

EMISSIONS TO GROUND – CONTROL MEASURES

This waste licence application provides for

- (i) the restoration of Ballinclare Quarry by backfilling it to former ground level using imported inert soil and stone waste and other particulate / sludge wastes;
- (ii) the recovery / recycling of construction and demolition waste through crushing / screening and soil washing activities.

During the initial site establishment (construction phase) and subsequent landfilling and C&D waste recovery / recycling activities (operational phase), there is potential for accidental spills or leaks of fuel, hydrocarbons or other hazardous substances being used or stored across the proposed inert landfill and materials recovery / recycling facility to adversely impact land quality.

Potential for uncontrolled emissions to ground existed previously at the application site when it was an active hard rock quarry. As at that time, similar risks will in future be minimised by implementing a series of mitigation measures (outlined in section on groundwater impacts below) and adhering to an Environmental Management System (EMS). It is envisaged that the EMS to be developed specifically in respect of the proposed inert landfilling and materials recovery / recycling activities will comprise, amongst other aspects, details of systems and procedures to implement and monitor the effectiveness of mitigation measures as well as systems which provide for the proper handling, storage, control and monitoring for all potentially hazardous substances.

Site-based personnel at the proposed facility at Ballinclare Quarry will use existing toilet, hand washing and welfare facilities at existing site offices and the staff canteen located in the centre of the site. Wastewater from these facilities is piped to an on-site effluent treatment system which comprises an aeration treatment unit and two modular Puraflo system over a 300mm deep gravel bed. This system was previously approved by way of the recent (2016) quarry planning permission and will remain in service for the life of the proposed facility. No new or upgraded wastewater treatment facilities are required to service the needs of the proposed development.

Past experience at the quarry is that management practices can serve to minimise and prevent any uncontrolled emissions to ground and any consequent, potentially adverse, implications for land quality or ground contamination.

Specific Control Measures (to Give Effect to EU Council Directives)

In order to minimise the risk of pollution to groundwater arising as a result of the planned inert waste disposal (backfilling) activities and C&D waste recovery / recycling activities, a number of mitigation measures will be implemented to protect groundwater, prevent accidental discharge of fuel or chemicals and detect / monitor any potential adverse impacts.

These measures, give effect to the requirements of *Council Directive 80/68/EEC of 17 December 1979 on the Protection of Groundwater Against Risk of Pollution by Dangerous Substances* and the requirements of *Directive 2006/118/EC of 12 December 2006 on the protection of groundwater against pollution and deterioration*. They also give effect to the requirements of the national transposing legislation, specifically the *European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010)*.

Proposed mitigation measures are identified under a range of headings below. The majority of measures set out seek to avoid, prevent and reduce any adverse impacts on groundwater.

Inert Landfill Liner

Suitable uncontaminated natural, undisturbed soil waste and/or soil by-product (i.e. non-waste) which conforms to an engineering specification will be imported for re-use in the construction of the 1m thick basal and side clay liners required for the inert landfill at the application site. This clay liner will be of sufficiently low permeability (less than or equal to $1 \times 10^{-7} \text{m/s}$) to provide an appropriate level of protection to groundwater and the surrounding aquifer, in line with accepted inert landfill design standards (and current legislative requirements).

Testing and Inspection of Imported Material

Only soil and stone waste, C&D materials and other approved inert waste streams carried by authorised waste collectors will be accepted at the proposed inert landfill and materials recovery / recycling facility at Ballinclare Quarry. All waste intake and acceptance will be subject to regulation and control by way of any EPA Waste Licence issued in respect of the proposed facility.

Insofar as practicable, the source of each large consignment of soil imported to site for landfilling purposes shall be identified in advance and subject to basic characterisation testing to confirm that it is inert and acceptable for intake according to the criteria set by Council Decision 2003/33/EC and any EPA Waste Licence. Ideally, characterisation testing will be undertaken in advance by customers, clients or sub-contractors forwarding soil and stone and other approved backfill materials to the application site.

Operating procedures at the proposed facility will require all wastes forwarded for landfilling and/or recovery / recycling purposes to be sorted at source, inert and free of any non-hazardous / hazardous domestic, commercial or industrial wastes. Any waste consignment arriving at the facility with such wastes intermixed with it will be deemed unacceptable for intake at the facility on the basis of a CCTV / visual inspection at the weighbridge and will be immediately rejected and re-directed off-site to an alternative authorised waste facility.

All soil and stone / inert landfilling material imported to the facility will be unloaded (end-tipped) from trucks at the active landfill area. In addition to visual / CCTV inspection at the weighbridge(s), it will be inspected again by site-based personnel to ensure that there is no non-hazardous or hazardous domestic, commercial or industrial wastes intermixed with it. Should any intermixed, waste be identified at this point, the entire consignment will be rejected and reloaded back onto the HGV / tipper truck and the haulier directed to remove it off-site to an authorised (i.e. permitted or licensed) waste facility.

Similarly, should any non-inert or non-C&D waste be identified amongst incoming waste consignments at the C&D waste recovery areas, the entire waste consignment will also be rejected and reloaded onto the HGV / tipper truck and the haulier directed to remove it off-site to an authorised waste facility.

Waste Quarantine and Compliance Testing

Any soil and stone waste, C&D material or other inert wastes which are accepted for intake to the facility but subsequently suspected to be non-compliant with agreed waste acceptance criteria will be re-loaded onto HGV trucks and transferred to the waste inspection and quarantine facility for closer examination and/or testing.

It is proposed to designate the existing shed to the east of the weighbridge as the on-site waste inspection and quarantine facility. The shed is roofed, closed on all four sides and has a concrete floor, thereby protecting any quarantine material from incident rainfall and avoiding the potential to generate (suspect) contaminated surface water run-off (and a requirement for separate wastewater collection and storage infrastructure).

A representative sample will be taken (in line with any waste licence requirements) of the wastes accepted and placed at the landfill facility for compliance test purposes. This data shall be used to confirm that the accepted waste intake is inert / complies with permitted acceptance criteria.

Fuel Storage / Refuelling

The following measures will be implemented at the application site to prevent accidental spills:

- No refuelling of plant / machinery, maintenance or repairs will take place in the quarry void to prevent accidental spillages reaching the ground or being washed off in surface water;
- A refuelling pad with connection to hydrocarbon separator is provided at the application site, beside the workshop. Mobile plant / machinery refuelling will take place on the refuelling pad;
- Drip trays will be used for all refuelling activities;
- Fuel storage will continue at the existing bunded storage facility at the site;
- All petroleum-based products (lubricating oils, waste oils, etc.) will be stored on drip trays under cover in the workshop to prevent pollution due to accidental leakages;
- Waste oil and grease containers will be stored under cover in the workshop. Waste containers will be collected and disposed of by a suitably licenced contractor;
- An emergency spill response kit (with containment booms, absorbent materials and drip tray) will be provided on-site to contain/ stop the migration of any accidental spillages, should they occur; and
- Plant operators will be briefed during 'toolbox' talks and site induction on where the spill kit is kept and how and when it is deployed.

Plant / Equipment Maintenance

The following measures will be implemented to reduce the risk of leaks:

- All plant / machinery maintenance and repairs will take place under cover in the existing workshop at the site or on the hardstand refuelling pad;
- All plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids; and
- Regular visual inspection and testing will be undertaken of the integrity of tanks, drums, bunded pallets and double skinned containers.

On-site Passive Wetland Treatment System

A separate drainage system will be provided to reduce pressures and dewater groundwater beneath the basal landfill liner. Any dewatered groundwater / storm water run-off collecting in the quarry sump (not otherwise used for soil washing / dust suppression) and storm water run-off from the inert landfilling activities collecting at temporary sumps within the lined landfill area (behind a perimeter berm) will be pumped up to the approved (Siltbuster) treatment plant and from there to the proposed on-site (passive) wetland treatment system prior to discharge off-site to the Potters River.

The sizing and design of the wetland treatment system has been developed having regard to the likely contaminants (and concentrations thereof) which could be present in the waste intake which will be predominantly sourced from construction sites.

The effectiveness of the proposed wetland treatment systems can be enhanced by the temporary addition of various, more active treatment systems, such as chemical dosing, aeration or other such processes. This can allow a wetland system to handle higher contaminant loads or flows for periods of time (should it be necessary) before reverting to more standard (passive) modes of operation, therefore providing flexibility should leachate generation rates and chemical constituents change over time.

Based on the initial assessment and design, the proposed wetland treatment system at Ballinclare Quarry will comprise the existing approved treatment system plus

- (i) A leachate reception tank : up to 50m³, self-bunded storage tank with level controls.
- (ii) A pump house : housed in a standard shipping container (6.0m x 2.4m x 2.6m) containing feed, discharge and chemical dosing pumps;
- (iii) A wetland treatment system: comprising the following elements in series
 - (a) Anaerobic (biochemical reactor) wetland;
 - (b) Iron Sequestering Unit (ISU);
 - (c) Aerobic wetland.
- (iv) Off-site discharge via existing ditch / drainage channel to the Ballinclare Stream and the Potters River further downstream.

Infiltration of Suspended Solids

There are potential impacts on groundwater from increased mobilisation of soil fines and/or waste particulates in infiltrating rainfall / run-off. In order to minimise erosion of inert soil and other waste particulates and transportation of fines in groundwater the following measures will be implemented:

- stockpiled wastes / surfaces will be placed at a safe angle of repose and will be bladed off;
- stockpiled wastes / surfaces will be re-vegetated where they are / will be exposed to the elements and will remain in place for a sufficient length of time to justify such a measure; and
- surface water run-off containing suspended solids will be directed to temporary holding areas within the lined landfill area or beyond where some initial settlement of solids / particulates can occur prior to being pumped to the wetland treatment area.

Traffic Management

In order to reduce the risk of an accidental vehicle collision and associated fuel spills or oil leaks, a site-specific traffic management system will be put in place to reduce potential conflicts between HGV's travelling to / from the existing weighbridges, designated waste disposal and/or recovery facilities within the quarry and the existing site egress along the L1157 Breagura Road. Speed limits will also be applied across the site to further reduce the risk of collisions (and of fuel leaks arising therefrom).

Monitoring

Groundwater monitoring measures have previously been implemented at the quarry. These monitoring measures will be re-instated at the proposed inert landfilling and materials recovery / recycling facility to monitor any potential impact of proposed waste disposal and C&D waste recovery / recycling operations on groundwater quality.

The results of all groundwater monitoring undertaken will be recorded and submitted to Wicklow County Council and/or the EPA in an Annual Environmental Report for their record and review. The groundwater monitoring regime will remain in place for the duration of the disposal (backfilling) and restoration works at the quarry void. Sampling and monitoring will continue for a short aftercare period following cessation of landfilling activities and completion of site restoration works thereafter.

Post – Operational Stage

The proposed mitigation measures outlined above for the construction and operational stages will also be implemented for the post-operational stage while site infrastructure is being decommissioned and the final landscaping works are being undertaken to restore the site to a grassland / scrub habitat. In addition, appropriate seasonal timing of site restoration works, soil subsoiling and grass seeding will reduce the any adverse impacts of soil erosion across the site.