


TECHNICAL APPENDIX 14.6 VIKING WIND FARM ADDENDUM ENVIRONMENTAL STATEMENT		 viking energy Harnessing Shetland's natural resources
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SITE ENVIRONMENTAL MANAGEMENT PLAN

VIKING WIND FARM

TECHNICAL SCHEDULE 2 POLLUTION PREVENTION PLAN


SEMP Version:	1.0	
Rev No.	Revision Description:	Date :
0.0	Addendum ES, Appendix A14.6	Sept 2010

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1 INTRODUCTION


1.1 Scope and Objectives

- 1.1.1 The information contained herein forms Technical Schedule 2 (TS2), Pollution Prevention Plan (PPP), of the Viking Wind Farm Site Environmental Management Plan (SEMP).
- 1.1.2 The SEMP, including the information and measures contained within this plan, form part of the Contract. The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, will be adhered to by the appointed *Contractor* in developing the detailed design of the wind farm and in development of the construction method statements and other plans relating to environmental management as required by the Contract.
- 1.1.3 The objective of this pollution prevention plan is to ensure prevention of pollution to land, air or water and compliance with current environmental legislation, and to provide a benchmark for best practice such that all possible preventative measures will be taken to avoid pollution of land or the water environment during construction works and during the operational phase of the wind farm. Noise pollution mitigation may also be dealt with through the PPP, although it is recognised that this may also be covered by the Health and Safety File.
- 1.1.4 The *Contractor* will update/revise this Pollution Prevention Plan to reflect site-specific conditions/issues. The *Contractor* will submit the detailed Pollution Prevention Plan to the Employer for approval at least 4 weeks prior to any construction works commencing on site.

1.2 Reference Documentation

- 1.2.1 This pollution prevention plan will be read and implemented on site in conjunction with the requirements of SEPA's Prevention of Pollution from Civil Engineering Contracts: Special Requirements publication (SEPA, 2006) industry best practice, published guidance documents, and other documents as contained / specified within the SEMP and its associated Technical Schedules (TS). In particular:


- **SEPA Pollution Prevention Guidelines (PPGs):**
 - PPG01 General guide to the prevention of water pollution
 - PPG02 Above ground oil storage tanks
 - PPG03 Use and design of oil separators in surface water drainage systems
 - PPG04 Treatment and disposal of sewage where no foul sewer is available
 - PPG05 Works and maintenance in or near water
 - PPG06 Working at construction and demolition sites
 - PPG07 Refuelling facilities
 - PPG08 Safe storage and disposal of used oils

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- PPG18 Managing fire water and major spillages
- PPG21 Pollution incident response planning
- PPG26 Storage and handling of drums and intermediate bulk containers
- **SEPA:** The Water Environment (Controlled Activities) (Scotland) Regulations 2005, A Practical Guide, Version 5 June 2008.
- **Scottish Natural Heritage (SNH):**
 - Constructed tracks in the Scottish Uplands, March 2005.
 - Floating Roads on Peat, Forestry Civil Engineering and SNH, August 2010.
- **British Standards Institute (BSI):**
 - Code of Practice for Earth Works, BS6031:1981
 - Code of practice for noise and vibration control on construction and open sites, BS5228-1: 2009.
- **Forestry Commission:** The Forests and Water Guidelines, 4th Edition, 2003
- **CIRIA Publications:**
 - Control of Water Pollution from Construction Sites – Guide to Good Practice (SP156)
 - Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (C532)
 - Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648)
 - Control of Water Pollution from Linear Construction Projects – Site Guide (C649)
 - Environmental Good Practice – Site Guide (C650)
 - The SUDS Manual (C697)
 - Site Handbook for the Construction of SUDS (C698)
- **SEMP Technical Schedules**

1.3 Responsibility


- 1.3.1 The company to whom the civil engineering construction contract is granted will be solely responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed to the specifications stated within the Contract.
- 1.3.2 This responsibility will include the actions of any third party who is sub-contracted or otherwise involved in the project.

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- 1.3.3 It is the responsibility of the *Contractor* to contact SEPA, SNH, other statutory and non-statutory bodies (e.g. RSPB, riparian owners, fishery and angling concerns etc) in the vicinity of and downstream of the proposed project so that the requirements and interests of these parties are adhered to and protected throughout the duration of the Contract.
- 1.3.4 The *Contractor* will be responsible for obtaining all necessary consents, licenses and permissions for his activities as required by current legislation governing the protection of the environment.
- 1.3.5 The ECoW will independently be maintaining a Pollution Prevention Measures Register (PPMR) in which all mitigation measures put into place will be listed and checked weekly to assess the requirement for maintenance.

1.4 Contractor Requirements

- 1.4.1 The *Contractor* is required to submit a detailed Pollution Prevention Plan prior to commencement of works within any area of the site. This plan should be viewed as an evolving document(s), tailored to suit specific activities or work areas, and be continually reviewed at weekly meetings for the duration of the works.
- 1.4.2 The detailed Pollution Prevention Plan will include, as a minimum, specific procedures relating to:
- Fuel handling and storage, including the locations of both periodic and regular fuelling points and emergency spill response;
 - Concrete batching and / or concrete wash out areas, including locations of batching plants, pollution prevention measures, drainage controls;
 - Responsibilities and details for monitoring and training in relation to pollution prevention and mitigation measures.
 - Design, management and mitigation measures for noise, including monitoring of noise at the nearest sensitive receptors (unless covered elsewhere within the Health and Safety File).
- 1.4.3 In addition to the above minimum requirements for the Pollution Prevention Plan, the *Contractor* is also required to submit a number of other Environmental Plans which deal with specific aspects of pollution prevention. These include detailed:
- Drainage Management Plan (refer to TS4),
 - Watercourse Crossing Plan (refer to TS5); and
 - Site Waste Management Plan (refer to TS3).

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1.4.4 Works may be suspended at the request of the Employer, the ECoW, Planning Monitoring Officer, SEPA, SNH or HSE at any time where a potential risk from pollution is identified and resulting harm may be caused to land, water or human health, or where construction methods and mitigation measures are not as specified within the construction method statements and relevant plans as submitted and agreed at the commencement of the works.

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2 POLLUTION PREVENTION AND MITIGATION

2.1 Definitions & Potential Pollution Sources

2.1.1 Pollution may be defined as the introduction of a contaminant into air, land or water, resulting in an impact (generally negative) to the ecosystem into which the substance is released.


2.1.2 Pollution may arise as a result of poor planning and implementation of management procedures associated with traffic, plant and materials handling, waste management, surface water and drainage management, and concrete management.

2.1.3 Contaminants associated with the construction of a wind farm may be both chemical (e.g. released fuels, oils, lubricants, surfactants and other cleaning chemicals, flocculants etc) as well as physical (e.g. dust and other airborne particulates, siltation and sedimentation of watercourses). Noise may also constitute a form of pollution.

2.1.4 There are a number of potential sources of pollution from wind farm construction works which may adversely impact upon both terrestrial and aquatic ecosystems:

- Direct disturbance of the banks and bed of rivers and lochs during water course crossing construction, repair and/or upgrade works;
- Pumping of standing water required for de-watering of excavations such as turbine bases, or as required for drainage management purposes;
- Run-off from exposed ground, excavations and material stockpiles (aggregate and excavated / overburden peat and soil), tracks and haul routes;
- Run-off from tracks, bridges and culverts crossings at water course crossings;
- Run-off from recently reinstated areas (road verges, borrow pits etc);
- Peat landslides;
- Cement and cement wash from concrete batching plants, storage areas and other areas where cement grout or concrete is being applied;
- Plant washing and vehicle wheel wash areas;
- Fuel and chemical storage/refuelling areas;
- Leaking/vandalised plant and equipment; and
- Sewage and waste water from construction compound and permanent control building amenities.

2.1.5 Pollution from fuels, cement run off, other chemicals and silt or other particulate matter can pose a significant risk to both terrestrial and aquatic habitats, potentially resulting in direct mortality of fish, invertebrates and vegetation as well as longer term effects on fresh water


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ecology.

- 2.1.6 Of particular concern on wind farm sites is the control of particulates and suspended silt resulting from erosion and run off from exposed soils. Sedimentation and silt can have both short and longer term impacts to freshwater ecological systems. For example damage to fish stocks may occur via fine particulates coating fish gills or accumulation of sediment on river or stream beds can limit successful development of fish eggs and larval development may also be inhibited. In addition, suspended silt and increases in turbidity can affect nutrient levels and result in significant impact on the biological diversity of the water course.
- 2.1.7 All forms of pollution can also render receiving waters unsuitable for resource uses (such as private water supplies, agricultural or industrial abstraction etc), fish farming, angling and general recreation, amenity and tourism reasons.
- 2.1.8 Strict compliance with all pollution prevention measures contained within the SEMP is essential where construction works are occurring within the catchment of the Sand Water SSSI (refer to SEMP Section 2.0 for further details).
- 2.1.9 Noise and vibration from construction activities, in particular from the excavation of borrow pits, may lead to a temporary loss of amenity or health effects at nearby receptors.
- 2.1.10 **Good construction practice and appropriate mitigation and monitoring are therefore essential for prevention of potential pollution from any of the sources noted above.**

2.2 General Pollution Prevention Measures

- 2.2.1 The following points (not exhaustive) indicate general pollution prevention measures in accordance with those highlighted within the guidelines referenced above and the Environmental Statement:
- i. Precautions will be taken to ensure the protection of watercourses and groundwater against pollution, silting and erosion during Watercourse Crossing construction operations.
 - ii. Any material or substance which could cause pollution, including silty water, will be prevented from entering surface water drains or water courses by the propitious use of and appropriate placement of straw bales, silt fences, cut-off drains, silt traps and drainage to vegetated areas where appropriate.
 - iii. Any silty water generated on site will ideally be settled out as much as possible through drainage mitigation measures (silt traps etc) and channelled into vegetated areas 20-50m from watercourses to allow the settlement of solids.
 - iv. All refuelling will be carried out in designated locations, 50 metres away from water courses. Where this buffer distance cannot be achieved a minimum of 20m may be agreed with the ECoW. Irrespective of the buffer distance and location of refuelling, drip trays and spill kits will be available in accordance with standard best practice across the construction industry.
 - v. Areas of waste, oil / fuel / chemical storage and permanent refuelling will be

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located 50m from watercourses or drainage paths. Where this is not possible no closer than 20m will be allowed without express permission from the ECoW. Such storage areas will be appropriately sited to prevent the downward percolation of contaminants to natural soils and groundwater.

- vi. Fuel, oils and chemicals will be stored on an impervious base within a bund able to contain at least 110% of the volume stored. Rainwater will not be allowed to accumulate within the bund and in any way compromise the required 110% volume capacity.
- vii. Site compounds, parking areas and turning areas and vehicle and equipment washing areas are to be sited at least 10m from water courses.
- viii. All waste and stockpiled materials will be stored in designated areas and isolated from any surface drains and a minimum of 50 metres away from watercourses, although where this is not possible, a minimum of 20m buffer may be agreed with the ECoW.
- ix. The use of cut-off ditches, silt fences, silt traps and drainage to vegetated areas will be employed as required / appropriate in areas of excavation, exposed soils, stockpiling, dewatering and plant and wheel washing.
- x. A Personnel Site Induction will make specific reference to required pollution prevention measures as detailed in the guidance discussed above (refer to Technical Schedule TS1, Site Induction Material, of the SEMP).
- xi. All works will be carried out in accordance with best practice and will aim to prevent deterioration in the ecological status of surface waters and to avoid compromising the restoration potential of such waters.
- xii. In the event of a pollutant spillage on site, the material will be contained (using an absorbent material such as sand or soil or commercially available booms) and Scottish Environment Protection Agency (**SEPA**) notified immediately using the emergency **hotline number (0800 80 70 60)**.

2.2.2 The buffer distances referred to in several of the items listed above are **minimum distances**. Each area of works will be assessed individually to determine whether there is sufficient buffering capacity to settle solids and suspended silt prior to entry of run-off into the water course. Buffering capacity will generally depend on the topography and vegetation type and sensitivity. This type of assessment will be implemented through the *Contractor's* detailed Drainage Management Plan.

2.3 Water Environment


2.3.1 The removal of established vegetative cover can lead to the loss of large quantities of soil particles and suspended silt to watercourses which can then cause significant pollution of water. Therefore, any earth moving works or other similar operations giving rise to contaminated drainage must be carried out in accordance with BSI Code of Practice for Earth Works, BS6031:1981.

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- 2.3.2 Site drainage and surface run off contaminated with silt will not be allowed to directly enter any watercourse; as such, appropriate sedimentation and silt mitigation measures will be implemented on site in order to treat contaminated waters.
- 2.3.3 Should formal discharge of contaminated site drainage be required (for example where sedimentation and silt mitigation measures are not possible or are of insufficient capacity to deal with site drainage), SEPA will be contacted in order to determine possible and appropriate licensing requirements as determined by the quality and quantity of effluent to be discharged, the location of the effluent discharge point and the receiving water.
- 2.3.4 As per the requirements of Technical Schedule TS4, Drainage Management Plan, the *Contractor* will undertake a detailed pollution risk assessment to inform preparation of a detailed drainage design. The outcome of this is a detailed Drainage Management Plan (DMP) which is required to be submitted for review by the Employer and the ECoW prior to commencement of construction works in a particular area of the site. This DMP will include a pollution risk assessment for the site and details on planning, design and management of appropriate sediment and silt control measures.
- 2.3.5 As per the requirements of Technical Schedule TS9, Environmental (Incident and Emergency) Response Plan, the *Contractor* will provide a plan detailing all contingency planning and emergency response procedures. This should include relevant telephone numbers (e.g. SEPA Emergency Hotline number, contact details for downstream landowners and water users etc.) and record the availability of equipment to carry out any emergency remedial work.

2.4 Watercourse Crossings

- 2.4.1 All Watercourse Crossing works are required to be carried out in accordance with the Water Environment and Water Services Act (WEWS) and Controlled Activities Regulations (CARs). Furthermore, works undertaken in or near watercourses will be completed in accordance with SEPA PPGs, and Technical Schedules 4 and 5 (Drainage Management Plan and Watercourse Crossing Plan) of the SEMP.
- 2.4.2 In line with the requirements of Technical Schedule TS5, Water Course Crossing Plan (WCCP), the *Contractor* will prepare a detailed Water Course Crossing Plan prior to commencement of works. The *Contractor* will submit this plan to the Employer and ECoW and SEPA for approval and will liaise with SEPA on appropriate CAR authorisations for each crossing.
- 2.4.3 The mitigation measures specified within the detailed WCCP will be monitored by the *Contractor* and ECoW during construction works.
- 2.4.4 As described in the body of this document, a number of mitigation measures are required to reduce environmental impact during the Watercourse Crossing works. These are summarised below:
- Following good practice and industry standard approaches, CARs, SEPA's PPGs, and other relevant industry best practice publications;
 - On-site inspection and advice from the ECoW;

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- Appropriate emergency response and oil spill response during construction works, including the use of drip trays / spill kits etc;
- Buffer zones and silt mitigation measures adjacent to water courses, including installation of adequate splash boards on bridge crossings to prevent mud and run-off from construction traffic;
- Stockpiling of any excavated materials away from watercourses; and
- Any additional ecological mitigation measures as required (such as electrofishing of watercourses prior to Watercourse Crossing works to remove potentially sensitive receptors for return to watercourse once works are completed).

2.5 Water Abstraction and Dewatering Activities

2.5.1 Suitable mitigation measures will be installed to minimise the volume of silt contained within pumped waters and to avoid or minimise the impact of the pumped water discharge on the water environment. These may include, but are not restricted to, the following techniques:

- In order to prevent disturbance from the base of excavations or from the bed of water courses during abstraction, any pump intakes will be protected from sediment by raising the intake using a floating rose and a 'Terram' filter;
- Prior to discharge, any silty water will be treated as per the mitigation measures detailed within this PPP and also Technical Schedule TS4, Drainage Management Plan.

2.5.2 The *Contractor* will discuss and agree all pumping and associated mitigation measures with the ECoW prior to commencement of works. SEPA will also be consulted where considered necessary.

2.6 Dust Suppression & Vehicle Wash


2.6.1 Water needed for dust suppression on the haul roads during periods of dry weather and the compound vehicle wash will be clean water. Clean water may be obtained from re-circulated clean or treated (silt removed) drainage waters.

2.6.2 Where required, water may be extracted from local watercourses or groundwater. In these instances, the *Contractor* will liaise with SEPA beforehand to agree abstraction locations, rates and CAR authorisation requirements.

2.7 Welfare facilities

2.7.1 Toilet, washroom and kitchen facilities for workers at the construction compound near to Sand Water SSSI will be in the form of sealed units which are regularly maintained and emptied to ensure no waste water spills from them.

Drinking Water

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2.7.2 Drinking water for the site will be sourced from a registered supply and will be brought in by mains feed or mobile bowser and stored in a potable supply tank where no mains feed is available. Abstraction and treatment from an appropriate local watercourse or groundwater may be an alternative requirement.

2.7.3 The *Contractor* will ensure that appropriate training, signage and physical measures are in place to ensure that only potable water is supplied to the potable water tank and that no pollution of potable supplies occurs as a result of construction works.

Sewage

2.7.4 Disposal of sewage from the site will be carried out by methods recommended in PPG4.

2.7.5 Wind farm sites are generally remote and therefore connection to a main sewer may not be feasible during the construction stage; therefore, sustainable septic systems (waterless toilets or septic tanks) must be installed and maintained appropriately. Due to the sensitivity of upland environments and the nature of the underlying soil, conditions are unlikely to be suitable for the use of a soakaway.

2.7.6 All sewage collected from within septic systems will be tankered from site at an appropriate frequency and disposed of by an appropriately licensed contractor into the local foul water sewer system.

Toilets

2.7.7 Where water supply for toilet cisterns is proposed to be extracted from local watercourses or groundwater, abstraction locations and rates will be agreed with SEPA beforehand.

2.7.8 There will be training, signage and physical measures to ensure that abstracted river water is not supplied to the potable water tank and that measures are implemented to ensure that abstraction activities do not cause pollution of water courses of potable supplies.

2.8 Concrete Pollution Prevention Measures


2.8.1 Cement is alkaline and highly toxic to aquatic organisms. Measures will be implemented to prevent the direct release of any cement or cement contaminated run-off into water courses.

Base Pours

2.8.2 Accidental spillage and potential burst-out of concrete may occur during pouring of concrete for the turbine bases.

2.8.3 Foundation excavations are generally below the level of the surrounding ground, and therefore the risk of concrete spills exiting the base area is considered to be low. However, where the topography allows, foundation excavations are generally designed to be gravity draining in order to control ingress/egress of surface water from the excavation. It will therefore be stipulated that, prior to commencement of each base pour, the *Contractor* will assess the local gradient and the potential risk of concrete run-off exiting the base area and subsequently entering natural watercourses or otherwise impacting on sensitive habitats.

2.8.4 Where a potential risk is identified, cut off ditches and diversion dams will be installed in order

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to channel potential spillages and run-off water to a suitable collection area (pre-constructed pond or other area suitable for temporary containment of spillages). In the event of a major spill, treatment of the contained material would be agreed with the Environmental Manager and in accordance with CIRIA and SEPA guidance. Depending on the volume of effluent, treatment may involve settlement and evaporation and/or neutralisation of the collected effluent prior to ground soakaway, or pump-out and disposal off-site. Residual solidified concrete within the containment area would be broken up and disposed of off-site prior to reinstatement of the area.

Concrete Wash Out

- 2.8.5 Washout of concrete trucks will only be undertaken in designated areas. Designated wash out areas will be located at least 50m from any open watercourse, field drain or sensitive habitat area. No surface run-off from within the wash out area will be permitted to leave the area and directly enter any drain or water course. Each wash out area should be located away from main construction traffic area or access areas to prevent disturbance or tracking. A sign should be installed adjacent to each washout facility to inform concrete equipment operators to utilise only the designated washout areas.
- 2.8.6 The number of wash out areas should be kept to a minimum. The number and location of wash out areas will be specified within the *Contractor's* Construction Method Statement (CMS) prior to commencement of construction activities.
- 2.8.7 At the designated wash out areas, wash water will be contained within a specially constructed lined containment lagoon. Lagoons should be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations. The supernatant from the wash pit may be reused for truck washing.
- 2.8.8 When temporary concrete washout facilities are no longer required for the work, any hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

2.9 Emergency Response

- 2.9.1 An Environmental Incident and Emergency Response Plan will be developed for the site in line with the requirements of TS9. This will include details on incidents and emergencies relating to pollution.
- 2.9.2 Pollution control related environmental incidents may include: spillages (oils and chemicals); contaminated or silty run-off entering a watercourse or water supply; flooding; riverbed or other aquatic habitat / species disturbance; damage to underground services; damage to habitats; poor waste disposal and storage.

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3 MONITORING AND CONTROLS

3.1 Monitoring

- 3.1.1 On site meetings / inspections will be carried out as necessary to confirm the appropriate use of mitigation measures identified within the *Contractor's* environmental plans relating to pollution control (as listed in Section 1.4). These meetings / inspections will highlight any further issues / measures which may be relevant either prior to commencement or during the works.
- 3.1.2 To ensure all mitigation measures put in place are maintained and continue to be effective, monitoring will be carried out. To ensure compliance of the works with this Pollution Prevention Plan, the ECoW will regularly inspect the Balance of Plant *Contractor's* works.
- 3.1.3 The Planning Monitoring Officer (PMO) will also inspect the works as part of an overall construction works inspection programme as required on behalf of the planning authority.
- 3.1.4 Regular checks of plant and equipment will be undertaken by the *Contractor* to identify any oil or fuel leaks will be carried out to confirm the condition of the plant. Records will be kept of all inspections / findings for review by the ECoW and the PMO and for discussion during regular meetings as discussed above. Regular checks for visual evidence of contamination / sediment will also be made alongside watercourses, near by working areas and in areas of surface water discharge
- 3.1.5 The ECoW will be maintaining a Pollution Prevention Measures Register (PPMR) in which all mitigation measures put into place will be listed, and audited weekly to assess the requirement for maintenance.
- 3.1.6 Water Quality Monitoring will also be undertaken (as per the requirements of TS6) for the purposes of monitoring water quality and ensuring quality is maintained at levels similar to baseline data throughout the construction phase. In addition to baseline water quality data, baseline data on fish and macro-invert populations from most of the main Viking Wind Farm catchments has been collected and reported upon in the ES. SEPA also requested that a survey of benthic diatoms in freshwater lochs is undertaken prior to commencement of construction and this data will also be used to inform baseline conditions and monitor impacts on lochs during the construction phase.

3.2 Records

- 3.2.1 Records will be kept for all initial, final and routine monitoring inspections of *Contractor's* mechanical plant and working construction areas, as well as ecological and environmental issues. These records will be stored in an agreed location on site and be available for internal and external monitoring as required.
- 3.2.2 Record sheets will detail the date, location of inspection, frequency, findings, appropriate person/s notified and identified actions as necessary by the PMO / ECoW.

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3.3 Training

- 3.3.1 All employees, subcontractors, suppliers and visitors to the site will be notified via a site induction of the requirements on site for pollution prevention. Further details on the minimum requirements of the site induction are contained within Technical Schedule TS1.
- 3.3.2 Through tool box talks, site personnel and subcontractors will be educated on those aspects of environmental management as appropriate to the task assigned to them.
- 3.3.3 The ECoW will be consulted prior to commencement of works in any area of the site. Consultation meetings will include discussion on the works to be undertaken, review of applicable Environmental Plans and agreement on required mitigation and pollution prevention measures. Measures agreed at such consultation meetings will be disseminated to the relevant employees, subcontractors, suppliers and other appropriate persons via tool box talks and formal communications (email / memo), particularly where required for record purposes (e.g. variations, auditing and monitoring records).
- 3.3.4 The *Contractor* will ultimately be responsible for overseeing and enforcing pollution prevention procedures such that potential adverse impacts to human health or the environment from any activities involving handling of potential pollutants are avoided or mitigated. For the avoidance of doubt, pollution prevention procedures include, but are not necessarily limited to: all aspects of traffic, plant and materials management, waste management, surface water and drainage management and concrete management.