O'CONNOR SUTTON CRONIN
Consulting Civil and Structural Engineers

2 HOLLES STREET, DUBLIN 2.
Telephone: 661 8677 Fax: 661 8820
Compuserve: 101610,3631 Internet: 101610.3631@compuserve.com

BORD GAIS EIREANN
SUMMARY REPORT
ON
LIMERICK SITE.

AUGUST 1995.

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Consulting Civil and Structural Engineers

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Telephone: 661 8677 Fax: 661 8820
Compuserve: 101610,3631 Internet: 101610.3631@compuserve.com

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Telephone: 661 8677 Fax: 661 8820
Compuserve: 101610,3631 Internet: 101610.3631@compuserve.com

JO'C/SH.

PROJECT NUMBER; B87.

SUMMARY REPORT ON BORD GAIS EIREANN LIMERICK SITE.

BACKGROUND.

1. Bord Gais Eireann has instructed O'Connor Sutton Cronin to prepare a brief summary of relevant information regarding the Limerick site on the basis that this summary report would be made available to possible purchasers of the site in the event of the site being put for sale on the open market.

2. Messrs O'Connor Sutton Cronin, Consulting Engineers, for themselves and Bord Gais Eireann give notice that this summary report is furnished in good faith and the information provided is believed to be correct, but any intending purchaser of this site shall not rely on it as representations of fact and must satisfy themselves as to its correctness. The various sections of this report shall be read together as one publication and any query of interpretation shall be referred to O'Connor Sutton Cronin, Consulting Engineers for clarification. This summary report is copyright and shall not be copied save on consent of O'Connor Sutton Cronin, Consulting Engineers and where copied on consent should be copied in its entirety so as to avoid misinterpretation.

SITE CLEARANCE CONTRACT (LIMERICK SITE).

3. O'Connor Sutton Cronin Consulting Engineers were instructed by Bord Gais Eireann to implement a site clearance contract at the above location.

4. The site clearance contract consisted of the following activities;

- The discharge of effluents contained in certain steel storage vessels and in gas seals on site.
- The export of tarry sludge as toxic waste where appropriate under EU Regulations.
- The demolition of the steel tanks in vessels in question.
- The infilling of the basement structures originally comprising the water seal to the gas holders.

5. The main contractor who executed all of the above works was;

- McCallan Bros. Limited
  Omagh Road
  Carrickmore
  Co. Tyrone
  BT79 9PQ.

6. **SCOPE OF WORK CARRIED OUT PRIOR TO THE COMMENCEMENT OF THE SITE CLEARANCE CONTRACT WAS AS FOLLOWS;**

A - Level Survey of Site. (See Appendix B herein).

B - Site Tests for Ground Chemistry. (See Appendix D herein).

C - Site Tests for Ground Geotechnology. (See Appendix C herein).

D - Laboratory Tests on Tank Contents. (See Report herein).

7. **THE FOLLOWING IS THE LIST OF APPENDICES HEREIN;**

Appendix A: Site photographs during demolition

Appendix B: Site drawings.

Appendix C: IGSL records of site tests for ground geotechnology.

Appendix D: GIBB Environmental records of site tests for ground chemistry.

A **LEVEL SURVEY OF SITE.**

8. These site levels were taken before work on the site clearance contract commenced on site and would be no longer relevant.

B **SITE TESTS FOR GROUND CHEMISTRY.**

9. **THE FOLLOWING IS AN EXTRACT FROM THE REPORT PREPARED BY GIBB ENVIRONMENTAL SCIENCES.**

10. **INTRODUCTION.**

11. **Scope of the Study.**

At the request of O'Connor Sutton Cronin and Associates Limited (Consulting Civil and Structural Engineers, Dublin), GIBB Environmental Sciences has undertaken combined chemical and landfill gas investigations of three former gaswork sites at Limerick, Clonmel

and Waterford in September 1990. These sites belong to Bord Gais Eireann and are being considered for redevelopment. This report details the investigations conducted at each site, discusses the findings of each study and presents recommendations for site rehabilitation/redevelopment.

12. General Methodology.

Each site investigation consisted of the excavation of a number of trial pits in an approximate grid pattern across the area of the site. All trial pits were excavated in positions previously selected by O'Connor Sutton Cronin and Associates Limited as shown on their drawings M8/05, M25/05 and M25/06. The selection of these positions resulted from an in-depth desk study of historical information conducted by the Consulting Engineers. Trial pits were excavated using a mechanical excavator, to a maximum depth of approximately 2.5 metres. Where relevant, concrete surfaces were broken out both prior to and during excavations. The positions of trial pits are shown in Figures 1-3 and the logs of the trial pits form the Appendices of this report.

In total, 24 trial pits were excavated throughout the three sites all of which were investigated for both chemical contamination and for the presence of landfill gas.

The standard practice adopted was to take two solid samples at various depths from each pit; this sampling regime was extended where relevant. These samples were subsequently analysed for a range of contaminants common to gas work sites.

Prior to careful backfilling, a 65mm diameter plastic pipe was inserted into each pit. Pipes were 2.5m in length with the lower 1.5m being perforated. After allowing at least one week for equilibrium conditions to become established, the concentrations of methane, carbon dioxide and oxygen within each pipe where monitored using portable instruments.

A GMI Landsurveyor was used for methane and oxygen and a portable infra red meter used for carbon dioxide.

Liquid samples and sludge were also collected for subsequent analyses; these originated either from trial pits or from tanks (above and below ground level) still present at the sites.

In addition, two samples of suspect fibrous material were taken to check for the possible presence of asbestos. One further soil sample from close to a sub-station in the Limerick site was analysed for polychlorinated biphenyl (PCB) content.

13. **LIMERICK.**

14. **Site Description and Historical Information. (Before Site Clearance Contract).**

The former gas works site at Limerick is located along Dock Road and O'Curry Street and access may be gained by both routes. See drawings in Appendix 'B'. At present it is occupied by Bord Gas Eireann who have an office block and enclosed compound situated there.

There are live gas service lines on the site running parallel to Dock Road and a line which connects to the existing gasometer. An above-ground spiral gas holder still remains on the site as does a Naphtha storage tank.

Fill material from excavation works on gas lines within Limerick is currently being deposited across the site. Bedrock can also be seen toward the Southern end of the site sloping downward towards the River Shannon. Spent oxide scattered during earlier demolition was observed throughout the site. There is an empty tar storage tank situated in the southeast corner of the area.

Gas production is thought to have begun here in 1840, and followed the trends over the years changing from coal to oil, LPG and naphtha gas production. Coke and tar works are also believed to have existed on the site.

15. **Site Investigation.**

On 17 September 1990, 10 trial pits were dug to a maximum depth of approximately 2-2.5m using a mechanical excavator. All trial pits were sampled for chemical contamination and pipes inserted in order to monitor for the presence of landfill gas. Various liquid and sludge samples were taken for the determination of specific contaminants. These samples were taken from trial pits, a tank base (west quadrant) and from water traps in the above-ground gas holder. In addition, a solid sample was taken from the area around the small electricity substation; this sample was analysed for PCB content.

When excavating trial pit 6, an underground cavity having a concrete/iron roof was found, so the pit was therefore moved from it original position approximately 1 metre northwards.

The position of all trial pits is shown in Figure 1 while the logs are given in Appendix A of this report. The concentrations of methane, carbon dioxide and oxygen in each pipe were measured on two subsequent occasions at weekly intervals using portable equipment.

Generally the trial pits indicated the presence of fill material contaminated in tar together with spent oxide both of which pollutants are associated with the production of coal gas.

Bedrock was encountered 1 - 1.5m below ground level in the centre of the site (TP 4, 5 and 8).

16. **LIMERICK: Analytical Results and Discussion.**

17. **Analytical Data.**

The results of the determination of contaminants such as cyanide, which are commonly found in gas work sites, are given in Table 1 while PAH concentrations in both solid and water samples are presented in Table 2. Table 3 shows the pH of various water samples taken at the Limerick site as well as the concentration of ammonia, sulphate, organic loading, cyanide and phenols in these samples. The calorific values of five samples are given in Table 4 while, finally, the results of gas monitoring undertaken at weekly intervals following the excavation of the trial pits are in Table 5.

A soil sample taken near the sub-station on the site was checked for PCB's but none was detected (is less than 1 ppm) which shows either that no major spillage of transformer fluid has occurred around the equipment or, possibly, that PCB's have not even been used in transformers.

18. Discussion of Results.

The analytical data obtained in samples from Limerick are contained in Tables 1 - 5. The concentrations of some potential chemical contaminants in solids from the trial pits, as listed in Table 1, show a wide variation. This is very apparent in the figures of the toluene extractable material. These, which are a good indicator of the concentrations of tar present, range from a maximum of 39.3% to a minimum of 0.065%. In general, coal tar is apparent to the eye when the concentration is about 1% or higher. Although no 'action' trigger value is given for coal tar in Appendix D, which is taken from the document ICRCL 53/83 (second edition), tar concentrations above 1% (1000ppm) are undesirable in land to be developed. Using this criterion, 15 of the 21 samples analysed exceed this rather arbitrary limit.

The magnitude of the 'trigger' values given in Appendix D depends on the proposed enduse of the site with the lowest ones being applicable to the most sensitive end-use i.e. domestic housing with gardens. In the Appendix D it will be seen that the two levels are given i.e. 'threshold' and 'action' values. If the former is not exceeded a site can be considered as being uncontaminated so that no remedial action will be needed. If the 'action' value is

exceeded remedial action should be undertaken or the end-use changed. Therefore there is a 'grey' area between the 'threshold' and 'action' levels where any remedial action taken will be at the discretion of the developer and regulatory authorities and their appropriate advisors.

Comparison between the data in Table 1 and Appendix D indicates that contamination due to these potential pollutants poses no significant problem since, in general, these are below the 'action' levels. There are however, 'pockets' of high sulphate such as at the surface of TP 8 where concentration of 10.2% SO4 was found. Since sulphate contamination is sporadic and limited we suggest that further samples are tested once any remedial actions have been undertaken since it seems probable that sulphate resistant concrete will be required in foundations. Further information should be obtained to enable the optimum class to be selected.

From the PAH data presented in Table 2, it is evident that some of the samples have concentrations above the 'action' level (1000ppm) even for more less sensitive end-uses such as the erection of industrial units. For example, TP8 (1.1m) has a value of approximately 57,000 ppm. Such high PAH values are associated with tar - TP 8 (1.1m) had a toluene extraction value of 280,000 ppm - so that if tar contamination is removed the problem due to PAH's will also be overcome. For completion, the concentration of individual PAH's are included in this report since this information may be use in the long term to compare the variations which are likely to be found from one site to another.

Groundwater on the site, as shown by the analytical data obtained from trial pits 2 and 4, is polluted by typical gas works contaminants. Thus water from TP2 contains 340ppm ammonia (expressed as N) and 45 ppm phenol while water from TP 9 has a total cyanide content of 5500 ppm.

During site rehabilitation it is important that such contaminated liquids are not allowed to discharge to surface water. Instead they should be pumped to foul sewer or if this is not practical due, for example, to lack of capacity in the local treatment works they should be removed by tanker for environmentally acceptable treatment. The levels of contaminants in water samples from the gas holder are low so that they pose no problem.

Calorific Values (CV) for selected samples from the Limerick site are given in Table 3. Samples whose CV is above 10 MJ/kg will support combustion whiles those below 2 MJ/kg will not. Currently experimental work is being undertaken to narrow these limited. Material from TP 8 (1.1m) which contains 28% tar and sludge from the naphtha tank will support combustion while, in our opinion, other material should not pose a problem. As suggested above, tarry material should be dealt with prior to redevelopment. Therefore, if it is removed or stored on site in a 'suitable' crib, problems due to potential combustibility disappear. A similar argument applies to the contents of the naphtha tank.

The gas monitoring data in Table 5 show a tract of methane in trial pit 8. 2% methane maximum was found on September 26, but this had dropped to 0.04% a week later. This trail pit also showed a small concentration of carbon dioxide (3%). Other trial pits show no significant concentrations of methane or carbon dioxide. If the tar contaminated fill in the

vicinity of TP 8 is removed to overcome problems due to PAH's and potential combustibility, such action should also overcome any potential gas problems. Therefore if such limited remedial action is taken then there should be no need to specially design building to prevent methane or carbon dioxide ingress.

19. OVERVIEW OF CONTAMINATION PRESENT AT THE LIMERICK, CLONMEL AND WATERFORD SITES.

Table 15 summarises data obtained on the samples from the three sites which have been analysed for heavy metals using the inductively coupled plasma (ICP) spectrographic technique. These results show that heavy metals do not pose any significant pollution problem at any of the sites. Also the heavy metal content should present no problem if material were to be removed from any of the sites and taken to landfill for disposal.

The conditions found at the tree sites can be summarised as follows;

Limerick

Tar is the major pollutant found in various parts of the site; material contaminated with this to a significant extent should either be removed from the site or be confined in an engineered 'crib' on the site. Such action will eliminate potential problems due to other pollutants such as PAH's.

Polluted ground water on the site should be pumped to foul sewer or be taken from the site. Both above-ground and below-ground tanks should be cleaned out and demolished prior to redevelopment.

C **SITE TEST FOR GROUND GEOTECHNOLOGY.**

20. **THE FOLLOWING IS AN EXTRACT FROM THE REPORT PREPARED BY IRISH GEOTECHNICAL SERVICES LIMITED.**

REPORT ON A SITE INVESTIGATION AT THE OLD LIMERICK GAS WORKS, DOCK ROAD, LIMERICK FOR O'CONNOR SUTTON CRONIN, CONSULTING ENGINEERS ON BEHALF OF BORD GAIS EIREANN.

Report No. 1622 **December 1990**

21. **INTRODUCTION**

It is proposed to develop the old works site at Dock Road, Limerick.

The consulting engineers for the project, Messrs O'Connor Sutton Cronin, have ordered an investigation of the site to determine sub-soil conditions from an engineering viewpoint and to establish the presence of any contamination that may have been caused, to the sub-soil and ground water, due to the nature of the industry previously carried out at this location.

Irish Geotechnical Services Ltd. arranged the excavation of a number of trial pits, which were logged by our technician, and from which several samples were obtained. This work was directed by environmental specialists employed by the consulting engineer. This specialist also obtained samples of various sub-soils and ground water. The environmental aspect of this site investigation will not constitute part of this report.

A number of boreholes were also sunk on the site using conventional 200mm casing. On refusal of test apparatus rotary percussive drilling was utilised to prove bedrock.

This report describes the findings of the investigations and relates these findings to the design of foundations for any proposed development.

22. FIELDWORK

The site location and trial pit and borehole positions thereon are shown on the site plans enclosed in Appendix 'C' of this report.

Ten trial pits were opened on the site using a JCB hydraulic excavator.

Six boreholes were then sunk using conventional cable tool techniques, boreholes were taken to refusal depth, probably on the underlying rock.

Finally rotary percussive techniques were used at five locations to prove the limestone bedrock.

The particular segments of the investigation are detailed in the following paragraphs.

23. Trial Pits

Pits were opened through a variety of made ground in ten locations. Full details of stratification are given in Appendix la in the Trial Pit Records. The fill showed a wide variation in make up, with pungent tars and oxides noted in several location, while more normal hardcore or clay fill was noted in other positions.

Refusal of excavator at shallow depth in several locations (Notably Pits 4, 5, 8 & 9) may indicate the presence of high rock horizon.

Disturbed samples were taken by our site technician and returned to the laboratory for identification and testing.

Samples were also taken by the environmental specialists (Gibb Environmental) and removed for further analysis.

24. Boreholes

The descriptions and depths of the various sub strata are given on the individual boring records found in Appendix 'C'.

The records also give details of samples taken and in situ tests carried out as well as ground water conditions pertaining at the time of the investigation.

Where chiselling techniques were required to penetrate natural or unnatural obstructions details are given in full on the records.

Boreholes 1, 3, 4, 5 and 6 recorded refusal at shallow depth on presumed bedrock, the depth to refusal varying from 0.30 to 1.00 metres and the overlying material being in all instances made ground.

At Borehole 2 a penetration through filled ground of 7.30 metres was recorded with refusal at 7.50 metres on presumed bedrock. The fill varied from dark organic material to coarse granular material.

Ground water was present in Borehole 2 while no free water was found in the remaining boreholes.

25. **Rotary Percussive Drilling**

Rotary drilling techniques were employed at the locations where presumed shallow rock was noted in the cable tool boreholes. Full details of findings are given on the boring records.

A consistent drilling pattern at each borehole indicates that the material is indeed limestone rock.

No cavities or anomalies were noted and a 3.00 metre penetration (minimum) was achieved at each position.

26. TESTING

27. Field Tests

Standard penetration tests were carried out at intervals in each boreholes and results (N values) are given in the right hand column of the boring records. 'N' values in the fill vary from 4 to 27 implying a wide variation in consistency.

28. Laboratory tests.

Disturbed samples were taken of the fill and returned to the laboratory. Sulphate contents and pH values were determined for several samples of the fill and results are presented in Appendix 'C' of this Report.

29. DISCUSSION

The investigation has shown very variable made ground overlying limestone bedrock. Bedrock level varies from 0.30 to 7.50 metres. The possible previous usage of the area for quarrying purposes (from old record maps) may explain the rapid rock variation.

The variation in the fill in constitution and strength will tend to preclude its use as a founding medium and consequently all new foundation loadings should be transferred to the underlying bedrock.

Over much of the site, the proximity of rock to the surface will allow direct excavation and placement of foundations. The allowable bearing capacity of the rock should exceed any design requirements.

Towards the Dock Road the depth of fill increases to in excess of 7.50 metres and here direct excavation will prove impractical. Piling techniques can be used to transfer loads to the underlying rock or the use of vibroflotation techniques to consolidate the fill could be considered.

D LABORATORY TESTS ON TANK CONTENTS.

30. The following are the details of the tank/contents furnished by O'Connor Sutton Cronin Consulting Engineers and Gibb Environmental Science.

TANK T26 (LIMERICK) (NOW DEMOLISHED)

Located at Bord Gais Limerick, this is a water sealed spiral guided gas holder which was constructed in 1978. The water seal tank is of welded steel construction located above ground. The tank is approximately 35m in diameter and 9 metres high. The holder has two lifts of welded steel construction, each approximately 8.4m high.

This holder is currently used for the storage of natural gas. The Contractor shall include in his tender for the purging and disconnection from the mains of this gasometer.

RESULTS.

Water from gas holder water chamber 2.

PH	AMMONIA NITROGEN as N.	SULPHATE as SO4	T.O.C.	TOTAL CYANIDE.	TOTAL PHENOLS AS TAR ACIDS.
8.95	Less than .01	31	10	0.64	1.4

Water from gas holder water chamber 1.

8.75	Less than .01	415	13	0.11	0.1

TANK 27 (NOW DEMOLISHED)

This tank which is of steel construction was formerly used for the storage of naphtha fuel. It now contains a quantity of tar.

31. **SCOPE OF WORKS CARRIED OUT DURING THE SITE CLEARANCE CONTRACT WAS AS FOLLOWS;**

E Purging of all gas holders as necessary.

F Discharge of all effluents either contained in tanks or in gas water seals under licence issued by the Local Authority under the Water Pollution Acts.

G The export if and as required of tarry waste under EU Regulations where this waste comprised a portion of the contents of the tanks in question.

H The demolition of the steel tanks and gas holders.

I The infilling if and as required of the underground basement - type structures comprising the gas seal under certain of the tanks in question.

32. **SPECIFICATION FOR THE INFILLING OF PITS REMAINING AFTER DEMOLITION OF THE TANKS.**

33. (From Section 2.23 of Specification).

It shall be the contractors responsibility to backfill, compact and level off all underground tanks, pits and other openings to existing ground levels to leave the site free from the possibility of collapse or subsidence. As noted earlier tanks shall not be filled in until approved by the Engineer. All such filling shall be hard durable and inert materials such as crushed rock or selected demolition rubble and shall be free of any organic or degradable material. The material shall be graded to permit full compaction and shall be of a maximum size compatible with the dimensions of the void to be filled. Imported hard material shall be used for fill. All compacting plant shall be of a suitable size and weight for the volume of void to be filled and the size of the filling material.

34. The present status of the site clearance contract is that all work has now been completed.

JOHN O'CONNOR
For O'Connor Sutton Cronin.

August 1995.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 1.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 2.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 3.

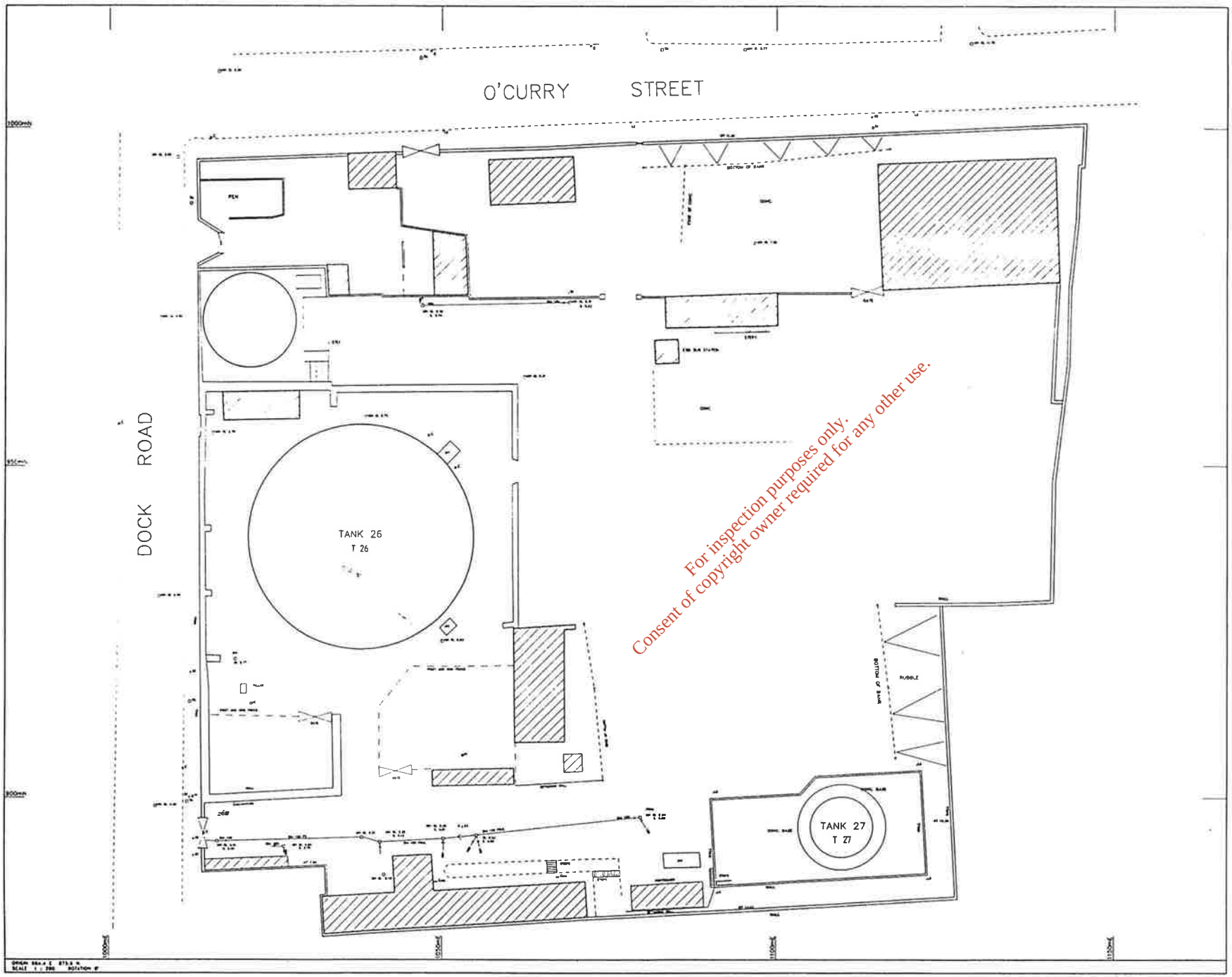
LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 4.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 5.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 6.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 7.

LIMERICK SITE PROGRESS PHOTOGRAPH NUMBER 8.



REFER TO DRAWING No. B26/14 FOR NOTES

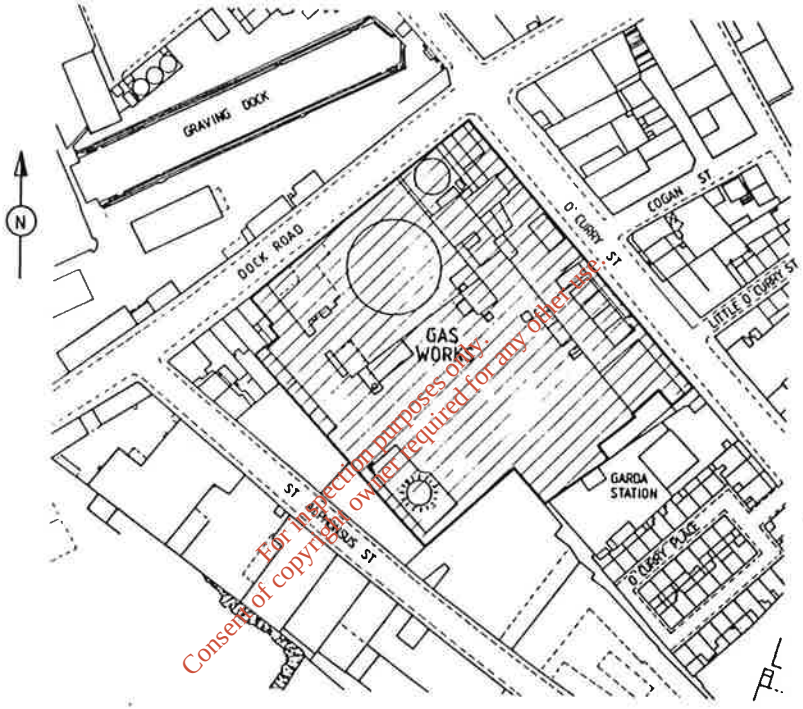
O'CONNOR SUTTON CRONIN

BORD GAIS EIREANN

REMOVAL OF CONTAMINATED LIQUIDS AND SALE OF STORAGE VESSELS AND GASOMETERS

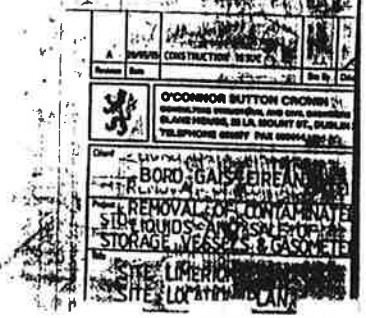
LIMERICK
TANK LOCATION PLAN

6/11



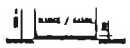
SITE LOCATION PLAN SCALE : 1 / 1000

LIMERICK



TANK – 1
(DUBLIN - PEARSE ST)
"C2" APPLICATION

TANK – 4
(DUBLIN - PEARSE ST)
"C2" APPLICATION



TANK – 6
(DUBLIN - PEARSE ST)
"C2" APPLICATION

TANK – 7
(DUBLIN - PEARSE ST)
"C2" APPLICATION

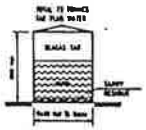
TANK – 8
(DUBLIN - PEARSE ST)
EMPTY

TANK – 9
(DUBLIN - PEARSE ST)
LICENCE APPLICATION

TANK – 10
(DUBLIN - PEARSE ST)
"C2" APPLICATION

TANK – 11
(DUBLIN - PEARSE ST)
LICENCE APPLICATION

TANK – 12
(DUBLIN - PEARSE ST)
"C2" APPLICATION

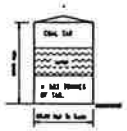


TANK – 13
(DUBLIN - PEARSE ST)
LICENCE APPLICATION

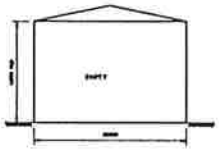
TANK – 14
(DUBLIN - PEARSE ST)
EMPTY

TANK – 15
(DUBLIN - PEARSE ST)
EMPTY

TANK – 16
(DUBLIN - PEARSE ST)
EMPTY



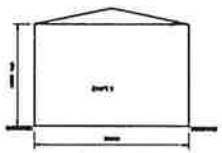
TANK – 17
(DUBLIN - PEARSE ST)
"C2" APPLICATION



TANK – 18
(DUBLIN - PEARSE ST)
EMPTY

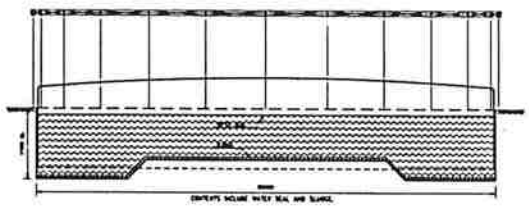
TANK – 19
(DUBLIN - PEARSE ST)
FOR RE-CYCLING

TANK – 20
(DUBLIN - PEARSE ST)
FOR RE-CYCLING

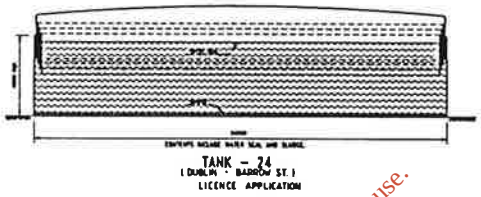


TANK – 21
(DUBLIN - PEARSE ST)
EMPTY

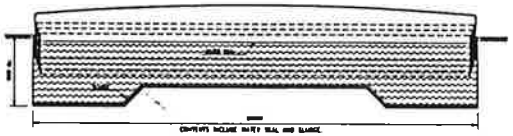
TANK – 22
(DUBLIN - RIVER DODDER / GRAND CANAL RINGSEND)
LICENCE APPLICATION



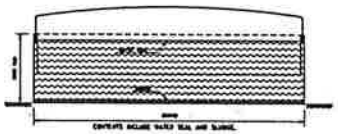
TANK – 23
(DUBLIN - BARROW ST)
LICENCE APPLICATION



TANK – 24
(DUBLIN - BARROW ST)
LICENCE APPLICATION

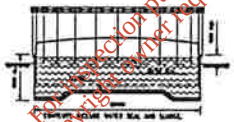


TANK – 25
(DUBLIN - BARROW ST)
LICENCE APPLICATION

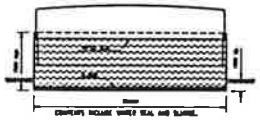


TANK – 26
(LIMERICK)
LICENCE APPLICATION

TANK – 27
(LIMERICK)
"C2" APPLICATION

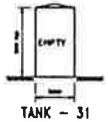


TANK – 28
(CLONMEL)
LICENCE APPLICATION



TANK – 29
(CLONMEL)
LICENCE APPLICATION

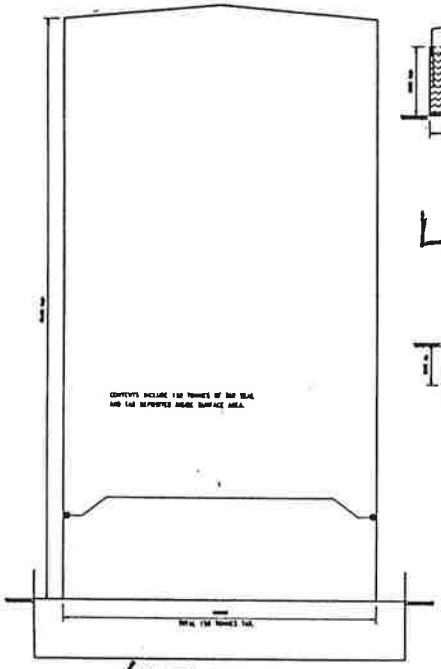
TANK – 30
(WATERFORD)
FOR RE-CYCLING



TANK – 31
(WATERFORD)

TANK – 32
(WATERFORD)
FOR RE-CYCLING

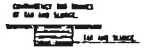
LIMERICK * LIMERICK



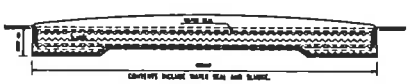
GASOMETER TANK – 5
(DUBLIN - PEARSE ST)
"C2" APPLICATION

TANK – 33
(WATERFORD)
LICENCE APPLICATION

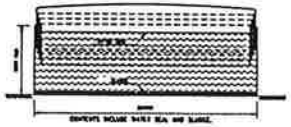
TANK – 34
(WATERFORD)
"C2" APPLICATION



TANK – 35
(WATERFORD)
"C2" APPLICATION



TANK – 36
(CORK)
LICENCE APPLICATION



TANK – 37
(CORK)
LICENCE APPLICATION

~~DUBLIN~~
~~WATERFORD~~
~~CORK~~
LIMERICK
~~CLONMEL~~

O'CONNOR SUTTON CRONIN
CONSULTING STRUCTURAL AND CIVIL ENGINEERS
BLAKE HOUSE, 23 LR. MOUNT ST., DUBLIN 2.
TELEPHONE 089177 FAX 089414

BORD GAIS EIREANN

REMOVAL OF CONTAMINATED LIQUIDS AND SALE OF STORAGE VESSELS AND GASOMETERS

TANK CONTENT DESCRIPTION

Scale	Drawn By	Drawing Number	Rev.
1 : 200	D.D.	826/14	F
Date	Chkd By		
24/08/11	P.S.		
	Appd By		
	P.S.		

APPENDIX Ia. - Trial Pit Records

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 1
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 8.4
	Date: 20.9.90

Description	Depth	Legend	Samples: Ref. No.	Type	Depth
Layer of clayey stony FILL with root fibres	0.20				
Layerof sandy FILL with some clay	0.40				
Tar oxides in a black silty CLAY. very pungent. . .Fill material present i.e brick,concrete			22601	D	0.50
	2.10				

Ground Water Conditions: Water noted at 2.00m.

Remarks:

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 2
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 7.5
	Date: 20.9.90

Description	Depth	Legend	Samples: Ref. No.	Type	Depth
TARMAC	0.10				
Coarse hardcore FILL with rock, brick, masonry and silty clay throughout	1.50				

Ground Water Conditions

Water present at 0.60m

Remarks

Hole flooded from 0.90 - 1.50m

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 3
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 8.0
	Date: 20.9.90

Description	Depth	Legend	Samples: Ref. No.	Type	Depth
Concrete covering	0.10				
Heavy concrete , rock and brick FILL- with some stones and traces of sandy clay					
	0.80				
Heavy concrete slabs - possible old floor	0.85				
Spent oxides in a black/brown silty stony CLAY					
	1.40				
Brown silty CLAY with some gravel					
	1.60				

Ground Water Conditions

Remarks

Chiselling 0.80 - 0.85 = ½hr

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract	Sheet No.	Trial Pit No.
BORD GAIS		4

Location	Excavation Method
LIMERICK	JCB

Client	Ground Level	Date
O'CONNOR SUTTON CRONIN	~ 6.3	20.9.90

Description	Depth	Legend	Samples		
			Ref. No.	Type	Depth
Brown silty clayey hardcore FILL with brick, rubble and mortar					
	0.40				
Concrete slab or floor					
	0.50				
Brown silty clayey HARDCORE FILL, brick, etc. with wood and metal					
	0.90		22610	D	0.90
CLAY and hardcore FILL, fragments of rock					
	1.40				
REFUSAL at 1.40 (Possibly Rock)					

Ground Water Conditions

Remarks: Chiselling/breaking up : 1 hr.

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 5
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 6-4
	Date: 20.9.90

Description	Depth	Legend	Samples: Ref. No.	Type	Depth
Fill material: SAND, BRICK, ROCKS, CONCRETE, MASONRY etc.					
	0.90				
Tar, sewer effluent - heavy odour	1.00				
FILL CLAY and fragments of rock	1.40				
REFUSAL, Possibly rock at 1.50	1.50		22603	D	1.50

Ground Water Conditions

Water seepage at 1.00m

Remarks

Old sewer pipe at 0.70m.
Chiselling for 1 hr.

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No.: 6
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 6.3
	Date: 20.9.90

Description	Depth	Legend	Samples Ref. No.	Type	Depth
Dark grey/brown/black silty clayey FILL with bricks, timber and iron	0.40				
Light grey/white stony, very silty CLAY with brick					
Grey brown stony sandy CLAY with traces of fill	0.80		22605	D	0.80
	2.30		22606	D	2.30

Ground Water Conditions: Groundwater at 2.30m

Remarks: Cavity beside slit trench from 0.40 - 1.60m

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 7
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~5.7
	Date: 20.9.90

Description	Depth	Legend	Samples		
			Ref. No.	Type	Depth
HARDCORE FILL : Large concrete and masonry slabs with brick and rubble. A stony clay is present throughout					
	0.70		22609	U	0.80
Brown silty firm to soft stony CLAY - very plastic					
	1.50				

Ground Water Conditions

Water at 1.10m

Remarks

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No.	Trial Pit No. 8
Location: LIMERICK	Excavation Method: JCB	
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 6.4	
	Date: 20.9.90	

Description	Depth	Legend	Samples		
			Ref. No.	Type	Depth
TOPSOIL, grass	0.10				
FILL MATERIAL : iron oxides and ash, some tar residue, in a clayey fill			22602	D	0.90
REFUSAL AT 1.50 - Possibly rock	1.50		22603	D	1.50

Ground Water Conditions

Remarks

JCB hammer penetrated from 1.00 - 1.50m.
Unable to break material. Chiselling for ½ hour

Report No. 1622	TRIAL PIT RECORD	IGSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 9
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 7.7
	Date: 20.9.90

Description	Depth	Legend	Samples Ref. No.	Type	Depth
REINFORCED CONCRETE	0.28				
Black pungent damp hard material with silty clay and stones. Some brick up to 0.75m. Fill material. Strong sulphur smell			22607	D	1.20
Refusal at 1.50, Possibly rock	1.40 1.50				

Ground Water Conditions

Water at 1.40m

Remarks

Chiselling for 1½ hrs.

Report No. 1622	TRIAL PIT RECORD	GSL

Contract: BORD GAIS	Sheet No. / Trial Pit No. 10
Location: LIMERICK	Excavation Method: JCB
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 7.3
	Date: 20.9.90

Description	Depth	Legend	Samples: Ref. No.	Type	Depth
CONCRETE	0.10				
Coarse ROCK pieces with boulders. Red silty CLAY with iron oxides	0.90				
Grey black soft silty CLAY with stones (FILL)	1.60		22608	D	1.20
Black to brown silty, stony CLAY, pungent (FILL)	2.20				

Ground Water Conditions

Water at 1.90m

Remarks

APPENDIX Ib. - Boring Records

Report No. 1622	BORING RECORD	IGSL

Contract: GAS WORKS LIMERICK

Borehole No. 1

Sheet 1 of 1

Location: DOCK ROAD, LIMERICK

Type and Diameter: Cable Tool 200mm & Rotary Percussive

Client: O'CONNOR SUTTON CRONIN

Ground Level: ~6.4

Date: 6.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Samples Type	Samples Depth	Field Records And Tests
Old Concrete floor			0.10				
FILL, stones, old concrete and red brick, sand present							1.00 N=4
			1.20				
Presumed ROCK			1.40				
Rotary percussive drilling in rock from 1.40m							
			4.90				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
				No water present.

Remarks: Chiselling from 1.20 - 1.40 for 1½ hrs.

Sample/Test key
U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Report No. 1622	BORING RECORD	IGSL

Contract: BORD GAIS

Borehole No. 2
Sheet 1 of 1

Location: LIMERICK

Type and Diameter: Cable Tool 200mm

Client: O'CONNOR SUTTON CRONIN

Ground Level: ~ 7.8

Date: 2.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Type	Depth	Field Records And Tests
Old concrete floors			0.10				
Damp FILL - black soft very silty clay with brick etc.				20439	D	1.50	1.50 N=8
							3.00 N=11
Grey brown soft silty stony CLAY (FILL)			3.30	20440	D	3.30	
Brown friable silty CLAY with coarse angular stones and fill material throughout			4.00	20441	D	4.00	
				20442	D	5.00	5.00 N=14
Black angular coarse gravelly clayey FILL with red brick and glass			5.90	20443	D	5.90	
							6.50 N=27
				20444	D	6.70	
Fine black gravelly SAND, fill with brick, glass etc.			7.10	20445	D	7.10	
			7.30	20446	W	Water	
Fragments of Limestone (Presumed rock)			7.60				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
2.11.90	5.90	5.90	5.90	First strike
	7.30	Nil	2.80	Final level

Remarks

Chiselling 5.90 - 7.10 = 2hrs
7.00 - 7.30 = 1½hrs

Sample/Test key
U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Report No. 1622	BORING RECORD	IGSL

Contract	Borehole No. 3
BORD GAIS LIMERICK	Sheet 1 of 1
Location: DOCK ROAD, LIMERICK	Type and Diameter: Rotary Percussive Cable Tool - 200mm
Client: O'CONNOR SUTTON CRONIN	Ground Level: ~ 5.8
	Date: 6.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Type	Depth	Field Records And Tests
FILL : Old red brick, stones, clay and timber				20427	D	1.00	1.50 N=4
				20428	D	2.00	
Refusal at 2.40			2.40				
Overburden/Fill, boulders, etc.				Rotary Percussive			
			2.90	2.40 - 6.00			
Hard drilling in presumed rock							
			6.00				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
				No water present

Remarks: Chiselling from 1.20 - 1.40 for 1 hr.

Sample/Test key
U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Report No. 1622	BORING RECORD	IGSL

Contract: BORD GAIS

Borehole No. 4

Sheet 1 of 1

Location: LIMERICK

Type and Diameter: Rotary Percussive Cable Tool 200mm

Client: O'CONNOR SUTTON CRONIN

Ground Level: ~7.5

Date: 1.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Samples Type	Samples Depth	Field Records And Tests
Stony clayey FILL			0.20				
Presumed ROCK			0.30				
Soft Rock/boulders			0.90				Rotary drilling from 0.30 to 4.00
Hard continuous drilling in presumed rock			4.00				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
				No water present

Remarks

Chiselling 0.20 - 0.30 = 1½hrs

Sample/Test key

U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Report No. 1622	BORING RECORD	IGSL

Contract	Borehole No. 5
BORD GAIS	Sheet 1 of 1
Location LIMERICK	Type and Diameter Rotary Percussive Cable Tool 200mm
Client O'CONNOR SUTTON CRONIN	Ground Level ~ 7.1
	Date 1.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Samples Type	Samples Depth	Field Records And Tests
Stony clayey FILL with steel pipe			0.80				
Presumed rock			1.00				
Boulders/broken rock			1.70				Rotary drilling from 1.00 to 5.00
Continuous drilling (Presumed bedrock)			5.00				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
				No water present

Remarks

Chiselling 0.80 - 1.00 = 1½hrs

Sample/Test key

U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Report No. 1622	BORING RECORD	IGSL

Contract	Borehole No. 6
GAS WORKS LIMERICK	Sheet 1 of 1
Location DOCK ROAD, LIMERICK	Type and Diameter Cable Tool 200mm & Rotary Percussive
Client O'CONNOR SUTTON CRONIN	Ground Level ~7.3
	Date 6.11.90

Description	Reduced Level	Legend	Depth	Samples Ref. No.	Type	Depth	Field Records And Tests
FILL : Stones, concrete, rubble and red brick				20426	D	0.75	
			1.00				1.00 N=R
Boulders and broken limestone							Rotary drilling from 1.40m.
			1.40				
Hard drilling in presumed LIMESTONE ROCK							
			4.50				

Water Level Observations during Boring

Date	Hole Depth	Casing Depth	Depth to Water	Remarks
				No water present

Remarks

Chiselling from 1.20-1.40m for 1½ hrs.

Sample/Test key
U-Tube Sample
D-Disturbed Sample
W-Water Sample
S-Standard Penetration Test
C-Cone Penetration Test
N-Blows/0.3 metres
R-Refusal
V-Vane

Appendix II .... Testing

REPORT NO. 1622

CHEMICAL ANALYSIS

IGSL

CONTRACT GAS WORKS, DOCK ROAD, LIMERICK

BOREHOLE NO.	SAMPLE NO.	DEPTH (METRES)	SAMPLE TYPE	TEST CODE	SULPHUR TRIOXIDE		pH VALUE
					PARTS SO_3 PER 100,000 WATER	PER CENT SO_3 SOIL	
2	20439	1.50	FILL	S		0.18	7.7
	20446	--	WATER	W	21.4		7.6
6	20426	0.75	FILL	S		Negligible	7.6

TEST CODE W -WATER S .- SOIL A - AQUEOUS SOIL EXTRACT.

Appendix III ..... Site Plan

IRISH GEOTECHNICAL SERVICES LTD.

DRAWN BY		OLD LIMERICK GAS WORKS	SCALE 1:28
CHECKED BY		BOREHOLES + TRIAL PITS	DRAWING No. 1622
DATE	2APR 91		

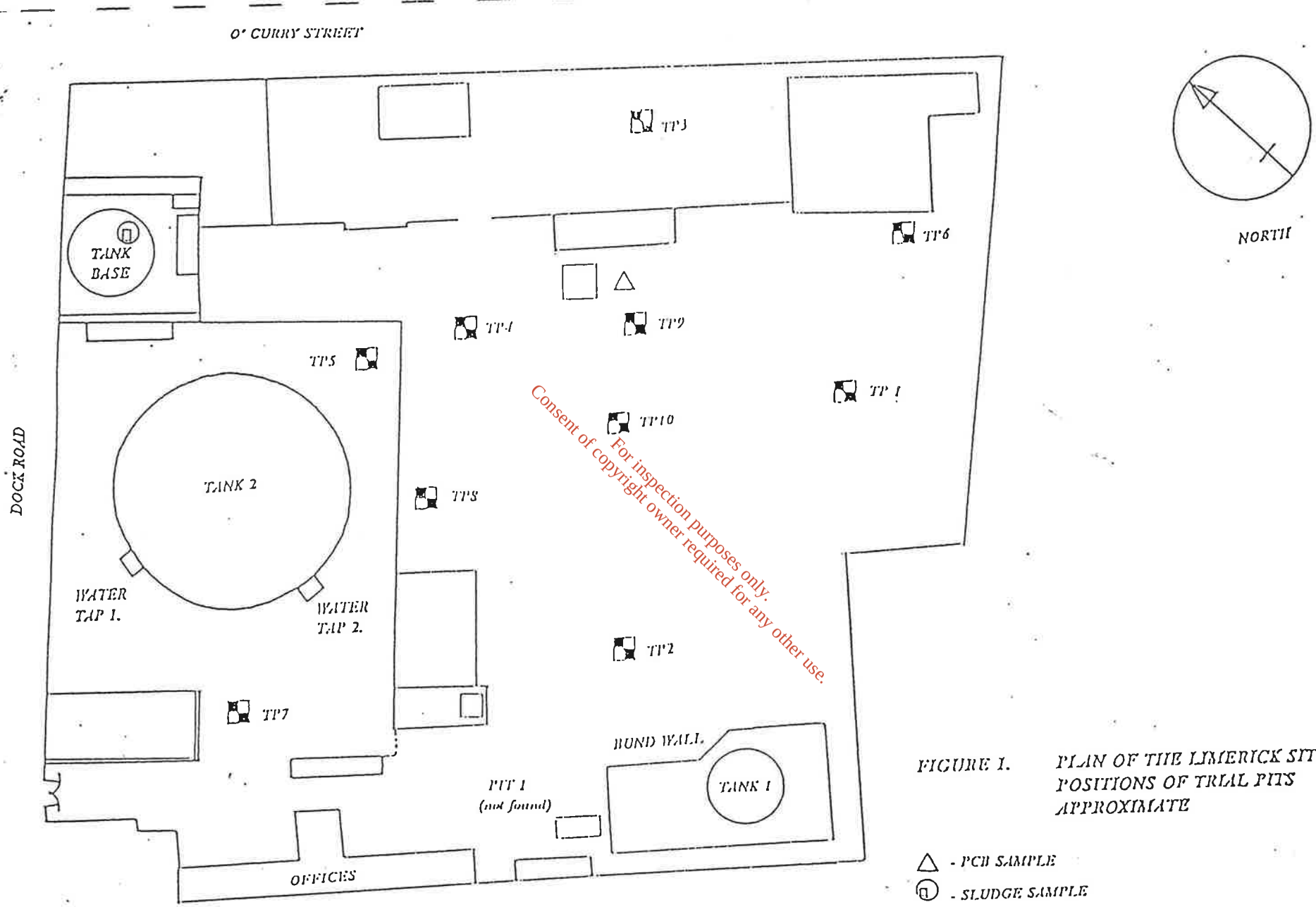


FIGURE 1. PLAN OF THE LIMERICK SITE POSITIONS OF TRIAL PITS APPROXIMATE

△ - PCB SAMPLE

⊓ - SLUDGE SAMPLE

(NB. TP 7 Within locked enclosure)

GIBB ENVIRONMENTAL SCIENCES

GIBB Environmental ences

TABLE 1: ANALYTICAL DATA ON SOLID SAMPLES FROM THE LIMERICK SITE

TRIAL PIT	DEPTH (m)	pH	SULPHATE (as $\%SO_4$)	SULPHIDE (as H_2S)	CYANIDE (total)	CYANIDE (free)	PHENOLS	TOLUENE EXTRACTABLE MATERIAL	DESCRIPTION
1	1.4	8.65	0.91	20	18	9	200	75,000	Tar, soil and stones
2	0.2	7.3	0.13	13	15	1.4	38	393,000	Tar and rock
2	1.1	8.6	0.08	11	1.6	1.0	6	17,500	Grey clay and stones
2	1.5	7.6	0.08	35	2.7	1.1	40	15,000	Grey soil and stones
3	1.6	9.7	2.72	6	2.3	2.3	3	650	Chalk (?), soil and ash
4	0.25	8.4	0.41	40	5	1.5	10	26,000	Soil and stones
4	1.0	8.6	1.33	2	2.6	<1	3	1,500	Grey soil and stones
5	0.6	7.95	0.07	11	8.2	1.5	75	72,000	Tar and soil
6	0.3	5.85	0.25	44	35	2.5	23	21,000	Soil, brick and ash
6	0.55	8.5	0.24	7	1.7	1.3	9	9,500	Grey soil and stones
6	0.8	8.35	0.44	99	<1	<1	3	16,500	Grey soil and concrete
6	1.6	7.8	2.27	740	<1	<1	6	16,500	Soil and stones
7	0.3	7.65	0.83	5	1.8	<1	6	4,200	Grey ash, stones and soil
7	1.0	7.85	0.40	17	2.8	<1	8	4,900	Soil, stones and ash
8	Surface	2.55	10.20	0.3	260	110	9	9,200	Soil and stones
8	0.12	6.65	8.86	11	370	93	7	62,000	Soil and stones
8	0.9	7.35	0.38	26	4.4	1.9	8	89,000	Ash, soil and coal
8	1.1	7.7	0.17	0.5	142	37	100	280,000	Tar, soil and stones
9	0.7	10.35	1.70	30	130	17	8	51,500	Soil and concrete
10	0.8	7.35	6.52	360	18	13	7	19,000	Grey soil and ash
10	1.8	7.35	3.48	340	69	4.8	7	22,000	Grey soil and stones

Apart form pH and sulphate all results are expressed as mg/kg i.e., ppm

TABLE 2: PAH RESULTS ON SAMPLES FROM LIMERICK

	TP 1 (0.5m) (Solid)	TP 1 (1.4m) (Solid)	TP 8 (1.1m) (Solid)	TP 9 (1.2m) (Solid)	TANK BASE WEST QUADRANT (Water)	NAPHTHA TANK (Sludge)
Total PAH	4845	13191	57422	753	22.7	100
Naphthalene	100	158	892	39	1508	10
Acenaphthene	160	528	854	<1	711	<1
Acenaphthylene	110	<1	1686	<1	867	4
Fluorene	267	972	2227	23	1243	3
Phenanthrene	1824	4426	20469	392	14500	51
Anthracene	914	2123	11865	101	<1	<1
Fluoranthene	650	2177	9039	114	<1	<1
Pyrene	437	1420	5130	37	3848	<1
Benzo (a) anthracene	88	326	1065	17	<1	<1
Chrysene	86	361	1213	10	<1	<1
Benzo (b) fluoranthene	63	236	868	6	<1	<1
Benzo (k) fluoranthene	1	<1	454	3	<1	<1
Benzo (a) pyrene	91	322	1133	6	<1	<1
Dibenxo (ah) anthracene	1	<1	<1	<1	<1	<1
Benzo (ghi) perylene	24	61	183	2	<1	29
Indeno (123 cd) pyrene	31	81	343	2	<1	2

Note: (i) For the four solid samples all results, including total PAH, are expressed as mg/kg i.e., ppm
(ii) For the water sample total PAH is given as mg/l
(iii) In the water sample, a cyclohexane extract gave 530 mg/l, mineral oils were 320 mg/l and coal tar derivatives were 210 mg/l

TABLE 3: RESULTS OBTAINED ON WATER SAMPLES TAKEN AT LIMERICK

SAMPLE AND POSITION	pH	AMMONIA NITROGEN AS N	SULPHATE AS SO_4	TOTAL ORGANIC CARBON T.O.C	TOTAL CYANIDE	TOTAL PHENOLS AS TAR ACIDS
Water sample from TP 2	9.75	340	740	1000	15.1	45
Water sample from gas holder water chamber 2	8.95	<0.01	31	10	0.64	1.4
TP 9 water sample	8.35	154	3600	90	5500	10
Water sample from gas holder water chamber 1	8.75	<0.01	415	13	0.11	0.1

With the exception of pH, all results are quoted in terms of mg/litre

TABLE 4: CALORIFIC VALUES OBTAINED ON SAMPLES FROM LIMERICK

TP 1 (0.5m)	2.20
TP 1 (1.4m)	4.57
TP 8 (1.1m)	18.9
TP 9 (1.2m)	4.60
Naphtha tank	25.0

Results are expressed in terms of MJ/kg

TABLE 5: GAS DATA OBTAINED AT LIMERICK (results expressed as %)

26th SEPTEMBER 1990			
TRIAL PITS	CH_4	O_2	CO_2
1	<0.01	20.4	<0.5
2	<0.01	20.8	<0.5
3	<0.01	21	<0.5
4	1	20	<0.5
5	<0.01	20.6	<0.5
6	<0.01	20.5	<0.5
7	0.02	20.4	<0.5
8	2	19.8	<0.5
9	1	20.1	<0.5
10	<0.01	20.8	<0.5

3rd OCTOBER 1990		
CH_4	O_2	CO_2
<0.01 ←	20.6 Full of Water	<0.5 →
<0.01	20.7	<0.5
0.03	20.2	<0.5
<0.01	20.2	<0.5
0.01	20.2	<0.5
<0.01	20.6	<0.5
<0.01	20.5	<0.5
0.04	15.6	3
<0.01	20.3	<0.5
0.01	20.5	<0.5

APPENDIX A

LOGS OF TRIAL PITS EXCAVATED AT LIMERICK
17th September 1990

TP 1

0
Fill consisiting of sand, rubble, bits of earthenware pipes and red bricks.

0.5m
Tar stained fines, sand, gravel and bricks.

1.4m
A layer of oozing tar in fill. Strong smell of naphthalene. Tar stained sand.

2.2m Pit terminated in fill.

TP 2

0
Tarmacadam mound.

0.1m
Boulders, oozing tar, strong gas works odour.

0.6m
Water ingress (oily sheen) into fill consisting of gravel, rubble, sand and boulders.

1.1m
Tar stained rubble.

1.5m Pit terminated in tarry liquid. Strong smell of naphthalene.

TP 3

0
Concrete.

0.15m
Fill material consisting of chalky clay, concrete blocks, bricks and powdery chalk.

0.65m
Concrete floor.

0.75m
Tar stained rubble.

0.9m
Fill consisting of spent oxides, blue stained wood, lime and grey/blue powdery chalk(?)

1.7m Pit terminated.

TP 4(a)

0 Heaped piles of bricks and rubble

0.15m Concrete slab.

0.2m Layer of bricks and tar stained clayey material. Some oxides. 150mm water main, pit moved forward approx. 3m (see log TP 4(b) below)

TP 4(b)

0 Sparse grass cover and rubble.

0.1m Fill conssiting of fine rubble, chalky clay, bricks and slag.

0.3m Concrete floor.

0.4m Rubble fill.

0.9m Concrete foundation.

1.5m Bedrock.

1.6m Pit terminated.

TP 5

0
Sparse grass cover

0.1m
Fill consisting of rubble, sand, bricks, concrete lumps and broken earthenware pipes.

0.6m
Cracked sewer pipe.

0.8m
Sewage sludge form pipe, black coated rubble.

0.9m
Powdery cement-like fill, water seepage above bedrock.

1.1m Pit terminated in bedrock.

TP 6

(This pit was adjacent to a 1.6m cavity which had a concrete/iron roof. Pit was relocated 1m to northwards)

0
Rubble, tar stained fines, soil and spent oxide.

0.4m
Fine rubble, sands, limited tar staining, strong phenolic smell.

2.3m
Water ingress.

2.5m Pit terminated.

TP 7

This pit was excavated within the secure compound.

0
Gravel.

0.3m
Tar stained fines, stones, gravel and rubble.

0.4m
Increasing amount of sand in fill with depth, some large boulders and sections of old walls.

1.1m
Rubble, tar stained fines and some clayey lumps.

1.2m
Water ingress.

1.6m Pit terminated.

TP 8

0
Sparse grass cover, with spent oxides at surface level.

0.1m
Fused slags, tarmac lumps, tar stained boulders. Strong smell of hydrogen sulphide.

0.4m
Tar oozing in from side of pit.

0.9m
Foundry wastes in tar stained rubble, spent oxides and blue cyanide fill.

1.0m
Bedrock.

1.1m Pit terminated.

TP 9

0
Concrete blocks.

0.15m
Tar stained fines/light rubble, some coke.

0.2m
Thick, black, oozing tar, strong smell of sulphides.

1.4m
Water ingress with oily sheen. Acute smell of sulphide.

2.1m Pit terminated in fill. Flooded.

TP 10

0
Concrete.

0.1m
Spent oxide in a clayey material with fused slags, boiler wastes, slight tar staining.

1.6m
Wet tar stained clayey rubble. Sewer pipe in fill.

2.0m
Oily liquid ingress.

2.1m Pit terminated.