

**DIRECTIVE 2004/35/CE OF THE EUROPEAN PARLIAMENT AND OF THE  
COUNCIL of 21 April 2004 on environmental liability Article 12 Request for Action**

---

*water damage which is any damage that significantly adversely affects the ecological, chemical and or quantitative status and or ecological potential, as defined in Directive 2000/60/EC of the waters concerned*

**compiled by Susan Crosthwaite  
7/7/2015**

*The prevention and remedying of environmental damage should be implemented through the furtherance of the "polluter pays" principle, as indicated in the Treaty and in line with the principle of sustainable development. The fundamental principle of this Directive should therefore be that an operator whose activity has caused the environmental damage or the imminent threat of such damage is to be held financially liable, in order to induce operators to adopt measures and develop practices to minimise the risks of environmental damage so that their exposure to financial liabilities is reduced.*

## **Acknowledgements**

**Research by Dr. Rachel Connor M.B., Ch.B. F.R.C.R.**

**EU Directive assistance by Pat Swords BE CEng FICChemE CEnv MIEMA**

I have been in touch with Rachel since early 2012 when she initiated a complaint to the ombudsman. A very useful meeting with Graeme Pearson MSP and John MacKenzie encouraged her to pursue her case and they have been a great source of support and encouragement ever since. Following a trip to Geneva, in support of Christine Metcalfe and the successful complaint to the UNECE Compliance Committee, (ACCC/C/2012/68) citing a breach of the Aarhus Convention, with counsel and Pat Swords, we have continued endeavours to illustrate how windfarm developments continue to be in breach of articles of the Aarhus Convention. I arranged a meeting on October 24<sup>th</sup> 2014 with Dr. Rachel Connor, Christine Metcalfe, Pat Swords and counsel to discuss how we could legally use the evidence of water contamination from windfarms uncovered by Dr Rachel Connor. Dr. Rachel Connor (along with Tim Harrison - also alleging water contamination from Whitelee), went on to give evidence at the Whitelee Extension 3 Public Local Inquiry

**Thanks also go to the many individual campaigners who have encouraged, provided information and support in challenging the spin and the damage caused by the development of wind turbines**

*All italics are quoted from official documents in the public domain*

## Contents

1. ‘Request for Action’ under Article 12 of the Environmental Liabilities Directive: .....	5
1.1. Under DIRECTIVE 2004/35/CE .....	5
2. Summary of Request:.....	6
3. Subject matter of Directive 2004/35/CE .....	10
3. 1 Request for Action .....	10
4. EVIDENCE.....	11
4.1 How, Why and When windfarm developers are contravening and being allowed to contravene legislation. .....	11
4.1.1 Water and Environmental Damage: .....	12
4.2 SEPA and SW have set out protected areas according to EU Directives .....	13
4.3 Inquiry Statement Evidence by Dr. Rachel Connor (the full document can be found at Appendix 1). ....	16
4.3.1 The discovery of private water supply contamination:.....	16
4.3.2 Compliance .....	20
4.3.3 Public water Supply: .....	20
4.3.4 Surface water .....	25
4.3.5 214 Surface waters impacting on Public Reservoir raw water quality and PWS .....	27
4.3.6 Geology and Groundwater .....	29
4.3.7. Consent of Whitelee windfarm Extensions and impact of the Jacobs Report-4.2.1 .....	33
4.3.8 - 5 Windfarm impact on private water supplies .....	37
4.4 ELD 2004/35/CE states (15)....public authorities should ensure the proper implementation and enforcement of the scheme provided for by this Directive.....	41
4.4.1 SEPA are not fully implementing and enforcing water directive regulations as stipulated in Article 8 of the Water Directive: .....	43
4.4.2 Potential for environmental harm .....	43
4.5. Monitoring .....	45
4.5.1. Arecleoch SPR windfarm .....	46
4.5.2. Fault and Dyke impacts .....	49
4.5.3. Impacts of siting wind turbines on peat bogs: .....	51
4.5.4 Windfarms not yet constructed: .....	52
4.5.5.Kilgallioch.....	53
4.5.6. Dersalloch and windfarms surrounding Straiton .....	57
4.5.7. Afton Windfarm.....	62
4.5.8.Hadyard Hill Extension.....	64
4.5.9. Tralorg.....	67
4.5.10.Assel Valley Windfarm.....	67
4.5.11.Ballantrae (Glenapp) Windfarm .....	70

4.6. Other incidents of note:.....	72
5.1 All the following elements of the Environmental Liability Directive (ELD) 2004/35/CE apply .....	73
5.2 Article 1 .....	75
5.3 Article 2 Definitions .....	76
5.4 Article 3: Scope.....	76
5.5 Article 5 .....	77
5.6 Article 6 .....	77
5.7 Article 7 .....	78
5.8 Article 11 .....	78
5.9 Article 12 .....	79
5.10 Article 13 .....	79
5.11 Article 19 .....	80
6. Directive 2004/35/CE Article 2 refers to the Water Framework Directive 2000/60/EC.....	80
6.1 Elements of Directive 2000/60/EC .....	80
6.2 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy: .....	82
6.3 Article 1 .....	83
6.4 Article 2 .....	84
6.5 Article 3 .....	85
6.6 Article 4 .....	85
6.7 Article 5 .....	86
6.8 Article 6 .....	87
6.9 Article 7 .....	87
6.10 Article 8 .....	88
6.11 Article 11: .....	88
6.12 Article 16 .....	90
7. Directives covering pollutants .....	92
7.1 COUNCIL DIRECTIVE (67/548/EEC) .....	92
7.2 DIRECTIVE 1999/45/EC .....	93
8. Competent Authorities - their statutory responsibility: .....	94
8.1 The Directive and Competent Authorities .....	94
8.2: Scottish Protection Environmental Agency SEPA .....	94
8.2.1 SEPA Water regulations .....	95
8.2.2 The Water Environment (Controlled Activities) (Scotland) Regulations 2011.....	97
8.2.3 Monitoring .....	99
8.3 Scottish Water.....	102
8.3.1 2001 No. 207 WATER SUPPLY The Water Supply (Water Quality) (Scotland) Regulations 2001	102

8.3.2 Where does our water come from.....	103
8.3.3 Scottish Water and windfarms .....	104
8.4. Forestry Commission Scotland: .....	104
8.4.1 Woodland for Water .....	105
8.4.2 The UK Forestry Standard Forestry Commission: .....	105
8.4.3 Environmental impacts of forestry.....	107
8.5 Councils: .....	107
8.5.1 Between a rock and a hard place.....	107
8.5.2The Private Water Supplies (Scotland) Regulations 2006.....	107
8.5.3 Around 150,000 people in Scotland rely on a private water supply .....	108
8.5.4 The Private Water Supplies (Scotland) Act 2006 (209) places a burden of responsibility .....	109
8.6. Scottish National Heritage SNH .....	109
SNH have responsibilities for Catchment Management with regard to habitats. ....	109
9. CIRIA C648 Control of water pollution from linear construction projects.....	110
9.1 This publication provides guidance to clients, consultant, designers, contractors and regulators.....	110
9.2 Groundwater .....	111
9.3 3.1 TYPES AND SOURCES OF POLLUTION .....	112
9.4 3.2 Pollution Offences .....	113
Conclusion .....	113
GLOSSARY OF TERMS .....	116
Maps.....	117

## 1. ‘Request for Action’ under Article 12 of the Environmental Liabilities Directive:

‘DIRECTIVE 2004/35/CE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage’<sup>1</sup>

Susan Crosthwaite, of Cosses Country House, Ballantrae, Ayrshire KA26 0LR is calling for a Request for Action’ under Article 12 of The Environmental Liabilities Directive.

Cosses Country House, a business dependent on rural tourism within the UNESCO designated Galloway and Southern Ayrshire Biosphere <sup>2</sup> is sited in the vicinity of the River Stinchar protected drinking water catchment zone.

### 1.1. Under DIRECTIVE 2004/35/CE Persons adversely affected:

*‘(25) Persons adversely affected or likely to be affected by environmental damage should be entitled to ask the competent authority to take action. Environmental protection is, however, a diffuse interest on behalf of which individuals will not always act or will not be in a position to act. Non-governmental organisations promoting environmental protection should also therefore be given the opportunity to properly contribute to the effective implementation of the Directive.’*

**Susan Crosthwaite is calling for an immediate and full independent investigation into the pollution of surface and groundwater of ALL windfarm developments sited on River Basin Districts that include all interdependent rivers, lochs, estuaries, coastal waters and associated underground waters and requests cessation of all development until full Strategic Environmental Assessment guarantees that water catchment areas will not be adversely impacted by such developments.**

It must be noted that the access to justice provisions of the Directive on Environmental Liabilities are only a limited implementation of the broader rights to challenge acts and omissions of public authorities related to the national law on the environment, e.g. Article 9(3) of the Aarhus Convention<sup>3</sup>. Clearly, the maintaining of the proper quality of groundwater and surface water for drinking, is a provision of (not least) the Water Framework Directive, and is related to the national law on the environment. So therefore, it is submitted that the broader provisions of Article 9(3) apply.

---

<sup>1</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004L0035&from=EN>

<sup>2</sup> <http://www.gsabiosphere.org.uk/natural-heritage-of-the-biosphere/>

<sup>3</sup> [http://ec.europa.eu/environment/aarhus/pdf/marc\\_pallemaerts.pdf](http://ec.europa.eu/environment/aarhus/pdf/marc_pallemaerts.pdf)

## 2. Summary of Request:

[“The Environmental Liability \(Scotland\) Regulations 2009](#) (ELD) came into force on 24 June 2009. The regulations transpose the European Union Environmental Liability Directive into Scots law and aim to establish a new kind of civil law mechanism based on the 'polluter pays' principle.

The evidence of pollution stems from the monitoring recorded as a requirement for Whitelee windfarm construction 2006-2009. The results of monitoring were not considered by the Scottish Government prior to consenting the WL WF Extensions 1 and 2 in 2010, despite evidence indicating ground water contamination had occurred from the original windfarm on a designated Drinking Water Protected Area.

Potential for such damage to the surface and groundwater will be cited at application or appeal stage for all windfarm developments on River Basin sites, specifically the proposed windfarms at Afton, , Sneddons Law, Kilgallioch, Assel Valley, Tralorg, Hadyard Hill Ext., Ballantrae (Glenapp) windfarms and the 5 windfarms around Straiton with special reference to Dersalloch. None of these projects are built. Lack of legally required monitoring will be cited at Arecleoch and Mark Hill windfarms

**A wind farm development involves wind turbine installations and activities which involve the use and storage of dangerous substances.**

The ELD 2004/35/CE states:

*Whereas:*

*The prevention and remedying of environmental damage should be implemented through the furtherance of the "polluter pays" principle, as indicated in the Treaty and in line with the principle of sustainable development. The fundamental principle of this Directive should therefore be that an operator whose activity has caused the environmental damage or the imminent threat of such damage is to be held financially liable, in order to induce operators to adopt measures and develop practices to minimise the risks of environmental damage so that their exposure to financial liabilities is reduced.*

*Definitions*

*1. 'environmental damage' means*

*(b) water damage which is any damage that significantly adversely affects the ecological, chemical and or quantitative status and or ecological potential, as defined in Directive 2000/60/EC<sup>[1]</sup> of the waters concerned*

*2. 'damage means a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly.*

---

<sup>[1]</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

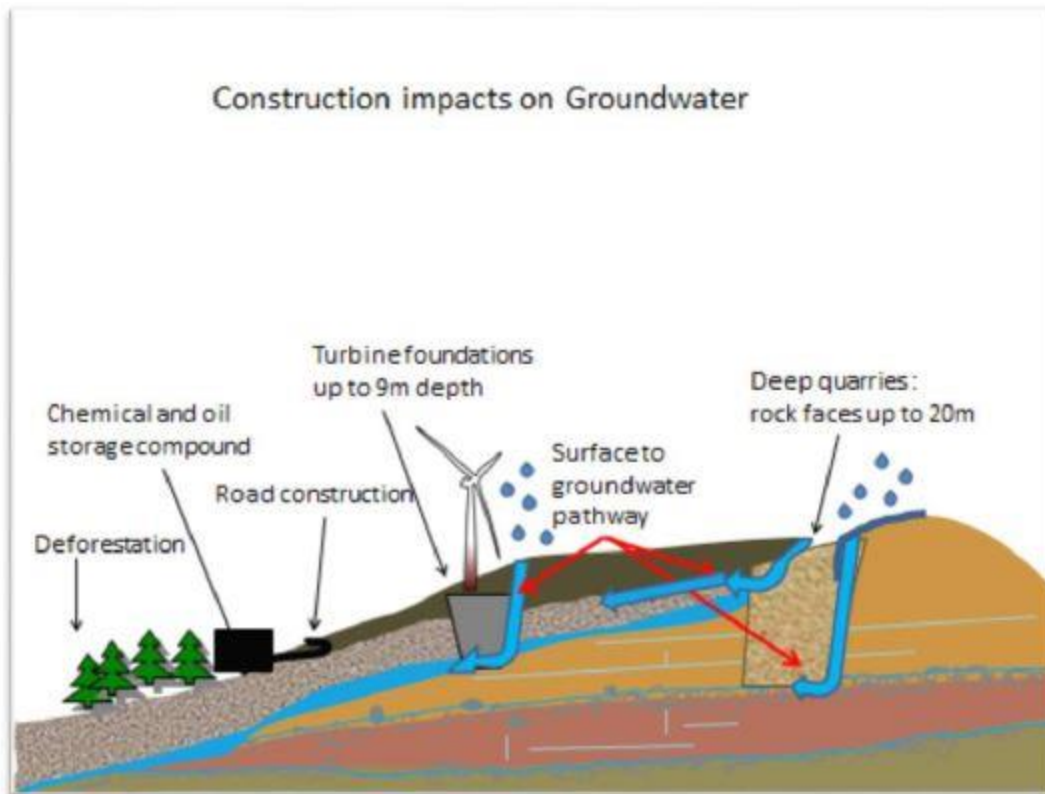
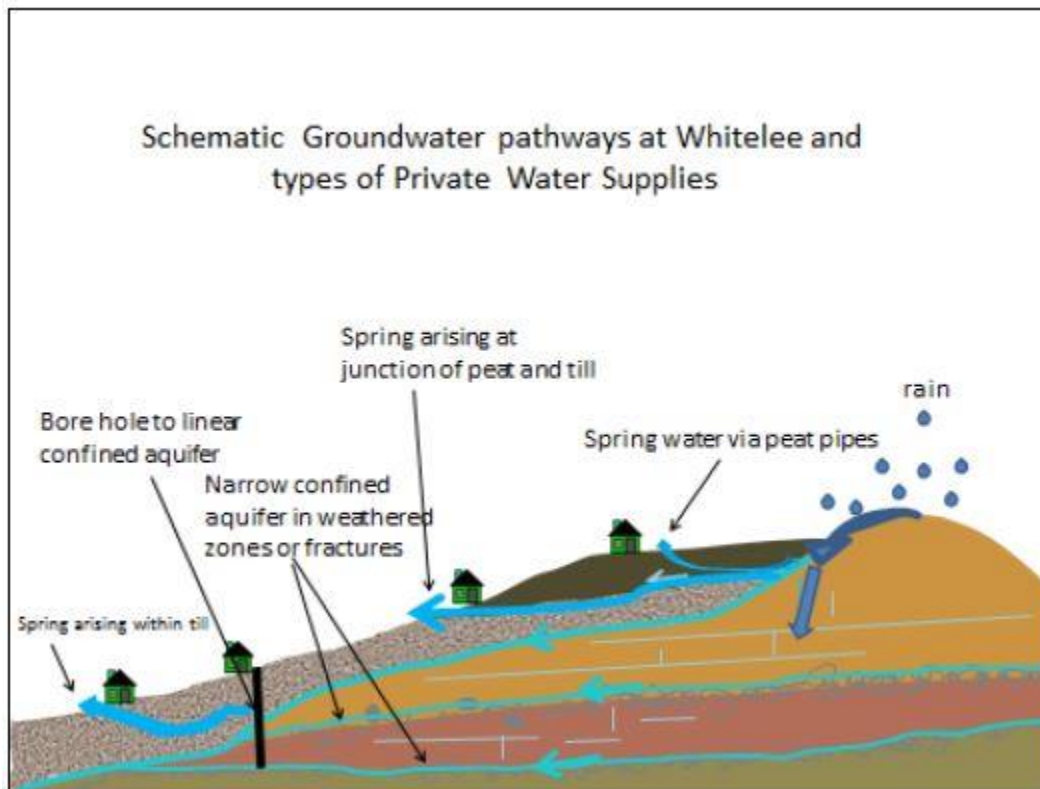


Illustration of Construction impacts on groundwater: R. Connor



Illustrations of water pathways: R. Connor



**Evidence from FOI questions submitted to SEPA reveal that there have been a number of recorded incidents from windfarms across Scotland of pollution to surface and ground water due to chemicals finding their way into water courses.**

Developers and the government bodies have allowed windfarm developments to proceed in the knowledge that **there are risks** to environmental water, including surface and groundwater. Competent authorities: SEPA/SW/FCS/SNH/DWQR/Councils and the Scottish Government have failed in their legal duty to protect the water environment. ELD 2004/35/CE (15)....*public authorities should ensure the proper implementation and enforcement of the scheme provided for by this Directive.*

Developments have not been monitored or assessed according to the legal requirements *as defined in WFD 2000/60/EC* <sup>[2]</sup> *Article 8 1. Member States shall ensure the establishment of programmes for the monitoring of water status in order to establish a coherent and comprehensive overview of water status within each river basin district:* (see page 90) during the preparation, construction, operation and decommissioning of windfarms. **Damage** has therefore resulted in the pollution of water catchment areas resulting in the contamination of public and private water supplies.

Developers and Government Departments have undertaken research showing adverse change of water quality related to windfarm construction, but this information has not been used to inform Strategic Environmental Assessments for all windfarm best practice. ELD 2004/35/CE (7) *..the use of risk assessment procedures to determine to what extent human health is likely to be adversely affected is desirable.* Independent Environmental Impact Assessments including independently assessed geohydrology reports during scoping and planning stages of windfarm applications are not routinely carried out. Environmental Statements are not routinely required to map and provide the definitive source of water for reservoirs or private water supplies (PWS).

Incidents and concerns have been reported by a Planning Monitoring Officer (PMO) to the regulatory authorities but have **not** been investigated. PMOs are not routinely employed and information from a PMO may be difficult and costly for the public to access, consequently developments proceed unabated. ELD 2004/35/CE (8) *Those activities should be identified, in principle, by reference to the relevant Community legislation which provides for regulatory requirements in relation to certain activities or practices considered as posing a potential or actual risk for human health or the environment and 2000/60/EC (14) The success of this Directive relies on close cooperation and coherent action at Community, Member State and local level as well as on information, consultation and involvement of the public, including users.*

There are numerous fault lines (fractures) and dykes (intrusions) involving bedrock geology

---

<sup>[2]</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

across much of Scotland but their possible impact is very much ignored by the competent authorities and wind developers. The blasting for quarries, access roads and formation of turbine bases can have a very detrimental effect on ground water flows, acting as a conduit for polluted water by the fault or dyke into the aquifer.

Mitigation measures are implemented according to ‘best practice’ but consent conditions are not site specific and are based on ‘model’ conditions. There is uncertainty as to how these are properly policed and adequately monitored . Research for some sites demonstrates that mitigation has been inadequate or problems not communicated to statutory authorities to allow implementation of timeous or effective mitigation. ELD 2004/35/CE Article 5 (2) whenever an imminent threat of environmental damage is not dispelled despite the preventive measures taken by the operator, operators are to inform the competent authority of all relevant aspects of the situation, as soon as possible.

Appealed windfarms (such as Tralorg, Assel Valley and Dersalloch) have been directly consented by the Scottish Government Reporters in designated drinking water protection zones, without adequate consideration for potential adverse impacts on public and private water supplies.

WFD 2000/60/EC Article 7 3. Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water.

Where water quality standards have fallen consistently below regulatory standards- WFD 2000/60/EC Whereas: (25) *Environmental objectives should be set to ensure that good status of surface water and groundwater is achieved throughout the Community and that deterioration in the status of waters is prevented at Community level-* statutory authorities have not informed the public of the potential risks to their health.

*“If there was a scandal about beef being mislabelled as horse meat, surely this is worse. If the public are under the impression that their water meets the standards for wholesome water and it does not, for prolonged periods of time, then surely as a minimum they should have a right to be told.”*(Inquiry Statement)

It is clear, from public documents (4.2 SEPA and SW), that until Dr Rachel Connor began her research at Sneddon Law and Whitelee that no consenting or regulatory authority gave this issue any consideration. Informed knowledge about the effect of windfarms on surface or ground water, on drinking water supplies, whether public or private, is inadequate.

A search in the House of Commons library (Ref. 1412-033) on the impact of windfarms on surface and ground water by Cathy Jamieson MP, confirmed this. The Crew Report<sup>[5]</sup> is now trying to address this but the time scale will allow more damage to be done unless windfarm construction on sensitive sites is put in abeyance.

---

<sup>[5]</sup> <http://www.crew.ac.uk/projects/raw-water-quality-changing-wind-farm-impacts-and-management>

Groundwater is an important resource, providing more than one-third of the potable water supply in the British Isles. In addition, it provides essential base-flow to rivers and wetland areas, often supporting important ecological systems. However, groundwater is vulnerable to pollution – especially because it is generally less apparent than surface water and the potential impacts on groundwater are rarely observed and so tend to receive little consideration.

Groundwater pollution is problematic because aquifer pollution persists for long periods and is often very difficult and costly to remediate. It is generally more vulnerable to pollution by chemicals, metals, hydrocarbons and salts than by sediments, because particulate pollutants are naturally filtered during infiltration and recharge.

It is ironic that in trying to encourage renewable energy generation, developers, particularly encouraged by Scottish Government approval, are succeeding in tearing up areas of natural carbon regulation unsurpassed by anything in human technology. The sphagnum moss which drives peat formation holds significant amounts of water and releases it only slowly. This means it is held for long periods in the uplands before it finally filters towards the lowlands, so providing a degree of natural regulation which helps prevent downstream flooding also purifying the water before it enters the reservoirs and the rivers. Industrialisation, on this massive scale, of these pristine protected water catchment zones has led to deteriorating water quality for many people in Scotland. The Scottish Government has been complicit in promoting industrial scale exploitation of designated water catchment areas, by passing and promoting the legislation drafted in 2010 to allow commercial industrial windfarm development on publicly owned land, being owned by Scottish Water as well as Forestry Commission Scotland.

(chapters 5 and 6 cover details of the relevant legal directives referred to above)

### **3. Subject matter of Directive 2004/35/CE**

#### **3.1 Request for Action**

Under the provision of Article 12 a ‘Request for Action’ is being sought by Susan Crosthwaite representing:

*1. Natural or legal persons:*

*(a) affected or likely to be affected by environmental damage*

*or*

*(b) having a sufficient interest in environmental decision making relating to the damage or, alternatively, shall be entitled to submit to the competent authority any observations relating to instances of environmental damage or an imminent threat of such damage of which they are aware and shall be entitled to request the competent authority to take action under this Directive.*

*To this end, the interest of any non-governmental organisation promoting environmental protection and meeting any requirements under national law shall be deemed sufficient for the purpose of subparagraph*

2. *The request for action shall be accompanied by the relevant information and data supporting the observations submitted in relation to the environmental damage in question.*

The evidence below and all the accompanying documents attached to Dr. Rachel Connor's statement available from [dpea.scotland.gov.uk/](http://dpea.scotland.gov.uk/) WIN-190-1 is *the relevant information and data supporting the observations submitted in relation to the environmental damage in question*

#### 4. EVIDENCE

##### 4.1 How, Why and When windfarm developers are contravening and being allowed to contravene legislation.

When any planning permission is granted for a windfarm application by the Local Planning Authority or at appeal by the DPEA or when consent under the Electricity Act 1989, s. 36 it then falls to the Planning Authority, to discharge and enforce any conditions of consent which were attached to the permission or consent (see the Town and Country Planning (Scotland) 1997, s.57).

The key legislation concerning drinking water quality in Scotland can be found at:

<http://www.scotland.gov.uk/Topics/Environment/Water/17670/9395>

and <http://www.scotland.gov.uk/Resource/0045/00457867.pdf>

and [http://www.sepa.org.uk/water/protected\\_areas.aspx](http://www.sepa.org.uk/water/protected_areas.aspx)

The Scottish Government has, in addition, been complicit in promoting industrial scale exploitation of designated water catchment areas, by passing and promoting the legislation, drafted in 2010, to allow commercial industrial windfarm development on publicly owned, Scottish Water land.

They have enabled the contamination of public and private water supplies as well as adversely damaging environmental habitats By not adhering to their own laws and regulations, the authorities have allowed developments to proceed without the proper controls.

**DIRECTIVE 2004/35/CE clearly states that: The fundamental principle of this Directive should therefore be that an operator whose activity has caused the environmental damage or the imminent threat of such damage is to be held financially liable, in order to induce operators to adopt measures and develop practices to minimise the risks of environmental damage so that their exposure to financial liabilities is reduced.**

Whitelee Third Extension, Public Examination Submissions in relation to Matter 4 (Drinking Water Supplies) which can be found at [www.dpea.scotland.gov.uk/](http://www.dpea.scotland.gov.uk/) (simple search WIN-190-1). Dr Rachel Connor and Tim Harrison have now begun a legal process to oppose Whitelee 3, citing both private and public drinking water were affected by the original 140 turbine development– see the Inquiry Statement (IS) (Appendix 1) Public Local Inquiry (PLI) on June 16<sup>th</sup>/17<sup>th</sup> 18<sup>th</sup> and 24<sup>th</sup> 2015.

## 4.1.1 Water and Environmental Damage:

### Article 2 Definitions

#### 1. 'environmental damage' means

(b) water damage which is any damage that significantly adversely affects the ecological, chemical and or quantitative status and or ecological potential, as defined in Directive 2000/60/EC<sup>4</sup> of the waters concerned

2. 'damage means a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly.

#### 5. 'waters' means all waters covered by Directive 2000/60/EC:

##### 1. Member States shall identify, within each river basin district:

- all bodies of water used for the abstraction of water intended for human consumption providing more than 10 m<sup>3</sup> a day as an average or serving more than 50 persons, and
- those bodies of water intended for such future use.

Member States shall monitor, in accordance with Annex V, those bodies of water which according to Annex V, provide more than 100 m<sup>3</sup> a day as an average.

2. For each body of water identified under paragraph 1, in addition to meeting the objectives of Article 4 in accordance with the requirements of this Directive, for surface water bodies including the quality standards established at Community level under **Article 16**, Member States shall ensure that under the water treatment regime applied, and in accordance with Community legislation, the resulting water will meet the requirements of Directive 80/778/EEC<sup>5</sup> as amended by Directive 98/83/EC<sup>6</sup>.

3. Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water.

### DIRECTIVE 2004/35/CE

### Article 3: Scope

#### 1. This Directive shall apply to:

(a) environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities;

(b) ) damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.

---

<sup>4</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

<sup>5</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31980L0778>

<sup>6</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:330:0032:0054:EN:PDF>



## Article 5

**Preventive action: 1. Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures.**

**2.....whenever an imminent threat of environmental damage is not dispelled despite the preventive measures taken by the operator, operators are to inform the competent authority of all relevant aspects of the situation, as soon as possible.**

**4. The competent authority shall require that the preventive measures are taken by the operator. If the operator fails to comply with the obligations laid down in paragraph 1 or 3(b) or (c), cannot be identified or is not required to bear the costs under this Directive, the competent authority may take these measures itself.**

**This presentation on You tube (<https://www.youtube.com/watch?v=BQf0hLYXd7o>) by Dr. Rachel Connor illustrates how the directive is being contravened and the need for this ‘Request for Action’. Her evidence given at the above PLI clearly demonstrates the need for a full independent investigation into the impact industrial windfarm construction and associated activities are having on our water supplies and habitats:**

SEPA legislation states [http://www.sepa.org.uk/land/land\\_regulation.aspx](http://www.sepa.org.uk/land/land_regulation.aspx)

- water damage as any damage causing: deterioration of the ecological/chemical status of a body of surface water; the chemical or quantitative status of a body of groundwater;
- habitats and species damage as: any damage to protected species and natural habitats; particularly if it has significant adverse effects on reaching or **maintaining the favourable conservation status** of the protected species or natural habitat.

### **4.2 SEPA and SW have set out protected areas according to EU Directives**

[http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx) An interactive map where all protected water catchment zones can be identified can be found at: <http://gis.sepa.org.uk/rbmp/> Despite SEPA derived – river basin planning consultations there has been no regard given to the possibility of pollution to surface or ground water from the extensive areas of wind turbines now sited on numerous river basins and catchment areas.

[http://www.sepa.org.uk/water/protected\\_areas.aspx](http://www.sepa.org.uk/water/protected_areas.aspx)

The Scottish Government has set out maps of drinking water protection zones:

<http://www.scotland.gov.uk/Topics/Environment/Water/17670/ProtectedAreasMaps2013> , according to The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013, which came into force from 11th March 2013. (This revokes the 2007 Drinking Water Protected Areas order).

That there could even be a possibility of contamination to surface and ground water from wind turbine development is hardly considered in Scottish SEAs, as can be seen in the River Basin Management Plan for the Scotland river basin district 2009–2015 Strategic Environmental Assessment statement [http://www.sepa.org.uk/media/37739/scotland\\_rbmp\\_sea.pdf](http://www.sepa.org.uk/media/37739/scotland_rbmp_sea.pdf) which does **not** mention the possible impact of these developments.

The river basin management plan for the ‘Scotland River Basin District 2009–2015 Summary’- has **no** mention of the possible SEA of windfarm developments in these areas. In fact as can be seen from the table below, taken from this summary, although windfarms are not listed at all, forestry adversely affects 87 water bodies and very few windfarms do not have forestry clearance as pre-construction work:

[http://www.sepa.org.uk/media/37752/scotland\\_rbmp\\_summary.pdf](http://www.sepa.org.uk/media/37752/scotland_rbmp_summary.pdf)

Table 4: Our plan for tackling the principal pressures on the water environment in the Scotland river basin district

Pressure	Activity responsible for pressure	Number of water bodies adversely affected			
		2008	2015	2021	2027
Pollution	Agriculture	345	229	114	7
	Sewage disposal	208	162	90	1
	Other (acidification, abandoned mines)	115	94	67	42
Abstraction and impoundment	Drinking water supply	107	81	65	0
	Agricultural irrigation	100	86	64	0
	Hydropower	125	94	90	8
	Other (eg aquaculture; drinks manufacture)	95	85	71	0
Alterations to beds, banks and shores	Urban land uses and urban flood protection	45	43	31	0
	Agriculture	125	93	52	0
	Forestry	93	87	47	0
	Legacy of past engineering activities	33	27	24	0

The programme of measures includes the mechanisms needed to ensure that the necessary action is taken to manage and reduce pressures.

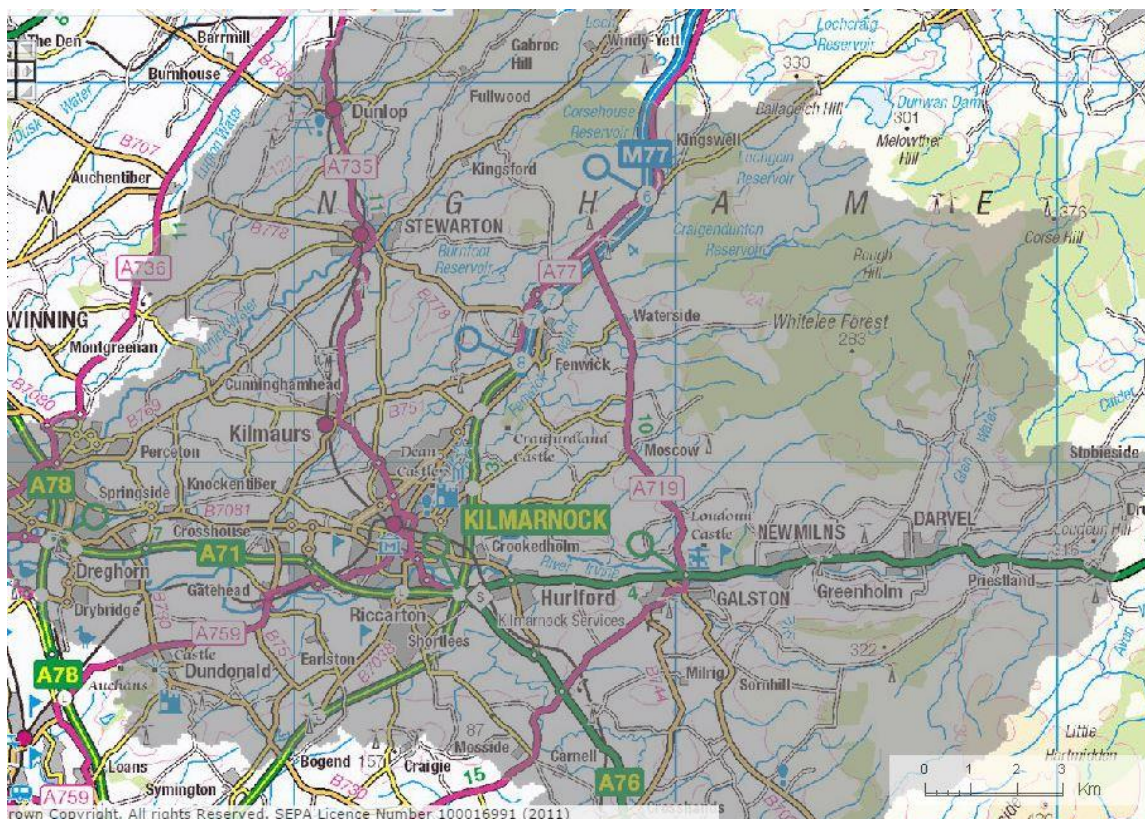
Action on most of the significant pressures will be secured through the Water Environment (Controlled Activities) (Scotland) Regulations 2005. Among other things, these regulations apply to:

- activities liable to cause water pollution;
- water abstraction;
- water impoundment;
- new engineering alterations to the beds, banks and shores of rivers and lochs.

There have been SEPA – river basin planning consultations in which there is no evidence that anyone has raised the possibility of pollution to surface or ground water from wind turbines.

[http://www.sepa.org.uk/water/protected\\_areas.aspx](http://www.sepa.org.uk/water/protected_areas.aspx)

**The following map shows the protected River Basin and catchment for surface and groundwater for the River Irvine:**



The Scottish Government has set out maps of drinking water protection zones <http://www.scotland.gov.uk/Topics/Environment/Water/17670/ProtectedAreasMaps2013> according to The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2013, which came into force from 11th March 2013. (This revokes the 2007 Drinking Water Protected Areas Order)

Whitelee Windfarm original-1/2/& 3 and Sneddon Law windfarms are sited mostly within this water catchment area, although some of the most easterly section of the windfarm may impact on the River Clyde water catchment zone.



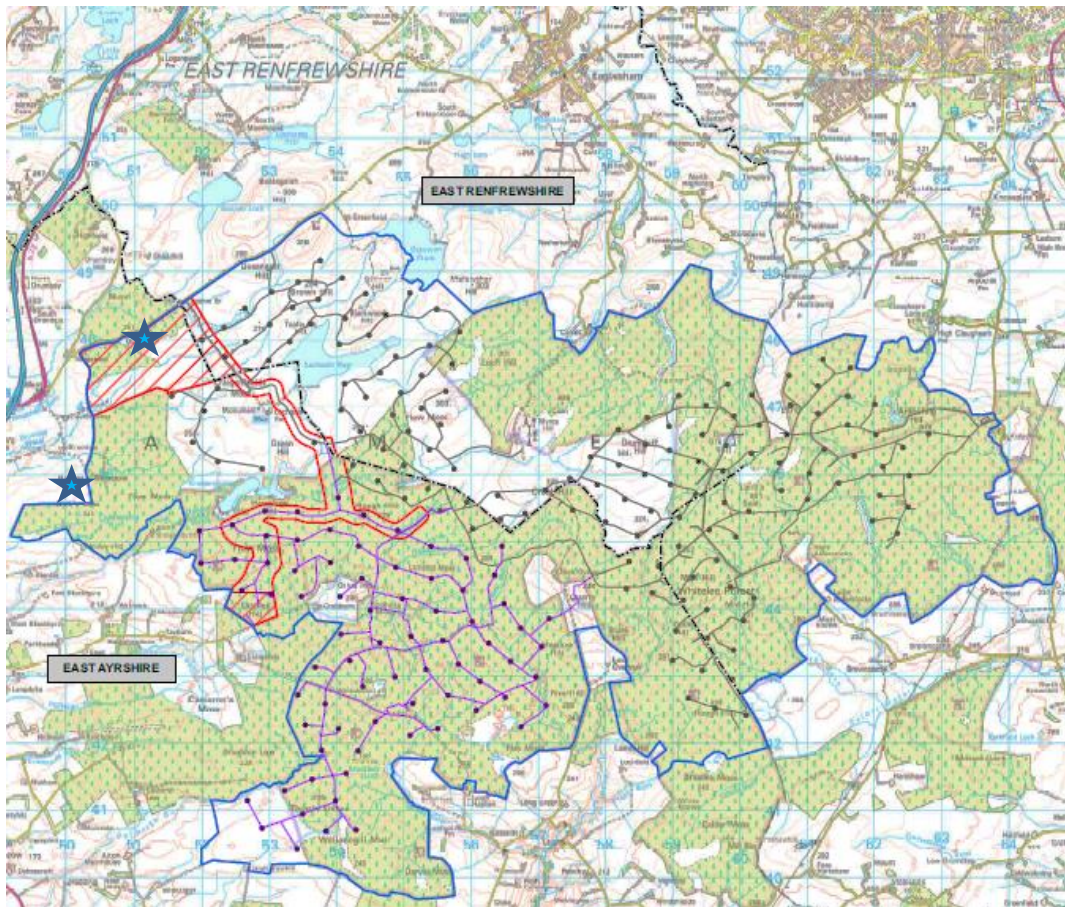


Fig 3. Cumulative map of 215 turbines for original Whitelee Windfarm with Extensions 1 and 2 and proposed area of Extension 3 (in red). [From ES for Extension 3] Stars indicate Lochgoin and Craigmendun reservoirs.

Within the submitted EIA and ES ( Environmental Impact Assessment and Environmental Statement) **it is quite clear that there has been no in depth consideration of designated drinking water protection zones during the consent process for any phase of Whitelee windfarm, which now occupies much of the water catchment for the population of Kilmarnock and the Irvine valley.**

#### 4.3 Inquiry Statement Evidence by Dr. Rachel Connor (the full document can be found at Appendix 1).

(Dr. Rachel Connor underwent a 5 hour cross examination at the PLI but this material has not yet been ruled on.

Relevant extracts are recorded below for my emphasis:

##### 4.3.1 The discovery of private water supply contamination:

1-7 Background

*8 In the same way that these concerns regarding the impact of windfarm development on PWS had been raised in written objections to the Scottish Governments' Energy Consents and*

*Deployment Unit (ECDU) prior to the consent of WL1 and 2, (EAC) these concerns were raised with, but disregarded by, the consenting authority, in this case, East Ayrshire Council, prior to permission for Sneddon Law being finalised in January 2013.*

*9 However, as a result of continued concerns from several local residents about the proximity of WL2 construction work and turbine foundations to the shared water collection tank at Airtnoch farm, supplying water to 10 homes along the Hareshawmuir valley, EAC undertook testing of this large PWS in February 2013, to provide reassurance. This showed bacterial contamination of our water supply. This was a great surprise to us, as we had previously believed our water to be clean, safe and reliable. I then discovered that Scottish Power Renewables (SPR) had been obliged to monitor our water supply as a requirement during the construction of Whitelee windfarm from 2006, but I was unable to find those test results at EAC. Thus I decided to investigate this further.*

## **11 WLWF History**

*12 The original WLWF is built largely on a Scottish Government designated, statutory Drinking Water Protected Area (DWPA). Whitelee was historically an area of largely unspoilt moss, heather and deep peat, which was partly drained and afforested from 1962-1992. Only 35ha of the natural blanket bog remained. It was deemed 'suitable for development' as it was regarded by the Scottish Government as windy and largely 'unproductive', which of course is what you would wish for a water catchment. Much of the windfarm site is land owned by the Scottish Government – or more correctly, by their agencies, Scottish Water (SW) and Forestry Commission Scotland (FCS).*

*14 It was predicted from surveys that the peat would be on average 3m deep, but in fact it was much deeper, between 8m and 9m deep in places. Over 2 million m<sup>3</sup> of peat were excavated for the whole development. This meant that instead of turbine foundations being the predicted 3 m deep, foundations into solid ground had to be up to 12m (40 feet) in depth. (Whitelee windfarm guide, pers.comm)*

*15 The first part of the site preparation involved clear felling of hundreds of hectares of trees. This began in 2005 (SW, \_risk assessment Amlaird\_water catchment , 2010) and continued into 2013. Approximately 3 million trees were felled; many chipped and spread on the peat along with the tree branches, for brash to support floating roads.*

*16 Six quarries with 85 articulated dump lorries ferried almost 6 million tons of excavated rock around the site for roads and turbine foundations<sup>1</sup>. Over 160,000 m<sup>3</sup> of concrete were used in turbine foundations and other areas, with a cement manufacturing and rock crushing plant on site.*

*17 This was an industrial project of epic proportions, on difficult boggy ground with vast*

*natural peat deposits, on a Drinking Water Catchment supplying water to 73 private water supplies (Environs, 2006) and two public water reservoirs, Craigendunton and Lochgoin, supplying water to 34,000 homes in North Kilmarnock and the Irvine valley.*

### *18 Monitoring*

*19 SPR had been obliged , by means of planning conditions attached to the s.36 consent to monitor several designated 'at risk' private water supplies (PWS) surrounding the Whitelee WF site, including Airtnoch / Hareshawmuir valley supply, as part of the consent for the original Whitelee windfarm. The results of the Airtnoch monitoring had not been communicated to the competent authority (EAC) or any other responsible authority, despite knowledge of a severe increase of bacterial contamination of the Airtnoch supply from 2006, at the start of Whitelee windfarm construction. It later became apparent, when the Planning Monitoring Officer reports became available to us in 2015, that Airtnoch was only one of several PWS, reliant upon the Whitelee site as a water source and catchment area, to suffer severe bacterial contamination. Although the PMO reports were available to EAC, East Renfrewshire Council (ERC) and South Lanarkshire Council (SLC) from 2006, the actual water test results were not made known to either the Environmental Health Department or the Planning Department. This dangerous level of bacterial and other contamination involving PWS, and contamination of groundwater (GW) and surface water (SW) were known to SPR prior to submission of a planning application for the first Whitelee WF Extension (WL1) in 2010.*

*20 Therefore, in what now seems an extraordinary omission, both the Atkins PWS risk assessment for WL1 and 2 report (Atkins, SPR Whitelee windfarm Extension 1 and 2 PWS Risk Assessment, 2010) and submission of the Environmental Statement (ES) (SPR, ES WL Ext 1 and 2 - Geology, Soils, Hydrogeology, 2010) for the WL WF Extension to Scottish Ministers, SEPA and the Local Authority as consultees, failed to include, or refer to, the already known contaminated ground or surface waters, or private water supplies on the existing WL WF site.*

*21 For our water supply, it seems also extraordinary that not only was this bacterial contamination with dangerous coliforms (Figure 2, page 13) not reported to authorities once over the course of seven years, during which time people were repeatedly unwell, but the cause of contamination was never investigated and no effort was made to find the Airtnoch water source, now seen as likely to be arising from an industrial construction site and power station.*

*22 As a final contribution to what appears to us, the public consumer and windfarm neighbour, at best a complete failure in a public health system and at worse, collusion and negligence, is the discovery that Scottish Water had been contracted by SPR to provide the laboratory facilities for testing samples for the Whitelee PWS. An FOI request to SW to obtain this data has failed on the grounds that commercial confidentiality to SPR outweighs the Public Interest. (SW, FOI refused re disclosing PWS monitoring results at WL WF, 2015).*

23 *The RPS PWS risk assessment (Whitelee PWS Risk Assessment Report , 2003) had categorised the large Airtnoch supply incorrectly as a surface water source/supply and it was on this basis that Airtnoch water was monitored during the WL WF construction. The 2010 Atkins PWS risk assessment related to the WL Extensions had categorised the Airtnoch PWS as being at medium risk for pollution, which therefore required monitoring. Atkins (Atkins PWS risk Assessment WL WF Extension Report and Appendix 1. , 2010) was concerned that the nearest turbine foundation was very near the water supply (approximately 350m) and that there might need to be micro-siting of the turbine foundation and protective mitigation around turbine construction to avoid contamination of the water supply. Despite this concern, no cognisance was given in the risk assessment to monitoring results obtained by RPS and the Ecological Clerk of Works (ECoW) for SPR, as reported by the PMO, already demonstrating severe deterioration of water quality over the course of construction of the original WL WF.*

25- 28 discusses how contamination of Airtnoch occurred.

29 - 35 discusses how the Risk Assessment was flawed

### 36 Monitoring results

37 *Over the course of seven years, EAC were never sent any of these water monitoring results, either directly from SPR, or indirectly from SPRs appointed monitoring agents, (PMO) Ironside Farrar. After EAC confirmed that they had never received our water test results (B.Gilchrist, 2013), SPR admitted in writing to a journalist, that they had not made these results available to the competent authority (Mega M. ).*

38 *As a result of continued pressure from residents and from this journalist, in September 2013, EAC finally obtained the water monitoring results for the Airtnoch water supply from SPR for the years from 2006 to 2013.*

39 ***These results (Figure 2, page 13 and Figure 3, page 13) revealed the gross bacterial contamination of this PWS occurring over seven years, with coliform counts peaking at 170,000/100ml (required value = 0). The value required to diagnose a urinary tract infection in a human is 120,000/100ml; this level of bacterial contamination would be equivalent to drinking an untreated urinary tract infection!***

40 *Over this time period, several local residents and/or their house guests had been repeatedly and intermittently vomiting and diarrhoea (Connor R. , 17.phone text message to Dr Niblock , president of Scottish Standing Committee, Royal College of Radiologists from R. Connor, 26 Jan 20012.), (Letters of ill health related to WF construction period, 2015).*

42 *SPR have repeatedly denied that they caused any private water contamination, yet during this time increasing concerns were being raised by the PMO in reports sent to SPR (CRE), of increasing coliform contamination of several PWS on the WL WF site, including Airtnoch (Ironside Farrar Ltd, August 2007) 633, 634.*



### 4.3.2 Compliance

44 *Regardless of whether SPR considered that they had a role in causation, SPR failed to comply with planning conditions for WL Extension (SPR, Issue 02 Condition 6.8 and 6.9 (Phase 1 and 2) Monitoring Plan, 2010) by failing to notify householders that their water was unfit to drink, or provide emergency contact details in the event of water problems, as required in planning condition 6.8 and RPS for WLWF 5.2 (RPS, 2003) in their Pollution Prevention Plan. SPR failed to meet these conditions by failing to notify either EAC or residents directly of adverse monitoring results, as stated in these conditions and mitigation arrangements. SPR failed to acknowledge that serious bacterial contamination occurred not just once, but throughout the entire construction period 2006-2012.*

45-67 illustrates the noncompliance: 54 *SPR also denied any responsibility for PWS contamination on the basis that no industrial contaminants were measured in water supplies. However, at no time did SPR or its agents include water test parameters which included the measurement of industrial contaminants or minerals in PWS. Absence of industrial contaminants in the water supplies was therefore a self-fulfilling prophecy on the part of SPR and represented completely inadequate surveillance of PWS.*

### 4.3.3 Public water Supply:

69-70 *Three public water reservoirs are sited on the Whitelee plateau, namely Lochgoin in East Renfrewshire, which feeds into Craigenduntun reservoir supplying East Ayrshire and Dunwan Dam (which no longer supplies public water) to the North East, above Eaglesham. (Figure 6, page 19).*

71 *Amlaird Water treatment works (WTW), at Waterside, receives raw water from Craigenduntun reservoir, which in turn is fed by a feeder conduit from Lochgoin via a small 'lochan' at the North West end of the reservoir (Figure 6, page 19).*

72 *Amlaird supplies public water to over 34,000 customers; probably as many as 50,000 people. The water from Craigenduntun has historically been brown and peaty, partly due to the deep peat on the Whitelee plateau, which forms the base of the reservoir and partly to the surface water run off of streams running into the reservoir. Amlaird received substantial reinvestment and rebuilding in 2005, to allow it to treat this water and produce water that met EU, UK and Scottish standards for wholesome and safe public water*

73-83 illustrate alarming test results from Amlaird WTW including Figures 8,9,10

84 *Therefore, the recommendations by the WHO, the EU, and all competent environmental and water authorities, is that the overriding goal should be to improve and provide as clean and pure incoming water to a treatment plant as is possible, to reduce the demands for treatment and disinfection. Graeme Pearson MSP asked questions in Parliament about the impact of a deterioration in raw water quality on public water quality (SG, S4W-21827parliamentary Qs, 2014), which confirmed the Scottish Government's view of the importance of a clean raw water*

supply, and change of land use as a cause of the raw water quality (SG, S4W-21826 Parliamentary Qs, 2014).

85 The colour of the raw water intake also peaked at this time in 2011 (Figure 10, page 21). Colour is important, because this correlates best with the amount of dissolved organic carbon in the water and the amount of disinfection chemicals that are probably needed to kill the bacteria.

86 Scottish Water had recognised that there was a problem with the deteriorating water quality, even in 2008 during the construction period for WL WF in 2006-2009. Their 2010 risk assessment states,

**a. Raw water quality at Amlaird water treatment works (WTW) is generally good. However, raw water colour is consistently high and true colour reached levels of 272 Hazens in 2008, with the works originally designed for a maximum of 244. In 2009-10, apparent colour was generally 230-240 Hazens, but peaked at 400 Hazens following reservoir de-stratification in the autumn. In 2006 there was also a *Cryptosporidium* breach.**

(SW, \_risk assessment Amlaird\_water catchment , 2010)

87 Despite this ‘cleaning’ and improvement to the reservoir, the highest peaks of colour in raw water occurred in 2011.

88 During 2013, SW were successfully prosecuted in Hamilton Sheriff Court by SEPA, for polluting the nearby Craufurdland burn in Waterside in 2011, with excessive discharges of iron and manganese from the Amlaird WTW resulting from treatment of the raw water. Once again, although there were multiple breaches of environmental pollution regulations, the worst excesses occurred during the peak construction period of the windfarm extension.

89 The combination of high levels of chlorine, needed to disinfect the water from the bacterial load, and the high organic content of the raw and treated water meant that there were unacceptably high levels of compounds called Trihalomethanes (THMs) within the public water supply. These concentrations were 40% higher than allowable regulatory limits during this period of windfarm construction (Figure 11, page 24). THMs are a large group of compounds, the largest component of which is usually chloroform. There are other more toxic disinfection by products in water which depend on the method of disinfection, for example, sometimes ammonia is added to the water instead of, or in combination with chlorine. Levels of all drinking water disinfection by products are strictly regulated to avoid toxicity when drunk over long periods.

90-94 looked at THMs

95 The high levels of THMs in Scottish public water was not new. It had been commented upon in the Scotsman and was recognised by UK regulatory authorities. It had been written up extensively by Professor Simon Parsons in work commissioned by the DWQR in 2008

*(S.Parsons, Study into the disinfection by products by chloramination, potential health implications and techniques for minimisation., 2009)*

*96 This study, conducted over approximately nine months, looked at seven unnamed water supplies from a number of different sources in Scotland, including two peat based reservoirs. Whilst the study did not include the time of year when organic carbon tends to be highest,(usually autumn after the first heavy rains), there were still public water supplies with 400% higher than allowable THM levels. Prof.Parsons's study also provided a world literature review of human toxicity and reported cancer associations and reproductive toxicity associated with population based evidence of increased oral ingestion of THMs.*

*97 The cancers typically associated with increased THM levels in humans are colon, bladder and brain cancers. In laboratory animals both Parson's study and WHO water quality guidelines, refer to the animal studies which show, more typically, dose related kidney and liver tumours. Reproductive toxicity is largely related to pregnancy failures and miscarriage.*

98-99: Concerns

*100 I had failed earlier in the year to get East Ayrshire Council to take the impacts seriously with respect to water, and the now consented Sneddon Law windfarm. One of our neighbours had four quarries and more than three close turbine bases within the water catchment of his borehole supply. Whilst SEPA had raised concerns about the impact of this windfarm on PWS in their letter to EAC when assessing that planning application, they had not objected. Despite our concerns that CWP Ltd, [Developers of Sneddon Law] had not conducted a formal geohydrology survey and assessed groundwater flows which might impact on borehole supplies, EAC had signed off the Planning Permission for Sneddon Law WF in January 2013. This was similar to the WL Extension planning application, where I had also raised concerns about proximity of the nearest turbine to our water collection tank in an objection to EAC and Scottish Ministers. Along with other PWS on the Whitelee site, we suffered gross bacterial contamination at East Collarie during the windfarm construction period.*

101-106: meeting Professor Parsons

*107 It was apparent that for the approximately 75,000 people in Scotland without a mains supply of public water, that there was virtually no effective protection of their water supplies from renewable energy developments. Whilst in theory there is protective legislation such as The Private Water Supplies (Scotland) Act 2006, and the EU's Water Framework Directive for more general protection of drinking water catchments and river basins, the reality is that there is no regulatory authority able or willing to protect PWS from such development once a windfarm has been consented.*

*108 For example, a large windfarm may have been likely to be consented centrally (following an inquiry) by the Scottish Government, against the wishes of Councils, local communities or*

*individuals likely to be affected; SEPA would then have responsibility for monitoring the water environment of the development, SW would have no responsibility for the water coming into a reservoir, but would have responsibility for the reservoir quality; the local Council would have no responsibility for the water environment, but would have responsibility for protecting existing PWS and for enforcing any Planning Conditions attached to a consent. The ability of the Local Authority to do that would depend on which PWS the developer considered to be at risk and on the developer conveying monitoring results to the Local Authority. If the developer considered a PWS to be at low, or no risk, no monitoring would be conducted at all!*

*109 Whilst PWS were of no concern to SW, at Whitelee, many PWS share the same water catchment area as SW and it is this catchment area which is now host to 60 SPR turbines.*

110-111: what 'red flags' are there when to notify the public?

*112 The comprehensive reply (C.Davidson, 2014) was very revealing. It was apparent that SEPA, SW, DWQR and EAC, as well as the CPHM, had been aware for some time of the deteriorating quality of the raw water input to the treatment works and the subsequent failure of the ability of the treatment works to be able to cope and be able to meet standards for wholesome water.*

113 double standards

*114 There were however, contradictions in the CPHM reply to me in that exceedances for THMs occurred for over nine months, far in excess of the allowable short term values by UK authorities.*

115- 126 : Excessive THM discussions

*127 If there was a scandal about beef being mislabelled as horse meat, surely this is worse. If the public are under the impression that their water meets the standards for wholesome water and it does not, for prolonged periods of time, then surely as a minimum they should have a right to be told.*

*128 The DWQR are responsible, as the water quality Regulator in Scotland for monitoring compliance of public water with the standards required in the legislative framework. In all of this, it might reasonably be wondered what their role was?*

*129 A request by Cathy Jamieson MP to the House of Commons Library, requesting a search on contamination of water supplies by windfarms, paraphrases comment made by DWQR in their 2013 report: **DWQR's position on THMs is that the 100 µg/l standard will soon have been in place for 10 years and that full compliance can and must be achieved in***



***Scotland, just as it has been elsewhere in the UK. In fact, the EU Drinking Water Directive requires disinfection by-products to be as low as possible and therefore Scottish Water's efforts must not stop at achieving the standard. The trend in 2012 towards failures due to a lack of plant maintenance, both at larger works and nanofiltration membrane sites, is worrying and DWQR as received assurances from Scottish Water that the situation has been rectified. One contributory factor at some sites may be a change in the quality of raw water, meaning that a once adequate treatment process is now unable to cope. The extent of this issue has yet to be fully quantified, but Scottish Water must gain an intimate understanding of the quality of water it has to treat and design, build and optimise treatment processes accordingly'***  
(my accentuation) (C.Jamieson, 2014)

### 130-133 dangers to health of water contamination

***134 Despite the clear danger to health of a contaminated water supply, SPR seem to have a flagrant disregard for informing responsible authorities and those affected, of water quality results or pollution incidents which are likely to endanger health, whether for private or public water supplies. Despite repeated requests from EAC, SPR have still not released all the PWS monitoring results for WLWF. SW were employed by SPR to provide analysis of PWS supplies during WL WF and Extension construction. Despite the implications for public health, under an EIR request, they have refused to release results to residents of those PWS, citing commercial confidentiality as the overwhelming priority (SW FOI refused re disclosing PWS monitoring results at WL WF, 2015).***

***135 Scottish Water, who host 60 of Scottish Power's turbines on their land for substantial remuneration from SPR/CRE, had not conducted a risk assessment of the effects of industrial construction on their public water catchment area, a statutory Drinking Water Protected Area, prior to construction of the original Whitelee windfarm.***

### 136-138 Risk assessment

***139 Scottish Ministers were informed of the PMO reports for WL WF (see below). Why were the impacts on the hydrological environment not taken seriously and investigated?***

***"2.0 Monitoring Process***

***2.1 Methodology.....***

***(Ironside Farrar Ltd, 2006), 463".***

***140 Why were the growing and documented concerns in the SW 2010 risk assessment impacting on public water quality and the PMO Reports for WL WF considered in relation to additional windfarm construction at Whitelee not raised by SEPA or SW to Ministers before consent for the Whitelee Extension was granted?***

*141 A letter in reply to Graeme Pearson MSP from SW's CEO Mr. Millican in 2014 therefore seems to be at odds with SW's published conclusions in 2008 and their own surface water monitoring and raw water quality monitoring data, Turning to your specify query about windfarms, Scottish Water is often consulted about plans for new windfarm developments. At no time would we compromise water quality as a result of development in the catchment area of a water supply source. There is no evidence to suggest that the Whitelee windfarm has affected the public water supply. But changing weather patterns can sometimes impact on a raw water supply. (DWQR.SW, 2014)*

142-151 SW failures

**152 Summary:**

**153 In summary, with regard to the proven deterioration of both raw and public water quality that coincided with construction of Whitelee windfarm and its extensions:**

**154 There has been an astonishing public denial by all responsible authorities to acknowledge the contribution of the 'elephant in the room'; the single largest industrial environmental construction project in Scotland, namely Whitelee windfarm in contributing to the deterioration of raw water quality at public water reservoirs.**

**155 There have been failures of responsibility and regulation by those authorities whose role is to ensure provision of safe and wholesome public water.**

**156 There has been a failure to properly investigate or to acknowledge the cause of the water deterioration**

**157 There was a failure to adequately test consumer supplies most likely to suffer the worst water quality results**

**158 The DWQR did not appear to increase routine water test frequency in the light of ongoing problems**

**159 A failure to communicate at all to the Public that the water supply did not meet standards for 'wholesome water' (SG, Water Wholesomeness – Water Supply(Scotland) Act 2001) for prolonged periods over at least three years, which would have allowed consumers the choice to decide whether to use alternative drinking water.**

160-166 How does this information impact on consideration for the proposed WL3?

#### **4.3.4 Surface water**

**168 The public water reservoirs of Lochgoin and Craigendunton are both largely dependent on surface water supplies. So to understand why the raw water quality in these public water-supply reservoirs had apparently deteriorated, it was important to understand if there had been any**

*change in the surface waters as a result of constructing Whitelee windfarm on a protected drinking water catchment area.*

*169.....Furthermore, the PMO (Ironside Farrar Ltd., 2007), 634, 635 and (Ironside Farrar Ltd, August 2007), 2102, 2103, had commented upon the SPR and SW monthly monitoring surface water results from 02/03/05 to 02/11/07 at 8 points within its catchment area, which recorded large increases in presumptive coliforms, some with E.coli and increased turbidity at several monitoring locations. It seemed that the impact of windfarm construction on the surface and potentially the reservoir water quality was not new to the regulatory authorities, even if it was unknown to members of the public.*

*170 There was discussion during those Ayrshire & Arran Water Liaison Group meetings that some surface water supplies to those reservoirs had been identified which were proving particularly 'troublesome' in terms of poor water quality. This is not what one would have expected simply from a high rainfall picture alone where, on undisturbed land, all supply streams should have been affected more or less equally. Both SW and SPR have been keen in their various responses to me to attribute poor water quality results to heavy rainfall. (Mathers, 18. Mathers, Martin. SPR Response regarding Water Quality. 2013,.) (DWQR.SW, 2014) (R. Connor, Comment to Graeme Pearson MSP re. SW letter of 21.10.14.)*

*171 The use of Bishopton meteorological figures by SPR to prove this point is particularly odd. Bishopton, being a part of Greater Glasgow, is almost 30 miles away on the Clyde estuary, with a very different rainfall pattern to Whitelee. SEPA has a rainfall measuring station at nearby Amlaird WTW and there is a meteorological office (now under the auspices of SEPA) near the southern margin of Whitelee at Saughall, near Darvel. Saughall G.R. NS 259841 636403, is at approximately the same altitude as Whitelee (max 376m). This implies for the period in question that perhaps Bishopton figures were appropriately higher than at Whitelee, in order to evidence unavoidable pollution as being due to an unpredictable Act of God, namely heavy rainfall.*

*172- Mitigation unable to cope with high rainfall*

*173 There is documentary evidence in numerous Ironside Farrar Ltd PMO reports 1-8, (461, 2178, 2108, 2121, 2128, 2135, 2144, 2161, covering September 2006 to December 2007 inclusive, (excluding Vol 2 , which is not available) of the inability of mitigation measures on the WLWF site to cope with the high rainfall during construction activities; this repeatedly included: the spine road being partially washed away, tracks collapsing, slurry generated on roads being dumped in borrow pits, borrow pits leaking their bunds, silt laden water entering watercourses, various water courses silting up , peat slippage, and damaged culverts producing dirty water.*

*174 It is an unfortunate indictment that the stated 'best practice' mitigation methods employed at Whitelee windfarm appear to have been unable to cope with the ground and weather*

conditions. The PMO reports paint a picture not of the effectiveness of mitigation to prevent environmental impact, but rather an environmental disaster.

177 What is apparent, looking at the rainfall figures for 2006-2010 for the Whitelee area (Fig 12), is that the peak rainfall periods did not produce the spikes above what would be expected for seasonal trends of colour in raw water from Craigendunton reservoir (Figure 10, page 21).

182 Fortunately, Whitelee windfarm site and its surface waters have been the subject of detailed academic research and monitoring extending almost continuously over an eight year period, by researchers trying to determine whether the disturbance of millions of tons of carbon storing peat, is likely to produce a worthwhile gain in terms of the carbon saving from siting a windfarm on such a precious carbon storing resource.

183 In trying to understand the impacts of WF construction, two peer reviewed studies of surface water changes directly related to the construction activity have been completed (H. Murray, 2012) (S.Waldron, 2009) and continuing research also provides data for surface waters extending into and beyond the construction period for Whitelee Extension 1 and 2 (A.Phin, 2014).....-187 Research.. Water Framework Directive (2000), which underpins much of the current Scottish legislation designed to protect drinking water catchment areas and river basins.

189 Collectively, Dr. Murray's Ph.D. thesis and poster presentation, Professor Waldron's peer reviewed paper all show well the documented effects of leaching of dissolved organic carbon (DOC) and soluble reactive phosphorus (SRP) from the disturbance of peat and the felling and mulching of forests on the Whitelee site.

190- 205 Monitoring phosphate trends of surface water and lack of access to windfarm site and some evidence

206 The proposed WL 3 site has a significant depth of peat, up to 5m from peat probing.(WL3 ES).There will be extensive forestry felling of  $\pm 37$  hectares. All but 10 ha is immature forest and will be mulched and left in situ. (the 10 ha of more mature timber being removed from the site).  
207 From Dr. Murray's work, this mulching is likely to increase phosphate run off.

208 These factors, surrounding the tributaries to the Drumtee water will produce significant changes of increased phosphates, total and dissolved organic carbon and increased suspended solids and turbidity if the previous 'best practice' mitigation methods implemented previously are utilized once again, as is foreshadowed in SPR's material.

#### **4.3.5 214 Surface waters impacting on Public Reservoir raw water quality and PWS**

215 Dr. Steve Carroll, Consultant Geohydrologist, reviewed the geohydrology section of WL Ext ES (S.Carroll, hydrogeology of the Whitelee wind farm, 2015) and the raw water data for

*Amlaird on our behalf. His views are that raw water quality to the reservoir were influenced by changes in surface water run off resulting from construction activity.*

***“....The observed increase in turbidity, iron and manganese in raw water intake to the Amlaird water treatment plant over an extended period in 2010-2011 during the expansion phase of construction would, on the face of it, appear to be evidence of deleterious impacts of construction on surface water runoff in line with SP’s estimation of a potential hazard in the Environmental Statement.***

***If this is the case, then the mitigation measures specified by SP and their contractors were inadequate in themselves or insufficiently enforced. (S.Carroll, hydrogeology of the Whitelee wind farm, 2015)”***

216-218 –other potential for pollution

*221 We have documented evidence of oil and fuel spills, although many spills were apparently remedied after the intervention of the PMO (e.g. PMO Reports March/April 2007, May/June 2007, Sept/Oct 2007, Jan/Feb 2009 Diesel spills 29/06/07, 14/11/08). The PMO also repeatedly reported of fly tipping within borrow pits and ‘littering’ e.g. of paint cans, around the site. There is documented evidence of other synthetic and toxic chemicals entering the groundwater on the WL WF site. As this was never investigated and a cause of contamination identified for these chemicals, it is not possible to devise a mitigation strategy which would prevent reoccurrences on the proposed WL3 site.*

## ***222 Summary:***

- ☐ ***There is peer reviewed research documenting adverse effects on surface waters draining from the Whitelee windfarm site related to construction activity. The WL3 ES has provided no change in mitigation methods that will show these adverse changes will not reoccur.***
  - ☐ ***The general effects on surface waters outside the site have been most marked for leaching and increase of phosphate concentration resulting in a downgrading of catchment water quality status, according to SEPA recognized criteria.***
  - ☐ ***This decrease in surface water quality is contrary to requirements outlined in the Water Framework Directive 2000.***
  - ☐ ***The whole WL 3 site is within a DWPA.***
  - ☐ ***Increase in the dissolved organic carbon content occurred in the surface waters related to construction activity and correlated with increase in the DOC seen within raw water for the public reservoir. These surface water changes were also reflected in increases in groundwater organic carbon for WL WF.***
  - ☐ ***The change in reservoir raw water quality resulted in a direct need for increased treatment and increased disinfection of raw water, producing potable water that failed regulatory water quality standards, failing to meet the statutory legislative requirements of the European Drinking Water Directive (Council Directive 98/83/EC)***
- The WL 3 ES has predicted that there is a potential for pollution in groundwater from this development to affect both public and private water supplies.***

- *Drumtee Water (Catchment 13 in WLWF ES ) suffered the largest increases in iron, manganese and colour/DOC during construction of the original WLWF. This same catchment and the private water supplies dependent on this catchment, are again most likely to be affected by WL Extension 3.*
- *Independent geohydrology assessment suggests mitigation in protecting surface water run off during construction of WL Extension from Whitelee was either ineffective or insufficiently enforced. SPR intend to use the same ‘best practice’ mitigation methods to protect the hydrological environment on the WL3 site.*
- *It is reasonable to conclude that the methods to be employed at WL3 will not be effective.*

### 4.3.6 Geology and Groundwater

224-227-Little or no thought given to groundwater sources

227 *Even to someone with no hydrological knowledge, it would seem a bizarre and risky assumption, to assume that a holding or collection tank could be taken as a proxy for a water source. However, this is exactly what all four SPR hydrological consultants (RPS, 2003), (Environs, 2006), (Atkins, Atkins PWS risk Assessment WL WF Extension Report and Appendix 1. , 2010) and WL ES 3, Ch. 9) did for the various phases of Whitelee windfarm ES and risk assessment, including Whitelee 3. This would be the cheapest and easiest assessment for the developer, but would leave the water source and any water piped from a source to a holding tank completely vulnerable to damage and pollution, with no protection from planned mitigation.*

228 *We know from SEPA’s brief response (SEPA, Whitelee X3 - SEPA response, 2012) to the Whitelee Extension 3 proposal that PWS and hydrology have not been specifically addressed, despite the history of contamination of groundwater and surface water PWS during previous construction at Whitelee. There has been no request from SEPA for further information from SPR, despite water sources for the nearest properties of Kingswell and Cauldstanes remaining uncharacterised. This is contrary to SEPA’s policy on assessing PWS in the vicinity of windfarms (SEPA guidance-on-assessing-the-impacts-of-development-proposals-on-groundwaterabstractions- and-groundwater-dependent-terrestrial-ecosystems, 2014).*

229 *We obtained an independent Geohydrological review from Dr. Steve Carroll (S.Carroll, Whitelee windfarm hydrogeology summary, 2015) of the Whitelee windfarm site, providing him with information from preceding WLWF Environmental Assessments and preceding PWS risk assessments, to inform our understanding of the current situation and geohydrological risks pertaining to the proposed WL 3.*

230 is a summary of Dr Carroll’s report including:

*“Lavias of the CPV formation elsewhere in central Scotland often show zonesporous and permeable sedimentary rocks or broken up lava at the junction offflows of different age. These zones could form very localised aquifers and allow more rapid groundwater flows than*



***would occur in fractured basalt that form most of the lava flows. These narrow aquifers and potential water channels through fractures are also more difficult to predict from an overall geological map.”***

*231 In PWS wells that draw groundwater from the CPV formation (e.g. as at Kingswells or Ardochrigg) most of the water inflow is probably in interlava aquifers, fracture or fault zones.*

*233 The geology is important, because it controls where groundwater is stored and how it flows from where it infiltrates as rain to where it discharges in springs, streams or water supply wells. The hydrogeologists that we consulted (Dr B. O’Dochartaigh, Dr S. Carroll) are in agreement about the ways in which the groundwater system at Whitelee most probably works. However, the sparseness of well logs or test bore holes across this site means that these hypotheses cannot be confirmed, quantified or mapped.*

*234 Because no boreholes were drilled or groundwater testing requested from the developer by planning or regulatory authorities, even in relation to assessing impacts to groundwater from potentially polluting activities such as quarrying, the importance of potential pollution pathway into shallow groundwater through superficial deposits or to deep groundwater through rock fractures was not adequately assessed for previous Whitelee windfarm proposals.*

*235 Pollution of groundwater is recognised as being particularly serious, not just because there may be untreated domestic water abstraction reliant on groundwater (as here on the Whitelee site), but because in general, groundwater flows are very slow compared to surface water flows and pollution within groundwater aquifers may persist for many years*

*238 Dr B. O’Dochartaigh, senior Geohydrologist at the BGS, reviewed Dr Carroll’s preliminary geohydrology assessment at Whitelee ( Review of S. Carroll’s geohydrology Whitelee report, 2015) and largely agreed with his findings and conclusions, except that she thought the bedrock, described as impermeable on published BGS groundwater maps may be more fractured than previously described by SPR. (see above) However, she expressed concern to me that SEPA had not required SPR at Whitelee, or CWP Ltd at the adjacent Sneddon Law site to sink test bore holes to obtain a better understanding of rock characteristics on the local site, to allow quantification of the geohydrology risk, in view of the scarcity of detailed geological information on this site (B.O’Dochartaigh, 2015). BGS has no record of the actual depth of overlying peat, glacial till, alluvium and bedrock structure in various parts of this extensive site. Dr O’Dochartaigh also commented that any domestic abstraction was likely to be within the shallower part of the bedrock (within tens of metres) which would be more susceptible to surface water pollution.*

*240 Turbine foundations are major ground engineering projects. WL 3 ES (9.5.2.2.) describes clearly how these foundations will allow potential contamination of groundwater by surface water and indeed, this is exactly what happened, despite mitigation, in preceding WL WF developments to the detriment of PWS*

241 *It is understood that with this type of geology, where the structure of layers and fractures is unknown in detail, it can be practically impossible to predict the path, depth and quantity of groundwater with any confidence. Furthermore, the confined and limited aquifers, high water table and narrow unsaturated zone of soil or peat means this type of geology and ground structure is particularly susceptible to pollution.*

243 *The ‘unsaturated’ soil zone is a critical area in attenuating pollution, or bacterial contamination at the surface from reaching the groundwater /water table, by allowing natural oxidation processes and bacterial action to break down contaminants.*

247 *I am therefore both amazed and disappointed that on a site extending over 30 square miles, SPR had not previously drilled such test boreholes to provide this information. Equally, I am disappointed that SEPA, charged with protecting groundwater from the effects of development, did not require SPR (or CWP Ltd for Sneddon Law) to provide this information in their site analysis and risk assessment.*

248 *Figure 23 to Figure 27, on pages 62 to 64, are schematic diagrams which explain the underlying geology and likely water flows on this site as they relate to spring or borehole abstraction (and potentially streams feeding into reservoirs). Figure 27, page 64, is an outline of the various types of construction activity risk on a windfarm site and how a pollution pathway is created, allowing surface water easy access to groundwater as described in WL3 ES. Please refer to: Inquiry Statement (Appendix 1) 273/274/275/276/277/278 for Figures 22-27*

249 *In areas where the bedrock has been exposed, or extracted, for example in the quarries (borrow pits) or where there are deep turbine foundations, any surface water contamination has the potential to pass directly into groundwater.*

253 *It is therefore even more surprising in my view, that the hydrology experts commissioned by SPR to evaluate the risks to water supplies have not, in all three environmental impact assessments for the various phases of Whitelee, either requested more geological information from the drilling of test boreholes, or been able to evaluate the available information to construct a source – pathway – receptor model for pollution which includes groundwater.*

254 *This standard pollution risk modelling, which formed the basis for risk assessment in the PWS risk assessments (Atkins, SPR Whitelee windfarm Extension 1 and 2 PWS Risk Assessment, 2010), (Environs, 2006), did not properly consider the possibility of groundwater pollution, which is extraordinary, given that Whitelee windfarm was the largest environmental construction project in Scotland at the time and that groundwater pollution is recognised by regulatory authorities and trade organisations, such as BGS and CIRIA (Construction Industry, Research and Information Association), to have much more persistent and significant consequences than surface water contamination.*



255 SEPA have informed me that where old quarries are used as landfill sites, the quarry is 'lined', specifically to avoid contamination of groundwater. At Whitelee, some quarries were constructed without the method statement being approved and we are not aware that these, or other quarries were lined. Quarries were used not only as a repository for the millions of cubic metres of peat and soil excavated on site but for the dumping of silt and slurry from roads and track, contaminated by HGV movements. Presumably the filling of quarries with deep unstable peat provides the potential for organic matter to leach into the groundwater for years to come, with the consequent changes in GW. This practice is endorsed by SEPA (SEPA, WhiteleeX3 - SEPA response, 2012)

256 CIRIA 352 is regarded as a key reference in guiding construction methodology and SPR makes reference to complying with CIRIA recommendations in its construction mitigation methods.(Planning condition 6.4 WL Extensions)

257 CIRIA 352 states with regard to avoiding pollution 2.5.3 : Piling, in particular vibro-replacement piles forms a direct flow pathway down columns of granular material for contaminated water and leachates to potentially move into an underlying aquifer both during and after construction.

260 Is the 'storage' and frequent oil change of a minimum of 170,000 litres of oil on a DWPA really an acceptable risk for public and private water supplies? In what way does the operation of the existing WL windfarm comply with The Water Environment (Oil Storage) (Scotland) Regulations 2006? Contrary to SEPA's assertions (e.g. Macritch Hill WF response (Angus Council ref: 15/00047/S36), windfarms are not excluded from complying with these regulations).

261 It is recognised that contaminated groundwater may occur at some distance from the pollution site (Small water treatment systemsDWI70\_2\_137\_manual, 2001) 3.3. 'Water abstracted from deep wells and boreholes may have originated from catchments several miles away' and (CIRIA 648) "Construction activities must not affect the reliable yield or quality of any groundwater abstraction or receiving environment"

4.1.1 262-Expert Summary from geohydrology consultant Dr S. Carroll

#### ***In summary***

- ☐ ***The ES's submitted for the various phases of Whitelee windfarms have not investigated geohydrology at an appropriate level of detail, nor have they considered the reliance of private and public water supplies on either groundwater flow to springs and surface streams or direct groundwater abstraction from boreholes.***
- ☐ ***The required borehole logs required to make an informed, adequate groundwater risk assessment have not been obtained, or have not been made available.***
- ☐ ***Given the minimal unsaturated zone on most of the WL site, inadequate consideration has been given to ability of the local soil structure to influence the natural degradation of surface pollutants.***

- *The current WL Ext 3 ES has not identified, mapped or provided a geohydrological risk assessment for the nearest PWS abstraction to turbine foundations (Cauldstanes).*
- *SEPA have failed to assess the WL 3 application in accordance with their own policy of requiring developers to identify water sources for PWS that may be at risk.*
- *The ES for WL3 has identified the particular risks of constructing borrow pits and turbine foundations in providing a preferential route for surface water to contaminate groundwater. This contamination of GW was documented as occurring with preceding WL WF developments.*

#### **4.3.7. Consent of Whitelee windfarm Extensions and impact of the Jacobs Report-4.2.1**

*294 I was extremely disappointed to discover that even the concerns of SPR's consultants, Jacobs Ltd, regarding the adverse impacts on groundwater and the recommendation that mitigation methods outlined in the original WL WF ES should be reviewed, had not been made available to the ECU or to Scottish Ministers prior to awarding consent for WL2 or taken into consideration when devising planning conditions for further turbines to be sited on public and private water catchment areas.*

*295 Water pollution is a material planning consideration; why didn't Scottish Ministers inform the ECU of what was already happening on the existing WL WF site?*

***296 Why is this past history of consenting WL Extensions relevant to the proposed WL Extension 3?***

*297 As part of the planning conditions for WL Extensions 1 and 2, (SPR, Issue 02 Condition 6.8 and 6.9 (Phase 1 and 2) Monitoring Plan, 2010) SPR were required to monitor groundwater quality, as they had done for the original WL WF.*

*298 Jacobs referred to this in the summary of their report (Jacobs, Jacobs Whitelee Post Construction Report Nov 09, 2009) and made additional recommendations that continued ground water monitoring should occur on the original site, particularly for investigation of the presence of phenols, and that the predictions made in the original ES should be reviewed and future mitigation should be revised in view of the findings.*

***299 Why were the recommendations of Jacobs Ltd not implemented for WL WF Extensions?***

*300 In their final report (Ironside Farrar Ltd, 2010) the PMO also recommended further investigation of the veracity of laboratory results with respect to abnormal sample test results. They felt that WF had not generally impacted on GW, but that the findings of focal chemicals in a borehole such as cresols and phenols, could not be explained*

*301 Although there is reference throughout the PMO reports of concerns regarding the deteriorating quality of groundwater, EAC were not informed of the groundwater*

*pollution raised in the Jacobs 2009 report during the construction of WL WF until 2014, and to date (10/04/15), EAC have not received any groundwater monitoring results for the WL Extension.....*

*303 These GW monitoring results are critical to the WL 3 proposal not only in providing a base line for monitoring GW in relation to the now-proposed WF Extension, but to understand whether mitigation used for constructing the WL1 and 2 was any more successful in preventing GW pollution than in WLWF. SPR have referred to these 'successful' mitigations methods as those which will be employed on the proposed WL3 site.*

*304 I also searched the British Geological Survey (BGS) data base, which lists and maps all recorded boreholes (such as those for Whitelee WF original) and there is no record of any boreholes for WL WF Extensions, even though the boreholes for WL WF original were mapped and recorded.*

*306 Consenting further development of WL3 on this water catchment area would repeat the previously uninformed consent decision, putting public health at risk.*

#### ***4.2.2 The Jacobs Report – involvement of Statutory authorities.***

*307 SW had standing orders in place with SPR such that they should be notified directly of any contamination event on water catchment land (SW, FOI response 5139426 from SW re. notification by SPR of contamination spills at WL WF, 2015).*

*308 This did not happen, despite abnormal water sampling results showing significant chemical contamination with phenols, toluene and phthalates found in a borehole (WP01) (Figure 28, page 72) nearest to the two public water reservoirs from 2007. SW was not aware of the Jacobs post construction report 2009 until I forwarded them a copy early in 2015. SEPA also recorded other pollution events on the Whitelee SW catchment area e.g. Four oil drums, some with oil leaks: Env/0839797 (SEPA, SEPA Pollution Incidents Whitelee 2004-2014\_FOI, 2014) but again, this was not notified to SW.*

*309 – 335 discussion of possible errors and explanations*

#### ***336 The role of Regulatory Authorities in preventing water contamination.***

*340 It is also apparent that there has been a complete failure by the Local Authorities to ensure that SPR had complied with all the planning conditions and a failure to ensure that all the monitoring required to comply with conditions was actually carried out. The PMO reports for WLWF repeatedly made reference to PWS monitoring results that were not obtained, to monitoring wells that were not replaced when they were damaged and to SPR wanting to cease*

*monitoring of SW, GW and PWS once earth works had completed, rather than over the lifetime of the construction period.*

*341 In my opinion, Local Authorities are woefully under resourced to carry out their monitoring and enforcement task effectively, to understand and act on the specialist results and to have the resource to instigate prosecution when developers fail to comply with conditions.*

*342 Other authorities such as SEPA and SW have the expertise to properly interpret monitoring results for water, but are not involved in the notification of monitoring results. Even when notification arrangements were in place between SPR and SW, to protect public water supplies, they were apparently disregarded without penalty.*

*343 In my opinion there is a serious disconnect in the effectiveness of the whole regulatory and planning process in respect of water.*

*344 There is no effective protective mechanism for PWS if the competent local authority is responsible for protecting the water supply, but has no mechanism to insist that a developer find, chart and protect the water source, and is subsequently not responsible for the hydrological environment upon which that water supply depends.*

*345 The hydrological environment is SEPA's responsibility and yet they have no responsibility for the quality of public drinking water supplies or for PWS and they do not receive any monitoring results.*

#### *346 Laboratory Investigation 348-363*

*359 In summary, Ms H thought it unlikely a laboratory error would result in so many high readings. (I neither identified the laboratory concerned to UKAS, nor the client customer -SPR)*

*364 Groundwater contamination:*

*365 This occurred under three broad headings*

- ☐ *Focal, point source chemical contamination*
- ☐ *Diffuse chemical contamination*
- ☐ *Diffuse mineral and organic changes in groundwater*

*366 Focal point source chemical contaminants.*

*367 The Jacobs 2009 Post Construction GW quality report (Jacobs Whitelee Post Construction Report Nov 09) identified phenols, chlorinated phenols, toluene and DEHP appearing during the construction monitoring period in borehole WP01, the borehole sited between the two public water reservoirs (Figure 28, page 72). Chloroform was also detected in two other boreholes WP02 and WP04.*

368 At WP01, the peak level of phenols (120ug/L) was four times the allowable environmental limit of 30ug/L. Phenols and chlorinated phenols are part of a group of substances called cresols. (3 methylphenol and 4 methylphenol are m-cresol and p-cresol respectively Cresols have a wide variety of uses as solvents, disinfectants, or intermediates in the preparation of numerous products. They are commonly used in the production of fragrances, antioxidants, dyes, pesticides, and resins. In addition, p-cresol is used in the production of lubricating oils, motor fuels, and rubber polymers, while m-cresol is also used in the manufacture of explosives. (IPCS INTERNATIONAL PROGRAMME ON CHEMICAL SAFETY, 1997)

370 Chlorinated phenols are of particular concern for toxicity. They are found in pesticides, herbicides and disinfectants and well as being used as an 'anti clogging' agent in some fuels. Cresol concentrations in surface water (up to 204 ug/L) and ground water (2 mg/L) have been observed adjacent to industrial effluent sites where coal tar and creosote compounds have been handled in large quantities. At WLWF methylphenol (Cresol) was detected up to 180ug/l in borehole WP01, between the two public reservoirs.

371 Toluene, found at WP01, is a volatile organic compound, which is often used as a degreaser and as a component of fuels and other organic chemicals. In high concentrations it is a nervous system toxin to humans – as well as other serious effects. However, because of its volatility, its presence in the groundwater to this level at borehole WP01 to 19ug/L in 2008, is unusual.

372 It should be the responsibility of SPR to investigate which chemicals used on the site might have contaminated the GW at this site.

373 SEPA's response to the appearance of these synthetic organic chemicals in GW was to minimise the potential impact, rather than draw conclusions which might support the need for investigation on a precautionary basis. (SEPA reply re. Jacobs report 2009 and DEHP 2015)

379 Diffuse source chemical Contaminants

380 The Jacobs post construction report shows alarming levels of DEHP in all boreholes across the site, up to 3200ug/L. This is 400 times the recommended drinking water quality limit (WHO, 2011).

381 DEHP is recognized particularly as an endocrine and reproductive toxin in humans (Assessing exposure to phthalates – The human biomonitoring approach. Review.), (SEPA reply re. Jacobs's report 2009 and DEHP 2015), (WHO, 2011), (DEHP EU Risk assessment report Document).

382-397 DEHP toxicity discussions

*390 DEHP is recognised as a ubiquitous chemical in the environment. It is and was widely used as a plasticiser in plastics, cabling, pipes, also in hydraulic oils and electrical capacitors and transformers. Some of these uses may be pertinent to activities and products on the Whitelee site.*

#### *398 Other Diffuse Contamination - 399-408*

*409 Of note is that there is no base line data for pH or carbon in GW, with monitoring for these substances only starting late in 2007, a year after construction had started.*

#### *410- Aluminium levels*

*413 From PMO reports for May/June (Ironside Farrar Ltd, 2007), 556, (Ironside Farrar Ltd, August 2007), 2091, (Ironside Farrar Ltd, 2007), 607, it is reported that deep peat, slurry and silt was stored in the onsite quarries and that not only were leaks seen from the quarries, but that these quarries allow ready access of surface water to groundwater; including any chemical contaminants.*

#### *423 Conclusions*

- ☐ *There was documented contamination of GW by synthetic chemicals on the WLWF site.*
- ☐ *Some of these chemicals have the potential for serious health consequences*
- ☐ *Investigations of causation were not performed at the time of detection*
- ☐ *There was a ready assumption to attribute the detection of unexpected chemicals to laboratory or sampling error, rather than investigate the abnormal result.*
- ☐ *If the responsible authorities take no action, those chemicals could show up in PWS*
- ☐ *Too little is known about the geohydrology on this site to make any predictive assumptions of the likely dissemination of GW toxins.*
- ☐ *Mitigation measures employed failed to prevent the GW contamination.*
- ☐ *Adverse changes have occurred in GW, contrary to the EU Water quality framework directive.*
- ☐ *Lack of recommended follow up GW monitoring data for WL WF Extension precludes any assessment of continuing or residual GW impact on this site and on the WL3 site.*
- ☐ *Without understanding causation, it is not possible to devise effective prevention or mitigation to prevent further GW contamination at WL3, if consented.*

#### **4.3.8 - 5 Windfarm impact on private water supplies**

425-451 summarises of affected PWS

#### **452 Response to this evidence**

*453 What seems extraordinary is that from the outset and the initial application for a windfarm on the WLWF site and the original PWS risk assessment provided by RPS Ltd in 2003, there*

were concerns from Environmental Consultants about the potential impact of windfarm development on PWS.

456 Despite this and planning condition 6.8 and 6.9 for WL1 and WL2, despite gross bacterial contamination of several PWS and failure of supply altogether for three households, at no time were residents notified of any problems related to their supplies.

457 Planning conditions to protect quality and quantity of PWS were not upheld in any of the preceding WLWF developments.

460 I am unaware of any household on the Airtnoch/Hareshawmuir water supply who were either informed of adverse water quality monitoring, or who were supplied with emergency contact details for Whitelee extensions.

**461 Therefore, for WL3, there can be no confidence that provision of such arrangements will provide any degree of protection or reassurance for those PWS likely to be impacted by this development.**

463 Without any investigation of water sources or substantive evidence to support their presumption, local farmers and high rainfall were blamed by SPR, SEPA, and EAC for producing the gross unprecedented levels of bacterial contamination involving PWS, even when water sources are not on land supporting agricultural activity.

464 Bacterial and E.coli contamination is related to faecal contamination from any mammal, including human beings.

465 These authorities have clearly failed to remember Public Health ‘events’ such as the spectacular outbreak of Hepatitis A amongst senior doctors that occurred in relation to faecal contamination of Carse of Gowrie raspberries, traced back to casual raspberry pickers relieving themselves on site<sup>10</sup>.

466-494 PWS evidence

494 No water monitoring by either SPR, or EAC occurred at all during the construction of either WLWF or the WL Extensions (2006 -2013).

495 Local authority testing, to determine the cause of persistently discoloured water in 2013, revealed iron levels eight times and manganese more than three times UK and Scottish drinking water standards.

496- 556 PWS evidence

## 5.1 Historical Summary of PWS impacts on the Whitelee WF site

557 Although the serious impacts on multiple PWS presented here relate to the previous WLWF developments 2006 – 2012, the consequences of those effects continue into the present and into the future development of WL 3. Those effects carried forward in consideration of this WL 3 will be summarised below.

558-565 567- 572summary -see Appendix 1

566 Contrary to Planning conditions and pollution prevention plans 5.2 RPS (RPS, 2003), (Issue 02 Condition 6.8 and 6.9 (Phase 1 and 2) Monitoring Plan, 2010), as far as I am aware, none of the other households had contact details or emergency numbers, as was required, supplied by SPR in case of water failure.

573 Throughout this investigation there has been a complete failure of the Regulatory Authorities to work together, to share knowledge and resources and to take collective responsibility toward protecting the individuals who have had the effects of industrial development imposed on their water catchments and their water supplies.

574 A common theme for both SPR and regulatory authorities has been to apportion blame for water contamination on: the pre-existing PWS collection and distribution systems, farmers, agricultural animals, rainfall, pre-existing forestry, and laboratory error, usually without providing any substantive evidence to support that assertion.

575 There has been a historic failure by SPR to provide a duty of care, or even to comply with planning conditions to protect drinking water quality and quantity, resulting in actual detriment of public health. There has been a failure by SPR to behave responsibly to protect private drinking water supplies reliant on water sources from the Whitelee site by communicating monitoring results promptly to relevant authorities and residents directly. There has been frankly misleading reassurance made by SPR to a serving Member of Parliament in answer to questions made to that MSP by his constituents.

577 The Influence of Previous Whitelee Windfarm development on PWS related to the current WL 3 application for consent.

578 SPR have stated that for the current WL3 application they intend to use the same 'best practice' mitigation that was informed by apparently successful and effective mitigation for WL original WL Extn 1 and 2.

“Page 9. 69. Mitigation measures, based on best practice, have been proposed to control the effects on the receiving environment. The measures have been informed by experience gained on Whitelee Windfarm and Whitelee Extension with regard to potential site-specific issues and the most appropriate measures to avoid or reduce these. The activities on the Whitelee Windfarm construction site were managed in close liaison with Scottish Water and SEPA. These



*arrangements are being continued during construction of Whitelee Extension and would be applied during the proposed Development. (emphasis added) Non Technical Summary Whitelee Extension Phase 3 2012P 10. 71. With the proposed mitigation measures in place, it is concluded that the proposed Development would not result in any residual effects on geology, soils or groundwater that are considered to be significant in the context of the EIA Regulations. ”*

#### *WL3 ES Appendix 9.2 Private Water Supplies*

*579 It is patently obvious from the documented surface, groundwater and PWS monitoring that occurred for WLWF and for the surface and PWS monitoring that occurred in relation to WL 1 and 2 construction, that this mitigation was ineffective and failed to protect either PWS that were being monitored, or those PWS that were not being monitored, but which suffered spectacular failures. This was to the detriment and financial hardship of those families dependent on those water supplies. Many of the properties previously affected by WLWF, will now be at risk again from the proposed WL 3.*

*580 To employ the same stated mitigation measures for WL Ext 3 would be to perpetuate an environmental disaster.*

*581 We have no confidence in the ability of SPR to produce an effective pollution prevention plan (PPP) for WL3 , given that the preceding WL PPP’s*

- ☐ *failed to provide emergency contact details to affected households,*
- ☐ *failed to notify residents of gross bacterial contamination of PWS and*
- ☐ *failed to provide alternative water supplies to households where water supplies failed altogether.*

*582 WL Ext 3 ES: 9.1 6 states:*

*‘Mitigation will be detailed within a site Pollution Prevention Plan to be implemented during the construction of the windfarm. This plan will be produced following consultation and agreement with SEPA and will incorporate a Pollution Incident Plan, including emergency procedures’. WL Ext 3 ES: 9.1*

*583 Water sources which were not mapped for previous EIA’s or risk assessments have still not been mapped for the current ES.*

*584 The current ES is therefore not fit for purpose, which is to provide consenting authorities (in this case the Scottish Government ) with enough information to understand that the application has properly considered the impact and adverse aspects of the development on sensitive receptors and has demonstrated mitigation measures that will be effective in avoiding those adverse effects; in this instance, the effect on domestic and drinking water supplies reliant on the development site.*

*591 There is no consideration of the effects of groundwater flow of the adjacent igneous dyke, previously described by Atkins Ltd for SPR in 2010, in relation to water supply to Cauldstanes and Veyatie and the potential for this to concentrate contaminants to the limited aquifers on this site.*

*596 There is no evidence presented to suggest that any of the reassurances or measures that SPR provide in respect of protecting the hydrological environment of this site will be any more effective than those that were made in respect of the preceding WL WF developments which have occurred over the past nine years.*

The PLI produced some new material- maps and test results, which will be added as an Appendix along with the outcome.

#### **4.4 ELD 2004/35/CE states (15)....public authorities should ensure the proper implementation and enforcement of the scheme provided for by this Directive**

The WATER ENVIRONMENT AND WATER SERVICES (SCOTLAND) ACT 2003 (WEWS) gave Scottish ministers powers to introduce regulatory controls over water activities, in order to protect, improve and promote sustainable use of Scotland's water environment.

It is in everyone's interest that consents to windfarms are covered by the best conditions. These unfortunately are based on 'model' conditions and not site specific. As authorities do not carry out their own EIA they tend to issue generic condition even though ESs often warn of potential harm. There is a tendency for authorities to impose 'too few' conditions to allow the development to move forward easily BUT this allows for inaccuracies, oversights and errors causing environmental damage.

DIRECTIVE 2004/35/CE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage:

From Eversheds LLP on behalf of CWP Ltd. 24/09/2014

*"3.2 Para 6. With regard to the issue of compliance, firstly there is no requirement in planning terms for there to be confidence that the wind farm company will actively strive to comply with the condition, since that is the purpose of the enforcement jurisdiction."*

The Ecological Clerk of Works (ECoW), employed by the developer is critical in the role of monitoring and reviewing the construction process. He should report to the Planning Monitoring Officer (PMO) (independent but paid for by the developer) who reports to the authorities, but the PMO is often not involved until the end which means that problems are missed. Also the PMO reports are not readily available to the public and they are very expensive to acquire.

In the case of PWSs and an incident, the ECoW should inform the PMO, or local authority who informs the Environmental Health Officer, who should then inform all those on a PWS.

Evidence from the Inquiry Statement illustrate that the authorities ignored evidence available to them from the PMO -Ironside Farrar Ltd. 2006 in their report on Whitelee original:

*139 Scottish Ministers were informed of the PMO reports for WL WF (see below). Why were the impacts on the hydrological environment not taken seriously and investigated?*

*140 Why were growing and documented concerns in the SW 2010 risk assessment impacting on public water quality and the PMO Reports for WL WF considered in relation to additional windfarm construction at Whitelee not raised by SEPA or SW to Ministers before consent for the Whitelee Extension was granted?*

[END of EXTRACT]

For the WL WF Extensions, no PMO was employed and no ECoW reports have been made available either.

**SEPA and the Councils have not effectively policed conditions and consequently we have unequivocal environmental pollution.** There is clear confusion in the regulatory process as to who has responsibility for monitoring and enforcing conditions. Thus developers set out in their ESs possible negative impacts and then state that their Best Practice Mitigation will ensure that the environment is protected. This clearly is not the case.

It would seem that everyone is trying to off load responsibility on everyone else. In a letter to Cathy Jamieson MP from Fergus Ewing MSP, the Minister about Whitelee is a clear example of the end result of the Scottish Government's policy of overruling local communities, individuals and Councils in consenting such windfarms, but once done, delegating all responsibility for that decision back to the Councils to enforce conditions attached to that consent which they already knew and had already stated would have negative impact.

Statements (ES) for the consented Whitelee wind farm and subsequent extensions. All environmental information was consulted on during the application stage and all parties given an opportunity to comment at the time. All information was taken into account and conditions attached to the consent in line with advice given by the statutory consultees. As noted in my previous letter, conditions are under deemed planning permission and it is for the local planning authority, in this case East Ayrshire Council, to monitor and discharge these conditions.

Extract from letter to Cathy Jamieson MP from Fergus Ewing MSP about Whitelee  
There are many examples above in the Inquiry Statement of the authorities breaching legal requirements. For example:

*114 There were however, contradictions in the CPHM reply to me in that exceedances for THMs occurred for over nine months, far in excess of the allowable short term values by UK authorities.*

*127 If there was a scandal about beef being mislabelled as horse meat, surely this is worse. If the public are under the impression that their water meets the standards for wholesome water and it does not, for prolonged periods of time, then surely as a minimum they should have a right to be told.*

*128 The DWQR are responsible, as the water quality Regulator in Scotland for monitoring compliance of public water with the standards required in the legislative framework. In all of this, it might reasonably be wondered what their role was?*

#### **4.4.1 SEPA are not fully implementing and enforcing water directive regulations as stipulated in Article 8 of the Water Directive:**

FOI84979 requested Full Geohydrology reports for Kilgallioch, Assel Valley, Tralorg and Breaker Hill –in response SEPA could only provide developer’s Environmental Statements. Public and private water supplies in the vicinity of windfarm developments do not have a credible risk analysis (from a fully independent geohydrology report) which assesses the likelihood of both disruption (reduced quantity) and contamination of supplies. This must include the mapping and borehole testing of the full catchment area as it is not adequate to map collection tanks and not to map the water source.

According to SEPA’s own statement of legally binding conditions each wind farm application ‘should’ contain (this is not the same as the legal requirement of “MUST” contain) site layout plans which illustrate the location of all built elements, including access roads, turbines, crane hard standing, borrow pits, construction compound, welfare facilities, oil storage, cabling and substation so that assessment of their location in relation to the following sensitive receptors can be assessed:

• Peat land • Watercourses • Lochs • Wetlands • Water supplies (public and private) • Groundwater

The test intervals must be specified.

It is breaching legal requirements for pollution to occur or for the potential of pollution to be allowed to occur which would lead to someone drinking that water.

Minimum monthly tests should be carried out.

Council Policy must support the objectives of the Water Framework Directive (2000/60/EC). In that development meets the objectives and shows that:

- a. it will not harm the water environment;**
- b. it will not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water); and**
- c. it will not harm the biodiversity of the water environment.**

#### **4.4.2 Potential for environmental harm**

DIRECTIVE 2004/35/CE Article 3: Scope

*1. This Directive shall apply to:*

*(a) environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities;*

*(b) ) damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.*

## **Article 5**

*Preventive action: 1. Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures.*

The precautionary principle was regularly ignored by the developers and authorities during the construction of all the Whitelee developments as can be seen in these examples:

*“Although the PMO reports were available to EAC, East Renfrewshire Council (ERC) and South Lanarkshire Council (SLC) from 2006, the actual water test results were not made known to either the Environmental Health Department or the Planning Department. This dangerous level of bacterial and other contamination involving PWS, and contamination of groundwater (GW) and surface water (SW) were known to SPR prior to submission of a planning application for the first Whitelee WF Extension (WL1) in 2010.”*

***100 I had failed earlier in the year to get East Ayrshire Council to take the impacts seriously with respect to water, and the now consented Sneddon Law windfarm. One of our neighbours had four quarries and more than three close turbine bases within the water catchment of his borehole supply. Whilst SEPA had raised concerns about the impact of this windfarm on PWS in their letter to EAC when assessing that planning application, they had not objected. Despite our concerns that CWP Ltd, [Developers of Sneddon Law] had not conducted a formal geohydrology survey and assessed groundwater flows which might impact on borehole supplies, EAC had signed off the Planning Permission for Sneddon Law WF in January 2014. This was similar to the WL Extension planning application, where I had also raised concerns about proximity of the nearest turbine to our water collection tank in an objection to EAC and Scottish Ministers.***

*44 Regardless of whether SPR considered that they had a role in causation, SPR failed to comply with planning conditions for WL Extension (SPR, Issue 02 Condition 6.8 and 6.9 (Phase 1 and 2) Monitoring Plan, 2010) by failing to notify householders that their water was unfit to drink, or provide emergency contact details in the event of water problems, as required in planning condition 6.8 and RPS for WLWF 5.2 (RPS, 2003) in their Pollution Prevention Plan. SPR failed to meet these conditions by failing to notify either EAC or residents directly of adverse monitoring results, as stated in these conditions and mitigation arrangements. SPR failed to acknowledge that serious bacterial contamination occurred not just once, but throughout the entire construction period 2006-2012.*

*54 SPR also denied any responsibility for PWS contamination on the basis that no industrial contaminants were measured in water supplies. However, at no time did SPR or its agents include water test parameters which included the measurement of industrial contaminants or minerals in PWS. Absence of industrial contaminants in the water supplies was therefore a self-fulfilling prophecy on the part of SPR and represented completely inadequate surveillance of PWS.*



*134 Despite the clear danger to health of a contaminated water supply, SPR seem to have a flagrant disregard for informing responsible authorities and those affected, of water quality results or pollution incidents which are likely to endanger health, whether for private or public water supplies. Despite repeated requests from EAC, SPR have still not released all the PWS monitoring results for WLWF. SW were employed by SPR to provide analysis of PWS supplies during WL WF and Extension construction. Despite the implications for public health, under an EIR request, they have refused to release results to residents of those PWS, citing commercial confidentiality as the overwhelming priority (SW FOI refused re disclosing PWS monitoring results at WL WF, 2015).*

*234 Because no boreholes were drilled or groundwater testing requested from the developer by planning or regulatory authorities, even in relation to assessing impacts to groundwater from potentially polluting activities such as quarrying, the importance of potential pollution pathway into shallow groundwater through superficial deposits or to deep groundwater through rock fractures was not adequately assessed for previous Whitelee windfarm proposals.*

*307 SW had standing orders in place with SPR such that they should be notified directly of any contamination event on water catchment land (SW, FOI response 5139426 from SW re. notification by SPR of contamination spills at WL WF, 2015).*

*308 This did not happen, despite abnormal water sampling results showing significant chemical contamination with phenols, toluene and phthalates found in a borehole*  
[END of EXTRACT]

## **4.5. Monitoring**

(CIRIA C648 Control of water pollution from linear construction projects)  
“9.5 8.2.

*It is essential to know the status of surface water and groundwater before construction starts. Mitigation measures should be designed to protect these baseline conditions in the water environment. Baseline data can then be used as a benchmark to determine what effect, if any, construction activities are causing.*

*A baseline survey of surface water features should include the presence, water quality, depth and flow characteristics of all water bodies at or near the site. Particular attention should be given to identifying ephemeral ditches and field drains that tend only to flow in wetter conditions and may be easily overlooked during site survey work. Groundwater data is usually obtained from the engineering ground investigation or a dedicated groundwater monitoring investigation, and can include water quality and water level as well as ground permeability and/or porosity. The level of information obtained should be risk-based, depending on the likely impacts to occur and the sensitivity of the water feature. In some circumstances it would be adequate to obtain samples and test for a limited range of parameters such as suspended solids,*



*hydrocarbons, BOD and pH. Where there are greater risks, for example the presence of contaminated land, then testing for a full suite of chemical determinands may be more appropriate.*

Often baseline monitoring is done after forestry felling has begun, which then does not provide a true record of the original status of the surface and ground water on which to base any degradation of the site. On-going regular testing for all developments is a legal requirement and the ONLY proof that mitigation is working and that there is no significant negative impact on the water environment from the windfarm.

*ELD 2004/35/CE Article 5.3 Definitions*

*14. 'baseline condition' means the condition at the time of the damage of the natural resource and services that would have existed had the environment damage not occurred, estimated on the basis of the information available;*

**As Whitelee is SPR's flagship windfarm the credibility of all their windfarm developments is based on the belief that their professed mitigation measures are successfully preventing any pollution. How can the public be confident that this is the case if they do not constantly and consistently monitor all subsequent developments with results made easily available?**

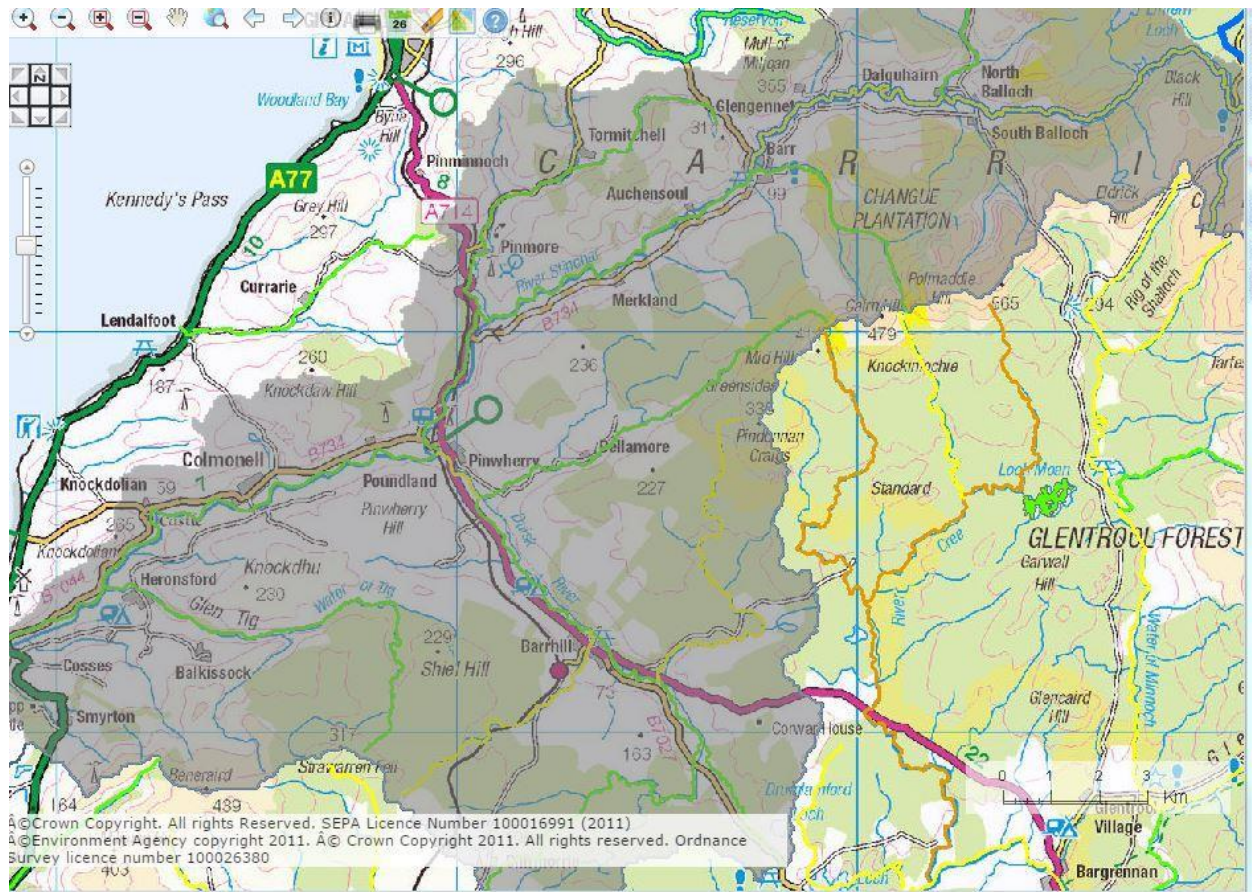
Without regular testing showing consistent positive test results there can be no confidence that there will be no effect on public or private water supplies and on the water environment on any development site.

**4.5.1. Arecleoch SPR windfarm** consists of 60 turbines, which became operational in the Autumn of 2011 and was formally opened along with 28 industrial turbines at Mark Hill in June 2011. Both these windfarms along with Hadyard Hill, Hadyard Hill Extension, Assel Valley, Millenderdale and Straid windfarms are all sited within the River Stinchar water catchment protected zone seen in the map below. Tralorg plus the 5 'Straiton' windfarms including Dersalloch are sited on the Girvan and Doon water catchment zones.

None of these developments, according to the FOI replies, have been adequately monitored or assessed according to the legal requirements *as defined in Directive 2000/60/EC Article 8* <sup>[2]</sup> during the preparation, construction or operation of windfarms.

---

<sup>[2]</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>



The extent of the protected River Stinchar zone is the grey shaded area

The same 'best practice' mitigation methods to protect the hydrological environment have been used on the Arecleoch site as the Whitelee site which leaves us with a lot of unanswered questions and a LOT to be worried about.

FOI Ref: FOI85279 request **illustrates that SEPA are NOT doing the required monitoring:**

*1. Arecleoch - Could you please therefore supply me with details of all water testing sites, dates and results from base line to present day and list all properties tested for including suspended solids and particulate matter/ colour (mg/lpt/Co)/turbidity (NTU), Iron/manganese/E coli/ coliforms/toluene and any other pollutants. states:*

***Q1. We advise SEPA has no routine groundwater quality, level monitoring or microbiology water quality monitoring in the Arecleoch area.***

**It is therefore reasonable to conclude that the methods employed may not be effective.**

FOI Ref: FOI85279 Q.9. *Is SEPA monitoring the Water of Tigg?*

*10. If so please can you supply evidence?*

***Q9. and Q10. Please refer to the table below for sampling conducted at the Water of Tigg near Heronsford. We advise both sets of results indicate this site would classify as High/Good.***

Site	Date	Biological Monitoring Working Party	No. of Taxa	Average score per taxon	No. of top scoring taxa
Water of Tigg nr Heronsford	08.06.05	174	27	6.4	8
Water of Tigg nr Heronsford	23.11.05	126	19	6.6	6

***We advise SEPA does not have any monitoring points on the Water of Tigg, therefore we do not hold any monitoring data.***

The date of this testing i.e. 08.06.05 would, in this instance enable these results to be used as base line data only. SEPA has not further monitored this important tributary of the River Stinchar which rises in the heart of the Arecleoch development and which could have provided valuable data on windfarm mitigation.

**The fact that they have not monitored the impact on the surface and ground water before during and after the development of the 60 SPR turbines at Arecleoch is a breach of the water directives.**

And the question must be asked as to why this essential process has not been implemented when it could provide much needed evidence for developers to prove that their best practice and mitigation measures work?

EIR requests for information routinely show that monitoring information is not held.

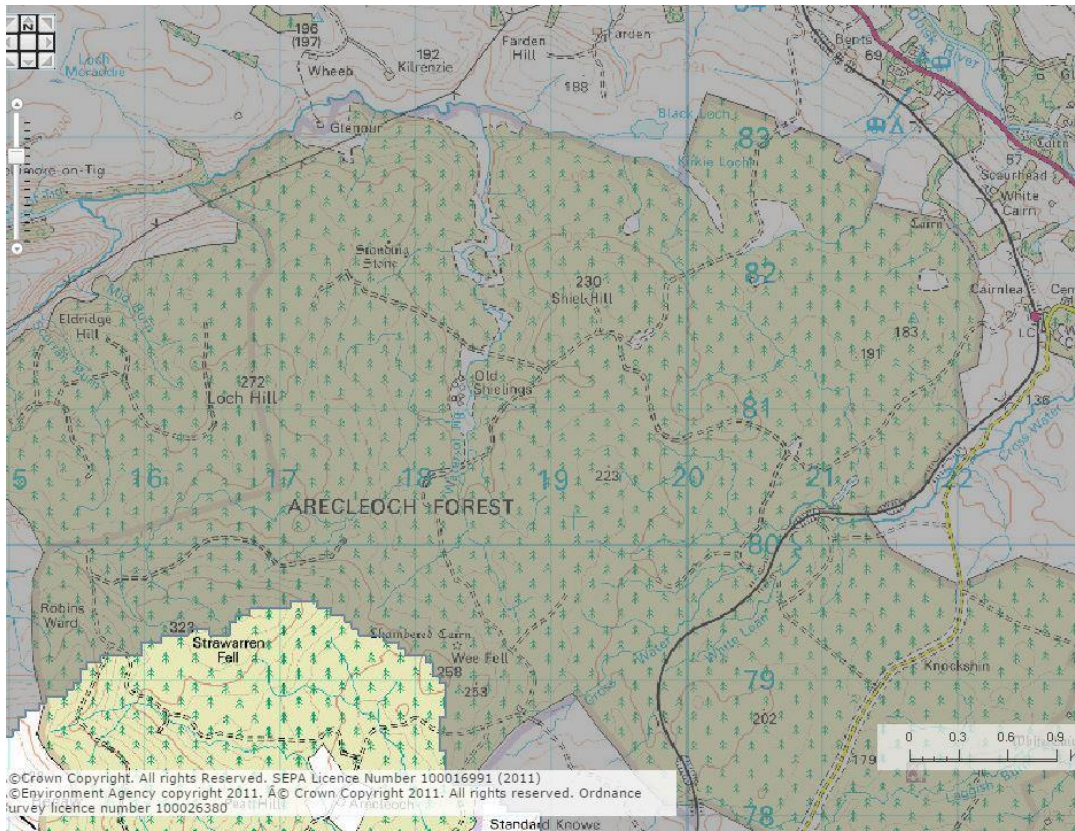
EIR/2015/565 to South Ayrshire Council re PWS show again lack of monitoring:

***Q.3. In the case of PWS located within or close to already constructed wind farms, was a risk assessment conducted within baseline measurements? If so, was it before any forestry clearance began?***

**“Arecleoch**

***The Council does not hold a record of a risk assessment being undertaken. The Council’s records show that a private water supply investigation was carried out, which looked at 15 properties and their sensitivity to the development. Our records do not show any baseline measurements collected.”***





The map above illustrates the area occupied by Arecleoch windfarm within the River Stinchar protected water catchment area (shaded grey). The extent of rivers (Water of Tigg) and their tributaries are clearly visible.

#### 4.5.2. Fault and Dyke impacts

Fault lines (cracks caused by fracturing such as earth quakes) and dykes (caused by an igneous intrusion from the centre of the earth) are dominant in much of Scotland but are very much ignored by the competent authorities and wind developers. They can have an important impact on the aquifer allowing water to flow in a different direction to the topography. This means that without extensive borehole testing there is no way of knowing the relationship between dykes/fault lines and aquifers. The FOI below clearly illustrates that this essential information is not monitored, therefore there is NO way of identifying the integrity of water networks let alone how they influence reservoirs and PWS.

FOI Ref: FOI85279 Q. 8. *Is SEPA monitoring the relationship between dykes/fault lines and aquifers?*

***Q8. SEPA is not monitoring the relationship between dykes/fault lines and aquifers therefore we do not hold any monitoring data. This information is excepted under Regulation 10(4)(a) of the Environmental Information Regulations 2004.***

***Under SEPA's duty to advise and assist under the terms of The Environmental Information (Scotland) Regulations 2004 regulation 9, the interaction between Faults and Dykes and groundwater is a topic which would be covered in most Hydrogeology textbooks.***

Considering the number of fault lines and dykes crossing these areas (the Glenapp Fault runs through Arecleoch) and the potential for negative impact on the aquifer, I find this comment 'a topic which would be covered in most Hydrogeology textbooks' **a total dereliction of duty of care.**

The Southern Uplands Fault is a fault in Scotland that runs from Girvan (or more specifically from the Rhins of Galloway) to Dunbar on the East coast. The Stinchar, Dove Cove and Glen App faults form a part of the Southern Upland Fault Zone in the southwest whilst in the northeast, the Lammermuir, Dunbar-Gifford, Crossgatehall, Pentland and Firth of Forth faults are all associated with the Southern Uplands Fault

It has become evident through the witness statement of Dr Lee during the PLI that SPR used a 1928 outdated map -for their original Whitelee Geohydrology Report –and did not research the possibility of a later map. They then used the same 'desk top' study in subsequent Whitelee ES in the geohydrology section, as the basis for best practice and mitigation.

*Andesite and andesitic quartz dolerite are two types of volcanic rock. The fact that they are NW-SE trending is typical of Tertiary dykes (linear igneous intrusions) in the region, as this is the dominant stress field that occurred during the Tertiary (ca 50Ma) when the Atlantic ocean was opening up (North America was tearing-away from the land mass that is now Europe). Andesites have less Mg and Fe containing minerals, than for example a basalt. They are also often coarser grained (they cool more slowly) and because of the petrology (chemical and physical appearance/make-up) they may weather more readily than basalt, which is finer grained., Andesites often don't weather nearly as well as basalts.*

*No igneous rock is particularly permeable when fresh, but if "rock A" weathers (that includes chemical weathering by groundwater) faster than "rock B" then its presence can be a weakness. Rocks, including igneous rocks that are injected along fault lines are also sometimes fractured because of the faults' movement.*

*Local igneous intrusions such as dykes can (depending on their thickness) produce quite localised hydrothermal convection cells - this hot circulating water can alter the dyke and surrounding rock quite drastically, turning something that's hard and non-permeable into a mushy and/or fractured mess which can be very permeable*

*They can prove to be a "weakness" along which fluids can percolate to lower strata*

This is verified in section 4 of the Inquiry Statement -Geology and Groundwater and illustrated in figure 21:

*229 We obtained an independent Geohydrological review from Dr. Steve Carroll (S.Carroll, Whitelee windfarm hydrogeology summary, 2015) of the Whitelee windfarm site, providing him with information from preceding WLWF Environmental Assessments and preceding PWS risk assessments, to inform our understanding of the current situation and geohydrological risks pertaining to the proposed WL 3.*

230 is a summary of Dr Carroll's report including:

*Lavas of the CPV formation elsewhere in central Scotland often show zonesporous and permeable sedimentary rocks or broken up lava at the junction offflows of different age. These zones could form very localised aquifers and allow more rapid groundwater flows than would occur in fractured basalt that form most of the lava flows. These narrow aquifers and potential water channels through fractures are also more difficult to predict from an overall geological map.*

*241 It is understood that with this this type of geology, where the structure of layers and fractures is unknown in detail, it can be practically impossible to predict the path, depth and quantity of groundwater with any confidence (Groundwater and its susceptibility to degradation. , 2003), Figure 21, page 54. Furthermore, the confined and limited aquifers, high water table and narrow unsaturated zone of soil or peat means this type of geology and ground structure is particularly susceptible to pollution.*

[END of EXTRACT]

Blasting for quarries, turbine bases and access roads can further fracture the bedrock and form pathways direct to the aquifers (see the illustration on page 7). Quarry sites are selected for their easy access to the bedrock and are often at the top of a water catchment area. They are continuously used by heavy contract vehicles such as bulldozers and excavators etc. (which require fuel and oil etc.). Any spillage could find its way directly to the aquifer through a fracture with no potential to mitigate.

It can also be seen from Dr. Connor's evidence statement that once the bedrock has been removed that the quarries are then used as landfill:

*413 From PMO reports for May/June (Ironsides Farrar Ltd, 2007), 556, (Ironsides Farrar Ltd, August 2007), 2091, (Ironsides Farrar Ltd, 2007), 607, it is reported that deep peat, slurry and silt was stored in the onsite quarries and that not only were leaks seen from the quarries, but that these quarries allow ready access of surface water to groundwater; including any chemical contaminants.*

[END of EXTRACT]

#### **4.5.3. Impacts of siting wind turbines on peat bogs:**

##### **3.9 Impacts of siting wind turbines on peat bogs:**

*Historically, drainage ditches were used to lower the water table in an attempt to make peatland more suitable for farming or forestry (Armstrong et al., 2009). The water table is naturally high on peatland and lowering it, in the first instance, changes the ecology of a peatland by simplifying the micro-topography and species composition of the bog (Lindsay, 2010). A very small change in water table can result in substantial alterations to the bog moss communities (Lindsay, 2010). Reducing the water table also exposes peat to more aerobic conditions (altering the microbial community) which increases decomposition and mineralisation rates (Holden et al., 2007; Anderson et al., 2013). Increased mineralisation from the underlying mineral material (not the peat itself) would result in the leaching of nutrients*



(calcium, magnesium, manganese, aluminium and potassium) and increases in suspended sediment (from erosion), ammonium and Dissolved Organic Carbon (DOC) in water ways (Leeks & Roberts, 1987; Duxbery & Peverly, 1978; Holden et al., 2007; Worral et al., 2007). The hydrological response of peatland also changes with the lowering of the water table as water pathways change. In undisturbed peatland, most water movement occurs in the upper acrotelm layer (the living plant layer) and is controlled by the amount of water held there (NE, 2010). However, lowering the water table can result in the settlement of peat (drying) and a reduction in its porosity (Holden et al., 2007). This leads to a reduction in the storage capacity of the peat and faster discharge of water as it and the acrotelm layers ability to store water will be reduced. Ditches create more sub-surface storage but they also provide a rapid conduit for run-off (Holden et al., 2006; Ballard et al., 2012) which results in changes in the volume of runoff (Leeks & Roberts, 1987) and the frequency of flooding peaks (Holden et al., 2004; Ballard et al., 2012). However, the magnitude of change is variable and is linked to factors that include; density of ditches, the soil properties of the specific peat and the slope of the site (Holden et al., 2004; Lane & Milledge, 2013). In addition, drainage can increase the occurrence and or efficiency of naturally occurring soil pipes (tubes within the peat that can transport water) which can further increase sedimentation and runoff (Holden et al., 2007). Another potential consequence of drainage ditches at wind energy facilities on blanket bogs is the risk of peat slides. These have been recorded at a number of wind energy facilities in Ireland and Britain (e.g. Derrybrien, Co. Galway and Garvagh Glebe, Co. Leitrim) and the construction of drainage ditches associated with roads have been linked as a secondary causal factor (Lindsay & Bragg, 2005 ; Long et al., 2011b). In their paper classifying peat movements, Dykes & Warburton (2007) define a peat slide as “failure of blanket bog involving sliding of intact peat on a shearing surface at the interface between the peat and the mineral substrate material or immediately adjacent to the underlying substrate” (Tosh, D.G., Montgomery, W.I. & Reid, N. (2014). ‘A review of the impacts of wind energy developments on biodiversity’. Report prepared by the Natural Heritage Research Partnership (NHRP) between Quercus, Queen’s University Belfast and the Northern Ireland Environment Agency (NIEA) for the Research and Development Series No. 14/02)

#### **4.5.4 Windfarms not yet constructed:**

There are many windfarm developments about to begin construction throughout Scotland and in particular in the locality of South Ayrshire and Dumfries and Galloway. Following the recent subsidy changes the time restriction on completion of developments will encourage further shortcuts in an already under regulated process. Councils must resist the pressure to allow projects to proceed without all the legal requirements to safeguard the water environment. Councils need to note that ELD 2004/35/CE:

##### *Article 5.3 Definitions*

9 9. ‘imminent threat to damage’ means a sufficient likelihood that environmental damage will occur in the near future;

12. 'natural resource means protected species and natural habitats, water and land;

EIR/2015/565

Q6. With regard to wind farms not yet constructed -Kilgallioch, Tralorg, Assel Valley, Millenderdale, Glenapp and Dersalloch: There is no information to suggest that base line testing has been undertaken.

As Arecleoch and Mark Hill developments have obviously been constructed using the same conceptual desk studies and professional opinions as Whitelee; and without due consideration for the results of the 'Jacob's Whitelee Windfarm Post Construction Groundwater Quality Monitoring Report Nov 2009' identified in Dr Connor's Inquiry Statement:

#### **4.2.2 The Jacobs Report – involvement of Statutory authorities.**

*307 SW had standing orders in place with SPR such that they should be notified directly of any contamination event on water catchment land (SW, FOI response 5139426 from SW re. notification by SPR of contamination spills at WL WF, 2015).*

[END of EXTRACT]

**Without conducting the legally required monitoring, how can the council possibly sign off conditions of consent with any confidence that mitigation measures will work for any of these consented windfarms.**

**4.5.5.Kilgallioch** (Areacleoch extension) states in the hydrology section (only 9 pages about a windfarm on extremely deep peat with highly sensitive areas) in the ES for 96 turbines in its desk top study:

#### **11.4.9 Migration of Pollutants from Contaminated Land**

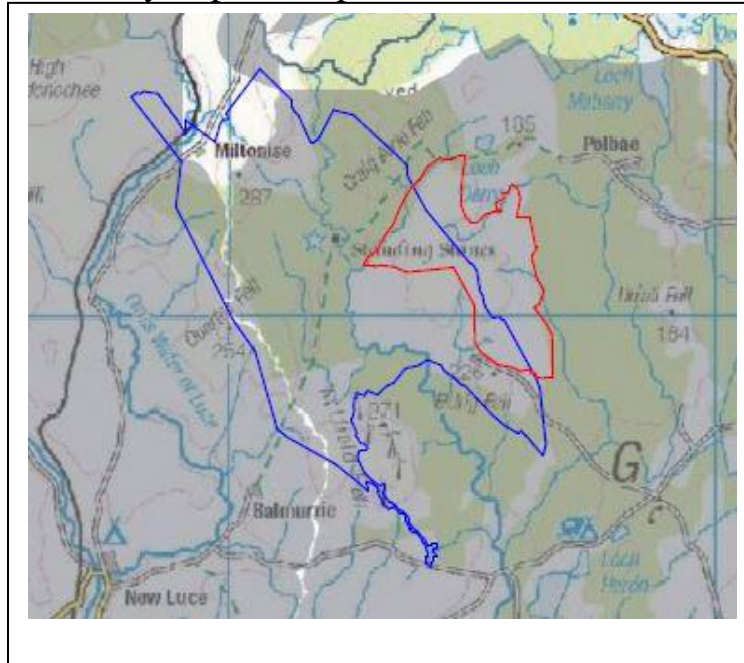
73. Desk studies have not identified any areas of potentially contaminated land within the study area and no effects are anticipated. Should potentially contaminated land be encountered during excavations, however, this would be tested and appropriate action taken in accordance with The Environmental Protection Act 1990 (Amendment) (Scotland) Regulations 2001 (Ref. 11-15). Effects associated with contaminated land are therefore considered to be of negligible magnitude and significance, in accordance with Table 11.2.

23. The significance of the unmitigated effect is a product of combining sensitivity and magnitude, as defined in Table 11.2.

Table 11.2: Unmitigated Significance Criteria

	Sensitivity		
Magnitude	Low	Moderate	High
Negligible	Negligible	Negligible	Negligible
Low	Negligible	Minor	Moderate
Moderate	Minor	Moderate	Moderate / Major
Major	Minor	Moderate / Major	Major

Even though the following map of protected water catchment zones (grey area) clearly shows that these areas could be severely impacted upon:



40. During the design phase of the Development, areas that drain into Kirkcowan Flow SAC / SSSI and Blood Moss SSSI have been avoided to circumvent any potential effect on these designations.

The blue outline is the area of the windfarm / the blue area is Kirkcowan Flow SSSI which shows it is surely impossible for the development not to have an impact? It should be noted that all this area is within the UNESCO Biosphere - an area which should be afforded total protection from all damaging developments. The table 11.4 from the ES clearly illustrates the potential for pollution to this area.

The Galloway and Southern Ayrshire Biosphere has fundamental, complementary functions required of a UNESCO Biosphere Reserve Conservation – to preserve genetic resources, species, ecosystems and landscapes;

There are 14 Special Areas of Conservation and 4 Special Protection Areas within the Biosphere.

The impact of the geology on the flow of ground water can only be guessed at through the ‘desk top’ studies and ‘professional’ judgements due to the presence of the Southern Upland Fault. The lack of detailed borehole testing and mapping leaves the potential for pollution wide open in an ecologically sensitive area



The Killantringon fault line lies in a North/east to south west direction and has the same impact potential as stated above- (4.5.3.)

Table 11.4: Sensitivity of Receptors to Potential Effects

Receptor	Potential Effects	Sensitivity	Comment
Groundwater and subsurface water	Pollution as a result of erosion and sedimentation from construction activities and uncontained spills from chemical handling / storage.  Diversion of subsurface flows as a result of track construction and the installation of turbine foundations / hardstanding.	High	Considered high sensitivity as hydrocarbon pollution in bedrock fissures has a lengthy attenuation period and some private water supplies draw water from boreholes.
Kirkcowan Flow SAC / SSSI and Blood Moss SSSI	Pollution or pH changes as a result of track construction and uncontained spills from chemical handling / storage. Drying out of peat as a result of construction activities.	High	Considered high sensitivity as the function of these receptors could be altered as a result of pollution and reinstatement of these receptors would be complex.
Soils	Pollution as a result of track construction and chemical handling / storage.	Moderate	Considered moderate sensitivity as the receptor has some capacity to filter and attenuate most potentially polluting chemicals and sediment over time.
Peat	Pollution as a result of track construction and uncontained spills from chemical handling / storage. Drying out or destabilisation of peat as a result of construction activities.	Moderate	Considered moderate sensitivity as the receptor has some capacity to filter and attenuate most potentially polluting chemicals and sediment over time. Reinstatement / rewetting of this receptor is possible.
Bedrock	Loss of strata as a result of stone winning from borrow pits or turbine excavations.	Low	Considered low sensitivity as the receptor can function normally throughout all phases of the Development.

*The imminent threat of such damage occurring by reason of any of those activities; (b) ) damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.*

#### *Article 5*

*Preventive action: 1. Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures.*

Potential construction effects leaves the door wide open for pollution and ‘Good Practice measures’ may be embedded in the design but they have clearly not worked in other developments.

### 11.4.3 Potential Construction Effects

57. Various construction activities could give rise to effects on the hydrogeological environment. These activities are outlined in Chapter 4: Project Description of this ES. Good practice measures to protect surface and ground water have been embedded into the Development design and are set out in the WMP, provided as Technical Appendix 4.3 to this ES.

Kilgallioch lies on the water catchment zones of the Bladnoch, Water of Luce and Natura status Kirkcowan Flow - River Water Bodies - Tarf Water (u/s Drumpail Burn) Ground Water Bodies - Newton Stewart bedrock and localised sand and gravel aquifers Fresh Water Fish Directive Salmonid Waters River Bladnoch and Water of Luce, Drinking Water Directive Groundwater Newton Stewart bedrock and localised sand and gravel aquifers.

Stranoch Windfarm (24 turbines) which is pending a decision by the Scottish Government following a Public Inquiry is due west of Kilgallioch sited fully on the Water of Luce protected water catchment zone. Again the potential for harm must be considered by the DPEA.

#### DIRECTIVE 2004/35/CE Article 3: Scope

*1. This Directive shall apply to:*

*(a) environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities;*

*(b) ) damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.*

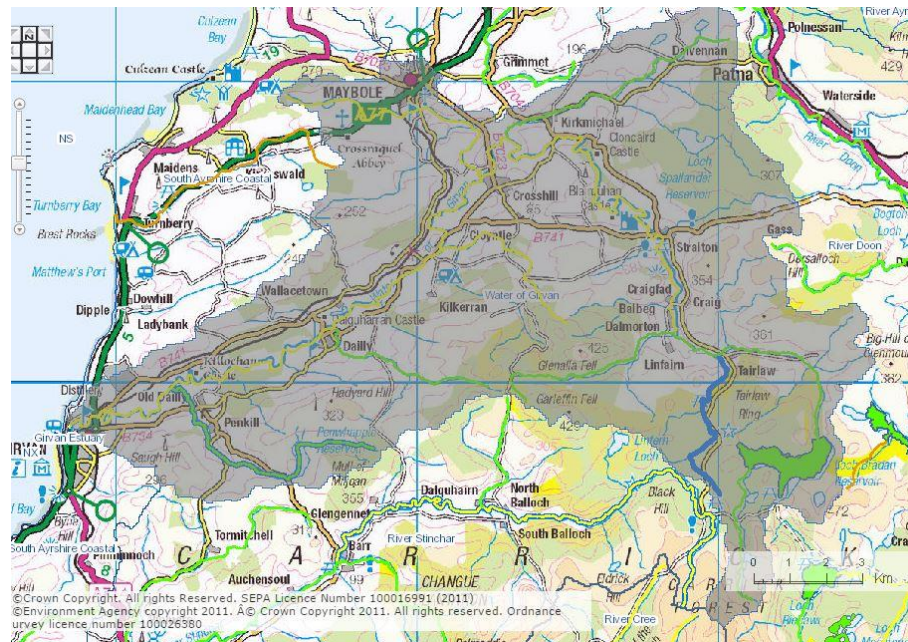
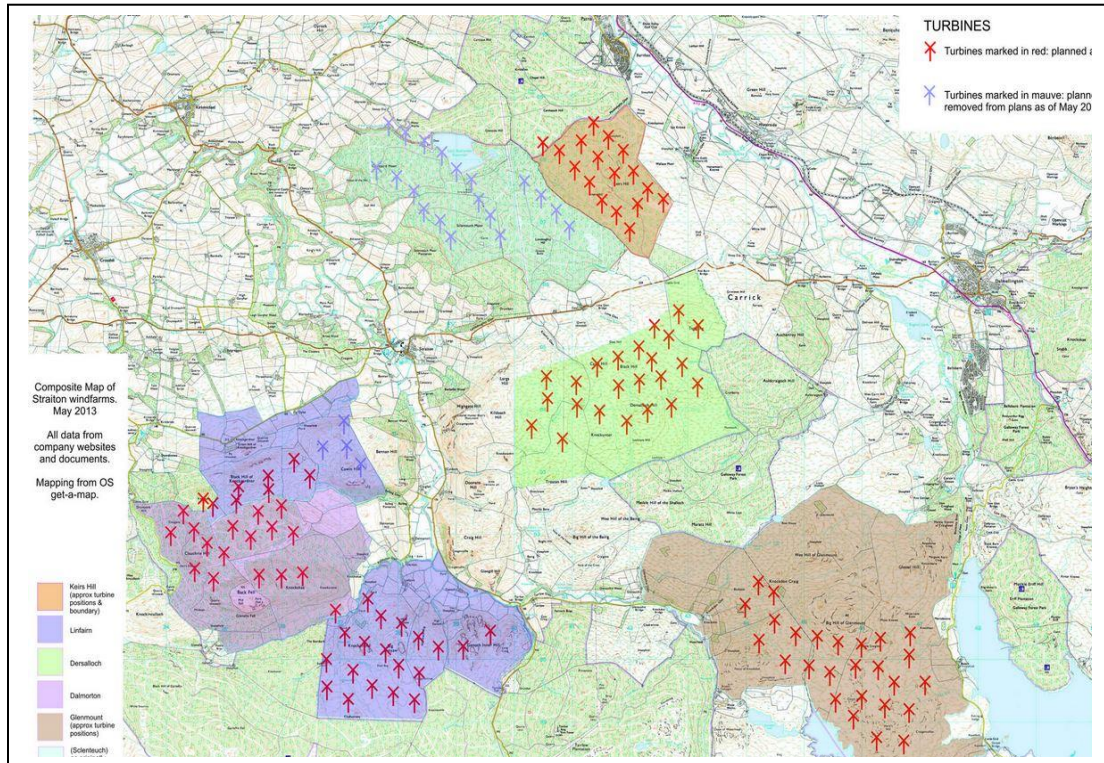
#### *Article 5*

*Preventive action: 1. Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures.*



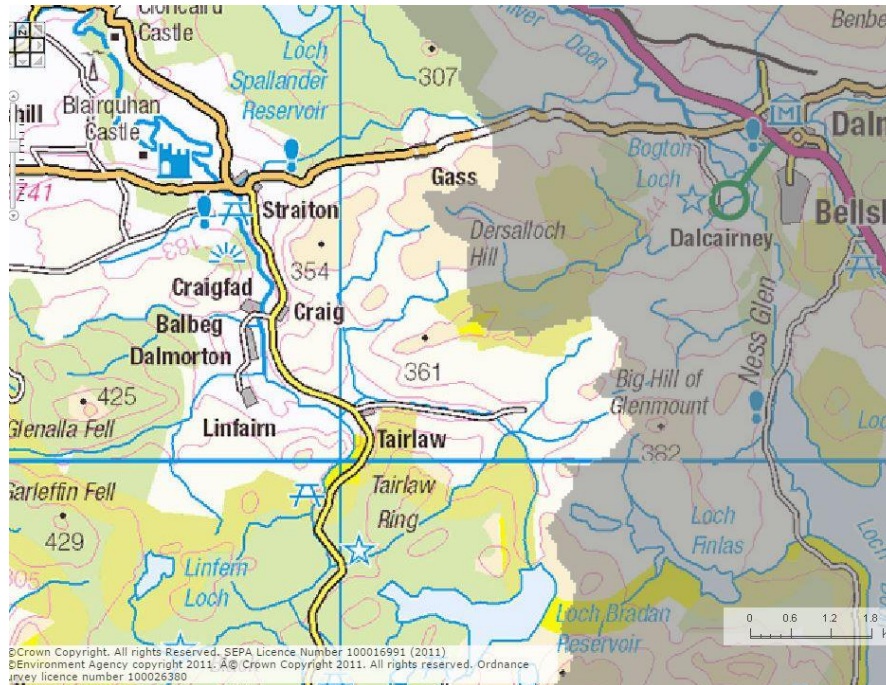
#### 4.5.6. Dersalloch and windfarms surrounding Straiton

The Straiton area is at the head of the Girvan and Doon water catchment areas. Some of this catchment feeds into Loch Bradan which supplies a large part of South Ayrshire and beyond.





It can be clearly seen from both the above map showing the Water of Girvan catchment zone (shaded grey) and the map below of the River Doon catchment zone (shaded grey) that the development of Dersalloch will seriously impact on the surface and groundwater of River Water Bodies - Dalcairnie Burn/Shalloch Burn, Ground Water Bodies - Girvan bedrock and localised sand and gravel aquifers, Fresh Water Fish Directive Salmonid Waters (SEPA) - River Doon Drinking Water Directive Groundwater SEPA - Girvan bedrock and localised sand and gravel aquifers.

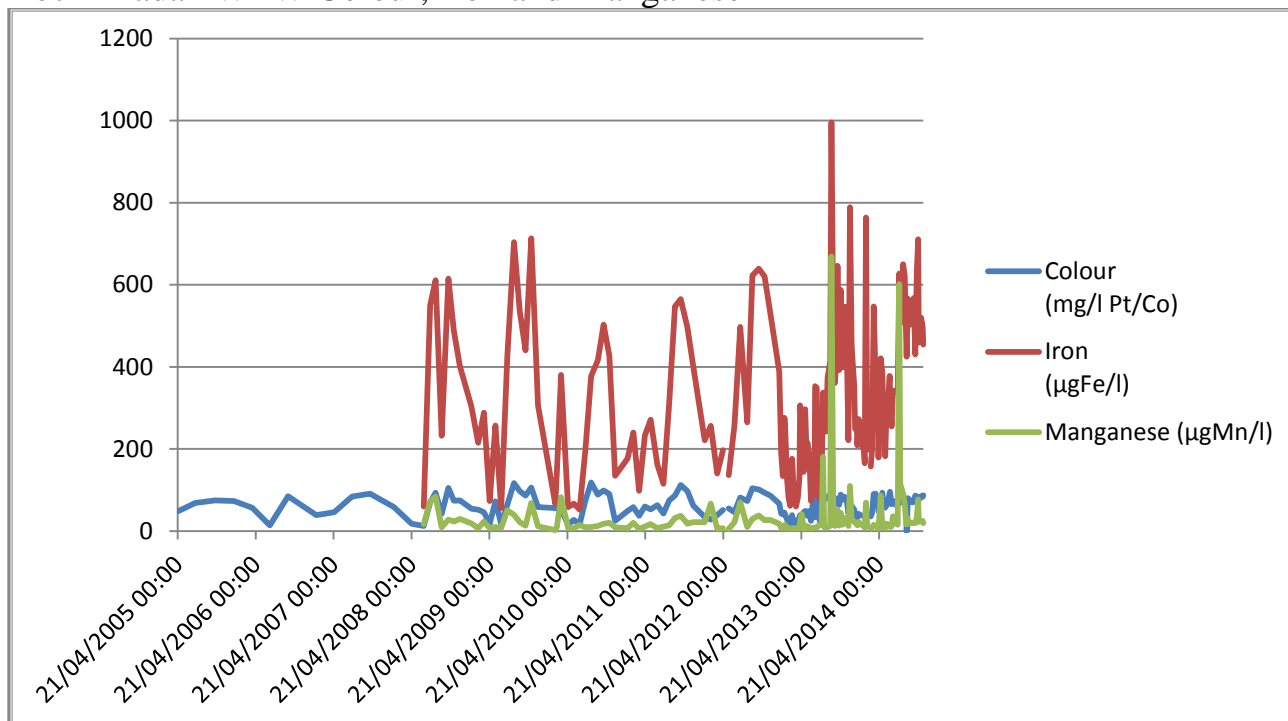


Already pre construction work and felling is affecting the quality of the water as can be seen from the graphs below:

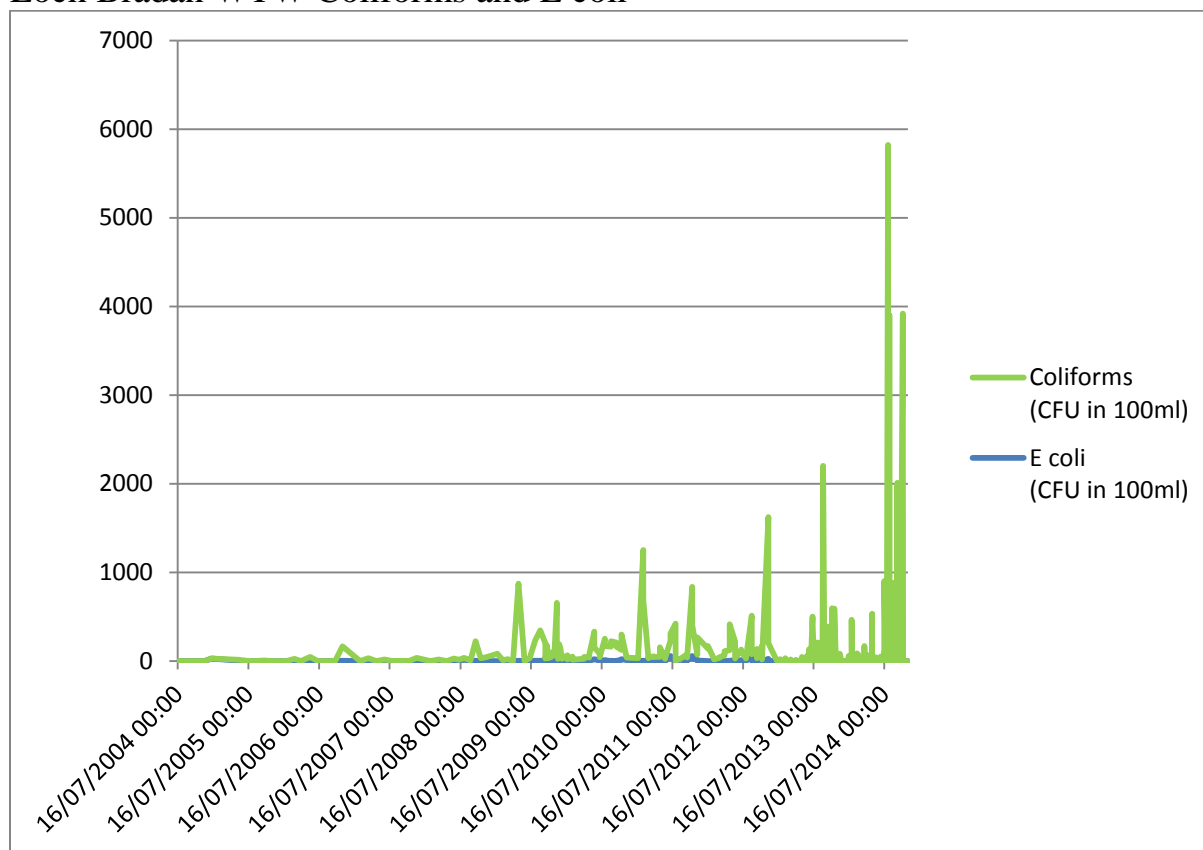
Serious questions arise from all the data below on colour, iron, manganese, coliforms, E.coli and Turbidity (my interpretation of figures supplied by Scottish Water).

For effects from similar peaks in contaminants in water during Whitelee construction -see para 39- *'which made many pws owners very ill'.*)

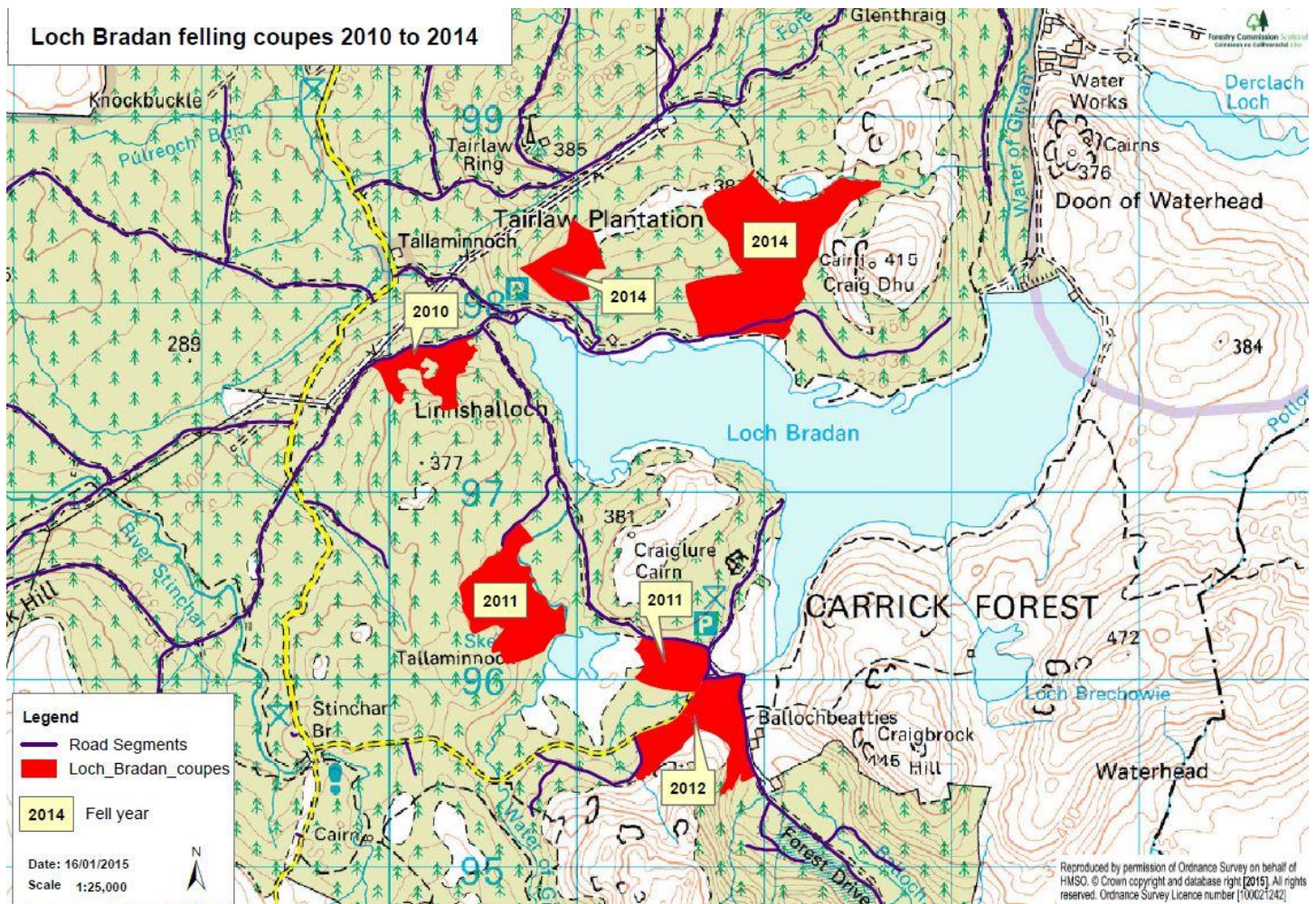
## Loch Bradan WTW Colour, Iron and Manganese



## Loch Bradan WTW Coliforms and E coli







Questions need to be asked about the correlation of pre-construction FCS felling plans –seen above, and the disturbance of peat with raised levels of colour, iron and Manganese

Figures on raw water data from the WTWs at Loch Bradan reservoir in 2013 show unacceptable levels of Trihalomethanes (THMs)

Bradan B	Distribution for Zone Bradan B (South Kilmarnock, Irvine, Troon, Darvel)	Knockmarloch Drive, Kilmarnock, KA1	29/07/2013 13:30	29/07/2013	6607017	Authorised	119.1
Bradan C	Distribution for Zone Bradan C	Meadowpark Drive, Ayr, KA7	13/08/2013 09:20	13/08/2013	6624781	Authorised	112.6
Bradan A	Distribution for Zone Bradan A (Ayr, Dalmellington, Prestwick, Annbank, Hurlford)	Carson Drive, Irvine, KA12	30/09/2013 09:45	30/09/2013	6684294	Authorised	106.1
Bradan A	Distribution for Zone Bradan A (Ayr, Dalmellington, Prestwick, Annbank, Hurlford)	Cavendish Place, Troon, KA10	11/10/2013 09:10	11/10/2013	6693248	Authorised	109.7
Bradan A	Distribution for Zone Bradan A (Ayr, Dalmellington, Prestwick, Annbank, Hurlford)	McClean Drive, Dreghorn, Irvine, KA11	18/11/2013 10:55	18/11/2013	6790910	Authorised	101.1

These figures correlate with the spikes in the above graphs during 2013.

Inquiry statement 86-159:

90 There are increasing concerns worldwide about THMs in public water, which can be absorbed not just by drinking water, but absorbed through inhalation and via the skin, for example when showering. The absorption and dose related effects are greatest in young

*children and infants. Trihalomethanes are conservatively recognised by the World Health Authority (WHO) as a possible human carcinogen.*

*The regulatory standard set by the EU and UK regulatory authorities is set at 100ug/L. In N. America, this limit is set 20% lower at 80ug/L, recognising that long term effects of exposure are difficult to quantify in humans and that there are other non-carcinogenic health effects which can also be serious, particularly related to fatty change in the liver.*

*[END of EXTRACT]*

*Article 7 (Directive 2000/60/EC)*

*2. For each body of water identified under paragraph 1, in addition to meeting the objectives of Article 4 in accordance with the requirements of this Directive, for surface water bodies including the quality standards established at Community level under Article 16, Member States shall ensure that under the water treatment regime applied, and in accordance with Community legislation, the resulting water will meet the requirements of Directive 80/778/EEC as amended by Directive 98/83/EC .*

*3. Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water.*

There is a grave need to investigate these figures and the correlation windfarm construction including pre-construction (accelerated) forestry clearance.

SW had concerns that windfarms were impacting on the ability of WTW to treat raw water adequately (Amlaird WTW catchment risk assessment – FINAL report March 2010)

#### *5.3.1 Windfarm construction and water colour*

*Windfarm construction has co-incided with an increase in raw water colour at Amlaird and other Scottish Water treatment works.*

*A Scottish Water Incident Report in August 2008 reported that increases in colour co-incided with windfarm construction within the Amlaird water supply catchment. The report intimated that windfarm construction may have had an effect on raw water quality, although this was not conclusive.*

*Turbidity also increases following heavy rain, but is normally within the range 1–3 Nephelometric Turbidity Units (NTU). The WTW is normally able to cope with the temporary deterioration in raw water quality and can still produce final water of acceptable clarity.*

The problem of poor raw water quality to Amlaird is now being addressed by planning to bypass water from the Whitelee windfarm site by building a 1m wide pipe to provide alternative water supplies from Glasgow to Kilmarnock at considerable cost to the public purse.

This is a clear breach of the WFD: see Article 11 3 (c/d)

*(c) measures to promote an efficient and sustainable water use in order to avoid compromising the achievement of the objectives specified in Article 4;*

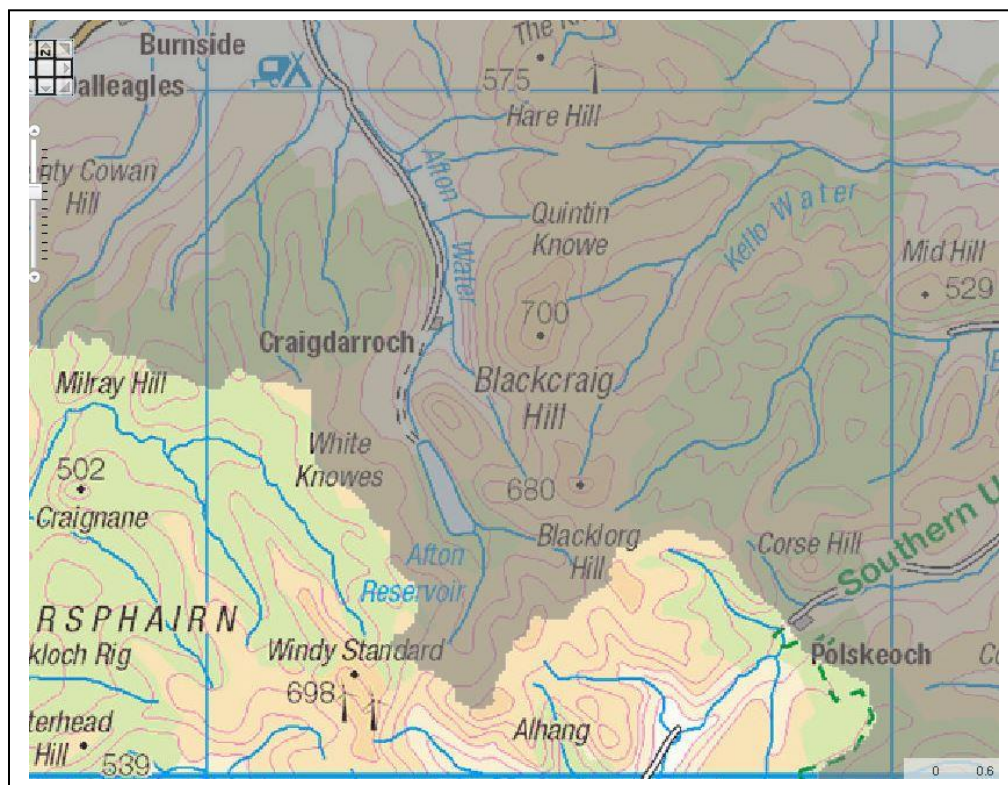


*(d) measures to meet the requirements of Article 7, including measures to safeguard water quality in order to reduce the level of purification treatment required for the production of drinking water;*

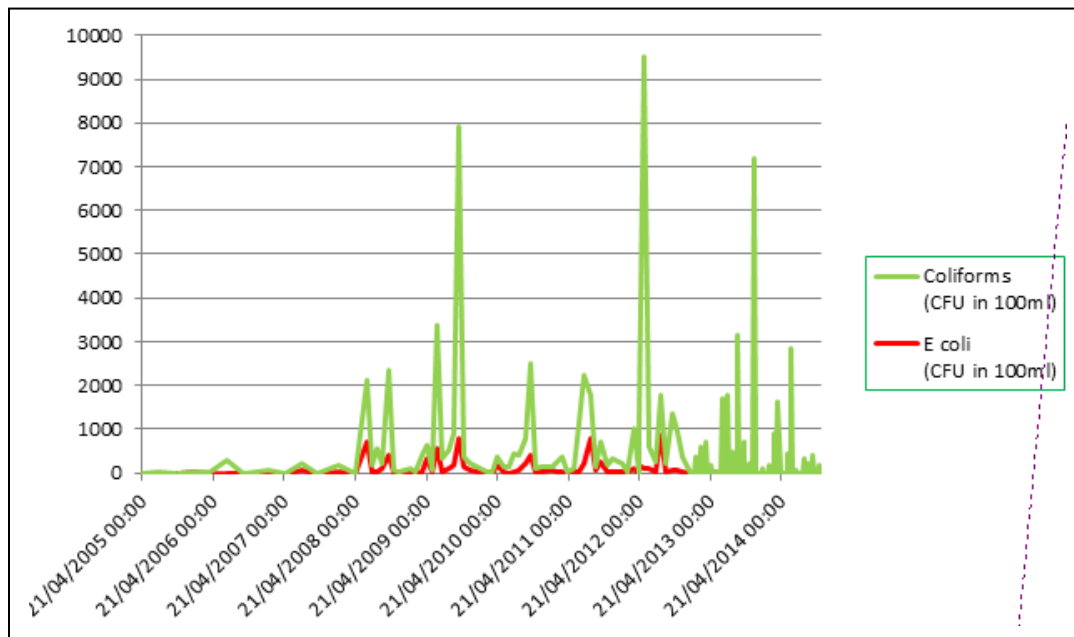
Is this an admission that mitigation has not worked at Whitelee after all? Will the same have to happen for other reservoirs affected by windfarm construction?

#### 4.5.7. Afton Windfarm

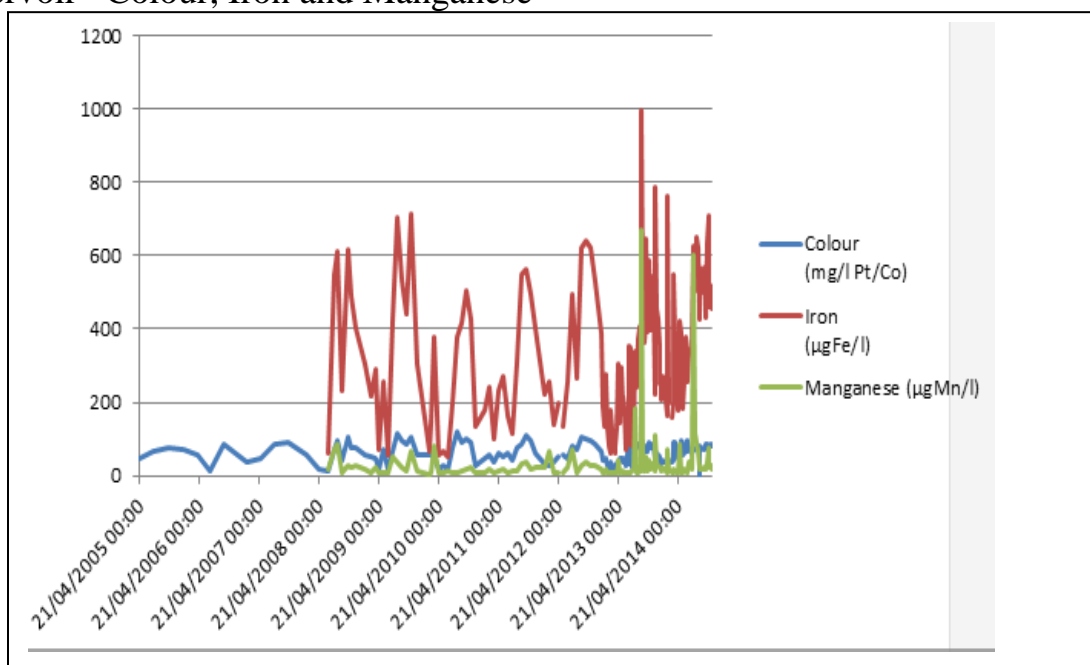
Another windfarm recently consented by the Scottish Government which will have many turbines close to a public reservoir, is Afton, on the Ground Water Bodies - New Cumnock bedrock and localised sand and gravel aquifers / Fresh Water Fish Directive Salmonid Waters of the River Nith Drinking Water Directive Groundwater, (New Cumnock bedrock and localised sand and gravel aquifers) This reservoir serves much of East Ayrshire and again is showing worrying trends of contaminants in drinking water possibly due to pre-construction forest clearance.



## Afton Reservoir Water Supply: Coliforms and E coli



## Afton Reservoir –Colour, Iron and Manganese



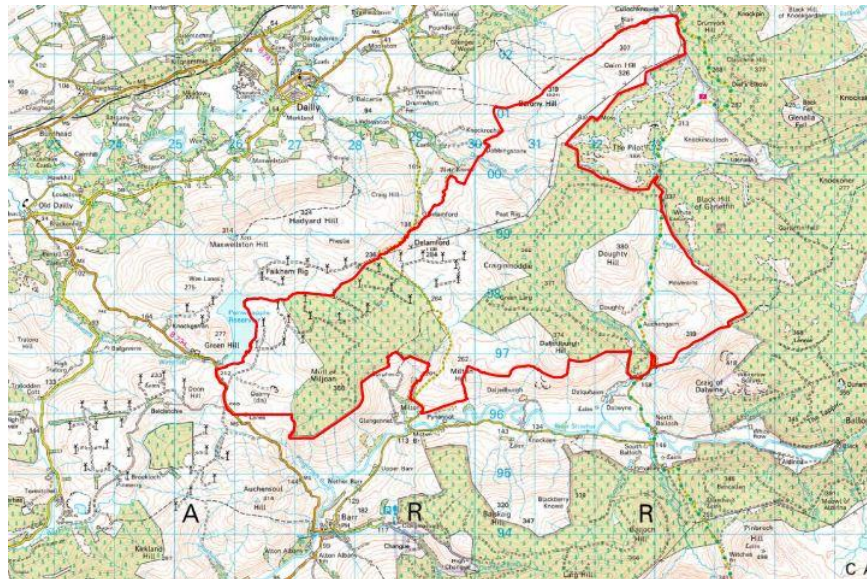


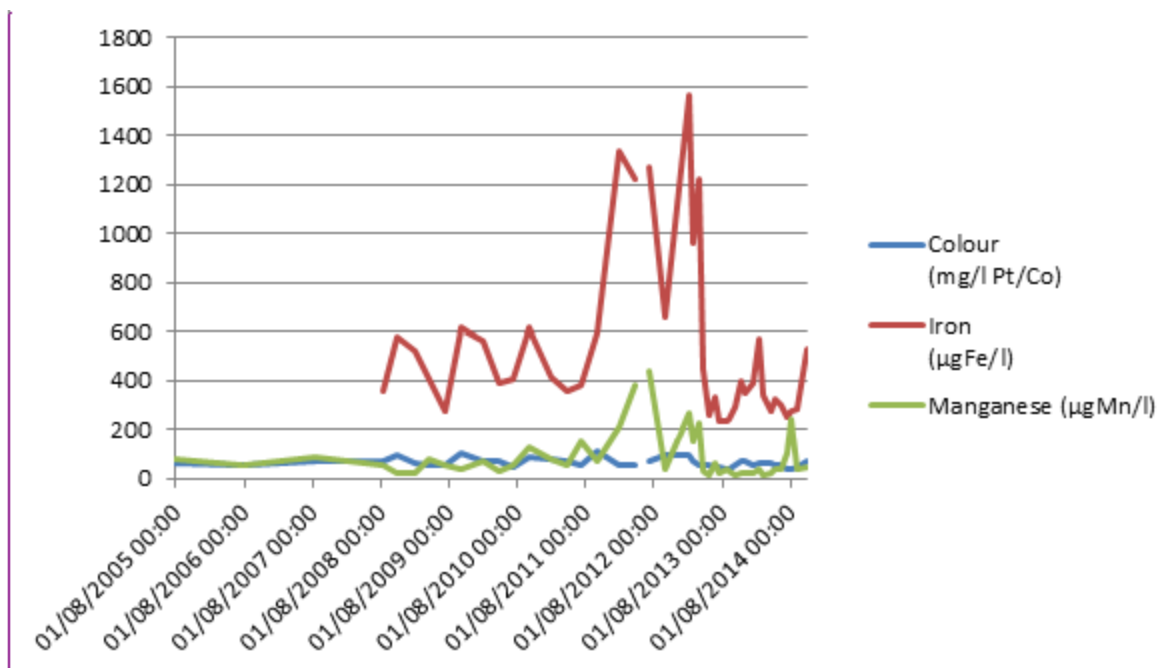
#### 4.5.8.Hadyard Hill Extension

Hadyard Hill windfarm (SSE) has been operational since March 2006

This windfarm has turbines close to Penwhapple reservoir. It does not have on going forest clearance so the question is ‘what is causing the graphs below to show potentially worrying amounts of pollutants in the water?’ Penwhapple Reservoir serves much of South Ayrshire including my own property.

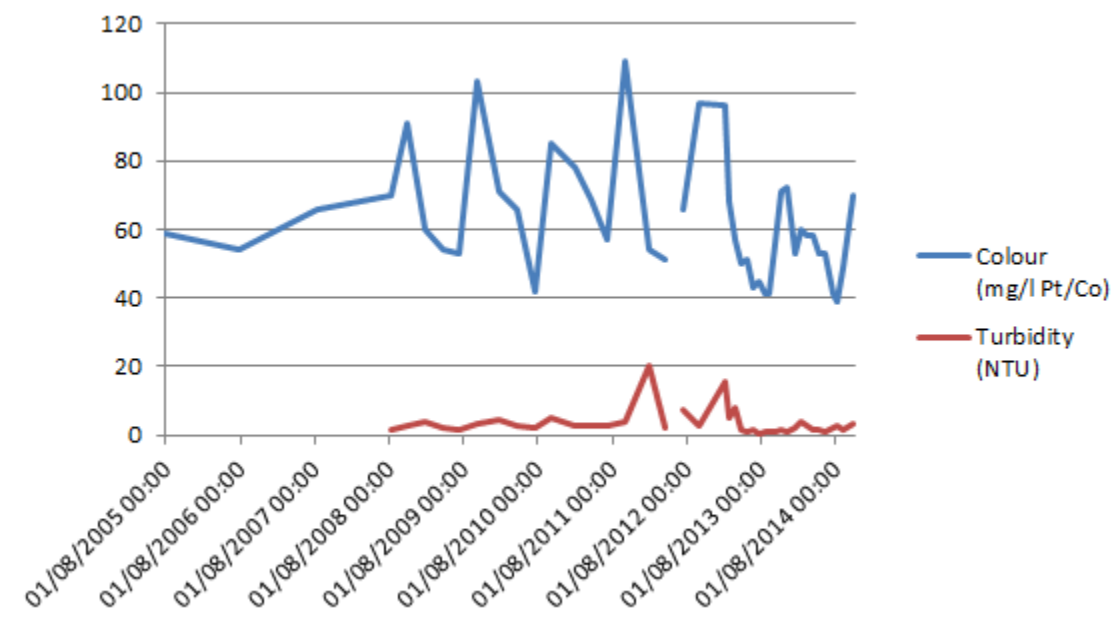
SSE have an application to extend their wind farm at Hadyard Hill, near Barr by 51 turbines with a height of 126.5m. These would join the existing 52 turbines(shown below) making a total of 103 turbines and from the map below it is easy to see what a negative impact these will have on the water catchment zones of the River Stinchar and Waters of Girvan.



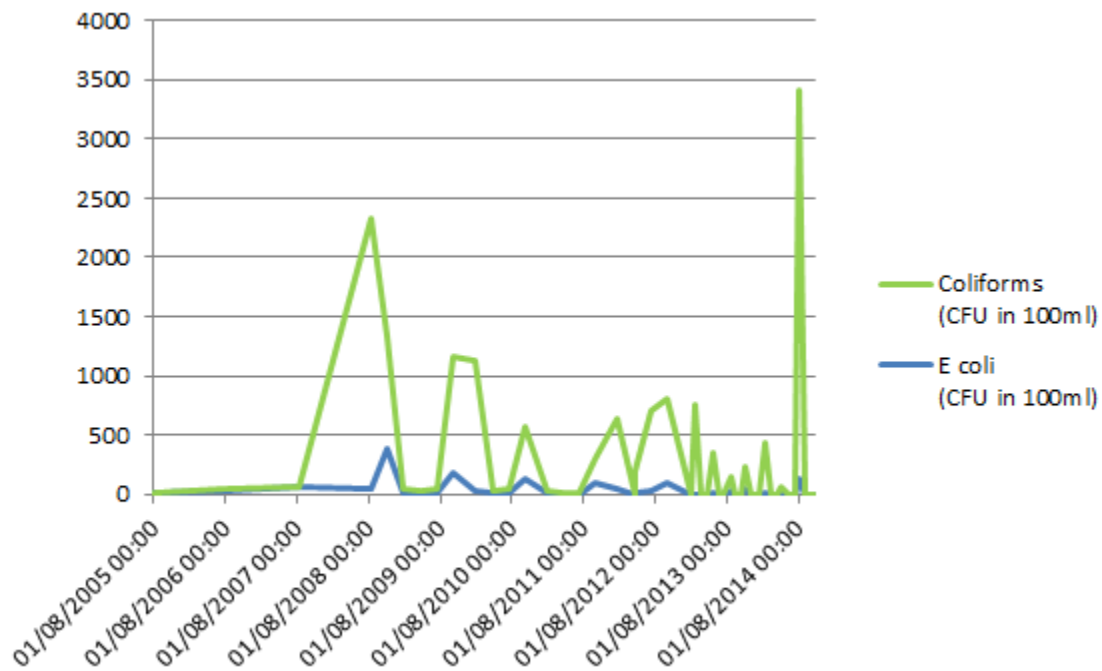


Figures from SW on raw water data from Penwhapple WTW:  
Hadyard Hill- Colour, Iron and Manganese

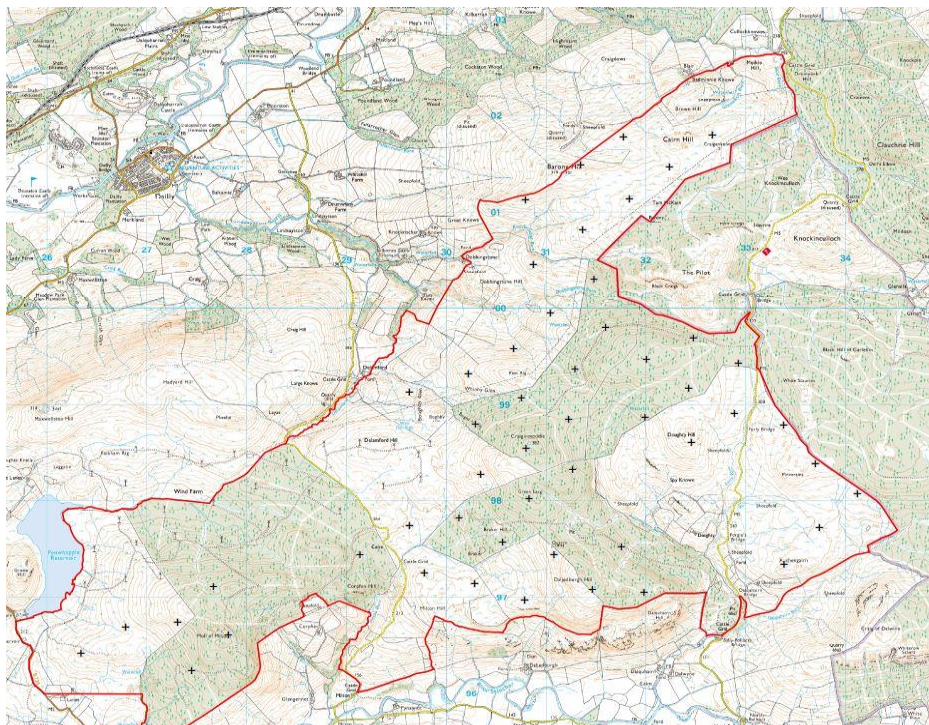
#### Hadyard Hill- Colour and Turbidity



## Hadyard Hill – Coliforms and E coli



What further impact will these SSE 51 turbines have on this reservoir, public and PWS?



#### 4.5.9. Tralorg

The following extracts from the ES illustrate the vulnerability of the hydrology:

9.2.2.A thrust fault has been mapped with an east-west trend between the Shalloch and Penwhapple Formations to the north and the older Ardwell Group to the south. This thrust passes through the southern part of the development area. There are also a number of other faults mapped, predominantly with a northeast to southwest trend. Some of these displace the earlier thrust fault.

9.2.7 The entire site lies within the Water of Girvan river catchment. Most of the site lies within the catchment of Penwhapple Burn (including Laigh Assel Burn), which enters the Water of Girvan 670 m to the north-northwest of the site.

9.2.8 SEPA's consultation response (Table 9.1) notes that the catchment of Penwhapple Burn and also local groundwater bodies are drinking water protected areas designated under the Water Framework Directive (WFD). SEPA's online register of protected areas shows the protected groundwater bodies to be the Girvan Bedrock and Localised Sand and Gravel Aquifer and the Girvan Coastal Sand and Gravel Aquifer (SEPA, 2011). Five of the eight proposed turbines are located on the first of these groundwater bodies and much of the proposed infrastructure lies within the catchment of Penwhapple Burn.

9.2.16 **The groundwater regime is difficult to quantify as a result of the complex nature of the geology; the large number of manmade issues created across the site further complicates matters and the lack of borehole record availability within 2km of the site for groundwater levels. The groundwater flow details below have been assumed based upon the aquifer characteristics detailed above, till distribution and topography**

#### 4.5.10. Assel Valley Windfarm

Extracts from the Hydrology section of the ES for Assel Valley clearly show that very little (if anything) is known about the surface and ground water associated with the Water of Assel – WoA which is a tributary of the River Stinchar.

It states:

11.26 Geological mapping (see Chapter 10, Geology) show numerous faults pass beneath the application area typically with a south west – north east trend.

Table 11.5 Intergranular and Fracture Flow



*Low or very low aquifer productivity Not considered to be particularly vulnerable to groundwater pollution. Although faults could provide local groundwater storage and rapid groundwater movement.*

#### *Groundwater Levels and Flow*

**11.32 SEPA has confirmed that it does not hold any records of groundwater level monitoring within 5km of the Site.**

*11.40 The Dalfask Farm private water supply is an underground spring supply used for all domestic and farming requirements. The supply has been in operation for in excess of 50 years and has not run dry to the knowledge of the landowner. The exact location of the spring source is not known by the landowner.*

*11.41 From the water interest survey it is understood High Troweir Farm abstract water on an ad-hoc basis from the watercourses which flow through the farm land. This water is used as and when needed for agricultural purposes.*

*11.42 With the exception of the private water supply at High Troweir, used for agricultural purposes only, all private supplies recorded as part of this survey are from groundwater sources.*

*11.44 SEPA has confirmed that it does not hold any information regarding groundwater quality at the site. Routine sampling of groundwater within 5km of the site is not undertaken. It is likely that any groundwater present at site would be of good quality, given rural land use.*

*11.46 The Site is shown to extend across the valley of the WoA, extending from Troweir Hill (296mAOD) in the north to Daldowie Hill (238mAOD) in the south. The majority of the turbines are located to the north of the site along the ridge between the Dalfask (223mAOD), Troweir, the remaining turbines are located on Shalloch Hill. The WoA is a tributary of the River Stinchar.*

*11.47 The Site lies principally within the surface water catchment of the WoA. Two turbines and associated access roads are also located within the headwaters of the Laigh Assel Burn, a tributary of the Penwhapple Burn to the north east of the Site and the headwaters of the Doune Burn, north west of the Site.*

*11.48 With the exception of the infrastructure detailed above all internal site windfarm associated infrastructure is within the sub-catchment headwaters of the Laggan Burn, Barbae Burn and several unnamed tributaries of the WoA (see Figure 11-4). The construction access track is located within the catchment of two very small watercourses, again tributaries of the WoA.*

*11.49 Table 11-8 shows catchment areas for the principal watercourses and key catchment descriptors from the FEH CD-ROM, database where available, which can be used to describe the anticipated response in the catchments to rainfall.*

*11.53 SEPA has confirmed that it does not maintain any surface water flow gauging stations on watercourses within the Planning Application Site or within a 3km radius of the Site.*

*11.54 The WoA is not gauged as detailed in the Hydrometric Register7.*

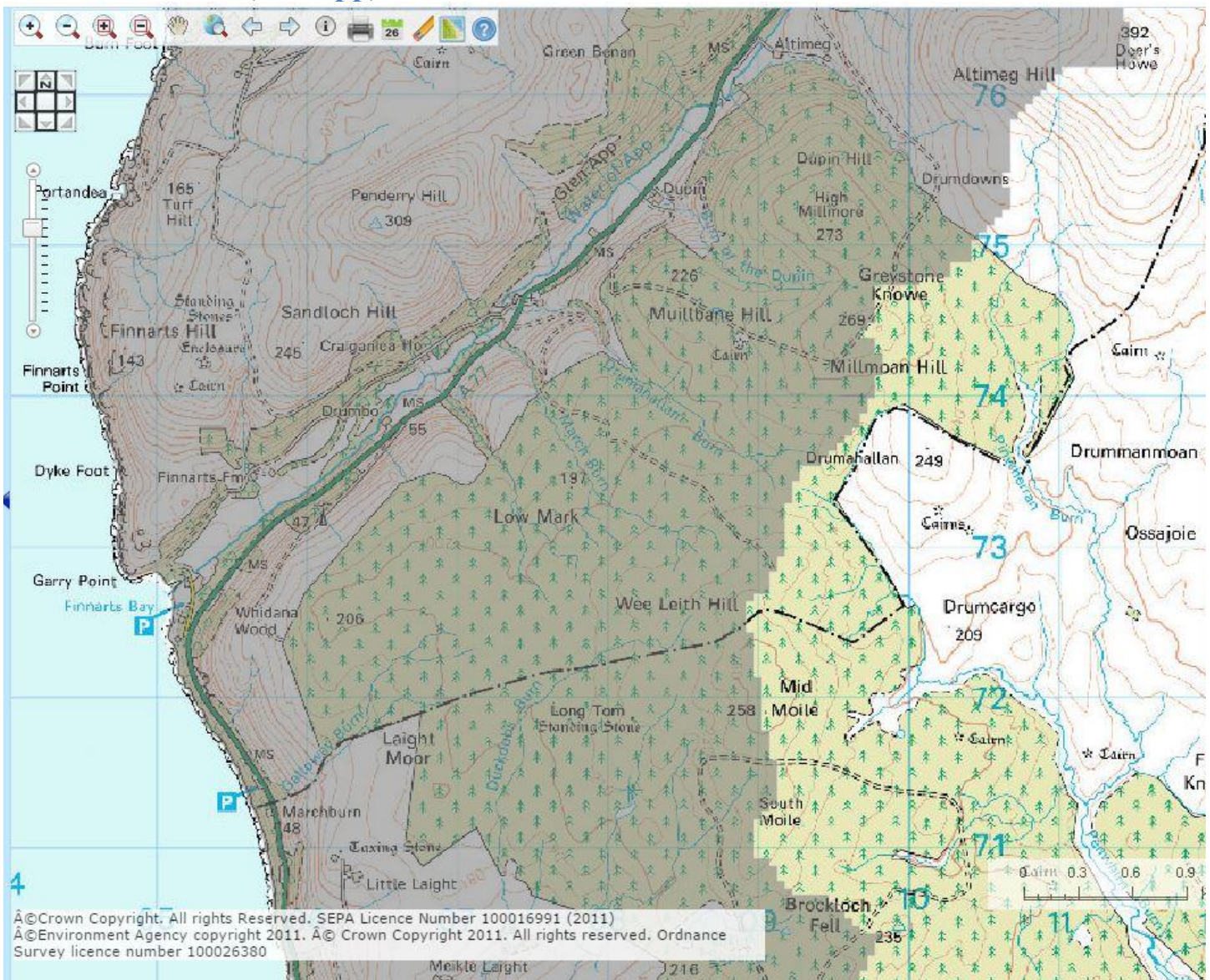
*11.57 ART confirm that the WoA is an important tributary of the River Stinchar and electrofishing surveys have often recorded high densities of fish. It is understood that the conductivity of water in the WoA is generally high in comparison to the southern Stinchar catchment and the highly productive environment is capable of supporting high fish densities. Migratory species, including salmon, trout and eels are present in accessible parts of the WoA. 11.59 SEPA has confirmed that the WoA is the only watercourse within the Site which has been classified for water quality. The WoA has an overall classification of good calculated over a stretch of 11.75km (NGR NX 2276593982).*

*11.71 Potential generic effects associated with windfarm construction and operations are shown in Table 11-1. Construction of a windfarm in a rural location, more so than in other locations, involves various activities that have potential to either directly or indirectly affect the water quality and flow of surface water and groundwater. These potential effects could indirectly affect ecological and fisheries interests. Potential effects include:*

- alteration of the existing drainage regime as a result of construction of windfarm infrastructure;*
- increased erosion and sediment deposition in watercourses as a result of construction and decommissioning works;*
- pollution of watercourses as a result of accidental spillages or inappropriate storage or refuelling practices during construction, operation and decommissioning; alteration of existing watercourses during construction and operation, which may lead to increased flood risk; and*
- changes in catchment response which may reduce base-flow to rivers or locally increase flood risk.*



#### 4.5.11. Ballantrae (Glenapp) Windfarm



Drinking Water Directive Groundwater (shaded grey)- Cairnryan bedrock and localised sand and gravel aquifers with several watercourses covering 5 catchments and 1 reservoir

This application has just been consented by SAC with 53 conditions attached. At the panel hearing on Wednesday 3<sup>rd</sup> June 2015, 'planning' assured the panel that the conditions would be stringent enough to protect the water environment. It has 7 PWS which are unchartered and is on an undulating forested area on peat (not unlike Whitelee site) some of it up to 5-6 meters. It is crossed by dykes running NE to SW.

The risks to this water environment are high, as stated by Dr. Rachel Connor in her statement:

227 Even to someone with no hydrological knowledge, it would seem a bizarre and risky assumption, to assume that a holding or collection tank could be taken as a proxy for a water source. However, this is exactly what all four SPR hydrological consultants (RPS, 2003), (Environs, 2006), (Atkins, Atkins PWS risk Assessment WL WF Extension Report and Appendix 1. , 2010) and WL ES 3, Ch. 9) did for the various phases of Whitelee windfarm ES and risk assessment, including Whitelee 3. This would be the cheapest and easiest assessment for the developer, but would leave the water source and any water piped from a source to a holding tank completely vulnerable to damage and pollution, with no protection from planned mitigation.

228 We know from SEPA's brief response (SEPA, Whitelee X3 - SEPA response, 2012) to the Whitelee Extension 3 proposal that PWS and hydrology have not been specifically addressed, despite the history of contamination of groundwater and surface water PWS during previous construction at Whitelee. There has been no request from SEPA for further information from SPR, despite water sources for the nearest properties of Kingswell and Cauldstanes remaining uncharacterised. This is contrary to SEPA's policy on assessing PWS in the vicinity of windfarms (SEPA guidance-on-assessing-the-impacts-of-development-proposals-on-groundwaterabstractions- and-groundwater-dependent-terrestrial-ecosystems, 2014).

229 We obtained an independent Geohydrological review from Dr. Steve Carroll (S.Carroll, Whitelee windfarm hydrogeology summary, 2015) of the Whitelee windfarm site, providing him with information from preceding WLWF Environmental Assessments and preceding PWS risk assessments, to inform our understanding of the current situation and geohydrological risks pertaining to the proposed WL 3.

230 is a summary of Dr Carroll's report including:

*Lavas of the CPV formation elsewhere in central Scotland often show zonesporous and permeable sedimentary rocks or broken up lava at the junction offflows of different age. These zones could form very localised aquifers and allow more rapid groundwater flows than would occur in fractured basalt that form most of the lava flows. These narrow aquifers and potential water channels through fractures are also more difficult to predict from an overall geological map.*

234 Because no boreholes were drilled or groundwater testing requested from the developer by planning or regulatory authorities, even in relation to assessing impacts to groundwater from potentially polluting activities such as quarrying, the importance of potential pollution pathway into shallow groundwater through superficial deposits or to deep groundwater through rock fractures was not adequately assessed for previous Whitelee windfarm proposals.

[END of EXTRACT]

There are more questions than answers arising from these ESs and FOIs. How can we know with certainty that our drinking water is safe? There are so many imponderables that without



boreholes it is impossible to map the water catchment and ensure that the water directives below are adhered to.

#### 4.6. Other incidents of note:

Jennifer Rodger - Cruach Mor windfarm- (SPR) and her story is even worse. Not only did they have gross bacterial contamination, but their water supply was frequently interrupted to the point that, with no water, in the middle of winter they had to stay in a hotel!! Eventually, SPR had to pipe in an alternative mains supply at vast cost.

There are many SEPA reported incidents and these are available by FOI from SEPA:

Event Number	Event Date	Location Description	Cause	Event Description	Action
ENV/0851808	15-Dec-2011	Nether Cleuch at track crossing, Abington	Operational Failure	Silt in Wandel Burn at A702 near Clyde windfarm	15/12/2011 PS noticed slight discolouration of Wandel Burn at crossing with A702 at about 12.30 hrs. Identified source as forestry activities within the Clyde windfarm site near the Nether Cleuch about 4 km upstream. Silty water observed in Nether Cleuch upstream of the culvert crossing - due to timber extraction activities of forwarder. Also silt from track entering the burn as a result of forestry haulage activities. SSER and Simon Coleman of Euroforest/Dick Bros notified and forestry activities in the vicinity of Nether Cleuch were ceased at 15.00 hrs. 16/12/2011 Neil Mackay of SSER confirmed that there was no visible siltation of the watercourse (Nether Cleuch and downstream) and that alternative extraction pathways for the timber were being investigated. PS requested contact details for operators involved in forestry activities and advise that follow up letters relating to the pollution and the unauthorised engineering (see ENV/851807) would be dispatched. Follow up letter sent on 20/12/2011 - response required by 30/1/2012. Deadline for response extended to 3 Feb 2012. Satisfactory reinstatement plans received - works to reinstate burn and improve culvert planned for April/May 2012. NFA
ENV/0851807	15-Dec-2011	Nether Cleuch at track crossing, Abington	Operational Failure	Unauthorised engineering near culvert structure on Nether Cleuch, Abington	15/12/2011 PS investigated pollution event - found to be originating from forestry activities on Nether Cleuch within Clyde windfarm site. Culvert crossing on forestry track has recently been replaced without authorisation - bad design, disconnects watercourse upstream and downstream of the culvert. Also catch pits have been excavated in the watercourse upstream and downstream of the culvert. SSER and Euroforest/Dick Bros (responsible for forestry) confirmed that culvert recently replaced after operational failure. SEPA advised of the problems and requested remedial action in follow up letters sent on 20 December 2011. response required by 30 Jan 2012.
ENV/0851888	05-Dec-2011	Aller Cleuch @ borrowpit 124, Clyde Windfarm	Operational Failure	Silt entering Aller Cleuch from BP124, Clyde Windfarm	PMO at Clyde Windfarm emailed PS directly on 5/12/11 to raise concerns about silty water from turning area on BP124 running into Aller Cleuch. PS picked up message on 7/12/2011 and called Craig Fisher to request information. He explained that there had been a problem with silty water collecting on pad and running down slope to burn but that mitigation measures had been put in place and the burn was running clear. 15/12/2011 PS checked Clydes Burn (d/s of Aller Cleuch) at bridge over B7076 at 14.00 hrs - all clear. 16/12/2011 PMO sent report to PS from site visit on 14/12/2011 indicating there were still silt run-off problems at BP124. PS contacted Hanson requesting an update. Hanson provided a report on 20/12/2011 detailing problem and mitigation carried out on 14/12/2011 covering both picture of 12.00pm before the incident. Picture of when you inspected the stream, picture of work being carried out. Picture of the catchpit being excavated at turning point on BP124. Picture of dirty water percolating through brash. Picture of the silt fence being extended. Picture of area completed. Picture following morning with clear water running in stream. SEPA requested that the restoration plan for the area in the vicinity of BP124 and the start of the Aller Cleuch (agreed in principle about 18 months ago) be provided as soon as is practicable in 2012. In the meantime, regular monitoring of the burn should be performed and mitigation measures taken to prevent silty water from entering the burn as required. NFA
ENV/0851300	08-Nov-2011		Other	Fuel spill at T80 on Clyde windfarm	Caller reporting oil leaking at the Clyde Windfarm, Crawford, Central Section under Hanson Control - turbine number 80. Wind turbine transformer has failed resulting in approx 1000 litres of oil leaking into the integral bund of the package sub station. Following trial holes around the the transform building there are indications that some oil may have escaped from the bund and has contaminated the surrounding ground. The building is bedded on sand which may have contained some of the oil and the turbine is not close to any water course. 600 ltrs of oil has already been recovered from the bund. Clean up operation will continue to-morrow. Incident happened on Tuesday evening but on checking today they came across it. 11/11/11 PS called Peter Nelson for update. Clean up is continuing. Watercourses in vicinity are being monitored - no sign of oil. REport to follow 17/11/2011 Email update from Peter Nelson 18/11/2011 Voicemail message from Siman Purli from Braemar and Howells (specialist cleanup company) 21/11/11 Spoke to Simon Purli - provided update on clean up and about LK301 (kelp derivative oil dispersal). Advised that SEPA was OK with the use of LK301 subject to seeing the data sheet 23/11/11 Data sheet for LK301 received - advised that SEPA has no concerns about its use as long as it is used in accordance with manufacturers instructions. 8/12/11 REceived email from Peter Nelson (sser) confirming oil spill clean up complete and no impact on nearby watercourses. NFA
ENV/0850732	06-Oct-2011	Back Burn at confluence with Grinshie Grains	Operational Failure	Back Burn at confluence with Grinshie Grains complaint of silt	Complaint of silt from forestry activities near the Clyde Windfarm entering the burn at NGR NT 03011 15566. The polluted burn runs through part of the central section of the windfarm site and Hanson are responsible for this area. It was alleged that the slurry on the track was a foot deep in places and being washed into the watercourses at water crossings. 07/10/2011, I visited the area with Hanson representative, Robert Blowers. I noted that Scottish Woodlands were taking remedial action whilst I was on site, with repairs to bridges, tracks and drainage ponds. I noted the watercourses were running clean at the time of my visit. I discussed the situation with Scottish Woodlands Harvesting manager Alex Cranke whom we met on site. I sent an email to Scottish Woodlands Mr Cranke regarding this matter and reminded them of their obligations to comply with the conditions under General Binding Rules of the Water Environment (Controlled Activities) (Scotland) Regulations 2011 to prevent pollution of the water environment.

ENV/0847313	11-Apr-2011	Smiddy Cleuch at confluence with Clydes Burn	Unknown	Complaint of oil in waters of Smiddy Cleuch near B7071, Beattock Summit	Access E. 12/4/11 PS attended site at 11.15. Saw and smell small quantities of oil in ditch and in watercourse near the ppe that conveys discharge from ditch to watercourse. Sample taken for analysis of oil type. Could not see obvious source of oil from site compound but contacted CA Blackwell at 18.00, and they agreed to investigate and take measures to (i) prevent any further oil from entering the ditch from the compound and (ii) remove oil from the ditch so it cannot enter the watercourse. PS left voicemail on complainant's phone with update. Lab analysis of sample confirmed oil type as diesel. 18/4/11 PS checked Smiddy Cleuch at 10.30 - no oil visible in burn although small quantities of oil still visible in ditch. Clear evidence of measures taken to prevent oil from entering the burn (absorbent pads, oil booms along length of ditch and at pipe discharge point from ditch to burn). PS spoke to Blackwell representatives at site compound Access E who explained the works undertaken. Oil drip identified and remedied, removal of contaminated soil, laying of new concrete pad below generator, pads and booms in ditch checked and replaced twice a day, appropriate disposal of oil-contaminated material. Further excavation of area around septic tank (low point) to take place during next week to ensure there is no ongoing source of oil to the ditch. Vigilant monitoring of ditch and watercourses will take place during next few periods of heavy rain. Follow up letter sent to Blackwell on 9/5/11 NFA	1
-------------	-------------	--	---------	---	---	---

ENV/0851300	08-Nov-2011		Other	Fuel spill at T80 on Clyde windfarm	reporting oil leaking at the Clyde Windfarm, Crawford, Central Section under Hanson Control - turbine number 80. Wind turbine transformer has failed resulting in approx 1000 litres of oil leaking into the integral bund of the package sub station. Following trial holes around the the transform building there are indications that some oil may have escaped from the bund and has contaminated the surrounding ground. The building is bedded on sand which may have contained some of the oil and the turbine is not close to any water course. 600 ltrs of oil has already been recovered from the bund. Clean up operation will continue to-morrow. Incident happened on Tuesday evening but on checking today they came across it. 11/11/11 PS called Peter Nelson for update. Clean up is continuing. Watercourses in vicinity are being monitored - no sign of oil. REport to follow 17/11/2011 Email update from Peter Nelson 18/11/2011 Voicemail message from Siman Purli from Braemar and Howells (specialist cleanup company) 21/11/11 Spoke to Simon Purli - provided update on clean up and about LK301 (kelp derivative oil dispersal). Advised that SEPA was OK with the use of LK301 subject to seeing the data sheet 23/11/11 Data sheet for LK301 received - advised that SEPA has no concerns about its use as long as it is used in accordance with manufacturers instructions. 8/12/11 REceived email from Peter Nelson (sser) confirming oil spill clean up complete and no impact on nearby watercourses. NFA	1
-------------	-------------	--	-------	-------------------------------------	--	---

ENV/0849271	20-Jul-2011	Hill of Towie Windfarm, Main Compound, Keith, AB55 6YU	Operational Failure	Polluted drinking water supply associated with a windfarm development at Hill of Towie, Drummuir.	The complainant, informed SEPA that private drinking water supply had been contaminated- potentially by construction work associated with a windfarm above her property. On investigation SSE are laying a cable between Hill of Towie and Keith for connection to the national grid. Peter Martin, the project manager showed SEPA officers round the site and all the activities that may have given rise to siltation of . Details of the incident were given to Ewan McNeil of Moray Council's Environmental Health department for further investigation. Scottish and Southern Energy(SSE) did not report the incident but acted in a responsible manner and will be dealt with by issuing a warning letter	1
ENV/0849271	20-Jul-2011	Hill of Towie Windfarm, Main Compound, Keith, AB55 6YU	Operational Failure	Polluted drinking water supply associated with a windfarm development at Hill of Towie, Drummuir.	The complainant, informed SEPA that private drinking water supply had been contaminated- potentially by construction work associated with a windfarm above her property. On investigation SSE are laying a cable between Hill of Towie and Keith for connection to the national grid. Peter Martin, the project manager showed SEPA officers round the site and all the activities that may have given rise to siltation of . Details of the incident were given to Ewan McNeil of Moray Council's Environmental Health department for further investigation. Scottish and Southern Energy(SSE) did not report the incident but acted in a responsible manner and will be dealt with by issuing a warning letter	1
ENV/0853353	09-Mar-2012	T117 on Central Section @ Clyde Windfarm, Elvanfoot	Operational Failure	Fuel spill at T117, Clyde Windfarm	09/03/2012-db- Received a call from reported that there had been a fuel leak from a generator the previous evening that had been under control but reassessment in the morning made call it in to SEPA. The incident was as a result of a generator that Siemens use to commission the turbines. An issue with the generator at T117 resulted in an estimated 400 litres of fuel spilling onto the hardstanding. Siemens reported this to Hansons and expressed that the situation was under control. Hansons offered assistance in the form of their contractor Braemar Howells who specialise in hydrocarbon containment and clean up. Siemens apparently declined as they maintained that it was under control however Hansons operators who then visited the area did not see any action being taken and fuel ponding at the base of the generator. There were reports that the drain plug for the bund/skin was missing and had been blocked with cotton wool. Braemar Howells arrived onsite on the Thursday evening to begin worked following the call from Hansons and stayed onsite until 11pm trying to salvage and minimise the damage.09/03/12-db- Following a call from as stated above, i visited the windfarm and met LF onsite at Access C. We were taken onsite by Jim Kilbride who is the site manager for Scottish & Southern Energy Renewables. On arrival at T117 we could see the residual fuel around the base of the generator and booms at the catchpit below the hardstanding and again slightly downstream from this.LF and i assessed the area and could see very small trace amounts coming from the catch pit that was boomed. We sampled here and also sampled slightly downstream where this drained into a forestry drain prior to discharging into the Crinchie Grain. We made our way across to the Crinchie Grain and sampled upstream and downstream of any potential tributaries from the hardstanding area. It was difficult to ascertain which arms of tribs and which arms of drainage from forestry would possibly impact on the watercourse if the fuel was to leach out in different directions. We could see no sign of any other sources as we made our way back to the hardstanding. We then discussed with Dorothy Neun and Jim Kilbride of SSER as to the continued approach to the containment and clean up. They explained that Braemar Howells would be onsite and monitor the area. They would also be carrying out a flush the following day using a compound that breaks down the hydrocarbons in the soil and they can then capture residues in the booms. Prior to leaving site we spoke with Siemens representatives Ian Johnson and James Maxwell and expressed that we would require a timeline and report into their response to this incident. The same was requested from . This would be used to assess the negligence that towards the initial spill that SSER and Hansons were accusing Siemens of. They were obviously concerned due to the hierarchy of contractors.13/03/2012-db- Spoke with who said that Braemar Howells were happy with the flush and that they suspended all contractors going onsite without the proper control systems in place for any such incident. They also had a toolbox talk with Siemens who reviewed their procedures. The issue appears to be that staff on the ground were not aware of these systems, only management was aware and this resulted in a lack of immediate action and false thinking that the situation was under control. Requested to that all reports should be submitted to me by 21/03/2012. Still awaiting sample results 23/03/2012-db- Sample results indicate that there was no oil in the watercourse of notable significance from the catchpit. There were small trace amounts in the upstream sample but this almost undetectable. Reports were also submitted by and SSER. Siemens report received 3/5/1218/5/12 Warning letter sent to Siemens	1

We also can provide photographic and other proof of the failure of mitigation measures to protect water courses at the Braes of Doune windfarm.

This might only just be the beginning of the mounting evidence of damage caused by industrialising our water catchment areas.

## 5.1 All the following elements of the Environmental Liability Directive (ELD) 2004/35/CE apply

The ELD 2004/35/CE states:

Whereas:

*(2) The prevention and remedying of environmental damage should be implemented through the furtherance of the "polluter pays" principle, as indicated in the Treaty and in line with the principle of sustainable development. The fundamental principle of this Directive should therefore be that an operator whose activity has caused the environmental damage or the imminent threat of such damage is to be held financially liable, in order to induce operators to adopt measures and develop practices to minimise the risks of environmental damage so that their exposure to financial liabilities is reduced.*



*(3) Since the objective of this Directive, namely to establish a common framework for the prevention and remedying of environmental damage at a reasonable cost to society, cannot be sufficiently achieved by the Member States and can therefore be better achieved at Community level by reason of the scale of this Directive and its implications in respect of other Community legislation, namely Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds<sup>7</sup>, Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora<sup>8</sup>, and Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy<sup>9</sup> (see 6.1), the Community may adopt measures in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve that objective.*

*(7) For the purposes of assessing damage to land as defined in this Directive the use of risk assessment procedures to determine to what extent human health is likely to be adversely affected is desirable.*

*(8) This Directive should apply, as far as environmental damage is concerned, to occupational activities which present a risk for human health or the environment. Those activities should be identified, in principle, by reference to the relevant Community legislation which provides for regulatory requirements in relation to certain activities or practices considered as posing a potential or actual risk for human health or the environment.*

*(9) This Directive should also apply, as regards damage to protected species and natural habitats, to any occupational activities other than those already directly or indirectly identified by reference to Community legislation as posing an actual or potential risk for human health or the environment. In such cases the operator should only be liable under this Directive whenever he is at fault or negligent.*

*(13) Not all forms of environmental damage can be remedied by means of the liability mechanism. For the latter to be effective, there need to be one or more identifiable polluters, the damage should be concrete and quantifiable, and a causal link should be established between the damage and the identified polluter(s). Liability is therefore not a suitable instrument for dealing with pollution of a widespread, diffuse character, where it is impossible to link the negative environmental effects with acts or failure to act of certain individual actors.*

*(15)....public authorities should ensure the proper implementation and enforcement of the scheme provided for by this Directive:*

---

<sup>7</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31979L0409:en:HTML>

<sup>8</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043>

<sup>9</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>



*(18) According to the 'polluter-pays' principle, an operator causing environmental damage or creating an imminent threat of such damage should, in principle, bear the cost of the necessary preventive or remedial measures. In cases where a competent authority acts, itself or through a third party, in the place of an operator, that authority should ensure that the cost incurred by it is recovered from the operator. It is also appropriate that the operators should ultimately bear the cost of assessing environmental damage and, as the case may be, assessing an imminent threat of such damage occurring.*

*(21) Operators should bear the costs relating to preventive measures when those measures should have been taken as a matter of course in order to comply with the legislative, regulatory and administrative provisions regulating their activities or the terms of any permit or authorisation.*

*(25) Persons adversely affected or likely to be affected by environmental damage should be entitled to ask the competent authority to take action.....Non-governmental organisations promoting environmental protection should also therefore be given the opportunity to properly contribute to the effective implementation of the Directive.*

*(26) The relevant natural or legal persons concerned should have access to procedures for the review of the competent authority's decisions, acts or failure to act.*

*(28) Where environmental damage affects or is likely to affect several Member States, those Member states should co-operate with a view to ensuring proper and effective preventative or remedial damage.*

*(31) Member States should report to the Commission on the experience gained in the application of this Directive so as to enable the Commission to consider, taking into account the impact on sustainable development and future risks to the environment, whether any review of this Directive is appropriate*

## **5.2 Article 1**

*The purpose of this Directive is to establish a framework of environmental liability based on the 'polluter pays' principle, to prevent and remedy environmental damage.*

### 5,3 Article 2 Definitions

1. *'environmental damage' means*

*(b) water damage which is any damage that significantly adversely affects the ecological, chemical and or quantitative status and or ecological potential, as defined in Directive 2000/60/EC<sup>10</sup> of the waters concerned*

2. *'damage means a measurable adverse change in a natural resource or measurable impairment of a natural resource service which may occur directly or indirectly.*

5. *'waters' means all waters covered by Directive 2000/60/EC*

8. *'emission' means the release in the environment, as a result of human activities, of substances, preparations .....*

9. *'imminent threat to damage' means a sufficient likelihood that environmental damage will occur in the near future;*

12. *'natural resource means protected species and natural habitats, water and land;*

13. *'services' and 'natural resource services' means the function performed by a natural resource for the benefit of another natural resource or the public;*

14. *'baseline condition' means the condition at the time of the damage of the natural resource and services that would have existed had the environment damage not occurred, estimated on the basis of the information available;*

15. *'recovery' including natural recovery, means in the case of water.....the elimination of any significant risk of adversely affecting human health*

### 5.4 Article 3: Scope

1. *This Directive shall apply to:*

*(a) environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities;*

*(b) damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such*

---

<sup>10</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

*damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent.*

*2. This Directive shall apply without prejudice to more stringent Community legislation regulating the operation of any of the activities falling within the scope of this Directive and without prejudice to Community legislation containing rules on conflicts of jurisdiction.*

## **5.5 Article 5**

### *Preventive action*

*1. Where environmental damage has not yet occurred but there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures.*

*2. Member States shall provide that, where appropriate, and in any case whenever an imminent threat of environmental damage is not dispelled despite the preventive measures taken by the operator, operators are to inform the competent authority of all relevant aspects of the situation, as soon as possible.*

*3. The competent authority may, at any time:*

*(a) require the operator to provide information on any imminent threat of environmental damage or in suspected cases of such an imminent threat;*

*(b) require the operator to take the necessary preventive measures;*

*(c) give instructions to the operator to be followed on the necessary preventive measures to be taken; or*

*(d) itself take the necessary preventive measures.*

*4. The competent authority shall require that the preventive measures are taken by the operator. If the operator fails to comply with the obligations laid down in paragraph 1 or 3(b) or (c), cannot be identified or is not required to bear the costs under this Directive, the competent authority may take these measures itself.*

## **5.6 Article 6**

### *Remedial action*

*1. Where environmental damage has occurred the operator shall, without delay, inform the competent authority of all relevant aspects of the situation and take:*

*(a) all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and*

*(b) the necessary remedial measures, in accordance with Article 7.*

*2. The competent authority may, at any time:*

*(a) require the operator to provide supplementary information on any damage that has occurred;*

- (b) take, require the operator to take or give instructions to the operator concerning, all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effect on human health, or further impairment of services;*
- (c) require the operator to take the necessary remedial measures;*
- (d) give instructions to the operator to be followed on the necessary remedial measures to be taken; or*
- (e) itself take the necessary remedial measures.*

*3. The competent authority shall require that the remedial measures are taken by the operator. If the operator fails to comply with the obligations laid down in paragraph 1 or 2(b), (c) or (d), cannot be identified or is not required to bear the costs under this Directive, the competent authority may take these measures itself, as a means of last resort.*

## **5.7 Article 7**

### *Determination of remedial measures*

- 1. Operators shall identify, in accordance with Annex II, potential remedial measures and submit them to the competent authority for its approval, unless the competent authority has taken action under Article 6(2)(e) and (3).*
- 2. The competent authority shall decide which remedial measures shall be implemented in accordance with Annex II, and with the cooperation of the relevant operator, as required.*
- 3. Where several instances of environmental damage have occurred in such a manner that the competent authority cannot ensure that the necessary remedial measures are taken at the same time, the competent authority shall be entitled to decide which instance of environmental damage must be remedied first.*  
*In making that decision, the competent authority shall have regard, inter alia, to the nature, extent and gravity of the various instances of environmental damage concerned, and to the possibility of natural recovery. Risks to human health shall also be taken into account.*
- 4. The competent authority shall invite the persons referred to in Article 12(1) and in any case the persons on whose land remedial measures would be carried out to submit their observations and shall take them into account.*

## **5.8 Article 11**

### *Competent authority*

- 1. Member States shall designate the competent authority(ies) responsible for fulfilling the duties provided for in this Directive.*

2. *The duty to establish which operator has caused the damage or the imminent threat of damage, to assess the significance of the damage and to determine which remedial measures should be taken with reference to Annex II shall rest with the competent authority. To that effect, the competent authority shall be entitled to require the relevant operator to carry out his own assessment and to supply any information and data necessary.*
3. *Member States shall ensure that the competent authority may empower or require third parties to carry out the necessary preventive or remedial measures.*
4. *Any decision taken pursuant to this Directive which imposes preventive or remedial measures shall state the exact grounds on which it is based. Such decision shall be notified forthwith to the operator concerned, who shall at the same time be informed of the legal remedies available to him under the laws in force in the Member State concerned and of the time-limits to which such remedies are subject.*

## **5.9 Article 12**

*1. Natural or legal persons:*

*(a) **affected or likely to be affected by environmental damage***

*or*

*(b) **having a sufficient interest in environmental decision making relating to the damage or, alternatively, shall be entitled to submit to the competent authority any observations relating to instances of environmental damage or an imminent threat of such damage of which they are aware and shall be entitled to request the competent authority to take action under this Directive.***

*To this end, the interest of any non-governmental organisation promoting environmental protection and meeting any requirements under national law shall be deemed sufficient for the purpose of subparagraph*

*2. The request for action shall be accompanied by the relevant information and data supporting the observations submitted in relation to the environmental damage in question.*

## **5.10 Article 13**

*Review procedures*

*1. The persons referred to in Article 12(1) –see para2 -shall have access to a court or other independent and impartial public body competent to review the procedural and substantive legality of the decisions, acts or failure to act of the competent authority under this Directive.*



*2. This Directive shall be without prejudice to any provisions of national law which regulate access to justice and those which require that administrative review procedures be exhausted prior to recourse to judicial proceedings.*

## **5.11 Article 19**

### *Implementation*

*1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 30 April 2007. They shall forthwith inform the Commission thereof.*

*When Member States adopt those measures, they shall contain a reference to this Directive or shall be accompanied by such a reference on the occasion of their official publication. The methods of making such reference shall be laid down by Member States.*

*2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive together with a table showing how the provisions of this Directive correspond to the national provisions adopted.*

## **6. Directive 2004/35/CE Article 2 refers to the Water Framework Directive 2000/60/EC**

**6.1 Elements of Directive 2000/60/EC:** On October 23 2000, the "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" was adopted. The Water Framework Directive (WFD) applies to all water in the natural environment - that is all rivers, lochs, estuaries and coastal waters as well as groundwater. It came into force on December 22nd 2000.

The Water Framework Directive has two key components:

- it requires us to manage our water environment on the basis of units that make sense in environmental terms - **River Basin Districts** that include all interdependent rivers, lochs, estuaries, coastal waters and associated underground waters. A plan will have to be drawn up for each River Basin District setting out where there are environmental pressures and what will be done to tackle them. The first River Basin Management Plan is due in 2009;
- it also requires that, for the first time, we **control and monitor all impacts** - physical, polluting and otherwise - on the water environment with the aim of achieving 'good' ecological status for most rivers etc. by specified deadlines - 2015 in most cases. Status is determined not just by the chemical composition of waters but by ecology, that is the fish, plant and other life that inhabit it.

**The basic objectives to be achieved as set out in Article 4(1) can be summarised as follows:**

- prevent deterioration in the status of surface water bodies
  - protect, enhance and restore all bodies of surface water with the aim of achieving good surface water status by 2015
  - prevent deterioration of the status of groundwater bodies
  - protect, enhance and restore all bodies of groundwater with the aim of achieving good groundwater status by 2015
  - prevent or limit the input of pollutants to groundwater and reverse any significant and sustained upward trend in the concentration of pollutants in groundwater
  - comply with European wide measures against priority and priority hazardous substances (this also brings in DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006<sup>11</sup> on machinery, and amending Directive 95/16/EC (recast) Whereas (3) Member States are responsible for ensuring the health and safety on their territory of persons, in particular of workers and consumers and, where appropriate, of domestic animals and goods, notably in relation to the risks arising out of the use of machinery.)
  - achieve compliance with any relevant standards and objectives for protected areas
- The Directive repeals and replaces a number of older EC water Directives and incorporates the remaining existing water Directives (the Bathing Water, Nitrates and Urban Waste Water Treatment Directives) into its framework through its protected areas provisions. The "Natura" Directives on the protection of Habitats and Birds are also linked to this Directive through the protected area provisions. **The Directive requires Member States to put in place systems for managing their water environments, based on natural river basin districts and underpinned by extensive environmental monitoring and scientific investigation, called "river basin management".** It further requires Member States to take account of the need to recover the costs of water services as a way of encouraging the sustainable use of water resources.

Co Luxembourg, 1 July 2015 Court of Justice of the European Union  
Judgment in Case C-461/13<sup>12</sup>

This new ruling by the European Court of Justice (ECJ) in Luxembourg on 1st July 2015, clarifying when developments affecting the quality of rivers should not be allowed to go ahead, represents a great step forward for the protection of freshwater bodies all across Europe.

---

<sup>11</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0042>

<sup>12</sup> <http://curia.europa.eu/jcms/upload/docs/application/pdf/2015-07/cp150074en.pdf>

The ECJ's judgment confirms BUND's view that infrastructure projects affecting water streams should not be allowed to go ahead if they deteriorate water status. The Court's ruling does not only have implications for the specific case of the River Weser, it represents significant progress for freshwater bodies all across Europe. Member States will now need to review and seriously reduce their use of exemptions to achieving the Water Framework Directives objectives.

Jeremy Wates, EEB Secretary General, stated: "This new ruling has important implications for a whole range of ongoing and planned projects all across Europe which, following the court's clarification, should not be given the go-ahead. EU Member States failed to meet the WFD target of getting all European waters in good condition by 2015. This ruling means Europe's rivers should be given a much higher level of protection against harmful developments than has been the case today."

## **6.2 Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy:**

*Whereas:*

*(1) Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such.*

*(11) As set out in Article 174 of the Treaty, the Community policy on the environment is to contribute to pursuit of the objectives of preserving, protecting and improving the quality of the environment, in prudent and rational utilisation of natural resources, and to be based on the precautionary principle and on the principles that preventive action should be taken, environmental damage should, as a priority, be rectified at source and that the polluter should pay.*

*(14) The success of this Directive relies on close cooperation and coherent action at Community, Member State and local level as well as on information, consultation and involvement of the public, including users.*

*(17) An effective and coherent water policy must take account of the vulnerability of aquatic ecosystems located near the coast and estuaries or in gulfs or relatively closed seas, as their equilibrium is strongly influenced by the quality of inland waters flowing into them. Protection of water status within river basins will provide economic benefits by contributing towards the protection of fish populations, including coastal fish populations.*

*(18) Community water policy requires a transparent, effective and coherent legislative framework. The Community should provide common principles and the overall framework for action. This Directive should provide for such a framework and coordinate and integrate, and, in a longer perspective, further develop the overall principles and structures for protection and sustainable use of water in the Community in accordance with the principles of subsidiarity.*

*(22) This Directive is to contribute to the progressive reduction of emissions of hazardous substances to water.*

*(25) Common definitions of the status of water in terms of quality and, where relevant for the purpose of the environmental protection, quantity should be established. Environmental objectives should be set to ensure that good status of surface water and groundwater is achieved throughout the Community and that deterioration in the status of waters is prevented at Community level.*

*(26) Member States should aim to achieve the objective of at least good water status by defining and implementing the necessary measures within integrated programmes of measures, taking into account existing Community requirements. Where good water status already exists, it should be maintained. For groundwater, in addition to the requirements of good status, any significant and sustained upward trend in the concentration of any pollutant should be identified and reversed.*

*(27) The ultimate aim of this Directive is to achieve the elimination of priority hazardous substances and contribute to achieving concentrations in the marine environment near background values for naturally occurring substances.*

*(37) Member States should identify waters used for the abstraction of drinking water and ensure compliance with Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption(16).*

*(46) To ensure the participation of the general public including users of water in the establishment and updating of river basin management plans, it is necessary to provide proper information of planned measures and to report on progress with their implementation with a view to the involvement of the general public before final decisions on the necessary measures are adopted.*

## **6.3 Article 1**

### **Purpose**

*The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which:*

*(a) prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems;*

*(b) promotes sustainable water use based on a long-term protection of available water resources;*

*(c) aims at enhanced protection and improvement of the aquatic environment, inter alia, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances;*

*(d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution,*

## **6.4 Article 2**

*Definitions For the purposes of this Directive the following definitions shall apply:*

*24. "Good surface water chemical status" means the chemical status required to meet the environmental objectives for surface waters established in Article 4(1)(a), that is the chemical status achieved by a body of surface water in which concentrations of pollutants do not exceed the environmental quality standards established in Annex IX and under Article 16(7), and under other relevant Community legislation setting environmental quality standards at Community level.*

*27. "Available groundwater resource" means the long-term annual average rate of overall recharge of the body of groundwater less the long-term annual rate of flow required to achieve the ecological quality objectives for associated surface waters specified under Article 4, to avoid any significant diminution in the ecological status of such waters and to avoid any significant damage to associated terrestrial ecosystems.*

*29. "Hazardous substances" means substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern.*

*30. "Priority substances" means substances identified in accordance with **Article 16(2)**. Among these substances there are "priority hazardous substances" which*



*means substances identified in accordance with Article 16(3) and (6) for which measures have to be taken in accordance with Article 16(1) and (8).*

*31. "Pollutant" means any substance liable to cause pollution, in particular those listed in Annex VIII.*

*32. "Direct discharge to groundwater" means discharge of pollutants into groundwater without percolation throughout the soil or subsoil.*

*35. "Environmental quality standard" means the concentration of a particular pollutant or group of pollutants in water, sediment or biota which should not be exceeded in order to protect human health and the environment.*

### **6.5 Article 3**

*1. Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water.*

*2. Member States shall ensure the appropriate administrative arrangements, including the identification of the appropriate competent authority, for the application of the rules of this Directive within each river basin district lying within their territory.*

*4. Member States shall ensure that the requirements of this Directive for the achievement of the environmental objectives established under Article 4, and in particular all programmes of measures are coordinated for the whole of the river basin district.*

### **6.6 Article 4**

*Environmental objectives*

*1. In making operational the programmes of measures specified in the river basin management plans:*

*(a) for surface waters*

*(i) Member States shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water, subject to the application of paragraphs 6 and 7 and without prejudice to paragraph 8;*

*(ii) Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive, in accordance with the*

provisions laid down in **Annex V**, subject to the application of extensions determined in accordance with paragraph 4 and to the application of paragraphs 5, 6 and 7 without prejudice to paragraph 8;

(iii) Member States shall protect and enhance all artificial and heavily modified bodies of water, with the aim of achieving good ecological potential and good surface water chemical status at the latest 15 years from the date of entry into force of this Directive, in accordance with the provisions laid down in **Annex V**, subject to the application of extensions determined in accordance with paragraph 4 and to the application of paragraphs 5, 6 and 7 without prejudice to paragraph 8;

(iv) Member States shall implement the necessary measures in accordance with **Article 16(1) and (8)**, with the aim of progressively reducing pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances without prejudice to the relevant international agreements referred to in Article 1 for the parties concerned;

(b) for groundwater

(i) Member States shall implement the measures necessary to prevent or limit the input of pollutants into groundwater and to prevent the deterioration of the status of all bodies of groundwater, subject to the application of paragraphs 6 and 7 and without prejudice to paragraph 8 of this Article and subject to the application of **Article 11(3)(j)**;

(ii) Member States shall protect, enhance and restore all bodies of groundwater, ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status at the latest 15 years after the date of entry into force of this Directive, in accordance with the provisions laid down in Annex V, subject to the application of extensions determined in accordance with paragraph 4 and to the application of paragraphs 5, 6 and 7 without prejudice to paragraph 8 of this Article and subject to the application of **Article 11(3)(j)**;

## **6.7 Article 5**

*Characteristics of the river basin district, review of the environmental impact of human activity and economic analysis of water use*

1. Each Member State shall ensure that for each river basin district or for the portion of an international river basin district falling within its territory:

- an analysis of its characteristics,
- a review of the impact of human activity on the status of surface waters and on groundwater, and
- an economic analysis of water use

*is undertaken according to the technical specifications set out in Annexes II and III and that it is completed at the latest four years after the date of entry into force of this Directive.*

*2. The analyses and reviews mentioned under paragraph 1 shall be reviewed, and if necessary updated at the latest 13 years after the date of entry into force of this Directive and every six years thereafter.*

## **6.8 Article 6**

### *Register of protected areas*

*1. Member States shall ensure the establishment of a register or registers of all areas lying within each river basin district which have been designated as requiring special protection under specific Community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water. They shall ensure that the register is completed at the latest four years after the date of entry into force of this Directive.*

*2. The register or registers shall include all bodies of water identified under Article 7(1) and all protected areas covered by Annex IV.*

*3. For each river basin district, the register or registers of protected areas shall be kept under review and up to date.*

## **6.9 Article 7**

### *Waters used for the abstraction of drinking water*

*1. Member States shall identify, within each river basin district:*

- all bodies of water used for the abstraction of water intended for human consumption providing more than 10 m<sup>3</sup> a day as an average or serving more than 50 persons, and*
- those bodies of water intended for such future use.*

*Member States shall monitor, in accordance with Annex V, those bodies of water which according to Annex V, provide more than 100 m<sup>3</sup> a day as an average.*

*2. For each body of water identified under paragraph 1, in addition to meeting the objectives of Article 4 in accordance with the requirements of this Directive, for surface water bodies including the quality standards established at Community level under Article 16, Member States shall ensure that under the water treatment regime applied, and in accordance with Community legislation, the resulting water will meet the requirements of Directive 80/778/EEC as amended by Directive 98/83/EC.*

*3. Member States shall ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water.*

#### **6.10 Article 8**

*Monitoring of surface water status, groundwater status and protected areas*

*1. Member States shall ensure the establishment of programmes for the monitoring of water status in order to establish a coherent and comprehensive overview of water status within each river basin district:*

*- for surface waters such programmes shall cover:*

*(i) the volume and level or rate of flow to the extent relevant for ecological and chemical status and ecological potential, and*

*(ii) the ecological and chemical status and ecological potential;*

*- for groundwaters such programmes shall cover monitoring of the chemical and quantitative status,*

*- for protected areas the above programmes shall be supplemented by those specifications contained in Community legislation under which the individual protected areas have been established.*

*2. These programmes shall be operational at the latest six years after the date of entry into force of this Directive unless otherwise specified in the legislation concerned. Such monitoring shall be in accordance with the requirements of Annex V.*

*3. Technical specifications and standardised methods for analysis and monitoring of water status shall be laid down in accordance with the procedure laid down in Article 21)*

#### **6.11 Article 11:**

*Programme of measures*

*1. Each Member State shall ensure the establishment for each river basin district, or for the part of an international river basin district within its territory, of a programme of measures, taking account of the results of the analyses required under Article 5, in order to achieve the objectives established under Article 4. Such programmes of measures may make reference to measures following from legislation adopted at national level and covering the whole of the territory of a Member State. Where appropriate, a Member State may adopt measures applicable to all river basin districts and/or the portions of international river basin districts falling within its territory.*

2. Each programme of measures shall include the "basic" measures specified in paragraph 3 and, where necessary, "supplementary" measures.

3. "Basic measures" are the minimum requirements to be complied with and shall consist of:

(c) measures to promote an efficient and sustainable water use in order to avoid compromising the achievement of the objectives specified in Article 4;

(d) measures to meet the requirements of Article 7, including measures to safeguard water quality in order to reduce the level of purification treatment required for the production of drinking water;

(e) controls over the abstraction of fresh surface water and groundwater, and impoundment of fresh surface water, including a register or registers of water abstractions and a requirement of prior authorisation for abstraction and impoundment. These controls shall be periodically reviewed and, where necessary, updated. Member States can exempt from these controls, abstractions or impoundments which have no significant impact on water status;

(f) controls, including a requirement for prior authorisation of artificial recharge or augmentation of groundwater bodies. The water used may be derived from any surface water or groundwater, provided that the use of the source does not compromise the achievement of the environmental objectives established for the source or the recharged or augmented body of groundwater. These controls shall be periodically reviewed and, where necessary, updated;

(j) a prohibition of direct discharges of pollutants into groundwater subject to the following provisions: Member States may authorise reinjection into the same aquifer of water used for geothermal purposes. They may also authorise, specifying the conditions for: - injection of water containing substances resulting from the operations for exploration and extraction of hydrocarbons or mining activities, and injection of water for technical reasons, into geological formations from which hydrocarbons or other substances have been extracted or into geological formations which for natural reasons are permanently unsuitable for other purposes. Such injections shall not contain substances other than those resulting from the above operations, - reinjection of pumped groundwater from mines and quarries or associated with the construction or maintenance of civil engineering works, - injection of natural gas or liquefied petroleum gas (LPG) for storage purposes into geological formations which for natural reasons are permanently unsuitable for other purposes, - injection of natural gas or liquefied



*petroleum gas (LPG) for storage purposes into other geological formations where there is an overriding need for security of gas supply, and where the injection is such as to prevent any present or future danger of deterioration in the quality of any receiving groundwater, - construction, civil engineering and building works and similar activities on, or in the ground which come into contact with groundwater. For these purposes, Member States may determine that such activities are to be treated as having been authorised provided that they are conducted in accordance with general binding rules developed by the Member State in respect of such activities, - discharges of small quantities of substances for scientific purposes for characterisation, protection or remediation of water bodies limited to the amount strictly necessary for the purposes concerned provided such discharges do not compromise the achievement of the environmental objectives established for that body of groundwater;*

## **6.12 Article 16**

*Strategies against pollution of water*

*1. The European Parliament and the Council shall adopt specific measures against pollution of water by individual pollutants or groups of pollutants presenting a significant risk to or via the aquatic environment, including such risks to waters used for the abstraction of drinking water. For those pollutants measures shall be aimed at the progressive reduction and, for priority hazardous substances, as defined in **Article 2(30)**, at the cessation or phasing-out of discharges, emissions and losses. Such measures shall be adopted acting on the proposals presented by the Commission in accordance with the procedures laid down in the Treaty.*

*2. The Commission shall submit a proposal setting out a list of priority substances selected amongst those which present a significant risk to or via the aquatic environment. Substances shall be prioritised for action on the basis of risk to or via the aquatic environment, identified by:*

- (a) risk assessment carried out under Council Regulation (EEC) No 793/93(22)<sup>13</sup>,*
- (b) targeted risk-based assessment (following the methodology of Regulation (EEC) No 793/93)<sup>14</sup>*

*focusing solely on aquatic ecotoxicity and on human toxicity via the aquatic environment.*

*When necessary in order to meet the timetable laid down in paragraph 4, substances shall be prioritised for action on the basis of risk to, or via the aquatic*

---

<sup>13</sup> <http://eurlex.europa.eu/legalcontent/EN/TXT/?uri=CELEX:31993R0793>

<sup>14</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31993R0793:EN:HTML>

*environment, identified by a simplified risk-based assessment procedure based on scientific principles taking particular account of:*

- evidence regarding the intrinsic hazard of the substance concerned, and in particular its aquatic ecotoxicity and human toxicity via aquatic exposure routes, and*
- evidence from monitoring of widespread environmental contamination, and other proven factors which may indicate the possibility of widespread environmental contamination, such as production or use volume of the substance concerned, and use patterns.*

*3. The Commission's proposal shall also identify the priority hazardous substances. In doing so, the Commission shall take into account the selection of substances of concern undertaken in the relevant Community legislation regarding hazardous substances or relevant international agreements.*

*4. The Commission shall review the adopted list of priority substances at the latest four years after the date of entry into force of this Directive and at least every four years thereafter, and come forward with proposals as appropriate.*

*5. In preparing its proposal, the Commission shall take account of recommendations from the Scientific Committee on Toxicity, Ecotoxicity and the Environment, Member States, the European Parliament, the European Environment Agency, Community research programmes, international organisations to which the Community is a party, European business organisations including those representing small and medium-sized enterprises, European environmental organisations, and of other relevant information which comes to its attention.*

*6. For the priority substances, the Commission shall submit proposals of controls for:*

- the progressive reduction of discharges, emissions and losses of the substances concerned, and, in particular*
- the cessation or phasing-out of discharges, emissions and losses of the substances as identified in accordance with paragraph 3, including an appropriate timetable for doing so. The timetable shall not exceed 20 years after the adoption of these proposals by the European Parliament and the Council in accordance with the provisions of this Article.*

*In doing so it shall identify the appropriate cost-effective and proportionate level and combination of product and process controls for both point and diffuse sources and take account of Community-wide uniform emission limit values for*

*process controls. Where appropriate, action at Community level for process controls may be established on a sector-by-sector basis.*

*7. The Commission shall submit proposals for quality standards applicable to the concentrations of the priority substances in surface water, sediments or biota.*

*8. The Commission shall submit proposals, in accordance with paragraphs 6 and 7, and at least for emission controls for point sources and environmental quality standards within two years of the inclusion of the substance concerned on the list of priority substances. For substances included in the first list of priority substances, in the absence of agreement at Community level six years after the date of entry into force of this Directive, Member States shall establish environmental quality standards for these substances for all surface waters affected by discharges of those substances, and controls on the principal sources of such discharges, based, inter alia, on consideration of all technical reduction options. For substances subsequently included in the list of priority substances, in the absence of agreement at Community level, Member States shall take such action five years after the date of inclusion in the list.*

## **7. Directives covering pollutants**

**DIRECTIVE 2004/35/CE** Annex 111 says:

*“(a) dangerous substances as defined in Article 2(2) of Council Directive 67/548/EEC of 27 June 1967 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous substances (8);”*

### **7.1 COUNCIL DIRECTIVE (67/548/EEC) of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (67/548/EEC)<sup>15</sup>**

#### **Article 2**

*1. For the purposes of this Directive: (a) "substances" means chemical elements and their compounds as they occur in the natural state or as produced by industry; (b) "preparations" means mixtures or solutions composed of two or more substances.*

---

<sup>15</sup> <https://osha.europa.eu/en/legislation/directives/exposure-to-chemical-agents-and-chemical-safety/osh-related-aspects/58>

- (e) toxic: substances and preparations which, if they are inhaled or taken internally or if they penetrate the skin, may involve serious, acute or chronic health risks and even death;*
- (f) harmful: substances and preparations which, if they are inhaled or taken internally or if they penetrate the skin, may involve limited health risks;*
- (h) irritant:*

## **7.2 DIRECTIVE 1999/45/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 May 1999<sup>16</sup>**

*concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations*

### **Article 2(2)**

*2. The following are "dangerous" within the meaning of this Directive:*

- (h) harmful substances and preparations: substances and preparations which may cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;*
- (j) irritant substances and preparations: non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with the skin or mucous membrane, may cause inflammation;*
- (k) sensitising substances and preparations: substances and preparations which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction of hypersensitisation such that on further exposure to the substance of preparation, characteristic adverse effects are produced;*
- (l) carcinogenic substances and preparations: substances or preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence;*
- (m) mutagenic substances and preparations: substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce heritable genetic defects or increase their incidence;*
- (n) substances and preparations which are toxic for reproduction: substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce, or increase the incidence of, non-heritable adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity;*
- (o) substances and preparations which are dangerous for the environment: substances and preparations which, were they to enter the environment, would or*

---

<sup>16</sup> <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31999L0045>

*could present an immediate or delayed danger for one or more components of the environment.*

## **8. Competent Authorities - their statutory responsibility:**

**DIRECTIVE 2004/35/CE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage'**

### **8.1 The Directive and Competent Authorities**

*(15)....public authorities should ensure the proper implementation and enforcement of the scheme provided for by this Directive.*

#### **Article 11**

*Competent authority*

- 1. Member States shall designate the competent authority(ies) responsible for fulfilling the duties provided for in this Directive.*
- 2. The duty to establish which operator has caused the damage or the imminent threat of damage, to assess the significance of the damage and to determine which remedial measures should be taken with reference to Annex II shall rest with the competent authority. To that effect, the competent authority shall be entitled to require the relevant operator to carry out his own assessment and to supply any information and data necessary.*
- 3. Member States shall ensure that the competent authority may empower or require third parties to carry out the necessary preventive or remedial measures.*
- 4. Any decision taken pursuant to this Directive which imposes preventive or remedial measures shall state the exact grounds on which it is based. Such decision shall be notified forthwith to the operator concerned, who shall at the same time be informed of the legal remedies available to him under the laws in force in the Member State concerned and of the time-limits to which such remedies are subject.*

This EU Directive (the very same origin of legislation which upholds windfarm energy policies) was adopted by member states by 30<sup>th</sup> April 2007 and reference to it should be on all related Government regulation documents. (Article 19)

## **8.2: Scottish Protection Environmental Agency SEPA<sup>17</sup>**

---

<sup>17</sup> [http://www.sepa.org.uk/land/land\\_regulation.aspx](http://www.sepa.org.uk/land/land_regulation.aspx)



The Environmental Liability (Scotland) Regulations 2009 came into force on 24 June 2009. The regulations transpose the European Union Environmental Liability Directive into Scots law and aim to establish a new kind of civil law mechanism based on the 'polluter pays' principle.

**The regulations oblige operators of certain activities to take preventative measures where there is an imminent threat of environmental damage, and to remediate any environmental damage caused by their activities.**

**What is environmental damage?**

The regulations identify three categories of environmental damage: land damage, water damage and habitats and protected species damage.

The regulations determine:

- water damage as any damage causing: deterioration of the ecological/chemical status of a body of surface water; the chemical or quantitative status of a body of groundwater;.
- habitats and species damage as: any damage to protected species and natural habitats; particularly if it has significant adverse effects on reaching or **maintaining the favourable conservation status** of the protected species or natural habitat.

*Protected species and natural habitats include any species mentioned in Article 4(2) and listed in Annex I of the **Birds Directive and their habitats**, any species listed in Annex II of the **Habitats Directive and their habitats**, any species listed in Annex IV of the **Habitats Directive and their breeding sites or resting places and any habitats listed in Annex I of the Habitats Directive**.*

### **8.2.1 SEPA Water regulations**

In 2003, an ambitious piece of European environmental legislation called the Water Framework Directive (WFD) resulted in the Water Environment and Water Services (Scotland) Act 2003 (WEWS Act) becoming law in Scotland – see chapter 6

The WEWS Act gave Scottish ministers powers to introduce regulatory controls over water activities, in order to protect, improve and promote sustainable use of Scotland's water environment. This includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. SEPA and Scottish Water have set out protected areas according to the above directives<sup>18</sup>. An interactive map<sup>19</sup> shows where all protected water catchment zones can be identified.

*Environmental Protection The Scotland River Basin District*<sup>20</sup>

---

<sup>18</sup> [http://www.sepa.org.uk/water/river\\_basin\\_planning.aspx](http://www.sepa.org.uk/water/river_basin_planning.aspx)

<sup>19</sup> <http://gis.sepa.org.uk/rbmp/>

<sup>20</sup> <http://www.scotland.gov.uk/Resource/0045/00457867.pdf>

*These Directions apply in relation to the exercise of SEPA's functions pursuant to—*

- *Part 1 of the Water Environment and Water Services (Scotland) Act 2003 ('the Act'); and*
- *such other enactments as the Scottish Ministers may specify under section 2(8) of the Act, including those listed in Schedule 1 to the Water Environment (Relevant Enactments and Designation of Responsible Authorities and Functions) (Scotland) Order 2011(a).*

*They apply only in relation to surface water and groundwater within the area designated and named "Scotland River Basin District" for the purposes of Part 1 of the Act.*

*They should be read with reference to SEPA's functions pursuant to—*

- *section 5(3) of the Act which requires SEPA to review, and where necessary, update the characterisation of the Scotland River Basin District ("the District");*
- *section 8 of the Act which requires SEPA to monitor of the status of the water environment in the District and to secure the analysis of that monitoring information;*
- *section 9 of the Act which requires SEPA to set objectives for each body of water in the District and to prepare a programme of measures to achieve those objectives;*
- *the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations 2013; and*
- *the Water Environment (Controlled Activities) (Scotland) Regulations 2011 including, in particular, regulation 15(1)(e) and (f).*

*By virtue of section 2(1) and, more specifically, section 5 of the Act, SEPA is required to review the characterisation of the District in accordance with the specifications in Annex II to Directive 2000/60/EC. Article 3 of, and Schedule 1 to, these Directions set out the criteria by which SEPA must determine the type of each body of surface water in accordance with those specifications.*

*By virtue of section 2(1) of the Act and, more specifically, regulation 12(2) of the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations*

*2013, SEPA is required to ensure that monitoring is carried out in accordance with Annex V to the Directive 2000/60/EC. Annex V set out the standards against which the status of each body of water can be classified. Article 3 of, and Schedules 2 to 6 to, these Directions apply standards for this and other purposes with a view to achieving the environmental objectives of the Directive.*

*Regulation 21(1)(b) of the Water Environment (River Basin Management Planning: Further Provision) (Scotland) Regulations 2013 provides that, for the*

*purposes of assessing the chemical status of each body of groundwater under section 8 of the Act, SEPA must use the following—*

- *groundwater quality standards in Annex I to the Directive 2006/118/EC(b); and*
- *threshold values which the Scottish Ministers direct SEPA to apply for those purposes*

## **8.2.2 The Water Environment (Controlled Activities) (Scotland) Regulations 2011**

These regulations are more commonly known as the Controlled Activity Regulations (CAR). If you intend to carry out any activity which may affect Scotland's water environment, you must be authorised to do so. Discharges, disposal to land, abstractions, impoundments and engineering works are all regulated by SEPA. This sub-section states<sup>21</sup>:

*“Chapter 3*

*Measures for protection of the water environment*

*20. Regulation of controlled activities*

*(1)The Scottish Ministers may by regulations make such provision for or in connection with regulating any activity (a “controlled activity”) as they consider necessary or expedient for the purposes of protection of the water environment.*

*(2)Such regulations may, in particular—*

*(a)make provision for or in connection with regulating the activities specified in subsection (3),*

*(b)otherwise make such provision for or in connection with the basic measures and supplementary measures mentioned in paragraph 2 of Article 11 of the Directive as the Scottish Ministers consider necessary or expedient for the purpose of facilitating the achievement of the environmental objectives set out in river basin management plans.*

*(3)The activities referred to in subsection (2)(a) are—*

*(a)activities liable to cause pollution of the water environment,*

*(b)abstraction of water from bodies of surface water or groundwater,*

*(c)the construction, alteration or operation of impounding works in bodies of surface water,*

*(d)building, engineering or other works in, or in the vicinity of, any body of inland surface water,*

*(e)activities connected with any of the activities specified in paragraphs (a) to (d).*

---

<sup>21</sup> <http://www.legislation.gov.uk/asp/2003/3/part/1/chapter/3>

*(4)The provision which may be made in regulations under this section includes provision for any of the purposes specified in Part 1 of schedule 2.*

*(5)Part 2 of that schedule has effect for supplementing Part 1.*

*(6)In subsection (3)—*

*“abstraction”, in relation to a body of surface water or groundwater, means the doing of anything whereby any water is removed by mechanical means from that body of water, whether temporarily or permanently, including anything whereby the water is so removed for the purpose of being transferred to another body of water within the water environment,*

*“impounding works”, in relation to a body of surface water, means—*

*(a)any dam, weir or other works in the body of water by which water may be impounded,*

*(b)any works diverting the flow of water in the body of water in connection with the construction or alteration of any dam, weir or other works falling within paragraph (a),*

*“pollution”, in relation to the water environment, means the direct or indirect introduction, as a result of human activity, of substances or heat into the water environment, or any part of it, which may give rise to any harm; and “harm” means—*

*(a)harm to the health of human beings or other living organisms,*

*(b)harm to the quality of the water environment, including—*

*(i)harm to the quality of the water environment taken as a whole,*

*(ii)other impairment of, or interference with, the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems,*

*(c)offence to the senses of human beings,*

*(d)damage to property, or*

*(e)impairment of, or interference with, amenities or other legitimate uses of the water environment.*

*(7)This section is without prejudice to section 22.”*

SEPA is responsible for the protection of the water environment and authorisation is required for activities such as discharges to surface and groundwater as well as engineering activities on the water environment.

The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) (CAR)<sup>22</sup> includes a requirement that surface water discharges must not result in pollution of the water environment. **The applications are required to show the location of all built elements associated with the wind farm so that we can assess their impacts on peatlands, watercourses, lochs, groundwater**

---

<sup>22</sup> [http://www.sepa.org.uk/water/water\\_regulation.aspx](http://www.sepa.org.uk/water/water_regulation.aspx)

**dependent terrestrial ecosystems, water supplies and groundwater.** We consider if appropriate mitigation and pollution prevention measures are included in the environmental management plan.

### **8.2.3 Monitoring**

*(Directive 2000/60/EC<sup>23</sup> -came into force in 2006- Article 8 -Monitoring of surface water status, groundwater status and protected areas*

*1. Member States shall ensure the establishment of programmes for the monitoring of water status in order to establish a coherent and comprehensive overview of water status within each river basin district:*

*- for surface waters such programmes shall cover:*

*(i) the volume and level or rate of flow to the extent relevant for ecological and chemical status and ecological potential, and*

*(ii) the ecological and chemical status and ecological potential;*

*- for groundwaters such programmes shall cover monitoring of the chemical and quantitative status,*

*- for protected areas the above programmes shall be supplemented by those specifications contained in Community legislation under which the individual protected areas have been established.*

*2. These programmes shall be operational at the latest six years after the date of entry into force of this Directive unless otherwise specified in the legislation concerned. Such monitoring shall be in accordance with the requirements of Annex V.*

*3. Technical specifications and standardised methods for analysis and monitoring of water status shall be laid down in accordance with the procedure laid down in Article 21)*

SEPA, Scottish Natural Heritage, Forestry Commission (refer to **CIRIA C648**) and the windfarm industry have worked together to produce guidance on good practice during wind farm construction<sup>24</sup>.

Base-line monitoring is required during scoping of developments and, according to this document:

*“2.5 It is the responsibility of the developer of the wind farm to ensure that planning conditions are adhered to. It is also the responsibility of the author of the planning permission and conditions to monitor and ensure compliance. SEPA and SNH will often advise the determining authority (either the Planning Authority or the Scottish Government Energy Consents and Deployment Unit) if conditions are required to meet pollution prevention or nature conservation objectives.*

---

<sup>23</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32000L0060>

<sup>24</sup> <http://www.snh.gov.uk/docs/A1168678.pdf>



*5.1 During wind farm construction the developer and contractor have to comply with a number of obligations under both the conditions of the planning consent and environmental legislation. To ensure effective implementation and monitoring of these obligations, Clerk of Works (of varying disciplines relevant to the site) are commonly requested as a condition of planning consent. The Clerk of Works (CoW) role is focused on providing environmental/heritage advice and monitoring compliance – not implementing measures. They will also advise on relevant wildlife/heritage legislation and aid in the development of practical solutions. In certain circumstances it may be appropriate for an onsite CoW to have the authority to temporarily stop works over a small part of the site to avoid a crime being committed. Clerks of Works is a term often used to describe a multidisciplinary team of individuals covering a diversity of specialist roles, e.g. hydrology, landscape, archaeology and soils.*

***5.2.1a) Construction Activities Installation of site tracks, compounds, hard standings, borrow pits, electrical cable installation, turbine foundations, vehicle movements, micro-siting of infrastructure and fuel and chemical storage. Monitoring should be undertaken before, during and after construction on many of these activities.***

***b) Monitoring of Pollution Prevention and Mitigation undertaken by a developer This may include: monitoring site pollution prevention plan, water quality monitoring, advising on required pollution prevention measures,***

The regulations oblige operators of certain activities to take preventative measures where there is an imminent threat of environmental damage, and to remediate any environmental damage caused by their activities.

*Site Waste Management Plan (SWMP) It is the developer's responsibility to monitor compliance with the SWMP. Point of contact should be established with SEPA regarding waste issues.*

## ***2. Additional resources required***

*The CoW role is focused on providing archaeological and environmental advice and monitoring compliance – not implementing the measures. Generally, for the CoW's advice to be effective, appropriate capacity needs to be allocated to environmental protection by the infrastructure contractor. This may involve a dedicated 'environmental team' on site whose core responsibility is to maintain and monitor environmental protection measures. This team would require access to the necessary equipment at all times. The size of the 'environmental team' required will depend on the size and sensitivity of the site. For example during peak construction activity on a 50 turbine upland site, around 3-4 full time staff may be required in addition to the CoW.*

***3. Position of Clerks of Works within Construction Team Structure Obligations under planning conditions and environmental legislation are the responsibility of***

*the developer. These obligations are largely passed onto the infrastructure contractor, via the infrastructure contract, to implement on site. As explained above, the Clerks of Work's role is to monitor compliance and provide advice. As a result of this compliance-monitoring role, it is often best (for ease of communication) for the Clerks of Works to be employed directly by the developer. This helps to ensure direct reporting lines.*

## 8.2

*A monitoring programme should be set up during felling operations to ensure that the forestry contractor is meeting the required specifications.*

### *Monitoring*

*a) The following monitoring recommendations should be considered:*

*(i) Long term monitoring is required to inform site management and aftercare;*  
*(ii) Monitor felling or in-situ chipping before, during and after operations, to ensure the contractors have achieved the safety and environmental specifications agreed within the contract;*

*(iii) Assessing the potential impact of felling on watercourses;*

*(iv) Monitor the response of vegetation to tree removal and the response of the water table to actions to improve hydrology. **This should ideally be initiated pre-clearance to establish baseline conditions and then continued at an appropriate and pre-agreed frequency and duration post clearance;***  
*and*

*(v) **Results from monitoring programmes should inform an adaptive management approach to allow the defined ecological aims and objectives to be met within the specified timescales.***

### 9.5 Additional protection measures

***Monitoring surface water quality (including turbidity/suspended solids) before, during and after construction, in addition to regular visual inspections (as noted above), should ensure the effectiveness of the mitigation measures and a minimal effect on aquatic flora and fauna.***

9.6 Draw up an Action Plan outlining trigger points at which action will be taken should a problem occur, e.g. pollution event, release of sediment etc. Trigger points should be related to monitoring activities informed by baseline data.

14.3 Long-term monitoring is essential to develop cost-effective techniques and methods that work to ensure successful restoration.”

### 8.3 Scottish Water

The key legislation is defined in Chapter 6. Also **The Water (Scotland) Act 1980**<sup>25</sup>

concerning drinking water quality in Scotland:

Both public and private water supply legislation is based on COUNCIL DIRECTIVE 98/83/EC of 3 November 1998 on the quality of water intended for human consumption<sup>26</sup>

#### 8.3.1 2001 No. 207 WATER SUPPLY The Water Supply (Water Quality) (Scotland) Regulations 2001<sup>27</sup>

Water authorities must supply wholesome water for domestic purposes. It is a criminal offence to supply water unfit for human consumption;

*Wholesomeness*

4.—(1) *Water supplied—(a) for such domestic purposes as consist in or include, cooking, drinking, food preparation or washing; or*  
*(b) for any of those domestic purposes to premises in which food is produced, shall, subject to paragraphs (4) and (5) below, be regarded as wholesome for the purposes of Part VI A of the Act, as it applies to the supply of water for those domestic purposes, if the requirements of paragraph (2) are satisfied.*

(2) *The requirements of this paragraph are— (a) that the water does not contain—*  
*(i) any micro-organism (other than a parameter) or parasite;*

*or (ii) any substance (other than a parameter), at a concentration or value which would constitute a potential danger to human health;*

*(b) that the water does not contain any substance (whether or not a parameter) at a concentration or value which, in conjunction with any other substance it contains (whether or not a parameter) would constitute a potential danger to human health;*

*(c) that the water does not contain concentrations or values of the parameters listed in Tables A and B in Schedule 1 in excess of or, as the case may be, less than the prescribed concentrations or values;*

*and (d) that the water satisfies the formula  $[\text{nitrate}]/50 + [\text{nitrite}]/3 \cdot 1$ , where the square brackets signify the concentrations in mg/l for nitrate (NO<sub>3</sub>) and nitrite (NO<sub>2</sub>).*

(3) *The point at which the requirements of paragraph (2), in so far as they relate to the parameters set out in Part I of Table A and in Table B in Schedule 1 are to be complied with is—*

*(a) in the case of water supplied from a tanker, the point at which the water emerges from the tanker;*

<sup>25</sup> <http://www.scotland.gov.uk/Topics/Environment/Water/17670/9395>

<sup>26</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:330:0032:0054:EN:PDF>

<sup>27</sup> [http://www.legislation.gov.uk/ssi/2001/207/pdfs/ssi\\_20010207\\_en.pdf](http://www.legislation.gov.uk/ssi/2001/207/pdfs/ssi_20010207_en.pdf)

- (b) in any other case, the consumer's tap.*
- (4) Water supplied for regulation 4(1) purposes shall be regarded as unwholesome for the purposes of Part VI A of the Act if, on transfer from a treatment works for supply for those purposes—*
- (a) it contains a concentration of the coliform bacteria or E. coli. parameter (items 1 and 2 in Part II of Table A in Schedule 1) in excess of the prescribed concentrations;*
- or (b) it contains a concentration of nitrite in excess of 0.1 mgNO<sub>2</sub>/l.*
- (5) Subject to paragraph (6), water supplied for regulation 4(1) purposes shall be regarded as unwholesome for the purposes of Part VI A of the Act if, on transfer from a service reservoir for supply for those purposes, it contains a concentration of the coliform bacteria or E. coli parameter in excess of the prescribed concentrations.*
- (6) Water transferred from a service reservoir for supply for regulation 4(1) purposes shall not be regarded as unwholesome for the purposes of Part VI A of the Act because the maximum concentration for the coliform bacteria parameter listed in Part II of Table A in Schedule 1 is exceeded if, as regards the samples taken in any year in which the reservoir in question is in use, the results of analysis for that parameter establish that in at least 95% of those samples coliforms were absent.*

Scottish Ministers must take enforcement action against a water authority that fails in its duty to supply wholesome water unless the failure is trivial or the water authority is complying with a legally binding undertaking to remedy the matter; The World Health Organisation describes water as a basic nutrient of the human body which is critical to life. The Food Standards Agency advise that we take around 1.5 to 2 litres of water in a typical day, the equivalent to 6 to 8 250ml glasses.

**8.3.2 Where does our water come from?**<sup>28</sup> *Essentially all of our water comes from rain; when it rains two things can happen:-*

- 1. The water can flow into streams, rivers, lochs and reservoirs, and this type of water is known as surface water.*
- 2. Alternatively, the water can seep through the ground until it reaches rocks which it cannot pass through. It then forms water pools and this is known as ground water. It is often very pure as many of the pollutants are naturally filtered out through the seeping process.*

---

<sup>28</sup><http://www.scottishwater.co.uk/assets/domestic/files/you%20and%20your%20home/water%20quality/yourwaterleaflet.pdf>

*Some Scottish Water customers are supplied with water from ground water sources, however most of our customers receive their tap water from surface water sources.*

*Why does water need to be treated? As humans we cannot live without water and we depend upon it for nearly everything that we do. If water carries certain microorganisms, this could seriously damage our health. As a result, the main aim of our treatment process is to remove any harmful microorganisms and ensure our water is safe for you to use and drink.*

*Water quality and the law; There are very strict laws governing drinking water quality in the UK. The water that we supply to our customers must meet high standards set by the Government and the European Union. As a result we regularly test our water quality at the treatment works and at our customer's tap. These sample results are sent to the Drinking Water Quality Regulator and are available for your information, at selected Scottish Water offices on request.*

### **8.3.3 Scottish Water and windfarms**

The Scottish Government passed a law to allow the leasing of Scottish Water land to windfarms.

In SW documentation -Large-scale wind<sup>29</sup> it states:

*We also host third party wind development on some sites. For example, at Whitelee, (215 turbines - the largest on shore UK windfarm and one of the largest wind farms in Europe) Scottish Water hosts 60 turbines on land adjacent to its reservoir.*

*Such developments offer Scottish Water a rental income or a discount on the cost of power it purchases from the grid.*

*Scottish Water is also actively pursuing plans for smaller wind development schemes in appropriate locations to help directly power its own assets. **Scottish Water Horizons**<sup>30</sup>, our commercial subsidiary, has a programme of investment in a number of such schemes.*

### **8.4. Forestry Commission Scotland:**

Forestry Commission Scotland

Nisbet (2001) stated that the major water quality concerns associated with commercial forestry are increased turbidity and sedimentation due to the soil disturbance accompanying cultivation, drainage, road construction and harvesting

---

<sup>29</sup> <http://www.scottishwater.co.uk/investment-and-communities/investment-programme/energy>

<sup>30</sup> <http://www.scottishwater.co.uk/business/horizons>



operations; and the enhanced capture of acid deposition by forest canopies resulting in further acidification of surface waters.

The deforestation in preparation for windfarms is clearly linked with increased C and P concentrations and export in stream water.

<http://www.caithnesswindfarms.co.uk/Whitelee.pdf>

#### **8.4.1 Woodland for Water:** Woodland measures for meeting Water Framework Directive objectives<sup>31</sup>

*“Certain forestry management operations have the potential to increase the risk of diffuse pollution to water. In contextualising the scale of diffuse pollution from forestry, 25% of lochs in the Scotland River Basin were found to be potentially affected by forestry related activities.”*

Forestry Commission<sup>32</sup>

This provides further background, gives an overview of the developments relevant to forests and water, and summarises the main statutes.

Again activities based on the same legal water directives.

#### **8.4.2 The UK Forestry Standard Forestry Commission:**

The governments’ approach to sustainable forest management<sup>33</sup>

*“Prior authorisation must be obtained from the water regulatory authority for building, engineering and other activities in or adjacent to watercourses that affect river hydromorphology; this includes water abstraction, impoundments, constructing culverts and extracting river gravel. authorisation for gravel extraction may also be required from the conservation agency if the river is designated as, or flows through, a Special area of Conservation, Special Protection area or Site of Special Scientific Interest Forestry operations must not lead to harmful or polluting substances contaminating public or private water supplies.*

*Water flowing from and within forests supports habitats for a large range of plants and animals, and is used for both public and private drinking water supplies, agriculture, industry and recreation. Well-oxygenated water that is low in sediment content and free from contaminants is required. Water quality can be maintained or enhanced through good forest planning and management, and in particular through the identification and management of buffer areas. These areas,*

---

<sup>31</sup> Woodland for Water: Woodland measures for meeting Water Framework Directive objectives

<sup>32</sup> [http://www.forestry.gov.uk/pdf/FCGL007.pdf/\\$FILE/FCGL007.pdf](http://www.forestry.gov.uk/pdf/FCGL007.pdf/$FILE/FCGL007.pdf)

<sup>33</sup> <http://www.forestry.gov.uk/theukforestrystandard>

*which will include the riparian zones next to watercourses, are set aside to help buffer any potentially adverse effects of adjacent land management. a range of special measures applies to buffer areas in terms of forest and operational planning and any applications of pesticide or fertiliser. These measures ensure that soil disturbance, siltation and the risk of pollution are minimised.*

*a buffer area is fundamental to both existing and new forests. Key aspects of the design of the buffer area are width, structure, choice of species and management regime. Extending the buffer margin to include wet and boggy source areas can be particularly important in relation to pesticide applications. In general, the aim in buffer areas is to establish and maintain a partial cover of riparian woodland comprising species native to the location and soils. It is important for landscape and water environment reasons to avoid parallel-sided corridors and design the margin in response to the landform. In addition, where there are particular sensitivities in the aquatic zone, such as salmonid spawning beds or the presence of the freshwater pearl mussel, wider buffer areas may be required. Factors such as climate, altitude, slope and soil type all have a bearing on the effectiveness of the buffer area and therefore on the desired width. Watercourses and waterbodies should be identified and appropriate buffer areas established and maintained to protect aquatic and riparian zones from adjacent activities.*

*6 Forest drainage should be planned and, where necessary, existing drains should be realigned to ensure that water is discharged slowly into buffer areas and not directly into watercourses.*

*7 Forest operations should be conducted to prevent watercourses being polluted with sediment or discoloured; inspections should be carried out during forestry works and any incidents involving contamination of the water environment reported to the water regulatory authority without delay – remedial action should be taken immediately if pollution starts to occur.*

*8 Fertiliser and pesticide applications should match the needs of the stand and should be planned with careful attention given to buffer and storage areas, weather and ground conditions, and the risk to water supplies; contingency plans should be in place in case of a spillage.*

*9 Where extensive fertiliser applications are being planned within the same catchment, phasing should be considered to ensure nutrient losses do not exceed environmental quality standards.*

*10 a minimum of oil and fuel should be stored on site and appropriate precautions should be taken. acidification is one of the most serious threats to water quality in some parts of upland Britain. The role of forestry in relation to diffuse pollution through acid deposition has been the subject of research and is now better understood. Where forestry could pose a threat, a range of measures and assessment procedures have been agreed to protect waters from adverse effects.*

*Where new planting or restocking is proposed within the catchments of water bodies at risk of acidification, an assessment of the contribution of forestry to acidification and the recovery process should be carried out; details of the assessment procedure should be agreed with the water regulatory authority.”*

### **8.4.3 Environmental impacts of forestry**

Proposals for new planting (including short rotation coppice and Christmas trees), deforestation, and the construction of forest roads and quarries come under the forestry provisions of the EU Environmental Impact Assessment (EIA) Regulations.

The Forestry Commission and the Department of Agriculture and Rural Development in Northern Ireland are responsible for the implementation of the Regulations, and will advise applicants about their scope and whether there is likely to be a need for an EIA. Forestry proposals that may have significant environmental impacts will require an EIA before approval is granted.

If an EIA is required, the applicant must prepare a comprehensive forest management plan, together with an exploration of the potential environmental impacts – this process will involve appropriate specialists. The applicant must submit an Environmental Statement to the forestry authority, and this and the EIA will be made available to the public and to the various statutory environmental authorities. The Forestry Commission or Department of Agriculture and Rural Development will take account of any comments received before making their decision. The Environmental Liability Directive (2004/35/EC) establishes a common framework for liability with a view to preventing and remedying damage affecting the land, including damage to animals, plants, natural habitats and water resources. The Directive is the first EC legislation whose main objectives include the application of the ‘polluter pays’ principle. It requires those responsible for the most significant cases of environmental damage to take immediate action to prevent the damage occurring and to put right damage where it does occur.

## **8.5 Councils:**

**8.5.1 Between a rock and a hard place** protecting their local development plans and being pressured and coerced into consenting industrial windfarms. Once consented by whatever means they are tasked with policing the conditions of consent

### **8.5.2 The Private Water Supplies (Scotland) Regulations 2006<sup>34</sup>**

- *Local authorities must take appropriate steps to keep themselves informed about the wholesomeness of public and private water supplies in their area and notify the water authority if not satisfied;*

---

<sup>34</sup> [http://www.legislation.gov.uk/ssi/2006/297/pdfs/ssi\\_20060297\\_en.pdf](http://www.legislation.gov.uk/ssi/2006/297/pdfs/ssi_20060297_en.pdf)

- *Local authorities are required to secure improvements to private water supplies if they consider them necessary; and*
  - *Wholesomeness is defined for private supplies in the Private Water Supplies (Scotland) Regulations 1992*
  - *Councils must:*
  - *Define wholesomeness in the same manner and prescribe the same standards as for public supplies*
  - *Require local authorities to classify private supplies according to size and use*
  - *Require local authorities to monitor private supplies in their area according to classification*
  - *Require local authorities to secure improvements to private supplies if necessary*
- Local authorities must take appropriate steps to keep themselves informed about the wholesomeness of public and private water supplies in their area and notify the water authority if not satisfied;*

**8.5.3 Around 150,000 people in Scotland rely on a private water supply<sup>35</sup>** - any water supply not provided by Scottish Water - for their drinking water. Instead of Scottish Water, the owner or person who uses the supply is responsible for its maintenance. Supplies vary in size from those that serve one household to those that serve hundreds of people. Tens of thousands of people also use them occasionally each year, typically when they are on holiday. The quality of water from private supplies is highly variable and when poor can cause significant health problems.

*The sources of private water supplies also vary, including surface water such as streams and rivers as well as private impoundment reservoirs, and groundwater such as wells and boreholes or springs where groundwater issues naturally at the surface from an aquifer.*

*Private water supplies are regulated by the Private Water Supplies (Scotland) Regulations 2006 ("the 2006 Regulations") which transpose the revised European Drinking Water [Directive \(Council Directive 98/83/EC\)](#), and update earlier Regulations. Their overriding objective is to ensure the provision of clean and wholesome drinking water and deliver significant health benefits to those using such supplies. The 2006 Regulations, which came into force on 3 July 2006, incorporate the latest advances to improve drinking water quality including the use of risk assessments from 'source to tap' as part of an effective drinking water surveillance programme.*

*The primary legislation pertaining to water supplies in Scotland is the Water (Scotland) Act 1980. Under the Act, each dwelling requires to be supplied by an adequate and wholesome water supply. If an unsatisfactory supply is identified, the*

---

<sup>35</sup> <http://www.scotland.gov.uk/Topics/Environment/Water/17670/pws>

*local authority has powers to serve a notice requiring improvements to be carried out.*

**–A growing number of these PWS are now being affected by windfarm development.**

It is recognised by public health authorities that the majority of significant public outbreaks of gastrointestinal upset originate from contaminated private water supplies e.g. E. Coli 0157.

**8.5.4 The Private Water Supplies (Scotland) Act 2006 (209) places a burden of responsibility on the owner and occupier of the land upon which a private water supply arises , to protect that supply and to notify consumers on that PWS of any adverse water test results.**

Local Authorities are responsible for the regulation of private water supplies in accordance with the Private Water Supplies (Scotland) Regulations 2006. This requires a relevant person(s) to be identified for a private water supply. It is the responsibility of the relevant person to ensure any maintenance or improvements required to be carried out on their private water supply.

Determination and notification of relevant person

4.—(1) A local authority shall, in relation to each private water supply to any premises within its area, determine, for their respective interests, those persons who—

- (a) provide the supply;
- (b) occupy the land from, or on which, the supply is obtained or located; or
- (c) exercise powers of management or control in relation to the supply, and a person so determined shall, in these Regulations, be referred to as a “relevant person”.

A Relevant person under this Act has a duty of care to protect the source of the Private Water Supply. Note that under b) the wind farm operator as the likely occupier - even if they are not the owner of land from which PWS arises, have responsibilities under this Act.

## **8.6. Scottish National Heritage SNH<sup>36</sup>**

SNH have responsibilities for Catchment Management with regard to habitats.

---

<sup>36</sup> <http://www.snh.org.uk/pdfs/strategy/renewables/Good%20practice%20during%20windfarm%20construction.pdf>



A catchment is the area of land drained by a river and its tributaries. The area of a catchment could include the slopes of hills, floodplains, lochs and forests. The quality and quantity of waters within a catchment closely reflect a wide range of natural processes and human activities which occur throughout the entire catchment, including its ground waters and wetlands.

**The waters in a catchment are connected, which means that an activity leading to poor water quality in one part of the catchment may have the potential to affect the health of a much wider area.**

The Water Framework Directive (WFD) is again the legislation by which SNH prevent deterioration and enhance status of aquatic ecosystems, including groundwater;

- promote sustainable water use;
- reduce pollution;
- contribute to the mitigation of floods and droughts.

## **9. CIRIA C648 Control of water pollution from linear construction projects<sup>37</sup>**

**9.1 This publication provides guidance to clients, consultant, designers, contractors and regulators** on how to plan and manage water pollution from road, railway, pipeline, waterway and other linear construction projects.

This is one of the best guidance documents in circulation and referenced in:

[http://www.forestry.gov.uk/pdf/FCGL007.pdf/\\$FILE/FCGL007.pdf](http://www.forestry.gov.uk/pdf/FCGL007.pdf/$FILE/FCGL007.pdf)

<http://www.snh.org.uk/pdfs/strategy/renewables/Good%20practice%20during%20windfarm%20construction.pdf>

and verifies the requirements of the EU Directives and transposition into Scottish Law:

*“This publication was produced as a result of CIRIA Research Project 708, “Control of water pollution from linear construction projects”*

*“2 Water environments*

*Understanding surface water and groundwater environments is critical to:*

*\_ route selection*

*\_ scheme design*

*\_ planning construction working methods*

---

<sup>37</sup> [http://persona.uk.com/A21Ton/Core\\_dox/N/N9.pdf](http://persona.uk.com/A21Ton/Core_dox/N/N9.pdf)

- identifying mitigation measures to minimise the risk of water pollution.

**9.2 Groundwater** is an important resource, providing more than one-third of the potable water supply in the British Isles. In addition, it provides essential base-flow to rivers and wetland areas, often supporting important ecological systems. However, groundwater is vulnerable to pollution – especially because it is generally less apparent than surface water and the potential impacts on groundwater are rarely observed and so tend to receive little consideration. Groundwater pollution is problematic because aquifer pollution persists for long periods and is often very difficult and costly to remediate: groundwater pollution prevention measures cost 10–20 times less than groundwater clean-up and aquifer remediation programmes. Groundwater quality is endangered by construction activities that provide a pollution source or pathway or that significantly vary natural groundwater levels (see Table 2.2). In contrast to surface water, groundwater is generally more vulnerable to pollution by chemicals, metals, hydrocarbons and salts than by sediments, because particulate pollutants are naturally filtered during infiltration and recharge. Pollution of groundwater is likely to result in the loss of potable or other water supplies, the degradation of receiving river or wetland waters and habitats, and, for offenders, prosecution.

Table 2.2 *Construction activities that pose a high risk of groundwater impact*

Pollution risk	Hazards
1 Activities that provide a pollution source	<ul style="list-style-type: none"> <li>❖ Fuel and chemical use and storage</li> <li>❖ waste handling, storage and disposal</li> <li>❖ accidental spillages</li> <li>❖ use of concrete, bentonite and grout</li> <li>❖ uncontrolled discharges</li> <li>❖ works in contaminated land</li> </ul>
2 Activities that provide a pollution pathway	<ul style="list-style-type: none"> <li>❖ Tunnelling</li> <li>❖ piling</li> <li>❖ boreholes</li> <li>❖ excavations</li> </ul>
3 Activities that cause significant variations in groundwater levels	<ul style="list-style-type: none"> <li>❖ Dewatering activities during excavations, earthworks, and tunnelling</li> <li>❖ artificial recharge activities</li> </ul>

Groundwater is also at a high risk of pollution in areas where it is directly

*encountered – i.e. when working at or below the water table in deep excavations, earthworks, tunnelling and piling. In these situations, a direct pathway to the aquifer exists with little or no natural protection.*

### 9.3 3.1 TYPES AND SOURCES OF POLLUTION

*Pollution has a number of legal definitions that now, importantly, include things which might lead to effects on ecosystems or people:*

- \_ poisonous, polluting or solid matter*
- \_ substances that harm the health of human beings or other living organisms,*
- \_ substances that harm the quality of the water environment, including aquatic and terrestrial ecosystems dependent on the water environment*
- \_ substances that cause offence to the senses of human beings*
- \_ substances that cause damage to property, and/or*
- \_ substances that cause impairment of, or interference with, amenities or other legitimate uses of the water environment.*

*Table 3.1 illustrates types of pollution and typical sources at construction projects.*

*Table 3.1 Pollution types and sources*

Type of surface or groundwater pollution	Source at construction projects
Suspended solids – silt, sediments, “muddy” water	Surface water runoff, dewatering, outfalls, concrete, bentonite and grout operations, works in water
Organic compounds including hydrocarbons – fuel, oil, some chemicals	Contaminated land, fuel storage and use, vehicle maintenance, plant and vehicles, waste management
Alkaline pH	Concrete, bentonite and grout operations
Other chemicals	Herbicide and pesticide application, contaminated land, use of chemical additives (concrete operations etc)
Solid waste matter (litter, stone, wood, vegetation etc, particularly if it has the potential to block the flow of the river)	Uncontrolled waste handling and disposal, works in or near water, temporary watercourse crossings (haul roads)
Discoloration – as a result of clay, mud, chalk particles etc	Surface water runoff, dewatering, discharge, concrete, bentonite and grout operations, works in water

### 9.4 3.2 Pollution Offences

*Almost any uncontrolled discharge to a water body (including groundwater) has the potential to result in a criminal offence. Water pollution is an offence of strict liability –in all cases it does NOT require proof of negligence or that actual harm was done.*

*It remains an offence in England, Wales, Northern Ireland and Scotland to cause pollution to enter a controlled water, unless it is within the conditions of discharge consent.*

	England and Wales	Scotland	Northern Ireland
<b>Offence</b>	"cause or knowingly permit" pollution or solid matter to enter a controlled water without consent	"the direct or indirect introduction, as a result of human activity, of substances or heat into the water environment which may give rise to any harm" without consent	"knowingly or otherwise" discharge or deposit material in a waterway or groundwater without consent
<b>Law</b>	Water Resources Act 1991	Control of Pollution Act 1974	Water (Northern Ireland) Order 1999

*The law relating to water pollution may appear complex but the principle is simple: it is an offence to cause pollution.*

*While directly causing pollution is obviously an offence (e.g. pumping silty water into a river), permitting pollution through negligence is regarded with equal or greater concern – i.e. knowing a source of pollution exists and doing nothing about it. This is of particular importance on a linear site where site security is harder to ensure or where works may not be taking place on sections of the route during certain phases of the project. Potential pollution risks (such as off-site agricultural runoff or on-site runoff into site drainage) may still exist in these areas, which are the contractor's responsibility. Reporting pollution to the environmental regulator will be taken as mitigation.*

### Conclusion

"The law relating to water pollution may appear complex but the principle is simple: it is an offence to cause pollution. And 8.2 It is essential to know the status of surface water and groundwater before construction starts.

Mitigation measures should be designed to protect these baseline conditions in the water environment. Baseline data can then be used as a benchmark to determine what effect, if any, construction activities are causing."

(CIRIA, 2006)

1. Developers and the government bodies are allowing developments to proceed in the full knowledge that there are risks to environmental water, including surface and groundwater.
2. There have been failures of responsibility and regulation by those authorities whose role is to ensure provision of safe and wholesome public water.
3. A failure by developers to communicate abnormal water quality monitoring results to consenting and regulatory authorities
4. A failure of ANY of the Regulatory authorities to do anything about the 'cause' of the known and recognised deterioration in public water quality
5. There is failure to adequately test consumer supplies of those most likely to suffer the worst water quality results.
6. WTWs raw water data test results showing high levels of colour, iron, manganese, coliforms, E coli and turbidity are not being investigated and resolved by the appropriate authority
7. There is failure to communicate to the Public that the water supply is not meeting standards for 'wholesome water' (SG, Water Wholesomeness – Water Supply(Scotland ) Act 2001) for prolonged periods.
8. There is failure to properly investigate or to acknowledge the cause of water deterioration
9. Inadequate consideration has been given to the ability of the local soil structure to influence the natural degradation of surface pollutants
10. There is a failure to monitor and test for specific contamination events related to focal noxious chemical spill or diffuse contamination (phenols, toluene and phthalates petro-hydrocarbons DEHP and changes in pH)
11. There is a failure to acknowledge contamination of surface water run off with a likely impact on eutrophication and environmental water quality
12. Immediate regular testing and monitoring of all current windfarms for all possible contaminants is required



13. Disinfection procedures mean drinking water is failing to meet European and UK regulatory standards leading to increased levels of Trihalomethanes – recognised by WHO as possible human carcinogens
14. Contamination of Private Water Supplies means spring supplies fail completely, boreholes silt up temporarily and water quality is rendered unfit to drink
15. SEPA have failed to assess applications in accordance with their own policy of requiring developers to identify water sources for PWS that may be at risk
16. The ES's submitted for the various windfarms have not investigated geohydrology at an appropriate level of detail, nor have they considered the reliance of private and public water supplies on either groundwater flow to springs and surface streams or direct groundwater abstraction from boreholes
17. There is no effective protective mechanism for PWS if the competent local authority is responsible for protecting the water supply, but has no mechanism to insist that a developer find, chart and protect the water source, and is subsequently not responsible for the hydrological environment upon which that water supply depends
18. Failure of authorities to monitor base line testing through all stages of development to operational and beyond then applying the results to ES of prospective windfarms
19. Absence of borehole logs required to make an informed, adequate groundwater risk assessment
20. Local Authorities are under resourced to carry out their monitoring and enforcement task effectively, to understand and act on the specialist results and to have the resource to instigate prosecution when developers fail to comply with conditions
21. Predictions from surveys about the depth of peat are under estimated e.g. reported average 3m deep, but in fact are much deeper, between 8m and 9m deep in places. This means that instead of turbine foundations being predicted at 3 m deep, foundations into solid ground have to be up to 12m deep
22. There is a serious disconnect in the effectiveness of the whole regulatory and planning process in respect of water

23. Mitigation measures specified by developers and their contractors are inadequate in themselves or insufficiently enforced
24. This 'Request for Action' calls for an immediate independent investigation into water contamination of ALL windfarm developments on water protected zones
25. Immediate cessation of all further development until safe levels of drinking water can be assured
26. Events are proving how damaging to water quality and public health it has been for the previous First Minister Alex Salmond, through the Scottish Water Act, to permit the industrialisation of water catchment areas in Scotland via wind power installations. The relevant section of this Act must clearly be repealed so that complete protection of reservoirs, lochs and private water supplies can be restored.

The Inquiry statement by Dr Rachel Connor and Tim Harrison, third party objectors, in relation to Matter 4, the issue of DRINKING WATER SUPPLIES in the public examination of an application for consent under the Electricity Act, s.36 for the Third Extension to the Whitelee Windfarm **may be the first documented evidence of such an effect and it could have worldwide implications.**

[dpea.scotland.gov.uk/](http://dpea.scotland.gov.uk/) go to simple search and put in WIN-190-1

In essence this submission provides the evidence that water contamination is occurring at many levels

## GLOSSARY OF TERMS

BGS – British Geological survey

CPHM- Consultant in Public Health Medicine

CWP- Community Windpower Ltd

D&G- Dumfries and Galloway

DECC-Department of Energy and Climate Change DECC

DEFRA-Department of Environment, Food & Rural Affairs  
DEHP - Bis (2 – ethylhexyl)phthalate  
DOC – Dissolved Organic Carbon  
DPEA- Department of Energy Appeals  
DWPA- Drinking Water Protected Area  
DWQR- Drinking water quality regulator  
DWS – Drinking water standards  
EAC – East Ayrshire Council  
ECoW- Ecological Clerk of Works  
ECU – Energy Consents Unit  
ELD-The Environmental Liability (Scotland) Regulations 2009 (ELD)  
EPAW European Platform Against Windfarms  
ES- Environmental Statement  
GW – Groundwater  
LA- Local authority  
PMO- Planning Monitoring Officer  
PWS – Private water supplies  
S.G. – Specific gravity  
SAC- South Ayrshire Council  
SEPA- Scottish Environment Protection Agency  
SPR- Scottish Power Renewables  
SRP – Soluble reactive phosphate  
SW- Scottish Water  
THM- Trihalomethanes  
WEWS The Water Environment and Water Services (Scotland) Act 2003  
WL WF- Whitelee windfarm

### **Maps:**

Many of the surface and groundwater maps are taken from the SEPA interactive map and are used for the sole purpose of illustrating the area which legally requires protection as stipulated in the water frameworks directive  
Some maps are taken from Developers Environmental Statements