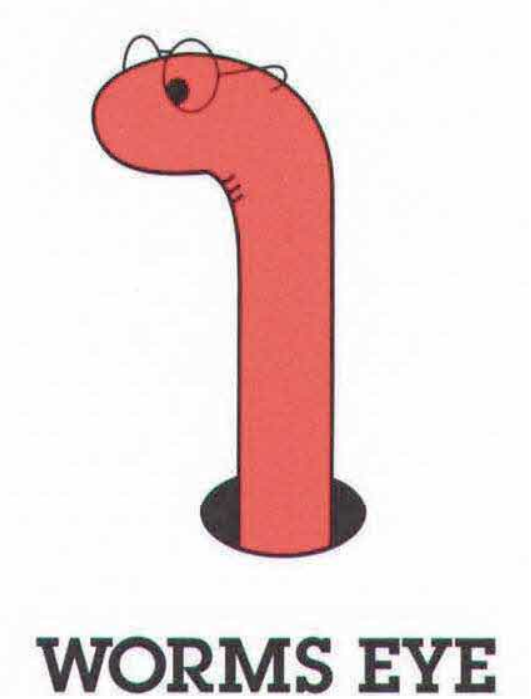
Electronic Report



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Our Ref: Gannow Lane/BB12 6JG/2020
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PROPOSED HOUSES, FORMER DEXTER PAINTS
GANNOW LANE, BURNLEY, BB12 6JG
PRELIMINARY RISK ASSESSMENT (DESK STUDY) – Amended 25.02.2022

INTRODUCTION

A residential development is proposed. The objective is to carry out a Preliminary Risk Assessment (PRA) to consider contamination, landfill, geotechnical and coal mining issues. This is an amended version of our previous report following a change in design.

SITE DESCRIPTION

The site, a rectangular plot 135 by 60m, is located to the north of Gannow Lane in Burnley, and at OS Grid Reference 381740, 432670. The site, inspected on 16/4/20 by Mr M Whitaker, mostly comprised a vacant site. A berm, across the north of the site, split the north (overgrown with a telecom mast at the northeast corner), from the rest of the site. The centre of the site was vacant, mostly surfaced with hardcore/rubble, with piles of fly-tipped material and building materials. At the southwest were two modern bungalows, with the foundations for a third in place. In recent years the south of the site was used for car sales, with a small office, now demolished. A former, demolished, building at the south/middle was occupied by a paint manufacturer. The site slopes down to the north.

There is a small industrial estate to the east, workshop to the southeast, houses to the west and the canal to the north. The area slopes gently down to the north/northwest.

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PROPOSED DEVELOPMENT

It is proposed to build thirty-six town houses with a central access road. There will be a block of nine along the south side, a block of thirteen on the east side, and fourteen along the west side. Each house will have an associated driveway and garden.

There will be a communal open space at the north and the telecom mast at the northeast will remain.

TREES

The north of the site is very overgrown and there is a collection of deciduous trees, about 4 to 12 metres high, towards the northeast. This is not an accurate arboricultural survey.

NOT INCLUDED IN THE REPORT

- Arboricultural or Invasive Plant Survey (Japanese Knotweed etc.).
- Asbestos Survey
- Flood Risk Assessment.
- Underground Services Survey.

General comments may be made where they are applicable to the environmental and geotechnical risk assessment, these do not constitute a detailed risk assessment.

DATA SOURCES

The following data sources have been viewed in compiling this report.

- BGS, Geology Map, 1:50000 scale, Solid and Drift Edition
- BGS, on-shore boreholes scans
- Coal Authority Consultants Report, 8/4/20
- Landmark Envirocheck Report, 8/4/20
- Ordnance Survey, Historical Maps, 1:10000 and 1:2500 scale
- Walkover Survey, 16/4/20.

This report is referred to as a Preliminary Risk Assessment (PRA), alternative names are 'Phase I' Report or a Desk Study.

ENVIRONMENTAL DATA

A Landmark Envirocheck report and geological maps have been reviewed, the following is a summary of the combined data. The Envirocheck report indicated none of the following within 250 metres:

- Contaminated land register entries
- Discharge consents
- Source protection zones
- Radioactive sites
- Fuel stations
- Sensitive land uses (other than nitrate vulnerable zone)

Geology of Site

A geological fault runs southeast to northwest across the site, splitting the site into northeast and southwest sections, with another fault just to the southwest.

The geological map indicates that the underlying solid rocks are sandstone of the Tim Bobbin Rock Horizon, in the Pennine Lower Coal Measures, dipping to the north/northeast at about 10º.

Surface drift is shown as glacial till (boulder clay) of unknown thickness and natural subsidence hazards are shown as very low to no hazard.

Radon

The site is in a lower probability radon area as less than 1% of homes in the area are above the radon action level. Radon protection measures are not required.

Surface Water (Hydrology)

The Leeds to Liverpool canal forms the north boundary, there are no nearby rivers or streams.

There are the following pollution incidents to surface water listed within 100 metres:

- Minor incident, 25m southeast, oil and silt to Sweet Cough in 1992.
- Minor incident, 25m southeast, oil to canal, 1999.
- Minor incident, 33m northeast, fire water, 1995*
- Minor incident, 62m north, detergent/surfactant to Sweet Clough, 1994*

There is a surface water abstraction point 100 metres west, abstraction from canal for general cooling.

The area slopes down to the northwest, the flow of surface water is expected to be in this direction.

* not relevant due to distance/severity/significance

Groundwater (Hydrogeology)

The solid rocks under the site are indicated as a Secondary A.

Superficial (drift) deposits are classed as a Secondary Undifferentiated aquifer.

Groundwater flow is likely to follow the topography and move to the northwest.

Substantiated Pollution Incidents

A substantiated pollution incident 219m southeast, construction/demolition material, was a significant incident for land impact and minor incident for air impact*

* not relevant due to distance/severity/significance

Flooding (General)

Information from the EA flood maps suggests areas where rivers would flood. There are two zones:

- 'normal' flooding, based on a 1 in 100 chance of it happening in any year (1:200 if flooding is from the sea). This is normally closer to the river.
- 'extreme' flooding, further away from the river and having a 1 in 1000 chance.

Flooding can occur for many reasons other than those dealt with by the EA maps. These include:

- burst pipes, blocked drains, sewers and culverts, inadequate drainage
- cloudbursts/flash flooding overwhelming normally satisfactory drainage systems

Statements in this report such as 'clear of flooding/flood plain' and 'flooding – no further action' are references to the EA river and sea flood maps and are no guarantee that flooding will not occur.

Groundwater Flooding

The site is in an area with potential for groundwater flooding of property situated below ground level.

Flooding from Rivers

The site is shown to be clear of flooding from rivers and seas.

Surface Water Flooding

The site is shown to be clear of areas of surface water flooding, areas immediately north and east shown at risk of 1 in 100 to 1 in 1000 year surface water flooding.

Landfill/Waste Sites

There are four landfill sites listed within 250 metres as follows:

- 26m northeast, unknown waste type.
- 98m south, railway sidings, unknown waste type.
- 117m northeast, unknown waste type.
- 249m northwest, unknown waste type.

There was a prosecution relating to authorised processes, 62 metres west, depositing/keeping controlled waste on land at Rose Grove Ironworks.

Filled Ground

Within 250 metres of the site there are the following suspected filled features:

- 38 metres southeast.
- 91 metres northeast.

Hazardous Substances Sites

- The was a Planning Hazardous Substance Consent 25 metres southeast at Beta Chemicals, toxic substances, hydrogen fluoride, 1992.

Mining

A Coal Authority consultants report has been obtained, the salient points were:

- There is a worked seam (Arley) at 242m deep, last worked in 1940 when 1.2m was extracted.
- A geological fault runs southeast to northwest across the site.
- The Lower Bent seam outcrops 16m southeast (northeast of the fault) and 21m southeast (southwest of the fault). This is shown to be a workable seam.
- The site is underlain by probable unrecorded shallow mine workings.
- No present or future planned underground mining.
- The site is in an area where notice to withdraw support was given in 1976, this has not been withdrawn.
- The site in in an area of previous investigation (no details given).
- The site requires further investigation.
- There are two mine entries within 100 metres:
    - 381432-001, shaft, 55m southeast. This was treated in 1983 by pressure grouting the top 25m and a reinforced concrete cap constructed at 1.7m below ground level.
    - 381432-002, shaft, 75m southeast. This was treated in 1983 by pressure grouting the top 25m and a reinforced concrete cap constructed at 1.7m below ground level.
- No opencast mining within 500m.
- No record of mine gas emissions within 500m.

Coal Seams

The findings suggest the Lower Bent seam is mapped as the Lower Bottom seam on the geology map and in the geological memoirs.

A geological fault runs southeast to northwest across the site, splitting the site into northeast and southwest sections, with another fault just to the southwest.

Northeast of the fault, the Lower Bottom seam outcrops about 60 metres southeast. The conjectured outcrop of this would be about 40m southwest, suggesting it passes beneath the northeast of site at about 7 to 20m below rock head.

Southwest of the fault, the Lower Bottom seam outcrops about 20m south. Bearing in mind the fault to the southwest, the conjectured outcrop of this would be about 25m southwest, suggesting it passes beneath the southwest of the site at about 4 to 23m below rock head.

The Lower Bottom seam is underlain by the Cannel, Fulledge Thin and King Mine, 7m, 11m and 27m below the Lower Bottom respectively, then the China Mine (over 50m below the King seam).

Nearby Industry

IPPC listing 198m southeast at Cloverbrook, coating/printing/textile, pre-treating by washing (2 listings)*

Local Authority Air Pollution Control listing 75m north, adhesive coating, textile and fabric coating (two listings). Site since developed for housing*

There are thirteen trade/commercial/manufacturing points of interest within 100 metres:

- Paint manufacture and car dealers, on-site (now demolished).
- Engineering, 6m south.
- Commercial vehicle dealers, 7m southeast.
- Car body repairs and garage services, 22 to 27m northeast.
- Business Park, 32m east.
- Sheet metal works, 40m east.
- Road haulage, 56m southwest*
- Commercial vehicle dealers, 78m west*
- Container manufacturing, 82m east*
- Hardware, 85m southwest*
- Car body repairs, 87m north*

* not relevant due to distance/severity/significance

NEARBY BOREHOLES/PREVIOUS REPORTS

The following information contains British Geological Survey materials © NERC (2022). The BGS hold records for a borehole 112 metres southeast, the salient points are:

Drift (Marl)	0.0 – 11.89m
Rock	11.89 – 17.42m
Coal	17.42 – 18.09m
Seat	18.09 – 19.05m
Rock	19.05 – 36.88m
Coal	36.88 – 37.51m
Seat	37.51 – 38.73m
Rock	>38.73m

Anecdotal evidence suggests four trial holes were carried out across the site as part of a previous investigation. These suggest conditions on-site to comprise:

Made ground (gravel, topsoil, brick, rubble)	0.0 to between 0.8 and 1.0m
Brown/grey clay	>0.8/1.0m

PREVIOUS INVESTIGATION

A limited investigated was carried out by Worms Eye, on the site immediately to the east, in February 2000. Four boreholes were carried out and the salient points were as follows:

Ground Conditions

The boreholes showed fill material to depths of between 1.8 to over 3.0m, overlying firm and, in places, stiff clay. There appeared to be a trend of increasing thickness of fill approaching the canal. BH2, furthest south, showed compact red brick, mortar, slate and stone fill down to abut 1.5m, overlying soft clay. Beneath this was stony clay which became form then stiff by 4.0m deep.

Further north, BH1, showed compact fill with brick and mortar to below 1.0, overlying clayey fill then firm clay. A topsoil band was encountered at about 2.4m, before firm then stiff clay was reached.

BH3, near the canal, showed compact fill with stone, brick, clay and occasional pieces of wood, before topsoil was encountered at about 2.8m, over soft clay, becoming firm at 5.0m and stiff at 6.0m.

Gas Testing

Gas testing was carried out on three occasions and showed low, near normal, gas levels.

Contamination Testing

Four tests, one per borehole, were carried out for a general suite of contaminants. These showed raised levels of PAHs and TPHs..

SITE HISTORY

Date	On Site	Off Site
1848 (1.10560)	Undeveloped with possible stream running SE-NW across the site.	Canal forms north boundary and Gannow Lane the south. Surrounding area generally undeveloped fields. Sweet Clough 100m northeast.
1892 (1:2500)	Stream not present. Terraced houses run East to West at the south with north of site undeveloped.	Houses 10m east and west, 15m south, along Gannow Lane. Gannow Colliery 40m southeast.
1912 (1:2500)	Terraced houses (Harling Street) run east to west on the south of the site.	Rosegrove Iron works 5m west. Timber yard 5m west (south if Iron works). Cotton mills 140m east, 230m southeast and 240m northwest.
1932 (1:2500)	Little or no change	Cotton mill 40m northwest (north of canal). Filled ground >100m northeast, along line of Sweet Clough.
1958 (1:2500)	Allotments present on the north of the site, extending to the east.	Mill to the north extended eastwards. Filled ground >100m north to >100m northeast, along the line of the former Sweet Clough valley (presumed culverted). Gannow Colliery redeveloped as a depot.
1977 (1:10000)	Housing cleared and 'works' now occupies the south of the site, with presumed yard to the north.	Works built on site to the east. Houses to south demolished, joiners built 20m southeast. Sidings to south reduced in size.
1988 (1:10000)	Little or no change	Sidings to south cleared and site filled. Motorway constructed 175m southeast.
2003 (1:10000)	Little or no change	Former iron works to west demolished and houses built.
2013 (1:10000)	Little or no change	No relevant change
2020 (1:10000)	Building demolished and small building present at southwest. Telecom mast at northeast of site.	Mill to north demolished and houses built. New industrial estate 10m east.

BETA chemicals formerly occupied the land to the east, now an industrial estate.

IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC COAL MINING RISKS

The table below initially summarises the potential risks associated with coal mining legacy for the proposed development site, identified from list sources of information.

Coal Mining Issue	Yes	No	Risk Assessment
Recorded underground coal mining	X		>30 metres, negligible risk
Underground coal mining (recorded at shallow depths)		X	
Underground coal mining (possible at shallow depths)	X		<30 metres, possible risk
Future underground coal mining		X	
Mine entries (shafts and adits)	X		>50 metres, no risk
Coal mining geology (fissures)		X	
Record of past mine gas emissions		X	
Unrecorded mine gas emissions	X		Possible risk
Recorded coal mining surface hazards		X	
Surface mining (opencast workings)		X	
Nearby subsidence claims		X	
Mine Workings Found in Previous Investigations		X	

For those coal mining issues identified as "yes" a more detailed discussion and assessment is made of the risks to the application site and the proposed development. These are detailed below.

Shallow Underground Mining – unrecorded/probable/possible

The findings suggest the Lower Bottom coal seam is the shallowest seam. The next seams being the Cannel, Fulledge Thin and King coal seams. These need to be considered further and the Geological Memoir for this area has been reviewed. To achieve a minimal thickness of rock cover over a worked coal seam, 10 times the seam thickness is widely accepted.

At over 75 metres deep, the China seam is neither shallow, nor a risk to the development.

Lower Bottom Coal Seam

The is reported as being up to 1.2m thick and worked in the area. Beneath the northeast of the site, this would allow about 7 to 20m of rock cover, about 6 to 16 times the seam thickness. This is insufficient rock cover, in the event of a collapse of the workings, to minimise risks to the development.

Beneath the southwest of the site, this would allow about 4 to 23m of rock cover, about 3 to 19 times the seam thickness. This is insufficient rock cover, in the event of a collapse of the workings, to minimise risks to the development.

Cannel Coal Seam

The seam is reported as being an inferior coal, described as an oily shale, 0 to 0.8m thick. There are no indications of the seam being worked. This would allow about 7m of rock cover between the seams, about 9 times the seam thickness. Although this is insufficient rock cover there are no indications of this inferior coal being worked.

Fulledge Thin Coal Seam

The coal seam is reported as being about 0.8m thick and worked in the area. This would allow about 11m of rock cover between seams, about 13 times the seam thickness. This is sufficient rock cover, in the event of a collapse of the workings, to minimise risks to the development.

Bearing in mind the overlying Cannel seam is not reported as worked, this would increase the thickness of rock cover below the Lower Bottom, to about 20 times the seam thickness.

King Coal Seam

The coal seam is reported as being up to 2.55m thick and worked in the area. This would allow about 9 metres of rock cover between the seams, about 3 times the seam thickness. This is insufficient rock cover between the seams, in the event of a collapse of the workings, to minimise risks to the development.

This assumes the Fulledge Thin seam is worked beneath the site. If this is not worked, the cover between the Lower Bottom and the King would be about 27m, about 10 times the seam thickness. This is borderline rock cover.

General

There are four shallow coal seams with insufficient rock cover above the shallowest (Lower Bottom) seam. The risks beneath this depends on which, if any, of the previous seams are worked.

At this stage there is insufficient physical data, and several variable factors, to conclude the risks to the site from shallow mining.

Summary of Coal Seams – Northeast of Site:

Seam	Likely Depth Below Rock (m)	Thickness (m)	Worked	Rock Cover/ Thickness	Sufficient Cover Below Rock Head	Rock Thickness Between Seams (m)	Rock Cover/Thickness between seams	Sufficient Cover Between Seams
Lower Bottom	7 to 20	1.2	Y	7 – 20	N	-	-	-
Cannel	14 to 27	0.0 – 0.8	N	17	Y	7	9	N
Fulledge Thin	25 to 38	0.8	Y	31	Y	11	13	Y
King	34 to 47	2.55	Y	13	Y	9	3	N
China	>80	-	-	-	-	-	-	Y

Summary of Coal Seams – Southwest of Site

Seam	Likely Depth Below Rock (m)	Thickness	Worked	Rock Cover/ Thickness	Sufficient Cover Below Rock Head	Rock Thickness Between Seams (m)	Rock Cover/Thickness between seams	Sufficient Cover Between Seams
Lower Bottom	4 to 23	1.2	Y	4 – 23	N	-	-	-
Cannel	11 to 34	0.0 – 0.8	N	13	Y	7	9	N
Fulledge Thin	22 to 41	0.8	Y	27	Y	11	13	Y
King	31 to 50	2.55	Y	12	Y	9	3	N
China	>80	-	-			-	-	Y

Mine Gas

There are four shallow coal seams, three of which may have been worked. Taking into account their depth, and potential for workings, it is considered these may pose a risk to the site from mine gases.

Mine Shafts

The nearest mine shaft is shown to be about 55m from the site. This has been treated and capped. The shaft does not pose a risk to the development.

DISCUSSION

Contamination

The site has formerly been used for housing, allotments, paint manufacturer and car sales business. The findings also suggest demolition rubble has been used on site, which can contain raised levels of contaminants (especially lead, sulphate, asbestos and PAHs). The car sales and allotments are unlikely to pose a high risk. However, low levels of hydrocarbons, exceeding residential thresholds, may have been generated by leaks from storage of vehicles. Low levels of contaminants are also often found on old allotments, from introducing materials to promote vegetable growth, asbestos from former sheds, and heavy metals/hydrocarbons from early pesticides.

The greater risk will come from the former paint manufacture. Contaminants from this, including liquid contaminants, may be present and can include raised levels of lead and solvents, which may be present at high levels at shallow depth, and deeper beneath the site.

Off-site industry of concern are the iron works to the west, joiners to the southeast, chemical works to the east and engineers/vehicle workshops in the surrounding area. These are sites where contaminants are likely to have been generated which could migrate to the site, especially mobile contaminants (PAHs, TPHs, VOCs).

Whilst there are several pollution incidents listed in the wider area, the two of potential concern are both incidents of 'oil' 25 metres away, which may have migrated to the site.

The proposed development will be houses with gardens. Potential pollutant linkages are:

- Direct contact with and ingestion of soil.
- From homegrown vegetables and soil attached to vegetables.
- Inhalation and ingestion of dust.
- Sulphate attack on buried concrete.
- Inhalation of vapours.
- Contaminants entering drinking water pipes.

The history of the site and surrounding are suggest contaminants are likely to be present and may exceed residential thresholds over a wide area. These may be at high levels in places and a moderate to high risk to householders is anticipated.

Controlled Waters

There is an underlying Secondary A aquifer beneath clay. There are no nearby source protection zones or ground water abstraction points.

The canal forms the north boundary and has a water abstraction point 100m to the west.

The gardens will allow rainwater to pass through the surface soils.

Regarding ground water, there is clay present beneath the site, expected to be over 10m thick. The underlying clay will impede the passage of water and it is considered that only a very low risk to ground water is likely

The canal forms the north boundary. However, these were designed with a clay lining, to prevent water loss, which will also impede the passage of water to the canal. Bearing in mind the highest levels of contaminants are expected on the south of the site, there is underlying clay, and the canal construction, only a very low risk to the canal is anticipated.

Landfill Gas/Ground Gas/Mine Gas

The site is within 250m of four landfill sites with other areas of made ground in the surrounding area and made ground beneath the site, this may increase in depth along the south boundary if basements are present.

Regarding the landfill sites, there is no record of waste types. However, these were filled pre 1970s, which suggest fill material is likely to be mostly ash type waste (probably incinerated household waste) and likely have a low to moderate gas generation potential. Bearing in mind the clay between the site and landfills to the north/northeast, distance to the southern landfill, and underlying clay, it is considered that the landfills are likely to pose a low risk.

There is made ground beneath the site which may deepen on the south of the site. The information to date suggests this is likely to be demolition rubble with a low gas generation potential and low risk to the site.

There are shallow, possibly worked, coal seams. It is considered that these pose a potential risk to the development, which will be reduced due to the thickness of underlying clay.

Bearing in mind the number of proposed houses it is considered that a period of gas monitoring around the site is required.

Radon

Radon protection measures are not required.

Flooding from Rivers

The Environment Agency maps show that this site is clear of flooding from rivers.

Groundwater and Surface Water Flooding

The site is shown to be clear of, but adjacent to, areas of surface water flooding.

The site is shown to be in an area with limited potential for groundwater flooding to occur.

Foundations

It is expected that made ground will be present, with underlying clay. This can provide variable conditions for foundations and a range of options may need to be considered, including reinforced concrete raft to a piled foundation.

If foundations are to be on clay the shrinkage potential of the clay needs to be determined, to ensure foundations are below the potential effects of tree root shrinkage.

Shallow Mining

When considering the potential for mining subsidence, the accuracy of the data needs to be considered. In this case, the scale and detail of the geological maps means precise calculations are not possible.

The presence of two mine shafts 50 metres from the site indicates that coal seams have been worked in this area.

The findings indicate there are four shallow coal seams, three of which are worked in the area. The depth of the seams suggests insufficient thickness of rock cover to minimise damage to the structure in event of a collapse of mine workings, depending on which, if any, of the seams are worked.

A geological fault runs southeast to northwest across the site, with a further fault to the southwest. If workings are present these are most likely to be present beneath the northeast of the site, rather than the faulted area to the southwest.

Although the potential inaccuracies on the geology map pose difficulties with making accurate measurements. It is considered that the Coal Authority Report, geology map and memoirs suggest workings may be present, and that there may be insufficient rock cover.

INDUSTRY PROFILE

The site was formerly used as a paint manufacturers and car sales, with made ground across the site. Off-site industry of concern is an iron foundry, joiners, chemical works and garage workshops/engineers.

Industry	Possible Contaminants
Potential Contaminants	Metals: copper, zinc, chromium, nickel, lead, cadmium, arsenic, Inorganic compounds: cyanide, thiocyanate, sulphates Acids Organic solvents (VOC) Fuel oil, diesel (TPHs) Asbestos PCBs SVOCs General Hydrocarbons (PAHs)

CONCEPTUAL MODEL

A conceptual model based on the source-pathway-receptor concept is included with this desk study to show the potential pollutant linkages with this site.

Source	Receptors	Pathway	Potential/Likely Pollutant Linkage
Asbestos	Construction workers	Inhalation	Yes
	End-users	Inhalation	Yes
	Off-site	Migration off-site	Yes
Inorganic contaminants	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes
	Groundwater	Leaching towards	Yes
	Canal	Leaching towards	Yes
Sulphate	Building fabric	Concrete directly in contact with soil	Yes
Hydrocarbons	Construction workers	Short-term direct contact, inhalation of dust, ingestion	Yes
	Householders	Direct contact, ingestion, from home grown vegetables, ingestion and inhalation of dust	Yes
	Service pipes	Seeping into drinking water pipes	Yes
	Groundwater	Leaching towards	Yes
	Canal	Leaching towards	Yes
Hydrocarbon vapours	Construction workers	Short-term inhalation	Yes
	Householders	Inhalation of vapours indoors and outdoors	Yes
Landfill gas	End-users - in buildings	Seeping into buildings, explosion, asphyxiation	Yes
Radon	End-users - in buildings	Seeping into buildings	No

CONCLUSION

Contamination

Taking into account the past use of the site it is considered likely that contaminants will be present at levels exceeding residential thresholds. These posing a potential moderate to high risk to householders.

An intrusive investigation is required, consisting of boreholes/trial holes and tests to confirm the presence/absence and extent of contamination on the site.

There are no specific point sources for contamination and the investigation will need to target proposed gardens (most sensitive part of the development), former paint works (on-site), former ironworks (west), joiners (southeast), chemical works/industrial estate (east), proposed houses and provide all round coverage.

Controlled Waters

At this stage a low risk to controlled waters is anticipated. This will need to be reviewed following the soil tests and it is expected that leachate tests, and possibly tests on shallow water samples, will be required to confirm the risk.

Landfill Gas/Ground Gas/Mine Gas

There are four landfill sites within 250 metres, made ground beneath the site and shallow coal seams.

These pose potential landfill, ground and mine gas risks to the development and a gas testing programme is required. Monitoring points will need to target the proposed buildings.

Radon

Radon protection measures are not required.

Flooding

The EA maps indicate that the area is clear of flooding from rivers.

The maps indicate that the area is clear of, but adjacent to, areas of surface water flooding.

These maps are fairly crude and it is beyond the scope of this report to provide a comprehensive flood risk assessment. For greater confidence a detailed flood risk assessment should be obtained.

Foundations

A series of boreholes are required in the area of the proposed building to allow the most suitable foundations to be designed.

Plasticity tests are required to confirm the shrinkage potential of the clay.

Shallow Mining – Watching Brief

In common with many mining areas, it is recommended that site staff here keep a watching brief during the project, particularly while excavations are taking place. Any unusual features such as voids, cracks, ground movement or strange soil conditions should be flagged up and safely checked out.

Shallow Mining

The findings suggest there are four coal seams, three of which may be worked, at shallow depth beneath the site, below rock head, and beneath the proposed buildings. The anticipated depth of the coal seams suggests there may be insufficient cover and a potential risk to the proposed development, if the workings are present and these were to collapse.

A series of rotary boreholes are required to assess the depth of seams, thickness, and presence of workings further. Once rotary drilling has been carried out the mitigation strategy can be finalised, and the project constructed safely, to meet the requirements of development on unstable land. Boreholes should provide all round coverage, to confirm:

- If the coal seams are present (geological maps do not locate seams precisely).
- If present, their depth and thickness
- If they have been worked beneath the site.

To do this it will be necessary to drill boreholes (Coal Authority permission required). It is suggested 6 boreholes extend to 30 metres below rock head (about 45 metres deep), 3 on the northeast of the site and 3 on the southwest.

Yours faithfully
on behalf of Worms Eye Ltd

David Lord
BSc (Hons)
FGS, MIEnvSc, AIEMA

PROPOSED HOUSES, FORMER DEXTER PAINTS

GANNOW LANE, BURNLEY, BB12 6JG

LIST OF APPENDICES – PRELIMINARY RISK ASSESSMENT (Desk Study)

Existing Site Plan

Photographs of Site

Proposed Site Plan

Landmark Summary Map

Landmark Envirocheck Report

Historical Maps

Coal Authority Consultants Report

Coal Authority Summary Map

Conceptual Model

ABBREVIATIONS

Chemical	BAP	Benzo(a)pyrene
	BTEX	Benzene, toluene, ethylbenzene, xylene
	DAHA	Dibenzo(ah)anthracene
	MTBE	Methyl tertiaryt-butyl ether (additive to petrol)
	EPH	Extractable Petroleum Hydrocarbons (formerly Diesel Range Organics – DRO)
	NFD	No fibres detected (asbestos test)
	PAH	Polycyclic aromatic hydrocarbons
	PCB	Polychlorinated biphenyls
	PID	Photo ionisation detector
	PRO/GRO	Petrol range organics/gasoline range organics
	SVOC	Semi-volatile organic compounds
	TCE	Trichloroethylene
	TPH	Total petroleum hydrocarbons
	VOC	Volatile organic compounds
Other	AGS	Association of Geotechnical Specialists
	BGS	British Geological Survey
	BRE	Building Research Establishment
	CBR	California Bearing Ratio
	CIEH	Chartered Institute of Environmental Health
	CIRIA	Construction Industry Research and Information Association
	CLEA	Contaminated Land Exposure Assessment (Environment Agency)
	CLR 8	Contaminated Land Research Report 8 (Environment Agency)
	DWQ	Drinking water quality
	EA	Environment Agency
	EQS	Environmental quality standards
	ICRCL	Inter-departmental Commission for the Reclamation of Contaminated Land
	LQM	Land Quality Management Ltd (Land and Environmental Consultancy)
	NHBC	National House Builders Council
	SGV	Soil Guideline Values
	SPT	Standard penetration test
	TPHWG	TPH Working Group

1. This report should be considered in relation to the objectives agreed between Worms Eye and the Client, outlined in the introduction.

2. For the work, reliance has been placed on publicly available data, obtained from the sources identified in the report. The information is not exhaustive and further information may be available from other sources. When using the information it has been assumed it is correct, and no attempt has been made to verify the information.

3. This report has been produced in accordance with current UK policy and guidelines, for land and groundwater contamination, enforced by the Local Authority and the Environment Agency.

4. During the site walkover, reasonable effort was made to obtain an overview of the site. However, no attempt was made to enter areas that are unsafe, a risk to health and safety, locked, barricaded, overgrown, or areas not made accessible.

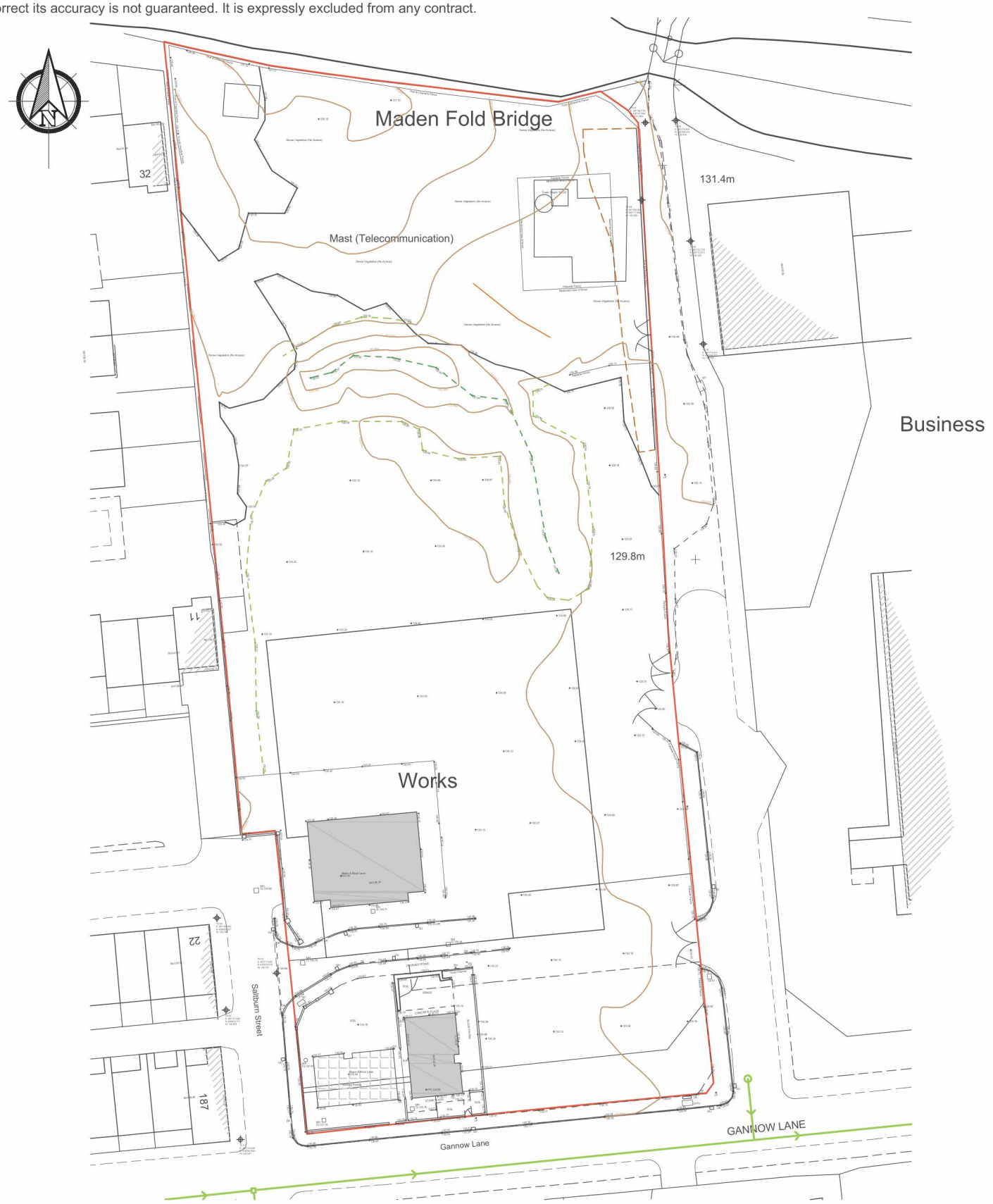
5. Access, the presence of services and activities on the site, limited locations where sampling could be carried out and the techniques that could be used.

6. Assessments are based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.

7. The conclusions and recommendations provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.

8. Worms Eye cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright of this report, and other plans or documents prepared by Worms Eye, is owned by them, and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies may be made and distributed by the client, as expected, in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability, or warranties, shall be extended to other parties by Worms Eye, without their written agreement.

9. New information, revised practices, or changes in legislation, may necessitate the re-interpretation of the report, in whole or in part.



EXISTING SITE PLAN

Site: Former Dexter Paints, Unit 15, Gannow Lane, Burnley

Client: Mr Nixon
Drawn: AxK
Date: 31.03.20
Scale: 1:500 @ A3
Project No: NIX10 / Dwg 01
Amendments:

Notes:
All work is to be carried out to the latest current British standards Codes of Practice and recognised working practices. All work and materials should comply with Health and Safety legislation and to be approved by the Local Authority Planning / Building Control Officer.
All dimensions are in millimetres unless where explicitly shown otherwise. The contractor should check and clarify all dimensions as work proceeds and notify the design team of any discrepancies. Do not scale off the drawings, if in doubt ask.
Avalon Chartered Town Planning are not liable for work undertaken prior to Full Planning Consent and/or Building Regulations Approval

Avalon RTPI
Chartered Town Planning
Town Planning - Architectural Design - Building Regulations - Surveying
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Phone: 01282 834834
[redacted]

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

Panoramic View Looking Northeast

Panoramic View Looking North

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

Panoramic View Looking Southeast

Panoramic View Looking West

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

Panoramic View Looking Northeast

View Looking Southeast

View Looking Southwest

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

Panoramic View Looking East

Panoramic View Looking Northwest

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

General Site Photographs

Former Dexter Paints, Unit 15 Gannow Lane, Burnley, BB12 6HY

Panoramic View Looking South

Panoramic View Looking North