2300	2300	520	520	520	72000	72000	72000	12000	12000	12000	44000	44000	44000
Lead	C4SL	310	310	310	200	200	200	80	80	80	2330	2330	2330	630	630	630	1300	1300	1300
Mercury, inorganic	SGV report + CLEA 1.06	240	240	240	170	170	170	80	80	80	3600	3600	3600	470	470	470	1100	1100	1100
Nickel	SGV report + CLEA 1.06	130	130	130	130	130	130	230	230	230	1800	1800	1800	290	290	290	3500	3500	3500
Selenium	SGV report + CLEA 1.06	600	600	600	350	350	350	120	120	120	13000	13000	13000	1400	1400	1400	2600	2600	2600
Vanadium	LQM/CIEH + CLEA 1.06	190	190	190	74	74	74	18	18	18	3200	3200	3200	440	440	440	970	970	970
Zinc	LQM/CIEH + CLEA 1.06	40000	40000	40000	3700	3700	3700	620	620	620	670000	670000	670000	81000	81000	81000	170000	170000	170000
Cyanide (free)	Hydrock + CLEA 1.06	760	760	760	750	750	750	2300	2300	2300	16000	16000	16000	1600	1600	1600	3400	3400	3400
Phenol	SGV report + CLEA 1.06	310	420	520	180	290	420	66	140	280	3200	3200	3200	3200	3200	3200	3200	3200	3200
Acenaphthene	LQM/CIEH + CLEA 1.06	2000	3100	3900	210	480	1000	34	85	200	85000	98000	100000	15000	15000	15000	29000	30000	30000

Contaminant	Source of GAC	Human Health Generic Assessment Criteria (mg/kg)																	
		residential without plant uptake (1%SOM)	residential without plant uptake (2.5%SOM)	residential without plant uptake (6%SOM)	residential with plant uptake (1%SOM)	residential with plant uptake (2.5%SOM)	residential with plant uptake (6%SOM)	allotments (1%SOM)	allotments (2.5%SOM)	allotments (6%SOM)	commercial (1%SOM)	commercial (2.5%SOM)	commercial (6%SOM)	POSresi (1%SOM)	POSresi (2.5%SOM)	POSresi (6%SOM)	POSpark (1%SOM)	POSpark (2.5%SOM)	POSpark (6%SOM)
Acenaphthylene	LQM/CIEH + CLEA 1.06	2000	3000	3900	170	400	850	28	69	160	84000	97000	100000	15000	15000	15000	29000	30000	30000
Anthracene	LQM/CIEH + CLEA 1.06	20000	22000	23000	2300	4900	9200	380	950	2200	520000	540000	540000	74000	74000	74000	150000	150000	150000
Benz(a)anthracene	LQM/CIEH + CLEA 1.06	3.7	5.2	6.2	3.1	4.7	5.9	2.5	5.5	10	89	95	97	17	18	18	26	33	40
Benzo(a)pyrene	LQM/CIEH + CLEA 1.06	1	1	1	0.83	0.94	1	0.6	1.2	2.1	14	14	14	2.6	2.6	2.6	4.5	5.6	6.5
Benzo(b)fluoranthene	LQM/CIEH + CLEA 1.06	7	7.3	7.4	5.6	6.5	7	3.5	7.4	13	100	100	100	18	18	18	30	38	45
Benzo(ghi)perylene	LQM/CIEH + CLEA 1.06	47	47	47	44	46	47	70	120	160	650	660	660	120	120	120	270	310	350
Benzo(k)fluoranthene	LQM/CIEH + CLEA 1.06	10	10	10	8.5	9.6	10	6.8	14	23	140	140	140	26	26	26	46	57	67
Chrysene	LQM/CIEH + CLEA 1.06	8.8	9.7	10	6	8	9.3	2.6	5.8	12	140	140	140	25	26	26	34	45	55
Dibenz(ah)anthracene	LQM/CIEH + CLEA 1.06	0.86	0.91	0.93	0.76	0.86	0.9	0.76	1.5	2.3	13	13	13	2.3	2.3	2.3	4.5	5.5	6.3
Fluoranthene	LQM/CIEH + CLEA 1.06	970	990	1000	260	460	670	52	130	290	23000	23000	23000	3100	3100	3100	6300	6300	6400
Fluorene	LQM/CIEH + CLEA 1.06	1900	2500	2900	160	380	780	27	67	160	64000	69000	71000	9900	9900	9900	20000	20000	20000
Indeno(123cd)pyrene	LQM/CIEH + CLEA 1.06	4.2	4.4	4.4	3.2	3.9	4.2	1.8	3.8	7.1	60	61	62	11	11	11	17	22	26
Naphthalene	LQM/CIEH + CLEA 1.06	1.6	3.9	9.3	1.5	3.7	8.7	4.1	9.9	23	200	480	1100	3900	4100	4200	1100	1600	2300
Phenanthrene	LQM/CIEH + CLEA 1.06	840	930	970	92	200	380	16	38	90	22000	22000	23000	3100	3100	3100	6200	6300	6300
Pyrene	LQM/CIEH + CLEA 1.06	2300	2400	2400	560	1000	1600	110	270	620	54000	54000	55000	7400	7400	7400	15000	15000	15000
TPH fractions																			
TPH ali EC05-EC06	LQM/CIEH + CLEA 1.06	30	55	110	30	55	110	740	1700	3900	300	560	1200	300	560	600000	300	560	1200
TPH ali >EC06-EC08	LQM/CIEH + CLEA 1.06	73	160	370	73	160	370	2300	5600	13000	140	320	740	600000	610000	620000	140	320	740

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TPH ali >EC08-EC10	LQM/CIEH + CLEA 1.06	19	46	110	19	46	110	320	770	1700	78	190	450	13000	13000	13000	77	190	450
TPH ali >EC10-EC12	LQM/CIEH + CLEA 1.06	48	120	280	48	120	280	2200	4400	7300	48	120	280	13000	13000	13000	48	120	280
TPH ali >EC12-EC16	LQM/CIEH + CLEA 1.06	24	59	140	24	59	140	11000	13000	13000	24	59	140	13000	13000	13000	24	59	140
TPH ali >EC16-EC35	LQM/CIEH + CLEA 1.06	45000	64000	77000	45000	64000	76000	260000	270000	270000	1000000	1000000	1000000	250000	250000	250000	460000	480000	490000
TPH ali >EC35-EC44	LQM/CIEH + CLEA 1.06	45000	64000	77000	45000	64000	76000	260000	270000	270000	1000000	1000000	1000000	250000	250000	250000	460000	480000	490000
TPH aro EC05-EC07	LQM/CIEH + CLEA 1.06	260	480	980	65	130	280	13	27	57	1200	2300	4700	56000	56000	56000	1200	2300	4700
TPH aro >EC07-EC08	LQM/CIEH + CLEA 1.06	610	1300	2700	120	270	610	22	51	120	870	1900	4400	56000	56000	56000	870	1900	4400
TPH aro >EC08-EC10	LQM/CIEH + CLEA 1.06	33	81	190	27	65	150	8.6	21	51	610	1500	3600	5000	5000	5000	610	1500	3600
TPH aro >EC10-EC12	LQM/CIEH + CLEA 1.06	180	420	870	69	160	350	13	31	74	360	900	2200	5000	5000	5000	360	900	10000
TPH aro >EC12-EC16	LQM/CIEH + CLEA 1.06	1250	1600	1700	140	310	590	23	57	130	36000	37000	38000	5000	5000	5000	10000	10000	10000
TPH aro >EC16-EC21	LQM/CIEH + CLEA 1.06	1300	1300	1300	250	480	770	46	110	260	28000	28000	28000	3800	3800	3800	7600	7700	7800
TPH aro >EC21-EC35	LQM/CIEH + CLEA 1.06	1300	1300	1300	890	1100	1200	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900
TPH aro >EC35-EC44	LQM/CIEH + CLEA 1.06	1300	1300	1300	890	1100	1200	370	820	1600	28000	28000	28000	3800	3800	3800	7800	7800	7900
TPH >EC44-EC70	LQM/CIEH + CLEA 1.06	1300	1300	1300	1200	1300	1300	1200	2100	3000	28000	28000	28000	3800	3800	3800	7800	7800	7900
VOCs - BTEX & MTBE																			
Benzene	SGV report + CLEA 1.06	0.27	0.49	1	0.08	0.16	0.33	0.017	0.035	0.075	28	50	95	72	72	73	90	100	110
Toluene	SGV report + CLEA 1.06	610	1300	2700	120	270	610	22	51	120	870	1900	4400	56000	56000	56000	870	1900	4400
Ethylbenzene	SGV report + CLEA 1.06	170	380	840	65	150	350	16	39	91	520	1200	2800	25000	25000	25000	520	1200	2800

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Xylene, o-	SGV report + CLEA 1.06	60	140	320	45	110	250	28	67	160	480	1100	2600	41000	42000	43000	480	1100	2600
Xylene, m-	SGV report + CLEA 1.06	55	130	300	44	100	240	31	74	180	630	1500	3500	41000	42000	43000	630	1500	3500
Xylene, p- (use this for combined m & p)	SGV report + CLEA 1.06	53	130	290	42	98	230	29	70	160	580	1400	3200	41000	42000	43000	580	1400	3200
MTBE	EIC/AGS/CL:AIRE + CLEA 1.06	73	120	220	49	84	160	23	44	90	7900	13000	24000	75000	75000	75000	20000	33000	63000
VOCs - other benzenes																			
Iso-propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.06	12	28	67	11	27	64	32	79	190	390	950	2300	25000	25000	25000	390	950	2300
Propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.06	40	97	230	34	82	190	34	83	200	400	980	2300	25000	25000	25000	400	980	2300
1,2,4-Trimethylbenzene	EIC/AGS/CL:AIRE + CLEA 1.06	0.41	0.99	2.3	0.35	0.86	2	0.38	0.93	2.2	42	99	220	250	250	250	310	360	410
VOCs - chlorobenzenes																			
Bromobenzene	EIC/AGS/CL:AIRE + CLEA 1.06	0.91	2.1	4.9	0.88	2	4.7	3.2	7.6	18	97	220	520	5200	5400	5600	850	2000	3500
Chlorobenzene	LQM/CIEH + CLEA 1.06	0.33	0.74	1.7	0.33	0.73	1.7	5.9	14	32	59	130	310	12000	13000	14000	680	1500	2900
1,2-Dichlorobenzene	LQM/CIEH + CLEA 1.06	17	40	94	16	39	91	94	230	540	570	1400	3200	95000	100000	100000	570	1400	3300
1,3-Dichlorobenzene	LQM/CIEH + CLEA 1.06	0.31	0.74	1.7	0.29	0.7	1.7	0.25	0.61	1.5	32	77	180	300	300	300	390	440	470
1,4-Dichlorobenzene	LQM/CIEH + CLEA 1.06	42	100	230	30	72	170	15	37	88	230	540	1300	17000	17000	17000	220	540	1300
Hexachlorobenzene	LQM/CIEH + CLEA 1.06	0.2	0.5	1.7	0.2	0.5	1.4	0.18	0.42	0.92	0.2	53	55	6.5	6.5	6.5	11	11	11
Pentachlorobenzene	LQM/CIEH + CLEA 1.06	14	21	27	5.2	10	17	1.2	3.1	7	43	110	830	110	110	110	190	190	190
1,2,3-trichlorobenzene	LQM/CIEH + CLEA 1.06	1.1	2.6	6.2	1	2.6	6.1	4.7	12	28	110	270	630	1700	1800	1800	130	330	1600
1,2,4-trichlorobenzene	LQM/CIEH + CLEA 1.06	1.8	4.5	11	1.8	4.5	11	31	75	180	230	560	1300	10000	11000	12000	320	790	1900

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1,3,5-trichlorobenzene	LQM/CIEH + CLEA 1.06	0.23	0.57	1.4	0.23	0.57	1.4	4.7	12	28	24	590	140	1600	1700	1800	37	91	220
1,2,3,4-tetrachlorobenzene	LQM/CIEH + CLEA 1.06	17	39	84	12	29	62	4.4	11	26	120	300	730	830	830	830	120	1600	1600
1,2,3,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.06	0.53	1.3	3	0.49	1.2	2.8	0.38	0.94	2.2	39	98	240	79	79	79	39	120	130
1,2,4,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.06	0.51	1.2	2.4	0.3	0.68	1.4	0.064	0.16	0.37	20	49	97	13	13	13	25	26	26
VOCs - chloroalkanes & alkanes																			
Bromodichloromethane	EIC/AGS/CL:AIRE + CLEA 1.06	0.019	0.034	0.07	0.016	0.03	0.061	0.016	0.032	0.068	2.1	3.7	7.6	73	73	74	56	67	81
Bromoform	EIC/AGS/CL:AIRE + CLEA 1.06	5.2	11	2.3	2.8	6	13	0.95	2.1	4.6	760	1500	3100	3900	3900	4000	2700	4700	5200
Chloroethane	EIC/AGS/CL:AIRE + CLEA 1.06	8.4	11	18	8.3	11	18	110	210	380	960	1300	2100	2600	3500	5700	2600	3500	5700
Chloroethene (aka vinyl chloride)	LQM/CIEH + CLEA 1.06	0.00054	0.0007	0.0011	0.00047	0.00064	0.00099	0.00055	0.001	0.0018	0.063	0.081	0.12	3.5	3.5	3.5	4.8	5	5.4
Chloromethane	EIC/AGS/CL:AIRE + CLEA 1.06	0.0085	0.0099	0.013	0.0083	0.0098	0.013	0.066	0.13	0.23	1	1.2	1.6	540	550	560	140	150	170
1,1-Dichloroethane	EIC/AGS/CL:AIRE + CLEA 1.06	2.5	4.1	7.7	2.4	3.9	7.4	9.2	17	35	280	450	850	46000	47000	48000	1800	3000	5600
1,2-Dichloroethane	LQM/CIEH + CLEA 1.06	0.0065	0.0093	0.016	0.0053	0.008	0.014	0.0046	0.0083	0.016	0.71	1	1.8	29	29	29	21	24	28
1,1-Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.06	0.23	0.41	0.82	0.23	0.4	0.82	2.8	5.6	12	26	46	92	2200	3900	11000	2200	3900	5900
Cis 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.06	0.12	0.2	0.39	0.11	0.19	0.37	0.26	0.5	1	15	24	47	1300	1300	1400	690	840	1000
Trans 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.06	0.19	0.35	0.71	0.19	0.34	0.7	0.93	1.9	4	22	40	81	3800	4000	4000	1700	2100	2700
Dichloromethane	EIC/AGS/CL:AIRE + CLEA 1.06	2.1	2.8	4.5	0.58	0.98	1.7	0.1	0.19	0.34	270	360	560	760	760	760	1500	1500	1500
1,2-Dichloropropane	EIC/AGS/CL:AIRE + CLEA 1.06	0.024	0.042	0.085	0.024	0.042	0.085	0.62	1.2	2.6	3.3	5.9	12	1700	1900	2200	160	210	290

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Hexachloroethane	EIC/AGS/CL:AIRE + CLEA 1.06	0.22	0.54	1.3	0.2	0.48	1.1	0.27	0.67	1.6	8.2	20	48	120	130	130	8.2	20	48
Tetrachloroethene	LQM/CIEH + CLEA 1.06	1	2.3	5.3	0.94	2.1	4.8	1.6	3.7	8.7	130	290	660	3400	3400	3400	420	950	2200
1,1,1,2-Tetrachloroethane	LQM/CIEH + CLEA 1.06	1.1	2.5	5.8	0.89	2.1	4.8	0.78	1.9	4.4	120	260	590	1400	1400	1400	1500	1800	2100
1,1,2,2-Tetrachloroethane	LQM/CIEH + CLEA 1.06	2.9	5.8	13	1.4	2.9	6.5	0.41	0.89	2	300	600	1200	1400	1400	1400	1800	2100	2300
Tetrachloromethane	LQM/CIEH + CLEA 1.06	0.018	0.04	0.09	0.018	0.039	0.089	0.16	0.37	0.85	3	6.7	15	340	350	350	170	240	320
Trichloroethene	LQM/CIEH + CLEA 1.06	0.11	0.23	0.51	0.11	0.22	0.49	0.43	0.95	2.2	12	25	55	1200	1300	1300	660	860	1100
1,1,1-Trichloroethane	LQM/CIEH + CLEA 1.06	6.3	13	28	6.2	13	28	48	110	240	700	1400	3100	140000	140000	140000	1400	2900	6400
1,1,2 Trichloroethane	EIC/AGS/CL:AIRE + CLEA 1.06	0.88	1.8	3.9	0.6	1.2	2.7	0.28	0.61	1.4	95	190	400	990	990	1000	1100	1300	1500
Trichloromethane	LQM/CIEH + CLEA 1.06	0.92	1.6	3.2	0.75	1.3	2.7	0.36	0.7	1.5	110	190	370	1700	1700	1700	2700	2900	3100
Other phenols & chlorophenols																			
2-Chlorophenol	LQM/CIEH + CLEA 1.06	65	94	120	3.7	8.4	18	0.58	1.4	3.2	3600	4000	4300	610	610	610	1100	1100	1100
2,4-Dichlorophenol	LQM/CIEH + CLEA 1.06	58	85	110	0.88	2	4.4	0.13	0.3	0.7	3500	4000	4200	610	610	610	1000	1100	1100
2,4-Dimethylphenol	EIC/AGS/CL:AIRE + CLEA 1.06	210	410	730	19	43	97	3.1	7.2	17	1400	3100	7200	5000	5000	5000	1400	9600	9900
2-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.06	3700	5400	6900	82	180	400	13	28	64	160000	180000	180000	25000	25000	25000	15000	48000	49000
3-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.06	4700	6300	7500	81	180	400	12	28	63	170000	180000	180000	25000	25000	25000	27000	48000	49000
4-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.06	3800	5500	7000	81	180	400	12	28	63	160000	180000	180000	25000	25000	25000	27000	48000	49000
Pentachlorophenol	LQM/CIEH + CLEA 1.06	22	31	35	0.55	1.3	3	0.084	0.21	0.49	1200	1300	1400	180	180	180	220	250	270
2,3,4,6-Tetrachlorophenol	LQM/CIEH + CLEA 1.06	82	110	130	0.87	2	4.7	0.13	0.31	0.73	3900	4200	4400	610	610	610	1000	1100	1100

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2,4,6-Trichlorophenol	LQM/CIEH + CLEA 1.06	82	110	130	1.4	3.3	7.5	0.22	0.51	1.2	3900	4200	4400	610	610	610	1100	1100	1100
Phthalates																			
Bis (2-ethylhexyl) phthalate	EIC/AGS/CL:AIRE + CLEA 1.06	2700	2800	2800	280	610	1100	48	120	280	85000	86000	86000	9700	9700	9700	17000	17000	17000
Butyl benzyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.06	43000	44000	44000	1400	3400	7300	220	550	1300	940000	940000	950000	130000	130000	130000	250000	260000	260000
Diethyl Phthalate	EIC/AGS/CL:AIRE + CLEA 1.06	14	29	65	120	260	570	19	41	94	14	29	65	49000	50000	50000	14	93000	96000
Di-n-butyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.06	4.7	11	450	13	31	67	2	5	12	4.7	15000	15000	1300	1300	1300	2600	2700	2600
Di-n-octyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.06	3400	3400	3400	2300	2800	3100	940	2100	3900	89000	89000	89000	11000	11000	11000	20000	20000	20000
Pesticides																			
Aldrin	LQM/CIEH + CLEA 1.06	2.1	2.1	2.2	1.7	2	2.1	1.3	2.6	4	54	54	54	6.6	6.6	6.6	13	13	13
Atrazine	LQM/CIEH + CLEA 1.06	31	32	32	0.24	0.56	1.3	0.037	0.085	0.2	870	880	880	100	100	100	180	180	180
DDD	Hydrock + CLEA 1.06	1300	1300	1300	890	1100	1100	400	790	1200	22000	22000	22000	2700	2700	2700	5700	5700	5700
DDE	Hydrock + CLEA 1.06	1300	1300	1300	860	1100	1200	370	770	1300	22000	22000	22000	2700	2700	2700	5700	5700	5700
DDT	Hydrock + CLEA 1.06	1100	1200	1200	770	940	1000	330	660	1100	21000	21000	21000	2600	2600	2600	5500	5500	5500
Dichlovos	LQM/CIEH + CLEA 1.06	25	32	37	0.29	0.6	1.3	0.044	0.091	0.2	840	870	890	120	120	120	140	160	180
Dieldrin	LQM/CIEH + CLEA 1.06	3.5	3.8	3.9	0.69	1.4	2.2	0.13	0.32	0.73	90	91	92	12	12	12	23	23	23
Endosulfan - alpha	LQM/CIEH + CLEA 1.06	44	78	110	2.9	7	16	0.47	1.2	2.7	2300	3000	3400	490	490	490	940	970	990
Endosulfan - beta	LQM/CIEH + CLEA 1.06	53	89	120	2.8	6.6	15	0.44	1.1	2.6	2600	3200	3500	490	490	490	950	980	990
Hexachlorocyclohexa nes - alpha (inc.	LQM/CIEH + CLEA 1.06	460	580	650	19	46	100	3	7.4	18	14000	15000	15000	2000	2000	2000	4000	4100	4100

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		residential without plant uptake (1%SOM)	residential without plant uptake (2.5%SOM)	residential without plant uptake (6%SOM)	residential with plant uptake (1%SOM)	residential with plant uptake (2.5%SOM)	residential with plant uptake (6%SOM)	allotments (1%SOM)	allotments (2.5%SOM)	allotments (6%SOM)	commercial (1%SOM)	commercial (2.5%SOM)	commercial (6%SOM)	POSresi (1%SOM)	POSresi (2.5%SOM)	POSresi (6%SOM)	POSpark (1%SOM)	POSpark (2.5%SOM)	POSpark (6%SOM)
Lindane)																			
Hexachlorocyclohexanes - beta (inc. Lindane)	LQM/CIEH + CLEA 1.06	50	52	52	1.7	3.9	8.5	0.26	0.64	1.5	1100	1100	1100	150	150	150	300	300	310
Hexachlorocyclohexanes - gamma (inc. Lindane)	LQM/CIEH + CLEA 1.06	18	22	23	0.58	1.4	3	0.089	0.22	0.52	530	550	550	71	71	71	140	140	140
Dioxins, furans & dioxin-like-PCBs																			
Total dioxins, furans & DL-PCB (aerial dep.)	SGV report + CLEA 1.06	0.0099	0.0099	0.0099	0.0085	0.0087	0.0087	0.0073	0.008	0.0083	0.24	0.24	0.24	0.023	0.023	0.023	0.049	0.049	0.049
Non-dioxin-like PCBs																			
PCB-28	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.2	0.27	0.32	0.058	0.13	0.23	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
PCB-52	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.2	0.28	0.34	0.062	0.14	0.28	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
PCB-101	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.34	0.37	0.38	0.03	0.53	0.76	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
PCB-138	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.36	0.37	0.38	0.41	0.67	0.89	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
PCB-153	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.36	0.38	0.38	0.51	0.77	0.96	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
PCB-180	Hydrock + CLEA 1.06	0.39	0.39	0.39	0.37	0.38	0.39	0.6	0.87	1.1	9	9	9	1.2	1.2	1.2	2.5	2.5	2.5
Explosives																			
HMX	LQM/CIEH + CLEA 1.06	6500	6500	6500	5.7	13	26	0.86	1.9	3.9	110000	110000	110000	13000	13000	13000	0.35	0.4	0.5
RDX	LQM/CIEH + CLEA 1.06	370	370	370	3.5	7.4	16	0.52	1.1	2.5	6400	6400	6400	790	800	800	19	1500	1600
2,4,6-Trinitrotoluene	LQM/CIEH + CLEA 1.06	57	57	58	1.6	3.7	7.8	0.24	0.58	1.4	1000	1000	1100	130	130	130	260	270	270
Other inorganics																			

Contaminant	Source of GAC	Human Health Generic Assessment Criteria (mg/kg)																	
		residential without plant uptake (1%SOM)	residential without plant uptake (2.5%SOM)	residential without plant uptake (6%SOM)	residential with plant uptake (1%SOM)	residential with plant uptake (2.5%SOM)	residential with plant uptake (6%SOM)	allotments (1%SOM)	allotments (2.5%SOM)	allotments (6%SOM)	commercial (1%SOM)	commercial (2.5%SOM)	commercial (6%SOM)	POSresi (1%SOM)	POSresi (2.5%SOM)	POSresi (6%SOM)	POSpark (1%SOM)	POSpark (2.5%SOM)	POSpark (6%SOM)
Antimony	EIC/AGS/CL:AIRE + CLEA 1.06	370	370	370	180	180	180	52	52	52	6800	6800	6800	740	740	740	1700	1700	1700
Barium	EIC/AGS/CL:AIRE + CLEA 1.06	1300	1300	1300	780	780	780	260	260	260	22000	22000	22000	2700	2700	2700	5800	5800	5800
Mercury, elemental	SGV report + CLEA 1.06	0.17	0.42	1	0.17	0.42	1	4.3	11	26	4.3	11	26	4.3	11	26	4.3	11	26
Molybdenum	EIC/AGS/CL:AIRE + CLEA 1.06	670	670	670	250	250	250	58	58	58	18000	18000	18000	1400	1400	1400	2900	2900	2900
Thiocyanate	Hydrock + CLEA 1.06	8.9	8.9	8.9	8.8	8.8	8.8	28	28	28	190	190	190	25	25	25	53	53	53
Other organics																			
Biphenyl	EIC/AGS/CL:AIRE + CLEA 1.06	34	84	200	34	84	200	14	35	84	34	84	200	9500	9500	9500	34	84	19000
Carbon disulphide	LQM/CIEH + CLEA 1.06	0.1	0.2	0.44	0.1	0.2	0.44	4.8	10	23	12	23	50	11000	11000	12000	1300	1900	2700
2,4-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.06	170	170	170	1.5	3.2	7.2	0.22	0.49	1.1	3700	3800	3800	500	500	500	140	960	990
2,6-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.06	78	84	87	0.78	1.7	3.9	0.12	0.27	0.61	1900	1900	1900	250	250	250	290	490	500
Hexachloro-1,3-butadiene	LQM/CIEH + CLEA 1.06	0.22	0.55	1.3	0.21	0.51	1.2	0.25	0.61	1.4	32	69	120	25	25	25	48	50	51
Mercury, methyl	SGV report + CLEA 1.06	8.4	11	14	7.4	9.6	11	7.9	8	8	370	390	410	53	53	53	73	93	97
Styrene	EIC/AGS/CL:AIRE + CLEA 1.06	35	78	170	8.1	19	43	1.6	3.7	8.7	630	1400	3400	3000	3000	3000	630	1400	3400
Tributyl tin oxide	EIC/AGS/CL:AIRE + CLEA 1.06	8.4	9.8	11	0.27	0.64	1.4	0.042	0.1	0.25	230	230	240	31	31	31	63	64	65
2-Chloronaphthalene	EIC/AGS/CL:AIRE + CLEA 1.06	3.8	9.3	22	3.7	9.2	22	40	98	230	390	960	2200	7500	8400	9000	110	1800	2800