

Corrib Gas Development

Report for PMC Meeting Dated 14th June 2006

Prepared by : P. Mahon Senior Engineer, Project Manager for Mayo County Council

Water Quality – Carrowmore Lake

- Mayo County Council's Project Team have continued to monitor the surface waters in and around the Bellanaboy site. Summaries of the most recent verified results are attached.
- The results show;
In the last monitoring period the discharge of surface water from the Terminal Site has remained satisfactory due to the continued operation of the axonics treatment unit and the fact that overtopping of the mineral soil water on site has effectively ceased. The discharge from the site has had no adverse impact on the water quality of the Bellanaboy River or Carrowmore Lake or on the drinking water produced at the Erris Regional Water Works.

Mayo County Council installed an online aluminium monitor at the Erris Regional water Works at Barnatra in May 2006. This monitor measures the level of aluminium in the treated water on a continual basis giving real time levels to the plant operators and records the level on the scada system at the plant.

Environmental Issues

- Access to the Bellanaboy site for some personnel working directly with Shell E&P Ireland has been restricted since the last PMC meeting . Access to the site for officials of Mayo County Council has not been restricted.
- The quantity of cloudy water in the excavated area of the terminal footprint has reduced since the last PMC meeting and overtopping has effectively ceased.
- The quality of the surface water leaving the site at SP1 has remained satisfactory in the last month.
- The Axonics treatment plant has continued to operate . All treated water is either stored in a holding tank adjacent to the Axonics unit or discharged into the site drainage system.
- Shell E & P Ireland have proposed to install a new unit with five times the capacity of the existing Axonics unit. Mayo County Council have recently written to Shell E & P Ireland asking for a programme for the installation and commissioning of the new unit as a matter of urgency. Once all the cloudy water has been treated, a plan for dealing with the excavated area of the terminal footprint is being sought from the developer.

Update on Roads and Transportation

The accommodation works and road repair works at Glenturkbeg and Muinhin are practically complete.

CARROWMORE LAKE

Results from 27/04/2006 to 02/06/2006 (26 samples)

(Awaiting some results)

Analysis by Complete Laboratory Solutions, Rosmuc, Co. Galway

Parameter	Units	Average	Max	Min
Colour	mg/l	150	224	109
Turbidity	N.T.U	3.6	10.8	1.8
pH	pH units	7	7.4	6.1
Conductivity	uS/cm	107	165	100
Iron	mg/l Fe	0.517	1.892	0.224
Manganese	mg/l Mn	0.065	0.15	0.02
Ammonia	mg/l NH ₄	0.023	0.1	0.01
Nitrate	mg/l NO ₃	0.44	0.44	0.44
Nitrite	mg/l NO ₂	0.018	0.036	0.017
Dissolved Aluminium	ug/l Al	67	150	20
Total Aluminium	ug/l Al	138	320	20

ERRIS REGIONAL WATERWORKS (Final Treated Water)

Results from 06/05/2006 – 05/06/2006 (23 samples)

(Awaiting some results)

Analysis carried out at Erris Regional Waterworks

Parameter	Units	Average	Max	Min	Drinking Water Limits
Colour	mg/l	2.7	11	0	<10 Haz
Turbidity	N.T.U	0.53	0.6	0.49	<2.0 NTU
pH	pH units	6.78	7.58	6.35	6.5 – 8.5
Free Chlo/Res	mg/l	0.575	0.91	0.2	>0.3
Total Chlo/Res	mg/l	0.73	1	0.3	>0.3
Flourine	ppm	0.77	0.9	0.65	0.6-0.8
Dissolved Aluminium	ug/l	20	20	20	200
Total Aluminium	ug/l	48	100	20	200

BELLANABOY RIVER
(Upstream and Downstream of discharge from Terminal site)
Results from 27/04/2006 to 02/06/2006 (26 samples)
(Awaiting some results)

Analysis by Complete Laboratory Solutions, Rosmuc, Co. Galway

Parameter	Units	BEL 1 (upstream)			BEL 2 (downstream)		
		Average	Max	Min	Average	Max	Min
Temp.	°C	11.5	15.4	8.5	11.6	14.9	8.5
Dissolved Oxygen	% Sat.	92	97	81	91	96	85
Suspended Solids	mg/l	27	155	4	31	219	4
Turbidity	N.T.U	15.2	154	2.8	20.5	191	3
pH	pH units	6.8	7.2	6.4	6.8	7.3	6.5
Conductivity	uS/cm	134	197	72	140	190	78
Total Dissolved Solids	mg/l	78	112	43	80	115	46
Phosphate	mg/l P	0.138	0.721	0.027	0.086	0.571	0.012
Phosphate	µg/l PO ₄	163	761	100	263	1752	30
Total Phosphorus	mg/l P	0.262	1.532	0.095	0.166	0.808	0.032
Ammonium	mg/l NH ₄	0.127	0.713	0.10	0.171	1.203	0.01
Ammonia	mg/l NH ₃	0.093	0.553	0.005	0.121	0.933	0.005
Nitrate	mg/l NO ₃	0.625	1.685	0.44	0.796	3.199	0.44
Nitrite	mg/l NO ₂	0.017	0.043	0.005	0.021	0.056	0.017
Dissolved Aluminium	ug/l Al	189	870	30	149	1200	30
Total Aluminium	ug/l Al	518	2900	70	507	3100	70

SP 1
(Discharge point from terminal site)
Results from 27/04/2006 to 02/06/2006 (26 samples)
(Awaiting further results)
Analysis by Complete Laboratory Solutions, Rosmuc, Co. Galway

SP 1				
Parameter	Units	Average	Max	Min
Suspended Solids	mg/l	7.3	40	4
Turbidity	N.T.U	4.3	15.2	2.5
pH	pH units	6.9	7.2	6.6
Conductivity	uS/cm	162	203	117
Total Dissolved Solids	mg/l	94	121	68
Phosphate	mg/l P	0.018	0.054	0.01
Phosphate	µg/l PO₄	55	167	30
Total Phosphorus	mg/l P	0.051	0.123	0.023
Ammonium	mg/l NH₄	0.042	0.135	0.01
Ammonia	mg/l NH₃-N	0.032	0.105	0.005
Nitrate	mg/l NO₃	0.454	0.779	0.44
Nitrite	mg/l NO₂	0.017	0.017	0.017
Dissolved Auminium	ug/l Al	76	110	20
Total Aluminium	ug/l Al	140	210	40

**Axonics Water Treatment Units
(Pre-treatment and Post-treatment Results)
Results from 27/04/2006 to 02/06/2006
(Awaiting some results)**

Analysis by Complete Laboratory Solutions, Rosmuc, Co. Galway

Parameter	Units	Pre-Treatment(No samples)	Post-Treatment(3 Samples)		
			Average	Max	Min
Suspended Solids	mg/l		4	4	4
Turbidity	N.T.U		1.6	3.1	0.6
pH	pH units		6.9	7	6.8
Conductivity	uS/cm		218	222	215
Total Dissolved Solids	mg/l		127	129	126
Phosphate	mg/l P		0.01	0.01	0.01
Phosphate	µg/l PO₄		30	30	30
Total Phosphorus	mg/l P		0.016	0.02	0.013
Ammonium	mg/l NH₄		0.275	0.037	0.018
Ammonia	mg/l NH₃-N		0.021	0.029	0.014
Nitrate	mg/l NO₃		1.705	1.896	1.514
Nitrite	mg/l NO₂		0.024	0.029	0.019
*Dissolved Aluminium	ug/l Al		1800	1800	1800
*Total Aluminium	ug/l Al		1800	1800	1800

* only 1 set of results available

The North Western Regional Fisheries Board

Update on Water quality in Carrowmore Lake and the Bellanaboy River - June 2006

A survey of the macroinvertebrate fauna in the Bellanaboy River (carried out by the NWRFB in consultation with the EPA) was completed during 21 February 2006 following concerns about the potential for aluminium toxicity in this catchment. The survey revealed a good diversity of invertebrate fauna (memo to PMC 5th April) both above and below the Shell terminal discharge point. The presence of certain Ephemeropteran indicator species suggested that the likelihood of toxicity due to aluminium discharges was unlikely to have occurred in this watercourse. Mayo County Council had also collected a detailed background physiochemical dataset for catchment watercourses and these had revealed insignificant increases in the total aluminium load to the lake from this development.

A further invertebrate survey was undertaken in the Bellanaboy River on 5 June 2006 as a follow up to the initial survey. Sampling was carried out at two locations, above (Bel. 1), and below (Bel. 2), the Shell terminal discharge point. Overall, the diversity and abundance of invertebrates remained similar at Bel. 1 (control) when compared to the survey carried out in February, with identical scores of 9.6 achieved. The lower site at Bel. 2 (below discharge) revealed increases in the diversity of some sensitive taxa at this downstream location. This accounted for an increased score (SSRS 9.6) recorded at Bel. 2 during the June survey compared with the February score (SSRS 8.0). Both upstream and downstream stations have identical scores and score highly with respect to the SSRS (Small Stream Risk Score for the Water Framework Directive). The presence of high numbers of certain pollution tolerant taxa and the occurrence of filamentous algae blanketing the substratum at both sites would indicate the possibility of excessive phosphorus run off from the catchment generally. This would be in line with the findings of the water quality report on the lake produced by the Fisheries Board last year.

Mayo Co. Co. continued to carry out monthly sampling of the lake for chlorophyll and total phosphorus. Total phosphorus concentrations in the lake remain high with an average concentration of 0.071 µg/l P for the period January to May 2006. This compares with an average total P concentration of 0.046 µg/l P for the same period in 2004 during a Fisheries Board sampling programme. The average chlorophyll concentration during the January to May sampling period was 5.53 mg/m³ and 19.5 mg/m³ for the 2006 and 2004 sampling programmes respectively. There has been no visible occurrence of the algal bloom on Carrowmore Lake so far this year although this could be explained by the generally unseasonable climatic conditions experienced for the past few months. Several months of further sampling will need to be carried out to monitor the progress of the *Anabaena sp.* and other Cyanobacteria populations that have been identified from an examination of the phytoplankton in the lake.

Meanwhile, angling on the lake during Spring, 2006 has been excellent with 138 salmon reported from the fishery to the end of May 2006.

Srahmore Peat Repository
WL 199-1

Environmental Management System Up-Date No. 14 (14/06/06)

Environmental Monitoring:

- The Srahmore site was fully compliant regarding emissions, since the last meeting (10/05/06)
- There were no complaints received at the site since the last meeting.
- There were no incidents recorded at the site since the last meeting.

Continued compliance at the site is due to peat deposition suspension, and the natural re-vegetation of the site in line with the Bog Rehabilitation Plan, as required by the Srahmore Waste Licence.

Environmental Work:

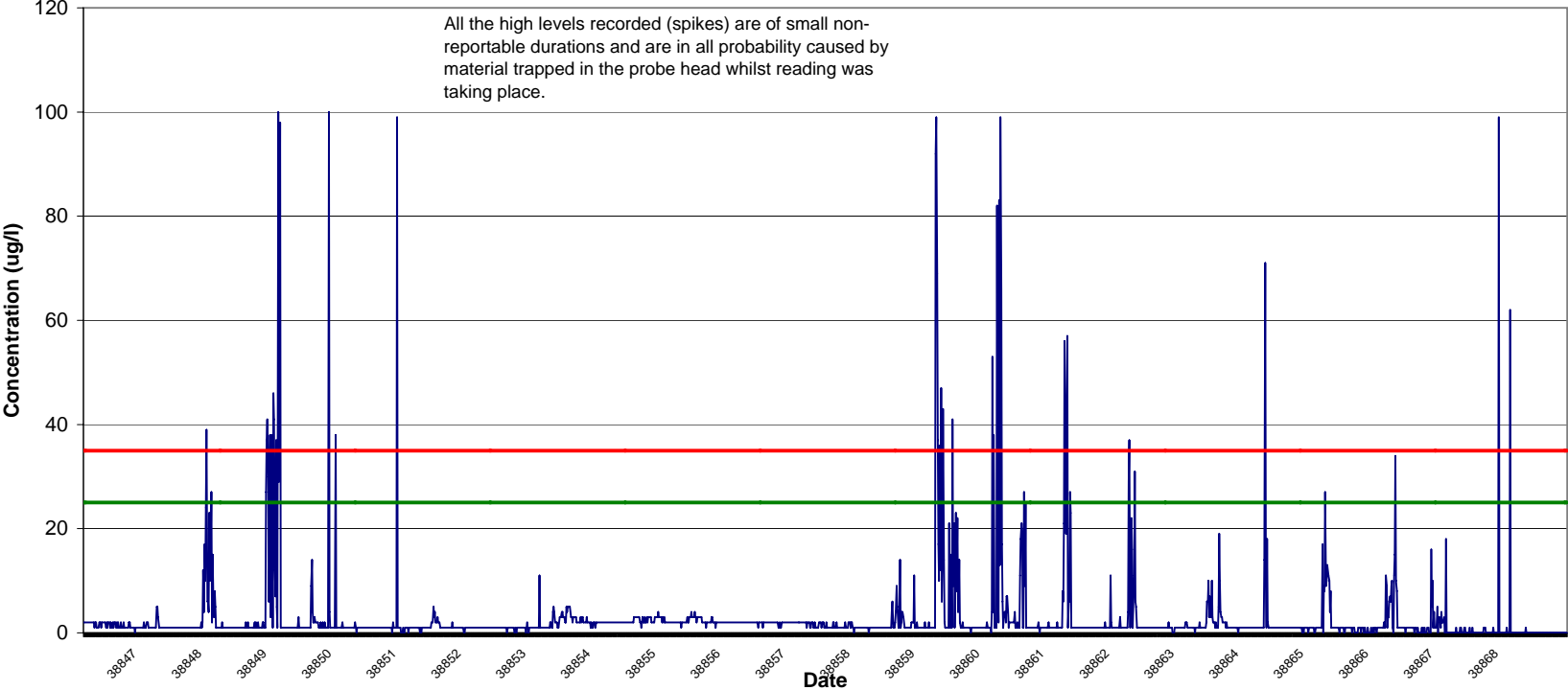
Environmental work at the site is on-going. This includes daily, weekly and monthly visual inspections at all emissions points.

END.

**Total Suspended Solids Results,
at SP1 for May 2006**

- TSS
- Action Limit
- Target Limit

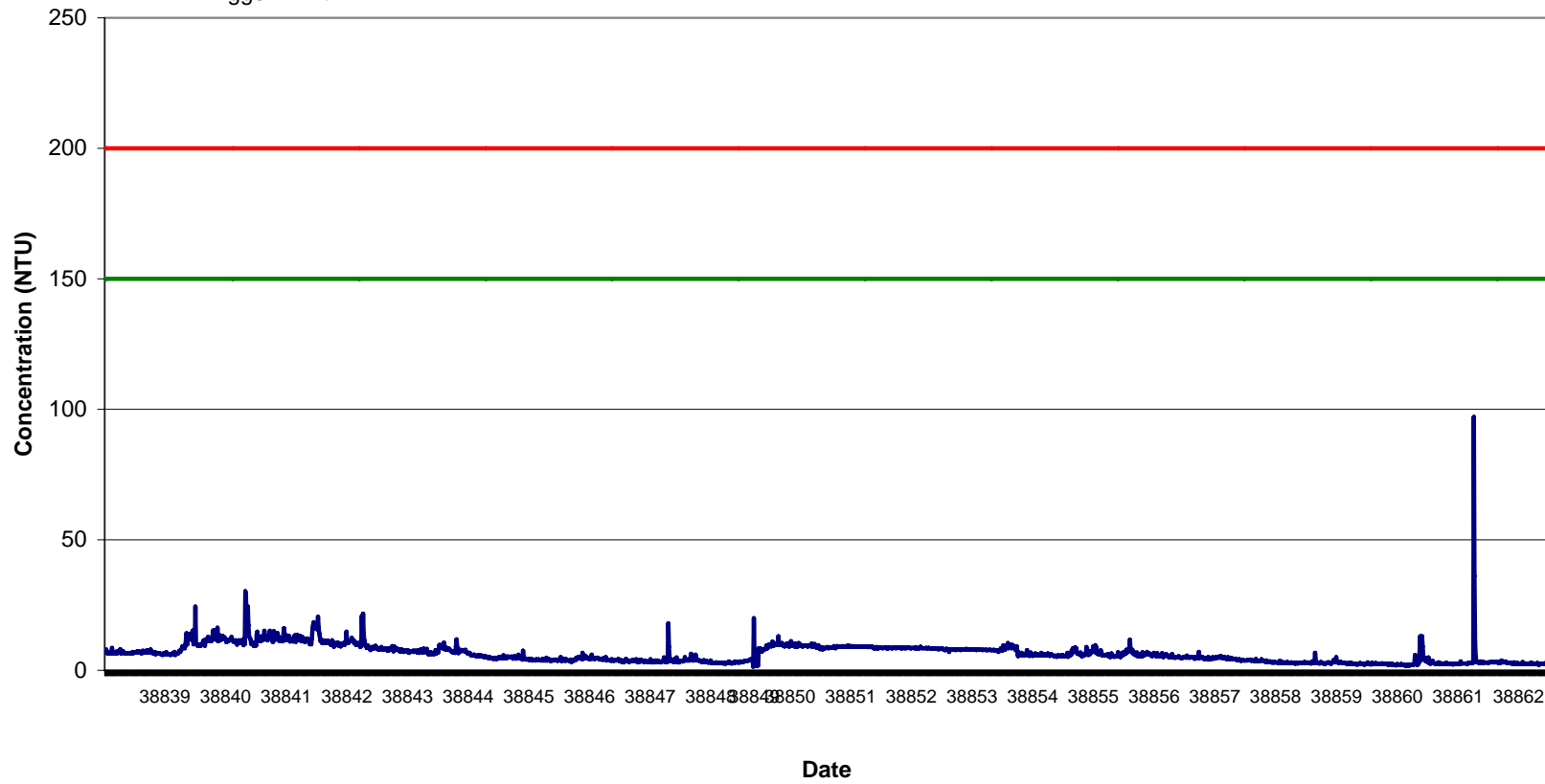
NB - Action and Trigger Levels are outlined in Section 7 of the EMP



Turbidity Results, at SP1 for May 2006

— Turb
— Action Limit
— Trigger Limit

NB - Action and Trigger Levels are
outlined in Section 7 of the EMP



Orthophosphate Results, at SP1 and the composite sampler May 2006

- SP1
- Composite
- Action Limit
- Trigger Limit
- Limit of Detection

NB - Action and Trigger Levels are outlined in Section 7 of the EMP

