Section 6.0 – Surface and Groundwater Management Plan

Guidance Notes:

This section contains details of the relevant statutory provisions, including any consents required, in respect of the water environment, to protect both physical habitat and morphology and to avoid unacceptable adverse impacts including changes to flow volume, water levels and water quality due to construction.

FORTH REPLACEMENT CROSSING – FIFE ITS

FRC/ITS/GC/SGWMP/01

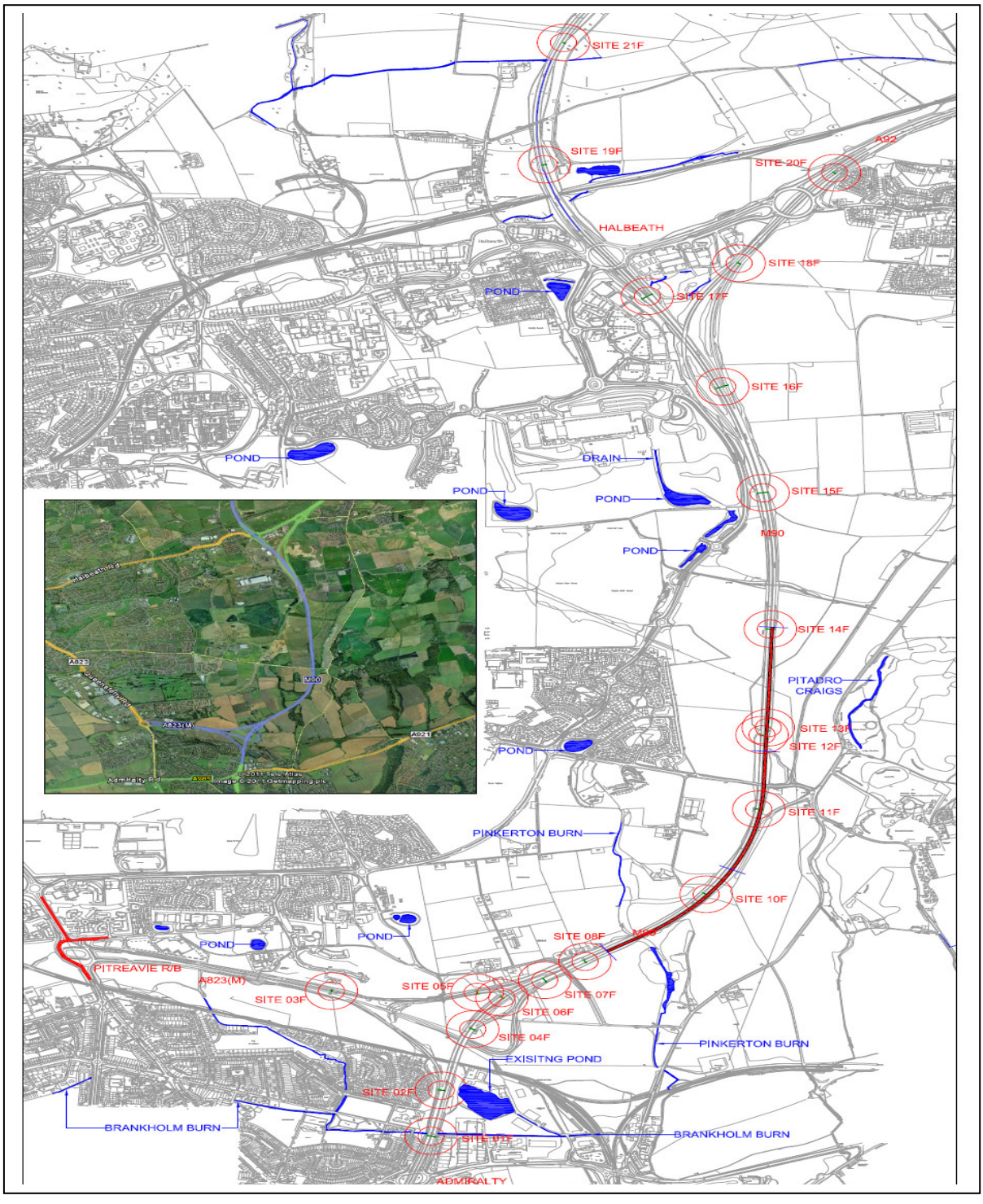
Surface and Groundwater Management Plan

Contents

6.1 Objective

To comply with relevant statutory provisions, including any consents required, in respect of the water environment, to protect both physical habitat and morphology and to avoid unacceptable adverse impacts including changes to flow volume, water levels and water quality due to construction.

6.2 A description of watercourses, waterbodies and aquifers which could be affected during construction and identification of sources of potential pollution



6.3 Regulation

The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) will be strictly adhered to.

Activities which fall within CAR include:

- Activities liable to cause pollution of the water environment.
- Abstraction of water from bodies of surface water or groundwater.
- The construction, alteration or operation of impounding works in bodies of surface water.
- Building, engineering or other works in, or in the vicinity of, any body of inland surface water.
- Activities connected with any of the activities specified above.
- The direct or indirect discharge, and any activity likely to cause a direct or indirect discharge, into groundwater of the substances listed in Schedule 2 to the regulations.
- Any other activity which directly or indirectly has or is likely to have a significant adverse impact on the water environment.

Where required, the site team will ensure that the abstraction, impoundment and discharge of water is in line with requirements laid out in the Controlled Activities Regulations (CAR). To date an abstraction license has been obtained for the site which allows the abstraction of up to 50m^3 per day from two abstraction points Located at: NT 1266 8392 and NT 1302 8899.

General Binding Rules (GBRs) for specific low risk activities will be complied with and the Project Manager will make arrangements to apply for any necessary registrations and licenses from SEPA in advance of the works.

6.4 Guidance

In order to ensure best practice with regard to the protection of water quality, all work must be carried out in line with:

- Pollution prevention Guideline 5 (PPG5) “Works in, near or liable to affect watercourses”.
- Pollution prevention Guideline 2 (PPG2) “Above ground storage tanks”.
- Pollution prevention Guideline 26 (PPG26) “Storage and handling of drums and intermediate bulk containers”.
- SEPA’s code of practice for installers, owners and operators of underground storage tanks and pipelines.
- SEPA’s Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods.
- CIRIA Publications (C532, C648 & C649).
- BS 6031 Code of Practice for Earthworks regarding the general control of site drainage.

6.5 Concrete Cement and Grout

Concrete, cement and grouts are highly alkaline and corrosive and can have a detrimental impact on watercourses. To minimize any impact:

- Concrete lorries must wash down in designated areas – these areas should be lined with an impermeable sheet to prevent ground contamination.
- Any concrete or cement mixing will be sited on an impermeable designated area at least 10M away from a watercourse or surface water drain.

Note - It is not anticipated that we will establish/ operate any concrete batching plant on site.

6.6 Silt Management

We will consult with SEPA regarding the measures to be implemented to contain and manage surface water run-off from the construction site to prevent deterioration of the water environment and other adverse impacts including changes to flow volume, water levels and water quality. Measures to be implemented will include the following:

- Provision of cut off ditches or drains and sustainable drainage systems (SUDS) with suitably sized treatment facilities such as settlement or detention basins.
- Use of oil interceptors (If required by SEPA) at site offices and work compounds.
- Consent will be obtained from SEPA for any soakaway or filtration systems or to enable discharge of surface water run-off to watercourses or foul sewers or disposal off-site.
- Silt fences or non-erodable bunds of material will be used adjacent to water courses to prevent water containing silt being released directly to the water environment.
- The period of exposure of bare areas and uncontrolled runoff from newly paved areas will be limited as far as practical.
- If flocculants are considered necessary to aid settlement of fine suspended solids such as clay particles, the chemicals used must first be approved by SEPA.
- If required a surface water/ ground water monitoring plan will be implemented.

6.7 Site Drainage

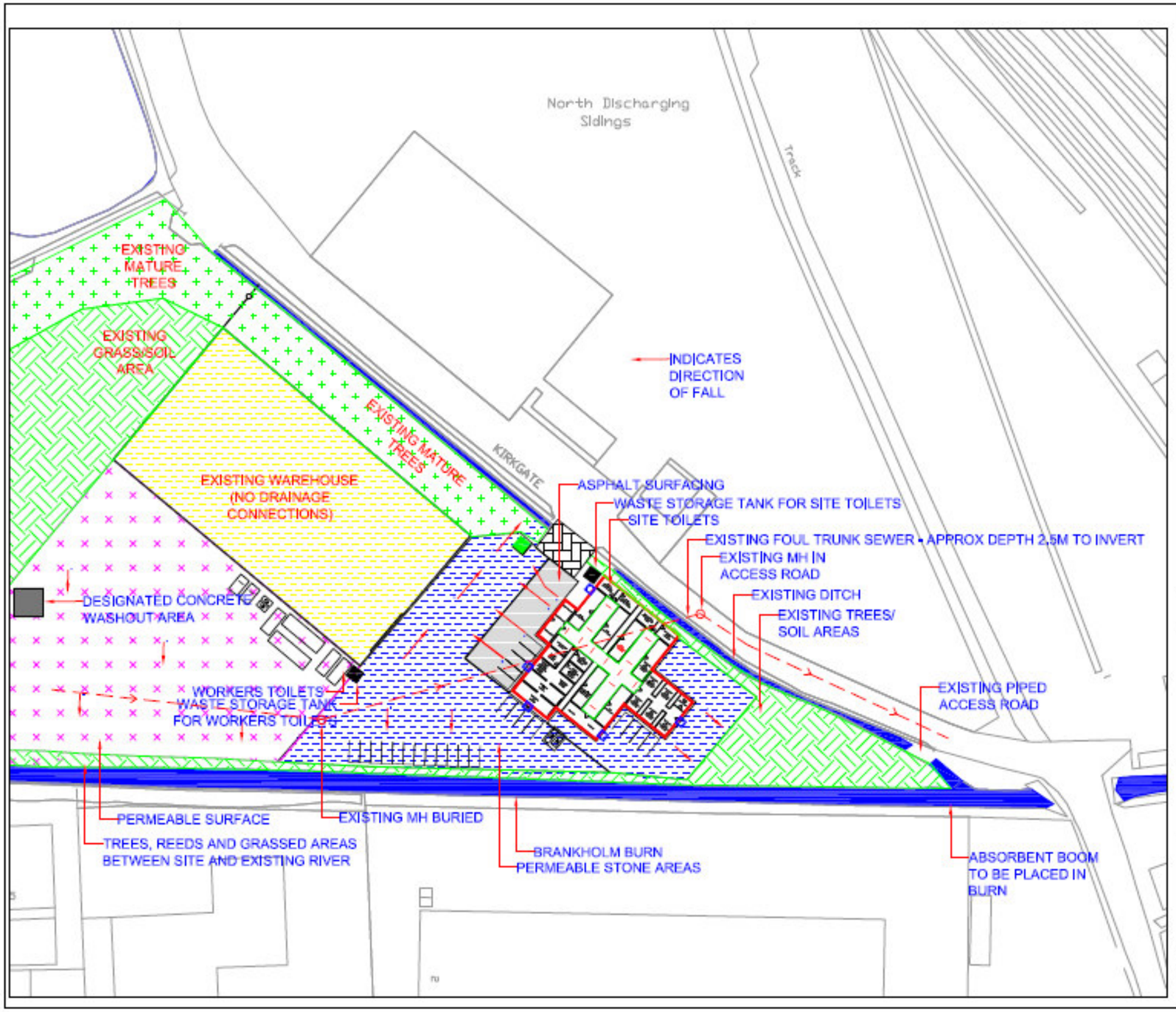
Drainage systems can act as a pathway to spread pollutants. Drains can also make pollution invisible, so it is important to know where drains are located and where they lead in order to prevent polluting materials entering drains.

- All existing drainage on site (e.g. surface water, foul sewer) will be identified and a “drainage plan” will be made available for specific areas. See example of site compound overleaf.
- All drain covers and gullies will be clearly marked to identify them (Recommendation is red for foul, blue for surface water).
- The types of pollution risk that could enter the drains will be identified e.g. silty water, fuel or cement washings.
- If any pollution enters a drain, immediately stop the pollution with a physical block, stop the activity causing the pollution, then notify the SHEQ department.

(See pollution incident response plan – Appendix J)

Specific Drainage plans will be developed to cover specific construction activities, i.e. working on existing drainage network, mine workings consolidation, etc. The Drainage Drawing for the site compound is shown below.

GRAHAM
CONSTRUCTION



POSSIBLE TYPES OF POLLUTION

- Noise and Dust
- Fuel & Oils
- Artificial Light
- Surface Runoff
- Concrete Washout Area

REV	DATE	BY	DESCRIPTION

GRAHAM

PROJECT
FORTH REPLACEMENT CROSSING - FIFE ITS

TITLE
SITE DRAINAGE LAYOUT

DRAWING NO	REV
FRC-ITS-GC-SK-29	0

SCALE	BY	DATE
NTS	RMcF	26/09/11

DRAINAGE LAYOUT FOR SITE COMPOUND

6.8 Foul Drainage

Disposal of foul water and sewage effluents from site facilities will comply with PPG 4 Treatment and disposal of sewage. The following measures will be implemented as appropriate:

- Containment by temporary foul drainage facilities and disposal off-site by a licensed contractor.
- Connection to the local foul water and sewage system as agreed with the relevant authorities.
- Where a foul sewer is not present, appropriate treatment and discharge to a watercourse or soakaway with prior authorisation from SEPA. Any foul drainage discharge outwith the public sewer will require authorisation from SEPA.

6.9 Environmental Clerk of Works

An Environmental Clerk of Works will be appointed and he/ she will be present on site during construction to supervise the implementation of appropriate environmental safeguards.

The Environmental Clerk of the Works for the Fife ITS Project will be Jenni Taylor. The ECoW will be onsite on request from the Contractor. Approval of the ECoW will be sought from the Employer.

6.10 Procedures for monitoring groundwater levels and quality at abstraction boreholes and wells to enable adverse effects on quality or levels to be identified.

Water quality monitoring will be carried out prior to and during construction for certain activities in order to assess chemical and biological parameters as required by SEPA.

Monitoring will be carried out to identify;

- Pollution risks that are unacceptably high.
- Spillages and leakages.
- Non-compliance with the CoCP.
- Suspected pollution incidences.

Regular sampling and testing of water quality at abstraction boreholes and wells at Gantry G08F, G18F and G20F has been undertaken at appropriate intervals. Monitoring of watercourses and receiving surface water has also been carried out.

6.11 A description of the response procedures to be implemented in the event of works affecting groundwater levels or quality with subsequent adverse effects on abstractions, watercourses, waterbodies or springs

See Pollution Incident Response Plan - Section 6.

6.12 Dealing with works in areas of potentially contaminated land

See Geology, Land Contamination and Waste Management Plan – Section 5.

6.13 Dealing with intercepted groundwater containing elevated concentrations of contaminants

Any groundwater containing elevated concentrations of contaminants will be contained for proper treatment and disposal.

6.14 Measures to reduce flood risk during construction works

Before the construction of the site compound commenced and Environmental Impact Assessment was completed, FRC-FITS-JG-EIA-0001 EIA for Contractors Compound. The EIA contained the following items;

- General overview of the Document;
- Location address and plans;
- Description of existing area;
- Proposed use of the site;
- Storage of Construction Materials; and
- Environmental Impact Assessment for:
    - Water Environment;
    - Geology, Contaminated Land & Ground Water;
    - Terrestrial and Freshwater Ecology;
    - Land Use;
    - Air Quality;
    - Noise & Vibration; and
    - Conclusion.

If required throughout the project individual Environmental Appraisals can be completed for particular works activities. These will be laid out in a similar format to the headings above.

6.15 Measures to be implemented in relation to construction associated with outfalls

Not relevant for the Fife ITS Project as no new outfalls will be created, only re-laying of existing drainage with no new addition.

6.16 Consultation with local authorities and SEPA regarding specific requirements in relation to establishing and operating concrete and road surfacing material batching plants on site.

As indicated in section 6.5 we do not anticipate that we will establish/ operate any concrete batching plant on site. Similarly we do not intend to utilise a road surfacing batching plant on site. Where there is any deviation from these plans/ intentions, the local authority and SEPA will be consulted and given due time to consider any such proposals.

6.18 Storage and Control of Oils and Chemicals

6.18.1 Storage of Hazardous Chemicals

The Pollution Prevention Guidelines: - PPG26 Storage & Handling of Drums & Intermediate Bulk Containers should be complied with on this project and COSHH Risk Assessments should be completed for all hazardous chemicals brought onto site.

Flammable liquids e.g. petrol, paints and solvents should be stored in secure stores clearly marked with appropriate warning signs.

Storage for hazardous substances should be as per the suppliers' recommendations and should be sited away from sensitive areas of the site. Additionally the storage area will provide containment in the event of the spillage.

6.18.2 Oil Storage Issues

Oil is one of the most common pollutants in the UK and spilt oil can pollute streams, rivers and groundwater supplies which can be used for drinking water.

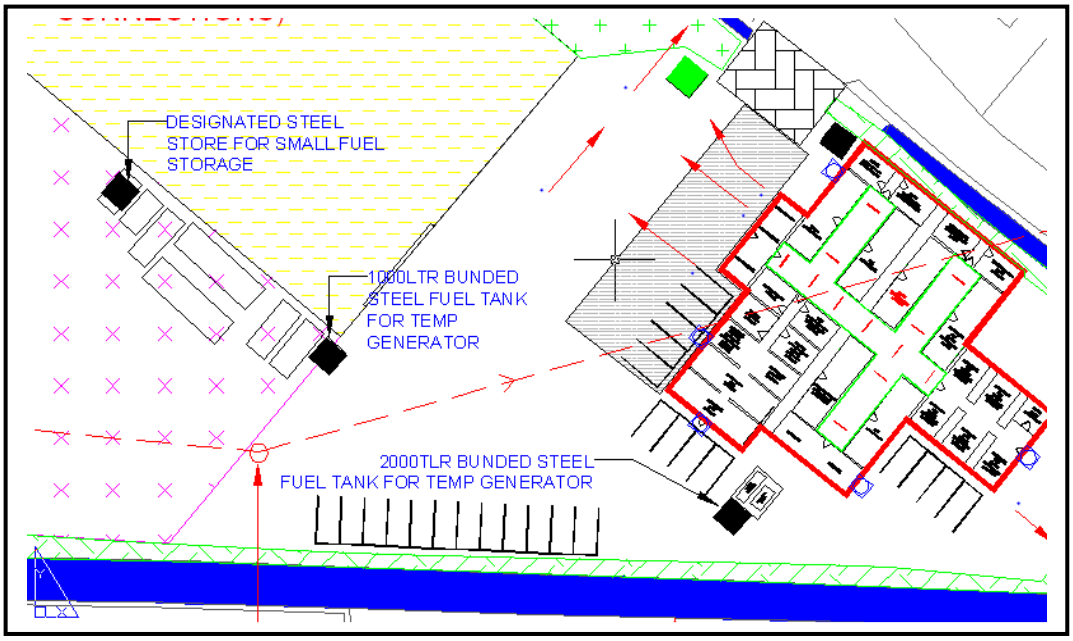
We will fully comply with the Water Environment (Oil Storage) Scotland Regulations 2006.

6.18.3 Types of Oil expected to be found on Site

- Petrol
- Diesel
- Heating oils
- Biofuels
- Lubricating and hydraulic oils
- Synthetic and mineral oils
- Biodegradable
- Shuttering and cutting oils
- Waste oils

6.18.4 Oil Storage Locations

Oil is stored in dedicated areas as indicated on the site map below. These areas are specifically designed and constructed to be safe and secure and all reasonable measures will be put into place in order to secure fuel tanks from vandalism.



In all cases we will avoid storing oil in high risk locations such as:

- Where there is risk of damage by impact or collision e.g. from site traffic
- Within 50M of a spring, well or borehole
- Within 10M of a watercourse, ditch or drainage channel

- Where spilt oil could enter open drains or soak into unmade ground where it could pollute groundwater.

6.18.5 Oil Storage Tanks and Containment Systems

If storing more than 200litres of oil, a secondary containment system shall be provided. The capacity of the secondary containment system will be either 110% of the largest drum or 25% of the total volume stored (whichever is greater). Additionally all ancillary equipment will be kept contained within the bund.

Figure 1 – Proprietary oil storage tank system (Capacity of 200 Litres or more)

If practical, any open oil storage areas will be covered (as illustrated below) in order to prevent rainwater collecting

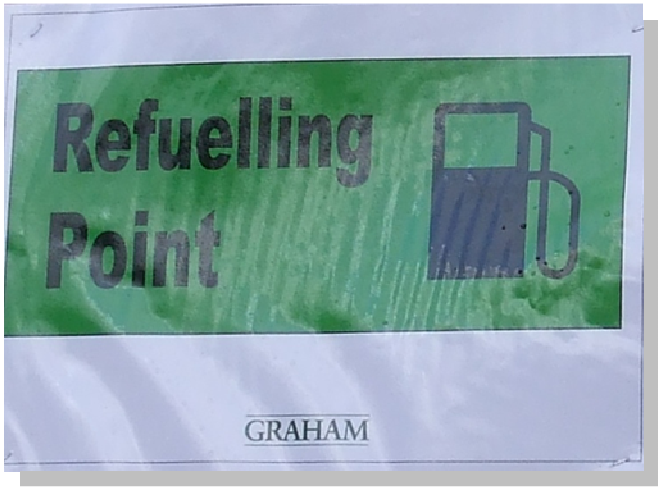
Stationary plant will be fitted with drip trays to retain any leakage of oil or fuel. Trays will be emptied at regular intervals to prevent overflow.

6.18.6 Inspection and Maintenance

All oil storage areas, containers and secondary containers are frequently inspected and checked for signs of damage, corrosion, bulging, leaks or unauthorised use and interference. Any required maintenance, defects or faults are repaired immediately.

6.18.7 Refuelling and Dispensing

A **designated refuelling area** consisting of an impermeable surface has been established for the project, situated well away from the watercourse. Signage (such as that illustrated below) has been erected to indicate the location of the refuelling area and an oil spillage kit is also at hand at this area. All fuel deliveries to site are supervised by a designated individual.



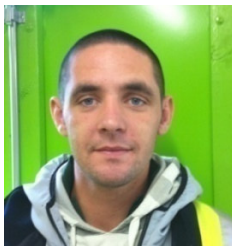
Refuelling is carried out using a drip tray or other secondary containment solution to prevent oil from spilling onto the ground. Where mobile refuelling is carried out, all bowsers carry an emergency spill kit. All oil containers (including mobile bowsers) are returned to the designated storage area after use.

6.18.8 Appointed Persons for Refuelling

Dedicated person(s) have been appointed and trained for the purpose of refuelling on site. An “appointed persons” poster such as that on the following page should be completed and displayed on site.

Appointed Persons for Refuelling

1. Primary Appointed Person for Refuelling:



IAN HUGHES

- Where refuelling of plant is required please contact **IAN HUGHES**
- This operative has been trained in the 'storage and use of fuel and oils' and is the 'primary' appointed person for carrying out refuelling of any item of plant on this project.
- This operative has also been trained in the 'use of spill kits'.

2. Secondary Appointed Person(s) for Refuelling:

JOHN MCGEE

WILLIAM BARRON

- In the absence of the 'Primary Appointed Person for Fuelling', duties have been delegated to either **JOHN MCGEE** or **WILLIAM BARRON**.
- Both of these operatives have been trained in the 'storage and use of fuel and oils'.
- Both of these operatives have also been trained in the 'use of spill kits'.

Note:

(a) Refuelling must only be carried out by a trained operative as noted above.
(b) If none of the above trained personnel are available please contact the General Foreman or a GRAHAM Supervisor.
(c) In the event of an 'oil spillage' please refer to our 'Emergency Response Plan for dealing with a Spillage of Fuel Oil' and contact a GRAHAM supervisor.