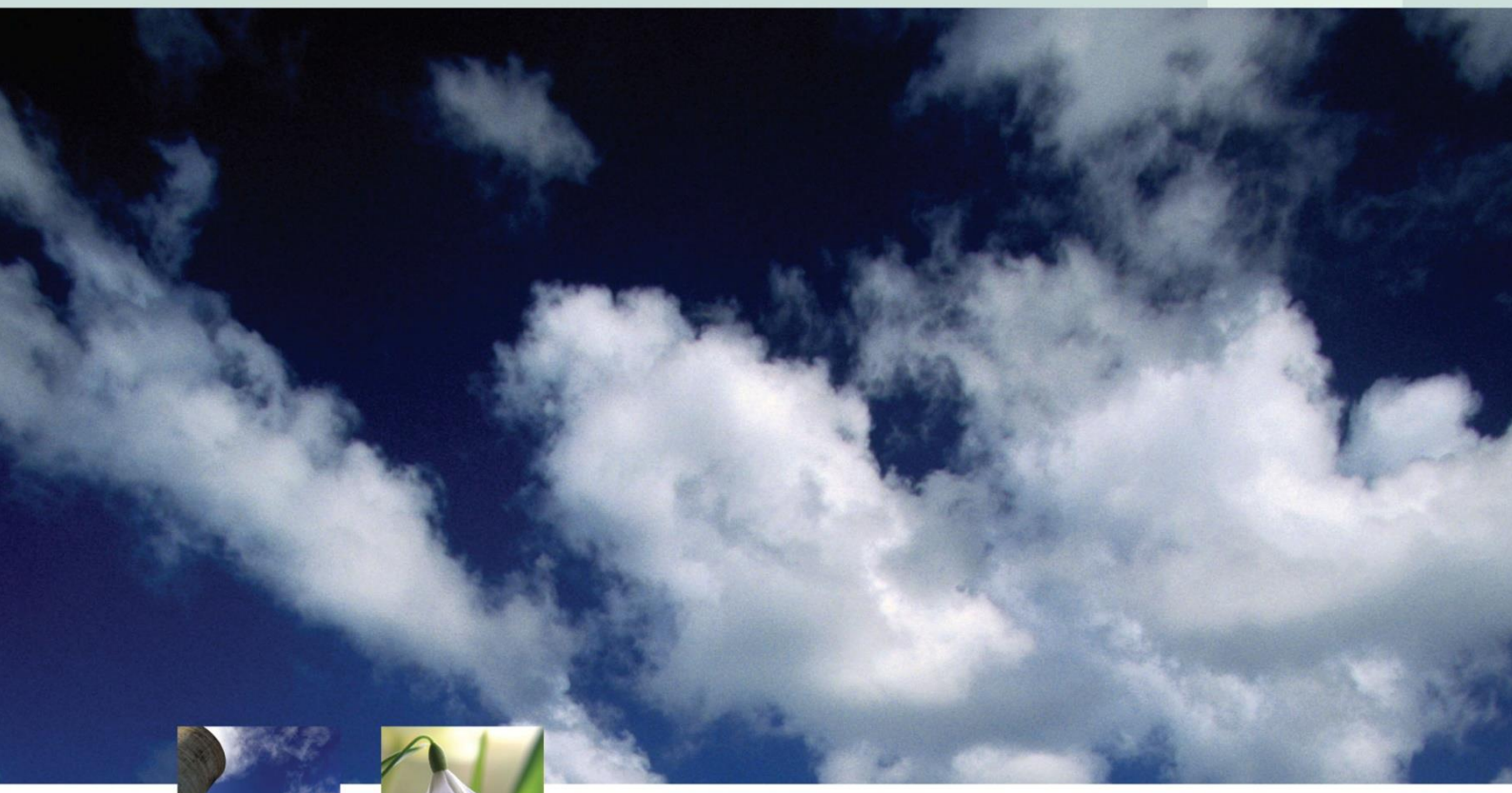

FIRE PREVENTION PLAN
DOC REF: BUK-E10

Biomass UK No.2 Ltd

Prepared By:
Sol Environment Ltd

Date:
October 2016

Project Ref:
SOL1605BUK201

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VERSION CONTROL RECORD			
Contract/Proposal Number:		SOL1605BUK201	
Authors Name:		Steve Butler	
Signature:			
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1	Initial Submission to Natural Resources Wales	October 2016	SMB

CONTENTS

1 Introduction

1.1 Introduction

This document has been prepared by Sol Environment Ltd on the behalf of Biomass UK No.2 Ltd for the proposed operation of a renewable energy generation facility that incorporates Advanced Thermal Treatment (ATT, gasification) at their site on Woodham Road, Barry.

The document provides a structured framework and approach in effectively preventing potential fires associated with the processing and storage operations at the site.

This Fire Prevention Plan document (referred hereafter as the 'FPP') has been produced in accordance with Natural Resources Wales Fire Prevention Plan Guidance.

1.2 Structure of the Fire Prevention Plan

This FPP has been structured in accordance with the Fire Prevention Plan Guidance and considers the following relevant aspects of the facility:

- Preventing Fires;
- Self Combustion;
- Detecting and Suppressing Fires;
- Containing and Mitigating Fires;
- Managing Waste Piles;
- Piles and Separation Distances;
- Enclosing Piles Using Bays and Walls;
- Layout of Piles on Site;
- Seasonality and Pile Management;
- Managing Fire Water; and
- Water Supplies.

1.3 Status of the Fire Prevention Plan

The FPP is a "live" document and will form part of the key environmental management document for the facility. All monitoring procedures, responsibilities and compliance actions will updated as and when required.

2 SITE BACKGROUND

2.1 Site Setting

Biomass UK No.2 Ltd (Biomass UK hereafter) intend to operate a renewable energy generation facility on land at Woodham Road, Barry, CF63 4JE. The facility will be regulated in accordance with the requirements of the Environmental Permitting Regulations, under the conditions of an Environmental Permit.

The Advanced Thermal Treatment (ATT) plant is designed to process shredded mixed waste wood feedstocks to produce heat to raise steam in a convention tube boiler for utilisation in a steam turbine for the production of renewable electricity with an export capacity up to 10MWe.

The Installation has been designed to process approximately 86,400 tonnes of non-hazardous mixed waste wood per annum.

The location of the subject Site is shown on Figure A1, Annex A, centred at approximate National Grid Reference OS X (Eastings) 312610 OS Y (Northings) 167683 (NGR ST 12610 67683). The site layout is shown in Figure A2.

The application site is located within Barry Port at the centre of an industrial and commercial area. The site extends in area to 0.77ha (1.86 acres). It is flat and open with no formal boundary enclosures other than some mounding to prevent vehicular access to the west and south, and steel palisade fencing to the east. There are no buildings present on the site.

Table 2.1 provides further information in relation to the site.

Table 2.1 Site Setting

Direction	Description
North	Immediate Vicinity: Unused Land Within 500m: Unused Land, Ffordd Y Mileniwn, Railway Line, Residential Area (Barry) Beyond 500m: Residential Area, A4055, Barry Road, Gibbons Down
North East	Immediate Vicinity: Truck Paring Within 500m: Industrial Buildings, Scrap Metal Yard, Haulage Depot, Unused Land, Entrance Channel (Dock) Beyond 500m: Unused Land, Industrial Works , Residential Areas (Palmerstown, Dinas Powys)
East	Immediate Vicinity: Truck Parking, David Davies Road Within 500m: Entrance Channel (Dock), Industrial Buildings, Unused Land Beyond 500m: Industrial Buildings, Unused Land, the Coast
South East	Immediate Vicinity: David Davies Road, Grassed Area, Railway Within 500m: Entrance Channel (Dock), Industrial Buildings, Unused Land Beyond 500m: Unused Land, the Coast, Bristol Channel
South	Immediate Vicinity: David Davies Road, Grassed Area, Railway

	Within 500m: Entrance Channel (Dock), Industrial Buildings, Atlantic Way Beyond 500m: Unused Land, the Coast, Bristol Channel
South West	Immediate Vicinity: Woodham Road, Nissen Industrial Buildings Within 500m: Entrance Channel (Docks) Beyond 500m: Barry Island, Jackson Bay, Whitmore Bay, Bristol Channel
West	Immediate Vicinity: Woodham Road, Nissen Industrial Buildings Within 500m: Unused Land, Railway, Cory Way, The Vale Glamorgan Council, Residential Buildings Beyond 500m: Residential Properties, Waterfront Retail Park, Docks, Barry
North West	Immediate Vicinity: Woodham Road, Nissen Industrial Buildings Within 500m: Unused Land, Ffordd Y Mileniwn, Railway Line, Residential Area (Barry) Beyond 500m: Barry

The Natural Resources Wales flood risk map indicates that the site does not lie within an area where there is a risk of flooding from rivers and the sea. The southern boundary of the side lies immediately adjacent to land which has a low risk of flooding. This is land assessed as having a chance of flooding between 1 in 1000 (0.1%) and 1 in 100 (1%).

According to TAN 15: Development and Flood Risk Development Advice Map the site is located in Zone B which is defined as areas known to have been flooded in the past. The site lies just outside of Zone C2 which is defined as land without significant flood.

Barry Dock is located approximately 40m to the south of the site.

There are no main rivers located within 500m to the site.

The facility has been designed to prevent and mitigate the offsite impacts associated with fire as far as practically possible.

The wind direction is pre-dominantly from the south west.

An outline of the key design features of the site are provided below:

- Internal fire barriers separating fire areas on site will be a minimum of 2 hour fire resisting rating, including fire rating any sealing of penetrations;
- An automatic fire detection and alarm system will be installed;
- An automatic sprinkler system will be installed;
- An automatic suppression system will be installed;
- A suitable number of manual break-glass call points will be installed;
- Appropriate first aid fire-fighting equipment will be provided throughout the site;
- Planning inspection, maintenance and testing procedures will be established and used to ensure that all fire protection systems can be operated effectively. A component person will regularly test and inspect all fire safety equipment, installations and systems; and
- Fire extinguishers throughout the plant and in the control and electrical room areas.
- The Site is secured, fitted with perimeter fencing;

- The site is manned at all times;
- All mixed wood waste will be stored within the enclosed waste storage building;
- All waste storage on site is in accordance with the requirements of TGN 7.01;
- All main buildings, roadways and externals areas are constructed of impermeable hardstanding;
- Site is installed with a sealed drainage system that can be isolated to prevent all releases to controlled water;
- The design of the site drainage system allows the recycling of fire water from the site.

All of the above features are discussed in further detail within the sections below.

3 FIRE PREVENTION PLAN

This Fire Prevention Plan has been developed to include an assessment of fire risk on site and the measures in place to prevent, detect, suppress, mitigate and contain fires.

All staff and contractors working on site will understand the contents of the Fire Prevention Plan and what they must do during a fire.

The Fire Prevention Plan will be kept in the Site Office and all staff will be aware of where it is kept. Regular exercises will be carried out to test how well the plan works and that staff understand what to do.

Based on the maximum permitted throughput of the site, a maximum (average) of 250 tonnes of mixed waste wood can be accepted onto site per day (assuming deliveries will take place on a 5 days per week basis).

Wastes will be received will be accepted in accordance with the established sites waste acceptance procedures which are part of the Environmental Management System. These procedures dictate that all wastes are required to be stable, non-reactive and solid in nature. Any liquids that are accepted onto site must be transferred directly into bulk storage. No explosive, flammable or highly flammable materials will be received or processed by the site.

The table below provides an overview of the key wastes stored on site and provides and overview of the waste types, volumes, maximum waste quantities and storage locations.

Table 3.1: Waste Storage

Material	Max Pile Vol (m^3)	No. piles (max)	Moisture Cont (%)	Location Stored	Fire Risk & Key control measure
Mixed Waste Wood Shredded Baled and Bagged	2000	1	20%	Waste Storage Building	LOW RISK • Internal Storage Only; • Storage area meets the requirements of TGN 7.01; • Stored within segregated area; • On site fire response (bowsers/tender); • On site automatic fire detection and alarm system; • On site automatic sprinkler system.

KEY NOTES IN RELATION TO THE ABOVE TABLE:

- All material storage will comprise pre-shredded waste wood in a stable dry state (i.e. moisture content 20%);

- All wood waste will be stored within the dedicated Waste Storage Building;
- Internal fire barriers separating fire areas on site will be a minimum of 2 hour fire resisting rating, including fire rating any sealing of penetrations;
- An automatic fire detection and alarm system will be installed;
- An automatic sprinkler system will be installed;
- An automatic suppression system will be installed;
- A suitable number of manual break-glass call points will be installed;
- Appropriate first aid fire-fighting equipment will be provided throughout the site;
- Planning inspection, maintenance and testing procedures will be established and used to ensure that all fire protection systems can be operated effectively. A component person will regularly test and inspect all fire safety equipment, installations and systems;
- Fire extinguishers throughout the plant and in the control and electrical room areas;
- The site is equipped with fire response system with emergency standby water bowsers/fire tenders; and
- The location of all stored wastes and stockpiles is provided in Figure 1 – Annex 1[1].

A suite of site drawings is provided in Annex 1 which provide the following information:

- Layout of site indicating where combustible, flammable and hazardous materials are stored on site (location of process areas, chemicals, piles of combustible materials, oil and fuel tanks etc);
- Means of access and egress into the site for emergency services;
- Site drainage infrastructure indicating foul and surface water drains, direction of flow, location of outfall points;
- Site fire protection systems, hydrants and water supplies;
- Location of emergency spill response equipment and key pollution control equipment; and
- Location of key receptors such as critical infrastructure, schools, hospitals, residential areas, workplaces, protected habitats and rivers within 1km of the site.

The basic design features of the site include the following:

- All thermal treatment plant can be shut down and controlled remotely;
- All surface water will be collected within a sealed drainage system and either reused or discharged to sealed lagoon. There will be no emissions to controlled water from the site;
- On site storage of firewater;
- Segregated waste storage building to minimise the potential for the spread of fires; and
- Impermeable floors and roadways.

The above design measures enables the following fire control strategy to be adopted:

- Extinguishing of fires at source through the use of fire response, hoses and emergency services;
- Application of water to cool unburned material and other hazards;
- Separation of unburned material from the fire using sites mobile plant and mechanical shovels;

1 Annex 1 will be populated as a result of the detailed design process

- Separation of burning material from the fire to quench it with hoses;

Note: Controlled burn is not a strategy that is considered possible at this site.

The site has been designed to be manned on a 24 hour basis and equipped with sufficient fire prevention and environmental controls to ensure that any fire can be brought under control with minimal impact to the environment.

All aspects of the site have been subject to detailed fire risk and DSEAR assessments and included in Annex C (Please note that the Fire Risk Assessment and DSEAR assessments will be completed as detailed design / pre-operational condition of the EPR Permit).

3.1 Basic Fire Prevention

The site incorporates the following basic fire prevention measures in all areas where combustible materials and other flammable gases are stored or processed:

- There will be no combustible and flammable materials located within 6m of any potential ignition sources.
- All general sources of ignition on site such as light bulbs and heating pipes will be controlled. With the exception of the emergency flare, no aspect of the plant or processes requires the use of any naked flames.
- Basic fire prevention measures will be provided on process signs and included within standard working procedures to reinforce fire protection and safety measures.
- The following procedures will be carried out when 'hot work' (i.e. maintenance / repair) is being carried out on site:
  - All staff and contractors will be required to operate under strict *'Permit to Work'* systems and follow safe working practices when undertaking any hot working such as welding and cutting;
  - Fire extinguishers will be provided at the scene of any hot work so that they can be used immediately should a fire occur. The extinguishers will be stationed adjacent to the pathway of escape from the work area and not in a place where staff using them could be trapped by fire;
  - Any hot work in areas where wastes or other combustible materials are present, a 6m 'safe' area will be cleared and all work will be designated as a two-person job: One person doing the hot work and a second acting as a fire watch;
  - As far as practical, wastes will be cleared away from the area of any hot work before hot work starts;
  - Potentially combustible materials, including mobile plant hydraulic lines, will be covered by a fire blanket and/or damped down with water as appropriate before hot work starts; and

  - A fire watch will be conducted at the scene of any hot work at least one 1 hour after hot work has finished as sparks from hot work can smoulder for a significant time period.
- All visitors, contractors and drivers using the site will be required to undergo a safety induction and be made aware of the correct safety and fire prevention procedures to follow whilst on site.
- Biomass UK will operate a no smoking policy in all areas of the site, with the exception of suitable designated smoking areas (specifically located externally and situated away from combustible materials.) The designated smoking area will be signposted and supplied with a sand bucket or similar for discarded smoking materials.
- Biomass UK will operate a scheduled maintenance and inspection programme for all areas of the site. This process will specifically ensure that the plant is maintained at a sufficient level of cleanliness and housekeeping (5S, SixSigma programmes etc) to ensure that the plant does not present a fire risk. This programme will aim to keep levels of dust, loose fibre and paper and other combustible materials in buildings and around the site to a minimum.
- The scheduled maintenance and inspections programme will include all electrical systems (including portable electrical appliances (PAT) testing) and fixed electrical equipment. Competent advice on issues such as grounding and bonding controls for electrical systems will also be sought where necessary.
- As part of the housekeeping carried out on site, it will be ensured that flammable materials, such as oils, greases, fuels, paints etc, are always stored correctly and put back in store after use.
- Housekeeping will be included in the routine site inspections and the site will be kept as free from loose/discarded combustible wastes and dusts as practical.
- The perimeter fence will be inspected periodically to ensure that the site security has not been compromised.
- The gatehouse, controlling the sole access point to the installation, will be manned on a 24-hour basis at all times. CCTV is installed to monitor the external and internal areas of the Installation. This will minimise the risk of vandalism and arson. Thermal cameras will also be fitted in the exterior yard areas to remotely detect thermal activity / fire.
- All site vehicles will be fitted with fire extinguishers and dust filters.
- All bucket loaders will be fitted with appropriate strips to prevent sparks when the bucket comes into contact with hard-standing.
- Undetected fires may smoulder and form long after the processing plant and equipment has been shut down / turned off. Therefore, in the event of a formal plant “shut-down‟ procedures will be carried out including inspection of the site after work has ceased to reduce the risk of a smoulder being undetected and turning into a fire.

  The procedure will address issues such as:
  - Over-run of conveyors to ensure that they are as clear of waste as practical;
  - Clearance of waste which may have accumulated under equipment;

  - Ensuring that any flammable materials such as fuels have been secured;
  - A fire watch at least one hour after the end of operations;
  - Spread out any waste loads awaiting processing or in reception to ensure that there are no undetected hot items or other materials which could start a fire;
  - Check that mobile plant has been moved to a safe distance;
  - Check that fire detection systems have been activated; and
  - Check that security systems have been activated and that gates etc are secure.
- The plant will be manned at all times.
- A dedicated external emergency or quarantine area will be designated on site which is big enough to cope with a major incident, with a clear area of at least 10m around the perimeter.

Annex B shows the checklists which will be used to help prevent a fire and minimise its impact

3.2 Self Combustion

None of the wastes stored or processed on site are considered likely for self-combustion.

The bulk of the waste storage on site will be dry waste wood materials which will have an inherently low fire risk and are not prone to anaerobic digestion/self-heating conditions.

The relative high turnover and throughput of materials within the site will ensure that all biomass is processed within a 3 - 4 week period and therefore will not be subject to significant degradation or decomposition.

No hot loads of waste will ever be delivered or processed at the site.

3.3 Detecting and Suppressing Fires

The Biomass UK site will be manned at all times with all areas will be inspected on a daily basis to ensure that housekeeping is maintained to a high level and in accordance to NRW Guidance.

All wood waste piles will be inspected to ensure that the sealed bales are maintained in suitable condition.

The site is equipped with an automatic fire detection and alarm system, an automatic sprinkler system and an automatic suppression system.

In order to detect and tackle the fire as quickly as possible, portable extinguishers and firehoses are also provided throughout the site to supplement the automated sprinkler systems.

The site operators and maintenance personnel will carry out regular and programmed inspections in all areas as part of the scheduled maintenance programme and pre-shift inspections.

The site is fitted with CCTV as an additional security and fire control.

3.4 Containing and Mitigating Fires

The following measures are carried out on site to contain and mitigate against fires:

- Appropriate measures will be in place that limit the size, duration and impact of a fire. These measures will include the following:
  - Internal storage of all combustible materials in dedicated batches;
  - High turnaround of waste and fuel materials ensuring that no materials will be stored on site for periods greater than 3 – 4 weeks.
- There will be a dedicated emergency or quarantine area on site which is big enough to cope with a major incident, with a clear area of at least 10m around the perimeter.
- All waste stockpiles will be appropriately sized and separated according to the NRW's requirements.
- All waste / fuel materials will be stored with appropriate fire breaks, fire walls and separated from any other potential combustion sources or flammable materials.
- Stockpiles and waste inventories will always be maintained to ensure that the minimum quantities to ensure business continuity is maintained.
- The following fire-fighting strategy will be carried out on site:
  - Call the Fire and Rescue Service immediately;
  - Raise the alarm, initiate evacuation of people on site and ensure all staff and visitors are accounted for;
  - Attack the fire if it is safe to do so using the fire extinguishers on site;
  - Ensure operators of appropriate machinery are in a safe location to help create fire breaks, under the direction of the Fire and Rescue Service when they arrive;
  - Appoint a clearly identified person to liaise with the emergency services on site. They should identify themselves to the Fire and Rescue Service, as soon as the Fire and Rescue Service arrives on site; and
  - Ensure access routes are clear.
- When the fire has been successfully dealt with then:
  - All combusted or partially combusted material will be removed using appropriate and lawful disposal;
  - The plant will be safely re-commissioned;
  - The cause of the fire will be investigated to ensure that it does not reoccur;
  - The sites accident management plan and management system documents will be reviewed and improved where necessary;
  - Training requirements for site personnel will be reviewed; and
  - It will be assessed what further fire reduction measures are required and any new measures and procedures will be implemented.
- All waste storage piles will be located on an impermeable / fire resistant surface.
- Secondary and tertiary containment facilities for firewater run-off are installed on site which include impermeable floor slabs, containment bunds, surface water shut-off valves and fire water storage.

3.5 Managing Waste Piles

All waste piles will be managed according to the NRW's Fire Prevention Plan guidance.

There will be adequate water supplies at all time on site in order to fight a fire.

Easy access will be maintained around the whole site to enable easy access for emergency vehicles.

No wood waste will be stored for more than 3 months (1 month maximum typical).

3.6 Piles and Separation Distances

Due to the waste being stored internally within the waste storage building, the waste storage is not required to meet the pile size and separation distance standards.

The wood waste will be stored in accordance to the plans provided within Annex A.

3.7 Enclosing Piles Using Bays and Walls

Full and frequent stock rotation will be carried out on site which will be monitored and recorded in accordance with the Environmental Management System.

Stock capacity will be constantly managed and controlled.

Due to the waste being enclosed internally within the waste storage building, the waste storage is not required to meet the bay requirements provided within the NRW's Prevention Plan Guidance.

The wood waste will be stored in accordance to the plans provided within Annex A.

3.8 Turning and Monitoring of Piles

Typically no batches of incoming received wastes will be stored within the reception / storage area for longer than 3 – 4 weeks. All incoming waste will be rotated to ensure older wastes are processed and treated at the earliest opportunity.

Methods ensuring adequate waste rotation is achieved will feature within the standard operating procedures i.e. taking older waste from the rear of the pile before newer waste at the front.

All piles will be turned regularly to ensure that the anaerobic conditions are avoided and localised warming is dissipated quickly.

Due to the nature of the waste streams, stockpile temperature monitoring is not required.

3.9 Layout of Piles on Site

The provisional layout of the site has been provided in the Annex A.

The final layout will be determined by the findings and recommendations of the DSEAR, Fire Safety Assessments and HAZOP assessments. All of these assessments will be completed as part of the Detailed Design Stages of the project and submitted to Natural Resources Wales as part of the pre-operational conditions of the EPR Permit.

The final design will provide confirmation of the exact distances, bay / storage locations and location of other vulnerable areas on site.

The following factors have been considered will be considered when deciding on the detailed layout of the site:

- Separation distances required between piles;
- Location of heat sources;
- Vulnerable areas on site; and
- Buildings.

A detailed fire risk assessment is provided in Annex C (to be supplied prior to operation – suggested Pre-operational condition).

3.10 Seasonality and Pile Management

All wastes will be supplied by pre-assessed and approved waste contractors.

All waste received on site will be subject to contract and acceptance requirements.

The site cannot accept wastes greater than the capacity of the Waste Storage Building and is therefore physically limited to 2000m^3 of storage.

Under normal operations the incoming waste stockpiles will be managed at significantly less than this capacity.

The seasonal variation of wastes (i.e. during national holidays) may require the site to hold more wastes than under normal operating conditions.

3.11 Managing Fire Water

The site has does not have any surface water drains within the storage or building areas.

All of the site drains have the ability to be isolated in the event of an emergency for the purposes of preventing any off site release of fire water or contamination.

The following has been designed in the event of a fire:

- An actuated penstock to isolate the surface water drainage system in the event of a fire;
- All fire water will enter the drainage system and overflow into the attenuation tank;
- The fire water will be tested to allow discharge to the surface water connection point;
- If not suitable, all fire water is to be pumped and tankered away to a suitable water treatment facility.

All site surface water drainage systems are ultimately connected to the surface water drainage system and equipped with shut off valves to ensure the site can be isolated in the event of a major fire / incident.

A full Fire Risk Assessment will be prepared following the completion of the HAZOP and DSEAR assessments for the site. These assessments will be completed as part of the detailed design process.

3.12 Water Supplies

The basic design features of the site include the following:

- Sealed Drainage Systems: The entire site has been designed such that all water can be contained and retained on site. This design promotes the reuse and recycling of firewater;
- Sealed Site with no uncontrolled surface water drains;
- Segregated waste storage location to minimise the potential for the spread of fires;
- Impermeable floors and roadways;
- Automated fire detection systems and sprinklers.

The above design measures enables the following fire control strategy to be adopted:

- Extinguishing of fires at source through the use of fire hoses, emergency services and fire sprinkler systems;
- Total capture and reuse reducing the amount of firewater run-off generated and protection of controlled water;
- Application of water to cool unburned material and other hazards;
- Separation of unburned material from the fire using sites mobile plant and mechanical shovels;
- Separation of burning material from the fire to quench it with hoses.

In addition the site is supplied with fire hydrant / mains supplies.

ANNEX A: SITE PLANS AND TECHNICAL DETAILS

(to be fully completed in detailed design)

A1: SITE LAYOUTS

1. Do not scale off this drawing 2. All dimensions to be confirmed on site 3. This drawing is copyright of Sol Environment Ltd 4. This drawing is to be read in conjunction with relevant consultant drawings and specifications	**Rev:**	**Date:**	**Desc:**	**Client:**	BIOMASS UK NO.2 LTD	**Job No:**	SOL1605BUK201	**Drawing No:**	BUK201
	0	OCT 16	Original	**Project:**	BARRY ENERGY RECOVERY FACILITY	**Date:**	OCT 16	**Revision:**	0
				Drawing Title:	SITE LOCATION	**Drawn By:**	STEVE BUTLER	**Scale:**	NTS

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Rev:	Date:	Desc:
0	OCT 16	Original

Client:	BIOMASS UK NO.2 LTD	**Job No:**	SOL1605BUK201	**Drawing No:**	BUK202
Project:	BARRY ENERGY RECOVERY FACILITY	**Date:**	OCT 2016	**Revision:**	0
Drawing Title:	SITE LAYOUT	**Drawn By:**	STEVE BUTLER	**Scale:**	NTS

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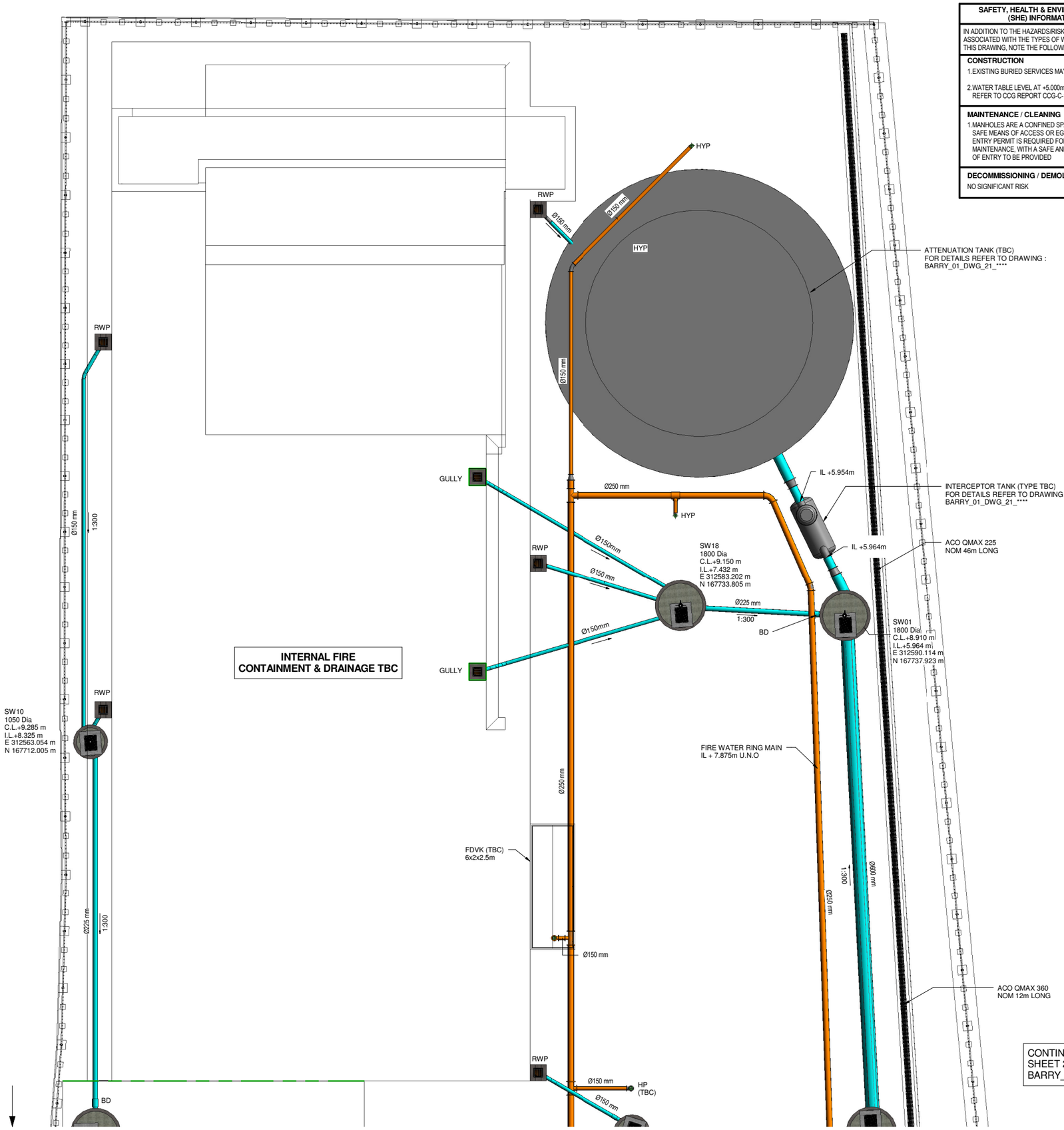
A2: SITE DRAINAGE PLAN



SAFETY, HEALTH & ENVIRONMENTAL (SHE) INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION

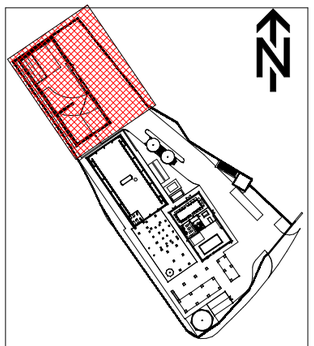
1. EXISTING BURIED SERVICES MAY BE PRESENT.
2. WATER TABLE LEVEL AT +5.000m AOD (APPROX) REFER TO CCG REPORT CCG-C-15-80605-5

MAINTENANCE / CLEANING

1. MANHOLES ARE A CONFINED SPACE WITHOUT A SAFE MEANS OF ACCESS OR EGRESS. ENTRY PERMIT IS REQUIRED FOR ACCESS AND MAINTENANCE, WITH A SAFE AND SUITABLE MEANS OF ENTRY TO BE PROVIDED

DECOMMISSIONING / DEMOLITION

NO SIGNIFICANT RISK



LOCATION PLAN

FOUL AND SURFACE WATER DISCHARGE FLOW RATE RATE AND LOCATION TBC BY GALIFORD TRY.

FIRE RING MAIN SIZE AND MATIRIAL TBC (ASSUMED PE PIPE)

FIRE HYDRANT POSITIONS TBC

ATTENUATION SIZE & FORM TBC

DUCTING TO INTERCEPTOR AND ATTENUAION TBC

FIRE DELUGE VALVE KIOSK LOCATION ,SIZE, DRAINAGE & POWER CONNECTION TBC

DO NOT SCALE - IF IN DOUBT ASK

NOTES

GENERAL

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES (mm) & ALL LEVELS ARE IN METRES (m) AOD, UNLESS STATED OTHERWISE.
3. ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE AND ANY DISCREPANCIES SHOULD BE REPORTED TO GHD LIVIGUNN.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT PROJECT STANDARDS AND SPECIFICATIONS.

DRAINAGE:

1. ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CESWI 7TH EDITION
2. NEW DRAINS ARE UNDERGROUND PVC-U IN ACCORDANCE WITH BS 4660. PROCESS WATER DRAINS TO BE HATHERNWARE CHEMICAL RESISTANCE - TBC
3. PIPE JOINTS IMMEDIATELY ADJACENT TO STRUCTURES AND CHAMBERS ARE FULLY ARTICULATED ROCKER PIPE JOINTS.
4. ROCKER PIPES ARE 600mm LONG U.N.O ROCKER PIPES TO BE POSITIONED MINIMUM ACHIEVABLE DISTANCE FROM MANHOLE OR CHAMBER WITH ALLOWANCE FOR INSTALLATION OF FLEXIBLE JOINT
5. ALL BURIED PIPES AND DUCTS UNDER STRUCTURE TO BE ENCASED IN MIN 150mm THICK C16/20 MASS CONCRETE. ALSO WHERE GROUND COVER IS LESS THAN 900mm.
6. PIPE BEDDING DETAILS SHOWN ON DRAWINGS: BARRY_01_DWG_01_20135 &20136

LEGEND:

- HYDRANT RING MAIN
- SURFACE WATER DRAIN
- FOUL WATER DRAIN
- PROCESS WATER DRAIN (AS HATHERNWARE THERMACHEM PIPEWORK)
- ELECTRICAL DUCTS
- POTABLE WATER MAIN (AS PURITON BARRIER PIPE OSA)

SW00 SURFACE WATER MANHOLE
FW00 FOUL WATER MANHOLE
DP00 ELECTRICAL DRAWPIT
RWP RAIN WATER PIPE
GU00 ROAD GULLY
HYP HYDRANT POINT (PROPOSED)
IV ISOLATION VALVE (PROPOSED)
BD BACK DROP
FDVK FIRE DELUGE VALVE KIOSK

REFERENCE DRAWINGS :

BARRY_01_DWG_01_20131 - SITE SERVICES GA SHEET 1 OF 4
BARRY_01_DWG_01_20132 - SITE SERVICES GA SHEET 2 OF 4
BARRY_01_DWG_01_20133 - SITE SERVICES GA SHEET 3 OF 4
BARRY_01_DWG_01_20134 - SITE SERVICES GA SHEET 4 OF 4
BARRY_01_DWG_01_20135 - SITE SERVICES DETAILS SHEET 1
BARRY_01_DWG_01_20136 - SITE SERVICES DETAILS SHEET 2

2D EXPORT FROM A 3D MODEL
ALL ALTERATIONS TO BE MADE IN THE MODEL FILE

PRELIMINARY

Rev	Date	Description	By	Chk	App
B	04.10.16	UPDATED FOR ATTENUATION	JW	MS	GB
A	01.06.16	FIRST ISSUE	JW	MS	GB

Revision

GHD LIVIGUNN
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CLIENT: GallifordTry

PROJECT: BARRY BIOMASS UK NO 2 LIMITED

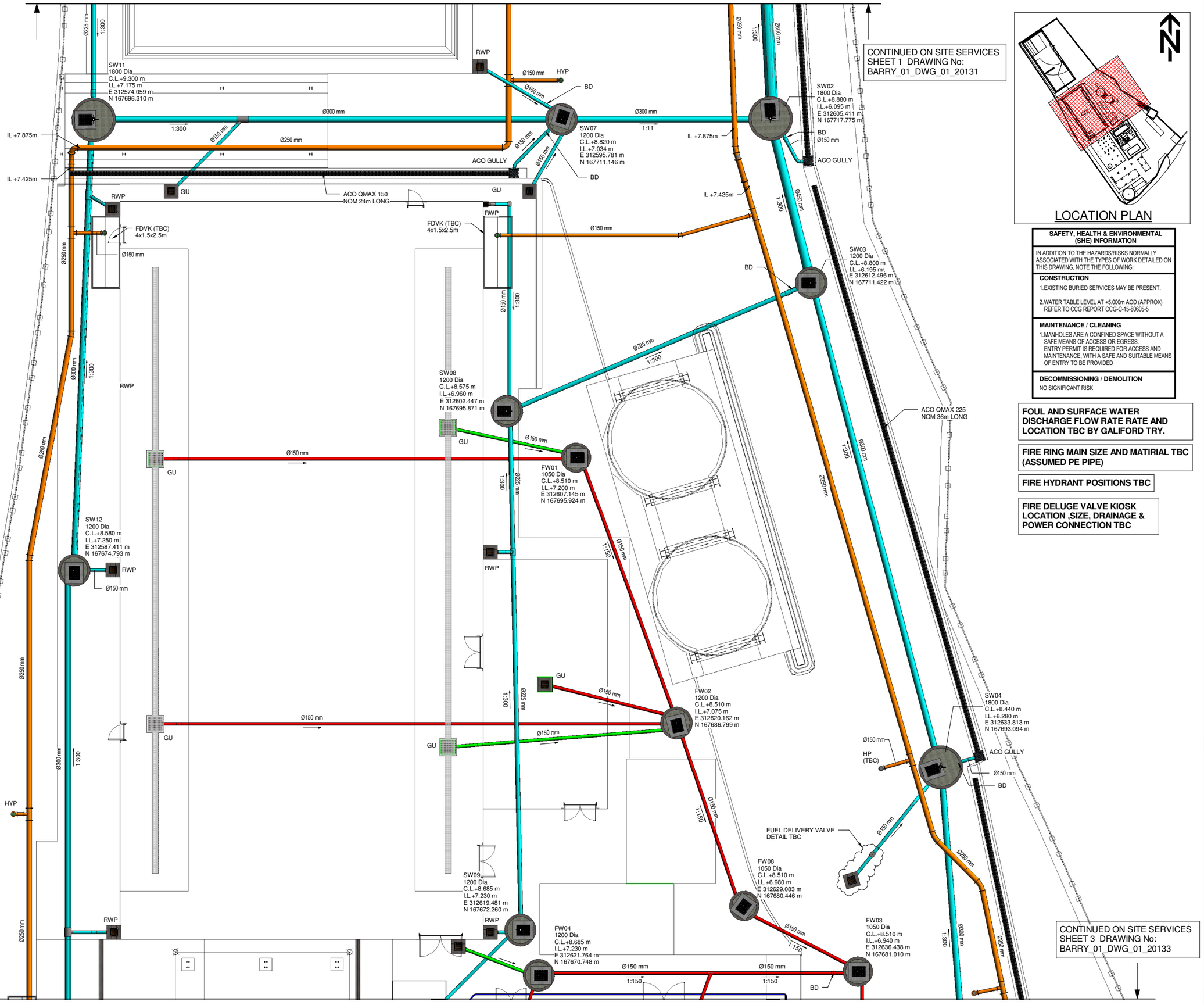
TITLE: SITE SERVICES. SHEET 1

SCALE:

DRAWING SIZE: A1

DWG No. BARRY_01_DWG_01_20131

REV. B



LOCATION PLAN

SAFETY, HEALTH & ENVIRONMENTAL (SHE) INFORMATION
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:
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DECOMMISSIONING / DEMOLITION NO SIGNIFICANT RISK

FOUL AND SURFACE WATER DISCHARGE FLOW RATE RATE AND LOCATION TBC BY GALIFORD TRY.

FIRE RING MAIN SIZE AND MATIRIAL TBC (ASSUMED PE PIPE)

FIRE HYDRANT POSITIONS TBC

FIRE DELUGE VALVE KIOSK LOCATION ,SIZE, DRAINAGE & POWER CONNECTION TBC

DO NOT SCALE - IF IN DOUBT ASK

NOTES

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DRAINAGE:

1. ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH CESWI 7TH EDITION
2. NEW DRAINS ARE UNDERGROUND PVC-U IN ACCORDANCE WITH BS 4660. PROCESS WATER DRAINS TO BE HATHERNWARE CHEMICAL RESISTANCE - TBC
3. PIPE JOINTS IMMEDIATELY ADJACENT TO STRUCTURES AND CHAMBERS ARE FULLY ARTICULATED ROCKER PIPE JOINTS.
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5. ALL BURIED PIPES AND DUCTS UNDER STRUCTURE TO BE ENCASED IN MIN 150mm THICK C16/20 MASS CONCRETE. ALSO WHERE GROUND COVER IS LESS THAN 900mm.
6. PIPE BEDDING DETAILS SHOWN ON DRAWINGS: BARRY_01_DWG_01_20135 &20136

LEGEND:

- HYDRANT RING MAIN
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- FOUL WATER DRAIN
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IV ISOLATION VALVE (PROPOSED)
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DRAWING TO BE REPRODUCED IN COLOUR

PRELIMINARY

Rev	Date	Description	By	Chk	App
B	04.10.16	UPDATED FOR ATTENUATION	JW	MS	GB
A	24.03.16	FIRST ISSUE	JW	MS	GB

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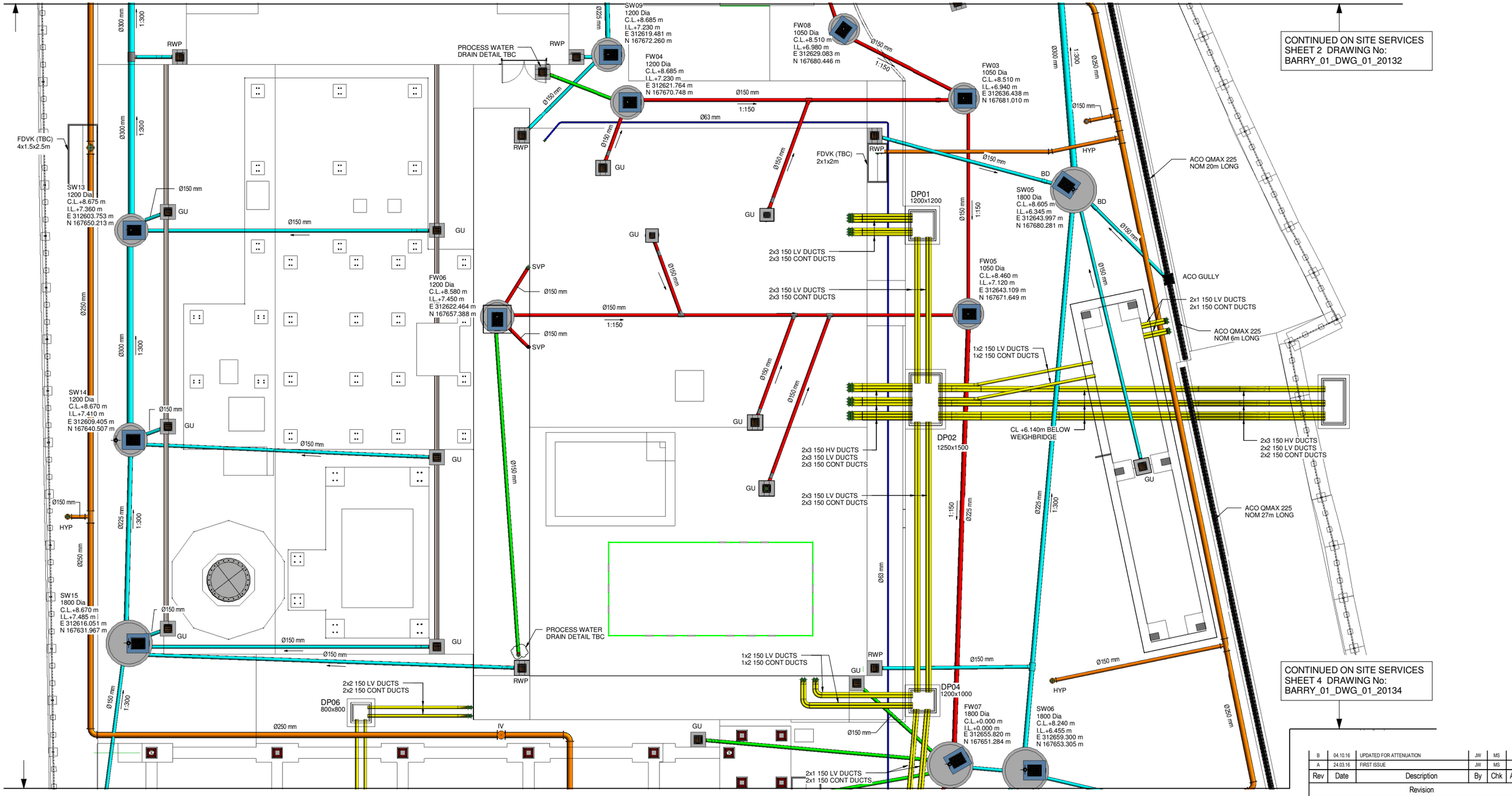
PROJECT
BARRY BIOMASS UK NO 2 LIMITED

TITLE
SITE SERVICES. SHEET 2

SCALE 1:100
DRAWING SIZE A1

DWG No. BARRY_01_DWG_01_20132
REV. B

DO NOT SCALE - IF IN DOUBT ASK



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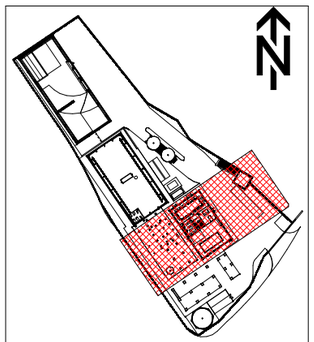

LOCATION PLAN

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FIRE HYDRANT POSITIONS TBC

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PROJECT: BARRY BIOMASS UK NO 2 LIMITED

TITLE: SITE SERVICES. SHEET 3

SCALE	DRAWING SIZE
1:100	A1

DWG No. BARRY_01_DWG_01_20133 REV. B

DO NOT SCALE - IF IN DOUBT ASK

CONTINUED ON SITE SERVICES SHEET 3 DRAWING No: BARRY_01_DWG_01_20133

SW15
1800 Dia
C.L.+8.670 m
I.L.+7.485 m
E 312616.051 m
N 167631.967 m

SW16
1200 Dia
C.L.+8.350 m
I.L.+7.530 m
E 312624.511 m
N 167614.950 m

SW17
1200 Dia
C.L.+8.550 m
I.L.+7.665 m
E 312635.108 m
N 167622.177 m

DP04
1200x1200

DP06
800x800

FW07
1800 Dia
C.L.+0.000 m
I.L.+0.000 m
E 312655.820 m
N 167651.284 m

SW06
1800 Dia
C.L.+8.240 m
I.L.+6.455 m
E 312659.300 m
N 167653.305 m

FWPS01
1800 Dia
C.L.+0.000 m
I.L.+0.000 m
E 312656.942 m
N 167646.212 m

FDVK (TBC)
4x1.5x2.5m

PROCESS WATER DRAIN DETAIL TBC

TANK CONNECTION DETAILS TBC BY TANK SUPPLIER

FOUL OVERFLOW PIPE I.L +7390 mm

ACO QMAX 225

ACO QMAX 225 CHAMBER C.W SILT TRAP

FOUL WATER VALVE CHAMBER DETAIL TBC

FLOW METER CHAMBER DETAILS & ACCESS REQUIREMENTS TBC

ON HOLD

SITE DISCHARGE SURFACE WATER PIPE

EXISTING SURFACE WATER DRAIN

CONNECTION TO EXISTING WATER MAIN

NEW PUMPED SURFACE WATER DRAIN FOR DETAILS REFER TO DRAWING BARRY_01_DWG_01_*******

NEW PUMPED FOUL WATER DRAIN FOR DETAILS REFER TO DRAWING BARRY_01_DWG_01_*******

EXISTING BURIED HV CABLE

EXISTING OVERHEAD CABLE

EXISTING POTABLE WATER SUPPLY

NOTES

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TITLE: SITE SERVICES. SHEET 4

SCALE: 1:100

DRAWING SIZE: A1

DWG No.: BARRY_01_DWG_01_20134

REV.: B

A3: SENSITIVE RECEPTORS

Specific receptors have been identified where people are likely to be regularly exposed for prolonged periods of time (e.g. residential areas). The location of the discrete sensitive receptors is presented in Table 1 and Figure 3.

A Location of Sensitive Receptors				
ID	Receptor	Type	Easting	Northing
1	Vistamar House	Residential	312199	167543
2	Docks Office	Industrial	312243	167664
3	Phillipa Freeth Court	Residential	312162	167836
4	Barry Dock Station	Station	312359	167806
5	54 Dock View Road	Residential	312368	167918
6	89 Dock View Road	Residential	312528	168111
7	131 Dock View Road	Residential	312724	168359
8	Wimbourne Buildings	Industrial	313155	167691
9	Bendrick Road	Residential	313437	167606
10	Public Recycling Facility	Recycling Facility	313445	167271
11	Atlantic Crescent	Industrial	312983	167416
12	Port Office	Industrial	312659	167100
13	Queens Way	Industrial	312414	167253
14	Dyfrig Street	Residential	312037	166947

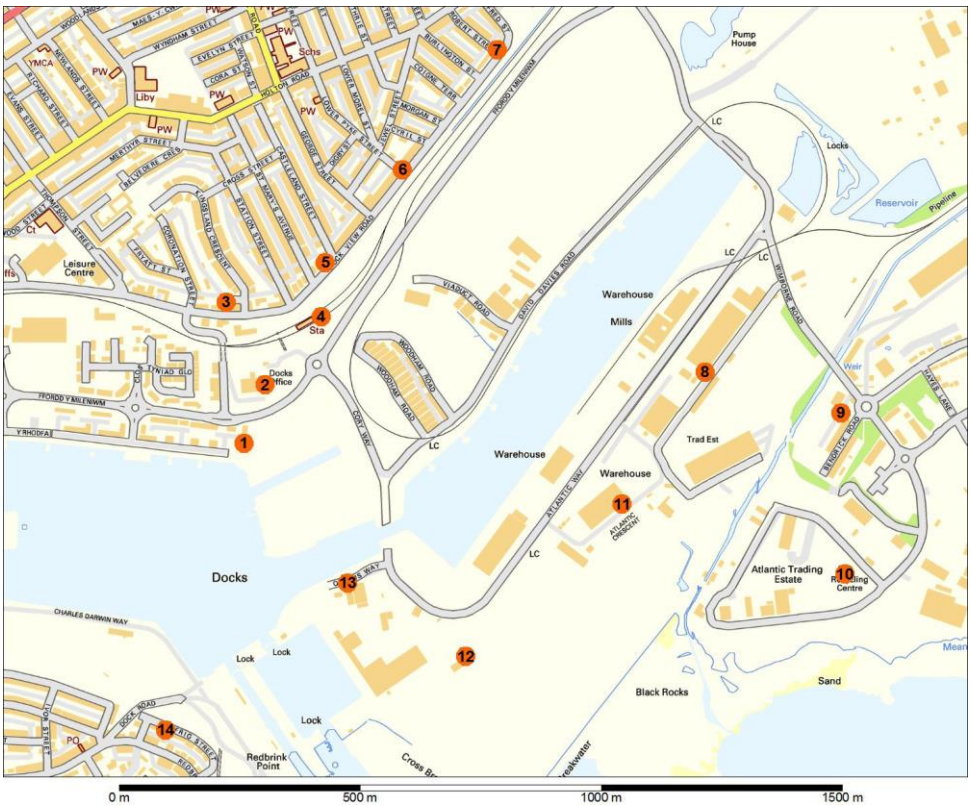


Figure A3: Sensitive Human health Receptor Locations (Contains OS data © 2016)

A4: WINDROSES BY YEAR

Figure D1: 2009

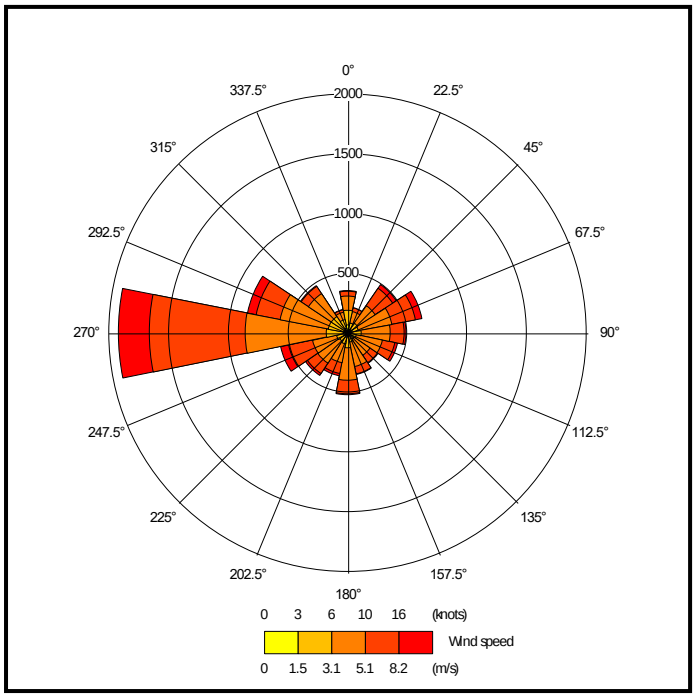


Figure D2: 2010

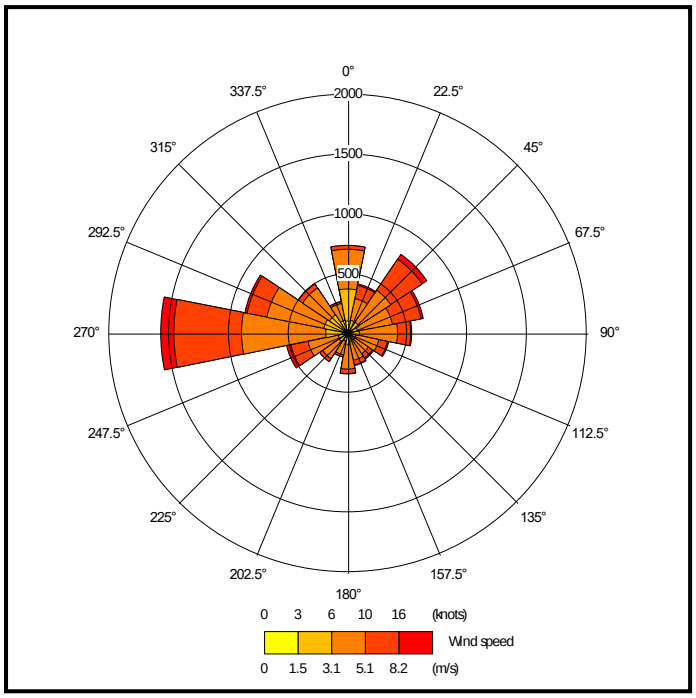


Figure D3: 2011

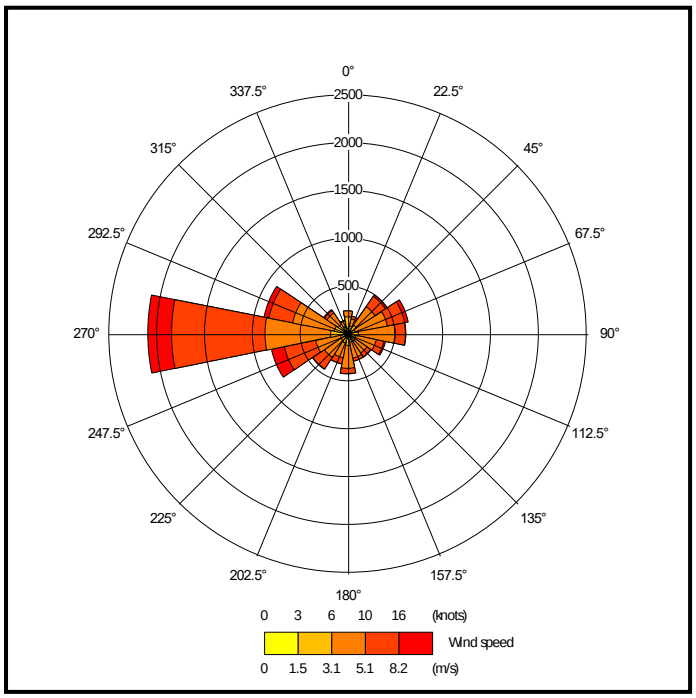


Figure D4: 2012

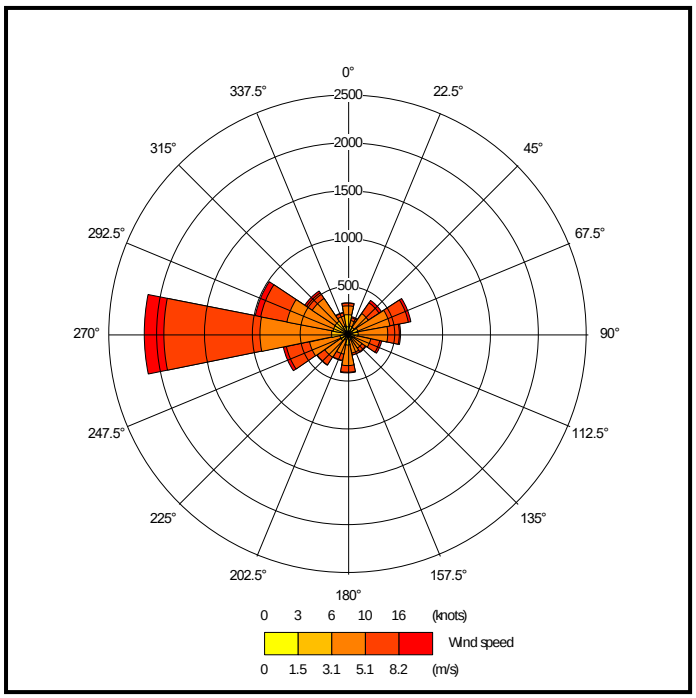
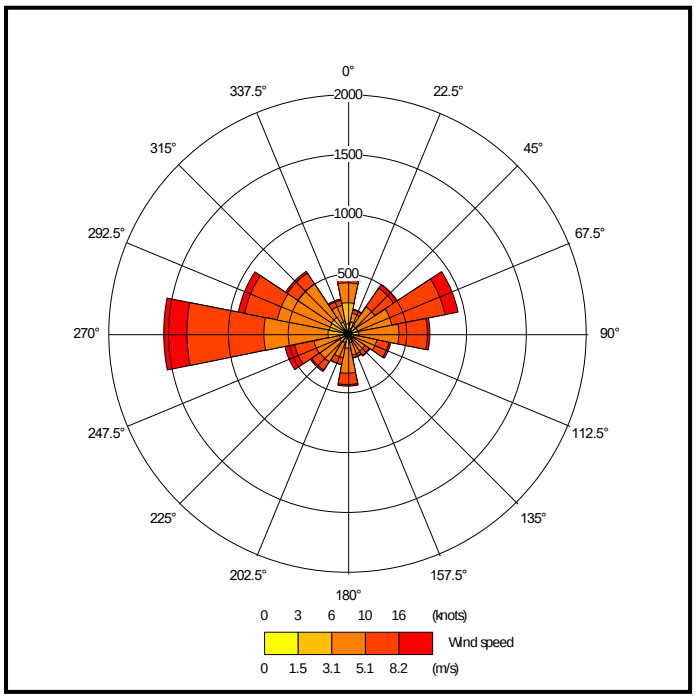


Figure D5: 2013



ANNEX B: EMERGENCY RESPONSE PROCEDURES

(to be completed in Pre-Operational Conditions)

ANNEX C: DSEAR AND FIRE RISK ASSESSMENTS

(to be completed in Pre-Operational Conditions)

ANNEX D: CHECKLISTS

Material Storage Checklist		
Item	Yes / No	Comments / Actions
Do you have combustible, flammable and other hazardous materials, including cylinders on site?		
Does the management system describe how you manage the quantity and type of material you intend to stockpile including seasonal and market variations?		
Is the location and duration of storage appropriate?		
Do separation distances between the piles and other risk reduction measures on site meet the requirements of the Fire and Rescue Service?		
Have the Fire and Rescue Service been consulted about pile layout, design and firefighting strategy?		
Is an automatic fire detection and suppression system fitted?		

Personnel Safety Checklist		
Item	Yes / No	Comments / Actions
Is there suitable access for firefighting vehicles?		
Has the potential fire spread on and around site been assessed?		
Has it been considered where is best to park machinery at night to allow access for fire plan procedures or to minimise the loss in the event of fire?		
Can any of the following affect access to and around your site: • Rough Terrain? • Buildings / Debris? • Security / Fencing?		

Environmental Conditions Checklist		
Item	Yes / No	Comments / Actions
Is the drainage plan for site complete and up to date?		
Has it been identified where local surface water and groundwater run-off will flow to and how they may be affected by firewater run-off?		
Are firefighting water supplies adequate on site and are suitable open water supplies available and accessible?		
Are the location of hydrants and their flow rates marked on the site plan, even outside the site boundaries?		
Are there adequate plants, equipment and facilities to contain firewater on site?		
Is it aware what properties and residential areas surround the site may be affected by smoke?		
Is there a plan in place to tell people living what to do if there is a fire e.g keep door and windows shut?		
Is there a plan to dispose of firewater and other wastes?		