

Carrickmines-Shanganagh River Flood Relief Scheme

Preliminary Surface Water Management Plan

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Contract

This report relates to the Carrickmines-Shanganagh River Flood Relief Scheme commissioned by Dún Laoghaire-Rathdown County Council (DLRCC), on behalf of the Office of Public Works (OPW). Tara Saccardo of JBA Consulting compiled this report. This report draws on the EIAR and CEMP for the proposed development, which was prepared by the competent experts listed in Table 1-1 of Chapter 1, EIAR Volume 2.

Purpose

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Abbreviations

CCTV	Closed-Circuit Television
CEMP	Construction Environmental Management Plan
DHLGH	Department of Housing, Local Government and Heritage
DLRCC	Dún Laoghaire-Rathdown County Council
ECOW	Ecological Clerk of Works
EIAR	Environmental Impact Assessment Report
EIF	Environmental Incident Form
EIRP	Environmental Incident Response Plan
EPA	Environmental Protection Agency
FRS	Flood Relief Scheme
NPWS	National Parks and Wildlife Service
OPW	Office of Public Works
SWMP	Surface Water Management Plan
UÉ	Uisce Éireann
WFD	Water Framework Directive

1 Introduction

1.1 General

JBA Consulting and Egis have developed a Preliminary Surface Water Management Plan (SWMP) on behalf of Dún Laoghaire-Rathdown County Council (DLRCC) and the Office of Public Works (OPW) in relation to a proposed Flood Relief Scheme (FRS) on the Carrickmines-Shanganagh River, in the vicinity of Sandyford, Leopardstown, Loughlinstown, and Shankill. This has been prepared in response to Item 11a of the Request for Additional Information from An Coimisiún Pleanála on 15th December 2025.

Item 11a of the RFI states:

“Submit a comprehensive Surface Water Management Plan (SWMP) that addresses both the development as a whole and specific work areas which consider the complexity and individual response to each works area. At a minimum, the plan should consider the main activities, and areas where sediment, surface water runoff and pollution generation have the potential to arise including the following:

- *Earthworks, to include planning, excavation and processing, transportation of materials (within and outside of the proposed Scheme);*
- *Deposition of materials and temporary stockpiling.”*

The proposed development will comprise of a series of flood defences positioned along the banks of the Carrickmines-Shanganagh river system as it flows from the R117 Enniskerry Road towards the sea between Killiney and Shankill. The defences comprise new and upgraded flood walls, culvert adjustments, and instream works.

1.2 Objectives

The SWMP for the proposed scheme details the control and management measures for avoiding, preventing, or reducing any significant adverse impacts on the surface water environment during the construction phase.

The control and management measures are specific to the proposed development and are based on best practice approaches that can be used to protect surface water during the construction phase of the proposed scheme.

1.3 Guidance

The SWMP and the control and management measures relating to surface water management have been prepared with regard to the following guidance documents, where relevant:

- Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (Construction Industry Research and Information Association (CIRIA) 2001);
- Best Practice Guide BPGCS005 – Oil Storage Guidelines (Enterprise Ireland 2003);
- CIRIA Guidance C741 Environmental Good Practice on Site (Charles & Edwards 2015);
- Fishery guidelines for Local Authority works. (Department of Marine and Natural Resources 1998);
- Control of Water Pollution from Construction Sites. Technical Guide (C532) (CIRIA 2001);
- Control of Water Pollution from Linear Construction Projects. Site Guide (C649) (CIRIA 2006);
- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA 2006);
- Safety, Health and Welfare at Work (Construction) Regulations 2013 – S.I. No. 291 of 2013;
- Development and Flood Risk – Guidance for the Construction Industry (C642) (CIRIA 2004);
- Environment Agency Pollution Prevention Guidelines for construction and demolition sites (EA, 2012);

- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland (IFI) 2016); and
- Planning for Watercourses in the Urban Environment, A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (IFI, 2020).

1.4 Watercourses in the Vicinity of the Proposed Site

The proposed development is located in the Ovoca-Vartry WFD catchment, Dargle_SC_010 sub-catchment, and Carrickmines Stream_010 and Shanganagh_010 sub-basins. The entirety of the scheme is located within the Wicklow groundwater body. The Wicklow groundwater body currently holds "Good" WFD status (2016-2021); and is considered to be 'At Risk'.

The Carrickmines-Shanganagh river catchment comprises a number of streams and tributaries, in the upper reaches of the catchment, the Kilgobbin Stream flows east into the Ballyogan Stream. The Glenamuck Stream joins further downstream, before a confluence with the Racecourse Stream. This meets the Cabinteely Stream and becomes the Carrickmines River. At Cherrywood, the Carrickmines River meets the Shanganagh River, which continues to flow east, passing Shanganagh Wastewater Treatment Plant to the north before draining into the Irish Sea.

The proposed scheme includes interventions on some of these rivers and streams including: Ballyogan Stream, Carrickmines River, Brides Glen River and Shanganagh River.

1.5 Site Specific Surface Water Risks

The main activities / areas where sediment and surface water runoff and pollution generation have the potential to arise include the following:

- Earthworks – including planning, excavation and processing, transportation of materials (within and outside of the proposed scheme), and deposition of materials and temporary stockpiling (if required).
- The most significant area of concern regarding sediment control for the proposed scheme is when existing low porosity surfaces (existing roads and footpaths) are removed, and the underlying granular layers are disturbed and exposed. Typically, these surfaces are likely to be exposed during the following activities associated with the proposed scheme:
 - The preparatory and site clearance works, particularly topsoil stripping;
 - Tracking of machinery; and
 - Location of historic landfills.
- Concrete activities – concrete, grout and other cement-based products which would typically be used in
- the carriageway and pavement works are highly alkaline and can generate very fine, highly alkaline silt (11.5 pH);
- Watercourse crossings – there is a higher likelihood of impacts on water quality when construction is taking place over or near surface waters
- Drainage Systems – There is a potential for disrupting local drainage systems due to diversions required to accommodate the construction works; and
- Construction compound and machinery re-fuelling areas.

Section 3 details mitigation measures which will be implemented where practicable to reduce the likelihood of the pollution events occurring during the construction phase.

The Table 1-1 identified the key surface water pollution risks associated with each work area within the proposed scheme.

Table 1-1: Surface Water Pollution Risks

Work Area	Earthworks / Excavation	Sediment Runoff	Stockpiling	Concrete Works	Fuel / Chemical Spill	Drainage Diversions/ Pumping Over	In stream / Near water Works
Clon Brugh	✓	✓	✓	✓	✓	-	✓
Belarmine Park	✓	✓	✓	✓	✓	-	✓
Kilgobbin	✓	✓	✓	✓	✓	-	✓
Glenamuck Road North	✓	✓	✓	✓	✓	✓	✓
Cherrywood	✓	✓	✓	✓	✓	✓	✓
Lower Brides Glen / N11	✓	✓	✓	✓	✓	✓	✓
Commons Road / Bayview	✓	✓	✓	✓	✓	✓	✓

Note: The table identifies potential risks that may arise within each work area during construction. The actual applicability and extent of each risk will vary depending on the specific construction activities being undertaken at a given time.

The mitigation measures outlined in Section 3 will be implemented on a risk-based approach. Depending on the work area, different combinations of sediment controls, stockpiles management measure, refuelling controls, drainage management measures and emergency response procedure will be applied in accordance with the risks identified in Table 1-1.

2 Roles and Responsibilities

The roles and responsibilities of key staff are discussed in Section 4 of the Construction Environmental Management Plan (CEMP) submitted within ACP Ref no 321937-25.

The contractor will appoint a suitably qualified and experienced Ecological Clerk of Works (ECoW), or equivalent, who will ensure the successful development, implementation, and maintenance of the SWMP.

3 Surface Water Control and Management Measures

The mitigation measures outlined in this section are intended to manage site specific risks identified in Section 1.5. Measures are implemented on a risk-based approach and may vary between work areas depending on the nature of the works and proximity to sensitive receptors.

3.1 General

As identified in Chapter 8 of the EIAR and Section 6 of the CEMP as submitted within ACP Ref no 321937-25, and in order to protect surface water, groundwater and air quality throughout the proposed scheme site, the construction contractor will be required to develop and implement a Surface Water Management Plan with the minimally required list of mitigations measures outlined below to be incorporated into this plan.

In order to safeguard the local surface water network, and in turn the local groundwater network, from surface water-based pollution events, the following must be strictly adhered to:

- The Principal Contractor will ensure compliance with environmental quality standards specified in the relevant legislation, namely European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments), and the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988);
- The contractor will construct a site compound at a location remote from any drains;
- Oil booms and oil soakage pads will be maintained on-site to enable a rapid and effective response to any accidental spillage or discharge. These shall be disposed of correctly and records will be maintained by the site manager of the used booms and pads taken off site for disposal;
- Management of silt-laden water on-site, including procedures for accidental leaks / spills to ground, as well as water quality monitoring to ensure compliance with environmental quality standards specified above;
- At no point during the construction phase will untreated water be discharged to local surface water network without the water quality meeting the statutory limits as set under the environmental quality standards specified above;
- Fail-safe site drainage and bunding through drip trays on plant and machinery will be provided to prevent discharge of chemical spillage from the sites to surface water;
- Any accidental discharge will be controlled by the use of oil booms in the water prior to construction starting;
- Temporary stockpiles will be monitored for leachate generation. These stockpiles will be placed within designated areas and not located within the vicinity of watercourses, wetlands or artificial surface water drainage features;
- Excavated contaminated soils will be segregated and securely stored in a designated area where the possibility of runoff generation or infiltration to ground or surface water drainage has been eliminated through bunding and imperviable geotextile linings. The contaminated soils will then be classified as clean, inert, non-hazardous or hazardous in accordance with the EC Council Decision 2003/33/EC. Furthermore, the contractor will ensure that no cross-contamination with clean soils happens elsewhere throughout the development site;
- Silt fencing will be installed prior to the commencement of any construction works in order to enhance the protection of identified water features (Figure 3-1). An ECoW will be present during the installation of these protective measures to ensure that they are installed to best practice standard and correctly located in their assigned areas. The following sub-sections will provide greater detail on specific locations of these silt fence / trench sections;
- Silt fences will be repaired and/or replaced as necessary by the principal contractor as part of the on-going environmental monitoring programme;

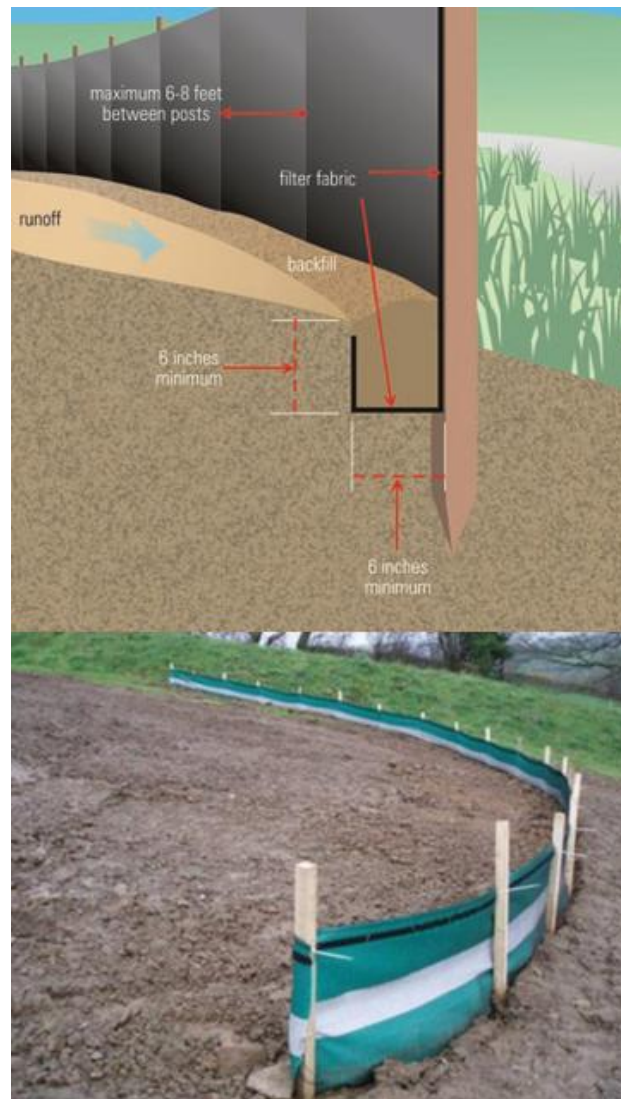


Figure 3-1: Example of suitable silt fence mitigation ensuring maximum safeguard efficiency

3.2 Construction Compound

A total of six construction compounds will be set up to support the groups of proposed measures at five locations throughout the catchment. The construction compound will include installation of the necessary facilities including the site office, welfare facilities, etc.

These works will be taking place in a built-up area with space constraints. Consultation with landowners for temporary use of these sites will be required, with lands for compounds to be temporarily acquired by agreement with the landowners. Movement of vehicles and construction machinery to and from these sites could potentially impact soils locally through compaction or contamination through stored materials. Following construction, site compounds will be restored to their pre-construction state. There will be a temporary slight adverse and not significant effect on the site compound areas during construction, with no long-term adverse effects expected following remediation.

All site and welfare compounds are proposed for areas where subsoil permeability is low, and the average groundwater recharge is between 1 – 100 mm/year.

Further details on the construction compound, including the construction compound layout, are provided in Section 3.4 of Chapter 4 (Construction Activities) of the EIAR.

3.2.1 Site Establishment

As some of the construction compounds are located on a greenfield site, the appointed contractor will be required to provide a temporary geogrid mattress overlain in stone for trafficking within the construction compound. All surface water runoff will be intercepted and directed to appropriate treatment systems (settlement facilities and oil trap) for the removal of pollutants prior to discharge.

3.2.2 Security

Controlled access to the construction compound will be implemented, fencing will be erected, and lighting will be installed. The construction compound will be secured with Closed-Circuit Television (CCTV), to ensure safe storage of all material, plant and equipment.

3.2.3 Welfare and Sanitary Facilities

The construction compound will be engineered with appropriate services as discussed in Section 3.4 of the EIAR. Water and wastewater disposal etc. will be organized by the appointed contractor. In work areas of the proposed scheme, where permanent provisions (for the duration of the construction programme) are not practicable, appropriate temporary provisions will be made. Temporary welfare facilities will need to be used: for example, portable toilets in the vicinity of works. Welfare facilities will discharge wastewater either to an existing sewer, with the permission of the sewerage undertaker, or wastewater will be collected and disposed of in an appropriate manner to a suitably licensed facility offsite to prevent water pollution and in accordance with the relevant statutory requirements.

3.2.4 Fuel Storage

All hydrocarbons used during the construction phase will be appropriately handled, stored, and disposed of in accordance with recognised standards as laid out by the EPA;

- All chemical and fuel filling locations will be contained within signposted, designated bunded areas, a minimum of 10m from any surface water drain;
- At the construction compound, where the site is pervious, an area of hard standing will be installed in a demarcated area for refuelling, and vehicle / plant cleaning and service areas. This area will be drained via a hydrocarbon interceptor trap to a soakaway if possible, or to local surface water drains, with the permission of the asset owner;
- The retained contents of the separators will be collected for disposal by a licensed operator to a licensed waste disposal / recovery facility;
- Suitable precautions will be taken to prevent spillages from equipment containing small quantities of hazardous substances (for example, chainsaws and jerry cans) including:
 - Each container or piece of equipment will be stored in its own drip tray made of a material suitable for the substance being handled;
 - Spill kits and drip trays will be provided for all equipment and at locations where any liquids are stored and dispensed, and staff will be trained on the procedures to be followed; and
 - Containers and equipment will be stored on a firm, level surface.
- Procedures and contingency plans will be in place at each work area to address cleaning up small spillages as well as dealing with an emergency incident. A stock of absorbent materials such as sand, spill granules, absorbent pads and booms will be kept at each work site, on plant working near water and particularly at refuelling areas and where fuel or oil is stored;
- The storage of fuels, other hydrocarbons and other chemicals within the construction compound shall be in accordance with relevant legislation and with best practice. In particular:

- Fuel tanks, drums, and mobile bowzers (and any other equipment that contains oil and other fuels) will be housed within a bund of at least 110% capacity of the fuel tank itself or at least 25% of the total volume of the containers, whichever is greatest. The fuel tank will be double skinned. There will be no passive drainage from the bund; any water collected within it will be pumped out and removed off site for disposal; and
 - Any designated area or areas for oils, fuel, chemicals, hydraulic fluids, etc. storage and refuelling will be set up at least 10m from any surface water drains (as per CIRIA guidance listed in Section 1.1.2) and the storage location within the Construction Compound shall be organised so as to be as far away from surface water drains as is practicable to minimise risks from leaks and spills.
- Storage areas will be covered, wherever possible, to prevent rainwater filling the bunded areas;
 - Fuel fill pipes will not extend beyond the bund wall and will have a lockable cap secured with a chain;
 - Where fuel is delivered through a pipe permanently attached to a tank or bowser:
 - The pipe will be fitted with a manually operated pump or a valve at the delivery end which closes automatically when not in use;
 - The pump or valve will be fitted with a lock;
 - The pipe will be fitted with a lockable valve at the end where it leaves the tank or bowser;
 - The pipework will pass over and not through bund walls;
 - Tanks and bunds will be protected from vehicle impact damage;
 - Tanks will be labelled with contents; capacity information and hazard warnings; and
 - All valves, pumps and trigger guns will be turned off and locked when not in use. All caps on fill pipes will be locked when not in use.

3.3 Construction Phase Haul Road Mitigations

Through grassed areas, shallow land drains will be provided adjacent to haulage roads. The land drains will be provided with check dams which will allow infiltration of the collected surface water to ground.

Silt screens will be provided running alongside the haulage roads through grassed areas to prevent silt and fines from impacting on the adjacent landscape.

Procedures and contingency plans will be in place at each work area to address cleaning up small spillages as well as dealing with an emergency incident.

3.4 Control of Sediment

There are a number of sources of sedimentary or silt-laden water on a construction site, including silty 'runoff' from stripped soils; and the stockpiling of soils. Control measures for each of these are to be provided. Area specific measures are identified below.

Mitigation for the protection of surface and groundwater quality from runoff carrying fine sediments and urban pollutants involves silt control measures. These include proper planning of works, site compound construction, storage management and excavation plans, as follows:

- The CEMP will include the mitigation measures outlined in this EIAR to address sediment control during construction and the potential risk of sediments and various pollutants release into local watercourses. This includes silt fencing, runoff control and measures to prevent contaminant entering the stormwater by proper storage of hazardous materials and waste management practice;
- Planning of works will be conscious of available weather forecasts and avoid working during heavy rain/storm events to minimise the risk of runoff that may be in excess of the capacity of the runoff control measures outlined in this EIAR. If working during precipitation events cannot be avoided, then runoff

control measures will be actively monitored during the works to ensure their capacity is not compromised;

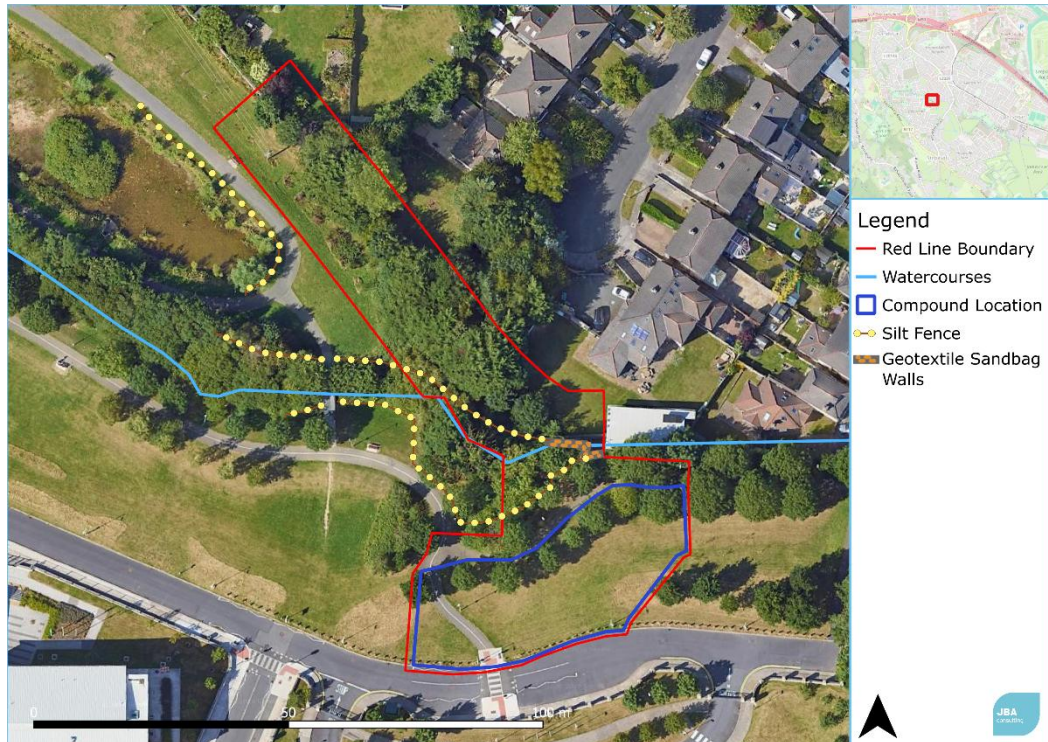
- Adherence to best practice guidance for pollution prevention and sediment management measures (e.g., use of oil booms, spill kits, and silt fences etc.) will be applied.
- The contractor will construct a site compound at a location remote from any drains, in a minimum distance of 10m;
- Storage locations and topsoil piles will be placed in appropriate places, distant to existing drains/sewerage with a minimum distance of 10m;
- All soil stockpiles will be covered (i.e., with a tarpaulin or vegetated) to minimise the risk of rain/wind erosion. Vegetation will be established as soon as possible on all exposed soils;
- In the event of an extended dry period, stockpiles will be dampened using water to minimise the risk of airborne particles entering watercourses;
- Excavations will remain open for as little time as possible before the placement of fill to minimise the potential of water ingress into excavations;
- Management/Response plans will be implemented to identify mobilisation of soil particles/pollution and initiate the interception and treatment of pollution/silt run-off;
- Silt fencing or other appropriate measures, such as geotextile sandbag walls, will be put in place downstream of exposed soils or soil stockpiles. Silt fencing will be used as the primary silt control measure during construction. In areas with established vegetation or steep slopes, geotextile sandbags will be used instead to minimise disturbance to vegetation while providing effective sediment control. Indicative locations of silt control measures are shown in the maps in the following section.

3.4.1 Area-specific mitigation measures

3.4.1.1 Area 1 – Clon Brugh



Figure 3-2: Indicative locations of silt fences and sandbag walls (Clon Brugh)

3.4.1.2 Area 2 – Belarmine Park**Figure 3-3: Indicative locations of silt fences and sandbag walls (Belarmine Park)****3.4.1.3 Area 3 - Kilgobbin****Figure 3-4: Indicative locations of silt fences and sandbag walls (Kilgobbin)**

3.4.1.4 Area 4 – Glenamuck Road North

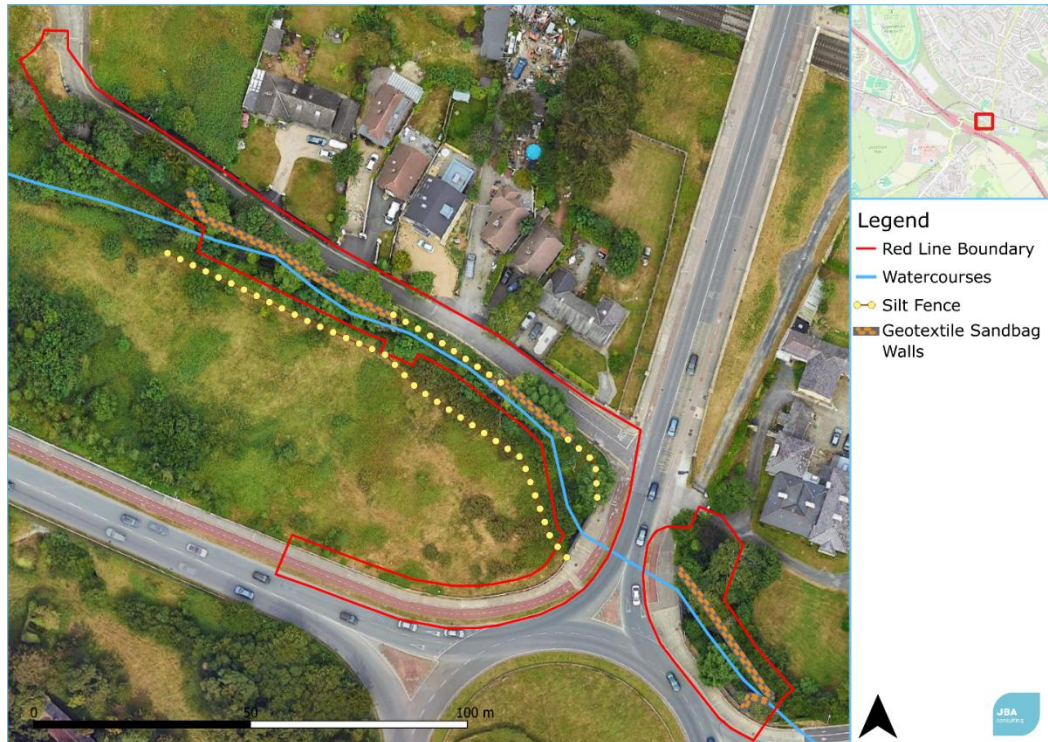


Figure 3-5: Indicative locations of silt fences and sandbag walls (Glenamuck Road North)

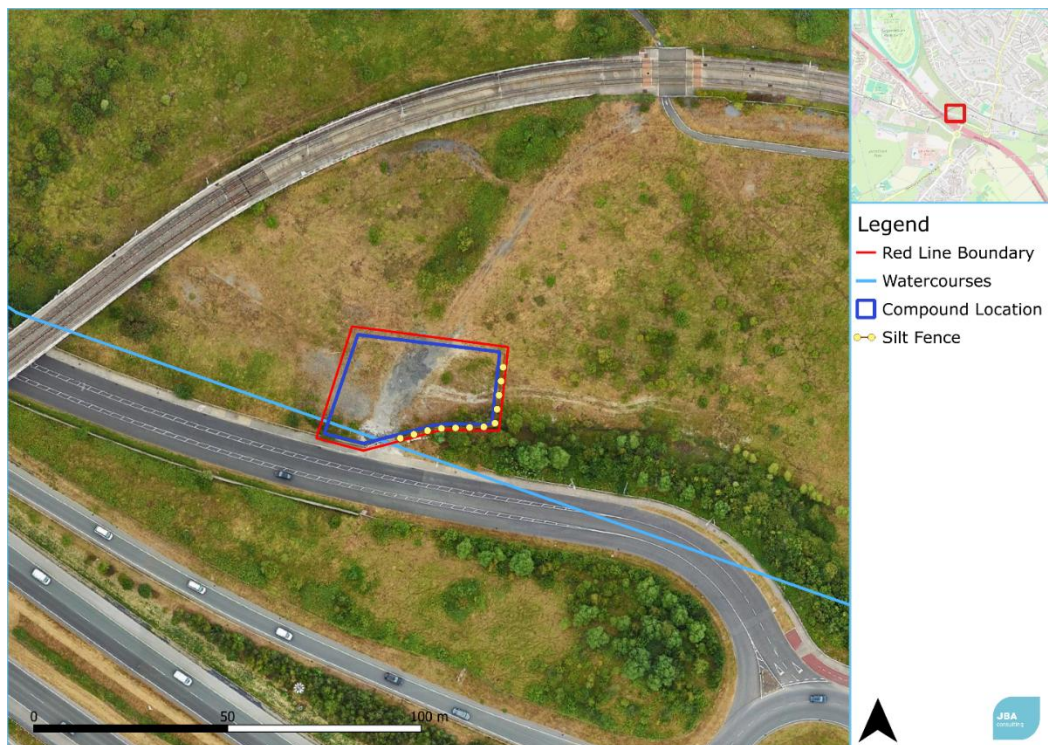


Figure 3-6: Indicative locations of silt fences at site compound, upstream of Glenamuck Road North

3.4.1.5 Area 5 – Cherrywood

Figure 3-7: Indicative locations of sandbag walls (Cherrywood Road)

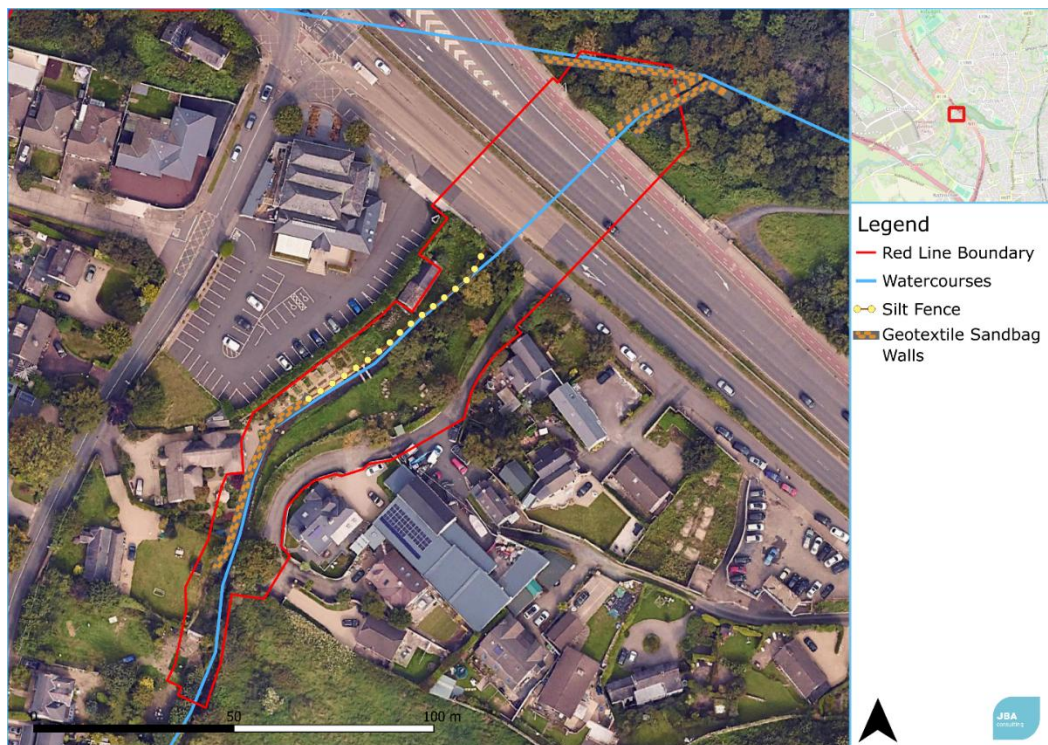
3.4.1.6 Area 6 – Lower Brides Glen, N11 & Bray Road

Figure 3-8: Indicative locations of silt fences and sandbag walls (Lower Brides Glen & N11)



Figure 3-9: Indicative locations of silt fences and sandbag walls (Bray Road)

3.4.1.7 Area 7 – Commons Road & Bayview

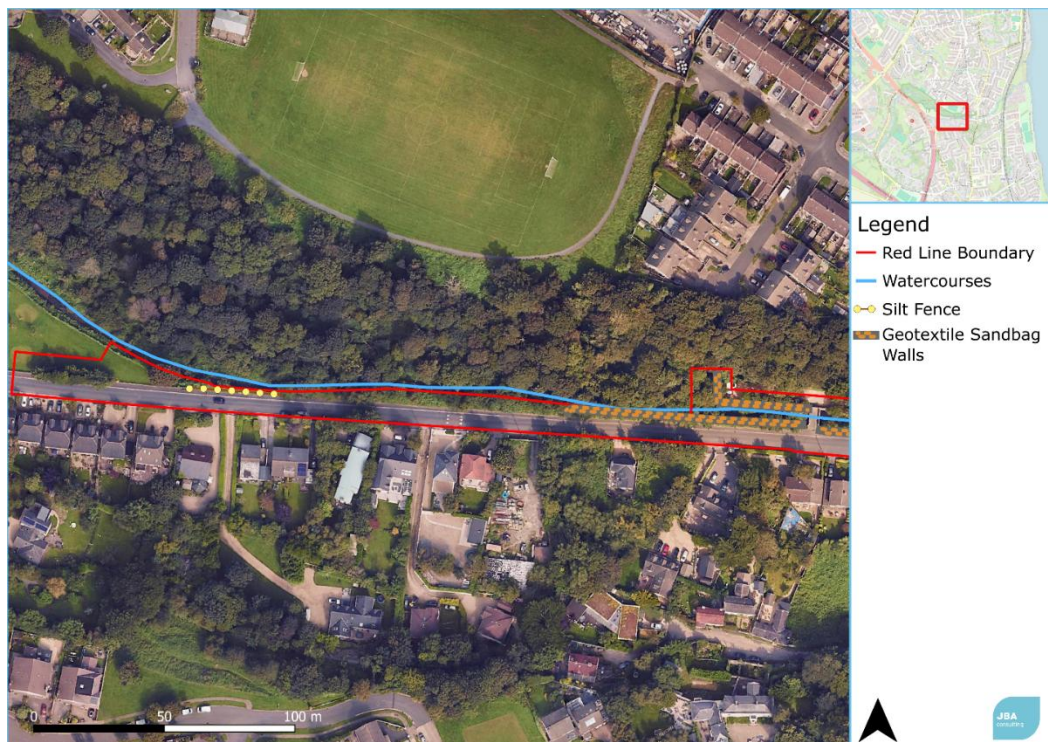


Figure 3-10: Indicative locations of silt fences and sandbag walls (Commons Road west)

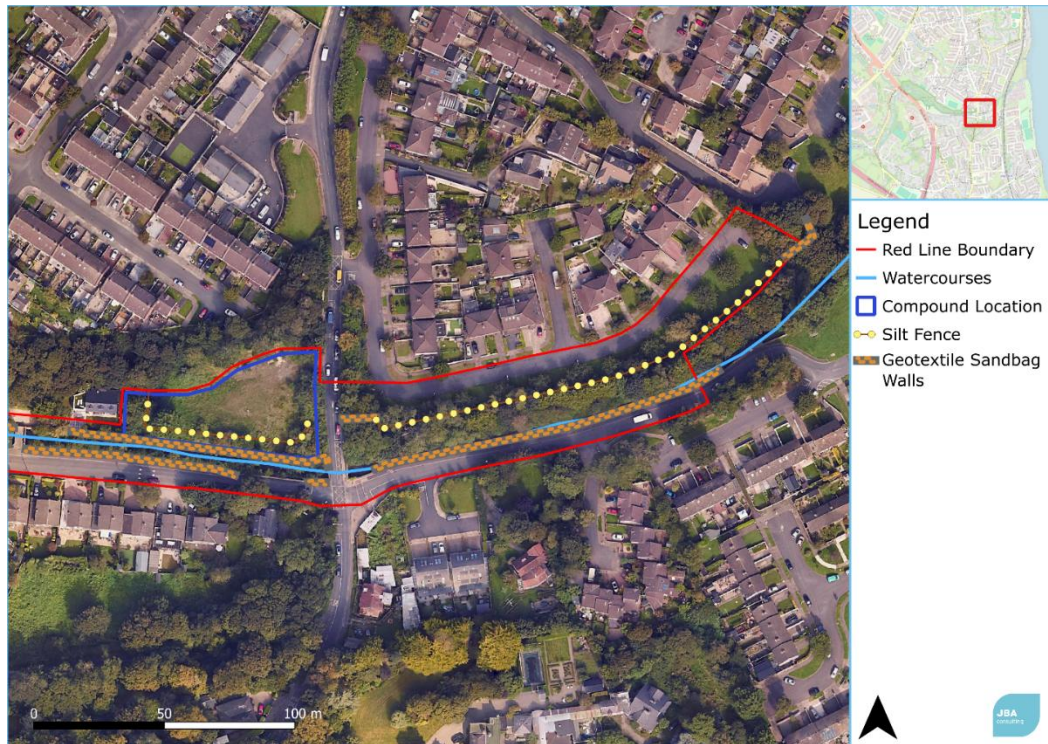


Figure 3-11: Indicative locations of silt fences and sandbag walls (Commons Road East)



Figure 3-12: Indicative locations of silt fences and sandbag walls (Bayview)

3.5 Use of Concrete

A concrete management plan will be drawn up at the outset of the project to ensure safe management of concrete pours, management of concrete lorries and washing of materials used in concrete construction etc. It will cover at minimum the points below:

- Washout of concrete plant will occur at a designated impermeable area with waste control facilities.
- Concrete delivery, concrete pours and related construction methodologies will be part of the procedure agreed with the contractor to mitigate any possibility of spillage or contamination of the local environment. Particular attention will be paid during the pouring process in order to avoid leakages or spills of concrete;
- Wherever reasonably possible, pre-cast concrete features should be utilised to minimise the risk of a concrete-based pollution event;
- Controlled release or pre-washing of installed culverts to ensure that the first release of water through culverts does not result in a washing through of concrete (and other built-up debris).
- Weather conditions will be taken into account when planning construction activities which require the use of wet concrete to minimise the risk of the runoff of concrete 'washout' from site;
- Where on-site batching is proposed by the appointed contractor this activity will be carried out at least 10m from surface water drains. Washout from such mixing plant will be carried out only in a designated contained impermeable area;
- Batching and mixing activities and material storage areas will be located at least 10m (as per CIRIA guidance listed in Section 1.3) away from surface water drains;
- Chute washout will be carried out at designated locations only, at least 10m from surface water drains. These locations will be signposted throughout the construction works areas. Chute washout locations will be provided with appropriate designated, contained impermeable area and treatment facilities including adequately sized settlement tanks;
- The clear water from the settlement tanks shall be pH-corrected prior to discharge to any surface water drains;
- There will be no hosing of concrete, cement, grout, or similar material spills into surface water drains. Such spills shall be contained immediately, and runoff prevented from entering the watercourse; and
- Discharge of washout water to wastewater (foul) sewer will only be carried out with the express permission of the sewerage undertaker and will be treated to the standard required; for example, because of its high pH (alkalinity), washout water may need treatment before disposal to the foul sewer.

3.6 Vehicles and Plants

- Vehicles and plant provided for use on the proposed scheme will be in good working order to ensure optimum fuel efficiency, and will be regularly inspected to ensure they are free from leaks and are promptly repaired when not in good working order;
- Spill kits will be carried on all vehicles;
- Vehicles and plant will not park near or over drains;
- Refuelling of vehicles and plant will be carried out on hard standing surfaces, using drip trays to ensure no fuel can contaminate the ground outside of the bunded areas;
- For deliveries and dispensing activities, the appointed contractor will ensure that:
 - Site-specific procedures are in place for bulk deliveries;
 - Delivery points and vehicle routes are clearly marked; and
 - Emergency procedures are displayed, and a suitably sized spill kit is available at all delivery points, and staff are trained in these procedures and the use of spill kits.
- The appointed contractor will provide wheel washing facilities, and any other necessary measures to remove mud and organic material from vehicles, at the construction compound, where necessary. These will be located at least 10m away from any surface water drains;

- The cleaning of delivery trucks shall be carried out at the construction compound and shall not be undertaken at the works areas;
- The surface run-off from vehicle washing areas will be directed to an on-site treatment system where possible; this also increases the potential for reusing the water. Such a treatment system would typically include:
 - A settlement lagoon to remove suspended solids such as mud and silt;
 - Catchpits or silt traps on drains and ensure that they are in place during cleaning. Empty them at regular intervals; and
 - Removal of oil, grease, petrol, and diesel from wash water by passing it slowly through an appropriately sized oil separator.
- The use of detergents in the cleaning process will be minimised; where required, biodegradable and phosphate-free detergents will be used;
- If detergents are used in the washing process, the wash water will not be directed through the oil separator as this will prevent it from working. It will be contained and disposed of off-site using a suitable licensed waste disposal operator, or if a foul or combined sewer is nearby, the surface runoff could be directed to it, with the permission of the sewerage undertaker; and
- To further minimise water used for washing vehicles, trigger-operated spray guns will be used, with an automatic water supply cut-off.

4 Monitoring and Verification of Control Measures

The monitoring programme outlined below is intended to verify the effectiveness of the mitigation measures described in Section 3 and to identify any deterioration in water quality or failure of control measures at the earliest opportunity.

4.1 Inspection of Control Measures

The appointed Contractor shall be required to carry out routine inspection of all surface water control measures to verify that they are functioning as intended and continue to provide effective protection of nearby watercourses.

The contractor shall carry out following as a minimum:

- Silt fences and geotextile sandbag barriers shall be inspected daily and following significant rainfall events;
- Settlement tanks, drainage controls and treatment systems shall be inspected regularly to ensure adequate capacity and performance;
- Fuel storage, refuelling areas, bunds, drip trays and spill response equipment shall be inspected daily;
- Temporary stockpile protection measures shall be inspected to ensure cover systems and runoff controls remain effective;
- Any defects, damage or evidence of failure shall be rectified immediately.

A proper inspection records shall be maintained by the Contractor and made available to the ECoW.

4.2 Water Quality Monitoring

The appointed contractor shall be required to carry out visual monitoring of surface water control measures (settlement tanks, silt fences, fuel storage areas etc.) on a daily basis.

Furthermore, surface water quality sampling will be undertaken at each works area. Monitoring during construction will be within the remit of the ECoW appointed, who will have a stop-works power to halt activity as needed.

In-field/live analysis of results such as:

- pH;
- Dissolved Oxygen;
- Conductivity; and
- Turbidity/Suspended Solids.

Water quality monitoring will be undertaken by the ECoW to allow reactive management, especially during instream works, and where releasing water after working in the dry, or other high impact situations. Discharge standards will meet Surface Water Regulation Standards for all relevant parameters, or comparable to water quality standards achieved upstream, as determined by baseline.

Monitoring frequency will be at the discretion of the ECoW, but should not be less frequent than:

- Weekly, where instream works are taking place; and
- Monthly, or as necessary, in other locations.

If hydrocarbons are observed or other water quality parameters are suspected to have been exceeded, an investigation will be carried out to determine whether any element of the construction of the Scheme could

be causing the contamination. If any potential sources of contamination are observed, appropriate actions will be taken (depending on the source and nature) to prevent further contamination and the incident shall be recorded and investigated in more detail to prevent a recurrence. If required, the relevant regulatory authorities will be informed.

5 Environmental Incident Response Plan

This section sets out the preliminary Environmental Incident Response Plan (EIRP) which is intended to ensure that, in the unlikely event of an incident, response efforts are prompt, efficient, and suitable for the particular circumstances. The EIRP details the procedures to be undertaken in the event of a significant release of sediment into a watercourse, or a significant spillage of chemical, fuel or other hazardous substances (e.g., concrete), non-compliance incident with any permit or licence, or other such risks that could lead to a pollution incident, including flood risks. The EIRP will identify the onsite risks and appropriate responses. The focus of including the measures in this EIRP is on prevention of the incident arising in the first place.

5.1 Roles and Responsibilities

The EIRP will be reviewed and updated regularly so that it continues to apply to construction activities and is amended when applicable regulations are revised or when amendments are required by a regulatory authority. It will be the responsibility of the Ecological Clerk of Works (ECoW), and/or the site manager, as stipulated by the appointed contractor to maintain and change the EIRP as required. The EIRP may also require amendments from the various stakeholders or suppliers as the proposed scheme progresses. The appointed contractor shall provide a full list, including the exact locations, of all pollution control plant and equipment. All such plant and equipment shall be maintained in place and in working order for the duration of the works. As part of the development and management of the EIRP, the appointed contractor will:

- Assess the pollution risks and develop emergency and spill response procedures for specific construction activities;
- Obtain details of key people that may need to be contacted for help in the event of an incident;
- Provide equipment for dealing with pollution incidents;
- Identify emergency access routes along the proposed scheme;
- Train personnel to follow procedures and use equipment correctly;
- Audit the EIRP; and
- Take action following an incident to ensure that it does not occur again.

5.1.1 Contacts

The EIRP will detail the initial contact that should be made in case of an emergency incident as well as those responsible for following up once an emergency event is declared. To cover the full length of the proposed scheme, more than one contact may be needed. The EIRP will indicate which contacts apply to which sections of the proposed scheme.

Contact details will include the organisation, position title, name, mobile phone number and email address of relevant personnel. Numbers will be obtained for contacts, including the following:

- An Garda Síochána (local station);
- Nearest Hospital Emergency Department;
- Inland Fisheries Ireland (IFI)
- Radio / mobile contacts for management staff and trained personnel;
- Out-of-hours contacts;
- Environmental regulators (hotline or local contact);
- Local authorities;
- Fire Services;
- Uisce Éireann (UÉ) - Irish Water;
- National Parks and Wildlife Service (NPWS);
- Environmental Protection Agency (EPA);
- Department of the Environment, Climate and Communications (DECC);

- Department of Housing, Local Government and Heritage (DHLGH); and
- Spill response and clean-up contractors.

5.1.2 Training and Testing

Personnel will be trained on the implementation of the EIRP and how to use the necessary equipment such as spill kits. Emergency arrangements will need to be reviewed and tested periodically (and always after an incident) to ensure that measures are effective, and that the workforce is aware of what to do in the event of an incident. Emergency drills will be recorded, and improvements noted and actioned accordingly.

5.2 Environmental Emergency Response Procedures

5.2.1 Fuel and Chemical Spillages

For pollution prevention measures, including area-specific measures, refer to Section 3 above. Emergency procedures will be further developed by the contractor with either scheme-specific works, area-specific or activity-specific measures, and all personnel will be required to know these procedures.

In terms of pollution spill response procedures, these will vary depending on the sensitive receptor and nature of construction activities. However, the following information will be included as a minimum and displayed at appropriate locations along the proposed development, at re-fuelling locations, fuel storage areas, etc.:

- Instructions on how to stop work and switch off sources of ignition;
- Instructions on how to contain the spill;
- Location of spill clean-up material;
- Name and contact details of responsible personnel (these personnel will assess the scale of the incident to determine whether the environmental regulator needs to be called); and
- Measures particular to that location or activity (for example, close to a settlement pond).

More detailed plans may be location-specific, or specific to a particular activity depending on the nature of the work. They will identify the potential sources of pollution and pathways to receptors so that containment measures can be put in place at these locations. Suitable equipment, such as spill kits, oil booms and absorbent material, will be held at appropriate locations within the proposed development site and personnel will be trained in the use of the equipment.

Emergency equipment will be obtained from a reputable supplier, and personnel will be trained in its correct use. Material safety data sheets and best practice assessments will be used for advice on appropriate spill measures. The type of equipment required will depend on the activity taking place.

Every effort will be made to prevent an environmental incident during the construction phase of the proposed development. The objective of the surface water management measures is to prevent an incident arising in the first place. Oil / fuel spillages are one of the main environmental risks that will exist during the construction phase of the proposed development which will require an emergency response procedure. An example of the steps that will be followed in the event of a spillage to ensure that the environmental risk is reduced to as low as reasonably practical is provided in this section. This procedure can be tailored to be location / activity specific as required:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers;
- Notify the ECoW and/or site manager immediately with location, type, and extent of the spill so that they can take appropriate action;
- If necessary, the ECoW and/or site manager will inform the appropriate regulatory authority, including the Fire Services, depending on the size and nature of the spill - the appropriate regulatory authority will vary depending on the nature of the incident;

- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;
- Contain the spill using the spill control materials, track mats or other material as required. Do not use detergent or hoses to disperse spilled fuel.
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats;
- Contain and dispose of used spill materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited;
- Record the incident using an Environmental Incident Form and follow set protocols (see below).

5.2.2 Other Environmental Incidents

Environmental incidents are not limited to just fuel spillages. For example, other environmental incidents may include:

- Accidental stripping of a protected habitat or habitat to be retained;
- Accidental release from settlement pond / tank etc.; and
- Unplanned utility strikes, resulting in foul water releases, temporary loss of services etc.

Therefore, any environmental incident will be investigated in accordance with the following steps:

- Immediately notify the ECoW and/or site manager, giving information on the location, type, and extent of the incident so that they can take appropriate action;
- In the very unlikely event of an incident occurring which may impact on a sensitive receptor, the ECoW and/or site manager will inform the appropriate persons / regulatory authority. The appropriate persons / regulatory authority will vary depending on the nature of the incident;
- The details of the incident will be recorded on an Environmental Incident Form (identified by the appointed contractor) which will provide information such as the cause, extent, actions, and remedial measures used following the incident. The form will also include any recommendations made to avoid the reoccurrence of the incident;
- A record of all environmental incidents will be kept on file by the ECoW and/or site manager and the appointed contractor. These records will be made available to the relevant authorities if required; and
- The ECoW and/or site manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the appointed contractor as appropriate.

5.2.3 Invasive Species Material Management

In accordance with relevant best practice guidance, material arising from invasive species removal shall be managed to prevent any risks of pollution to surface waters. Wherever practicable, invasive species material shall be removed directly from the work area and transported to an appropriately authorised facility, thereby avoiding temporary stockpiling. Where temporary storage is required, appropriate containment measures shall be implemented to prevent any release of material to nearby watercourses or drainage systems.

5.3 Environmental Incident Form

An example of an Environmental Incident Form (EIF) is provided in Table 5-1. An EIF will record details of any environmental incidents. This form will be appended to the EIRP.

Table 5-1: Environmental Incident Form Example

Incident Details				
Date:				
Time:				
Location:				
Extent:				
Direct Activity being Undertaken:				
Cause:				
Dangerous Substance(s) Involved (identify and quantity):				
Remedial Measures Undertaken:				
Parties Involved in the Incident				
Name	Role	Phone Number	Email	Address
Description of the Incident				
Recommendations following the Incident				

5.4 Corrective Action

When an incident happens, it is important to learn from it and ensure that such an incident does not occur again. This may involve changing the method of work for a particular activity, providing containment or treatment materials, or simply training personnel so they are aware of the correct method of work. Similarly, if an audit of planned arrangements indicates that measures are not in place, or those in place need to be improved, action will be taken immediately.

Record of toolbox talks, corrective actions and lessons learned shall be kept and communicated to all relevant persons, teams, sub-contractors, etc. across the proposed scheme.

6 References

Best Practice Guide BPGCS005 – Oil Storage Guidelines (Enterprise Ireland 2003)

Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (Construction Industry Research and Information Association) (CIRIA 2001)

Control of Water Pollution from Linear Construction Projects. Technical Guide (C648) (CIRIA 2006a)

Control of Water Pollution from Linear Construction Projects. Site Guide (C649) (CIRIA 2006b);

Design Manual for Roads and Bridges Part 3 DN-DNG-03022 (NRA HD 33/15) (Including Amendment No. 1) (TII 2015a)

A Framework for Emergency Management (Department of Housing, Local Government and Heritage 2021)

Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA 2006a)

Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (Inland Fisheries Ireland (IFI) 2016)

Planning for Watercourses in the Urban Environment, A Guide to the Protection of Watercourses through the use of Buffer Zones, Sustainable Drainage Systems, Instream Rehabilitation, Climate / Flood Risk and Recreational Planning (IFI, 2020)

CIRIA Guidance C741 Environmental Good Practice on Site (Charles & Edwards 2015)

Road Drainage and the Water Environment DN-DNG-03065 (TII 2015b);

Safety, Health and Welfare at Work (Construction) Regulations 2013 – S.I. No. 291 of 2013

Fishery guidelines for Local Authority works. (Department of Marine and Natural Resources 1998)

Development and Flood Risk – Guidance for the Construction Industry (C642) (CIRIA 2004)

Environment Agency Pollution Prevention Guidelines for construction and demolition sites (EA, 2012)

Directives and Legislation

EC Council Decision 2003/33/EC

European Communities (Environmental Objectives (Surface Waters)) Regulations, 2009 (S.I. No. 272 of 2009 and amendments), and the European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293 of 1988)

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