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Administration,  
Environmental Licensing Programme,  
Office of Climate, Licensing & Resource Use,  
Environmental Protection Agency,  
Headquarters,  
PO Box 3000,  
Johnstown Castle Estate,  
County Wexford

19<sup>th</sup> June 2008

**Re: D0051-01 - Clonakilty Waste Water Discharge Licence Application – Reply to Notice in accordance with Regulation 18(3) of the Waste Water Discharge (Authorisation) Regulations 2007**

Dear Ms. O'Connor,

I refer to your letter of the 4<sup>th</sup> April 2008 concerning the above. The following is my reply to your request for further information in accordance with Regulation 18(3)(b) dealing in sequence with the points raised :

**Regulation 16 Compliance Requirements**

- 16(1)(c) – The existing peak population equivalent catered for at the Clonakilty Waste Water Treatment Plant is of the order of 16,324 with upgrade to plant proposed to cater for 20,500 pe. Consequently this application is in the category of agglomeration size >10,000 pe. The name of the agglomeration is **Clonakilty and Environs**. The environs include Inchidoney, Shannonvale, Ring and other areas adjacent to the town boundary as shown on map of agglomeration boundaries similar to those submitted with original application (revised map attached). The boundaries of the agglomeration are based on the Cork County Development Plan boundaries and subsequent amendments.

o PE Estimate

Sources	Domestic	Commercial	Trade	Total
Existing Peak	7,202	7,000	2,122	16,324
Proposed Peak	9,763	8,400	2,337	20,500

o No leachate or industrial sludges are currently treated at the waste water treatment plant. In the first quarter of 2007 204,000 litres of leachate was treated at Clonakilty Waste Water Treatment Plant from Benduff Landfill site at Rosscarbery which has been closed for a number of years. No further leachate has been extracted from the landfill since then and no further extractions are envisaged with full capping in place since 2004.

o Planning permission granted within the agglomeration boundary not yet commenced or completed – most permitted development is required to provide own waste water treatment where practical. Other development not commenced or completed - population equivalent = 529 pe of which non-domestic percentage is 38%.

o Ability of waste water works to accommodate extra loading. – It is envisaged that a substantial amount of this development will not have taken place until the waste water works has been upgraded in January 2011 particularly in light of the downturn in the economy. In the meantime extra aeration capacity has been installed in the oxidation ditches and more frequent desludging is carried out to cater for loading over and above that for which the plant was originally designed.

- 16(1) (e) All tables were revised and have been re submitted with the response to the regulation 18 notice. Table D has been revised to evaluate the data recorded in Section E4 of the application (also revised). In the original application the statistical data was measured using an excel format however the average and median data was calculated by the excel formulas and ignored any results which were less than the limit of detection. This led to a bias in the results and after consultation with colleagues any results which were less than the limit of detection were halved where there were a spread of results available. The true recorded values were less than the LOD and in fact in many cases would be very close to the blank result. By halving the LOD and using this value for statistical calculation purposes this will reflect the situation where 50% of the results will lie on either side of half of the LOD and provide a more accurate estimation of these parameters. The tidal level values for the estuary ,available data for the Feagle River and the surface tidal current for the estuary has been supplied in section a of Table D . The relevant references have also been supplied with the revised Table D. The PE figure for these tables is 16,324 as this is the current PE of the system and these results were evaluated and submitted from real data and samples collected in 2007. A revised section D and tables E4 have been submitted with this response.
- 16(1) (i) It is proposed to include SCADA technology in the upgrade of the plant to ensure proper monitoring and alarming of all equipment associated with running of the plant, pumphouses and overflows etc. This will lead to rapid response to any problems or emergencies that may arise in the course of operation of the scheme thereby preventing unintended waste water discharges. It is also proposed to shortly develop a Performance Management System (PMS) for the Clonakilty Wastewater Treatment Plant. This will provide a uniform approach to dealing with all relevant performance management issues including emergency procedures, reporting procedures and plant operation procedures. Also included in the improvements is a storm tank which will retain storm overflow volumes thus leading to reduction of possible pollution particularly that caused by “first flush”. Regarding the storm water overflows for this project, there are two overflows in the system - Clarke Street and Long Quay pump stations. These are designed in accordance with the criteria set out in Table 3 of the DoEHLG ‘*Procedures and Criteria in Relation to Storm Water Overflows*’.  
 The dilution factor at the Clarke Street overflow, based on recorded dry weather flows, is 9. In accordance with Table 3, the overflow setting here is Formula A (i.e. Formula A is pumped to the treatment works).  
 For the Long Quay pumping station, 750 m<sup>3</sup> of storage is proposed which provides 40 l/head storage for a population equivalent of 18,750, which is in excess of the requirement in Table 3, where the dilution factor is >4. The overflow setting is Formula A.  
 However as there will be a flow limit of 111 litres per second set to hydraulic load to the plant the pumps at both stations will be set to overflow at a setting of 3 DWF to ensure this is not exceeded.
- 16 (1) (k) The estimated existing peak discharge flow is approximately 84 l/s at 3 DWF with an associated BOD load of 980 kgs/day. The proposed peak discharge flow is 111 l/s (with slight plant over-capacity design of 115 l/s) and associated BOD load of 1,230 kgs/day. The EIS has been carried out on the basis of this proposed discharge flow of 111 l/s and BOD load of 1230 kgs/day with an average flow of 53 litres/sec used for modeling and simulation purposes.
  - o Information regarding modeling report is contained in Appendix 6.2 of Volume 2 of the EIS. Further information as outlined in Notice letter is awaited from the relevant consultant and will be forwarded as soon as received. The extent of the tidal zone is Clarke Street Bridge upstream of the Primary discharge and the Secondary/Emergency discharges from Long Quay and Clarke Street Pump Stations.
  - o Information regarding modeling report is contained in Appendix 6.2 of Volume 2 of the EIS. Further information as sought in Notice letter is awaited from the relevant consultant (entailing considerable amount of data format transformation) and will be forwarded as soon as received.
  - o The data presented in Table 6.1 of Appendix 6.2 of the EIS Appendices are computed levels of contaminants based on the discharge levels and dilution.
  - o The Environmental Impact Statement was commissioned for the purposes of providing an assessment of the impacts from the Clonakilty Waste Water Treatment Plant. As such it focused primarily on the proposed peak flow discharge of the Upgraded Plant with flow and load as outlined above. In terms of the modeling and simulation of effluent discharges carried out in the EIS a flow rate of 53 litres per second was used as an average flow from the Plant.
- 16 (1) (l)
  - o Amendment to Section G of application form - Dangerous Substances Directive – As there is no licensed or known industries from which dangerous substances would emanate in the

Clonakilty agglomeration and no further leachate is received at the plant this directive is not applicable. However as part of the licence application process for D0051-01(Clonakilty) both influent and effluent were screened for the presence of dangerous substances as defined in the 2001 regulations and the guidance notes supplied by the agency( the results were supplied in Section E4 of the application). There were no breaches of the 2001 regulations in the discharge. The influent data confirmed the absence of dangerous substances in the discharges to the plant on the date that sampling occurred.

- o As part of the scoping process for the EIS project information was submitted to the Department of Environment Heritage and Local Government, which they would then have passed onto the relevant sections in their department. Attached is the correspondence received back from the Department of Environment Heritage and Local Government. As part of the ecology work of the EIS the Regional DCO of the National Parks and Wildlife Service was contacted about general matters regarding ecology but specific questions were not answered and no formal opinions given. On the 16<sup>th</sup> June 2008 Valerie Hannon of Cork County Council met with the regional group of the NPWS . The object of the meeting was to discuss the agencies request for consultation on the licence application. We are currently awaiting a formal response from the NPWS office in Cork and this will be submitted to the agency soon as it is available. In the interim maps of the designated areas have been supplied along with the site synopsis for the area.(NPWS corr in file)
  - o As a result of the discharge the main interaction of ecology will be with water quality. A change in nutrient/BOD loading to Clonakilty Estuary may induce a range of ecological impacts that range from positive to negative depending on the changes that occur in the WWTP emissions. The EIS has discussed the potential conflicting impacts upon ecology of an improvement in estuarine water quality, i.e. improvements may result in a decrease in macroinvertebrate densities which could result in a significant impact upon birds. In general however, a reduction in the potential eutrophic status of Clonakilty Estuary is viewed as beneficial to ecology.
  - o The abstraction directive, the water framework directive, the birds directive, the groundwater directive , the habitats directive the environmental liabilities directive , the bathing water directive have been discussed previously in section G .1 of the application and there are no changes in the information supplied..
  - o A test report is supplied with the 2007 data that will be submitted to the agency as part of the requirements of the urban waste water directive. In 2007 the discharge from the treatment plant failed the urban wastewater directive limits for Suspended Solids. The plant recorded one exceedance for BOD and COD however the absolute limit was not breached and the plant was compliant with BOD and COD discharge limits in 2007.
  - o There are no designated shellfish production areas in Clonakilty Bay and there are no proposals to extend designated shellfish production status to Clonakilty Bay.
- 16(1) (m) Section B.10 of the application Capital Investment Programme describes in detail the improvement works proposed to be carried out under this programme. This outlines the main recommendations, proposed elements, costings and likely timeframe for various stages of the works. Projected completion date is January 2011.
  - 16(1) (n) Planning Permission for the proposed barrage has been granted by Cork County Council to Clonakilty Town Council (Planning Ref. No. 96/1376). The proposed location for the barrage (**E139360 N040500 to E139590 N040700**) is approximately 850 metres downstream of the Clonakilty Waste Water Treatment Plant discharge point. A substantial amount of preliminary investigative works and surveys has been carried out with a view to constructing the barrage in the short rather than the long term.

In the EIS carried out for the Clonakilty Waste Water Treatment Plant Upgrade an assessment of the impact of the discharge of the effluent from the plant on the receiving waters was carried out for the scenario of the barrage across the Clonakilty Harbour. The modelling indicated that the barrage would make only a very minor difference to water quality. For a more detailed assessment of impact of the proposed barrage see section 7.4.3 of Volume 1 the EIS. Further information on the proposed barrage is available in Appendix 6.2 and 6.3 of Volume 2 of the EIS.

Supporting Data

The following maps have been resubmitted to reflect the change outlined in 16(1) c:

1. B1- (3 No.) -Agglomeration Boundary – Revision 1
2. B2- (2 No.) - Site Location Plan – Revision 1
3. B3- (1 No.) - Primary Discharge Point – Revision 1
4. B4- (3 No.) – Secondary Discharge Point – Revision 1
5. B5- (1 No.) – Storm Water Overflow Points – Revision 1
6. B8- (1 No.) – Position Of Site Notice – Revision 1
7. C1- (1 No.) - Proposed Upgrade Process Flow Diagram – Revision 1
8. C2 – (1 No.) – Proposed Storm Tank – Revision 1

Revised Documentation And Documents Also Supplied

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Section D Revised –Tables And References

Section E 4 – E4 Revised Excel Spreadsheets

Section G – Site Synopsis , OS Heritage Maps, Test Report For 2007

Yours sincerely,

-----  
Declan Groarke  
Senior Executive Engineer  
Water Services

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**SECTION A Revised**

**NON-TECHNICAL SUMMARY**

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# APPLICATION FOR A WASTEWATER DISCHARGE LICENCE

## CLONAKILTY SEWERAGE SCHEME

### Non-Technical Summary Revised

#### **A Description of the Wastewater Works and the Activities Carried out therein**

##### The Collection System

The wastewater in Clonakilty and its environs is collected in a partially combined foul and surface water network consisting of both gravity and pumped systems. The foul sewage consists of both domestic and industrial effluent. Generally the central part of the town gravitates in the partially combined system to the two main pump stations of the scheme – Long Quay and Clarke Street. These then along with Inchydoney main pumping station pump directly to the wastewater treatment plant. Pump stations on the outskirts of the town fed by essentially separate foul systems include Inchydoney (main and minor), Gallanes and Templebryan North. Further private pumping stations are located at Templebryan South housing estate, Clonakilty Technology Park, Ard Alainn housing estate (Tawnies Lower Td.) and Inis Sioda housing estate (Scartagh). See Drawing No. CLON A1. of Attachment No. A1 for locations.

Both Long Quay and Clarke Street pump stations have storm overflow channels set at high levels in order to avoid high tide infiltration back from the overflow. Occasionally bypasses set at lower levels on overflows at both pump station have to be opened manually to relieve flooding in the lower areas of the town. It is proposed to lower the levels of the overflows with the installation of Tideflex non-return valves to avoid tidal back-up. Long Quay pumps are capable of pumping 4 DWF and Clarke Street 5 DWF. In order to cater for storm water at Long Quay in excess of 4 DWF it is proposed to provide 750 m<sup>3</sup> storm tank adjacent to the pumphouse. This tank is sized to store 30 minutes storage of the excess in the inlet pipe capacity over and above the pump capacity. These proposed works are to be carried out under the upgrade of the wastewater treatment plant approved under the Water Services Investment Programme.

All other pump stations contain overflows either to surface water (both Inchydoney stations), ground soakaway (Gallanes) or holding tank (Templebryan North housing estate, Templebryan South housing estate, Clonakilty Technology Park, Ard Alainn housing estate and Inis Sioda housing estate) to cater for emergencies such as pump breakdown or electricity outage. However this seldom occurs as each contains duty and standby pumps. In case of emergency Inchydoney stations are linked by telemetry with the wastewater treatment plant and all other stations have 24 hour storage with flashing beacon alarm for pump malfunction.

The main pump station in Inchydoney is over 3 km from the wastewater treatment plant and in order to overcome possible septicity in the rising main due to long retention times air is injected into it at both the pump station and at an intermediate air injection station 1.3 km from the plant.



## Wastewater Treatment Plant

The existing wastewater treatment plant in Clonakilty is located on the sea front, east of the GAA pitch and adjacent to the Model Railway Village. The site is approximately 2.2 ha in area on reclaimed land and is relatively flat, lying at approximately 5.5 m OD. The influent from the town and environs is pumped into the inlet works from two pumping stations located at Clarke Street Bridge and Long Quay. A separate pumped feed from Inchydoney also enters the works.

The original design loads on the existing treatment plant were:-

- Design Population 5,333 pe
- Dry Weather Flow 1 DWF = 17 l/s
- Peak Flow 6 DWF = 102 l/s
- BOD Loading 364 kg/day

The purpose of the plant is to remove solids and pollutant matter from sewage entering the works thus rendering the treated effluent suitable for discharge to a watercourse. Grit and others materials are removed at the inlet works and the extended aeration process removing the main pollutant matter prior to discharge to harbour.

The existing treatment works consists of:-

- (a) Grit Removal: A grit trap is currently in operation at the plant with a design flow capacity of 0 – 180 l/s, which is adequate to serve up to 22,000 p.e. flowing at 3 DWF.
- (b) Grit Classifier - has been installed recently. This receives the grit from the grit trap and separates out the grit from other materials and conveys the relatively dry grit into an adjacent wheelie bin for removal to landfill.
- (c) Screening – In the year 2000, a mechanically brushed screen and Lisep unit (Haigh Ace Inlet System) were installed. The largest model, 991, was installed in Clonakilty and has a maximum capacity of 100 l/s. Although the design peak flow is 102 l/s, the current peak flow entering the works when all pumps are running, is in the region of 135 l/s. The screen, therefore, is on occasion operating at maximum capacity, with no room for an increase in flows entering the works.
- (d) Emergency Bypass – A hand-operated penstock is located between the screen and the inlet flumes at the inlet works. This penstock leads to a backdrop manhole, which connects to the treatment plant outfall at the easterly end of the site allowing bypass of plant in emergency situations.
- (e) Inlet Flumes – After the screen outlet, the inlet channel splits into two channels 300 mm wide, with future provision for a third channel. The two channels have Venturi flumes installed with a 200 mm throat to enable measurement of the flow through the works which is then transmitted to control house. These channels were designed for a flow capacity of 51 l/s. The divided flows are piped from here to the oxidation ditches
- (f) Extended Aeration – Extended aeration is by means of 2 no. racetrack type oxidation ditches with 4 no. rotors located midway along length of each ditch as a means of aeration. The design p.e. for these ditches was 2,666/stream. Aeration is by means of



rotors located midway along the racetrack, which also maintains a velocity of approximately 3 m/s for the mixed liquor within the ditch.

These ditches were designed for a much lower BOD loading than the peak 15,000 p.e. that it serves in the summer. However, the plant was designed for a higher hydraulic load of 6 DWF, whereas now most plants are designed to take a hydraulic loading of 3 DWF. Recently a further floating aerator was introduced into each ditch in order to increase the amount of oxygen available for microorganisms to cater for the increased loading. Dissolved oxygen probes measure the oxygen levels within the oxidation ditches. The flow from the oxidation ditches is piped to the settling tanks.

- (g) Settling Tanks – 2 no. circular hopper-bottomed settling tanks are currently in operation as a means of secondary sedimentation. Sludge settles to the bottom of these tanks and is returned to the lifting wheel chambers. The supernatant liquid from the settling tanks is piped to the outlet channel.
- (h) Outlet Channel – The 400 mm outlet channel collects the treated effluent from the settling tanks which then flows by gravity to the sea outfall. The flow is measured in the outlet channel and transmitted to control house.
- (i) Sludge Return – The sludge from the settling tanks is returned to the oxidation ditches by means of a sludge-lifting wheel. This lifting wheel lifts the sludge to a sufficient height so that it can flow by gravity to the oxidation ditch. The sludge can also be drawn off from the lifting wheel chambers to the sludge pump sumps for wasting.
- (j) Excess Sludge Pumps – 2 no. submersible pumps, one duty and one standby pump the excess sludge produced from the extended aeration process on to the picket fence thickener. The pumps operate automatically and pump the sludge to the picket fence thickener tank.
- (k) Picket Fence Thickener – A picket fence thickener is located adjacent to the control house. The supernatant effluent is returned to the head of the oxidation ditch, and the thickened sludge which settles to the bottom of the tank is pumped to the sludge filter belt press.
- (l) The Filter Belt Press – Located in the control house, the filter belt press reduces the moisture content of the sludge to approximately 12 - 14% dry solids with the aid of polyelectrolyte which is mixed with the sludge prior to the press. A screw conveyor then conveys the sludge to a tanker for recovery to agriculture.
- (m) Control House – This consists of the control room, laboratory, storeroom and toilet. The control room contains a mimic of the plant operation and control panel with displays of various equipment, operations and measurements. A telemetry system is also in place to monitor the Inchidoney scheme operations.

The Clonakilty Sewerage Scheme is currently operated by a Cork County Council employed caretaker who carries out his duties generally during normal working hours Monday to Friday while checking the plant as required outside of these hours.

An upgrade of the wastewater treatment plant approved under the Water Services Investment Programme is to be carried out in the near future in order to cater for a total loading of 20,500 pe. For further details concerning these proposals see Section B10 of the application - Capital Investment Programme.

## The Sources of Emissions from the Wastewater Works

The pollution load from the Clonakilty agglomeration arises from the following areas:

- The local population
- Shannonvale Chickens
- Clona Milk Dairies
- Irish Yoghurts
- Hotels, schools, hospital, abbatoir, technology park etc.

Shannonvale Chickens has its own treatment plant discharging treated effluent to public sewer.

Development in Clonakilty generally has increased substantially in recent years with high seasonal variation in the population reaching its peak in summertime with influx of tourists and holidaymakers. Latest recorded peak pe at the plant is for 15,000.

The treatment plant was designed to be built in two stages with room allowed on the site for a third oxidation ditch to be added on expansion of the plant to cater for 20,500 pe. This increased load will include effluent from Shannonvale and Ring villages.

## The nature and quantities of foreseeable emissions from the waste water works into the receiving aqueous environment as well as identification of significant effects of the emissions on the environment

It must be noted that Clonakilty Harbour is classified as a National Heritage Area, Special Area of Conservation and a Special Protection Area.

Emissions from the plant are to comply with the Urban Wastewater Treatment Directive whose limits are :

BOD – 25 mg/l ; SS – 35 mg/l ; Phosphorus – 2 mg/l ; Nitrogen – 15 mg/l

Peak hydraulic load proposed through the plant after upgrade = 3 DWF = 111 l/s or 9590 m<sup>3</sup>/d  
Flows in excess of this will be required to be overflowed at pump stations to storm tanks or for discharge to harbour.

One of the main concerns regarding the effects of the emissions on the environment is the classification of Inchydoney as a Blue Flag beach. The fact that it has maintained its status as such for the last number of years is an indication of the quality of water in the area and the compliance with coliform requirements.

The Environmental Impact Statement accompanying this application was carried out in conjunction with the proposed upgrade of the Wastewater Treatment Plant. This found that the optimum location for the outfall from the plant is its present one as the distance to Inchydoney beach meant the greatest reduction in bacterial contamination occurred.

The EIS also recommends that in order to allow for any change in the designation of the receiving waters or any increase in the wastewater flows, the WWTP should be designed to allow for retrofitting of disinfection equipment so that coliform levels in the treated effluent be reduced if necessary.

Modelling carried out as part of the EIS indicated that an increase in nutrient levels in Clonakilty Harbour is unlikely to occur due to full tidal flushing of the estuary on each tidal cycle. However, at low river flows, the effluent from the WWTP will result in unacceptably high concentrations of nitrogen and phosphates in the receiving water.

It is recommended that the WWTP should provide for reduction of nitrogen and phosphates in the treated effluent. The maximum levels of total phosphorus (P) and total nitrogen (N) in the treated effluent being discharged to sensitive areas under the Urban Wastewater Treatment Regulations 2001 are 2 mg/l P and 15 mg/l N. These levels are considered appropriate for the upgraded and expanded Clonakilty WWTP. Allowance should be made in the design of the WWTP for the further reduction in nitrogen and phosphates in the effluent if required.

In relation to odour and noise emissions the EIS states

1. Odour emissions are not predicted to be perceived at any sensitive receptor beyond the site boundary.
2. During the operational phase it has been concluded that the facility will not result in an adverse impact at the nearest sensitive receptors arising from on-site plant noise.

## **The proposed technology and other techniques for preventing or, where this is not possible, reducing emissions from the waste water works**

### **Technologies**

It is proposed to include SCADA technology in the upgrade of the plant to ensure proper monitoring and alarming of all equipment associated with running of the plant and pumphouses overflows etc. This will lead to rapid response to any problems or emergencies that may arise in the course of operation of the scheme.

### **Techniques**

It is proposed to develop a Performance Management System (PMS) for the Clonakilty Wastewater Treatment Plant. This will provide a uniform approach to dealing with all relevant performance management issues including emergency procedures, reporting procedures and plant operation procedures.

The EIS recommends facilities be provided in upgrading of WWTP to allow for retrofitting of disinfection as well as nitrogen and phosphorus removal if such becomes necessary at a later date.

It is proposed to provide odour control and removal at both the inlet works and the sludge treatment plant to ensure no detrimental effect to adjacent development.

## **Measures planned to comply with the general principle of the basic obligations of the operator, i.e., that no significant pollution is caused**

An upgrade of the wastewater treatment plant approved under the Water Services Investment Programme is to be carried out in the near future in order to cater for a total loading of 20,500 pe. For further details concerning these proposals see Section B Capital Investment Programme of the application.

This will lead to improvement in the quality of effluent from the wastewater treatment plant with consequent beneficial effects on the environment.

Included in the improvements is a storm tank serving Long Quay pump station which will retain storm overflow of 30 minutes duration thus leading to reduction of possible pollution particularly that caused by "first flush".

Modelling carried out as part of the EIS indicated that an increase in nutrient levels in Clonakilty Harbour is unlikely to occur due to full tidal flushing of the estuary on each tidal cycle. However, at low river flows, the effluent from the WWTP will result in unacceptably high concentrations of nitrogen and phosphates in the receiving water.

It is recommended that the WWTP should provide for reduction of nitrogen and phosphates in the treated effluent. The maximum levels of total phosphorus (P) and total nitrogen (N) in the treated effluent being discharged to sensitive areas under the Urban Wastewater Treatment Regulations 2001 are 2 mg/l P and 15 mg/l N. These levels are considered appropriate for the upgraded and expanded Clonakilty WWTP. Allowance should be made in the design of the WWTP for the further reduction in nitrogen and phosphates in the effluent if required.

## Measures planned to monitor emissions into the environment

*Cork County Council operates a composite sampler on the primary discharge outlet from the treatment plant to the tidal area in Clonakilty Harbour. The plant is currently monitored by the Environment Directorate of Cork County Council on a monthly basis to measure compliance with the requirements of the Urban Wastewater directive. It is not possible to collect samples from an upstream and downstream of the discharge location. There are extensive tidal mudflats in the area around the discharge location and there is no safe access for personnel in this location for a downstream sample due to the nature and shallowness of the water and the large mudflats which are not suitable for pedestrian access in the area. On that basis upstream samples are not collected as we cannot relate the results and impacts in this manner by comparison with downstream samples.*

*The inlet and outlet were previously monitored by the water services section on a regular basis in order to evaluate the performance of the plant. Clonakilty Harbour which is the receiving water body is monitored in terms of the impacts of discharges in the bathing areas which are located near the mouth of the estuary. There are Blue Flag beaches in the vicinity of Clonakilty Harbour and these beaches are consistently meeting the very high bathing water quality standards which are set by the Blue Flag criteria for water quality.*

*It is proposed to continue with this multi-faceted approach to monitoring the treatment plant and the impacts of the discharge to waters. There is no drinking water abstraction point downstream of the plant. Consequently the Abstraction directive does not apply and neither are there designated shellfish waters downstream of the plant.*

*Samples are analysed for BOD, COD, Ammonial, pH, Suspended Solids, Total Nitrogen, Total Phosphorous, Sulphate, Ortho phosphate (in recent times) and Metals (in recent times).*

*The Wastewater Laboratory of Cork County Council is accredited for a number of analytical tests under the Irish National Accreditation Board (INAB) under the ISO 17025 international standard. It is currently accredited for the following parameters under the ISO 17025 system:*

- pH
- Biochemical Oxygen Demand

- *Chemical Oxygen Demand*
- *Suspended solids*
- *Ammonia*
- *Ortho Phosphate*
- *Chloride*
- *Sulphate*

*The laboratory performs a number of analytical tests e.g. Fats, Oil, Grease & Metals using an ICP-OES system and while it is not currently accredited for extra tests the analytical procedures and protocol are adhered to by the laboratory as if the tests are accredited. The laboratory also participates in proficiency testing schemes which measure the accuracy of results and performance of the laboratory in both the EPA scheme and the WRC Aquacheck scheme from the UK. The performance of the laboratory in these schemes is excellent and the non accredited tests are within the performance criteria for the schemes as evaluated by the scheme coordinators.*

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**LEGEND**

——— AGGLOMERATION BOUNDARY

No.	Date	Drawn	Checked	Revision Description
1	18.06.2008	JC	DG	AMMENDMENT TO AGGLOMERATION NAME

**Cork County Council,  
Western Division.**



N. O'MAHONY, B.E.,  
SEN. ENGR. (WATER SERVICES),  
COURTHOUSE, SHIBBEREEN.  
  
M. MURRELL,  
DIRECTOR OF SERVICES  
WEST CORK

Job Title:  
**CLONAKILITY AND ENVIRONS  
LICENCE APPLICATION TO EPA**

Drawing Title:  
**ATTACHMENT B.1-SHEET 1  
AGGLOMERATION BOUNDARY  
SERVED BY WASTE WATER  
TREATMENT PLANT**

Prepared By: J. CREAGH	Checked By: D. GROARKE	Date: DEC. 2007
Drawing number: CLON_01	Scale: 1:15000	Rev: 1





### NOTES

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### LEGEND

AGGLOMERATION BOUNDARY

No.	Date	Drawn	Checked	Revision Description
1	18.06.2008	JC	DG	AMMENDMENT TO AGGLOMERATION NAME

## Cork County Council, Western Division.



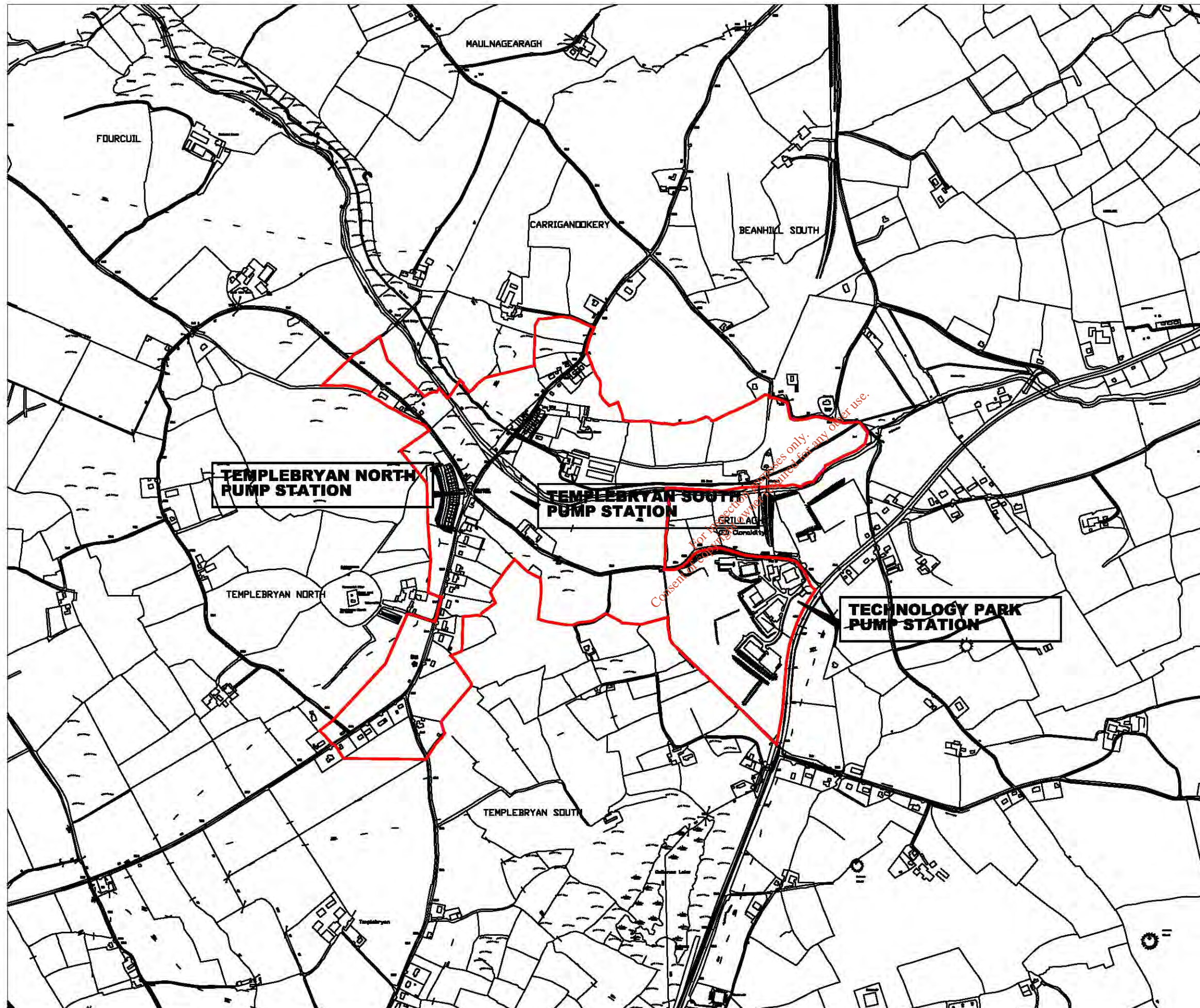
N. O'MAHONY, B.E.,  
SENIOR ENGR. (WATER SERVICES),  
COURTHOUSE, SKIBBEREEN.  
  
M. MURRELL,  
DIRECTOR OF SERVICES  
WEST CORK

Job Title:  
**CLONAKILTY AND ENVIRONS  
LICENCE APPLICATION TO EPA**

Drawing Title:  
**ATTACHMENT B.1-SHEET 2 OF 3  
AGGLOMERATION BOUNDARY  
SERVED BY WASTE WATER  
TREATMENT PLANT**

Prepared By: J. CREAGH	Checked By: D. GROARKE	Date: DEC. 2007
Drawing number: CLON_02	Scale: 1:10000	Rev: 1





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**LEGEND**

— AGGLOMERATION BOUNDARY

No.	Date	Drawn	Checked	Revision Description
1	18.06.2008	JC	DG	AMMENDMENT TO AGGLOMERATION NAME

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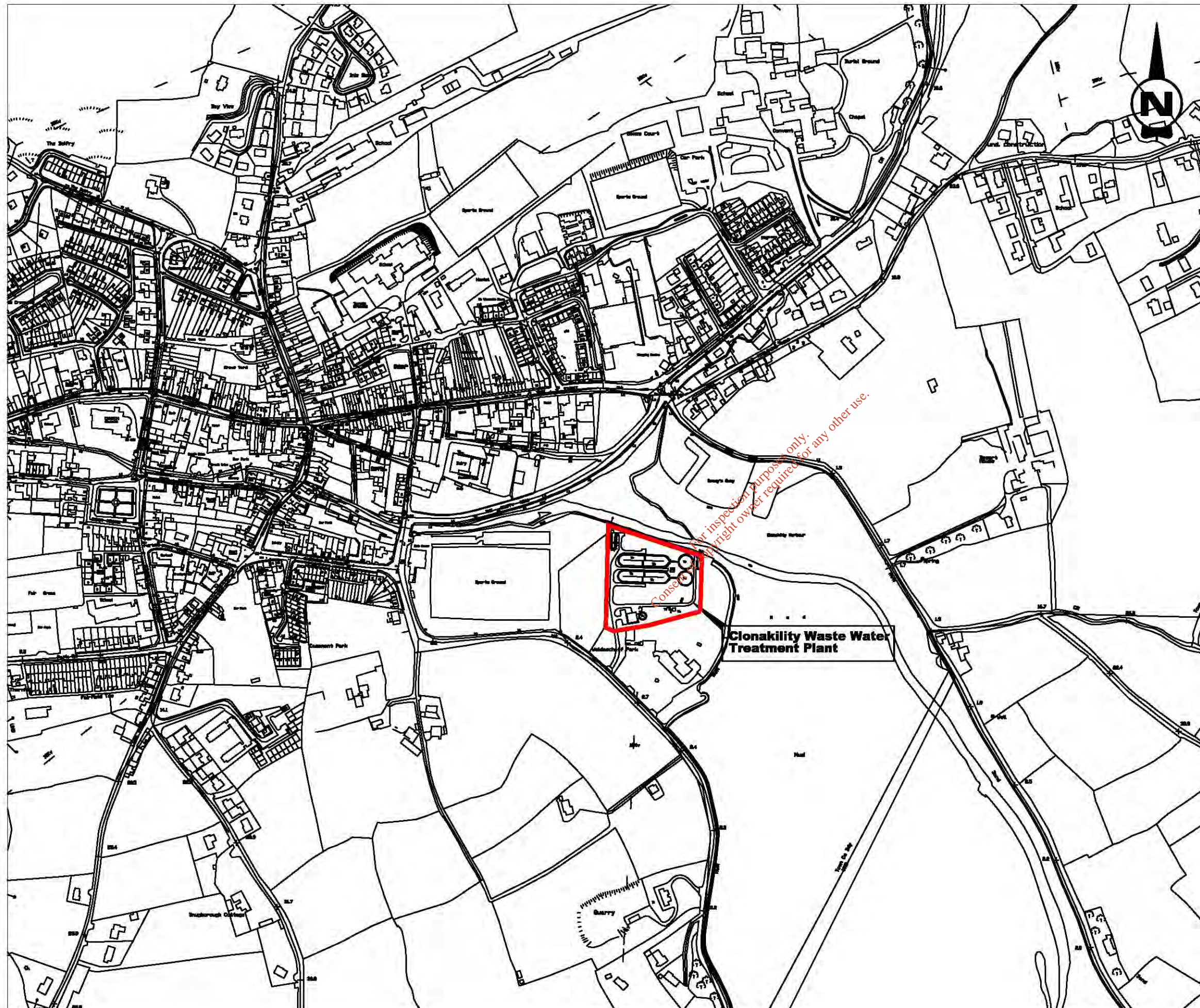
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DIRECTOR OF SERVICES  
WEST CORK

Job Title:  
**CLONAKILITY AND ENVIRONS  
LICENCE APPLICATION TO EPA**

Drawing Title:  
**ATTACHMENT B.1-SHEET3 OF 3  
AGGLOMERATION BOUNDARY  
SERVED BY WASTE WATER  
TREATMENT PLANT**

Prepared By: J. CREAGH	Checked By: D. GROARKE	Date: DEC. 2007
Drawing number: CLON_03	Scale: 1:10000	Rev: 1





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WASTE WATER TREATMENT SITE BOUNDARY

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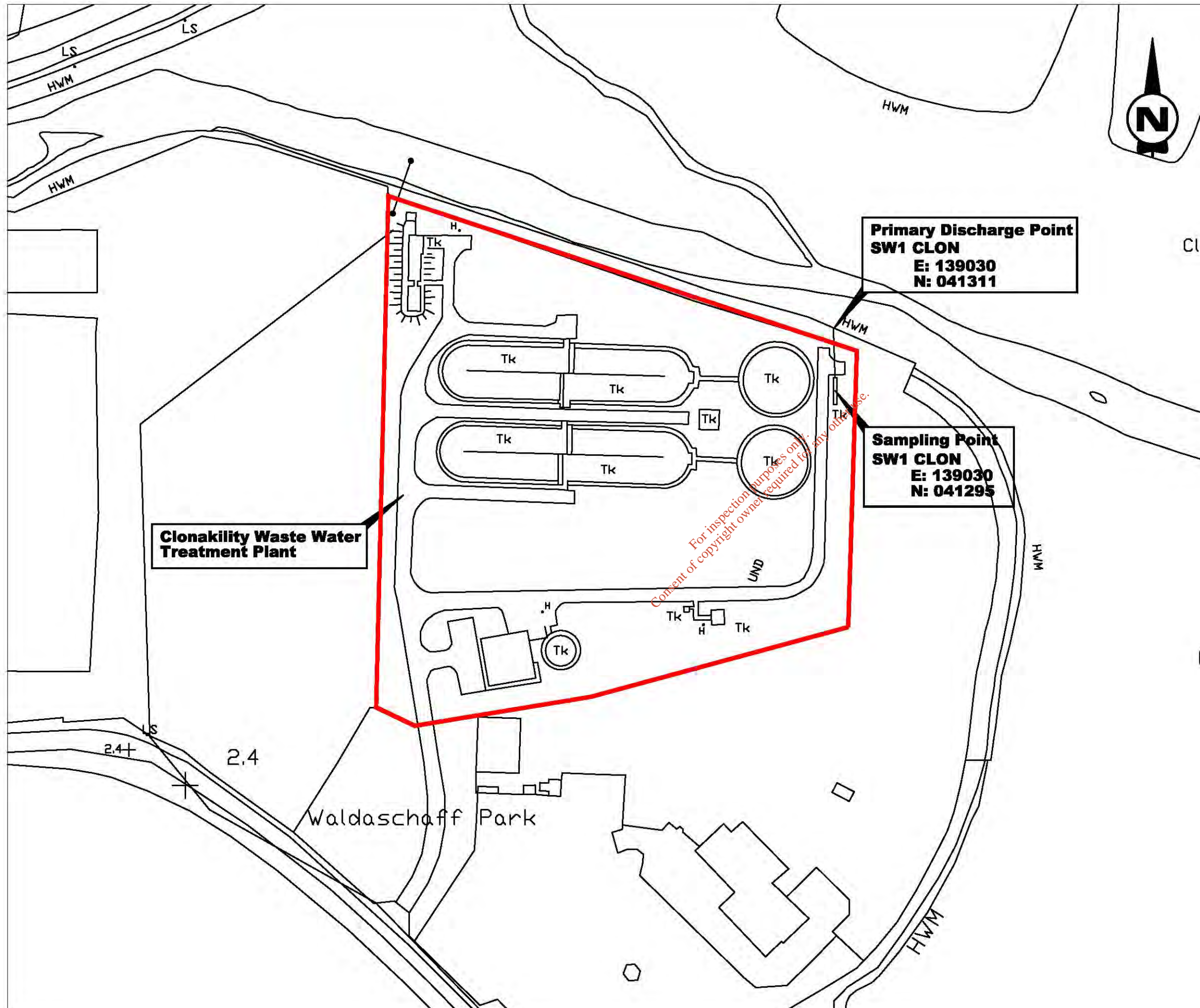
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Job Title:  
**CLONAKILITY\_AND\_ENVIRONS  
LICENCE\_APPLICATION\_TO\_EPA**

Drawing Title:  
**ATTACHMENT\_B.2  
SITE\_LOCATION\_PLAN  
SHEET\_1\_OF\_2**

Prepared By: J.CREAGH	Checked By: D.GROARKE	Date: DEC.2007
Drawing number: CLON_04	Scale: 1:5000	Rev: 1





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WASTE WATER TREATMENT SITE BOUNDARY

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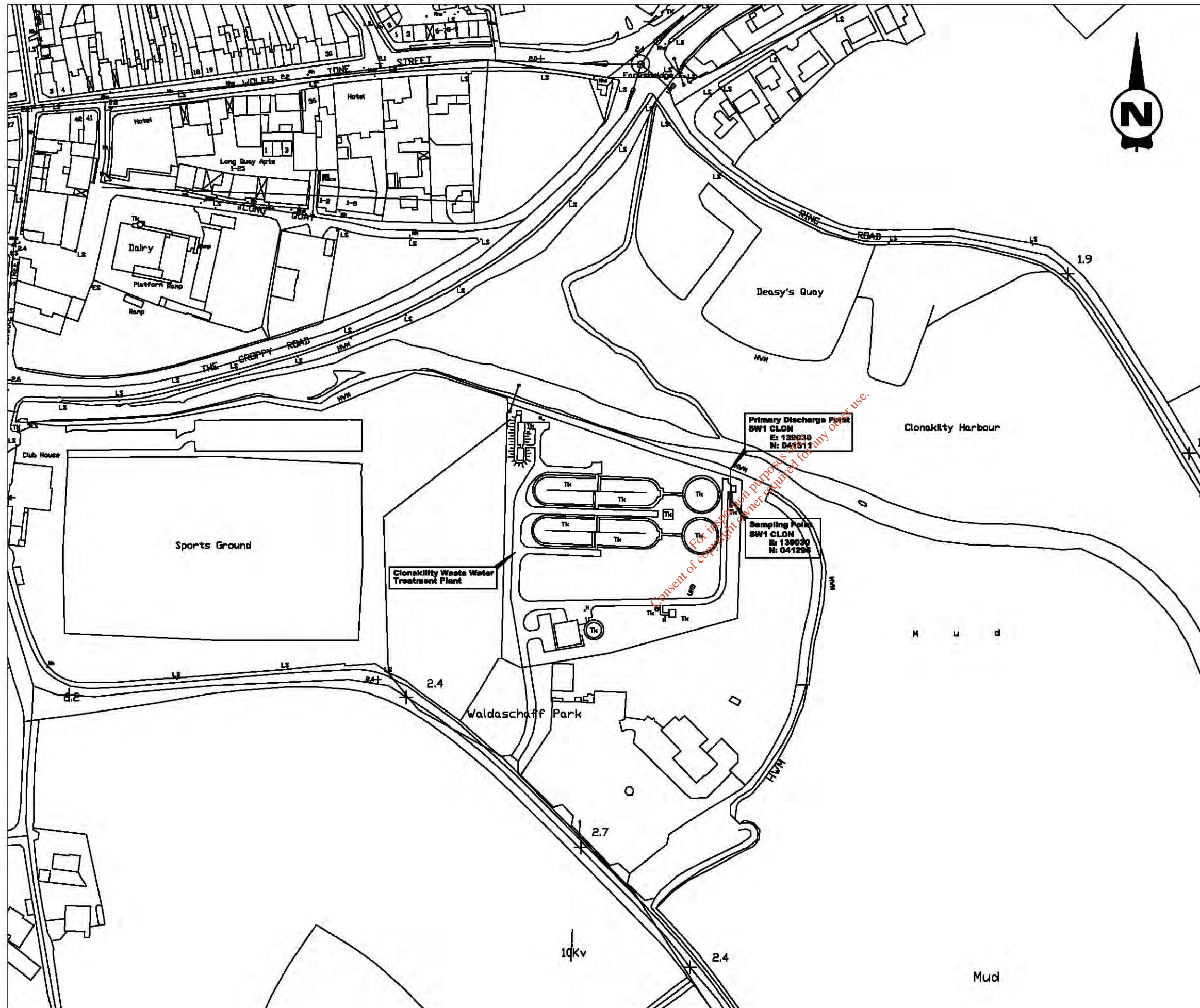
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Job Title:  
**CLONAKILITY\_AND\_ENVIRONS  
LICENCE\_APPLICATION\_TO\_EPA**

Drawing Title:  
**ATTACHMENT B.2  
SITE\_LAYOUT\_PLAN  
SHEET\_2\_OF\_2**

Prepared By: J.CREAGH	Checked By: D.GROARKE	Date: DEC.2007
Drawing number: CLON_05	Scale: 1:1000	Rev: 1





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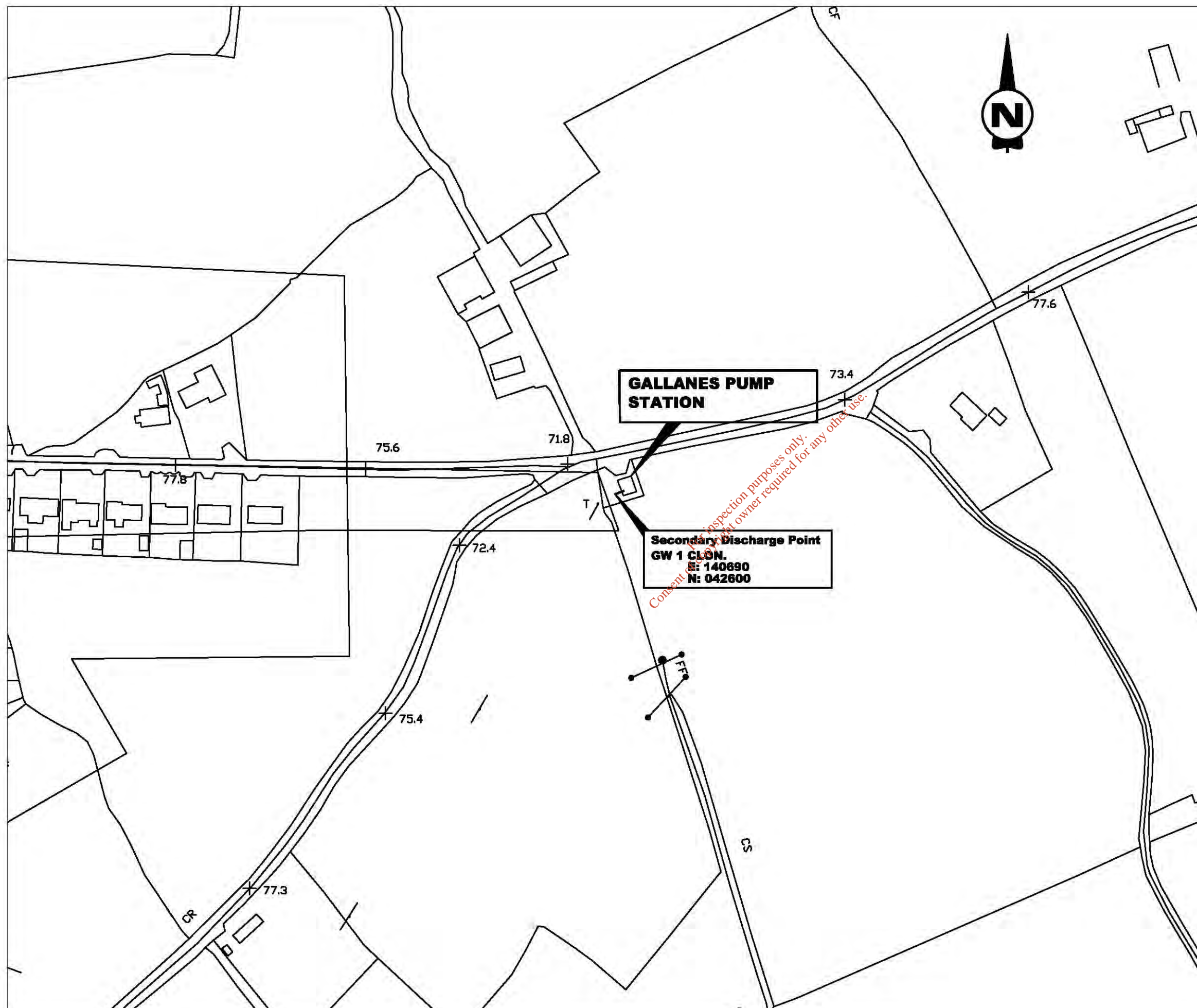
Drawing Title:  
**ATTACHMENT B.3  
PRIMARY\_DISCHARGE\_POINT**

Prepared By: J. CREAGH	Checked By: D. GROARKE	Date: DEC. 2007
Drawing number: CLON_06	Scale: 1:2000	Rev: 1









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**GALLANES PUMP STATION**

**Secondary Discharge Point  
 GW 1 CLON.  
 E: 140690  
 N: 042600**

No.	Date	Drawn	Checked	Revision Description
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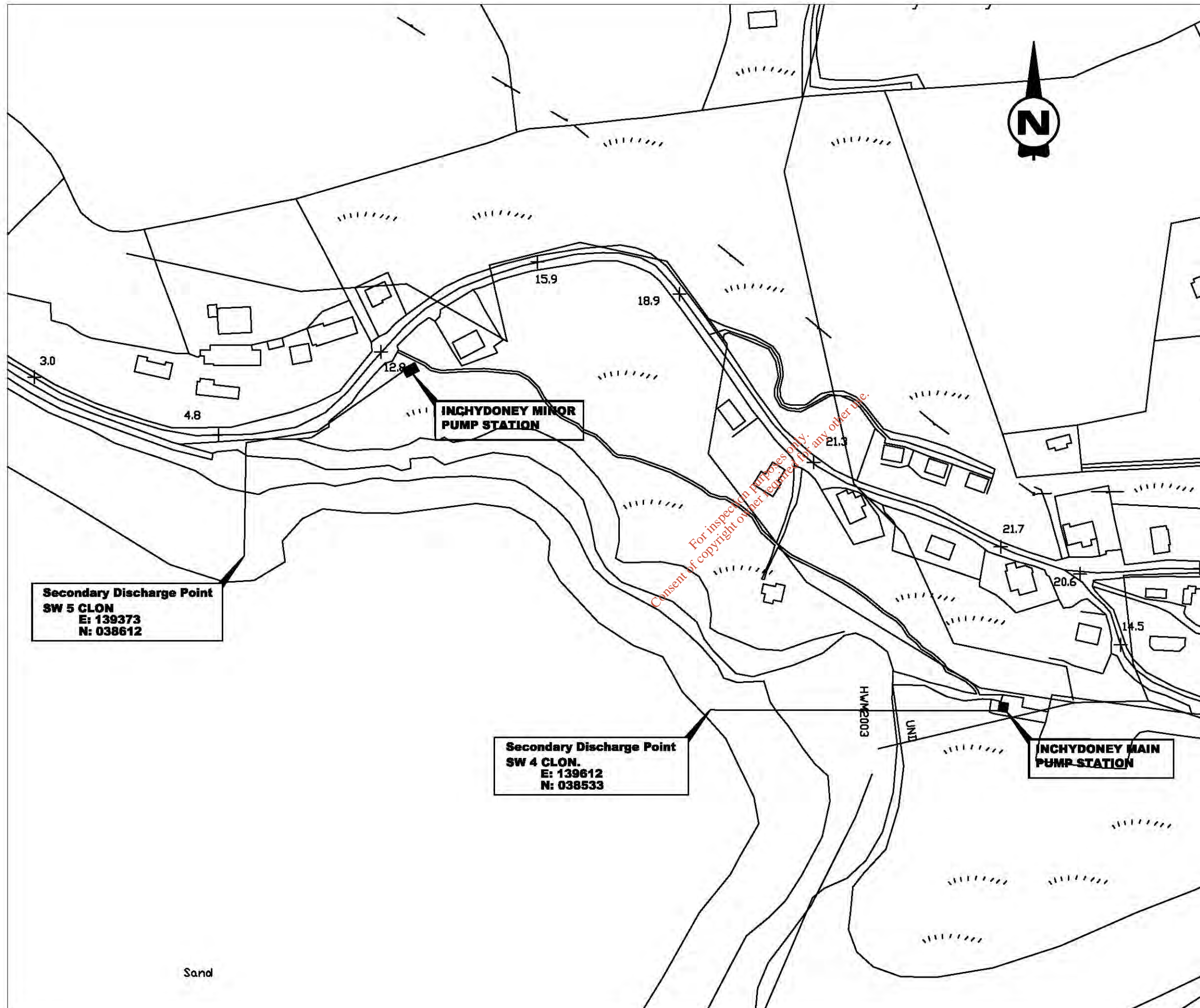
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Job Title:  
**CLONAKILITY\_AND\_ENVIRONS  
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Drawing Title:  
**ATTACHMENT B.4  
 SECONDARY\_DISCHARGE\_POINTS  
 SHEET\_2\_OF\_3**

Prepared By: J.CREAGH	Checked By: D.GROARKE	Date: DBC.2007
Drawing number: CLON_08	Scale: 1:2000	Rev: 1





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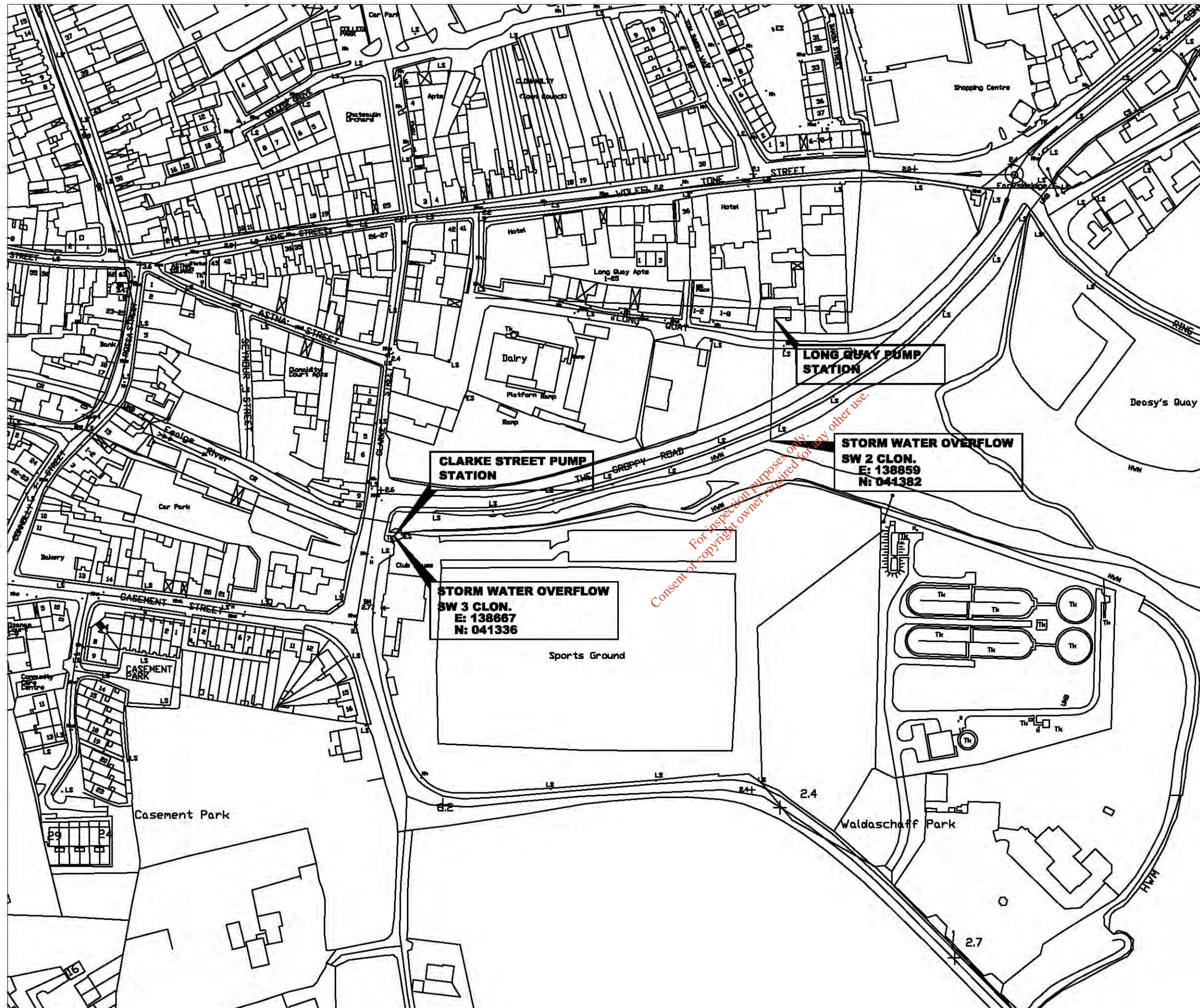
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M. MURRELL,  
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Job Title:  
CLONAKILITY\_AND\_ENVIRONS  
LICENCE\_APPLICATION\_TO\_EPA

Drawing Title:  
ATTACHMENT B.4  
SECONDARY\_DISCHARGE\_POINTS  
SHEET\_3\_OF\_3

Prepared By: J. CREAGH	Checked By: D. GAROARKE	Date: DEC. 2007
Drawing number: CLON_09	Scale: 1:2000	Rev: 1





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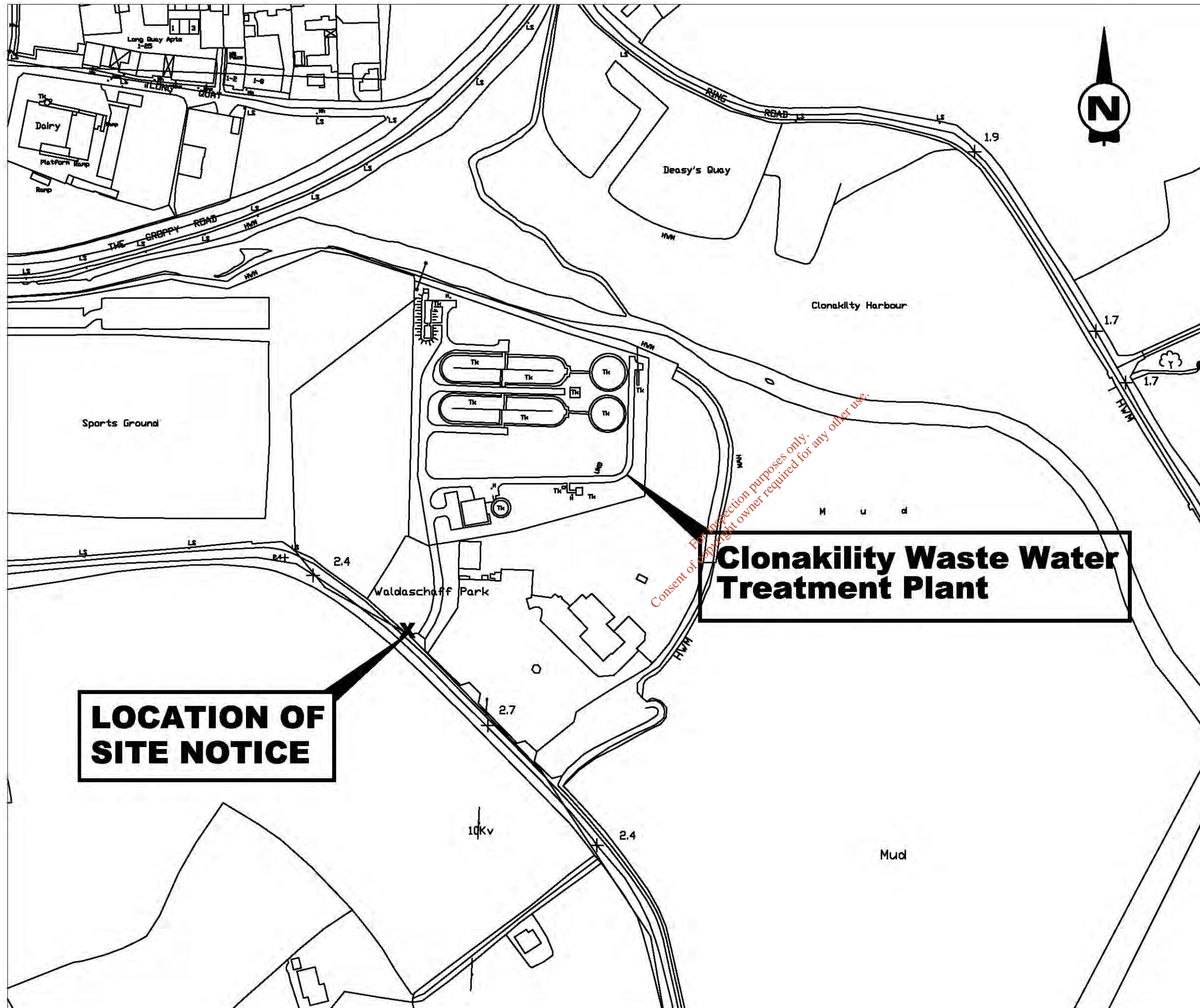
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Job Title:  
**CLONAKILITY AND ENVIRONS  
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Drawing Title:  
**ATTACHMENT B.5  
 STORM WATER OVERFLOW POINTS**

Prepared By: J. CREAUGH	Checked By: D. GROARKE	Date: DBC.2007
Drawing number: CLON_10	Scale: 1:2000	Rev: 1





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**Clonakilty Waste Water Treatment Plant**

**LOCATION OF SITE NOTICE**

No.	Date	Drawn	Checked	Revision Description
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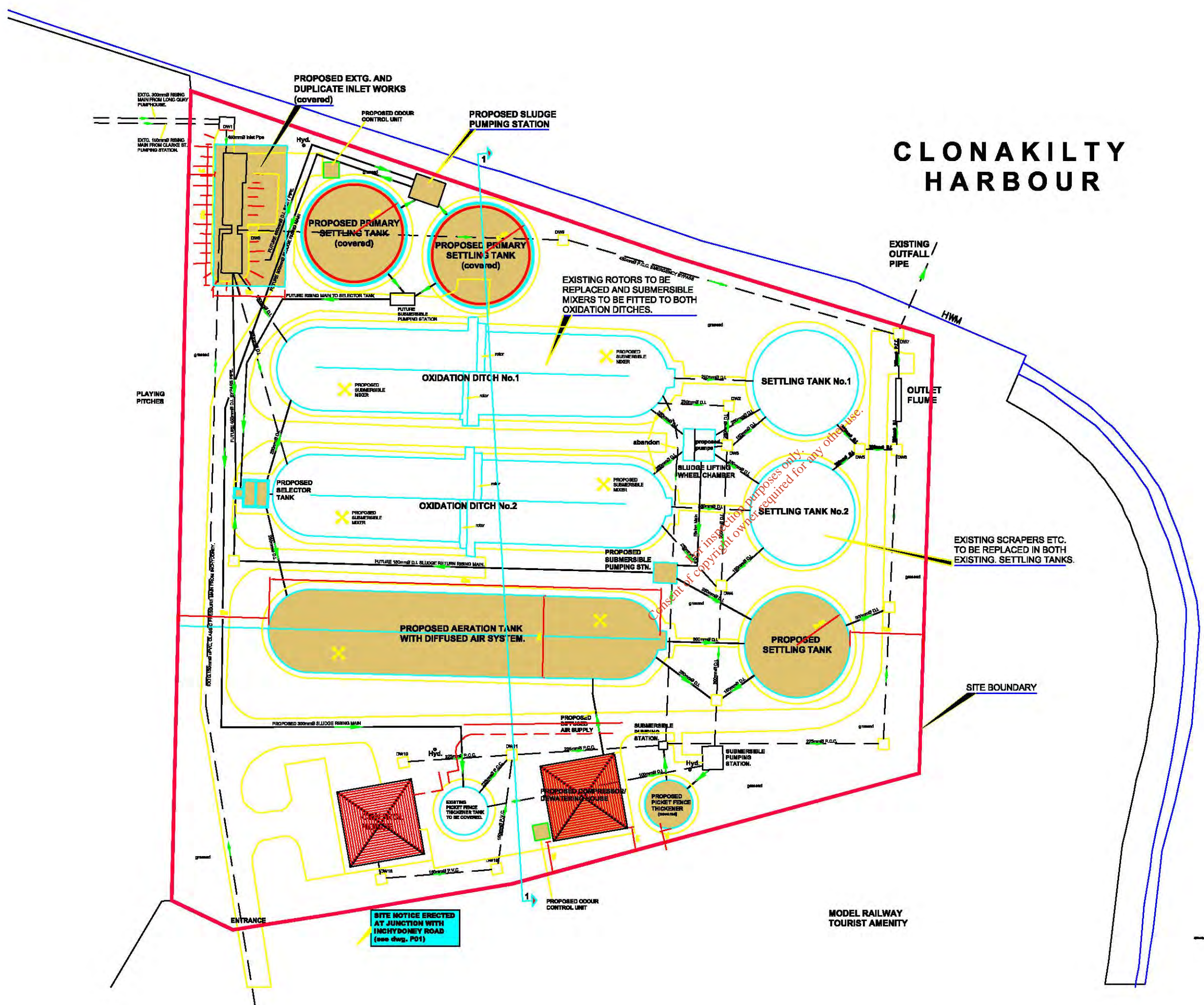
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Job Title:  
**CLONAKILITY\_AND\_ENVIRONS  
EPA\_LICENCE\_APPLICATION**

Drawing Title:  
**ATTACHMENT B.8  
POSITION\_OF\_SITE\_NOTICE**

Prepared By: J. CREAGH	Checked By: D. GROAKE	Date: DBC.2007
Drawing number: CLON_11	Scale: 1:2000	Rev: 1





# CLONAKILTY HARBOUR

## NOTES


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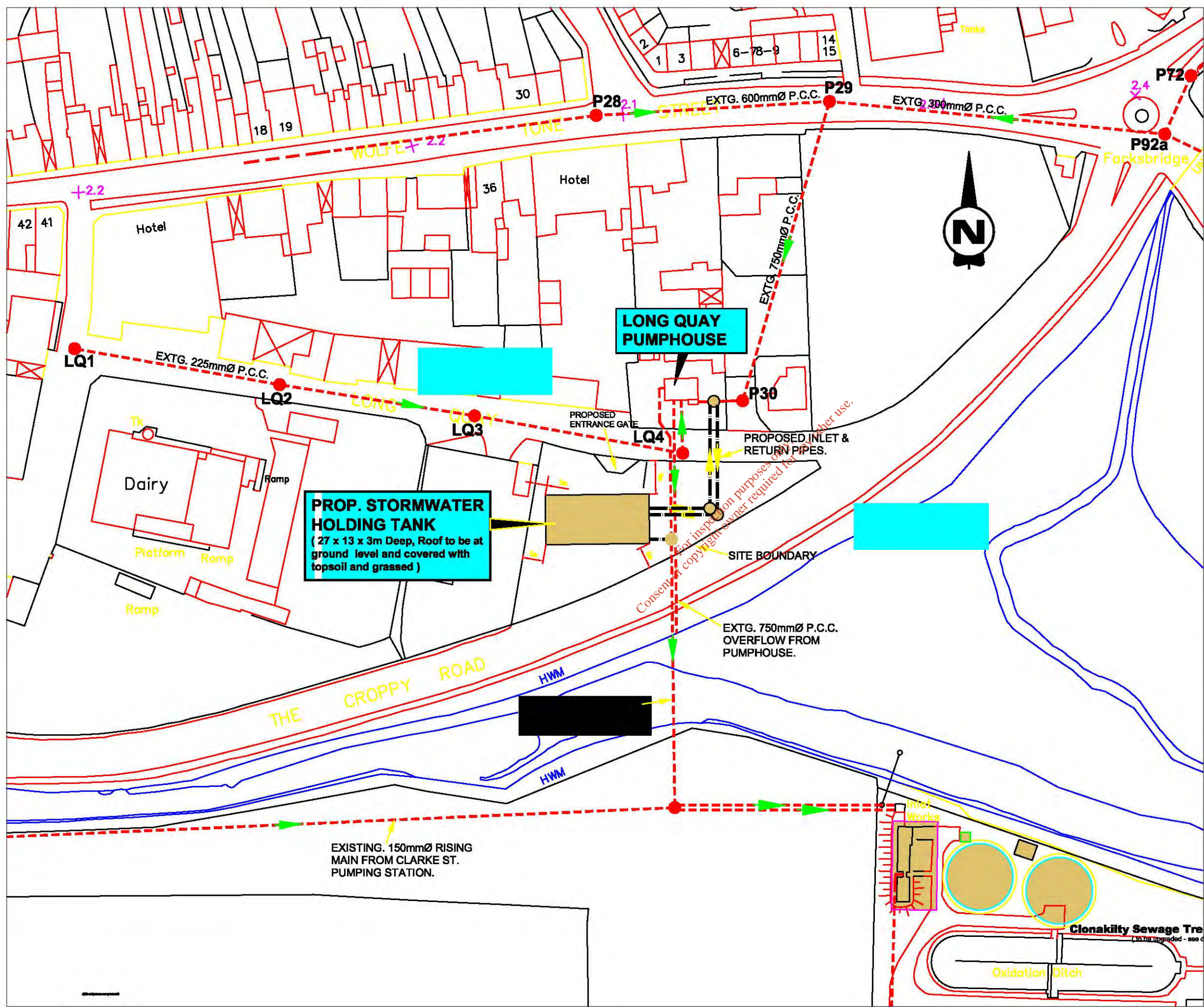
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M. MURRELL,  
DIRECTOR OF SERVICES  
WEST CORK

Job Title:  
**CLONAKILTY AND ENVIRONS  
EPA LICENCE APPLICATION**

Drawing Title:  
**ATTACHMENT C.1  
PROPOSED UPGRADE PROCESS  
FLOW DIAGRAM**


Prepared By: J.CREAGH	Checked By: D.GROAKE	Date: DEC.2007
Drawing number: CLON_12	Scales: NTS	Rev: 1





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Job Title: <b>CLONAKILITY_AND_ENVIRONS                  EPA_LICENCE_APPLICATION</b>					
Drawing Title: <b>ATTACHMENT_C.2                  PROPOSED_LONG_QUAY                  STORM_TANK</b>					
Prepared By: J. CREAGH		Checked By: D. GROAKE		Date: DEC. 2007	
Drawing number: CLON_13		Scale: 1:1000		Rev: 1	



**TABLE D.1(i)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED  
(Primary Discharge Point)**

**Discharge Point Code:** SW01Clonakilty

Source of Emission:	Treated Effluent from Wastewater treatment Plant
Location:	Youghals, Clonakilty Townland of Youghals
Grid Ref. (12 digit, 6E, 6N):	E139030 N041311
Name of receiving waters:	Clonakilty Harbour,
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels -level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted			
Normal/day	1500m <sup>3</sup>	Maximum/day	2500m <sup>3</sup>
Maximum rate/hour	150m <sup>3</sup>	Period of emission (avg)	<u>24 hours per day</u> _____min/hr _____hr/day _____day/yr
Dry Weather Flow	m <sup>3</sup> /sec		

**TABLE D.1(i)(b):EMISSIONS TO SURFACE/GROUND WATERS- Characteristics of the emission Revised**  
**(Primary Discharge Point)**

**Discharge Point Code:** SW01Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	7.5	
2	Temperature	Not Available	
3	Electrical Conductivity(@25°C)	1000	
		Max. daily average (mg/l)	kg/day**
4	Suspended Solids	38.5*	58.6
5	Ammonia (as N)	9.7	14.8
6	Biochemical Oxygen Demand	11.9	18.1
7	Chemical Oxygen Demand	51.2*	77.97
8	Total Nitrogen (as N)	20.4	31.1
9	Nitrite (as N)	Not Available	Not Available
10	Nitrate (as N)	2.3	3.4
11	Total Phosphorus (as P)	3.3	5.0
12	Orthophosphate (as P) <sup>Note 1</sup>	2.7	4.2
13	Sulphate (SO <sub>4</sub> )	48.9	74.5
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	<0.01	<0.00015

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

\*note 3 values recorded less than LOD were recorded as ½ the LOD in order to generate statistical data

**\*\*Note 4 kg/day loadings results using average flow of 1524.27 m<sup>3</sup>/day which is the average flow measured on the dates of sampling  
Flow data recorded in Section E4**

**TABLE D.1(i)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS Revised**  
**Primary Discharge Point - Characteristics of the emission**  
**Discharge Point Code: SW01Clonakilty**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day**	kg/year**
1	Atrazine	<0.01	<0.00002	<0.0073
2	Dichloromethane	<1	<0.00152	<0.5548
3	Simazine	<0.01	<0.00002	<0.0073
4	Toluene	<0.01	<0.00002	<0.0073
5	Tributyltin	<0.02	<0.00003	<0.01095
6	Xylenes	<1	<0.00152	<0.5548
7	Arsenic	6	0.00915	3.34
8	Chromium	10*	0.0152	5.55
9	Copper	10*	0.0152	5.55
10	Cyanide	<5	<0.0076	<2.774
11	Fluoride	400	0.61	222.7
12	Lead	10*	0.0152	5.55
13	Nickel	10*	0.0152	5.55
14	Zinc	39	0.067	24.46
15	Boron	49	0.07	25.6
16	Cadmium	10*	0.0152	5.55
17	Mercury	1.2	0.0018	0.657
18	Selenium	2	0.0031	1.13
19	Barium	10*	0.0152	5.55

\*note 3 values recorded less than LOD were recorded as ½ the LOD in order to generate statistical data

**\*\*Note 4 kg/day loadings results using average flow of 1524.27m3/day which is the average flow measured on the dates of sampling  
Flow data recorded in Section E4**



**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS Revised**  
**(Secondary Discharge Point) (1 table per discharge point)**  
**Discharge Point Code: SW02Clonakilty**

Source of Emission:	Emergency Overflow Long Quay Pump Station
Location:	Long Quay ,Townland of Scartagh
Grid Ref. (12 digit, 6E, 6N):	E138859 N041382
Name of receiving waters:	Clonakilty Harbour
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels -level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted not available			
Normal/day	not available m <sup>3</sup>	Maximum/day	not available m <sup>3</sup>
Maximum rate/hour	not available m <sup>3</sup>	Period of emission (avg)	not available_____min/hr _____hr/day _____day/yr
Dry Weather Flow	not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW02Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW02Clonakilty**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED**  
**(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code: SW03Clonakilty**

Source of Emission:	Emergency Overflow Clarke Street Pump Station
Location:	Clarke Street, Townland of Youghals
Grid Ref. (12 digit, 6E, 6N):	E138667 N041336
Name of receiving waters:	Clonakilty Harbour
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels –level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted not available			
Normal/day	not available m <sup>3</sup>	Maximum/day	not available m <sup>3</sup>
Maximum rate/hour	not available m <sup>3</sup>	Period of emission (avg)	not available_____min/hr _____hr/day _____day/yr
Dry Weather Flow	not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW03Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW03Clonakilty**

Number	Substance	As discharged		
		Max. daily average ( $\mu\text{g/l}$ )	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED**  
**(Secondary Discharge Point) (1 table per discharge point)**

**Discharge Point Code: SW04Clonakilty**

Source of Emission:	Emergency Overflow Inchydoney Main pump house
Location:	Inchydoney, Townlands of Inchydoney.
Grid Ref. (12 digit, 6E, 6N):	E139612 N038533
Name of receiving waters:	Muckruss Strand
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels -level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted not available			
Normal/day	not available m <sup>3</sup>	Maximum/day	not available m <sup>3</sup>
Maximum rate/hour	not available m <sup>3</sup>	Period of emission (avg)	not available_____min/hr _____hr/day _____day/yr
Dry Weather Flow	not available m <sup>3</sup> /sec		



**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW04Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW04Clonakilty**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS **REVISED****  
**(Secondary Discharge Point) (1 table per discharge point)**  
**Discharge Point Code: SW05Clonakilty**

Source of Emission:	Emergency Overflow Inchydoney Minor Pump House
Location:	Inchydoney, Townlands of Inchydoney.
Grid Ref. (12 digit, 6E, 6N):	E139373 N038612
Name of receiving waters:	Muckruss Strand
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels -level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted not available			
Normal/day	not available m <sup>3</sup>	Maximum/day	not available m <sup>3</sup>
Maximum rate/hour	not available m <sup>3</sup>	Period of emission (avg)	not available_____min/hr _____hr/day _____day/yr
Dry Weather Flow	not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point)  
(Secondary Discharge Point)**

**Discharge Point Code:** SW05Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: SW05Clonakilty**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available

**TABLE D.1(ii)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED**  
**(Secondary Discharge Point) (1 table per discharge point)**  
**Discharge Point Code: GW01Clonakilty**

Source of Emission:	Emergency Discharge to Ground at Gallanes Pump House
Location:	Gallanes, Townland of Gallanes.
Grid Ref. (12 digit, 6E, 6N):	E140690 N042600
Name of receiving waters:	Not applicable
River Basin District:	South Western River Basin District
Designation of receiving waters:	Not applicable
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels –level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted not available			
Normal/day	not available m <sup>3</sup>	Maximum/day	not available m <sup>3</sup>
Maximum rate/hour	not available m <sup>3</sup>	Period of emission (avg)	not available_____min/hr _____hr/day _____day/yr
Dry Weather Flow	not available m <sup>3</sup> /sec		

**TABLE D.1(ii)(b): EMISSIONS TO SURFACE/GROUND WATERS - Characteristics of the emission (1 table per discharge point (Secondary Discharge Point))**

**Discharge Point Code:** GW01Clonakilty

Number	Substance	As discharged	
		Max. daily average	
1	pH	Not available	
2	Temperature	Not available	
3	Electrical Conductivity (@25°C)	Not available	
		Max. daily average (mg/l)	kg/day
4	Suspended Solids	Not available	Not available
5	Ammonia (as N)	Not available	Not available
6	Biochemical Oxygen Demand	Not available	Not available
7	Chemical Oxygen Demand	Not available	Not available
8	Total Nitrogen (as N)	Not available	Not available
9	Nitrite (as N)	Not available	Not available
10	Nitrate (as N)	Not available	Not available
11	Total Phosphorus (as P) <sup>Note 1</sup>	Not available	Not available
12	Orthophosphate (as P)	Not available	Not available
13	Sulphate (SO <sub>4</sub> )	Not available	Not available
14	Phenols (sum) <sup>Note 2</sup> (ug/l)	Not available	Not available

Note 1: For waste water samples this monitoring should be undertaken on a sample filtered on 0.45µm filter paper.

Note 2: USEPA Method 604, AWWA Standard Method 6240, or equivalent.

**TABLE D.1(ii)(c): DANGEROUS SUBSTANCE EMISSIONS TO SURFACE/GROUND WATERS**

**Secondary Discharge Point - Characteristics of the emission (1 table per discharge point)**

**Discharge Point Code: GW01Clonakilty**

Number	Substance	As discharged		
		Max. daily average (µg/l)	kg/day	kg/year
1	Atrazine	Not available	Not available	Not available
2	Dichloromethane	Not available	Not available	Not available
3	Simazine	Not available	Not available	Not available
4	Toluene	Not available	Not available	Not available
5	Tributyltin	Not available	Not available	Not available
6	Xylenes	Not available	Not available	Not available
7	Arsenic	Not available	Not available	Not available
8	Chromium	Not available	Not available	Not available
9	Copper	Not available	Not available	Not available
10	Cyanide	Not available	Not available	Not available
11	Fluoride	Not available	Not available	Not available
12	Lead	Not available	Not available	Not available
13	Nickel	Not available	Not available	Not available
14	Zinc	Not available	Not available	Not available
15	Boron	Not available	Not available	Not available
16	Cadmium	Not available	Not available	Not available
17	Mercury	Not available	Not available	Not available
18	Selenium	Not available	Not available	Not available
19	Barium	Not available	Not available	Not available



**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED**  
**(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code: SW02Clonakilty**

Source of Emission:	Storm Overflow From Long Quay Pump Station		
Location:	Long Quay ,Townland of Scartagh		
Grid Ref. (12 digit, 6E, 6N):	E138859 N041382		
Name of receiving waters:	Clonakilty Harbour		
River Basin District:	South Western River Basin District		
Designation of receiving waters:	NHA,SAC,SPA		
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents	0.14m/s***	
	Tidal Levels -level to OD Poolbeg **		0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow*
	HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m**		0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted			
Normal/day	Not Available m <sup>3</sup>	Maximum/day	Not Available m <sup>3</sup>
Maximum rate/hour	Not Available m <sup>3</sup>	Period of emission (avg)	Not Available_min/hr _____hr/day _____day/yr

**TABLE D.1(iii)(a): EMISSIONS TO SURFACE/GROUND WATERS REVISED**  
**(Storm Water Overflow) (1 table per discharge point)**

**Discharge Point Code: SW03Clonakilty**

Source of Emission:	Storm Overflow Clarke Street Pump Station
Location:	Clarke Street, Townland of Youghals
Grid Ref. (12 digit, 6E, 6N):	E138667 N041336
Name of receiving waters:	Clonakilty Harbour
River Basin District:	South Western River Basin District
Designation of receiving waters:	NHA,SAC,SPA
Flow rate in receiving waters: River Feagle*	Surface Tidal Currents 0.14m/s*** Tidal Levels -level to OD Poolbeg ** 0.9 m <sup>3</sup> .sec <sup>-1</sup> Mean Flow* HW Sp-4.1m, HW Np-3.3m ,LW Sp- 0.7m,LW Np-1.5m Mean Tide-2.4m** 0.075 m <sup>3</sup> .sec <sup>-1</sup> 95%ile flow*

- River Feagle Data for Mean Flow,95% Percentile-reference Marine Study Final Report Feb 2006 \*\*Reference Clonakilty Tidal Barrage Study 2000
- \*\*\* Clonakilty EIS section 6.3.9

**Emission Details:**

(i) Volume emitted			
Normal/day	Not Available m <sup>3</sup>	Maximum/day	Not Available m <sup>3</sup>
Maximum rate/hour	Not Available m <sup>3</sup>	Period of emission (avg)	<u>Not Available</u> min/hr _____hr/day _____day/yr

**TABLE E.1(i): WASTE WATER FREQUENCY AND QUANTITY OF DISCHARGE – Primary and Secondary Discharge Points**

Identification Code for Discharge point	Frequency of discharge (days/annum)	Quantity of Waste Water Discharged (m <sup>3</sup> /annum)
SW01Clonakilty <b>(P)</b>	365days per annum	556260 (based on average flow )
SW02Clonakilty	Not available	Not available
Sw03Clonakilty	Not available	Not available
SW04Clonakilty	Not available	Not available
SW05Clonakilty	Not available	Not available
GW01Clonakilty	Not available	Not available

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upstream from Ring Pier to the existing town outfall. It can be seen that for about 50% of the time the channel will contain only river waters. Concentrations of the various parameters in the channel at this time have been calculated and are presented in Table 6.1

River Flow m <sup>3</sup> /s	Type	Dissolved Nitrogen mg/l	Ortho- Phosphate mg/l	Faecal Coliform fc/100ml
0.075	95%ile	11	3.3	444 x 10 <sup>3</sup>
0.9	Mean Flow	2.3	0.46	55 x 10 <sup>3</sup>

**Table 6.1** – Computed contaminant concentrations in river channel at low tide.

Based on: Effluent Flow: 53 l/s, River backgrounds N: = 1mg/l, OP = 0.02mg/l and FC = 0.

#### 6.4 **Model Results – Bacterial Simulations**

The model simulations were run for two tidal cycles and outputs generated at 1 hour intervals. Outputs are presented in two formats:

- (a) contour plots of bacterial concentration;
- (b) time series plots of bacterial concentration at selected sampling strips.

The contour plots, output type (a), show the movement of the effluent plume as it is advected and dispersed over the tidal cycle. Examples for the three outfall cases are contained in Appendices A, B & C. These show high and low water plume excursions for spring and neap tides during calm conditions.

The time series plots, output type (b), provide a more comprehensive method of comparing the impacts of differing discharge locations. The output contains the peak plume bacterial concentration where it enters a sampling strip and is derived from model output at all stages in the tidal cycle. The peak concentration is the highest value recorded in any 10m x10m cell of the sampling strip. The chosen sampling strip locations are indicated in Figure 6.2. Locations 2 and 3 correspond to the 'Blue Flag' bathing areas while Location 1 is popular with surfing enthusiasts. Locations 4 & 5 within the harbour are chosen for comparative purposes and are not of any special significance.

Time series output plots for each sampling strip are included in Figures 6.3 to 6.7 with a summary of predicted maximum bacterial concentrations extracted from these plots presented in Tables 6.2 to Table 6.5.

The results clearly show that in terms of minimising the bacterial contamination on the Blue Flag beach at Inchydoney the optimum solution is to retain the outfall at the existing location. This applies to both calm and windy conditions.

along the eastern shoreline from Ring to the sea is dry. Tidal levels for the harbour based on data measured at Wind Rock, are presented in Table 1.1.

Tide Level	Level to OD Poolbeg
Mean High Water Spring Tide	4.1m
Mean High Water Neap Tide	3.3m
Mean Tide Level	2.4m
Mean Low Water Neap Tide	1.5m
Mean Low Water Spring Tide	0.7m

Table 1.1 - Tidal Levels at Wind Rock.

Upstream of the proposed barrage site approx. 80% of the seabed is above the 2.4m contour and therefore will be dry for half of each tidal cycle. The river channel has a bed level of approx. 2m in this area.

The harbour bed comprises extensive areas of fine to medium sand where bed forms indicate mobility and lesser areas of soft silty sediments with exposed clay/peat formations are present. Much of this sediment has its origin in the open sea and would have been transported into the harbour on the flooding tide. The outer and middle parts of the harbour are dominated by sand while the north and western shorelines are the muddier regions.

Mobile sand ribbons are present adjacent to and along the bed of channels. These extend upstream of the proposed barrage site, almost as far as the town itself. Coarser materials including fine gravels and pebbles were occasionally observed in these channels with the sediments becoming increasingly finer away from the channels.

Local anecdotal evidence indicates that appreciable and rapid variations occur in bed levels and channel patterns in the middle harbour while nearer the town towards the head of the harbour variations are not noticeable.

### Barrage Structure

The proposed barrage will be constructed at the location shown in Figure 1.1. It will extend 300m from bank to bank and contain sluice valves. These will be

lower high tides and greater river inflows.

### **BOD**

The model shows that BOD concentrations in the harbour generally vary with tide levels, being highest at low water when dilution is lowest. With the closure of the barrage at high water, BOD concentration would be initially at its lowest level but would rise gradually with increased input of BOD. On opening of the barrage, BOD levels would revert to normal concentrations.

### **Coliforms**

Coliform concentrations would behave similarly to BOD concentrations. Coliform concentrations in the harbour generally vary with tide levels, being highest at low water when dilution is lowest. With the closure of the barrage at high water, coliform concentration would be initially at its lowest level but would rise gradually with increased input of coliforms. On opening of the barrage, coliform levels would revert to normal concentrations.

### **Ammonium**

Ammonium concentrations would also behave similarly to BOD concentrations. Ammonium concentrations in the harbour generally vary with tide levels, being highest at low water when dilution is lowest. With the closure of the barrage at high water, ammonium concentration would be initially at its lowest level but would rise gradually with increased input of ammonium. On opening of the barrage, ammonium levels would revert to normal concentrations.

### **6.3.9 Summary**

This section presents the findings of a marine study of the proposed treated waste water discharges from the town of Clonakilty. The study assesses the dispersive characteristics of the coastal area and comments on the siting of the outfall with regard to possible impacts, particularly on the 'Blue Flag' bathing beaches at Inchydoney.

The oceanography of the region is typical of coastal sites, though with added complexities due to the shallow inner harbour and the local topographic features. Outside the harbour the surface tidal currents are generally weak and are influenced by prevailing winds. Peak values observed here were about 0.14m/s. Dispersion characteristics are good as shown by dye and drogue data. Tidal ranges in the area are approx. 3.4m on springs and 1.8m on neaps.

A two dimensional flow model together with a particle track dispersion model was used to simulate the discharges. Recorded data from current meter, drogue and dye releases were used for calibration and validation purposes. Twelve separate simulations were conducted.

Five representative sampling sites within the model domain were selected to aid assessment of outfall options (Figure 6.16). The predicted maximum bacterial concentrations at these locations are

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Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-PO <sub>4</sub> -P	Cond 20C	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	NO <sub>3</sub> as N
04/07/2007	Influent											0.01	0.01	0.031	0.01	0.01	0.067	0.01		
09/08/2007	Influent			419																
19/09/2007	Influent			771	306			24.6												
24/10/2007	Influent	7.2		746	170	7.1	79	42.9	62	5.39	991	0.01	0.01	0.01	0.01	0.01	0.089	0.01	0.099	
25/10/2007	Influent	7.5	300	783	176	7.43	86	-	64	6	118	0.01	0.01	0.01	0.01	0.01	0.1	0.01	0.033	0.77
	<b>Average</b>	7.35	300	679.75	217.3333	7.265	82.5	33.75	63	5.695	554.5	0.01	0.01	0.017	0.01	0.01	0.0853	0.01	0.066	0.77
	Median					7.265				5.695										

parameter	method	results	units	source
Arsenic (OES)	ICP-OES	6	ug/L	GR1056 25/10/07 influent
Atrazine	HPLC	<0.01	ug/L	GR1056 25/10/07 influent
Cyanide	Colorimetry	<5	ug/L	GR1056 25/10/07 influent
Dichloromethane	GC-MS 1	<1	ug/L	GR1056 25/10/07 influent
EPH	GC-FID	5.9	ug/L	GR1056 25/10/07 influent
Mercury (OES)	ICP-OES	<0.2	ug/L	GR1056 25/10/07 influent
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1056 25/10/07 influent
Polyaromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1056 25/10/07 influent
Selenium (OES)	ICP-OES	8	ug/L	GR1056 25/10/07 influent
Simazine	HPLC	<0.01	ug/L	GR1056 25/10/07 influent
Toluene	GC-MS 1	<0.01	ug/L	GR1056 25/10/07 influent
Total Organic Carbon	TOC analyser (NPOC)	107.00	mg/L	GR1056 25/10/07 influent
TPH C10-C36	GC-FID	5.9	ug/L	GR1056 25/10/07 influent
Tributyltin*	GC-MS 1	<0.02	ug/L as Sn	GR1056 25/10/07 influent
Xylene	GC-MS 1	<1	ug/L	GR1056 25/10/07 influent

1/2 LOD

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Sample Date	Sample	pH	BOD mg/L	COD mg/L	SS mg/L	TP mg/L	TN mg/L	NH <sub>3</sub> mg/L	SO <sub>4</sub>	O-PO <sub>4</sub> -P	Flow	Cond 20C	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Barium	Boron	NO <sub>3</sub> -N	Fluorides	
17/01/2007	Effluent	7.4	1.7	10.5	1.25	0.51	3.3				1957												
07/02/2007	Effluent	7.5	4.3	10.5	8	1.37	12.4				1084												
21/03/2007	Effluent	7.4	21	120	101	2.85	7.02				1425												
12/04/2007	Effluent	7.5	13	47	38	2.3	12.8				966												
03/05/2007	Effluent	7.7	49	160	127	5.13	18.1				926												
13/06/2007	Effluent	7.8	3.5	31	4	2.33					1111												
04/07/2007	Effluent	7	10	50	29	0.1		2.5			1237		0.01	0.01	0.01	0.01	0.01	0.059	0.01				
09/08/2007	Effluent	7.7	3.1	10.5	5	1.46	13.4	8.1	44.8		1240		0.01	0.01	0.01	0.01	0.01		0.01				
19/09/2007	Effluent	7.6	5.95		12		12.7	12.1			2257		0.01	0.01	0.01	0.01	0.01	0.048	0.01				
24/10/2007	Effluent	7.5	7.5	37	6	2.93	30	16.2	53	2.56	2500	1000	0.01	0.01	0.01	0.01	0.01	0.028	0.01	0.053			
25/10/2007	Effluent	7.6	nfr	35	92	10.63	74	15.6	61	2.77	2064	1175	0.01	0.01	0.01	0.01	0.01	0.024	0.01	0.045	2.25	0.4	
<b>Average</b>		7.518182	11.905	51.15	38.477273	2.961	20.41333333	9.725	48.9	2.665	1524.273	1000	0.01	0.01	0.01	0.01	0.01	0.03975	0.01	0.049	2.25	0.4	
<b>Median</b>						2.315				2.665													
<b>Kg/Day</b>			18.146467	77.96655	58.649857	4.513372	31.11548727	14.8235523	74.53694	4.0621868		1524.27273	0.015	0.015	0.015	0.015	0.015	0.061	0.015	0.07469	3.4296	0.6097	

Parameter	Method	Results	Units	Source	Kg/Day
Arsenic (OES)	ICP-OES	6	ug/L	GR1057 25/10/07 final effluent	0.00915
Atrazine	HPLC	<0.01	ug/L	GR1057 25/10/07 final effluent	<0.00002
Cyanide	Colorimetry	<5	ug/L	GR1057 25/10/07 final effluent	<0.00762
Dichloromethane	GC-MS 1	<1	ug/L	GR1057 25/10/07 final effluent	<0.00152
EPH	GC-FID	8.3	ug/L	GR1057 25/10/07 final effluent	0.01265
Mercury (OES)	ICP-OES	1.2	ug/L	GR1057 25/10/07 final effluent	0.00183
Phenols (Total)	GC-MS 2	<0.10	ug/L	GR1057 25/10/07 final effluent	<0.00015
Polyaromatic Hydrocarbons	HPLC	<0.01	ug/L	GR1057 25/10/07 final effluent	<0.00002
Selenium (OES)	ICP-OES	2	ug/L	GR1057 25/10/07 final effluent	0.00305
Simazine	HPLC	<0.01	ug/L	GR1057 25/10/07 final effluent	<0.00002
Toluene	GC-MS 1	<0.01	ug/L	GR1057 25/10/07 final effluent	<0.00002
Total Organic Carbon	TOC analyser (NPOC)	11.00	mg/L	GR1057 25/10/07 final effluent	16.76700
TPH C10-C36	GC-FID	8.3	ug/L	GR1057 25/10/07 final effluent	0.01265
Tributyltin*	GC-MS 1	<0.02	ug/L as Sn	GR1057 25/10/07 final effluent	<0.00003
Xylene	GC-MS 1	<1	ug/L	GR1057 25/10/07 final effluent	<0.00152

■ 1/2 LOD

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6<sup>th</sup> October 2005

Our Ref.: G2005/531

Your Ref.: Wastewater treatment plant upgrade at Clonakilty

Ms Debbie Good,  
Senior Environmental Scientist,  
White Young Green,  
Unit 14, Penrose Wharf,  
Penrose Quay,  
Cork

WHITE YOUNG GREEN (IRL)		PROJECT NO.	
CORK			
NO.	1 2 OCT 2005		FILE REF.
ACT			
INFO			
INIT			

**Re: Wastewater treatment plant upgrade at Clonakilty**

A Chara,

We refer to your notification in relation to the above-proposed development. Outlined below are the archaeological comments of the Department of the Environment, Heritage and Local Government.

We are unable to comment on the proposed development based on the information submitted. It is our recommendation that an Archaeological Impact Assessment, as described below, should be prepared to assess the potential impact, if any, on archaeological remains in the area where development is proposed to take place. This will enable this office to formulate an informed archaeological recommendation before a decision is taken.

**“Archaeological Impact Assessment should be compiled as follows ;**

1. The applicant is required to engage the services of a suitably qualified archaeologist to carry out an archaeological assessment of the development site. No sub-surface work should be undertaken in the absence of the archaeologist without his/her express consent.
2. The archaeologist should carry out any relevant documentary research and inspect the site. Test trenches may be excavated at locations chosen by the archaeologist (licensed under the National Monuments Acts 1930-1994), having consulted the site drawings.
3. Having completed the work, the archaeologist should submit a written report to the Heritage and Planning Division of the Department of Environment, Heritage and Local Government. Where archaeological material/features are shown to be present, preservation *in situ*, preservation by record (excavation) or monitoring may be required.”

It should be borne in mind that, if significant archaeological remains are found, refusal might still be recommended, and/or further monitoring or excavation required.

Mise le meas,

Helen Francis,  
Development Applications Unit

AN ROINN COMHSHAOIL,

OIÐHREACHTA AGUS

RIALTAIS ÁITIÚIL

DEPARTMENT OF THE

ENVIRONMENT, HERITAGE AND

LOCAL GOVERNMENT

DÚN SCÉINE

LÁNA FHEARCAIR

BAILE ÁTHA CLIATH 2

DÚN SCÉINE

HARCOURT LANE

D 2

Tel: +353 1 888 3109

Fax: +353 [redacted]

1 678 0721





WHITE YOUNG GREEN (IRL)		PROJECT NO.
CORK		
NO.	FILE REF.	
	05 OCT 2005	
	C000324	
ACT.		
REC.		
INIT.		

3 October 2005

Our Ref: G2005/531

Ms Debbie Good,  
Senior Environmental Scientist,  
White Young Green,  
Unit 14,  
Penrose Wharf,  
Penrose Quay,  
Cork.

**Re: Clonakilty Wastewater Treatment Plant Upgrade**

Dear Ms Good,

I wish to acknowledge receipt of your recent correspondence in relation to the above.

Your enquiry has been allocated the above reference number which should be used in all correspondence with this office. In addition your enquiry has been circulated to a number of relevant individuals/divisions within the Department for their comments and we will revert to you in due course.

If you need any further assistance please contact the undersigned.

Yours sincerely,

*Mairead O'Boyle*  
Mairead O'Boyle,  
Development Applications Unit.

AN ROINN COMHSHAOIL,

OIDHREACHTA AGUS

RIALTAIS ÁITIÚIL

DEPARTMENT OF THE

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## SITE SYNOPSIS

**SITE NAME: CLONAKILTY BAY**

**SITE CODE: 000091**

Clonakilty Bay in west Cork is an inter-tidal expanse that stretches from Clonakilty to the open sea, and comprises two small estuaries separated by Inchydoney Island. The site also includes adjacent sand dunes and inland marshes, and therefore is a coastal complex with a good diversity of habitats including several habitats listed on Annex I of the EU Habitats Directive.

Sand flats dominate the inter-tidal area, although mud flats occur at the sheltered upper end of the inlets. The vegetation consists of algal mats (*Enteromorpha* spp.) with brown seaweeds (*Fucus* spp.) occurring where the coast is rocky. The invasive Cord-grass (*Spartina* sp.) occurs in places. The intertidal flats have a typical diversity of macro-invertebrates, including *Arenicola marina*, *Scrobicularia plana*, *Hediste diversicolor*, *Nephtys hombergii*, *N. cirrosa*, *Hydrobia ulvae* and *Cerastoderma edule*.

Sand dunes grade from a strandline, colonised by Frosted Orache (*Atriplex laciniata*), Sea Sandwort (*Honkenya peploides*) and Sea Rocket (*Cakile maritima*), through to fixed dunes vegetated by grasses, small herbs and several species of orchid. They also support an interesting array of introduced plants, amongst which Great Mullein (*Verbascum thapsus*), Viper's-bugloss (*Echium vulgare*) and Teasel (*Dipsacus fullonum*) are the most noticeable. Embryonic shifting dunes and white *Ammophila* dunes are also represented. Of particular interest is a small area of decalcified dune heath with some *Ulex europaeus*.

Inland of the western estuary, an extensive area of wetland occurs, which in itself contains a fine range of habitats from saline lagoons, to brackish grasslands, open freshwater marsh and Alder (*Alnus glutinosa*) scrub. Species found here are characteristic of marshy areas and include Creeping Bent (*Agrostis stolonifera*), Water Horsetail (*Equisetum fluviatile*), Marsh Cinquefoil (*Potentilla palustris*) and Marsh Willowherb (*Epilobium palustre*). The saline influence is evident by the occurrence of species such as Saltmarsh Rush (*Juncus gerardii*) and Sea Rush (*J. maritimus*).

The site contains a good diversity and density of waterfowl, with over 7,000 waders and wildfowl occurring regularly. Seven species have populations of national importance: Shelduck (168), Grey Plover (76), Lapwing (2,509), Dunlin (1,508), Curlew (1,231), Redshank (263) and Greenshank (27). The site is most noted, however, for its population of Black-tailed Godwit (866), which is of international importance and comprises over 10% of the national total. Amongst the other species which occur, there are notable populations of Golden Plover and Bar-tailed Godwit, both of which are listed on Annex I of the EU Birds Directive. All counts given are average winter peaks over either two or three seasons from 1994/95 to 1996/97. Herons commonly use the site and a heronry exists in the trees near Clonakilty.

Otter spraints were found frequently during a recent survey of the marsh area.

The site is under pressure from a number of sources, notably recreation and tourism developments and agricultural improvements, including drainage and fertiliser application.

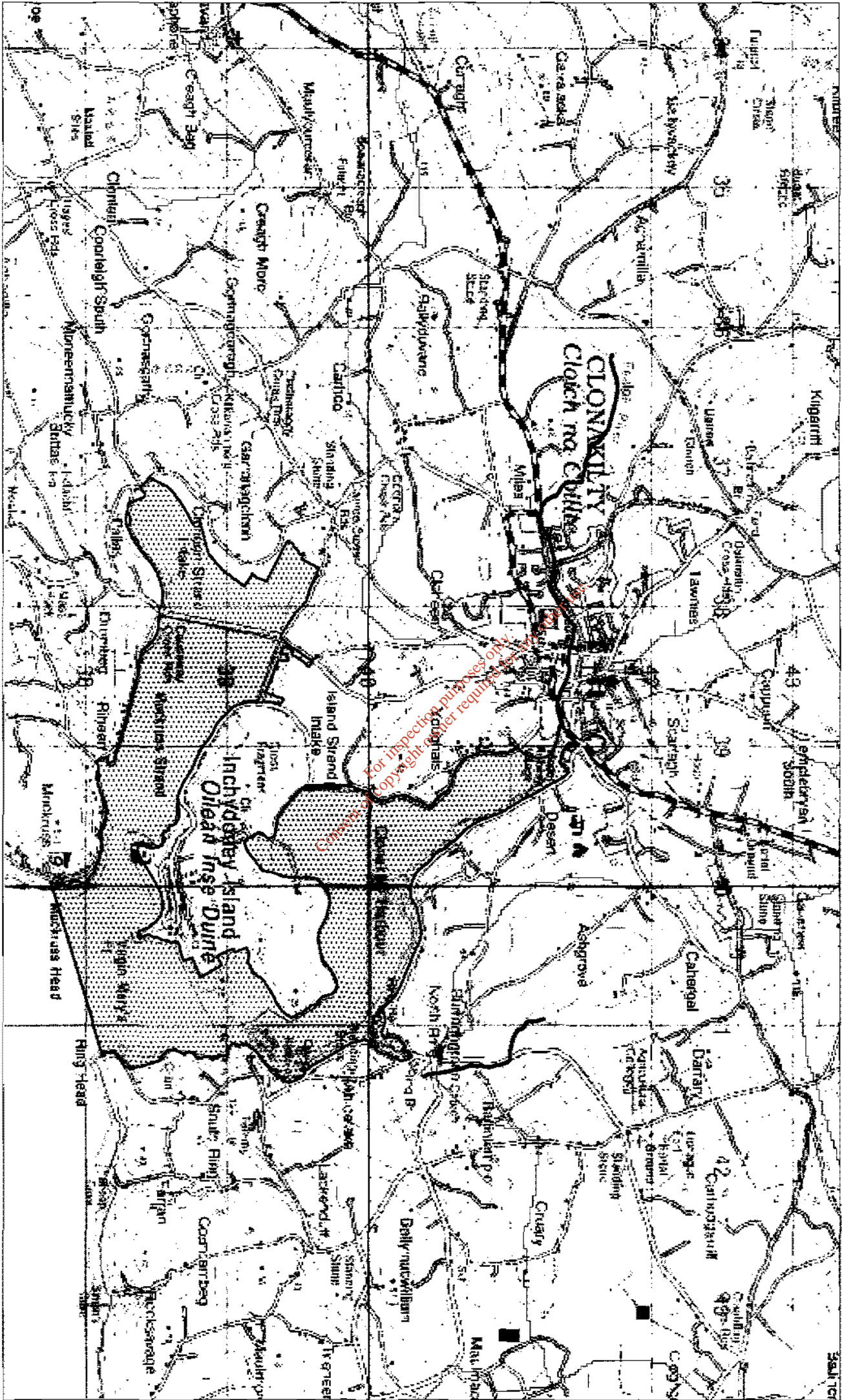
This site is of considerable scientific interest because it contains a good diversity of coastal habitats. These habitats show a succession from salt to freshwater influences and include six which are listed on Annex I of the EU Habitats Directive. Its value is enhanced considerably by the birdlife it supports. The occurrence of Black-tailed Godwit in internationally important numbers is particularly significant. The site also supports nationally important numbers of seven other species of waterfowl as well as two species listed on Annex I of the EU Birds Directive.

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7.8.1999



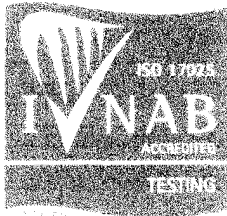
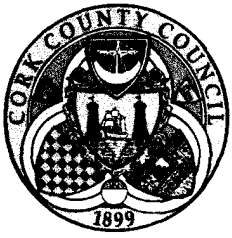
# Clonakilty bay SPA (area number 000091)











# Laboratory Test Report

## Cork County Council

### Waste Water Laboratory

#### Inniscarra, Co. Cork

June 19, 2008

Industry Name: Clonakilty Sewage Works  
 Address: Clonakilty, Co. Cork

Industry Code No. 305  
 Report Ref No. 319-06-08-157  
 Issued to: D. Gowanke  
Water Services  
Western Division

Licence No. Type S

Licence	Volume	pH	B.O.D.	C.O.D.	Sus Solids	TP-P	Code	Comments
Limit	m3	12.99	mg/l	mg/l	mg/l	mg/l		
999999		3.99	25	125	35	99		
<b>Date</b>								
		7.4	1.7	<21	<2.5	0.51	GR013	G TN-N\$= 3.3 mg/l
		7.5	4.3	<21	8	1.37	GR118	C TN-N\$= 12.4
		7.4	21	120	* 101	2.85	GR253	G TN-N\$=7.02mg/L THM\$=<1
~		7.5	13	47	* 38	2.3	GR288	C TN-N\$=12.8mg/L THM\$=
		7.7	* 49	* 160	* 127	5.13	GR340	C TN-N\$=18.1mg/L.
		7.8	3.5	31	4	2.33	GR490	C THM\$=<1.0mg/l
		7.0	10	50	29	<0.2	GR579	C Sulphate\$=88.6mg/l, Amm-N\$=
~		7.7	3.1	<21	5		GR709	G NH3=8.1mg/L SO4\$=44.8mg
		7.6	5.95	42	12		GR871	G TN-N\$=12.7mg/l NH3=12.1r
	2500	7.5	7.54	37	6	2.93	GR1025	G SO4=53.2mg/l
		7.6		35	* 92	70.6	GR1057	C OPO4-P=2.77mg/l
	276	7.5	8	48	14		GR1154	C SO4= 219.6mg/l
% Compl.	100	100	90	91	66	100	***	***
Average	1388.00	7.52	11.55	47.50	36.37	3.12	******	******

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The samples are received at the Laboratory on the day of sampling. The above test methods are based on Standard Methods for the examination of Water and Waste Water, 21st Edition 2005, APHA, AWWA, WEF.

C = Composite Sample, G = Grab Sample.

The compliance value may be varied on items marked with an \* by the application of uncertainty of measurement values on reverse Page Chemical Procedure Numbers(CP No.) for INAB accredited tests are as follows:

- CP NO. 1 = B.O.D.
- CP NO. 3 = S.S.
- CP NO.20 = TP-P
- CP NO. 5 = pH
- CP NO. 6 = C.O.D.
- CP NO. 7 = Cl
- CP NO.22=Ammonia(KONELAB)
- CP NO.23 = OPO4-P(KONELAB)
- CP NO.24 = Chloride (KONELAB)
- CP NO.25=Sulphate(KONELAB)

This report relates only to the samples listed above. This report shall not be reproduced except in full and only with the approval of the testing laboratory. Cork County Council is not accredited by INAB for tests marked with \$. Kg loadings based on flows as supplied by the company. ~ indicates results that have been edited.

Reported by: V. Hannon Date: 19/06/08

Ms. V. Hannon Technical Manager  
 Deputy Technical Manager



## **Wastewater Laboratory Cork County Council- Test Report Addendum**

- a. Sample date reported in column 1 on this report is the date of collection of the sample from the industry name and address as outlined at the top of the report.
- b. Cork County Council wastewater laboratory are not accredited for sample collection.
- c. Data reported in (d) below is defined in section 5.10.3 (c) in wastewater laboratory quality manual.
- d. Table of Uncertainty Of Measurement – Estimate Of Values For Accredited Tests

Chemical Procedure No.	range	Test Name	Estimated Uncertainty	Units
CP No. 1	1 - 8 mg/l	Biochemical Oxygen Demand (BOD)	± 0.30	mg/l
CP No. 1	9 -70 mg/l	Biochemical Oxygen Demand (BOD)	± 3.2	mg/l
CP No. 1	71 - 700 mg/l	Biochemical Oxygen Demand (BOD)	± 40	mg/l
CP No. 3	35 mg/l	Suspended Solids (SS)	± 6.4	mg/l
CP No. 3	200 - 400mg/l	Suspended Solids (SS)	± 41.6	mg/l
CP No. 3	700 - 1000mg/l	Suspended Solids (SS)	± 80.0	mg/l
CP No. 5	2 - 12	pH	± 0.12	pH Units
CP No. 6	< 6 mg/l	Chemical Oxygen Demand (COD LR)	± 5.6	mg/l
CP No. 6	15 - 75 mg/l	Chemical Oxygen Demand (COD LR)	± 10.6	mg/l
CP No. 6	100 -135 mg/l	Chemical Oxygen Demand (COD LR)	± 17.4	mg/l
CP No. 6	120 - 1500mg/l	Chemical Oxygen Demand (COD) High Range	± 26.8	mg/l
CP No. 7	5.0 - 125 mg/l	Chloride (Cl)	± 0.85	mg/l
CP No. 20	0.2 - 2.5 mg/l	Total Phosphorus (TP-P)	± 0.22	mg/l
CP No. 22	0.1 - 0.9 mg/l	Ammonia (Konelab)	± 0.04	mg/l
CP No. 22	1.0 - 2.0 mg/l	Ammonia (Konelab)	± 0.10	mg/l
CP No. 22	2 - 10 mg/l	Ammonia (Konelab)	± 0.32	mg/l
CP No. 22	11 - 19 mg/l	Ammonia (Konelab)	± 0.72	mg/l
CP No. 22	20 - 25 mg/l	Ammonia (Konelab)	± 1.56	mg/l
CP No. 23	0.05 - 1.00 mg/l	Orthophosphate as P (Konelab)	± 0.04	mg/l
CP No. 24	25.00 - 99.00 mg/l	Chloride (Konelab)	± 3.04	mg/l
CP No. 24	100.00 - 200.00 mg/l	Chloride (Konelab)	± 11.16	mg/l
CP No. 25	30.00 - 199.00 mg/l	Sulphate (Konelab)	± 3.42	mg/l
CP No. 25	200.00 - 250.00 mg/l	Sulphate (Konelab)	± 8.70	mg/l

**November 2007**

The raw data used to evaluate the above estimations is stored in the Wastewater Laboratory, Cork County Council.

The method followed is located in the Uncertainty of Measurement file and in the Eurachem Guidelines for Quantifying Uncertainty in Analytical Measurement.