REV	DATE	DESCRIPTION	DRW	CHK
P01	10.05.24	FIRST ISSUE	AND	ATE
P02	21.05.24	BASIN SIZES AND POSITIONS UPDATED.	AND	ATE
P03	24.05.24	SUB-CATCHMENT 7 ADDED. DISCHARGE RATE UPDATED TO 1 IN 1 YEAR GREENFIELD RUN OFF. PIPEWORK ROUTE FROM BASIN C TO OUTFALL UPDATED. CESSPOOL REMOVED FROM AREA TO NORTH EAST.	AND	ATE
P04	27.05.24	TITLE BLOCK UPDATED.	AND	ATE

Existing consented discharge point at SE 599 099. Discharging into EA Beck under Consent No. WRA 7037. Permitted to receive drainage from Coal Stockyard Site only, after receiving settlement and oil interception

Former Coal Stocking Yard

SUB-CATCHMENT 1
SUB-CATCHMENT 2
SUB-CATCHMENT 3
SUB-CATCHMENT 4

SEE INSET DETAIL

Proposed Foul cesspool
Proposed Foul cesspool
Proposed Foul cesspool

Proposed surface water pumping station
Proposed rising main
Proposed Oil Interceptor

Proposed Attenuation Basin A
Storage Volume: 9,750m³
Max. WL = 9.00
Base Level = 7.25

Proposed Attenuation Basin B
Storage Volume: 7,800m³
Max. WL = 9.00m
Base Level = 6.50m

Proposed Attenuation Basin C
Storage Volume: 4,650m³
Max. WL = 9.00
Base Level: 6.00

All attenuation basins to be lined with man-made liner (HDPE or similar TBC)

Existing Reedholme surface water pumping station

Proposed sampling point for discharge consent compliance auditing

Existing consented discharge point at SE 591 091. Discharging into a Tributary of the EA Beck under Consent No. WRA 7038. Permitted to receive drainage from Ash Mound site only, after receiving settlement and oil interception.

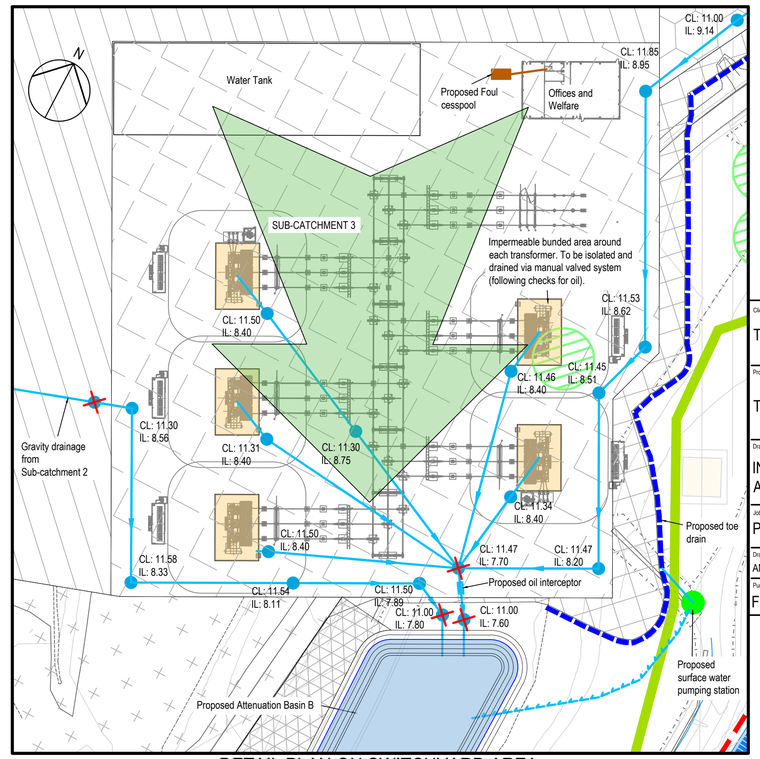
Proposed flow control chamber to restrict flow to the 1 in 1 year Greenfield run-off rate of 95.18 l/s

Thorpe Marsh

CATCHMENT AREAS			
	Catchment	Description	Area [m²]
	Sub-Catchment 1	General development area	82,000
	Sub-Catchment 2	General development area	88,000
	Sub-Catchment 3	Switchyard area	31,500
	Sub-Catchment 4	Poss. welfare area	12,550
	Sub-Catchment 5	Internal slopes draining onto development area	39,250
	Sub-Catchment 6	External formed slopes - being picked up by toe drains	10,750
	Sub-Catchment 7	Existing external slopes draining towards attenuation basins	18,185
	TOTAL		282,235

KEY:
- Planning red line boundary
- Land ownership boundary
- Environmental permit boundary (as denoted on H.J.Banks Conditioning Plan 60837 - Drg. No. HJB/408/18)
- General surface water drainage falls. Drainage to be via a system of gravel filter drains with perforated pipes. System to be designed to accommodate 100% of the surface water with no allowance for infiltration
- Proposed surface water drain
- Proposed surface water manhole
- Proposed surface water manhole with isolation point
- Proposed foul water drain
- Existing Reedholme surface water pumping station
- Proposed impermeable bunded area around each transformer. To be isolated and drained via a manual valved system (following checks for oil).
- Proposed toe drain around newly formed embankments.
- Proposed surface water pumping station.
- Proposed surface water rising main.
- Existing wooded area.

GENERAL ARRANGEMENT PLAN
1:2500



DETAIL PLAN ON SWITCHYARD AREA
1:1000

CONFIDENTIAL

Client
THORPE MARSH GREEN ENERGY HUB LIMITED

Project Title
THORPE MARSH LANDFILL (EPR/CP3091SC/V002)

Drawing Title
INDICATIVE DRAINAGE STRATEGY FOR DEVELOPMENT AREA

Job No.	Originator	Zone	Level	Type	Role	Drawing No.	Revision
P23165	SMCE	ZZ	XX	DR	D	0310	P04

Drawn	Checked	Date	Scale	Size
AND	ATE	08.05.24	As Shown	A1

Purpose Of Issue: FOR COMMENT
Status: S3

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Drainage Statement

Surface Water

The overall catchment area for the development has been assessed as 264,050m^2. This catchment is the combination of all the development areas, plus the cut and constructed slopes around the development areas. The assumed catchment area is shown on drawing P23165-SMCE-ZZ-XX-DR-D-0310.

The surface water drainage system will be designed to collect 100% of the rainfall (minus the 5mm interception loses) on the development platform, including the switchyard and welfare area. Additionally, the drainage system will accommodate 100% of the rainfall on the cut and formed slopes into the existing PFA bunds, where these fall onto and towards the development platform.

The newly formed slopes, forming the outer shoulder of the development platform, and falling down away from the development platform, will be drained via a perimeter toe drain. This will be in the form of a shallow ditch or swale. The water from this will be directed towards a pumping station situated at the lowest point, from where it will be pumped up to the main attenuation basin.

The development platform will have local falls to direct surface water towards drainage infrastructure. These will generally consist of gravel filled trenches with perforated pipes. The pipes will feed into the main surface water drainage network that extends throughout the development platform (see drawing P23165-SMCE-ZZ-XX-DR-D-0310). This drainage network will consist of pipes, varying in size from 150mm to 900mm, laid at suitable falls for the anticipated rainfall. Manholes have been provided throughout the drainage network to allow maintenance of the system. Some of these manholes will also provide and isolation feature (e.g., penstocks) to isolate the surface water drainage if there is a fire or pollution event.

Within the switchyard there are 5No. transformers. These are sat within individual bunded areas. Drainage from these bunds will be via a manually-operated system, whereby the bund is checked for the presence of oil contamination prior to discharge of any collected water. Should significant quantities of oil be detected within the bunded area, then alternative arrangement will be made to remove the oil / water via tanker for disposal. All the discharge from within the bunded areas around the transformers will additionally pass through an oil interceptor located prior to the attenuation basins.

All surface water will be attenuated in open attenuation basins formed within the site. These basins will be lined (with HDPE or similar line) to prevent infiltration into the PFA waste.

The attenuation storage volume required has been calculated using the HR Wallingford Surface Water Storage Estimation tool and the IH124 estimation methodology. Rainfall values for the 6hr and 12 hr 1 in 100-year storm events have been manually edited to the FEH13 values. A 40% climate change to rainfall has been applied as per Environment Agency guidance for the area. This gives a storage requirement of approx. 21,500m^3.

Attenuation has been provided by 3No. basins, located outside of the development platform, with a total storage volume of 22,200m^3. It is assumed that these basins will all have a maximum water level of 9.0mAOD during events requiring attenuation. This will provide a freeboard of around 1.0m to the immediate surrounding ground levels (note – the basins are situated on a plateau in the existing PFA mound). The basins have varying base levels, getting lower towards the discharge

point, however the top water level remains the same through all 3No. basins. There will be some surcharging of the upstream manholes and pipes during extreme rainfall events. The basins will fully empty via gravity drainage at the greenfield run-off rate via the outfall following a storm event.

It is proposed to link the 3No. attenuation basins with swales or diches.

The outfall for the surface water will be via the existing consented discharge point at SE 591 091, into a tributary of the EA Beck. The consent number for this discharge is WRA 7038. Discharge will be limited to greenfield run-off rate, which has been calculated as 103.54l/s. A hydrobrake or similar will be provided within the flow control chamber to limit the discharge to this value.

Foul Water

There are no readily accessible foul water drains nearby the development. All foul water will be collected in below ground cesspools, sized based on anticipated usage and emptying frequency.

Foul drainage will be limited to the drainage from the welfare areas, principally from toilet usage and hand washing.

Management and Maintenance

The facility operator will ensure that regular inspection of the drainage systems is carried out, the inspections are logged and any remedial work necessary at the time of inspection is completed to ensure continued satisfactory operation of the designed system.

Planned Preventative Maintenance
As a minimum, the maintenance Contractor appointed by the facility operator should complete the following scope of works during the planned bi-annual preventative maintenance inspection:

- **External Drainage**
  a) Check for satisfactory operation of external foul and surface water drainage systems and report any defects.

Manholes, pipes, gullies and drainage channels

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and remove, when encountered, any litter and debris from manholes, pipes, channels, gullies or surfaces in the drained area.	Minimum every 6 months or as required.
Remedial Actions	Local repair or replacement of runs to maintain the functionality of the sewer.	As required
	Cleaning of sediment and obstructions in pipes and manholes when blockages are discovered.	As required
Monitoring	Lift manhole covers and visually inspect for silt, debris and signs of blockages within the drainage system.	Every 6 months
	Check manhole cover and frames for damage.	Every 6 months

Filter Drains

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter (including leaf litter) and debris from filter drain surface, access chambers and pre-treatment devices	Monthly (or as required)
	Inspect filter drain surface, inlet, outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly, or as required
Occasional Maintenance	Remove or control tree roots where they are encroaching the sides of the filter drain, using recommended methods (e.g., NJUG, 2007 or BS 3998:2010)	As required
	At locations with high pollution loads, remove surface geotextile and replace, and wash or replace overlying filter medium	Five yearly, or as required
	Clear perforated pipework of blockages	As required

Swales

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Attenuation Basins

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways and access routes	Monthly (during growing season), or as required
	Cut grass – meadow grass in and around basin	Half yearly (spring – before nesting season, and autumn)
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)
	Inspect inlets, outlets and overflows for blockages, and clear if required.	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually
Occasional Maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided).
Remedial Actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realignment of rip-rap	As required
	Repair / rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required