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Project	EAGLE HOUSE, PORT TALBOT – PHASE 1 REPORT
Client	Castell Group

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CONTENTS

1.0 INTRODUCTION	3
1.1 Introduction	3
1.2 Scope of Works.....	3
1.3 Development Proposals	3
1.4 Limitations.....	3
2.0 EXISTING SITE INFORMATION	4
2.1 Site Location	4
2.2 Published Geology.....	5
2.3 Hydrology.....	5
3.0 DESK STUDY	6
3.3 Radon Report.....	6
3.4 Enviro Insight Report	6
3.5 CON29M Mining Report.....	7
4.0 CONCEPTUAL MODEL	8
4.1 Rationale.....	8
5.0 PRELIMINARY CONCEPTUAL MODEL AND QUALITATIVE RISK ASSESSMENT	9
Source Characterisation	9
Preliminary Qualitative Risk Assessment.....	13
6.0 DESK STUDY SUMMARY	1
6.1 Summary of Findings	1
APPENDIX A	2
Phase 1 Data	2
APPENDIX B	8

Eagle House
Phase 1 Summary Page 1 of 2

Client			Castell Group
Current Site Status			The site is currently occupied by Eagle House, and is within the town centre of Port Talbot
Development Proposals			The development proposals are understood to comprise residential housing.
Site Conditions	Location		The site is at SA13 1DH
	History	Site	The site has been occupied by various developments since the late 1800s.
		Adjacent land	Commercial properties, the Grand Hotel and the listed Plaza Cinema.
	Geology	The geology comprises superficial deposits of alluvial sands and gravels, underlain with middle coal measures	
Mining	None recorded		
Controlled Waters	Surface Water	No terrestrial waters.	
	Ground Waters	No records of controlled waters	
Flood Risk	Low risk		
Radon	The site is not in an area at risk from Radon		
Landfill	There are no landfills within the site area		

Eagle House
Phase 1 Summary Page 2 of 2

Principle contamination issues	The following contamination issues were identified during the Phase 1; Garages, sub-station and rail sidings.
Environmental Risk	- Significant and widespread contamination is considered unlikely, unless some processes as yet unidentified have occurred. - Initial consideration, in advance of site investigation is that: - The risk to end users is considered to be Low - The risk to construction/maintenance workers is considered Moderate. However with appropriate PPE the risk is considered to be Low - The risk to the off site surface water and groundwater receptors is Low to Very Low - The risk to end users from marginally elevated soil gas is considered to be Low
Waste Management	- In advance of site investigation: - Made ground has not yet been identified - Natural arisings likely to be 100% inert
Geotechnical Constraints	Based on the available information, the following issues may be anticipated, and should be investigated by site investigation prior to development; - Near surface soft clay - Below ground services - Potential instability of excavations - Potential subsidence due to loose ground - Potential elevated background chemical values
Services	Below ground services may be anticipated on site including existing site drainage
Future Works	The following future works/surveys may be required; - Topographical survey - Trial Pitting/window sample Ground Investigation to prove the ground conditions and to collect samples for soil contamination testing and assessment.

1.0 INTRODUCTION

1.1 Introduction

Spectrum Geo Services (SGS) were requested by Castell Group, to undertake a Phase 1 Desk Study of a site at Eagle House, Port Talbot.

This report includes a review of the available geological and historical information and makes recommendations regarding environmental risk, and further Phase 2 Ground Investigation operations.

1.2 Scope of Works

The objectives of this assessment are:

- Provide a Phase 1 Desk Study

1.3 Development Proposals

It is understood that the intention is to develop the site for the purposes of Residential Development.

1.4 Limitations

Subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that were not apparent from the data available for review.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any regulatory authorities for approval. Redevelopment sites in particular may have planning conditions attached in respect of contaminated land assessment. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to the regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all of the regulatory authority requirements.

2.0 EXISTING SITE INFORMATION

2.1 Site Location

The development site is at Eagle House, Port Talbot, SA13 1DH. The site location plan shown as Figure 21035/01.

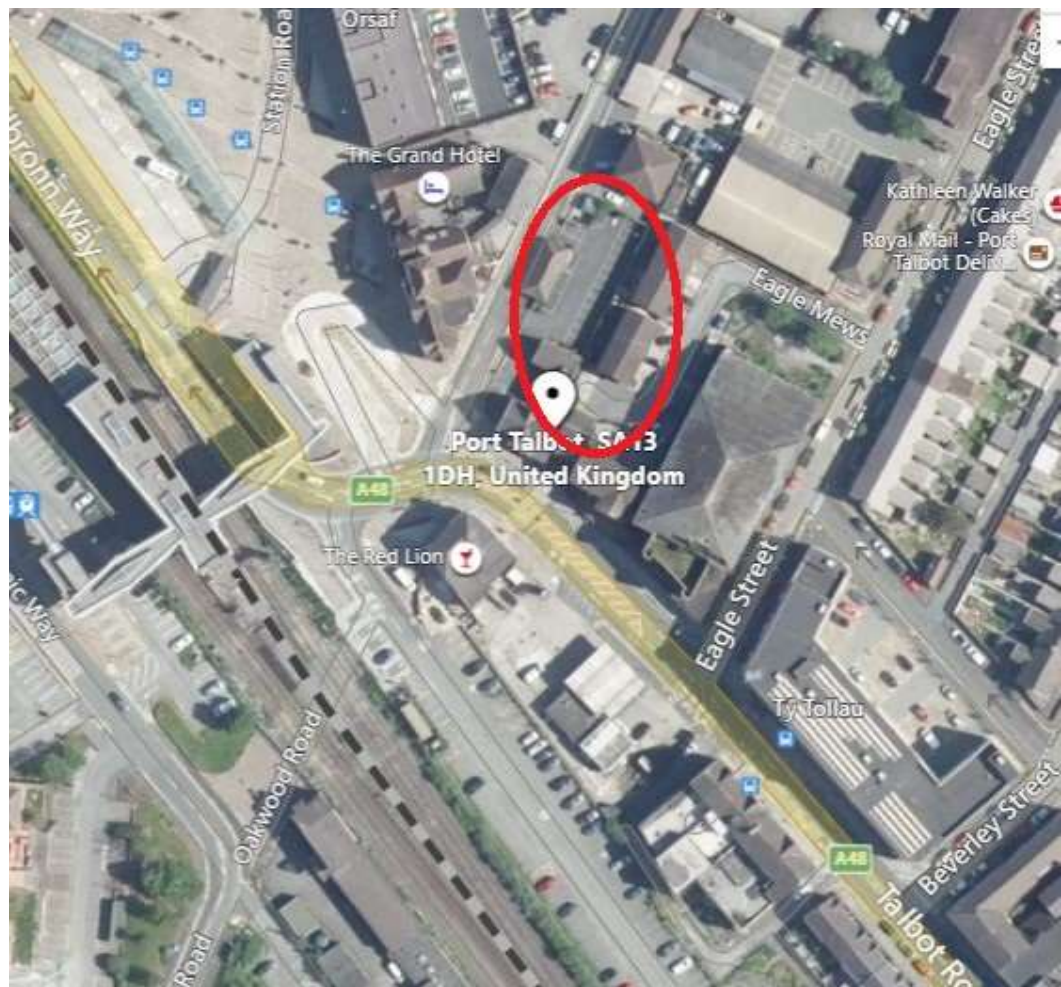


Figure 21035_01

2.2 Published Geology

Based on data available from the BGS webviewer, the following geological setting is anticipated;

- Superficial deposits.

1:50 000 scale superficial deposits description: Alluvial Fan Deposits - Sand And Gravel. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers (U).

Setting: rivers (U). These sedimentary deposits are fluvial in origin. They are detrital, ranging from coarse- to fine-grained and form beds and lenses of deposits reflecting the channels, floodplains and levees of a river or estuary (if in a coastal setting).

- Solid Geology.

1:50 000 scale bedrock geology description: South Wales Middle Coal Measures Formation - Mudstone, Siltstone And Sandstone. Sedimentary Bedrock formed approximately 310 to 318 million years ago in the Carboniferous Period. Local environment previously dominated by swamps, estuaries and deltas.

Setting: swamps, estuaries and deltas. These sedimentary rocks are fluvial, palustrine and shallow-marine in origin. They are detrital, forming deposits reflecting the channels, floodplains and deltas of a river in a coastal setting (with periodic inundation from the sea).

2.3 Hydrology

The site lies has no surface waters in proximity. The River Afan lies several hundred metres to the west.

3.0 DESK STUDY

3.1 Introduction

To facilitate a Desk Study, Enviro Insight and historical map information was procured, and is Appended.

3.2 Site History

Information about the historical development of the site and the adjacent land has been obtained from a review of the available Ordnance Survey maps. The historical land use is summarised in below:

On site historical Land use

- 1872 Map: Shows the site to be occupied by the Eagle Inn. In the north of the site was a Smithy. Rail lines are shown running along what is now Oakwood Lane.
- The 1899 map shows more development around the site, with more rail lines running along the eastern boundary to Central Station. A sawmills is shown just to the north east. By 1917 the Grand Hotel has been built. The 1937 map is similar, with public lavatories mid site.
- By 1952, the Plaza Cinema is built to the south east. The lavatories are still at site, together with an electrical sub station. The Talbot Garage is to the north. The sawmills are extant. 1967 is similar.

3.3 Radon Report

The radon report indicates that no radon protection measures are required.

3.4 Enviro Insight Report

The Enviro Insight report assesses the recorded likelihood of occurrence of various environmental risks at the site.

- a) Historic Landfill – none,
- b) Landfill – none,
- c) Current land use – none,
- d) Abstraction Licences – none,
- e) Former uses – garages, electrical sub-station.
- f) Flooding – low,

- g) Natural Hazards – Very low/negligible,
- h) Mining – none identified..
- i) Natural ground subsidence – negligible.

3.5 CON29M Mining Report

The Coal Authority CON29M report indicates no risk from coal mining.

4.0 CONCEPTUAL MODEL

4.1 Rationale

The site characterisation attempts to identify potential previous and existing site sources of contamination. The Conceptual Model links the identified sources likely to cause significant possibility of significant harm via pathways to identified critical receptors. The Conceptual Model is therefore based on a number of identified source-pathway-receptor scenarios. For land to be classified as contaminated a significant pollutant linkage will need to be identified which will include each component of the Conceptual Model. The absence or removal of a source or interception of a pathway will 'break' the pollutant linkage.

The Conceptual Model is characterised by identification of the following:

- On-site sources, which may impact on-site receptors via plausible pathways.
- On-site sources, which may impact off-site receptors via plausible pathways.
- Off-site sources, which may impact on-site receptors via plausible pathways.

The change of land use will require assessment of the new site development layout within the context of introducing new exposure pathways. The planning regime will require assessment of the site to ensure the new development will not be classed as contaminated land under the definition provided by the Part 2A of the Environmental Protection Act 1990 as defined in the Environment Act 1995.

From the information available a Conceptual Model for the site has been produced. The majority of possible contaminants outlined in the Conceptual Model may be present on the site through its former use as agricultural fields. These include metals, asbestos and PAH.

5.0 PRELIMINARY CONCEPTUAL MODEL AND QUALITATIVE RISK ASSESSMENT

Source Characterisation

All potential **on-site** and **off-site** sources of contamination identified by this desk study are detailed in Table 5.1.1 below. The table also details any potential sources which have been discounted.

Table 5.1. 1: Identified Potential Sources of Contamination

Source		Distance (m)	Compass Direction	Identified by:	Comments
Former Rail Sidings	Off-Site	50	E	Historical maps	Suite of contamination testing required to negate source
Electrical Sub-Station	On-Site	0		Historical maps	
Garages	Off-Site	50	NE	Historical maps	

It is not possible to discount all of the potential sources of contamination. Potential sources of contamination which cannot be discounted are carried forward to a preliminary qualitative risk assessment. The Contaminants of Concern (CoC) for the remaining potential sources of contamination are listed in Table 5.1. 2.

Table 5.1. 2: Contaminants of Concern

CONTAMINANTS OF CONCERN									
Source	Metals	PCB	PAH	Soil Organic Matter	SO ₄ , SO ₃	pH	Asbestos	SVOCs / VOCs	
ON-SITE									
Made Ground	X	X	X	X	X	X	X	X	

Pathway Characterisation

The potential pathways by which receptors might be exposed to contaminants (sources) at the site can vary depending on the proposed or current land use (e.g. residential properties, public open space, retail).

For humans, the three possible routes of exposure to contaminants are:

- Inhalation of dusts or vapours
- Ingestion of dusts or soil either by hand-to-mouth activity or by eating plants grown in contaminated soils
- Dermal (skin) contact with contaminated soils and waters and transfer of contaminants through the skin into the body

Buildings and service conduits can also be affected by contaminants in the following ways:

- Soil gas or vapour pooling in voids within or beneath structures
- By direct contact of building fabric with contaminated soils
- Service trenches acting as preferential migration pathways
- Ingress of contaminants into conduits, contaminating drinking water supplies

Finally, for the local water environment the following pathways may be present:

- Run-off from the site surface entering surface water courses near the site
- Leaching of contaminants from the soil to on-site groundwater
- Migration of contaminated on-site groundwater to off-site groundwater and/or surface water bodies

Receptor Characterisation

The receptors are the elements in the pollutant linkage that can potentially be harmed by the contaminants. These are as follows:

- Humans: site workers and residential users
- Buildings: building fabric and services; and
- The local water environment (surface water and groundwater)

Pollutant Linkages

The significance of potential pollutant linkages at the site is now qualitatively assessed by considering the magnitude of the hazard and the possibility of the linkages occurring based on the observations made, in Table 5.1.3 below.

Preliminary Qualitative Risk Assessment

The preliminary conceptual model outlined above has been used to undertake an initial qualitative risk assessment for the site to determine the possibility of significant risks that may exist following development of the site. The qualitative risk assessment will also investigate the risks to the wider environment as a result of contamination from on site sources.

Table 5.1.3: Preliminary Qualitative Environmental Risk Assessment for Identified sources of Contamination

Source	Potential contaminants	Potential Pathway(s)	Potential receptor(s)	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation Required
Made Ground	Metals, PAHs, PCB, asbestosl, SO ₄ , pH,	Ingestion, inhalation, dermal contact	Humans (residents & end users)	Dermal contact, inhalation and ingestion pathways will be broken in areas covered by hardstanding. However the risk of humans coming into contact with potential contaminants at the site will remain in areas of soft landscaping. Contaminants could compromise the integrity of any water supply pipe and subsequently lead to consumption of contaminated water supply.	High	Very Low	Low	Yes
			Humans (site workers)	Construction and maintenance workers could come into contact with contaminated made ground. Excessive exposure may occur during some manual activities including working in service trenches.	High	Low	Moderate	Yes
		Direct contact, aggressive ground conditions,	Building fabric and services	The presence of contamination in shallow soils may pose a risk to buried concrete structures. Direct contact with this contamination in both soil and superficial groundwater (if present) can result in damage to concrete fabric and services in a similar fashion to that described above for water supply pipe.	High	Low	Moderate	Yes
		Leaching, migration.	Surface water environment	There is no surface water at the site. The majority of proposed development is to consist of tarmac and drained surfaces which will prevent surface water run-off from coming into contact with potentially contaminated made ground.	High	Very Low	Low	No
			Groundwater environment – Superficial Groundwater	Mobile contaminants that may be present on site, could migrate to surface water bodies by transportation via the bedrock aquifer, however the presence of hardcover to the site will reduce the infiltration of water through potentially contaminated soils therefore reducing the leaching potential. Given that superficial deposits are expected to be very limited beneath the site, it is unlikely that a superficial aquifer will be present.				

Source	Potential contaminants	Potential Pathway(s)	Potential receptor(s)	Assessment	Potential Severity	Potential Probability	Risk Class	Investigation Required
			Groundwater environment – Bedrock Aquifer	The underlying bedrock is a Secondary (B) Aquifer – Low Permeability Layer	Moderate	Very Low	Very Low	No

6.0 DESK STUDY SUMMARY

6.1 Summary of Findings

The former uses of garage, rail sidings and sub-station indicate a broad suite of chemical testing to eliminate source.

Thus, it is recommended that a limited programme of soil chemistry testing and assessment is undertaken, by means of trial pitting or window sampling to eliminate the risk to end users of the following determinands.

Background

As, Cu, Hg, Cd, Cr, Ni, Pb, pH, SO₄

Organics

Speciated PAH, Soil Organic Matter, PCB

Asbestos

To facilitate this, it is recommended that trial pits and or/window samples are constructed at the site, to determine the nature of the strata and to allow the collection of soil samples for ongoing laboratory testing.

A report quantifying the results, assessing them with current guidelines, and their potential risk to receptors and end users should then be developed.

APPENDIX A

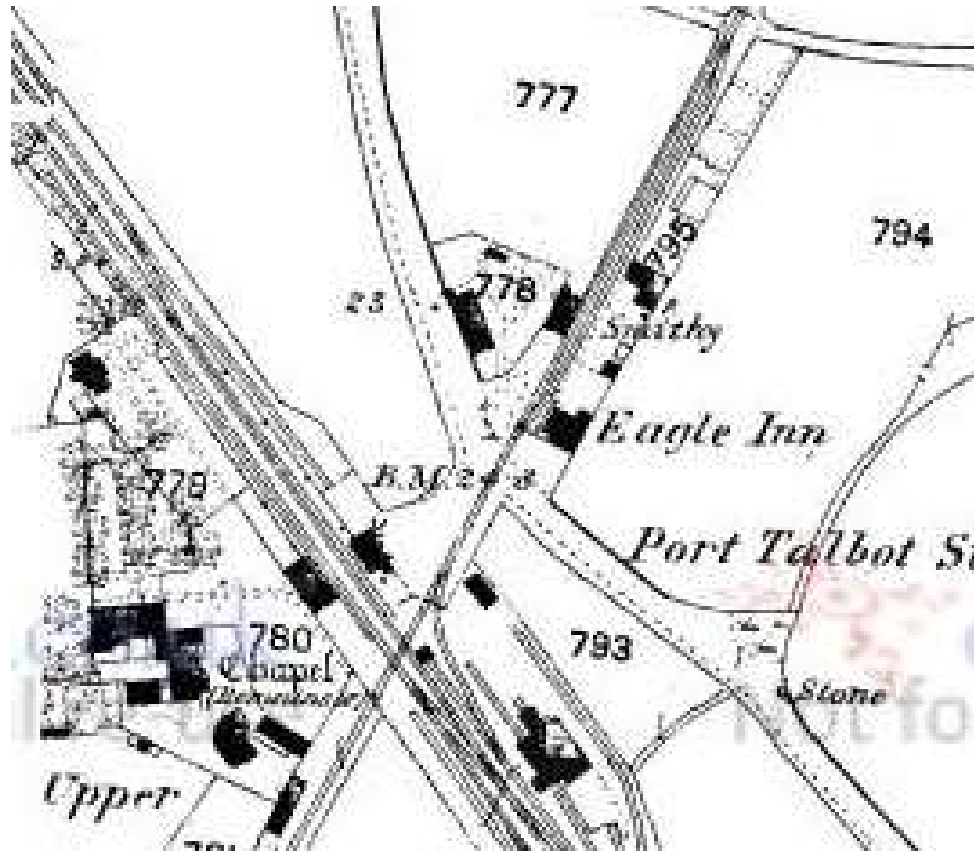
Phase 1 Data

Enviro Insight

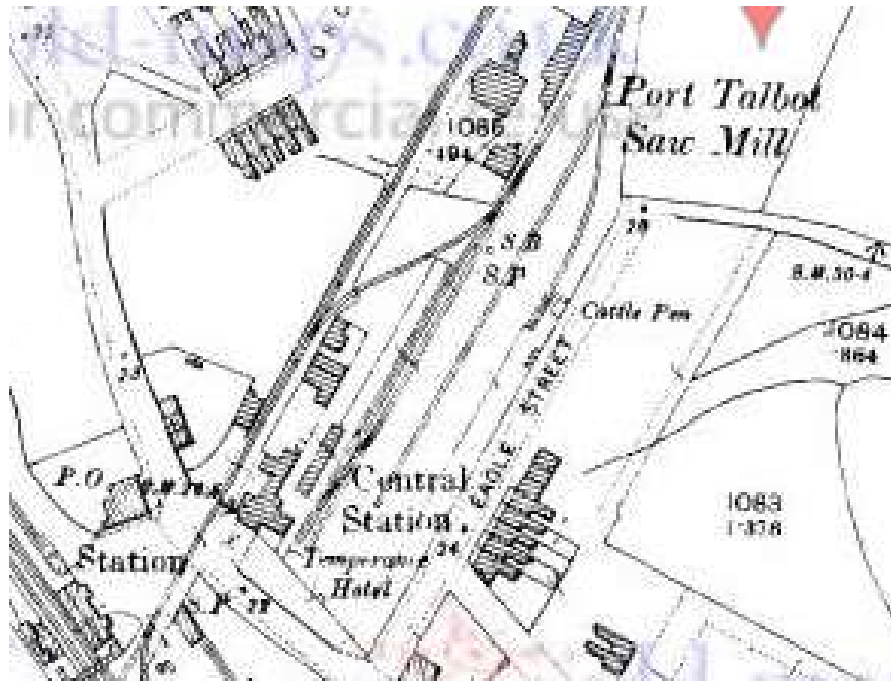
Historical Maps

CON29M Coal Mining Report

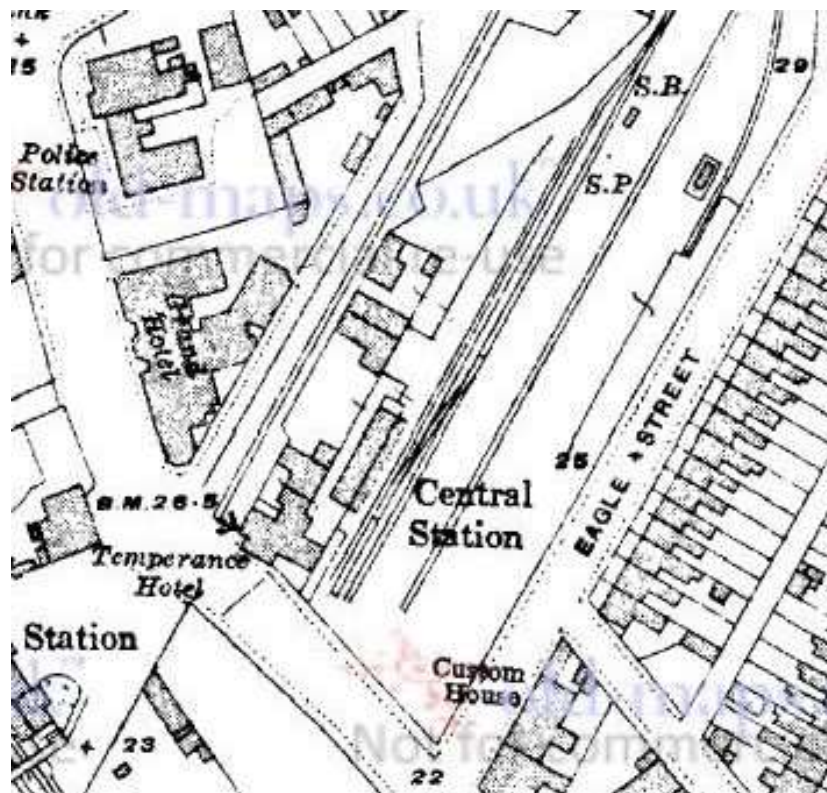
Radon Report



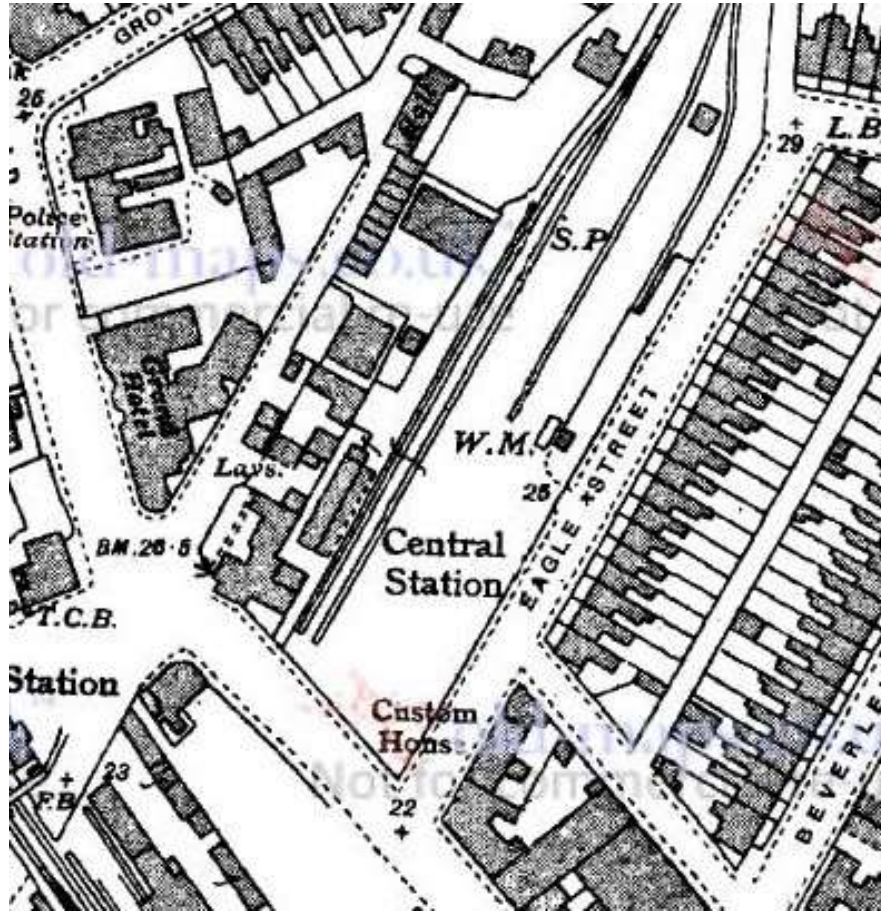
1872



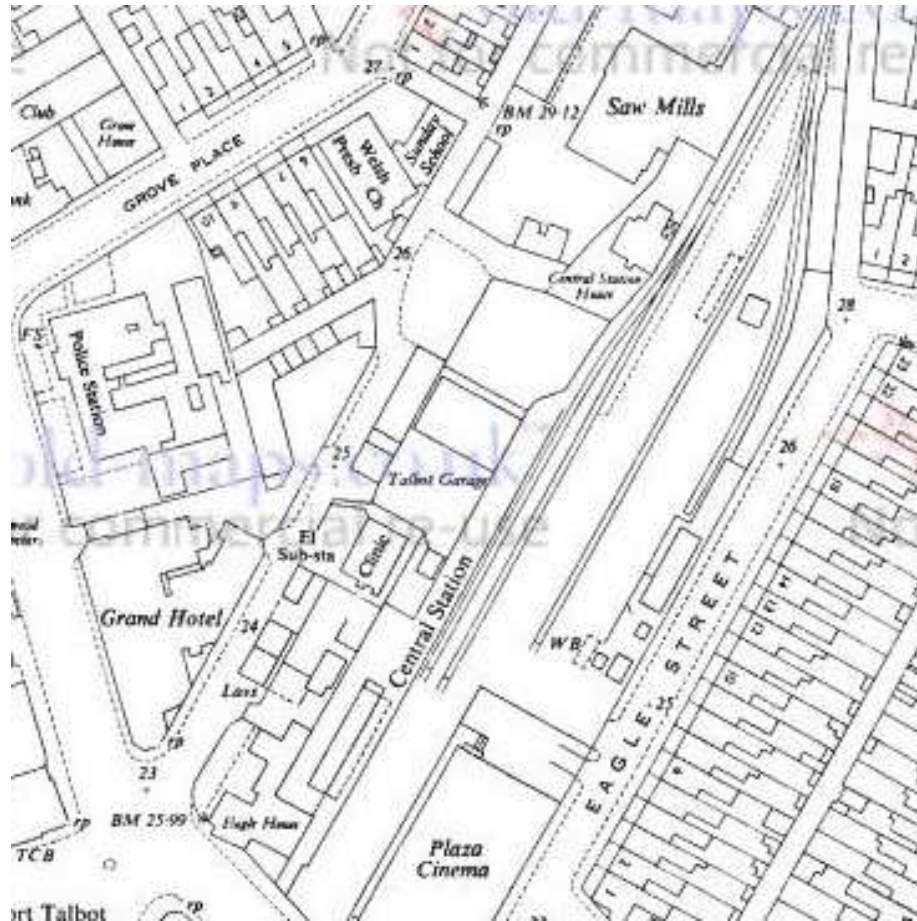
1899



1917



1937



1952



1967

APPENDIX B

Principles of Environmental Risk Assessment

The Environmental Protection Act 1990, Part II A Contaminated Land (Section 57 of the Environment Act 1995), revised by Scottish Statutory Instrument No.658 (2005), and the Contaminated Land Regulations 1999 provide a basis on which to determine the risks and liabilities presented by a contaminated site. Contaminated Land is defined within Annex 3, Chapter A Part 1- Scope of Chapter and in all those Sections mentioned as:

“Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that-

- (a) Significant harm is being caused or there is significant possibility of such harm being caused; or*
- (b) Significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused.”*

Section 57 of the Environment Act 1995 requires that any site identified as being “contaminated” by the Local Authority will be registered by them and remediation will be required to render the site fit for use.

The presence of contamination is not the sole factor for deciding whether a site is contaminated. Relevant parties should identify site-specific risks and provide objective, cost-effective methods to manage the contamination in a manner that satisfies the proposed end-use.

A risk-based approach, which takes both technical and non-technical aspects into consideration when making decisions on contamination resulting from past, present or future human activities, is advocated. The assessment of environmental risks generally relies on the identification of three principal elements forming a ‘pollutant linkage’:

- SOURCE:** the contaminant
- PATHWAY:** the route through which the contaminant can migrate, and
- RECEPTOR:** any human, animal, plant, water environment or property that may be adversely affected (harmed) by the contaminant

In the absence of any one of these elements, on any given site, there is no risk. Where all three elements are present, risk assessment is required to determine the significance of the harm that is being or may be caused. As outlined above, the terms of the Contaminated Land regime specify that remediation need only be implemented where a site is causing, or there is a significant possibility that it will cause, significant harm, or significant pollution to the water environment.

Development of contaminated land is usually addressed through the application of planning and development legislation and guidance (i.e. Planning Advice Note 33). The suitable for use approach is seen as the most appropriate to deal with contaminated land, taking account of environmental, social and economic objectives. The assessment is made in the context of the proposed land use (i.e. residential, retail, open-space and tourist developments).