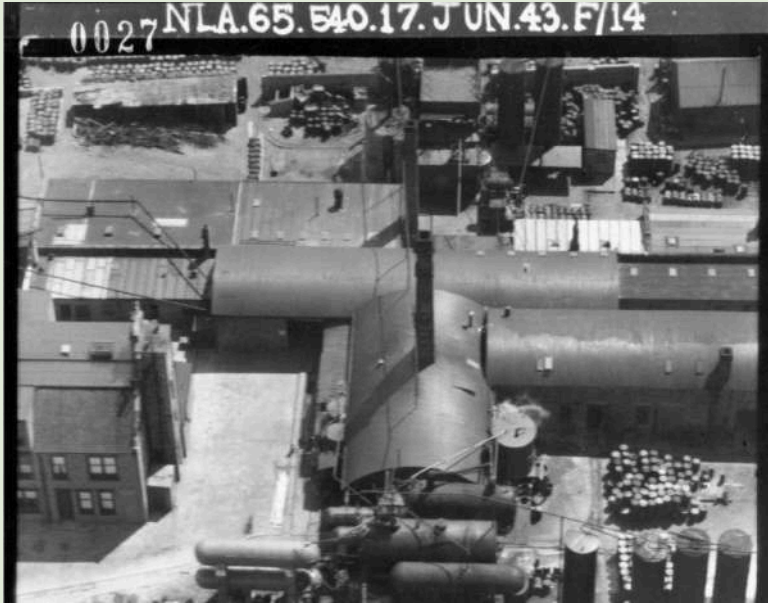


The Dowrie Works

An Investigatory Report
By Angus Clean Environments

March 2022



The Dowrie Works

An investigatory report written by Angus Clean Environments (ACE)

Background

The North British Chemical Works later known as the Dowrie Works or Bitumen Compound was established by William Briggs in 1890. Oil was refined from waste coal tar produced by the Arbroath Gas works and made into a range of bitumen products. The company occupied a large site on an area of coastline adjacent to Arbroath golf course, south of Elliot.

A lack of knowledge and poor practice at the time led to the disposal of waste by landfilling and tipping along the foreshore. Indeed, historic maps show the expansion of the site over the beach for use as a refuse tip. A survey by SCAPE in 2009 found a dump of demolition material consisting of brick, concrete lumps and iron, together with a makeshift coastal defence. The coastal defence extends two to three hundred metres and is formed of wooden barrels and oil drums filled with bitumen, with tar poured on top of them.

The Dowrie Works closed in 1968 and ownership of the land was transferred to Angus Council in 1979. Members of the public have been picking up lumps of bitumen waste from the shoreline for decades. However, it wasn't until 2005 that erosion exposed the extent of the waste along the site of the makeshift coastal defence. This was reported to Angus Council by a member of the public.

Freedom of Information Request

A Freedom of Information request was made to Angus Council in January 2022 to access every item of information held in relation to the Dowrie Works both current and historical. It was deemed necessary to make this request due to concerns about a lack of transparency and information about management of the site. It is important that the public understand the basis of decisions made by Council Officers and Elected Members.

The Freedom of Information request produced two significant reports. The first was written by Angus Council following discovery of the eroded waste site in 2005. (*"Report on the Proposed Extension to Rock Armour Coastal Protection at Dowrie Bitumen Works, Elliot, Arbroath. NGR 361294, 738161"* see Appendix 1). The second report was produced by T. A. Millard who were commissioned by Angus Council to undertake an investigation of the site in 2006. (*"Intrusive Site Investigation. Coastal Zone At Site of Former Bitumen Works Arbroath 2006"* see Appendix 2).

Angus Council's Report written between 2006-2009

This report set out the background to the Dowrie Works and clarified that Angus Council were the land owner. The report concluded that;

"There is a significant possibility of significant harm to human health from this waste being exposed due to erosion. The risk of harm in this case is believed to be heightened due to the fact that bitumen can become soft during warm weather and that potentially it can then be found covering the beach which is openly and freely used by the public as an amenity space.

The report also stated "the possibility exists that chemicals or substances worse in nature to the bitumen may be exposed given the ongoing erosion and ever changing condition of the site and the unknown make up of the waste deposited".

T.A. Millard's report 2006

Engineering company T.A Millard Scotland Ltd undertook an intrusive site investigation and produced a report for Angus Council. The investigation identified at least 3900 cubic feet of waste. However, they noted that the contaminated area could be vastly larger as the full dimensions were not fully identified through the course of the investigation. Key Information contained in this report can be summarised as follows;

- The scope of the investigation was selected on the basis of the remedial scheme that the Council had already decided it wanted to carry out which was to cover up the waste with rock

amour. The alternative option of removing the waste to a licensed facility was not considered feasible on the basis of cost, convenience and logistics.

- A soil leaching procedure was used to analyse substances with hazardous properties (HP). Copper is a carcinogenic substance (HP7) and was reported to be at a level four times greater than the threshold for causing harm and Nickel almost twice the level. Lead (HP10) can cause reproductive problems and was reported to be more than three times the threshold. Other substances such as Cadmium, Barium and Arsenic were also identified.
- T.A. Millard concluded that the site was a low hazard based on;
 1. The chemical make up of the contaminants
 2. The remoteness of the site
 3. The waste being generally below ground

In their conclusion T.A. Millard stated that a discussion was held with Angus Council during which it was decided that “the main problem associated with the waste was ‘a nuisance factor’, coupled with the fact that during the summer months the tar could become sticky and odorous when exposed to sunlight. T.A Millard therefore supported Angus Council’s preferred option to cover up the waste with membrane and rock armour. The Vice Convenor, Infrastructure Services said in a BBC report in 2009 that “while the waste materials were “unsightly”, they were not hazardous. The coastal strip was covered with rock armour at a cost of around £200,000. T.A. Millard also suggested that the length of the coastline be monitored to ensure that the same erosion did not happen again.

2009 - 2022

Between 2009 and 2022 lumps of bitumen continued to wash up on the beach between East Haven and Arbroath. Not realising that they were escaping from the contaminated site, members of EHT periodically disposed of bitumen rocks in the ‘rubble waste’ at the Recycling Centre in Arbroath. Rusted metal canisters have also been observed on the foreshore from time to time.

During a survey of the beach prior to the Great Angus Beach Clean in September 2021 sections of the affected coastal strip were observed to have significantly eroded. Tar was seen trickling out of the dunes and the air was filled with noxious fumes. Rolls of lead and ten rusted canisters containing waste and tar were found scattered over a large section of foreshore.

The Contaminated Land Officer from Angus Council visited a few days later. He had been involved in the decision to cover up the waste in 2009 so was familiar with the background to the site. He reiterated the view that the exposed waste presented simply a ‘nuisance’ and should be remediated by covering it up again with rock armour. Angus Council have confirmed that they hope to do this by the end of March 2022.

Discussion and Concerns

The FOI material obtained in Feb 2022 contains no evidence of any new investigatory work to assess risks and hazards. The decision to cover up the waste with rock armour again appears to be based on the recommendations made in the report by T.A. Millard sixteen years ago. However, the public have concerns about the limitations of the intrusive investigation which took place in 2006 and the subsequent report findings. In particular, Angus Clean Environments (ACE) highlight the following;

1. T. A. Millard clearly stated that the investigation was restricted by time scale and limited in its scope. They say that they did not have the time or resource to examine the area extensively or take samples to identify hot spots. Some of the sampling methods used in 2006 are no longer approved for use, for example, soil leaching procedures.
2. In the limited amount of sampling which T.A Millard did undertake, they found a number of hazardous substances at levels which could cause significant harm to human health. Despite this, they say in their conclusion that one of the reasons they assess the site as ‘low risk’ is because they are not concerned about the chemical make up of the contaminants. New

guidance on the classification of waste was introduced across the UK in 2015 and would support the need for further investigation.

3. The second reason T.A. Millard regarded the site as low risk was because of the sites remoteness. This is in conflict with Angus Councils own view in 2006 when they stated that the site is “used frequently by the public as an amenity space for dog walking especially and there is no reasonable way to deny access to the site”. Furthermore, in 2012 NCN1 was built across the site opening it up to large numbers of cyclists and walkers.
4. The third reason T.A Millard provided for grading the site as low risk was that the waste was generally below ground. It is correct that vast amounts of waste is buried underground particularly demolished buildings on the old site. However, the waste which was tipped across the coastal edge to form a barrier from the sea continues to erode. It has spilled onto the foreshore over many decades and some has entered the sea.
5. It is concerning that T.A.Millard state that the scope of the investigation was selected on the basis of the remedial scheme that the Council had already decided that it wanted to carry out. This raises concerns that the reports conclusions were designed to fit a predetermined outcome. It is also concerning that T. A. Millard state in their conclusion that a discussion was held with Angus Council during which it was decided that “the main problem associated with the waste was ‘a nuisance factor’”. The Land Contamination Officer used the term again in 2021. It appears that the word ‘nuisance’ was adopted by the Local Authority to describe a site which they had designated contaminated and at risk of causing significant harm. This was inappropriate given that the term ‘statutory nuisance’ does not apply to contaminated land sites such as the Dowrie Works. It is specifically excluded. (section 79 of the Environmental Protection Act 1990). This leaves the public to ponder about why the Local Authority would choose to use terminology designed to trivialise the nature of the contaminated waste. It may even provide an explanation as to why the Vice Convenor for Infrastructure services was persuaded to describe the waste materials as “unsightly”and not hazardous.
6. Angus Council has a legal duty under the Environmental Protection Act 1990:
 - to identify Contaminated Land in its area;
 - to ensure clean-up of land, where required; and
 - to maintain a register of Contaminated Land.

To the astonishment of ACE it has been discovered that Angus Council has not designated the land at the former Dowrie Works as a contaminated land site. An enquiry with SEPA in March 2022 revealed that they have no record of any discussions relating to the Dowrie Works and no knowledge of the site. As far as we have been able to elicit, Angus Council has no register of contaminated land sites at all. ACE can only assume that Angus Council have taken the view that by covering over the waste with membrane and gabion boulders that they have broken the pollutant linkages. However, given that the site is subject to erosion then that interruption of the contaminant and receptor pathway can not be guaranteed. T.A. Millard stated that the site would require monitoring due to ongoing erosion. In their report of 2006 Angus Council said that “the possibility exists that chemicals or substances worse in nature to the bitumen may be exposed given the ongoing erosion and ever changing condition of the site and the unknown make up of the waste deposited”. It is not clear what monitoring procedures were in place following the works in 2009 or how long solid materials have been escaping from the site. ACE would therefore argue that Angus Council should have registered the site not just as a contaminated land site but also as a special site. Section 2c (1) of the Contaminated Land (Scotland) Regulations 2000 requires all sites which have been involved with the refining of oil and bitumen products at any time to be registered as a special sites.

7. There is no evidence that there has been any discussion at any time with SEPA about the contaminated land at the former Dowrie Works. By not registering the Dowrie Works as a contaminated land and special site Angus Council retain all decision making powers in relation to monitoring and remediation options.

Conclusion

In reviewing the two reports in to contamination at the former Dowrie Works, it is apparent that Angus Council worked closely with T.A. Millard in 2006 to achieve the remediation outcome they wanted. The Angus Council Contaminated Land Officer and Engineering and Design staff provide glowing testimonials for T.A. Millard on their web-site. It seems reasonable to consider whether there has been sufficient independent scrutiny and transparency in the decision making process both in 2006 and 2022. Whilst we agree that further short term work requires to be undertaken as a matter of urgency, we believe a further intrusive investigation may need to be undertaken to fully assess current risks and hazards.

ACE would argue that the former Dowrie Works should be registered both as a contaminated land site and a special site. To not do so is disingenuous especially when strategic documents such as the Angus Shoreline Management Plan 2 continue to refer to the area as contaminated land. SeaGreen Wind Energy in their survey report of 2012 said that; "it became apparent through consultation with Angus Council that the former works present significant potential for contaminated ground with unknown hazards which require to be avoided".

ACE would also suggest that the Environmental Protection Act 1990 should be amended to ensure that land owners of contaminated sites should not be permitted to also assume the role of enforcing authority. There is a clear conflict of interest between these two roles.

The public fully appreciate that alternative remediation options could run into millions of pounds. However, if that is the most effective way to protect the environment and secure the area for future generations then this is something which we would like Angus Council to work towards. It is not desirable or sustainable to repeatedly cover up an eroding contaminated site of this magnitude with gabion boulders decade after decade.

Finally, ACE totally agree that it is unreasonable for Local Authorities to bear the burden of cleaning up historically contaminated land. Whilst the Scottish Government make resources available from time to time to undertake work of this nature it would also seem appropriate to make use of community benefit funds from from major investors in the area.

Report on the Proposed Extension to Rock Armour Coastal Protection at Dowrie Bitumen Works, Elliot, Arbroath. NGR 361294, 738161

This report details the identified problem at an area of land known as Dowrie Works, located on the coast about a mile south of Elliot adjacent to the Arbroath Golf Club (Appendix 1). Also included here is the determination given to the contaminated area of land as defined in the Environmental Protection Act 1990: Part IIA.

The site occupies an area of grassy sand dunes sandwiched between the main north-south railway line and the beach, and covers an area of about 3.2 ha. The factory appears to have been serviced partly by a rail siding and partly by a single track road which crosses the railway beside the golf course green keepers huts.

A fresh water culvert runs across the golf course and through the site exiting at a large concrete sea outfall. The existing rock armour has been placed for a 100m stretch north of the concrete outfall (see Photo 1). A further 100m length of unprotected coastline to the north continues to be eroded, exposing the previously deposited waste materials (see Photo 2). No significant protection exists to the south of the outfall but this does not appear to present a problem (see Photo 3).

Over the years of operation the bitumen factory was expanded several times and as part of this expansion it appears to have been necessary to add to the coastline in order to make extra space. Historic maps actually show the expansion of the site over the beach as a refuse tip. However, it is unfortunate that the rock armour that was placed to protect the new outfall did not continue for the entire length of the filled material.

Following a complaint from a member of the public regarding pools of bitumen on the beach, officers from the Environmental Health Department visited the site to assess the problem. It was decided that the issue might best be dealt with under the contaminated land regime.

The first step taken was to assess ownership and having referred to the Sasine Register, Angus Council was identified as the current site owner (Appendix 2). However, in referring to the areas identified within the deeds as being part of the site, it was discovered that the filled material was largely outside of this on the foreshore. Having consulted with Angus Council officers in Legal Services, it was advised that the areas of ground as shown in the descriptive writ are described as being areas of ground between the railway and the sea. Judicial interpretation provides that where the subjects are bounded by the sea the boundary extends to the low-water mark of ordinary spring tides, including the foreshore. In the circumstances it would therefore be reasonable to assume that the effective ownership of Angus Council does extend to the foreshore.

The mass of waste is seen as one large relatively continuous deposit of bitumen, but this is partly because as the waste material is exposed by erosion, it softens during warm weather and covers the face. In reality we do not know exactly what makes up the deposits, especially as the historic maps indicate a "refuse tip" in the area. In assessing the preferred remedial solution, it was necessary to know more about the extent of the waste and to inform on the relative volume of deposited material. It was necessary to assess whether the waste merited protection from further erosion, compared to the cost of simply removing it for off site disposal. In order to do this an intrusive site investigation was conducted (Appendix 4). Given that the waste extended back significantly away from the beach it was decided that the removal of the waste would be cost prohibitive, as well as being operationally difficult.

The alternative solution was to provide an erosion protection that would render the material immobile in the environment. Angus Council Roads Department has conducted a feasibility study and design for the proposed rock armour protection. Initially cost estimates from contractors were very high and funds were not available, however a more recent tendering exercise has provided a more realistic quote and the funds for this level of spend have been earmarked. A copy of the tender report can be seen in (Appendix 5).

The following guidance is taken from the Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance: Edition 2.

Significant Harm and the Significant Possibility of Significant Harm

Section 78A(4) of the Environmental Protection Act 1990: Part IIA - Contaminated Land, defines "harm" as meaning "harm to the health of living organisms or other interference with the ecological systems of which they form part and, in the case of man, includes harm to his property". Section 78A(5) provides that what harm is to be regarded as "significant" and whether the possibility of significant harm being caused is significant shall be determined in accordance with the statutory guidance.

What Harm is to be Regarded as "Significant"?

The local authority should regard as significant only harm which is both:

- (a) to a receptor of a type listed in Table A of the statutory guidance; namely **Human Beings; Ecological Systems or Living Organisms** forming part of such systems within certain designated areas; **Property** in the form of crops, including timber; produce grown domestically, or on allotments, for consumption; livestock; other owned or domesticated animals; wild animals which are the subject of shooting or fishing rights; or property in the form of buildings.
- (b) within the description of harm specified for that type of receptor in that Table.

The local authority should consider the "current" use of the land, and this can be taken to include any likely informal recreational use of the land, whether authorised by the owners or occupiers or not, (for example, children playing on the land); however, in assessing the likelihood of any such informal use, the local authority should give due attention to measures taken to prevent or restrict access to the land.

The receptors assessed as at risk in this case are:

A human health effect defined as death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments.

The area is used frequently by the public as an amenity space for dog walking especially and there is no reasonable way to deny access to the affected area. Large pieces of buried material containing drums of bitumen and other detritus from the decommissioned factory, often find their way onto the foreshore due to the corrosion of exposed metal drums releasing large bitumen lumps, and this is exaggerated by the softening effect of the sun's heat on warmer days. This presents the double hazard of producing pools of soft sticky bitumen, as well as leaving dangerous sharp metal protuberances.

An ecological system effect defined as any ecological system, or living organism forming part of such a system, within a location which is, an area notified as an area of special scientific interest (commonly called a Site of Special Scientific Interest – SSSI) under section 28 of the Wildlife and Countryside Act 1981. For any protected location, harm which results in an irreversible adverse change, or in some other substantial adverse change, in the functioning of the ecological system within any substantial part of that location; or harm which affects any species of special interest within that location and which endangers the long term maintenance of the population of that species at that location.

In addition, in the case of a protected location which is a European Site (or a candidate Special Area of Conservation or a potential Special Protection Area), harm which is incompatible with the favourable conservation status of natural habitats at that location or species typically found there.

There is a SSSI environmental designation at Elliot Links less than 500m north along the beach. This site supports nesting little terns just to the south of the burn. The stable dune system supports several rare plants including small scabious and nationally rare sea pea, as well as several uncommon species of invertebrates.

Whether the Possibility of Significant Harm Being Caused is Significant?

The local authority should take into account the following factors in deciding whether the possibility of significant harm being caused is significant:

- (a) the nature and degree of harm;
- (b) the susceptibility of the receptors to which the harm might be caused; and
- (c) the timescale within which the harm might occur.

The factors considered in looking at significant possibility in this case are:

Human health effects arising from the intake of a contaminant, or other direct bodily contact with a contaminant (exposure), if the amount of the pollutant in the pollutant linkage in question which a human receptor in that linkage might take in, or to which such a human might otherwise be exposed, as a result of the pathway in that linkage, would represent an unacceptable intake or exposure, assessed on the basis of relevant information on the toxicological properties of that pollutant.

Such an assessment should take into account the likely total intake of, or exposure to, the substance or substances which form the pollutant, from all sources including that from the pollutant linkage in question; the relative contribution of the pollutant linkage in question to the likely aggregate intake of, or exposure to, the relevant substance or substances; and the duration of intake or exposure resulting from the pollutant linkage in question. The question of whether an intake or exposure is unacceptable is independent of the number of people who might experience or be affected by that intake or exposure.

Toxicological properties should be taken to include carcinogenic, mutagenic, teratogenic, pathogenic, endocrine disrupting and other similar properties. The chemical constituents within bitumen can be generally described as a mixture of PAHs or polycyclic aromatic hydrocarbons, but the exact makeup will vary greatly. Other elements such as sulphides and metals are also present. This mixture of chemicals means that bitumen (in this case we don't know the exact type or form) could be described as having the same classification as many of the mixed petroleum products listed in technical indices. Many of these petroleum products will have some or all of the toxicological properties listed above.

All other human health effects (particularly by way of explosion or fire), if the probability, or frequency, of occurrence of significant harm of that description is unacceptable, assessed on the basis of relevant information concerning that type of pollutant linkage, or that type of significant harm arising from other causes. Such an assessment should take into account the levels of risk which have been judged unacceptable in other similar contexts.

In making any assessment of what is an unacceptable probability or frequency, in relation to this effect, the local authority should give particular weight to cases where the pollutant linkage might cause significant harm which:

- (a) would be irreversible or incapable of being treated;
- (b) would affect a substantial number of people;
- (c) would result from a single incident such as a fire or an explosion; or
- (d) would be likely to result from a short-term (that is, less than 24-hour) exposure to the pollutant.

All ecological system effects, if significant harm of that description is more likely than not to result from the pollutant linkage in question, taking into account relevant information for that type of pollutant linkage, particularly in relation to the ecotoxicological effects of the pollutant.

Contaminated Land Determination

Having considered the guidance above the definition of contaminated land is described 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 SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused". Furthermore the statutory guidance uses the concept of a "POLLUTANT LINKAGE" – that is, a linkage between a CONTAMINANT and a

Coast Protection Works at Dowrie Works, Elliot, Arbroath

RECEPTOR, by means of a PATHWAY. The CONTAMINANT may be described as a POLLUTANT only when a PATHWAY and RECEPTOR are present.

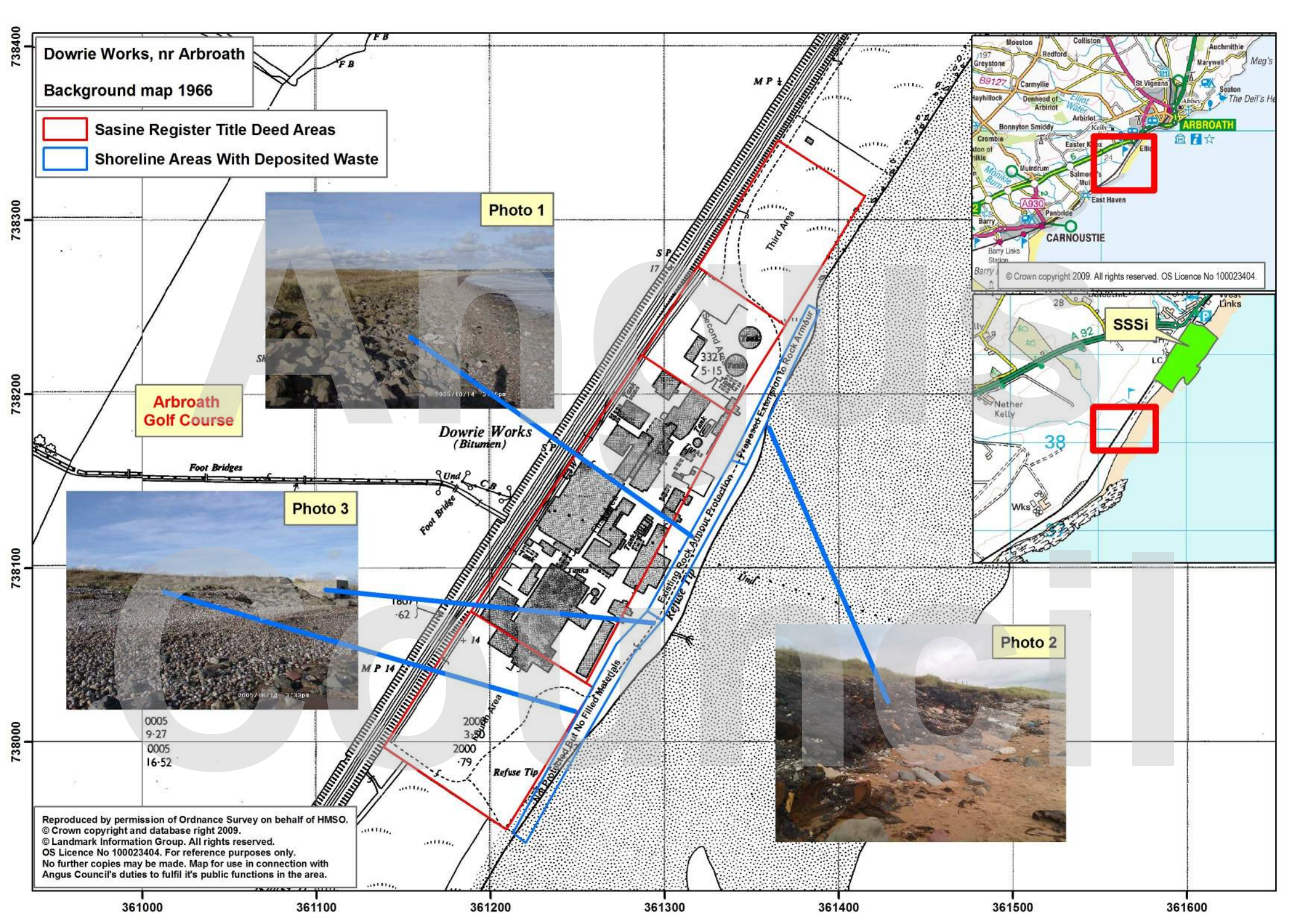
In the case described at Dowrie Works it would seem reasonable to assess that there is a significant possibility of significant harm to human health from the waste being exposed due to erosion. The risk of harm in this case is believed to be heightened due to the fact that the bitumen can become soft during warm weather, and that potentially it can then be found covering the beach which is openly and freely used by the public as an amenity space.

In considering the potential for harm to any ecological system it would be necessary to determine the likelihood of this type of impact. It would seem reasonable to assume that given the length of time the erosion of bitumen type material has been occurring, that the risk to the neighbouring SSSI is minimal especially as there is no current observed impact. However, it may be prudent to adopt a more conservative view as the Part IIa contaminated land regime only requires that the test of significant possibility is passed. The possibility exists that chemicals or substances worse in nature to the bitumen may be exposed given the ongoing erosion and ever changing condition of the site, and the unknown makeup of the waste deposited.

Coast Protection Works at Dowrie Works, Elliot, Arbroath

Appendix 1

Dowie Works Plan & Photos



Dowie Works, nr Arbroath
Background map 1966

- Sasine Register Title Deed Areas
- Shoreline Areas With Deposited Waste



Arbroath Golf Course



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 © Landmark Information Group. All rights reserved.
 OS Licence No 100023404. For reference purposes only.
 No further copies may be made. Map for use in connection with
 Angus Council's duties to fulfil it's public functions in the area.

0005
 9-27
 0005
 16-52

2006
 3-20
 2000
 -79

361000 361100 361200 361300 361400 361500 361600

738400
 738300
 738200
 738100
 738000

Coast Protection Works at Dowrie Works, Elliot, Arbroath

Appendix 2

Sasine Register Ownership Deed



REGISTERS DIRECT



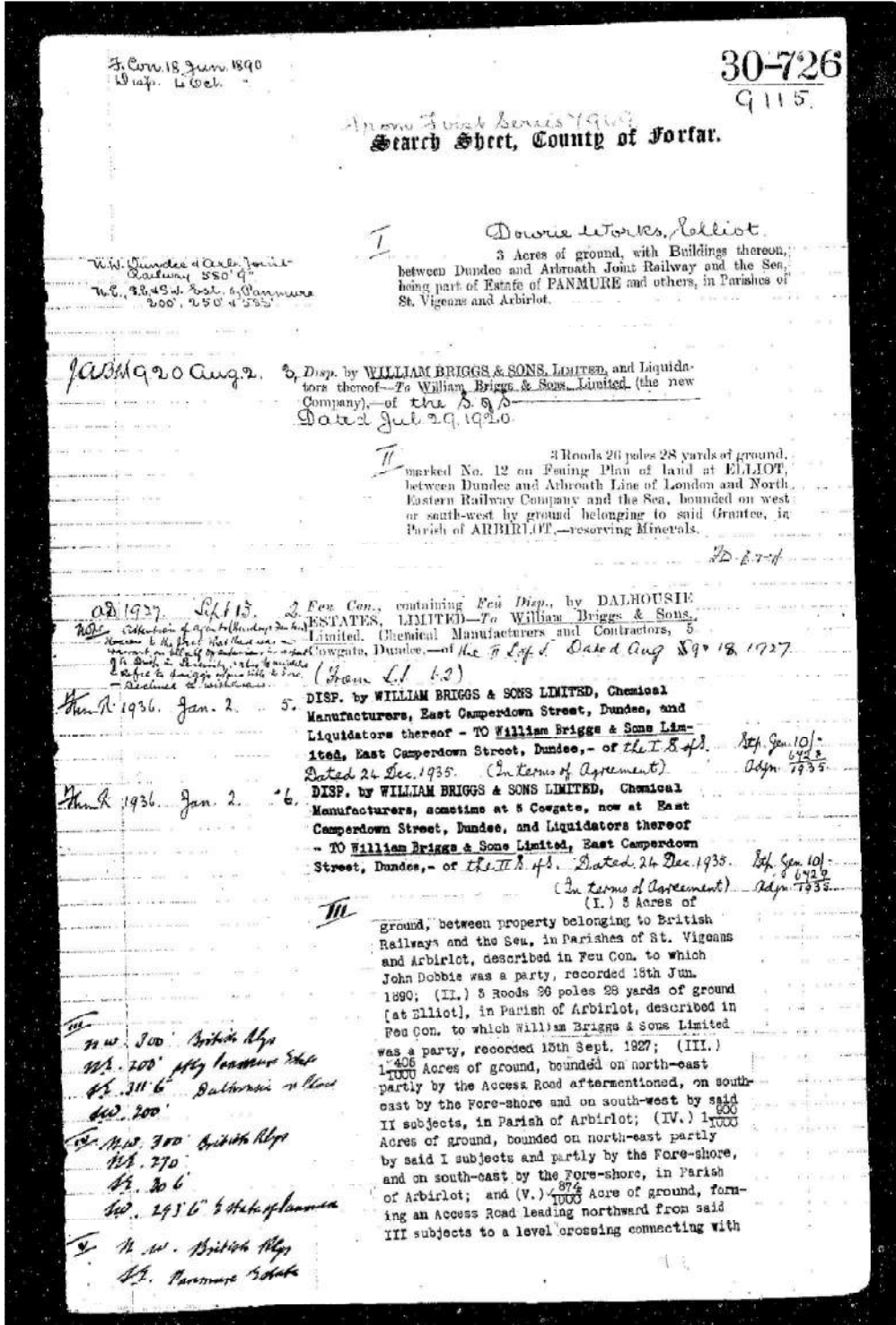
SASINE REGISTER

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County: ANGUS
Search Sheet Number: 9115

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Time: 11:11:23

This search is not covered by the Keeper's Indemnity.
This copy does not have any evidential status.



Feu Con. 18 Jun 1890
Diap. 4666

30-726
9115

Angus Feudal Series 79115
Search Sheet, County of Forfar.

W. Dundee & Arbroath Joint
Railway 580' 9"
W. 32' 45" S. Est. of Panmure
200', 250' 450'

I

Dunrobin Works, Elliot.

3 Acres of ground, with Buildings thereon,
between Dundee and Arbroath Joint Railway and the Sea,
being part of Estate of PANMURE and others, in Parishes of
St. Vigons and Arbirlot.

1890 Aug 2.

Disp. by WILLIAM BRIGGS & SONS LIMITED, and Liquidators thereof - To William Briggs & Sons Limited (the new Company), - of the S. & S.
Dated Jul. 29, 1920.

II

3 Rods 26 poles 28 yards of ground,
marked No. 12 on Feuing Plan of land at ELLIOT,
between Dundee and Arbroath Line of London and North
Eastern Railway Company and the Sea, bounded on west
or south-west by ground belonging to said Grantee, in
Parish of ARBIRLOT. - reserving Minerals.

1897 Sept 15.

2 Feu Con., containing Feu Disp., by DALHOUSIE
ESTATES, LIMITED - To William Briggs & Sons
Limited, Chemical Manufacturers and Contractors, 5
Cowgate, Dundee. - of the 7th Sep. Dated Aug 18, 1927.
(From C. 1. 1. 2)

1936 Jan. 2.

5. DISP. by WILLIAM BRIGGS & SONS LIMITED, Chemical
Manufacturers, East Camperdown Street, Dundee, and
Liquidators thereof - To William Briggs & Sons Limited,
East Camperdown Street, Dundee, - of the I. S. of S.
Dated 24 Dec. 1935. (In terms of Agreement)

Rep. Jan 10/
642
Adm. 1935

1936 Jan. 2.

6. DISP. by WILLIAM BRIGGS & SONS LIMITED, Chemical
Manufacturers, sometime at 5 Cowgate, now at East
Camperdown Street, Dundee, and Liquidators thereof
- To William Briggs & Sons Limited, East Camperdown
Street, Dundee, - of the II. S. of S. Dated 24 Dec. 1935.
(In terms of Agreement)

Rep. Jan 10/
642
Adm. 1935

III

ground, between property belonging to British
Railways and the Sea, in Parishes of St. Vigons
and Arbirlot, described in Feu Con. to which
John Dobbie was a party, recorded 18th Jun.
1890; (II.) 3 Rods 26 poles 28 yards of ground
(at Elliot), in Parish of Arbirlot, described in
Feu Con. to which William Briggs & Sons Limited
was a party, recorded 15th Sept. 1927; (III.)
1⁴⁰⁰/₁₀₀₀ Acres of ground, bounded on north-east
partly by the Access Road aftermentioned, on south-
east by the Fore-shore and on south-west by said
II subjects, in Parish of Arbirlot; (IV.) 1⁶⁰⁰/₁₀₀₀
Acres of ground, bounded on north-east partly
by said I subjects and partly by the Fore-shore,
and on south-east by the Fore-shore, in Parish
of Arbirlot; and (V.) 4⁸⁷⁶/₁₀₀₀ Acre of ground, form-
ing an Access Road leading northward from said
III subjects to a level crossing connecting with

71 w. 300' British Alps
203. 200' 48y Leathen Sch
43. 311' 6" Balthornie in Hill
462. 200'
14. 14. 300' British Alps
128. 770'
43. 30 6'
200. 243' 6" 3 Huts of Panmure
7. 12 w. British Alps
43. Panmure Sch



REGISTERS DIRECT



SASINE REGISTER

Username: ilnala
User Reference:

Search No: 2006-0175388
County: ANGUS
Search Sheet Number: 9115

Date: 27/01/06
Time: 11:12:46

This search is not covered by the Keeper's Indemnity.
This copy does not have any evidential status.

30-727

Search Sheet, County of Forfar.

9115

branch roadway leading to main Dundee Arbroath Road at Elliot, being all parts of Lands and Barony of PANMURE and others, described in Extract Decr. of Sp. Serv. of Arthur George Maule Ramsay, recorded 5th Oct. 1886, - reserving right of access over said Access Road, - under burden of Feu-rights of said I and II subjects.

1951 Feb. 28. 1 DISP. by THE DALHOUSIE ESTATES LIMITED, Brechin - TO William Briggs & Sons Limited, Chemical Manufacturers, Dundee, - of *the IIIrd Dept. Bala Feb. 12, 1951.*

(from Act 62) £1200

1951 June 1. 22 *Disch. part length on Act 62*

1951 June 1. 23 *Disch. part length on Act 62*

3454 (No.48) Jun. 7. 1972. 10-10.30 3574.150.
AGREEMENT containing DISP. by BRIGGS AMASCO LIMITED (formerly WILLIAM BRIGGS & SONS LIMITED) - TO Scottish Gas Board, - of servitude right of laying down &c. pipe along Line I to J on Plan for 460 Yards in and through subjects formerly known as DOWRIE WORKS, ELLIOT, Arbroath (now demolished). Dated Mar. 1, 2 and 13, 1972.

£23.

02010 (No.108)30 Apr. 1979 10-10.30 (By Post) 4133.233
CONVEY. by BRIGGS AMASCO LIMITED (formerly WILLIAM BRIGGS AND SONS LIMITED) - TO ANGUS DISTRICT COUNCIL, - of subjects at ELLIOT, part of lands and Barony of PANMURE and others, I, II, III, IV and V described in Disp. to said Granter, recorded 28 Feb. 1951 (under exception of subjects in Agreement to which said Granter was a party, recorded 7 Jun. 1972). Dated 2 Dec. 1977.

£200.

507.

Continue against No. subjects on No. 1 P.C.

PRINT

CLOSE

Coast Protection Works at Dowrie Works, Elliot, Arbroath

Appendix 3

Site Photos for Comparison 2005-2009

Coast Protection Works at Dowrie Works, Elliot, Arbroath



Coast Protection Works at Dowrie Works, Elliot, Arbroath



Coast Protection Works at Dowrie Works, Elliot, Arbroath



Coast Protection Works at Dowrie Works, Elliot, Arbroath



Coast Protection Works at Dowrie Works, Elliot, Arbroath



Appendix 2

Coast Protection Works at Dowrie Works, Elliot, Arbroath

Appendix 4

Intrusive Site Investigation April 2006

Millard Consulting Ltd



Our Ref: CM/LM/1011

RECEIVED
5 - MAY 2006

28th April 2006

FAO [REDACTED]
Contaminated Land Officer
Angus Council
Town House
High Street
Montrose
DD10 8QL

INFRASTRUCTURE
HIGHWAYS
HYDROLOGY
SURVEYING
ENVIRONMENT
STRUCTURES
MANAGEMENT
EXPERT EVIDENCE
TRANSPORTATION

Dear [REDACTED]

RE: FORMER BITUMEN WORKS, ARBROATH

Please find enclosed two bound copies of the report for the above project.

We trust that we have interpreted your requirements correctly and that the enclosed reports are satisfactory and sufficient for your requirements and we look forward to hearing from you in due course.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'C. [REDACTED]'. Below the signature is a large black rectangular redaction box.

Encls.

**INTRUSIVE SITE INVESTIGATION
COASTAL ZONE AT SITE OF FORMER BITUMEN
WORKS, ARBROATH**

APRIL 2006

REPORT REF: 5508/04/CM/04-06/1224

INTRUSIVE SITE INVESTIGATION
COASTAL ZONE AT SITE OF FORMER BITUMEN WORKS,
ARBROATH

APRIL 2006

REPORT REF: 5508/04/CM/04-06/1224

CLIENT: Angus Council

ENGINEER: T A Millard Scotland Ltd
2 Whitefriars Crescent
Perth
PH2 0PA

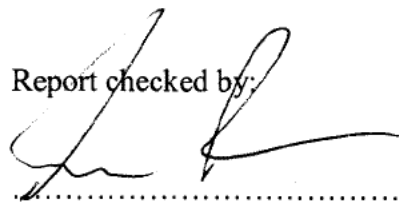
Tel: 01738 638141
Fax: 01738 638157

Report prepared by:



.....
[Redacted]

Report checked by:



.....
[Redacted]

CONTENTS

1. Introduction
2. Site investigation
3. Conclusions and Recommendations

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- A) Site Plans
Figure 1 – Trial Pit Location Plan
- B) Materials Testing Report (ref. S23223) by Scientific Analysis Laboratories
- C) Photographs
- D) Notes on Limitations

1.0 Introduction

- 1.1 This report has been prepared by TA Millard Scotland Limited for the benefit of Angus Council and their advisors only, no third party liability or duty of care is extended. Third parties using any information contained in this report do so at their own risk.
- 1.2 The following report has been prepared using information available at the time of writing only and no liability is taken for information which has become available since this time.

Background

- 1.3 The site is located on the Scottish coastline approximately 5 miles south of Arbroath adjacent to the Arbroath Golf Club.
- 1.4 The geographical area of the site contains a fresh water sea outfall and a length of rock armour for coastal protection. The outfall is for fresh water which flows across the adjacent golf course, below the railway line through a culvert and out to sea through a purpose built concrete outfall. The rock armour is located to the north east of this outfall and is 100m in length and provides a protective shield to the coastline, this armour also stretches approximately 10m to the south west of the outfall although the condition of this area is somewhat dilapidated.
- 1.5 The site investigation area was accessed by crossing the Arbroath coastal railway and travelling south along a single track coastal path for approximately 1.5 miles. The nearest crossing point is an un manned crossing to the south east of the golf club house adjacent to the clubs maintenance facility.

History

- 1.6 During the previous site use as a bitumen works, this section of the Arbroath coastline was reinforced using waste materials produced by the facility.
- 1.7 From available information it would appear that these waste materials were placed / disposed of in front of the facility in the form of a landfill to create a protective barrier designed to reduce erosion by the North Sea.
- 1.8 It would appear that at a later date this barrier was further added to with a layer of subsoil / sand based materials to the seaward side with the rock armour previously identified implemented along one 100m stretch from the outfall.
- 1.9 Over time, the seaward facing area to the north east of the rock armour has been eroded, exposing the bitumen materials behind. The exposed materials are increasing in amount and number, have been washed on to the beach in some cases and are generally prone to melting / becoming sticky and odorous in summer months.
- 1.10 This intrusive site investigation and assessment has been designed to ascertain the type and amount of bitumen materials located within the barrier (both behind and outside the rock armour protection zone) and assess the best remedial options for the sea defences

in this area in order to protect the coastline, remove the bitumen from public access and ensure that the coastline is not impacted in any way.

1.11 Information available at this time is:

- Historical plan records provided by Angus Council

1.12 The works undertaken by TA Millard Scotland Limited comprised:

- Excavation of a number of trial trenches along the barrier area,
- Sampling and laboratory testing of a bitumen sample for geo chemical parameters and waste management criteria

The locations of these exploratory trial trenches are shown on the trial pit location plan which is located to the rear of this document.

2.0 Site Investigation

2.1 Works Completed

The site investigation undertaken by TA Millard on 24th March 2006 was primarily focused on the area of coastline located to the north east of the end of the rock armour and was designed to assess the amount of bitumen materials located within this area of erosion.

For completeness and to gain extra information, TA Millard also undertook an assessment of the materials located behind the rock armour section of coastline and those located to the south west of the outfall.

2.2 Ground Conditions Encountered

Ground conditions were generally constant across the site area which was investigated and consisted of 0.3m of sandy topsoil materials located above the bitumen waste materials.

The bitumen waste was black in colour and mixed with brick, concrete and metal fragments (see photographs below).



In all cases the bitumen waste identified in all the trial holes was very hard and could not be excavated, therefore an accurate assessment of the depth of waste materials present could not be undertaken.

However, it is believed from historic information that the bitumen waste materials would have been placed initially at beach level and built up from there to provide protection to the existing coastal zone which was weak and being eroded.

2.3 Site Works

The first stage of the intrusive investigation comprised the excavation of nine trial trenches at varying distances to the north east of the rock armour.

These trenches varied in location from: trench 1 which was located at the end of the rock armour to trench 9 which was 53m to the north east of the end of the rock armour.

During the investigation, bitumen waste deposits were identified within the following trenches (distances are measured from the edge of the coastline to the edge of the bitumen where identified):

Trench	Distance (m)	Comments
1	>16m	Trench was terminated 16m from the coastline due to footpath, bitumen waste was still present
2	>15m	Trench was terminated 15m from the coastline due to footpath, bitumen waste was still present
3	>15m	Trench was terminated 15m from the coastline due to footpath, bitumen waste was still present
4	n/a	No bitumen waste identified, concrete slab identified within southern part of trench stopped further excavation
5	>4m	Trench was parallel to coastline and bitumen waste was identified across its complete width
6	4.5m	Bitumen waste was present from the coastline to 4.5m
7	3m	Bitumen waste was present from the coastline to 3m
8	1.5m	Bitumen waste was present from the coastline to 1.5m
9	n/a	No bitumen identified

The above trenches are shown diagrammatically on the trial pit location plan to the rear of this document.

The second stage of the investigation comprised the excavation of four further trial trenches at locations behind the rock armour and to the south west of the outfall.

These locations varied from: trench 10 which was located 28m to the south east of the outfall to trench 13 which was 65m to the northeast of the outfall and located behind the rock armour.

Bitumen deposits were identified within the following trenches (distances are measured from the edge of the coastline to the edge of the bitumen where identified):

Trench	Distance (m)	Comments
10	>10m	Trench was terminated 10m from the coastline due to footpath, bitumen waste was still present
11	>13m	Trench was terminated 13m from the coastline due to footpath, bitumen waste was still present
12	>18m	Trench was terminated 18m from the coastline due to footpath, bitumen waste was still present
13	>20m	Trench was terminated 20m from the coastline due to footpath, bitumen waste was still present

The above trenches are also shown diagrammatically on the trial pit location plan at the rear of this document

2.4 Volumes

From available information at this time it is clear that the bitumen waste materials cover an area of at least 2600m² and that the depth would be expected to be greater than 1.5m across most of that area giving a total volume of greater than 3,900m³.

It should be noted this area could be vastly larger as the full dimensions were not identified during the investigation although it is felt that this is unlikely from historic plans.

Should this material be removed from site it would need to be removed in road going trucks which have a capacity of 18m³ which would mean a minimum of 220 trucks.

2.5 Geochemical Testing

A sample of the bitumen materials was taken by TA Millard and tested to ascertain its waste properties in order to assess potential disposal options should the materials be required to be removed from site.

The Waste Acceptance Criteria Test (see Appendix C for full listing of results) was completed for the majority of acceptable criteria although the type of sample (bitumen is rubbery and so cannot be crushed into very small samples very easily) limited one series of tests (PCBs).

The results appear to indicate that the sample would be viewed as non hazardous waste by landfill operators and can therefore be taken to any number of landfills within the Arbroath / Angus area.

However, TA Millard would suggest that the results schedule should be forwarded to landfill operators to ensure suitability and acceptability for the specific landfill and to gain prices for disposal prior to any kind of excavation being attempted.

3.0 Conclusions and Recommendations

Due to the remote location of the site, the chemical make up of the materials and the fact that they are generally located below ground level, the risks to human health, ground water and surface water (the three receptors usually assessed under contaminated land legislation) are considered to be low.

After discussions with Angus Council it is considered that the main problem associated with this waste material is the nuisance factor of it being exposed within the coastal embankments and in some cases located on the beach itself coupled with the fact that during summer months, when exposed to sunlight bitumen materials can become sticky and odorous.

Ordinarily this type of material could easily be excavated and removed from site, disposed of at a suitably licensed facility and replaced with more suitable imported materials.

However, in this case there are a number of reasons why this is not an ideal solution:

1. The logistics and high costs associated with removing such a large amount of materials from the remote location to a suitable facility (materials would need to be moved in large heavy trucks along the single track coastal road, crossing two small bridges and across the unmanned railway crossing and along a further single track unmade road before accessing public highways)
2. The logistics and high costs associated with sourcing, transporting and placing any replacement materials (again materials would need to be moved in large heavy trucks from the public highway down the single track unmade road, across the unmanned railway crossing and along the single track road to the placement location).
3. The inconvenience factor of the coastal footpath being closed for long periods of time to facilitate works.
4. The problems involved in excavating the bitumen materials which are compacted and difficult to excavate.

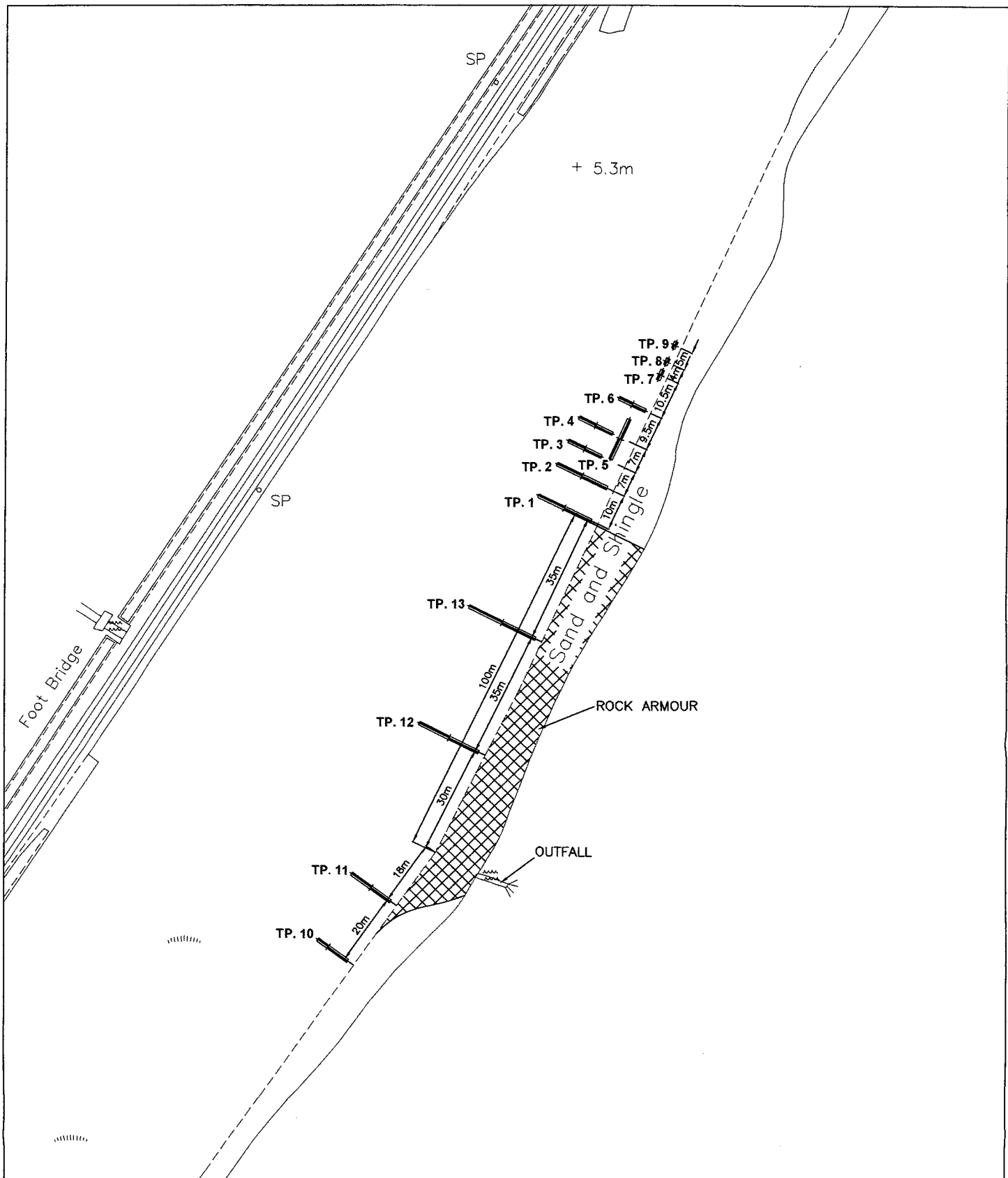
With the above points in mind TA Millard Scotland Limited would suggest that a more suitable remedial option would be the rock armour protection zone being developed and extended 50m to the north east to ensure that bitumen materials are protected and secure.

We would also suggest that the length of coastline to the south west should be monitored to ensure that the same erosion is not happening in this area (currently this area would appear to be substantially unaffected).


We consider that the following would be the best option for a number of reasons (logistics, cost, convenience and timescales) to remediate the affected length of coastline, protect and secure the bitumen materials and ensure limited access to the materials by the general public.

APPENDIX A

Site Plans



LEGEND:


 - DENOTES LOCATION OF TRIAL PIT

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LICENCE NUMBER AL100005494.

REV	AMENDMENT DETAILS	DRAWN	APPROVED	DATE

PROJECT ARBROATH COASTAL ZONE	DESIGNED AND DRAWN BY ASB	SCALE 1:1000
	APPROVED BY CM	CHECKED BY CM
DRAWING TITLE TRIAL PIT LOCATION PLAN	DRAWING STATUS	DATE 24.4.06
	CAD REFERENCE FILE NUMBER 5508_04_001_	
CLIENT ANGUS COUNCIL	DRAWING NUMBER 5508/04/001	REVISION

T A Millard Scotland Limited
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www.tomillard.co.uk



offices at
Northwich, Ipswich, Sevenoaks
and Nineston

APPENDIX B

Materials Testing Report (ref. S23223)
by Scientific Analysis Laboratories

5508

Scientific Analysis Laboratories

Report Number: S23223
Date of Report: 17 March 2006
Client: T A Millard Scotland Ltd
2 Whitefriars Crescent
Perth
PH2 0PA

Client Contact: [REDACTED]
Client Job Reference: Arbroath, Coastal Zone
Order Number: None Supplied

Date Job Received at SAL: 1 March 2006
Date Analysis Started: 1 March 2006

The results reported relate to samples received at the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs

Key to symbols used on this report:
W: Analysis was performed at another SAL laboratory
S: Analysis was subcontracted
N: Analysis is not UKAS accredited
U: Analysis is UKAS accredited

Report written by: [REDACTED]

Report checked and authorised by: [REDACTED]



1977

Report Number: S23223
 Client Job Reference: Arbroath, Coastal Zone
 Total TPH

SAL Ref.	S23223/001
Client Ref.	Sample1
Type	Soil

Determinand	Method	Units	LOD	Symbol
PAH	GC/FID	mg/kg	1*	N
TPH	GC/FID	mg/kg	1*	U

TOC	OX/IR	%	0.1	WN	**
-----	-------	---	-----	----	----

*Analysis completed on 'as received' sample

**Sample unsuitable for analysis

Report Number: S23223
 Client Job Reference: Arbroath, Coastal Zone
 Target VOC Suite

SAL Ref.	S23223/001
Client Ref.	Sample1
Type	Soil

Determinand	Method	Units	LOD	Symbol
Benzene	GC/MS	ug/Kg	1	WU
Toluene	GC/MS	ug/Kg	1	WU
Ethylbenzene	GC/MS	ug/Kg	1	WU
m,p Xylene	GC/MS	ug/Kg	1	WU
o Xylene	GC/MS	ug/Kg	1	WU

Report Number: S23223

Client Job Reference: Arbroath, Coastal Zone
PCB

SAL Ref.	S23223/001
Client Ref.	Sample1
Type	Soil

Determinand	Method	Units	LOD	Symbol	
Heptachloro, BZ# 180	GC/MS	ug/kg	0.05	WU	**
Hexachloro, BZ# 138	GC/MS	ug/kg	0.05	WU	**
Hexachloro, BZ# 153	GC/MS	ug/kg	0.05	WU	**
Pentachloro, BZ# 101	GC/MS	ug/kg	0.05	WU	**
Pentachloro, BZ# 118	GC/MS	ug/kg	0.05	WU	**
Tetrachloro, BZ# 52	GC/MS	ug/kg	0.05	WU	**
Trichloro, BZ# 28	GC/MS	ug/kg	0.05	WU	**

**Sample unsuitable for analysis

Report Number: S23223
Client Job Reference: Arbroath, Coastal Zone

Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457-3

SAL Ref.	S23223/001
Client Ref.	Sample 1
Type	Soil Leachate

Determinand	Method	Units	LOD	Symbol	Result
Antimony	HG-ICP	mg/kg	0.2	N	<0.2
Arsenic	HG-ICP	mg/kg	0.05	N	<0.05
Barium	ICP	mg/kg	0.1	N	0.7
Cadmium	ICP	mg/kg	0.05	N	<0.05
Chromium	ICP	mg/kg	0.2	N	<0.2
Copper	ICP	mg/kg	0.2	N	<0.2
Lead	ICP	mg/kg	0.5	N	<0.5
Mercury	CV-ICP	mg/kg	0.01	N	<0.01
Molybdenum	ICP	mg/kg	0.1	N	<0.1
Nickel	ICP	mg/kg	0.1	N	<0.1
Selenium	HG-ICP	mg/kg	0.05	N	<0.05
Zinc	ICP	mg/kg	0.1	N	<0.1
Chloride	Col.	mg/kg	1	N	276
DOC	OX/IR	mg/kg	10	WN	130
Fluoride	Col.	mg/kg	1	N	1
Monohydric Phenols	Col.	mg/kg	1	N	<1
Sulphate (total) as SO4	ICP	mg/kg	100	N	<100
Total Dissolved Solids	Grav	mg/kg	100	N	805

Note: Soil leaching procedure is not covered by our UKAS accreditation

APPENDIX C

Photographs



Photograph 1 – Bitumen materials in Trial Pit No. 1



Photograph 2 – Bitumen Materials in Trial Pit No. 5



Photograph 3 – Bitumen Materials in Trial Pit No. 6



Photograph 4 – Bitumen Materials in Trial Pit No. 11

APPENDIX D

Notes on Limitations

**TA MILLARD SCOTLAND LIMITED, ENVIRONMENTAL AND GEOTECHNICAL
CONSULTANCY SERVICES**

NOTES ON LIMITATIONS

General

TA Millard Scotland Limited have completed the attached report for the use of the Client detailed on the front cover and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed.

Third parties should not use or rely upon the contents of the report unless written approval has been gained from TA Millard Scotland Limited; (due to legal requirements, a charge may be levied against such approval).

TA Millard Scotland Limited accepts no responsibility or liability for:

- a) the consequences of this documentation being used for any purpose or project other than that for which it was commissioned, and
- b) this document to any third party with whom approval for use has not been agreed.

Phase I Environmental Risk Assessments, Desk Studies and Audits

The work completed and utilised to provide this report comprises a study of available documentation. The opinions and results presented in this report have been arrived at by utilising the finite amount of data available at the time of writing and are relevant only to the purpose for which the report was commissioned. The data which has been reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative information pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, TA Millard Scotland Limited reserves the right to review this information and, if warranted, to modify the opinions presented in the report accordingly.

It should be noted that the risks which are identified in this report are perceived risks based on the available information at the time of writing and that the actual risks associated can only be assessed following a physical investigation of the site.

Phase II Intrusive Environmental Audits

The intrusive investigation has been completed to provide information concerning the type and degree of contamination present along with ground and groundwater conditions which facilitates a reasonable risk assessment to be completed. The stated objectives of the ground investigation have been limited to assessing the proven risks which are associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work, chemical testing and monitoring completed as part of this project has potentially been restricted by the short timescale available, and the locations of exploratory holes undertaken have potentially been restricted to areas unoccupied by buildings(s) and buried services. A more comprehensive post demolition / decommission investigation may be required if the site is to be redeveloped. For these reasons any costs included in relation to site remediation must be considered as tentative only at this time.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a “snap shot” or general indication of ground conditions located on the site. The fact that the site has been investigated does not preclude the existence of localised “hotspots” of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided in this report take into account currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Intrusive Geo-environmental Investigations

The intrusive investigation of the site has been completed to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of any associated risks together with engineering and development implications.

The exploratory holes investigate only a small volume of the ground in relation to the size of the site and therefore, can only provide a “snap shot” or general indication of ground conditions located on the site. The opinions provided and recommendations given in this report are based only on the ground conditions apparent at the site of the exploratory holes. It should be noted that there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments concerning groundwater conditions are based on observations made at the time of completion of site work, it should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation completed was selected on the basis of the specific development being proposed by the Client and is likely to be inappropriate to another form of development or scheme.

The risk assessment and opinions provided in this report take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Coast Protection Works at Dowrie Works, Elliot, Arbroath

Appendix 5

Roads Department Tender Report

August 2009

Tender Report**1. Introduction**

Tender documents were issued to 6 no. contractors on 9 July 2009, for the above project and subsequently returned to the Head of Law and Administration on 13 August 2009. Tenders were opened by the Head of Roads on 13 August 2009 under delegated authority and in accordance with Financial Regulations.

2. Proposed Works

The proposed works involve the extension of the existing rock armour to prevent the further erosion of the dunes and prevent the exposure of debris and bitumen from the former bitumen works, Dowrie Works.

3. Tender Prices

Tenderer	Submitted Tender Sum	Arithmetically Checked/Corrected Sum
D J Laing Contractors	£285,671.33	£285,671.33
Delson Contracts	£169,481.60	£169,491.60
Dundee Plant Company Ltd	£149,455.29	£149,455.29
Ennstone Thistle	£170,991.00	£170,991.00
T & N Gilmartin	£163,878.38	£163,878.38
Tayside Contracts	£195,894.78	£195,894.78

The tenders were checked by the Head of Roads and the general level of pricing contained within the lowest tender is considered to be competitive having regard to the nature of work involved and is slightly below the pre-tender estimated costs.

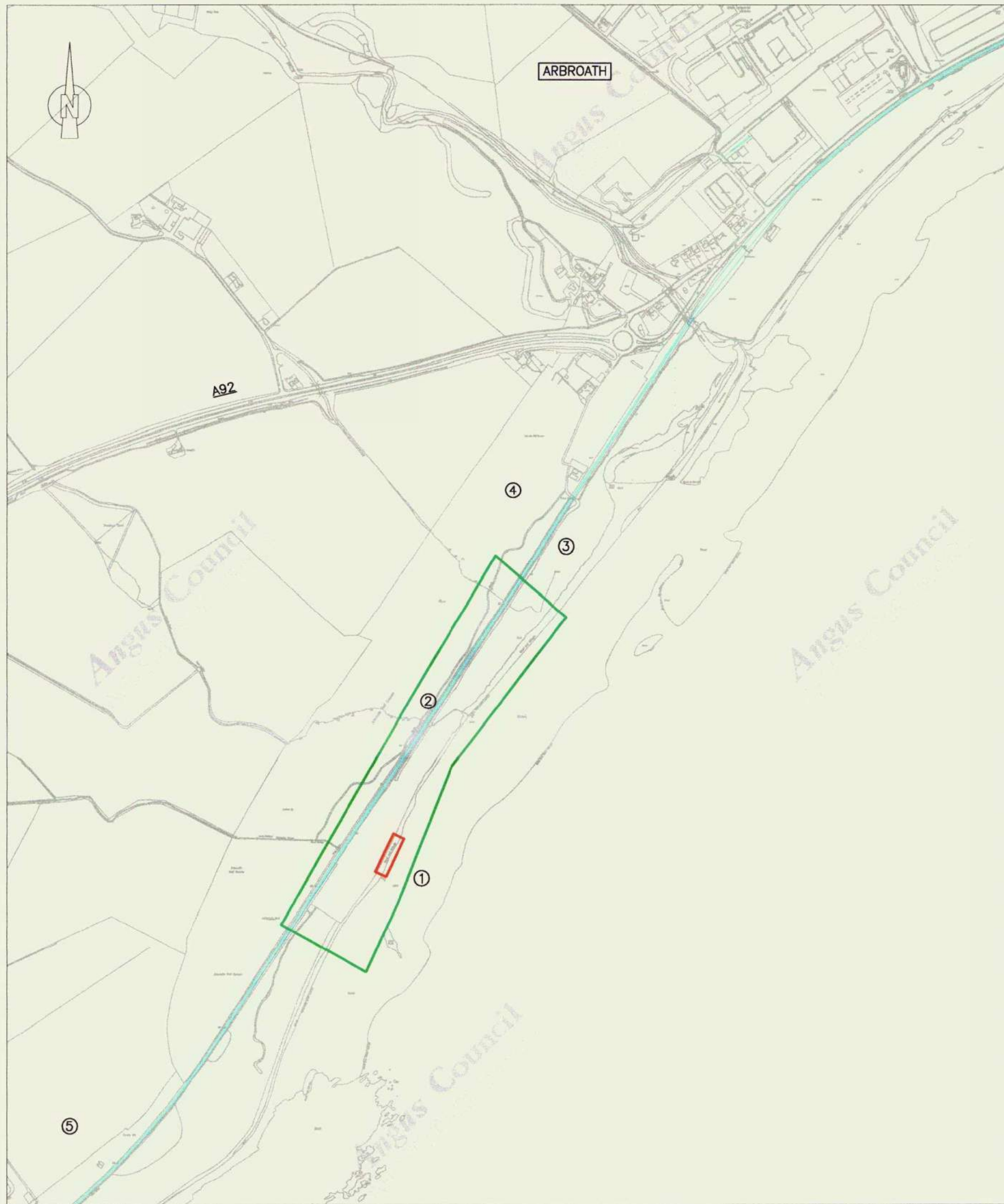
4. Financial Commitment

The total estimated cost for the project based on the tender price submitted by Dundee Plant Company Limited excluding VAT is:

Works including preliminaries	£149,455.29
Engineering Administration (to completion)	15,944.71
Network Rail (estimated costs)	£12,000
Planning (estimated costs)	£1500
Marine Construction Works Licence	£1,100.00
Contingencies	£20,000
Total Cost	£200,000

5. Conclusion

On the basis of the tenders received the lowest tender for Coast Protection Works at Dowrie Works, Elliot, Arbroath 2009 submitted by Dundee Plant Company limited and checked in accordance with the Financial Regulations in the amount of £149,455.29 is recommended for acceptance.



Plan Scale 1:10000

AREA OF PROPOSED WORKS - [Red hatched symbol]
 NOTIFIED NEIGHBOURS - [Green hatched symbol]

NEIGHBOURS NOTIFICATION

1. CROWN ESTATE COMMISSIONERS
2. RAIL TRACK SCOTLAND
3. ANGUS COUNCIL
4. ARBROATH ARTISAN GOLF CLUB
5. GUTHRIE BATCHELOR

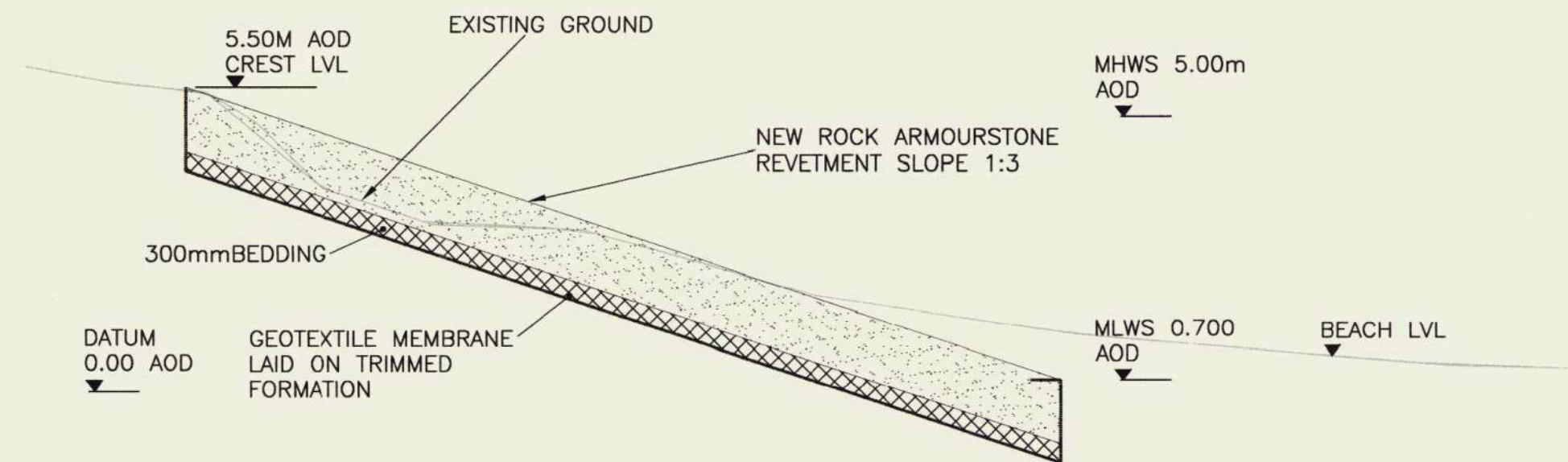
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Site Plan Scale 1:1250

Scope of Works

Carry out repairs and maintenance works to the existing defences and also extend the existing rock armour revetment a further 100m to prevent further erosion of the dunes and exposure of bitumen deposits from the former Dowrie Bitumen Works.



Proposed Works Scale 1:100

			Drawing Size: A2	Plotting Scale: 1:1	Status: Final	<p>Angus Council INFRASTRUCTURE SERVICES DEPARTMENT Engineer - Head of Roads, Angus Council</p> <p>E&DS Section County buildings Market Street Farfar DD8 3WR Tel: 01307 461460 Fax: 01307 473388</p>	Drawing Title: Site Layout		
			Drawn by: DL	Checked By: MD	Approved By: MD		Project Title: Coastal Protection Works at Dowrie Works, Arbroath		
			Date: 1/07/09	Date: 3/07/09	Date: 3/07/09		Project No: 115070139	Drawing No: 002	Revision: 0
Rev.	Date	Description	Drawn	Checked	Approved	Information			

Path & Filename:
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