Attachment C.2 - Measures to Prevent Unintended Discharges

1. EXISTING MEASURES TO PREVENT UNINTENDED DISCHARGES

Techniques:
A Performance Management System (PMS) is in place at the Macroom Wastewater Treatment Plant (WWTP). This PMS was developed by the Water Services National Training Group (WSNTG). The PMS provides a uniform approach to dealing with all relevant performance management issues, including Independent Compliance Audits, Management of Change, Dispute Resolution, Public Relations, Emergency Procedures and Reporting Procedures.

The current operator is contractually obliged to perform the operation of the WWTP in accordance with the Performance Management System and to maintain the design performance capability of the existing WTP. Further measures planned to comply with the general principle of the basic obligations of the operator, i.e., that no significant pollution is caused.

Prevention of Pollution:
Any alteration / upgrading of the existing infrastructure undertaken by the operator shall not increase the potential to cause pollution in the environment. In particular, any alterations to the WWTP will be designed to enable any operator of the facility to prevent pollution of the environment by the following potential contaminants:

- Surface water run-off;
- Spillages;
- Solid Waste.

Toxic Substances:
The WWTP operator is to ensure that any modification or alterations to the WWTP do not increase the impact by any toxic substances. All chemicals and dangerous substances must be always stored safely, and all appropriate safety measures must be taken to ensure against leakage and spillage in accordance with the relevant Health & Safety Legislation. As part of the operator's contract, failure to meet specified final effluent quality standards results in financial penalties due to non-compliance. The penalties vary depending on the severity of the pollution caused.

2. PROPOSED MEASURES TO PREVENT UNINTENDED DISCHARGES

The Wastewater Discharge Authorisation Licence D0126-01 granted by the EPA sets stringent discharge Emission Limit Values (ELV). The original WWTP was designed to service a population equivalent (PE) of 6,000. The existing WWTP is significantly hydraulically overloaded resulting in the WWTP failing to meet the specified ELV's as per WWDL D00126-01.

As such, it is proposed to upgrade the existing WWTP to cater for the future agglomeration load (8,300PE) and to reliably achieve the required treatment capacity and proposed ELVs.

The proposed upgrade works are designed to meet the proposed ELVs consist of the following:

- Preliminary treatment:
    - Upgrade and replacement of the existing storm water overflow (SWO) immediately upstream of the inlet works with new screened SWO (SW002);
    - Decommissioning of the existing preliminary treatment works including the screen;
    - Construction of a new inlet works and screening system;
    - Construction of a new grit removal system;
    - Construction of a new full flow to treatment (FFT) pumping station; and
    - Construction of a new stormwater storage tank equipped with storm water pumps.
- Secondary treatment:
    - Decommissioning of the existing oxidation ditch;
    - Construction of a new flow splitting chamber;
    - Construction of 2 No new integrated fixed-film activated sludge (IFAS) reactor tanks (Aeration Tanks);
    - Decommissioning of the existing final settlement tank;
    - Construction of 2 No. new final settlement tanks;
    - Construction of both return & waste activated sludge (RAS/WAS) pumping stations,
    - Installation of a lime batching & dosing facility, and
    - Installation of ferric sulphate dosing system including bunded chemical storage tank.
- Sludge management system:
    - Decommission existing sludge holding tank;
    - Construction of a new sludge picket fence thickener (PFT);
    - Construction of an odour control system;
    - Installation of a new polymer make-up system, to be located within the existing building which is to be retained;
    - Decommissioning of the existing dewatering equipment within the existing building; and
    - Installation of a new sludge dewatering equipment/system (to be installed within the existing building, which is to be retained).
- Outfall:
    - Construction of a new final water sampling manhole on the existing outfall pipeline, within the WWTP site;
    - Discharge of final effluent through the existing outfall SW001 to the River Sullane.
- Ancillary works:
    - Construction of a solar PV panel installation capable of a maximum power generation of 42.32kWp;
    - Construction of a new sheet pile flood protection wall. This wall is to be constructed within the site boundary to a level of 300mm above the 0.1% Annual Exceedance Probability (AEP) (1-in-1000 year) flood level;

- New standby energy generator & bunded fuel tank;
- Relocation of the existing shed from the southern side of the WwTP site to the northern side of the WwTP site;
- Demolition of existing sheds adjacent to the site entrance to create a designated area with a separate site entrance to be used by Cork County Council Roads Department;
- Construction of a new control and administration building;
- Construction of new surface water drainage system with oil interceptor and attenuation system, in accordance with Sustainable Drainage Systems (SuDS); and
- Site landscaping and finishes.

Technologies:

The normal operation of the proposed development will be fully automated. The Macroom WWTP will have its own automation control center, where the WWTP's operation will be monitored. Telemetry/Alarms will also be available remotely to the operator when not present at the WWTP.

Alarms and telemetry will be used on plant equipment to ensure the plant is operating within specified limits. Operators will be automatically notified if such limits are exceeded.

Standby equipment and provisions in the event of the power supply being interrupted, such as a permanent standby generator and equipment with automatic switchover will be provided at the upgraded WWTP.

Mitigation Measures to reduce the risk of WWTP spillages resulting in untreated effluent entering the River Sullane have been considered throughout the design stages of the project. The potential for overflow has been minimised at each stage of the treatment process by applying appropriate control measures to reduce the likelihood of such an event occurring. The design features employed to minimise the risk of unintended discharges associated with overflow or spillages are described below.

RAS is transferred directly from the FST's into the RAS pumping station. The direct link between the two systems reduces the likelihood of a spillage in comparison to that which would be present if multiple interconnecting chambers were used.

Considering the combined nature of the Macroom Sewerage Scheme, there is a risk that flows arriving to the Macroom WWTP would be far in excess of the design Formula A flows and hydraulically overload the inlet works.

The proposed Formula A chamber will be split in two cells divided by a weir – flows will enter the foul side and on normal conditions (up to formula A) be forwarded to the inlet works, if flows surpass Formula A they will overflow through the weir to the storm side of the chamber. The storm side of the chamber shall be equipped with a 6mm screen to capture any debris within the effluent. Flows from the storm side of the chamber will firstly discharge directly to the new Storm Water Holding Tank. An overflow level shall also be provided in the storm side of the Formula A chamber to discharge directly into the outfall in case the storm tank has reached its full capacity (SW002).

Due to the profile of the existing sewer arriving to the plant, it will not be possible to discharge wastewater from the storm tank to the river by gravity without surcharging the upstream network, and

discharge from the storm tank will therefore be through pumping under normal operation.

The storm pumps will be located in the storm tank itself, thus removing the need for an additional sump and facilitating constructability of the project. Pumped flows will be pumped to a high-level chamber where they will combine with the treated effluent prior to discharge through the existing outfall (SW004).

In the event of a power failure, an actuated valve will fail in the closed position at the inlet to the storm tank to prevent localised flooding, and a separate overflow will discharge from the upstream Formula A weir directly to the river (Emergency Overflow SW002). It should be noted that this will require surcharging of the upstream network.

Once incoming flows subside below FFT, stormwater stored in the stormwater holding tank will be returned to the FFT PS by 2 No. pumps located in a sump within the tank.

The potential for an unintended release of chemicals is minimal. All chemicals are stored in bunded containers, while chemical deliveries are received in a contained area equipped to collect spillages.

The upgraded Macroom WWTP has been designed to achieve a high level of hydraulic safety, and therefore presents minimal risk for unintentional spills to occur.

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