Attachment E1 Emissions to Atmosphere

There will be no emissions of environmental significance from this development.

Greenport Environmental in association with technology provider WTT, has designed a fully enclosed facility using the best available technology for treatment of air emissions from the building and the process. The composting technology selected is aerated in-vessel composting which will ensure potential odours will be minimized.

As a back-up control measure, the extraction system and abatement technology selected will ensure all air within the building and from the composting tunnels will be fully treated prior to discharge ensuring there will be no significant impact on the external environment.

The abatement technology selected is best available technology and comprises of three components, a scrubber system, a humidifier & a biofilter system. The extraction system and abatement technology are all controlled by a computerized air flow management system which can be monitored from the centralized control room.

The biogas generated from the anaerobic technology system will be fed into a CHP system to generate electricity and heat energy. The electricity will be used in the process and any excess energy will be fed into the national grid. The heat energy will be used to supplement the heating of the tunnels and the pasteurisation system. Any biogas that does not meet the specification for the CHP unit will be directed for treatment in the abatement equipment.

In the event of a failure of either of the CHP units, a backup boiler unit which can operate on biogas will be used as a backup. In the unlikely event of failure of all three units, there will be sufficient capacity for up to 8 hours to allow maintenance of the CHP/boiler units. In the event of failure of all of these systems, any excess gas can be oxidized prior to discharge via a potential emission point which will automatically ignite the gas prior to discharge.

Building ventilation

Air is continuously drawn from the facility building in order to keep the building under negative pressure at all times (i.e when a door is opened air flows into the building through the door) preventing fugitive emissions. A computerised air flow management system will control the ventilation system based on air flow, pressure and temperature. This system is interlinked with the scrubber, humidifier and biofilter control system to ensure optimum conditions are maintained at all times.

Air scrubber

This system will be used, as required, in the event that basic gases are generated. The H_2SO_4 will neutralise any basic gases that may be in the air prior to secondary treatment

in the humidifier. The scrubber will also reduce any dust or bioaerosols that are present in the air. The exhaust air exiting the tunnels is conveyed to the acid scrubber which uses H_2SO_4 as reagent. The reagent is controlled by a dosing pump controlled by pH. The water discharge is automatically controlled by conductivity measurement whereas the water make-up in the scrubber is controlled by level sensors. The scrubber is also equipped with a reagent storage tank and a scrubber liquor holding tank.

Air humidifier

Before the collected exhaust air flows through the biofilter, it is moistened with water using the air humidifier. A high air humidity level is essential for the correct operation of the biofilter. The air flows through the humidifier where nozzles spray water through the air increasing the humidity of the air. Guide plates for the droplet discharger are mounted on the output side to prevent water droplets entering the biofilter. In the air humidifier, any remaining dust/basic gases are further removed from the air.

Biofilter

The humid air is blown into an air plenum which distributes the air evenly under the biofilter. The air flows under the biofilter floor and from here through a biologically active, solid media bed. In this humid environment, residual gases in the air are removed from the airstream by absorption and diffusion into a moist film on the filter media known as a biofilm. Any particulates and compounds either accumulate in the biofilm, or are consumed by the resident microorganisms. Bio-oxidation, occurs when microorganisms consume the gases, particulate matter or volatile organic compounds in the presence of oxygen. Water, Carbon dioxide and other non odorous gases, are the end products. The result of the biofiltration process is an elimination of odour emissions.

A computerised control system is used to monitor to biofilter to ensure optimum conditions of temperature humidity and air flow and substrate composition are maintained. The optimum temperature of the biofilter is between 20 – 40°C with humidity between 40 and 70% to support mesophilic bacteria. In addition to the control system, regular inspections of the system will be carried out to ensure the system is operating effectively - no odorous emissions or short-circuiting of the airflow.

Refer to Drawing 061-306-042

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-1
Source of Emission:	Biofilter
Location :	North of Main Building
Grid Ref. (12 digit, 6E,6N):	R 126067.91 E R 151834.62 N
Vent Details Diameter: Height above Ground(m):	Surface of Biofilter
Date of commencement:	2009

Characteristics of Emission :

Flow rate of fans: 55.000 m3/h at 3.000 Pa

(i) Volume to be emitted:			
Average/day	1320.000m^3/d	Maximum/day	1500.000m^3/d
Maximum rate/hour	63.000m^3/h	Min efflux velocity	m.sec^{-1}
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. ☐ dry. _____%O_2			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr 24 hr/day 365 day/yr

Emission Point Ref. Nº:	A2-2
Source of Emission:	CHP Unit 1
Location :	South of Main Building
Grid Ref. (12 digit, 6E,6N):	R 126067.91 E R 151834.62 N
Vent Details Diameter: Height above Ground(m):	
Date of commencement:	2009

(Volume to be emitted:			
Average/day		Maximum/day	
Maximum rate/hour	<4000NM^3/h	Min efflux velocity	m.sec^{-1}
(Other factors			
Temperature	^{o}C(max)	^{o}C(min)	^{o}C(avg)
For Combustion Sources: Volume terms expressed as :	☐ wet.	☐ dry.	_____%O_2

Emission Point Ref. Nº:	A2-3
Source of Emission:	CHP Unit 2
Location :	South of Main Building
Grid Ref. (12 digit, 6E,6N):	R 126067.91 E R 151834.62 N
Vent Details Diameter: Height above Ground(m):	
Date of commencement:	2009

Volume to be emitted:			
Average/day		Maximum/day	
Maximum rate/hour	<4000NM^3/h	Min efflux velocity	m.sec^{-1}

Other factors			
Temperature	ºC(max)	ºC(min)	ºC(avg)

For Combustion Sources:

Volume terms expressed as : ☐ wet. ☐ dry. _____%O_2

Emission Point Ref. N^{o}:	A2-4
Source of Emission:	Boiler Emission Point
Location :	South of Main Building
Grid Ref. (12 digit, 6E,6N):	R 126067.91 E R 151834.62 N
Vent Details Diameter: Height above Ground(m):	
Date of commencement:	2009

Volume to be emitted:			
Average/day		Maximum/day	
Maximum rate/hour	<4000M^3/h	Min efflux velocity	m.sec^{-1}

Other factors			
Temperature	^{o}C(max)	^{o}C(min)	^{o}C(avg)

For Combustion Sources:

Volume terms expressed as : ☐ wet. ☐ dry. _____%O_2

Emission Point Ref. N^{o}:	A2-5
Source of Emission:	Potential Emission Point
Location :	South of Main Building
Grid Ref. (12 digit, 6E,6N):	R 126067.91 E R 151834.62 N
Vent Details Diameter: Height above Ground(m):	
Date of commencement:	2009

(i) Volume to be emitted:

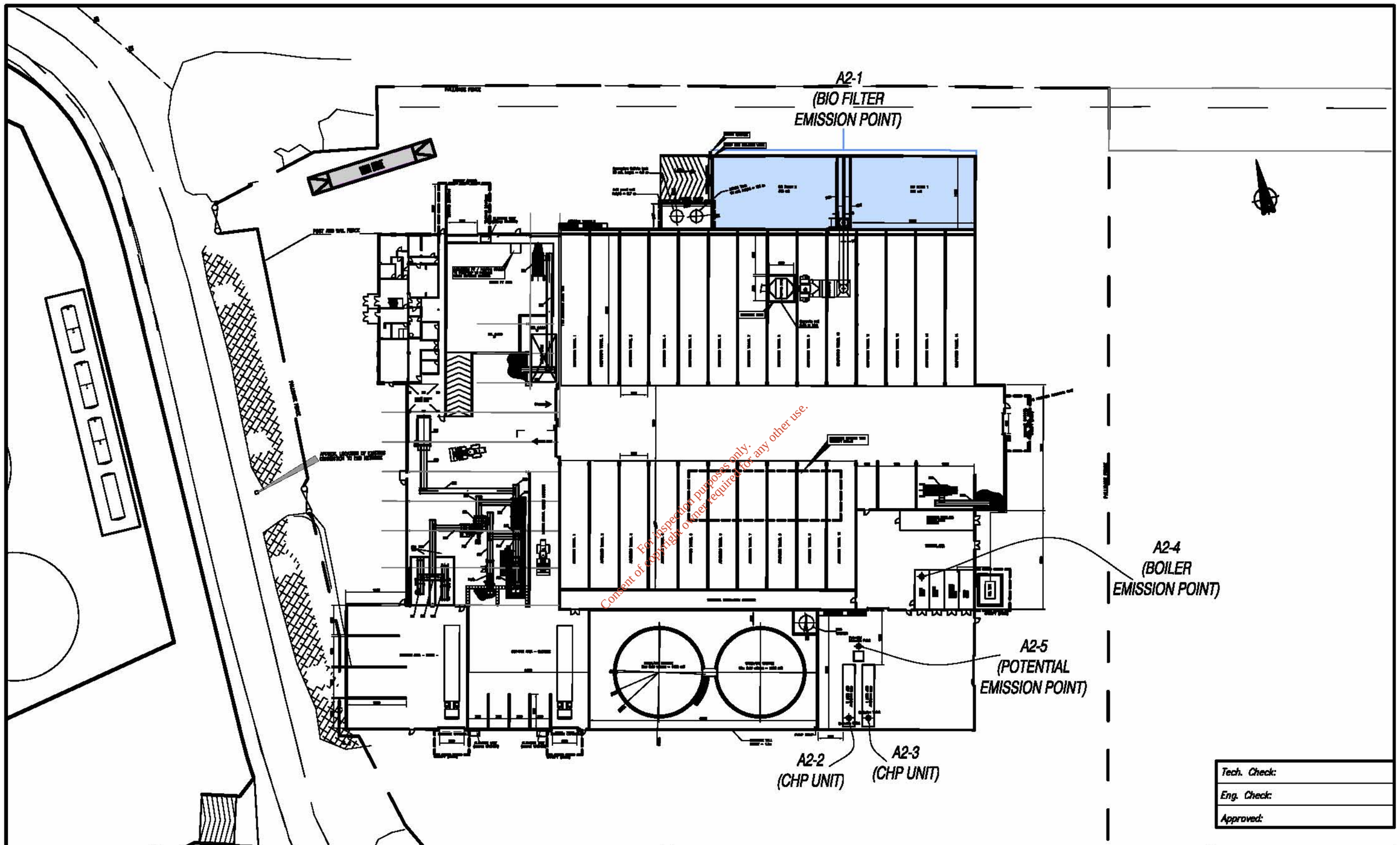
Average/day		Maximum/day	
Maximum rate/hour	<750NM^3/h	Min efflux velocity	m.sec^{-1}

(ii) Other factors

Temperature	^{o}C(max)	^{o}C(min)	^{o}C(avg)

For Combustion Sources:

Volume terms expressed as : ☐ wet. ☐ dry. _____%O_2



Tech. Check:	
Eng. Check:	
Approved:	

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Job:	GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title:	EMISSION MAP 1 – AIR

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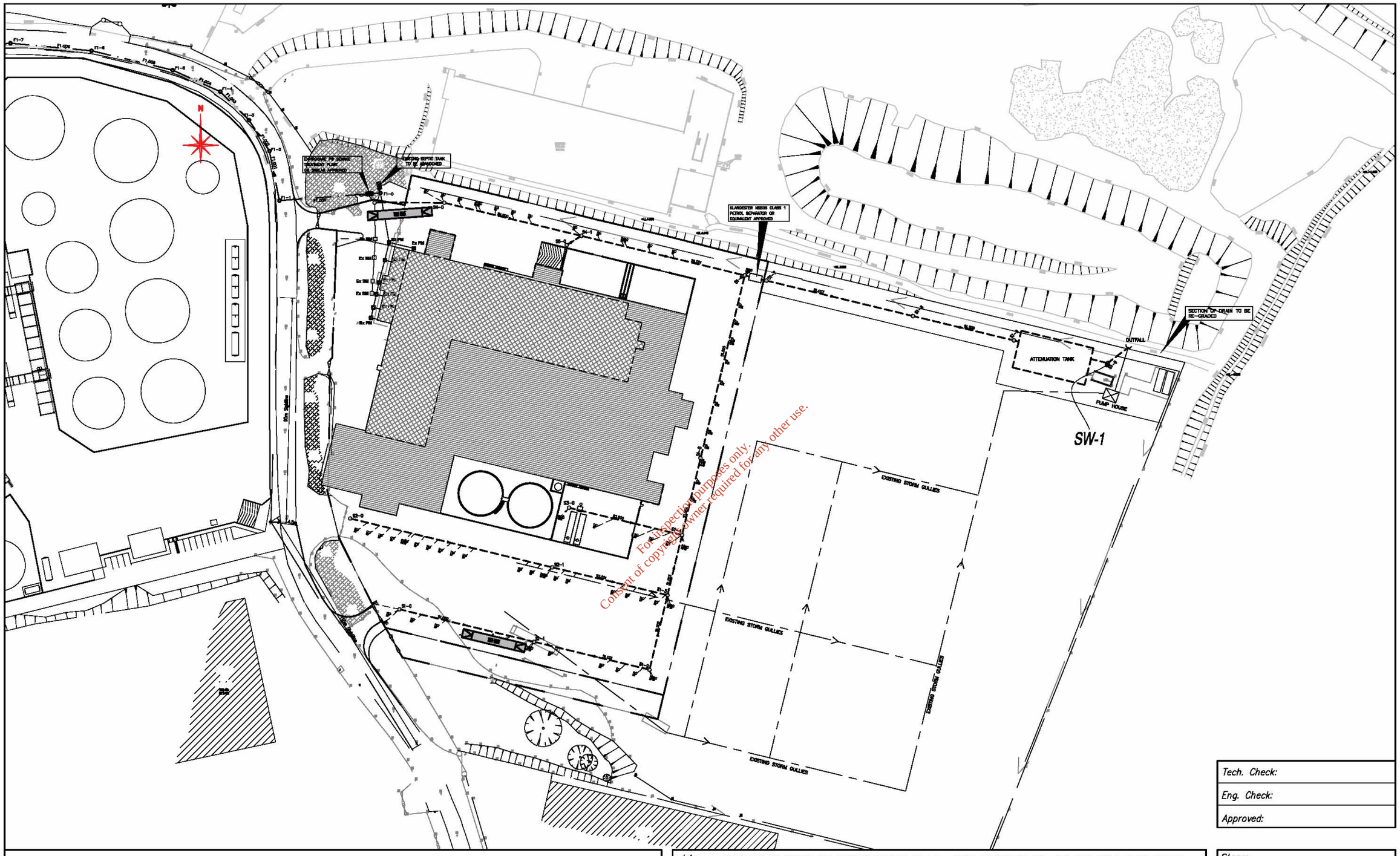
Stage:	
Scale @A3:	1:1500
Drawn:	Kevin Ryan
Date:	28–07–2009
Drawing No:	061–306–042
Rev:	P1

Attachment E.2 Emissions to surface waters

There will be no emissions to surface waters of environmental significance from this development. As the process will be fully enclosed, there will be no process discharges to surface water. All hard surfaces around the building within the site boundary will discharge via a Class 1 oil interceptor, attenuation tank and control value discharge to an existing storm water discharge point.
A roof water harvesting storage tank will be installed to collect additional rainwater for re-use with the process.

Refer to Drawing 061-306-043



Job:	GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title:	EMISSION MAP 2 – SURFACE WATER

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Approved:	

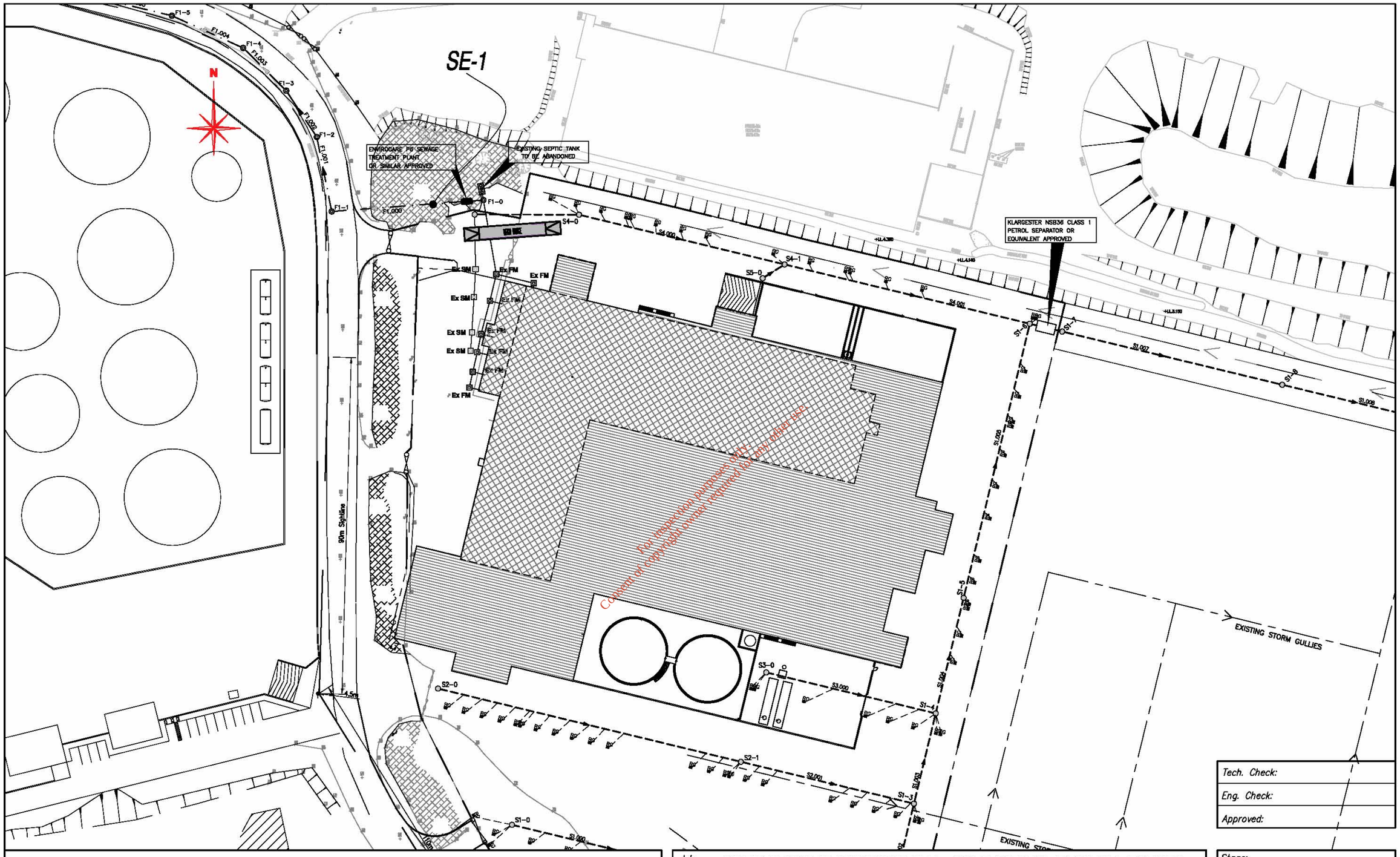
Stage:	
Scale @A3:	1:1500
Drawn:	Kevin Ryan
Date:	28–07–2009
Drawing No:	061–306–043
Rev:	P0

Attachment E.3 Emissions to sewer

There will be no emissions to sewer of environmental significance from this development. There will be no process discharges to sewer. The existing toilets and showers in the office area are currently discharging to a septic tank unit. This unit will be abandoned and replaced by an Envirocare P6 sewage treatment plant or similar approved unit and the treated water from this unit will discharge to the existing sewer.
All process wastewater generated during the process will be stored in dedicated storage tanks and reused within the process.

In the unlikely event that excess wastewater is generated, the wastewater will be removed from site for further treatment at an approved wastewater treatment facility.

Refer to Drawing 061-306-044 for the proposed emission point from the Envirocare unit.



Job:	GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES
Title:	EMISSION MAP 3 – SEWER

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Stage:	
Scale @A3:	1:1500
Drawn:	Kevin Ryan
Date:	28-07-2009
Drawing No:	061-306-044
Rev:	P0

Attachment E4 Emissions to Groundwater

There will be no emissions to groundwater from this development. The facility is designed as a fully enclosed development which will ensure there are no emissions of environmental significance from the facility to groundwater.

Attachment E.5 Noise Emissions

The facility will not have a noise impact of significance on the nearest noise sensitive locations.

The development is designed as a fully enclosed facility with all process operations conducted within the building which will ensure all potential noise sources will not have an impact outside the site boundary. The development is located in an industrial area surrounded by engineering companies, open coal and clinker storage, fuel depots and a vibrant port.

Access to the facility is via the Harbour Road which is accessed of the N69, east of the town of Foynes. There will be no traffic movements to the facility through the town of Foynes as the source of the raw material and destination of the finished products are all located in an easterly direction.

Please refer to Section 8.5.3 of EIS for further details.

Attachment E.6 Environmental Nuisances

Bird Control

The process is fully enclosed and will not attract birds. Material entering and leaving the premises will be in enclosed vehicles. There will be no material left outside the facility that could attract birds.

Dust Control

The building is fully enclosed with negative air pressure ensuring no dust will be emitted from the facility. The composting/biogas process operates under optimum conditions of moisture in sealed vessels and this will ensure the dust from the process is retained. All air from the building and from the process vessels will be treated using best available technology which comprises of three components. The scrubber system, humidifier and biofilter will all serve to remove all dust from the air within the facility. Trucks delivering biodegradable material will pass through a wheelwash system which will ensure no dust will emanate from the wheels of the trucks.
The screening plant will include a dedicated dust extraction filtration system to ensure dust is minimised within the building at this location.

Fire Control

A computerised control system will be installed to monitor and control temperatures optimal for composting within the in-vessel tunnels. All tunnels are provided with a water sprinkler system to maintain a damp environment and which can be used in the unlikely event of an emergency. The biogas tunnels operate under low oxygen conditions which are controlled by gas monitors.

An Emergency Response Plan will be developed to account for all likely emergency scenarios. The Foynes Port Authority has an established Emergency Response Plan for the Foynes Port which includes all emergency services. There is a local Fire Station located within one mile of the facility. All staff will be trained in emergency response procedures including evacuation to dedicated assembly points.

The building will be designed and equipped to meet relevant fire regulations.

Litter Control

There will be no litter issues associated with the development as the facility is full enclosed with all delivery and processing occurring indoors. Regular inspections will be completed to ensure there is no litter impact from the facility.

Traffic Control

The movement of trucks and other vehicles associated with the facility will be in line with the attached drawing 061-306-120.

Vermin Control

The process is not conducive to attracting vermin. All deliveries of biodegradable will be transferred immediately to a process tunnel which will be sealed and temperatures in the range of 50-60^{o}C. Vermin such as flies, or mice would not survive in such an environment and therefore will not be attracted to the facility. There will be no long-term storage of incoming or outgoing material on-site. As a precautionary measure, a pest control company will be employed under contract to maintain and monitor bait traps on a monthly basis.

Road Cleansing

As the facility is fully enclosed with all processing operations being conducted within the building, no road cleaning will be required. The vehicles leaving the building after delivery will undergo a cleaning procedure to ensure no debris leaves the building on the truck wheels.

PALLISADE FENCE

WEIGH BRIDGE

POST AND RAIL FENCE

PALISADE FENCE

CANOPY (OVER)

CLEANING UNIT (STEAM WASHER)

COLLECTION PIT / PUMPING STATION TO OVERPUMP TO PROCESS WATER DRAINAGE NETWORK

INTAKE PIT AREA

AEROBIC TUNNELS

STORM MANHOLE

SUMP WITH ISOLATION VALVE

Ammonium Sulfate tank 20 m3, height = 4,5 m

Acid proof wall height = 0,7 m

H2SO4 tank 10 m3, height = 3,5 m

BIO FILTER 2 365 m2

BIO FILTER 1 365 m2

COMPOSTING TUNNEL 1

COMPOSTING TUNNEL 2

COMPOSTING TUNNEL 3

COMPOSTING TUNNEL 4

COMPOSTING TUNNEL 5

COMPOSTING TUNNEL 6

COMPOSTING TUNNEL 7

COMPOSTING TUNNEL 8

COMPOSTING TUNNEL 9

COMPOSTING TUNNEL 10

COMPOSTING TUNNEL 11

COMPOSTING TUNNEL 12

COMPOSTING TUNNEL 13

COMPOSTING TUNNEL 14

TWIN UNDERGROUND WATER TANK

CONCRETE BUNG

Concrete wall 0,25 m high

RAINWATER STORAGE TANK CAPACITY 308m3

DRAINAGE TUNNEL CANOPY (OVER)

TO PROCESS CLEANING UNIT

ANAEROBIC TUNNEL 1

ANAEROBIC TUNNEL 2

ANAEROBIC TUNNEL 3

ANAEROBIC TUNNEL 4

ANAEROBIC TUNNEL 5

ANAEROBIC TUNNEL 6

ANAEROBIC TUNNEL 7

ANAEROBIC TUNNEL 8

ANAEROBIC TUNNEL 9

ANAEROBIC TUNNEL 10

TECHNICAL INSTALLATION CORRIDOR

ELECTRICAL ROOM AND CONTROL ROOM OVERHEAD

TECHNICAL AREA

CANOPY (OVER)

GAS WASHER

Potential Emission Point

Emission Point

WATER/GAS STORAGE Max fluid volume = 1400 m3

WATER/GAS STORAGE Max fluid volume = 1400 m3

DISPATCH AREA – CLEAN –

DISPATCH AREA – OVERSIZE

DRAINAGE CHANNEL

CLEANING UNIT (STEAM WASHER)

CANOPY (OVER)

CONCRETE WALL HEIGHT = 1.9m

PUMP SUMP

DRIVING SHOVEL ACCESS CORRIDOR

OVERHEAD DRIVING SHOVEL

LEGEND

- STAFF
- VISITORS
- DELIVERY TRUCKS
- COLLECTION TRUCKS

greenport environmental

REV	AMENDMENT	BY	DATE

Job: GREENPORT ENVIRONMENTAL COMPOSTING FACILITY FOYNES

Title: SITE TRAFFIC MOVEMENTS

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Stage: PLANNING
Scale @A0: 1:250
Drawn: T.C.
Date: 2009-05-13
Drawing No: 061-306-120 | Rev: PL0