



APPENDIX D – PREVIOUS DRAINAGE INVESTIGATIONS

Former Rhodia Site Sea Outfall Investigation

Week Commencing 11th December 2017

Purpose: To gather as much information as possible about the sea outfall and its associated underground physical assets upstream to the leachate plant sampling point.

The sea outfall was installed to discharge all the sites' effluent into the Irish Sea. In the late 1990's the outfall discharged up to 40 megalitres per day. After the site closed and the buildings were demolished the only effluent stream remaining is the settled leachate that is pumped to sea via the sea outfall.

The environment discharge permit for the leachate system dated 2007 (but believed to originate in the early 2000's) describes the leachate being discharged through a 600mm diameter drain from a sample point -designated S01 at grid reference NX9649 1583 and then to the sea outfall with a discharge point given at the low water mark grid reference NX9602 1627.

There are two separate sea outfall pipes; one that is currently used for the leachate outfall; this starts at MH566 upstream of S01 and leads down to the cliff edge and the consented discharge point below MH1. There is a second pipe that begins at MH9 on site and runs via MH17, MH15, 14, 13, 12 & 11 to the second sea outfall. We have inspected most of this and found it to be a serviceable condition. There's no access to the vertical section.

We started our investigation on the leachate discharge system at the two manholes upstream of S01 – these are marked on the drawing as S01A and MH566. Manhole 566 has a 225mm invert that rapidly opens to a 600mm drain that leads to S01A. At S01A the drain reduces to 150mm diameter. It flows to the sample point S01 in a 150mm diameter plastic pipe. After S01 the pipe reduces to 100mm diameter.

We next find the plastic pipe in manhole 10, grid reference NX9641 1598; here the pipe is sitting in the invert of a 600mm drain; we think this is the original drain as referenced in the discharge permit. Having the plastic pipe in the invert makes it impossible to obtain travelling CCTV footage so we have not managed to confirm the condition of the host drain along its length. What we have seen indicates that it is fair condition.

There is a manhole upstream of MH10, it's a 450mm lateral connection to MH10 and it is designated MH300 on the plan, it's grid reference is NX9644 1598. We have inspected from it down to MH10 and find the drain to be in good condition. MH300 could be a useful manhole as it would give access to the leachate sea outfall for any pumped water from the old anhydrite mine.

Going downstream from MH10 the next available manhole is MH7 at grid reference NX9635 1613. This is outside the site boundary. The plastic pipe is visible in the invert. From here the plastic pipe is next seen in the flume and dosing chamber -we have called this MH17C. This is a locked and welded compound with no access; it's grid reference is NX9634 1614. From here the host drain and the plastic pipe are found at MH4, MH3 & MH2 and it is believed to enter the sea outfall at MH1. MH1 is

another locked and welded structure. At MH4 the pipe is visible in the invert, as it is at MH3. We managed to push a camera from MH3 down to MH2; the host pipe appears intact and in fair condition. At MH2 there is a dropshaft down to MH1. The plastic pipe traverses the dropshaft and exits the manhole through a wall. The pipe is anchored through this wall. MH2 is a dog leg manhole with a large cast concrete lid. There's no access from above. There's also a diverter drain running from MH2 across to MH12; there's no flow down this pipe.

There is an unmarked 225mm drain flowing from a southerly direction through a manhole designated MH3A. This is a light duty cover with a constant 20% flow that discharges into MH3. This flows around the plastic pipe to MH2 and then into the dropshaft. Dye tests of the leachate drain indicated that leachate was not flowing through this unmarked drain.

As there is no access at MH1 we could not determine the internal condition of the vertical discharge.

Video footage of the Greenpeace activities on this outfall in 1991 shows a swan's neck outfall, with the top of the neck at the high-water mark. This swan's neck has been washed away in the intervening period, the horizontal section to the low water mark has been open to the elements for several years.

There is a second sea outfall pipe; this runs down the cliff from MH17, through the southern side of MH17C to MH15 which is a Y manhole. This connects across to MH5. The other leg of the Y is stopped off but it runs down to MH14 then to MH13, then to MH12 and finally it drops into a box section culvert called MH11 on the plan before discharging over the cliff. We have footage of this drain – it's a combination of 600 and 450mm diameter pipe and is in good condition. Access to the vertical section is poor and unsafe. There's no access at MH11 other than by dangling over the cliff.

Upstream of MH17 the drain flows from MH9 – an on-site manhole with grid reference NX9638 1597. Manhole 9 has a cast slab cover – very similar to MH2 in this respect and it would need heavy lifting gear to open. We did get the camera upstream to MH9 only to find a half wall blocking the pipe. Water is flowing over this weir wall.

When you look at the site drawing there's an octagonal base to the east of MH9. This used to be an effluent "treatment" unit and I believe it connected to MH9 via a 600mm drain. We could not find any access points for this drain.

Conclusions

We have not been able to confirm the condition of the vertical section or the low water horizontal section as there is currently no access to these parts of the pipe. Unlocking MH1 and undertaking a confined space entry will be required.

There is an existing route for discharges of pumped water. The leachate discharge system has been modified, compared to the consent, by the installation of a 110mm continuously welded plastic pipe from sample point S01 down to the sea discharge. We presume this was done to comply with the consent to discharge 017490484 "condition 2 – nature of the discharge. The discharge shall consist solely of trade effluent...." However, the cross connection from MH3A to MH3 implies that this condition is currently in breach. The 110mm diameter pipe is probably insufficient for the planned mine water discharge.

The plastic pipe is laid, so far as we can tell, as a loose fit in the existing pipe. As such, it may be possible to utilise the host pipe to carry the mine water to sea. The discharge pipe had a working capacity of 40 megalitres per day when in operation.

The condition of the pipe is generally fair along the lengths we have managed to inspect.

There is a second route from the site via MH 9, 17, 15,14,13,12,11 to the second sea outfall. There's one section of 450mm pipe, all the rest, apart from the final box section is 600mm. The report describes the condition of the drain which is generally acceptable; however, we could not investigate the vertical drop to the low water mark. Further investigation would need to be made to inspect MH9.

Ian Woodhouse

Director

Unblock Cumbria Ltd

West Cumbria Mining
Data

Former Rhodia Site Discharge Pipeline

Lat WGS84	Long WGS84	Point Name	Grid Ref OSGB36	Height CL (m)	Depth IL (m)	Diameter	Comments
54.31'47.22135	-3.36'11.24454	0001/MH17	NX9635 1612	135.22	128.62		
54.31'47.495375	-3.36'11'14871	0002/MH7	NX9635 1613	132.321	127.501		
54.31'47'74426	-3.36'11.60059	0003/MH17 C	NX9634 1614	130.257	Not Available		See Note 1
54.31'47.90225	-3.36'14.41532	0004/MH15	NX9635 1614	124.988	122.608		
54.31'48.18553	-3.36'14.84566	0005/MH5	NX9628 1615	123.777	120.507		
54.31'48.67863	-3.36'20.78765	0006/MH3A	NX9618 1617	107.49	106.97		
54.31'49.02763	-3.36'21.68920	0007/MH13	NX9619 1618	105.167	103.397		
54.31'48.87476	-3.36'22.72649	0008/MH3	NX9614 1618	103.036	101.116		
54.31'49.13679	-3.36'22.54640	0009/MH2	NX9615 1619	102.436	Not Available		Concrete slab
54.31'48.91533	-3.36'23.33640	0010/MH12	NX9613 1618	101.607	99.997		
54.31'50.16636	-3.36'24.01693	0011/MH1	NX9612 1622	95.73	94.63		See Note 2
54.31'49.39749	-3.36'27.06512	0012/MH11	NX9607 1620	85.034	Not Available		See Note 3
54.31'48.29819	-3.36'18.15023	0013/MH14	NX9623 1616	113.693	111.473		
54.31'48.59459	-3.36'17.81828	0014/MH4	NX9623 1617	113.93	112.03		
54.31'35.62159	-3.36'0332579	0015/MH566	NX9648 1576	138.625	136.805		
54.31'37.39589	-3.36'02.76644	0016/MHS01A	NX9649 1582	138.412	135.912		
54.31'37.71606	-3.36'02.91861	0017/MHS01	NX9649 1583	138.004	135.074		
54.31'42.75301	-3.36'06.07332	0018/MH300	NX9644 1598	138.26	136.26		
54.31'42.79022	-3.36'07.71437	0019/MH10	NX9641 1598	138.284	132.634		
54.31'45.22282	-3.36'09.35327	0020/MH9	NX9638 1597	137.365	Not Available		Concrete Slab

Note Heights are expressed in metres above Wgs84 ellipsoid surface. Invert levels are measured and deducted from cover levels

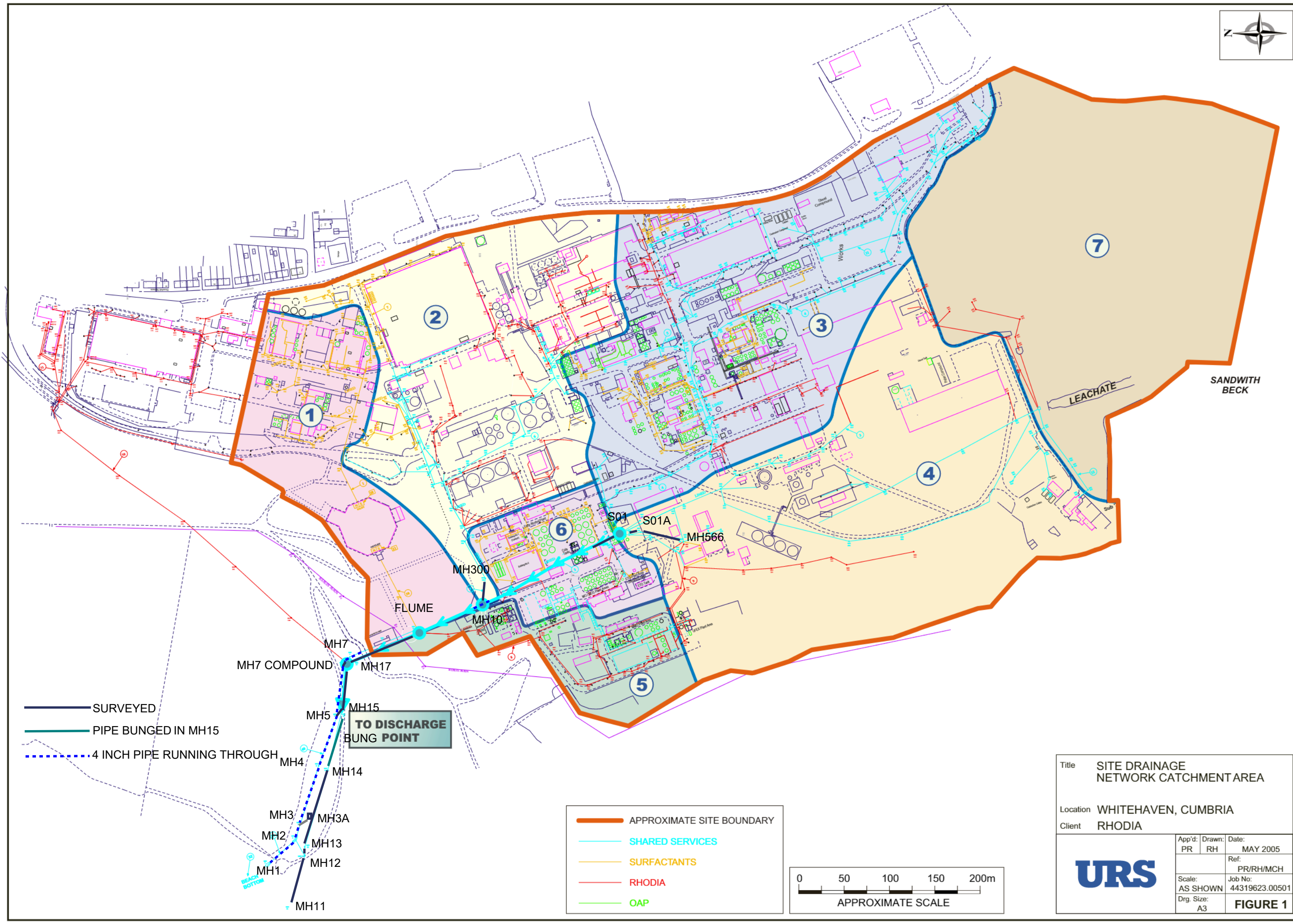
Note 1 MH17C is the unmarked compound that is locked and welded

Note 2 MH1 is the locked & welded vertical drop on the cliff edge. IL is measured to the top of the discharge pipe

Note 3 MH11 is the other sea discharge pipe. The cover level is the top of the flume - alongside the concrete structure

Manhole Photos From Upstream MH 566 to the Sea Outfall below MH1





APPENDIX E– EXISTING OUTFALL PHOTOGRAPHS



Photo 1 – Northern Discharge Pipe – Shaft (I)



Photo 2 – Northern Discharge Pipe – Shaft (II)

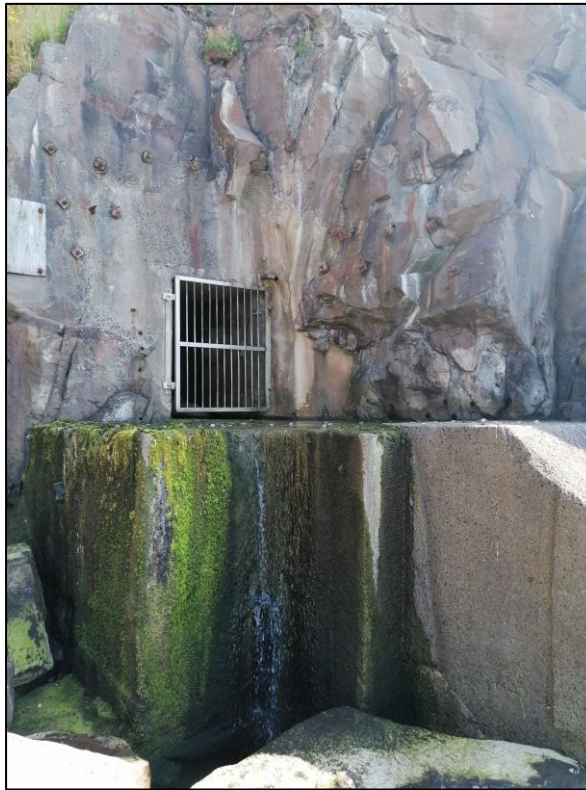


Photo 3 – Northern Discharge Pipe – Sea Outfall (I)



Photo 4 – Northern Discharge Pipe – Sea Outfall (II)

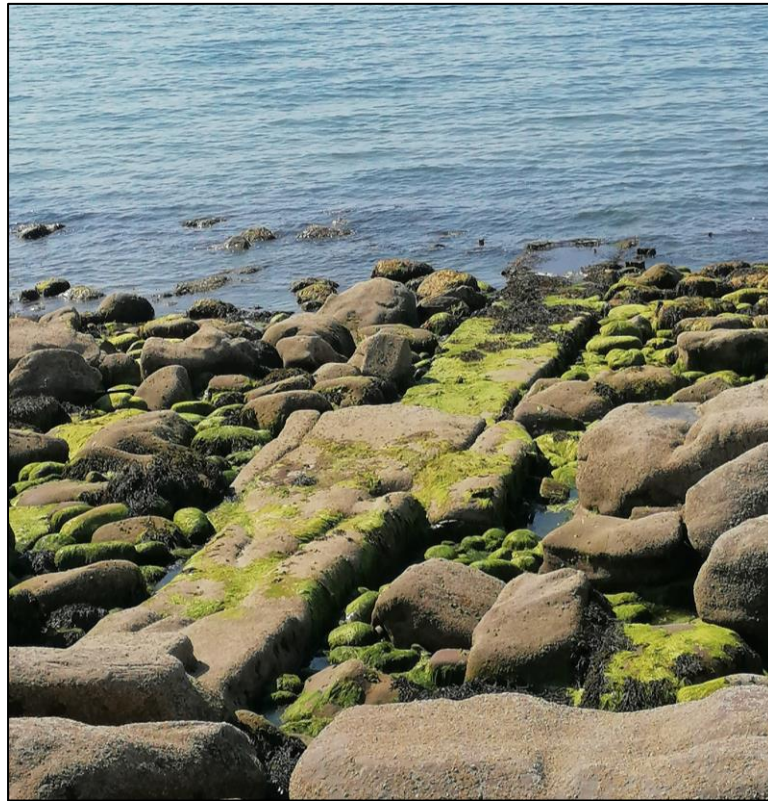


Photo 5 – Northern Discharge Pipe – Sea Outfall (III)



Photo 6 – Cliff Outfall (I)



Photo 7 – Cliff Outfall (II)

APPENDIX F – PROPOSED DRAINAGE LAYOUT

Issues

Issues

Issues

KEY

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- S.W. Foul
 Proposed Sewer
 Proposed Disconnection Manhole
 Proposed Finished Floor Level
 Existing Combined Sewer
 Existing SW Sewer
 Proposed Road Level
 Existing Road Level
 Existing Level
 Site Boundary

Rev	Date	Initials	Details
Drawing Revisions			

North Point 	Project: Marchon,
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Quality Ass.	Client
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UKAS 005
Quality
Assurance

SGS Certificate
GB02/54539

Sheet 1

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Drawing No.	Revision

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