| CONSENT NO. | AN0308501 |
|---|---|

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

**WATER RESOURCES ACT 1991**

**SECTION 88 - SCHEDULE 10**

**(AS AMENDED BY THE ENVIRONMENT ACT 1995)**

**CONSENT TO DISCHARGE**

**TO:** Environment Quality Scientist
Dwr Cymru Cyfyngedig
Pentwyn Road
Nelson
Treharris
CF46 6LY

The **ENVIRONMENT AGENCY** ("The Agency") in pursuance of its powers under the Water Resources Act 1991 **HEREBY CONSENTS** to the making of several discharges **OF SEWAGE EFFLUENT**, as follows:

Storm Sewage and Sewage in an emergency.

**FROM:** A Combined Sewer Overflow.

**AT:** Cardiff East Pumping Station.

**TO:** Severn Estuary

**SUBJECT TO** the conditions set out in the following schedule:

| | |
|---|---|
| Storm Sewage: | Schedule No. AN030850101 |
| Sewage in an Emergency | Schedule No. AN030850102 |

Subject to the provisions of Paragraphs 7 and 8 of Schedule 10 of the Water Resources Act 1991, no notice shall be served by the Agency, altering this consent, without the agreement in writing of the consent holder, during a period of 4 years from the date this consent takes effect.

This consent is issued and takes effect on the 26th day of March 2002

Signed .....
Team Leader Water Quality Consents

**Asiantaeth yr Amgylchedd Cymru**
Ty-Abacus, Parc Busnes Llaneirwg, Llaneirwg, Caerdydd, CF3 0EY
Ffon: 029 20770088 Ffacs: 029 20798555

**Environment Agency Wales**
Abacus House, St Mellons Business Park, St Mellons, Cardiff, CF3 0EY
Tel: 029 20770088 Fax: 029 20798555

| | |
|---|---|
| **CONSENT NO.** | **AN0308501** |
| **SCHEDULE NO.** | **AN030850101** |
| **DATE ISSUED** | 26/3/02 |

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

## CONDITIONS OF CONSENT TO DISCHARGE

**Storm Sewage** ("the Discharge")

**FROM:** Cardiff Eastern Long Sea Outfall.

### NATURE

1. The Discharge shall consist solely of storm sewage.

### LOCATION

2. The Discharge shall be made in the manner and at the place specified as:

   (a) discharging via a 1830 metre long, 1.83m diameter pipe;

   (b) discharging to the Severn Estuary;

   (c) at National Grid Reference ST 2266 7503;

   (d) shown marked 'Consent Point' on Plan AN0308501 attached as Annex 1.

### SAMPLE POINT

3. An appropriately labelled sample point shall be provided and maintained at National Grid Reference ST 2181 7667 as shown marked 'Sample Point' on the attached Plan AN0308501, so that a representative sample of the Discharge may be obtained. The Consent Holder shall ensure that all constituents of the Discharge pass through the said sampling point at all times and in any legal proceedings it shall, for the purposes of Section 10 of the Rivers (Prevention of Pollution) Act 1961, be presumed, until the contrary is shown that any sample of the Discharge taken at the said sampling point is a sample of what was discharging into controlled waters.

### VOLUME

4. A storm sewage storage facility of 18500 cubic metres design capacity, made up of 9,200m3 storage on-line in the Rover Way and Roath sewers and 9,300m3 in the Interceptor Sewer at Cardiff East, controlled via a motorised penstock, shall be provided and fully utilised prior to discharge being made.

5. The storm control motorised penstock shall be reopened as soon as the water level in the Cardiff Waste Water Treatment Works Inlet pumping station sump falls below –17.58m AOD and the pass forward flow for the Cardiff Eastern catchment has fallen below 2230 litres per second.

6. The Discharge shall only occur when, and only for as long as, the storm sewage storage facility is fully utilised and the rate of flow at the storm overflow weir is in excess of 2230 litres per second due to rainfall and/or snow melt. The storm sewage storage facility shall be emptied automatically by maintaining the pumping rate of 5000 litres per second at the Cardiff Wastewater Treatment works inlet pumping station until the water level in the pumping station sump falls below –17.58 m AOD.

7. The operating levels of the six duty pumps at the Cardiff Wastewater Treatment Works inlet Pumping Station shall be as indicated on the drawing attached as Annex 2.

**FLOW**

8. a) A continuous flow recorder on the foul connection to the Interceptor Sewer, shall be provided and operated to measure and record the instantaneous flow passing the storm overflow into the Interceptor Sewer for treatment at the Cardiff Wastewater Treatment Works.

   b) A level recorder in shaft TS1, backed up by a level recorder in the Cardiff Wastewater Treatment works Inlet pumping station sump, shall be provided and operated to measure and record the corresponding liquid levels. The level measurements shall be used to control the operation of the storm control penstock, which will close when the level in TS1 rises to –12.29 m AOD.

9. As soon as practicable after completion of the flow recorder and level recorder installation the Consent Holder shall employ an independent expert to certify that the installations accurately and reliably i) measures and records the instantaneous flow and ii) measures and records the corresponding liquid levels. The Consent Holder shall satisfy himself as to the professional competence of the expert. A copy of the certifier's report shall be provided to the Agency when it is available.

10. Records of the flow readings and liquid levels shall be maintained by the Consent Holder and shall be provided to the Agency on an annual basis at the end of each calendar year, and available at any time to the Agency upon request, in a format specified by the Agency.

11. The Consent Holder shall produce and maintain a quality control manual, to the satisfaction of the Agency, specifying procedures for the calibration, operation and maintenance of the flow recorder and level recorders. The flow recorder and level recorders shall be calibrated, operated and maintained by the Consent Holder in accordance with the provisions of the manual. The Consent Holder shall keep a record of these procedures available for inspection by the Agency and provide a copy to the Agency on request.

12. The Consent Holder shall record all failures of the continuous flow recorder and level recorders and any other breaks in the flow record. The reasons for these failures and breaks shall be recorded and all steps taken to prevent a re-occurrence. The Consent Holder shall ensure that as far as possible the recorders remain fully operational at all times. Any failures shall be remedied as soon as possible.

**EVENT MONITORING**

13. (a) A recording system shall be provided and maintained to record the frequency and duration of overflow events.

(b) The Consent Holder shall supply the Agency with a written report on the frequency and duration of overflow events on an annual basis at the end of each calendar year, or on request.

(c) Records shall be kept available to the Agency for a minimum period of 2 years.

**MAINTENANCE**

14. (a) The overflow, penstock, level recorders and associated equipment shall be maintained in an efficient operational condition.

(b) The Consent Holder shall maintain the outfall pipe in an efficient operational condition, so as to minimise the probability of blockages or other failures, and shall implement periodic inspections of the outfall pipe.

**COMPOSITION**

15. (a) The Discharge shall have passed, without prior comminution or maceration, through a screening device having apertures no greater than 6 millimetres in two dimensions.

(b) The screening devices shall be maintained in an efficient operational condition.

(c) All screenings must be removed and disposed of in a manner such as to prevent entry to the discharge.

**TELEMETRY**

16. (a) A 24 hour response telemetry alarm system shall be provided by start of commissioning of the overflow.

(b) The 24 hour response telemetry alarm shall be maintained to provide a notification in the event of:

i) operation of the combined sewer overflow;
ii) failure of the screen raking mechanism during normal operation;

| CONSENT NO. | AN0308501 |
|---|---|
| SCHEDULE NO. | AN030850101 |



**LISTED SUBSTANCES**

17. The Consent Holder shall notify the Agency in writing if any known or planned introduction or material change in respect of discharges from trade premises to the sewerage system occurs, that may increase or introduce into the effluent any "dangerous substance" (set out in Annex 3 to this notice as updated from time to time and notified to the Consent Holder in writing), and any other substance considered by the Consent Holder as having or likely to have a significant effect on the receiving waters.

| CONSENT NO | AN0308501 |
|---|---|
| SCHEDULE NO | AN030850101 |

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

## ANNEX 3

| | | | |
|---|---|---|---|
| 1. | Mercury and its compounds | 2. | Cadmium and its compounds |
| 3. | Hexachlorocyclohexane (lindane and related compounds) | 4. | Carbon tetrachloride |
| 5. | DDT (the isomers of 1,1,1-trichloro-2,2 bis{p-chlorophenyl} ethane) | | |
| 6. | Pentachlorophenol (PCP) | 7. | Aldrin |
| 8. | Dieldrin | 9. | Endrin |
| 10. | Isodrin | 11. | Hexachlorobenzene (HCB) |
| 12. | Hexachlorobutadiene (HCBD) | 13. | Chloroform |
| 14. | Polychlorinated biphenyls | 15. | Dichlorvos |
| 16. | 1,2-Dichloroethane | 17. | Trichlorobenzene |
| 18. | Atrazine | 19. | Simazine |
| 20. | Tributyltin compounds | 21. | Triphenyltin compounds |
| 22. | Trifluralin | 23. | Fenitrothion |
| 24. | Azinphos-methyl | 25. | Malathion |
| 26. | Endosulfan | 27. | Lead |
| 28. | Chromium | 29. | Zinc |
| 30. | Copper | 31. | Nickel |
| 32. | Arsenic | 33. | *Iron |
| 34. | *pH outside range 5.5 to 9.0 | 35. | *Boron |
| 36. | Vanadium | 37. | PCSD'S |
| 38. | Cyfluthrin | 39. | Sulcofuron |
| 40. | Flucofuron | 41. | Permethrin |
| 42. | 4-Chloro-3-methyl-phenol | 43. | 2-Chlorophenol |
| 44. | 2,4-Dichlorophenol | 45. | 2,4-D (ester) |
| 46. | 2,4-D (non ester) | 47. | 1,1,1-Trichloroethane |
| 48. | 1,1,2-Trichloroethane | 49. | Bentazone |
| 50. | Benzene | 51. | Biphenyl |
| 52. | Chloronitrotoluenes | 53. | Demeton |
| 54. | Dimethoate | 55. | Linuron |
| 56. | MCPA | 57. | Mecoprop |
| 58. | Mevinphos | 59. | Napthalene |
| 60. | Omethoate | 61. | Toluene |
| 62. | Triazophos | 63. | Xylene |
| 64. | Cyanide | 65. | Azinphos-ethyl |
| 66. | Fenthion | 67. | Parathion |
| 68. | Parathion-methyl | 69. | Trichloroethylene |
| 70. | Tetrachloroethylene | 71. | Dioxins |
| 72. | PAHs | 73. | Nonyl phenol |
| 74. | Nonyl phenyl ethoxylate | 75. | Di-ethylhexyl phthalate |
| 76. | Bisphenol-A | 77. | Diazinon |
| 78. | Chlorfenvinphos | 79. | Chlorotoluron |
| 80. | Isoproturon | 81. | Diuron |
| 82. | Propetamphos | 83. | Flumethrin |
| 84. | Amitraz | 85. | High-Cis Cypermethrin |
| 86. | Cyromazine | 87. | Deltamethrin |
| 88. | Cypermethrin | | |

This list is applicable as at 1 December 1998 and will be updated as and when changes to the relevant legislative requirements occur.

*Notification to the Agency by the Consent holder is only required in respect of changes to trade effluents likely to cause significant changes to the pH value, and/or iron or boron concentrations, of the crude sewage.

| | |
|---|---|
| **CONSENT NO.** | **AN0308501** |
| **SCHEDULE NO.** | **AN030850102** |
| **DATE ISSUED** | 26/3/02 |

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

**Sewage in an Emergency** ("the Discharge")

**FROM:** Cardiff Eastern Long Sea Outfall.

**NATURE**

1. The Discharge shall consist solely of sewage in an emergency.

2. The Discharge of screened sewage shall only occur when:

   a) the Cardiff Wastewater Treatment Works inlet pumping station is inoperative as a result of one or more of the following:

      (i) electrical power failure not due to the act or default of the Consent Holder, its agents, representatives, officers, employees or servants;

      (ii) mechanical breakdown of duty and standby pumps;

   or

   b) the Cardiff Wastewater Treatment Works is incapable of receiving pass forward flows

   or

   c) flows in the Interceptor Sewer exceed 5000 litres per second and actions taken in accordance with "Dwr Cymru Welsh Water, The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff", have failed to prevent the risk of external flooding,

   and it is not reasonably practicable to dispose of the sewage otherwise. There shall be no undue delay on the part of the Consent Holder in remedying any such failure or breakdown.

3. The discharge of unscreened sewage shall only occur when there is power or mechanical failure of the screens or pumps;

   and it is not reasonably practicable to dispose of the sewage otherwise. There shall be no undue delay on the part of the Consent Holder in remedying any such failure or breakdown.

## LOCATION

4. The Discharge shall be made in the manner and at the place specified as:

   (a) discharging via a 1830 metre long, 1.83 metre diameter pipe;

   (b) discharging to the Severn Estuary;

   (c) at National Grid Reference ST 2266 7503;

   (d) shown marked 'Consent Point' on Plan AN0308501 attached as Annex 1.

## SAMPLE POINT

5. An appropriately labelled sample point shall be provided and maintained at National Grid Reference ST 2181 7667, as shown marked 'Sample Point' on the attached Plan AN0308501, so that a representative sample of the Discharge may be obtained. The Consent Holder shall ensure that all constituents of the Discharge pass through the said sampling point at all times and in any legal proceedings it shall, for the purposes of Section 10 of the Rivers (Prevention of Pollution) Act 1961, be presumed, until the contrary is shown that any sample of the Discharge taken at the said sampling point is a sample of what was discharging into controlled waters.

## VOLUME

6. A storage facility of 18,500 cubic metres design capacity, made up of 9,200m3 storage on-line in the Rover Way sewers and 9,300m3 in the Interceptor Sewer at Cardiff East, shall be provided above the Cardiff WWTW inlet pumping station wet well design top water level.

7. The Discharge shall only occur when, and only for as long as, the sewage storage facility is fully utilised. The sewage storage facility shall be emptied automatically at the end of the emergency.

8 (a) In order to maximise the use of the storage available in the first flush storm tanks and sewerage network to minimise the frequency of discharges to coastal and esturial waters, the works shall be operated in accordance with the "Dwr Cymru Welsh Water, The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff" attached as Annex 4 to this consent.

   (b) The "Dwr Cymru Welsh Water, The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff " attached as Annex 4 to this consent may be varied from time to time by written agreement between the consent holder and the Agency,

**COMPOSITION**

9. Unless the emergency discharge is a result of a screening failure at Cardiff Eastern District Pumping Station, the following shall apply:

   (a) The Discharge shall have passed, without prior comminution or maceration, through a screening device having apertures no greater than 6 millimetres in two dimensions.

   (b) The screening device shall be maintained in an efficient operational condition.

   (c) All screenings must be removed and disposed of in a manner such as to prevent entry to the discharge.

**TELEMETRY**

10. (a) A 24 hour response telemetry alarm system shall be provided and maintained to give notification of failure or breakdown of the Cardiff WWTW inlet pumping station.

   (b) A 24 hour response telemetry alarm system shall be provided and maintained to give notification of failure or breakdown of the Cardiff Eastern District pumping station.

   (c) The Consent Holder shall take all reasonable remedial measures to return the pumping station(s) to normal operation, as soon as practicable after warning of failure or breakdown of the pumping station(s).

   (d) The Consent Holder shall notify the Agency, as soon as practicable, when there is potential for operation of the emergency overflow in the event of failure or breakdown of the pumping station(s).

11. (a) A 24 hour response telemetry alarm system shall be provided and maintained to provide a notification in the event of operation of the emergency overflow.

   (b) The Consent Holder shall notify the Agency, as soon as practicable after receipt of an overflow telemetry warning, that operation of the emergency overflow has taken place.

## RECORDING AND REPORTING

12. (a) The Consent Holder shall establish and operate a documented maintenance programme and record all non-routine actions undertaken that may have adversely affected effluent quality. Copies of the programme shall be made available for inspection by the Agency's officers at all reasonable times.

(b) On request the Consent Holder shall supply the Agency with a written report on the maintenance and all non-routine actions that may have adversely affected effluent quality.

13. The Consent Holder shall supply the Agency with a written report on the operation of the emergency overflow on an annual basis at the end of each calendar year, or on request.

## OTHER

14. A duplicate electricity supply shall be provided and maintained for use in the event of failure of the normal electricity supply.

15. The 6 duty pumps at Cardiff WWTW inlet pumping station shall be maintained in good working order, and at least two stand-by pumps shall be provided and maintained.

16. The stand-by pumps shall automatically activate should any of the duty pumps become inoperative for reasons other than power failure. The pumping station shall be maintained so that the pumps shall automatically reactivate after the power is restored after interruption to the supply.

ANNEX I


| ASIANTAETH YR AMGYLCHEDD ENVIRONMENT AGENCY | |
|---|---|
| CONSENT PLAN NUMBER | AN0308501 |
| AUTHORISED SIGNATURE | |

| | | | | | |
|---|---|---|---|---|---|
| C | THIRD ISSUE | R.J.T. | | | 16/10/06 |
| B | SECOND ISSUE | R.J.T. | A.R. | H.A.B. | 16/8/06 |
| A | FIRST ISSUE | R.J.T. | C.J.T. | H.A.B. | 28/6/06 |
| Issue | Description | Auth. | Chk. | Appd. | Date |

Notes

CARDIFF · WATER · WATER · PARTNERS

Client: WELSH WATER

Project: CARDIFF WASTE WATER TREATMENT WORKS

Title: EASTERN OUTFALL LOCATION

Hyder Consulting

Project Code

Drawing No. SK6

Issue

Hyder

Gwaith Trin Dŵr
Gwastraff Tregŵr
Heol Victoria
Tre Gŵyr
Abertawe SA4 3AB

Ffacs: +44 (0)1792 872 604

Gowerton Waste Water
Treatment Works
Victoria Road
Gowerton
Swansea SA4 3AB

Fax: +44 (0)1792 872 604



Ruth Tipping
Customer Contact Dept
Environment Agency Wales
Abacus House,
St Mellons
Cardiff
CF3 0LT

21st February 2001

Tel 01792 511828

Dear Ruth,

**Discharge Consent Applications - Cardiff Eastern Outfalls**
Please find enclosed discharge consent applications for :-

Cardiff Eastern Long Sea Outfall – Storm and Emergency
Cardiff Eastern Short Sea Outfall – Storm and Emergency

Please note that much of the supporting information submitted with the main discharge application and the other associated outfalls is applicable to the current application. I have therefore appended lists of supporting documentation rather than make further copies of bulky documents. However, should you require further copies then please let me know.

The application fee of 2 x £645 was included in the cheque which accompanied my applications for the Rhymney Valley, Western Valley and Cardiff Central outfalls on the 20th November 2000.

Yours sincerely,

Dr Lewis Keil
Scientist - Wastewater

DŴR CYMRU
WELSH WATER

...ewin
...nneg
Gwaith Trin Carthion
Tre Gŵyr
Heol Victoria
Abertawe SA4 3AB

Ffôn: (01792) 873 551
Ffacs: (01792) 872 604

Dŵr Cymru Cyf
South Western Division
Environmental and
Engineering Department
Gowerton Sewage
Treatment Works
Victoria Road
Swansea SA4 3AB

Tel: (01792) 873 551
Fax: (01792) 872 604

Regional Finance Manager
Environment Agency
Welsh Region
PO Box 425
St Mellons Business Park
St Mellons
Cardiff CF3 0LT

20th November 2000

Tel 01792 511828

E.A
3225 CC
21 NOV 2000
PAID
WELSH REGION

Dear Sir,

**Discharge Consent Applications - Cardiff Scheme**
Please find enclosed discharge consent applications for :-

Rhymney Valley Trunk Sewer CSO and Emergency Outfall (£645) AN030590 1
Western Valley Trunk Sewer CSO and Emergency Outfall (£645) AN030600 1
Cardiff Central Sewage Pumping Station Storm and Emergency (£645) AN030610 1

All three applications are for new consents, rather than variations of existing ones.

I had raised a cheque for a total of 5 applications but a recently identified flow discrepancy means that further works is required on the two applications (short and long outfall) for Cardiff East Sewage Pumping Station. Discussions are ongoing between Hyder and EAW to resolve this.

I enclose a cheque for £3225. I would ask that you hold the £1290 balance as payment for the 2 Cardiff East SPS applications which I hope to be able to submit shortly.

Please note that much of the supporting information recently submitted with the main discharge application is applicable to the current applications. I have therefore appended a list of supporting documentation rather than make further copies of bulky documents. However, should you require further copies then please let me know.

Yours faithfully,

Dr Lewis Keil
Scientist - Wastewater

ACCOUNTANCY
21 NOV 2000

Ein cyf/Our ref: SE/ACSC/PJ/AN0308501

Date: 26 March 2002

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

Environment Quality Scientist
Dŵr Cymru Welsh Water
Plas y Ffynnon
Cambrian Way
Brecon
Powys
LD3 7HP

COPY

Dear Sir/Madam

**WATER RESOURCES ACT 1991, SCHEDULE 10 (AS AMENDED BY THE ENVIRONMENT ACT 1995) APPLICATION FOR CONSENT TO DISCHARGE SEWAGE EFFLUENT BY DŴR CYMRU WELSH WATER FROM CARDIFF EASTERN LONG SEA OUTFALL.**
**APPLICATION NO: AN0308501**

Further to your application the Agency has decided that consent should be given subject to conditions. I enclose the Agency's formal consent to discharge sewage effluent in an emergency from a combined sewer overflow at Cardiff East Pumping Station, Cardiff.

Under the present Scheme of Charges for Discharges to Controlled Waters an annual charge will be made for all consents to discharge, except where the discharge is of sewage effluent of five cubic metres or less per day. The charge is based on information derived from the conditions attached to the consent to discharge, as outlined in the enclosed leaflet.

If you consider that the conditions imposed by the consent are unreasonable you have a right of appeal to the National Assembly for Wales at Cathays Park, Cardiff CF10 3NQ.

Notice of an appeal must be given in writing within three months of this notification and must be accompanied by a statement of the grounds of appeal.

**Asiantaeth yr Amgylchedd Cymru**
Ty Abacus, Parc Busnes Llaneirwg, Llaneirwg, Caerdydd, CF3 0EY
Ffon: 029 20770088 Ffacs: 029 20798555
www.environment-agency.gov.uk

**Environment Agency Wales**
Abacus House, St Mellons Business Park, St Mellons, Cardiff, CF3 0EY
Tel: 029 20770088 Fax: 029 20798555
www.environment-agency.gov.uk

If granted, a consent under Schedule 10 of the Act, covers water quality considerations only. It does not alter the need to obtain any other consents or approvals which might be required in connection with your proposal under other legislation. For example it does not give any right or permission to discharge where land is not owned by the applicant.

The 'Sewage in an Emergency' schedule of the attached consent, clauses 2.(c) and 8.(a) & (b), contains reference to an operational document titled "Dwr Cymru Welsh Water, The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff", attached as Annex 4 to the consent. Clause 8(b) specifies that the document may be varied from time to time by written agreement between the consent holder and the Agency. As agreed at our joint meeting on 26th March 2002 the operational document is required to be reviewed by 30th June 2002.

Please take careful note that if the holder of the consent changes, you must inform the Agency IN WRITING as soon as possible of the name of the new holder. This is to ensure that the rights and charges associated with the Consent are transferred to the new holder. A Certificate of Holder notice will be sent to you shortly which is designed for this purpose, and should be kept safely with the Consent until required.

If you have any queries regarding the enforcement of this consent, please contact David Williams, Team Leader Environment Protection, on 029 20 770088 quoting extension 2106.

Yours sincerely,

P.E. Jeffery

pp **David Charrett**
**Team Leader Customer Contact**

Enc.

**Asiantaeth yr Amgylchedd Cymru**
Ty Abacus, Parc Busnes Llaneirwg, Llaneirwg, Caerdydd, CF3 0EY
Ffon: 029 20770088 Ffacs: 029 20798555
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**Environment Agency Wales**
Abacus House, St Mellons Business Park, St Mellons, Cardiff, CF3 0EY
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ENVIRONMENT AGENCY

# WATER RESOURCES ACT 1991 (schedule 10)

# (as amended by the Environment Act 1995)

## Application for new consent/variation to an existing consent* to discharge

( * delete as appropriate)

| Regional/Area Address: | *Official Use Only*<br>*Dist/Area Ref:* EEP 2<br><br>*Application No.*<br>AN0308501<br>*Date Received:*<br>22-02-01<br>*Fee Received:* |
|---|---|

Each applicant must complete the main form and may need to complete a separate annexe if appropriate. Please look through the form and read the notes carefully before you complete it. Processing of your application will be aided by full and accurate completion of all the relevant sections and provision of the necessary plans. If you have any queries regarding the form please contact the person given in the notes.

**NOTE:**
**All information contained within this application will be made available on the public register unless there is a request to withhold any of it. Any such request should provide a full justification stating why the information needs to be withheld**

## 1 SITE ADDRESS

1.1 Address or other sufficient description of land or premises to which this application applies.

CARDIFF EASTERN LONG SEA OUTFALL
ROVER WAY
TREMORFA
CARDIFF

Post Code:

## 2 DETAILS OF DISCHARGE(S)

2.1 State the nature of the discharge(s) **(see note i and ii)** - tick one or more boxes as appropriate:-

Sewage Effluent - volume of 5 cubic metres per day or less ☐

Sewage Effluent - volume greater than 5 cubic metres per day **(complete annexe 1)** ☐

Sewage Effluent discharged under storm or emergency conditions **(complete annexe 2)** ☑

Cooling Water **(complete annexe 3)** ☐

Trade Effluent *(including site drainage)* **(complete annexe 3)** ☑

Others *(please specify)* ☐

2.2 Please state the maximum quantity it is proposed to discharge in any one day N/A $m^3$/day
Briefly state how this figure was calculated **(see note ii)**.

2.3 a) Indicate proposed means of discharge - tick as appropriate and show on plan:-
(for 1, 2 & 3 please state dimensions below)

| | | | | | |
|---|---|---|---|---|---|
| 1. Pipe | ☑ | 4. Borehole | ☐ | 7. Sub-Irrigation System | ☐ |
| 2. Channel | ☐ | 5. Well | ☐ | 8. Combination of 6. & 7. | ☐ |
| 3. Culvert | ☐ | 6. Soakaway | ☐ | 9. Other *(please specify below)* | ☐ |

1·83 m diameter 1830m long sea outfall

b) National Grid Reference(s) of point(s) of discharge **(see note iii)**.

ST / 2266 / 7503 *(please indicate on accompanying plans)*

2.4 a) The Agency will normally require adequate provision for the taking of samples of the discharge in a safe and convenient manner at any time. Please indicate the means proposed **(see note iv)** - tick as appropriate and show on plan:-

At the outlet ☐ At a manhole or sampling chamber ☐

Other *(please specify)* AT CARDIFF EAST PUMPING STATION

b) National Grid Reference(s) of sampling point(s). (If different from 2.3 b) above)

ST / 2181 / 7667 *(please indicate on accompanying plans)*

c) What flow measurement facilities will be provided **(see note v)**?
Please give details.

SPILL FREQUENCY MONITORING EQUIPMENT TO BE PROVIDED

2.5 a) Type of Treatment Plant(s) to be used *(please specify make and model)* - tick as appropriate:-

Septic Tank ☐ Package Sewage Treatment Works ☐ Other ☐

N/A STORM OVERFLOW

b) Will the treatment process involve the use of any chemicals (eg ferric salts, polyeletrolytes) X/N
If yes please give details.

2.6 a) On what date do you anticipate the discharge will commence? 1 / 4 / 01

b) If you require the consent for a limited time period please give dates; from: / /

to: / /

c) If the discharge is not continuous please detail the period/circumstances when it will occur.

STORM & EMERGENCY CONDITIONS

2.7 a) Are there any existing consents for discharge from the premises (see note vi)? Y/X
If yes, please give the reference numbers *(Any further information should be given in section 5.3).*

AN 0004501

b) Has any person had a Prohibition Notice served on them in respect of this site? Y/N
If yes, please give the reference number.

# 3 SITE DETAILS

3.1 Please give the name of the relevant Planning Authority.

CARDIFF COUNTY COUNCIL

3.2 Please give details of the premises - tick as appropriate:-

1. Single Dwelling ☐
2. Multiple Dwellings ☐
3. Industrial Premises ☐
4. Vehicle Parking Area ☐
5. Commercial Premises *(please specify)* ☐
6. Fish Farm ☐
7. Mineral Workings ☐
8. Water Services plc STW ☐
9. Water Supply ☐
10. Other *(please specify)* ☑

WATER SERVICES plc STORM SEWAGE PS

3.3 Please indicate source of the water supply - tick as appropriate:- N/A

1. Well ☐
2. Borehole ☐
3. Precipitation (eg. rain or snow) ☐
4. Mains *(please state water supply company)* ☐
5. River *(please give name below)* ☐
6. Estuary *(please give name below)* ☐
7. Coastal Water *(please give name below)* ☐

# 4 DETAILS OF RECEIVING ENVIRONMENT

4.1 Receiving Medium - tick the category(s) to which the proposed discharge(s) is(are) to be made:-

1. Estuarial Water (tidal river or stream) ☐
2. River or Stream (non-tidal) ☐
3. Canal ☐
4. Lake, Loch or Pond ☐
5. Into Land ☐
6. Onto Land ☐
7. Directly into Groundwater ☐
8. Coastal Water (see note vii) ☑

*State name of receiving water if known:*

BRISTOL CHANNEL

4.2 In the case of sub-irrigation systems, soakaways or boreholes:- N/A

(a) Is any part of the system within 5 metres of the boundary of the premises? Y/N

(b) Is any part of the system within 10 metres of a watercourse? Y/N

(c) Is any part of the system within 50 metres of a borehole or spring? Y/N

(d) For wells and boreholes state dimension(s) in metres. m

(e) For sub-irrigation systems, soakaway pits, wells and boreholes, state maximum depth in metres. m

(f) For boreholes, state details of lining in metres:

(i) Depth of lining m

(ii) Depth of perforated lining m

(iii) Depth of unperforated lining m

(g) A percolation test must be carried out in accordance with British Standard BS6297:1983. Have the results been provided? Y/N

4.3 Is there a foul sewer available to which the discharge(s) could be made (see note viii)? N/A Y/N
If yes, please give the reasons it is not practical to connect to it (eg. distance, flow etc.).

# 5 DETAILS OF APPLICANT AND OTHER INFORMATION

5.1 **(See general notes and note ix)**

(a) Full name and postal address of applicant. This should be the person who will become the consent holder should consent be issued.

* DWR CYMRU WELSH WATER
* PLAS Y FFYNNON
* CAMBRIAN WAY
* BRECON
* POWYS
*

Post Code: LD3 7HP

Daytime Telephone Number: 01874 623181

Company Registration Number (if appropriate):

(b) Agent (if any) - Full name and postal address.

*
*
*
*
*
*

Post Code:

Contact Name and Daytime Telephone Number:

5.2

Please give full name and address to which bills should be sent if different to that given above:

*
*
*
*
*
*

Post Code:

Daytime Telephone Number:

5.3 Are there any other factors to be taken into account? Please continue on a separate sheet if necessary.

# DECLARATION

I/We:

1. apply under the Water Resources Act 1991 (as amended by the Environment Act 1995) for consent to discharge, as described in this Application. "This Application" means this page, all the other pages of this form and any attached annexes, the attached plan(s), any other sheets attached, and any other written information supplied to support the application.

2. enclose the required application fee, payable to the Environment Agency **(see note x)**.

3. enclose 3 copies of the plan(s) and location maps with all relevant information clearly marked **(see note xi)**.

4. will pay required advertising costs **(see note xii)**.

5. confirm that I/we* will notify the Environment Agency of any changes in the information in this application which might be material to the continuation of the consent.

6. confirm that the information given in this application and any questions which the Environment Agency may have about it is/~~will* be~~ true to the best of ~~my~~/our* knowledge, information and belief and ~~am~~/are* not aware of any other facts or information which might affect the granting of a consent, or conditions which might be put on it **(see note xiii)**.

7. confirm that I/we* will pay any annual charges due should a consent be granted YES/~~NO*~~. If no please indicate who will by completing section 5.2 above **(see note xiv)**.

**(* Delete as appropriate)**

**SIGNED:** A.R Andrews **PRINT NAME:** ANDREWS

**ON BEHALF OF:** DWR CYMRU CYF **DATED:** 21/02/01

o O o

# CONFIDENTIALITY

I/we apply for commercial confidentiality and enclose a full written justification **(see note xv)**.

**SIGNED:** ..... **DATED:** .....

**PLEASE RETURN THIS FORM TO THE ADDRESS GIVEN ON THE FRONT PAGE**

ENVIRONMENT AGENCY

ANNEXE 2

SEWAGE EFFLUENT DISCHARGED IN STORM OR EMERGENCY CONDITIONS

**Please complete this annexe if you are proposing to make a discharge of sewage in emergency or storm conditions (if the effluent is to contain a trade component then Annexe 3 should also be completed)**

*Official Use Only*
*Application No.*

1. Site Name.

CARDIFF EASTERN LONG SEA OUTFALL
ROVER WAY
TREMORFA
CARDIFF

2. State the type of discharge - tick as appropriate:-

| | |
|---|---|
| Storm tanks | ☐ |
| Combined Sewer Overflow from sewerage system | ☑ |
| Combined Sewer Overflow from pumping station | ☐ |
| Emergency overflow from sewerage system | ☑ |
| Emergency overflow from pumping station | ☐ |
| Other *(please specify)* | ☐ |

3. For effluents discharging from sewage treatment works, is the storm/emergency effluent discharged via the same outlet as the treated effluent? N/A Y/~~N~~

If no please give: a) the National Grid Reference of the treated effluent outlet.

☐☐/☐☐☐☐/☐☐☐☐

b) the consent or application number covering the treated effluent discharge.

If yes please give the National Grid Reference of the storm/emergency sampling point **(see notes)**

☐☐/☐☐☐☐/☐☐.☐☐

4. For effluents discharging from combined sewer overflows, is the discharge via a dedicated pipe? Y/~~N~~

If no please give the National Grid Reference of the overflow into the sewer.

☐☐/☐☐☐☐/☐☐☐☐

5. Overflow settings

| | | |
|---|---|---|
| a) | Overflow setting to storm tanks. | N/A l/s |
| b) | Maximum flow to storm tanks. | N/A l/s |
| c) | Overflow setting to storm sewage overflow. | 2230 l/s |
| d) | Maximum flow to storm sewage overflow. | N/A l/s |

6. Storage capacity

| | | |
|---|---|---|
| a) | Volume of Storm Tanks. | N/A $m^3$ |
| b) | Retention time of storm tanks at maximum flow. | N/A hours |
| c) | Storage capacity of sewer/wet well. | 9700 $m^3$/day |

7. Please provide full details of the design criteria that have been used to support this application.

SEE CARDIFF WWTW STORAGE PROVISION AND METHOD 2 ANALYSIS REPORT AND ATTACHED CORRESPONDENCE LETTERS DATED 13TH & 27TH JANUARY 1999

8. Will facilities be provided to raise alarms (eg. telemetry)? Y/N
If yes, please give details.

TELEMETRY ON STORM SPILL & EMERGENCY

9. Will facilities be provided to prevent the discharge of gross solids? Y/N
If yes, please give details (for screens give bar spacing or aperture).

6MM SCREENS WITH HIGH LEVEL OVERFLOW IN THE EVENT OF SCREENING POWER OR MECHANICAL FAILURE

10. What provisions will be made to deal with:

a) power failure (eg. standby generators)?

SUPPLY TAKEN FROM CARDIFF WWTW WHICH HAS DUAL SUPPLY

b) mechanical breakdown (eg. standby pumps)?

NO STANDBY SCREENING FACILITIES BUT HIGH LEVEL OVERFLOW IF SCREENS FAIL

c) rising main failure?

N/A

d) tanker access?

N/A

*Notes (see also the notes on the main form):*

*Full details of the design criteria must be provided in order for the application to be determined. If you have any queries about what information is required please contact the person given in notes attached to the main form.*

ENVIRONMENT AGENCY

# ANNEXE 3
# TRADE EFFLUENT DISCHARGES

**Please complete this annexe if you are proposing to discharge trade effluent (this includes site drainage).**

*Official Use Only*
*Application No.*

1. Site Name.

CARDIFF EASTERN LONG SEA OUTFALL
ROVER WAY
TREMORFA
CARDIFF

2. a) Describe in full the trade effluent and the process(es) from which it arises.

SEE 'CARDIFF SCHEME, TRADE EFFLUENT DATA, MARCH 2000'

b) Please state the type and number of treatment units you are proposing to use *(if site drainage please include details of oil/petrol interception facilities).*

3. **Rainfall Dependent Discharges**

a) Is the volume going to be rainfall dependent? TRADE ELEMENT OF DISCHARGE IS NOT RAINFALL DEPENDENT — Y/N

b) If yes, please give the total area drained. — $m^2$

c) Please give details of any activities which occur in the drainage area which could contaminate surface water **(see note b).**

4. **Rainfall Independent Discharges**

a) What is the maximum rate of discharge? — l/s

b) What is the ~~average~~ max daily flow? MAXIMUM CONSENTED TRADE FLOW — 10,900 $m^3/d$

c) For discharges where the source of supply is other than mains water: N/A

i) give the abstraction licence number.

ii) give the National Grid Reference of a point where the influent can be sampled.

☐☐/☐☐☐☐/☐☐☐☐ *(please mark on the plan)*

5. a) Will any self monitoring take place? Y/N
If yes, please give details.

NO

b) Will automatic sampling equipment be provided? Y/N
If yes, please give details of type, frequency and location *(please indicate on plan).*

NO

6. a) Please state the maximum temperature in degrees Celsius of the effluent when discharged if different from ambient.

AMBIENT

b) Will the discharge be monitored for temperature? Y/N
If yes, please give details of type and location *(please indicate on plan).*

NO

7. Has an application for Authorisation been made for a 'prescribed process' as defined in Part 1 of the Environmental Protection Act 1990? Y/N

If yes, please complete the following:

a) The application reference.

c) Contact name of case officer.

8. a) Please indicate if any of the specified substances given below or their compounds will be present in the effluent and if so at what maximum concentration (please give values in micrograms per litre - ug/l). Please see note c. SEE 'CARDIFF SCHEME, TRADE EFFLUENT, MARCH 2000'

| SUBSTANCE | CONCENTRATION (ug/l) | | | SUBSTANCE | CONCENTRATION (ug/l) | | |
|---|---|---|---|---|---|---|---|
| | Max | Min | Mean | | Max | Min | Mean |
| Iron | | | | Lead ✓ | | | |
| Arsenic | | | | Malathion | | | |
| Atrazine | | | | Mercury ✓ | | | |
| Azinphos-ethyl | | | | Nickel ✓ | | | |
| Azinphos-methyl | | | | PCB's | | | |
| Boron | | | | PCSD's | | | |
| Cadmium ✓ | | | | Parathion | | | |
| Carbon tetrachloride | | | | Parathion-methyl | | | |
| Chloroform | | | | Pentachlorophenol (PCP) | | | |
| Chromium ✓ | | | | Perchloroethylene * | | | |
| Copper ✓ | | | | Permethrin | | | |
| Cyanide ✓ | | | | pH < 5.5 or > 9.0 | | | |
| Cyfluthrin | | | | Phosphorus | | | |
| DDT | | | | Polychlorinated biphenyls | | | |
| 1,2 Dichloroethane | | | | Simazine | | | |
| Dichlorvos | | | | Sulcofuron | | | |
| Dioxins | | | | Tetrachloroethylene | | | |
| Drins (eg. Aldrin, Dieldrin) | | | | Tributyltin compounds | | | |
| Endosulfan | | | | Trichlorobenzene | | | |
| Fenitrothion | | | | Trichloroethane | | | |
| Fenthion | | | | Trichloroethylene | | | |
| Flucofuron | | | | Trifluralin | | | |
| Hexachlorobenzene (HCB) | | | | Triphenyltin compounds | | | |
| Hexachlorobutadiene (HCBD) | | | | Vanadium | | | |
| Hexachlorocyclohexanes (HCH's) | | | | Zinc ✓ | | | |
| | | | | | | | |

b) Are there any other significant chemical components used on site which may be contained in the effluent, including biocides or additives? Y/N

If yes, please give details.

* IN RIBBONS LTD, Y & P CATCHMENT

*Notes (see also the notes attached to the main form):*

a) *For direct trade effluent discharges, full details of the type of the effluent are required (eg. cooling water from air conditioning units), along with typical analytical details and the results of any toxicity studies on the effluent or its constituents. In certain circumstances the Agency may require that specific samples be taken and tests and analysis carried out. The Agency is empowered to recover any costs incurred as a result of special studies.*

b) *Possible sources of contamination include oil/chemical storage areas, vehicle loading/unloading areas, heavy vehicle parking areas and oil/petrol filling points. Any other potential sources of contamination should be detailed.*

c) *Where discharges of trade effluent take place to a sewerage system, as covered by this application, please give details of all authorised discharges of substances listed in table 8 overleaf.*

ASIANTAETH YR AMGYLCHEDD
ENVIRONMENT AGENCY

# ANNEXE 4
# WELSH REGION SUPPLEMENTARY INFORMATION ANNEXE

**Please complete this annexe for <u>every</u> proposed discharge.**

| *Official Use Only* |
| --- |
| *Application No.* |

**<u>For all proposed discharges:</u>**

1. Site Name.

CARDIFF EASTERN LONG SEA OUTFALL
ROVER WAY
TREMORFA, CARDIFF

2. Is this application being made to reinstate a lapsed Consent?

Y/N

If so, please state the Number of the lapsed Consent:

1830 mm

**IMPORTANT: If you are in need of advice on either part of question 2, please contact the Agency Regional Consents Section on 01222 770088.**

3. If the proposed discharge is to be made down a pipe, channel or culvert (as given in Section 2.3 in the main application form), please state the <u>diameter</u> (including units):

4. Please indicate the anticipated cost of the proposed scheme, including any alternatives which may have been considered:

PART OF £180 MILLION SCHEME

5. Is there any trade effluent component in the proposed discharge?

Y/N

If yes, please confirm here that you have completed and enclosed Annexe 3: *Tick* ✓

ASIANTAETH YR AMGYLCHEDD
ENVIRONMENT AGENCY

6. Will the proposed discharge be pumped or made under gravity? (please circle):

| (Pumped) / Gravity |
|---|

If pumped, please state the maximum pump rate in l/sec:

| 5000 l/s |
|---|

**For proposed discharges of sewage in storm or emergency conditions:**

7. Please confirm here that you have completed and enclosed both Annexes 1 and 2: N/A

| *Tick* |
|---|
| ✓ |

8. Please state:

| | |
|---|---|
| Population served (head) | 27843 |
| Consumption (l/head/day) default = 180 | 190 |
| Infiltration ($m^3$/day) | 51753 (BASELINE WHICH DOES NOT INCLUDE REACTIVE INFILTRATION) |
| Industrial effluent flow ($m^3$/day) | $8640_{DESIGN}$ (CONSENTED FLOW IS HIGHER THAN THIS DESIGN FIGURE : 10,900) |
| Dry Weather Flow ($m^3$/day) | 111853 |
| SOCA (l/sec) | 5758 |
| Predicted spill frequency (per annum) | 60 |

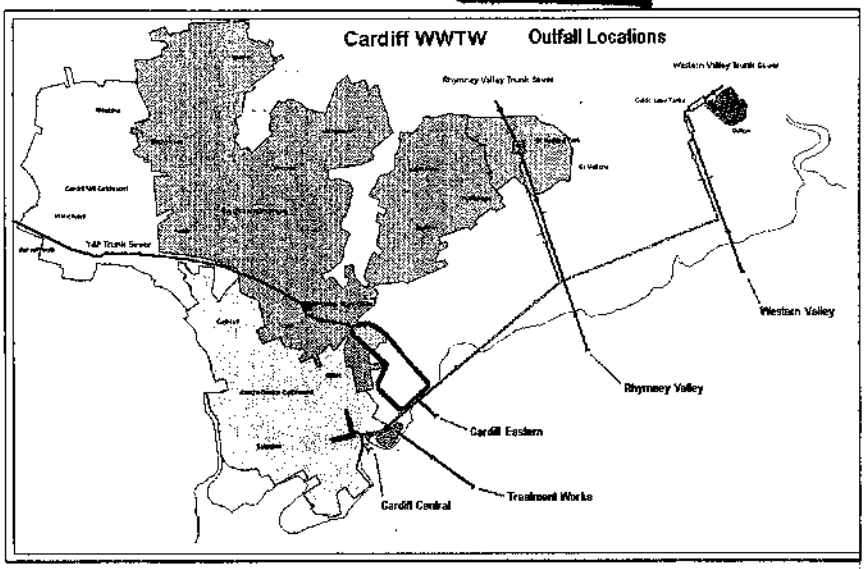
**IMPORTANT NOTES FOR ALL CONSENT APPLICATIONS:**

1. **Whoever signs the declaration on the main application form takes responsibility for the discharge, and will become the registered consent holder, if consent is given. In the case of a 'body corporate' (e.g. a public limited company ('plc'), limited company, local authority), the 'body corporate' will be the registered consent holder, and the person with the delegated authority to sign on behalf of the 'body corporate' should give their job title.**

2. **Agents making an application on behalf of a client, must attach their clients written authority.**

3. **If the name and/or address of the applicant changes after submission of this application to the Environment Agency, the applicant must inform the Agency in writing.**

ANNEX 1




ASIANTAETH YR AMGYLCHEDD
ENVIRONMENT AGENCY

| | |
|---|---|
| CONSENT PLAN NUMBER | AN030850I |
| AUTHORISED SIGNATURE | |

OUTFALL
ST22667503

CONSENT POINT

Client

Project

Title

CARDIFF · WASTE WATER · PARTNERS

Hyder

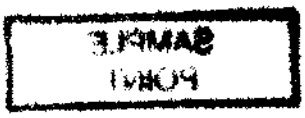
HYDER CONSULTING LIMITED
PO Box 4
Pentwyn Road
Nelson
CF46 6YA
Tel: +44 (0)1443 451 889
Fax: +44 (0)1443 452 144

Scale | Datum | Project Code | Drawing No. | Issue


Notes

| Issue | Description | Auth. | Chd. | Appd. | Date |
|---|---|---|---|---|---|
| C | THIRD ISSUE | R.J.T. | | | 10/11/00 |
| B | SECOND ISSUE | R.J.T. | A.R. | M.A.B. | 14/8/00 |
| | FIRST ISSUE | R.J.T. | C.J.T | M.A.B. | 29/4/99 |

CAD Ref: C | S:\NE\4929\2NDSTAGE\4929SK6


SAMPLE
POINT

Dwr Cymru Welsh Water

Annex 4.
AN0308501.

COPY

# The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff

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General Description Document

13th February 2002

| Emergency Numbers (All 9 999) | | | | | |
|---|---|---|---|---|---|
| Fire | Llantrisant HQ | 01443 232000 | | | |
| Police | Cardiff Central | 029 20 222 111 | | | |
| Hospital | Royal Gwent Hospital | 01633 234 234 | | | |
| Hospital | Heath Hospital Cardiff | 029 20 747 747 | | | |


Cardiff WWTW
Water Enterprises
Tide Fields Road
Tremorfa
Cardiff. CF23 2RX
Phone No. 02920 442750
Fax No. 02920 442757


Wessex

St Mellons
Cardiff
Tel:
Fax

Notice of activity that may affect:

Cardiff / Rhymney Valley /Western Valley Sewerage Catchments.

Fax: Pages:

Dwr Cymru Welsh Water

Annex 4.
AN0308501.

COPY

# The Integrated Waste Water Treatment Works and Sewerage Feeder System Operational Document for Cardiff

---

General Description Document

13th February 2002

Hyder

Consulting

## Table of Contents

# 1 Introduction

This document gives an overall description of the Cardiff scheme, inclusive of not only the stations in the catchments at Cardiff East, Rhymney Valley and Western Valley, but also of the main Treatment works itself.

# 2 The Integrated System

Cardiff Waste Water Treatment Works is a major part of a project, which intercepts and replaces four existing crude wastewater discharges into the Severn Estuary. It provides treatment for flows from the catchments of Cardiff Central, Cardiff East, Ystradyfodwg and Pontypridd, Rhymney Valley and the Western Valleys of Gwent.

A total population equivalent of 888,000.

Flows up to the design FFT (6.06m $^3$/sec) will receive preliminary followed by secondary treatment at the works prior to discharge through the long sea outfall.

The stations at Cardiff Central, Cardiff Eastern, Rhymney Valley and Western Valley receive and manage their respective catchment flows, allowing only the design pass forward flows to pass for treatment at the works, whilst also managing any excess storm flows through a combination of storage, screening and/or pumping, prior to sea discharge.

Cardiff Eastern, Rhymney Valley and Western Valley passed forward flows for treatment are discharged into a common interceptor sewer, of some 10km in length with a varying diameter from 1.6m at its head to 2.4m at its point of discharge at the inlet station of the treatment works where the collected flows arrive for pumped removal to treatment.

Due to its geographical location, Cardiff Central station does not discharge into either the interceptor sewer and/or the inlet pumping station, it discharges its pumped passed forward flow for treatment directly into the collection chamber upstream of the inlet works screening facility at the treatment works

The design pass forward values for treatment, both independently and collectively are shown in a tabulated format below.

| Rhymney Valley | Western Valley | Cardiff Eastern | Cardiff Central | Totals |
|---|---|---|---|---|
| 1,109l/sec | 1,458l/sec | 2,230l/sec | 1,260l/sec | 6,057l/sec |

# 3. The Rhymney Valley Station

Sewage flows arrive at the head of the storage tanks from the Rhymney valley catchments via a gravity sewer.

The flows arriving are between the ranges of 987l/sec in peak dry weather flow conditions to 2670l/sec in storm flow conditions.

At the Northern end of the storage tanks, there is an inlet chamber that houses two number manually operated penstocks, namely: -

1. The main inlet penstock sized at 1200mm

2. A bypass penstock sized at 1200mm

The bypass penstock is only to be utilized when there is a need to isolate the storage tanks, either for planned maintenance activities, or due to a breakdown in operational plant within the tank system.

The bypass pipeline is sized at 1,050mm diameter, and has the capacity to pass 1.1 $m^3$ /sec (i.e. 1,100l/sec)

Under normal conditions the bypass penstock will be in the closed position, and the inlet penstock will be in the open position.

Flow passes through the penstock and on through an old disused inlet works structure and on into an open channel of dimensions 1250mm width x 200mm depth.

The flow then passes forward and travels through the center channel of the main storage tank structure.

**NB Downstream of the aforementioned flow measurement device, the flow path travels through a further potential diversion chamber. It should be noted that the penstocks within this chamber whilst still present have been de-commissioned and serve no purpose. They are not a part of the revised system.**

At the exit end of this centre channel there is a 1000mm height x 700mm width stainless steel modulating penstock that has been supplied by Adams Hydraulics.

This penstock is automated and powered by an Auma Actuator.

After passing this penstock the flow enters a 1200mm pipe.

Approximately 250metres downstream a magnetic flow meter supplied by ABB Kent, ranged for 0-2000litres per second records the flow, and this flow in conjunction with the aforementioned modulating penstock represents the primary flow control device for the overall system.

In essence a milliamp output is recorded at the flow meter and transmitted to the ABB controller unit situated at the storage tanks MCC panel.

This is then in turn transmitted to the Auma actuator of the modulating penstock, which adjusts itself to the appropriate position to achieve the desired set point.

At present the Flow to Full Treatment value that this penstock is allowed to pass is 1110 litres per second.

With the onset of storm conditions flows will exceed the F.F.T. figure and the level in the through channel may increase to a point where they will pass across high level slot weirs into the two adjacent storm storage tanks.

The maximum predicted storm flows to be expected at the station is 2670litres per second, thus with a pass forward flow of 1110l/sec the balance of 1560l/sec will initially be retained in the storage tanks.

The storage tanks have a capacity of 10,810$m^3$

Should storm conditions persist the storage tanks themselves will become full and at this point they will overflow into the storm screen.

Huber Rotomat has supplied the storm screen and it is designed to retain solids < 6mm and return them upstream and thus retain them on the foul side.

A Milltronics level device fitted in the screen reception chamber controls the screen operation.

In conjunction with this activity an automated penstock operates on a timed basis to flush retained screenings out of a 525mm diameter pipe, which in turn delivers them to a point upstream of the main controlling magnetic flow meter.

The control set up is such that 30 minutes after screen initiation the penstock opens for a two-minute period and then closes.

This operation is repeated every ten minutes during the running time of the screen.

Flows passing through the screen are discharged directly to sea via a 1500mm pipeline.

As the storm abates and flows become lower, the level within the through channel of the storage tanks falls.

When flows and hence levels fall below the F.F.T. figure six number automated penstocks open to allow the captured storm volume to be passed forward.

Thus the storage tanks are emptied.

A Milltronics level device fitted in the through channel controls the operation of these tank-emptying penstocks.

When the level measurement in both the through channel and the storage tanks are identical the tank drainage penstocks will once again close.

At this stage the system is once again restored to the normal DWF condition.

# 4. The Western Valley Station

Sewage flows arrive at the head of the storage tanks from the Western valley catchments via a gravity sewer.

The future flows estimated to arrive at the tank are between the ranges of 1146l/sec in peak dry weather flow conditions to 3492l/sec in storm flow conditions.

At the Northern end of the storage tanks, there is a common inlet chamber with a penstock and stop log facilities, which normally passes flow into twin storage tanks;

There is also the option by utilizing the penstock of allowing flow to be diverted into a 1050mm diameter bypass pipeline and into the storm spill pipeline.

This bypass penstock is only to be utilized when there is a need to isolate the storage tanks, either for planned maintenance activities, or due to a breakdown in operational plant within the tank system, thus it is normally closed.

Under normal flow conditions, flow passes into and through the western side tank.

At a point one meter prior to the discharge point of both tanks there is an interconnecting automated penstock that is normally in the open position and allows hydraulic balancing between the western and eastern tanks.

Thus in effect they become one tank.

On the southern exit faces of both tanks there are electrically operated penstocks sized at 1500mm x 1500mm

These are also normally open.

Flow passes out of both of the tanks and into a common chamber out of which there is one exit pipe, sized at 1000mm.

Approximately 4meters downstream of the commencement of this exit pipe there is a 1000mm high x 700mm wide stainless steel modulating penstock that has been supplied by Adams Hydraulics.

This penstock is automated and powered by an Auma Actuator.

After passing this penstock the flow carries on through the FFT pipeline, which passes flows, limited to 1.458 $m^3$/sec to the interceptor sewer and onto Cardiff WWTW.

Approximately 15metres downstream of the flow control penstock a magnetic flow meter supplied by ABB Kent, ranged for 0-2000litres per second records the FFT flow, and this flow meter in conjunction with the aforementioned modulating penstock represents the primary flow control device for the system.

In essence a milliamp output is recorded at the flow meter and transmitted to the ABB controller unit situated at the storage tanks MCC panel.

This is then in turn transmitted to the Auma actuator of the modulating penstock, which adjusts itself to the appropriate position to achieve the desired set point.

At present the Flow to Full Treatment value that this penstock is allowed to pass is 1458 litres per second.

On the western tank there is an identical 1000mm high x 700mm wide stainless steel modulating penstock that has been supplied by Adams Hydraulics also automated and powered by an Auma Actuator.

This is fitted so that in the event of failure of the main unit, the standby unit can be selected on the MCC panel and modulation to the preset FFT figure will occur.

With the onset of storm conditions flows will exceed the F.F.T. figure and the level in the storage tanks will increase

The maximum predicted future storm flows to be expected at the station is 3,492litres per second, thus with a pass forward flow of 1,458l/sec the balance of 2,034l/sec will initially be retained in the storage tanks.

The storage tanks have a capacity of approximately 16,672$m^3$

Should storm conditions persist the storage tanks themselves will become full and at this point they will overflow into the mechanical storm screen which is housed in an adjoining chamber on the Eastern corner of the storage tanks.

Huber Rotomat has supplied the storm screen and it is designed to retain solids > 6mm, collecting screenings on the foul side whilst allowing screened storm spills to pass.

A Milltronics level device fitted in the screen reception chamber controls the screen operation.

In conjunction with this activity an automated penstock operates on a timed basis to flush retained screenings out of a 525mm diameter pipe, which in turn delivers them to a point upstream of the main controlling magnetic flow meter.

The control set up is such that 30 minutes after screen initiation the penstock opens for a two-minute period and then closes.

This operation is repeated every thirty minutes during the running time of the screen.

Flows passing through the screen are discharged directly to sea via a storm spill pipeline of varying diameter.

As the storm abates and flows become lower, the screening operation ceases and levels within the storage tanks fall.

When flows fall below the F.F.T. figure the captured storm volume is passed forward and thus the storage tanks are emptied.

On completion of tank emptying the system is once again restored to the normal FFT condition.

# 5. The Eastern District Station

The Cardiff Eastern District CSO & PS's are located on a site between Rover Way and the foreshore at Tremorfa, Cardiff. They serve the catchments of Cardiff East and Ystradyfodwg & Pontypridd (Y&P).

Sewage arrives at the site via two sewers laid along Rover Way – one from the east and the other from the west, historically known as the Rover Way and the Roath sewers respectively.

The works at Cardiff Eastern District (CED) comprises:

A connection into the new Cardiff Interceptor Sewer - to pass forward foul sewage for treatment at Cardiff WWTW;

A storm connection into the Interceptor Sewer - to pass the "first flush" storm flow into storage in the sewer;

A CSO - to screen and spill excess storm flows into the Bristol Channel via two pumped outfalls – one 1830m long and the other 180m long, using a new storm pumping station (with four submersible pumps) together with a retained part of the original pumping station (with two screw pumps).

The peak rate of combined sewage flow arriving at the site is expected to be 10.4 $m^3/s$.

The first 2.230 $m^3/s$ of sewage flow (FFT) will follow the flow path shaded brown, directly into the Interceptor Sewer for treatment at the WWTW. An actuated modulating penstock, controlled by a downstream flow meter will limit the flow to a maximum pass forward value of 2.230 $m^3/s$.

As the flow arriving at the station rises above 2.230 $m^3/s$, in wet weather, the first 9300 $m^3$ of storm sewage (at a flow rate up to 6.0 $m^3/s$) will pass through a storm connection pipe into the Interceptor Sewer for storage. This flow path is shaded green on the plan. This stored volume will eventually be treated at the WWTW, as soon as flow conditions allow.

Concurrently with 2.3 above, the on-line storage in the Rover Way & Roath sewers will automatically fill as the flow rate in the sewers rises during storms.

The storm connection will be closed by means of an actuated penstock once the storage within the Interceptor Sewer is filled.

In the event of a prolonged storm, the level of sewage will rise in the common through channel and eventually spill over two overflow weirs, pass through 6mm screens and enter into the pumping sump. Three duty submersible pumps will lift the storm sewage into a chamber at the head of the long sea outfall. This flow path is shaded blue on the plan.

The capacity of the long sea outfall depends on the level of the tide in the Bristol Channel – the capacity will reduce as the tide level increases. Should the rate of storm flow exceed the capacity of the long sea outfall at any time, the sewage in the head chamber will spill over a weir into the part of the chamber feeding the short sea outfall.

The screened capacity of the new storm PS is 5.0 $m^3/s$; in the event of flows exceeding this rate, the storm sewage will spill over a set of higher-level weirs into the sump of the screw pumps. These weirs are also equipped with 6 mm screens of 4.0 $m^3/s$ capacity.

The screw pumps will discharge into the short sea outfall, shown shaded purple on the plan.

The installed capacity of the screens is 9.0 $m^3/s$ and the installed capacity of the pumps is 10.4 $m^3/s$ (excluding the standby pump).

Summary

Foul and storm sewage from the Y&P and Cardiff East catchments arrive at the site of Cardiff Eastern District CSO & PS.

The total peak rate of flow is expected to be 10.4 $m^3/s$.

The foul sewage flow, up to a maximum rate of 2.230 $m^3/s$ (FFT), will pass into the Cardiff Interceptor Sewer for treatment at Cardiff WWTW.

# 6. The Treatment Works

The treatment works broadly consists of: -

- A 35m deep inlet pumping station.
- Screening, grit removal, cleaning and handling facilities
- An intermediate pumping station.
- A biological treatment plant consisting of 16 no. Sequential Batch Reactor Basins (SBRs).
- An Outfall Pumping Station operating intermittently to overcome tidal ranges discharging via a 4.2 km sea outfall.
- A sludge treatment plant comprising mechanical thickening and dewatering by centrifuges followed by thermal drying.
- Associated pipelines and chambers.
- Power distribution and control facilities.
- A visitor centre and operational control room.

The incoming flows are screened, where non-organic matter larger than 6mm is removed. This material is then washed and processed within the screening building.

Grit is removed by a vortex separator and after removal is also washed and discharged into skips housed in the screening building.

Preliminary treated sewage is then pumped to two distribution chambers. These chambers distribute the flow to two sets of SBRs, each set comprising 8 no. 51 x 45m basins. The SBR is a batch type activated sludge process that combines the aeration and settlement stages into a single unit. It will operate on a 4-hour cycle for normal flows (i.e. up to 1.4 DWF, 4438 l/s) and a 3-hour cycle for wet weather peak flows. During winter conditions, when flow to the Works could be at a consistently high but varying level it may be necessary to select an intermediate cycle of 3.6hours for normal operation.

A Four-hour cycle will comprise: -

- 2 hours of filling and aerating (inflow, no outflow)
- 1 hour of filling and settling (inflow, no outflow)
- 1 hour of decanting (no inflow, outflow)

Similarly for a 3-hour cycle

- 1.5 hours of filling and aerating
- 45 minutes of filling and settling
- 45 minutes of decanting

An internal selector zone has been constructed at the inlet of each basin, which receives both incoming sewage and returned activated sludge. Following this, flow passes through a full width baffle wall; ports in the selector and baffle wall ensure an even inflow of sewage across the width of the basin.

Aeration is achieved using fine bubble diffused air utilising membrane diffusers. Air is supplied by centrifugal blowers arranged in 2 sets of 5 units (4 duty and 1 standby).

Discharge of treated effluent from these basins is achieved through travelling arm decanters. Within the decant phase the decanter is driven from top water level to the bottom water level At the end of the cycle the decanter is raised to its park position just above top water level. The treated effluent then gravitates to the outfall pumping station where it is pumped/gravitates out through the 4.2 km long sea outfall depending on the tidal condition.

## PROCESS EQUIPMENT

### Inlet Pumping Station

The station is an 18.50m diameter, 35m deep shaft divided vertically into 3 sections. The first section, the 'debris shaft' receives flow from the Interceptor Sewer and admits flow into each of the 2 pumping sumps via isolating penstocks. Debris dropped out in the debris shaft is removed by a 'clam shell' grab from the surface on a bi-annual basis.

Each pumping sump is equipped with 4 no. 875 l/sec submersible sewage pumps. The pumps are removable by mobile crane from the surface; the station remains 'on-line' when pumps are being removed.

The station has been hydraulically modelled to ensure optimum efficiency and self-cleansing, and has been designed to eliminate the need for routine access, and hence keep the station available for duty.

The flow to full treatment of 4800 l/sec, discharged by the interceptor sewer, can be handled by 5 pumps running continuously, assisted periodically by a $6^{th}$ pump. 2/3 pumps are maintained as standby plant.

The control of the pumping regime has been amended during the commissioning period and now controls between the ranges of 1.5m – 3m from the shaft base level.

A flow limiting facility has also been installed and successfully commissioned that optimises the pumping output.

This is achieved by deriving a forward flow figure for the pumps based on the following formula: -

Forward flow Value = Treatment works Design FFT – Actual Cardiff Central input

Thus if incoming flows to the inlet shaft allow, the FFT is constantly achieved and the pump discharge volumes are optimised at periods when the Cardiff central value falls below its FFT value.

Levels within the shaft are measured using pressure transducers, and are trended and recorded on the main works SCADA system.

High-level alarms are transmitted over the telemetry system to the main central control room in Nelson where out of hours operator call outs is achievable.

There is a one-hour response period for all alarms generated at the works.

Forward flows are measured using magnetic flow meters at the valve chambers of the respective sumps, with individual measurement for each pump.

## Inlet Works

The Inlet Works combines the flows pumped from the Inlet Pumping Station and Cardiff Central Pumping Station in an upstream chamber that feeds into 5 channels for screening.

The combined flow of 6060 l/sec is the maximum that the works can treat.

Each screen channel is equipped with isolating penstocks (upstream and downstream) and Screening is achieved using 6mm escalator type screens.

At the FFT of 6060 l/sec, 3 screens operate with the 4$^{th}$ unit as a further assist for use during storm flush conditions, whilst the 5$^{th}$ screen is a common standby.

There is a 6$^{th}$ channel equipped with a weir that has been provided alongside the screen channels to act as an automatic by-pass channel.

After the screening operation the channels then feed into a single channel and screened influent flows down to the grit removal area.

The grit removal facility consists of two vortex separators, and each is capable of treating up to 4200 l/sec with optimum grit removal.

Each grit trap can be isolated from the flow, and a bypass channel has also been provided.

Removed screenings are macerated, dewatered, and compacted prior to discharge off site.

Removed grit is washed and dewatered prior to discharge off site.

## Interstage PS

The Interstage PS is divided into 2 separate sumps. Each sump is equipped with 4 no. Submersible sewage pumps each of 1130 l/sec capacity.

At the FFT of 6060 l/sec, 3 pumps in each well operate, leaving 1 pump in each well as a standby. Pump maintenance is achieved by lifting the pump out of the well. The station remains 'on-line' when pumps are removed or re-installed.

## Sequential Batch Reactors (SBR)

Each of the 2 groups of SBRs has 8 basins.

The basins can operate in either Cardiff SBR mode - when flow into the basin will be prevented during decant, or in ICEAS mode - when flow into the basin will be continuous. Both modes of operation can produce a satisfactory effluent quality.

Each basin will act as an independent unit, equipped with its own decanters, aeration equipment and valves. One aeration blower will supply 2 adjacent basins. Each basin will only require aeration for 50% of the complete period, so a blower will only supply 1 basin at a time.

Failure of components within a basin will automatically take the basin out of service.

Each group of 8 basins has 4 duty blowers, with a common standby, which automatically replaces a faulty blower.

The blowers are of the centrifugal type.

# 6. The Global Management Protocols

As experience of the overall "Global" network has increased, so too the necessity for a global management protocol has become apparent.

It was identified that this protocol was necessary to introduce actions that would need to be carried out by operational staff both at the treatment works facility and also at the outlying stations during abnormal flow conditions

These actions have introduced not only a transparency of operations and operational problems throughout the network, but have also allowed for joint mitigation of potential flooding events.

The protocols are enclosed on the following pages.

Feb 15, 2002

## Temporary Emergency Flow/level mitigation

The following actions are proposed Emergency measures to mitigate flow level concerns until permanent flood relief etc. has been fully considered and implemented by Welsh Water.

| | | | | | | | | Ensure storm storage tanks fully utilised before action | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Guide word | Deviation | Result | Consequences | Checks | Options | Criteria | Permission or Actions by Others | Communications | Tidal Check | |
| a) | None | No flow from inlet<br>OR<br>Interstage PS | Hi Hi Inlet Sump Level | Upstream flooding<br>OR<br>Premature storm discharge | Check:<br>Level @ inlet PS<br>Pump status<br>Forward Flow should be 4.8m3/s | Return pumps to service | | NONE | Wessex, who also receive Auto High level alarm | NO | |
| b) | None | No flow from inlet<br>OR<br>Interstage PS | Hi Hi Inlet Sump Level | Upstream flooding<br>OR<br>Premature storm discharge | Check:<br>Level @ inlet PS<br>Pump status<br>Forward Flow should be 4.8m3/s<br>Flow path, valves etc. | Turn out all incoming flows. EDPS,<br><br>(Request Wessex to turn out WV and RV) | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex who also receive Auto High level alarm | Yes | Yes |
| c) | None | No flow from inlet<br>OR<br>Interstage PS | Hi Hi Inlet Sump Level | Upstream flooding<br>OR<br>Premature storm discharge | Check:<br>Level @ inlet PS<br>Pump status<br>Forward Flow should be 4.8m3/s<br>Flow path, valves etc. | Turn out all incoming flows. Central<br><br>Wessex to turn out WV and RV | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex who also receive Auto High level alarm | Yes | |
| d) | None | No flow through Outfall PS | Hi Hi Inlet Sump Level | Upstream flooding<br>OR<br>Premature storm discharge | Check:<br>Levels<br>Pump status<br>Tide<br>Valves | Return pumps to service | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| e) | None | No flow through Outfall PS | Hi Hi Inlet Sump Level | -:- | -:- | Clear blockage | | | | |
| f) | None | No flow through Outfall PS | Hi Hi Inlet Sump Level | -:- | -:- | Turn out all incoming flows. EDPS, Central<br><br>(Request Wessex to turn out WV and RV) | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex who also receive Auto High level alarm | |
| g) | None | No flow into Inlet pump sump | Low level in Inlet pump sump | Upstream flooding OR Premature storm discharge | Check:<br>Level @ inlet PS<br>Pump status<br>Forward Flow should be 4.8m3/s<br>Flow path,<br>Inlet PS valves. | | | | Wessex | |
| h) | Less of | Less flow through works than required | Hi Hi Inlet Sump Level | Upstream flooding OR Premature storm discharge | Check:<br>Levels<br>Pump status<br>Valves | Correct pumping<br>OR<br>Valve positions<br>OR<br>Combination of: | | | Wessex | |
| i) | Less of | Less flow through works than required | Hi Hi Inlet Sump Level | Upstream flooding OR Premature storm discharge | Check:<br>Levels<br>Pump status<br>Valves | 1. Throttle FFT at WV | Strategic plant failure AND Imminent Danger of Flooding | Wessex | Wessex, who also receive Auto High level alarm | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| j) | Less of | Less flow through works than required | Hi Hi Inlet Sump Level | Upstream flooding OR Premature storm discharge | Check: Levels Pump status Valves | 2. Throttle FFT at: RV | Strategic plant failure AND Imminent Danger of Flooding | Wessex | Wessex, who also receive Auto High level alarm | | |
| k) | Less of | Less flow through works than required | Hi Hi Inlet Sump Level | Upstream flooding OR Premature storm discharge | Check: Levels Pump status Valves | 3. Throttle FFT at: EDPS | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex | | |
| l) | Less of | Less flow through works than required | Hi Hi Inlet Sump Level | Upstream flooding OR Premature storm discharge | Check: Levels Pump status Valves | 4. Throttle FFT at: Central | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex | | |
| m) | Less of | Less flow into tunnel than required | Low Tunnel level | Upstream flooding ANDOR Premature storm discharge [See Note a.] | Check Instrumentation. CSO valve positions. | Correct deficiencies found | | | Wessex | | |
| n) | More than | More flow into tunnel than consent | Hi Hi Tunnel Level | Increased flow through works: Consent failures (72 hours). Upstream flooding ANDOR Premature storm discharge | Check Flows from: EDPS, Central | a) Reduce offending station to consented flows.<br><br>b) Refer to Process Scientist | | | Wessex, who also receive Auto High level alarm | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| o) | More than | More flow into tunnel than consent | Hi Hi Tunnel Level | | Check Flows from RV, WV | Reduce offending station to consented flows | | Wessex | | | |
| p) | More than | More flow into tunnel than consent | Hi Hi Tunnel Level | Increased flow through works: Consent failures. Upstream flooding AND/OR Premature storm discharge | Check All Flows | Increase flows above consent. Bypass SBRs (Poor Sample) Actions: 1. Disable (Key Switch) alarm 2. Open Bypass valves 3 Select S/By pumps in Inlet & Interstage [See Note b] | Strategic plant failure AND Imminent Danger of Flooding | | DCWW, EA and Wessex who also receive Auto High level alarm | | |
| q) | Vandalism | | Further discussion required. | | | | | | | | |

[Notes:

r) If Debris Shaft fitted with Ultrasonic to cover high level above 20 metres this could be used to monitor level of tunnel before inlet sump valves. If this level is above inlet sump level raise alarm. This would give early warning of shut valves on inlet and possible problems with SBR Bug Food. Operator to inform Process Scientist if this condition persists? (This Point to be discussed with Ops Scientist for clarification if feasible or are we talking rubbish?)

s) Limited to approximately 2 hours then problems expected with auto throttling of SBR valves. System needs to be proven

Further actions required:

1. Check which items are tide dependant?
2. Consider revised format in bock form
3. Consider overflow from MH1 to beach (For SBR Bypass pumping if outfall sump overcome.
4. Fit ultrasonic level device in debris shaft to show difference in sump and tunnel level. This will highlight valve position problems. An ultrasonic detector is programmed to be fitted in the sump to show levels above 20 metres, consider if this could do both jobs.
5. Finalise actions at different very high levels ie 19 , 20 metres etc.
6. Consider remote telemetry access for standby crew via ISDN as RAS too slow.
7. Consider PC Anywhere to take control of SCADA remotely
8. To be correlated with previous procedures before finalising

9. Consider remote PLC reset via telemetry
10. Consider auto throttle of FFT valves
11. Consider remote activation of FFT valves by telemetry
12. Consider 24/7 working

United Utilities

**Temporary Protocol for planned and emergency work that may affect the levels in the Sewerage catchments of the Cardiff Waste Water Treatment Works**

Due to the sewerage systems susceptibility to sudden rises in water level under storm or pump failure conditions; the following protocol has been agreed between Welsh Water, Wessex Water and United Utilities. This protocol has been put in place as a temporary procedure pending further investigation and corrective action to the systems.

This protocol is based on assessment of the known data of the system, and should be reviewed in 3 months time or if there are any changes to the systems as known. Specific tasks or activities should be risk assessed in their own right for H&S compliance.

| No. | Risk | Comment | Action |
|---|---|---|---|
| 1 | Sewer Levels | Hydraulic Levels in the interceptor tunnel are available on the Welsh Water Telemetry system for Wessex and United Utilities to view. | Automatic Telemetry |
| 2 | Hi Level Alarms | High level & High High level Alarms are for the inlet sump. These are received at the main Nelson Control Room where they are relayed to United Utilities and Wessex Water. United Utilities and Wessex Water will put into motion the agreed actions. *[Contingency plans containing formalised priority actions for this eventuality are under development by a team set up to deliver this]* | Automatic Telemetry / Control room |
| 3. | Data and trends | Telemetry pages for the Four CSOs in this area are available for each party to view. | Automatic Telemetry |
| 4 | Programmed Work | Any planned works that may adversely affect the sewage level in the catchments or interceptor sewer are to be notified to the other party by the agreed notification system. | E-mail or Fax Notice |
| 5 | Men in Sewers/Wells (Planned) | If men are committed to areas that could be affected by adverse sewage levels, the other parties are to receive prior notification by the agreed system. | E-mail or Fax Notice |
| 6 | Emergency Work | Any Equipment failures or Emergency work that may have an adverse affect on levels are to be notified to the other party by the quickest means and confirmed by the agreed notification system. | Phone, then confirm by, E-mail or fax notice |
| 7 | Significant Rainfall | If there is significant rainfall that could affect the Cardiff Central Catchment, Wessex Water Operators will contact the Welsh Water Control room. The Control room Operator will call out the Cardiff Standby man and request he checks the status of the penstocks for correct position. The standby man will monitor the situation until he is satisfied that the risk of flooding is minimised. | Phone |

## Emergency Numbers
## Cardiff WwTW and associated CSOs Trunk Sewers.

| Name | Role | Telephone No. | Mobile No. | Fax No. | E-mail |
|---|---|---|---|---|---|
| **Wessex (Sewerage Management)** | | | | | |
| Mark Ramsey | Supervisor | | 07810 181694 | | |
| Wayne Morris | | | 07810 181692 | | |
| Tom Hamilton | Manager | | 07880 785127 | | |
| Control Room | Bath Centre | | | | |
| **United Utilities (Cardiff WwTW)** | | | | | |
| Sewage Works | Control Room | 029 20 442757 | | 02920442750 | |
| Derek Baker | Team Leader | 029 20 442778 | 07774 150275 | | Derek.baker@dwrcymru.com |
| Steve Smith | Unit Controller | 01443 400100 | 07798 632716 | | Steve.smith@dwrcymru.com |
| Brian Warner | Operations Co-ordinator | 029 20 442777 | 07778 926247 | | Brian.warner@dwrcymru.com |
| **Welsh Water** | | | | | |
| Control Centre | Nelson | 01443 452660 | | | |
| **Hyder Consulting (Design & Commissioning)** | | | | | |
| Eddie Morton | Electrical | | 07790 155137 | | |
| Doug James | Sewerage Network | | 07909 996660 | | |
| Jeff Martin | Project Director | | 07747 791005 | | |

| Emergency Numbers (All 9 999) | | | | | |
|---|---|---|---|---|---|
| Fire | Llantrisant HQ | 01443 232000 | | | |
| Police | Cardiff Central | 029 20 222 111 | | | |
| Hospital | Royal Gwent Hospital | 01633 234 234 | | | |
| Hospital | Heath Hospital Cardiff | 029 20 747 747 | | | |


Cardiff WWTW
Water Enterprises
Tide Fields Road
Tremorfa
Cardiff. CF23 2RX
Phone No. 02920 442750
Fax No. 02920 442757


Wessex

St Mellons
Cardiff
Tel:
Fax

## Notice of activity that may affect:

## Cardiff / Rhymney Valley /Western Valley Sewerage Catchments.

Fax: Pages:

Phone: Date:

Re: Ops Notification CC:

Emergency Planned

- Comments:

| Activity: | | |
|---|---|---|
| Estimated Times | | |
| Possible consequences: | | |
| Precautionary Measures advised: | | |
| Name of person notifying: | Signed | Time |

# Consent Applications for Cardiff East P.S
# Supplementary Information

## Operational Regime

The existing long and short sea outfalls have sufficient capacity to spill flows up to a design peak of 5.2$m^3$/sec.

All flows will initially pass through the long sea outfall. Dependent upon the tidal levels and spill discharge characteristics the long sea outfall will be maximised up to a weir level oif 7m A.O.D. where upon the flow will be split and the balance will discharge via the short sea outfall.

## Spill Analysis

The spill analysis that accompanies this application has been compiled from hydraulic simulations of the most recent Hydroworks model, with the following inputs:-

- 'Typical' year from historical rainfall data set for Rhoose raingauge at Cardiff International Airport.
- Constant input of 1.0$m^3$/s (average DWF) upstream of Kimberley Road CSO
- Hydraulic model to generate average DWF for the Cardiff East catchment.
- Hydraulic model to generate the storm response.
- No inclusion of the 1.3$m^3$/s inflow recorded entering the system just upstream of Kimberley Road CSO during storm conditions.

This approach was agreed with the Environment Agency at the meeting on 23 January '01. In addition to this analysis further work is being undertaken to accurately represent the inflow of 1.3$m^3$/s recorded entering the system during storm conditions. Once a methodology for representing this flow has been reached with the EA further spill analysis will be undertaken.

The results of the spill analysis will form part of a coastal modelling exercise such that the impact on water quality performance at "Barry Bathing Waters" can be evaluated.

The inclusion of the 1.3$m^3$/s inflow upstream of Kimberley Road CSO will have a detrimental effect on the predicted spill frequency and volumes. As this is the case DCWW will be carrying out CCTV investigations along the existing Y&P trunk sewer to attempt to identify the source of the inflow.

# CARDIFF EAST DAP
# ANNUAL SGR ANALYSIS

**SGR Analysis with DWF set to 1.0m3/s from Y P no inflow of 1.3m3/s and storm response generated by the model.**

| SGR No. | LONG OUTFALL (m3) | SHORT OUTFALL (m3) |
|---|---|---|
| 1 | 234527.2 | 18461.2 |
| 2 | 70235.9 | 0 |
| 3 | 112074.9 | 0 |
| 4 | 28836.3 | 0 |
| 5 | 88286.4 | 320.1 |
| 6 | 226297.2 | 1808.4 |
| 7 | 49745.9 | 0 |
| 8 | 105367.9 | 0 |
| 9 | 14536.3 | 0 |
| 10 | 31895.3 | 0 |
| 11 | 7373.8 | 0 |
| 12 | 56655.1 | 0 |
| 13 | 159017 | 0 |
| 14 | 42310.8 | 0 |
| 15 | 161015.4 | 0 |
| 16 | 0 | 0 |
| 17 | 51619.5 | 0 |
| 18 | 58422.6 | 389.1 |
| 19 | 50963.5 | 0 |
| 20 | 71243.9 | 160.3 |
| 21 | 102568.5 | 0 |
| 22 | 56516.6 | 0 |
| 23 | 18311.8 | 0 |
| 24 | 62451 | 0 |
| 25 | 76027.2 | 0 |
| 26 | 59387 | 0 |
| 27 | 43226.4 | 0 |
| 28 | 0 | 0 |
| 29 | 51789.9 | 0 |
| 30 | 31885.1 | 0 |
| 35 | 60054.4 | 0 |
| 40 | 40599.5 | 0 |
| 45 | 39135.4 | 0 |
| 50 | 17012.4 | 0 |
| 55 | 0 | 0 |
| 60 | 35514.2 | 0 |
| 65 | 0 | 0 |
| 70 | 0 | 0 |
| 75 | 26605.5 | 0 |
| 80 | 18564.4 | 0 |
| 85 | 0 | 0 |
| 90 | 0 | 0 |
| 95 | 0 | 0 |
| 100 | 0 | 0 |

*Spill Frequency - Long Outfall = 60
Short Outfall = 5

PREVIOUSLY SUBMITTED SUPPORTING INFORMATION

(NOT INCLUDED WITH THESE APPLICATIONS)

# CARDIFF WASTE WATER TREATMENT WORKS

## DISCHARGE CONSENT APPLICATION

### Contents



** this report to follow .

# CARDIFF OUTFALLS

## DISCHARGE CONSENT APPLICATIONS

## CONTENTS

1. Application Forms :-

Rhymney Valley Trunk Sewer CSO and Emergency Outfall
Western Valley Trunk Sewer CSO and Emergency Outfall
Cardiff Central Sewage Pumping Station Storm and Emergency

2. Location Drawings (7 copies of each)

3. Cardiff WWTW, Power Supply Security Statement (7 copies)

Previously submitted information

1. Cardiff WWTW – Water Quality Modelling Report.

2. Cardiff Outfall Phase 2 – Plume Modelling & Initial Dilution Studies

3. Cardiff WWTW – General Description

4. Cardiff WWTW – Control Philosophy

5. Power Supply security statement

6. Drawing nos. SK9 & SK10

7. Cardiff Scheme Trade Effluent Data, March 2000

# Water Resources Act 1991
## as amended by the Environment Act 1995
## Consents to Discharge
## Certificate of Holder

ASIANTAETH YR AMGYLCHEDD CYMRU
ENVIRONMENT AGENCY WALES

**Part A**

**To:** DWR CYMRU CYFYNGEDIG
PENTWYN ROAD
NELSON
TREHARRIS
CF46 6LY

NB: For a body corporate the job title is a point of contact.
Holder Start Date: 26/03/02

The **Environment Agency** ("the Agency") hereby confirm that the above named person is a/the registered holder of consent AN0308501 Consent Issued: 26/03/2002

Nature of Discharge(s): SSOR Sewage - Storm effluent - Rainfall

at ST2266075030 CARDIFF EAST DISTRICT LONG OUTFALL

---

Note: This certificate should be kept with the consent document for future reference. If you transfer responsibility for the discharge to somebody else you must pass the consent to them and tell the Agency within 21 days. **Responsibility for the consent cannot be disclaimed by the holder but the registration of holder may be transferred to a successor.** To do this please complete the form below, then tear it off and return it to the address shown. If you fail to transfer the consent, even though you are no longer on the site, you may still be liable for prosecution for pollution. If you transfer the consent but do not tell us, you will be committing an offence. In case of any queries please contact your local Environment Agency office.

---

cut here

**Part B** **Please complete in block capitals or type.**

**To:**

## Water Resources Act 1991: Notice of transfer of consent to discharge

**Consent** AN0308501 Consent Issued: 26/03/2002

Name: DWR CYMRU CYFYNGEDIG
Address: PENTWYN ROAD
NELSON
TREHARRIS
CF46 6LY

I/We* hereby serve notice on the Agency that I/we* am/are* no longer a/the* Holder of the above consent which will be/was* transferred to: * delete as appropriate

**Name(s) of new holder(s):**
**Address:**

**Post Code:**

**Date of Transfer to new Holder(s);** .....

**Signed:**..... **Dated:** .....

**Name** (block capitals):..... **Position:** .....

(to be completed when signing on behalf of corporate bodies )

# Deddf Adnoddau Dwr 1991
## fel y'i diwygiwyd gan Ddeddf yr Amgylchedd 1995
## Caniatâd Gollwng
## Tystysgrif Daliwr

ASIANTAETH YR AMGYLCHEDD

**Rhan A**

**At:** DWR CYMRU CYFYNGEDIG
PENTWYN ROAD
NELSON
TREHARRIS
CF46 6LY

DS: I gorff corfforedig mae teitl y swydd yn bwynt cysylltu.
Dyddiad Cychwyn Daliwr: 26/03/02

Mae **Asiantaeth yr Amgylchedd** ("yr Asiantaeth") yn cadarnhau drwy hyn mai/bod y sawl a enwyd uchod yw/yn ddaliwr cofrestredig uy caniatâd AN0308501 Cyhoeddwyd Caniatâd: 26/03/2002

Natur y gollwng: SSOR Sewage - Storm effluent - Rainfall
yn ST2266075030 CARDIFF EAST DISTRICT LONG OUTFALL

---

Nodyn: Dylid cadw'r dystysgrif hon gyda'r ddogfen ganiatâd i gyfeirio ati yn y dyfodol. Os byddwch yn trosglwyddo cyfrifoldeb y gollwng i rywun arall, rhaid i chi gyflwyno'r caniatâd iddo ef neu hi a dweud wrth yr Asiantaeth cyn pen 21 diwrnod. **Ni all y daliwr wadu cyfrifoldeb y gollwng, ond gall cofrestriad y daliwr gael ei drosglwyddo i olynydd.** I wneud hynny, byddwch cystal â llenwi'r ffurflen isod, ei datgysylltu a'i dychwelyd i'r cyfeiriad a nodir. Os methwch drosglwyddo'r caniatâd, hyd yn oed os nad ydych ar y safle mwyach, gallwch fod yn agored yr un fath i gael eich erlyn am lygru. Os trosglwyddwch y caniatâd ond heb ddweud wrthom, byddwch yn cyflawni trosedd. Os bydd gennych ymholiadau, byddwch cystal â chysylltu â swyddfa Asiantaeth yr Amgylchedd yn lleol.

---

**Rhan B** **Llenwch mewn priflythrennau bras neu deipio.**

**At:**

# Deddf Adnoddau Dwr 1991: Hysbysiad am drosglwyddo caniatâd gollwng

**Caniatâd:** AN0308501
Cyhoeddwyd Caniatâd: 26/03/2002

**Enw:** DWR CYMRU CYFYNGEDIG
**Cyfeiriad:** PENTWYN ROAD
NELSON
TREHARRIS
CF46 6LY

Yr wyf fi/Yr ydym ni* drwy hyn yn hysbysu'r Asiantaeth nad fi/ni/nad wyf/ydym mwyach yw/yn* Ddeiliad y caniatâd uchod. Caiff/Cafodd hwnnw ei drosglwyddo i: *dilewch yn ôl yr angen

**Enw(au) y Daliwr/Dalwyr newydd:**
**Cyfeiriad:**

**Cod Post:**

**Dyddiad Trosglwyddo i'r Daliwr/Dalwyr newydd:** .....

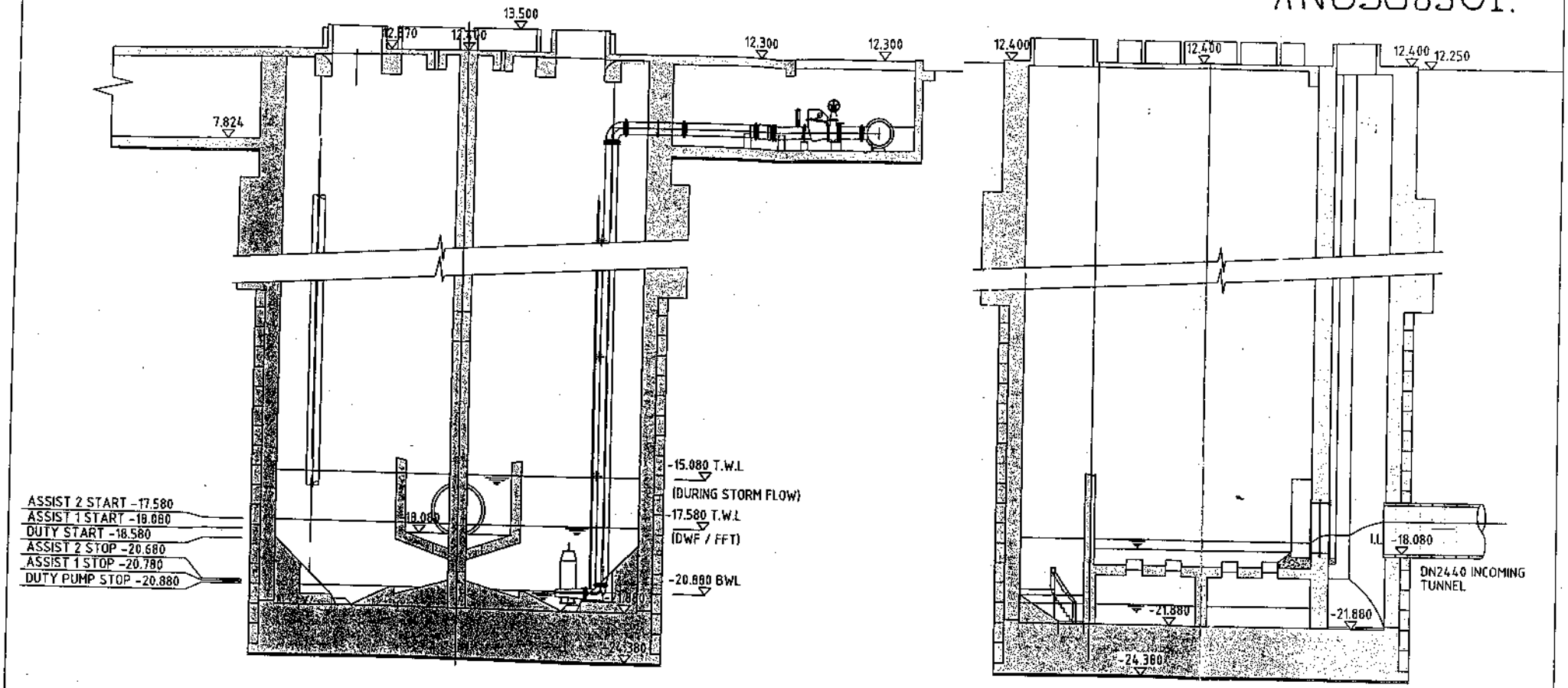
**Llofnodwyd:**..... **Dyddiedig:** .....

Enw Enw (priflythrennau bras):..... **Safle:** .....
(i'w lenwi wrth lofnodi ar

COPY

ANNEX 2

AND308501.




| Issue | Description | Auth. | Chk. | Appd. | Date |
|---|---|---|---|---|---|
| B | SHADED AREAS ADDED | djs | | | 09.11.01 |
| A | FIRST ISSUE | R.J.T. | | | 26/9/95 |

Notes

CAD Ref. A : I:\CAD\NE00928\03308.MDB

Client: DWR CYMRU WELSH WATER

Project: CADRIFF SEWERAGE & WATE WATER TREATMENT WORKS

Title: INLET PUMPING STATION

Scale (A3): 1:200

Datum: NEWLYN

Hyder Consulting

HYDER CONSULTING
P.O. Box 6
Pontypridd Road
Nelson
CF46 6YA
Tel: +44 (0)1443 365 000
Fax: +44 (0)1443 365 2643

Project Code: NE00928

Drawing No.: 3108

Issue: B