

Susan Crosthwaite

Our Ref: KB/CA/EB
Your Ref: -

28 June 2017

Dear Susan Crosthwaite

ENVIRONMENTAL LIABILITY (SCOTLAND) REGULATIONS 2009 (THE REGULATIONS) REQUEST FOR ACTION AND REVIEW UNDER REGULATION 14

Further to your request for action and review, SEPA has determined the request. I apologise for the previous deadlines having been missed.

SEPA has determined that the information provided does not demonstrate in a plausible manner that "Environmental Damage" to groundwater or surface water bodies has occurred or that there is an imminent threat of it.

Determination of your Request for Action

The process for dealing with requests for action and review is set out in Regulation 14 of the Regulations. This is a three stage process as follows:

1. SEPA considers whether the claim is plausible; if so
2. SEPA invites the operator to respond; and then
3. SEPA determines on the basis of the information provided by both the interested person and the operator whether it accepts or refuses the request.

This correspondence deals with Stage 1 of the process as described above.

SEPA's correspondence dated 29th May 2016 contained an initial assessment which identified that the environmental damage you were requesting SEPA to consider was water damage, with the body of evidence supplied relating predominantly to Whitelee Windfarm. *Not exclusively*

For the purposes of this determination SEPA has considered activity that has taken place since 24th June 2009 (the date on which the above Regulations came into force).

Water Damage

The Regulations apply to water damage caused by an activity listed in Schedule 1 of the Regulations. That is any damage that significantly adversely affects any or all of the following—

Spikes in phosphorous quality can be caused by forestry activities as well as other natural and anthropogenic activities. SEPA considers that the deterioration referred to above, may be attributable to the forestry activities associated with windfarm construction either on their own or in contribution with other activities not related to windfarms.

SEPA recognises the potential for forestry activities to impact on water quality. Since 2009, guidelines and advice to planning authorities has been revised to take account of this.

SEPA will continue to engage in further awareness raising, with forestry stakeholders, including planning authorities, about mitigating and monitoring impacts on water quality.

If you have any questions regarding this letter please contact Kim Bradley at SEPA's Riccarton Office, 0131 273 7320, Kim.Bradley@sepa.org.uk.

Yours sincerely

Water and Land Unit Manager

SEPA Internal Filenote: F1480801 - Hydrogeological Comments on 2009 Post Construction Groundwater Quality Monitoring Report – Whitelee Windfarm

Ref. 1: Whitelee Windfarm, Post Construction Groundwater Quality Monitoring Report November 2009, Jacob Engineering U.K. Limited on behalf of Scottish Power

Introduction

Scottish Power commissioned their Consultant to carry out Water Quality Monitoring & Interpretation for their Whitelee Windfarm Site, nr Eaglesham in East Renfrewshire.

The Report [Ref. 1] presents the results and interpretation of groundwater quality monitoring at the Whitelee Windfarm from July 2006, prior to windfarm construction, through to September 2009, when the windfarm became operational. There has been a recent enquiry from members of the Public regarding some of the chemical constituents reported to be detected in the groundwater. Attention has been focused on concentrations of semi-volatile organic compounds (SVOCS) including Bis (2-ethylhexyl)phthalate (also known as DEHP - Di-(2-Ethylhexyl) phthalate).

Water Specialists from SEPA-Operations have contacted Water Resources Unit (WRU) to support with these concerns regarding groundwater quality.

Scope of Response

The involvement which WRU has had with this site to date, is in line with the text which SEPA-Comms provided to a Reporter in early January 2015; WRU were consulted as part of the Planning Application process for Whitelee Windfarm in 2005. WRU have no previous knowledge of this Scottish Power commissioned report [Ref. 1].

Email from Gavin Henderson SEPA-Comms to Fraser Wilson, Kilmarnock Standard Newspaper, dated 5th January 2015;

SEPA's remit covers the impact on the environment from pollution incidents and an investigation would be carried out into any alleged discharges which might lead to chemicals or pollutants impacting on the natural environment or watercourses. SEPA does also have a role in providing advice and guidance during the planning process for new wind farm developments, however this is primarily focussed on the installation of measures which will mitigate against pollution during the construction process (run off water, excess silt, fuel spillages etc).

There is no ongoing licensing regime through which the acceptability of any impacts to the Water Environment can be assessed. SEPA Policy has commented on these issues in the relation to SEPA's responsibilities under the Water Framework Directive and River Basin Management Planning.

The motivation for the reporting undertaken by Jacobs 2006 – 2009 is given as 'to provide data to assist in the assessment of whether the windfarm development was having any impact on local groundwater quality' [Ref. 1 Section 1].

SEPA Chemistry (Clemens Engelke & Daniel Merckel) and SEPA Policy Groundwater (Alex Pritchard) have provided extensive comment on the contaminants

identified by the member of Public, possible sources of the contaminants, and the determination of the contaminants under JAGDAG.

Findings & Advice

Groundwater in Scotland is protected as a drinking water resource and as such there should be no unacceptable impacts to Groundwater Quality. Hazardous Substances should be prevented from entering Groundwater and Non-hazardous Substances should be limited so that they do not cause pollution.

- **Bis (2-ethylhexyl)-phthalate**

Bis (2-ethylhexyl)-phthalate (also known as DEHP) is not listed as a hazardous substance by SEPA and is categorised as a non-hazardous substance, which should be limited in the Groundwater Environment. SEPA Chemistry has commented on this chemical and possible sources.

SEPA Chemistry highlight that while concrete can contain "plasticisers", they are not the same plasticisers as DEHP, and as such concrete would be an unlikely source of DEHP.

Pre-construction monitoring results show a detection of the chemical in one of the three rounds for all of the boreholes (concentrations 57 – 67ug/l).

Post-construction monitoring shows detections in 6 of 23 rounds with detected concentrations generally between 50 – 80 ug/l. Two of the monitoring rounds (Dec 2007 & Jan 2008) show result in excess of 1000 ug/l, though it is notable that the following months, Feb & Mar 2008, show no detection.

The lack of obvious source, in combination with the apparently random detection of DEHP on a very wide scale (boreholes are approx. 2 km apart), gives some support to the statement within the Report that cross contamination within the laboratory. Equally the chemical could be detected through sampling practise as the chemical is often found in vacuum pumps which are used for groundwater sampling. The source of the DEHP is considered at this stage to be unclear and may well be as a result of sampling or laboratory cross contamination.

*This is not so
Unacceptable
Excuse.*

- **Toluene, Chloroform and Total Petroleum Hydrocarbons**

Whilst not identified as a concern by the member of the Public, Toluene, Chloroform and Total Petroleum Hydrocarbons have also been detected during the Groundwater Monitoring. Toluene was determined under old Groundwater Directive (80/68/EEC) as List I and confirmed (under new Groundwater Directive 2006/118/EC) as Hazardous Substance as such should be prevented from entering groundwater, this contaminant has been detected in two of the 28 monitoring rounds at 7 ug/l and 18ug/l, which is slightly above the Minimum Reporting Value of 4 ug/l.

Mineral Oil, which encompasses the group Total Petroleum Hydrocarbons (TPH), is confirmed by JAGDAG (Joint Agencies Groundwater Directive Advisory Group) as Hazardous Substances under the new Groundwater Directive 2006/118/EC, and were previously determined as List I under the old Groundwater Directive.

No comments are made within the Report text on the sporadic detection of Volatile Organic Compounds (VOCs). Total Petroleum Hydrocarbon (TPH) group is detected routinely across all the Boreholes (note boreholes are approximately 2km apart). It is

notable that the highest concentration of all the monitoring rounds is detected from Borehole WS59A during the pre-construction monitoring rather than the post-construction monitoring. The detections of TPH show no pattern with the detections of VOCs or SVOCs, indicating a fuel source would be an unlikely source of the TPH.

The Report [Ref 1] suggests in Section 8.3 that the TPH concentrations could be linked to the peat deposits found across the site. It is recognised by WRU that organic compounds can result in a TPH result which can interfere with investigations to detect petroleum derived hydrocarbons. This argument is supported by the TPH being detected prior to construction activities taking place. Also this would be a plausible reason for the widespread detection of the contaminant. However the evidence should be considered non-conclusive as it is uncertain whether the construction of the boreholes would allow for peat to influence the water quality.

Outstanding Issues

- The Report [Ref 1] is not in context with any follow-up work or interpretation which may have been undertaken. Is there additional monitoring or good justification to show that unacceptable impact has not occurred?
- There are many uncertainties identified which must be addressed prior to a definitive advice being provided by WRU;
 - Pre-construction monitoring indicates that some contaminants (Total Petroleum Hydrocarbons and Bis (2-ethylhexyl)-phthalate or DEHP) were detected prior to the construction period; this has not been fully resolved and does shed considerable doubt on the site activities being a likely source, and on whether the samples are representative. Contamination of samples during the sampling procedure, or laboratory cross-contamination, remain plausible reasons for the detections of the contaminants found at this site.
 - The monitoring boreholes are spaced more than 2km apart, and the site is 10km by 3km, i.e. more than 3000 hectares. Contaminants are detected in all boreholes in some monitoring rounds with the following month showing no detections across the site. The Report suggest that site activities do not coincide with detection of pollutants, but in addition there should be confirmation of whether there could feasibly have been any site activities which could potentially cause such wide-scale and sporadic 'pollution'.
 - Conclusions and recommendations paragraph 8.3 states that 'Boreholes WP01 to WP04 are screened across peat and it is possible that the increased TOC and iron concentrations along with the decreasing pH concentration may be indicative of local increases of peat rich water into these boreholes. With this in mind, it is also possible that the elevated TPH concentrations recorded during the post construction monitoring may be due to the high levels of TOC associated with the peaty water (quantified as TPH during the solvent extraction based TPH analysis)' – whilst the presence of peat deposits can be a plausible reason for TPH detection and variability in the geochemistry across the site, the borehole logs provided indicate that only one of the named boreholes is screened across peat. This conclusion has not been substantiated by the factual information provided in the Report.

The disruption of peat deposits
is part of the cause
of the problem.

Report Conclusions

The Report [Ref 1] concludes with the following conclusions and recommendations;

Section 8.4 – *"In the light of the unexplained trends and changes noted above, it is recommended that the available monitoring data and information is assessed against the predictions made in the original Environmental Impact Assessment (EIA) for the windfarm development. The significance of the observed groundwater quality information should be assessed and consideration given to the need for revising existing impact predictions and associated mitigation / precautionary requirements."*

Section 8.5 – *"It is understood that a second phase of the Whitelee Windfarm is planned for construction and groundwater monitoring will again be undertaken to establish baseline conditions and monitor any construction impacts. It is recommended that during any such Phase 2 groundwater monitoring, bi-annual monitoring of the boreholes within the Phase 1 area is also undertaken and the data reassessed on a yearly basis."*

Although it is not known what further monitoring or assessment was carried out following the production of the report in November 2009. These conclusion seems appropriate to the results presented at the time, however the further work proposed should have been undertaken and this would identify whether there has been an unacceptable impact/ pollution event resulting in hazardous and non-hazardous substances polluting the water environment. At this stage the uncertainties identified on the previous page prevent WRU from commenting on whether there has been a detrimental impact to the Water Environment.

Standard WRU Site Setting Overview for Windfarm Review under Planning

Name of Development	Whitelees Windfarm
Applicant	N/A
Location	Eaglesham Moor, nr Eaglesham in East Renfrewshire
NGR	NS 570 460
Elevation (mAOD)	250-335

Geology and Aquifers	
Bedrock Geology	Clyde Plateau Volcanics Formation, Site is underlain by a mixture of Basalt, Andesite and Trachyte
Superficial Geology	Majority of the site is mapped as being covered by Peat with some Glacial Till and in some valley bottoms Alluvium Note: Ordnance Survey Mapping indicates a large area of the peat is covered by coniferous forestry.
Geological Faults	Some minor faults inferred, offset unknown
Bedrock Aquifer Classification	Fracture, Low Productivity (FL)
Superficial Aquifer Classification	Not a significant aquifer (NSA)
Groundwater Vulnerability Class*	Vulnerability mapping of the windfarm is a mosaic of vulnerability classes – these broadly follow the BGS mapping of superficial deposits. Generally - Where peat is mapped: Vulnerability is Class 4b Where till is mapped: Vulnerability is Class 4a Where no superficial deposits are mapped: Vulnerability is Class 5
Groundwater Levels and Groundwater Flow Direction	No site specific information available, likely to follow topography.
Groundwater Bodies	
WBID - Name	The windfarm is at the junction of 3 groundwater bodies: 150587 - Strathaven 150599 - Whitelee 150622 - Newton Mearns
Status (quantitative/chemical)	The 2013 Classification status of all 3 bodies is Good for both Chemical and Quantitative assessment.
Water Features Survey	
Surface Water Features	A number of rivers drain the windfarm, with the water being retained in several reservoirs. Present within the windfarm are the following water bodies. WBIDs Rivers 10010 - Dunwan Burn (u/s Dunwan Dam) 10399 - Kingswell Burn/Fenwick Water/Kilmarnock Water 10401 - Craufurdland Water/Dunton Water(u/s Hareshawmuir Water) 10402 - Hareshawmuir Water/Gawkshaw Burn Loch/Reservoirs 100305 - Lochgoin Reservoir, 100304 - Dunwan Dam Also Craigendunton Reservoir And a number of minor burns, drains and localised ponds
Wells, Springs, Issues	Multiple springs/issues
Groundwater Abstractions (CAR)	No licensed abstractions from groundwater within 2km
GWDTE	None designated – no local assessment available.

Not addressed
fully mapping

Designated sites, e.g. SSSI, SPA	The groundwater bodies are designated as Drinking Water Protected Areas (DWPA) the windfarm also includes Lochgoin Reservoir, Dunwam Dam, Kingswell Burn/Fenwick Water/Kilmarnoch Water and Craufurdland Water/Dunton Water (u/s Hareshawmuir Water) DWPAs
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* In a scale from 1 to 5 where Class 5 is high vulnerability and Class 1 is low vulnerability. Groundwater vulnerability depends significantly on the presence, type and thickness of the superficial geology.

Scope of Groundwater Analysis

Aluminium
Calcium
Sodium
Magnesium
Iron
Chloride
Total petroleum hydrocarbons (TPH)
Volatile organic compounds (VOCs)
Semi-volatile organic compounds (SVOCs)
pH (added in August 2007)
Electrical conductivity (added in August 2007)
Alkalinity (added in August 2007)
Total sulphate (added in August 2007)
Total organic carbon (added in August 2007)

*taken from Ref 1, Section 2.4

Overview of Water Quality Results

Contaminant	Lab. LOD	Overview	Comments
Bis (2-ethylhexyl)-phthalate or DEHP	10 ug/l	Detected 6 of 28 monitoring rounds	When detected, concentrations are generally between 50 – 80 ug/l.
Toluene	1 ug/l	Detected 2 of 28 monitoring rounds	The VOC analysis suite shows detections of Toluene in the last 2 monitoring rounds 7ug/l and 19ug/l.
Chloroform	0.1 ug/l	Detected 1 of 28 monitoring rounds	The VOC analysis suite shows detections of chloroform in one monitoring round (Apr 2008) at 1ug/l
Total Petroleum Hydrocarbon (TPH)	0.01 mg/l	Detected in 19 of 23 monitoring rounds. Maximum concentration 1.6 mg/l.	The detections of TPH show no pattern with the detections of VOCs or SVOCs.

Trends

‘Pre construction’ monitoring July – Sept 2006 (total of 3 monthly rounds)

‘Post construction’ monitoring from Sept 2006 (25 monitoring rounds)

Contaminant	Lab. LOD	Comments
Bis (2-ethylhexyl)-phthalate or DEHP	10 ug/l	Pre-C 1 of 3 rounds has detects in ALL boreholes 57 – 67ug/l Post-C 6 of 23 rounds detected concentrations, generally between 50 – 80 ug/l. With two monitoring rounds (Dec 2007 & Jan 2008) results are in excess of 1000 ug/l, it is notable that the following months, Feb & Mar 2008, show no detection.
Report text, section 3.3		<i>“A number of SVOC compounds were detected at low levels during various monitoring rounds. The detection of these SVOC compounds is thought to have been caused by cross contamination within the laboratory and the contaminants are not considered to be present on the site.”</i>
Toluene	1 ug/l	No detection in pre-C monitoring rounds, 2 detects in WP01 post-C; 7 ug/l and 19 ug/l, other rounds are no detection.
Report		No specific comments in report.
Chloroform	0.1 ug/l	No detection in pre-C monitoring rounds, 2 detects in one round post-C, both 1ug/l.
Report		No specific comments in report.
Total Petroleum Hydrocarbon (TPH)	0.01 mg/l	Pre-C routinely monitored in all BHs at >LOD to 1.6 mg/l (WS59A) Post-C routinely monitored in all BHs at >LOD – 0.17 mg/l, twice detected at 0.42 mg/l (WS08 & WP04). The detections of TPH show no pattern with the detections of VOCs or SVOCs.
Report text section 7.4		No comment in Report on highest concentration of TPH being detected in Pre-C monitoring period. <i>“The highest total petroleum hydrocarbons (TPH) concentration was recorded in the post construction monitoring round at WP04, with TPH concentrations across all the boreholes having increased in this round compared with the previous round. It is noted that this increase in TPH was not part of an established trend and it is therefore possible that these elevated results are a one off event (as has been observed for a number of parameters during the historical monitoring work).”</i>

section 8.3	"With this in mind, it is also possible that the elevated TPH concentrations recorded during the post construction monitoring may be due to the high levels of TOC associated with the peaty water (quantified as TPH during the solvent extraction based TPH analysis)."
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NOT plausible has to be a joke. How
 can you feel ^{3 million trees} ~~me~~ of forest and despoil
^{1 million cubic metres} ~~me~~ of peat and not 'expect' contamination
 of surface and ground water?

SEPA has become an arm of SG to
 enable their policies and no longer 'protects'
 the environment above all else.

~~Please supply me with every~~ ;

Your 'investigation' chose to 'ignore' all other
 matters and I still require answers as to all the
 reasons why it is necessary to ~~build a pipeline at~~
~~huge cost to~~ supply water from ~~both~~ Keshine to
 Melrose Valley and ~~the~~ Ayrshire when Craigenderton,
 Bradan, ~~...~~ ~~have~~ always supplied ~~in~~
 water prior to forest clearance and landfarm
 construction. Maintaining results?