Attachment C.1

Operational Information Requirements

Foul and storm water pumping station

Flow enters the foul and storm pumping station through a 450mm diameter inlet sewer. The inlet flow may be isolated with the operation of a manually actuated wall mounted penstock PEN01.

The inlet foul pumps (P01, P02 & P03) each have a capacity of 10 → 44l/s. The level (US01) in the inlet pumping station determines the rate of pumping via PLC control PL02. i.e. the speed of the pumps is controlled to maintain a level and maximum flow of 656l/s.

The forward feed, to the preliminary treatment building, is recorded by a flowmeter installed in the rising main. These pumps are run on VSD control.

Prior to the duty foul pump start-up the actuated gate valve (GV33) is opened. This valve remains open for a period of time after the duty pump has started. The purpose of this valve is to mix the contents of the foul sump to return settled sludge's into suspension. Initially this valve will be opened for 60 seconds but this will be adjusted during commissioning.

In the event of inlet flow exceeding the capacity of the foul pumps, the storm water will overflow through the 'Storm overflow Screen' (SC01). This storm screen capacity is 240l/s. The storm screen is actuated by a level reading from US01. Storm water conditions recorded by the ultrasonic mounted in the storm pumping station (US02) will initiate the storm pumps. The storm pumps acting as Duty, Assist and Standby (P04, P05 & P06) have a total capacity of 240l/s. Levels recorded by US02 will send signals to the PLC in PL02 and thus control operation of the storm pumps. Flows from the storm pumps to the storm water holding tank are recorded by FM02. Storm flows exceeding the storm pump capacity, will overflow through a bar screen and discharge to the river Barrow.

On subsidence of storm conditions as recorded by US01, the stormwater collected in the storm-pumping sump is diverted back to the foul sump operation of the actuated penstock PEN02.

Pressure readings may be taken locally from the pressure gauges mounted on the pumped lines. Air is extracted from the foul/storm pumping station to the odour removal unit. The rate of extraction is set up during commissioning and should not be adjusted.

Two of the storm pumps (P04, P05, P06) and the storm overflow screen (SC01) can also be operated by local generator in the event of a power failure. This is an automated control loop via the PLC.

In the event of the isolation of one of the biological streams the operator will be able to adjust the maximum forward feed rate for treatment. The forward feed rate is

calculated based on the maximum design feed rate of 65l/s, less the return flow rate recorded from the supernatant pump station, FM07.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
P01	Foul pump	US01	Level	Duty
P02				Assist
P03				Standby
P04	Storm pump	US02	Level	Duty
P05				Standby
P06				Assist
SC01	Storm Screen	US01	Level	Duty
SC02	Bar screen			
PEN01	Manual penstock	Manual	Maintenance	Normally in open position
PEN02	Actuated penstock	US01 & US02	Strom sump drain	Normally in closed position
DV01	Odour control damping valve	Manual	Maintenance	Set position on commissioning

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
US01	Ultrasonic Level sensor	Analogue	High level	Foul sump
US02				Storm sump
FM01	Flowmeter	Analogue		Feed to inlet works
FM02				Feed to storm tank

Stormwater holding tank and tank cleaning venturi.

Stormwater, diverted to the stormwater holding tanks during storm conditions, has the facility to be returned to the main process once storm conditions subside as indicated by FM01 and US01. Flow to the storm water tank is recorded by FM02. The tank selection for initial fill may be selected via the PLC as the inlet to each tank in opened through the actuated penstocks (PEN11 and PEN12). Each tank is fitted with a venturi jet mixer. This unit has the dual function of Aeration and tank cleaning. The venturi jet mixers act as mixing aerators to prevent the contents of the stormwater tanks from becoming septic. They will be controlled on a tank level and timer basis. The timer control is variable through the PLC. The venturi units will also be used as part of the tank drain down and cleaning cycle. The cycle is controlled by the level sensor in each tank and the forward feed rate of the foul pumps. As the tank is drawn down and the stormwater returned to the foul sump the venturi pump is started at a preset level. The unit will continue to run until a low level is reached. At an intermediate level, typically when 70% of the floor of the tank has been exposed the drain down penstock is closed and the flushing valve opened to allow clean water into the tank to washdown the side walls. The venturi pump continues to run during this period. After a set time period (Set initially @ 5 Min) the drain down penstock will open if the flow

conditions (FM01) to the inlet screens permits and the tank drain down will continue. At a low level the venturi pump stops and the flushing valve is closed. The penstock is closed when a low low level is reached.

A passive odour Control unit is to be installed on the stormwater tank. The storm tank walls are washed down after storm contents have been emptied. This wash down is achieved by the wall mounted sparge pipe and solenoid valves SV04 & SV05. The solenoid Valves are controlled by the level sensor in each tank and on a timed basis.

Tag	Description	Control	Control parameter	Comment
P07	Storm tank Venturi Mixer	US04	Level	Duty
P08		US05	Level	Duty
PEN 11	Actuated penstock	PLC	Duty tank select	Cycling
PEN 12				
PEN 10			US01	Duty
PEN 13				Duty

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
SV04	Solenoid valve	Digital		Wash down
SV05	Solenoid valve	Digital		Wash down
US04	Ultrasonic	Analogue	Storm water	Level indication
US05	Ultrasonic	Analogue		Level indication
FM03	Flowmeter	Analogue		Stormwater return

Screening plant

Flow enters the preliminary screening unit from foul pumping station. The flow direction is manually selected by operation of the channel penstocks. Under normal operating condition flow will be directed through the mechanical screen SC02. A level sensor (US05) mounted prior to the screen will stop the foul pumps in the event of a high level. Screenings of 6mm or larger are removed by the screen and conveyed to the washpactor. The screenings are washed down the launder channel and into the washpactor (SC05). The washpactor motor and mixer have a run time linked to the screen are controlled by a low level probe (LP01) mounted in the tank. The compacted screenings are deposited into the collection bin. The washwater/effluent from the washpactor is returned to the treatment process prior to the screen. Wastewater that passes trough the screen will flow through the grit trap. The direction of the flow is determined by the handstops mounted in the channel. Wastewater will continue through for biological treatment. In the event of maintenance work to be carried out on the mechanical screen, the flow can be directed through the manual bar screen. The screenings that are collected here are manually racked. The screening plant and grit and grease removal stage are installed in the preliminary treatment building. Air is extracted from the prelim building through a duct back to an odour scrubbing plant.

With the initiation of the screen cycle the following events occur:

1. Screen drive motor starts. (SC08)

2. Screen wash water solenoid opens (SV01). This is controlled on a timer, which can be adjusted during commissioning.
3. The washpactor/Launder chute solenoids are opened to wash the screenings into the washpactor. This is controlled on a timer, which is linked to the washpactor cycle.
4. The washpactor motors both start. The compactor motor operates continuously during the cycle and the impellor motor runs periodically. The stop/start of the impellor is controlled on a timer. The typical run/dwell periods are 5 mins and 1 mins respectively.
5. When the screen stops the washpactor stop cycle is also initiated.
6. The stop cycle is controlled on a timed basis in two stages. Firstly all motors are allowed to operate with washwater supply solenoids open for 5 mins. The mixer motor is then stopped and the compactor and washwater continued for a further 5 mins. The solenoids are then closed and the compactor stopped.
7. The washpactor is fitted with a low level probe, which will temporarily interrupt the cycle if activated. The cycle resumes when the operating level is achieved.
8. In the event of 3 high level interrupts to the foul pumps within 30 minutes (variable) then an alarm is raised. The foul pumps will be allowed to start with the screen cycle suspended. The bypass penstocks PEN05 and PEN06 are designed to allow the effluent to overflow within the channel. Effluent can continue to flow to treatment. In the event of a high alarm the foul pumps will be stopped. The pumps will restart when the level has dropped to the overflow level. In the event of 3 high level alarms within 30 mins (variable) an alarm is raised. The pumps will be held out until reset by the operator.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
SC03	Mechanical screen	US 01	Level	Duty
SC04	Manual screen	Manual		Used on bypass of mechanical screen
SC05	Washpactor	SC02	Mechanical screen	Duty
PEN03	Manual penstock	Manual	Manual	
PEN04				
PEN05				
PEN06				
SC05	Washpactor mixer	SC03	Mechanical screen	Duty

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
DV02	Odour damper valve			
I01	Gas detection	Analogue		

US05	Ultrasonic Level probe	Analogue	High level alarm	Foul Pump interrupt
pH01	pH probe	Analogue		Reading
LP01	Level probe	Digital		
SV01	Screen solenoid	Digital		Washing
SV02	Washpactor solenoid			
SV03	Launder channel solenoid			

Preliminary Works Grit Trap

After the screen the flow passes into the grit trap (SC06) where the grit trap paddle runs continuously. Initially the blower (AB04) and the grit classifier (SC07) are off and the 3-way valve (3BAV01) is in the air wash position (i.e. external to the discharge pipe).

The wash and lift sequence can be described as follows, the time periods may need to be adjusted on commissioning but can be outlined as follows:

1. A 0-24 hour timer is used to initiate the process timer.
2. The classifier starts and runs for 0-60 minutes and the blower starts.
3. After 0-10 minutes the 3-way valve changes to the air lift position.
4. After 0-10 minutes the 3-way valve reverts to the air wash position.
5. After 0-10 minutes the 3-way valve changes to the air lift position.
6. After 0-10 minutes the 3-way valve changes to the air lift position and the blower stops.

This cycle takes place up to 4 times in any 24hour period to be set on commissioning. The grit classifier discharges to an adjacent skip. If at any time the grit trap needs to be removed from operation for maintenance then penstock (PEN09) is opened and penstocks (PEN07 & PEN08) closed, thus allowing flow go straight to the outlet of the inlet works. The grit removal sequence is suspended if the grit trap is switched off.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
SC06	Grit trap	Manual	On/Off	
SC07	Grit Classifier	PLC/ Timer		
AB04	Grit trap blower			
PEN07	Handstop	Manual		
PEN08				
PEN09				

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**

3BAV01	Grit trap air valve	Digital		Timer control

Flow Splitting Chamber No. 1

Flow from the preliminary treatment units enter the FSC 1. Flow from the supernatant pump station is also returned to this chamber. Flow from this chamber is directed to the biological treatment units. It is possible to isolate one of the treatment streams by closing one of the penstocks, PEN14 & PEN15.

Anaerobic and Anoxic

Anaerobic

Flow enters each anaerobic tank from PSC 1.The flow to each anoxic tank can be isolated by the appropriate penstocks. The first stage of the biological treatment process is the anaerobic zone. The screened raw effluent is mixed with the returned sludge from the clarifier. This tank is enclosed to minimise the potential sources of oxygen. The mixers in each tank (MI01 Tank1 & MI02 Tank2) are controlled on timers. The dwell time is variable and is determined during commissioning. The purpose of this tank is to aid the removal of phosphorous by biological means. The ultrasonic level sensor in the tank acts as a low level cut out on the mixer in the event of the stream being drained down. It also raises a high level alarm.

Flow is divided into 2 streams, which enter the anoxic tanks. The anaerobic tank is separated from each anoxic tank by penstocks, high level PEN16, 20 & 24 and low level PEN17, 21 and 25 . Two penstocks to a 4th tank are permanently closed, PEN 28 & 29.

Anoxic Tank

The second stage of the biological process is the anoxic tank. The purpose of this stage is to aid denitrification. The flows into each tank are from the anaerobic tank and a recycle flow from the aerobic tank. Each tank has a mixer installed. The mixer is controlled on a timer. The level sensor in each tank is set to stop the mixer at a low level (During Drain Down) It will also raise a high level alarm. The level sensor will also stop the drain down pump at a low level. The drain down pump is started manually by a local on/off switch.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
MI01	Anaerobic mixer Tank 1	Timer / US06	Variable dwell time Low level stop	Duty
MI02	Anaerobic mixer Tank 2	Timer / US11	Variable dwell time Low level stop	Duty
MI02	Anoxic mixer	Timer / US07	Variable dwell time Low level stop	Duty
MI03		Timer / US08	Variable dwell time Low level stop	
MI05		Timer / US12	Variable dwell time Low level stop	
PEN16	Weir penstock	Manually controlled penstocks. Flow control.	Normally open	Tank 1. Duty
PEN18				Tank 1. Duty
PEN20				Tank 2. Duty
PEN22				Tank 2. Duty
PEN24				Tank 3. Duty
PEN26				Tank 3. Duty
PEN28			Normally closed	Tank 4. Duty
PEN17	Circular penstock		Normally closed	Tank 1. Duty
PEN19			Normally closed	Tank 1. Duty
PEN21			Normally closed	Tank 2. Duty
PEN23			Normally closed	Tank 2. Duty
PEN25			Normally closed	Tank 3. Duty
PEN27			Normally closed	Tank 3. Duty
PEN29			Normally closed	Tank 4. Duty
P100	Drain Down Pump	Manual US06/ US07	Low level	Not Perm. Installed

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
US06	Ultrasonic level sensor	Analogue	High level alarm	Mixer control Drain Down Pump Control.
US07			High level alarm	
US08			High level alarm	
US11			High level alarm	
US12			High level alarm	

Aeration tanks

Each Anoxic tank connects to a separate aeration tank. Each aeration tank can be isolated by means of manual penstocks installed at the inlet to each aeration tank. PEN18, 19, 22, 23, 26 & 27.

Under aerobic condition the nitrification takes place in the aeration tank. The oxygen required for this reaction is supplied by three blowers (AB01, AB02 and AB03). Fine

bubble diffusers diffuse the air as micro bubbles. The air supply line to each aeration tank will be equipped with one air regulation valve. One oxygen monitor is installed in each aeration tank. The regulation valve will control the volume of air supplied to each tank to maintain a DO level. Additionally one mixed liquor suspended solid meter is installed in each aeration tank. For the upstream denitrification process recirculation pumps are required. Therefore in each aeration tank one recirculation pump is installed (P20, P21 & P22).

Each aeration tank is equipped with one air regulation valve (BV01, BV02 & BV03). The position of the air regulation valves is controlled by the oxygen monitor in the aeration tanks. The air regulating valves operate to maintain a preset defined oxygen level within the assigned aeration; the limits are set during commissioning. Therefore the measured oxygen value will be permanently compared with the set point value of the oxygen. The set points of the oxygen level is set during commissioning.

Furthermore the air regulation valve shall not be completely closed in the automatic operation mode to ensure a minimum air supply in the aeration tank in the event of malfunction of this control and during low flow conditions. The minimum position of the air-regulating valve is determined by the position of the limit switch, set manually during commissioning. Additionally the oxygen level set point can manually be increased and decreased via the PLC, by the operator, depending on the ammonium-concentration in the final effluent sampling chamber.

Three blowers are installed in the blower station. These blowers operate on duty assist standby basis. The three blowers are equipped with VSD control. The cut in and cut out of these blowers are controlled by the pressure measurement (PT01) in the air manifold. The blowers operate in the way that a defined pressure, nominally 600 mbar, within the manifold will be kept constant. Therefore the measured pressure value will be permanently compared with the set point value of the pressure.

The recirculation pumps return the aerated effluent to the anoxic tank. They are controlled on a timed basis proportional to the forward feed rate (FM01). The flow recycle ration will be set at 2:1 during commissioning, and this will be modified by the operator as part of the process operation.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
P20	Recirculation pump	Timed FM01	Flow	Duty
P21				
P22				
AB01	Air blower	PT01	Maintain Pressure	VSD Control Duty/ Standby/ Assist
AB02	Air blower			
AB03	Air blower			
BV01	Actuated air valves	DO01/02	Dissolve oxygen	
BV02	Actuated air valves	DO03/04		
BV03	Actuated air valves	DO05/06		

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
PT01	Pressure transmitter	Analogue	High/Low	Pressure readings.
BPS01	Blower pressure gauge			Blower pressure
BPS02				
BPS03				
DO01	Dissolved oxygen probe	Analogue	High/Low	Monitoring of dissolved oxygen
DO02				
DO03				
DO04				
DO05				
DO06				
MLSS01	Suspended solids	Analogue	High/Low	Monitoring of suspended solids
MLSS02				
MLSS02				
FI01	Flow indicator	Analogue		Monitor overflow To aeration tanks

Settling/Clarifier tank

In the clarification tanks the activated sludge will be separated from the wastewater by sedimentation. Three circular tanks with floor scrapers and scum removal system are installed. Settlement occurs within the tank with the sludge settling to the bottom of the tank. The sludge is directed to the central hopper of the clarifier tank by the scraper system. The sludge collected in each hopper is directed to adjacent sludge pumping station. Clarifier 1 & 2 connect to S.P.S. No.1 and clarifier No.3 connects to S.P.S No.2.

The clarified wastewater flows radially to the periphery of the clarifier and overflows via the v-notch weirs. Scum may rise to the surface of the tank and is removed by a scum removal system. The scum flows by gravity to the sludge waste pump station.

The overflow weir on the scum collection box is mechanically actuated by a cam on the rotating scraper bridge. The control of the clarifier bridge is on/off only. Under normal operation the bride is in the on position.

Tag	Description	Control	Control parameter	Comment
M01	Clarifier drive No1	Manual	Duty selector switch	Rotating drive for tank
M02	Clarifier drive No 2	Manual	Duty selector switch	Rotating drive for tank
M10	Clarifier drive No 3	Manual	Duty selector switch	Rotating drive for tank

Flow-Dividing Chamber No.2 & No.3

Flow from aeration tank No.1 & 2 are combined in flow-dividing chamber No.2. Ferric sulphate is dosed into this chamber. The ferric dosing control system is described later. The flow to each clarifier is controlled by overflow weirs within the flow-dividing chamber. Flow from aeration tank No.3 flows to flow dividing chamber No.3 and overflows to clarifier No.3. Flow dividing chamber No.3 is installed with a view to future plant expansion. Ferric Sulphate is also dosed to this chamber.

Ferric Dosing

There is one bulk storage tank for the ferric sulphate. The level in the ferric dosing tank is measures by the ultrasonic level sensor (US15). This unit monitors the level within the tank and a low-level recorder alarm is configured in the SCADA programme. The recorder level will be adjustable by the operator based on lead-time, rate of consumption & delivery volume. There are two sets of duty/standby dosing pumps connected to the outlet from the ferric sulphate storage tanks. Pumps P21 & P22 dose to flow distribution chamber No.2 and pumps P30 & P31 dose to flow distribution chamber No.3. Dosing is proportional to Flow (FM01). The pumps will initially be configured based on a uniform flow distribution. Therefore P30. & P31 will dose @ 50% of P21 & P22. The stroke of the dosing pump is manually adjusted by the operator.

Tag	Description	Control	Control parameter	Comment
P21	Dosing pump	Manual	Inlet flow	Duty
P22	Dosing pump	Manual		Standby
P30	Dosing pump	Manual		Duty
P31	Dosing pump	Manual		Standby

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
US15	Ultrasonic	Analogue	High/Low	Ferric level.

Sludge pumping stations.

The sludge from clarification tanks enters the sludge pumping stations via connecting pipes. In each sludge pumping station there are two return activated sludge pumps and two surplus activated sludge pumps installed.

The return activated sludge pumps will pump the settled activated sludge to the anaerobic tank where the return activated sludge is mixed with the screened untreated effluent. The surplus activated sludge pumps pump the surplus activated sludge to the picket fence thickener. Sludge is wasted proportional to MLSS readings in the aeration tank.

An actuated gate valve on the common discharge of each sludge return pump set allows flow to return to the sump in order to agitate the sump contents on start up. ACT02 and ACT11

There are two sludge pumping stations. SPS No.1 is connected to Clarifier No.1 & No.2. SPS No.2 is connected to clarifier No.3 (And a future connection to clarifier No. 4)

Control

The sludge return pumps are configured in a duty/standby configuration and are controlled with variable speed drives. The VSD Controls the rate of return of sludge to the anaerobic tank (FM04 & FM05). This is to be configures as a percentage of the inlet flow (FM01). The operator is able to adjust this set point to optimise performance of the plant. The actuated bellmouths on the sludge draw off lines are controlled by the ultrasonic level sensor in the adjoining pump sump. ACT03 & ACT04 are controlled by US10. ACT06 is controlled by US14.

In the case of ACT03 & ACT04 it is assumed that an equal flow is achieved in both lines by virtue of similar hydraulics and overflow levels. The operator will be required to routinely check and reset the levels of the bellmouths. The level of the bellmouth is adjusted to maintain a constant level within the sludge return pump sump.

A low level in the sump (US10 & US12) will stop the respective sludge return pumps. If the low level persists for more than 20 mins (Variable by operator) an alarm will be raised on the SCADA system. The sludge waste is controlled by actuated gate valves. There is a separate gate valve to each clarifier. The sludge waste cycle will be controlled on a timed basis and the operator will need to monitor the MLSS readings to ensure a balances system. Surplus sludge from each stream is pumped in a common rising main to the PFT's. The operator selects the PFT's manually. Only one valve in each sump will be opened at a time. The pumps are controlled on a high/low signal from the respective ultrasonic level sensor. A No-Flow signal is generated by comparison of the sump level and pump run signal.

Tag	Description	Control	Control parameter	Comment
P09	Surplus sludge pump Station 1	Timer / US09/Operator variable		Duty/ Standby
P10				
P11	Return sludge pump Station 1	US10 / VSD/FM05/FM01		Duty/ Standby
P12				
P15	Surplus sludge pump Station 2	Timer / US04		Duty/ Standby
P16				
P17	Return sludge pump Station 2	US13 / VSD/FM05/FM01		Duty/ Standby
P18				
ACT03	Actuated bellmouth Station 1	Level	Set during commissioning	Duty
ACT04		Level		Duty
ACTGV37	Actuated gate valve Station 1	Time	PLC operation	Duty
ACTGV38		Time		Duty
ACT06	Actuated bellmouth Station 2	Level	Set during commissioning	Duty
ACT07 (Future)		Level		Duty
ACT08	Actuated gate valve Station 2	Time	PLC operation	Duty
ACT09 (Future)		Time		Duty

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
US09	Ultrasonic WAS Station 1	Analogue	High/ High level	Level Indication Pump Control
US10	Ultrasonic RAS Station 1	Analogue	High/ High level	Level Indication Pump Control
US13	Ultrasonic WAS Station 1	Analogue	High/ High level	Level Indication Pump Control
US14	Ultrasonic RAS Station 1	Analogue	High/ High level	Level Indication Pump Control
FM04	Electromagnetic flow meter. Sludge return Station 1	Analogue	No flow & time	Flow indication + record
FM05	Electromagnetic flow meter. Sludge return Station 2	Analogue	No flow & time	Flow indication + record

Picket fence thickener

Surplus activated sludge from the sludge pumping stations is fed to the PFT tanks. The purpose of the tank is to store and thicken the sludge. Thickening is aided by a rotating picket fence gate which directs settled sludge to a central hopper.

A sludge blanket level detector is installed in each of the PFT tanks. This unit monitors the sludge level only and enables the operator to know when dewatering is required and will prevent WAS pumps from operating if PFT is at high level.

As soon as a certain water level is exceeded, the supernatant flows to the emergency overflow weir and flows by gravity to the inlet pumping station. The supernatant is drawn-off by a manual supernatant withdrawal device. Air is extracted from the sludge tank through a duct back to an odour scrubbing plant.

Tag	Description	Control	Control parameter	Comment
M04	Gate drive PFT tank 1	Auto		Duty
M011	Gate drive PFT tank 2	Auto		Duty

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
DV03	Odour damper valve			
SB01	Sludge Blanket level indication	Analogue		Indication
DV04	Odour damper valve			
SB02	Sludge Blanket level indication	Analogue		Indication

Dewatering house

The operator initiates the centrifuge startup sequence from the graphic interface panel. A timer then locks out the operation of all associated feed equipment until the centrifuge reaches full operating speed.

Once this period has elapsed the operator can initiate the feed sequence, which starts the sludge feed pump, solid cake screw conveyor and the polymer feed. The operator can optimize performance by vary the sludge feed and the polymer feed to the centrifuge and monitoring the flowmeter.

When dewatering is complete the operator initiates the feed off sequence, which stops the sludge feed, the poly feed and energizes the wash water valve for a set period of time. Once the wash sequence has completed it is possible to stop the centrifuge and the conveyor.

Solids from the centrifuge are discharged to a skip outside the building during the process and the decanted and wash water are returned to the inlet flow splitter chamber through a series of manholes. The centrifuge and associated equipment are controlled through by a PLC in the graphic interface panel.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
P19	Feed pump	Centrifuge PLC	Centrifuge operation. Operator control	
P20				
CM01	Main centrifuge motor			
P25	Cake pump			
P23	Dosing pump			
P24				
MI03	Poly mixer			
P26	Booster pumps washwater feed			
P27				

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
SV03	Solenoid valve	Digital		
FM07	Flowmeter	Analogue		
I02	Gas detection	Analogue		
DV05	Odour damper valve	Analogue		

Final effluent station

The Clarified effluent flows through the flume prior to discharge to the river Barrow where the flow is to be measured using an ultrasonic level probe.

PLANT				
Tag	**Description**	**Control**	**Control parameter**	**Comment**
FL01	Flume			

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**
US17	Outlet ultrasonic	Analogue		Flow indication

Odour extraction

From the following treatment stages the exhaust air is treated in the odour treatment plant:

- the inlet and storm pumping station/8 channel @ 625m3
- the inlet works building @ 328m3

- the picket fence thickener @ 40m3
- the sludge dewatering machine and building @ 310m3
- the final effluent pumping station 67.5m3

Air is drawn from each of the above location at predetermined volumes and directed into an odour scrubbing unit.

Tag	Description	Control	Control parameter	Comment
BF01	Odour fan	US10		Duty

INSTRUMENTATION				
Tag	**Description**	**Signal**	**Alarm**	**Comment**

Storm Water Overflow from WWTW

It is not known if the storm water overflow from the WWTW complies with the DoEHLG *'Procedures and Criteria in relation to Storm Water Overflows'*, 1995.

There are no plans to decommission the storm water overflow from the WWTW.

There are no pumping stations within the waste water works, which overflow directly to the River Barrow in the event of an emergency. All overflows are directed to the storm tank in the event of an emergency. In the event that flows exceed the capacity of the foul pumps, storm pumps and storm tank and overflow to the River Barrow will occur.

2: SYSTEM PARAMETERS, DESIGN AND OPERATING CONSTRAINTS AND PLANT PERFORMANCE SPECIFICATION

2.1 Design Parameters

1. The design parameters for the Stage 1 Treatment Works are to cater for a design population of 6,000 population equivalent, giving a DWF of 17.6 l/sec. The Stage 2 expansion will allow for a population equivalent of 9,000 PE.

2. The Civil Works Contract will construct of a new Wastewater Treatment Works to cater for a population equivalent of 6,000. The existing treatment works must be kept in operation during the construction of the new works.

3. The layout of the existing treatment works is shown on drawing No. 20140/108 and the layout plan of the proposed treatment works is shown on Drawing No. 20140/109. The Civil Works will include the following works:-

    1. Laying of approximately 3004 m of gravity sewers and 814 m of rising main from the town to the Inlet Works
    2. Inlet Works including Inlet Works Buildings.
    3. Demolition of the existing Wastewater Treatment Works.
    4. Flow Dividing Chambers.
    5. Foul and Stormwater Pumping Station.
    6. 1 No. Anaerobic Tank.
    7. 2 No. Aeration Basins with anoxic zones.
    8. 2 No. Clarifiers.
    9. Sludge Return and Sludge Waste Pumping Station.
    10. Filtrate Pumping Station.
    11. Sludge Dewatering Building and Sludge Thickening Tank.
    12. Stormwater Tanks.
    13. Phosphate Dosing Plant Bund.
    14. Air Blower Building
    15. Administration Building.
    16. Outfall.
    17. Drainage Pump Sumps.
    18. Site Pipework.
    19. Siteworks.
    20. Access Roads, Fencing and Landscaping.

4. Design Flows

The design flow for the treatment works is 17.6 l/sec (DWF), for a population equivalent of 6,000 PE.

A breakdown of the design flows is as follows:

a)	Population equivalent	6,000
b)	Daily dry weather flow (DWF)	17.6 l/sec
c)	Max. rate of flow to full biological treatment (2.5 DWF)	44 l/sec
d)	Max. rate of flow to stormwater tanks	240 l/sec
e)	Max. rate of flow to inlet works	140 l/sec
f)	Daily BOD	420 kg/d
h)	Daily suspended solids	450 kg/d
i)	Total Phosphorus	21 kg/d
j)	Total Nitrogen	60 kg/d

The sewage is mainly domestic combined with stormwater. The average strength of the raw sewage based on DWF is 280 mg/l BOD, 300 mg/l suspended solids, 14 mg/l Total-P and 40 mg/l Total-N.

2.2 Influent Quality

1. The raw sewage characteristics are as stated above and the wastewater is mainly domestic.

2.3 Treatment Process

1. The process shall be a single stage anoxic zone extended aeration process followed by clarification. The process shall also include an anaerobic tank for the biological removal of phosphorous. The process must achieve the final effluent quality as set out below. The final process layout is shown on Drawing No. 20140/111.

2. The maximum incoming flow to the inlet and stormwater pumping station is: 240l/sec. Of this incoming flow, 2.5DWF (17.6l/sec) is pumped to the inlet works. The remainder overflows to the storm sump and is pumped to the storm tanks. The inlet works shall include screens together with a screenings washer compaction unit, overflow and pista grit traps. The storm tanks have a minimum retention time of 2 hours at an inlet flow of 5.5DWF. Flows up to 2.5 DWF will receive full treatment. The influent will be passed to an anaerobic tank where it will be mixed with return activated sludge.

receive full treatment. The influent will be passed to an anaerobic tank where it will be mixed with return activated sludge.

3. The anaerobic tank will be used to reduce the phosphorus concentration to a maximum of 2 mg/l in the effluent from the aeration tank. Ferric sulphate will be dosed at this point to reduce the effluent concentration to 0.7 mg/l.

4. The effluent from the anaerobic tank is split between the two aeration tanks. The first sections of the two aeration tanks are anoxic. The influent from the anaerobic tanks is mixed with recirculated mixed liquor from the aerobic zone. The mixed liquor is then aerated in the aerobic zone with the diffused air system.

5. The aerated effluent will pass through clarifiers and the clarified effluent discharged to the River Barrow. Activated sludge will be returned from the Sludge Pumping Station to the anaerobic tank.

6. Excess sludge drawn off from the Clarifiers will gravitate to the sludge pumping station. The excess sludge is then pumped to the sludge thickening tank.

7. The thickened sludge is pumped to the dewatering building for treatment. The dewatered sludge will be taken off site for disposal in accordance with the requirements of the County Sludge Management Plan.

2.4 Final Effluent Quality

1. The Contractor shall guarantee that the treated effluent shall achieve the following standards:-

   i) B.O.D. not greater than 20 mg/litre.

   ii) Suspended solids contents not greater than 30 mg/litre.

   iii) Total phosphorous not greater than 0.7 mg/1.

   iv) Ammonia concentration not greater than 5 mg/l.

   v) Nitrate concentration not greater than 5 mg/l.

   vi) Fats, oil, grease not greater than 10 mg/l.

2. The Contractor shall also guarantee that the final effluent shall not:-

   i) Settle to form objectionable deposits.

   ii) Float as debris, scum, oil or create any other nuisance.

   iii) Produce any undesirable or nuisance effect on the aquatic life in the River Barrow.

3. The Contractor shall be required to guarantee that the method of treatment adopted will yield an effluent quality in accordance with current European Communities Regulations and in compliance with the criteria outlined in Memorandum No. 1, Water Quality Guidelines by the Technical Committee on Effluent and Water Quality Standards.

2.5 Works layout and Unit Design

1. If the tenderer requires any alterations to the retention times or volumes for any tanks in order to guarantee the final effluent, they should state so in their tender. **Optimum sludge recycle rates from the aerobic zone to the anoxic zone shall also be stated in the tender.**

2. A detailed layout of the works is shown on the Drawings which accompany this Specification. Modifications to this layout shall as far as possible be avoided. Any modifications required and the reasons for these modifications shall be clearly stated in the tender.

3. The hydraulic design through the works has been carried out in such a manner as to provide for reasonable head differentials between the various units. If Tenderers require alterations to any of these or to the size of any unit they must state so in their Tender.

4. The tender must be submitted on the basis of this Specification but Tenderers may offer comments on any feature they consider undesirable or any other feature they consider desirable as an addition. The latter should be referred to and shown as an additional alternative item and must not be shown to replace items in the Specification.

2.6 Mechanical Performance and Specification

1. Plant performance shall be "fail safe" and plant shall be so arranged that easy fault diagnosis and correction shall be accomplished.

2. Maintenance procedures shall be simple, cheap and infrequent.

3. The plant shall be inherently safe and shall incorporate all necessary safeguards.

4. The Contractor shall guarantee the mechanical and process performance of the plant.

2.7 Manning

1. The Treatment Works will not be continuously attended. The Caretaker will visit and attend the works intermittently during normal working hours. The works including all control systems shall be suitable for such care.

2. A dial out alarm is included in the Contract as detailed.

2.8 Electrical Apparatus for Use in Hazardous Areas

1. Due to the possible presence of gases that could create an explosive atmosphere, the following areas of the plant have been classified as hazardous areas, with a Zone 1 area classification.

   a) Foul and Stormwater Pumping Station.

   b) Inlet Works Building and excluding the separate Control Room Area.

   c) Supernatant/filtrate pumping station.

2. Motors and electrical apparatus for installation in these areas shall be suitable for use in Zone 1 hazardous areas in accordance with BS 5345: Part 1 1989 and BS 5345: Part 2 1983.

3. Electrical apparatus in these areas i.e motors, control devices, fittings, fixtures, wiring etc. shall be specially constructed, certified and installed in accordance with the relevant standards and codes of practice.

2.9 Computerised Control System

1. A computerised control system will be installed at the treatment works under this Contract. Under this contract the contractor shall include for wiring all control and instrumentation signals to termination racks in the main control panel located in the Inlet Works Building to facilitate subsequent connection to the computerised control system. The computerised control system will be located in the office in the Administration Building. **A separate section of the control panel marked telemetry and mimic terminals shall also be provided in the main control panel under this contract.** Volt free controls shall be provided in this section for signals for pump stations, flows, levels, etc.

3: INFLUENT AND STORM PUMPING STATION

3.1 General

1. Influent from the gravity sewer will discharge to the pumping station where it will be pumped to inlet works.

2. Two foul pumps shall be installed (duty/standby) and each pump shall be complete with **variable speed control.**

3. Three storm pumps shall be installed (duty/assist/standby).

4. The pumping station has been classified as a hazardous area with Zone 1 classification. Motors and electrical apparatus for installation in this area shall be suitable for use in Zone 1 areas. Refer Clause 2.8.

3.2 Scope of Contract

1. The Contract includes for:

   i) Two submersible foul pumps (duty/standby)

   ii) Three submersible stormwater pumps (duty / assist / standby)

   iii) Storm overflow screen

   iv) Pipework, fittings and valves

   v) Controls, switchgear and instrumentation

   vi) Variable speed controls for the foul pumps.

3.3 Pump Units

1. All pumps shall be of the submersible type and shall be non-chokeable. The pumps shall be capable of handling 95 mm spheres.

2. The pump units shall be robust with all construction materials used having a high resistance to abrasion and corrosion. Full details of construction materials shall accompany the tender.

3. The pumps shall have a maximum speed of 1500 r.p.m. The pump characteristics shall be stable, non-overloading and shall be such that the pumps shall operate close to maximum efficiency at the design point.

4. The pumps shall meet the respective required duty against the calculated total head, made up of the static lift of 9.5 m and the head loss due to friction. The

head losses through pipes, fittings and valves shall be calculated by the Tenderers in each case. System curves and the head loss calculations shall be supplied with the tender.

5. The pump units shall be suitable for easy removal from the sumps. Guide rails, lifting chains, safety chains, hooks and a suitable pedestal shall be provided for each pump.

6. Motors shall be squirrel caged type suitable for submersible operation with IP68 protection and Class F insulation. Motor construction details shall be supplied with the tender. For motor protection refer to Clause 16.3.

7. The pump units shall be works tested and certified. Test sheets shall be supplied at the time of delivery.

8. An electronic control unit complete with sensors and warning lights shall be installed for monitoring the following pump conditions:

   i) Remote monitoring of stator over temperature.

   ii) Remove monitoring of leakage and bearing temperature.

   iii) Remote monitoring stator and oil housing leakage sensors.

9. These indications and warning lights shall be included at the main control panel. A mixing valve mounted directly on the pump casing and automatically activated to provide efficient mixing of the sump content prior to discharge shall be provided for each pump.

10. The Contractor shall include for any other monitoring units or controls necessary for the safe operation of the pumps.

3.4 Foul Pumps

1. Two pumps, one duty, one standby shall be provided.

2. The pumps shall each have a capacity of 44 l/sec against the calculated total head, made up of the static lift of 9.5 m and the head loss due to friction. The pumps shall be capable of pumping at a varying rate between 10 l/sec and 44 l/sec (2.5 DWF). The rate of pumping shall be automatically controlled in relation to a preset level in the pumping station.

3.5 Storm Pumps

1. Three pumps, one duty, one assist, one standby shall be provided.

2. The pumps shall have a capacity of 120 l/s each against the calculated total head, with two pumps running, made up of the static lift of 6.8 m and the head loss due to friction.

3.6 Storm Overflow Screen

1. A storm overflow screen shall be installed in the influent and storm pumping station, between the foul sump and storm sump.

2. The storm overflow screen shall be capable of handling flows up to 240 l/sec. The screen shall be weir mounted for screen with 6 mm for spacing. The screenings shall be retained in the foul sump to be pumped to the treatment works.

3. If the storm pumps fail to operate, the storm overflow screen may be flooded. The screen provided should be suitable for being completely submerged.

3.7 Pipework and Valves

1. The Contractor shall provide delivery pipework for each of the pump sets to the end of the Mechanical Contract as shown on the Drawings. A non-return valve and a sluice valve shall be provided on the delivery pipework of each pump. All pipework and fittings shall be ductile iron. The sluice valves shall be fitted with hand wheels.

2. Pipework shall be sized to give optimum system conditions.

3. Bolted couplings shall be installed at suitable points on the pipework for dismantling during maintenance.

4. Suitable pressure sensing equipment shall be provided on the storm delivery pipework. Pressure readings shall be indicated on 150 mm diameter pressure gauges on each delivery line.

3.8 Sump Level Sensing

1. An ultrasonic level sensing system shall be installed in each sump to control the operation of the pumps and to provide sump level indications and high level alarms at the main control panel in the Inlet Works Building.

2. Sensor devices shall be of the ultrasonic type suitable for use in sump conditions. The sensors shall have good accuracy, repeatability and linearity over the full range of levels.

3. The transmitters shall be wall mounted in the chamber adjoining the sumps.

4. Digital indications shall be provided for each system at the control panel.

3.9 Emergency Stop Buttons

1. The Contractor shall provide emergency stop push buttons for each pump and the storm screen, adjacent to the pumping station. These are to be latched push buttons with mushroom buttons to IP 65 protection. The switches shall override all other controls and the units shall not be capable of restarting until the emergency buttons are reset.

3.10 Pump Controls

1. The Contractor shall provide for automatic and manual control of the pumps. Automatic start/stop shall be in line with the level sensing equipment provided in the sump.

2. The following switches shall be provided and installed at the main control panel.

   i) Duty pump selector switch.

   ii) Individual hand-off-automatic switches for each pump motor - starter circuit.

3. The following indications and alarms shall be provided at the main control panel.

   i) Individual pump running lights.

   ii) Individual pump fault lights.

   iii) Individual hours run meters for each pump, showing day and night running.

   iv) Emergency stop button pressed light.

   v) Individual ammeters for each pump.

   The Control system shall provide for automatic changeover to standby unit in case of failure of the duty unit. The Contractor shall also provide for automatic alteration between duty and standby pump, after a set number of hours run on the duty pump.

3.11 Pressure Gauges

1. Pressure gauges shall be fitted to the delivery branch of each pump. All gauges shall be fitted with isolation valves.

2. Gauges shall have 150 mm diameter dials, calibrated in metres head and shall be manufactured to BS 1780.

4: FLOW MEASUREMENT AND RECORDING

4.1 Scope of Contract

1. The Contract includes for the supply and installation of:-

   i) Flowmeter and recording equipment for the inlet flow measurement.

   ii) Flowmeter and recording equipment for effluent flow measurement.

   iii) Flowmeter and recording equipment for flow to storm tanks.

   iv) Flowmeter and recording equipment for storm return flows.

   v) Flowmeter and recording equipment for supernatant return flows.

   vi) Flowmeter and recording equipment for sludge return flows.

4.2 Meters

1. All the flowmeters detailed above shall be electromagnetic type suitable for use with sewage and sludge. Details of the meters proposed are to be included with the tender.

2. Digital indicators shall be provided at the control panel for each meter.

3. Continuous readings shall be displayed on the Scada system and the inlet flow readings shall be used to control the rate of return of storm flows from the stormwater tanks.

4.3 Raw Sewage Influent Flow Measurement

1. An electromagnetic type sewage flow meter shall be installed on the 200 mm diameter rising main from the influent foul pumping station.

2. The design flow range is 0 - 65 l/sec. The meter shall have good accuracy and repeatability over the range.

3. The transmitter shall if dry mounting is required be mounted in a weatherproof box supplied and installed by the Contractor. Full details of such box shall be submitted with the tender. All transmission cables shall be provided and installed by the Contractor in ducts provided by the Civil Contractor.

4.4 Effluent Flow Measurement

1. An electromagnetic type sewage flow meter shall be installed in the 300 mm final effluent line from the clarifiers. The meter shall be installed in the chamber provided by the Civil Contractor.

2. The design flow range is 0-44 l/s. The meter shall have good accuracy and repeatability over the range.

3. The transmitter shall, if dry mounting is required be mounted in a weatherproof box supplied and installed by the Contractor.

4.5 Flow Measurement to Storm Tanks

1. An electromagnetic type sewage flow meter shall be installed on the 400 mm diameter rising main from the storm pumping station. The meter shall be installed in the chambers provided by the Civil Contractor.

2. The design flow range is 0-240 l/sec.

3. The transmitter shall, if dry mounting is required, be mounted in a weatherproof box supplied and installed by the Contractor. Full details of such box shall be submitted with the tender. All transmission cables etc. shall be provided and installed by the Contractor in ducts provided by the Civil Contractor.

4.6 Storm Return Flow Measurement

1. An electromagnetic type sewage flow meter shall be installed on the 150 diam. Storm return pipe to the inlet foul sump in the chambers provided by the Civil Contractor.

2. The design flow range is 0-50 l/sec. The meter shall have good accuracy and repeatability over the range.

3. The transmitter shall, if dry mounting is required, be mounted in a weatherproof box supplied and installed by the Contractor. Full details of such box shall be submitted with the tender. All transmission cables etc. shall be provided and installed by the Contractor in ducts provided by the Civil Contractor.

4. It should be noted that this pipe will be empty at times and partially full at other times. The meter should be capable of measuring flow under all conditions.

4.7 Supernatant Return Flow Measurement

1. An electromagnetic type sewage flow meter shall be installed on the 150 diam. Rising main from the supernatant/filtrate pumping station. The meter shall be installed in the chambers provided by the Civil Contractor

2. The design flow range is 0-20 l/sec. The meter shall have good accuracy and repeatability over the range

3. The transmitter shall, if dry mounting is required, be mounted in a weatherproof box supplied and installed by the Contractor. Full details of such box shall be submitted with the tender. All transmission cables etc. shall be provided and installed by the Contractor in ducts provided by the Civil Contract.

4.8 Sludge Return Flow Measurement

1. An electromagnetic type sewage flow meter shall be installed on the 150 diam. Rising main from the sludge return pumping station.

2. The design flow range is 0-30 l/sec. The meter shall have good accuracy and repeatability over the range.

3. The transmitter shall, if dry mounting is required, be mounted in a weatherproof box supplied and installed by the Contractor. Full details of such box shall be submitted with the tender. All transmission cables etc. shall be provided and installed by the Contractor in ducts provided by the Civil Contractor.

5: INLET WORKS

5.1 General

1. Of the incoming flow to the inlet works, flows up to 2.5 DWF will be passed for full treatment, flows between 2.5 DWF to 8 DWF will overflow through the storm screen and be pumped to the storm water holding tanks for storm treatment.

2. The inlet works shall be designed to cater for the Stage 2 design flow of 65 l/sec.

3. The inlet works shall contain facilities for screening, screenings washing and compaction, grit removal and washing.

5.2 Scope of Contract

1. The Contract includes for:-

   i) One Mechanical Raked Screen

   ii) By-pass Channel Screen

   iii) Grit removal equipment including grit classifier

   iv) Screenings washing and compaction unit

   v) 4 No. Manual

   vi) Controls, Switchgear and Instrumentation

   vii) Grit channel handstops

   viii) Chequer plate and open grid covers and walkways

   ix) Odour removal equipment

5.3 Screens

1. The screening chamber shall consist of one 0.5 m wide channel with 0.5 m wide by-pass channel. A mechanically raked screen shall be provided in the first channel with a manually raked screen in the by-pass channel.

2. Screenings from the screen shall be discharged into a screening trough. The screenings shall be water washed along the screenings trough to the screenings washing and compaction unit.

3. The layout is shown on Drawing No. 20140/116.

5.4 Mechanically Raked Screens

1. One mechanical screen shall be provided with 6 mm apertures capable of handling up to 65 l/sec.

2. The screen shall be a continuous self cleaning preformatted plate screen.

3. Guide rollers, sprocket elements and other key components shall be made of tough high density plastic. The bearings and sprockets shall be kept above the water line.

4. The unit shall be suitable for use as a continuous unit and shall be complete with neoprene side seals to prevent flow bypass around the screen.

5. A suitable pivoting scraper mechanism shall be provided to discharge the screenings collected on the rake into the screenings trough.

6. The screen, raking mechanism and ancillary equipment shall be manufactured from 304 Grade stainless steel. The tenderer shall include for all fixing, fittings and installation of safety guards.

5.5 By-Pass Channel Screen

1. The manually raked screen shall be provided in the by-pass channel.

2. The screen bars shall be 12 mm and shall taper slightly to the downstream side. The clear bar spacings shall not exceed 12 mm. The screen shall be manufactured from stainless steel. The tenderer shall include for all fixing, fittings and safety guards.

3. The Contractor shall provide a suitable manual rake for clearing the screens into the screenings trough.

5.6 Screenings Trough

1. The Contractor shall provide and install a stainless steel screenings trough. The trough shall span over the main channel and the by-pass channel and shall extend to the inlet point of the screenings washing and compaction unit.

5.7 Screenings Washing and Compaction Unit

1. A screenings washing and compaction unit shall be provided at the Inlet Works. Tenderers shall submit full details of the units offered with their tender. Screenings shall be water washed along the screenings trough to the unit. The filtrate water shall be returned to the screen channel and the compacted screenings shall be discharged into a closed skip. The unit shall be manufactured from stainless steel and shall be capable of handling screenings from the ultimate flows.

into a closed skip. The unit shall be manufactured from stainless steel and shall be capable of handling screenings from the ultimate flows.

2. The unit shall achieve consistently a compacted screenings moisture content of lower than 50% and shall wash the screenings before compaction to remove 90% of all organic matter. A sufficient volume reduction of screenings after compaction shall also be achieved. Detailed results of independent tests carried out on the unit offered shall be submitted with the Tender. The unit shall be capable of handling the maximum volume of screenings produced by the Mechanical screen. The unit shall be fully automatic.

3. The Contractor shall provide a connection from the washwater pipework at the Inlet Works to the screening trough. A suitable solenoid valve to control the supply shall be provided on the connection. The Contractor shall also provide a separate connection to the screenings unit. The unit shall be suitably weather proofed.

4. The washing and compaction unit shall discharge the compacted screenings through a discharge chute to an enclosed bagging unit. The discharge chute shall extend for a distance of 1 metre beyond the external edge of the concrete chamber, and the discharge height above finished ground level shall be not less than 2.0 m. The bagging unit shall be complete with 70 m of endless bag. The Contractor shall provide skip for screenings storage.

5. Full details of construction materials and protective coatings for the unit shall be provided with the tender. The Tenderer shall include for all fixing, fittings and safety guards.

5.8 Grit Removal System

1. The Contractor shall provide and install equipment for an automatic grit removal system incorporating a circular disc rotor in the grit chamber. The system shall be capable of removing grit particles of 0.2 mm diameter and shall not allow organic matter to settle out in the chamber. Tenderers shall provide full details of the system offered with their tender.

2. The grit trap shall be capable of dealing with maximum flow of 65 l/sec. The unit shall be fully automatic and be operated on a variable timer.

3. The Contractor shall provide all the necessary pipework in ductile iron.

4. The rotor shall be connected through a drive shaft to a gear unit driven by a suitably sized motor. The motor shall be squirrel cage type suitable for external mounting with Class F insulation. The speed of the rotating impeller and the height of the impeller on the drive shaft shall be adjustable.

5. Tenderers shall state in their tender if they require any modification to the configuration or size of the grit chamber shown on the Drawings.

6. The tenderer shall also supply and install an automatic screw classifier complete with a covered skip. The unit shall be capable of handling grit for the design flow of 65 l/sec. Refer to Section 5.16.

   The grit removal system shall also incorporate an automatic facility for removing grit from the grit chamber to the automatic screw classifier. The facility shall utilise an airlift pump with an air blower unit. The discharge pipework shall be 100 mm diameter ductile iron. The Contractor shall provide a 3 way ball valve and an electric actuator suitable for external mounting together with all necessary equipment for a complete system.

7. The air blower shall be of the rootes type, complete with silencers, acoustic hood, pressure gauge and adjustable pressure relief valve. The motor shall be squirrel cage type suitable for external mounting with Class F insulation. The motor shall be connected to the air blower through a high grade flexible coupling with safety guard and shall be mounted on the same base plate as the blower.

8. The Contractor shall also install 5 No. coplastic handstops to the grit channels.

5.9 Emergency Stop Buttons

1. The Contractor shall provide emergency stop push buttons adjacent to the screens, electrically actuated penstocks, washings compactor unit and grit removal system. These are to be latched push buttons with mushroom buttons with IP 65 protection. The switches shall override all other controls and the units shall not be capable of restarting until the emergency buttons are reset.

5.10 Mechanically Raked Screen Controls

1. The Contractor shall provide for automatic and manual control of the mechanically raked screen by means of ultrasonic level controllers. Automatic start and stop shall be in line with difference in level between ultrasonic probes installed before and after the screen.

2. A hand-off-automatic switch shall be provided for the screen at the main control panel.

3. The following indications and alarms shall be provided for the screen at the main control panel.

   i) Screen operating light.
   ii) Screen mechanical/electrical fault light.

iii) Screen hours run meter.

iv) Emergency stop button pressed light.

5.11 Screenings Washing and Compaction Unit Controls

1. The Contractor shall provide for automatic and manual control of the screenings washing and compaction unit and the water supply to the screenings trough. Automatic control of the solenoid valve on the water supply to the screening trough shall be by way of a multi setting time switch in the main control panel. Automatic start of the screenings washing and compaction unit shall be in line with the level of screenings in the unit collection chamber. Automatic stop shall be on completion of the cycle.

2. Individual hand-off-automatic switches shall be provided at the main control panel for the solenoid valve and the washing and compaction unit.

3. The following indications and alarms shall be provided at the main control panel.

   i) Solenoid valve open light.

   ii) Solenoid valve fault light.

   iii) Washing and compaction unit operating light.

   iv) Washing and compaction unit mechanical/electrical fault light.

   v) Washing and compaction unit hours run meter.

   vi) Emergency stop button pressed light.

4. The Contractor shall provided any other controls, indications or alarms that he considers necessary for the satisfactory operation of the equipment.

5.12 Grit Removal System Controls

1. The rotor assembly shall be controlled by an on-off switch at the main control panel.

2. The degritting facility shall be controlled both automatically and manually. Automatic control shall be by way of a multi-setting time switches mounted at the main control panel. Individual hand-off-automatic switches for the air blower and the solenoid valve shall be mounted at the main control panel.

3. The main indications and alarms shall be provided at the main control panel.

   i) Rotor assembly run light.

   ii) Rotor assembly fault light.

iii) Air blower run light.

iv) Air blower fault light.

v) Discharge valve open light.

vi) Discharge valve closed light.

vii) Emergency stop button pressed light.

viii) Rotor assembly hours run meter.

ix) Air blower hours run meter.

4. The Contractor shall provide any other controls, indicators or alarms that he considers necessary for the satisfactory operation of the equipment.

5.13 Screen Channel Penstocks

1. The Contractor shall include for the supply and installation of 4 No. Channel Penstocks, manually operated, Simon Hartley or equivalent to be installed in the screen channels as shown on Drawing No. 20140/116.

2. In the event of a blockage in the screen channel a high level alarm shall be activated and the influent raw sewage shall overflow into the bypass channel.

5.14 Washwater Supply

1. The washwater supply to the inlet works shall be taken from the site water main.

2. The Contractor shall provide all pipework and fittings to connect to the site water main.

3. The Contractor shall provide booster pumps to supply water at the required pressure for all equipment in the inlet works including all pipework, valves and fittings.

5.15 Chequer Plate Flooring

The Contractor shall supply and install pressure locked aluminium chequer plate flooring to all channels and chambers within the Inlet Works Building as shown on the Drawing No. 20140/116.

The flooring shall be industrial standard for use in corrosive conditions and shall be slip resistant. The flooring shall be complete with supports as required. Odour extract shall be taken directly from the inlet channel to the odour removal unit.

The Contractor shall supply and install aluminium covers to all cable duct chambers within the Inlet Building. The Contractor shall also install separate steel supports for the control panel.

5.16 Grit Classifier

1. The Contractor shall include for the supply and installation of a Jones and Attwood Screw Classifier (or similar approved) for the separation of grit particles discharged by the grit removal system. The unit shall be free standing and shall come complete with a closed skip for disposal of the grit. The unit shall be suitable for automatic operation and fully enclosed with appropriate safety guards. The unit shall include for connection to the outlet from the grit trap.

2. All extraneous solids and water shall be returned to the main sewage flow.

3. The unit shall be capable of handling grit removed from the grit trap at the ultimate design of the plant.

4. Full details of the unit offered together with automatic controls provided shall be included with the tender.

5. All indicating and alarm lights shall be installed at the Main Control Panel as detailed in this section.

5.17 Odour Control Units

The Contractor shall provide appropriate odour control equipment for the Inlet Building, the Foul and Storm Pumping Station. Full detail of the odour control units offered shall be included in the performance scheduled in Appendix 1.

The odour control system shall include fans, ducting, media complete with all control equipment. The minimum air changes for the building, pump sumps and storm tanks shall be not less than five air changes per hour.

The unit shall be capable of achieving the following:

(i) 95% reduction of hydrogen sulphide concentrations across the filtered beds at all times.

(ii) Mean H2S reduction of 99% with minimum reduction of 95%.

(iii) An odour removal efficiency of 95% or greater.

(iv) Concentration of <2 ou/m^3 at a distance of 25 m from the Inlet Buildings as determined by olfactometric measurements of the biofilter outlet gas stream.

The unit shall be supplied complete with control panel, galvanised skid, internal support grid, inoculated bed materials, fan and internal ducting.

The Contractor, if he so wishes, may provide alternative proposals and costings for an odour removal and control plant other than that outlined above. He shall outline with his tender the alternative offered and provide all documentation relating to same. The reduction outlined above shall also apply to any alternative offer.

Issue Code	PMS KE2007	**Annual Report 2007**	RESPONSE ENGINEERING
Date	21/01/2008		
Originator	M O'Regan		
Authorised by	E.Brennan		

Monasterevin WWTP
Annual Report
2007

Issue Code	PMS KE07	**Annual Status Report 2007**	RESPONSE ENGINEERING
Date	31/01/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

EXECUTIVE SUMMARY
Monasterevin WWTP
2007

Flows	**2007**	
Parameter	**Average**	**Design**
	M^3/d	**M^3/d**
Flow	1919	1200
PE (Flow)	9200	6000
PE (BOD)	4153	6000

Process Calculations		
Average MLSS	2537	**Mg/l**
Plant Volume	900	**M3**
Total Biomass	2283	**kg**
Daily BOD load	324	**kg**
FM Ratio	0.18	

Results Summary

	Inlet			**Effluent**			
	Max	Min	Ave	Max	Min	Ave	**STD**
	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	**Mg/l**
COD	1085	117	357	83	1	20	**125**
NH4	28	5	14.5	3	0	0.4	**5**
BOD	516	55	169	18	1	4.23	**20**
SS	772	15	175	40	1	7.95	**30**
TP	10.48	2.5	6.49	1.9	0.02	0.69	**0.7**

Appendix A

PMS ARP4

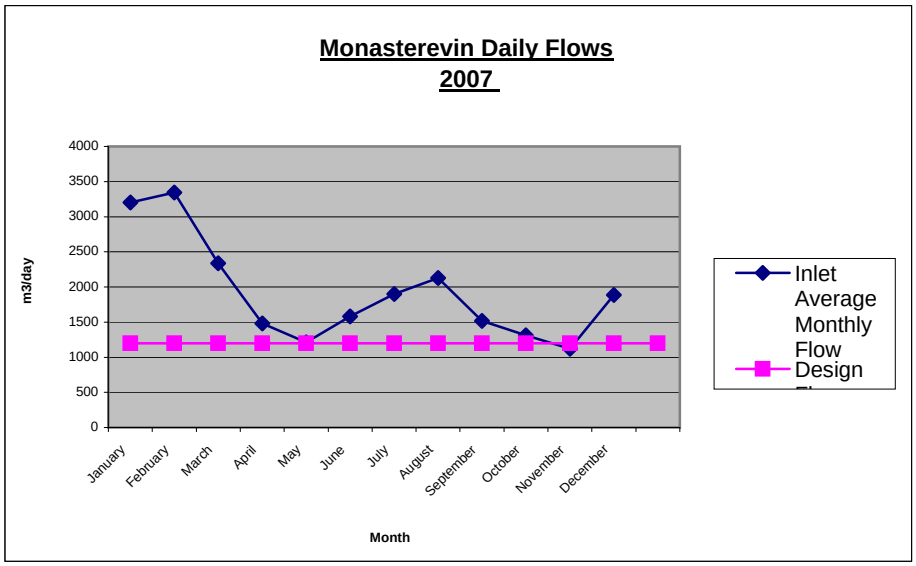
Issue Code	PMS KE07	**Annual Status Report 2007**	RESPONSE ENGINEERING
Date	31/01/2008		
Originator	M.O'Regan		
Authorised by	E. Brennan		

Plant:Monasterevin WWTP 2007

Monasterevin Monthly Comparisons

Flows

2007	Inlet Average Monthly Flow
January	3204
February	3346
March	2335
April	1479
May	1214
June	1583
July	1898
August	2129
September	1516
October	1313
November	1122
December	1884
Average	**1919**
Total	**23023**



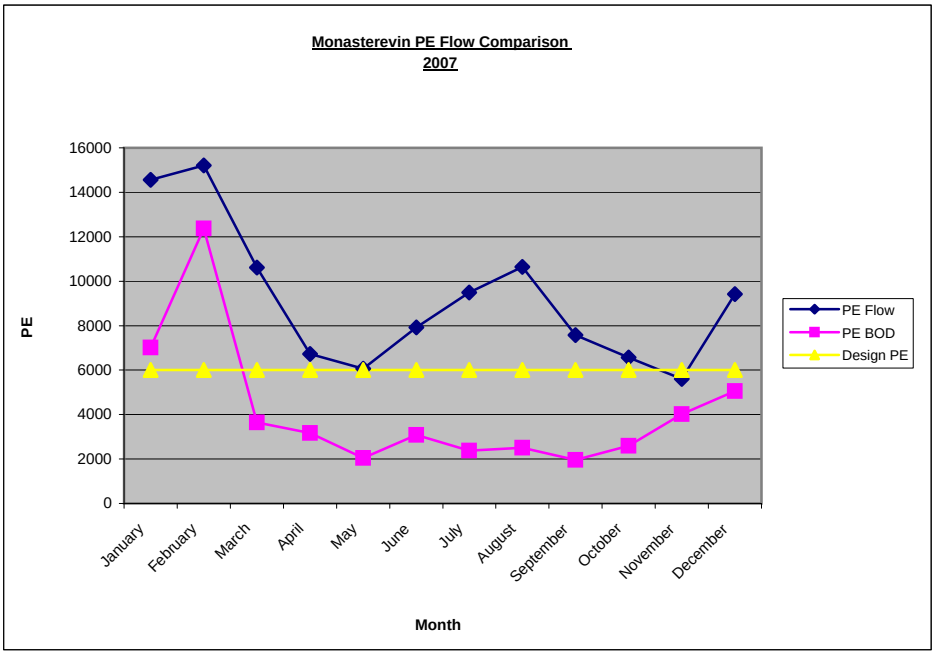
Appendix B

Issue Code	PMS KE07	**Annual Status Report 2007**	RESPONSE ENGINEERING
Date	31/01/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

Plant:Monasterevin WWTP **2007**

Monasterevin Monthly Comparisons Flows

2007	PE Flow	PE BOD
January	14562	7007
February	15211	12364
March	10612	3650
April	6722	3167
May	6070	2047
June	7917	3083
July	9490	2383
August	10643	2507
September	7578	1963
October	6564	2593
November	5608	4020
December	9419	5055
Average	**9200**	**4153.25**



Appendix C

PMS ARP 20 & 22

Issue Code	PMS KE07
Date	31/01/2008
Originator	M O'Regan
Authorised by	E. Brennan

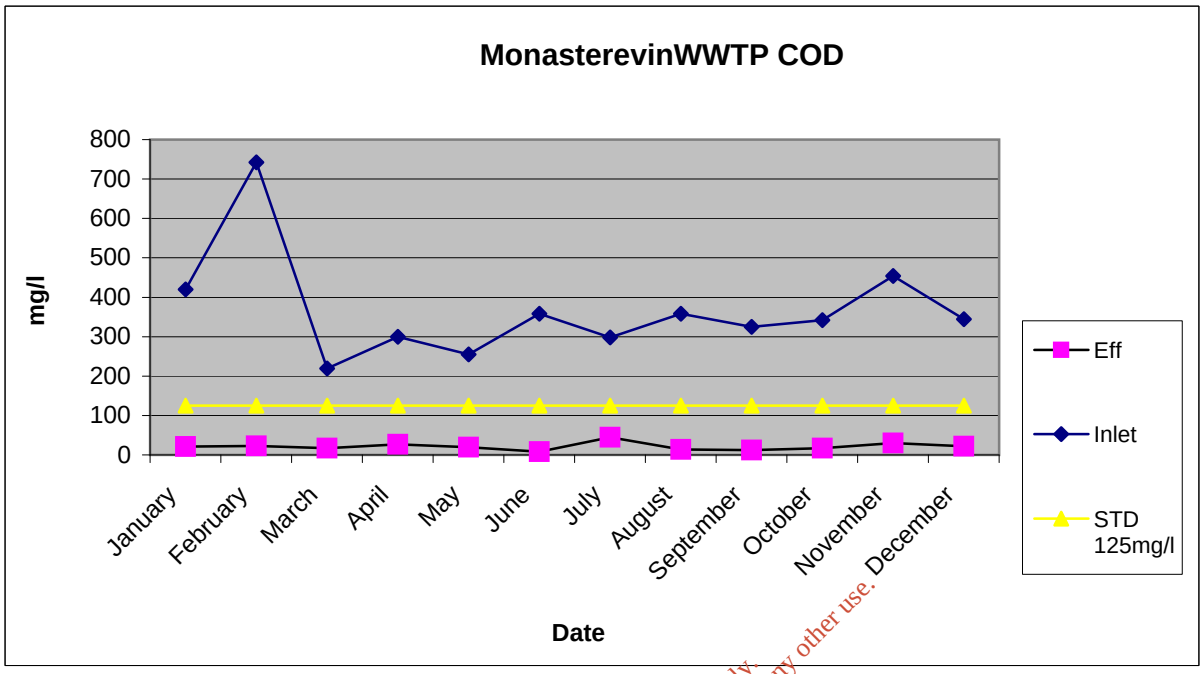
Annual Status Report 2007

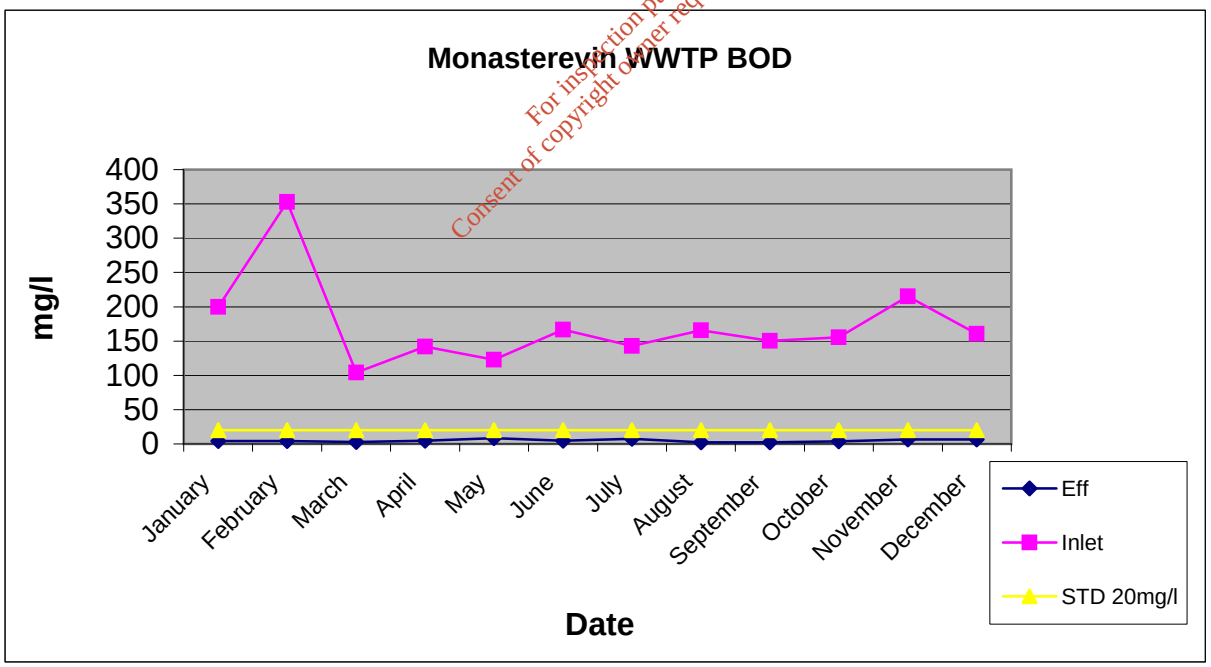
RESPONSE ENGINEERING

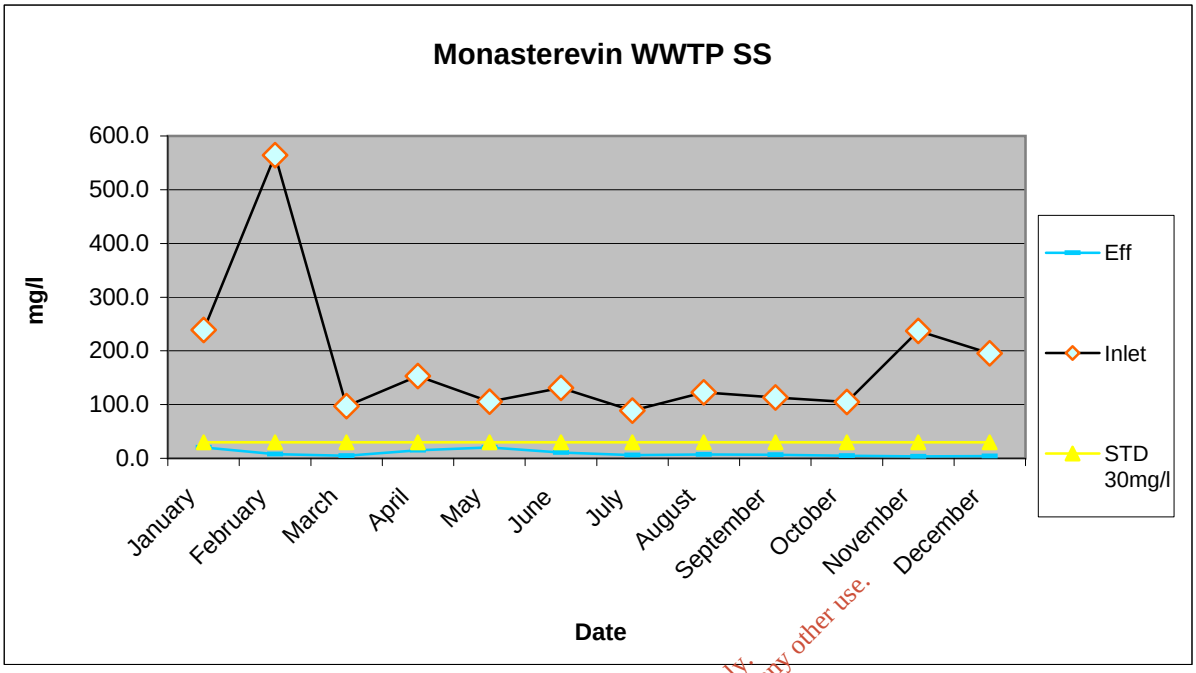
	F:M	COD (mg/l)		BOD_5 (mg/l)		NH3-N (mg/l)		SS (mg/l)		TP (mg/l)		pH			AT		
Standard			125		20		5		30		0.7						
Date		Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	Eff	Inlet	AT	Eff	MLSS 1 (mg/l)	MLSS 2 (mg/l)	SVI (ml/g)
January																	
Average	0.15	420.0	21	200	4	11	0	239.0	20.0	6.3	0.4		7.12	7.27	2549	2653	236
Min	0.15	146	3	69	<1	4.9	0.01	110	11	2.6	0.17		7.08	7.19	2162	2152	169
Max	0.15	1085	83	516	14	26.5	0.6	717	39	13	0.9		7.2	7.38	3038	2946	314
February																	
Average	0.74	742.0	22	353	4	18	1	564.0	7.5	6.5	0.6	7.3	7.38	7.24	3428	3725	
Min	0.74	456	2	217	<1	8.24	0.14	321	1	2.6	1.15	6.8	6.8	6.9	2998	3232	
Max	0.74	1033	41	471	7	27.1	0.9	772	14	8.9	0.02	7.6	7.9	7.4	3987	4210	
March																	
Average	0.20	219.0	17	104	3	13	0	97.0	4.5	6.1	0.5	7.4	7.25	7.29	3023	3213	169
Min	0.20	117	5	55	1	7.9	0	15	2	4.6	0.02	7.26	6.9	7.1	2478	2788	106
Max	0.20	381	32	181	5	17.3	0.7	122	8	9.3	1	7.8	7.6	7.5	3456	3788	216
April																	
Average	0.15	300.0	27	142	5	14	0	153.0	14.8	5.1	0.6	7.2	7.52	7.28	1859	2124	258
Min	0.15	130	5	62	2	10.2	0.14	24	2	3.2	0.3	7	7.2	7	1199	1456	161
Max	0.15	498	60	237	11	18.1	0.35	386	40	9.2	0.8	7.4	7.9	7.6	2822	2660	367
May																	
Average	0.06	255	20	123	8	33	0.21	105	20	5.74	0.55	7.49		7.15	2166	2085	206
Min	0.03	124	10	72	2	10	0.08	54	6	4.60	0.29	7.39		7.04	1912	1898	177
Max	0.10	323	31	153	13	110	0.37	142	36	7.60	0.97	7.60		7.26	2694	2256	294

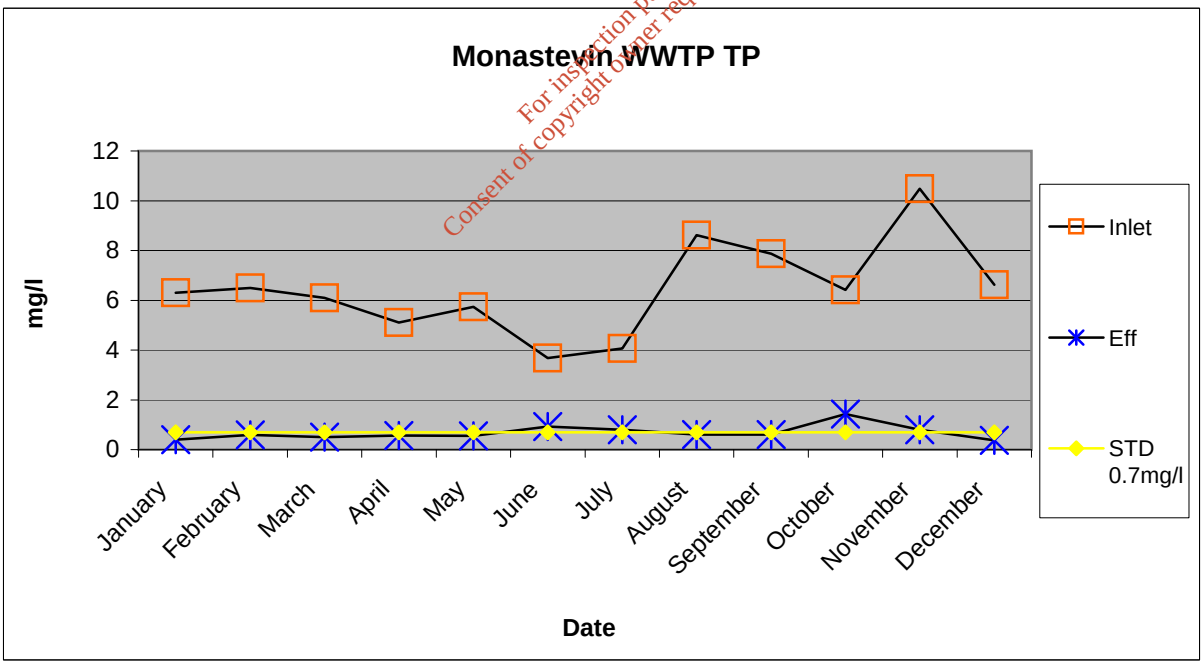
June																	
Average	0.13	359	8	167	5	12	0.13	131	11	3.68	0.93	7.48		7.17	2110	2164	188
Min	0.08	324	3	150	2	6	0.04	81	7	3.30	0.60	7.36		7.04	1960	2046	130
Max	0.18	401	15	185	8	16	0.20	204	15	4.60	1.40	7.61		7.26	2263	2341	220
July																	
Average	0.15	298	45	143	7	12	1.27	89	6	4.07	0.80	7.55		7.11	1719	2228	215
Min	0.12	188	24	86	2	9	0.20	52	3	3.70	0.50	7.50		7.08	1359	1587	169
Max	0.18	468	76	220	11	14	3.20	125	11	4.60	1.10	7.60		7.13	1998	2832	277
August																	
Average	0.15	358	14	166	2	17	0.11	123	7	9	0.6	7.6		7.22	2750	2690.5	184
Min	0.03	122	2	56	1	9	0.05	47	3	4	0.3	7.5		7.04	1846	1722	101
Max	0.39	503	26	267	3	23	0.25	226	10	17	1.0	7.7		7.32	3550	3056	269
September																	
Average	0.14	325	12.14286	150	2	15	0.18	113.4	6.71	7.87	0.60	7.56		7.20	2645	2625	184
Min	0.03	122	2	56	1	8	0.05	47.00	3.00	3.40	0.26	7.48		7.04	1846	1722	101
Max	0.39	503	26	267	3	23	0.60	226.0	10.00	17.00	1.50	7.66		7.32	3550	3056	269
October																	
Average	0.10	342	17.2	156	4	16	1.13	105.0	4.52	6.42	1.43	7.79		7.32	2211	2364	207
Min	0.02	214	1	90	2	10	0.01	50.0	1.60	2.50	0.15	7.68		7.15	1590	2194	168
Max	0.18	474	33	216	5	22	3.40	168.0	8.40	10.00	1.90	7.92		7.45	2594	2664	270
November																	
Average	0.11	454	30.2	215	7	22	0.59	237.4	3.36	10.48	0.80	7.69		7.45	2568	2366	220
Min	0.09	341	9	171	2	14	0.24	107.0	2.00	5.00	0.30	7.46		7.02	1848	1830	194
Max	0.15	604	70	289	18	28	0.90	463.0	5.20	17.00	1.20	7.82		8.03	3200	2942	243
December																	
Average	0.14	345	22.25	161	7	15	0.14	195.3	4.30	6.63	0.38	7.81		7.70	2320	2297	545
Min	0.08	279	13	125	5	14	0.05	31.0	3.60	4.90	0.20	7.74		7.52	2010	2050	400
Max	0.19	488	37	239	8	17	0.20	610.0	4.80	8.40	0.70	7.90		7.93	2668	2704	660
Average	**0.18**	**357**	**20**	**169**	**4**	**15**	**0.40**	**175.1**	**8.0**	**6.36**	**0.66**	**7.53**	**7.32**	**7.27**	**2425**	**2529**	**235**
Min	**0.02**	**117**	**1**	**55**	**1**	**5**	**0.00**	**15.0**	**1.0**	**2.50**	**0.02**	**6.80**	**6.80**	**6.90**	**1199**	**1456**	**101**
Max	**0.74**	**1085**	**83**	**516**	**18**	**28**	**3.40**	**772.0**	**40.0**	**17.00**	**1.90**	**7.92**	**7.90**	**8.03**	**3987**	**4210**	**660**
% Compliance			**100**		**100**		**100**		**100**		**66**						

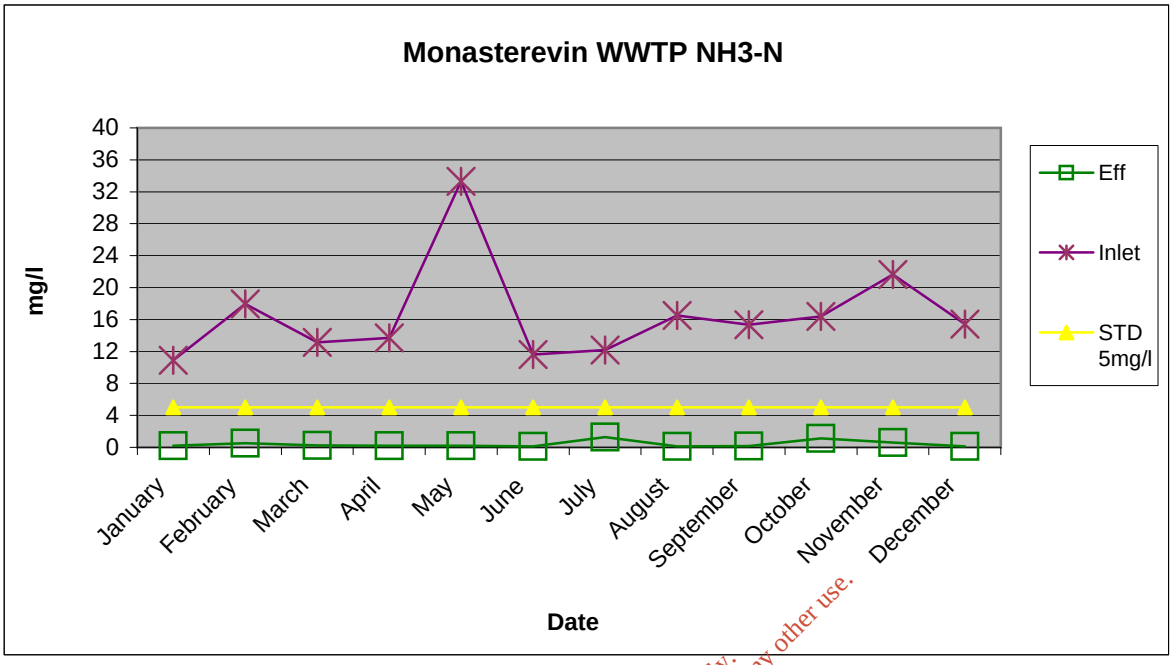
PMS ARP 20 & 22











Appendix D

PMS ARP 19/2

Issue Code	PMS KE07	**Annual Status Report 2007**	RESPONSE ENGINEERING
Date	31/01/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

Year 2007

Outgoing Sludge Record

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product	Contact at Destination	Receipt Received at Weigh Bridge
				Tonnes		
	Jan	Lisnavagh	Cake Sludge	10.41		
	Feb	Lisnavagh	Cake Sludge	32.46		
	Mar	Coolcarrigan	Cake Sludge	43.28		
	Apr	Lisnavagh	Cake Sludge	21.64		
	May	Lisnavagh	Cake Sludge	20.84		
	Jun	Lisnavagh	Cake Sludge	10.82		
	Jul	Lisnavagh	Cake Sludge	20.84		
	Aug	Lisnavagh	Cake Sludge	20.84		
	Sep	Lisnavagh	Cake Sludge	32.46		
	Oct	Osberstown	Cake Sludge	43.28	Walter McDermot	
	Nov	Osberstown	Cake Sludge	21.64	Walter McDermot	
	Dec	Osberstown	Cake Sludge	21.64	Walter McDermot	

Issue Code	PMS KE05	**Annual Status Report**	response group
Date	12/09/2008		
Originator	M.O'Regan		
Authorised by	E. Brennan		

Monasterevin WWTP
Annual Report
January 2008 - August 2008

Issue Code	PMS KE'08	**Annual Status Report 2008**	response group
Date	12/09/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

EXECUTIVE SUMMARY
Monasterevin WWTP
2008

Flows	**2007**	
Parameter	**Average**	**Design**
	M^3/d	**M^3/d**
Flow	2068*	1200
PE (Flow)	10338*	6000
PE (BOD)	5682*	6000

* January 2008 - August 2008

Process Calculations		
Average MLSS		**Mg/l**
Plant Volume		**M3**
Total Biomass		**kg**
Daily BOD load		**kg**
FM Ratio		

Results Summary

	Inlet			**Effluent**			
	Max	Min	Ave	Max	Min	Ave	**STD**
	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	**Mg/l**
COD							**125**
NH4							**5**
BOD							**20**
SS							**30**
TP							**0.7**

Appendix A

PMS ARP4

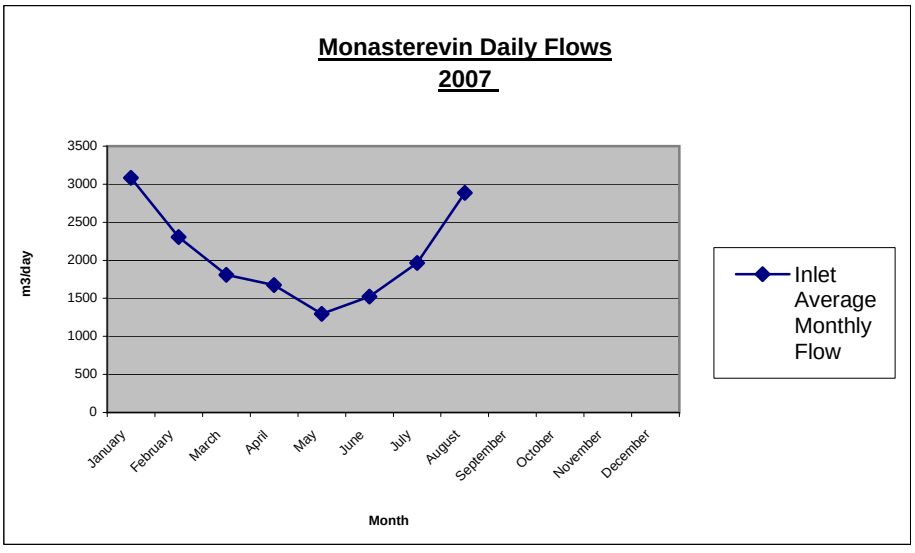
Issue Code	PMS KE'08	**Annual Status Report 2008**	response group
Date	12/09/2008		
Originator	M.O'Regan		
Authorised by	E. Brennan		

Plant:Monasterevin WWTP **2008**

Monasterevin Monthly Comparisons

Flows

2008	Inlet Average Monthly Flow
January	3083
February	2304
March	1809
April	1676
May	1296
June	1522
July	1964
August	2887
September	
October	
November	
December	
Average	**2068**
Total	**16541**



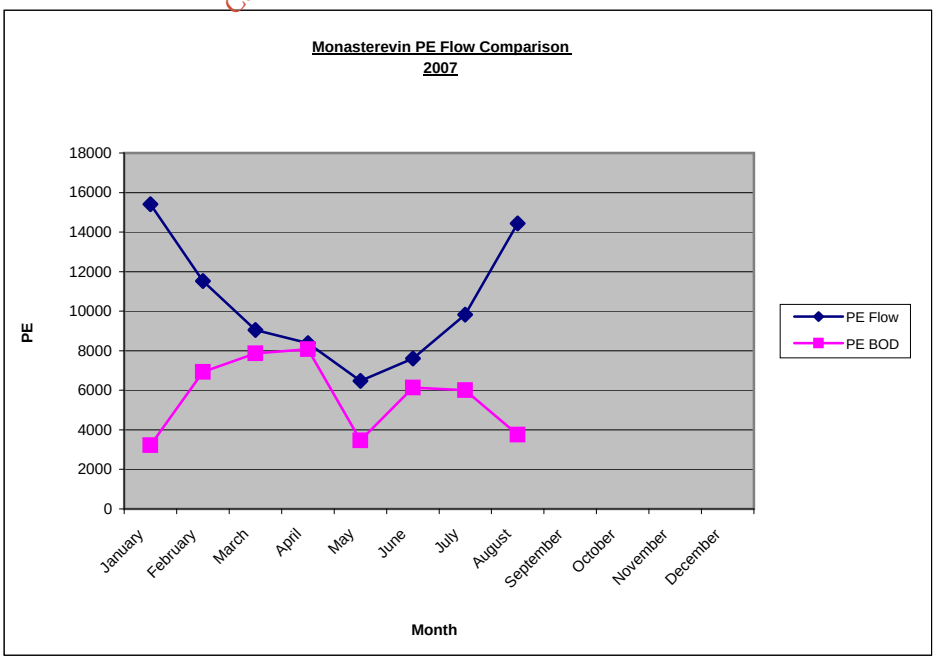
Appendix B

Issue Code	PMS KE'08	**Annual Status Report 2008**	response group
Date	12/09/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

Plant:Monasterevin WWTP **2008**

Monasterevin Monthly Comparisons Flows

2008	PE Flow	PE BOD
January	15416	3228
February	11522	6921
March	9044	7868
April	8380	8077
May	6479	3459
June	7608	6133
July	9819	6006
August	14435	3763
September		
October		
November		
December		
Average	**10338**	**5681.875**



Appendix C

PMS ARP 20 & 22

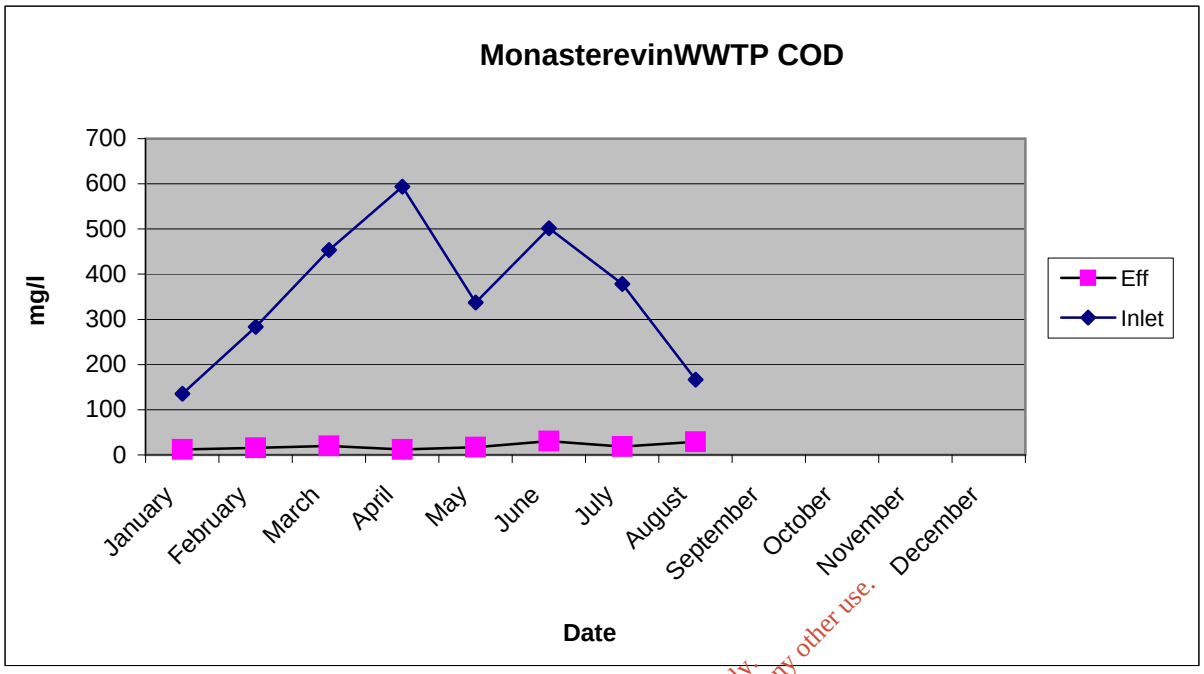
Issue Code	PMS KE'08
Date	12/09/2008
Originator	M O'Regan
Authorised by	E. Brennan

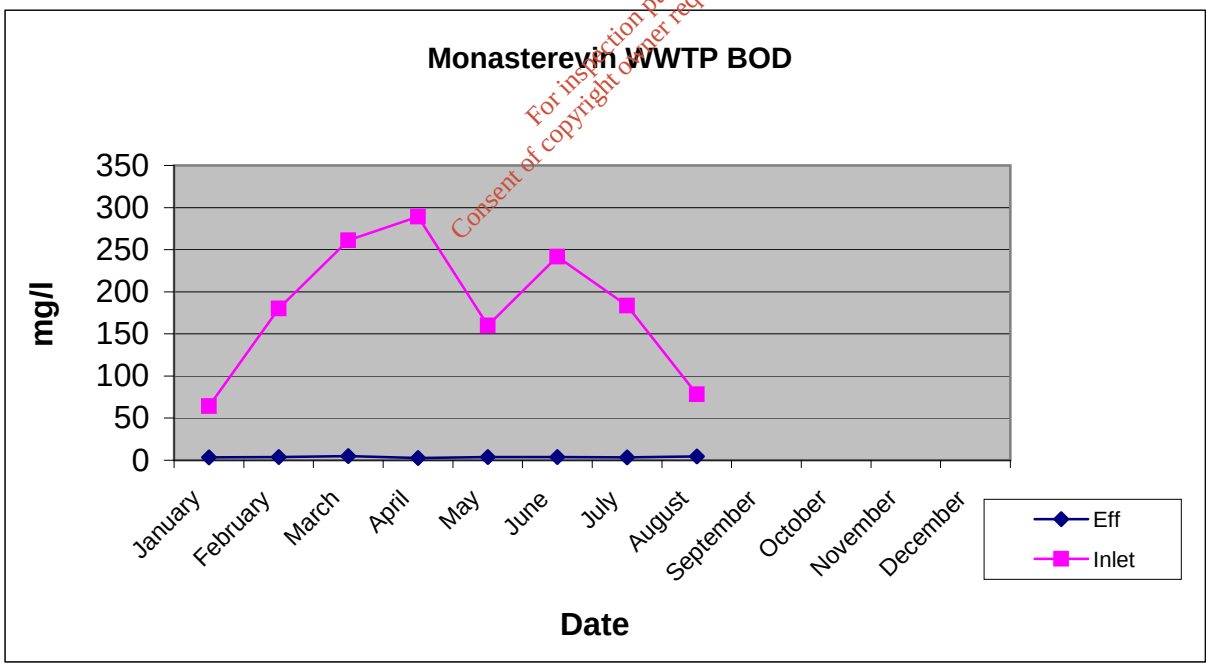
Annual Status Report 2008

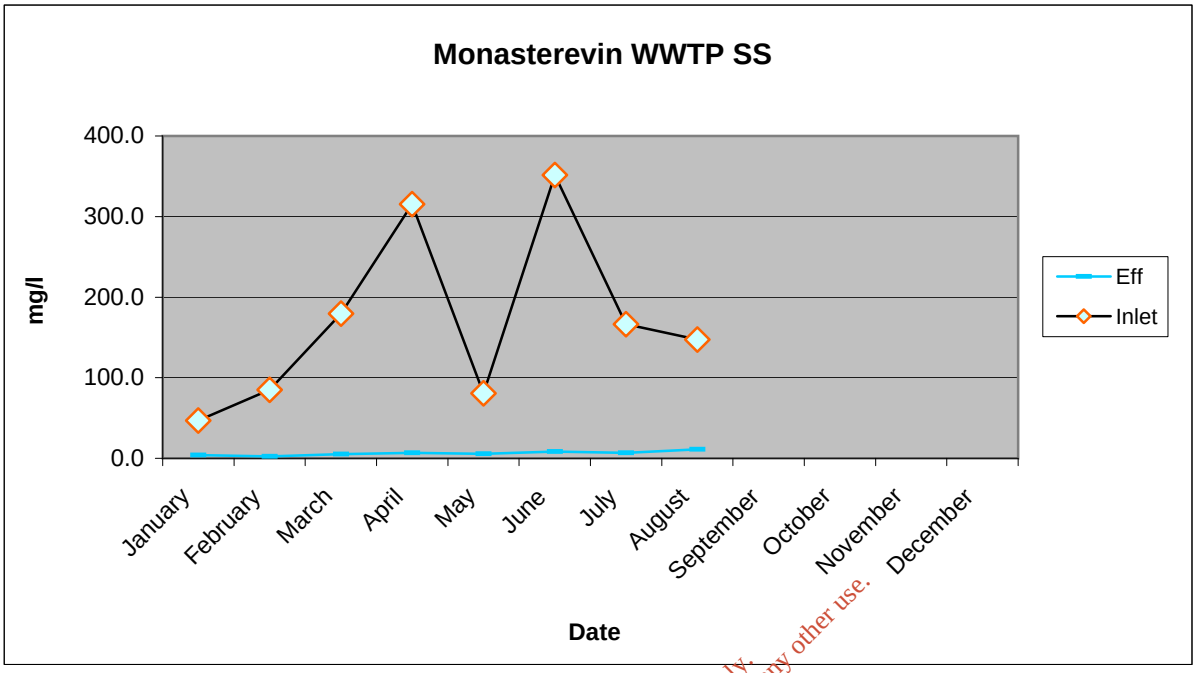
	F:M	COD (mg/l)		BOD_5 (mg/l)		NH3-N (mg/l)		SS (mg/l)		TP (mg/l)		pH		AT			
Standard			125		20		5		30		0.7						1----10
Date		**Inlet**	**Eff**	**Inlet**	**Eff**	**Inlet**	**Eff**	**Inlet**	**Eff**	**Inlet**	**Eff**	**Inlet**	**Eff**	**MLSS 1** (mg/l)	**MLSS 2** (mg/l)	**SVI** (ml/g)	**Micro**
January																	
Average	0.08	135.1	12	64	4	6	0	46.9	4.1	1.2	0.2	7.7	7.47	2632	2674	184	
Min	0.00	35	3	17	2	4.25	0.09	13	1.2	0.9	0.1	7.46	7.24	2134	2262	145	
Max	0.12	223	24	106	6	12.5	1.5	91	11	1.4	0.4	8.01	7.87	3176	3036	234	
February																	
Average	0.24	283.4	16	180	4	11	1	85.0	2.6	4.4	0.2	7.6	7.72	2994	2964	211	
Min	0.08	82	7	41	2	4.75	0.31	10	1.6	0.6	0.1	7.5	7.19	2748	2704	203	
Max	0.50	525	24	318	6	17.25	2.43	207	4.8	9.4	0.4	7.91	8.14	3636	3392	263	
March																	
Average	0.18	453.7	20	261	5	16	1	179.5	5.1	5.5	0.2	7.5	7.41	2952	2821	209	
Min	0.11	280	10	152	4	11	0.16	59	3.2	3.4	0.2	7.13	7.25	2568	2528	174	
Max	0.24	664	27	352	6.2	22	1.9	357	7.6	9.4	0.3	7.79	7.68	3268	3070	263	
April																	
Average	0.20	593.9	12	289	3	23	0	315.5	6.6	7.9	0.4	7.4	7.39	2939	2930	212	
Min	0.08	276	8	149	2	10.25	0.18	75	3.6	1.45	0.02	6.79	6.91	2410	2480	198	
Max	0.43	1160	16	580	3	48.5	0.9	890	9.2	14.6	0.8	7.78	7.82	3610	3440	232	
May																	
Average	0.08	337	17	160	4	22	0.47	81	5	7.42	0.93	7.45	7.28	2988	2894	191	
Min	0.04	160	11	77	2	16	0.19	15	2	6.60	0.30	6.85	7.05	2716	2692	172	
Max	0.11	476	32	225	5	34	1.10	144	14	9.75	1.66	7.76	7.93	3238	3220	215	

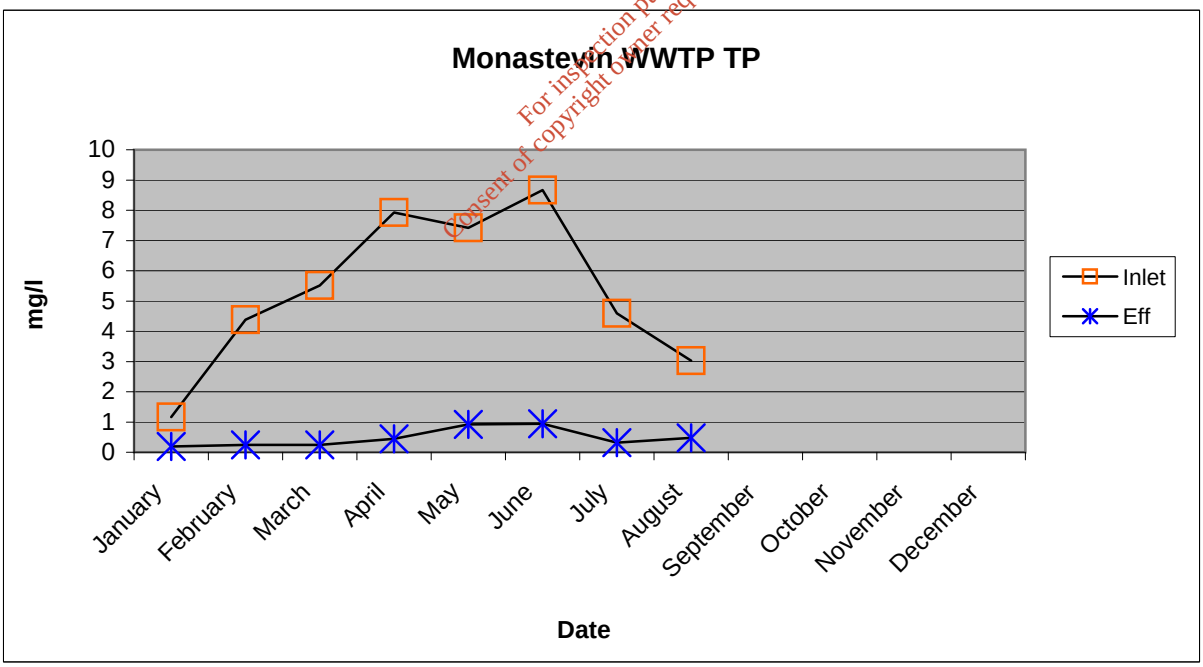
June																	
Average	0.16	502	30	242	4	21	0.98	352	8	8.67	0.94	7.55	7.25	2704	2708	171	
Min	0.07	278	15	132	2	7	0.10	132	3	6.75	0.32	7.47	7.00	2500	2440	155	
Max	0.42	694	59	350	6	36	4.00	868	12	10.50	2.24	7.61	7.56	2850	2950	200	
July																	
Average		379	19	184	3	14	0.79	167	7	4.59	0.32	7.37	7.42	2770	2706	142	
Min		176	3	82	1	8	0.18	91	2	2.60	0.10	7.02	7.19	2286	2244	115	
Max		614	46	325	6	21	1.84	242	14	8.35	0.60	7.71	7.88	3266	3104	160	
August																	
Average	0.10	167	29	78	5	3	0.33	147	11	3	0.5	7.2	7.12	2503	2605.6	150	
Min	0.04	61	14	28	2	1	0.19	32	6	1	0.2	6.6	6.79	2362	2314	119	
Max	0.22	382	52	182	7	6	0.47	285	24	5	0.8	7.7	7.88	2578	2822	172	
September																	
Average																	
Min																	
Max																	
October																	
Average																	
Min																	
Max																	
November																	
Average																	
Min																	
Max																	
December																	
Average																	
Min																	
Max																	
Average	**0.14**	**334**	**19**	**172**	**4**	**14**	**0.63**	**163.4**	**5.8**	**5.23**	**0.39**	**7.40**	**7.35**	**2776**	**2763**	**181**	
Min	**0.00**	**35**	**3**	**17**	**1**	**1**	**0.09**	**10.0**	**1.2**	**0.60**	**0.02**	**6.64**	**6.79**	**2134**	**2244**	**115**	
Max	**0.50**	**1160**	**59**	**580**	**7**	**49**	**4.00**	**890.0**	**24.0**	**14.60**	**2.24**	**8.01**	**8.14**	**3636**	**3440**	**263**	
% Compliance			**100**		**100**		**100**		**100**		**66**						

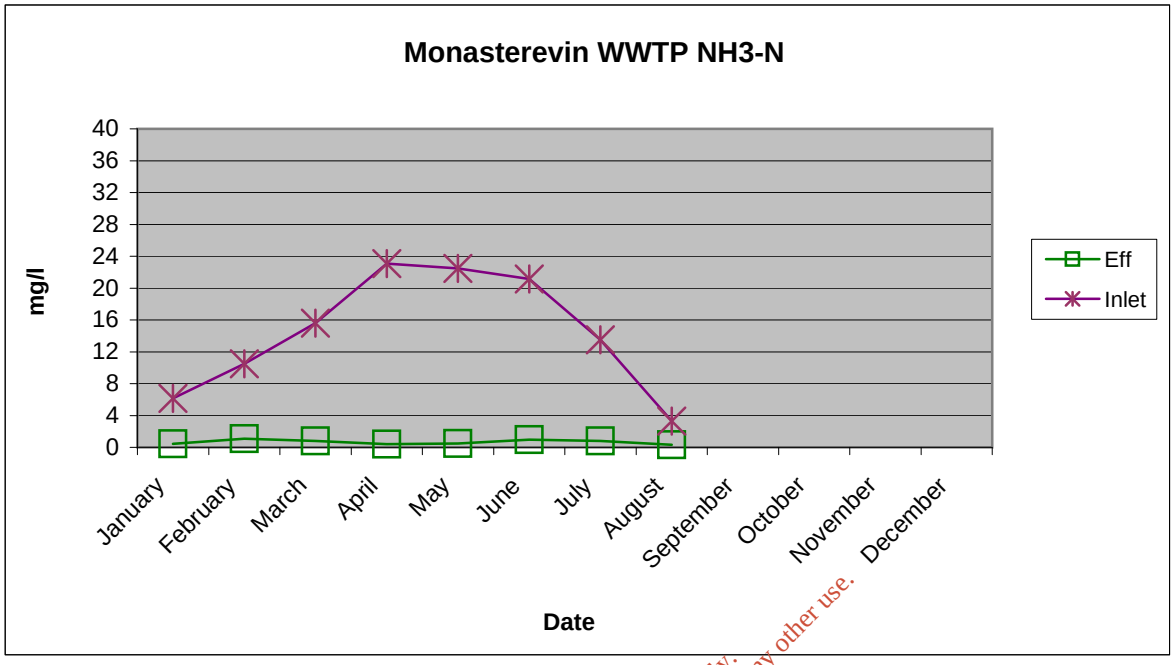
PMS ARP 20 & 22











Appendix D

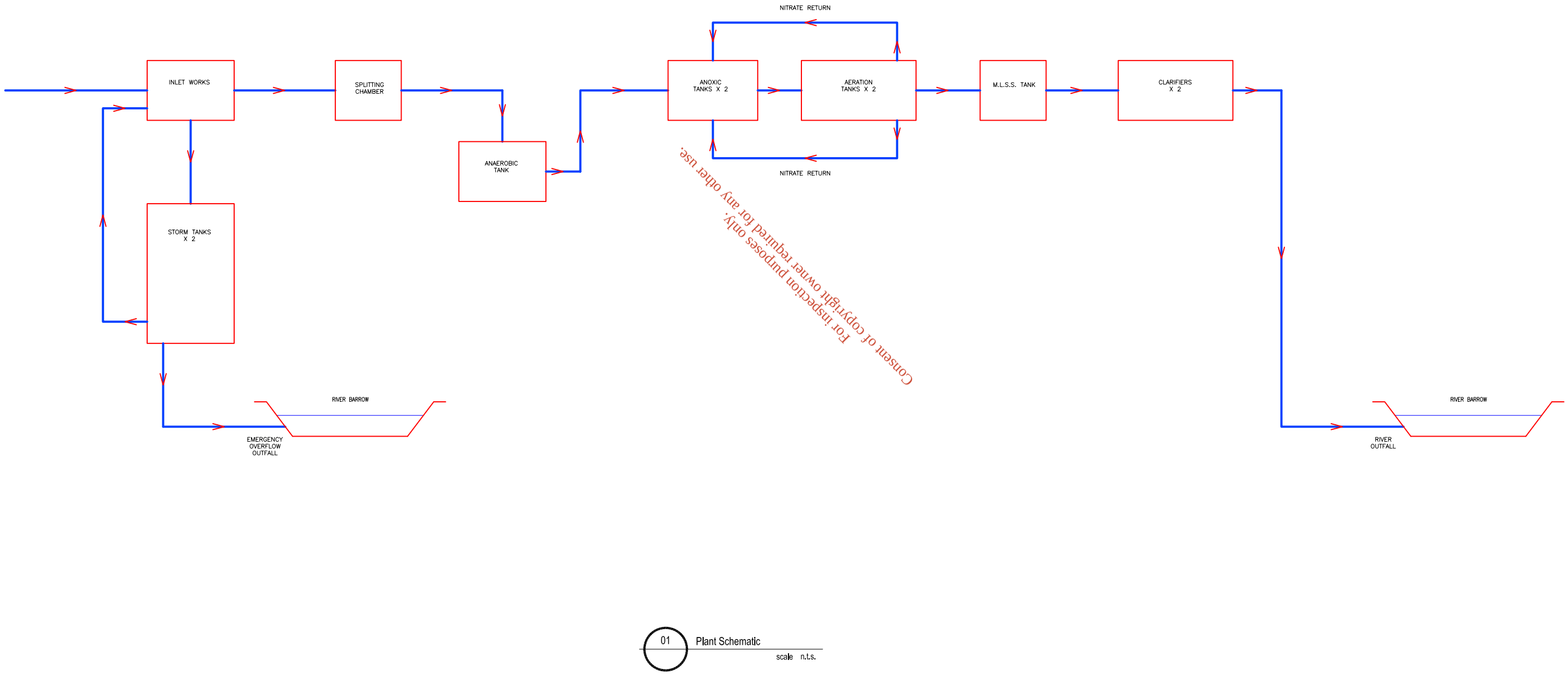
PMS ARP 19/2

Issue Code	PMS KE'08	**Annual Status Report 2008**	response group
Date	12/09/2008		
Originator	M O'Regan		
Authorised by	E. Brennan		

Year 2008

Outgoing Sludge Record

Batch No.	Date	Destination of Product	Type of Product	Quantity of Product	Contact at Destination	Receipt Received at Weigh Bridge
				Tonnes		



01 Plant Schematic

scale n.t.s.

PROJECT: 2008 E.P.A Licensing

DRAWING: Monasterevin Plant Schematic

FILE NAME: EPA Licensing\Monasterevin\Site Master\September

DRAWING NO: Monasterevin C.1

SUFFIX	INITIALS	DATE	DESCRIPTION

REVISIONS

Kildare County Council
Water Services Section
Aras Chill Dara, Devoy Park, Naas, Co. Kildare, Ireland.
Tel: 045-980362, Fax: 045-980359

Scale: n.t.s.
Date: September 08
Drawn by: J.O'D.
Checked: E.H.
Revision: –

Extract from EPA Publication ***'Estimated Dry Weather Flow and 95percentile Flow'*** Published 2007

Station Number	Waterbody	Location	Body Responsible	Hydro-Office Responsible	Station Status	Station Type	RIVER BASIN DISTRICT	CATCHNAME	Station Catchment Area [Km2]	Long Average Rainfall 41-60 (mm/annum)	Long Average Rainfall 71-00 (mm/annum)	DWF (m^3/s)	95 percentile (m^3/s)	Comment on DWF 95%	IRISH_GRID	EASTING	NORTHING	irish grid by GPS	Longitude	Latitude	TYPE	LOC_VERIF	LA Y/N	HYDRO_Area	Purpose of Station
14006	BARROW	PASS BR	OPW	DUB	Act. Permanent	Autographic Recorder	SOUTH EASTERN RBD	Barrow	1063.592	897.0	926.9	0.8000	1.4700		N622110	262258	210977	N 62245 / 10973	-7.0702917	53.1618587	RIVER	Y	N	14	Drainage Design /L.A. Discharge

• Hydro-Data Home • Contact Us • Search Query • Search Results • Map-Finder • Online Questionnaire

Summary Statistics Data

• *Daily Mean Flow Data* • *Daily Mean Level Data* • *Annual Maxima Data*

GENERAL STATION DETAILS			
Station Name: Pass Bridge	Station No: 14006	Watercourse: Barrow	NGR: N 622 109
Catchment Area (km^2): 1096	Catchment: Barrow	Gauge Type: AR	Datum: Poolbeg

SUMMARY HYDROMETRIC STATISTICS
Annual Average Rainfall (mm)[1]: 897
Est'd Annual Losses (mm)[1]: 483
Mean Annual Flow (m^3/s): 15.22 (Data derived for the period 1972 to 2002)

STATION HISTORY
Period of Continuous Hardcopy Records: 1954 to 2005
Period of Digitised Record: 1972 to 2003

Note 1 : Data extracted from the Environmental Protection Agency publication 'Hydrological Data', July 1997

DURATION PERCENTILES							
Flows equalled or exceeded for the given percentage of time (m^3/s) (Data derived for the period 1972 to 2002)							
1%	5%	10%	50%	80%	90%	95%	99%
68.9	45.8	33.7	10.7	5.30	2.78	1.37	0.34
Levels equalled or exceeded for the given percentage of time (mAOD Poolbeg) (Data derived for the period 1972 to 2003)							
1%	5%	10%	50%	80%	90%	95%	99%
61.64	61.11	60.77	59.91	59.66	59.59	59.54	59.46

COMMENTS / NOTES
Poor quality low flow data - to be used for indicative purposes only.

EXTERNAL LABORATORY ANALYSIS

Discharge Point:	**Monasterevin Inlet**	Samples taken 21/05/2008				
Parameter	**Unit**	**Results**	**Sampling method**	**Limit of Quantitation**	**Analysis Method**	
pH		7.9	Composite	<0.01	Electrometry	
Electrical Conductivity	µS/cm	1169	Composite	<0.06	Electrometry	
Suspended Solids	mg/l	174	Composite	<3	Filtration/Drying @ 104	
Ammonia as N	mg/l N	21	Composite	<0.09	Colorimetry	
BOD	mg/l	98	Composite	<2	Electrometry	
COD	mg/l	451	Composite	<5	Colorimetry	
Hardness as CaCO3	mg/l CaCO3	309	Composite	<2.58	Colorimetry	
Total Nitrogen as N	mg/l N	29.09	Composite	<1	Calculation	
Nitrite as N	mg/l N	<0.02	Composite	<0.003	Colorimetry	
Nitrate as N	mg/l N	0.2	Composite	<0.09	Colorimetry	
Total Phosphorous as P	mg/l P	9.8	Composite	<0.006	Digestion/Colorimetry	
Orthophosphate as P	mg/l P	4.13	Composite	<0.005	Colorimetry	
Anions	Sulphate mg/l	46.24	Composite	<2.11	Ion Chromatography	
Phenols (sum)	mg/l	<0.1	Composite	<0.1	GC/MS 2	
Flow (m3)	**1450m3**					
BOD Load (kg/day)	**142kg/day**					
P.E.	**2368**					

EXTERNAL LABORATORY ANALYSIS

Discharge Point: **Monasterevin Outlet** Samples taken 21/05/2008

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method	Compliance
pH		7.8	Composite	<0.01	Electrometry	Yes
Temperature	.C	18.1	Composite	<0.1	Thermometer	Yes
D.O.	mg/l	8.2	Composite	<0.1	Electrometry	Yes
Electrical Conductivity	µS/cm	1003	Composite	<0.06	Electrometry	Yes
Suspended Solids	mg/l	7	Composite	<3	Filtration/Drying @ 104	Yes
Ammonia as N	mg/l N	0.13	Composite	<0.09	Colorimetry	Yes
BOD	mg/l	<2	Composite	<2	Electrometry	Yes
COD	mg/l	29	Composite	<5	Colorimetry	Yes
Hardness as CaCO3	mg/l CaCO3	305	Composite	<2.58	Colorimetry	Yes
Total Nitrogen as N	mg/l N	6.94	Composite	<1	Calculation	Yes
Nitrite as N	mg/l N	0.03	Composite	<0.003	Colorimetry	Yes
Nitrate as N	mg/l N	5	Composite	<0.09	Colorimetry	Yes
Total Phosphorous as P	mg/l P	2.4	Composite	<0.006	Digestion/Colorimetry	Yes
Orthophosphate as P	mg/l P	0.94	Composite	<0.005	Colorimetry	Yes
Anions	Sulphate mg/l	76.78	Composite	<2.11	Ion Chromatography	Yes
Phenols (sum)	mg/l	<0.1	Composite	<0.1	GC/MS 2	Yes

EXTERNAL LABORATORY ANALYSIS

Discharge Point: **Monasterevin Upstream** Samples taken 21/05/2008

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
pH		8.4	Composite	<0.01	Electrometry
Electrical Conductivity	µS/cm	722	Composite	<0.06	Electrometry
Suspended Solids	mg/l	<5	Composite	<3	Filtration/Drying @ 104
Ammonia as N	mg/l N	0.03	Composite	<0.09	Colorimetry
BOD	mg/l	<2	Composite	<2	Electrometry
COD	mg/l	33	Composite	<5	Colorimetry
Hardness as CaCO3	mg/l CaCO3	353	Composite	<2.58	Colorimetry
Total Nitrogen as N	mg/l N	5.21	Composite	<1	Calculation
Nitrite as N	mg/l N	<0.02	Composite	<0.003	Colorimetry
Nitrate as N	mg/l N	3.69	Composite	<0.09	Colorimetry
Total Phosphorous as P	mg/l P	0.14	Composite	<0.006	Digestion/Colorimetry
Orthophosphate as P	mg/l P	0.14	Composite	<0.005	Colorimetry
Anions	Sulphate mg/l	33.6	Composite	<2.11	Ion Chromatography
Phenols (sum)	mg/l	<0.1	Composite	<0.1	GC/MS 2

EXTERNAL LABORATORY ANALYSIS

Discharge Point: **Monasterevin Downstream** Samples taken 21/05/2008

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
pH		8.4	Composite	<0.01	Electrometry
Electrical Conductivity	µS/cm	735	Composite	<0.06	Electrometry
Suspended Solids	mg/l	<5	Composite	<3	Filtration/Drying @ 104
Ammonia as N	mg/l N	0.03	Composite	<0.09	Colorimetry
BOD	mg/l	<2	Composite	<2	Electrometry
COD	mg/l	26	Composite	<5	Colorimetry
Hardness as CaCO3	mg/l CaCO3	354	Composite	<2.58	Colorimetry
Total Nitrogen as N	mg/l N	5.31	Composite	<1	Calculation
Nitrite as N	mg/l N	0.02	Composite	<0.003	Colorimetry
Nitrate as N	mg/l N	3.66	Composite	<0.09	Colorimetry
Total Phosphorous as P	mg/l P	0.18	Composite	<0.006	Digestion/Colorimetry
Orthophosphate as P	mg/l P	0.17	Composite	<0.005	Colorimetry
Anions	Sulphate mg/l	32.75	Composite	<2.11	Ion Chromatography
Phenols (sum)	mg/l	<0.1	Composite	<0.1	GC/MS 2

TOXIC SUBSTANCE ANALYSIS

Discharge Point: Monasterevin Inlet 29/05/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	<0.96	Composite	<10	ICPMS
Chromium	µg/l	1	Composite	<10	ICPMS
Copper	µg/l	4	Composite	<10	ICPMS
Cyanide	µg/l	<5	Composite	<5	Colorimetry
Fluoride	mg/l	0.39	Composite	<0.09	Colorimetry
Lead	µg/l	1	Composite	<10	ICPMS
Nickel	µg/l	2	Composite	<10	ICPMS
Zinc	µg/l	12	Composite	<10	ICPMS
Boron	µg/l	511	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	9	Composite	<10	HPLC

Discharge Point: Monasterevin Inlet 28/07/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	<0.96	Composite	<10	ICPMS
Chromium	µg/l	<0.93	Composite	<10	ICPMS
Copper	µg/l	4	Composite	<10	ICPMS
Cyanide	µg/l	<5	Composite	<5	Colorimetry
Fluoride	mg/l	0.41	Composite	<0.09	Colorimetry
Lead	µg/l	<0.38	Composite	<10	ICPMS
Nickel	µg/l	1	Composite	<10	ICPMS
Zinc	µg/l	13	Composite	<10	ICPMS
Boron	µg/l	150	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	<0.74	Composite	<10	ICPMS
Barium	µg/l	6	Composite	<10	HPLC

TOXIC SUBSTANCE ANALYSIS

Discharge Point: Monasterevin Outlet 29/05/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	<0.96	Composite	<10	ICPMS
Chromium	µg/l	6	Composite	<10	ICPMS
Copper	µg/l	6	Composite	<10	ICPMS
Cyanide	µg/l	5	Composite	<5	Colorimetry
Fluoride	mg/l	0.38	Composite	<0.09	Colorimetry
Lead	µg/l	3	Composite	<10	ICPMS
Nickel	µg/l	4	Composite	<10	ICPMS
Zinc	µg/l	19	Composite	<10	ICPMS
Boron	µg/l	217	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	12	Composite	<10	HPLC

Discharge Point: Monasterevin Outlet 28/07/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	<0.96	Composite	<10	ICPMS
Chromium	µg/l	5	Composite	<10	ICPMS
Copper	µg/l	4	Composite	<10	ICPMS
Cyanide	µg/l	<5	Composite	<5	Colorimetry
Fluoride	mg/l	0.4	Composite	<0.09	Colorimetry
Lead	µg/l	<0.38	Composite	<10	ICPMS
Nickel	µg/l	3	Composite	<10	ICPMS
Zinc	µg/l	22	Composite	<10	ICPMS
Boron	µg/l	49	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	11	Composite	<10	HPLC

TOXIC SUBSTANCE ANALYSIS

Discharge Point: Monasterevin Upstream 29/05//08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	1	Composite	<10	ICPMS
Chromium	µg/l	3	Composite	<10	ICPMS
Copper	µg/l	5	Composite	<10	ICPMS
Cyanide	µg/l	6	Composite	<5	Colorimetry
Fluoride	mg/l	0.23	Composite	<0.09	Colorimetry
Lead	µg/l	2	Composite	<10	ICPMS
Nickel	µg/l	2	Composite	<10	ICPMS
Zinc	µg/l	<4.6	Composite	<10	ICPMS
Boron	µg/l	396	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	118	Composite	<10	HPLC

Discharge Point: Monasterevin Upstream 28/07/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	1	Composite	<10	ICPMS
Chromium	µg/l	<0.93	Composite	<10	ICPMS
Copper	µg/l	<0.2	Composite	<10	ICPMS
Cyanide	µg/l	<5	Composite	<5	Colorimetry
Fluoride	mg/l	0.22	Composite	<0.09	Colorimetry
Lead	µg/l	<0.38	Composite	<10	ICPMS
Nickel	µg/l	1	Composite	<10	ICPMS
Zinc	µg/l	<4.6	Composite	<10	ICPMS
Boron	µg/l	26	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	<0.74	Composite	<10	ICPMS
Barium	µg/l	108	Composite	<10	HPLC

TOXIC SUBSTANCE ANALYSIS

Discharge Point: Monasterevin Downstream 29/05/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	1	Composite	<10	ICPMS
Chromium	µg/l	1	Composite	<10	ICPMS
Copper	µg/l	4	Composite	<10	ICPMS
Cyanide	µg/l	8	Composite	<5	Colorimetry
Fluoride	mg/l	0.23	Composite	<0.09	Colorimetry
Lead	µg/l	1	Composite	<10	ICPMS
Nickel	µg/l	2	Composite	<10	ICPMS
Zinc	µg/l	<4.6	Composite	<10	ICPMS
Boron	µg/l	438	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	111	Composite	<10	HPLC

Discharge Point: Monasterevin Downstream 28/07/08

Parameter	Unit	Results	Sampling method	Limit of Quantitation	Analysis Method
Atrazine	µg/l	<0.01	Composite	<0.01	HPLC
Dichloromethane	µg/l	<1	Composite	<1	GC-MS 1
Simazine	µg/l	<0.01	Composite	<0.1	HPLC
Toluene	µg/l	<1	Composite	<1	GC-MS 1
Tributyltin	µg/l	<0.02	Composite	<0.05	GC-MS 1
Xylenes	µg/l	<1	Composite	<1	GC-MS 1
Arsenic	µg/l	1	Composite	<10	ICPMS
Chromium	µg/l	3	Composite	<10	ICPMS
Copper	µg/l	3	Composite	<10	ICPMS
Cyanide	µg/l	5	Composite	<5	Colorimetry
Fluoride	mg/l	0.24	Composite	<0.09	Colorimetry
Lead	µg/l	<0.38	Composite	<10	ICPMS
Nickel	µg/l	3	Composite	<10	ICPMS
Zinc	µg/l	5	Composite	<10	ICPMS
Boron	µg/l	56	Composite	<10	Electrometry
Cadmium	µg/l	<0.09	Composite	<10	ICPMS
Mercury	µg/l	<0.2	Composite	<2.5	ICPMS
Selenium	µg/l	1	Composite	<10	ICPMS
Barium	µg/l	128	Composite	<10	HPLC

PT_CD	PT_TYPE	LA_NAME	RWB_TYPE	RWB_NAME	DESIGNATION	EASTING	NORTHING	VERIFIED
SW1-P	Primary	Kildare County Council	River	River Barrow	Proposed Canditate SAC	262631	209882	Y
SW2	Storm water overflow	Kildare County Council	River	River Barrow	Proposed Canditate SAC	262675	209970	Y
SW3	Emergency sewer overflow	Kildare County Council	River	River Barrow	Proposed Canditate SAC	262710	210067	Y
SW4	Storm water overflow	Kildare County Council	Not Known	Not Known	Not Known	TBC	TBC	N

Attachment No. E.2

Monitoring and Sampling Points

1. Please find attached a copy of Kildare County Council's WWTP Inspection Plan for 2008.

2. Samples are taken at the wastewater treatment plant from composite refrigerated samplers sited at the inlet and at the outlet from the WWTP.

3. Access is not required to either of the sampling points during normal operation as an automatic sampler is provided at the inlet and outlet sampling points. This automatic sampler takes a composite sample of the effluent every hour on a 24 hour basis. The sampler contains a refrigerated unit where the sample bottles are stored until collection. Grab samples can also easily be taken from both of these sampling points.

Sampling Methods

1. As stated above, sampling is carried out using an automatic composite sampler, which contains a refrigerated unit suitable for storing samples.

Analytical and Quality Control Procedures

1. Samples are analysed in accordance with the Standard Methods Book.

2. Please find attached a copy of the Osberstown WWTP Sampling Plan for 2008 (Attachment E.2(i)) which outlines procedures in relation to the taking and testing of samples. It should be noted that some of the testing required for this application was carried out in the Osberstown WWTP laboratory.

3. Please find copies of accreditation certificates for external laboratories, which were used in the testing of a number of samples for this application.

2008 Inspection Plan

UWWP Regulations

Inspection Type: **Monitoring/Compliance**

Inspector(s): **Water Services Section**

No. of Installations	Installation Name	Location	Description	Risk Category	Proposed 2008 Inspections	Inspector	Grade	Section	Directorate
1	Castledermot	South	WWTP	A	12	Mary Harney	Asst.Env. Scientist	Water Services	Water & Environmental Services
2	Kildare Town	South	WWTP	A	12	Des King	Environmental Tech.	Water Services	Water & Environmental Services
3	Rathangan	North	WWTP	A	12	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
4	Athy	South	WWTP	A	24	Mary Harney	Asst.Env. Scientist	Water Services	Water & Environmental Services
5	Leixlip	North	WWTP	A	24	Peter Tierney	Environmental Tech.	Water Services	Water & Environmental Services
6	Osberstown	North	WWTP	A	24	Des King	Environmental Tech.	Water Services	Water & Environmental Services
7	Allenwood	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
8	Ballymore Eustace	South	WWTP	B	6	Des King	Environmental Tech.	Water Services	Water & Environmental Services
9	Calverstown	South	WWTP	B	6	Fergal Humphreys	Asst. Chemist	Water Services	Water & Environmental Services
10	Clogherinkoe	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
11	Coill Dubh	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
12	Derrinturn	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
13	Kildangan	South	WWTP	B	6	Fergal Humphreys	Asst. Chemist	Water Services	Water & Environmental Services
14	Kilmeague	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
15	Monasterevin	South	WWTP	B	6	Des King	Environmental Tech.	Water Services	Water & Environmental Services
16	Robertstown	North	WWTP	B	6	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
17	Ardclough	North	WWTP	C	2	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
18	Clonuff	North	WWTP	C	2	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
19	Donore	North	WWTP	C	2	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
20	Milltown	North	WWTP	C	2	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
21	Newtown	North	WWTP	C	2	Caroline Murphy	Asst. Env. Scientist	Water Services	Water & Environmental Services
22	Nurney	South	WWTP	C	2	Des King	Environmental Tech.	Water Services	Water & Environmental Services
22									

Attachment E.2 (i)

Osberstown WWTP Sampling Plan 2007

WATER SERVICES SECTION
KILDARE COUNTY COUNCIL

Osberstown WWTP Sampling Plan

2007

1. Introduction

This Sampling Plan for the Osberstown Wastewater Treatment Plant (WWTP) is intended to give an overview of how the Local Authority intends to comply with the Urban Waste Water Treatment Regulations, SI254 / 2001 in 2007. The Plan will indicate the number of samples required to be taken for the Osberstown WWTP, the parameters to be analysed for, the type of samplers used and how samples should be taken. The samples are followed from point of sampling through to reporting.

2. Sampling Schedule

- The Fifth Schedule to the Urban Waste Water Treatment Regulations, SI254 / 2001 prescribes a minimum frequency of sampling, at regular intervals, as set out in Table 1. The Regulations set out minimum sampling and analysis requirements; it is recommended that, if at all possible, all waste water treatment plants should be monitored above the statutory minimum. There is no provision made in the regulations for the specific monitoring of treatment plants of < 2,000 p.e. but it is accepted best practice that all plants, regardless of size, should be monitored regularly, if practically possible. Consequently, Kildare County Council's policy is to monitor all plants > 500 p.e.[1]

1. Urban Waste Water Discharges in Ireland – A Report for the years 2002/2003, Section 2.1.3, page 10.

Table 1

Sampling Schedule 2007

Plant Name	P.E.*	Receiving Water	Sensitive**	Min. no. of Samples
Osberstown	78,043	River Liffey	Yes	24

* P.E. as calculated for 2006 and submitted in the 2006 EPA returns
** The outflow discharges to a sensitive area or the catchment of a sensitive area

- Waste Water Treatment Plants are required to be sampled in accordance with the Fifth Schedule of the Urban Waste Water Treatment Regulations, 2001 and must satisfy the performance requirements specified in Part 1 of the Second Schedule to the Regulations.

These performance requirements, i.e. concentration limits for key parameters in the effluents from secondary treatment plants, are as follows.[1]

BOD: 25 mg/l O_2; COD: 125 mg/l O_2; SS: 35 mg/l

- Part 2 of the Second Schedule gives a further requirement that Plants discharging to sensitive areas must meet one or both of the following.

Total Phosphorus: 2 mg/l P; Total Nitrogen: 15 mg/l N
(10,000 – 100,000 p.e.)

Therefore samples must be analysed for a minimum of BOD, COD and SS (and Total Phosphorus in sensitive areas). Samples, in general, are tested for the full set of parameters (See Appendix 1).

It has been agreed that the minimum number of samples to be collected and alaysed for the parameters as stated in the regulations is 48. Refer to Appendix 2 - Agreed Schedule of Analysis.

2.1 River Water Sampling

The number of river samples taken (above and below discharge point) should equal the minimum number of effluent samples required for the plant i.e. 24 (See Table 1). The parameters to be analysed are outlined in Appendix 1. River sampling can be taken at four points: Victoria Bridge (U/S), Carragh Bridge (U/S), Castlekeeley Ford (D/S) and the Leinster Aqueduct (D/S). The preferred sampling points are Victoria Bridge and Castlekeeley Ford.

The following sections refer to procedures and methods, etc. carried out at the Osberstown Laboratory.

3. Sampling Procedure[1,2,3]

3.1 Introduction

The objective of sampling is to collect a portion of material small enough in volume to be transported conveniently and handled in the laboratory while still accurately representing the material being sampled. This implies that the relative proportions or concentrations of all pertinent components will be the same in the samples as in the material being sampled, and that the sample will be handled in such a way that no significant changes in composition occur before the tests are made.

3.2 Sampling Procedure

Consult the Osberstown WWTP Methods Manuals to determine whether any special precautions should be taken when sampling for specific parameters. Therefore, each point made below is for general samples, the Methods Manuals may require you to ignore certain points i.e. glass bottles used instead of plastic containers.

- The use of some form of automatic sampler (flow-proportional or 24-hour composite) is essential.

- Portable 24-hour composite samplers may be used. Ideally ones with a sample refrigeration facility.

- When using portable 24-hour composite samplers with no refrigeration facility, minimise the effects of elevated temperature by protecting equipment from sunlight.

- Again, for 24-hour composite samplers with no refrigeration facilities try to start 24-hour sampling period for example at 09:00 and finish at 09:00 the next day (Therefore the least amount of time in the sunlight). Sample should be brought straight to laboratory for testing, thus eliminating standing time.

- Samples are taken in plastic containers (1L or 2.5L).

- Containers are filled to the top to eliminate air/oxygen.

- When sampling, ensure that the material/sample is a homogenous mixture i.e. the sample from composite sampler may need mixing before bottling.

- Samples must be transported to the laboratory in a cooler box.

- All samples must be labelled, indicating name of collector, date and time of collection and place of collection.

- When the sample is presented to the laboratory for analysis the sample is assigned a unique ID number and sample details are logged in the laboratory logbook.

1. The Environmental Protection Agency Act, 1992 [Urban Waste Water Treatment] Regulations, 1994
A Handbook on Implementation for Sanitary Authorities
2. Standard Methods for the examination of Water and Waste Water. 19th Edition 1995
3. Methods Manuals, Osberstown WWTP Environmental Laboratory, 2000 Version 3

4. Analysis Methods

The methods used by the Osberstown WWTP Laboratory when analysing samples are documented in the Laboratory Method Manuals (No. 1 & 2). These methods should be referenced for details of analysis and the methods followed whenever samples are being analysed.

5. Quality Control

Osberstown Laboratory

Reference should be made to the Osberstown Laboratory Quality Control Procedures Manual for all details pertaining to Quality Control protocol in the Osberstown WWTP Laboratory.

6. Result Recording/Reporting Procedures

Osberstown Laboratory

- All samples entering Osberstown WWTP Laboratory are logged in the Sample Logbook. This allocates a unique identifying number to the sample.

- Each parameter has an associated result logbook in which the sample details and results are recorded.

- Results for all the parameters are recorded on a result sheet, which is designated to a specific waste water treatment plant for a specific date.

- All results are inputted into a central database from which a printout of results is obtained for each plant. These are signed and verified.

- The EPA Returns Co-ordinator will request returns data from individuals in January / February of every year for the previous period, for submission to the EPA.

Author

Fergal Humphreys (EPA Returns Co-ordinator)

Appendix 1

The full set of analytical parameters are tested in Osberstown WWTP Environmental Laboratory and include BOD, COD, SS, *ortho*-phosphate, Total Phosphorus, ammonia, nitrite, nitrate, Total Kjeldahl Nitrogen (TKN) (and/or Total Nitrogen, TN). For operational purposes some additional parameters such as pH, dissolved oxygen (DO), alkalinity, dry solids should be measured.

Included below are the recommended analyses as set out in the regulations.

The Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations, 1994: A Handbook on Implementation for Sanitary Authorities

Recommended Analyses: Non-sensitive Areas

Parameter	Influent	Effluent	RWUS	RWDS	Note(s)
BOD_5	Yes	Yes	Yes	Yes	-
COD	Yes	Yes	No	[Yes]	a
Total S Solids	[No]	Yes	Yes	[Yes]	b, c

Notes

a The COD test is not suited to very clean waters and is not usually carried out on such samples. However, a provision is made in the table for the carrying out of the test on down-stream receiving waters visibly affected by discharge(s).

b In view of the often unpleasant nature of influent samples it is considered that suspended solids measurement need not be mandatory on such samples.

c The measurement of suspended solids in waters of apparent clarity is of little practical value, and it is proposed that their determination be confined to those down-stream samples of receiving water on which it is considered the COD should be determined (see above).

d The measurement of nutrients is essential in sensitive areas. Although phosphorus is the key element concerning the eutrophication of fresh waters, nitrogen is very often determined routinely on such waters, hence its recommended inclusion in programmes.

e Total Oxidised Nitrogen comprises nitrate and nitrite. The Total Kjeldahl Nitrogen [TKN] determination includes the measurement of ammonia. The measurement of TKN is not particularly suited to unpolluted (or mildly polluted) receiving waters and, accordingly, it is considered that the determination of ammonia instead of TKN on such waters is more practicable.

Recommended Analyses: Sensitive Areas – Rivers

Parameter	Influent	Effluent	RWUS	RWDS	Note(s)
BOD_5	Yes	Yes	Yes	Yes	-
COD	Yes	Yes	No	[Yes]	a
Total S Solids	[No]	Yes	Yes	[Yes]	b, c
Total Phosphorus	Yes	Yes	Yes	Yes	d
Total Oxidised Nitrogen	No	Yes	Yes	Yes	d, e
Total Kjeldhal Nitrogen	Yes	Yes	No	No	d, e
Ammonia	No	No	Yes	Yes	e

Schedule of Accreditation

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Accredited to ISO/IEC 17025:2005

EURO Environmental Services

Issue No: 006 **Issue date:** 01 May 2008

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Ireland

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Fax: +00 353 941198
E-Mail: info@euroenv.ie
Website: www.euroenv.ie

Testing performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Unit 35 Boyne Business Park Drogheda Co Louth Ireland	**Local contact** Damien O'Reilly Tel: +00 353 41 984 5440 Fax: +00 353 41 984 6171	Environmental Analysis	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Emission Stacks and Ducts	**Local contact** Geoff Fitzpatrick Tel: +00 353 41 984 5440 Fax: +00 353 41 984 6171	Sampling and Analysis	B

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
POLLUTANTS AND EFFLUENTS: STACK EMISSIONS	Physical Testing		
Filter papers and filter assemblies from stack sampling probes	Particulates	In accordance with BS EN 13284-1 using gravimetric analysis	A
ATMOSPHERIC POLLUTANTS	Sampling of source emissions to atmosphere		
	Water vapour	US EPA Method 4	B
ATMOSPHERIC POLLUTANTS	Sampling of source emissions to atmosphere	National and International Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Manual Stack Emission Monitoring	
Gaseous and Particulate Samples from Emission Stacks/Ducts	Isokinetic sampling for particulate matter	BS EN 13284-1:2002 BS ISO 9096:2003	B
	Gaseous Compounds - sampling and analysis		
	Velocity, temperature and pressure	BS EN 13284-1:2002	B
	Total Organic Carbon	BS EN 12619:1999	B
	Total Organic Carbon	BS EN 13526:2002	B
	Carbon Monoxide	BS EN 15058:2006	B
	Oxygen	BS EN 14789:2005	B
	Oxides of nitrogen	BS EN 14792:2005	B

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
SOILS	Chemical Testing		
	Elements: Arsenic Barium Beryllium Cadmium Cobalt Chromium Lead Manganese Nickel Selenium Silver Strontium Vanadium Zinc	SOP 202 using Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	A
		Documented In-House Methods to meet the requirements of the Environment Agency MCERTS Performance Standard - Chemical Testing of Soil	
	pH	SOP 300 using meter	A
WATERS	Chemical Tests		
Potable Water	Elements: Lithium Beryllium Boron Aluminium Vanadium Chromium Iron Manganese Cobalt Nickel Copper Zinc Gallium Arsenic Rubidium Strontium Silver Tin	SOP 177 by ICP-MS	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)		
Potable Water (cont'd)	Elements: (cont'd)		
	Antimony Caesium Barium Thallium Lead Uranium		
	Ammonia	SOP 114 by automated discrete analyser	A
Industrial Effluent	Total oxidised Nitrogen (TON)	SOP 151 by automated discrete analyser	A
	Alkalinity	SOP 102 by automated discrete analyser	A
Industrial and sewage effluent	Orthophosphate	SOP 117 by automated discrete analyser	A
Potable waters, industrial and sewage effluents	Chloride	SOP 100 by automated discrete analyser	A
	Sulphate	SOP 119 by automated colorimetry	
	Total phosphate	SOP 166 by automated discrete analyser	A
	Elements: Calcium Magnesium Sodium Potassium	SOP 184 by ICP-MS	A
Industrial effluent, surface and groundwater	Chemical Oxygen Demand	SOP 107	A

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used	Location Code
WATERS (cont'd)	Chemical Tests (cont'd)		
Potable waters, industrial and sewage effluents, surface and groundwater	pH	SOP 110	A
	Conductivity	SOP 112	A
	Turbidity	SOP 109	A
	Biochemical Oxygen Demand	SOP 113	A
	Colour	SOP 108 by automated discrete analyser	A
	Total Hardness	SOP 111 by automated discrete analyser	A
END			

PT_CD	PT_TYPE	MON_TYPE	EASTING	NORTHING	VERIFIED
P-Inlet	Inlet	Sampling Point	262612	209986	Y
P0	Primary	Sampling Point	262602	209917	Y
ASW1-PU	River Upstream	Sampling Point	262659	209924	Y
ASW1-PD	River Downstream	Sampling Point	262594	209849	Y

Results for Monasterevin Sewage Treatment Works 2007-2008

Inlet

Date	B.O.D.	C.O.D.	S.S.	pH	NH_3	NO_3-N	NO_2-N	Total P	PO_4^{3-}	PO_4^{3-}–P	Flow M^3	BOD Load kg/day	P.E.	Comments
23/04/2007	174	620	330	7.39	19	0.1	0.1	4.46	9.78	3.19	1270	221	3683	Composite
25/04/2007	171	441	306	7.29	19.2	0.1	0.1	6.18	14.57	4.75	1793	307	5117	Composite
03/05/2007	155	688	415	7.51	22.5	0.63	0.1	5.76	11.96	3.9	1260	195	3250	Composite
15/05/2007	126	338	277	7.3	21	0.32	0.1	8.04	18.4	6	2534	319	5317	Composite
05/06/2007	185	566	104	7.38	19	0.1	0.1	6.17	13.16	4.29	1664	308	5131	Composite
15/06/2007	87	400	100	6.97	15	0.1	0.1	4.06	8.62	2.81	1404	122	2036	Composite
15/08/2007	95	183	88	7.82	8.7	4.9	0.5	2.2	4.97	1.6	3136	298	4965	Composite
16/08/2007	54	201	49	7.64	6.4	0.98	0.4	1.6	2.6	0.8	2482	134	2233	Composite
22/01/2008	140	406	217	7.11	19	0.1	0.1	4.23	8.03	2.62	2867	401	6690	Composite
05/02/2008	176	300	100	7.74	14	0.1	0.1	4.34	9.05	2.95	3600	634	10560	Composite
15/04/2008	160	370	171	7.4	19	0.71	0.15	5.7	11.1	3.09	1456	233	3833	Composite
20/05/2008	120	362	201	7.3	22	0.1	0.1	5.8	11.07	3.6	1190	143	2383	Composite
21/05/2008	98	451	174	7.9	21	0.2	0.02	9.8	7.1	NT	1450	142	2368	Composite
22/05/2008	190	355	123	7.3	14	0.1	0.1	5.9	7.9	2.6	1126	214	3567	Composite
23/05/2008	137	342	207	7.2	17	0.1	0.1	6.02	11.9	3.9	1286	177	2950	Composite
24/05/2008	150	298	175	6.95	20	0.43	0.1	5.3	9.8	3.2	1067	161	2683	Composite
25/05/2008	155	364	192	7	24	0.1	0.1	6.2	11.04	3.6	1256	195	3250	Composite
26/05/2008	145	449	209	7.03	29	0.1	0.1	6.1	13.6	4.4	1408	204	3400	Composite
												AVERAGE PE	4168	

Results for Monasterevin Sewage Treatment Works 2007-2008

Effluent

Date	B.O.D.	C.O.D.	S.S.	pH	NH_3	NO_3-N	NO_2-N	Total P	PO_4^{3-}	PO_4^{3-}–P	Comments
23/04/2007	3	29	2	7.6	1.1	16	0.09	1.53	2.21	0.72	Composite
25/04/2007	8	27	7	7.1	0.3	13.29	0.1	1.38	2.48	0.81	Composite
03/05/2007	2	14	9	7.44	0.7	15.03	0.1	1.68	3.62	1.18	Composite
15/05/2007	2	34	5	7.34	0.7	18.11	0.1	1.57	2.51	0.82	Composite
05/06/2007	2	27	12	7.48	0.3	9.18	0.1	0.91	1.44	0.47	Composite
15/06/2007	3	12	3	7.03	5	12.25	0.16	5	3.53	1.15	Composite
15/08/2007	6	13	5	7.86	0.9	3.1	0.05	0.58	0.31	0.1	Composite
16/08/2007	2	46	6	7.79	0.7	0.98	0.42	1.6	2.6	0.84	Composite
27/11/2007	2	13	2	7.53	2.6	8.29	0.1	0.94	2.3	0.75	Composite
28/11/2007	4	20	4	7.01	0.9	7.93	0.1	0.81	1.47	0.48	Composite
29/11/2007	4	26	4	7.12	1	8.65	0.1	0.56	0.8	0.26	Composite
05/12/2007	2	22	1	7.07	2.71	3.33	0.5	2.42	6.35	2.06	Composite
22/01/2008	2	21	4	7.13	1.2	4.83	0.1	0.17	0.21	0.07	Composite
05/02/2008	2	30	1	7.84	1	3.52	0.1	0.05	0.06	0.02	Composite
19/03/2008	2	16	1	7.46	0.9	4.49	0.1	0.13	NT	0.1	Composite
15/04/2008	3	21	5	7.6	0.4	8.98	0.1	0.36	NT	0.1	Composite
20/05/2008	3	18	1	7.46	0.2	6.27	0.1	1.66	3.53	1.15	Composite
21/05/2008	2	29	7	7.8	0.13	5	0.03	2.4	0.94	NT	Composite
22/05/2008	1	31	2	7.5	0.4	5.8	0.1	1.92	2.88	0.94	Composite
23/05/2008	1	14	5	7.5	0.2	6.97	0.1	1.76	3.25	1.06	Composite
24/05/2008	1	20	4	7.29	0.1	6.55	0.1	2.27	4.55	1.42	Composite
25/05/2008	2	30	2	7.37	0.7	4.95	0.1	1.95	4.88	1.59	Composite
26/05/2008	2	19	4	7.44	0.99	3.18	0.1	1.75	4.72	1.54	Composite
17/06/2008	2	29	11	7.6	1	6.79	0.1	3.5	7.67	2.5	Composite

Results for Monasterevin Sewage Treatment Works 2007-2008

MLSS 1

Date	MLSS	pH
23/04/2007	2000	7.62
03/05/2007	2766	7.52
15/05/2007	2598	6.88
05/06/2007	2298	7.41
11/07/2007	2614	7.63
15/08/2007	2312	7.67
17/10/2007	2214	7.92
07/11/2007	2180	7.55
28/11/2007	2890	7.02
05/12/2007	2310	7.22
13/12/2007	2332	7.23
22/01/2008	2710	7.07
05/02/2008	3184	7.29
19/03/2008	2992	7.45
15/04/2008	3448	7.5

MLSS 2

Date	MLSS	pH
23/04/2007	2020	7.6
03/05/2007	21/03/1905	7.51
15/05/2007	20/03/1905	6.87
05/06/2007	07/07/1906	7.43
11/07/2007	12/06/1907	7.62
15/08/2007	06/08/1906	7.68
17/10/2007	05/12/1905	7.81
07/11/2007	12/01/1906	7.47
28/11/2007	01/02/1908	7.03
05/12/2007	25/10/1906	7.19
13/12/2007	20/05/1906	7.05
22/01/2008	20/08/1907	7.02
05/02/2008	23/08/1908	7.17
19/03/2008	28/09/1907	7.49
15/04/2008	31/07/1909	7.6

UPSTREAM RIVER

Date	B.O.D.	C.O.D.	S.S.	pH	NH_3	Total P	Comments
05/01/2007	2	14	4	7.62	0.1	0.05	Grab
24/04/2007	2	20	2	7.67	0.2	0.2	Grab
26/07/2007	4	24	8	8.03	0.3	0.48	Grab

DOWNSTREAM RIVER

Date	B.O.D.	C.O.D.	S.S.	pH	NH_3	Total P	Comments
05/01/2007	3	18	8	7.67	0.4	0.1	Grab
24/04/2007	2	25	2	7.62	0.3	0.2	Grab
26/07/2007	5	20	7	7.96	0.9	0.48	Grab

KILDARE COUNTY COUNCIL

MONASTEREVIN SEWERAGE SCHEME
WASTEWATER TREATMENT WORKS

REVIEW OF EFFLUENT DISCHARGE STANDARDS AND PROPOSED WASTEWATER TREATMENT WORKS

Nicholas O'Dwyer,
Consulting Engineers,
Carrick House,
Dundrum Centre,
Dublin 14.

March 2000

PROJECT NO. 20140		Prepared by Project Engineer		Approved by Review Engineer	
		Initials	Date	Initials	Date
Revision	Reason for Revision				
A					
B					
C					
D					

TABLE OF CONTENTS

MONASTEREVIN SEWERAGE IMPROVEMENT SCHEME
WASTEWATER TREATMENT WORKS

1.0 INTRODUCTION

This Report reviews the effluent discharge standards adopted in the Preliminary Report (June 1998) in the light of the following:

- SI No. 258 of 1998
  Local Government (Water Pollution) Act, 1997 (Water Quality Standards for Phosphorus) Regulations 1998.

- Recently completed flow and sampling survey at the existing treatment works (January 2000).

- Water Quality in Ireland 1995 - 1997, published in May 1999.

2.0 1998 PRELIMINARY REPORT EFFLUENT DISCHARGE STANDARDS

The effluent discharge standards adopted in the 1998 Preliminary Report are summarised as follows:

Parameter	Influent		Effluent		% Removal
	(g/ PE.d)	(kg/day)	(g/ PE.d)	(kg/day)	
Stage 1 (6,000 pe)					
BOD	60	360	6	36	90
S.S.	75	450	7.5	45	90
T.N.	11	66	9.4	56.4	15
P	2.5	15	0.25	1.5	90
Stage 2 (9000 pe)					
BOD	60	540	6	54	90
S.S.	75	675	7.5	67.5	90
T.N.	11	99	9.4	84.6	15
P	2.5	22.5	0.25	2.25	90

The projected wastewater flows in the 1998 Preliminary Report and concentrations for Stage 1 and Stage 2 are as follows:

	Stage 1	Stage 2
Wastewater Flow (l/h/d)	180	225
Daily Flow (m^3/d)	1080	2025
D.W.F. (L/s)	12.5	23.4
Peak Flow (l/s)	100 (8 DWF)	140 (6DWF)
BOD. Concentration (mg/l)	333	267
S.S. concentration (mg/l)	417	333
Nitrogen Concentration (mg/l)	61	49
Phosphorous Concentration (mg/l)	13.9	11

The river quality upstream of Monasterevin has a Q3-4 quality rating from the 1995 - 1997 Water Quality Data. The river quality 1 km d/s of Monasterevin Bridge had a water quality rating of Q3 from the 1991 - 1994 Water Quality Data, but this was not updated in the current Water Quality Data (1995 - 1997).

3.0 Flow and Sampling Survey (January 2000)

A three day flow and sampling survey was carried out at the existing treatment plant. The sampling procedure consisted of 8 No. 2 hour composite samples between 6.30a.m. and 10.30p.m. and 1 No. 8 hour composite sample between 10.30p.m. and 6.30a.m. Continuous flow recording was also carried out.

The results are summarised as follows:

A. Average Survey Flow = 1,714 m^3/day

Calculated Dry Weather Flow (3,500 PE @ 250 l/h.day) = 875 m^3/day

Note: The daily flows over the 3 day survey period were 2210m^3, 1015m^3 and 1916m^3. The dry weather flow has been calculated based on an existing population equivalent of 3500 PE @ 250l/h day.

B. Average BOD_5 Load = 246.7 kg/day

This is equivalent to a population equivalent of 3,500 PE @ 70 g/h/day.

Note: The BOD_5 load on Day 3 of the flow and sampling survey was 322 kgs. This is substantially higher than the previous days and is much higher than what would be expected for the existing population.

C. Average Ammonia (NH_3-N) Load = 21.7 kg/day

D. Average Phosphorus Load = 25.5 kg/day

This is equivalent to an average orthophosphate concentration of 15 mg/l in the influent.

E. Average Suspended Solids Load = 230.1 kg/day

This is equivalent to an average suspended solids concentration of 134 mg/l in the influent over the 3 day period. On day 2 the average suspended solids concentration was 170 mg/l.

With a population equivalent of 3500, the expected daily phosphorous load would be 8.8 kg/day. The average phosphorous in the influent to the plant was 21.7 kg/day. Typical values for total phosphorous in untreated wastewater range from 5 to 14 mg/l P. A concentration of 14 mg/l P should be used for the plant design. The high levels of phosphate may also be due to groundwater infiltration.

The nitrogen concentration in the effluent is lower than the concentration adopted in the 1998 Preliminary Report. Assuming a TKN/ammonia ratio of 1.6, the nitrogen concentration is calculated as 20.3 mg/l.

4.0 REVISED INFLUENT POLLUTION LOADS

The projected influent pollution loads and associated influent concentrations for the Stage 1 and Stage 2 design are calculated using the following flowrates:-

	Flow l/h/d	Daily DWF m^3/d
Stage 1	250	1,500
Stage 2	250	2,250

The BOD per person per day has been revised for Stage 1 to 70 g/h/d.

	Stage 1		Stage 2	
	Influent Load (kg/d)	Influent Conc. (mg/l)	Influent Load (kg/d)	Influent Conc. (mg/l)
B.O.D.	420	280	540	240
Suspended Solids (S.S.)	450	300	675	300
Ammonia Nitrogen (NH_3-N)	37.5	25	56.25	25
Total Kjeldahl Nitrogen	60	40	90	40
Total Phosphorous	21	14	31.5	14

5.0 WATER QUALITY STANDARDS

The Biological Quality Ratings (Q values) for the River Barrow upstream and downstream of the existing treatment plant are as follows:

(Reference - Water Quality in Ireland 1995-1997 published 1998)

	Quality Rating
Upstream of Existing Plant	3 - 4
Downstream of Existing Plant	3

The results available for orthophosphate measurements for the sampling stations upstream and downstream of the existing plant are as follows:

Orthophosphate Readings mg P/l

	Min.	**Med.**	**Max.**
Monasterevin Bridge	0.025	0.064	0.130
Dunrally Bridge	0.008	0.07	0.166
0.4 km u/s Athy Bridge LH5	0.006	0.073	0.124

The results for BOD at these stations are as follows:

	Min.	**Med.**	**Max.**
Monasterevin Bridge	2.2	3.0	4.3
Dunrally Bridge	1.4	3.5	5.7
0.4 kw u/s Athy Bridge LH5	1.6	2.8	4.4

The median value for the BOD upstream of the plant has increased from 2.2 mg/l in the 1991 - 1994 Water Quality Data to 3.0 mg/l in the 1995 - 1997 Water Quality Data. This reduces the waste assimilation capacity of the River Barrow at Monasterevin.

6.0 REVISED FINAL EFFLUENT STANDARDS

The revised final effluent quality standards are calculated as follows:

6.1 BOD

The waste assimilation capacity is calculated as follows:

Waste Assimilation Capacity WAC = $(C_{max} - C_{back})$ x F95 x 86.4 kg/day

The value for C_{back} is taken as 3.0 mg/l. (Median value at Monasterevin Bridge 1995 - 1997).

WAC = (4 - 3.0) x 1.47x 86.4 = 127.0 kg/day

Taking an influent BOD concentration of 280 mg/l at Stage 1 and a 92% removal rate the final effluent concentration is calculated at 22.4 mg/l. This is equivalent to a BOD_5 load of 33.6 kg/day. In order to achieve a final effluent BOD of <25 mg/l, a removal % of greater than the 90% originally proposed is required.

At Stage 2, the influent BOD concentration will be 240 mg/l, and with a 92% BOD removal rate, the final effluent concentration will be 19.2 mg/l. This is equivalent to a BOD load of 43.2 kg/day.

The background BOD_5 levels in the Barrow have increased from 2.2 mg/l to 3.0 mg/l from the 1991 - 1994 Water Quality Data to the 1995 - 1997 Water Quality Data. The waste assimilation capacity has therefore decreased from 228.6 kg/day to 127.0 kg/day. It is therefore recommended that the BOD removal be increased from 90% to 92%. This will give an effluent BOD of 22.4 mg/l in Stage 1 and 19.2 mg/l in Stage 2.

6.2 Total Phosphorus

The existing phosphorus point discharge load from the existing Treatment Works has been measured as 25.5 kg/day. The existing Biological Quality Rating of the river upstream of the plant is 3-4 and downstream of the plant is 3.

At Stage 1 the average phosphorous load to the plant is calculated as 21 kg/d at an average influent concentration of 14 mg/l. At Stage 2 the average phosphorous load to the plant is calculated at 31.5 kg/d. The effluent phosphorous concentration and daily effluent P load at various % removal rates are as follows:-

% Removal Rate	Stage 1 (6,000 pe)		Stage 2 (9,000 pe)	
	Effluent Conc. (mg/l)	Effluent P Load (kg/day)	Effluent P (Conc. Mg/l)	Effluent P Load (kg/day)
80	2.8	4.2	2.8	6.3
90	1.4	2.1	1.4	3.15
95	0.7	1.05	0.7	1.58

Taking an existing Q value of 3-4 (slightly polluted) upstream of the treatment plant and with reference to the 1998 Phosphorus Regulations the target river phosphate median concentration as required under the Third Scheduled (Part 1 of the Regulations) is as follows:

Existing Q Rating	Minimum Target Q Rating	Phosphate Median Concentration (µg P/l)
Q 3-4	Q 4	30
Q 3	~~3&618~~ Q3-4	50

In order to improve the Quality Rating of the river downstream of the treatment plant it will be necessary to reduce the phosphorus level in the river to the target level of 0.05 mg/l P.

At present the phosphorous level upstream of the plant at the sampling station at Pass Bridge is 64 µg/l (Q3-4). This level should be reduced to the target level of 30 µg/l (Q4)

under the new regulations. Once this is achieved, the target level of 50 µg/l downstream of the plant should be reached with 95% removal of phosphorous in the treatment plant.

The 95 percentile flow in the river is 127,000 m^3/day. The average flow is estimated as 381,000 m^3/day, based on data for the Barrow downstream of Monasterevin.

Taking a target Phosphate level of 0.03 mg P/l in the stretch of river upstream of the plant and a median flow rate of 381,000 m^3/day the increase in the phosphate river level as a result of the point load discharge from the proposed plant is calculated as 0.003 mg P/l. at Stage 1 and 0.004 mg P/l at Stage 2. This will result in a minimum river phosphate level downstream of the plant of 0.034 mg p/l which is less than the target level of 0.05 mg P/l.

Due to the fact that the upstream Phosphorus levels in the Barrow are significantly higher than the target level of 30 µg/l, it is recommended that a P removal rate of 95% is adopted in the design. This will assist in achieving the target level of 50 µg/l downstream of Monasterevin.

6.3 Nitrogen

It is recommended that nitrification / denitrification be included in the plant design at this stage for several reasons:-

(I) It is likely that over the 25 year design period of the plant that the effluent standards for nitrogen will become more stringent.

(ii) The levels of ammonia in the Barrow increase substantially downstream of the existing treatment plant. (The median level at Monasterevin Bridge is 0.029 mg.N/l and the median level at Dunrally Bridge is 0.08 mg.N/l). If nitrification is not allowed for, the levels of ammonia are likely to increase to over 0.1 mg N/l, when the flowrates increase to the Stage 1 and Stage 2 design flows.

(iii) In order for the biological phosphorous removal to be effective, the level of nitrates needs to be less than 5 mg/l so denitrification is also required.

6.4 Summary of Revised Final Effluent Standards

	Stage 1	Stage 2	
Parameter	**Concentration (mg/l)**		**% Removal**
BOD_5	23	19	92
Total Suspended Solids	30	30	95
COD	125	125	78
Total Phosphorus	0.7	0.7	95
Ammonia - Nitrogen	5	5	80
Nitrate - Nitrogen	5	5	

7.0 MODIFICATIONS TO PLANT FOR BIOLOGICAL NUTRIENT REMOVAL

In order to have biological phosphorous removal, an anaerobic zone needs to be provided prior to the anoxic zone in the biological treatment. The required retention time in this zone is two hours at average dry weather flows. The required size will be 125 m^3 and 188 m^3 for Stage 1 and Stage 2 respectively.

If there are nitrate levels of greater than 5 mg/l in the return sludge to the anaerobic zone, the activity of the poly P bacteria is inhibited and the biological phosphorous removal process will be ineffective. In order for biological phosphorous removal to be effective, there also needs to be a sufficient supply of volatile fatty acids for the growth of the poly P organisms.

The anoxic zone in the biological treatment and the sludge recirculation needs to be sufficiently sized to achieve approximately 80% denitrification. A volume of 300 m^3 and a recirculation rate of 5 DWF is required.

It was proposed in the 1998 Preliminary Report to provide two aeration basins with dimensions of: 15 m long x 10 m wide x 4.6 m water depth for Stage 1. In order to allow for an anoxic zone in each of the aeration basins, and to allow for the increased flow, the liquid depth should be increased to 6 m. The anaerobic zone will be located in the smaller tank which was originally to be the anoxic tank. Mixers will be required for both the anaerobic and the anoxic tanks. There will be one additional aeration tank and settlement tank required for Stage 2. An additional aeration tank and settlement tank have been shown on the drawings which will allow for future expansion to 12,000 pe.

8.0 PHOSPHOROUS REMOVAL BY CHEMICAL PRECIPITATION

	Stage 1	Stage 2
Influent phosphorous (kg/d)	21	31.5
Effluent phosphorous (kg/d)	1.05	1.58

Using ferric sulphate for precipitation, the quantity required will be as follows:

Stage 1 $\frac{(21\text{-}1.05)\ x2}{1.6\ x\ 0.125} = 199.5$ litres/day

Stage 2 $\frac{(31.5\ -\ 1.58)\ x\ 2}{1.6\ x\ 0.125} = 299.2$ litres /day

With biological phosphorous removal the phosphorous levels will be reduced to approximately 2 mg/l. The ferric sulphate required to reduce the phosphorous to the required effluent standards will be as follows:

Stage 2 $\frac{(2\ -\ 0.7)\ x\ 1,500\ x\ 2}{1,000\ x\ 1.6\ x\ 0.125} = 19.5$ litres/day

Stage 2 $\frac{(2\ -\ 0.7)\ x\ 2,250\ x\ 2}{1,000\ x\ 1.6\ x\ 0.125} = 29.25$ litres/day

The reduction in chemical usage will be: 180 litres/day and 270 litres/day for Stage 1 and Stage 2 respectively.

Approximate cost of ferric sulphate: £250/m^3.

Annual chemical cost saving for biological phosphorous removal:

Stage 1	£16,425.00
Stage 2	£24,637.00

9.0 SLUDGE PRODUCTION

The revised sludge production figures based on the revised BOD loadings and phosphorous removal are calculated as follows:-

The specific sludge yield is estimated as: 70 g/PE.d for Stage 1 and 60 g/PE.d for Stage 2, exclusive of the chemical sludge from phosphorous removal.

The specific sludge yield if there is 95% phosphorous removal by chemical precipitation will be: 16 g/PE.d for Stage 1 and Stage 2. With biological phosphorous removal, the sludge yield will be approximately 2 g/PE.d.

In line with the recommendations in the Kildare sludge management plan, the sludge produced in the plant in Monasterevin will be dewatered to 18% using a belt press or centrifuge and transported to Osberstown for further treatment. The expected sludge production will be as follows:-

(a) With chemical p-precipitation only:	kg/day	m^3/day (@ 2%)	m^3/day (@ 18%)
Stage 1	516	26.1	2.9
Stage 2	684	34.2	3.8

(b) With biological and chemical p-removal:	kg/day	m^3/day (@ 2%)	m^3/day (@ 18%)
Stage 1	432	21.6	2.4
Stage 2	558	27.9	3.1

It can be seen from the above that there are further benefits for biological phosphorous removal for sludge treatment and transport costs.

There will be an odour removal unit located in the sludge dewatering building for treating odours from the building and the sludge skips. The picket fence thickener should also be covered with odour extraction to the odour treatment unit in the sludge dewatering building.

10.0 DESIGN PARAMETERS AND LAYOUT OF WASTEWATER TREATMENT PLANT

10.1 Summary of Design Parameters

The basic design parameters for the wastewater treatment plant can be summarised as follows:

	Stage 1	Stage 2
Population Equivalent	6,000	9,000
Wastewater Flow l/.d	250	250
DWF m^3/day	1,500 m^3/d	2,250 m^3/day
l/sec	17.4 l/sec	26 l/sec
Peak Flow to the Works	240 l/sec	240 l/sec
(maximum flow through sewers)		
Maximum flow to Receive	12,000 m^3/d (8 DWF)	13,500 m^3/day (6 DWF)
Treatment	139 l/sec	156 l/sec
Max. Flow to Full Treatment	3,750 m^3/d (2.5 DWF)	5,625 (2.5 DWF)
	43.5 l/sec	65 l/sec
Max. Flow to Storm	8,250 m^3/d (5.5 DWF)	7,875 (3.5 DWF)
	95.7 l/sec	91.0 l/sec
Storm Tank Volume Required	687.5 m^3	656 m^3
Storm Tank Volume Provided	(2 x 340 m^3) 680 m^3	(4 x 340 m^3) 680 m^3
Retention Time	2 hrs. at peak flow	

10.2 Preliminary Layout of the Wastewater Treatment Works

A preliminary layout of the wastewater treatment works is shown on Preliminary Report Drawing No. 20140/06. This has been modified from the 1998 Preliminary Report to take into account the revised design for the plant.

The layout provides for the construction of the inlet works and new inlet pipeline for the Stage 2 requirements. The preliminary units will be sized to take the maximum flow (2.5 DWF) to the plant at Stage 2. There will be one mechanical screen and one manually raked screen and duty/assist grit traps.

Two stormwater detention tanks, each with a capacity of 340 m^3 will be provided to cater for the requirements of the Stage 1 and Stage 2. A retention time of 2 hours will be provided at peak flows. All flows to the plant will be screened. Stormwater flows will be retained and pumped back to the main incoming flow to receive full treatment when the main flow to treatment drops to 1.5 DWF. Storm flows of 8/6 DWF (Stage ½) for longer than 2 hours will overflow to the River Boyne. There will be no further storm tanks required for Stage 2.

It is proposed to provide three aeration tanks and three secondary clarifiers to meet to requirements of the Stage 2 parameters. 2 No. aeration tanks and 2 No. clarifiers will be constructed under Stage 1.

Chemical dosing facilities for phosphate will be provided. Sludge holding/thickening tanks and a sludge building complete with a belt press or centrifuge and ancillary equipment will also be provided. These units will all be designed for the Stage 2 requirements.

Other facilities to be provided under Stage 1 include the following:

(1) Air blower house
(2) Administration building
(3) Site roads and fencing
(4) Process and drainage pipework
(5) New access road and entrance
(6) Outfall pipe
(7) Telemetry and Scada control system
(8) Landscaping

10.3 Process Treatment Plant Unit Sizes

The process treatment plant unit sizes for the Stage 1 and Stage 2 design are summarised as follows:

	Stage 1	Stage 2
DWF	1,500 m^3/day	2,250 m^3/day
Anaerobic Tank Volume / Tank Size of each Tank Liquid Depth	1 No. 125 m^3 7 m x 3 m 6 m	2 No. 125 m^3 7 m x 3 m 6 m
Aeration /Anoxic Tank Volume / Tank Aerobic / anoxic volumes Size of each Tank Liquid Depth	2 No. 900 m^3 750 / 150 m^3 10 m x 15 m 6 m	3 No. 900 m^3 750 / 150 m^3 10 m x 15 m 6 m
Clarifier Volume / Tank Diameter of Tank Sidewall	2 No. 221.8 m^3 10 m 2.5 m	3 No. 221.8 m^3 10 m 2.5 m
Sludge Holding Tank Volume / Tank Sludge Production/day (at 18% d.3)	1 No. 185 m^3 2.9 m^3/day (maximum)	1 No. 185 m^3 3.8 m^3/day (maximum)

11. CONCLUSIONS AND RECOMMENDATIONS

On the basis of the review of the 1998 Preliminary Report, the following modifications should be made to the original proposals:

(i) The flow per person for Stage 1 and Stage 2 should be increased to 250 l/h/d based on the information in the flow and sampling survey.

(ii) The B.O.D. per person should be increased to 70 g/h/d for Stage 1 based on the information in the flow and sampling survey. It is expected that by Stage 2, a more typical value of 60 g/h/d will be acceptable. This should be reviewed at the Stage 2 design.

(iii) The tank sizes and site layout have been revised to take into account the new data.

(iv) The phosphorous removal should be increased to 95% to comply with the new phosphorous regulations (SI No. 258 of 1998), based on the information in the 1995 - 1997 Water Quality Data, and the information from the flow and sampling survey.

(v) Phosphorous removal should be mainly be by biological removal rather than chemical precipitation. This will give a significant reduction in chemical costs and will reduce sludge production.

(vi) Nitrification / denitrification should be incorporated into the biological treatment. This will reduce nitrate levels which would otherwise inhibit the biological phosphorous removal. It will also allow for any future requirements for nitrogen reduction which are likely to occur during the 25 year period that Stage 2 has been designed for.

(vii) The cost for additional tankage and mixers for biological phosphorous removal is significantly less than the chemical costs over the lifetime of the plant.

(viii) There is also an additional cost for the nitrification / denitrification process. This will ensure the efficient operation of the phosphorous removal process. It would cost substantially more to provide for nitrogen removal at a later stage.

(ix) The excess sludge produced in the plant should be dewatered to 18% d.s. by centrifuge or belt press and then transported to Osberstown STW for further treatment.

(x) There should be odour treatment for the preliminary works and sludge treatment plant including the picket fence thickener tank which should be covered.

Signed: _____

for NICHOLAS O'DWYER

Nature Conservation Area Designation.

Ireland, while a relatively small Island, is home to 28 species of land mammal, over 400 species of birds, more than 4,000 plant species, over 12,000 species of insect and a huge range of other living creatures.

Kildare has a wide diversity of natural and semi-natural habitats such as bogs, wetlands, lakes, river and upland habitats that support a wide range of wild plant and animal species. However, our recent economic developments have put the sites in which these flora and fauna can be found under serious pressure. Declining farming incomes and the need to further intensify has further led to a reduction in "marginal Lands" which were once a haven for such species.

In order to conserve the variety of birds, plant and animal species in Ireland it is necessary to conserve the habitats in which they live. Conservation areas are being designated in order to achieve this. Over 10% of land of Ireland is formally and legally designated as being of European importance for nature conservation.

There are three main types of Conservation Site Designation:

- Natural Heritage Area (NHA),
- Special Area of Conservation (SAC)
- Special Protection Area (SPA).

Natural Heritage Areas

Natural Heritage Areas are the primary National designation. In 1981 An Foras Forbaithe identified 27 ASI (Areas of Scientific Interest) in Kildare as part of a national inventory to identify special or typical landscape/geological features, habitats, plant/animal species and communities. The areas of ecological interest were resurveyed (1991-1994) and designated NHA. The Geological Survey of Ireland (GSI) is compiling a list of geological sites in need of protection through NHA designation. Under the Wildlife Amendment Act (2000), NHA's are legally protected from damage from the date they are formally proposed. Previous to this the County Development Plans were the primary protection mechanism for NHA's**.** Kildare has 23 NHA's (see list below). The process of formal designation of NHAs will began in 2002. NHAs are designated by the Minister without reference to Europe.

NHAs in County Kildare

Site Name	Site Number	OS Map Numbers (6")	Site Name	Site Number	OS Map Numbers (6")
Ballina Bog	00390	3	Hodgestown Bog	01393	9, 13
Ballynafagh Bog	00391	13	Kilteel Wood	01394	20
Ballynafagh Lake	01387	13	Liffey at Osberstown	01395	19

Barrow Valley at Tankardstown Bridge	00858	37	Liffey Bank at Athgarvan	01396	23
Carbury Bog	01388	3, 8	Liffey Valley Meander Belt	00393	29
Corballis Hill	01389	38	Mouds Bog	00395	18
Curragh	00392	22,23,28	Pollardstown Fen	00396	23
Derryvullagh Island	01390	31	Oakpark	00810	39/16
Donadea Wood	01391	9	Poulaphouca Reservoir	00731	25, 29
Dunlavin Marshes	01772	32, 33	Red Bog	00397	25
Grand Canal	02104	8, 11, 12, 13, 14, 16, 17, 19, 21, 23, 26 35	Royal Canal	02103	3,4,5,6,11,13
			Rye Water Valley/Carton	01398	6

Special Area of Conservation (SAC)

Special Areas of Conservation (SAC's) represent the prime wildlife conservation areas in Ireland, which are also considered extremely important from a European perspective. The legal basis on which SAC's are selected and designated in the "Habitats Directive" (92/43/EEC). The Directive was transposed into Irish legislation by the European Union (Natural Habitats) Regulations.

In 1997 some NHA's were designated as SAC's. SAC designation gives protection to certain habitats and species. This included priority habitats, which require particular attention.

There are currently 7 SAC's designated in Co. Kildare (see list below). Once a site is designated a SAC and publicly advertised it is legally protected. Once designated the site becomes a proposed candidate SAC (pcSAC). Following the three month period during which time landowners may lodge objections to the proposal to designate a site, details of each proposed SAC are transmitted to the EU Commission, after which time it is called a "candidate SAC". Once approved by the commission, the sites will be formally designated by the Minister. Four of the five sites are candidate SAC and one is a proposed candidate SAC.

Certain activities are restricted within SAC's and can only be carried out with the permission of the Minister for Environment and Local Government. These are called "Notifiable Actions" and vary depending on the type of habitat that is present on the site. When a site is designated landowners are sent copies of notifiable actions that are relevant to their lands.

SAC Sites in Kildare

Site Name	Designation	Site Code	OS Map No. (6")
Pollardstown Fen	cSAC	391	23
Ballynafagh Bog	cSAC	396	13
Ballynafagh Lake	cSAC	1387	13

Rye Water Valley at Carton.	cSAC	1398	6
Mouds Bog	pcSAC	395	18
River Barrow and Nore	pcSAC	2162	21, 26, 27, 30, 31, 34, 35, 37, 38, 39, 40
Red Bog	pcSAC	397	25

Special Protection Areas (SPA's)

Special Protection Areas (SPA's) are important bird habitats and were designated under the EU Birds Directive (79/409/EEC). The Directive requires designation of SPA's for listed rare and vulnerable bird species.

There is one SPA in County Kildare.

Site Name	Site Number	OS Map Numbers (6")
Poulaphouca Reservoir	00731	25, 29

Planning authorities are required by law to ensure that developments in their area do not cause any significant damage to SACs and SPAs. Developments likely to cause significant damage to the wildlife importance of a designated site must not be allowed. National Parks and Wildlife Service may suggest alternative approaches or will recommend a planning application be rejected. SAC's do not automatically prohibit development. Developments not causing significant harm to the conservation interest of a site may be permitted.

SAC's and SPA's collectively form part of "Natura 2000", a network of protected areas throughout the EU. Sites, which receive designation, will receive the protection they deserve. However, it is not simply enough to leave nature conservation in Kildare to these sites. Equally important habitats for bird, plant and animal species throughout the wider countryside are woodlands, ancient hedgerows, lakes and fens. They all contribute to the rich diversity of species and habitats within our county. It is important that these areas are well managed.

See below for 6" map listings of the designated sites.

You can view the extent on the Council GIS by clicking on Duchas sites then NHA and SAC.

OS Map and sheet numbers of Natural Conservation Areas

6" Map No	Site Name	Site Number	6" Map No	Site Name	Site Number
3	Ballina Bog Royal Canal Carbury Bog	00390 02103 01388	**21**	Grand Canal	02104
4	Royal Canal	02103	**22**	Curragh	00392
5	Royal Canal	02103	**23**	Grand Canal Curragh Liffey at Athgarvan Oakpark	02104 00392 01396 00810
6	Royal Canal Rye Water Valley/Carton	02103 01398	**25**	Poulaphouca Reservoir Red Bog	00731 00397
8	Carbury Bog Grand Canal	01388 02104	**26**	Grand Canal River Barrow	02104 02162
9	Donadea Woods Hodgestown Bog	01391 01393	**27**	River Barrow	02162
11	Royal Canal Grand Canal	02103 02104	**28**	Curragh	00392
12	Grand Canal	02104	**29**	Poulaphouca Reservoir Liffey Valley Meander Belt	00731 00393
13	Royal Canal Ballynafagh Bog Ballynafagh Lake Grand Canal Hodgestown Bog	02103 00391 01387 02104 01393	**30**	River Barrow	02162

14	Grand Canal	02104	**31**	Derryvullagh Island	01390
16	Grand Canal	02104	**32**	Dunlavin Marshes	01772
17	Grand Canal	02104	**34**	River Barrow	02162
18	Mouds Bog	00395	**33**	Dunlavin Marshes	01772
19	Grand Canal Liffey at Osberstown	02104 01395	**35**	Grand Canal River Barrow	02104 02162
20	Kilteel Wood	01394	**37**	Barrow Valley at Tankardstown Bridge River Barrow	00858 02162
21	Grand Canal River Barrow	02104 02161	**38**	Corballis Hill River Barrow	01389 02162
22	Curragh	00392	**39**	OakPark River Barrow	00810 02162
23	Grand Canal Curragh Liffey at Athgarvan Oakpark	02104 00392 01396 00810	**40**	River Barrow	02162

Site Name	Site Number	OS Map Numbers 6" and 25"	Site Name	Site Number	OS Map Numbers 6" and 25"
Ballina Bog	00390	3/3, 3/7	Hodgestown Bog	01393	9/14, 9/15, 13/2, 13/3
Ballynafagh Bog	00391	13/7, 13/8	Kilteel Wood	01394	20/6
Ballynafagh Lake	01387	13/3, 13, 13/7	Liffey at Osberstown	01395	19/5
Barrow Valley at Tankardstown Bridge	00858	37/6, 37/10	Liffey Bank at Athgarvan	01396	23/1, 23/2, 23/5, 23/6
Barrow River	02162	21, 26, 27, 30, 31, 34, 35, 37, 38, 39, 40	Liffey Valley Meander Belt	00393	29
Carbury Bog	01388	3/13, 3/14 8/2	Mouds Bog	00395	18/9, 18/10, 18/11, 18/13, 18/14, 18/15
Corballis Hill	01389	38/11	Oakpark	00810	39/16
Curragh	00392	22/8, 22/12, 22/16, 23/9, 23/10, 23/13, 23/14., 23/15 28/1, 28/2, 28/3, 28/7	Pollardstown Fen	00396	23/1, 23/2, 23/5, 23/6
Derryvullagh Island	01390	31/10	Poulaphouca Reservoir	00731	25/9, 25/13, 29/8
Donadea wood	01391	9/8, 9/12	Red Bog	00397	25/2
Dunlavin Marshes	01772	32/8, 33/1, 33/5	Royal Canal	02103	3/3, 3/4 4/3, 4/4 5/1, 5/5, 5/6, 5/10, 5/11, 5/15, 5/ 16 6/13, 6/14, 6/15, 11/2, 11/3,
Grand Canal	02104	8/2,8/13, 8/14 11/15, 12/3, 12/7, 12/8, 12/12,1 2/16 13/9, 13/10, 13/13, 13/14, 13/15, 13/16 14/13, 16/16, 17/3, 17/4, 17/6, 17/7, 17/8 17/9, 17/10, 17/12, 17/13,	Rye Water Valley/Carton	1398	6/9, 6/10, 6/13, 6/14

		19/1, 19/2, 19/3, 19/6, 10, 19/13, 21/, 21/11, 21/12, 21/15, 23/4, 23/8, 23/12, 26/3, 35/1, 35/5, 35/9			

KILDARE COUNTY COUNCIL

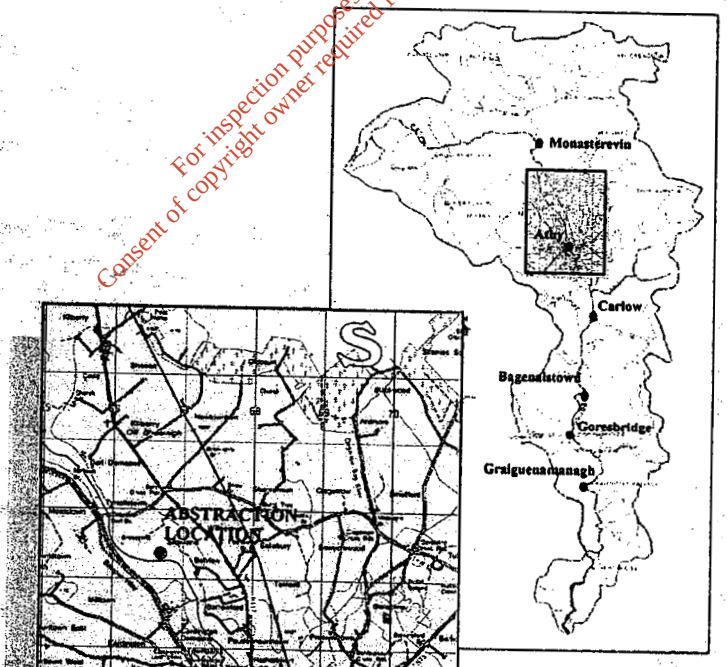
Meanma agus Misneach

ENVIRONMENTAL IMPACT STATEMENT

FOR

RIVER BARROW ABSTRACTION

NON-TECHNICAL SUMMARY



NDP
NATIONAL DEVELOPMENT PLAN

eis

Nicholas O'Dwyer

TOBIN
Patrick J. Tobin & Co. Ltd.

KILDARE COUNTY COUNCIL

NON-TECHNICAL SUMMARY OF ENVIRONMENTAL IMPACT STATEMENT

RIVER BARROW ABSTRACTION

Nicholas O'Dwyer Ltd.,
Consulting Engineers,
Carrick House,
Dundrum Centre,
Dublin 14.

February 2003

PROJECT NO. 20205		Prepared by Project Engineer		Approved by Review Engineer	
		Initials	Date	Initials	Date
Revision	Reason for Revision				
A					
B					
C					
D					

What is an Environmental Impact Statement?

Planning Regulations require that certain types of projects – such as this river abstraction – must have an Environmental Impact Statement (EIS) as part of the planning process. The purpose of the EIS is to publicly provide information about the effects of the project on the environment before any decision is made. In this way everyone can decide for themselves whether the effects are outweighed by the advantages of the project.

The EIS is usually prepared during the design stage of a project. This allows environmental experts to advise the designers about how to improve the project by avoiding problems before they happen. Experience has shown that it is much better to try to avoid environmental problems at the design stage than to try to fix them after the project has been built.

The EIS is prepared on behalf of the developer and must follow the Regulations that set out all of the information to be contained in the EIS. The Regulations set out how the information is to be presented – so that all aspects of the environment are covered and so that the full effects of the project can be clearly understood. The box below shows what must be provided.

Information that must be provided for an EIS
Project Description
Description of Existing Environment
Description of Likely Impacts
Description of Mitigation Measures
Non-Technical Summary

Topics that must be addressed in an EIS are:

Human Beings
Fauna
Flora
Soils
Water
Air
Climate
Landscape
Material Assets
Cultural Heritage
Interaction of Factors

It has been recognised that an EIS can become quite large and complex in order to satisfy the legal requirements. This can make people feel unable to easily understand what the effects of the project will be. To try to avoid this problem, the Regulations also require the preparation of a Summary, in non-technical language, of the main content and findings of the EIS.

The Non-Technical Summary

The following pages provide a summary of the main information that is contained in the EIS. It is laid out in the same order and using the same headings as the EIS. If you feel that you need to know more about any topic that is summarised here – look it up under the same heading in the main EIS.

SOME JARGON

Here are explanations of some words and phrases that are used and may need some clarification:

• EIA	Environmental Impact Assessment The process of preparing and assessing the EIS
• EIS	Environmental Impact Statement The document that describes the effects
• Scope	The coverage of the EIS
• Likely Impacts	The effects that are expected to take place
• Mitigation Measures	Steps taken to avoid, reduce or repair unwanted effects
• Applicant	Whoever is applying for permission to proceed with the proposed development

Submissions and observations in relation to the Environmental Impact Statement or the proposed development should be sent to:

An Bord Pleanála,
Irish Life Centre,
Lower Abbey Street,
Dublin 1.

THE PROPOSED DEVELOPMENT

Introduction and Background

At present County Kildare is heavily dependent on the River Liffey system for its water supply. The two major water sources, Ballymore Eustace Water Treatment Works and Leixlip Water Treatment Works account for approximately 80% of the water supply in the county. Most of the remainder of the water supply is currently obtained from groundwater sources in the county. As demand continues to grow in the Greater Dublin Area, competition for the Liffey Water Resource will be even more pronounced than it is now, and there is an urgent need to develop new sources.

As part of the water supply strategy, adopted by Kildare County Council in 1999, the Council, under the 1942 Water Supplies Act, intends to abstract 40,000 cubic metres per day from the River Barrow approximately 3.5km north of Athy. This quantity represents 2.2% of the average flow in the river at this location.

Alternatives Considered

The "Water Strategy for County Kildare" Report (1999) contained a detailed assessment of the potential water sources available to meet the projected water demand in County Kildare in the year 2020. Following a detailed technical assessment the Strategy Report recommended that four sources including the River Barrow be used to satisfy this requirement.

Six potential abstraction sites north of Athy along the River Barrow were assessed based on desk studies and site visits, together with an outline of the proposed works (See Figure 1). A comparative matrix showing the relative environmental issues at each site was drawn up to assess each site's attributes.

After a comprehensive examination the site in Srowland was selected (See Figure 2). The decision for selecting the site was based on a preliminary assessment of the various EIS topics resulting in the most environmentally advantageous site being selected.

Project Description

While the proposed development will not involve weirs or other works within the river, it is envisaged that the following works will be undertaken:

- The construction of a Riverside Intake Chamber and Pumping Station
- The construction of a Raw Water Storage Reservoir
- The construction of a Water Treatment Works and Pumping Station
- The construction of site roads, hardstandings, parking and other ancillary facilities
- The construction of an administration facility

All the water abstracted from the river will pass through the treatment units. A raw water bunded reservoir will provide a minimum of 3 days water storage to safeguard against pollution incidents upstream of the abstraction point.

It is anticipated that the Intake and Treatment Works will be constructed under a single phase of construction over approximately 30 months and that the plant will be in a position to produce water by 2008.

THE EXISTING ENVIRONMENT

The following topics are required to be examined under the EIA Regulations. The current condition and important features of each topic are highlighted. This provides a means of measuring the scale and significance of any effects that may be identified.

Human Beings

County Kildare is the fastest expanding county in the State as a result of the significant rate of population increase. A large portion of the population increases have occurred in towns in the north-east of the county such as Leixlip, Maynooth, Celbridge and Kilcock, whilst towns in the south (e.g. Athy, Castledermot) have experienced slow to moderate growth. Eighty per cent of the total current water demand is supplied from the River Liffey and obtained from treatment works developed and operated by other local authorities. As demand continues to increase in the Greater Dublin Area, competition for the Liffey Water Resource will be even more pronounced than it is now. Therefore there is an urgent requirement to develop new water sources in the Greater Dublin Region to satisfy this requirement.

Terrestrial Flora and Fauna

The area of the proposed site which is located adjacent to the River Barrow is a uniform stand of grass species, which is mown for silage. Arable crops (i.e. wheat) cover a section of the field and a wider variety of wild plant species can be found in the river lowland. The hedge forming the north-western boundary of the site is well grown and has a rich woody flora in keeping with its origin as a townland boundary.

The area has a small selection of mammals (rabbit, otter and fox), although considering the suitability of the habitat other mammal species such as badgers, hares, minks and hedgehogs, are likely to occur. A large number of bird species visit and nest on the surrounding areas of the River Barrow.

Aquatic Flora and Fauna

The River Barrow is an important habitat for a wide variety of freshwater invertebrates and is particularly important for many standing water species in a part of the country where natural standing waters such as lakes are scarce. A significant number of invertebrate species were recorded at the site.

Fisheries

The River Barrow has a well-established coarse and game fishery. At the site of the proposed abstraction point the river is a relatively slowflowing channel. The reach supports a wide variety of coarse fish species and migratory salmonids would be expected to pass upstream and downstream past the proposed abstraction site.

Soils

The soils of the site are deep and well drained suitable for the widest range of uses, including tillage, pasture, meadow and forestry. Bedrock beneath the site consists of the clean coarse limestones of the Milford formation.

Hydrology and Navigation

The River Barrow rises in the Slieve Bloom Mountains and flows eastwards initially and then southwards towards the sea. The total catchment area of the River Barrow is estimated at 3,068 km^2. The proposed location for the abstraction point is immediately north of Athy and south of the confluence with its tributary, the Stradbally River. The catchment area at the proposed abstraction point is approximately 1,527km^2. The River Barrow has been an important navigation waterway for more than 200 years. It is possible to navigate from the tidal limits at St. Mullins to Athy where it is linked to the Grand Canal navigation system.

Water Quality

Over the last 30 years there has been a considerable variation in river water quality in the Barrow catchment. Upstream of the proposed abstraction point there was a gradual deterioration in water quality throughout the 1970s. This was followed by periods of improvement in the 1980s and in the late 1990s.

Noise

Existing noise levels were surveyed at the development site emphasising the critical period, i.e. night-time, in which the noise would have the greatest potential impact. The proposed location is quiet rural, with traffic noise audible from the Monasterevin road (R417) and local roads.

Landscape

The site is located in the fertile flat lowlands beside the River Barrow. The landscape character of the area is generally rural, with large grassland fields, well-trimmed hedgerows and housing is dispersed. The landscape resources in the vicinity are centred on the Grand Canal.

Material Assets I

The are no known buried or overhead services nor direct road frontages within the site. The site is not known to underlay any significant mineral assets. Agriculture is the principle activity in the area.

Material Assets II (Cultural Heritage)

The site contains no upstanding buildings or structures. There are a number of known archaeological sites in the vicinity of the proposed development site, the most important being a ruined church and graveyard of an Early Christian and Medieval period to the west of the site. The River Barrow itself is an area of considerable archaeological interest. Archaeological objects found in the river nearby suggest that the area has been occupied since the Neolithic period of prehistory.

THE IMPACTS

Human Beings

Although the proposed development will involve the removal of approximately 14 hectares of productive agricultural land, when considered in the context of the County the impact will not be significant. The proposed development will provide additional volumes of water supply that will facilitate the demands from the anticipated population growth, therefore the predicted socio-economic impacts are positive both locally and throughout the county.

Terrestrial Flora and Fauna

The treatment works, access roads etc. will be located away from hedges and access along the riverbank will be maintained to accommodate wildlife movement. During construction it is important to prevent the exposure of concrete to the river water. Once operational any discharges into the water will be controlled and subject to licensing and strict regulation.

Aquatic Flora and Fauna

No long-term disturbance of the freshwater invertebrate fauna is anticipated, although there is expected to be some short-term disturbance during the construction phase. Overall the proposed water abstraction scheme at Srowland will have no significant impact on the invertebrate fauna of the River Barrow.

Fisheries

No significant adverse impacts are predicted from the proposed abstraction of water from the River Barrow.

Soils

There will be a substantial removal of high-fertility soil at the site, however the loss is not significant having regard to the overall extent of such soils in the county.

Hydrology and Navigation

There will be no significant impacts on navigation as a result of the proposed abstraction. The projected impact in terms of water depth is very small, as the river level is controlled by weirs downstream of the abstraction point. However, improvements to the navigation are proposed at two problem locations as a mitigation measure as set out in the next section.

Water Quality

Construction of the proposed development has the potential to generate considerable volumes of silt that has the potential to affect surface water quality during construction. The potential impact of reduced flow on the river water quality will be more than

compensated by the anticipated improvement in river water quality resulting from the implementation of the Urban Waste Water Directive and the Phosphorous Regulations.

Noise

Noise impacts at nearest houses from both the construction works and during operation of the plant are predicted to be within guideline limits for rural areas. There is no indication of potential vibration impact from the proposed development.

Landscape

The proposed development has the potential to impact on the character of the surrounding countryside. However these effects will be highly localised and will not, therefore be significant.

Material Assets I

The proposed abstraction plant is predicted to have an overall positive impact as additional water sources are essential to allow new developments to take place.

The proposed development will generate additional local traffic during the construction period however it will be well within the carrying capacity of the R 417.

Material Assets II (Cultural Heritage)

There will be no direct impacts on the known sites of archaeological importance from the proposed development. However a number of mitigation measures are recommended, as set out in the next section, given the potential for this stretch of the River Barrow to retain material of archaeological interest.

THE MITIGATION MEASURES

This section only includes those topics where mitigation measures are required.

Fisheries

During construction the principal mitigation measure necessary at Srowland is to ensure that activities associated with installing the intake works and pumping station are restricted to as small an area as possible to limit the amount of disturbance.

Soils

The final design shall include measures to intercept and collect any spillages from the proposed development into the River Barrow. The contractor's method statement is required to indicate how contamination of ground or surface waters, by mobilisation of soil particles, shall be prevented by management, monitoring, interception, removal and/or treatment.

Hydrology and Navigation

It is proposed to carry out improvements to the Navigation at Bagenalstown Lock and at the Cork-Dublin Gas Main crossing as mitigation for marginally lowering water surface levels downstream of the abstraction location.

Water Quality

Appropriate measures will be taken to minimise the mobilisation or river sediments and the generation of silt-laden runoff during construction of the intake works and the

bankside construction. Works in the river will be undertaken outside of the salmon-spawning season and discharges into the river will be prevented.

All local authorities within the Barrow catchment area are already obliged to comply with the requirements of the Urban Wastewater Directive, the Phosphorus Regulations and the Water Framework Directive to achieve improvement in water quality. Measures taken to comply with these Regulations will achieve the improvement in Water Quality required and no further mitigation measures will be required.

Noise

If the supplier specifications for the treatment plant indicate that sound power emissions are greater than assumed in the assessment carried out, mitigation measures such as lower noise sources, screening and orientation need to be considered.

Landscape

The following mitigation measures are proposed for the construction stage of the project:

- All perimeter hedges and trees should be retained and protected throughout the construction period
- The riverbanks should be protected and planted with locally appropriate riverbank and light woodland species
- The design of the proposed development will be carefully considered because of its affect on the Barrow and its potential visibility from both the road and the vicinity of the Grand Canal. Maximum building envelopes and acceptable surface finishes will be specified for the development to minimise visual impact

Material Assets II (Cultural Heritage)

An underwater assessment and/or investigation is recommended prior to construction operation if there is any direct impact with the existing riverbed. During the construction phase, an archaeological monitoring programme should be undertaken by an experienced archaeologist.

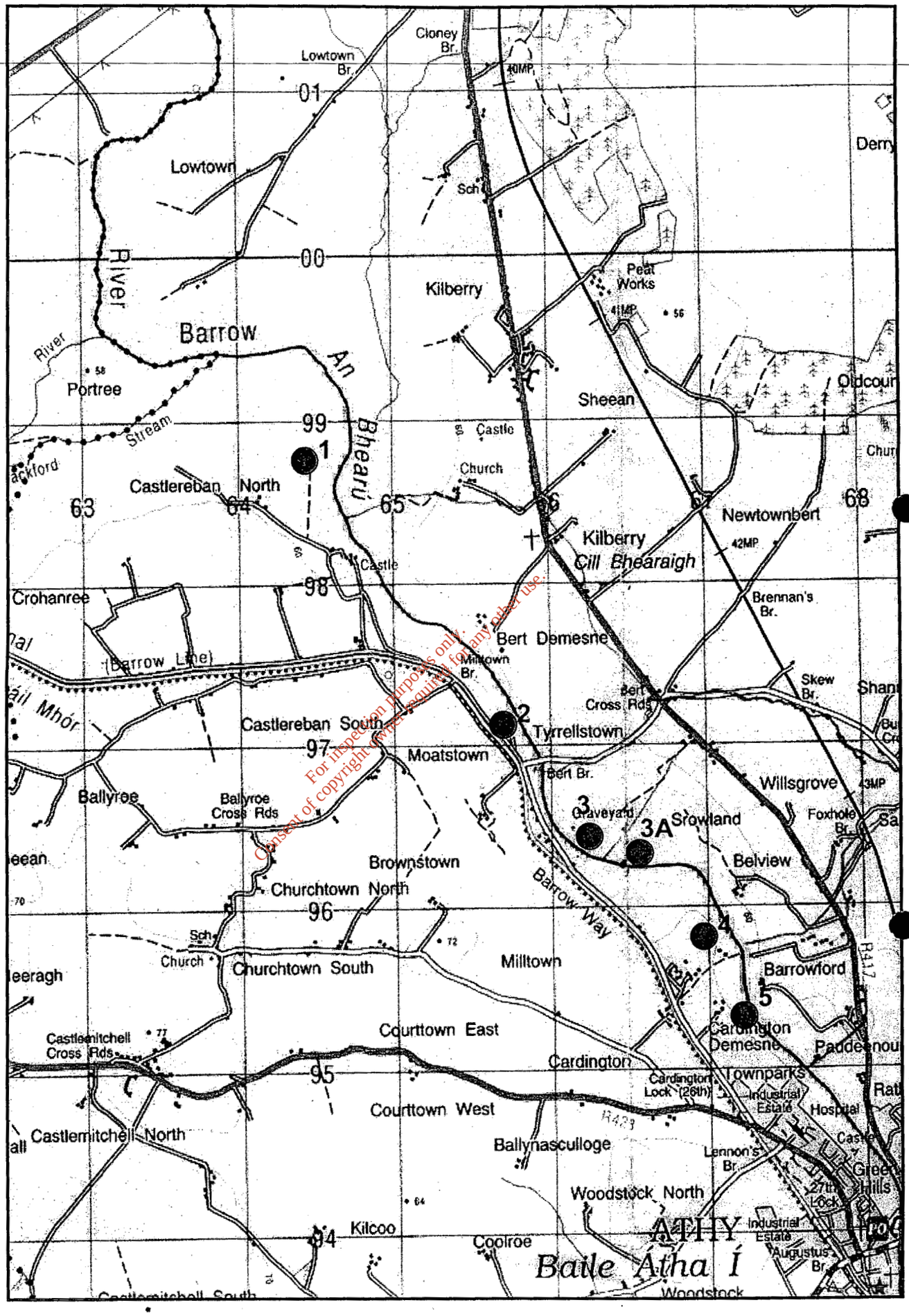


Figure 1 Assessment of Site Options

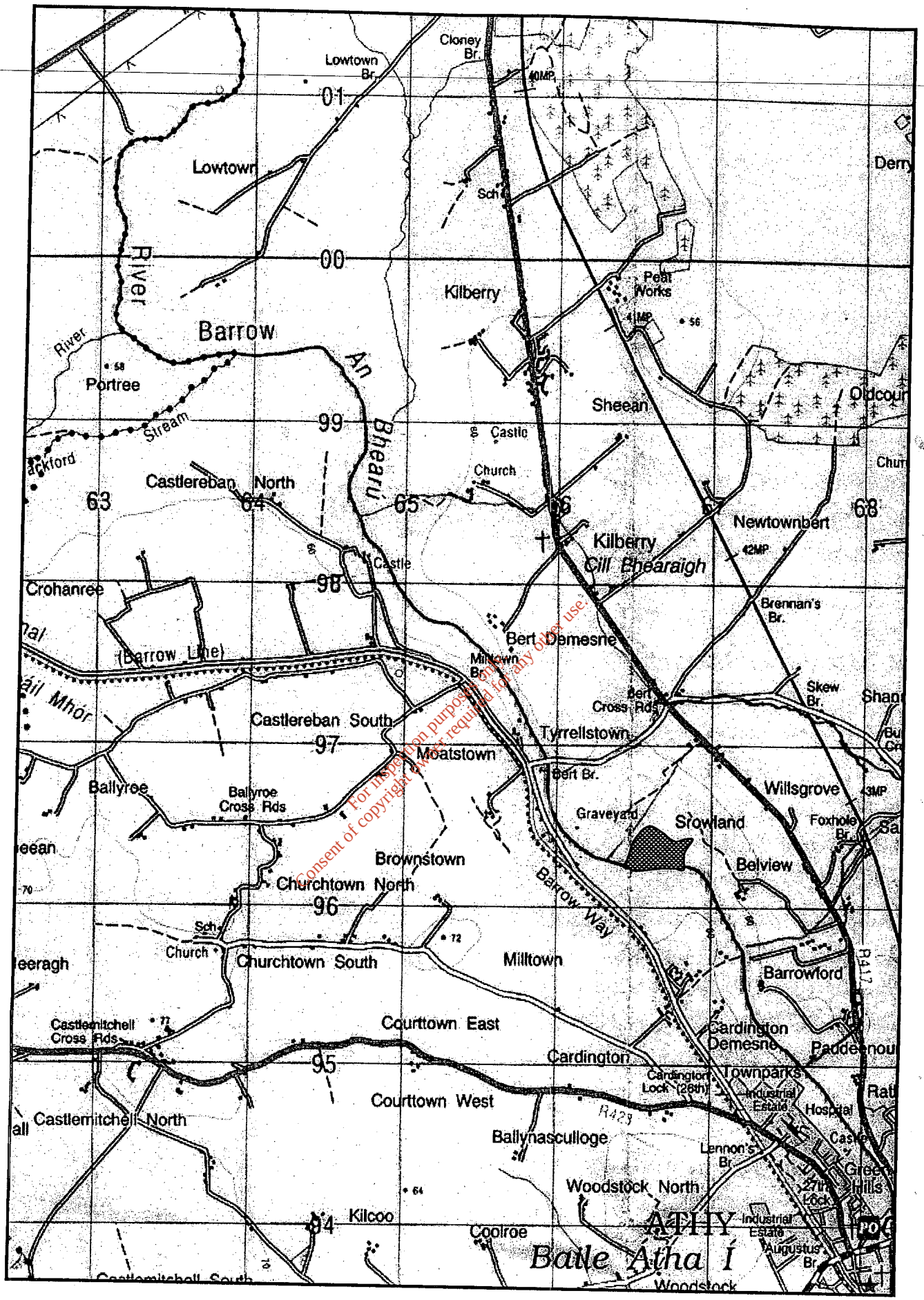


Figure 2 Site Location Map

An Bord Pleanála

Planning and Development Acts 2000-2002

Kildare County Council

APPLICATION by Kildare County Council for approval under section 175 of the Planning and Development Act, 2000 in accordance with plans and particulars, including an environmental impact statement, lodged with the Board on the 8th April, 2003.

PROPOSED DEVELOPMENT: Construction of facilities for the provision of public water supply entailing the transfer of water resources between river basins and comprising riverside intake chamber and pumping station, raw water storage reservoir, water treatment works and pumping station, site roads, hardstandings, parking and other ancillary facilities and an administration facility at Srowland, Athy, County Kildare.

DECISION

GRANT approval for the above proposed development in accordance with the said plans and particulars based on the reasons and considerations under and subject to the conditions set out below.

REASONS AND CONSIDERATIONS

Having regard to the current and projected public water supply demands in the county of Kildare and the Greater Dublin Region, to the conservation policies of Kildare County Council, to the provisions of the Kildare Water Strategy, of the Strategic Planning Guidelines for the Greater Dublin Area and of the current Kildare County Development Plan, it is considered that the proposal to abstract 40,000 cubic metres of water in any 24 hour continuous period from the River Barrow is reasonable and necessary and would be in accordance with the proper planning and sustainable development of the area and would not, subject to compliance with the conditions set out below, have significant adverse effects on the environment, including the proposed candidate Special Areas of Conservation of the River Barrow and the River Barrow Valley.

CONDITIONS

1. No water shall be abstracted at any time when the flow in the river is below 1.145 cubic metres per second. The volume of water abstracted at any other time shall be regulated to ensure that the abstraction does not cause the flow remaining in the river to fall below 1.145 cubic metres per second.

Reason: In the interest of protecting the navigation system of the River Barrow and to protect the ecological integrity of a proposed candidate Special Area of Conservation.

2. Construction works shall not be carried out in the River Barrow during the main upstream migration of lampreys (circa March to May).

Reason: To protect the ecological integrity of a proposed candidate Special Area of Conservation.

3. Vehicular access to the River Barrow channel shall be restricted to that necessary to allow for essential construction maintenance works.

Reason: To protect the ecological integrity of a proposed candidate Special Area of Conservation.

4. A monitoring programme for crayfish shall be formulated in consultation with the wildlife service of the Department of the Environment, Heritage and Local Government. Monitoring shall be carried out during construction works and for a minimum period of 1 year following commissioning of the water treatment works.

Reason: To protect the ecological integrity of a proposed candidate Special Area of Conservation.

5. Provision shall be made, in the development, for a continuous wildlife corridor along the bank of the River Barrow through the entire width of the water treatment works site.

Reason: To protect the ecological integrity of a proposed candidate Special Area of Conservation.

Member of An Bord Pleanála
duly authorised to authenticate
the seal of the Board.

Dated this day of 2003.

An Bord Pleanála

Board Direction

Ref: 09.EL2015

At a meeting held on 29th October, 2003, the Board considered:

(a) the objections made to the proposed development,

(b) the report of the Inspector, who held the oral hearing and

(c) the documents and submissions on file generally.

The Board decided to approve the proposed development with modifications, subject generally to the amendments shown in manuscript on the attached copy of the draft order.

Board Member _____ Date 30th October, 2003
Berna Grist

REPORT TO AN BORD PLEANALA

Re: Application by Kildare County Council to An Bord Pleanala under Section 8 of the Water Supplies Act 1942 for a Provisional Order for the Abstraction of a maximum of 40,000 cubic metres of water in any 24 hour continuous period from the River Barrow at Srowland Co Kildare made on 1 April 03 and

Application for Approval of the proposed development under Part X of the Planning and Development Act 2000, involving abstraction of water together with the construction of water treatment works in respect of which an EIS has been prepared, made on 7 April 03.

Board Refs: PL.09.PW2001 and 09.EL2015 respectively

REPORT OF

DOM HEGARTY BE Dip T & CP Chartered Town Planner and Civil Engineer

1 September 03

TABLE OF CONTENTS

Introduction

Kildare County Council, on 22 October 2001, made a proposal, under the Water Supplies Act 1942 for the taking of a supply of water (from the river Barrow) at Srowland, Athy Co Kildare. A Book of Reference of those persons likely to be affected was prepared and the persons concerned notified. On the 14 February 2003 a notice was published in a number of newspapers giving details of the proposal and giving information to the effect that "if any objection to the proposal is duly made and is not withdrawn, Kildare County Council will apply to the Board, under the Water Supplies Act 1942, and the Water Supplies Regulations 2000 for a provisional order declaring that the proposal may come into force". In the event 27 objections were made and not withdrawn.

The Council applied to the Board for approval of the Provisional Order on 1 April 2003.

The Council considered that an Environmental Impact Statement (EIS) was required. The EIS was prepared and an application for approval of the project, under Section 175 of the Planning and Development Act 2000, was submitted to the Board on 7 April 03.
.

A total of 15 submissions were received in relation to the EIS.

The Board, as required by legislation, arranged for an oral hearing into all matters relating to the Provisional Order and I was appointed to conduct it. The hearing took place in the Keadeen Hotel, Newbridge commencing on Tuesday 15 July 03.

I carried out an inspection of the site on Thursday 26 June 2003.

This report is in accordance with the warrant appointing me and reflects the proceedings of the oral hearing.

Description of Proposal

The oral hearing is in respect of the application by Kildare County Council for a Provisional Order in respect of the abstraction of a maximum of 40,000 cubic metres of water in any continuous 24 hour period from the River Barrow at Srowland, Co Kildare under Section 8 of the Water Supplies Act 1942. The estimated minimum quantity of water flowing past the proposed abstraction point in the summer during any continuous period not exceeding one day is 139,000 cubic metres per day.

The oral hearing is also in relation to the application for approval of the proposed abstraction scheme, together with construction of the allied water treatment works, in respect of which an EIS was prepared.

The proposed abstraction point is at Srowland, 5km north of Athy. The water treatment plant would adjoin the abstraction point and would incorporate storage bunds (constructed of earth embankments) for the equivalent of three days water supply.

It is likely that the treatment works would be procured as a PPP Contract in accordance with Government policy. This would involve a detailed design of the processes and building works by a successful tenderer, in accordance with the scale of development as outlined/considered in the EIS.

Written Grounds of Objection to the Scheme and Written Submissions in relation to the EIS

Kildare County Council (KCC) prepared and submitted to the Hearing a "Matrix of Objectors and Nature of Objections" – tabbed A attached -. I consider that this summarises effectively the objections/submissions received. They listed 16 categories. In terms of what might be considered the main issues, these were concerns with interference to navigation, effect on water quality/effect on fisheries and interference with Special Area of Conservation (SAC). Many of the objectors felt that the problems raised by the abstraction could be (even) worse than anticipated because there were other draw-downs in the catchment which were not being fully taken into account or were simply unknown. All of the written objections were responded to by the Authority and handed in to the Hearing. They comprise folders of objections and responses and submissions and responses.

The Hearing

Appearances

On behalf of Kildare County Council (KCC)

Tony Osborne, solicitor, legal representative for the Council
Ms Yvonne Scannell, BL
John Murphy, engineer, KCC
Pat Gallagher, Senior Planner, KCC
Jerry Cronin, engineer, Nicholas O'Dwyer, consulting engineers
James Oliver, ditto ditto
Michael Garrick, PJ Tobin & Co., consulting engineers
Conor Skehan, EIS Services Ltd
Brendan Allen, EIS Services Ltd
Niall Brady, Independent consultant
Ms Bridget Ginnity, ANV Technology
Paddy Ashe Independent consultant
Roger Goodwillie, EIS Services Ltd
John Browne, Fisheries consultant (representing Dr Martin Farrell, fisheries consultant)
Eugene Daly, Eugene Daly Associates

Objectors to Project

Canalways Ireland represented by Michael Hoey and Greg Casey
Roger Coleman (not present)
Hugh Cullen (not present – objection withdrawn – see letter on file – tabbed B)
Frank Dooley (ditto)
Ferrybank Management Co. (not present)
The Heritage Council (not present)
Michael Hoey
Kees Hoogeboom
Inland Waterways Association of Ireland – Vivian Cummins
Andrew Kavangh represented by Peter Sweetman
John Lynch (not present)
John McDonald (ditto)
Suzanne Nolan represented by Mr Phelan
Office of Public Works (indicated they would not be present/represented)
Declan O'Rourke
Percival Podger & Associates
Arnold and Georgina Poole
Quigleys Boat Hire represented by Michael Hoey
Trevor Shaw (not present)
Peter Sweetman
Tegral Building Products represented by Kevin McNair
John Timpson represented by Arnie Poole
Valley Boats represented by Michael Hoey

Submissions in relation to EIS
Michael Hoey
Suzanne Nolan
Andrew Kavanagh represented by Peter Sweetman
Canalways Ireland represented by Michael Hoey
Quigley Boat Hire represented by Michael Hoey
Inland Waterways Association of Ireland represented by Vivian Cummins
(Beatrice Kelly) The Heritage Council (not present)
Arnold and Ms Georgina Poole
(Ian Lumley) An Taisce represented by Peter Mr Sweetman
Duchas (not present)
Kees Heegeboom
Laois County Council (not present)
OPW (not present)
Barrow Navigation Group
Eileen O'Rourke
Percival Podger & Associates also stated to be representing Friends of the Curragh Environment limited
Tegral Building Products represented by Mr Kevin McNair
James Brown (late objector) representing himself and also represented by Dr Paul Johnston

PROCEEDINGS OF ORAL HEARING

At the outset I outlined how I intended to conduct the oral hearing. I would first ask the County Council to state their case in relation to the project as a whole, including the EIS, and present their evidence, after which I would hear the objectors and those making submissions in relation to the EIS.

Mr Peter Sweetman made a preliminary point that the River Barrow had now been designated a Special Area of Conservation (SAC), that the development contravened its provisions and that there was no point in proceeding further with the Hearing. I indicated that I would proceed as I had outlined.

County Council's Case

Some objections/submissions were made in the form of statements at the Hearing. A substantive part of the objections/submissions, however, were aired principally in the cross-examination of the Council's witnesses.

Mr Osborne, legal representative, "confirmed" that the procedures adopted were in accordance with the requirements of legislation.

Mr John Murphy, civil engineer and project manager of capital works in the Water Services Section of Kildare County Council (KCC) outlined the proposal and set it in context. (Copy of his submission is on file, tabbed C)

The proposal is to abstract 40 million litres per day (Ml/d) from the River Barrow. KCC had historically taken the major portion of its water supply (over 80%) from the River Liffey from water plants operated by Dublin City Council and Fingal County Council. A study in 1979 projected a demand in the county by year 2011 of 82 Ml/d, all of which would be supplied from the Dublin plant of Ballymore Eustace.

Notwithstanding the implementation of this strategy, the county had experienced shortages in 1990 and other shortfalls which required rationing for a short period in 1997 and 1999. That raised questions over the ability of the Liffey to be the main long-term sustainable source of water for the Greater Dublin Water Supply Area.

A further report was commissioned in the mid 90s to examine the water supply in the Greater Dublin region up to year 2016 and the likely sources for those amounts. It predicted that the requirements, *for the area served by the R Liffey at present in Co. Kildare*, would be 66 Ml/d by 2016. That requirement would have to be met by an active water conservation policy and the expansion of both the Dublin and Fingal plants. Alternative sources would have to be sought after that date. The report was updated in 2000 and it highlighted the urgent need to provide new sources. There was particular reference to the River Barrow, which it stated should be proceeded with as a matter of priority.

KCC, conscious of the supply limitations of the Liffey, decided that they required their own Strategy in order to ensure continuity and sufficiency of supply. That Strategy (report) was commissioned in 1997. It was required to contain an assessment

of needs up to year 2020 and as assessment of all existing and potential sources of water which could be used in meeting the demand identified. The report was presented to KCC in April 1999.

From a current demand of 57 Ml/d, the report projected a water demand in 2020 of 97.7 Ml/d. This would be met by reducing "leakage" in existing networks, by abstraction from the Liffey, the Barrow, groundwater and the Slaney. The report was forwarded to the Department of Environment and Local Government (DoELG). DoELG approved the Water Strategy in principle in November 1999. The Department also authorized KCC to:

1 Initiate a trial well drilling programme to prove reliability of groundwater yields and
2 prepare a proposal for a Water Abstraction Order under the 1942 Water Supplies Act for 40 Ml/d from the Barrow.

KCC commenced the trial drilling and embarked on the preparation of the Order. It was considered that the preparation of the Order also entailed the preparation of an EIS in that it was envisaged that water transfer in excess of 2,000 Ml/annum from the Barrow to other river basins could arise.

Mr Murphy clarified that DoELG's "approval in principle" meant that the management of the water supplies in the future would be on a phased basis. The Department approved of the overall approach to the management of water supplies in the future but they reserved the right to approve each individual project on its own.

In cross-examination, Mr Murphy stated that the Water Strategy (approved in principle in 1999 by DoELG), had not yet been amended. The Council were, however, currently working on a review. Any amendments to the Greater Dublin Strategy had not (yet) been incorporated in the Kildare strategy.

In answer to a an allegation that 52 Ml/d was proposed to be abstracted from the river and a mere 3 Ml/d returned via sewage works, Mr Murphy stated that what was at issue was the provision of a water supply for the year 2020. The EIS clearly defined numbers which showed the net inflows. Some flows would be discharged out of the catchment, the reason in fact for carrying out the EIS. The Council is aware that not all of the water they were going to take from the Barrow would be discharged back into the catchment in 2020. (Mr Garrick, also for the Council, stated that while it was difficult to forecast precisely the distribution of and timing of future population in the county, the towns of Kildare, Monasterevin, Kildangan, Kilberry and Athy itself would be the ultimate Barrow water users. The capacity of waste water treatment plants would be economically matched to the current demand for such capacity. When the water demand reached 40 Ml/d the waste water treatment plants would be similarly expanded to meet the increased demand. The Council have determined which water will be returned or not returned to the catchment by reference to the demand in each DED within the whole county of Kildare, being aware whether a particular DED was within the catchment or not).

Mr Pat Gallagher, Senior Planner with KCC, gave evidence in relation to relevant policies and objectives of the county plan, to relevant policies contained in the

Strategic Planning Guidelines for the Greater Dublin Area (SPGGDA) and to relevant policies as contained in the National Spatial Strategy 2002 (NSS). (Copy of his submission is on file – tabbed D)

The County Development Plan, in its overview section, noted that the county was the fastest growing in Ireland. It recognized the consequent growing demand for water in the county and the need to meet that demand, if development (particularly in south Kildare) was not to be restricted. Notwithstanding that, the 2001 County Housing Strategy's projections actually indicated populations well in excess of the 1999 Development Plan.

The Plan identified two regional water schemes and, in addition, stated that it was hoped within the period of the Plan to provide the South Regional Water Supply Scheme, which would meet the requirements of the rural areas as far south as a line from Grangemellon to Moone, as well as providing water to Athy Urban Dsitrict. The Council also recognized the special environmental, amenity, sporting and tourism value of the Liffey, was committed to its protection and *would promote the examination and adoption of alternative sources of water* supply to meet the additional needs of the county.

In relation to the Barrow itself, its valley is of great amenity and recreational value in the county and the region. The river has great tourist potential and is linked to the Grand Canal mainline system at Lowtown. Its main recreational use is for game and coarse fishing, picnicking and swimming. The river also has development potential for boating, canoeing and cruising as part of the Barrow Navigation System.

It is the Council's policy to exclude from this area any development which would be prejudicial to its natural beauty, amenity or recreational capacity. It was also a policy of the Council as expressed in the Development Plan that the minimum flow of water necessary for the conservation of the river's ecology would be identified by a study and it would be the Council's policy to maintain that flow.

It is the policy of the Council to pursue the establishment of the Barrow Valley as an SAAO area.

Mr Gallagher quoted a number of references from the SPGGDA, including the need for additional water supplies in the Hinterland of the area. Recommendations included that further studies should be undertaken of the Boyne and Barrow and (in a commentary on that recommendation) stated that additional water supplies were available in the GDA, especially in the Boyne and Barrow catchments.

Mr Gallagher's conclusions were that the County Plan contained policies and objectives facilitated the proposed development. He also felt that the population projections of the 1999 Plan were a significant under-estimation as were those of the 1999 SPGs. In that connection, the Housing Strategy were the most accurate projections and the most precise.

In his professional opinion, the proposed abstraction did not materially contravene the 1999 County Plan. The proposal was consistent with the SPGs and the underlying

policies of the NSS and otherwise in accordance with proper planning and sustainable development.

When asked if the proposal was in accordance with the policies and objectives of the County Development Plan, he reiterated that "the Development Plan contains policies and objectives that facilitate the proposed abstraction".

Mr Jerry Cronin, civil engineer and a Director of Nicholas O'Dwyer, consulting engineers, gave evidence on the need for the proposed development. (Copy of his submission is on file – tabbed E)

The proposal to abstract 40 million litres per day (40 Ml/d) – equal to 40,000 cubic metres per day - from the Barrow was one of the recommendations in the "Water Strategy for Co Kildare" submitted to KCC in March 99. Following the approval of the report and its recommendations by DoELG, his firm (in association with Patrick J Tobin & Co. Ltd) was engaged to prepare all necessary documentation associated with the application, under the 1942 Water Supplies Act, to abstract up to 40 Ml/d.

The Greater Dublin Water Supply Strategic Study (referred to earlier in the evidence of John Murphy) projected future peak demand to the design year 2021 within a range from 778 Ml/d to 900Ml/d, while the capacity of existing resources was limited to only 475.5 Ml/d. Taking the future potential of existing resources, it was projected that a new source or sources would have to be identified in the short-term to meet a minimum projected shortfall of 209.5 Ml/d. That strategy acknowledged that the proposed abstraction from the River Barrow was an essential element of the overall strategy and strongly supported its early implementation. The water strategy for the county, (also referred to earlier), completed in 1998 and submitted to Council in 1999, projected total demand for year 2020 at 93.7 Ml/d compared to, existing in 1999, 52 Ml/d.

The demand was predicated on maintaining losses to a low level over that period. KCC have established a well resourced water conservation team. While the team is responsible only for leakage control and management of part of that part of the county served from the Liffey, KCC are in the process of extending the responsibilities of the team to cover the entire county. The current level of Unaccounted for Water (UFW) is approximately 27%. It is intended that a target level of 20% will be achieved by 2005.

The water consumption of the past five years has followed closely the demand projections of the 1998 Strategy figures. The county is satisfied that a high level of confidence can be placed in those projections for future years.

The Strategy proposed that, from the four sources identified to meet Kildare's water demand of 93.7 Ml/d, the Barrow would contribute 31 Ml/d. When treatment losses are taken into account and a margin is provided to cover peak day requirements, the gross abstraction required from the Barrow amounts to 40 Ml/d. This is equivalent to approximately 29% of the 1 in 50 year drought flow – Dry Weather Flow (DWF). That is less that one third of the DWF at the proposed location, which is the maximum abstraction rate often set for "run of river" abstractions.

The Barrow water would be used to supply areas of south and mid Kildare, thereby reducing Kildare's dependence on the Liffey sources. The Barrow would provide approximately one third of the projected requirements for the county in the year 2020.

Mr Cronin confirmed that the flow in the river would be maintained at the minimum figure stated even if it meant that abstraction had to cease for a certain period.

Mr James Oliver, project engineer with Nicholas O'Dwyer, gave evidence in relation to the development itself (While Mr Oliver was available later to elaborate as required on the contents of his report his submission was read by Jerry Cronin. Copy of his submission is on file – tabbed F)

The water abstracted would flow through screens to an intake structure where it would be pumped to a raw water storage bund. The bunds would be constructed of earth embankments, whose external faces would be grassed. The internal surfaces would be lined with a suitable waterproof membrane. The capacity of the bund would be 120,000 cubic metres, the equivalent of three days storage at the maximum abstraction rate. Its purpose would be to provide suitable storage to protect the works against a serious pollution incident (upstream of the proposed abstraction plant) by allowing the stored raw water to be used until contamination water had passed the abstraction point.

Raw water would be supplied by gravity to a new treatment works, also on site. It was likely that this element of the scheme would be procured as a PPP Contract in accordance with Government policy. This would involve a detailed design of the processes and building works by a successful tenderer, in accordance with the scale of development as outlined/considered in the EIS.

Under the terms of the proposed Order, a minimum compensation flow downstream of the abstraction point of 99 Ml/d would be maintained. (The abstraction would cease, if necessary, if the flow in the river fell below that figure).

In accordance with the 1942 Act, a book of reference was prepared in order to include the particulars of persons who might be caused damage. These classes of persons included riparian landowners (down to the tidal limit at St Mullins – 68 km downstream), persons who operate hydroelectric generators, persons with fishing and/or sporting rights and commercial boat operators. A total of 27 Objectors made submissions in relation to the proposal. The authority made a detailed response to each objection. A copy of each objection and response was submitted to the Board - entitled Volume 1 (attached).

An EIS was considered to be required in that the scheme was felt to come within the category of infrastructure works for the transfer of water resources between river basins. A total of 15 submissions were received in relation to the proposal. The authority made a detailed response to each. A copy of each submission and response was submitted to the Board - entitled Volume 2 (attached).

Mr Michael Garrick, project hydrologist with Tobin consulting engineers, (copy of submission on file – tabbed G) stated that permission was being sought to abstract a *maximum* (my emphasis) of 40 Ml/d because:

- it was necessary to be able to refill the bunded storage, following its being drawn down, while simultaneously delivering the full 31 Ml/d to the treatment works at 2020.
- It was necessary to be able to meet any slight seasonality in the water demand, i.e. satisfy the peak week demand in a year, without drawing upon a full Off River Bunded Storage for this purpose.

Of the 40 Ml/d abstraction from the Barrow by 2020, it was expected that 20.9 Ml/d would be used *upstream* of the intake. The assessment is that approximately 10.1 Ml/d of that would be returned, as treated effluents, to the river, again upstream of the intake.

A further 7.6 Ml/d of the 10 Ml/d drawn from groundwater would be used in the upper catchment and will also contribute to effluent returns via drainage systems. A consultant hydrogeologist has determined that the groundwater abstraction itself will have no impact on baseflow in the river.

Against these returns, three sources of loss of water must be offset. The strategy envisages displacement of 3.9 Ml/d supplied at present from the Liffey catchment. Secondly, increased boat traffic on the Barrow branch of the Grand Canal will result in additional water being drawn (around the intake) at Srowland. This is not lost to the Barrow, merely for a short distance around the intake point itself. Additional traffic on the Grand Canal itself will take water from the system permanently. The net return to the catchment, however, is still likely to be 9.6 Ml/d.

Once equilibrium is reached between abstractions and returns, then on average, once in 50 years, when the proposed abstraction of 40 Ml/d leaves the river, 99 Ml/d will remain immediately downstream of the abstraction point. The gross abstraction of 40 Ml/d is therefore equivalent to a net abstraction of 30.6 Ml/d when returns are taken into account.

The gauging station commissioned and calibrated by the EPA at the intake in 2002 will be used in future to record the flow in the river at the intake, continuously, and independently available for inspection by any interested party.

Assessment of Dry Weather Flow

The hydrometric section of the Office of Public Works have maintained a number of flow gauging stations on this stretch of the river, between Monasterevin and Bagenalstown, for up to 60 years in some cases. Of these, Monasterevin was opened in 1941 and Levitstown Lock, 8.5 km south of the proposed intake, has existed since 1954. The data sets currently available from this station are:

- Digitized water level record for the 28 years 1972 to 2000
- Processed mean daily flow values from 1954 to 2000 and
- Current meter flow measurements taken during the years 1954 to 1996, a total of 145 measurements.

The current meter measurements include a water level and a corresponding flow value in cubic metres per second obtained by calculation from current meter measurements.

A probability plot of the annual minimum flows has been used to make low flow predictions. The Dry Weather Flow at Levittstown, quoted by EPA in their publications, is 1.7 cubic metres per second (cumecs). That matches the prediction arrived at in this study and is the figure used at Levittstown for water supply purposes. Because the proposed intake site lies upstream of Levittstown, so flow estimates based on those figures need to be adjusted. The adjusted figure was arrived at by a combination of adjusting pro rata for catchment area and by correlating the measurements with adjacent gauging stations. The catchment area above the intake is 1540 sq.km and is therefore 129 sq.km less than the area serving Levittstown Lock which is approximately 1660 sq.km. The smaller area reduces the estimated DWF from 1.7 cumecs to 1.56.

The other approach calculates flows derived from the gauge at Pass Bridge Monasterevin and that at Bert Bridge *just upstream of the intake*. These were tabulated in their relationship with the intake itself and Levitstown. It was shown at Table 10.6 of the EIS that low flow at Bert Bridge is well estimated as a multiple of 1.573 times the flow at Pass Bridge. The DWF at Pass Bridge is not less that 1 cumec. This would place an estimate of the DWF at Bert Bridge of 1.50-1.58 cumecs. It would have been similar if not marginally higher at the intake, one kilometer downstream.

This approach to the assessment therefore supports a conservative estimate of 1.5 cu mecs for the DWF at the proposed intake.

Low Flow Duration

If traditionally a hydroelectric generating station was obliged at certain times to interrupt generation due to the features of its intake, or due to informal arrangements with others, the flow-duration curve establishes that this is likely to occur for 5 days longer in an average year as a result of the proposed abstraction..

Off river bunded storage

While the bund is designed primarily to protect against the risk of a pollution incident upstream, it could nevertheless be used to curtail abstraction in the very driest week in a drought period. The abstraction rate from the river could be curtailed to 0.3 cu m/s while drawing 0.463 from storage, and using the storage to sustain the difference for 7 days. This would have to be balanced, as a matter of risk, against the chances of a pollution incident occurring in the same period.

Gauge at intake site

This station has been continuously recording since July 2002. The lowest flow recorded, at the end of the dry spell in September 2002, was 3.95 cumecs ("design" DWF 1.5 cumecs).

Navigation

The River Barrow has been an important navigation waterway for more than 200 years. It is an engineered waterway, using weirs and locks to establish the necessary draft. It is possible to navigate from the tidal limits at St Mullins to Athy, and to travel upstream of Athy off the main channel via the Barrow branch of the Grand Canal. Each weir serves to maintain a backwatered pool upstream, and it is this pool that provides the available draft, between bed and water level, for boat traffic travelling to the upstream lock. Boats and barges must be able to cross the cill of the lock upstream. The water surface upstream of the weir would be horizontal if there were no flow in the river. Otherwise, the water surface forms a backwater profile from the weir, extending upstream to the next control feature, and the shape of that backwater profile is characteristic of the flow and of the channel shape and gradient.

As a navigation waterway, the river already presents difficulties in terms of available draft in some sections in dry weather. Consultations have place with various organizations to define areas along the navigation channel where historically there have been difficulties with available draft, compared to the declared minimum draft of 760mm quoted by Waterways Ireland in the published guidebook for boat users on the Barrow. Inspections were carried out along the length of the river when flows were about the 90 Percentile value along the river. Overall the surveys confirmed that the problem areas were for the most part symptomatic of a need for maintenance. Extensive survey work has not encountered what might be called a structural high bed feature, other than:

- An area of locally diminished draft at the Cork-Dublin gas pipeline crossing of the Barrow and
- At the lower cill at the entrance to Bagenalstown Lock which is unusually high.

The entire navigation system from the proposed intake to the tidal limit has been surveyed by depth sonar. Each lock and weir has been surveyed as to cill levels upstream and downstream. (The actual details are in the written submission). In every case, the weir level is higher than the downstream cill of the next upstream lock, and so the backwater curve from the weir cannot fail to extend upstream to the next lock. The Bagenalstown lock downstream cill, at *only* 0.51m below the Fennis court Weir, has least to spare in this respect, hence the difficulties experienced there.

The available draft for navigation, has been examined for navigation by modelling the back water profile for each weir (actual details in submission) both with, and without, the proposed abstraction of 40 Ml/d and under a number of different flow conditions viz:

- The driest week in an average summer
- The 95 percentile flow and
- The once-in-50-year Dry Weather Flow

Assuming a uniform flow over the full crest width, under present conditions and without considering the water supply abstraction, the 50 year drought low creates depths of the order of 31mm to 77mm over most of the weirs, Bestfield being an exception at 89mm due to its shorter length.

In the post works regime, at the one-in-50-year drought severity, the reduction in depth at weirs, compared to the present position, varies from 10mm at Bestfield (the weir with greatest depth) *to 5mm to6mm everywhere else.*

In terms of impacts on water levels at the lock gates, the lower cill of each lock is backwatered by the controlling weir downstream, because in each case the weir crest level is higher than the level of the lower cill upstream. The estimated average maximum change in water level above (named) weirs at times of low flow as a result of the proposed abstraction would be of the order of 13mm (approximately half and inch).

As to mitigation measures, if an amount of silt were removed from the bed of the river, equal to the marginal amount by which the water surface level were reduced by the abstraction, then the available draft (and difficulties) would *remain* the same afterwards as before. Instead, it is proposed to address and resolve the substantial problems that *exist* at Bagenalstown Lock and the gas pipeline crossing point. In other words, to lower the Lock floor and downstream cill to allow unimpeded navigation to take place and, similarly, in respect of the gas crossing, to remove the surplus backfilled material there and to lower the bad of the channel to a level that will not impede navigation. The betterment delivered by carrying out those works (more than) equals the value of the dredging works to skim an impractically small amount all along the navigation. (Mr Garrick included in his submission a glossary of the terms used in his statement).

In cross-examination, Mr Garrick denied that KCC needed to know when and how the flows from the Barrow catchment bogs particularly affected the flow in the river. The river gauging stations record the effects of what happened all along the river over the years. Whatever happened in the bogs, or anywhere else in the catchment, the effects travel downstream and are fully recorded at the gauging station.

The difference between the level of the top of the gas pipe crossing the Barrow and the bottom of the river is of the order of 2.5m. He understood that there was a concrete surround on the pipe. With the permission of Bord Gais, KCC proposed to take the bed of the river, over the gas pipeline, down by an amount that Waterways Ireland, the navigation authority, would direct them to, of the order of 300mm. That would be KCC's estimate of what was necessary to remove as a navigation obstruction. Consultations have taken place with the Bord Gais. The mitigation measures KCC are obliged to take at that location amount to (only) 20mm. KCC propose a more expansive reduction at that location (300mm) so as to decisively remove it as a navigation impediment.

Mr Garrick agreed that permission had been granted for the abstraction of 13.2 Ml/d from the groundwater in the Barrow catchment. This could/would be abstracted in dry weather and wet weather. He also agreed that if that water was subsequently exported out of the catchment it would not be available to the Barrow. In calculating which catchment the abstracted water would be returned to, the water was assigned to DEDs on the basis of the Kildare Water Strategy and those within each catchment were calculating as draining to those catchments. The Strategic Planning Guidelines (SPGs), although account was had of them, were not used as the basis of population projection.

Mr Garrick stated that the estimated loss of (Liffey) water, when switching from Ballymore Eustace to using Barrow water, would be 3.9 Ml/d.

The Levittstown guage is net of any evaporation or trans-evaporation of anything upstream (This was in reply to a statement by **Mr Sweetman** that KCC were giving guarantees in relation to water in the Barrow that they would not be able to deliver on. They had not looked at the big picture. They had not looked at the likely changes taking place upstream such as the changes in the extensive bog system, evaporation from the major forestry in the area and water used in dairy farms). Mr Garrick stated that as far as the future was concerned, the Council were guaranteeing a minimum compensation flow.

(Mr Sweetman inquired as to the extent of the works involved in the vicinity of the gas pipeline crossing. Since the river had now been designated a Special Area of Conservation (SAC) such works might be held to contravene the provisions attaching to the SAC. In any event such works would not be permissible in the vicinity of the pipeline without the permission of Bord Gais and without turning off the mains gas supply which would not be forthcoming. The whole development is in fact proposed in an SAC, i.e. the abstraction of water from an SAC and now part of the treatment works site is also within an SAC).

Mr Conor Skehan, EIA, Landscape and Soils consultant, gave evidence on the EIS and its preparation (While Mr Skehan was available later to elaborate as required on the contents of his report, his submission was read by Brendan Allen. Copy of his submission is on file - tabbed H).

The EIS was prepared on the basis of an initial scoping document and extensive consultation. The evaluation is based upon a schematic design due to the nature of the public procurement process. Sufficient certainty exists, however, about the general location, character and scale of the proposed development to constitute a sufficient basis for evaluation.

The principal aspects of the project that have potential to affect the appearance of the **landscape** are:

- The administration, filter gallery and chemical buildings
- The raw water pumping station and intake structures and
- The sludge de-watering building.

Other lower and less prominent structures such as tanks, embankments, fences, roads and items of plant have significantly less potential to cause visual impacts.

The area comprises flat fertile intensively managed farmland which is very uniform except in the immediate vicinity of the river where there are more extensive areas of natural vegetation. The Grand Canal and the Barrow Way are two tourism resources of regional significance that occur to the west of the site. A local road parallels the Canal and has intermittent views towards the site. There are low densities of houses in the vicinity.

In terms of impacts, the upper portions of the administration gallery and dewatering building will be visually prominent and distinctive features in the local landscape particularly along the axis of the river and from places within the environs of the canal. The pumping station and intake structure will be prominent and highly contrasting when seen from the river and its immediate environs but the effects will be highly localized. The appearance and character of the complex will cause a change in the undeveloped rural character of the area. (In cross-examination he later explained that, while the initial works would create a "contrasting character", when planting took place the impact would be lessened).

The principal aspects of the project that have potential to affect the **soils** of the area are that there would be excavation of 60-80,00 cubic metres of soil, 30-40,000 cubic metres of fill and disturbance of other soils by compaction, surcharging and mobilization.

The construction and design shall be arranged to anticipate, avoid or minimize impacts arising from works to soil.

In cross-examination, Mr Skehan stated that the alternatives considered in this EIS, were the locations at which the abstraction might take place, not the alternative sources of supply which were the subject of the Kildare Water Strategy. The Kilberry site was questionable in archaeological terms because of its proximity to the upstanding remains of a Catholic church in an old abbey. Srowland, the site chosen, was close to a ringfort but that was considered to be a lower degree of importance and unlikely to be interfered with by the project.

In answer to a question of Mr Sweetman as to whether it was not a requirement of the Habitats Directive that a development of this sort could only be carried out where there was no alternative, Mr Skehan replied that it was one of the considerations but it was not the only consideration. The general thrust of the Directive was that if the development were to damage the SAC, the impact would have to be reduced to residual levels. (Mr Sweetman stated that Article 6 did not say that).

Mr Skehan, quoting from Paragraph 6.4.1 of the EIS stated that "the Barrow Valley has been surveyed for designation as a Special Area of Conservation because of its importance for otter, salmon and other fish species but the landward parts of the site have no such status, but as yet have not been submitted to Brussels. Similarly, they do not contain any special habitats or species in terms of the EU Habitats Directive (92/43/EEC), Birds Directive (79/409/EEC) or National legislation. (In reply to an allegation that the EIS is "fundamentally flawed" in that it does not acknowledge that the site is in fact a candidate SAC), Mr Skehan stated that "being surveyed for designation" was about as clear a description of the state of affairs as obtained at the time of being prepared. (Mr Sweetman referred at the Hearing to the Duchas map entitled "Proposed Candidate Special Area of Conservation" date 10 January 03. He stated that the actual (abstraction and treatment works) site had been surveyed and a map produced by Duchas. The SAC status of the area which included part of the abstraction site was advertised on 4 June last. A candidate site under the Directive has full qualification from the date it is advertised/notified).

In relation to a concern expressed by Mr Sweetman about mitigating the construction effects of the development e.g. run off from the construction site into the river, Mr Skehan stated that where the precise mitigation measure was not in the gift of the person writing the EIS, it was generally regarded as better practice to write these more loose fitting but robust terms that allowed for almost every eventuality to be provided for in the contractors final method statement.

Mr Brendan Allen, consultant, gave evidence on the human being and material assets impacts of the project (copy of his submission is on file - tabbed J).

His evidence in relation to human beings is that significant impacts are not likely and that the predicted impacts are generally positive. On the other hand, in the event of the water abstraction not taking place, population and economic growth are likely to be curtailed.

In relation to material assets, the principal impacts are considered to be increased traffic volumes to and from the abstraction site both during construction and operation. Loadings will be well within the carrying capacity of road and therefore no adverse impacts are anticipated and no mitigation measures are required.

Dr Niall Brady, archaeological consultant, gave evidence in relation to possible archaeological impacts (copy of his submission is on file - tabbed K).

There would be no impact on known features of interest at the site. Artefacts of interest were recovered during dredging works in the river in the late 1920s. There is a site of possible interest adjacent to but outside the works area.

It is recommended that underwater assessment and/or investigation of the riverbed be undertaken prior to construction. Monitoring across the development site is recommended during construction. (The Council confirmed that they would be acting on Dr Brady's recommendations).

The proposed development will not impact on archaeological features downstream of the abstraction location.

In cross-examination, Dr Brady stated that the mitigation measures for site KE 35001 was avoidance. The site is within 20m of the proposed development. It is a monument under the National Monuments Act, an earthen structure. The mitigation proposals within the development area concern the monitoring of the top soil strip that would be the initial stage. If as a result it is suspected that there is material of archaeological significance, there would be a strong recommendation for a full archaeological exercise to be carried out. There is no suggestion at this stage that the site extends beyond the perimeter defined by the State authorities.

Dr Brady confirmed the existence of monuments relevant to the location of alternative abstraction points in three locations. His examination of the river focused only on the three alternative abstraction points.

Ms Bridget Ginnity , consultant, gave evidence in relation to noise impacts (copy of her submission is on file tabbed L).

The predicted operation noise level at 28 to 30dB(A) at the nearest houses is well below the EPA guideline noise limits of 45dB(A) at night-time. No mitigation measures during plant operation are required.

There may be a small noise impact during construction but it is considered to be acceptable. Construction traffic noise would result in a slight increase on existing traffic noise levels but is of negligible impact.

Dr Patrick Ashe, consultant, gave evidence in relation to aquatic flora and fauna (copy of his submission is on file tabbed M).

The most significant invertebrate discovery is the presence of freshwater crayfish. In Annex II of the Habitats Directive is a list of "Animal (excluding birds) and plant species of Community interest whose conservation requires the designation of Special Areas of Conservation". The crayfish is the only one found in the river that is on the list and it is widely distributed in the River Barrow and in many of its tributaries.

Due to the fact that the typical section of the river is **U**-shaped in cross-sectional profile and deep at the margin, the projected drop in water level between 4mm and 36mm at DWF downstream of the proposed abstraction point will have no significant impact on the freshwater invertebrate fauna and will not cause any significant mortality. Duchas made a submission to the Board in April last. They did not object to the development but made a number of recommendations which KCC agreed to implement. These were that vehicular access to the river channel be kept to an absolute minimum, there be no disturbance to the river during the main upstream migration of lampreys and that an agreed (short-term) monitoring programme be set up for crayfish.

In cross-examination, after some discussion on which actual areas of the site came under the SAC legislation and when, Dr Ashe confirmed, regardless of the extent of the area of SAC, his recommendations that there would no significant impacts on aquatic fauna as a result of this development (including the crayfish). He referred to a statement earlier in the Hearing that in the normal course, there could be a fluctuation in level in the river of up to half a metre (500mm) in a matter of hours. To put the proposed development in perspective, the one in 50 years event Dry Weather Flow will only lower the level between 4mm and 36mm! Apart from the small variation in flow, the Barrow is basically a man-modified river, U-shaped in cross sectional profile. There are no margins to be exposed at low water unlike a normal river which would essentially be a very flattened V-shape.

Mr John Browne, fisheries consultant, read a submission on behalf of a fellow consultant **Dr Martin O'Farrell.** Mr Browne indicated that he was familiar with the development and would be prepared to respond to questions (copy of the submission is on file tabbed N).

The river, at the site of the proposed abstraction is a relatively slow flowing channel about 25m wide and with a depth range of 1 to 3m. It would typically be described as a cyprinid zone (an area more suitable for the rearing and production of coarse fish) though this reach would also be expected to support some salmonids and a variety of coarse fish species. The reach is not a salmonid spawning area but migratory salmonids would be expected to pass upstream and downstream past the proposed abstraction site during their journeys to and from the sea.

The proposed abstraction has the potential to impinge small fish and other macro-invertebrates on the intake screens. The intake screen design actually allows for a water intake velocity which is significantly lower than that recommended by the fisheries authorities in relation to the protection of juvenile salmonids. Provided water intake velocities are kept low, less that 0.3 metres per second, it is unlikely that freshwater fish species will be impinged and/or entrained.

A second potential impact of any abstraction from a watercourse is the possibility that the upstream migration of migratory species e.g. Atlantic salmon might be affected. The abstraction will only affect river flow (downstream) during extremely low flows which may occur during severe drought conditions. Adult salmonids do **not** migrate during periods of low flow and therefore their upstream migration will not be affected. The abstraction will have no significant effect during the relatively high river flows used by ascending salmonids.

A third potential impact is the possibility that the channel may be unsuitable for fish/fishing during extremely low flows which may occur during severe drought conditions. "The nature of the reach immediately downstream of the proposed abstraction point is such that the effect on water surface levels will be negligible (a drop of c.25mm in downstream water levels) ----". Thus the same area of wetted habitat will be available to resident fish population upstream and downstream of the proposed abstraction point during periods of low flow.

Concerns have been raised on the possible effects on water quality. In Irish waters, fish kills associated with periods of low flow in rivers and incidents of pollution have been common in the past. However, fish kills associated with drought conditions/high water temperatures/low oxygen levels at *night-time* have not been recorded. This has been attributed to the ability of fish to swim to more favorable reaches of a river when a particular location proved unfavourable to a particular species.

The proposed scheme will not have a significant impact on fisheries and it was his (Dr Farrell's) understanding that the statutory fisheries authorities mandated with the protection and maintenance of fisheries on the Barrow are in agreement with this view.

He noted Dr Paul Johnston (fishery expert for Mr Jim Brown)'s statement that salmon did not travel in times of low flow (which was his own position as well). In terms of how many "dry" days per annum when the fish would not move it was difficult to be categorical because it was different each year. If one took the 95 percentile flow as the threshold, then the average would be about 18 days. The central point is that the fish will eventually be able to get up and therefore *there will be no change in the existing situation* (my emphasis).

Mr Browne agreed that yes it would be one of the more important management aspects of salmon on the Barrow to have the fish passes in working order.

Mr Browne stated that there had been a general reduction in salmon stocks and the Barrow was no different in that respect from other rivers. It was a difficult river, however, because of the weirs. So at times when salmon were not surviving well at sea and because there was a fairly large drift net fishery, rivers like the Barrow would be severely hit. There will be no effect from the project.

Mr Eugene Daly, hydrogeology and geology consultant, gave evidence in relation to impacts on water quality (copy of his submission is on file tabbed O).

The results of monitoring for the river stretch immediately upstream and downstream of Srowland indicates that there has been an overall improvement in water quality in the most recent survey period 1998-2002. The improvement is most likely due to the new wastewater treatment plant at Athy, a reduction in phosphorus losses to water from agriculture and greater awareness and enforcement of regulations and licences.

Substantial waste loads are discharged to the Barrow system from both point sources (mainly sewage) and diffuse sources (farmyard, land runoff and septic tank effluent). A higher proportion of the total waste load appears to be discharged below the proposed abstraction point. The data on discharge and pollution loads suggest that point sources are the main sources of BOD and ortho-phosphate . These sources are generally more easily controlled and the benefits of the expenditure of resources are rapidly apparent.

Measures such as expenditure on wastewater treatment plants being undertaken currently, and in the future, to implement the provision of the Urban Wastewater Directives/Regulations and the Phosphorus Regulations are likely to lead to a combined long term reduction in point source discharges for BOD and ortho-phosphate of the order of 15% and 66%, respectively, for the catchment down to Royal Oak.

At the predicted median BOD levels, the reduction in river flow will result in a small decrease in the waste assimilation capacity (WAC) of the river down as far as Royal Oak. However, the expected improvement in water quality resulting from the implementation of Directives, will more that compensate for the small reduction in flow. The proposed upgrading of a number of treatment plants e.g. Kildare and Monasterevin will result in a significant improvement in the water quality of the river in the short term.

The general improvement in water quality and the increase in the WAC of long river stretches will permit additional beneficial uses to be made of the river. Abstraction for public water supply is a beneficial use of river waters.

As the impact of the proposed abstraction on river water quality in the future will be imperceptible, the proposed development will have no material influence on either the range of measures required, or on the effectiveness of these measures, in achieving the target water quality set out in the Phosphorus Regulations. Compliance with the

aforementioned Directives will achieve the improvement in water quality outlined above and no further mitigation measures will be required.

In cross-examination, Mr Daly stated that the flow in a river would be completely ground-water flow if there had been no rainfall in the previous 48 hours.

He did not examine the effects particularly of the extensive bogs upstream on water quality. His assessment was a summation of the total environmental baseline of the catchment and the human impact on that catchment.

Mr Roger Goodwillie, a Director of EIS Ltd, gave evidence in relation to terrestrial flora and fauna (copy of his submission is on file – tabbed P)

The site of the works is typical riverside farmland used for grass and tillage and of little ecological value.

The Barrow valley has been surveyed for designation as a Special Area of Conservation. It has the status of a proposed candidate SAC. It has been chosen because of its importance for otter, salmon, other fish species and the freshwater crayfish. The landward part, where the buildings are proposed, does not contain any special habitats or species in terms of the Habitats Directive, the Birds Directive or National legislation.

In summary, the project will not have a significant impact on the terrestrial flora and fauna either locally or downstream of the proposed abstraction point. There are no sensitive marginal communities nearby where water levels are a critical factor. All are adapted to wide variations in river flow.

In cross-examination, Mr Goodwillie agreed that both the river at Borris and at the abstraction point were candidate SACs and as such entitled to the full protection of the Directive. He stated, however, that this development had no significant effect on the SAC.

He did not know exactly how much of the abstraction site was within the SAC.

Council's response to written objections/submissions

The Council had prepared two booklets, viz. responses to the objections to the scheme and responses to the submissions made in relation to the EIS. As a forward to these booklets, the Council have prepared a matrix (already referred to in my introduction) of the objectors and the nature of the objections. The first column on the left of the matrix identifies all of the objectors. The second and third columns indicate whether the objection is to the proposal itself or to the EIS.

(While the parties present were content (eventually) to take the detailed responses as read and for the Council to just summarise their responses to the objections/ submissions, I felt that it would be advisable for the Council to give to the Hearing a shortened version of their responses to those parties who did not attend the Hearing. Their response to those parties at the Hearing would come about during the Hearing itself. Most of the responses are contained within the general case made by the

Council so I propose only to refer to them where there is something in particular that will not be picked elsewhere).

The Council do not feel that the abstraction by Mr **Frank Dooley** of 5760 cu m/d will be affected by a drop in level of 30mm during the driest week of summer. They note that this water is essentially for cooling water purposes only and would be returned to the river further down.

KCC are encouraged by the fact that the **Heritage Council** does not object to the proposal in principle. There is no question of any lack of consideration given to the wider impact of the proposal on the entire catchment. KCC consulted widely. Before (even) research work was commenced, KCC began with a formal briefing of their intentions to the Barrow Steering Group, "taking advantage of one of their quarterly meetings to reach the widest possible number of organised, interested groups". KCC (also) did consider the abstraction within the context of a framework for managing the whole catchment and the future demands of the eastern region.

In relation to the submission of **Carlow Tourism** it is important to realise that reducing a flow by any particular percentage does not bring with it a proportionate reduction in available depth or draft. There is no question of ever reducing available depths in the river by 29%. This fear arises possibly from some misunderstanding related to flows, as distinct from water levels.

KCC have no problem with the recommendations in the **Duchas** submission. These refer to minimising vehicular traffic and other disturbance in the river channel and to the suggestion that an agreed monitoring programme be set up for crayfish for the duration of the construction works and one year beyond.

One of the concerns of **Mr Andrew Kavanagh** is that abstraction will impact on the SAC at Borris. The EIS recognised that the river and the river valley was a candidate SAC. The Board are charged with ensuring that the requirements of the Habitats Directive with respect to SACs and proposed SACs are met when dealing with an application for consent under Part X of the Planning and Development Act 2000.

The discharges from **Laois County Council's** wastewater treatment plants (existing and proposed) were fully taken into account in the design of the scheme.

Mr J McDonald's riparian rights to abstract water for agricultural use would not be affected by the proposal. Any proposal of his, however, to develop his lands for industrial purposes would require planning permission and if a supply of water were required it would be part of the planning assessment.

KCC have satisfied themselves that the proposed site has sufficient protection against flooding and that the proposed works will not increase the risk of flooding at this or other locations. (This was a concern of **OPW**)

Objectors to the Scheme and Submissions in relation to EIS

Dr Paul Johnston, fisheries consultant, and appearing on behalf of **Jim Brown, Arnold Poole and Ms Trudi Hoogboom** stated that his clients had a number of concerns in relation to a range of environmental issues with regard to protected species and related fisheries issues. (Copy of his submission is on file – tabbed R)

The river valley was designated as an SAC along with the river Nore in 1998 and had recently been extended to cover the whole catchment. The site is very important for the presence of a number of (specified) EU Habitats Directive Annexe II species. Planning authorities are required to ensure that development in their area do not cause any significant adverse effect on the integrity of SACs, and they are required, as well, to incorporate designated sites into their Development Plans. Permission of the Minister for the Environment and Local Government is required before any individual including a developer can proceed with particular activities in an SAC. (Dr Johnston confirmed that he was not suggesting that the permission had been overlooked, but was merely drawing attention to it). These actions include extraction of water for irrigation or other purposes and alteration of the banks, channel, bed or flow of the river. It is not clear from the EIS how the developers intend to address the issue of SAC status.

Salmon is one of the species that should receive special attention. The river has already been considerably modified by man through the construction of a number of weirs and locks. A British study on the relationship between salmon migration and river flows, carried out over a ten year period has been cited as a guideline in assessing what the "threshold" flow may be for salmon in the Barrow. The threshold flow is fully defined in the EIS but may be summarised as the flow below which the upstream migration of salmon is inhibited and above which it is stimulated. By extrapolation it is suggested that the threshold flow probably approximates to the Q95 figure. Nevertheless, others note that "migration past weirs and obstructions is likely to be truly flow-dependent to a greater extent than movement in the open river". The Barrow has over 20 weirs with associated fish passes in most cases between St. Mullins and Athy. Upstream progress of fish appeared to be dependent upon progressively greater relative flows as the fish proceed further upstream. While the impact of reduced flows in most cases represents only a delay in migration, nevertheless, fish delayed near spawning time may not have the opportunity to reach the optimal spawning grounds. A number of mitigation measures are suggested:

- Would it be feasible to supplement the abstraction by utilising water from other sources so that demand on the Barrow could be reduced?
- A minimum prescribed flow below which abstraction must not take place. It is noted that such an assurance has been given
- Storage of water in a more substantial facility could reduce the demand during dry periods
- More substantial storage capacity would ensure that the threshold flows were maintained during the critical period when salmon were running.
- Diurnal modulation to stop abstraction at night during the critical period when fish are most likely to be moving upstream

- Locating the abstraction point downstream would reduce the potential for any impacts on migration.
- A detailed survey of the existing fish pass structures at each weir could be implemented
- The Barrow is the only river in Ireland with a significant stock of Twaite shad. While the impact of the proposed abstraction on the upstream migration of shad is not known and may not be significant, nevertheless, in view of its threatened status and local importance, any possibility of a potential impact should not be overlooked.

Dr Johnston agreed (with the Council) that the Barrow was largely a coarse fishery but there were significant trout and salmon fisheries in the system. The measures he suggested could help in mitigating any effects of the abstraction. He also stated that the bulk of the salmon moved in the river in the dry months of June, July and August. While the bulk of migration is up river in the summer, the dry season, the migration tends to take place (only) during raised water conditions within that period. In a drought situation the fish simply will not (be able to) move.

In a response the Dr Johnston's submissions on behalf of Mr **Jim** Brown, Mr **John** Browne on behalf of the Council, stated that the impact on fish species was not an area of concern. Dr Johnston's observations were more in the nature of general statements rather than objections *per se.* With regard to crayfish and lamprey, the Council had given a commitment to implement the recommendations in the submission of Duchas. There would be no vehicular traffic in the river channel or it would be kept to an absolute minimum. There would be no disturbance to the river during the upstream migration of the lamprey i.e. March to May. An agreed programme for crayfish, survey and monitoring would be set up.

It is true that weirs do have an adverse effect on the salmon population and in an ideal situation they shouldn't be there. Nevertheless, they are a fact of life. The lamprey will not be affected. They are migratory and will only pass by the area. In relation to fish being delayed near spawning time and not having the opportunity to reach the optimal spawning grounds, it is highly unlikely that at or near the spawning time there will be a shortage of water i.e. November to January.

Mr Jim Brown himself, questioned the lack of water conservation policies locally and nationally. He could not understand how the Authority would settle for a water loss of 20% in a new installation.

He stated that he had two rated fisheries which were not mentioned in the Book of Reference. He feels that they should (have) been.

He considered that a mitigating factor in relation to the abstraction would be that KCC, together with Waterways Ireland, fund a review of and overhaul of the fish passes which have fallen into disrepair. While Waterways Ireland are responsible for the upkeep of the canals, the care of the fish passes seems to be a grey area. Provision might also be made for a fish counter which would be beneficial to the monitoring of the fish situation in the river.

He disagreed with using the once in 50 years as the basis for working out the compensation water. He felt that the 95 percentile flow should be design minimum, below which KCC would not abstract.

(In answer to Mr Brown, it was confirmed that the provisions of the (Water) Framework Directive would be taken into account in the review, now underway, of the County Development Plan.

Mr Brown, in conclusion, felt that a review in either three years or five years was essential. He also felt that there was no policy for reducing consumption and not policy on recycling and those are something that have to be addressed by a future County Council.

Arnie Poole is manager of Valley Boats in Graiguenamanagh. He has been using the Barrow navigation since 1980 and is therefore speaking from experience.

It is generally accepted by users of the navigation that during the summer months the depth of the water in the channel is lower than it might be. Mr Pole's main point of contention is the figure, 750mm, the Council have used as the minimum draft requirement for navigation. Presumably, this figure was taken from the Barrow Navigation Guide. That figure was inaccurate and the actual figure should have been 760mm.

The Guide is only a guide and thus advisory. It is advising people wishing to navigate the Barrow that they should not attempt to bring a boat through the navigation if it draws more than 760mm. Certain boats had hit bottom and Waterways Ireland (the navigation authority) had received complaints. The contributors to the guide agreed at the time that the booklet was being updated that the figure should be held at 30 inches or 760mm.

Paragraph 14.1 of the 1998 Bye-Laws of the Canals Act 1986 states that the maximum draft of any boat, on the navigations, and that included the Barrow navigation, shall not exceed 1.2m or 1200mm. That document clearly establishes the boat draft of the Barrow navigation. KCC have said that the draft of a boat to make passage to its navigation is 750mm, notwithstanding that the Canals Act says 1200mm. It is not known how and when the accepted draft went down from 1200mm to 760mm.

Exchange between Mr Poole and Mr Garrick of KCC

Mr Garrick accepted that 760mm was the correct figure, essentially a matter of round-off of a figure of two feet and six inches which was the Imperial equivalent.

Mr Garrick had prepared a design note (submitted and tabbed S) on how KCC perceived the weirs and locks to function and on the issue of flow and depth and the separation of those two concepts. His submission included four drawings numbered 205/survey/024 to 027. They showed the surveyed levels of the weirs and the locks cills. (The actual river bed level of the entire channel from St Mullins upstream to the abstraction point was surveyed). For example, on drawing no. 24, at the Carlow lock, the difference in level between the top of Clogrennan Weir and the cill at the Carlow

lock (upstream of it) provide about 816mm clearance/depth at the Carlow lock. It is the level of the top of Clogrennan Weir that provides the minimum draft across Carlow lock cill. There is no draft of 1200mm available. It is doubtful that the original design of the Barrow weirs and locks, given that they were fixed in the positions they were in, in the 1700s, ever envisaged a draft of 1200mm. The figure of 1200mm, it seemed to Mr Garrick, was a maximum that should not be exceeded. The precise wording was "no person shall navigate or moor any boat on the canals ------ if such boat exceeds ----- 1.2 metres in draft". It did not seem capable of being read as a guaranteed draft on any of the waterways.

Mr Poole considered that the main difference between the parties was that KCC maintained that the level of the weir continued the whole way back/up to the next cill. It was the objectors' contention that there was a stretch called the backwater stretch above the weir which extended approximately half a mile to three quarters of a mile up to each weir but that ran out. The ground was on a slight incline baseline all the way up the lock. The water in that incline in the navigable channel relies on the flow of the water running down the river to keep that channel full. (*I can see some logic in the objectors' argument if the river is in spate. In that situation there might be a depth of water only partially dependent on the downstream weir. However, at times of low flow, if the backwater from the downstream lock did not reach the upstream cill, there would be no depth of water across the cill. On the other hand, in the situation as described by the Council, the river theoretically would be navigable at virtually no flow, other than that necessary to service boats through the locks provided of course that the locks were otherwise watertight).*

Mr Garrick for the Council agreed that the fundamental difference between the parties was on the issue of whether the crest of the weir on the downstream side was above the downstream cill of the lock upstream of that weir. In every case surveyed that was found to be the case. The extent of the coverage in each case is shown on drawings numbers 024 to 027. He categorically rejected the notion of a backwater pool running out before the next upstream cill. In the case of Bagenalstown lock, however, it was correct to say that if it is attempted to cross the lower cill at the 50 year low figure, there would be problems. That is not, however, because the downstream weir has a lower crest level than that cill. It is because the downstream weir level has not cleared that cill by 760mm. (The Lock is the location of one of the proposed mitigation measures). Mr Garrick agreed with Mr Poole's (sceptical) supposition that in a situation of zero flow, therefore, because the crest of a downstream weir was higher in every case than the cill of the next upstream lock, then the pool of water behind that weir at zero flow would cover the cill of the upstream lock. It would not, however, provide navigation depth at Bagenalstown lock, hence the need for mitigation measures. While there might be an impression that there was a gradient on the river bed, in many instances the bed is at or near level for long distances. Mr Poole stated that while he conceded that he could not "knock a hole" in Mr Garrick's figures, it was not the way the canal worked and he saw a serious problem for his business.

In reply to a question as to what he felt was the available draft at present, Mr Poole stated that he believed it to be 33 inches (838mm). He considered that a minimum

flow of 140 ml/d was absolutely critical. For navigation to be sustained on the river, it would need to strike a level which was the current summer low flow, an average summer low flow.

In relation to reducing the flow by 29%, Mr Garrick stated that this would be case in a flow that turned up once in 50 years only. If one took the seven days sustained low-flow of two years return period which was used as a figure indicative of the driest week in an average to good summer then the percentage was of the order of 10%. Mr Garrick rejected a proposal to put a weir at the abstraction point as a way of guaranteeing strict control on abstraction. If one looked at the position pre-works and post-works, the differences in terms of the flow duration curve was barely distinguishable one from the other.

In conclusion, Mr Poole stated that for navigation, the average summer level of water was needed. If they didn't have that, their ability to navigate the Barrow was going to be difficult.

Mr Garrick stated that it had always been KCC's position that they had an obligation to mitigate the impact of the proposal. This was to distinguish between that obligation and the issue of available draft *per se.* They had an obligation to ensure that afterwards things were the same with respect to draft as they were before.

Mr Poole felt that the Council's alternative of dredging was no longer an option because of the possible effect on lampreys which were now an endangered species.

Mr Lynch has permission for and is building a marina in Athy. His particular area of concern is the area from the 28th lock up to the abstraction point. He is worried that the reduction in water along that stretch is going to cause increased weed growth and cause problems for navigation.

Mr Garrick, for the Council, reading from the detailed written response to Mr Lynch, replied that while the area in question did not form part of the Barrow navigation proper, it was not to say that it was not possible to take boats into this reach.

The main factor influencing water level in this section is the weir at Ardreigh. That weir acts as a barrier holding back any water below the crest level at approximately 52.04 m OD. The water which is held behind the weir forms a still pond, a back-watered pool which is present in all flow conditions. At low flows the surface resembles a lake. The expected drop in water level at the weir is of the order of 7mm. There is currently no survey information for this stretch. When the survey team travelled along it, with a flow in the river of 340 Ml/d, the depth at the time was 1.44m.

The changes in levels, even at the dry weather conditions, would be of the order of 3mm at Cromaboo Bridge and even less than that at the marina.

Mr Garrick stated that the influence of the other draw downs in the area i.e. Tegral and Athy UDC would not be significant. The two together would come to no more than 6 Ml/d and even at that, Athy were not drawing directly from the river but from a

groundwater infiltration gallery. The total difference in depth of flow at Ardreigh Weir, pre-works and post-works, would be 7mm.

Mr Lynch felt that what was needed was an overall spatial strategy, in fact a water strategy. The river was quite capable of supplying water to all of the people of Ireland, if there was the storage capacity to do it. He believed that the place for that storage was in the cut-away bog on the right hand side of the Edenderry to Rathangan road.

Mr Lynch expressed concern in relation to an old mill race just above the Ardreigh weir. This back drain was drawing down substantial quantities of water which was not going over the weir. Mr Garrick stated that if there was a winched gate or other feature along the cut that was open, the water would not go over the weir. Essentially it was the responsibility of the navigation authority to manage those sluices, so that it they are left open at wintertime, for whatever reason, they needed to be closed in times of low flows. They should be closed, particularly at times of low flow in order to force the substantial fraction of the water to pass over the weir.

Mr Mc Nair of the **Tegral Group**, stated that his company currently abstracted 852 cu m/d (0.85 Ml/d). They were extremely concerned at the proposal to abstract 40 Ml/d in the absence of KCC providing them with an alternative supply.

Mr Garrick replied that what Tegral and others were abstracting was significantly less than the dry weather flow at the Ardreigh Weir. The water abstracted by Tegral comes from that quantity overflowing the weir. If the sluices are closed, as they ought to be and if the lock gates themselves are reasonably watertight, there is no way for water to pass downstream of Ardreigh except over the weir. There is nothing in this proposal to trigger the clause in Tegral's licence that says they must stop abstracting. KCC have committed themselves to ceasing the abstraction of water if the compensation flow in the river drops below 1.145.cumecs (99 Ml/d).

Mr Vivian Cummins of the **Inland Waterways Association of Ireland** (IWAI) stated that his organisation would be raising questions related only to the EIS. IWAI remain concerned that there appeared to be no consultant appointed (by KCC) with specialist expertise in river navigation. (Copy of his submission is on file – tabbed T and copy of clarification by KCC tabbed U)

It would appear that the boat draft line figure of 760mm was based on a guide boat draft line figure provided by Waterways Ireland for boat users on the Barrow. The context of the figure being quoted was that boats with a draft in excess of 2'6" might encounter difficulties in some locations at certain times of the year, a figure possibly adopted by Waterways Ireland as a precautionary tactic to avoid claims arising. It would appear from the survey information provided in the EIS that there was an average depth of 2m over the area of river surveyed with depths recorded in excess of 4m at the time of the survey. The proposed draft is not based on an assessment of the drafts of the existing boats using the river. Neither does the figure recognise that a boat with a draft of 760mm cannot rest on the bottom of the river but needs additional water beneath the boat to navigate.

A key figure for calculating a draft line should be the measurement between the top of the upstream lock gate and the upper cill level. The shallowest measurement taken was 2.04m at Ballykennan Lock. (Mr Garrick for KCC countered this by stating that while indeed the height between the top of the gate and the upper cill was 2.04m, that particular dimension did not have any significance in terms of available draft, because water level could not reach the top of the upstream gate in low flow conditions. For that to happen there would have to be established a head of water of 0.84m over the (upper) weir. Such conditions *cannot* occur during low flows.

It is clear from the EIS that the impact on water levels and accordingly on navigation will be considerable even in average summers. Having regard to all the stated policies in the County Development Plan in relation to the importance of the canals and to the promotion of tourism, the Association is of the opinion that the proposed effects on navigation are such as to materially contravene the policies and thereby the Plan itself.

In relation to off river bunded storage, it is unclear whether sufficient balancing storage will be provided or how an assessment would be made on the trade off between pollution risk assessment against the more pressing need to maintain the highest possible dry weather flow.

The lack of any survey information in relation to the river, upstream of Ardreigh Lock (Athy) would appear to overlook the navigational requirements of the boat slip at Rathstewart, the Athy UDC jetty at Back Square, the Rowing clubhouse and the 50 berth marina.

In cross-examination, Mr Cummins stated that there was navigation upstream of Athy as far as Rathstewart (1 km north of Athy – the intake is a further 2 km upstream). He did not know how far beyond Rathstewart was capable of navigation.

Mr Podger submitted that the issues of surface water and groundwater were inextricably linked and that these links in the context of this development had not been properly addressed/assessed. This was in fact the basis of most of his concerns, project splitting he called it. I had to point out that those abstractions were not, however, the subject of this Hearing. Nevertheless, it took up quite an amount of discussion and reflected the concerns of the objectors, relevant or not. (The Council, in response, denied that the abstractions were ever other than in the Barrow catchment. The Board decided to grant permission for the abstractions, part of their (stated) reasoning being that the proposed abstraction(s) is not likely to have a significant effect on the environment).

The Council are in breach of European law in that they have not complied with their obligation to carry out an economic analysis of water use, to develop a cost effective set and measure for achieving the environmental objective as required by the Water Framework Directive. (In response Dr Scannell for the Council, stated that (while) the deadline for implementing the WFD in Ireland was 22 December 2003, no legislation had yet been passed to implement it. To her knowledge the WFD required authorities to embark on a programme of measures to be established at the latest nine years form the date of entry into force of the Directive).

It appeared that because of the abstraction, there would be five days less for the salmon to get over the weirs.

A difficulty in this case is that the developer is also the controlling authority with no outside body, therefore, to ensure compliance.

Much has been said already in relation to (the lack of) alternative studies.

Because the Board had not made a determination in relation to Section 5 in respect of other abstractions, it had not been possible for him to partake fully in the Hearing. One of the Council's experts, for example, did not assess factors that could directly affect this proposal because of the limitations of his remit.

An abstraction of this nature where it is facilitating intensive development which has been identified as such is not balanced.

It was disappointing to find that there were obvious conflicts of fact. It is really not compatible with consistent planning to facilitate in any way plans that would include indicative and general plans.

At best the development is premature. A cumulative assessment of abstractions has not been assessed. The normal type of development condition, prior to commencement etc cannot apply nor can agreements be worked out between the developer and the Council because the Council is the developer.

Mr Sweetman submitted to me at the Hearing (as an *aide-memoire)*, a CD containing the reference documents, all public documents, which he had referred to in the course of the Hearing).

Many of his points (he was also appearing for **An Taisce and Mr Andrew Kavanagh**) were made by way of cross examination of various witnesses. One of the points he questioned the Council about was in relation to consideration of alternatives as required for an EIS. His own conclusion was that there had in effect been no consideration of alternatives

He considered that the development was a material contravention of the Development Plan. The evidence of the Council's planner was totally inadequate as he had not adverted to various salient points of the Development Plan in making his assessment. He had not realised that the entire river was an SAC, he did not assess it and he did not assess the relevance of the SAC to the Development Plan. He did not assess the view from Bert Bridge which is a protected view and which he now says the development is clearly visible from. (see details of planning register for vicinity of site, submitted by KCC at Mr Sweetman's request – tabbed X)

The EIS was totally inadequate, in particular, one of the very obvious areas being the (lack of) consideration of alternatives. A lot of the alternatives that were considered like the groundwater abstractions have already been put in place. The real alternatives in the proposal were not considered at all, like saving water and mending leaks.

In relation to alternative sites, there is a protected structure actually touching the selected site. Yet one of the alternatives was rejected because it was 500m from a protected structure.

The amount of water currently being discharged to the Barrow from the sewage works is 8,000 cumecs. Most of that water is at present being imported from a different catchment. There is 12,000 coming out in groundwater abstractions already from the catchment and that together with the 40,000 from this scheme means that 52,000 will be abstracted from the catchment. If there is only 8000 being discharged back into the Barrow, it means that 44,000 is being discharged elsewhere. The situation becomes even worse in that the 8000 now being discharged into the Barrow is being imported and since that is intended for that import to cease, that 8000 will be lost as well.

The Council's engineers were relying on the planners figures for population which the planners didn't have. That begs the question as to what reliance can be placed on those figures.

The Council state that they are going to maintain a water level which is a degraded water level. It is clear that there is going to be a significant effect on the navigation.

The mitigation proposed in respect of the gas pipeline is totally unsustainable. It is not possible for the Council to do what they propose to do in respect of the gas pipeline.

At times of Dry Weather Flow, according to the Council's experts, the flow in the Barrow is totally derived form groundwater. Permission has already been granted for the drawing down of 12,000 cumecs from the catchment and those figures have never been taken properly into consideration, in fact they have been totally ignored.

The Canals Act and Regulations are relevant as is the Water Supplies Act. The Duchas documents submitted, new site synopsis of the river Barrow area and the habitats and species document is also relevant, as well as the old site synopsis document relevant to the old SAC. The Article Six interpretation manual clearly states how the EU consider that Article. Article Six is important and it states that "for special areas of conservation, Member States shall establish the necessary conservation measures involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans and the appropriate statutory, administrative or contractual measures which correspond to the ecological requirements of the Natural habitats in Annex 1 and the species in Annex 2 present in the sites". It does on to state that "Member States should take the appropriate steps to avoid, in SACs, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which areas have been designated----". No mention was made by the Council of the presence of kingfishers or the possible effect on them.

Section 3 of Article Six is relevant in stating that any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to the appropriate assessment in view of the conservation objectives. The competent national authorities shall agree to a plan or project only

after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate having obtained the opinion of the general public.

In his opinion, the site holds priority species and therefore the Board cannot grant permission, particularly in the fact that no alternative in any way, no realistic alternative had been proposed. There is a level of sustainable abstraction from the Barrow but it would have to be as part of a proposal that was put together producing all the facts relevant to making a decision.

Because the plans are indicative only, it is not possible to be precise about the impacts. The most the Board could do is to "give a provisional order" and come back later with a full EIS.

Mr Hoey echoed the concern of Mr Podger in complaining that the cumulative effects of abstraction on the Barrow catchment had not been taken into account. He felt that it was not possible to grant development consent for this project as the Board had already made decisions to grant the alternatives.

(He had a separate concern in relation to not receiving documents from the Council which I feel is a matter between him and the Council).

He considered that the "arbitrary" setting of 760mm adopted as the navigation depth represented a damaged navigation and a river in trouble and suffering from human intervention.

Questions raised by the Inspector

I asked the parties (other than the Authority!) whether there was any abstraction figure that they would be agreeable to.

Mr Brown (fishing interest), said that he would not object if the figure proved to be sustainable and user friendly. At the moment the figures were just not right.

Mr Sweetman, while acknowledging that there must be abstraction for life to go on, felt that the proposal was so fundamentally flawed that he could not recommend other than an outright refusal.

Mr Hoey felt that the need for the abstraction had not been established.

(My) Questions to the Council

In the Kildare Strategy, reference had been made to trial testing of groundwater sources. There was an implication that the preference would be to use those resources if available. I asked what the results of those tests were and whether the forecasts were sustained or improved?

The tests indicated the potential for slightly better yields than predicted in the strategy, 13.5 Ml/d against 10.4 Ml/d in the Strategy. The review of the Strategy, however, has indicated considerable shortfall in the region and there would still be a need for 40 Ml/d from the Barrow. The latest review of the Strategic Planning

Guidelines for the Greater Dublin Area (SPGGDA) suggested that water supply would be the most significant factor affecting the long term capacity to accommodate growth in the region.

In reply to a question on phasing in of the supply, Mr Cronin stated that the normal operating conditions would be 31 Ml/d with a maximum of 40 to cover peak abstraction. The kind of conditions where the 40 Ml/d would be required would be a requirement to refill, if necessary the storage bunds and to, say in summertime, supply the average day peak week requirements, in industry for instance. (Unfortunately that would be at the worst time for the river). The Council were anticipating the need for the Barrow within four to five years and it would possibly take that long anyway to get the supply on-stream. About 14.5 Ml/d would be required initially in 2008. There is an issue in the 2000 strategy review that suggested the need for implementation of the Barrow to its full abstraction as soon as possible.

The three day storage requirement would be a fairly normal pollution risk requirement in an area where there were major roads.

The Strategy indicated that the groundwater resources would give flexibility. I asked the council to elaborate?

Mr Cronin stated that the county had four distinct regions. These were the eastern corridor of the county which would continue to be served by the Liffey; the northwest where it was proposed would be served from groundwater sources; the extreme south which would be served from the Slaney and lastly the south and southwest region which would be served from the Barrow. The idea is that the boundaries between the various supply areas are flexible so that if there is a difficulty in any particular area there is flexibility to transfer water between the regions to cover different situations.

The issue of water conservation had previously been raised. I asked the Council to elaborate on their policy?

KCC have a separate division for leakage management and control. They have established 50 district metered areas within the county where they have isolated all those regions. They have succeeded, since the late 90s, in reducing unaccounted for water from 33 to 35% to a current level of about 27%. The intention is to reduce it to 20%. Metering is a major element of the project and they have been granted significant funds recently to progress that. All non-domestic consumers are charged and the Council are required to have all such consumers metered by 2006. There is in operation a telemetry control system so that the Council have constant information on water usage throughout the county.

Having regard to the fact that this project would be a Design, Build and Operate (DBO) system and that the designs would be to some extent indicative, would the Council indicate to the Hearing the main elements in order that that Board would have as clear an impression as possible of the likely visual impacts?

The storage bunds would take up an area of about 30,000 square metres and would be of the order of 4m high. They will be of cut and fill construction with the maximum height being the side closest to the river. The height of the storage building would be

less that 9m and the design indicated is similar to the silo at Leixlip waterworks, a vertical cylindrical silo of steel construction. The general building height would be less that 7.5m.

Closing Submission by Kildare County Council (copy on file – tabbed V)

The Board will have recommendations to consider in three contexts. Firstly the application for confirmation of a provisional order; secondly an application for approval for development under part X of the 2000 Planning Act and accompanying EIS and finally the Inspector's assessment of an appropriate assessment made by the developer under the EU Natural Habitats Regulations 1997.

The development is vital public infrastructure needed in the public interest. KCC have established that the abstraction will not make the navigation of the Barrow impossible or unreasonably difficult.

In order to maintain the existing navigation capacity, the Council could either drain the entire Barrow to deepen it by about 20mm, an exercise that would be as futile as it would be impractical or alternatively remove two obstructions which are greater impediments. These are the high cill level in the Bagenelstown Lock and the excess cover on the Bord Gais pipeline. KCC have discussed with and agreed with Waterways Ireland, the statutory authority responsible, that it would take the latter mitigation measure. It is worth noting that Waterways Ireland did not serve an interference notice that they considered the taking of the water would make navigation impossible of unreasonably difficult. Furthermore, they have not objected to the proposal nor have they participated at the Hearing. It must therefore be assumed that they are satisfied with the proposal.

It should also be noted, in relation to fisheries, that the Southern Fisheries Board have not objected.

The proposed abstraction goes further than required by conditioning the provision of a minimum compensation flow downstream of the abstraction point. That undertaking will consequently ensure that any concerns that might exist in relation to future conditions, including climate change, catchment land use change and return effluents are fully addressed.

In relation to approval under the Planning Act, it is submitted that the EIS, itself in accordance with the legislation, together with all the public consultation and the submissions to the Hearing have resulted in all the likely significant impacts being described and available for assessment by the Board.

It was submitted that one single EIS should have been prepared for all of the abstractions from the Barrow catchments. This has already been rejected by the Board in its decision in relation to Pl 09 EC2020 where that was an issue.

There is no basis either for the carrying out of Strategic Environmental Assessment. The relevant EU Directive does not have to be implemented into law until July 2004 and, in any case, policy assessment has been specifically excluded from SEA Directive.

Article 28 of the Natural Habitats Regulations provides that the Board shall ensure that an appropriate assessment of the implications of the development in relation to the conservation objectives of the "EU" site has been undertaken. Article 28 (2) states that an EIS is an "appropriate assessment". The EIS describes potential impacts on SACs notified at the time it was prepared. Since then an additional area has been notified – the Barrow valley – on 23 June last.

Part of the land on which it is proposed to carry out the development has been proposed for designation. The Council did not anticipate it but will have to deal with it. The otter is the only protected species listed in the Directive, on the land affected by the proposal. Mr Goodwillie for the Council has earlier stated that the construction activities and the development would not significantly adversely affect the otter. KCC are also prepared to maintain access along the river as a wildlife corridor.

Because of this latest designation the Council are submitting two additional drawings, one showing the area which is proposed for designation and including the development, the other with the structures moved outside the SAC site. The second option is only put forward, in mitigation, if it is concluded that the development was going to significantly adversely affect the SAC. (This proposal was strenuously objected to in that it was put forward after all the parties had made their cases).

In relation to the other species for which it is proposed to designate, the freshwater pearl mussel is not present and is therefore not impacted. The Council has agreed with Duchas to implement an agreed monitoring programme for freshwater crayfish for the duration of the construction works and up to one year thereafter. In respect of lampreys, KCC, in response to Duchas, have agreed that there will be no disturbance of the river during the main upstream migration of lampreys. Atlantic salmon will not be significantly affected. The Twaite Shad is an estuarine fish and will not be present. Sea lamprey and brook lamprey are not impacted by the abstraction.

It should be noted that evidence was repeatedly given that reducing the water flow does not materially affect the depth because *when the navigation system is operated properly, water levels cannot drop below the crest of a weir (*my emphasis).

While Article 14 of the Canals Act Byelaws does prohibit boats on the canal which exceed 1.2m in draft, there is no obligation on Waterways Ireland to ensure a draft of 1.2m. Article 41 goes to say that the byelaws make no representation or give any warranty as to the condition of the canals.

Finally, considerations in relation to a single house proposal in this area of high amenity would be different from those applying to a vital public infrastructure facility.

I closed the Hearing.

Assessment

Introduction

To set the assessment in context, the proposal is to abstract a maximum of 40 Million litres of water (40,000 cubic metres) in any continuous period 24 hour period from the river Barrow at Srowland, about 5 km north of Athy. The abstracted water would be pumped up to storage bunds on site adjoining the river and from there by gravity to a treatment works, also on site. The bunds would have the equivalent of three days capacity (120 million litres). The water would be used for public water supply purposes in south and mid Kildare.

The Council estimate that the one in 50 year flow – the Dry Weather Flow- in the river, would amount to 139 million litres per day (Ml/d). In that one year in 50, therefore, when the proposed abstraction (40 Ml/d) leaves the river, 99 Ml/d will remain immediately downstream of the abstraction point. They are in fact prepared to guarantee that flow of 99 Ml/d (provided of course that flow is actually present upstream of the abstraction point!). The practice in "run of river" abstractions is to abstract up to a maximum of 33%. The percentage in this instance is 29.

As the Council have outlined in their closing remarks there are three issues for the Board to consider. The first is whether to confirm the Provisional Order under the 1942 Water Supplies Act; the second is whether to approve the overall development under Part X of the 2000 Planning Act and the third is the assessment of the scheme *viz a viz* the EU Natural Habitats Regulations 1997 in the context of the proposed designation of the Barrow and the Barrow valley as an SAC.

The information before the Hearing was that the treatment works would be procured as a PPP Contract in accordance with Government policy. This meant that the Hearing was dealing with an indicative design. The detailed design of the processes and building works would be carried out later by the successful tenderer, in accordance with the scale of development as outlined/considered in the EIS.

I propose to assess the scheme under headings as follows:

- Need for the scheme
- Proper planning and sustainable development (including visual impact)
- EIS
- Effect on navigation
- Effect on fisheries
- Hydrology/Water Quality and
- Effects on area as SAC.

Need for the Scheme

The need, both in terms of quantity of water required and the source of that water is set out in the evidence submitted to the Hearing, particularly by Messrs John Murphy and Jerry Cronin – tabbed C and E respectively - on file and summarised above.

There have been a number of studies in relation to the water supply situation in the (greater) Dublin region. "The Greater Dublin Water Supply Strategic Study" was published in 1996. It acknowledged that abstraction from the Barrow would be an essential element of the overall future strategy. KCC, conscious of the dependence of the county on supplies from the Liffey and of the limited potential from that source coupled with the growth of the Dublin counties themselves, commissioned their own study. The final report of that study, the Kildare Water Strategy, was submitted to KCC in March 1999. Four sources of water were identified, including the Barrow, in respect of which it proposed an abstraction of 31 Ml/d. The strategy was approved in principle by DoELG, who authorised the Council to prepare a proposal for a Water Abstraction Order of 40 Ml/d from the Barrow and to prepare an EIS. It was stated that it was likely, arising from the 2000 review of the strategy, that the need for implementation of the Barrow to its full abstraction would be much sooner that originally envisaged. There is, therefore, a clear need established for the proposed scheme.

Proper Planning and Sustainable Development of the Area

The planning evidence at the Hearing was criticised at being inadequate. Many policies were quoted directly from the Development Plan but without much attempt at tieing them into the planning of the scheme itself. The Council did not appear to be greatly conscious of the need to justify the scheme on planning grounds notwithstanding that approval was being sought under the 2000 Planning Act. It had to be pointed out to them, for example, that it was an objective of the Plan to preserve a view and prospect from nearby Bert Bridge. There appeared to be no input into the EIS from the planning department and limited knowledge of its contents.

The abstraction/treatment works site is situated in an area designated in the Development Plan as an area of High Amenity where it is the Council's policy to exclude from this area any development which would be prejudicial to its natural beauty, amenity or recreational capacity. While there was no particular explanation forthcoming as to why the Council considered this development acceptable other than that it was critical infrastructure, to quote from the EIS, the site is located in the fertile flat lowlands of south Kildare beside the River Barrow. Hedges are vigorous but generally well trimmed with occasional standards. The site itself is flat and featureless, except for the immediate environs of the river. In the assessment of impact, it was stated that the appearance and character of the complex will cause a change in the undeveloped rural character of the area. This was later "corrected" at the Hearing to the effect that, while the initial works would create a "contrasting character", when planting took place the impact would be lessened. I would certainly concur with that assessment.

I consider that the visual impact of the scheme will not be significant. The low-lying unobtrusive location, close to the abstraction point makes this site an appropriate site for the treatment works which is an important segment of necessary public infrastructure.

It is clear that the Development Plan is otherwise "aware" of the necessity to provide for the overall future water supply for the county. The Authority also demonstrated that the efficient use/conservation of water supplies was a high priority within the county. I consider, therefore, that the proposal is not contrary to the provisions of the County Development Plan and that it is otherwise in accordance with the proper planning and sustainable development of the area.

Environmental Impact Statement

Article 94 of the Planning and Development Regulations 2001 sets out the information to be contained in an EIS. I consider that the EIS properly addressed the requirements contained in the legislation.

There is a description of the proposed development and it comprises comprehensive information on the site, design and size of the proposal (consistent with the indicative nature of a Public Partnership Project).

There is a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects. (In the event I do not consider that there would be significant adverse effects).

The necessary data to identify and assess the main effects which the proposed development is likely to have on the environment has been compiled. In view of this being a PPP project, there might have been a concern that an assessment of the landscape effects would not have been possible. The bulk and extent of the works of the site are clearly set down in the plans and thus the main effects are capable of assessment. Where the plans might have lacked any detail, that detail was elaborated on at the Hearing.

There is an outline of the main alternatives studied and the main reasons for the final choice. It was disputed at the Hearing that alternatives were not in fact considered at all. It was considered that alternative sources of water should have been considered, not just the alternative points for abstraction from the river.

As outlined above, the issue of how to provide for future water supplies in the county and the region at large has already been the subject of major studies and consequent strategies. Those studies have already identified the Barrow as a major source of future supplies. In that context it would not have been appropriate to repeat that exercise. Nevertheless, the Council went to some lengths to demonstrate that they were adopting sustainable policies in relation to the procurement and use of their water supplies. In relation to outlining the main alternatives looked at, alternative sites for abstraction were examined, under a number of headings, and the main reasons were given for selection of the proposed choice.

Further information, as required by sub-section 2 of Schedule 6, by way of explanation or amplification of the information supplied under the previous heading was produced. This included a description of the aspects of the environment likely to be significantly affected by the proposed development, under the terms of sub-section

3 (b), including effects on human beings, terrestrial and aquatic fauna and flora, fisheries, soils, hydrology and navigation water quality, noise, landscape and material assets.

It is clear from the documentation and the oral evidence, and I am also satisfied that the requirements of the legislation in relation to the format and content of the EIS have been complied with. My comments on the findings of the EIS are contained elsewhere in this report.

In the event, given the type of project proposed, the aspects likely to be significantly affected by the proposed development were navigation and fisheries/aquatic flora and fauna. While hydrology was possibly of equal importance its importance basically stemmed from the effects on the aforementioned navigation and fisheries. The effect on landscape in an area designated as one of high amenity might have been a significant issue but as I have already stated, I do not feel that it was significant.

Effect on navigation

This was arguably the issue of most concern to the objectors and fortunately one that engaged the Council in a major way both in the preparation of the scheme and at the Hearing itself.

The most significant point made by the Council, in my opinion, is that the Barrow is an engineered waterway, using weirs and locks to establish the necessary draft. Each weir serves to maintain a backwatered pool upstream, and it is this pool that provides the available draft, between bed and water level, for boat traffic travelling to the (next) upstream lock. Boats and barges must be able to cross the cill of the lock upstream. The water surface upstream of the weir would be horizontal if there were no flow in the river. Otherwise, the water surface forms a backwater profile from the weir, extending upstream to the next control feature, and the shape of that backwater profile is characteristic of the flow and of the channel shape and gradient. In a situation of low flow, therefore, with virtually no flow over the weirs, navigation is determined by the difference in level between each weir and the level of the respective cill of the lock upstream. (The objectors felt that this assessment of the Council was not right. Boats have been encountering increasing difficulties. The objectors were also concerned that the Council had not engaged anyone with a knowledge of navigation). Nevertheless as far as I am concerned the logic of the Council's engineers is irrefutable.

The declared minimum draft on the Barrow, quoted by the navigation authority, Waterways Ireland, in the published guidebook for boat users is 760mm. (I don't accept that the 1.2m maximum draft quoted in the Canals Act has any relevance in that context and the Council engineers were of the opinion that it would never have been the norm for boats of 1.2m to navigate the Barrow). From their investigation of the entire length of the river bed, the Council determined that, apart from some silting up of the channel, there were two locations where, at times of low flow, this draft was not available, i.e. at the Bagenalstown lock cill (510mm) and the Bord Gais pipeline crossing. While the Council consider that they would feel obliged to remove 20mm from the bed of the river in order to *maintain* the existing navigation conditions, an option nevertheless that was neither practical nor desirable for the safety of fish

stocks, they propose instead to carry out significant mitigation works at Bagenalstown lock and the gas pipeline to give a material overall improvement by removing these navigation impediments. The difference between the level of the top of the gas pipe crossing and bottom of the river above is of the order of 2.5m. I see no reason why Bord Gais will object to removing of the order of 300mm from the bed of the river at that point and there is no indication that they are in any way opposed. Having regard to the contacts that have taken place between the Council and Bord Gais, the opposite would appear to be the case (see correspondence with Bord Gais submitted – tabbed W).

According to the Council, in the post works regime, at the one-in-50 year drought severity, the reduction in depth at weirs, compared to the present position, varies from 10mm at Bestfield (the weir with greatest depth) to 5mm to 6mm everywhere else.

The foregoing "effect on navigation" is a very short summary of the mass of evidence produced and which I have already summarised. I am not convinced that the proposed development will have any significant effect on navigation and indeed, I feel that the overall effect, arising from the mitigation measures, will be positive. I have dealt with this aspect before going on to look at the whole question of the accuracy of the forecasts of river flows and the effects of groundwater abstractions because I feel that together with the guarantee of minimum flows tendered by the Council, the precise flow in the river is not an issue here.

It is significant, I feel, that the navigation authority, Waterways Ireland, have not objected to the proposal.

Effect on fisheries/aquatic flora and fauna

This issue has increased relevance by virtue of the Barrow and the Barrow valley now being (candidate) SACs. Nevertheless, it is significant here also that neither Duchas (who did not object but made certain recommendations) nor the Heritage Council have any objections to the proposal.

While the Barrow would typically be a coarse fish river, *migratory* salmon do pass upstream and downstream. Salmon do not move during periods of low flow. Fish being delayed reaching the optimal spawning grounds is highly unlikely. There should not be any shortage of water between November and January, the period when the fish move to the spawning grounds. In relation to the *resident* fish population, the "nature of the reach downstream is such that the effect on surface water levels will be negligible". Reference was made to the cross section of the river being more U-shaped than the flat V-shaped of most rivers. The same area of wetted habitat will be available to those fish upstream and downstream of the abstraction point during periods of low flow. Reference was also made to a variation of half a metre in the level of the river in a matter of hours. In that context a variation of 10mm or so would be imperceptible. It is clear from the evidence that there will be little effect on the fish in the river.

The U-shape of the river cross section is also important in relation to other aquatic flora and fauna. The most significant invertebrate discovery is the presence of freshwater crayfish. In Annex II of the Habitats Directive is a list of "Animal

(excluding birds) and plant species of Community interest whose conservation requires the designation of Special Areas of Conservation". The crayfish is the only one found in the river that is on the list and it is widely distributed in the River Barrow and in many of its tributaries. Due to the fact that the typical section of the river is **U**-shaped in cross-sectional profile and deep at the margin, the projected drop in water level between 4mm and 36mm at DWF downstream of the proposed abstraction point will have no significant impact on the freshwater invertebrate fauna and will not cause any significant mortality. Certain commitments have been entered into, however, with Duchas in relation to protection of other aquatic life. For crayfish and lamprey, vehicular traffic in the river channel will be kept to a minimum and there will be no disturbance during the upstream migration of the lamprey. Lamprey will thus not be affected as they are migratory and only pass through. An agreed programme for crayfish, survey and monitoring would be set up.

Concerns were raised about the general management of the river from a fishing point of view e.g. the necessity to have the fish passes in order and that the locks be kept in a good state of repair. The suggestion was that while Waterways Ireland look after the navigation aspect, the management of the fisheries was a "grey" area. These issues were discussed at the Hearing. It is my view that while these are valid concerns the maintenance of fishing and navigation is not within the remit of the Council. The abstraction is not going to have implications for navigation and fishing and certainly nothing like what would be the consequences of defective fish passes, open sluice gates or defective lock gates. Indeed on one of the mornings of the Hearing reference was made to a sluice gate being open on the river on that day. If the abstraction could only function on the basis of the Council assuming maintenance of the river then abstraction would clearly not be a viable proposition. The system is predicated on a reasonable level of management of the river. That would include sluice gates being closed at times of low flow and lock gates being "reasonably" watertight. There is no reason to believe that this is not in operation now or in the future.

Hydrology/Water Quality

It is worth re-noting here that DoELG have an "approval" role in relation to both the overall approach to water supply in an area and to each individual scheme.

The Dry Weather Flow is the predicted one year in 50 flow. Under this probability plot one would expect the minimum daily flow at Levitstown to fall below 3 cu mecs (260 Ml/d) once in 5 years on average and below 2 cumecs (172 Ml/d) about once in 25 years. The lowest value since measuring began (1954) was "apparently" 2.08 cu mecs (180 Ml/d). The predicted DWF at Levitstown is 1.7 cu mecs (1.56 cu mecs at Srowland – 134 ml/d).

There are a number of areas of dispute in relation to estimating what the likely flow will be in the river in the future. The Council basic position is that they have been monitoring the flow in the river for nigh on fifty years and that together with factoring in other permitted discharges enables them to predict future flows very accurately.

The objectors, on the other hand, consider that predictions based on what happened in the past is not good enough. They point to the already pending permitted discharges

from the groundwater in the Barrow catchment (10.5 Ml/d) and to the changes that are otherwise taking place in the catchment such as afforestation and the changes in the bogs. As well as that they doubt the Council's figures in relation to amount and distribution of likely development in the county and the amount of water likely to be returned to the Barrow or exported from the catchment altogether.

The Council state that their operational requirement is 31 Ml/d. They state, however, that they need the 40Ml/d to be able to refill the bunded storage while continuing to supply 31 Ml/d and to meet any slight seasonality in the water demand.

In my view the Council have taken quite a conservative approach to estimating the effect of the abstraction. The 40Ml/d is a gross figure and does not include returns to the river from the developed areas via sewage works. When that is taken into account, the figure is reduced by 10 Ml/d (assumed 50% of the projected usage above the abstraction point to allow for losses due to using the canal and other losses out of the catchment).

They have not ignored the abstractions from the groundwater. While it is the opinion of their hydro-geologist that the groundwater abstractions will have no impact on baseflow in the Barrow, they do point out that 7.7 Ml/d of the groundwater will, in fact, be used in the upper Barrow catchment, and will also, therefore, contribute to effluent returns via drainage systems.

The abstraction will be related to usage. If the requirement is as expected the capacity will be required sooner rather that later. If development does not take place as expected then the full capacity will not be required. Draw-down will clearly be matched to usage.

I consider that the 1-in-50 year flow is a reasonable working basis. It is not a working flow. It is a basis for guaranteeing a *minimum* flow in the river. What they are saying is that abstraction will cease if the flow in the river falls below 99 Ml/d. The lowest point the river apparently reached in the last 50 years is about double that. As a basis for maintaining a minimum flow and a viable water supply it seems to me to be a reasonable proposition.

It is well to keep in mind that all of the concerns are directed to considering what is the likely effect of something that is predicted to happen once in 50 years. The flow in the river for 95% of the time, the 95 percentile flow, for example, is actually double the dry weather flow and the residual flow in the river during that period is of the order of 230 Ml/d. In relation to water quality while the abstraction will have a negligible effect again except at times of low flow, the evidence is that the quality of the water is in fact likely to improve significantly in future years. This will arise from the coming on-stream of various new sewage works and the implementation of the Urban Wastewater and Water Framework Directives. "The general improvement in water quality and the increase in the waste assimilative capacity of long river stretches will permit additional beneficial uses to be made of the river".

I agree with the overall conclusions as set out in the EIS. I consider that the proposed development will not have significant adverse effects on the environment.

Effect on (candidate) Special Areas of Conservation

While the River Barrow itself was proposed as a candidate SAC prior to the making of the EIS, the Barrow valley was notified only on 4 June last. The latter impinges on the site to a depth of approximately 70m along a line parallel to the river.

Reference was made at the Hearing for the need in SACs for member States to establish the necessary conservation measures involving, if need be, appropriate management plans etc. Given the candidacy status of the SACs and their relatively recent notifications, it would be premature at best to expect the necessary conservation measures and plans to be put in place as this stage.

Regardless of putting any plans in place, however, it was also stated that "Member States should take the appropriate steps to avoid, in SACs, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which areas have been designated----". My summary of the evidence of Mr Goodwillie, the Council's ecologist is as follows:

> The Barrow valley has been surveyed for designation as a Special Area of Conservation. It has the status of a proposed candidate SAC. It has been chosen because of its importance for otter, salmon, other fish species and the freshwater crayfish. The landward part, where the buildings are proposed, does not contain any special habitats or species in terms of the Habitats Directive, the Birds Directive or National legislation.
>
> In summary, the project will not have a significant impact on the terrestrial flora and fauna either locally or downstream of the proposed abstraction point. There are no sensitive marginal communities nearby where water levels are a critical factor. All are adapted to wide variations in river flow.

While some of the site is within the SAC and some without, Mr Goodwillie makes it clear that there are no special habitats or species at risk on any of the site. I have already addressed in my assessment the lack of any significant effect on the fish species and other aquatic flora and fauna. It is clear from the expert evidence that there will be no deterioration of natural habitats and the habitats of species as well as any disturbance of the species for which areas have been designated.

Concerns were raised about the possible effect of dredging around the Bord Gais pipe in the context of the SAC. There would be no dredging as such, they would essentially be minor works of clearing the overburden on the pipe crossing.

The Council, towards the end of the Hearing, put forward an alternative proposal for locating the different units of the treatment works wholly outside the SAC. They put this forward in case it was felt that the works breached in some way the SAC. Quite frankly, the development as proposed only marginally impinges on the area of the SAC and it seems to me that moving the units would be attempting to conform with the letter rather than the spirit of the SAC regulations. That being said there would appear to be no problem with either location from an engineering or visual aspect. I do not see any merit in the alternative proposal.

The next important reference is that "any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to the appropriate assessment in view of the conservation objectives. The competent national authorities shall agree to a plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate having obtained the opinion of the general public".

I am satisfied for the reasons I have stated, that the project will not adversely affect the integrity of the site(s) concerned. According to Article 28 of the Natural Habitats Regulations, the Minister and presumably now the Board was obliged to ensure that there was an appropriate assessment of the implications of a development in relation to the conservation objectives of a European site. The Council, in their closing statement, point to Article 28 of the Natural Habitats Regulations as their justification that the EIS is the appropriate assessment and that notwithstanding that an additional area has been designated since the EIS was prepared, it is clear that the proposed development will not affect that area either and that in any event, the Council are prepared to maintain access along the river as a wildlife corridor. I consider that the implications of the development for the European site, as modified, have been adequately assessed and I reiterate that I consider that there will not be significant effects on the integrity of the site. In terms of whether public opinion was obtained, I think that the 4 day hearing fulfilled the function of obtaining the opinion of the public.

Recommendation

Having examined the Environmental Impact Statement, inspected the site and studied the submissions both written and oral of the Kildare County Council and the other parties, I recommend that the Board approve the Provisional Order for the proposed abstraction of 40,000 cubic metres of water in any 24 hour continuous period from the River Barrow at Srowland, Co Kildare made by the Council on 1 April 03.

I also recommend that the Board approve the proposed development under Section X of the Planning and Development Act 2000 involving abstraction of water together with the construction of water treatment works in respect of which an EIS had been prepared.

I also consider that the proposed development will have no significant adverse effects of the (candidate) Special Areas of Conservation proposed for the River Barrow and the Barrow valley subject to the mitigation measures proposed in the EIS and outlined below being complied with. (It is not clear from the EIS that abstraction would not take place if the flow in the river fell below 99,000 cubic metres per day. I, therefore, suggest that a condition to this effect be imposed in both the Provisional Order and in the project approval.)

Reason and Consideration for Decision

Having regard to the current and projected public water supply demands in the county of Kildare and the Greater Dublin Region, to the conservation policies of the Council, to the provisions of the Kildare Water Strategy, Strategic Planning Guidelines for the

Greater Dublin Region and the provisions of the current Kildare County Development Plan, it is considered that the proposal to abstract 40,000 cubic metres of water in any 24 hour continuous period from the Barrow, is reasonable and necessary, would be in accordance with the proper planning and sustainable development of the area and would not, subject to compliance with the conditions set out below, have significant adverse effects on the environment, including the candidate Special Areas of Conservation of the River Barrow and the River Barrow valley.

Condition 1

No water shall be abstracted at any time when the flow in the river is below 99,000 cubic metres in any continuous 24 hour period.

Reason for Condition

In the interests of navigation and to protect the ecological integrity of the candidate SAC site.

Condition 2

There shall be no disturbance to the river during the main upstream migration of lampreys (circa March to May)

Reason for Condition

To protect the ecological integrity of the candidate SAC site.

Condition 3

Vehicular access to the river channel shall otherwise be kept to a minimum.

Reason for Condition

To protect the ecological integrity of the candidate SAC site.

Condition 4

An agreed monitoring programme shall be set up for the crayfish for the duration of the construction works and for up to one year afterwards.

Reason for Condition

To protect the ecological integrity of the candidate SAC site.

Condition 5

Provision shall be made for a wildlife corridor along the bank of the river for the length of the site.

Reason for Condition

To protect wildlife in the area, having regard to the designation of the river and its banks as a candidate SAC.

H D Hegarty
1 September 03

KILDARE COUNTY COUNCIL

Implementation Report 2008
for the
Barrow, Boyne & Liffey Catchments

Prepared by Kildare County Council in accordance with the Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations, 1998 (S.I. 258 of 1998)

Mr. J Boland

Director of Services
Environment & Water Services

July 2008

TABLE OF CONTENTS

SECTION 1 – WATER QUALITY IN FUNCTIONAL AREA

TABLE 1.1 – River Water Quality Standards to be achieved by 2007

NOTE

Data used in Table 1.1 for the determination of the current status of river water quality is as follows:

- **Current Q-Value**

The 'Current Q-Values' are based on the most recent Biological Surveys that were carried out by the Environmental Protection Agency. These are as follows;

Barrow Catchment – 2006
Boyne Catchment – 2006
Liffey Catchment – 2007

- **Current MRP Value ug/l P**

The MRP median concentration was based on samples taken during the period 01-Jan-2006 to 31-Dec-07.

- **An Article 3(9) Extension shall apply to the following stations;**

River	River Code	Station No.	Location	Reason
Tully Stream	14T02	0200	500m d/s Br. Near Tully House	LA WWTP, IPPC
Tully Stream	14T02	0300	Kilberrin Br,	LA WWTP, IPPC
Tully Stream	14T02	0390	Soomeragh Br.	LA WWTP, IPPC
Tully Stream	14T02	0400	Br. U/s Nurney	LA WWTP, IPPC
Tully Stream	14T02	0500	Br. d/s Cherrymills Br.	LA WWTP, IPPC
Figile	14F01	0050	Br. S of Ticknevin Br.	LA WWTP

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007								
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008					
River Name	River Code	Biological Monitoring Station	Station Location Name	Grid Reference	Baseline Q-value	Is Baseline Quality Satisfactory? Yes/No	Current Q-Value	Current MRP Value ug/l P
Blackwater (Longwood)	07B02	0060	Br S of Hortland	N 812 362	4	Yes	4	30
Blackwater (Longwood)	07B02	0100	Br at Johnstown	N 766 399	4	Yes	4	36
Blackwater (Longwood)	07B02	0200	Blackwater Br	N 738 423	3-4	No	4	40
Boyne	07B04	0100	River Br	N 658 327	3	No	3	35
Boyne	07B04	0200	Boyne Br	N 636 345	2-3	No	4	40
Boyne	07B04	0300	Kinnafad Br	N 614 356	2	No	3-4	50
Boyne	07B04	0400	Ballyboggan Br	N 639 402	3	No	4	35
Boyne	07B04	0600	Ashfield Br	N 685 449	3-4	No	3-4	29
Glash	07G02	0400	Clonuff Br	N 692 409	3	No	3	50
Glash	07G02	0600	Br u/s Boyne R confl	N 670 435	3	No	3	38
Clonshanbo	09C03	0300	Br N of Baltracey X-Rds	N 872 339	2-3	No	3	52
Clonshanbo	09C03	0600	Br u/s Lyreen R confl	N 890 343	3	No	3	56
Kilcullen Stream	09K02	0800	Br E of Yellowbog	N 843 073	3	No	4	30
Kilcullen Stream	09K02	1100	Br u/s Liffey River confl	N 847 092	3-4	No	3	22
Liffey	09L01	0400	Ballymore Eustace Br	N 927 097	2-3	No	3-4	17
Liffey	09L01	0500	1 km d/s Ballymore Eu Br	N 921 104	4	Yes	4	17
Liffey	09L01	0600	New Br (u/s Kilcullen)	N 876 099	4	Yes	4	10
Liffey	09L01	0700	Kilcullen Bridge	N 832 097	4	Yes	4	10
Liffey	09L01	0850	Connell Ford	N 813 137	4	Yes	4	9
Liffey	09L01	1000	2.5 km d/s Newbridge	N 817 179	4	Yes	4	9
Liffey	09L01	1050	Victoria Bridge	N 842 194	4	Yes	4	15
Liffey	09L01	1200	Castlekeely Ford	N 869 216	3-4	No	3-4	19
Liffey	09L01	1400	Millicent Bridge	N 881 246	3-4	No	3	30
Liffey	09L01	1500	Alexandra Bridge, Clane	N 880 270	3	No	3-4	46
Liffey	09L01	1600	Straffan, at Turnings Lr	N 923 292	3-4	No	3-4	62
Liffey	09L01	1610	Straffan, Turnings Lr (LHS)	N 923 292	1	No	3-4	50
Liffey	09L01	1700	Bridge in Celbridge	N 974 329	3-4	No	3-4	43
Liffey	09L01	1900	Leixlip Br. (RHS)	O 008 358	3	No	3	60
Lyreen	09L02	0035	Br NE of Treadstown	N 915 372	2-3	No	3-4	110
Lyreen	09L02	0100	U/s Rye Water confl	N 943 387	2	No	3	100
Lemonstown Stream	09L03	0600	Bridge N. of Ballybought	N 914 083	3-4	No	4-5	19
Morell	09MO1	0060	(S) br W of Tipper Ho	N 918 188	4	Yes	4	22
Morell	09MO1	0100	Bridge in Johnstown	N 919 215	3	No	3-4	15
Morell	09MO1	0150	br NE of Sherlockstown	N 916 247	3	No	3-4	18
Morell	09MO1	0300	Bridge u/s Liffey River confl	N 926 288	4	Yes	4-5	27
Painstown	09P01	0300	Bridge in Kill village	N 942 230	3-4	No	3	39
Painstown	09P01	0400	Painstown Bridge	N 940 243	3-4	No	3-4	44
Painstown	09P01	0500/0470	Br 300m u/s Morell R confl	N 924 264	4	Yes	3-4	38
Rye Water	09R01	0100	Balfeaghan Br	N 881 406	3-4	No	4	40
Rye Water	09R01	0200	500 m d/s Kilcock	N 891 394	3-4	No	3	62
Rye Water	09R01	0300	Anne's Bridge	N 930 395	3-4	No	3-4	61
Rye Water	09R01	0400	Kildare Bridge	N 947 386	3	No	3-4	86

Rye Water	09R01	0500	Sandford's Bridge	N 979 376	3	No	3-4	89
Rye Water	09R01	0600	Bridge in Leixlip	O 004 356	3	No	3	85

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007								
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008					
River Name	River Code	Biological Monitoring Station	Station Location Name	Grid Reference	Baseline Q-value	Is Baseline Quality Satisfactory? Yes/No	Current Q-Value	Current MRP Value ug/l P
Rathmore Stream	09R02	0100	Br at Rathmore	N 960 195	4	Yes	4-5	21
Rathmore Stream	09R02	0200	Bridge SW of Arthurstown	N 950 290	4-5	Yes	4	19
Rathmore Stream	09R02	0300	Bridge NE of Johnstown	N 925 219	4	Yes	4-5	18
Athy Stream	14A06	0200	Bridge near Glenbaun	S 682 942	3	No	3-4	17
Athy Stream	14A06	0400	1st Br d/s Barkersford Br	S 697 958	3-4	No	4	14
Barrow	14B01	1000	Pass Bridge	N 622 110	3-4	No	3-4	45
Barrow	14B01	1300	Ford E of Fisherstown House	N 633 058	3-4	No	3	25
Barrow	14B01	1400	Dunrally Bridge	N 636 018	4	Yes	4	Not available
Barrow	14B01	1500	Bert Bridge	S 659 969	3-4	No	3-4	35
Barrow	14B01	1600	Athy Bridge	S 681 944	3-4	No	3-4	50
Barrow	14B01	1900	Tankardstown Bridge	S 704 882	3-4	No	4	24
Barrow	14B01	2000	Maganey Bridge	S 717 847	3-4	No	4	38
Bothogue	14B04	0300	Bridge to S. of Timolin	S 799 932	3/0	No	4	29
Cloncumber Stream	14C17	0100	Br at Wheelam Crossroads	N 756 175	3	No	3-4	12
Cloncumber Stream	14C17	0200	Old River Bridge (W)	N 744 209	3-4	No	3	18
Figile	14F01	0050	Br S of Ticknevin Bridge	N 697 301	1/0	No	2-3	85
Figile	14F01	0100	Cushaling Bridge	N 651 258	2	No	3-4	49
Greese	14G04	0100	Spratstown Bridge	S 824 981	3-4	No	3-4	31
Greese	14G04	0200	Bridge near Greese Bank	S 799 955	3	No	3-4	35
Greese	14G04	0350	Bridge N.E. of Belan House	S 775 906	3-4	No	3	38
Greese	14G04	0400	Kilkea Bridge	S 746 883	3-4	No	3-4	38
Greese	14G04	0500	Br W. of Castleroe Cross Roads	S 729 849	3-4	No	3	40
Greese	14G04	0600	Bridge u/s Barrow River	S 717 829	3-4	No	3-4	31
Graney (Lerr)	14G07	0100	Miller's Bridge	S 845 854	3	No	3	49
Graney (Lerr)	14G07	0200	Bridge in Graney	S 817 839	3-4	No	3-4	48
Graney (Lerr)	14G07	0310	Just u/s Lerr River confl	S 785 850	4	Yes	3-4	39
Lerr	14L01	0080	E Br Castledermot	S 786 854	3-4	No	3-4	30
Lerr	14L01	0150	Bridge E. of Woodlands House	S 768 842	3	No	3	42
Lerr	14L01	0155	Agric Br S. of Woodlands House	S768 841	3	No	4	42
Lerr	14L01	0250	Ballaghmoon Bridge	S 742 815	3-4	No	3-4	48
Lerr	14L01	0300	Lerr Bridge	S 718 815	3-4	No	3-4	38
Levitstown Stream	14L02	0200	Br W of Duke Street	S 721 879	3-4	No	3-4	15
Palatine Stream	14P04	0200	Gorteen Bridge	S 759 816	4	Yes	3	39
Slate	14S01	0020	Quigley's Bridge	N 789 268	3	No	3	45
Slate	14S01	0050	Ford Bridge	N 762 255	3	No	3	46
Slate	14S01	0100	Agar Bridge	N 703 217	3	No	3	37
Slate	14S01	0150	E Br Rathangan (Opp Church)	N 673 193	3-4	No	3-4	38
Slate	14S01	0210	100 m d/s Bridge near Spencer Br	N 665 191	3-4	No	3-4	36
Tully Stream	14T02	0100	Bridge near Tully House	N 735 108	3	No	3	34
Tully Stream	14T02	0200	500 m d/s Br near Tully Ho	N 734 105	2	No	2-3	430
Tully Stream	14T02	0300	Kilberrin Bridge	N 717 073	2-3	No	2	216
Tully Stream	14T02	0390	Soomeragh Bridge	N 710 063	2-3	No	2	126
Tully Stream	14T02	0400	Bridge u/s Nurney	N 713 059	3	No	3	179

Tully Stream	14T02	0500	Bridge W. of Cherrymills Ho	N 682 043	3	No	3-4	163
Tully Stream	14T02	0600	Cloney Bridge	N 655 013	3-4	No	3-4	79

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007						
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008			
River Name	River Code	Biological Monitoring Station	Station Location Name	Standard to be Achieved by 2007 Q Value	Standard to be Achieved by 2007 MRP Value	Has Either Standard Been Achieved? Yes/No
Blackwater (Longwood)	07B02	0060	Br S of Hortland	4	30	Yes
Blackwater (Longwood)	07B02	0100	Br at Johnstown	4	30	Yes
Blackwater (Longwood)	07B02	0200	Blackwater Br	4	30	Yes
Boyne	07B04	0100	River Br	3-4	50	Yes
Boyne	07B04	0200	Boyne Br	3	70	Yes
Boyne	07B04	0300	Kinnafad Br	3	70	Yes
Boyne	07B04	0400	Ballyboggan Br	3-4	50	Yes
Boyne	07B04	0600	Ashfield Br	4	30	Yes
Glash	07G02	0400	Clonuff Br	3-4	50	Yes
Glash	07G02	0600	Br u/s Boyne R confl	3-4	50	Yes
Clonshanbo	09C03	0300	Br N of Baltracey X-Rds	3	70	Yes
Clonshanbo	09C03	0600	Br u/s Lyreen R confl	3-4	50	No
Kilcullen Stream	09K02	0800	Br E of Yellowbog	3-4	50	Yes
Kilcullen Stream	09K02	1100	Br u/s Liffey River confl	4	30	Yes
Liffey	09L01	0400	Ballymore Eustace Br	3	70	Yes
Liffey	09L01	0500	1 km d/s Ballymore Eu Br	4	30	Yes
Liffey	09L01	0600	New Br (u/s Kilcullen)	4	30	Yes
Liffey	09L01	0700	Kilcullen Bridge	4	30	Yes
Liffey	09L01	0850	Connell Ford	4	30	Yes
Liffey	09L01	1000	2.5 km d/s Newbridge	4	30	Yes
Liffey	09L01	1050	Victoria Bridge	4	30	Yes
Liffey	09L01	1200	Castlekeely Ford	4	30	Yes
Liffey	09L01	1400	Millicent Bridge	4	30	Yes
Liffey	09L01	1500	Alexandra Bridge, Clane	3-4	50	Yes
Liffey	09L01	1600	Straffan, at Turnings Lr	4	30	No
Liffey	09L01	1610	Straffan, Turnings Lr (LHS)	3	70	Yes
Liffey	09L01	1700	Bridge in Celbridge	4	30	No
Liffey	09L01	1900	Leixlip Br. (RHS)	3-4	50	No
Lyreen	09L02	0035	Br NE of Treadstown	3	70	Yes
Lyreen	09L02	0100	U/s Rye Water confl	3	70	Yes
Lemonstown Stream	09L03	0600	Bridge N. of Ballybought	4	30	Yes
Morell	09MO1	0060	(S) br W of Tipper Ho	4	30	Yes
Morell	09MO1	0100	Bridge in Johnstown	3-4	50	Yes
Morell	09MO1	0150	br NE of Sherlockstown	3-4	50	Yes
Morell	09MO1	0300	Bridge u/s Liffey River confl	4	30	Yes
Painstown	09P01	0300	Bridge in Kill village	4	30	No
Painstown	09P01	0400	Painstown Bridge	4	30	No
Painstown	09P01	0500/0470	Br 300m u/s Morell R confl	4	30	No
Rye Water	09R01	0100	Balfeaghan Br	4	30	Yes
Rye Water	09R01	0200	500 m d/s Kilcock	4	30	No
Rye Water	09R01	0300	Anne's Bridge	4	30	No
Rye Water	09R01	0400	Kildare Bridge	3-4	50	Yes

Rye Water	09R01	0500	Sandford's Bridge	3-4	50	Yes
Rye Water	09R01	0600	Bridge in Leixlip	3-4	50	No

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007						
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008			
River Name	River Code	Biological Monitoring Station	Station Location Name	Standard to be Achieved by 2007 Q Value	Standard to be Achieved by 2007 MRP Value	Has Either Standard Been Achieved? Yes/No
Rathmore Stream	09R02	0100	Br at Rathmore	4	30	Yes
Rathmore Stream	09R02	0200	Bridge SW of Arthurstown	4-5	20	Yes
Rathmore Stream	09R02	0300	Bridge NE of Johnstown	4	30	Yes
Athy Stream	14A06	0200	Bridge near Glenbaun	3-4	50	Yes
Athy Stream	14A06	0400	1st Br d/s Barkersford Br	4	30	Yes
Barrow	14B01	1000	Pass Bridge	4	30	No
Barrow	14B01	1300	Ford E of Fisherstown House	4	30	Yes
Barrow	14B01	1400	Dunrally Bridge	4	30	Yes
Barrow	14B01	1500	Bert Bridge	4	30	No
Barrow	14B01	1590	0.4 km u/s Athy Br LHS	4	30	No
Barrow	14B01	1900	Tankardstown Bridge	4	30	Yes
Barrow	14B01	2000	Maganey Bridge	4	30	Yes
Bothogue	14B04	0300	Bridge to S. of Timolin	3-4	50	Yes
Cloncumber Stream	14C17	0100	Br at Wheelam Crossroads	3-4	50	Yes
Cloncumber Stream	14C17	0200	Old River Bridge (W)	4	30	Yes
Figile	14F01	0050	Br S of Ticknevin Bridge	3	70	No
Figile	14F01	0100	Cushaling Bridge	3	70	Yes
Greese	14G04	0100	Spratstown Bridge	4	30	No
Greese	14G04	0200	Bridge near Greese Bank	3-4	50	Yes
Greese	14G04	0350	Bridge N.E. of Belan House	4	30	No
Greese	14G04	0400	Kilkea Bridge	4	30	No
Greese	14G04	0500	Br W. of Castleroe Cross Roads	4	30	No
Greese	14G04	0600	Bridge u/s Barrow River	4	30	No
Graney (Lerr)	14G07	0100	Miller's Bridge	3-4	50	Yes
Graney (Lerr)	14G07	0200	Bridge in Graney	4	30	No
Graney (Lerr)	14G07	0310	Just u/s Lerr River confl	4	30	No
Lerr	14L01	0080	E Br Castledermot	4	30	Yes
Lerr	14L01	0150	Bridge E. of Woodlands House	3-4	50	Yes
Lerr	14L01	0155	Agric Br S. of Woodlands House	3-4	50	Yes
Lerr	14L01	0250	Ballaghmoon Bridge	4	30	No
Lerr	14L01	0300	Lerr Bridge	4	30	No
Levitstown Stream	14L02	0200	Br W of Duke Street	4	30	Yes
Palatine Stream	14P04	0200	Gorteen Bridge	4	30	No
Slate	14S01	0020	Quigley's Bridge	3-4	50	Yes
Slate	14S01	0050	Ford Bridge	3-4	50	Yes
Slate	14S01	0100	Agar Bridge	3-4	50	Yes
Slate	14S01	0150	E Br Rathangan (Opp Church)	4	30	No
Slate	14S01	0210	100 m d/s Bridge near Spencer Br	4	30	No
Tully Stream	14T02	0100	Bridge near Tully House	3-4	50	Yes
Tully Stream	14T02	0200	500 m d/s Br near Tully Ho	3	70	No
Tully Stream	14T02	0300	Kilberrin Bridge	3	70	No
Tully Stream	14T02	0390	Soomeragh Bridge	3	70	No
Tully Stream	14T02	0400	Bridge u/s Nurney	3-4	50	No

Tully Stream	14T02	0500	Bridge W. of Cherrymills Ho	3-4	50	Yes
Tully Stream	14T02	0600	Cloney Bridge	4	30	No

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007					
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008		
River Name	River Code	Biological Monitoring Station	Station Location Name	Does an Article 3(9) Extension Apply?	If Yes, What is the revised compliance date
Blackwater (Longwood)	07B02	0060	Br S of Hortland	No	NA
Blackwater (Longwood)	07B02	0100	Br at Johnstown	No	NA
Blackwater (Longwood)	07B02	0200	Blackwater Br	No	NA
Boyne	07B04	0100	River Br	No	NA
Boyne	07B04	0200	Boyne Br	No	NA
Boyne	07B04	0300	Kinnafad Br	No	NA
Boyne	07B04	0400	Ballyboggan Br	No	NA
Boyne	07B04	0600	Ashfield Br	No	NA
Glash	07G02	0400	Clonuff Br	No	NA
Glash	07G02	0600	Br u/s Boyne R confl	No	NA
Clonshanbo	09C03	0300	Br N of Baltracey X-Rds	No	NA
Clonshanbo	09C03	0600	Br u/s Lyreen R confl	No	NA
Kilcullen Stream	09K02	0800	Br E of Yellowbog	No	NA
Kilcullen Stream	09K02	1100	Br u/s Liffey River confl	No	NA
Liffey	09L01	0400	Ballymore Eustace Br	No	NA
Liffey	09L01	0500	1 km d/s Ballymore Eu Br	No	NA
Liffey	09L01	0600	New Br (u/s Kilcullen)	No	NA
Liffey	09L01	0700	Kilcullen Bridge	No	NA
Liffey	09L01	0850	Connell Ford	No	NA
Liffey	09L01	1000	2.5 km d/s Newbridge	No	NA
Liffey	09L01	1050	Victoria Bridge	No	NA
Liffey	09L01	1200	Castlekeely Ford	No	NA
Liffey	09L01	1400	Millicent Bridge	No	NA
Liffey	09L01	1500	Alexandra Bridge, Clane	No	NA
Liffey	09L01	1600	Straffan, at Turnings Lr	No	NA
Liffey	09L01	1610	Straffan, Turnings Lr (LHS)	No	NA
Liffey	09L01	1700	Bridge in Celbridge	No	NA
Liffey	09L01	1900	Leixlip Br. (RHS)	No	NA
Lyreen	09L02	0035	Br NE of Treadstown	No	NA
Lyreen	09L02	0100	U/s Rye Water confl	No	NA
Lemonstown Stream	09L03	0600	Bridge N. of Ballybought	No	NA
Morell	09MO1	0060	(S) br W of Tipper Ho	No	NA
Morell	09MO1	0100	Bridge in Johnstown	No	NA
Morell	09MO1	0150	br NE of Sherlockstown	No	NA
Morell	09MO1	0300	Bridge u/s Liffey River confl	No	NA
Painstown	09P01	0300	Bridge in Kill village	No	NA
Painstown	09P01	0400	Painstown Bridge	No	NA
Painstown	09P01	0500/0470	Br 300m u/s Morell R confl	No	NA
Rye Water	09R01	0100	Balfeaghan Br	No	NA
Rye Water	09R01	0200	500 m d/s Kilcock	No	NA
Rye Water	09R01	0300	Anne's Bridge	No	NA
Rye Water	09R01	0400	Kildare Bridge	No	NA

Rye Water	09R01	0500	Sandford's Bridge	No	NA
Rye Water	09R01	0600	Bridge in Leixlip	No	NA

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007					
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008		
River Name	River Code	Biological Monitoring Station	Station Location Name	Does an Article 3(9) Extension Apply?	If Yes, What is the revised compliance date
Rathmore Stream	09R02	0100	Br at Rathmore	No	NA
Rathmore Stream	09R02	0200	Bridge SW of Arthurstown	No	NA
Rathmore Stream	09R02	0300	Bridge NE of Johnstown	No	NA
Athy Stream	14A06	0200	Bridge near Glenbaun	No	NA
Athy Stream	14A06	0400	1st Br d/s Barkersford Br	No	NA
Barrow	14B01	1000	Pass Bridge	No	NA
Barrow	14B01	1300	Ford E of Fisherstown House	No	NA
Barrow	14B01	1400	Dunrally Bridge	No	NA
Barrow	14B01	1500	Bert Bridge	No	NA
Barrow	14B01	1590	0.4 km u/s Athy Br LHS	No	NA
Barrow	14B01	1900	Tankardstown Bridge	No	NA
Barrow	14B01	2000	Maganey Bridge	No	NA
Bothogue	14B04	0300	Bridge to S. of Timolin	No	NA
Cloncumber Stream	14C17	0100	Br at Wheelam Crossroads	No	NA
Cloncumber Stream	14C17	0200	Old River Bridge (W)	No	NA
Figile	14F01	0050	Br S of Ticknevin Bridge	Yes	2013
Figile	14F01	0100	Cushaling Bridge	No	NA
Greese	14G04	0100	Spratstown Bridge	No	NA
Greese	14G04	0200	Bridge near Greese Bank	No	NA
Greese	14G04	0350	Bridge N.E. of Belan House	No	NA
Greese	14G04	0400	Kilkea Bridge	No	NA
Greese	14G04	0500	Br W. of Castleroe Cross Roads	No	NA
Greese	14G04	0600	Bridge u/s Barrow River	No	NA
Graney (Lerr)	14G07	0100	Miller's Bridge	No	NA
Graney (Lerr)	14G07	0200	Bridge in Graney	No	NA
Graney (Lerr)	14G07	0310	Just u/s Lerr River confl	No	NA
Lerr	14L01	0080	E Br Castledermot	No	NA
Lerr	14L01	0150	Bridge E. of Woodlands House	No	NA
Lerr	14L01	0155	Agric Br S. of Woodlands House	No	NA
Lerr	14L01	0250	Ballaghmoon Bridge	No	NA
Lerr	14L01	0300	Lerr Bridge	No	NA
Levitstown Stream	14L02	0200	Br W of Duke Street	No	NA
Palatine Stream	14P04	0200	Gorteen Bridge	No	NA
Slate	14S01	0020	Quigley's Bridge	No	NA
Slate	14S01	0050	Ford Bridge	No	NA
Slate	14S01	0100	Agar Bridge	No	NA
Slate	14S01	0150	E Br Rathangan (Opp Church)	No	NA
Slate	14S01	0210	100 m d/s Bridge near Spencer Br	No	NA
Tully Stream	14T02	0100	Bridge near Tully House	No	NA
Tully Stream	14T02	0200	500 m d/s Br near Tully Ho	Yes	2013
Tully Stream	14T02	0300	Kilberrin Bridge	Yes	2013
Tully Stream	14T02	0390	Soomeragh Bridge	Yes	2013
Tully Stream	14T02	0400	Bridge u/s Nurney	Yes	2013

Tully Stream	14T02	0500	Bridge W. of Cherrymills Ho	Yes	2013
Tully Stream	14T02	0600	Cloney Bridge	Yes	2013

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007				
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008	
River Name	River Code	Biological Monitoring Station	Station Location Name	Where Quality is Unsatisfactory What is the Principal Source of Pollution
Blackwater (Longwood)	07B02	0060	Br S of Hortland	
Blackwater (Longwood)	07B02	0100	Br at Johnstown	
Blackwater (Longwood)	07B02	0200	Blackwater Br	
Boyne	07B04	0100	River Br	
Boyne	07B04	0200	Boyne Br	
Boyne	07B04	0300	Kinnafad Br	
Boyne	07B04	0400	Ballyboggan Br	
Boyne	07B04	0600	Ashfield Br	
Glash	07G02	0400	Clonuff Br	
Glash	07G02	0600	Br u/s Boyne R confl	
Clonshanbo	09C03	0300	Br N of Baltracey X-Rds	
Clonshanbo	09C03	0600	Br u/s Lyreen R confl	Agriculture, on-site effluent treatment systems (ETS's)
Kilcullen Stream	09K02	0800	Br E of Yellowbog	
Kilcullen Stream	09K02	1100	Br u/s Liffey River confl	
Liffey	09L01	0400	Ballymore Eustace Br	
Liffey	09L01	0500	1 km d/s Ballymore Eu Br	
Liffey	09L01	0600	New Br (u/s Kilcullen)	
Liffey	09L01	0700	Kilcullen Bridge	
Liffey	09L01	0850	Connell Ford	
Liffey	09L01	1000	2.5 km d/s Newbridge	
Liffey	09L01	1050	Victoria Bridge	
Liffey	09L01	1200	Castlekeely Ford	
Liffey	09L01	1400	Millicent Bridge	
Liffey	09L01	1500	Alexandra Bridge, Clane	
Liffey	09L01	1600	Straffan, at Turnings Lr	Stormwater overflows, agriculture, on-site ETS's
Liffey	09L01	1610	Straffan, Turnings Lr (LHS)	
Liffey	09L01	1700	Bridge in Celbridge	Stormwater overflows, urban pressures, agriculture
Liffey	09L01	1900	Leixlip Br. (RHS)	Stormwater overflows, urban pressures, agriculture
Lyreen	09L02	0035	Br NE of Treadstown	
Lyreen	09L02	0100	U/s Rye Water confl	
Lemonstown Stream	09L03	0600	Bridge N. of Ballybought	
Morell	09MO1	0060	(S) br W of Tipper Ho	
Morell	09MO1	0100	Bridge in Johnstown	
Morell	09MO1	0150	br NE of Sherlockstown	
Morell	09MO1	0300	Bridge u/s Liffey River confl	
Painstown	09P01	0300	Bridge in Kill village	Stormwater overflows, agriculture, other (siltation)
Painstown	09P01	0400	Painstown Bridge	Stormwater overflows, agriculture, other (siltation)
Painstown	09P01	0500/0470	Br 300m u/s Morell R confl	Stormwater overflows, agriculture, other (siltation)
Rye Water	09R01	0100	Balfeaghan Br	
Rye Water	09R01	0200	500 m d/s Kilcock	Stormwater overflows, urban pressures, agriculture
Rye Water	09R01	0300	Anne's Bridge	Stormwater overflows, urban pressures, agriculture
Rye Water	09R01	0400	Kildare Bridge	

Rye Water	09R01	0500	Sandford's Bridge	
Rye Water	09R01	0600	Bridge in Leixlip	Stormwater overflows, urban pressures, agriculture

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007				
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008	
River Name	River Code	Biological Monitoring Station	Station Location Name	Where Quality is Unsatisfactory What is the Principal Source of Pollution
Rathmore Stream	09R02	0100	Br at Rathmore	
Rathmore Stream	09R02	0200	Bridge SW of Arthurstown	
Rathmore Stream	09R02	0300	Bridge NE of Johnstown	
Athy Stream	14A06	0200	Bridge near Glenbaun	
Athy Stream	14A06	0400	1st Br d/s Barkersford Br	
Barrow	14B01	1000	Pass Bridge	Agriculture, possible LA WWTP's
Barrow	14B01	1300	Ford E of Fisherstown House	
Barrow	14B01	1400	Dunrally Bridge	
Barrow	14B01	1500	Bert Bridge	Agriculture, possible LA WWTP's
Barrow	14B01	1590	0.4 km u/s Athy Br LHS	Agriculture, possible LA WWTP's
Barrow	14B01	1900	Tankardstown Bridge	
Barrow	14B01	2000	Maganey Bridge	
Bothogue	14B04	0300	Bridge to S. of Timolin	
Cloncumber Stream	14C17	0100	Br at Wheelam Crossroads	
Cloncumber Stream	14C17	0200	Old River Bridge (W)	
Figile	14F01	0050	Br S of Ticknevin Bridge	Agriculture, LA WWTP
Figile	14F01	0100	Cushaling Bridge	
Greese	14G04	0100	Spratstown Bridge	Agriculture, possible LA WWTP and IPPC Industry
Greese	14G04	0200	Bridge near Greese Bank	
Greese	14G04	0350	Bridge N.E. of Belan House	Agriculture, LA WWTP
Greese	14G04	0400	Kilkea Bridge	Agriculture, non-IPPC industry, LA WWTP
Greese	14G04	0500	Br W. of Castlerge Cross Roads	Agriculture, LA WWTP
Greese	14G04	0600	Bridge u/s Barrow River	Agriculture, LA WWTP, other (siltation)
Graney (Lerr)	14G07	0100	Miller's Bridge	
Graney (Lerr)	14G07	0200	Bridge in Graney	Agriculture, other (siltation)
Graney (Lerr)	14G07	0310	Just u/s Lerr River confl	Agriculture, other (siltation)
Lerr	14L01	0080	E Br Castledermot	
Lerr	14L01	0150	Bridge E. of Woodlands House	
Lerr	14L01	0155	Agric Br S. of Woodlands House	
Lerr	14L01	0250	Ballaghmoon Bridge	Agriculture
Lerr	14L01	0300	Lerr Bridge	Agriculture, other (siltation)
Levitstown Stream	14L02	0200	Br W of Duke Street	
Palatine Stream	14P04	0200	Gorteen Bridge	Agriculture, LA WWTP
Slate	14S01	0020	Quigley's Bridge	
Slate	14S01	0050	Ford Bridge	
Slate	14S01	0100	Agar Bridge	
Slate	14S01	0150	E Br Rathangan (Opp Church)	Agriculture
Slate	14S01	0210	100 m d/s Bridge near Spencer Br	Agriculture
Tully Stream	14T02	0100	Bridge near Tully House	
Tully Stream	14T02	0200	500 m d/s Br near Tully Ho	LA WWTP, IPPC industry
Tully Stream	14T02	0300	Kilberrin Bridge	Agriculture, LA WWTP, IPPC industry
Tully Stream	14T02	0390	Soomeragh Bridge	Agriculture, LA WWTP, IPPC industry
Tully Stream	14T02	0400	Bridge u/s Nurney	Agriculture, LA WWTP, IPPC industry

Tully Stream	14T02	0500	Bridge W. of Cherrymills Ho	
Tully Stream	14T02	0600	Cloney Bridge	Agriculture, LA WWTP, IPPC industry

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007				
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008	
River Name	River Code	Biological Monitoring Station	Station Location Name	If there is an identifiable source, please enter details
Blackwater (Longwood)	07B02	0060	Br S of Hortland	
Blackwater (Longwood)	07B02	0100	Br at Johnstown	
Blackwater (Longwood)	07B02	0200	Blackwater Br	
Boyne	07B04	0100	River Br	
Boyne	07B04	0200	Boyne Br	
Boyne	07B04	0300	Kinnafad Br	
Boyne	07B04	0400	Ballyboggan Br	
Boyne	07B04	0600	Ashfield Br	
Glash	07G02	0400	Clonuff Br	
Glash	07G02	0600	Br u/s Boyne R confl	
Clonshanbo	09C03	0300	Br N of Baltracey X-Rds	
Clonshanbo	09C03	0600	Br u/s Lyreen R confl	Sources identified, enforcement action taken.
Kilcullen Stream	09K02	0800	Br E of Yellowbog	
Kilcullen Stream	09K02	1100	Br u/s Liffey River confl	
Liffey	09L01	0400	Ballymore Eustace Br	
Liffey	09L01	0500	1 km d/s Ballymore Eu Br	
Liffey	09L01	0600	New Br (u/s Kilcullen)	
Liffey	09L01	0700	Kilcullen Bridge	
Liffey	09L01	0850	Connell Ford	
Liffey	09L01	1000	2.5 km d/s Newbridge	
Liffey	09L01	1050	Victoria Bridge	
Liffey	09L01	1200	Castlekeely Ford	
Liffey	09L01	1400	Millicent Bridge	
Liffey	09L01	1500	Alexandra Bridge, Clane	
Liffey	09L01	1600	Straffan, at Turnings Lr	Possible sources identified and being investigated.
Liffey	09L01	1610	Straffan, Turnings Lr (LHS)	
Liffey	09L01	1700	Bridge in Celbridge	Possible sources identified and being investigated.
Liffey	09L01	1900	Leixlip Br. (RHS)	Possible sources identified and being investigated.
Lyreen	09L02	0035	Br NE of Treadstown	
Lyreen	09L02	0100	U/s Rye Water confl	
Lemonstown Stream	09L03	0600	Bridge N. of Ballybought	
Morell	09MO1	0060	(S) br W of Tipper Ho	
Morell	09MO1	0100	Bridge in Johnstown	
Morell	09MO1	0150	br NE of Sherlockstown	
Morell	09MO1	0300	Bridge u/s Liffey River confl	
Painstown	09P01	0300	Bridge in Kill village	Possible sources identified and being investigated.
Painstown	09P01	0400	Painstown Bridge	Possible sources identified and being investigated.
Painstown	09P01	0500/0470	Br 300m u/s Morell R confl	Possible sources identified and being investigated.
Rye Water	09R01	0100	Balfeaghan Br	
Rye Water	09R01	0200	500 m d/s Kilcock	Possible sources identified and being investigated.
Rye Water	09R01	0300	Anne's Bridge	Possible sources identified and being investigated.
Rye Water	09R01	0400	Kildare Bridge	

Rye Water	09R01	0500	Sandford's Bridge	
Rye Water	09R01	0600	Bridge in Leixlip	Possible sources identified and being investigated.

TABLE 1.1: RIVER WATER QUALITY STANDARDS TO BE ACHIEVED BY 2007				
Local Authority Name	Kildare Co.Council	Implementation Report Year	2008	
River Name	River Code	Biological Monitoring Station	Station Location Name	If there is an identifiable source, please enter details
Rathmore Stream	09R02	0100	Br at Rathmore	
Rathmore Stream	09R02	0200	Bridge SW of Arthurstown	
Rathmore Stream	09R02	0300	Bridge NE of Johnstown	
Athy Stream	14A06	0200	Bridge near Glenbaun	
Athy Stream	14A06	0400	1st Br d/s Barkersford Br	
Barrow	14B01	1000	Pass Bridge	Possible sources identified and being investigated with bordering LA
Barrow	14B01	1300	Ford E of Fisherstown House	
Barrow	14B01	1400	Dunrally Bridge	
Barrow	14B01	1500	Bert Bridge	Possible sources identified and being investigated.
Barrow	14B01	1590	0.4 km u/s Athy Br LHS	Possible sources identified and being investigated.
Barrow	14B01	1900	Tankardstown Bridge	
Barrow	14B01	2000	Maganey Bridge	
Bothogue	14B04	0300	Bridge to S. of Timolin	
Cloncumber Stream	14C17	0100	Br at Wheelam Crossroads	
Cloncumber Stream	14C17	0200	Old River Bridge (W)	
Figile	14F01	0050	Br S of Ticknevin Bridge	Derrinturn WWTP
Figile	14F01	0100	Cushaling Bridge	
Greese	14G04	0100	Spratstown Bridge	Possible sources identified and being investigated with bordering LA and EPA
Greese	14G04	0200	Bridge near Greese Bank	
Greese	14G04	0350	Bridge N.E. of Belan House	Possible sources identified and being investigated, LA WWTP - Ballitore village
Greese	14G04	0400	Kilkea Bridge	Section 4-Leoville Ltd., LA WWTP - Kilkea village
Greese	14G04	0500	Br W. of Castleroe Cross Roads	LA WWTP - Castleroe village
Greese	14G04	0600	Bridge u/s Barrow River	LA WWTP - Castleroe village, sources of siltation being investigated.
Graney (Lerr)	14G07	0100	Miller's Bridge	
Graney (Lerr)	14G07	0200	Bridge in Graney	Possible sources identified and being investigated.
Graney (Lerr)	14G07	0310	Just u/s Lerr River confl	Possible sources identified and being investigated.
Lerr	14L01	0080	E Br Castledermot	
Lerr	14L01	0150	Bridge E. of Woodlands House	
Lerr	14L01	0155	Agric Br S. of Woodlands House	
Lerr	14L01	0250	Ballaghmoon Bridge	Possible sources identified and being investigated.
Lerr	14L01	0300	Lerr Bridge	Possible sources identified and being investigated.
Levitstown Stream	14L02	0200	Br W of Duke Street	
Palatine Stream	14P04	0200	Gorteen Bridge	Possible sources identified and being investigated with bordering LA
Slate	14S01	0020	Quigley's Bridge	
Slate	14S01	0050	Ford Bridge	
Slate	14S01	0100	Agar Bridge	
Slate	14S01	0150	E Br Rathangan (Opp Church)	Possible sources identified and being investigated.
Slate	14S01	0210	100 m d/s Bridge near Spencer Br	Possible sources identified and being investigated.
Tully Stream	14T02	0100	Bridge near Tully House	
Tully Stream	14T02	0200	500 m d/s Br near Tully Ho	LA WWTP - Kildare Town, Kildare Chilling Company Ltd.
Tully Stream	14T02	0300	Kilberrin Bridge	LA WWTP - Kildare Town, Kildare Chilling Company Ltd.
Tully Stream	14T02	0390	Soomeragh Bridge	LA WWTP - Kildare Town, Kildare Chilling Company Ltd.
Tully Stream	14T02	0400	Bridge u/s Nurney	LA WWTP - Kildare Town, Kildare Chilling Company Ltd.

Tully Stream	14T02	0500	Bridge W. of Cherrymills Ho	
Tully Stream	14T02	0600	Cloney Bridge	LA WWTP - Kildare Town, Kildare Chilling Company Ltd.

SECTION 2 – IMPLEMENTATION OF MEASURES

TABLE 2.1 – Implementation Programme Summary Table for Local Authority Area

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Local Government Water Pollution Acts, 1977 & 1990 - Licencing**	Reduce and control phosphorus discharges from all Section 4 or 16 Licenced activities.	Continual improvements to Licencing process.	Ongoing	S.E. Environment
			Enforcement of all Licence conditions.	Ongoing	S.E. Environment
			Prosecutions for breach of licence conditions.	Ongoing	S.E. Environment
			Licencing of small businesses, e.g. filling stations, hotels, golf clubs, restaurants etc.	Ongoing	S.E. Environment
			Review Section 4 & 16 Licences.	On-going	S.E. Environment
	Municipal Wastewater Treatment Plants	Reduce P inputs from LA WWTPs, pumping stations and combined sewer overflows.	Enforce Urban Wastewater Directive, continue investment in major capital schemes, small schemes, serviced land initiative schemes.	Ongoing	S.E. Water Services
			Environment & Water Services consultation meetings and workshops.	On-going	S.E. Environment
			Identify WWTPs that require upgrading/P removal, consult with Water Services.	30/11/2006	S.E. Environment, S.E. Water Services
			Determine P loadings discharged from wastewater treatment plants and assimilative capacity of receiving waters.	31/03/2007	S.E. Environment, S.E. Water Services
	On-site Wastewater Treatment Systems	Reduce P inputs to groundwaters and surface waters from on-site wastewater treatment systems serving single houses.	Assess each planning application proposing an on-site wastewater treatment system.	Ongoing	S.E. Environment
			Environment personnel will complete the FAS training course: 'Site Suitability Course for On-Site Wastewater Management'.	Ongoing	S.E. Environment

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Unauthorised Discharges and Misconnection Surveys**	Reduce P inputs to groundwaters and surface waters.	Identify sources of unauthorised discharges to stormwater drainage systems and surface waters.	On-going	S.E. Environment
			Serve notices if necessary and ensure unauthorised discharge is terminated.	On-going	S.E. Environment
	Farm Surveys	Reduce P inputs to groundwaters and surface waters.	Carry out farm surveys in the Barrow, Boyne and Liffey Catchments.	On-going	S.E. Environment
			Identify sources of farmyard pollution	Ongoing	S.E. Environment
			Serve Section 12 Notices or Advisory Letters as required.	Ongoing	S.E. Environment
			Data Storage	Ongoing	S.E. Environment
	Intensive Agricultural Enterprises	Reduce P inputs to groundwaters and surface waters.	Assess the status of all intensive agricultural enterprises.	Ongoing	S.E. Environment
	Pollution Control and Complaint Investigation	Reduce P inputs to groundwaters and surface waters.	Improve ability to respond to pollution incidents and deal with in a systematic manner.	Ongoing	S.E. Environment
	Prosecutions for Contravention of the Water Pollution Act.	Reduce P inputs to groundwaters and surface waters.	Investigate reports of pollution and contravention of the Water Pollution Act	Ongoing	S.E. Environment
			Prosecution for contravention of Water Pollution Act	Ongoing	S.E. Environment
	Waste Management	Achieve objectives of the Waste Management Plan.	Increase recycling and ensure safe disposal of wastes	Ongoing	S.E. Environment
	Sludge Management	Achieve objectives of the Sludge Management Plan.	Provide sluge handling facility	Ongoing	S.E. Environment, S.E. Water Services
	Geographical Information System	Develop GIS for Barrow, Boyne and Liffey catchments.	Update G.I.S. within the Council with relevant Environmental information.	Ongoing	S.E. Environment
	Groundwater Protection Scheme	Groundwater Protection.	Prepare Groundwater Protection Scheme for County Kildare.	Ongoing	S.E. Environment, S.E. Water Services
	Environmental Management System (EMS)	Adopt EMS approach in the implementation of measures.	Establish EMS approach.	Ongoing	S.E. Environment
	Inspection Plan	Reduce P inputs to groundwaters and surface waters.	Prepare Environmental Inspection Plan.	On-going	S.E. Environment
	Enforcement Team Training and Development	Develop competencies within enforcement personnel.	Training and development to be addressed through PMDS and PDP's.	On-going	S.E. Environment
	Abstractions	Record abstractions from surface water and groundwater in excess of 25 cubic metres.	Resister of abstractions to be maintained.	On-going	S.E. Environment

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Monitoring Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**River Water Monitoring**	Develop river water monitoring programme to fulfil requirements of P-Regulations.	Liase with EPA and other relevant bodies.	On-going	S.E. Environment
	WPA - Section 4 & Section 16 Licenses - Discharge Monitoring	Establish P inputs to surface waters, groundwaters and to LA sewerage systems.	Monitor all WPA Section 4 & 16 licensed discharges.	On-going	S.E. Environment
	Groundwater Monitoring	Monitor groundwater quality.	Support groundwater monitoring programmes.	Ongoing	S.E. Environment, S.E. Water Services
	Hydrometric Programme	Provide accurate flow data for surface waters.	Upgrade and maintain hydrometric network as required.	Ongoing	S.E. Environment
	Laboratory Information System (LabInfo)	Collect and store river water quality and WPA Section 4 & 16 licence data in approved data management system.	LabInfo management system to be used for data storage.	Ongoing	S.E. Environment
	Small Stream Risk Score (SSRS)	Attain competency in SSRS and use as a tool in implementation of measures.	Enforcement staff to complete relevant training course.	Ongoing	S.E. Environment
	Consultative & Co-operative Measures	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
	Environmental Enforcement Network	Provide consistent and effective enforcement of environmental legislation.	Attend various working group meetings and seminars. Implement new guidance and procedures.	Ongoing	S.E. Environment
	Rye River Group	Provide forum for discussion on water quality in the Rye Water system.	Environment Section represented on Rye River Group.	Ongoing	S.E. Environment
	Barrow Steering Group	Provide forum for discussion on water quality in the River Barrow.	Environment Section represented on Barrow Steering Group.	Ongoing	S.E. Environment
	Agricultural Sector	Improve co-opertaion and consultation with farming community.	Arrange meetings with representatives of the Irish Farmers Association.	Ongoing	S.E. Environment
	EPA - Hydrometric Division	Provide reliable hydrometric data for surface waters.	Develop co-operative approach with EPA staff.	Ongoing	S.E. Environment
	Water Framework Directive	Promote stakeholder involvement in the implementation of the Water Framework Dirctive.	RBDs to establish Advisory Councils and Steering Groups.	Ongoing	RBDs
	Public Education & Advisory Measures	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
	General Environmental Education	Promote environmental awareness.	General public education, Community Education Programmes, Water Conservation Programme, Race Against Waste.	Ongoing	D.O.S. Environment
	Schools Education Programme	Promote environmental awareness at primary and secondary school level.	Support 'Green Schools Programme', arrange visits to schools to promote environmental awareness.	Ongoing	D.O.S. Environment

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Public Education & Advisory Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
	Environmental Notices	Encourage better environmental awareness among relevant sectors.	Publish relevant and informative environmental notices in local press.	Ongoing	S.E. Environment
	Newsletters	Promote environmental awareness among the general public.	Print and make available relevant and informative environmental newletters.	Ongoing	S.E.O. Environment
	Internet Websites	Promote environmental awareness though the worldwide web.	Make environmental information and relevant application forms available on websites.	Ongoing	S.E. Environment
	Community and Voluntary Groups	Promote environmental awareness and support community initiatives.	Provide support and funding where possible to community groups.	Ongoing	D.O.S. Environment
	River Basin Districts	Ensure access to information, allow for consultation on major reports and encourage public involvement in the RBD Projects.	Establish RBD Adviusory Councils, arrange public meetings, use press releases and update project websites with all reports and announcements.	Ongoing	D.O.S. Environment
	Other national, agri-environmental & miscellaneous measures	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
	Agri-Environmental	Reduce P inputs to surface waters & groundwaters	Promote participation in REPS and/or pollution control grant schemes.	Ongoing	S.E. Environment

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Local Government Water Pollution Acts, 1977 & 1990 - Licencing**	Reduce and control phosphorus discharges from all Section 4 or 16 Licenced activities.	Continual improvements to Licencing process.	41 No. Section 4 licences issued, 93. No. Section 16 licences issued. Internal audit of the licensing process carried out in 2007. New licence application forms created.	
			Enforcement of all Licence conditions.	Licenced premises inspected in accordance with Environmental Inspection Plan. Companies notified of level of compliance. Audits of licences to continue.	
			Prosecutions for breach of licence conditions.	3 No. successful prosecutions taken for breach of Section 4 or Section 16 of Water Pollution Act in this reporting period.	
			Licencing of small businesses, e.g. filling stations, hotels, golf clubs, restaurants etc.	Surveys have commenced in towns focussing on business producing trade effleunt containing fats/oils/grease.	
			Review Section 4 & 16 Licences.	All Section 4 Licences in Barrow, Boyne and Liffey Catchments reviewed. A small number of Section 16 Licences are under review.	
	Municipal Wastewater Treatment Plants	Reduce P inputs from LA WWTPs, pumping stations and combined sewer overflows.	Enforce Urban Wastewater Directive, continue investment in major capital schemes, small schemes, serviced land initiative schemes.	New WWTPs commissioned or nearing completion. Construction of new WWTPs commenced, awaiting approval from DoEHLG, in planning . Improvements to existing WWTPs underway, e.g. P-removal.	
			Environment & Water Services consultation meetings and workshops.	Consultation meetings progressed since the merging of Environmnet and Water Services under the one Directorship. Workshops arranged on major new capital scheme projects.	
			Identify WWTPs that require upgrading/P removal, consult with Water Services.	Consultation with Water Services ongoing. P-removal installed at Robertstown WWTP.	
			Determine P loadings discharged from wastewater treatment plants and assimilative capacity of receiving waters.	Technician appointed to implement monitoring programme which needs to be expanded county wide.	Commence low flow study of receiving waters. Expand monitoring programme.
	On-site Wastewater Treatment Systems	Reduce P inputs to groundwaters and surface waters from on-site wastewater treatment systems serving single houses.	Assess each planning application proposing an on-site wastewater treatment system.	Common policy drawn up between Water Services, Planning and Environment Sections. Standard Site Characterisation Form used. Panel of site assessors set up.	
			Environment personnel will complete the FAS training course: 'Site Suitability Course for On-Site Wastewater Management'.	7 no. Environment personnel have completed the 'Site Suitability Course for On-Site Wastewater Management'	All staff involved in planning to receive the appropriate training.

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Unauthorised Discharges and Misconnection Surveys**	Reduce P inputs to groundwaters and surface waters.	Identify sources of unauthorised discharges to stormwater drainage systems and surface waters.	Missconnection surveys commenced at 2 locations.	
			Serve notices if necessary and ensure unauthorised discharge is terminated.	26 Warning letters issued.	Follow-up inspections required.
	Farm Surveys	Reduce P inputs to groundwaters and surface waters.	Carry out farm surveys in the Barrow, Boyne and Liffey Catchments.	A total of 621 farm surveys carried out in the Barrow, Boyne and Liffey catchments.	Continue farm survey work for the purpose of the EC (Good Agricultural Practice for Protection of Waters) Regulations 2006.
			Identify sources of farmyard pollution	Sources of farmyard pollution identified	
			Serve Section 12 Notices or Advisory Letters as required.	73 Section 12 Notices issued. 153 Advisory Letters issued. Water quality improvements recorded within river sub-catchments	
			Data Storage	Data base created for data storage.	
	Intensive Agricultural Enterprises	Reduce P inputs to groundwaters and surface waters.	Assess the status of all intensive agricultural enterprises.	Preliminary assessment carried out.	Review status of all I.A.E.and ensure proper regulation
	Pollution Control and Complaint Investigation	Reduce P inputs to groundwaters and surface waters.	Improve ability to respond to pollution incidents and deal with in a systematic manner.	Procedure in place to record and investigate pollution complaints. Pollution Response Vehicle and contractors available in event of major spills.	Review procedures in place on a regular basis.
	Prosecutions for Contravention of the Water Pollution Act.	Reduce P inputs to groundwaters and surface waters.	Investigate reports of pollution and contravention of the Water Pollution Act	Serious incidents investigated immediately. All reports of pollution recorded and prioritised.	
			Prosecution for contravention of Water Pollution Act	4 no. successful prosecutions for contravention of Water Pollution Act in this reporting period.	
	Waste Management	Achieve objectives of the Waste Management Plan.	Increase recycling and ensure safe disposal of wastes	Waste Management Plan reviewed. 43 no. Bring Centres in County Kildare. Civic Amenity Sites at Silliot Hill and Athy. Third site planned for north Kildare.	
	Sludge Management	Achieve objectives of the Sludge Management Plan.	Provide sludge handling facility.	Sludge Management Plan adopted for Kildare. Sludge handling facility constructed at Osberstown and is at commissioning stage.	
	Geographical Information System	Develop GIS for Barrow, Boyne and Liffey catchments.	Update G.I.S. within the Council with relevant Environmental information.	Geo-referenced data uploaded to the internal G.I.S. and updated when required.	
	Groundwater Protection Scheme	Groundwater Protection.	Prepare Groundwater Protection Scheme for County Kildare.	Groundwater Protection Scheme prepared for Kildare.	
	Environmental Management System (EMS)	Adopt EMS approach in the implementation of measures.	Establish EMS approach.	Alternative meetings held every two weeks on water quality and farm surveys, on-going review takes place, problems encountered discussed	
	Inspection Plan	Reduce P inputs to groundwaters and surface waters.	Prepare Environmental Inspection Plan.	Inspection Plan prepared	
	Enforcement Team Training and Development	Develop competencies within enforcement personnel.	Training and development to be addressed through PMDS and PDP's.	PDP's completed and relevant training to be provided.	
	Abstractions	Record abstractions from surface water and groundwater in excess of 25 cubic metres.	Resister of abstractions to be maintained.	Abstractions register maintained in the Environment Section, 10 abstractions on record.	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Monitoring Measures**	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**River Water Monitoring**	Develop river water monitoring programme to fulfil requirements of P-Regulations.	Liase with EPA and other relevant bodies.	Monitoring programmes in place to fulfil the requirements of all relevant legislation.	
	WPA - Section 4 & Section 16 Licenses - Discharge Monitoring	Establish P inputs to surface waters, groundwaters and to LA sewerage systems.	Monitor all WPA Section 4 & 16 licensed discharges .	Monitoring carried out in accordance with Environmental Inspection Plan prepared under RMCEI.	Review Plan and amend if necessary
	Groundwater Monitoring	Monitor groundwater quality.	Support groundwater monitoring programmes.	Groundwater monitoring programme established to fulfil requirement of the WFD. Upgrades to montioring sites carried out.	
	Hydrometric Programme	Provide accurate flow data for surface waters.	Upgrade and maintain hydrometric network as required.	To date €142,025.00 has been invested in the hydrometric programme.	Provide hydrometric station on the River Liffey at Osberstown.
	Laboratory Information System (LabInfo)	Collect and store river water quality and WPA Section 4 & 16 licence data in approved data management system.	LabInfo management system to be used for data storage.	LabInfo used to store river water quality and WPA Section 4 & 16 licence data.	Commence data exchage through EDEN when the system becomes available.
	Small Stream Risk Score (SSRS)	Attain competency in SSRS and use as a tool in implementation of measures.	Enforcement staff to complete relevant training course.	7 Environment personnel have completed the relevant training course. SSRS work carried in 3 sub-catchments.	
	Consultative & Co-operative Measures	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
	Environmental Enforcement Network	Provide consistent and effective enforcement of environmental legislation.	Attend various working group meetings and seminars, implement new guidance and procedures.	Environment personal represent Council on a number of working groups and attend relevant seminars.	
	Rye River Group	Provide forum for discussion on water quality in the Rye Water system.	Environment Section represented on Rye River Group.	Environment personnel supporting work of Rye River Group.	
	Barrow Steering Group	Provide forum for discussion on water quality in the River Barrow.	Environment Section represented on Barrow Steering Group	Environment personnel supporting work of Barrow River Group.	
	Agricultural Sector	Improve co-opertaion and consultation with farming community.	Arrange meetings with representatives of the Irish Farmers Association.	IFA representative notified in advance of farm surveys commencing in their area.	
	EPA - Hydrometric Division	Provide reliable hydrometric data for surface waters.	Develop co-operative approach with EPA staff.	Significant investmnent in development of the hydrometric network and flow measurement techniques.	
	Water Framework Directive	Promote stakeholder involvement in the implementation of the Water Framework Dirctive.	RBDs to establish Advisory Councils and Steering Groups.	Kildare County Council represented on ERBD Advisory Council and Technical Council. Kildare County Council represented on SERBD Steering and Management Groups.	
	Public Education & Advisory Measures	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
	General Environmental Education	Promote environmental awareness.	General public education, field trips, Community Education Programmes, Water Conservation Programme, Race Against Waste	Talks given through the Community Education Groups. Tours of Silliot Hill Waste Management Facility organised. Water Conservation Programme run every summer.	
	Schools Education Programme	Promote environmental awareness at primary and secondary school level.	Support 'Green Schools Programme', arrange visits to schools to promote environmental awareness.	42% of schools awarde the Green Schools Flag.	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Public Education & Advisory Measures**	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
	Environmental Notices	Encourage better environmental awareness among relevant sectors.	Publish relevant and informative environmental notices in local press.	Environmental notices aimed at the farming community and rural dwellers published.	
	Newsletters	Promote environmental awareness among the general public.	Print and make available relevant and informative environmental newletters.	Acorn Newsletter, Barrow News Newsletter and ENFO literature available.	
	Internet Websites	Promote environmental awareness though the worldwide web.	Make environmental information and relevant application forms available on websites.	Kildare County Council website hosts environmental information. Dedicated website for Osberstown WWTP developed.	
	Community and Voluntary Groups	Promote environmental awareness and support community initiatives.	Provide support and funding where possible to community groups.	Funding provided to Offaly and Kildare Waterways, Irish Peatland Conservation Council.	
	River Basin Districts	Ensure access to information, allow for consultation on major reports and encourage public involvement in the RBD Projects.	Arrange public meetings, use press releases and update project websites with all reports and announcements.	RBD Advisory Councils established. SWMI Report Published. ERBD 'Water Matters' roadshow came to Naas, SERBD workshop held in Portlaoise.	
	Other national, agri-environmental & miscellaneous measures	**Targets**	**Actions**	**Progress to Date**	**Corrective Actions**
	Agri-Environmental	Reduce P inputs to surface waters & groundwaters.	Promote participation in REPS and/or pollution control grant schemes.	REPS participation ongoing, uptake of grant aid through the Farm Waste Management Scheme and Farm Improvement Scheme amongst farming community.	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Local Government Water Pollution Acts, 1977 & 1990 - Licencing**	Reduce and control phosphorus discharges from all Section 4 or 16 Licenced activities.	Continual improvements to Licencing process.	On-going	
			Enforcement of all Licence conditions.	Ongoing	
			Prosecutions for breach of licence conditions.	Ongoing	
			Licencing of small businesses, e.g. filling stations, hotels, golf clubs, restaurants etc.	On-going	
			Review Section 4 & 16 Licences.	On-going	
	Municipal Wastewater Treatment Plants	Reduce P inputs from LA WWTPs, pumping stations and combined sewer overflows.	Enforce Urban Wastewater Directive, continue investment in major capital schemes, small schemes, serviced land initiative schemes.	On-going	
			Environment & Water Services consultation meetings and workshops.	On-going	
			Identify WWTPs that require upgrading/P removal, consult with Water Services.	Yes	
			Determine P loadings discharged from wastewater treatment plants and assimilative capacity of receiving waters.	No	On-going
	On-site Wastewater Treatment Systems	Reduce P inputs to groundwaters and surface waters from on-site wastewater treatment systems serving single houses.	Assess each planning application proposing an on-site wastewater treatment system.	Ongoing	
			Environment personnel will complete the FAS training course: 'Site Suitability Course for On-Site Wastewater Management'.	Ongoing	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Planning Control & Enforcement Measures**	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Unauthorised Discharges and Misconnection Surveys**	Reduce P inputs to groundwaters and surface waters.	Identify sources of unauthorised discharges to stormwater drainage systems and surface waters.	Ongoing	
			Serve notices if necessary and ensure unauthorised discharge is terminated.	Ongoing	
	Farm Surveys	Reduce P inputs to groundwaters and surface waters.	Carry out farm surveys in the Barrow, Boyne and Liffey Catchments.	Ongoing	
			Identify sources of farmyard pollution.	No	
			Serve Section 12 Notices or Advisory Letters as required.	Ongoing	
			Data Storage	Ongoing	
	Intensive Agricultural Enterprises	Reduce P inputs to groundwaters and surface waters.	Assess the status of all intensive agricultural enterprises.	Ongoing	
	Pollution Control and Complaint Investigation	Reduce P inputs to groundwaters and surface waters.	Improve ability to respond to pollution incidents and deal with in a systematic manner.	Ongoing	
	Prosecutions for Contravention of the Water Pollution Act.	Reduce P inputs to groundwaters and surface waters.	Investigate reports of pollution and contravention of the Water Pollution Act.	Ongoing	
			Prosecution for contravention of Water Pollution Act.	Ongoing	
	Waste Management	Achieve objectives of the Waste Management Plan.	Increase recycling and ensure safe disposal of wastes.	Ongoing	
	Sludge Management	Achieve objectives of the Sludge Management Plan .	Provide sludge handling facility.	Ongoing	
	Geographical Information System	Develop GIS for Barrow, Boyne and Liffey catchments.	Update G.I.S. within the Council with relevant Environmental information.	Ongoing	
	Groundwater Protection Scheme	Groundwater Protection.	Prepare Groundwater Protection Scheme for County Kildare.	Yes	
	Environmental Management System (EMS)	Adopt EMS approach in the implementation of measures.	Establish EMS approach.	Ongoing	
	Inspection Plan	Reduce P inputs to groundwaters and surface waters.	Prepare Environmental Inspection Plan.	Ongoing	
	Enforcement Team Training and Development	Develop competencies within enforcement personnel.	Training and development to be addressed through PMDS and PDP's.	Ongoing	
	Abstractions	Record abstractions from surface water and groundwater in excess of 25 cubic metres.	Resister of abstractions to be maintained.	Ongoing	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
Standard	**Monitoring Measures**	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**River Water Monitoring**	Develop river water monitoring programme to fulfil requirements of P-Regulations.	Liase with EPA and other relevant bodies.	On-going	
	WPA - Section 4 & Section 16 Licenses - Discharge Monitoring	Establish P inputs to surface waters, groundwaters and to LA sewerage systems.	Monitor all WPA Section 4 & 16 licensed discharges .	On-going	
	Groundwater Monitoring	Monitor groundwater quality.	Support groundwater monitoring programmes.	Ongoing	
	Hydrometric Programme	Provide accurate flow data for surface waters.	Upgrade and maintain hydrometric network as required.	Ongoing	
	Laboratory Information System (LabInfo)	Collect and store river water quality and WPA Section 4 & 16 licence data in approved data management system.	LabInfo management system to be used for data storage.	Ongoing	
	Small Stream Risk Score (SSRS)	Attain competency in SSRS and use as a tool in implementation of measures.	Enforcement staff to complete relevant training course.	Ongoing	
	Consultative & Co-operative Measures	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
	Environmental Enforcement Network	Provide consistent and effective enforcement of environmental legislation.	Attend various working group meetings and seminars. Implement new guidance and procedures.	Ongoing	
	Rye River Group	Provide forum for discussion on water quality in the Rye Water system.	Environment Section represented on Rye River Group.	Ongoing	
	Barrow Steering Group	Provide forum for discussion on water quality in the River Barrow.	Environment Section represented on Barrow Steering Group	Ongoing	
	Agricultural Sector	Improve co-opertaion and consultation with farming community.	Arrange meetings with representatives of the Irish Farmers Association.	Ongoing	
	EPA - Hydrometric Division	Provide reliable hydrometric data for surface waters.	Develop co-operative approach with EPA staff.	Ongoing	
	Water Framework Directive	Promote stakeholder involvement in the implementation of the Water Framework Dirctive.	RBDs to establish Advisory Council and Steering Groups.	Yes	
	Public Education & Advisory Measures	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
	General Environmental Education	Promote environmental awareness.	General public education, field trips, Community Education Programmes, Water Conservation Programme, Race Against Waste.	Ongoing	
	Schools Education Programme	Promote environmental awareness at primary and secondary school level.	Support 'Green Schools Programme', arrange visits to schools to promote environmental awareness.	Ongoing	

TABLE 2.1 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR LOCAL AUTHORITY AREA					
Local Authority	**Kildare Co.Council**	**Implementation Report Year**	**2008**		
To improve unsatisfactory water quality to meet the relevant specified standard and to maintain satisfactory water quality in County Kildare.	**Public Education & Advisory Measures**	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**Responsible for Implementation**
	Environmental Notices	Encourage better environmental awareness among relevant sectors.	Publish relevant and informative environmental notices in local press.	Ongoing	
	Newsletters	Promote environmental awareness among the general public.	Print and make available relevant and informative environmental newletters.	Ongoing	
	Internet Websites	Promote environmental awareness though the worldwide web.	Make environmental information and relevant application forms available on websites.	Ongoing	
	Community and Voluntary Groups	Promote environmental awareness and support community initiatives.	Provide support and funding where possible to community groups.	Ongoing	
	River Basin Districts	Ensure access to information, allow for consultation on major reports and encourage public involvement in the RBD Projects.	Arrange public meetings, use press releases and update project websites with all reports and announcements.	Ongoing	
	Other national, agri-environmental & miscellaneous measures	**Targets**	**Actions**	**Action Completed within Timeframe? Yes/No**	**If No, State Revised Timeframe**
	Agri-Environmental	Reduce P inputs to surface waters & groundwaters.	Promote participation in REPS and/or pollution control grant schemes.	Ongoing	

TABLE 2.2 – Implementation Programme Summary Table for Rivers in Local Authority Area

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA							
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**				
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
Blackwater	0060 - 0200	Maintain water quality at monitoring stations 0060, 0100 and improve water quality at station 0200 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river catchment.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, Section 16 licences)	Reduce P inputs to rivers.	Investigate P loadings from LA WWTPs discharging to River Blackwater.	Ongoing	S.E. Environment and S.E. Water Services
Boyne	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river catchment.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	Investigate P loadings from LA, IPPC, S4 WWTPs in River Boyne catchment.	On going	S.E. Environment and S.E. Water Services
Glash	0400 - 0600	Improve water quality at stations 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Glash catchment.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	Investigate P loadings from LA and IPPC WWTPs discharging to River Glash.	Ongoing	S.E. Environment and S.E. Water Services
Clonshanbo	0300 - 0600	Improve water quality at stations 0300 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river catchment.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Kilcullen Stream	0800 - 1100	Improve water quality at stations 0800 and 1100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Liffey	0400 - 1900	Improve water quality at stations 0400, 1200, 1400, 1500, 1600, 1610, 1700 and 1900 to the prescribed standards. Maintain water quality at stations 0500, 0600, 0700, 0850, 1000 and 1050 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
					Prosecutions for contravention of Water Pollution Act 1977, as amended.	Ongoing	S.E. Environment
					Review section 4 and 16 licences.	Ongoing	S.E. Environment
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Investigate status of all LA, S4 WWTPs discharging to River Liffey.	Ongoing	S.E. Environment and S.E. Water Services

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA							
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**				
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
Lyreen	0035 - 0100	Improve water quality at stations 0035 and 0100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Investigate urban stormwater overflows and run-off discharging to River Lyreen.	Ongoing	S.E. Environment and S.E. Water Services
Lemonstown Stream	0600	Maintain water quality at station 0600 at prescribed standards.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Review water quality data to determine where farm surveys required.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Morell	0060 - 0300	Improve water quality at stations 0100 and 0150 to the prescribed standards and maintain water quality at stations 0060 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
					Issue/Review section 4 licences.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (IPPC,S4 licences) Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Investigate urban stormwater overflows and run-off and IPPC licences, S4 WWTPs discharging in Morell catchment.	Ongoing	S.E. Environment and S.E. Water Services
Painestown	0300 - 0500	Improve water quality at stations 0300 and 0400 to presecribed standards and maintain water quality at 0500/0470 at prescribed standard.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	On going	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (S.4 & IPPC licences) & Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Investigate urban stormwater overflows, IPPC, S4 WWTPs discharging to Painestown River.	Ongoing	S.E. Environment and S.E. Water Services
Rye Water	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Investigate urban stormwater overflows and run-off discharging to Ryewater River.	Ongoing	S.E. Environment and S.E. Water Services
Rathmore Stream	0100 - 0300	Maintain water quality at stations 0100, 0200 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA							
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**				
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
Athy Stream	0200 - 0400	Maintain water quality at stations 0200 and 0400 at the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Review water quality data to determine where farm surveys required.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Barrow	1000 - 2000	Improve water quality at stations 1000, 1300, 1500, 1590, 1900 and 2000 to prescribed standards. Maintain water quality at station 1400 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in river sub-catchments.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
					Review section 4 and 16 licences.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers	Investigate status of all LA and S4 WWTPs and stormwater overflows discharging in Barrow catchment.	Ongoing	S.E. Environment and S.E. Water Services
Bothogue	0300	Improvewater quality at station 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Bothogue catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA)	Reduce P inputs to rivers.	Investigate P loadings from LA WWTPs and communal septic tank systems in the catchment.	Ongoing	S.E. Environment and S.E. Water Services
Cloncumber Stream	0100 - 0200	Improve water quality at stations 0100 and 0200 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Cloncumber catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Investigate status of LA WWTPs discharging to the Cloncumber Stream.	Ongoing	S.E. Environment and S.E. Water Services
Figile	0050 - 0100	Improve water quality at stations 0050 and 0100 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Figile catchment	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, EPA Waste licence)	Reduce P inputs to rivers.	Investigate status of LA WWTPs and EPA Waste Licence in Figile catchment.	Ongoing	S.E. Environment and S.E. Water Services
Greese	0100 - 0600	Improve water quality at stations 0100, 0200, 0350, 0400, 0500 and 0600 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Greese catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers.	Investigate status of all LA, IPPC and S4 WWTPs discharging to River Greese.	Ongoing	S.E. Environment and S.E. Water Services

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA							
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**				
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Actions**	**Timeframe**	**Responsible for Implementation**
Graney	0100 - 0310	Improve water quality at stations 0100 and 0200 to prescribed standards and maintain water quality at 0310 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Graney catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Lerr	0080 - 0300	Improve water quality at stations 0080, 0150, 0155, 0250 and 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Lerr catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
			LA Wastewater Treatment Plants	Reduce P inputs to rivers.	Assess status of WWTPs discharging to Lerr.	Ongoing	S.E. Environment and S.E. Water Services
Levitstown Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Levitstown catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Palatine Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Palatine Stream catchment.	Ongoing	S.E. Environment
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Assess status of WWTPs discharging to Palatine (Carlow Co. Co.).	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
Slate	0020 - 0210	Improve water quality at stations 0020, 0050, 0100, 0150 and 0210 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Slate catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
					Review section 4 and 16 licences.		
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Investigate P loadings from WWTPs discharging to River Slate.	Ongoing	S.E. Environment and S.E. Water Services
Tully Stream	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0390, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Carry out farm surveys and follow-up inspections in Tully Stream catchment.	Ongoing	S.E. Environment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Enforce sections 3, 4, 10, 12, 13 and 16.	Ongoing	S.E. Environment
					Review section 4 and 16 licences.		
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	Investigate P loadings from WWTPs discharging to Tully Stream.	Ongoing	S.E. Environment and S.E. Water Services

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA						
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Progress to Date**	**Corrective Actions**
Blackwater	0060 - 0200	Maintain water quality at monitoring stations 0060, 0100 and improve water quality at station 0200 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 61 farm surveys carried out. Follow up inspections ongoing.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	4 Section 4 Licences and 2 Section 16 licences issued and 8 Section 12 Notices issued in the Blackwater catchment.	
			Wastewater Treatment Plants (LA, Section 16 licences)	Reduce P inputs to rivers.	Johnstown Bridge WWTP upgraded with P-Removal. Newtown WWTP requires further investigation.	Assess impact of Newtown WWTP on receiving water.
Boyne	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed 16 farm surveys carried out. Follow up inspections ongoing.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 4 licence issued and 4 Section 12 Notices issued. 1 successful prosecution for contravention of Water Pollution Act.	
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	Clogherinkoe WWTP constructed.	
Glash	0400 - 0600	Improve water quality at stations 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed 23 farm surveys carried out. Follow up inspections ongoing.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	2 Section 12 Notice issued in the Glash catchment.	
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	In consultation with Water Services regarding 1 small sewerage scheme upgrade.	Seek funding for small sewerage scheme upgrade
Clonshanbo	0300 - 0600	Improve water quality at stations 0300 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, farm surveys and follow up inspections carried out as part of Lyreen River catchment work.	Priority catchment investigative monitoring.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Section 12 Notices issued in the Clonshanbo catchment as part of Lyreen River catchment work.	
Kilcullen Stream	0800 - 1100	Improve water quality at stations 0800 and 1100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed 19 farm surveys carried out.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	5 Section 12 Notices issued in the Kilcullen Stream catchment.	
Liffey	0400 - 1900	Improve water quality at stations 0400, 1200, 1400, 1500, 1600, 1610, 1700 and 1900 to the prescribed standards. Maintain water quality at stations 0500, 0600, 0700, 0850, 1000 and 1050 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 15 farm surveys carried out.	Review status of farm surveys in all sub-catchments
			Enforce Water Pollution Act	Reduce P inputs to rivers.	39 Section 12 Notices issued in the Liffey catchment.	
					5 successful prosecutions have been taken for contravention of Water Pollution Act in the Liffey catchment.	
					74 Section 16 licences and 16 Section 4 licences active active in the River Liffey catchment. All reviewed or under review.	
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Straffan WWTP decommissioned, sewage pumped to Leixlip WWTP. Expansion of Upper and Lower Liffey Vally sewerage schemes to commence.	Continue to assess the environmental impact of all WWTPs in Liffey catchment.

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA						
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Progress to Date**	**Corrective Actions**
Lyreen	0035 - 0100	Improve water quality at stations 0035 and 0100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 73 farm surveys completed. Follow up inspections ongoing.	Priority catchment for review of farm surveys and investigative monitoring.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 4 licence issued and 26 Section 12 Notices issued in the Lyreen catchment.	
			Urban stormwater overflows and run-off.	Reduce P inputs to rivers.	Expansion of the Lower Liffey Valley Sewerage Scheme to address pollution sources.	
Lemonstown Stream	0600	Maintain water quality at station 0600 at prescribed standards.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Water quality data reviewed and farm surveys not prioritised for this area.	
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 4 licence issued but not activated.	
Morell	0060 - 0300	Improve water quality at stations 0100 and 0150 to the prescribed standards and maintain water quality at stations 0060 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 6 farm surveys completed. Follow up inspections ongoing.	Review status of farm surveys in this catchment.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 12 Notice issued in the Morell catchment. 4 Section 4 licences active in the Morell catchment.	
			Wastewater Treatment Plants (IPPC,S4 licences) Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Sources of pollution identified and eleminated. Further investigations recommeded.	
Painestown	0300 - 0500	Improve water quality at stations 0300 and 0400 to presecribed standards and maintain water quality at 0500/0470 at prescribed standard.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Water quality data reviewed and 28 farm surveys completed. Follow up inspections ongoing.	Priority catchment for review of farm surveys.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	2 Section 4 licence issued, 6 Section 12 Notices issued in the Painstown catchment.	
			Wastewater Treatment Plants (S.4 & IPPC licences) & Urban stormwater overflows and run-off	Reduce P inputs to rivers.	In consultation with Water Services to identify potential point sources of pollution in Kill area.	Focus on impact of Kill PS on downstream monitoring station.
Rye Water	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 5 farm surveys completed. Follow up inspections ongoing.	Priority catchment for review of farm surveys.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	3 Section 12 Notices issued in the Rye Water catchment.	
			Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Expansion of the Lower Liffey Valley Sewerage Scheme to address pollution sources.	
Rathmore Stream	0100 - 0300	Maintain water quality at stations 0100, 0200 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, farm surveys will be carried out as required.	
			Enforce Water Pollution Act	Reduce P inputs to rivers.	3 Section 12 Notices issued and 1 Section 4 Licence active in the Rathmore Stream catchment.	

TABLE 2.2 IMPLEMENTATION PROGRAMME SUMMARY TABLE FOR RIVERS IN LOCAL AUTHORITY AREA						
Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Progress to Date**	**Corrective Actions**
Athy Stream	0200 - 0400	Maintain water quality at stations 0200 and 0400 at the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 40 farm surveys carried out.	
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 4 licence in Athy Stream catchment.	
Barrow	1000 - 2000	Improve water quality at stations 1000, 1300, 1500, 1590, 1900 and 2000 to prescribed standards. Maintain water quality at station 1400 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, farm surveys due to commence along the main channel areas.	Review status of farm surveys in this catchment.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	5 Section 12 Notices served in Barrow catchment. 2 successful prosecutions for contravention of Water Pollution Act.	
					18 Section 4 licences and 7 Section 16 licences (Athy WWTP) active in the Barrow River catchment	
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers	In consultation with Water Services to to identify potential point sources of pollution in Barrow catchment from LA WWTPs.	
Bothogue	0300	Improvewater quality at station 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 4 farm surveys carried out.	Review status of farm surveys in this catchment.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	2 Section 12 Notice issued. 1 Section 4 licence active.	
			Wastewater Treatment Plants (LA)	Reduce P inputs to rivers.	Wastewater treatment systems identified.	Assessment of impact on Bothogue to be carried out..
Cloncumber Stream	0100 - 0200	Improve water quality at stations 0100 and 0200 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 16 farm surveys carried out in Cloncumber Stream Catchment.	Review status of farm surveys in this catchment.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	3 Section 12 Notices served in Cloncumber Stream catchment.	
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Wastewater treatment plants identified.	Assessment of impact on Bothogue to be carried out.
Figile	0050 - 0100	Improve water quality at stations 0050 and 0100 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, preliminary farm visits carried out, inspections to follow.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 4 licence and 1 Section 16 licence active.	
			Wastewater Treatment Plants (LA, EPA Waste licence)	Reduce P inputs to rivers.	Construction of new Derrinturn WWTP expected to commence in 2008.	Liase with EPA on Waste Licence for Carbury Compost Ltd.
Greese	0100 - 0600	Improve water quality at stations 0100, 0200, 0350, 0400, 0500 and 0600 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 48 farm surveys have been completed.	Review status of farm surveys in this catchment.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	7 Section 12 Notices issued in the Greese catchment.	
					6 Section 4 Licences active in Greese catchment.	
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers.	Wastewater treatment plants identified. Assessment of impact on Greese carried out.	Review impact and make recommendations.

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Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Progress to Date**	**Corrective Actions**
Graney	0100 - 0310	Improve water quality at stations 0100 and 0200 to prescribed standards and maintain water quality at 0310 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 33 farm surveys completed. Follow up inspections ongoing.	Priority catchment for review of farm surveys
			Enforce Water Pollution Act	Reduce P inputs to rivers.	5 Section 12 Notices issued in the Graney catchment.	
Lerr	0080 - 0300	Improve water quality at stations 0080, 0150, 0155, 0250 and 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 39 farm surveys carried out.	
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 successful prosecution for contravention of Water Pollution Act. Section 4 licence revoked.	
			LA Wastewater Treatment Plants	Reduce P inputs to rivers.	1 Section 16 licence issued in the Lerr River catchment, Castledermot WWTP upgrade completed, P-removal installed.	Monitor impact of WWTP discharge on River Lerr
Levitstown Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 3 farm surveys completed.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 12 Notice issed in Levitstown Stream catchment.	
Palatine Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed and 8 farm surveys completed.	Review status of farm surveys in this catchment
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Preliminary consultation has taken place but further clarification required.	Further consultation with Carlow Co. Co. required.
			Enforce Water Pollution Act	Reduce P inputs to rivers.	1 Section 12 Notice issued in the Palatine Stream catchment.	
Slate	0020 - 0210	Improve water quality at stations 0020, 0050, 0100, 0150 and 0210 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 42 farm surveys carried out.	Review status of farm surveys in this catchment
			Enforce Water Pollution Act	Reduce P inputs to rivers.	16 Section 12 Notices issued in the Slate catchment.	
					2 Section 4 licences active in River Slate catchment.	
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Allenwood sewerage scheme completed. P-removal commissioned at Robertstown WWTP.	
Tully Stream	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0390, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Water quality data reviewed, 142 farm surveys have been carried out.	Staff assigned to carry out farm surveys
			Enforce Water Pollution Act	Reduce P inputs to rivers.	6 Section 12 Notices issued in the Tully Stream catchment.	
					1 Section 4 licence and 6 Section 16 licences active in the Tully Stream catchment. 3 successful prosecutions for contravention of Water Pollution Act.	
			Wastewater Treatment Plants (LA, IPPC & Section 4 licences)	Reduce P inputs to rivers.	Commissioning of new Kildare Town WWTP scheduled for mid 2010.	

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Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Action Completed Within Timeframe Yes/No**	**If No, State Revised Timeframe**
Blackwater	0060 - 0200	Maintain water quality at monitoring stations 0060, 0100 and improve water quality at station 0200 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, Section 16 licences)	Reduce P inputs to rivers.	Ongoing	Ongoing
Boyne	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, IPPC and Section 4 licences)	Reduce P inputs to rivers.	Ongoing	Ongoing
Glash	0400 - 0600	Improve water quality at stations 0400 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, IPPC and Section 4 licences)	Reduce P inputs to rivers.	Ongoing	Ongoing
Clonshanbo	0300 - 0600	Improve water quality at stations 0300 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Kilcullen Stream	0800 - 1100	Improve water quality at stations 0800 and 1100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Liffey	0400 - 1900	Improve water quality at stations 0400, 1200, 1400, 1500, 1600, 1610, 1700 and 1900 to the prescribed standards. Maintain water quality at stations 0500, 0600, 0700, 0850, 1000 and 1050 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
					Ongoing	Ongoing
					Ongoing	Ongoing
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Ongoing	Ongoing

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Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Action Completed Within Timeframe Yes/No**	**If No, State Revised Timeframe**
Lyreen	0035 - 0100	Improve water quality at stations 0035 and 0100 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Ongoing	Ongoing
Lemonstown Stream	0600	Maintain water quality at station 0600 at prescribed standards.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Morell	0060 - 0300	Improve water quality at stations 0100 and 0150 to the prescribed standards and maintain water quality at stations 0060 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
					Ongoing	Ongoing
			Wastewater Treatment Plants (IPPC,S4 licences) Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Ongoing	Ongoing
Painestown	0300 - 0500	Improve water quality at stations 0300 and 0400 to presecribed standards and maintain water quality at 0500/0470 at prescribed standard.	Farm Surveys	Assess farm management requirements on farms to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (IPPC licences), urban stormwater overflows and run-off	Reduce P inputs to rivers.	Ongoing	Ongoing
Rye Water	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Urban stormwater overflows and run-off	Reduce P inputs to rivers.	Ongoing	Ongoing
Rathmore Stream	0100 - 0300	Maintain water quality at stations 0100, 0200 and 0300 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing

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Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Action Completed Within Timeframe Yes/No**	**If No, State Revised Timeframe**
Athy Stream	0200 - 0400	Maintain water quality at stations 0200 and 0400 at the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Barrow	1000 - 2000	Improve water quality at stations 1000, 1300, 1500, 1590, 1900 and 2000 to prescribed standards. Maintain water quality at station 1400 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
					Ongoing	Ongoing
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers	Ongoing	Ongoing
Bothogue	0300	Improvewater quality at station 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA)	Reduce P inputs to rivers.	Ongoing	Ongoing
Cloncumber Stream	0100 - 0200	Improve water quality at stations 0100 and 0200 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Ongoing	Ongoing
Figile	0050 - 0100	Improve water quality at stations 0050 and 0100 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, EPA Waste licence)	Reduce P inputs to rivers.	Ongoing	Ongoing
Greese	0100 - 0600	Improve water quality at stations 0100, 0200, 0350, 0400, 0500 and 0600 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, Section 4 licences)	Reduce P inputs to rivers.	Ongoing	Ongoing

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Local Authority Name	**Kildare Co.Council**	**Implementation Report Year**	**2008**			
River	**Reach of River**	**Standard**	**Measures**	**Targets**	**Action Completed Within Timeframe Yes/No**	**If No, State Revised Timeframe**
Graney	0100 - 0310	Improve water quality at stations 0100 and 0200 to prescribed standards and maintain water quality at 0310 at prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Lerr	0080 - 0300	Improve water quality at stations 0080, 0150, 0155, 0250 and 0300 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			LA Wastewater Treatment Plants	Reduce P inputs to rivers.	Ongoing	Ongoing
Levitstown Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Palatine Stream	0200	Improve water quality at station 0200 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
Slate	0020 - 0210	Improve water quality at stations 0020, 0050, 0100, 0150 and 0210 to prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants	Reduce P inputs to rivers.	Ongoing	Ongoing
Tully Stream	0100 - 0600	Improve water quality at stations 0100, 0200, 0300, 0390, 0400, 0500 and 0600 to the prescribed standards.	Farm Surveys	Assess farm waste management to reduce P inputs to rivers.	Ongoing	Ongoing
			Enforce Water Pollution Act	Reduce P inputs to rivers.	Ongoing	Ongoing
			Wastewater Treatment Plants (LA, IPPC and Section 4 licences)	Reduce P inputs to rivers.	Ongoing	Ongoing

SECTION 3 – PROGRESS TO DATE

3.1 PLANNING CONTROL AND ENFORCEMENT MEASURES

3.1(1) Progress During Reporting Period

(i) Local Government Water Pollution Acts, 1977 & 1990 - Licensing

The approach adopted in the processing of effluent discharge licences under Section 4 and Section 16 of the Local Government (Water Pollution) Acts, 1977 – 1990 has been successful and there are now designated staff at technical and administrative level dealing with all license applications and the enforcement of active licences in the County. There are presently 41 Section 4 licences and 93 Section 16 licences active in County Kildare. A total of 19 licences have been revoked in this reporting period, 10 Section 4 licences and 9 Section 16 licences.

Each licence application is assessed individually and often involves consultation with the Planning and/or Water Services Departments. A copy of each "draft" Section 16 licence is forwarded to the Water Services Department and their comments are taken into account when processing the final licence. In the case of Section 4 licence applications, a copy of the "draft" licence is forwarded to the relevant Fisheries Board for their comment and observations. The priority is always to ensure that the quality of the receiving water is never compromised and that there is a mechanism in place to control and manage hydraulic and biological loadings placed on municipal wastewater collection and treatment systems. There has been a noticeable improvement in the standard of detail contained in application forms for Section 4 and 16 licences.

It is the Environment Section's aim to ensure full compliance with each of the licence conditions, as this is an important tool in protecting receiving water bodies and wastewater collection and treatment systems. Each licensed premises is inspected in accordance with the Environmental Inspection Plan for Kildare County Council, which is prepared and reviewed annually to take account of the requirements of the recommendations of the European Parliament and Council providing for Minimum Criteria for Environmental Inspections in Member States (2001/331/EC) (MCEI). The Environmental Inspection Plan rates each licence according to the risk it poses to the environment and an inspection frequency has been determined on this basis. A full site inspection is carried out and a grab sample of the effluent discharge is collected and taken for independent laboratory analysis. On receipt of the certificate of analysis a report on the inspection is completed.

The policy of the Council is to inform the licensee of each inspection and offer guidance where necessary. In many cases this has resulted, for example, in the upgrading of effluent treatment systems to include phosphorus removal, construction and installation of new fats/oils/grease interceptors and the installation of instrumentation such as flow meters and automatic samplers.

Where a licensee is continuously in breach of licence conditions and has ignored the instruction of the Council to address the matter, legal proceedings under the Water Pollution Act are recommended. A number of successful prosecutions for contravention of the Water Pollution Act in relation to licencing have been initiated

and 3 offenders have been successfully prosecuted since the 2006 Implementation Report. These prosecutions have ensured that the sources of pollution are eliminated as well as highlighting in the media that incidents of pollution will not be tolerated.

Priority has been given in the past number of years to the licencing of commercial premises such as filling stations, golf clubs, nursing homes, and hotels. It is estimated that over 90% of such premises in the county have now been licenced. This follows a request from the Department of the Environment, Heritage and Local Government to implement the approach recommended in Circular L8/03 (WSP).

Surveys have commenced in the towns of Naas, Newbridge, Celbridge, Leixlip and Maynooth, which focus on businesses producing trade effluent containing fats/oils/grease. As this primarily relate to restaurants and fast food outlets the inspections are combined with those of the Health Service Executive. Due to the intensive workload a streamlined approach to the licensing of these premises will be adopted.

Regarding new premises applying for a discharge licence the Council must be satisfied that the application form and other relevant information is fully complete in order for the licence to be correctly processed. The information on which the Council will base its decision must be accurate and, if necessary, additional information will be requested. For example, each application for a Section 4 discharge licence must be accompanied by an assessment of the assimilative capacity of the receiving water or in the case of a discharge to groundwater, a hydrogeological assessment. This allows for theoretical increases in key parameters on background concentrations to be calculated.

All Section 4 licences in the Barrow, Boyne and Liffey catchments have been reviewed. A number of Section 16 licences are under review.

Application forms for Section 4 and Section 16 licences have been updated to make them more user friendly while still ensuring that the relevant information is submitted. The application forms are available for download of the Council website.

Following an internal audit of the licensing process in 2007 a number of recommendations, primarily at administrative level, have been implemented.

(ii) Municipal Wastewater Treatment Plants

Kildare County Council has prioritised the construction/upgrade of wastewater treatment plants and collection systems based on the significance of environmental impacts.

A number of river water quality monitoring stations in County Kildare continue to be adversely affected by discharges from municipal wastewater treatment plants. However, sewerage schemes completed at the end of 2007 under the Water Services Investment Programme will go some way to addressing this problem. New sewerage schemes have been provided for Castledermot, Monasterevin, Kildangan, Coill-Dubh, Clogherinkoe, Curragh, Suncroft, Brownstown, Cutbush, Allenwood and Straffan. A

phosphorus removal system has been commissioned for Robertstown wastewater treatment plant.

Sewerage schemes, which are currently in the planning stage, include the Kildare Town Sewerage Scheme, Upper Liffey Valley Regional Sewerage Scheme-Extension to Osberstown WWTP, Lower Liffey Valley Regional Sewerage Scheme-Extension to Leixlip WWTP, Rathangan Sewerage Scheme, Ballymore Eustace Sewerage Scheme and Derrinturn WWTP. Planning permission was granted to a developer for the provision of a new wastewater treatment plant for the village of Ballitore.

The Environment Section continues to meet with the Water Services Section to discuss pressures on water quality attributable to wastewater treatment plants, pumping stations, combined sewer overflows or faulty sewer networks. This has progressed further since the merging of these sections under the one Directorship within the organisation since October 2007.

Workshops are being organised by the Water Services Section on major new capital scheme projects. The workshops provide an opportunity for the Environment Section to become involved in decision making at an early stage and bring forward for discussion any potential problems that may transpire as a result of such projects.

A system for the licensing or certification of wastewater discharges from areas served by local authority sewer networks was brought into effect on 27th September 2007 by the Minister for the Environment, Heritage and Local Government. The licensing and certification authorisation process was introduced on a phased basis commencing on 14th December 2007 in accordance with the requirements of the Wastewater Discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007).

All discharges to the aquatic environment from sewerage systems owned, managed and operated by water service authorities requires wastewater discharge licence or certificate of authorisation from the EPA. Local authorities are required to apply to the EPA for a licence by set dates depending on the population equivalent of the agglomeration served by the sewer network.

The authorisation process provides for the EPA to place stringent conditions on the operation of such discharges to ensure the potential effects of the receiving water bodies are strictly limited and controlled.

Applications for licences have been submitted to the EPA for Athy, Leixlip and Osberstown wastewater treatment plants, all with agglomeration population equivalents of more than 10,000. Licence applications for Kildare, Monasterevin and Rathangan wastewater treatment plants, all with agglomeration population equivalents of 2,001 to 10,000, are to be submitted by 22nd September 2008.

(iii) On-site Wastewater Treatment Systems

The Environment Section carries out an assessment of planning applications for all proposed developments, which would result in treated effluent discharges to groundwater and surface water from on-site wastewater treatment systems. These include one-off rural housing (septic tank systems, advanced wastewater treatment

systems) as well as small communities, hotels and other small businesses. The assessment is carried out with regard to the requirements of the EPA Wastewater Treatment Manuals 'Treatment Systems for Single Houses' and 'Treatment Systems for Small Communities, Business, Leisure Centres and Hotels' and the DOELG/EPA/GSI publication "Groundwater Protection Schemes'. Full regard is also given to the Groundwater Protection Plan for County Kildare.

Since the 1st August 2007 only Site Characterisation Reports completed by suitably qualified site assessors are accepted. The assessor must have successfully completed the Site Suitability Course for On-Site Wastewater Treatment and furnished proof of his/her professional indemnity insurance to the Environment Section. A standard site characterisation form is recommended in line with the model used at Appendix A in the EPA manual. A list of the approved site assessors is available from the Environment Section.

A maintenance clause for proprietary effluent treatment systems is inserted in planning permissions where appropriate.

A common policy has been drawn up between the Water Services, Planning and Environment Departments regarding wastewater treatment and disposal of treated effluent in designated settlements. Any planning application proposing to discharge >5m³/day of treated effluent to ground is assessed in accordance with the recommendations of the EPA Wastewater Treatment Manuals and is regulated as part of the licensing procedure for Section 4 Effluent Discharge Licences, under the Water Pollution Act.

In forming this policy the following considerations have been taken into account:

- The use of the "Site Characterisation Form" for the assessment of 'cluster' developments intending to discharge treated effluent to ground is required, but is not sufficient in itself.
- A 'risk based' or 'precautionary' approach is recommended when assessing developments that propose to discharge >5m³/day of treated effluent to ground.
- It must be shown that discharging to a large percolation area is the 'best option' particularly in areas in the county with a history of groundwater pollution (high nitrates etc.)
- Prior investigations must be carried out as part of the detailed site assessment to demonstrate the quality of the water in the aquifer and the attenuation capacity of the soils. This requires drilling of boreholes and a detailed assessment of the results by a suitably qualified person (hydrogeologist). The affect on the groundwater quality of the pollutant (B.O.D., nitrates, phosphates, etc.) loading should be assessed and quantified.
- Design details and drawings of the proposed percolation area are required. In this regard the use of the British Standard (BS 6297: 1983) may be considered more appropriate in designing the size of the percolation area.
- A long term operation and maintenance plan for the wastewater treatment system should be prepared.
- An ongoing monitoring programme to ensure the wastewater treatment system and percolation area is operating properly and is not causing environmental

pollution is required. This may involve the installation of boreholes to facilitate the monitoring of groundwater quality, at set intervals.

A small-scale pilot study has been carried out on a variety of single dwelling wastewater treatment systems in use in County Kildare. The purpose of this is to give a general overview of the treatment efficiency and level of maintenance associated with these treatment systems. The proprietary effluent treatments systems examined are all approved and certified by the Irish Agrément Board. The follow on from this has been the publication in local press and on the Council website of an information leaflet providing guidance on the basic upkeep and maintenance required for these wastewater treatment systems.

(iv) Unauthorised Discharges and Misconnection Surveys

The Environment Section regularly receives complaints from the public about unauthorised discharges of polluting matter to surface waters, groundwater or to stormwater systems. Each incident is prioritised and dealt with depending on its severity. The most common example is where a person has either deliberately or unintentionally made a connection of domestic wastewater to a surface water or stormwater system. In many cases the problem can be resolved without the need to issue enforcement notices.

(v) Farm Surveys

The agricultural sector continues to be a major contributor to poor water quality in rivers throughout County Kildare. In addition, a small number of very serious pollution incidents have occurred which are attributable to farming practices.

Therefore a significant effort is being put into the area of farm surveys and the identification of point and non-point discharges relating to farming activities.

There are a total of 68 active river water quality monitoring sites located throughout County Kildare. Farm surveys have commenced in each of the 24 river sub-catchments in the County. Areas where water quality is unsatisfactory are given priority although all catchments will be targeted with a view to achieving or maintaining satisfactory water quality conditions.

Farm surveys are carried out for the purpose of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006. Since the introduction of the Phosphorus Regulations a total of 621 farm surveys have been completed. There is now a legal requirement for farmers to follow Good Agricultural Practice giving the Local Authorities additional powers of enforcement.

A request has been made in July 2008 to the Department of Agriculture and Food, as provided for by Article 27(3) of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006, for a copy of the register of all holdings (agricultural production unit) in County Kildare. Depending on the level of detail contained in the response, a better picture on how much progress is being made in this area will emerge.

An indication that farm survey work is having a beneficial effect can be seen in recent improvements in water quality at monitoring stations in the catchments of the Clonshanbo River, Kilcullen Stream, Lyreen River, Morell River and Rye Water River. Unfortunately however similar improvements have not been recorded in other catchments where farm surveys have been carried out.

(vi) Intensive Agricultural Enterprises

An assessment of all Intensive Agricultural Enterprises in the County has been completed and was largely confined to pig, poultry, food and mushroom production activities. Information on quantities of waste produced, waste storage facilities, spreadlands etc. is being gathered and files opened on each activity.

Recent changes to the IPPC licensing system have seen the list of licensable activities extended. The activities most affected by the changes include certain intensive agricultural enterprises, the treatment and processing of milk, the slaughter of cattle, food production and the production of paper, pulp and board. A new ministerial order dated 1st June 2006 has set dates by which an application for an IPPC licence must be made to the Environmental Protection Agency.

The Environment Section has not identified any activities to which the new order will apply.

(vii) Pollution Control and Complaint Investigation

The Environment Section has a designated Environmental Complaints Co-ordinator. All contact details are available in the EPA/DoEHLG/EEN *'See Something? Say Something! How to Make an Environmental Complaint'* publication and on the Council website, www.kildare.ie. Phone calls received Out of Hours on 1890 500 333 are recorded and complaints referred to relevant staff as appropriate. The Fire Service who in turn contacts the designated Enforcement Officers directly with regard to environmental incidents for immediate response operates the Out of Hours service. Complaints received by the Environment Section are recorded in the Environmental Complaints Database. It is the policy of the Environment Section that all complaints are acknowledged within 5 working days and a reply issued within 20 working days.

Where necessary, a notice under the Water Pollution Act is served and in some cases prosecutions may be taken for contravention of the Water Pollution Act if the polluter does not take corrective action.

The Environment Section can utilise its Pollution Response Vehicle in the event of a significant oil spill into surface waters.

A list of contractors that can be called upon in the event of a major oil or chemical spillage has been compiled. The list contains the name of each contractor, it's location, contact details, response time and capabilities and if 24-hr callout is provided.

(viii) Prosecutions for Contravention of the Water Pollution Act

Since the previous Implementation Report successful prosecutions have been achieved in four cases where a contravention of the Water Pollution Act has occurred.

Legal proceedings have recently been recommended in a number of cases where a breach of the Water Pollution Act has occurred.

(ix) Waste Management

The Environmental Protection Agency granted a waste licence for the Integrated Waste Management Facility at Silliot Hill, Kilcullen on the 17th May 2002. This facility is located in the Liffey catchment. Landfilling activities ceased at the site on 30th March 2002 and the site now functions as a waste transfer station, recycling centre, civic amenity site and composting facility.

Kildare County Council reviewed its Waste Management Plan for the county in January 2006. A central policy objective of the Plan is to achieve the recycling targets as outlined in the Government policy documents, "Waste Management - Changing Our Ways", "Preventing and Recycling Waste - Delivering Change" and "Waste Management – Taking Stock and Moving Forward".

The current number of bring centres in the county is 43. At present, two civic amenity sites are operational in the County, at Silliot Hill, Kilcullen and in Athy town. A third site is planned for the north of the county.

The Council has also issued a significant number of Waste Permits and Waste Collection Permits under the Waste Management Act, 1996 - 2008. Environment personnel are involved in the enforcement of each permit.

Kildare County Council adopted a Sludge Management Plan for the County in 2001. The Sludge Management Plan identified the need for a hub centre for the treatment of sludge within the county. The site chosen was Osberstown and the facility is constructed and is currently at the commissioning stage.

(x) Geographical Information Systems

The Environment section provides the G.I.S. co-ordinator with relevant georeferenced environmental data, which is updated on the internal G.I.S. system as new information comes to light. This data includes the river network in the county, river water quality monitoring stations and the locations of Section 4 and Section 16 licenced activities. All sections within the organisation have access to this information.

(xi) Groundwater Protection Scheme

The Geological Survey of Ireland has completed a Groundwater Protection Scheme for County Kildare. This allows the Council to take account of the potential risk to groundwater resources and sources as well as geological and hydrogeological factors, when considering the control and location of potentially polluting activities.

The County Development Plan states that it is the Council's policy to protect groundwater resources having regard to the Groundwater Protection Scheme. The majority of future settlement, development and economic activity within the County is likely to take place in areas above significant aquifers as well as within the catchment of the River Liffey and it's tributaries. Strategies and policies in place to manage the growth and development of the County include the Groundwater Protection Scheme.

(xii) Environmental Management System

An environmental management systems approach to the implementation of the various measures is being used with staff meetings held regularly to discuss progress and any problems that have been encountered.

An on-going review of progress takes place and any problems encountered are highlighted.

(xiii) Inspection Plan

The Inspection Plan has been drawn up to take account of the requirements of the recommendations of the European Parliament and the Council providing for Minimum Criteria for Environmental Inspections (RMCEI) in Member States (2001/331/EC).

The Recommendation relates to the environmental inspection of all installations and enterprises whose emissions to air, water or waste management activities are subject to regulation under EU law. It covers not only those currently being regulated but also those that are subject to regulation i.e. unauthorised activities.

In accordance with the RMCEI, routine and non-routine inspections are carried out to check and promote compliance with relevant National and EU Environmental legal requirements and to monitor the impact of authorised and non-authorised installations on the environment.

Within Kildare County Council, the responsibility for environmental inspections falls between the Environment Section, Water Services Section, Fire Services and the Planning Section.

The Environment Section, with consultation and input from the other relevant sections, is responsible for the preparation of the Inspection Plan.

(xiv) Enforcement Team Training and Development

The implementation of relevant National and EU Environmental legislation will require the development of certain competencies within the inspection team. The training and educational requirements of each member of the enforcement team has been addressed through the Performance Management Development System process and the Personal Development Plans.

(xv) Abstractions

A register of all abstractions from waters in County Kildare is required under Section 9 (2) of the Local Government (Water Pollution) Act, 1977. Abstractions, which exceed 25 cubic metres in any 24 hours period, are registered as per Local Government (Water Pollution) Regulations, 1978 (S.I.108/1978). There are currently 10 registered abstractions.

3.1(2) Problems Encountered

Some problems are being encountered in the implementation of planning control and enforcement measures. These are outlined as follows,

(i) Local Government Water Pollution Acts 1977 & 1990 - Licensing

There has been a noticeable improvement in the standard of detail contained in application forms for Section 4 and 16 licences. However, the majority of applications require requests for further information and there appears to be a shortage of suitably qualified or experienced agents available to carry out this work to an acceptable standard.

In relation to larger developments where a discharge to surface water is proposed greater accuracy in determining the 95 percentile flow is required. This information is now looked for at the planning stage and avoids the need to retrospectively look for it after the development has been granted planning permission.

There is a need to clarify what flow data is to be used by Local Authorities in setting the emission limit values to surface waters and to ensure a consistency of approach.

Although the Environmental Protection Agency has an extensive Hydrometric Programme in place, in many areas long-term records of flow data are absent and recourse must be made to best estimates.

Prescribed bodies under the Water Pollution Act are forwarded copies of all draft Section 4 licences for comment and observation and this can lead to delays in some cases.

There continues to be a high level of non-compliance with licence conditions. Where this is identified the licensee is made aware of the non-compliance and instructed to take corrective action.

It has also been identified that there are serious health and safety issues relating to the provision of safe and easily accessible sampling points.

(ii) Municipal Wastewater Treatment Plants

Significant progress has been achieved and investment carried out at a number of wastewater treatment plants in the County. However, construction of new wastewater treatment plants for Kildare town and Derrinturn village has yet to commence and

therefore the water quality in the Tully Stream and Figile River, the respective receiving waters, will not improve to the prescribed standards set out in the Third Schedule of the Phosphorus Regulations.

The procedure for progressing major water services capital schemes requires approval from the Department of the Environment, Heritage and Local Government at various critical stages. At such points in the process, once submissions have been made to the Department, the means for the advancement of the projects are no longer within the control of the local authority. The movement of the scheme to the next significant stage is thus dependant on the decision of the Department and in awaiting such an approval, delays may occur.

Greater emphasis needs to be put on chemical and biological assessments of receiving waters above and below all wastewater treatment plants to monitor their impacts on these waters. The minimum target should be to meet the requirements of the Urban Wastewater Treatment Regulations, 2001. This information would allow realistic and effective programmes of measures to be developed and undertaken.

(iii) On-site Wastewater Treatment Systems

A small-scale pilot study has been carried out on a variety of single dwelling wastewater treatment systems in use in County Kildare. The purpose of this is to give a general overview of the treatment efficiency and level of maintenance associated with these treatment systems.

All of the proprietary effluent treatments systems examined are approved and certified by the Irish Agrément Board.

The main conclusion drawn from this study is that there is a lack of awareness and interest on the maintenance and desludging requirements of wastewater treatment systems and the need to use a holder of the correct Waste Collection Permit for the transport of the residual sludge.

In these circumstances the treatment efficiency of the wastewater treatment systems will be affected and this was reflected in the analytical findings of the study. In order to address this issue a notice to all dwelling owners with septic tank systems or wastewater treatment systems was published in the local media and further information is available on the Kildare County Council website.

(iv) Unauthorised Discharges and Misconnection Surveys

Misconnection surveys in large housing estates have commenced but due to the intensive workload and resources available progress in completing these surveys has been slow.

(v) Farm Surveys

Farm survey work is time consuming and in order to best utilise the resources available catchment areas to be targeted are prioritised. In many cases it can take several farmyard revisits before improvement works are carried out.

Funding through the Scheme of Investment Aid for Farm Waste Management and the Farm Improvement Scheme is no longer available and some farmers who have not availed of grant aid will have difficulty in financing farm improvement work.

Farmers who have not yet the storage capacity requirements in place for organic fertilisers have until the 31st December 2008 to do so. It is not be clear if problems with the storage of organic fertilisers will remain after this date.

(vi) Prosecutions for Contravention of the Water Pollution Act

Although there is an arrangement in place to meet with the Councils legal advisors on a regular and on-going basis to discuss matters in relation to all pending water and waste prosecution cases, delays, outside of the Councils control, can occur when cases are adjourned for a variety of different reasons.

(vii) Pollution Control and Complaint Investigation

The main problem encountered with pollution control measures is that in the vast majority of cases there is a direct overlap between the Environment and Planning Sections. The Environment Section regularly receives complaints relating to incidents of pollution that would not exist if planning permissions were fully complied with. In some cases the source of pollution may be from an unauthorised development. Environment personnel will carry out an inspection and report on the findings but the problem may not be resolved until the planning enforcement is followed through.

(viii) Inspection Plan

In the preparation of this Plan and in the review of the implementation of the 2007 Plan, there was found to be some overlap with other similar management tools such as the Performance Management Development System (PMDS), Service Indicators and the Local Authority Management System (LAMS). Although there is similarity between these systems the information is not always readily available and this leads to inefficiencies in time spent by staff in some sectors collating data.

3.1(3) Future Plans and New Directions

(i) Local Government Water Pollution Act 1977 & 1990 - Licensing

Due to the high level of non-compliance with licence conditions an increased level of enforcement in line with the Environmental Inspection Plan will be maintained. It is also planned to seek prosecutions against offenders who continuously breach licence conditions and fail to make any attempt to take corrective action.

It has been identified that there are serious health and safety issues relating to the provision of safe and easily accessible sampling points. This is being addressed in conjunction with the organisations Health and Safety officers and appointed consultants.

(ii) Farm Surveys

Kildare County Council will incorporate the requirements of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006 (S.I. No. 378 of 2006) into all inspections of farm holdings.

The Council will also aim to develop co-ordination arrangements with other public authorities with a view to promoting consistency of approach in inspection procedures and administrative efficiencies. Where farm surveys are taking place in river catchments shared with other local authorities information on the findings of these surveys will be made available.

(iii) Pollution Control and Complaint Investigation

Incidents of an urgent or serious nature are sometimes notified directly to the Enforcement Officers and although these incidents are investigated they may not necessarily be recorded in the complaints database. This is being addressed and all complaints received in 2008 are to be recorded in the complaints database and investigated in a systematic manner.

(iv) On-site Wastewater Treatment Systems

The Environment Section is considering random inspections of existing single house wastewater treatment systems in areas of poor water quality and appropriate advice and enforcement action, if necessary, will follow where problems are identified.

(v) Enforcement of Water Pollution Acts

The Local Government (Water Pollution) Act, 1977, as amended, will continue to be enforced and prosecutions will be brought against persons found to be in contravention of the Act.

(vi) Peat Abstraction

Suspected impacts from peat abstraction activities on water quality will be investigated although the extent of the impact has yet to be determined.

3.2 CONSULTATIVE AND COOPERATIVE MEASURES

3.2(1) Progress During Reporting Period

(i) Environmental Enforcement Network

The Environmental Enforcement Network (EEN) was set up in 2004 to allow public bodies involved in environmental protection and regulation to work together to achieve more consistent and effective enforcement of environmental legislation.

The main bodies of the EEN are:

- EPA Office of Environmental Enforcement
- Local Authorities
- Government Departments
- Gardai and some specific Garda units including Criminal Assets Bureau

The network is overseen by a Steering Committee made up of members of the above organisations and considers the ongoing work of the network and sets the priorities for the network on a continual basis. Working groups have been created to develop guidance and procedures to deal with a number of environmental priority areas such as Enforcement Management, Water, Waste, Producer Responsibility (Waste) and Kildare County Council is represented on these working groups.

(ii) Rye River Group

The Environment Section of Kildare County Council is represented on the Rye River Group, a group founded by Intel Ireland Ltd., Leixlip. The aim of this group is to restore water quality to a satisfactory condition and meetings held four times a year provide a forum for all local stakeholders to discuss a wide range of issues concerning the river and its riparian zones. The group is updated at each meeting on water quality trends and enforcement work being carried out in the catchment by Environment Section personnel.

(iii) Barrow Steering Group

The Environment Section of the Council is also represented on the Barrow Steering Group, which includes the major stakeholders within the Barrow catchment. Barrow Catchment Management objectives are:

- To act as a forum for discussion of issues related to the protection of the ecosystem and sustainable development of the Barrow catchment.
- To encourage stakeholder interest and participation in the Barrow catchment management.
- To facilitate communication and co-operation between stakeholders on issues relating to the Barrow catchment.
- To investigate sources of funding to maintain and develop the Barrow catchment management initiative.
- To increase public awareness and distribute information on issues relating to the Barrow catchment ecosystem.

The Barrow Steering Group was initiated in 1998 and has been meeting since that date on a quarterly basis in Carlow. The Southern Regional Fisheries Board provides a secretarial and co-ordinating role for the Barrow Steering Group.

(iv) Agricultural Sector

Notification of proposed farm survey activity in river catchment areas is given to a representative of the Irish Farmers Association in an effort to maintain good working relations between the association and it's members.

(v) Environmental Protection Agency – Hydrometric Division

Kildare County Councils Environment Section works in conjunction with the Hydrometric Section of the Environmental Protection Agency in the assessment of flows and nutrient loads in rivers throughout Kildare. This is proving beneficial in many hotspot areas prioritised for inspection.

(vi) Water Framework Directive

The Water Framework Directive was transposed into Irish law by the European Communities (Water Policy) Regulations, 2003 (S.I. No. 722). These regulations required the establishment of River Basin Districts. County Kildare is located in the Eastern River Basin District (ERBD) and the South Eastern River Basin District (SERBD).

The Regulations established the River Basin District Advisory Councils. This provided a forum for systematic involvement of interested parties. Kildare is represented by two Elected Members on each of the respective RBD Advisory Councils in addition to sectoral representatives.

Written consultation, Internet, media, and the River Basin District Advisory Councils facilitate the key requirement of engaging and consulting with relevant stakeholders and the public.

The publication of the Overview of Significant Water Management Issues (SWMI) reports in June 2007 each River Basin District was followed by a period of 6 months public consultation. The ERBD Project had a 'Water Matters' road show at locations throughout the district. The road show came to Naas (Lawlor's Hotel) on 31/10/2007 and was attended by staff from Kildare County Council. Similarly, the SERBD Project held public meetings and workshops e.g. in Portlaoise on 20/11/2007. Notices were also placed in local press.

The ERBD Project commenced the Mobile Monitoring Unit (MMU) initiative in 2006. Kildare were actively involved in this working group. In 2007 the Department of Environment, Heritage and Local Government committed to funding the initiative and in January 2008 the engagement of a Watershed Warden for the ERBD was finalised. To date, the Watershed Warden has carried out investigative work in Kildare in the Boyne Upper, Blackwater South and Liffey Water Management Units. The work programme was drawn up by Kildare and in consultation with the MMU project manager in order to support the preparation of the Programme of Measures. Public participation of the RBD Project is also part of the MMU initiative. As part of this work an environmental awareness campaign was commenced in schools throughout the ERBD. In Kildare, to date, 5 national schools have been visited, with presentations and workshops carried out in each. These are St. Patrick's Newbridge (4th, 5th & 6th class), Presentation Maynooth (4th, 5th & 6th class), Kilcullen (4th, 5th & 6th class), Celbridge (6th class), Patrician Brothers (6th class), Newbridge. This work will continue when the schools reopen after the summer holidays. Awareness material presented to schools is publicly available on the ERBD website on http://www.erbd.ie/Supporting_Workshops/downloads/Presentation_School.pdf

Kildare continue to be represented on the SERBD Management Group, the ERBD Technical Council and the ERBD Steering Committee. This has facilitated communication and data exchange from the SERBD and ERBD Projects and the local authority staff. In addition, representatives from Kildare County Council form part of the National Programme of Measures (POMs) Steering Group on Abstraction Pressures, which is lead by ERBD Project.

Kildare is represented on the Steering Group for Hydrological Aspects of the Water Framework Directive.

The publication in June 2008 by the Department of the Environment, Heritage and Local Government of the document *River Basin Management Planning – A Practical Guide for Public Authorities* is being made available on the Intranet. This will further increase awareness of the process to staff within the Local Authority, in particular those dealing within the areas of water and planning policy.

3.2(2) Problems Encountered

(i) Local Authority Management System (LAMS)

Kildare County Council appointed a co-ordinator for the Local Authority Management System (LAMS) in 2004 and devoted a significant amount of time on the implementation of LAMS within the organisation. This work has recently been superseded by the reviews carried out as part of the implementation of the Inspection Plan (RMCEI).

3.2(3) Future Plans and New Directions

(i) Water Framework Directive

Various deadlines in the implementation of the Regulations have recently been amended by the European Communities (Water Policy) (Amendment) Regulations, 2008 (S.I. No. 219).

A requirement of the Water Framework Directive is that local authorities must act together to make river basin management plans and establish a programme of measures for each river basin district. The draft river basin management plans and programmes of measures must be published by 22 December 2008. This is followed by a period of not less than 6 months for public consultation. In the ERBD, the River Basin Management System created by the ERBD Project will be used for the Updated Risk Assessment and for the making of the river basin management plan and programme of measures. The adoption of the river basin management plan is a reserved function and must be carried out by 16 October 2009. A river basin management plan and programme of measures will come into effect 22 December 2009. Established programme of measures must become operational by 22 December 2012.

It is proposed that a link from the Kildare County Council website www.kildare.ie to the established water framework directive websites containing information on Kildare such as www.erbd.ie www.serbd.com and www.wfdireland.ie will be facilitated.

3.3 MONITORING MEASURES

3.3(1) Progress During Reporting Period

(i) River Water Monitoring

Since the introduction of the Phosphorus Regulations the Environment Section has operated an integrated river water monitoring programme for rivers in the Barrow, Boyne and Liffey catchments. Up until December 2006 the various biological and physico-chemical monitoring programmes operated by the Environmental Protection Agency and Kildare County Council covered 89 monitoring stations. These were distributed throughout the three catchments as follows, Barrow 42 sites, Boyne 10 sites and Liffey 37 sites.

The Water Framework Directive Monitoring Programme became operational on 22nd December 2006 and Local Authorities were assigned responsibility for the physico-chemical monitoring aspect of the Operational Monitoring Programme. This has seen the number of sites reduce from 89 to 46 and these are distributed throughout the three catchments as follows, Barrow 18 sites, Boyne 5 sites and Liffey 23 sites. The sampling frequency has also changed as it is only required to sample these monitoring stations 4 times per year. Kildare County Council decided to maintain a frequency of 6 times per year as this will still allow median concentrations for orthophosphate to be determined in accordance with the Third Schedule of the Phosphorus Regulations.

The analysis of all river water samples taken for WFD Operational Monitoring purposes is carried out at the Dublin City Council Laboratory at Marrowbone Lane.

The task of Surveillance Monitoring for the Water Framework Directive Monitoring Programme has been assigned to the Environmental Protection Agency and 6 monitoring stations have been selected. These are distributed throughout the three catchments as follows, Barrow 3 sites, Boyne 1 sites and Liffey 2 sites. The sampling frequency for this monitoring is 12 times per year.

Environmental Protection Agency biologists carry out the biological assessment of water quality at selected Operational and Surveillance sites.

In addition to the Environmental Protection Agency biological assessments, Kildare County Council engages Conservation Services, Ecological and Environment Consultants, to carry out additional biological surveys on rivers in the county. This approach has been successful and in conjunction with inspection work potential sources of pollution were identified while other suspected sources were ruled out.

A river water quality monitoring programme under the European Communities (Quality of Salmonid Waters) Regulations 1988 was established in May 2006 to assess and ensure compliance with the Regulations. This monitoring programme covers 5 monitoring stations on the River Boyne main channel, designated Salmonid water for the purpose of the Regulations and it supports previous monitoring of the river carried out by the Environmental Protection Agency and cross-border Local Authorities.

A river water quality monitoring programme has also been established for the purpose of the Water Quality (Dangerous Substance Regulations) Regulations, 2001 (S.I. No. 12 of 2001).

Due to on-going water quality problems in the Lyreen River catchment, a 12-month Investigative Monitoring Programme has been completed and a review of the findings is currently underway. Physico-chemical monitoring, flow measurements using the velocity area method and SSRS work are used in the investigations.

(ii) Section 4 & Section 16 Licences - Discharge Monitoring

Sampling and on-site inspections of all Section 4 and Section 16 licenced activities is carried out by Environment personnel in accordance with the Environmental Inspection Plan for Kildare County Council (RMCEI). Following each site inspection a report is prepared and includes a laboratory analysis report detailing the quality of the effluent discharge at the time of the inspection. It is policy to inform all licensees on the findings of each inspection.

Samples taken are assigned a unique identification code when completing the Laboratory Instruction and Chain of Custody Form. It is aimed to deliver every sample to the laboratory on the day of collection but when this is not possible refrigerated storage is provided.

(iii) Groundwater Monitoring

The implementation of the Water Framework Directive National Groundwater Monitoring Programme is the responsibility of the Environmental Protection Agency.

There are a total of 19 groundwater monitoring sites in County Kildare. 2 sites are located in the Eastern River Basin District and 17 sites are located in the South Eastern River Basin District.

Site improvement work was required at 9 of these sites. A contractor was appointed by Kildare County Council and the work has been completed at a cost of €28,942.50.

(iv) Hydrometric Programme

Since 1998 the Environment Section has invested €142,025.00 in a Hydrometric Programme for the Barrow and Liffey catchments. The majority of the investment was in the Liffey catchment in support of the Three Rivers Project. Agency staff at the Dublin Regional Hydrometric Office provided site selection and design details while Environment Section personnel supervised construction work.

This has resulted in the development of a number of high quality hydrometric stations throughout the Barrow and Liffey catchments.

In the context of pollution control the hydrological information provide by these stations is needed in different forms for various purposes such as:

- Instantaneous flow at a particular time
- Current water level and flow conditions for management of spillages
- Dry weather flow for proposed abstractions from rivers
- 95 percentile flow for licencing of effluent discharges
- Continuous pattern of flow for management of fisheries, landfills and nutrient management planning
- Design of river channel control structures (weirs, flumes etc.)

The introduction of on-line EPA 'HydroNet' system provides access to summary hydrometric data that has been collected at the network of Local Authority hydrometric stations and processed by the EPA. The ESBI developed model for ungauged catchments will be a very useful tool when available.

(v) Laboratory Information System (LabInfo)

An important element of all analysis is the collection and compilation of data. LabInfo is a laboratory information system created by the LGCSB, which processes laboratory data across a multiple of disciplines and makes it available in a clear and concise manner.

LabInfo is the system recommended by the EPA to establish a standard approach for the collection and transfer of environmental data. Kildare County Council is currently using the system to collect and store water quality and licence monitoring data.

(vi) Small Stream Risk Score (SSRS)

Environment Section personnel have attended a two-day training course on the SSRS method developed by the Western River Basin District in conjunction with the Environmental Protection Agency. There is now 7 trained staff working in the enforcement area while the Environment Awareness Officer has also received training.

The SSRS method has a two-fold purpose:

1) It is a quick and economic method of pinpointing diffuse and point pollution sources.
2) It is designed to allow trained operators to decide if a small stream is definitely at risk of failing to meet its target of "Good Status" for the Water Framework Directive.

The SSRS is seen as a useful tool to assist personnel tasked with controlling water pollution. It is based on the well-understood response of macroinvertebrates to water pollution and is a rapid and reliable method.

SSRS work has been carried out this year in the Lyreen River, Kilcullen Stream and Morell River catchments and underpins investigative monitoring programmes.

The SSRS work is carried out during the period October to June, as most sensitive macro-invertebrates are present at this time.

(vii) Ballynafagh Lake

Ballynafagh Lake is an artificially created wetland and one of the few areas of open water in Co. Kildare. It is situated 2km northwest of Prosperous in the catchment of the River Slate. The lake and the connecting Blackwood Feeder are recognised as an area of high ecological value and is a candidate Special Area of Conservation under the EU Habitats Directive.

Hydrometric stations have been constructed at selected locations to monitor hydrological conditions at the site.

3.3(2) Problems Encountered

(i) Section 4 & Section 16 Licences - Discharge Monitoring

The provision of suitable sampling facilities to monitor the final effluent discharge to surface water or to the Local Authority sewer is a requirement under the licence. However, many licence holders have not complied with this condition and it gives rise to difficulties in gaining safe and unhindered access to the point of discharge to enable the taking of an effluent sample.

This issue will be addressed in conjunction with the organisations Health and Safety officers.

(ii) Hydrometric Programme

The importance of providing a hydrometric station in the middle catchment of the River Liffey at Osberstown has already been identified and consultants were engaged by the Environment Section to prepare a design for such a structure.

A hydrometric station will be provided through the Upper Liffey Valley Regional Sewerage Scheme (Extension to Osberstown WWTP).

(iii) Laboratory Information System & Environmental Data Exchange Network (EDEN)

There have been a number of technical difficulties with the roll out of the EDEN project. A Laboratory Information Management System (LIMS) working group was established but is no longer active.

A forum is required through which issues such as training and operations can be discussed.

3.3(3) Future Plans and New Directions

(i) Licensing

Monitoring of Section 4 and Section 16 licensed premises will be carried out in accordance with the Environmental Inspection Plan for County Kildare and additional monitoring will be carried out when deemed necessary.

An internal audit of the level of compliance with licence conditions will be carried out and a decision on what policy to adopt will be made.

(ii) Hydrometric Programme

A review of all existing hydrometric sites will be carried out and site improvement works will be carried out as required.

(iii) Laboratory Information System & Environmental Data Exchange Network (EDEN)

A review of the system operation within the Environment Section will be carried out and an appropriate level of training will be requested.

3.4 PUBLIC EDUCATION AND ADVISORY MEASURES

3.4(1) Progress During Reporting Period

Kildare County Councils Environmental Awareness Officer continues to manage environmental awareness on a number of levels.

(i) General Environmental Education

A key aspect of protecting the environment is education. Many people consider the area to be difficult to understand. And indeed, many issues involve complex technical issues. However, one of the roles of the Council is to explain the facts about areas such as water quality, pollution control and waste management to the public. The Council considers that education does not solely rest with the school population. There is also a need to encourage and educate the general public to consider the aquatic environment and water conservation and to reuse and recycle where possible, thus minimising indiscriminate dumping in the countryside and reducing levels of waste entering landfill sites.

In general, community groups are welcome to invite staff from the Environment Section to discuss relevant environmental issues. Under the Community Education Programme groups are given talks on various environmental topics. Focus has been placed on promoting community composting and to date, 7 community groups have received community composting units from the Council. These are used to divert green waste from common areas in housing estates and turn it into a resource for the local community. Feedback from these groups is that it is helpful in their work to know Council policies in relation to environmental issues.

As part of the Council's commitment to education school tours of Silliot Hill Waste Management Facility are organised and the tour has become has one of the most popular items on the education programme. For several years' schools from all over Kildare have visited the site to see first hand what happens to waste after it is collected from outside the door.

The Council runs an awareness campaign as part of the Water Conservation Programme every summer promoting the efficient use of the public water supply. The Council also offered water butts (barrels that catch and retain rain water) to all the Green Flag Schools in the county demonstrating that rainwater harvesting can reduce the use of treated water for non-essential purposes.

Kildare County Council also supports the national Race Against Waste campaign. A seminar on this theme was organised in Kildare in early 2006 and over twenty companies attended.

(ii) Schools Education Programme

A more specific programme of education is being conducted in both primary and secondary schools. The programme includes visits to schools countywide, with the objective of involving the students in environmental issues, which could have a wide effect, through influence on adults and younger people with whom they come in contact.

Kildare County Council actively supports 'The Green Schools Programme' in conjunction with An Taisce. To date 42 schools have received the coveted Green Schools Flag. There is agreement among these schools that the benefits of the school joining the Green Schools Programme are substantial. Over 40% of schools in County Kildare now have the Green Flag.

(iii) Environmental Notices

An annual Environmental Notice to the farming community and agricultural contractors is published in all local press circulating in the Barrow, Boyne and Liffey catchments. This notice appears in newspapers at the end of April each year advising farmers that due care must be taken with regard to the storage and control of silage effluent. It states that all silage effluent must be collected and prevented from discharging to any watercourse and that care must be taken when spraying herbicides, pesticides, fungicides etc., as agrochemicals are harmful to groundwater and surface water and the disposal of empty agrochemical containers should be carried out in an environmentally friendly manner.

A second Environmental Notice to all dwelling owners with septic tank systems or wastewater treatment systems was published in local press in July 2008. This gives very simple advice on essential maintenance and sludge removal procedures. A more detailed information leaflet has been placed on the Kildare County Council website, www.kildare.ie/countycouncil/Environment.

(iv) Newsletters

Kildare county Council publishes "The Acorn", an Environmental Newsletter aimed at informing the public of environmental issues within the county. This newsletter is distributed to all schools, libraries, tidy town committees, Council offices and is also available on the Kildare County Council website.

The Barrow News is a newsletter published twice a year by the Barrow Steering Group. The aim of this newsletter is to provide an update on catchment management activities within the Barrow catchment and is circulated to schools, libraries and newspapers within the Barrow catchment.
A full range of literature from ENFO – The Environmental Information Service, the Department of Agriculture, Forestry and Food, the Department of Environment and Local Government and other relevant bodies is on display or is available at the main offices of Kildare County Council.

(v) Internet Websites

Kildare County Council's website, www.kildare.ie/countycouncil hosts a wide range of environmental information on water quality, water supply, water conservation, sewerage schemes and operations, wastewater treatment and waste management.

The Osberstown WWTP has it's own dedicated website at www.osberstowntw.ie. The site provides information on plant details, process information, legislation, laboratory facilities and analysis etc.

(vi) Community and Voluntary Groups

A number of community and voluntary groups are supported through co-funding mechanisms such as the Environment Partnership Fund offered by the Department of Environment and Local Government and Kildare County Council. An example of this is Offaly and Kildare Waterways, a body set up to educate the public on the importance of waterways protection and the Irish Peatland Conservation Council.

The Council also supports community groups such as Tidy Towns through community grants and assisting in organising clean-ups of rivers and canals as well as funding community composting schemes and various resident association initiatives.

(vii) River Basin Districts

As the Water Framework Directive places public participation at the heart of the Directive it is the duty of both the South Eastern and Eastern River Basin District Projects to ensure access to information, allow for consultation on major reports and encourage members of the public to become actively involved in the projects. The projects publicise and hold public meetings to facilitate access to information and consultation. The projects web-sites carries reports, announcements and overviews of the project and the sites are updated ad developed on an on-going basis.

Public participation of the RBD Project is also part of the Mobile Monitoring Unit initiative. As part of this work an environmental awareness campaign was

commenced in schools throughout the ERBD. In Kildare, to date, 5 national schools have been visited, with presentations and workshops carried out in each. This work will continue when the schools reopen after the summer holidays.

3.4(2) Problems Encountered

None to date.

3.4(3) Future Plans and New Directions

Kildare County Council will continue to be involved in public education and advisory measures.

3.5 OTHER NATIONAL AGRI-ENVIRONMENTAL AND MISCELLANEOUS MEASURES

3.5(1) Progress During Reporting Period

(i) Agri-Environmental

Kildare County Council actively promotes participation in the Rural Environmental Protection Scheme and/or other pollution control grant schemes in its functional area.

It is the aim of the Council to co-operate fully and in the correct manner with the Department of Agriculture, Forestry and Food in the implementation of its duties under the European Communities (Good Agriculture Practice for Protection of Waters) Regulations 2006 (S.I. No. 378 of 2006)

3.5(2) Problems Encountered

(i) Agri-Environmental

Due to the very nature of the various pollution control schemes improvement in water quality may take longer than expected to materialise. It is for this reason that extensive evaluation of the water quality benefits of the schemes is required.

Funding through the Scheme of Investment Aid for Farm Waste Management and the Farm Improvement Scheme is no longer available and some farmers who have not availed of grant aid will have difficulty in financing farm improvement work.

(ii) Staffing

New personnel have been recruited to the Environment section but additional staff will be required if all proposed measures are to be fully implemented to achieve the

water quality standards set down in the Regulations. In addition, the implementation of the proposed River Basin Management Plans and Programme of Measures for the Eastern and South Eastern River Basin Districts will put extra pressure on existing resources.

3.5(3) Future Plans and New Directions

Kildare County Council will continue to consider any application for financial assistance made by a person/organisation involved in projects considered beneficial to the long-term improvement of water quality in the Barrow, Boyne and Liffey catchments.

3.6 SUMMARY AND CONCLUSIONS

3.6(1) Progress During Reporting Period

(1) Under the Local Government Water Pollution Acts, 1977,1990, 134 licences have been issued. 41 licences under Section 4 and 93 licences under Section 16.

(2) Monitoring and on-site inspections of licensed premises is being carried out in accordance with Environmental Inspection Plan.

(3) Auditing of licenses from a compliance point of view is being carried out and increased enforcement of the licence conditions is being carried out.

(4) 3 successful prosecutions for contravention of the Water Pollution Act have been achieved.

(5) A survey of unlicensed premises generating trade effluents containing fats/oils/greases is underway in a number of towns.

(6) Reviews of Section 4 and Section 16 licences are ongoing.

(7) Sewerage schemes have been completed at a number of important locations and construction of other major sewerage scheme projects will follow.

(8) Meetings and workshops with the Water Services Section are being organised to discuss issues around existing and proposed major capital scheme projects.

(9) Licensing and certification authorisation process introduced in accordance with the requirements of the Wastewater Discharge (Authorisation) Regulations 2007 (S.I. No. 684 of 2007). Applications submitted for Athy, Leixlip and Osberstown WWTP's. Applications being prepared for Kildare, Monasterevin and Rathangan WWTP's.

(10) Kildare County Council adopts the recommendation by DEHLG on "Groundwater Quality and Decisions on Planning Applications".

(11) A panel of qualified and indemnified site assessors has been established.

(12) Standard Site Characterisation form is recommended along the lines of the EPA model used at Appendix A of the EPA manual.

(13) A pilot study of on-site wastewater treatment systems has been completed.

(14) Misconnection surveys have commenced in some areas.

(15) Farm surveys are carried out for the purpose of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006 (S.I. No. 368 of 2006).

(16) 621 farm surveys have been carried out in twenty-three river sub-catchments.

(17) Local IFA representatives informed of pending farm survey work in their respective areas.

(18) Recent improvements at a number of water quality monitoring stations may be attributable to farm survey work.

(19) An assessment of all Intensive Agricultural Enterprises has been completed.

(20) Environmental complaints are handled in a structured manner during and out of work hours.

(21) Procedures and resources in place to deal with major chemical/oil spillages.

(22) 4 successful prosecutions for contravention of the Water Pollution Act have been achieved in this reporting period.

(23) The Waste Management Plan for County Kildare was reviewed in January 2006.

(24) Thirty-eight recycling "bring centres" located throughout County Kildare.

(25) Civic Amenity Sites located at Silliot Hill, Kilcullen and in Athy town. A third site is planned for the north of the County.

(26) Significant number of Waste Permits and Waste Collection Permits issued under the Waste Management Act, 1996.

(27) Sludge Handing Facility at Osberstown is at the commissioning stage.

(28) Groundwater Protection Scheme completed for County Kildare and this is linked to the County Development Plan.

(29) Environmental georeferenced data uploaded onto the internal G.I.S. system and updated as required.

(30) An Inspection Plan has been drawn up in line with the Minimum Criteria for Environmental Inspections (RMCEI). Quarterly updates are recorded.

(31) Training and educational requirements of the Enforcement Team addressed through the Performance Management Development System process and the Personal Development Plans.

(32) Register of all abstractions, exceeding 25 cubic metres, from waters in the County is maintained.

(33) River water monitoring carried out to fulfil the requirements of the Water Framework Directive.

(34) Monitoring programmes in place for the purpose of the Salmonid Regulations and Dangerous Substances Regulations.

(35) Biological assessments, in addition to the EPA surveys, are carried out by Conservation Services.

(36) 12 month Investigative Monitoring Programme completed in the Lyreen catchment and is currently being reviewed.

(37) All water quality and Water Pollution Act Section 4 and Section 16 licence discharge monitoring data is inputted to the LabInfo database.

(38) Site improvement work carried out a 9 monitoring stations for the purpose of groundwater monitoring under the Water Framework Directive.

(39) €142,025.00 invested in the Hydrometric Programme.

(40) Hydrological conditions at Ballynafagh Lake are being monitored.

(41) 7 environment personnel trained in the Small Stream Risk Score method and SSRS assessments carried out in a number of sub-catchments.

(42) Consultative and Co-operative Measures are being implemented through the Environmental Enforcement Network and its working groups, the Rye River Group, the Barrow Steering Group, the Agricultural Sector and the EPA Hydrometric Division.

(43) Public Education and Advisory Measures continue to be implemented and supported through, general environmental education, the schools education programme, environmental notices, newsletters, Internet websites, and community and voluntary groups.

(44) Agri-Environmental measures such as REPS and pollution control grant schemes are promoted when appropriates.

3.6(2) Problems Encountered

(1) The majority of Section 4 and Section 16 license applications still require further information requests leading to delays in the processing of the licence. Delays can also be encountered when draft licences are forwarded to prescribed bodies for comment.

(2) There are a number of issues regarding the provision of accurate flow data and the uses of this data in setting emission limit values to surface waters.

(3) There is a high level of non-compliance with the conditions of Section 4 and Section 16 licence.

(4) Health and Safety issues relating to the provision of safe and accessible sampling points for licensing purposes have been identified.

(5) New wastewater treatment plants for Kildare town and Derrinturn village have not yet been provided.

(6) There can be delays in progressing major capital schemes through the various critical stages.

(7) Greater emphasis needs to be put on chemical and biological assessments of receiving waters above and below wastewater treatment plants.

(8) Farm surveys are time consuming and may be interrupted when other duties require attention.

(9) Funding through pollution control grant schemes is no longer available.

(10) Due to the very nature of the various pollution control schemes improvement in water quality may take longer than expected to materialise.

(11) There appears to be a lack of awareness on the maintenance requirements of on-site wastewater treatment systems for single houses.

(12) Achieving a successful prosecution under the Water Pollution Act can take several months.

(13) Pollution complaints may sometimes require the involvement of a number of sections within the organisation. This can complicate the matter in hand and lead to delays in reaching a satisfactory outcome.

(14) In the preparation of the Inspection Plan 2008, an overlap with other similar management systems was found.

(15) Significant work by the Local Authority Management System co-ordinator has been superseded by the work dedicated to the Inspection Plan 2008.

(16) A hydrometric station in the middle catchment of the River Liffey is still required.

(17) There have been a number of technical difficulties with the roll out of the EDEN project.

(18) Although new personnel have been recruited to the Environment Section additional staff will be required.

3.6(3) Future Plans and New Directions

(1) An increased level of enforcement of all Section 4 and Section 16 licences is required and powers to prosecute offenders will be utilised.

(2) Health and Safety issues relating to sampling locations for Section 4 and Section 16 licences to be addressed.

(3) The requirements of the EC (Good Agricultural Practice for Protection of Waters) Regulations 2006 (S.I. No. 378 of 2006) are incorporated into all inspections of farm holdings.

(4) All complaints are to be recorded in the environmental complaints database and investigated in a systematic manner.

(5) Consideration is being given to random inspections of on-site wastewater treatment systems for single houses.

(6) Suspected impacts from peat abstraction activities on water quality will be investigated.

(7) Monitoring of Section 4 and Section 16 licensed premises will be carried out in accordance with the Inspection Plan 2008.

(8) An internal audit of the level of compliance will be carried out.

(9) A review of all existing hydrometric sites will be carried out.

(10) A review of the operations of the LabInfo and EDEN systems will be carried out.

(11) Kildare County Council will continue to implement the various initiatives associated with public education and advisory measures.

(12) The Council will continue to consider any application for financial assistance made by a person/organisation involved in projects considered beneficial to the long-term improvement of water quality in the county.