11th October 2016

Query 1:
Provide a copy of the licensee's certificate of incorporation, showing the company register number. If there is a different name on the existing licence, please clarify the matter.

Response

Please find overleaf the requested Certificates of Incorporation noting the name changes since the original date of incorporation. The Legal entity has however always remained the same since the date of incorporation and it is only the name of the legal entity that has changed as filed with the Companies Registration Office.

The name on the current licence is **Atlas Environmental Ireland Limited** which is the same legal entity as **Enva Ireland Limited** with the company registration number 317186.

Number 317186

Certificate of Incorporation on change of name

I hereby certify that

ATLAS ENVIRONMENTAL IRELAND LIMITED

having, by a Special Resolution of the Company,
and with the approval of the Registrar of Companies,
changed its name, is now incorporated
as a limited company under the name

ENVA IRELAND LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Wednesday, the 21st day of June, 2006

for Registrar of Companies

Number
317186

Certificate of Incorporation

on change of name

I hereby certify that

CULVORE LIMITED

having, by a Special Resolution of the Company, and with the approval of the Minister for Enterprise, Trade and Employment, changed its name, is now incorporated as a limited company under the name

ATLAS ENVIRONMENTAL IRELAND LIMITED

and I have entered such name on the Register accordingly.

Given under my hand at Dublin, this

Wednesday, the 14th day of June, 2000

for Registrar of Companies

Number
317186

Certificate of Incorporation

I hereby certify that

CULVORE LIMITED

is this day incorporated under
the Companies Acts 1963 to 1999
and that the company is limited.

Given under my hand at Dublin, this
Thursday, the 16th day of December, 1999

M. Reilly
for Registrar of Companies

Query 2:
State whether the licensee holds or is required to hold a greenhouse gas permit in relation to the activities at the installation. If yes, provide information on the permit.

The installation does not hold a greenhouse gas permit.

The installation is not required to hold a green house gas permit as it does not carry out any of the activities listed in Schedule 1 of S.I. 490 of 2012.

Query 3:

Describe the installations place in the context of and delivering the objectives of the National Hazardous Waste Management Plan.

Response

The four objectives of the current National Hazardous Waste Management Plan 2014 - 2020 include:

- To prevent and reduce the generation of hazardous waste by industry and society generally;
- To maximise the collection of hazardous waste with a view to reducing the environmental and health impacts of any unregulated waste;
- To strive for increased self-sufficiency in the management of hazardous waste and to minimise hazardous waste export;
- To minimise the environmental, health, social and economic impacts of hazardous waste generation and management.

While the first objective is an overarching requirement for all industry to prevent/reduce the generation of hazardous waste, it is the last three bullet points that provide the context for the Enva facility in Portlaoise as set out below:

Objective: To maximise the collection of hazardous waste with a view to reducing the environmental and health impacts of any unregulated waste;

Enva's facility in Portlaoise is home to the majority of Enva's hazardous collection fleet of 18 vehicles which travel country wide on a daily basis to collect hazardous waste and transport it back to the facility. Enva currently has an active customer base of over 4,000 customers ranging from sole trader (e.g. car mechanics) up large multinational companies (e.g. Manufacturing, Power Generation etc.).

Since 1980 the Enva Portlaoise facility has been the base for a nationwide collection service for the automotive industry, aimed at providing an economical service and thereby facilitate high collection rates and levels of compliance with hazardous waste legislation in this sector. Over the past 15 years Enva has expanded the customer offering provided by the Portlaoise facility beyond the automotive and oily waste to include a broader range of industrial, commercial and even household hazardous wastes. Enva services all 26 counties on a regular basis to ensure customers can have their hazardous waste removed on a timely basis and avoid the potential for tanks overfilling or other pollution incidents relating to their storage of hazardous wastes.

Enva currently provide waste collection services to over 150 civic amenity sites spread across the country and all wastes collected from these sites by Enva is brought back to the facility in Portlaoise. The facility is also the base for our mobile household hazardous waste collection service. This is where Local Authorities engage Enva to set up a temporary collection centre (e.g. in a car park etc.) to facilitate householders and members of the public disposing of their hazardous wastes in a legitimate manner. The wastes collected from this service are brought back to the Portlaoise facility to be further inspected, sorted and either processed on site or repackaged for onward shipment to an appropriately licensed facility.

Recommended Action 10(1) of the National Hazardous Waste Management Plan 2014 – 2020 highlights the need for "*resourcing local authorities to develop adequate collection facilities for small-scale quantities of hazardous waste from households and small businesses (e.g. at civic*

amenity sites, mobile special collections)". In this regard, the Enva facility in Portlaoise is already assisting the local authorities in the servicing of these collection facilities and thereby helping to achieve this objective.

Since 2015 the facility has also been the operational base for Enva's services provided to the farming sector. Similar to the mobile collection centres serving the public this involves temporary collection centres (typically at Mart sites) but aimed specifically at the wastes generated by the farming sector. The majority of wastes collected by Enva from this service are brought back to the Portlaoise facility to be further inspected, sorted and either processed on site or repackaged for onward shipment to an appropriately licensed facility.

The processing and storage infrastructure in place at the facility serves a range of different waste collection vehicles including waste oil tankers, vacuum tankers, curtain siders and small vans.

Objective: To strive for increased self-sufficiency in the management of hazardous waste and to minimise hazardous waste export;

The facility provides significant hazardous waste treatment infrastructure/capacity in the context of the country striving for self-sufficiency and also minimising the export of hazardous waste. In particular the facility provides key processing infrastructure for:

- Waste Oils & Liquid Oily Wastes;
- Contaminated Soils;

In addition the facility is seeking to expand its processing ability and increase recovery activities to reduce the volume of wastes being exported. This includes plans to recover inorganic liquid streams currently being exported to a national recovery solution (e.g. fertiliser).

Waste Oil & Liquid Oily Wastes

The Enva facility in Portlaoise is the largest oil recovery facility in the country with a capacity to process over 40,000 tonnes of oily waste liquids per annum. These wastes include interceptor waste, waste engine oil, waste lubricating oil, waste transformer oil and waste marine oils. Currently approximately 30,000 tonnes of wastes are being inputted into the process per annum, resulting in the recovery of approximately 13,000 tonnes of oil. There is remains sufficient processing capacity to process waste oils currently outside of the regulated sector (e.g. illegal small waste oil burners). Only a very small proportion of wastes generated by the oil recovery process has to be exported outside of Ireland currently (ca. 300 tonnes p.a.). This comprises of the filtercake and oily sludge that is sent for recovery into cement kiln fuels. As the cement kilns develop the capacity to burn waste and specifically hazardous wastes this may be capable of being fully recovered in Ireland in the future.

Contaminated Soil;

The facility is currently the only licenced facility in the State that can accept and treat contaminated soils classified as hazardous waste. Hazardous soils can in some cases be treated at the site where they are generated but where the hazardous soil has to be removed from the site it can either be exported or sent for remediation at the Portlaoise facility. The facility thereby provides very significant infrastructure facilitating a reduction in the volume of soil being exported from the State. Currently the techniques employed at the facility to remediate soils involve physical, biological and chemical processes but Enva is seeking to expand the remediation techniques and thereby increase the volume of oils that may treated within Ireland. Specifically Enva is planning to add soil washing infrastructure to the existing equipment which will allow a wider range of contaminated soils and possibly even sediments (e.g. harbour sediment) be remediated at the facility.

Currently the facility pre-processes a range of wastes prior to exporting these to facilities across Europe. Typically the pre-processing involves sorting and repackaging the waste to align it with a particular licenced waste process. This pre-processing helps ensure that the various types of hazardous wastes are disposed or preferably recovered in the most appropriate manner and help provide a more competitive cost bases for Irish industry. Furthermore Enva are monitoring the development of cement kiln infrastructure in Ireland and their capacity to take hazardous wastes. If these facilities develop suitable hazardous waste capability then the facility in Portlaoise could very provide important preparation processes (e.g. mixing, conditioning, analysis) necessary to ensure the waste streams being fed into these plants meets their acceptance criteria.

Recommended Action 14(i) of the National Hazardous Waste Management Plan 2014 – 2020 requires the DECLG (now DCCAE) to "*keep under review the provision and facilitation of hazardous waste treatment capacity and make recommendations on the appropriate economic or other instruments necessary for such capacity to be provided, either by the private or public sector*". The Enva facility provides significant waste treatment capacity and helps to ensure that Ireland is more self sufficient in the treatment and recovery of hazardous wastes.

Objective: To minimise the environmental, health, social and economic impacts of hazardous waste generation and management.

Enva's facility in Portlaoise provides for the processing of hazardous waste in a licenced manner which then subjects the activities to the appropriate controls to minimise any potential impacts on the environment and human health. As an operational licensed facility actively pursuing hazardous wastes from producers this helps reduce the potential for wastes to handled in an unregulated manner with the associated environmental impacts (e.g. oil contamination of water bodies or soil etc.). Over the past 35 years the facility has been instrumental in servicing the automotive sector and driving up the proper management of hazardous waste in this sector. Pollution events from wastes from the automotive sector are now relatively rare occurrences.

Virtually all wastes fully processed at the facility undergo a recover operation (i.e. waste oils & soil) rather than a disposal option. Thus the facility infrastructure provides for second uses of wastes rather than recovery rather simply disposing of the waste. Furthermore the vast majority of wastes that are only part processed at the facility (e.g. paint, batteries, solid oily wastes etc.) are sent on to third party recovery facilities with very little wastes being sent for disposal.

There are a relatively small number of hazardous waste facilities in Ireland capable of handing the range of hazardous wastes that the facility can accept and in most cases provide a recovery option for. The facility does therefore contribute to a competitive market for management of hazardous wastes and help minimise the economic impact on hazardous waste producers managing their waste in a regulated and responsible manner.

Enva is committed to the responsible operation of the facility in compliance with all licenced conditions to ensure that the plant operates with minimal impact on the environment. The operation of the facility within the envelop of any new licence granted will ensure that the facility will not impinge on the achievement of the listed environmental objectives of the National Hazardous Waste Management Plan 2014 – 2020, (i.e. to protect water quality (rivers, lakes, marine and groundwater) from hazardous waste, to protect air quality from hazardous waste and/or reduce air pollution or limit to levels that do not significantly impact the natural environment or human health, etc.).

11th October 2016

***Query 4**. With reference to table E.1(i) provided with item 12 or your response dated 6 September 2016, please state the thermal input value of the boiler in MW.*

Response

The maximum thermal input of the boiler is 5 MW, however the boiler is operated well below its maximum capability. This boiler operates utilising either natural gas or gas oil as a fuel.

Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants (Medium Combustion Plant (MCP) Directive) regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input 1MW to 50MW. Annex II of the Directive sets out the following emission limit values (mg/Nm^3) for existing medium combustion plants:

Pollutant	Gas Oil	Natural Gas
SO_2	-	-
NO_2	200	250
Dust	-	-

The response to EPA Query 12 submitted on the 6th September 2016 shows the completed Table E.1(i) for this boiler (Reference A1-1). The table notes that the fuel is Natural Gas with a maximum NO_X emission of $200mg/m^3$ (lower than the limit specified in the MCP Directive for Natural Gas at $250mg/m^3$).

It should be noted that the boiler can also be operated on Gas Oil but the limit listed in Table E.1(i) is as per the MCP for gas oil at $200mg/m^3$.

It is also noted that the Air Dispersion Model of the boiler emissions presented in response to Query 15 submitted on the 6th September 2016 is based on a NO_x emission of $200mg/m^3$ and hence the results of this model are valid for both fuel types.

11th October 2016

Query 5.

By reference to the new Emission points A3-53 and A3-57, please explain the context and purpose of the caustic scrubber mentioned as abatement on these emissions to air.

Response

Emission point A3-53 relates to abating the headspace gas from the 'Hodgefield Interceptor' which aqueous effluent is transferred through to retain any free phase hydrocarbons but allow the aqueous fraction to pass. This effluent has been identified as a potential source of odours, largely relating to the presence of hydrogen sulphide gases generated from anaerobic microbial activity in the waste oils. The headspace gas can have concentrations in the region of 100 ppm of hydrogen sulphide on occasion (it varies with different sources of waste oil). The combination of a caustic scrubber and an activated carbon filter (copper impregnated carbon) is a commonly deployed technique in the wastewater sector for abating hydrogen sulphide. The caustic scrubber provides an initial gross reduction in hydrogen sulphide levels (where NaOH reacts with H_2S to form NaHS and Sodium Sulphide) and the carbon filter providing a subsequent polishing stage (via adsorbtion onto the carbon).

Emission point A3-57 relates to the headspace gases from tanks receiving effluent from the Hodgefield Interceptor or other aqueous effluents that have no significant hydrocarbon content. Effluent that has passed through the Hodgefield interceptor is dosed in-line with chemical reagents (e.g. hydrogen peroxide, sodium hypochlorite etc.) to prevent odour and thus there is significantly less potential for odour/hydrogen sulphide generation from this treated effluent. Thus a carbon filter is sufficient for odour abatement at this emission point without the need for a caustic scrubber.

Query 6.

Please provide a drawing showing the location of the following emission points, existing and proposed:

- *A1-1, steam raising boiler stack;*
- *A2-1, regenerative thermal oxidiser stack;*
- *A3-52, oil filtration plant carbon filter stack;*
- *A3-56, tank farm ring main carbon filter stack;*
- *A3-53, hodgefield separator carbon filter stack;*
- *A3-54, tanker dig-out buildings and tanks 18 7 19 carbon filter stack;*
- *A3-57, WW1, WW2, WW3, WW4, and reactor tanks 1 and 2 carbon filter stack;*

Response

Please see attached figure 6.1 showing the location of these emission points.

Query 7.

In the final pages of item 29 of your response dated 6 September 2016, there is a discussion that contains two tables, 29.1 and 29.2.

a. The headings of these tables appear inconsistent. Please examine and clarify.

b. The reference to table 29.1 in the text beneath table 29.1 appears to be incorrect. Please examine and clarify.

Response

This is correct and there is a typographical error in the table titles in this section (which relates to the response to Query 29d of the EPA Request of 12th July 2016) which results in confusion around the accompanying text. This section of the previous Section 90 applicant response is reproduced below with the corrections to the text outlined for clarity. Text to be omitted is noted with a strikethrough and new text is underlined.

Background levels (for all BTEX, calculated at 8μg/m^3 for the period March to December 2015) for the Portlaoise area are also included as published by the EPA in the "Second Interim Report: Monitoring of Ambient Air Quality adjacent to ENVA Ireland Limited, Portlaoise, EPA Licence Reg. No. W0184-01" (June 2016). In addition, the cumulative impact of the RTO on top of the carbon filters is included in the results. The results of the TOC modelling are presented in ~~the following table~~ Table 29.1 for annual averages for each of the receptors. The table illustrates that the combined operation of 6 carbon filters has a greater impact that the single RTO. This is in part due to the number of carbon filters but also the lower discharge heights compared to the RTO as well as the lower temperature (and hence thermal buoyancy) of the carbon filter emissions compared to the RTO.

There is no specific limit for Total VOCs in ambient air so a set of comparator values are used for BTEX (as employed by the EPA) and these are outlined as follows for annual averages:

- *Benzene 5μg/m^3 (EU Limit Value)*
- *Toluene 1,910μg/m^3 (UK Environment Agency Guideline)*
- *Ethylbenzene 4,410μg/m^3 (UK Environment Agency Guideline)*
- *Xylenes 2,200μg/m^3 (UK Environment Agency Guideline)*

The annual average levels contributed cumulatively by the RTO and Carbon filters at Enva are less than 0.4% of the guideline for Toluene and Xylenes and less than 0.2% of the guideline for Ethylbenzene. Based on this analysis the cumulative impact of the simulated worst case scenario (all carbon filters and RTO operating continuously for the full year) the impact to human health at the nearest receptors would not be significant.

The limit for benzene is much lower than the other aromatics given the known carcinogenicity of benzene and the predicted results of the cumulative TOC impact from Enva (RTO and Carbon Filters) would result in levels excess of the annual benzene limit. However, it is important to note that there is no evidence to suggest the TOC emissions from the Enva facility contain elevated levels of benzene. The EPA study of benzene levels in the area in the vicinity of Enva concluded that "for benzene, the highest average concentrations are actually noted when winds are from the north east (i.e. not

related to ENVA)" and "that there are other local sources of benzene, which could include combustion sources (such as transport) or emissions from local commercial/industrial activities".

Based on the detailed EPA data collated for 2015 for the existing operation, it would appear that benzene from the Enva facility may have a maximum potential contribution of 0.5 to 1 $\mu g/m^3$ in the area. The EPA noted that in all cases the measured values are below the relevant guideline values. With the proposed control measures in place (carbon filters and RTO) these low levels of benzene would actually decrease so a comparison with the benzene limit for cumulative TOC emissions for this analysis is not valid.

Table 29.1: Results of Annual Average Modelled Concentrations from cumulative emissions from the RTO and Carbon Filters

Reference	2015 Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Carbon Filter Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)
R1	8	0.136	6.01	14.146
R2		0.186	6.23	14.416
R3		0.283	7.82	16.103
R4		0.308	7.33	15.638
R5		0.287	6.10	14.387
R6		0.249	5.54	13.789
R7		0.259	7.59	15.849
R8		0.261	7.89	16.151

~~*Table 29.1*~~ *Table 29.2 shows the maximum 1-hour concentrations for all receptors with the RTO and all carbon filters operating simultaneously at the emission limit values specified. As with the annual averages, the cumulative impact of the carbon filters is considerably greater than the RTO for the same reasons outlined.*

Again, there is no specific limit for Total VOCs in ambient air over a 1-hour average so a set of comparator values are used for BTEX (as employed by the EPA) and these are outlined as follows for annual averages:

- *Benzene 320$\mu g/m^3$ (Derived from NIOSH 15 minute limit)*
- *Toluene 8,000$\mu g/m^3$ (WHO and UK Environment Agency Guideline)*
- *Ethylbenzene 55,200$\mu g/m^3$ (UK Environment Agency Guideline)*
- *Xylenes 66,200$\mu g/m^3$ (UK Environment Agency Guideline)*

As with the annual averages, the predicted maximum 1-hour concentrations at the sensitive receptors are less than 5% of the relevant guideline for Toluene and less than 1% of the relevant guidelines for Ethylbenzene and the Xylenes. Based on this analysis, the simulated worst case impact of the RTO and all carbon filters operating simultaneously at the ELVs, will not give rise to ground level concentrations that have a significant impact on human health.

As outlined above, a comparison with the benzene 1-hour guideline is not valid given the low risk of significant benzene emissions from the Enva facility.

~~***Table 29.2: Results of Annual Average Model***~~

Table 29.2: 1-Hour Maximum Modelled Concentrations from cumulative emissions from the RTO and Carbon Filters

Reference	Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Carbon Filter Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)
R1	8	8	327	343
R2		7	243	258
R3		7	222	237
R4		6	198	212
R5		6	165	179
R6		6	201	215
R7		7	254	269
R8		8	265	281

Query 8.

Provide design information on the carbon filters as installed and proposed. In particular:

a. Provide information that demonstrates that the carbon filters (installed and proposed) have been sized adequately.

b. State how the fans have been sized and where they are located relative to the carbon filters and whether they are integrated into the carbon filter package plant.

Response

There are three different sizes of carbon filter in use or proposed at the Enva facility:

i) Small max design flow 475m^3/hr
ii) Medium max design flow 3,190m^3/hr
iii) Large max design flow 12,000m^3/hr

Please see technical details of the carbon filters over leaf.

The small carbon filters are currently in use to provide odour abatement from the existing storage/process tanks. These small carbon filters are rated for a maximum of 250m^3/hr however the actual flow is estimated to be less than 100m^3/hr based on the maximum (liquid) pumping rate of 50m^3/hr into and out of these tanks. These filters rely on a passive flow (i.e. based on temperature or tank filling) and have no extraction fans associated with the current use of these. All but one of these small carbon filters are planned to be replaced on installation and commissioning of the vapour balance ring main. The only unit proposed to remain in use is for the one relating to the effluent tanks (A3-57) which has flows of less than 100m^3/hr and is therefore appropriately sized for this emission point.

The medium sized carbon filters are rated for a maximum air volume of 3,190m^3/hr. The three existing carbon filters have fans drawing air into the filters with flow well within the design capacity of the carbon filters design range.

Existing Carbon filters	**Max Fan Flow rate**
Carbon filter (Oil Filtering room A3-52)	2,220m^3/hr
Carbon filter (Hodgefield Interceptor A3-53)	2,220m^3/hr
Carbon Filter (Paint De-packer A3-55)	2,220m^3/hr

Extraction from the Oil filtering room (approximately 140m^3) provides approximately 10 air changes per hour to this building which is in excess of the normal range of extraction employed (3-6 air changes per hour). This has been sized as such to account for the high flow but low organic load (less than 0.1kg/hr) that has been measured from this source. See response to Query 24 in the previous Section 90 response.

The headspace in the Hodgefield is a much lower volume as this is restricted to a tank (with lids limiting air intake) and not a room hence the measured flow rate is much lower at this source. However, the potential loading (H_2S and VOCs) are higher as measured at source (see response to Query 25 in the previous Section 90 response) when compared to the oil filtration plant (A3-52). But the loadings of the two filters are similar (less than 0.1kg/hr) and hence similar fans are applied albeit at varying flow rates. This filter also has a pre-scrubber given the potential for H_2S.

The paint depacker (A3-55) extracts from a confined work area and the maximum volume of extraction is well below the capacity of the carbon filter. The loads are similar to those for A3-52 and A3-53 and hence the same fan size has been applied.

Proposed Carbon filters	**Max Fan Flow rate**
Carbon Filter (tanker dig-out A3-54)	10,000m^3/hr
Carbon filter (Tank Farm ring main A3-56)	2,220m^3/hr
Carbon Filter (Effluent Tanks A3-57)	2,220m^3/hr

A medium sized carbon filter is proposed to provide contingency for the Vapour Balance ring main contingency (A3-56) in the event the RTO is not available. The flow rates exiting the vapour balance ring main will be relatively low (circa 100-200 m^3/hr) but a maximum flow of 2,220m^3/hr has been applied in Table E.1(ii) of the previous Section 90 response to allow for the maximum fan rating should a fan be required.

A large carbon filter is proposed to serve the proposed Tanker Dig Out/repackaging building, this is a bespoke designed unit (in conjunction with Jacobi Carbon) and will provide a minimum design capacity of 10,000 m^3/hr to ensure it is adequately sized. This will provide up to 10 air changes per hour to either a Tank being cleaned (Tank 18/19) or the Tanker Dig out building. Where the unit is required to provide extraction from a tank and the Tanker Dig out building simultaneously it would provide 5 air changes per hour which is still a high level of extraction. Refer to the response to Query 26 of the previous Section 90 response for details on the volumes and air exchanges.

Tanks WW1 and WW2 are used to hold processed effluent prior to discharge. Tank filling takes several hours as the pumping rate is 8m^3/hr hour and estimated to displace circa 10m^3 of headspace air per hour (as only one tank can be filled at any one time). There is no fan currently associated with this filter which is operated on a passive flow basis. A drum sized filter will provide capacity up to 475m^3/hr well in excess of the flow rates ca 10m^3/hr). If ultimately necessary a fan could be installed with a maximum rating of 2,220m^3/hr.

Fan/Flow Sizing

The fans have been sized relative to the design capacity of the carbon filter they serve (i.e. using a fan with the same or a lower maximum flow rating). It is in any case possible to reduce the flow rate of a fan by means of a variable speed motor if necessary.

In all cases the fans are located between the point of extraction and the carbon filter to draw air from the source and push it through the carbon filter.

Query 9.

In the context of the carbon filters as installed and proposed, complete table F.1 of the licence application form. When completing the table, and if necessary provide supplementary information, ensure you describe in detail the control procedures for the carbon filters, including the following:

a. *What process parameters will be monitored to show that the equipment is operating properly?*
b. *What are the set points or ranges for these parameters?*
c. *In the context of the monitored process parameter, what informs the decision as to when the carbon medium should be replaced?*
d. *State the expected frequency for carbon medium replacement or regeneration.*
e. *Describe the procedure for replacing or regenerating the carbon medium in each filter.*
f. *How long does it take to procure the replacement/regeneration service or to carry it out in-house?*
g. *State what mitigation measures or alternative abatement techniques will be in place during carbon filter downtime.*

Response

The following tables present the abatement/treatment control details for the carbon filters as installed and proposed at the Enva facility:

- A3-52, oil filtration plant carbon filter stack;
- A3-53, Hodgefield separator carbon filter stack;
- A3-54, tanker dig-out buildings and tanks 18 & 19 carbon filter stack;
- A3-55, paint de-packer area
- A3-56, tank farm ring main carbon filter stack;
- A3-57, WW1, WW2, WW3, WW4, and reactor tanks 1 and 2 carbon filter stack

As noted in response to Query 8, there are also a number of existing small carbon filter drums currently in use to provide odour abatement from the existing storage/process tanks. All of these carbon filters are considered minor emission points and all but one of them are planned to be replaced on installation and commissioning of the vapour balance ring main. As such, these temporary units have not been included in this response.

Data is presented in the form of Table F.1(i) of the IED application form and source specific characteristics are noted as footnotes to the relevant table. In addition there are a number of universal criteria that will apply to all criteria and in relation to the queries raised by the EPA these are addressed in the following table.

Query	Response
What process parameters will be monitored to show that the equipment is operating properly?	It is proposed that the following will be monitored at each carbon filter employed on site: • Volumetric Flow Measurements • VOC measurement • Olfactory assessment These three parameters will be tested at each carbon filter on a monthly basis as part of routine maintenance checks to ensure that the optimum operating conditions are maintained. All routine checks will be recorded as part of the EMS to allow performance of the filters to be tracked over time.
What are the set points or ranges for these parameters?	Set point for volumetric flow is specific to the carbon filter fan and the capacity of the system. These are noted in the following F.1(i) tables. VOC emissions will be tested using a portable VOC analyser (PID analyser) and the set point will be as follows: • Post Filter Emissions to atmosphere – 0.5kg/hr Olfactometric assessment will be carried out with the set point ass a risk based assessment to determine moderate or high risk of odour nuisance off site.
In the context of the monitored process parameter, what informs the decision as to when the carbon medium should be replaced?	In the event that the routine checks on carbon efficiency shows that any of the set points listed above is breached, this will trigger the replacement of the carbon medium in the specific filter.
State the expected frequency for carbon medium replacement or regeneration	This will vary depending on the loading to the carbon filter (flow and VOC load) coupled with the Adsorption Capacity (mg/g) of the carbon installed (both the volume of carbon and the type of carbon). For example, A3-55 (the paint de-packer area) will treat a periodic moderate load while A3-53 (Hodgefield separator carbon filter stack) will treat a more continuous but lower VOC load. Hence the capacity of each filter will be reached at different times and there is no set frequency for removal. It is anticipated that the carbon will be replaced several time a year on duty filters (i.e. excluding contingency units) but at least annually.
Describe the procedure for replacing or regenerating the carbon medium in each filter.	Enva propose to carry out the replacement/regeneration of the carbon medium in-house where drum sized units simply have the carbon taken out using a scoop/small shovel and replaced with fresh carbon. Spare carbon media will be maintained on site at all times. For the larger units it is proposed to use a vacuum tanker to remove the carbon (Enva provide this service commercially), with fresh carbon added using a forklift and bottom discharging FIBC being emptied into the filter. The measures to be employed during replacement would either be to shut down the process (e.g. oil filtering, paint depacking, effluent transfer) or to have a spare carbon filter to use during replacement if continuous operation is necessary.
How long does it take to	The replacement service can be carried out in a matter of hours using

procure the replacement/regeneration service or to carry it out in-house?	the in-house procedure outlined above to ensure minimum loss of operational capacity. As noted, the source served by the carbon filter will where possible be taken offline during the replacement process.
State what mitigation measures or alternative abatement techniques will be in place during carbon filter downtime.	As noted, the following sources are periodic operations and will be prohibited during the carbon replacement operation: • A3-52, oil filtration plant carbon filter stack; • A3-53, Hodgefield separator carbon filter stack; • A3-54, tanker dig-out buildings and tanks 18 & 19 carbon filter stack; • A3-55, paint de-packer area Emission point A3-56 (the tank farm ring main carbon filter stack) is itself a contingent mitigation measure for the RTO so during normal RTO operation this carbon may be easily replaced without any environmental impact. Emission point A3-57 which serves the WW1, WW2, WW3, WW4 and reactor tanks will be controlled by controlling the filling operations to these tanks during carbon replacement. The filling operation is the principle source of emissions and operational control of this filling will mitigate the potential for odours during the short term duration of the filling operation.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-52 (Oil Filtration Plant)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 2,220m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-53 (Hodgefield Separator)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 2,220m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-54 (Tanker Dig Out Area and the Tank 18/19 Cleaning)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 10,000m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-55 (Paint De-packer)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 2,220m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-56 (Carbon Filter from the Ring Main)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 2,220m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

TABLE F.1(i): ABATEMENT / TREATMENT CONTROL

Emission point reference number: *A3-57 (Carbon Filter from the Effluent Treatment Tanks)*

Control[1] parameter	Monitoring to be carried out[2]	Equipment [3]	Equipment back-up
Air Flow Set Point: (up to 2,220m^3/hr)	Periodic Volumetric Flow Measurements	Flow Meter and Pitot Tube	Spare fan maintained on Site
Carbon Efficiency Set Point: Post Filter Emissions to atmosphere – 0.5kg/hr	Periodic VOC measurement of emissions to atmosphere	Portable PID Monitor	Carbon Media maintained on site. Carbon replaced once set point is reached.
Olfactometry Set Point: High or Moderate risk of odour nuisance off site.	Monthly assessment of source (sensory assessment at the sample port)	Trained Odour Assessor	Carbon Media maintained on site. Carbon replaced once set point is reached.

[1] List the operating parameters of the treatment / abatement system which control its function.

[2] List the monitoring of the control parameter to be carried out.

[3] List the equipment necessary for the proper function of the abatement / treatment system.

Query 10.

For the ring main, state why air will be mechanically drawn into the carbon filter (or TO) and how this affects the function of the ring main as a vapour balancing technique. For each of the other carbon filter installations, provide a similar analysis in the appropriate context of a drawn flow as opposed to a passive flow.

Response

In relation to the operation of the vapour balance ring main this will only release air/vapour to the RTO (or carbon filter in a contingency scenario) when the pressure in the vapour balance ring main exceeds the set point pressure (~7 millbar). The releases from the vapour balance ring main are facilitated by a pressure relief valve opening into the duct leading the RTO. The RTO will have a fan to ensure the air/vapours released into the feed duct are pushed into the combustion chamber. There is no impact on the vapour balance system in that the pressure relief valve seeks to maximise the volume of air retained within the ring main and minimise emissions to air. However there will be more vapours/air volume generated within the system than can be simply contained within the tanks and ducting (e.g. due to the heating of tanks) and therefore there will be a need for release of excess gas volume/vapours (to the RTO). In the contingency scenario where the RTO is not operating a carbon filter will provide abatement to emissions from the ring main and discharge through A3-56. Passive diffusion through the carbon filter is likely to be sufficient in this case and it may not be necessary to install a fan on the proposed carbon filter. A low flow fan (2,220m3/hr) fan is noted in the information supplied in relation to this emission source in the event that a fan is required for this source.

<u>Oil Filtration Plant (A3-52)</u>

In order to ensure there are no odours from the oil filtering room, headspace air from within the room is extracted by means of an extract fan to provide sufficient air changes to the room. The abatement system is currently a carbon filter but will be replaced by the proposed RTO. When the proposed RTO is operational the airflow from the oil filtering room will be controlled by means of baffles and/or a fan to ensure sufficient air exchanges are being provided to the oil filtering room.

In the contingency scenario (i.e. RTO not operating) a fan (other than that associated with the RTO) will provide extraction from the oil filtering room to the proposed carbon filter and ensure the level of extraction required is maintained (i.e. as it operates currently).

<u>Hodgefield Interceptor Carbon Filter (A3-53)</u>

This abatement system relies upon extracting headspace air from within the enclosed Hodgefield Interceptor. It is necessary to use a fan to provide sufficient air extraction from the headspace to contain fugitive emissions from this equipment. In particular it is necessary to regularly open the various inspection hatches on this so as to inspect its performance and check for free phase oil building up.

Tank Cleaning & Tanker dig out Carbon Filter (A3-54)

This abatement system relies upon extracting air from within the tanks to be cleaned or from the proposed Building (Tanker dig out/re-packaging) and therefore a fan is necessary to provide the appropriate level of air flow from these sources and provide ventilation for personnel working in these areas.

Paint de-packer (A3-55)

This odour abatement system relies upon extracting air from the enclosed Paint De-packer and therefore a fan is necessary to capture and draw air from the immediate area around the paint de-packing operation and direct it to the carbon filter. A passive approach in this case would not capture the potentially odorous air from the process as it is a relatively open process with fugitive type emission sources.

Existing (drum) carbon filters

Currently there are a number of drum sized (205 litre) carbon filters being utilised to provide odour abatement on emissions from existing tank vents. These are all passive air flows and do not utilise fans.

Query 11.

Describe the measures in place at the installation to prevent accidents and limit the consequences of accidents should they occur. In particular describe the measures in place to prevent accidents associated with the ring main and the tank balancing system, including associated mitigation and process equipment. Identify the location of any relevant pressure relief valves, flame arrestors and other key equipment, installed and proposed. Describe how the triggering of pressure relief valves or use of other key equipment will be logged.

Response*:*

Enva operate a Health & Safety management system accredited by SGS to OSHAS 18001 which provides a continuous improvement/risk reduction approach to the management of HSE. The activities at the facility are as part of the company's HSE management system routinely subject to a risk assessment and subsequent implementation of a safe system of work. The provision of a safe system of work typically involves development of a Standard Operating Procedure or Work Instruction, training of personnel and the provision of appropriate equipment to carry out the activity (including PPE).

Risk assessments include where appropriate Hazard & Operability studies (HAZOPs) and Explosion Protection Documents (EPDs).

The company operates an incident reporting system where all HSE incidents including 'near-misses' are recorded and investigated appropriately. This results in the development of appropriate corrective and preventative actions to ensure all the available learning from the incident is identified and put into practice to prevent incidents from occurring.

The HSE management system also has an emergency preparedness aspect which aims to identify potential emergency scenarios at the facility and both prevent these but also plan for a response to these scenarios. An example of the continuous improvement & risk reduction programme would include the recent installation of lightning protection on the tank farm to minimise the potential for fire/explosion from a lightning strike.

In relation to the design of the ring main this has been conducted with assistance from consulting engineers Fingleton White who have previous experience in the design of hydrocarbon vapour recovery systems. The main design safety features include:

- Ring main ducting designed to withstand range of operational pressures (-7.5 to 10 mbar);
- Continuous monitoring of the internal pressure within the ring main duct (SCADA);
- Control valve to relieve any excess pressure in the ring main and discharge to the RTO (valve opens at 7mbar and closes again once the pressure drops to 5 mbar);
- Emergency pressure relief valve (PRV 1 to relieve pressure if the Control Valve fails (valve opens at 9mbar and closes again at 7mbar); This valve is proposed to be located upstream of the control valve and vent at a height to ensure safe dispersion subject to final design during installation;
- Multiple (4 no.) pressure/vacuum relief valves to allow air to enter the ring main and prevent excess vacuum building up within the system. Vacuum pressure valves

are set to open at a pressure of 0mbar; The location of these will be determined during installation but as air only enters by these valves there is no environmental significance in their location (as they only facilitate air entering the duct).

The triggering (i.e. opening to release excess pressure build up) of the emergency pressure relief valve is not envisaged to be a common occurrence but will in any case be recorded using the SCADA system.

Query 12.

Provide further justification why the storage tanks used by Emo are not proposed for inclusion in the ring main nor treatment system for off gases. Describe the vents in place on these tanks. State the concentration of VOC in off gases as measured at these tanks vents.

Response

There are 8 tanks located within the Enva tank farm that are currently used to store virgin fuels for a third party (Emo). Each of these tanks is 50m^3 in volume and is used to store either kerosene or gas oil. These tanks are not heated and are not used to store heated product at any time and hence the potential for fugitive emissions is limited. Each of these tanks is fitted with a 75mm vent port for safety reasons to prevent any pressure build up within the tank.

It is not proposed to connect these tanks to the ring main for two main reasons:

1. As these tanks contain virgin oils owned by a third party, these oils are kept separate from the Enva waste and recovered oils to prevent potential cross contamination between the oils. A connection to the ring main would create a potential direct pathway between the tanks and hence this is not proposed.

2. A review of the relevant BAT guidance on the storage of oils illustrates that, as per industry standard practice, oil storage tanks (for such products in such volumes) do not require a recovery system to be installed. The 2014 "BAT Conclusions for the Refining of Mineral Oil and Gas" states the following in relation to storage of liquid fuels:

   BAT 49. In order to reduce VOC emissions to air from the storage of volatile liquid hydrocarbon compounds, BAT is to use floating roof storage tanks equipped with high efficiency seals or a fixed roof tank connected to a vapour recovery system.

   The BAT note also provides a definition of "volatile liquid hydrocarbon compounds" and defines these as "*petroleum derivatives with a Reid vapour pressure (RVP) of more than 4 kPa, such as naphtha and aromatics*".

   The SDS for Kerosene product states a Vapour Pressure of 3 kPa @20°C and the Gas Oil has a vapour pressure of <0.1 kPa @20°C. Both of these products have vapour pressures lower than that defined in the BAT and, as such, neither would be classified as "volatile" under the 2014 BAT.

   As a result, BAT 49 does not apply to the storage of the EMO products and there is no best practice requirement for fitting these tanks with any form of vapour recovery (such as the ring main). There are no other relevant BAT conclusions that require these tanks to be fitted with any such control mechanism.

This is consistent with industry norms where heavier oils like Gas Oil and Kerosene are stored in such tanks and without the need for vapour recovery or other abatement. Applying a standard to Enva that is higher that legislated and industry best practice may put the company at a competitive disadvantage in the market.

Given the two reasons outlined above, in particular the absence of any BAT requirement for this abatement, it is not proposed to connect these tanks to the ring main.

Query 13.

State whether the installation is an establishment to which the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations apply.

Response

The installation has been notified as a Lower Tier site to the Health & safety Authority (HSA) under the above regulations, this is due to the storage inventory of Petroleum Products (specifically alternative fuels). The HSA have however on review of the notification indicated that the facility does not fall under the above regulations.

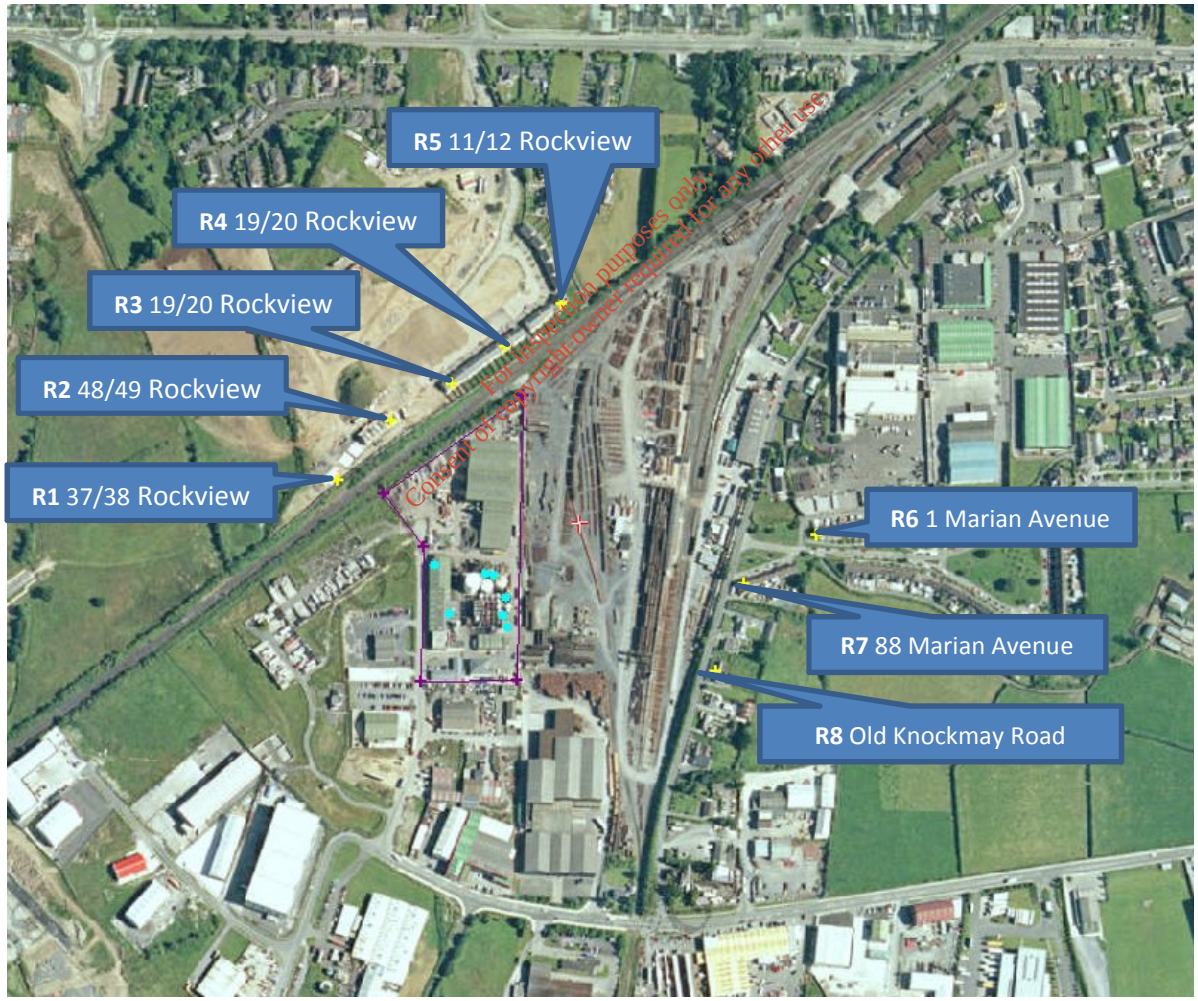
Query 14.

Provide contour plots for ground level concentrations for all paramete4s and scenarios from air dispersion model calculations, cumulative from all emission points, existing and proposed. Show the location of the installation boundary and sensitive receptors on all contour plots. The following earlier information refers:

- Item 17 of response dated 17/5/206;
- Items 15 and 29 of response dated 6/9/2016

The following sections provide the requested contour plots for each of the scenarios requested. For clarity, the tabulated results for each of the modelling scenarios as reported are also included. The site boundary is outlined in purple and the figure below shows the location of the discrete receptors modelled in the various scenarios.

Figure 14.1: Location of site boundary and discrete receptors



Modelling Output from Air Dispersion Modelling Report prepared for Item 17 of the response dated 17/05/2016

Scenario: Total VOCS from the RTO Only

Reference	Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	Comparator Limit ($\mu g/m^3$)
R1	0.34	0.136	0.476	5
R2		0.186	0.526	
R3		0.283	0.623	
R4		0.308	0.648	
R5		0.287	0.627	
R6		0.249	0.589	
R7		0.259	0.599	
R8		0.261	0.601	

Table 14.1: Results of VOC Modelling from the RTO(annual averages)

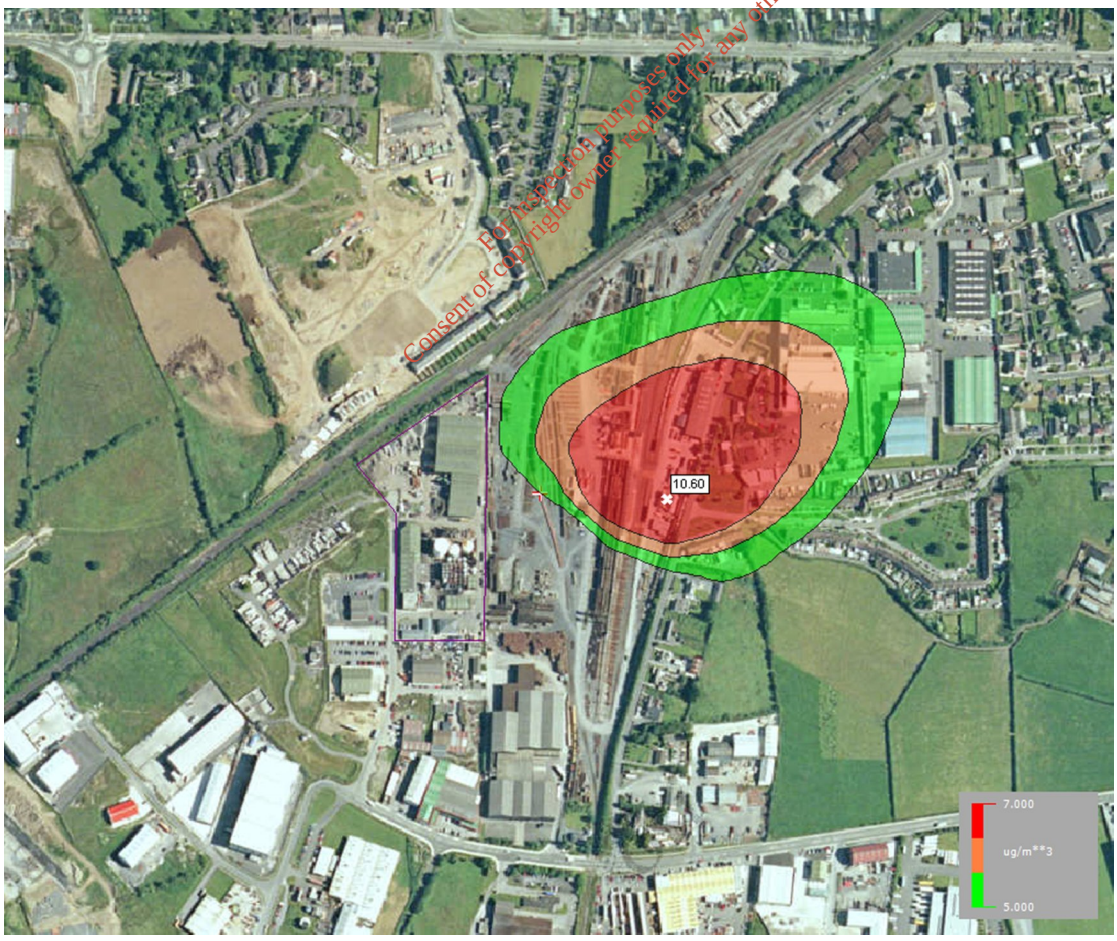
Figure 14.2: Results of VOC Modelling from the RTO (annual averages but excludes background)

Scenario: Oxides of Nitrogen from the RTO only

Reference	Background ($\mu g/m^3$)	RTo Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	Limit ($\mu g/m^3$)
R1	16	1.81	17.81	40
R2		2.03	18.03	
R3		2.78	18.78	
R4		3.67	19.67	
R5		4.04	20.04	
R6		7.00	23.00	
R7		6.12	22.12	
R8		3.51	19.51	

Table 14.2: Results of NO_2 Modelling from the RTO (annual averages)

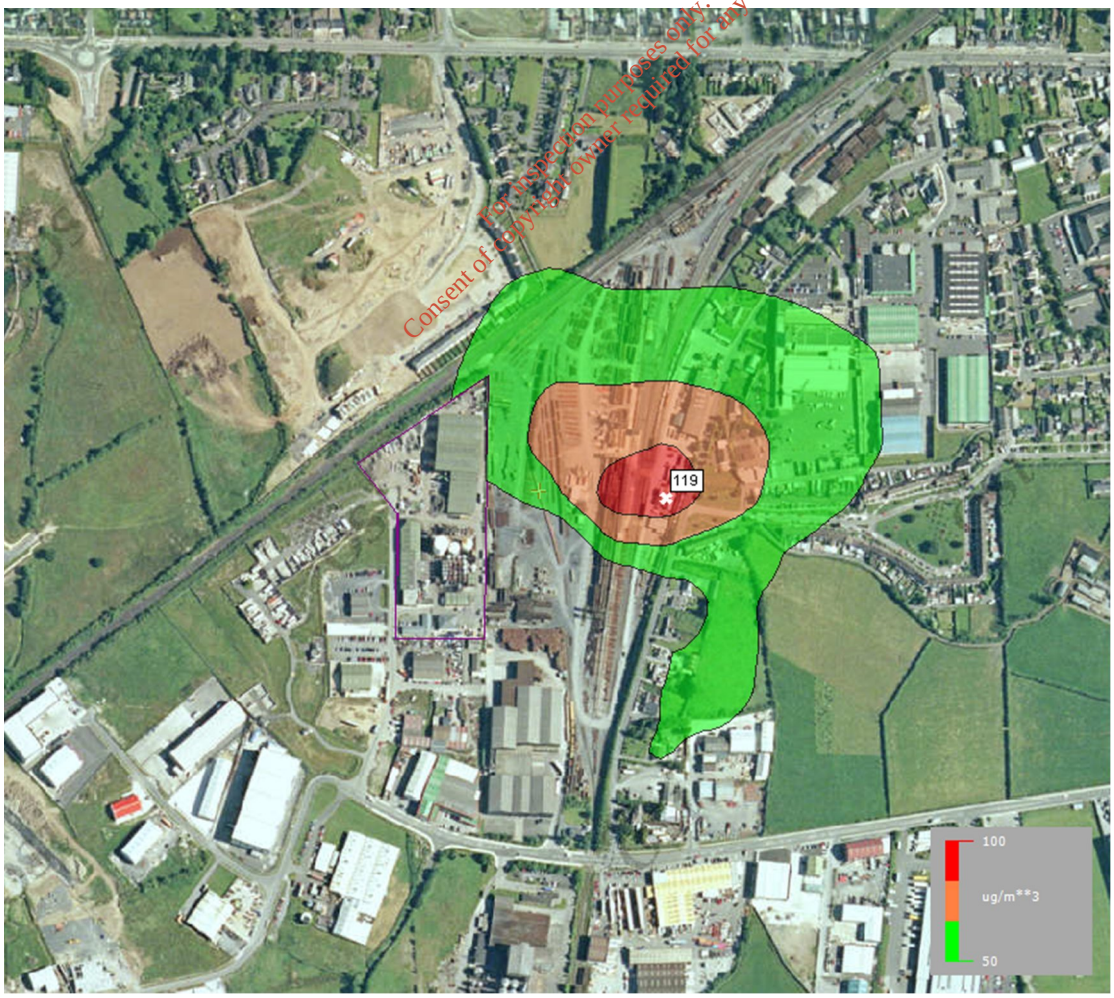
Figure 14.3: Results of NO_2 Modelling from the RTO (annual averages excluding background)



Reference	Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	Limit ($\mu g/m^3$)
R1	16	31.67	47.67	200
R2		33.68	49.68	
R3		40.43	56.43	
R4		49.15	65.15	
R5		53.55	69.55	
R6		73.78	89.78	
R7		61.30	77.30	
R8		42.12	58.12	

Table 14.3: Results of NO_2 Modelling from the RTO (1-hour averages as 98th percentile)

Table 14.4: Results of NO_2 Modelling from the RTO (1-hour averages as 98th percentile excluding background)



Scenario: Carbon Monoxide from the RTO

Reference	Background (mg/m^3)	RTO Impact (mg/m^3)	Cumulative Impact (mg/m^3)	Limit (mg/m^3)
R1	0.5	0.030	0.530	10
R2		0.033	0.533	
R3		0.033	0.533	
R4		0.032	0.532	
R5		0.032	0.532	
R6		0.037	0.537	
R7		0.053	0.553	
R8		0.047	0.547	

Table 14.4: Results of CO Modelling from the RTO (8-hour averages)

Table 14.5: Results of CO Modelling from the RTO (8-hour averages excluding background)

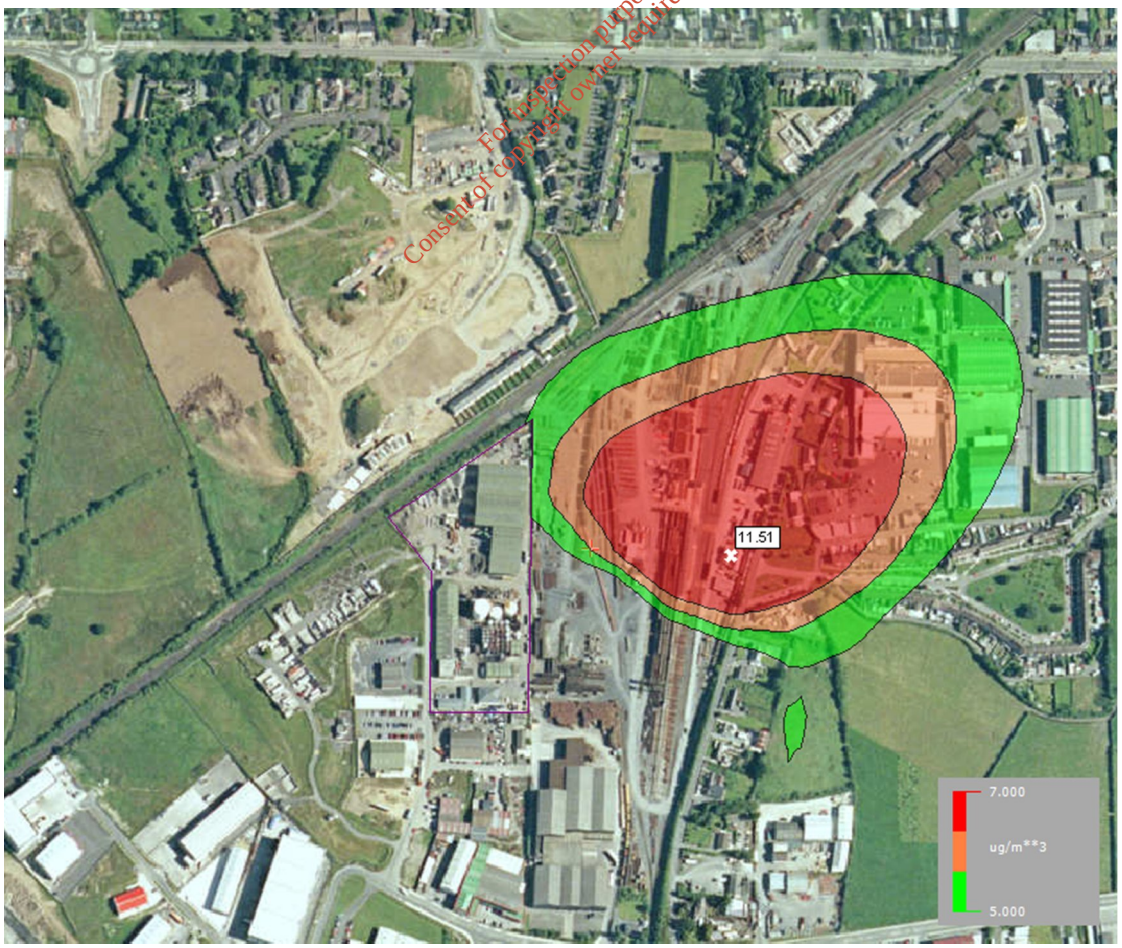
Modelling Output from Air Dispersion Modelling response prepared for Item 15 of the response dated 06/09/2016

Scenario: Nitrogen Dioxide from the RTO and Boiler

Reference	Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Boiler Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	Limit ($\mu g/m^3$)
R1	16	1.81	0.17	17.98	40
R2		2.03	0.20	18.23	
R3		2.78	0.29	19.07	
R4		3.67	0.32	19.99	
R5		4.04	0.28	20.32	
R6		7.00	0.32	23.32	
R7		6.12	0.35	22.47	
R8		3.51	0.34	19.85	

Table 14.5: Results of NO_2 Modelling from the RTO and Boiler (annual averages)

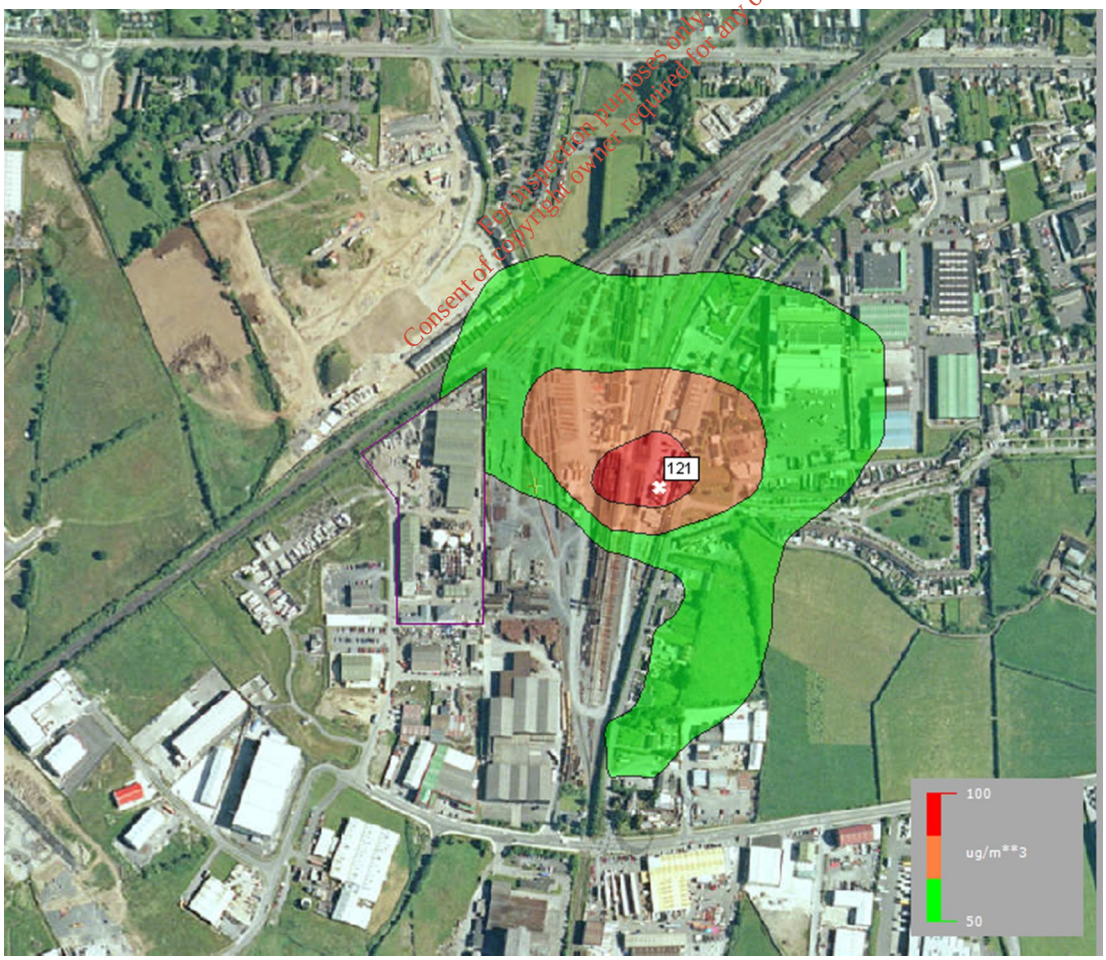
Figure 14.6: Results of NO_2 Modelling from the RTO and Boiler (annual averages excluding background)



Reference	Background ($\mu g/m^3$)	RTO Impact ($\mu g/m^3$)	Boiler Impact ($\mu g/m^3$)	Cumulative Impact ($\mu g/m^3$)	Limit ($\mu g/m^3$)
R1	16	31.67	7.90	55.57	200
R2		33.68	7.61	57.29	
R3		40.43	8.03	64.46	
R4		49.15	8.42	73.57	
R5		53.55	7.88	77.43	
R6		73.78	6.20	95.98	
R7		61.30	6.98	84.28	
R8		42.12	7.95	66.07	

Table 14.6: Results of NO_2 Modelling from the RTO and Boiler (1-hour averages as 98th percentile)

Table 14.7: Results of NO_2 Modelling from the RTO and Boiler (1-hour averages as 98th percentile)



Query 15.

Provide an assessment of the potential noise impact arising outside the installation boundary as a result of the proposed soil washing activity described in item 7 of your response dated 17 may 2016. Consider the potential impact in the context of doors open and closed in the soil building.

Response

As noted in the May 2016 submission, the proposed process for washing of soils & grits will utilise specialist processing plant that will likely include trommels, centrifuges and washing plant. This will be a bespoke design to suit the materials to be treated, throughputs and outputs required by Enva.

At the time of lodging this response to the EPA, Enva have not concluded any procurement discussions with suppliers of this equipment and, as such, it is not possible at this time to provide an accurate simulation of the noise impact of the proposed plant as requested.

Enva proposes that in advance of the installation and operation of the plant at the site, Enva will supply the following information to the EPA to resolve this request:

- A noise modelling report on the impact of the plant during various operations which will be carried out.
- A description of the washing plant and all elements of the plant will be provided along with source characteristics of the key plant (sound power levels and tonal components).
- Details of the simulated noise impact modelling.
- Details of the simulated impact of the plant arising outside the installation boundary, i.e. at the nearest noises sensitive receptors (such as the properties in Rockview) who may be impacted by the plant.
- An analysis of the potential for noise breakout from the building under the current building layout followed by an analysis of the need for further mitigation through use of additional barriers, enclosures, installation of doors on the building, etc.
- Details of any other mitigation measures relevant, e.g. restriction on operating hours, etc.

Enva suggest that in the absence of any site specific relevant information at this point, the above specified works are required as a condition of the revised licence in advance of the operation of the washing plant,

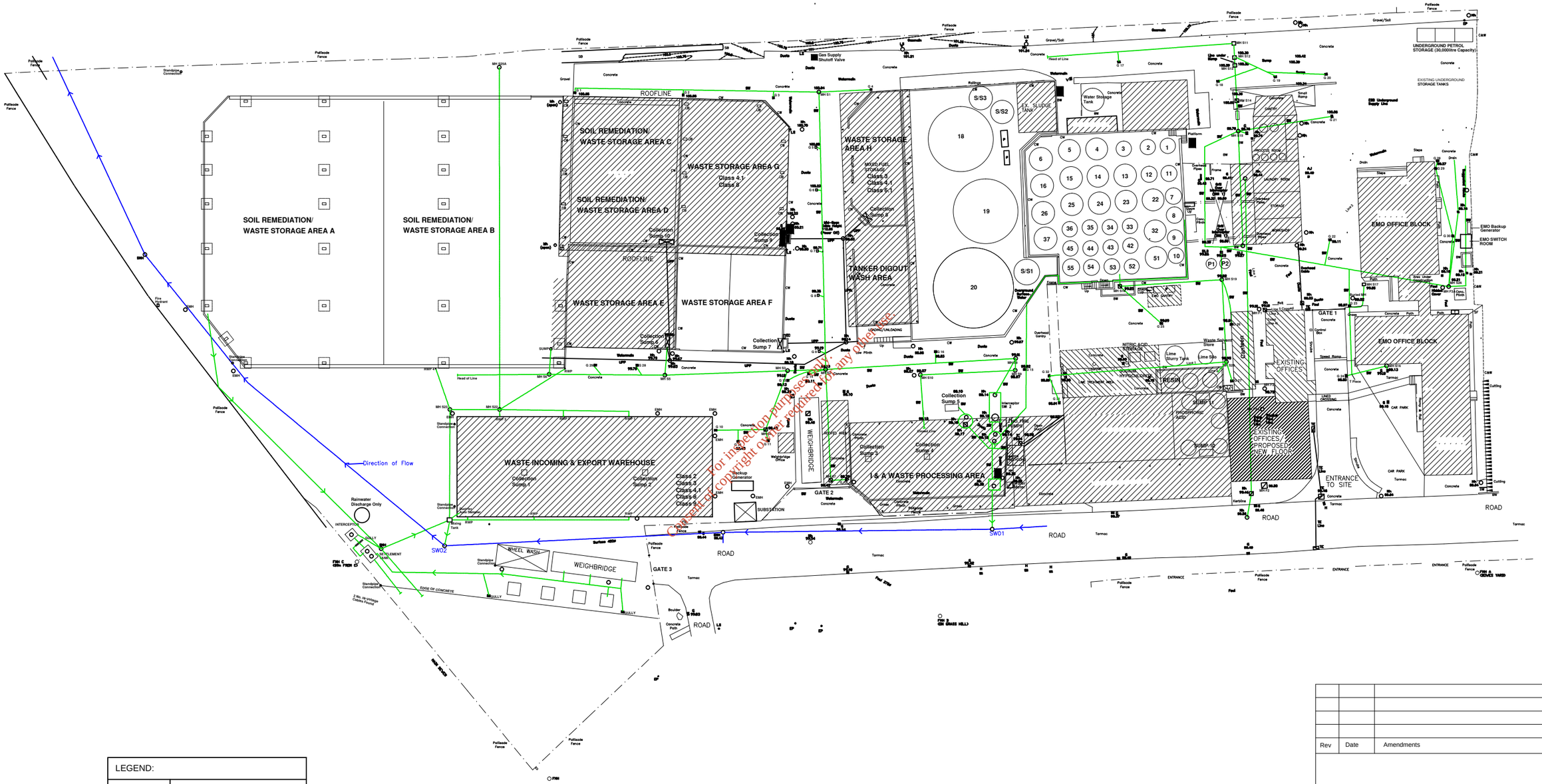
Query 16.

Provide a drawing showing the path followed by stormwater discharged at SW1 and SW2 to local water courses and the River Triogue.

Response

Figure 16.1 over leaf shows where the sites drainage system connects to the municipal storm drain.

In relation to mapping the path outside the facility details were requested from Laois County Council and the attached maps were provided, however these do not provide sufficient details to accurately map the flow of discharged stormwater to the River Triogue. The blue lines depicted on these maps reportedly represent the mapped storm drains.



LEGEND:

———	Surface Water (SW)
———	Municipal Storm Drain (MSD)

Rev	Date	Amendments

Enva Ireland Limited
Cronnlnam Industrial Estate
Portlaoise, Co. Laois
www.enva.ie
Tel: 057 8678600
Callsave: 1850 504 504
Fax: 057 8678699
Email: portlaoise@enva.ie

Title

Figure 16.1

Map showing Connection Points to Municipal Storm Drain

Drawn by.	Checked by.	Scale.	Sheet No.	Date.
CK	AP	1:750 @ A3	8	10-11-2016

Drawing no.

ENV-1605-16

11th October 2016

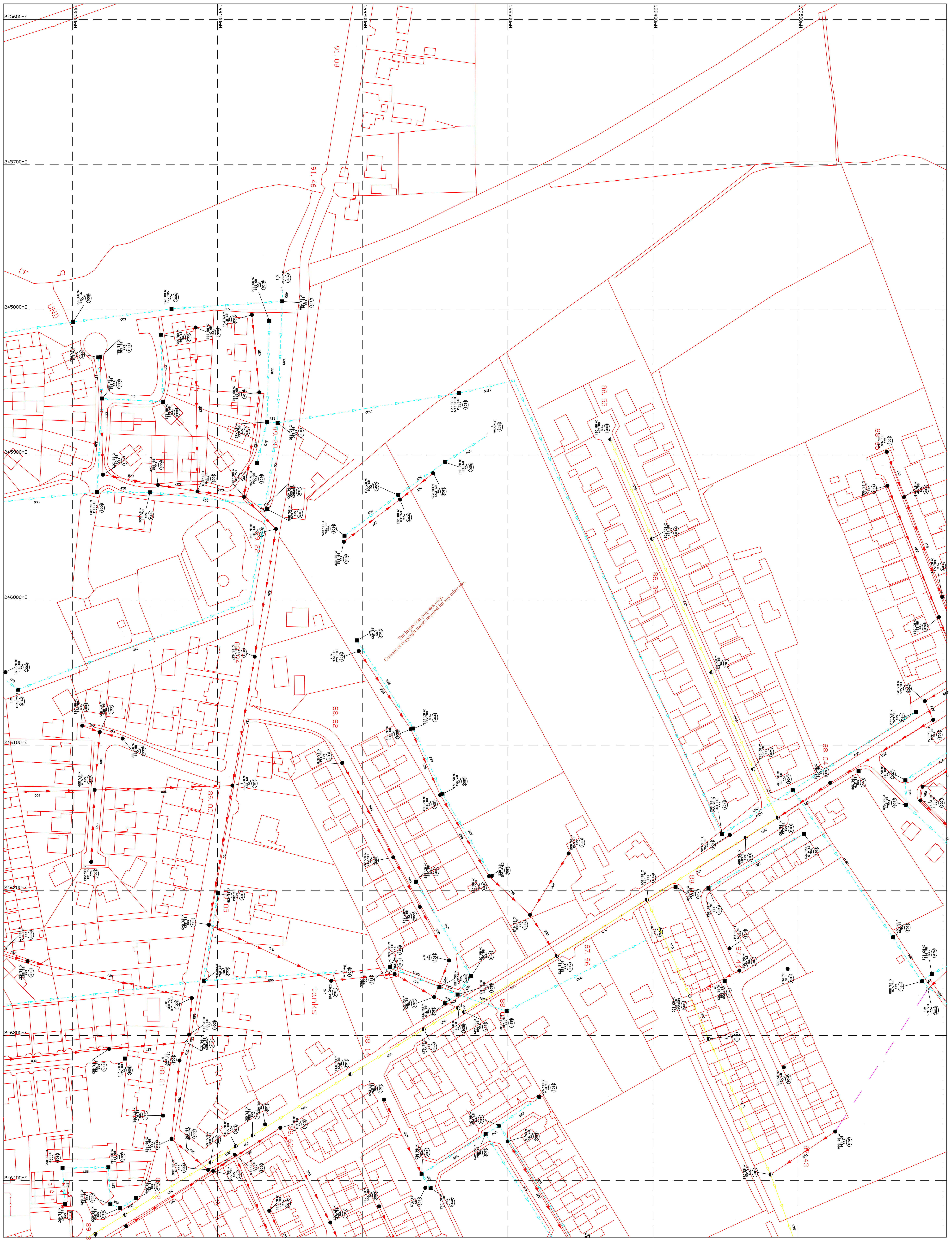
MAPS OF

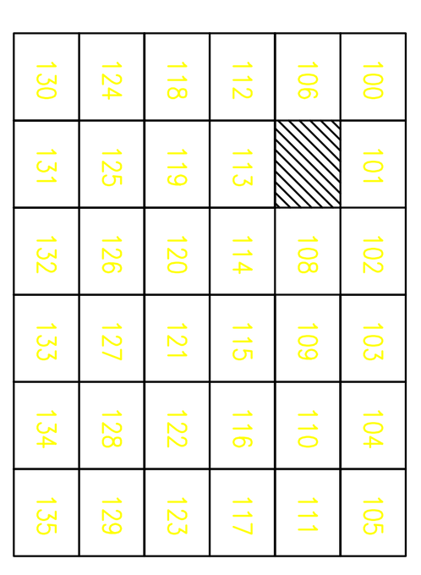
MUNICIPAL STORM DRAINAGE NETWORK

AS PROVIDED BY

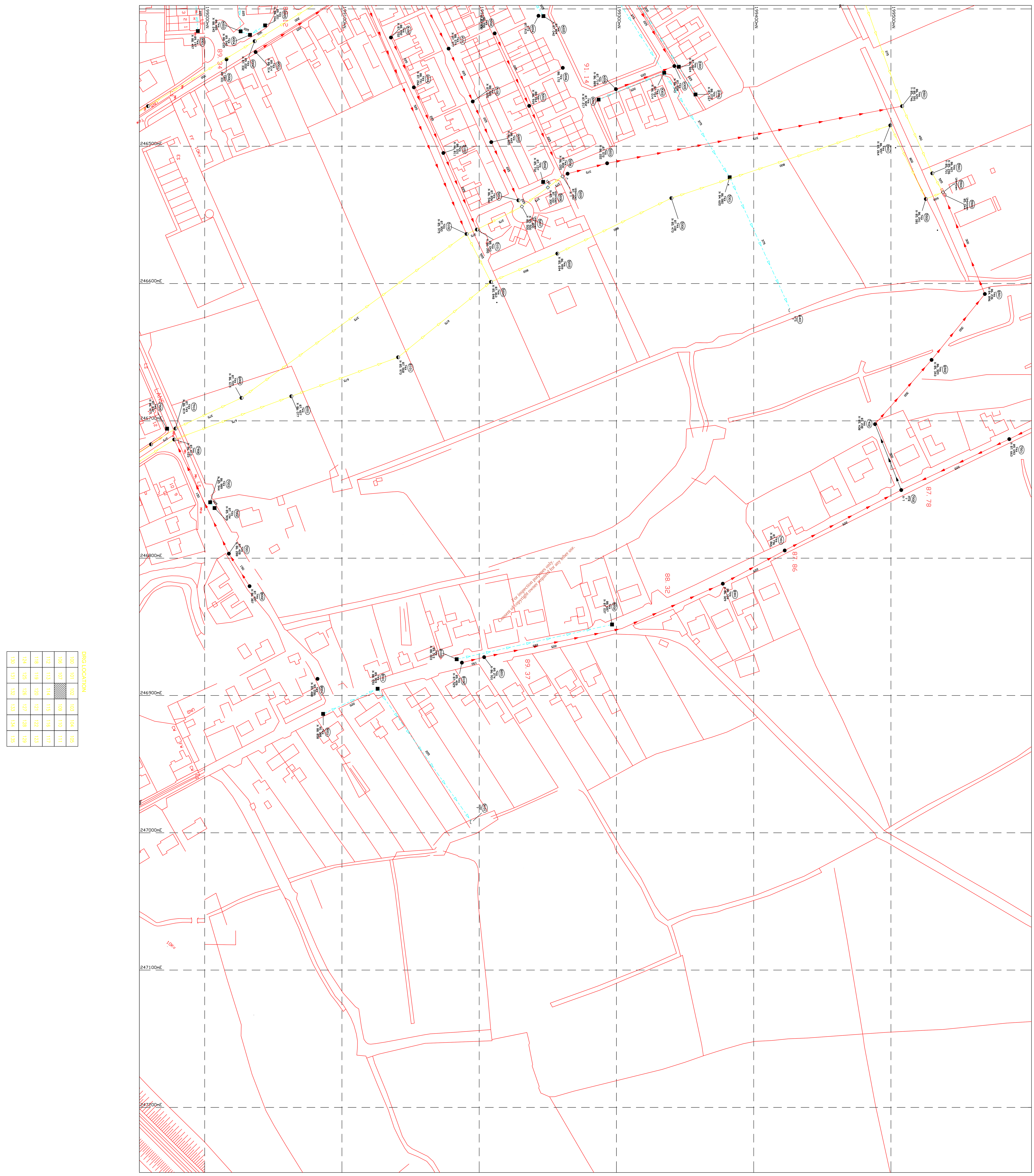
LAOIS COUNTY COUNCIL

(7 NO. BLOCKS)



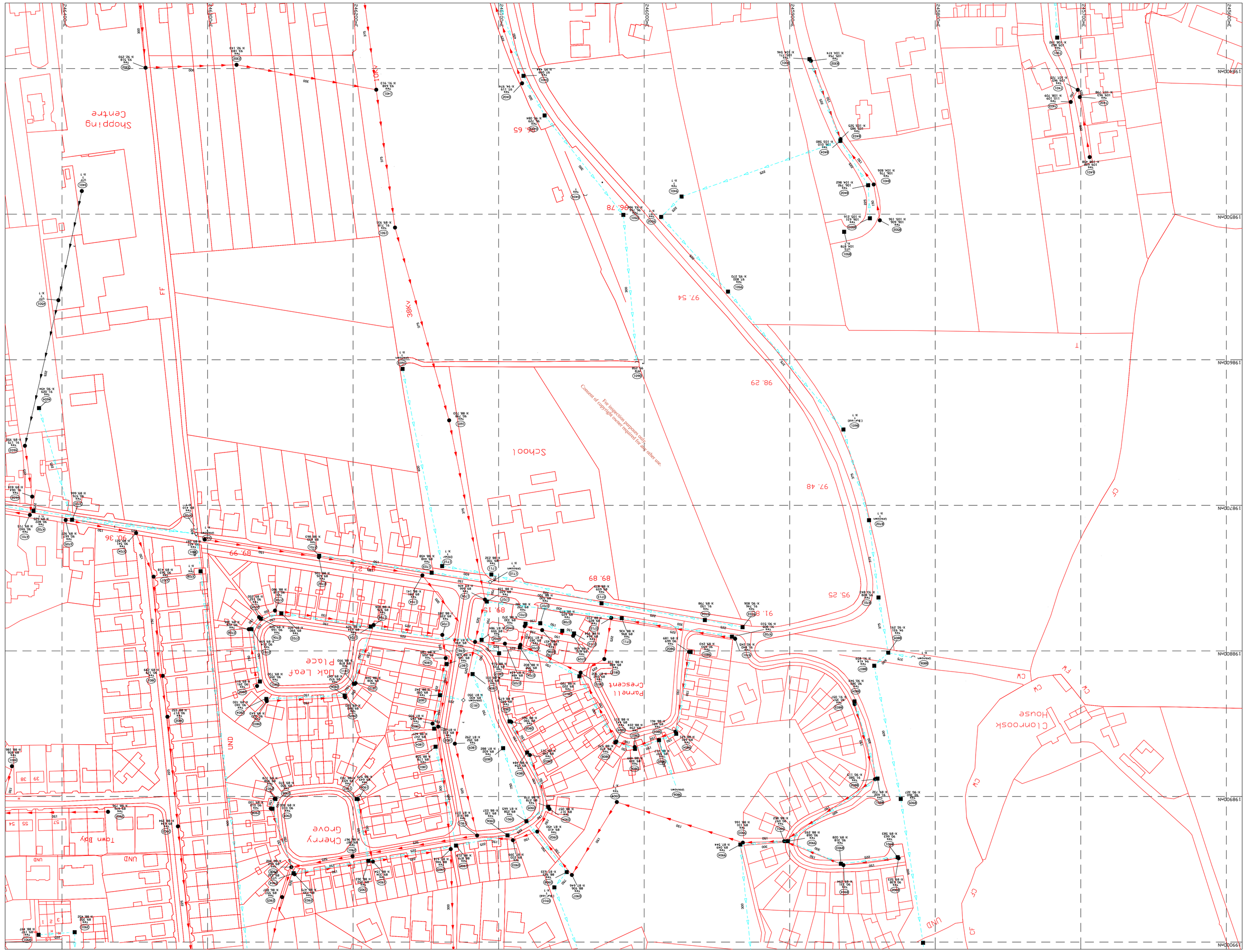


USA/107



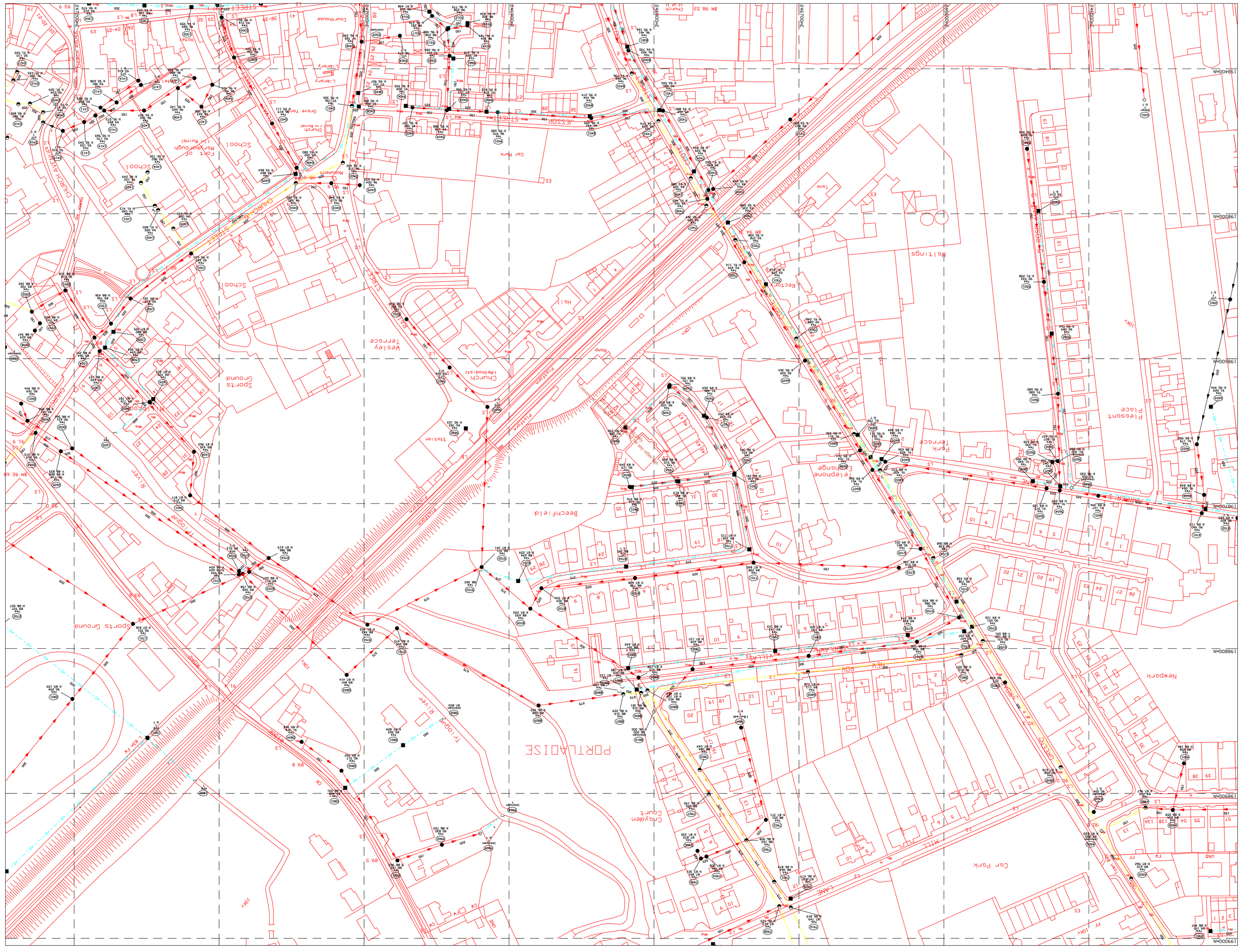
DRG LOCATION

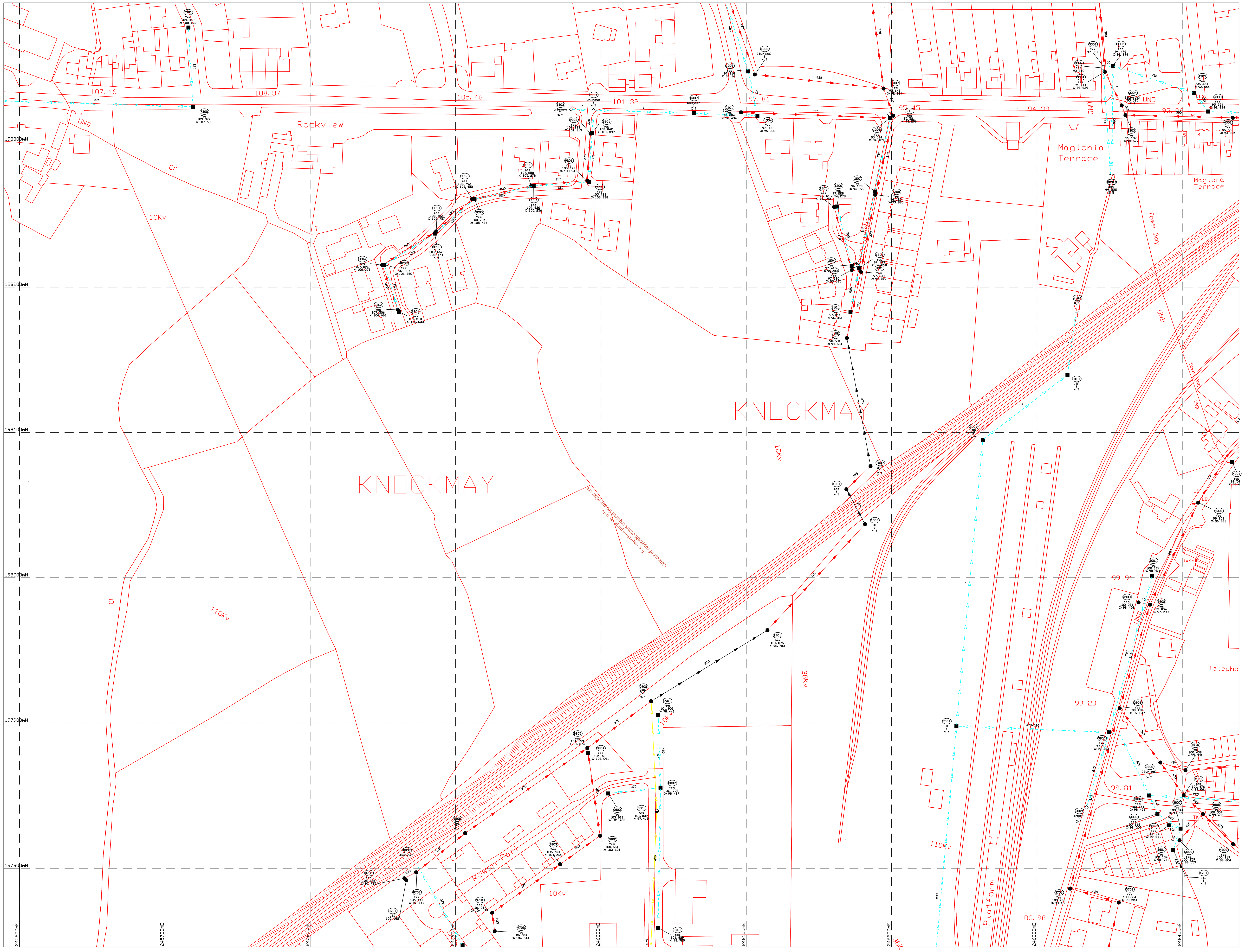
100	101	102	103	104	105	
106	107	108	109	110	111	
112		114	115	116	117	
118	119	120	121	122	123	
124	125	126	127	128	129	
130	131	132	133	134	135	

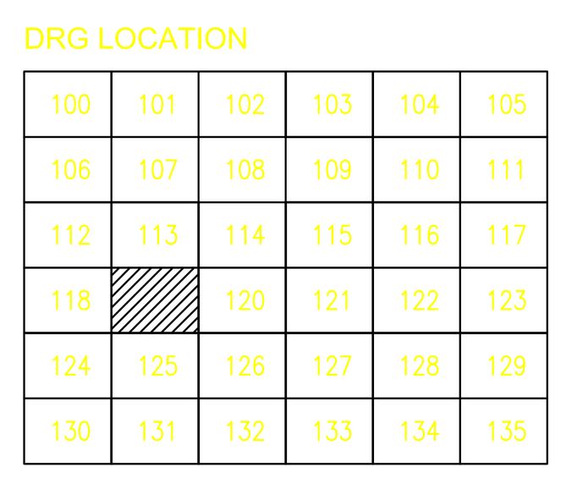


DRG LOCATION

100	101	102	103	104	105
106	107	108	109	110	111
112	113		115	116	117
118	119	120	121	122	123
124	125	126	127	128	129
130	131	132	133	134	135



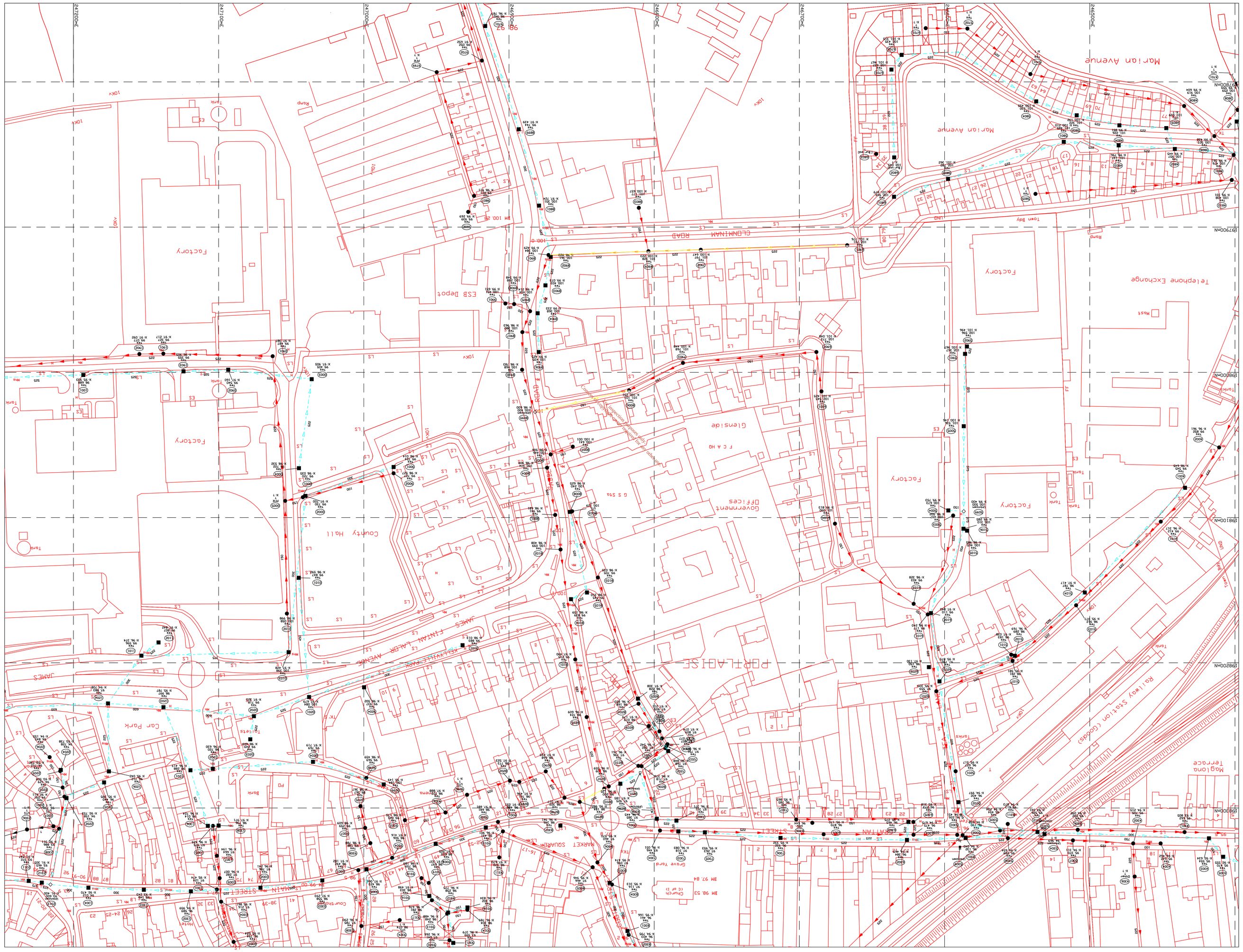


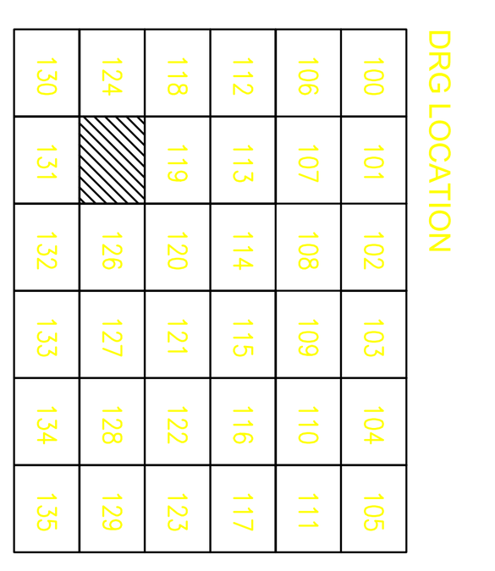


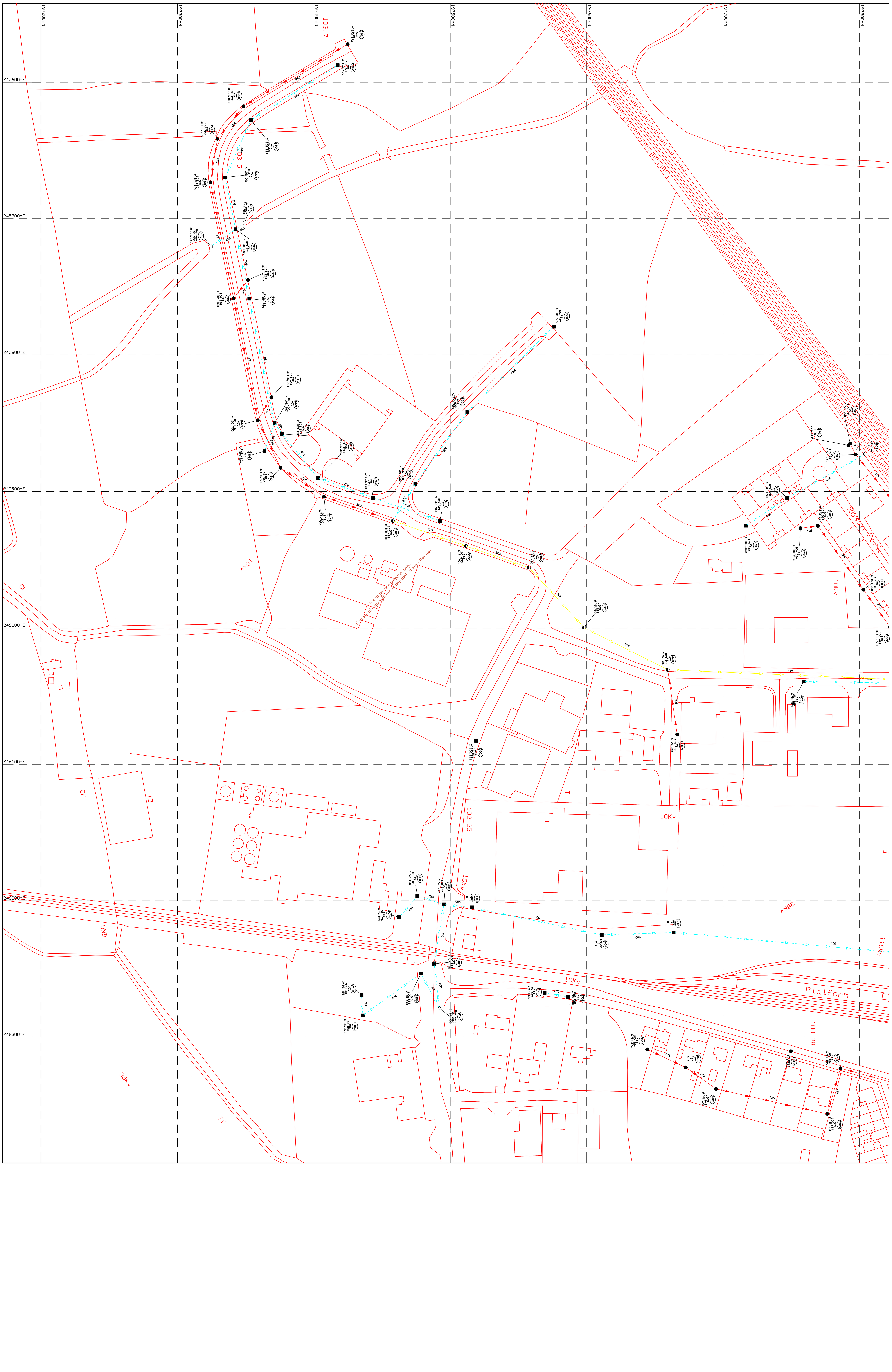
USA/119

DRG LOCATION

100	101	102	103	104	105
106	107	108	109	110	111
112	113	114	115	116	117
118	119		121	122	123
124	125	126	127	128	129
130	131	132	133	134	135



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246000mE
246100mE
246200mE
246300mE
Platform
10Kv
38Kv
103.5
103.7
102.25
100.98

USA/125

Query 17.

In relation to stormwater discharge at SW1 and SW2, please address the following issues:

a. *State whether the discharges at SW1 and SW2 comprise any source other than stormwater.*
b. *State what preventative measures have been or are proposed to be put in place to ensure that stormwater is, to the extent possible, uncontaminated upon discharge.*
c. *Propose revised trigger levels for implementation at discharge points SW1 and SW2 that are demonstratively protective of water quality and for the following parameters: TOC, COD, suspended solids, pH. Other parameters may be proposed in addition.*
d. *State whether continuous monitoring of TOC (or other appropriate parameters) is appropriate at SW1 and SW2.*

Response

Responses to each of the stormwater queries are presented in the following paragraphs:

Query a

Stormwater discharges from SW1 & SW2 are comprised of predominately stormwater with periodic bundwater discharges (includes boiler blow down – see note below) also included in SW1. There are no other process water discharges to the storm network and these are discharged to the effluent system with no connectivity to the storm network.

Stormwater across the site is separated into two catchments as follows:

- SW1 serves the southern end of the site, collecting surface water run off around the waste oil processing plant and tank farm and areas external to the following storage areas to C, D, E, F, G, K, L & M.
- SW2 serves the northern end of the site collecting surface water from the external areas adjacent to soil treatment areas (Area A & B) and Area J.

As required following heavy rainfall, bundwater from the main tank farm is periodically discharged to the storm network. Bundwater is itself largely comprised of stormwater but also includes some condensate and blowdown from the steam raising boiler system. The condensate and blowdown consists of mains water that has been treated (e.g. softened) for use in the generation of steam to heat the tanks. Steam produced by the boiler is conveyed throughout the tank farm by a network of pipes (steam coils) and while in most cases it is captured and returned to the condensate return tank currently there are 2 no. condensate lines that do not return to the condensate return tank and discharge into the bund. These are planned to be connected into the condensate return tank with the works expected to be completed by March 2017. The steam system also 'blows down' to remove some condensate and prevent any build up of particulate matter in the boiler.

Query b

There are a number of measures employed across the facility to minimise contamination of the stormwater discharge including:

- Separation of process effluent arising from all waste processing for either on-site treatment and discharge to sewer or export as necessary;
- Detergents are not used to clean yard surfaces unless these are fully captured and returned to process effluent (sewer discharge/off site treatment);
- Vehicle washing (involving detergents) is carried out off site at a commercially operated facility and not on the Enva site;
- Facility wheel wash operates on a closed loop system without discharging to storm drains;
- Roofing is employed over most waste storage/processing areas to prevent contamination of rainwater (additional roofing is proposed e.g. mixed fuel storage);
- Contaminated run off in the tanker dig out bay is all pumped to process, this area is to be roofed and hence will reduce the volume of contaminated stormwater generated;
- A road sweeper is regularly employed at the facility to remove surface grit/solids from facility roadways and help minimise this from entering the stormwater system;
- The sites stormwater drainage infrastructure includes silt traps in each gully as well as large underground silt traps and class 1 interceptors to remove solids and oil residues from stormwater discharges. These are subject to routine maintenance to remove settled residues and hence minimise the discharge to the municipal system.
- Discharges of stormwater are subject to a set of Trigger Values specified in Condition 6.4.1 of the current licence (W0184-01). While these trigger values are set for SW1 in the condition, they have been employed for both discharge points.

Currently bundwater is automatically pumped out of the bund (to the sites stormwater drainage system) unless the pump system detects oil to be present. As part of the ongoing improvements on site, Enva propose that bundwater will be analysed for COD prior to discharge to the sites stormwater infrastructure. A trigger value of 187mg/l of COD (revised Trigger Value for SW1) is proposed as the trigger value for diverting bundwater to the sites effluent treatment plant (see following note on trigger values) or alternatively discharged directly to sewer.

A series of additional mitigation measures are presented in the NIS prepared in response to Item 18.

Query c

A series of existing trigger values were set by the EPA for Storm Water Emissions for SW1 as part of Condition 6.4.1 of the existing licence and these are shown in the following table:

Parameter	**Trigger Value**
BOD	25mg/l
COD	250mg/l
Oils, Fats and Grease	15mg/l
Suspended Solids	60mg/l

These trigger values have since been employed on site for both SW1 and SW2 and all data from 2014 to date illustrates compliance with the trigger values at both SW1 and SW2. A revised set of trigger values have been requested as part of this review.

The EPA "Guidance on the setting of trigger values for storm water discharges to off site surface waters at EPA licenced IPPC and waste facilities" (2012) has been used as the basis for revising the trigger values. The EPA Guidance stresses that "*the parameter for which a trigger level is defined should be an appropriate indicator for on-site sources of contamination*". Given the nature of operations at the Enva facility, COD and Suspended Solids are considered the most appropriate

parameters for setting trigger levels. The EPA has also requested TOC and pH trigger values should also be developed.

The action values for pH are based on the range specified in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 271 of 2009). pH is an indicator of acidity or alkalinity of the surface water which will be discharged from the site. The pH of stormwater is slightly higher than that of rain water due to the alkalinity that stormwater picks up when coming into contact with paved surfaces. pH may be readily monitored on site and this allows for early action and intervention if the trigger range is breached.

There are no limits for COD or Suspended Solids listed in the Surface Water Regulations (European Communities Environmental Objectives (Surface Waters) Regulations 2009, S.I 272 of 2009) for comparison. The European Communities (Quality of Salmonid Waters) Regulations, (S.I. 293 of 1988) and the Freshwater Fish Directive (78/659/EEC) set an annual average limit of 25mg/l limit on Suspended Solids but these are in the receiving water body and do not relate to water discharges.

In the absence of direct standards for COD and Suspended Solids, the historical monitoring results from 2015 and 2016 have been compiled to allow for the determination of relevant trigger values in accordance with the EPA Guidance. Both parameters are sampled on a weekly basis ensuring a significant dataset (104 samples per discharge) is employed and results have been reviewed to generate trigger levels based on the average plus two standard deviations (warning level) and average plus three standard deviations (action level) as per EPA Guidance. The results for SW1 and SW2 are presented in the following tables. Both COD and Suspended solids may be tested in the on-site laboratory for compliance with the trigger values. This allows for early action and intervention if the trigger range is breached.

Parameter	COD Values (mg/l)	Suspended Solids (mg/l)	Rationale
Warning Value SW1	106	45	Average + 2 SD
Action Value SW1	187	58	Average + 2 SD
Warning Value SW2	102	45	Average + 2 SD
Action Value SW2	128	59	Average + 2 SD

Total Organic Carbon (TOC) is not currently monitored at the discharge points SW1 and SW2. Mineral oil is tested by an external laboratory on a monthly basis and a trigger value of 5mg/l is applied and all data from 2014 to date illustrates compliance with this trigger value. The EPA have requested that trigger values be established for TOC for discharge points SW1 and SW2 however, there are two principle reasons why this cannot be carried out at this point:

- The absence of any baseline TOC information from the discharge points prohibits the development of site specific trigger values as per the EPA Guidance 2012. Unless this information is gathered over a 12 month period these trigger values cannot be accurately quantified.
- There are no limits for TOC listed in the Surface Water Regulations or any other environmental regulation for water quality. As such, a generic value for the protection of the environment cannot be applied as a trigger. TOC is listed as an indicator parameter in

the European Communities (Drinking Water) Regulations 2007, but no limit is set and this is not relevant to the protection of water quality.

Given the above constraints it is not possible to determine a trigger value for TOC based on the information at hand and it is not considered necessary or appropriate, it is therefore proposed to proceed with trigger values for COD, Suspended solids and pH only.

The summary of the proposed trigger values (warning and action values) for all parameters that are applicable to the site are summarised in the table below. These trigger values have been calculated based on the EPA's Guidance.

Parameter	Warning Value		Action Value	
	SW1	SW2	SW1	SW2
Suspended Solids (mg/l)	45	45	58	59
COD (mg/l)	106	102	187	128
pH (pH Units)	-	-	6-9	6-9

Query d

Notwithstanding the absence of any reliable TOC trigger value as outlined above, there are a number of reasons why the use of a continuous TOC analyser on the SW1 and SW2 discharges is not required.

The EPA guidance states that the parameter for which a trigger level is defined should be an appropriate indicator for on-site sources of contamination – given that both COD and Suspended Solids will provide the best indication of potential sources of on-site pollution and well established trigger values have been employed for these parameters, it is not necessary to include TOC as an additional parameter. In addition, the absence of any site specific or generic trigger value that may be employed for TOC, the installation of a TOC analyser would be redundant at these discharge points.

The site houses two Class I full retention interceptors at the site and, as such, the risk of significant discharges of organic material is low. The interceptors are regularly cleaned and maintained and the results of the monthly mineral oil testing illustrates that for circa 79% of samples there is no mineral oil detected in the discharge. For the remaining 21%, the levels are below the current trigger value.

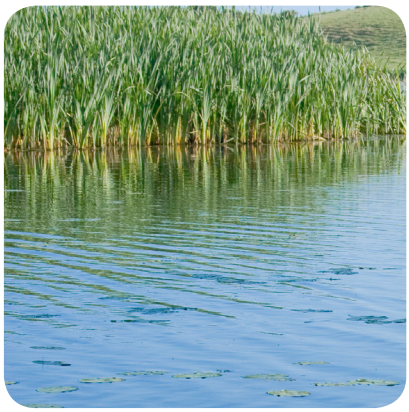
Finally, the BAT for the Waste Treatment Industries (August 2006) does not impose any requirement for continuous TOC analysis of stormwater and there is no associated BAT emission limit. In the absence of a best practice recommendation for installation of this meter, to request the site to install a meter would be contrary to the need for BAT guidance for licensing.

In short, given the existing controls, the revised trigger values for the most appropriate parameters (COD and Suspended Solids) and the low risk for any TOC discharge, the installation of such an analyser would offer little environmental benefit for excessive cost. Enva is committed to the ongoing improvement of discharges from the site as per the list of mitigation measures listed in the NIS (refer response to Item 18)

Enva Ireland Ltd.

Natura Impact Statement

MDE0973Rp0030 (November 2016)





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Enva Ireland Ltd. Portlaoise

Natura Impact Statement

Document Control Sheet

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Project Title:	EPA Licence Review for Enva, Clonminam Industrial Estate, Portlaoise, Co. Laois
Document Title:	Natura Impact Statement, Enva Portlaoise, Co. Laois.
Document No:	MDE0973Rp0030

Text Pages:	60	Appendices:	1

Rev.	Status	Date	Author(s)		Reviewed By		Approved By	
F01	Final	10th November 2016	ACr		PC		PC	

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1 INTRODUCTION

The Enva Ireland Ltd. facility in Clonminam Industrial Estate, Portlaoise, Co. Laois currently operates as a hazardous waste facility under an Industrial Emissions licence granted by the Environmental Protection Agency (EPA) (Licence No. W0184-01). This EPA licence is now subject to review.

The preparation of the Natura Impact Statement (NIS) complies with the requirements of Article 6 of the *Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter referred to as the Habitats Directive). This is transposed in Ireland principally through the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) (hereafter the Birds and Habitats Regulations) and the Planning and Development Act 2000 (as amended). The NIS has been prepared by RPS on behalf of Enva Ireland Ltd.

The NIS provides information on and assesses the potential for the site operations to have an adverse affect on European Site integrity. It contains information required for the Public Authority (in this instance the EPA) to undertake an Appropriate Assessment (AA).

1.1 LEGISLATIVE CONTEXT FOR APPROPRIATE ASSESSMENT

The Habitats Directive provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as the Natura 2000 network. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC (hereafter referred to as the Birds Directive).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European Sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

> *Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

Article 6(4) states:

> *If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

The Habitats Directive has been transposed into Irish law by the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). In the context of the licence review, the governing legislation is principally Article 27 of the Birds and Natural Habitats Regulations which sets out the duties of public authorities (in this case the EPA) relating to nature conservation; and Article 42 which addresses AA. If screening for AA determines the likelihood for significant effects on a European Site(s), in view of its conservation objectives, then AA must be carried out for the licence review, including the compilation of a NIS to inform the decision making.

1.2 PURPOSE OF THE AA PROCESS

The overall purpose of the AA process is to ensure that the operation of the Enva facility in Portlaoise does not result in any adverse effects on the integrity of any European Sites in view of the Sites conservation objectives. This NIS has been prepared in support of the AA process having regard for the legislative requirements of EU and national law as outlined previously.

The responsibility for carrying out the AA lies with the EPA. The NIS will inform the AA determination made by the EPA.

1.3 CONSULTATION

Enva, as applicant, have had considerable consultation with the EPA on the application and the Appropriate Assessment process. In addition, Laois County Council was consulted on the details of the municipal storm water network and outfall.

1.4 WORK COMPLETED TO DATE

Screening for AA was compiled by RPS on behalf of Enva in May 2016. It concluded that the site operations had no potential for likely significant effects on any European Sites either alone or in-combination with other plans or projects.

The Screening for AA was submitted to the EPA in support of the licence review. The EPA subsequently carried out their own AA Screening and determined that the site operations were likely to have a significant effect on European Sites and that an Appropriate Assessment was required. The EPA requested that Enva prepare and submit a NIS to help inform the AA.

2 ASSESSMENT METHODOLOGY

2.1 GUIDANCE DOCUMENTS ON AA

This NIS has been prepared with regard to the following legislation, guidance documents and Department Circulars where relevant:

European and National Legislation:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (also known as the 'Habitats Directive');
- Council Directive 2009/147/EC on the conservation of wild birds, codified version, (also known as the 'Birds Directive');
- European Communities (Birds and Natural Habitats) Regulations 2011 to 2015; and
- Planning and Development Act 2000 to 2014.

Guidance:

- *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.* DEHLG (2009, revised 10/02/10);
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission (2001).
- *Communication from the Commission on the Precautionary Principle*. European Commission (2000b)
- *EC study on evaluating and improving permitting procedures related to Natura 2000 requirements under Article 6.3 of the Habitats Directive 92/43/EEC*. European Commission (2013).
- *Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission*. European Commission (2007).
- *Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*[1]. European Commission (2000a).
- *Marine Natura Impacts Statements in Irish Special Areas of Conservation*. A working Document. DAHG (2012).

Departmental/NPWS Circulars:

- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.* Circular NPWS 1/10 and PSSP 2/10.
- *Appropriate Assessment of Land Use Plans*. Circular Letter SEA 1/08 & NPWS 1/08.
- *Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments*. Circular L8/08.
- *Guidance on Compliance with Regulation 23 of the Habitats Directive.* Circular Letter NPWS 2/07.

[1] The Commission has notified its intent to revise this guidance and a draft revised document was published in April 2015. It would appear that this has not been finalised to date, and no revised guidance document is available on the Commissions official website as of September 2016.

- *Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on Natura 2000 sites*. Circular Letter PD 2/07 and NPWS 1/07.

2.1 GUIDING PRINCIPLES AND CASE LAW

Over time legal interpretation has been sought on the practical application of the legislation concerning AA as some terminology has been found to be unclear. European and National case law has clarified a number of issues and some aspects of the published guidance documents have been superseded by case law. Case law has been considered in the preparation of both the Screening and NIS for site operations at the Enva facility, Portlaoise, Co. Laois.

2.2 STAGES OF APPROPRIATE ASSESSMENT

The AA process progresses through four stages. If at any stage in the process it is determined that there will be no adverse effect on the integrity of a European Site in view of the sites conservation objectives, the process is effectively completed. The four stages are as follows:

- Stage 1 – Screening of the proposed plan or project for AA;
- Stage 2 – An AA of the proposed plan or project;
- Stage 3 – Assessment of alternative solutions; and
- Stage 4 – Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.

Stage 1: Screening for AA

The aim of screening is to assess firstly if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there is potential for significant effects or there is uncertainty regarding the significance of effects then it will be recommended that the plan is brought forward to the next stage of the AA process. Screening of the site operations was undertaken by the EPA and it was determined that an AA was required.

Stage 2: Appropriate Assessment

The aim of Stage 2 of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to Stage 3. As part of this stage an NIS is prepared to support decision making. This document is the NIS for the site operations at the Enva site (Portlaoise).

Stage 3: Alternative Solutions

If it is not possible during Stage 2 of the AA process to conclude that there will be no adverse effects on site integrity, Stage 3 of the process must be undertaken which is to objectively assess whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have adverse impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process states that, 'other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria' (EC, 2001). In other words, if alternative solutions exist that do not have adverse impacts on European Sites; they should be adopted regardless of economic considerations. This stage of the AA process should result in the identification of the least damaging options for the plan or project.

Stage 4: Imperative Reasons of Overriding Public Interest (IROPI)

This stage of the AA process is undertaken when it has been determined that a plan or project will have adverse effects on the integrity of a European Site, but that no alternatives exist. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine whether or not the competent authority can allow it to progress. This is the determination of 'over-riding public interest'.

It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'over-riding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or public safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. Stage 4 of the process defines and describes these compensation measures.

2.3 INFORMATION SOURCES CONSULTED

The following general sources of information have been consulted for background environmental information. A detailed reference list can be found in **Section 7**.

- Information provided by Enva on site operations at their Portlaoise Site;
- Department of Environment, Community and Local Government – online land use mapping www.myplan.ie/en/index.html;
- GeoHive online mapping http://map.geohive.ie/mapviewer.html;
- Ordnance Survey of Ireland – Online mapping and Aerial photography www.osi.ie;
- National Parks and Wildlife Service – online European Site information www.npws.ie;
- National Parks and Wildlife Service – Information on the status of EU protected habitats in Ireland (NPWS 2013a & 2013b);
- Ireland's Article 12 submission to the EU Commission on the *Status and Trends of Bird Species (2008-2012)*;
- Information on the conservation status of birds in Ireland (Colhoun & Cummins, 2013);
- Environmental Protection Agency – EnVision maps www.epa.ie;
- Information on River Basin Districts - www.wfdireland.ie;
- Geological Survey of Ireland – Geology, soils and hydrogeology www.gsi.ie;
- *Actions for Biodiversity 2011-2016*: *Irelands National Biodiversity Plan* (DAHG, 2011).

2.4 IMPACT PREDICTION

The methodology for the assessment of impacts is derived from the *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites* (EC, 2001). When describing changes/activities and impacts on ecosystem structure and function, the types of impacts that are commonly presented include:

- Direct and indirect effects;
- Short and long-term effects;
- Construction, operational and decommissioning effects; and
- Isolated, interactive and cumulative effects.

A "source –pathway-receptor" approach has been applied for this assessment. The ***source*** relates to the site operations which have the potential to give rise to adverse impacts to European Sites. The ***pathway*** is the link between the source and receptor by which the site operations can be linked to European Sites e.g. a watercourse connecting the site operations to a European Site. The ***receptor*** in this instance is the European Site, its qualifying interest habitats and species.

3 OVERVIEW OF THE FACILITY AND ITS RECEIVING ENVIRONMENT

3.1 DESCRIPTION OF THE ENVA SITE AND ACTIVITIES

The Enva Ireland Ltd. facility is located on a 2 hectare site at Clonminam Industrial Estate, Portlaoise, Co. Laois (Irish National Grid Reference: S 45915 97492). The industrial estate is surrounded by a railway yard, vehicle repair and panel beaters, commercial units and oil storage. The nearest residential area is situated approximately 30m north of the facility boundary.

The Enva site has been an EPA-licensed hazardous waste facility since 1999 (License No. W0184-01) where it has carried out waste oil reprocessing (approximately 20,000 tonnes in 2014) and storage activities since the late 1970's. From 2004 activities were expanded on-site to include the processing of additional wastes including the treatment of contaminated soil, repacking of oily contaminated wastes and recovering paint wastes. The facility also stores waste in containers prior to transfer offsite for recovery or disposal. The infrastructure consists of a tank farm (45 tanks heated and unheated) for the processing and storage of waste and virgin hydrocarbon fuels, waste processing and storage buildings, a roofed concrete soil remediation area and associated office buildings. A number of storage tanks belong to and are used by EMO oil and are not associated with the licensed activity. One dual fuel process boiler is operated on-site that is fuelled on natural gas or kerosene gas oil, typically natural gas, to provide heat for waste oil processing tanks.

Reprocessing of waste oil is undertaken on a batch basis as part of a multi–stage process. The stages of this reprocessing activity are briefly summarised below:

- Pre-acceptance – prior to waste oil being accepted for recovery processing it is subjected to a number of waste acceptance controls and testing.
- Preliminary dewatering – this stage involves the separation of oil and water. The waste oil is typically heated to temperatures between 50-80 °C to improve the viscosity of the oil. Heating the waste oil also improves the rate of separation of oil from water.
- Processing – waste oils suitable for processing are filtered and demulsifying chemicals are added. High specification fuels are also de-metallised, heated up to 80°C and filtered/centrifuged prior to the drying stage.
- Blending/Finishing – reprocessed oils are tested to ensure they meet limits specified in the EPA licence conditions. Then reprocessed oils are blended with virgin oil and additives (as necessary) to meet customer specification requirements.

The frequency of waste oil reprocessing activity occurring is dependent on the quantity of waste oil collected and the level of water content in the oil. The water content in the oil can vary - from circa 45% in ship oils to circa 15% in garage and interceptor oils.

EPA (2015) states the following in relation to emissions to air from the Enva site:

- *Air quality in the vicinity of the ENVA Ireland Ltd. Portlaoise facility and in Portlaoise Town is within ambient air quality guideline values;*
- *There has been no significant change in the magnitude of emissions from the drying tanks when comparing recent emissions data and the data submitted as part of the original licence application;*

- *Dispersion modelling of emissions from the drying tanks indicate that ground level concentrations are within ambient air quality guideline values;*
- *Odour nuisance was not identified during independent odour agent or EPA odour surveys in 2014 and early 2015. However in December 2015 Enva was prosecuted in relation to odours originating from the facility during the second half of 2015.*

Final wastes to leave the site are disposed of at hazardous waste facilities both within and outside of the State.

Process effluent consists of water removed from the waste oil processing system and that collected from the soil remediation area. The aqueous effluent from the separation of oil is treated twice on a batch basis to remove as much oil as possible, before settling and then passing through oil separators before being pumped under controlled conditions through a monitoring station to a final process effluent drain. This drains to the existing Industrial Estate foul sewer system to the west of the site and is pumped to the Portlaoise Wastewater Treatment Works (WWTW) for treatment prior to discharge to the River Triogue downstream of Portlaoise.

Surface water on site is generated from yards and roofs. There are two surface water collection systems on site:

- Yard gullies draining to a four chamber oil interceptor and pumped to a second oil interceptor on the west of the site (SW1);
- Surface water from the north end of the site (SW2) is collected and passed through the second oil separator as mentioned in the point above.

Following treatment via oil separator and silt trap the water is discharged to the municipal surface water system which ultimately discharges to the River Triogue. The River Triogue discharges to the River Barrow north east of Mountmellick *ca.* 13.5km downstream of the Enva site. The River Barrow forms part of the River Barrow and River Nore SAC.

3.2 BRIEF DESCRIPTION OF THE RECEIVING ENVIRONMENT

Records of qualifying interest (QI)/special conservation interest (SCI) species for which European Sites are designated within the vicinity of the site and for which the River Barrow and River Nore SAC is designated for were obtained online[2]. The Enva Portlaoise site is located within the 10km National Grid Square S49. The following species were noted:

River Barrow and River Nore SAC QI's:

- Desmoulin's Whorl Snail (*Vertigo (Vertigo) moulinsiana*) was recorded within the 10km grid square S49 (31/12/1940) with the recorded location as 'Maryborough, Portlaoise' which is *c.* 2-3km north of the Enva site;
- Freshwater pearl mussel (*Margaritifera margaritifera*) was recorded south of the Enva site, within 18km, in the grid square S47 (04/09/2007) on a stretch of the River Nore;
- Freshwater white-clawed crayfish (*Austropotamobius pallipes*), the closest record is 2km south-east (S479971) of the site (24/07/1997) on the River Triogue. However, the most recent record

[2] NBDC online database www.biodiversityireland.ie Accessed 1st November 2016.

(10/08/2006) was within 4km of the site (S471939) on the Triogue River, at Cush Bridge (upstream of the Enva site);

- Sea lamprey (*Petromyzon marinus*), the closest record was 60km south of the site in the grid square S63, on the River Nore near Thomastown, Co. Kilkenny;
- Brook lamprey (*Lampetra planeri*) was recorded within 39km of the site (N1319) (19/05/2012) on the Silver River, Co. Offaly, in the Lower Shannon river catchment[3];
- River lamprey (*Lampetra fluviatilis*) was recorded 61km south-east of the site (S721392) (06/06/2012) downstream on the River Barrow at St. Mullins, Co. Carlow;
- Twaite shad (*Alosa fallax*) was recorded 61km south-east of the site (S726379) (10/05/2014) downstream on the River Barrow at St. Mullins, Co. Carlow. It was also noted in the SAC Supporting Documents that the upper stretches of the River Barrow and River Nore were very important spawning grounds, with the Owenass River of particular importance. The Owenass River drains into the River Barrow approx. 1.3km (a.c.f.) upstream of the confluence of the River Triogue and the River Barrow;
- Atlantic salmon (*Salmo salar*), the closest record is 38km north-west of the site (N1319) (19/05/2012) on the Silver River, Co. Offaly, in the Lower Shannon river catchment;
- European Otter (*Lutra lutra*) was recorded 6km south-west of the site (S411937) (13/10/2010) on the Cappanacloghy 15 River, part of the Nore Sub-catchment; and
- Killarney fern (*Trichomanes speciosum*) was recorded 54km south-east of the site (S7242) (13/02/2008) at Carraiglead, on the border of Co. Carlow and Co. Kilkenny, which is located on the banks of the River Barrow.

NBDC website and River Barrow and River Nore SAC Supporting documents:

- Common Kingfisher (*Alcedo atthis*) was recorded within the 10km grid square S49 (31/07/1972) (no exact location recorded);
- Hen Harrier (*Circus cyaneus*) was recorded within the 10km grid square S49 (31/12/2011) (no exact location recorded);
- Corn Crake (*Crex crex*) was recorded within the 10km grid square S49 (31/07/1991) (no exact location recorded);
- European Golden Plover (*Pluvialis apricaria*), the closest record is 3km south-west of the site (S449951) (08/03/2016) at Cuilnamona, Co. Laois; and
- Marsh Fritillary (*Euphydryas aurinia*) was recorded 4km south of the site (S467930) (02/09/2014) at Cashel Bog, upstream of Portlaoise town and the Enva site.

Records of IAPS were obtained for the 10km grid square S49[4]. The following high-impact species were noted:

- *Rhododendron ponticum*
- *Dama dama* (Fallow Deer)
- *Mustela furo* (Feral Ferret)
- *Rattus norvegicus* (Brown Rat)

According to the EPA online Envision maps[5] the study area is located in the Barrow Catchment and the Barrow_SC_020 Sub-catchment. Watercourses in the vicinity of the proposed works include:

[3] EPA EnVision Maps http://gis.epa.ie/Envision Accessed 07th November 2016.
[4] NBDC online database www.biodiversityireland.ie Accessed 01st November 2016.

- Clonminam Stream (no water quality values listed), The Gold Club Stream (no water quality values listed) and Curriersbog Stream (no water quality values listed) are located to the south-east side of the Enva Portlaoise site. These drain into the Triogue River network.
- The Triogue River runs along the eastern boundary of Portlaoise town. It is of 'Good' water quality status at a bridge monitoring point 1.6km upstream of Portlaoise town (RS14T010100). 'Poor' water quality status was recorded at Kyle Bridge, on the Triogue River, downstream of Portlaoise and the Enva site (RS14T010200).
- The Triogue River runs through Portlaoise Town (from south east to north) and converges with the Kylegrove Stream north of Portlaoise Town.
- The Ratheven River (no water quality values listed) and Red Hill stream ('Moderate' water quality status at 'bridge near Red Hill'), drain into the Triogue River, approx. 5-6km north-east of the Enva site, which is of 'Poor' water quality status at Eyne Bridge, downstream of this confluence.
- Sronagh stream (no water quality values listed) and Derrydavey River (no water quality values listed) drain into the Triogue River, of 'Moderate' water quality at 'Triogue Bridge, upstream of the Barrow confluence', with the confluence point of the three rivers located south-east of Mountmellick.
- Knightstown 14 River (no water quality values listed) discharges into the Triogue River at Ardara-Kilnacash, approx. 10km north-east of the Enva site, which then drains into the River Barrow.
- The Owenass River, of 'Moderate' water quality, 1.7km downstream of Mountmellick, drains into the River Barrow approx. 1.3km (a.c.f.) upstream of the confluence of the River Triogue and the River Barrow. The stretch of the River Barrow which runs from where the Owenass River drains into it and the confluence point of it with the River Triogue is of 'Moderate' water quality at Barranagh's Bridge.
- Downstream of the confluence of the Triogue River and the River Barrow 'good' water quality status was recorded at 'Barrow - Portnahinch Bridge (South of Garryhinch House)' (RS14B010600).

According to the GSI Groundwater Data Mapviewer[6] the study area is located in the 'Portlaoise' groundwater body and the point at which the River Triogue drains into the River Barrow is located in the 'Portlaoise' groundwater body also.

A QI of the River Barrow and River Nore SAC is the priority habitat 'Petrifying springs', which is groundwater-dependent habitat and the site synopsis of the SAC notes that a good example of this habitat can be found in the Dysart Woods, which is located near Thomastown within the Bagenalstown Upper groundwater body.

3.3 BRIEF DESCRIPTION OF THE EUROPEAN SITES WITHIN THE ZONE OF INFLUENCE

A buffer of 15km is typically taken as the initial zone of influence (ZoI) extending beyond the reach of the footprint of a plan or project, as per Ministerial guidance (DoEHLG 2010), although there may be scientifically appropriate reasons for extending this ZoI further afield depending on the pathway of potential impacts. With regard to the Enva site, the 15km distance is considered acceptable to assess all potential impacts on European Sites.

[5] http://gis.epa.ie/Envision Accessed 01st November 2016.
[6] http://spatial.dcenr.gov.ie/GeologicalSurvey/Groundwater/index.html Accessed 28th October 2016

The European Sites within 15km of the Enva site are listed in **Table 3.1,** and shown in **Figure 3.1**. The spatial boundary data for the European Sites shown in **Figure 3.1** was the most recent available online from NPWS (October 2016).

As identified in **Table 3.1**, the River Barrow and River Nore SAC is the only European Site within 15km that has connectivity to the Enva Site. This is by virtue of the fact that surface (storm) water discharges from the site are diverted to the Laoise County Council municipal storm network and ultimately discharge to the River Triogue, with the River Triogue ultimately discharging into the River Barrow and River Nore SAC. Wastewater from the Enva site is discharged to the Irish Water WWTW in Portlaoise for treatment and this treated wastewater is discharged under licence by Irish Water also to the Triogue.

The EPA AA Screening Determination for the licence review highlighted the following:

"*That the activity is not directly connected with or necessary to the management of any European site and that it cannot be excluded, on the basis of objective information, that the activity, individually or in combination with other plans or projects, will have significant effect on any European site and accordingly determined that an Appropriate Assessment of the activity is required, and for this reason determined to require the applicant to submit a Natura Impact Statement.*

The reasons for this determination are as follows:

1. *According to the licensee, there are two stormwater discharges (SW1 and SW2) from the installation to the local water network. This network drains into the River Triogue which converges 13km downstream with the River Barrow and the River Barrow and River Nore SAC.*
2. *The following represents the nature of the discharges between January 2014 and July 2016 according to monitoring data provided by the licensee:*
    - *SW1*
        - *COD: average 62mg/l, maximum 227mg/l*
        - *Suspended solids: average 18mg/l, maximum 59mg/l*
    - *SW2*
        - *COD: average 44mg/l, maximum 168mg/l*
        - *Suspended solids: average 20mg/l, maximum 59mg/l*
3. *It is evident from the monitoring results that rainwater falling on the installation is becoming contaminated before it is discharged from the installation to the local drainage network and ultimately the River Triogue.*
4. *According to EPA data the WFD ecological status (10-12) of the Triogue River and feeder streams in the vicinity of the installation is "poor". The status is "moderate" some 350m upstream of the confluence of the feeder streams and the Triogue River. The status is "moderate" again in the Triogue River some 7.7km downstream of the confluence (this stretch of the river having passed through Portlaoise and received the licensed discharge (register number D0001-01) from the Portlaoise waste water treatment plant) and remains so until its confluence with the River Barrow and the River Barrow and River Nore SAC.*
5. *There remains doubt as to the potential impact of the discharge from the installation on water quality in the local surface water network and downstream in the River Barrow and River Nore SAC. "*

Therefore, the River Barrow and River Nore SAC is the only European Site that is being considered further in this NIS.

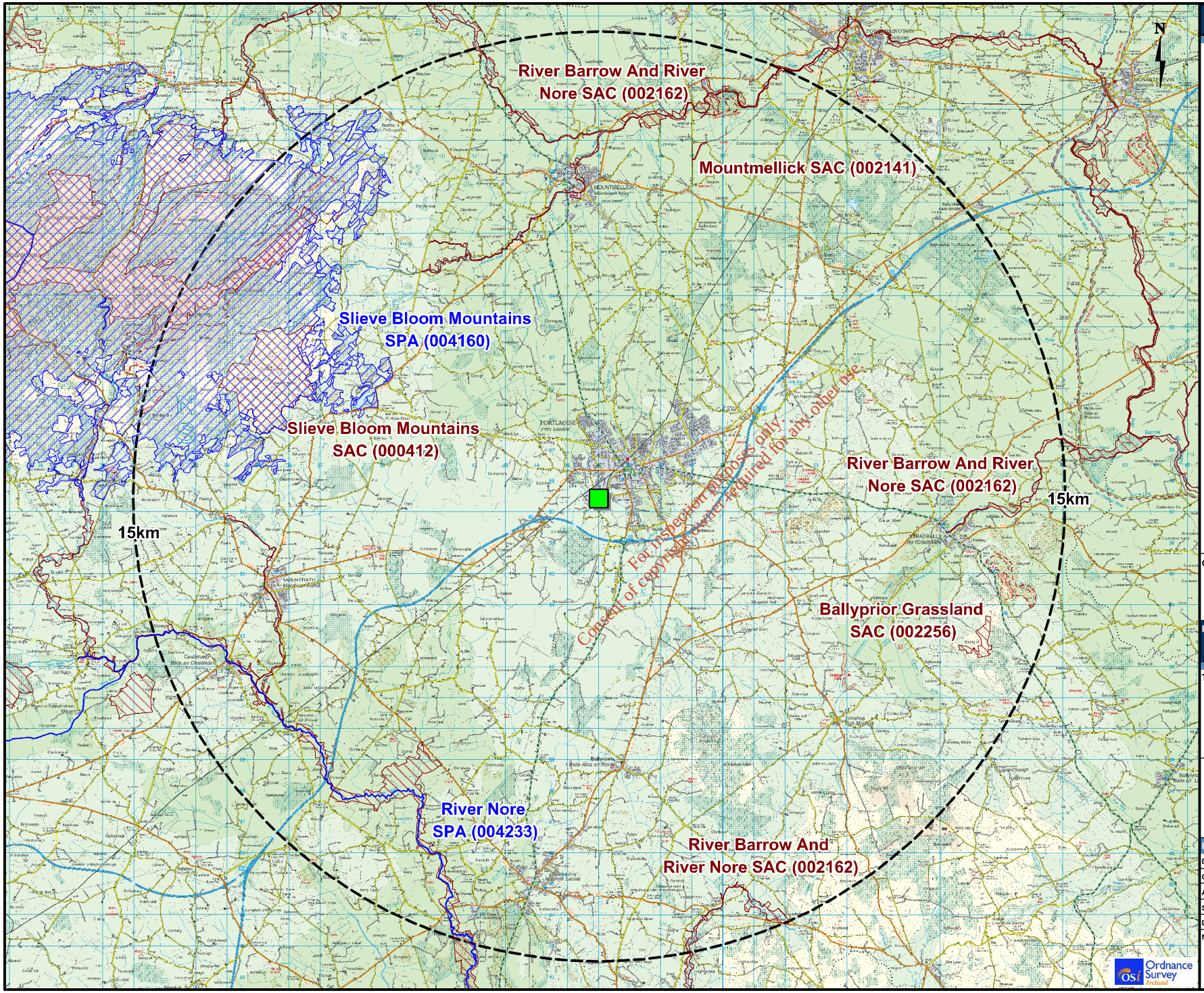
Table 3.1 European Sites within 15km of the Enva site

Site Name and Code	Distance from the Enva Site (approximate) [7]	Qualifying Interest Habitats and Species (* = Priority Habitat)[8]	Connectivity
River Barrow and River Nore SAC [002162]	*ca.* 8km	**Conservation Objectives Generic Version 1.0 (19/07/11)** **Annex I Habitats** ▪ Estuaries [1130] ▪ Mudflats and sandflats not covered by seawater at low tide [1140] ▪ Salicornia and other annuals colonizing mud and sand [1310] ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] ▪ Mediterranean salt meadows (*Juncetalia maritimi*) [1410] ▪ Water courses of plain to montane levels with the *Ranunculion fluitantis and Callitricho-Batrachion* vegetation [3260] ▪ European dry heaths [4030] ▪ Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] ▪ Petrifying springs with tufa formation (*Cratoneurion*) [7220]* ▪ Old sessile oak woods with Ilex and *Blechnum* in British Isles [91A0] ▪ Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* **Annex II Species** ▪ Desmoulin's Whorl Snail (*Vertigo moulinsiana)* [1016] ▪ Freshwater pearl mussel (*Margaritifera margaritifera*) [1029] ▪ White-clawed crayfish (*Austropotamobius pallipes*) [1092] ▪ Sea lamprey (*Petromyzon marinus*) [1095] ▪ Brook lamprey (*Lampetra planeri*) [1096] ▪ River lamprey (*Lampetra fluviatilis*) [1099]	Potential for hydrological linkages to the SAC via the wastewater and surface water discharges to the River Triogue which ultimately discharges to the European Sites. No direct linkage exists due to the distance and presence of an extensive buffer area (both urban and rural) between the Enva site and the European Site.

[7] Measured "as the crow flies".
[8] Downloaded from www.npws.ie 28/10/16.

Site Name and Code	Distance from the Enva Site (approximate)[7]	Qualifying Interest Habitats and Species (* = Priority Habitat)[8]	Connectivity
		▪ Twaite shad (*Alosa fallax fallax*) [1103] ▪ Salmon (*Salmo salar*) [1106] ▪ Otter (*Lutra lutra*) [1355] ▪ Nore Freshwater Pearl mussel (*Margaritifera durrovensis*) [1990] ▪ Killarney fern (*Trichomanes speciosum*) [1421] ▪ Atlantic salmon (*Salmo salar*) [1106]	
Ballyprior Grassland SAC [002256]	*ca.* 12.5km	**Conservation Objectives Generic Version 5.0 (15/08/16)** **Annex I Habitats** ▪ Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) (*important orchid sites) [6210]*	No connectivity between the Enva site and the European Site due to the distance between them and lack of hydrological connection between the two areas.
Slieve Bloom Mountains SAC [000412]	*ca.* 10km	**Conservation Objectives Generic Version 1.0 (06/09/16)** **Annex I Habitats** ▪ Northern Atlantic wet heaths with Erica tetralix [4010] ▪ Blanket bogs (* if active bog) [7130] ▪ Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]*	No connectivity between the Enva site and the European Site due to the distance between them and lack of hydrological connection between the two areas.
Mountmellick SAC [002141]	*ca.* 11km	**Conservation Objectives Generic Version 5.0 (16/08/16)** **Annex II Species** ▪ Desmoulin's Whorl Snail (*Vertigo moulinsiana*) [1016]	No connectivity between the Enva site and the European Site due to the distance between them and lack of hydrological connection between the two areas.
River Nore SPA [004233]	*ca.* 11.5km	**Conservation Objectives Generic Version 5.0 (15/08/16)** **Annex I Species** ▪ Kingfisher (*Alcedo atthis*) [A229]	No connectivity between the Enva site and the European Site due to the distance between them and lack of hydrological connection between the two areas.

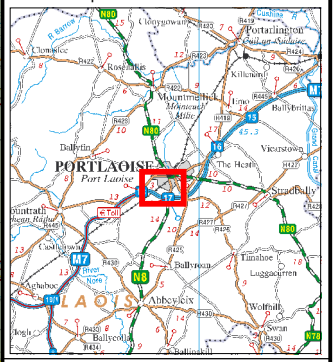
Site Name and Code	Distance from the Enva Site (approximate)[7]	Qualifying Interest Habitats and Species (* = Priority Habitat)[8]	Connectivity
Slieve Bloom Mountains SPA [004160]	*ca.* 8km	**Conservation Objectives Generic Version 5.0 (15/08/16)** **Annex I Species** ▪ Hen Harrier (*Circus cyaneus*) [A082]	No connectivity between the Enva site and the European Site due to the distance between them, lack of hydrological connection between the two areas and given the location of the Enva site in a highly urban/industrial area, the habitat is not favoured for nesting by Hen Harrier as they typically nest in moorland and young forestry plantations.



Legend

- Proposed Works
- Special Areas of Conservation (SACs)
- Special Protected Areas (SPAs)
- Circle Radius 15 km

Data Source:
Special Areas of Conservation (SACs) and Special Protected Areas (SPAs) boundaries downloaded from National Parks and Wildlife (NPWS) website www.npws.ie
Data last updated on website March 2016.



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4 ASSESSMENT OF POTENTIAL IMPACTS ON THE RIVER BARROW AND RIVER NORE SAC

4.1 INTRODUCTION

The assessment considers the impacts[9] that the site operations could have on the integrity of the River Barrow and River Nore SAC, with respect to the conservation objectives of the sites and to their structure and function. EC guidance (MN2000) states that the integrity of a site involves its ecological functions and the decision as to whether it is adversely affected should focus on, and be limited to, the site's conservation objectives.

This section considers and sets out the elements of site operations that have potential to give rise to likely significant effects on The River Barrow and River Nore SAC. The potential effects have been assessed in the absence of any mitigation measures, and taking account of the precautionary principle.

In line with the relevant guidance this stage of the Appropriate Assessment consists of three main steps:

- **Impact Prediction** - where the likely impacts of the AFF are examined. A source-pathway-receptor model has been used to assess potential for impact;
- **Assessment of Effects** - where the effects of the AFF are assessed as to whether they have any adverse effects on the integrity of European Sites as defined by conservation objectives; and
- **Mitigation Measures** - where mitigation measures are identified to ameliorate any adverse effects on the integrity of any European Site.

4.2 RIVER BARROW AND RIVER NORE SAC

The River Barrow and River Nore SAC passes through eight counties including County Laois, with both the River Barrow and Nore rising in the Slieve Bloom Mountains. The SAC has good examples of alluvial forest and petrifying springs, both priority Annex I habitats, significant sites of old oak woodlands which support a variety of woodland species with a large component of the site consisting of an estuary. Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. Along with supporting several habitats listed under Annex I of the EU Habitats Directive, the site is very important for the presence of a number of EU Habitats Directive Annex II species, including being the only site in the world to host the Nore Freshwater Pearl Mussel, the hard water form of the Freshwater Pearl Mussel, which is limited to a 10km stretch of the River Nore (NPWS, 2016). It is also noted that the status of the Freshwater Pearl Mussel as a qualifying interest for the SAC is under review (NPWS, 2011).

The Barrow/Nore is mainly a grilse fishery though spring salmon fishing is good in the vicinity of Thomastown and Inistioge on the Nore. The upper stretches of the Barrow and Nore, particularly the Owenass River, are very important for spawning (NPWS, 2016).

[9] Impacts considered include direct, indirect, short term, long term, temporary, permanent and cumulative.

The main threats to the site and current damaging activities listed in the Site Synopsis include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, over-grazing within the woodland areas, invasion by non-native species and water quality remaining vulnerable (NPWS, 2016). The Natura 2000 Standard Data Form (NPWS, 2015) lists threats, pressures and activities that have negative impacts on the SAC as a whole, reproduced in **Table 4.1,** with industrial or commercial areas (E02) and Pollution to surface waters (limnic & terrestrial, marine & brackish) (H02) being of relevance to this site and NIS.

Table 4.1 Threats, Pressures and Activities with Negative Impacts on the SAC (adapted from NPWS, 2015)

Threats and Pressure Code	Description
A02.01	Agricultural intensification
A04.01.01	Intensive cattle grazing
A10.01	Removal of hedges and copses or scrub
B02	Forest and Plantation management & use
B05	Use of fertilizers (forestry)
B07	Forestry activities not referred to above
C01.01.01	Sand and gravel quarries
C01.03	Peat extraction
D03.01	Port areas
E02	Industrial or commercial areas
F01.01	Intensive fish farming, intensification
F02	Fishing and harvesting aquatic resources
F02.01.02	Netting
F02.03	Leisure fishing
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)
I01	Invasive non-native species
J02	Human induced changes in hydraulic conditions
J02.02.01	Dredging/removal of limnic sediments
J02.05.02	Modifying structures of inland water courses
J02.06	Water abstractions from surface waters
J02.12.02	Dykes and flooding defense in inland water systems
J03.02.01	Reduction in migration/ migration barriers
K01.01	Erosion
M01	Changes in abiotic conditions

Table 4.2 details the conservation status of each qualifying interest of the River Barrow and River Nore SAC, alongside the generic threats and pressures facing those habitats and species, as identified in NPWS (2013a & 2013b).

Table 4.2 – Conservation Status of each of the Qualifying Interests of the River Barrow and River Nore SAC

Qualifying Interests (*Priority Habitat)	Current Conservation Status[10]	Threats	Pressures
Estuaries [1130]	Inadequate (Improving)	▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Nautical sports (G01.01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Estuarine and coastal dredging (J02.02.02) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Bottom culture (F01.03) ▪ Suspension culture (F01.02) ▪ Piers / tourist harbours or recreational piers (D03.01.02) ▪ Slipways (D03.01.01)	▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Bottom culture (F01.03) ▪ Suspension culture (F01.02) ▪ Nautical sports (G01.01) ▪ Estuarine and coastal dredging (J02.02.02) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Piers / tourist harbours or recreational piers (D03.01.02) ▪ Slipways (D03.01.01)
Mudflats and sandflats not covered by seawater at low tide [1140]	Inadequate (Improving)	▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Bottom culture (F01.03) ▪ Hand collection (F04.02.02) ▪ Estuarine and coastal dredging (J02.02.02) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Nautical sports (G01.01)	▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Bottom culture (F01.03) ▪ Suspension culture (F01.02) ▪ Hand collection (F04.02.02) ▪ Estuarine and coastal dredging (J02.02.02) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Nautical sports (G01.01)
Salicornia and other annuals colonizing mud and sand [1310]	Inadequate (Declining)	▪ Invasive non-native species (I01) ▪ Erosion (K01.01) ▪ Silting up (K01.02) ▪ Intensive cattle grazing (A04.01.01) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08) ▪ Reclamation of land from sea, estuary or marsh	▪ Invasive non-native species (I01) ▪ Erosion (K01.01) ▪ Silting up (K01.02) ▪ Intensive cattle grazing (A04.01.01) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08) ▪ Reclamation of land from sea, estuary or marsh

[10] Status of EU Protected Habitats and Species in Ireland (NPWS, 2013a & 2013b).

		(J02.01.02) ▪ Dykes, embankments, artificial beaches, general (J02.12) ▪ Walking, horseriding and non-motorised vehicles (G01.02) ▪ Intensive sheep grazing (A04.01.02) ▪ Species composition change (succession) (K02.01) ▪ Changes in abiotic conditions (M01)	(J02.01.02) ▪ Dykes, embankments, artificial beaches, general (J02.12) ▪ Walking, horseriding and non-motorised vehicles (G01.02) ▪ Intensive sheep grazing (A04.01.02) ▪ Species composition change (succession) (K02.01)
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Inadequate (Stable)	▪ Intensive cattle grazing (A04.01.01) ▪ Intensive sheep grazing (A04.01.02) ▪ Paths, tracks, cycling tracks (D01.01) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Disposal of industrial waste (E03.02) ▪ Reclamation of land from sea, estuary or marsh (J02.01.02) ▪ Polderisation (J02.01.01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Erosion (K01.01) ▪ Invasive non-native species (I01)	▪ Intensive cattle grazing (A04.01.01) ▪ Intensive sheep grazing (A04.01.02) ▪ Paths, tracks, cycling tracks (D01.01) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Other industrial / commercial area (E02.03) ▪ Reclamation of land from sea, estuary or marsh (J02.01.02) ▪ Polderisation (J02.01.01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Erosion (K01.01) ▪ Invasive non-native species (I01)
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Inadequate (Stable)	▪ Intensive cattle grazing (A04.01.01) ▪ Paths, tracks, cycling tracks (D01.01) ▪ Erosion (K01.01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Infilling of ditches, dykes, ponds, pools, marshes or pits (J02.01.03)	▪ Intensive cattle grazing (A04.01.01) ▪ Paths, tracks, cycling tracks (D01.01) ▪ Erosion (K01.01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Infilling of ditches, dykes, ponds, pools, marshes or pits (J02.01.03)
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]	Inadequate (Declining)	▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Mechanical removal of peat (C01.03.02) ▪ Modification of hydrographic functioning, general	▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Mechanical removal of peat (C01.03.02) ▪ Modification of hydrographic functioning, general

		(J02.05)	(J02.05)
European dry heaths [4030]	Bad (Stable)	▪ Agricultural intensification (A02.01) ▪ Non intensive cattle grazing (A04.02.01) ▪ Non intensive sheep grazing (A04.02.02) ▪ Abandonment of pastoral systems, lack of grazing (A04.03) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Mining and quarrying (C01) ▪ Wind energy production (C03.03) ▪ Roads, paths and railroads (D01) ▪ Walking, horse riding and non-motorised vehicles (G01.02) ▪ Off-road motorized driving (G01.03.02) ▪ Air pollution, air-borne pollutants (H04) ▪ Invasive non-native species (I01) ▪ Problematic native species (I02) ▪ Burning down (J01.01) ▪ Erosion (K01.01) ▪ Species composition change (succession) (K02.01) ▪ Damage by herbivores (including game species) (K04.05) ▪ Collapse of terrain, landslide (L05) ▪ Changes in abiotic conditions (M01) ▪ Changes in biotic conditions (M02)	▪ Agricultural intensification (A02.01) ▪ Non intensive cattle grazing (A04.02.01) ▪ Non intensive sheep grazing (A04.02.02) ▪ Abandonment of pastoral systems, lack of grazing (A04.03) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Mining and quarrying (C01) ▪ Wind energy production (C03.03) ▪ Roads, paths and railroads (D01) ▪ Dispersed habitation (E01.03) ▪ Walking, horse riding and non-motorised vehicles (G01.02) ▪ Off-road motorized driving (G01.03.02) ▪ Fences, fencing (G05.09) ▪ Air pollution, air-borne pollutants (H04) ▪ Invasive non-native species (I01) ▪ Erosion (K01.01) ▪ Species composition change (succession) (K02.01) ▪ Problematic native species (I02) ▪ Burning down (J01.01) ▪ Damage by herbivores (including game species) (K04.05) ▪ Collapse of terrain, landslide (L05)
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Bad (Stable)	▪ Agricultural intensification (A02.01) ▪ Grazing (A04) ▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Air pollution, air-borne pollutants (H04) ▪ Invasive non-native species (I01) ▪ Landfill, land reclamation and drying out, general (J02.01)	▪ Agricultural intensification (A02.01) ▪ Grazing (A04) ▪ Pollution of surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Air pollution, air-borne pollutants (H04) ▪ Invasive non-native species (I01) ▪ Landfill, land reclamation and drying out, general (J02.01)
*Petrifying springs with tufa formation	Inadequate (Stable)	▪ Landfill, land reclamation and drying out, general (J02.01) ▪ Abandonment of pastoral systems, lack of grazing	▪ Landfill, land reclamation and drying out, general (J02.01) ▪ Abandonment of pastoral systems, lack of grazing

(*Cratoneurion*) [7220]		(A04.03) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Trampling, overuse (G05.01) ▪ Roads, motorways (D01.02) ▪ Intensive grazing (A04.01) ▪ Water abstractions from groundwater (J02.07) ▪ Surface water abstractions for agriculture (J02.06.01) ▪ Collapse of terrain, landslide (L05) ▪ Intensive maintenance of public parks /cleaning of beaches (G05.05) ▪ Missing or wrongly directed conservation measures (G05.07) ▪ Continuous urbanisation (E01.01) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Speleology (G01.04.02) ▪ Invasive non-native species (I01) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Other sport / leisure complexes (G02.10) ▪ Groundwater pollution by leakages from waste disposal sites (H02.02)	(A04.03) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Trampling, overuse (G05.01) ▪ Roads, motorways (D01.02) ▪ Intensive grazing (A04.01) ▪ Water abstractions from groundwater (J02.07) ▪ Surface water abstractions for agriculture (J02.06.01) ▪ Collapse of terrain, landslide (L05) ▪ Intensive maintenance of public parks /cleaning of beaches (G05.05) ▪ Missing or wrongly directed conservation measures (G05.07) ▪ Continuous urbanisation (E01.01) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Speleology (G01.04.02) ▪ Invasive non-native species (I01) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Other sport / leisure complexes (G02.10)
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	Bad (Improving)	▪ Invasive non-native species (I01) ▪ Grazing in forests/ woodland (B06) ▪ Problematic native species (I02) ▪ Garbage and solid waste (H05.01)	▪ Invasive non-native species (I01) ▪ Grazing in forests/ woodland (B06) ▪ Problematic native species (I02) ▪ Garbage and solid waste (H05.01)
*Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion*	Bad (Improving)	▪ Invasive non-native species (I01) ▪ Grazing in forests/ woodland (B06) ▪ Problematic native species (I02) ▪ Garbage and solid waste (H05.01)	▪ Invasive non-native species (I01) ▪ Grazing in forests/ woodland (B06) ▪ Problematic native species (I02) ▪ Garbage and solid waste (H05.01)

albae) [91E0]			
Killarney fern (*Trichomanes speciosum*) [1421]	Favourable	▪ Grazing (A04) ▪ Outdoor sports and leisure activities, recreational activities (G01) ▪ Invasive non-native species (I01) ▪ Problematic native species (I02) ▪ Taking / Removal of terrestrial plants, general (F04)	▪ Grazing (A04) ▪ Outdoor sports and leisure activities, recreational activities (G01) ▪ Fire and fire suppression (J01) ▪ Invasive non-native species (I01) ▪ Problematic native species (I02)
Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]	Inadequate (Declining)	▪ Abandonment of pastoral systems, lack of grazing (A04.03) ▪ Shipping lanes (D03.02) ▪ Reclamation of land from sea, estuary or marsh (J02.01.02) ▪ Species composition change (succession) (K02.01) ▪ Infilling of ditches, dykes, ponds, pools, marshes or pits (J02.01.03) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Landfill, land reclamation and drying out, general (J02.01)	▪ Abandonment of pastoral systems, lack of grazing (A04.03) ▪ Shipping lanes (D03.02) ▪ Reclamation of land from sea, estuary or marsh (J02.01.02) ▪ Species composition change (succession) (K02.01) ▪ Infilling of ditches, dykes, ponds, pools, marshes or pits (J02.01.03) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Landfill, land reclamation and drying out, general (J02.01)
Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]	Bad (Declining)	▪ Modification of hydrographic functioning, general (J02.05) ▪ Other human induced changes in hydraulic conditions (J02.15) ▪ Restructuring agricultural land holding (A10) ▪ Water abstractions from groundwater (J02.07) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Diffuse pollution to surface waters due to other sources not listed (H01.09) ▪ Pollution to surface waters by storm overflows (H01.02)	▪ Modification of hydrographic functioning, general (J02.05) ▪ Other human induced changes in hydraulic conditions (J02.15) ▪ Restructuring agricultural land holding (A10) ▪ Water abstractions from groundwater (J02.07) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Diffuse pollution to surface waters due to other sources not listed (H01.09) ▪ Pollution to surface waters by storm overflows (H01.02)

		▪ Other point source pollution to surface water (H01.03) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08) ▪ Surface water abstractions for public water supply (J02.06.02) ▪ Collapse of terrain, landslide (L05) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Other outdoor sports and leisure activities (G01.08) ▪ Changes in abiotic conditions (M01)	▪ Other point source pollution to surface water (H01.03) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08) ▪ Surface water abstractions for public water supply (J02.06.02) ▪ Collapse of terrain, landslide (L05) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Other outdoor sports and leisure activities (G01.08)
White-clawed crayfish (*Austropotamobius pallipes*) [1092]	Inadequate (Stable)	▪ Invasive non-native species (I01) ▪ Introduction of disease (microbial pathogens) (K03.03) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Leisure fishing (F02.03)	▪ Invasive non-native species (I01) ▪ Leisure fishing (F02.03) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Introduction of disease (microbial pathogens) (K03.03) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01)
Sea lamprey (*Petromyzon marinus*) [1095]	Bad (Stable)	▪ Bait digging / collection (F02.03.01) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01) ▪ Canalisation (J02.03.02) ▪ Reduction in migration/ migration barriers (J03.02.01)	▪ Canalisation (J02.03.02) ▪ Reduction in migration/ migration barriers (J03.02.01) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01)
Brook lamprey (*Lampetra planeri*) [1096]	Favourable	▪ Bait digging / collection (F02.03.01) ▪ Other point source pollution to surface water (H01.03) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Siltation rate changes, dumping, depositing of dredged deposits (J02.11) ▪ Invasive non-native species (I01)	▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Other point source pollution to surface water (H01.03) ▪ Siltation rate changes, dumping, depositing of dredged deposits (J02.11)

River lamprey (*Lampetra fluviatilis*) [1099]	Favourable	▪ Bait digging / collection (F02.03.01) ▪ Other point source pollution to surface water (H01.03) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Invasive non-native species (I01) ▪ Reduction in migration/ migration barriers (J03.02.01) ▪ Siltation rate changes, dumping, depositing of dredged deposits (J02.11) ▪ Dredging/ removal of limnic sediments	▪ Siltation rate changes, dumping, depositing of dredged deposits (J02.11) ▪ Dredging/ removal of limnic sediments (J02.02.01) ▪ Reduction in migration/ migration barriers (J03.02.01) ▪ Other point source pollution to surface water (H01.03) ▪ Invasive non-native species (I01) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05)
Twaite shad (*Alosa fallax*) [1103]	Bad (Stable)	▪ Invasive non-native species (I01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Reduced fecundity/ genetic depression in animals (inbreeding) (K05.01)	▪ Invasive non-native species (I01) ▪ Fishing and harvesting aquatic resources (F02) ▪ Reduced fecundity/ genetic depression in animals (inbreeding) (K05.01)
Atlantic salmon (*Salmo salar*) (only in fresh water) [1106]	Inadequate (Stable)	▪ Agricultural intensification (A02.01) ▪ Intensive sheep grazing (A04.01.02) ▪ Fertilisation (A08) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Forest replanting (non-native trees) (B02.01.02) ▪ Use of fertilizers (forestry) (B05) ▪ Peat extraction (C01.03) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Disposal of industrial waste (E03.02) ▪ Intensive fish farming, intensification (F01.01) ▪ Poaching (F05.04) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08)	▪ Agricultural intensification (A02.01) ▪ Intensive sheep grazing (A04.01.02) ▪ Fertilisation (A08) ▪ Artificial planting on open ground (non-native trees) (B01.02) ▪ Forest replanting (non-native trees) (B02.01.02) ▪ Use of fertilizers (forestry) (B05) ▪ Peat extraction (C01.03) ▪ Disposal of household / recreational facility waste (E03.01) ▪ Disposal of industrial waste (E03.02) ▪ Intensive fish farming, intensification (F01.01) ▪ Poaching (F05.04) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08)

		▪ Invasive non-native species (I01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Water abstractions from surface waters (J02.06) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Predation (K03.04) ▪ Threats and pressures from outside the Member State (XO)	▪ Invasive non-native species (I01) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Water abstractions from surface waters (J02.06) ▪ Management of aquatic and bank vegetation for drainage purposes (J02.10) ▪ Predation (K03.04) ▪ Threats and pressures from outside the Member State (XO)
Otter (*Lutra lutra*) [1355]	Favourable	▪ Roads, motorways (D01.02) ▪ Professional passive fishing (F02.01) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01)	▪ Roads, motorways (D01.02) ▪ Professional passive fishing (F02.01) ▪ Pollution to surface waters (limnic & terrestrial, marine & brackish) (H01)
Nore freshwater pearl mussel (*Margaritifera margaritifera durrovensis*) [1990]	Bad (Declining)	▪ Other human induced changes in hydraulic conditions (J02.15) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Water abstractions from groundwater (J02.07) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Mechanical removal of peat (C01.03.02) ▪ Sand and gravel quarries (C01.01.01) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08) ▪ Changes in abiotic conditions (M01)	▪ Other human induced changes in hydraulic conditions (J02.15) ▪ Modification of hydrographic functioning, general (J02.05) ▪ Pollution to surface waters by industrial plants (H01.01) ▪ Water abstractions from groundwater (J02.07) ▪ Diffuse pollution to surface waters due to agricultural and forestry activities (H01.05) ▪ Mechanical removal of peat (C01.03.02) ▪ Sand and gravel quarries (C01.01.01) ▪ Diffuse pollution to surface waters due to household sewage and waste waters (H01.08)

4.3 IMPACT PREDICTION

A source – pathway – receptor approach has been used as part of this assessment process.

Process Effluent

Process effluent from the site (including washing water from the drum cleaning operation) is treated on-site on a batch basis to remove oil and as required precipitate out metals before being discharged under controlled conditions to a monitoring station and discharged to the local foul sewer. It is then treated at Portlaoise WWTW before being discharged under licence from the EPA to the Triogue River. The Enva site incorporates the necessary treatment methods to process effluent prior to discharge to the foul sewer. The process effluent is contained in a separate network to storm water run-off and there is no connectivity between the systems.

The Portlaoise WWTW (which itself operates under EPA licence D0001-01) has a design Population Equivalent (P.E.) of 39,000 and provides preliminary, primary, secondary and tertiary treatment as well as chemical dosing for nitrogen and phosphorus removal. The plants final effluent was compliant with the Emission Limit Values in 2015 and the plant is currently operating under the hydraulic and organic loading capacity. The discharge from the WWTW does not have a negative impact on water quality or WFD status, and water quality both upstream and downstream of the discharge is of 'Poor' status (Irish Water, 2015). Owing to this, that fact that the process effluent from the Enva plant is currently treated prior to discharge to the foul sewer, and that there will be no significant change to the nature of the process effluent as a result of site operations, no impacts to water quality in the Triogue River are envisaged and hence there will be no resultant impacts to the downstream European Site.

Strom Water Discharge

Infrastructure

The storm water network at the Enva site consists of *c.* 821m of PVC pipe work that is used to collect all storm water run-off across the site. The network consists of 100mm to 225mm pipes serving the concrete hardstand across the site collecting all stormwater from the roofs, buildings and yard areas within the site.

Periodically, storm water from the bund of the tank farm is pumped into the storm water network. This is the only 'process' material that enters the storm water network. Bund water is largely comprised of storm water but also includes some condensate and blow down from the steam raising boiler system. The condensate and blow down consists of mains water that has been treated (e.g. softened) for use in the generation of steam to heat the tanks. Steam produced by the boiler is conveyed throughout the tank farm by a network of pipes (steam coils) and while in most cases it is captured and returned to the condensate return tank currently there are two condensate lines that do not return to the condensate return tank and discharge into the bund. These are planned to be connected into the condensate return tank with the works expected to be completed by March 2017. The steam system also 'blows down' to remove some condensate and prevent any build up of particulate matter in the boiler.

The storm water network map across the site is presented in **Appendix A**.

Prior to discharge the storm water is treated through a Class I interceptor (two located on site) in accordance with Condition 3.12.3 of the current licence. These interceptors are full retention interceptors designed to the IS EN 858 standard. These two interceptors are noted in the site drawing at the northwest of the site and in the area between Area K and Tank 20.

In series with each interceptor is a silt trap which is designed to mitigate the potential for particulate emissions to storm water.

On collection and treatment the storm water is routed through two discharge points:

- SW01 serves the southern end of the site, collecting surface water run-off around the waste oil processing plant and tank farm and areas external to the following storage areas to C, D, E, F, G, K, L & M.
- SW02 serves the northern end of the site collecting surface water from the external areas adjacent to soil treatment areas (Area A & B) and Area J.

Both discharge points discharge to the Laois County Council municipal storm water network within Clonminam Industrial Estate.

Maintenance

Both interceptors are checked weekly by onsite staff as part of the routine maintenance schedule. If there is oil present on the surface, this material is skimmed off using the onsite vacuum tanker and the oil residue treated on site. Both interceptors are fully cleaned at least annually including the washing of the coalescence filter. The interceptors were last cleaned on the 7th and 8th of June 2016 and records are maintained on site.

The silt trap gully's are inspected weekly and cleaned as required as part of the routine maintenance schedule.

Monitoring

A weekly grab sample is taken from each discharge point via an existing in line auto-sampler and tested for pH and COD. A monthly check is carried out for mineral oils. In addition to this a monthly sample is also tested for suspended solids. All results are compared against a set of trigger values which have been set by the EPA (COD: 250mg/l and Suspended solids: 60mg/l).

Off-site

Once into the Laois County Council municipal storm water network, the storm water mixes with other storm discharges from public roads, paths, etc., as well as other third party discharges on agreement with Lois County Council. It is understood that a precise map of the full Laois County Council municipal storm water network is not available, however, some mapping has been made available by Enva and is included in **Appendix A**.

The mapping indicates that on entering the municipal storm water network the pipes run in a north easterly direction south of the railway line and then are thought to pass under the rail line and

towards the suburban centre of the town before discharging further east to the River Triogue. These areas are largely suburban residential and the primary discharges to the network would be from road, pavements and other hardstanding.

The mapping does not show where the network discharges to a surface water body but it is known that the discharge is to the Triogue. Ultimately, the River Triogue discharges to the River Barrow and River Nore SAC at Mountmellick *c.* 13.5km north east of the Enva site, and it is this pathway, the River Triogue, that connects the Enva site to the SAC.

4.4 ASSESSMENT OF EFFECTS

4.4.1 Conservation Objectives

Article 6 of the Habitats Directive states that:

> *Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications of the site in view of the site's* ***conservation objectives****.*

The Conservation Objectives (COs) for European Sites are set out to ensure that the QIs/SCIs of that site are maintained or restored to a favourable conservation condition/conservation status. Maintenance of favourable conservation condition of habitats and species at a site level in turn contributes to maintaining or restoring favourable conservation status of habitats and species at a national level and ultimately at the Natura 2000 Network level.

Favourable Conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is "favourable".

Favourable Conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

Site specific COs have been developed for the River Barrow and River Nore SAC. These have been extracted from the NPWS website www.npws.ie and are presented in **Table 4.3** below alongside the attributes and targets to maintain or restore the QIS/SCIs to a favourable conservation condition.

An assessment of potential effects of storm water run-off from the Enva site on the achievement of the COs of the River Barrow and River Nore SAC has been undertaken and is presented in **Table 4.3**.

Table 4.3 Assessment of Effects of Surface Water Discharge on the Conservation Objectives of the River Barrow and River Nore SAC[11]

Attribute	Measure	Target	Impact Assessment
Estuaries [1130]: *To maintain the favourable conservation condition of Estuaries in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with *Fabulina fabula* community.	No impacts are predicted as there will be no changes to community distribution as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the estuarine habitat (known distribution *c.* 112km downstream of the site, NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Community extent	Hectares	Maintain the natural extent of the *Sabellaria alveolata* reef, subject to natural process.	No impacts are predicted as there will be no changes to community extent as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the estuarine habitat (known distribution *c.* 112km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Mudflats and sandflats not covered by seawater at low tide [1140]: *To maintain the favourable conservation condition of the Mudflats and sandflats not covered by seawater at low tide in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex.	No impacts are predicted as there will be no changes to community distribution as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 132km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
***Salicornia* and other annuals colonizing mud and sand [1310]:** *To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			

[11] Taken from Conservation Objectives Version 1.0, 19/07/2011, accessed online at www.npws.ie on 01st November 2016.

Attribute	Measure	Target	Impact Assessment
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For the one sub-site mapped: Ringville - 0.03ha.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Habitat distribution	Occurrence	No decline, subject to natural processes.	No impacts are predicted as there will be no changes to habitat distribution as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 142km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions.	No impacts are predicted as there will be no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 142km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site. Also the fact that no barriers to sediment supply will be created.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	No impacts are predicted as surface water discharge from the Enva facility will not alter the flooding regime. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 142km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter natural flooding regime will be created by the discharge of storm water run-off from the site.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	No impacts are predicted as there will be no changes to hydrological regime as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 142km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime.
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonation's including transitional zones, subject to natural processes including erosion and succession.	See above.
Vegetation structure:	Centimetres	Maintain structural variation within sward	No impacts are predicted as there will be no changes to hydrological regime and no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to

Attribute	Measure	Target	Impact Assessment
vegetation height			the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 142km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.	See above.
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009).	See above.
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur.	See above.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]: *To restore the favourable conservation condition of Atlantic salt meadows in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 1.25ha, Killowen - 2.59ha, Rochestown - 17.50ha, Ringville - 6.70ha.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Habitat distribution	Occurrence	No decline, subject to natural processes.	No impacts are predicted as there will be no changes to hydrological regime and no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 139km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water

Attribute	Measure	Target	Impact Assessment
			run-off to maintain the current hydrological regime and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions.	No impacts are predicted as there will be no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 139km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site. Also the fact that no barriers to sediment supply will be created.
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime.	No impacts are predicted as surface water discharge from the Enva facility will not alter the flooding regime. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 139km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter natural flooding regime will be created by the discharge of storm water run-off from the site.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.	No impacts are predicted as there will be no changes to hydrological regime as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 139km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime.
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonation's including transitional zones, subject to natural processes including erosion and succession.	See above.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward.	No impacts are predicted as there will be no changes to hydrological regime and no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 139km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Vegetation	Percentage cover	Maintain more than 90% of area	See above.

Attribute	Measure	Target	Impact Assessment
structure: vegetation cover	at a representative sample of monitoring stops	outside creeks vegetated	
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009)	See above.
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur.	See above.
Mediterranean salt meadows (*Juncetalia maritimi*) [1410]: *To restore the favourable conservation condition of Mediterranean salt meadows in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 0.08ha, Rochestown - 0.04ha, Ringville - 6.70ha.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Habitat distribution	Occurrence	No decline, subject to natural processes.	No impacts are predicted as there will be no changes to habitat distribution as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 147km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions.	No impacts are predicted as there will be no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 147km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site. Also the fact that no barriers to sediment supply will be created.
Physical structure:	Hectares flooded; frequency	Maintain natural tidal regime.	No impacts are predicted as surface water discharge from the Enva facility will not alter the flooding regime. This is due to the distance between the Enva site and the downstream

Attribute	Measure	Target	Impact Assessment
flooding regime			location of the habitat (known distribution *c.* 147km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter natural flooding regime will be created by the discharge of storm water run-off from the site.
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession.	No impacts are predicted as there will be no changes to hydrological regime as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 147km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime.
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonation's including transitional zones, subject to natural processes including erosion and succession.	See above.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward.	No impacts are predicted as there will be no changes to hydrological regime and no changes to sediment supply as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (known distribution *c.* 147km downstream of the site, (NPWS, 2011)), the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off to maintain the current hydrological regime and that if there was any suspended sediments they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.	See above.
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry & Ryle, 2009).	See above.
Vegetation structure:	Hectares	No significant expansion of *Spartina*. No new sites for this	See above.

Attribute	Measure	Target	Impact Assessment
negative indicator species: *Spartina anglica*		species and an annual spread of less than 1% where it is already known to occur.	
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260]: *To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat distribution	Occurrence	No decline, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Habitat area	Kilometers	Area stable or increasing, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes.	No impacts are predicted as surface water discharge from the Enva facility will not alter river flow in any significant way. This is due to the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter river flow will be created by the discharge of storm water run-off from the site.
Hydrological regime: groundwater discharge	Metres per second	The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation.	No impacts are predicted due to the fact that surface water discharge from the Enva facility and/or site operations will not alter groundwater flow or groundwater movement.
Substratum composition: particle size range	Millimetres	The substratum should be dominated by large particles and free from fine sediments.	Potential for impact as although the discharge of surface water from the Enva site will not change to composition of the substratum or cause scour, and although on average suspended sediment levels in the surface water discharge are below the 25mg/l limit set by the Freshwater Fish Directive (2006/44/EC), on occasion sediment levels exceed this limit and there could exist the potential for deposition of fine sediments. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'maintaining' the favourable conservation of this habitat downstream in the SAC.
Water chemistry: minerals	Milligrammes per litre	The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits.	No impacts are predicted as there will be no changes to the nature of the surface water discharge from historical conditions, with neutral to alkaline conditions recorded in the surface water discharge from 2014 to date (refer to AERs and self monitoring reports on EPA website) which are conditions suitable for the formation of tufa and the absence of acid conditions will ensure existing tufa is not eroded.
Water quality: suspended	Milligrammes per litre	The concentration of suspended solids in the water column should	Potential for impact as although on average suspended sediment levels in the surface water discharge are below the limit set by the 25mg/l Freshwater Fish Directive (2006/44/EC), on

Attribute	Measure	Target	Impact Assessment
sediment		be sufficiently low to prevent excessive deposition of fine sediments.	occasion sediment levels exceed this limit and there could exist the potential for deposition of fine sediments. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'maintaining' the favourable conservation of this habitat downstream in the SAC.
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition.	No impacts are predicted as there will be no changes to the nature of the surface water discharge and lack of nutrient producing activities/substances in the areas drained by the surface water network on the Enva site. The areas and nature of usage of the areas drained by the surface water network on site are not associated with activities that would generate nutrients in surface water. The soil remediation area of the site and all other process effluent that could contain nutrients is drained to the process effluent system before being treated and discharged to the foul sewer network prior to further treatment in Portlaoise WWTW. Therefore, the nature of the surface water discharge will be maintained at oligotrophic conditions.
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition.	No impacts are predicted due to the fact that there will be no changes to hydrological regime and no changes to sediment or nutrient supply as a result of surface water discharge from the Enva facility.
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained.	No impacts are predicted due to the fact that there will be no alteration to river banks or floodplains and no significant changes to water levels as a result of surface water discharge from the site and floodplain connectivity will be maintained.
European dry heaths [4030]: *To maintain the favourable conservation condition of European dry heaths in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat distribution	Occurrence	No decline from current habitat distribution, subject to natural processes.	No impacts are predicted due to the fact that European dry heath is generally found on dry or free-draining soils and is typically located above the waterline and thus does not come into contact with surface water.
Habitat area	Hectares	Area stable or increasing, subject to natural processes. Habitat area is not known but estimated as less than 400ha of the area of the SAC, occurring in dispersed locations.	
Physical structure:	Occurrence	No significant change in soil nutrient status, subject to natural	

Attribute	Measure	Target	Impact Assessment
free-draining, acid, low nutrient soil; rock outcrops		processes. No increase or decrease in area of natural rock outcrop.	
Vegetation structure: sub-shrub indicator species	Percentage cover	Cover of characteristic sub- shrub indicator species at least 25%: gorse (*Ulex europaeus*) and where rocky outcrops occur bilberry (*Vaccinium myrtillus*) and woodrush (*Luzula sylvatica*). Some rock outcrops support English stonecrop (*Sedum anglicum*), sheep's bit (*Jasione montana*) and wild madder (*Rubia peregrina*) as well as important moss and lichen assemblages.	
Vegetation structure: senescent gorse	Percentage cover	Cover of senescent gorse less than 50%.	
Vegetation structure: browsing	Percentage cover	Long shoots of bilberry with signs of browsing collectively less than 33%.	
Vegetation structure: native trees and shrubs	Percentage cover	Cover of scattered native trees and shrub less than 20%.	
Vegetation composition: positive indicator species	Number	Number of positive indicator species at least 2 e.g. gorse and associated dry heath/ acid grassland flora.	
Vegetation structure: positive indicator species	Percentage cover	Cover of positive indicator species at least 60%. This should include plant species characteristic of dry heath in this SAC including gorse, bilberry and	

Attribute	Measure	Target	Impact Assessment
		associated acid grassland flora.	
Vegetation composition: bryophyte and non-crustose lichen species	Number	Number of bryophyte or non-crustose lichen species present at least 2.	
Vegetation composition: bracken (*Pteridium aquilinum*)	Percentage cover	Cover of bracken less than 10%.	
Vegetation structure: weedy negative indicator species	Percentage cover	Cover of agricultural weed species (negative indicator species) less than 1%.	
Vegetation composition: non- native species	Percentage cover	Cover of non-native species less than 1%.	
Vegetation composition: rare/scarce heath species	Location, area and number	No decline in distribution or population sizes of rare, threatened or scarce species, including Greater Broomrape (*Orobanche rapum-genistae*) and the legally protected clustered clover (*Trifolium glomeratum*).	
Vegetation structure: disturbed bare ground	Percentage cover	Cover of disturbed bare ground less than 10% (but if peat soil less than 5%).	
Vegetation structure: burning	Occurrence	No signs of burning within sensitive areas.	
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]: *To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			

Attribute	Measure	Target	Impact Assessment
Habitat distribution	Occurrence	No decline, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Habitat area	Hectares	Area stable or increasing, subject to natural processes.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations.
Hydrological regime: Flooding depth/height of water table	Metres	Maintain appropriate hydrological regimes.	No impacts are predicted as surface water discharge from the Enva facility will not alter the hydrological/flooding regime. This is due to the natural capacity of the River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter natural flooding regime will be created by the discharge of storm water run-off from the site.
Vegetation structure: sward height	Centimetres	30-70% of sward is between 40 and 150cm in height.	No impacts are predicted due to the fact that there will be no changes to hydrological regime and no changes to sediment supply as a result of surface water discharge from the Enva facility.
Vegetation composition: broadleaf herb: grass ratio	Percentage	Broadleaf herb component of vegetation between 40 and 90%.	See above.
Vegetation composition: typical species	Number	At least 5 positive indicator species present.	See above.
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control - NB Indian balsam (*Impatiens glandulifera*), monkeyflower (*Mimulus guttatus*), Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*).	See above.
***Petrifying springs with tufa formation (*Cratoneurion*) [7220]:** *To maintain the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion) in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Square metres	Area stable or increasing, subject	No impacts are predicted as there will be no loss of habitat and no impact to groundwater or

Attribute	Measure	Target	Impact Assessment
		to natural processes.	groundwater movement as a result of surface water discharge from the Enva facility or site operations. There will be no changes to the nature of the surface water discharge from historical conditions, with neutral to alkaline conditions recorded from 2014 to date (refer to AERs and self monitoring reports on EPA website). Therefore, if any petrifying springs are located along riverbanks and come into contact with surface water arising from the site there will be no impacts associated with dissolution of tufa due to the neutral to alkaline nature of the surface water discharge and therefore no impacts on habitat area.
Habitat distribution	Occurrence	No decline.	See above.
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes.	See above.
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions.	No impacts are predicted as there will be no changes to the nature of the surface water discharge from historical conditions, with neutral to alkaline conditions recorded in the surface water discharge from 2014 to date (refer to AERs and self monitoring reports on EPA website), and lack of nutrient producing activities/substances in the areas drained by the surface water network. The areas and nature of usage of the areas drained by the surface water network on site are not associated with activities that would generate nutrients in surface water. The soil remediation area of the site and all other process effluent that could contain nutrients is drained to the process effluent system before being treated and discharged to the foul sewer network prior to further treatment in Portlaoise WWTW. Therefore, the nature of the surface water discharge will be maintained at oligotrophic and calcareous conditions.
Vegetation composition: typical species	Occurrence	Maintain typical species.	No impacts are predicted as there will be no changes to groundwater or groundwater movement, no changes to the nature of the surface water discharge from historical conditions, with neutral to alkaline conditions recorded in the surface water discharge from 2014 to date (refer to AERs and self monitoring reports on EPA website), and lack of nutrient producing activities/substances in the areas drained by the surface water network. Therefore, growing conditions for typical species will be maintained.
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]: *To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 85.08ha for sub-sites surveyed.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations and that woodland is typically located above the waterline and would not come into contact with surface water.

Attribute	Measure	Target	Impact Assessment
Habitat distribution	Occurrence	No decline.	See above.
Woodland size	Hectares	Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and “small” woods at least 3ha in size.	See above.
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; sub-canopy layer with semi- mature trees and shrubs; and well-developed herb layer.	See above.
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types.	See above.
Woodland structure: natural regeneration	Seedling : sapling : pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.	See above.
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter.	See above.
Woodland structure: veteran trees	Number per hectare	No decline.	See above.
Woodland structure: indicators of local distinctiveness	Occurrence	No decline.	See above.
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%.	See above.

Attribute	Measure	Target	Impact Assessment
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak *(Quercus petraea*) and birch (*Betula pubescens*).	See above.
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control.	See above.
***Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]:** *To restore the favourable conservation condition of Old oak woodland with Ilex and Blechnum in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 181.54ha for sites.	No impacts are predicted as there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations. This is due to the distance between the Enva site and the downstream location of the habitat (closest known distribution *c.* 50km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments in the discharge they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Habitat distribution	Occurrence	No decline.	See above.
Woodland size	Hectares	Area stable of increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size.	See above.
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi- mature trees and shrubs; and well-developed herb layer.	See above.
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types.	See above.
Woodland	Seedling : sapling	Seedlings, saplings and pole	See above.

Attribute	Measure	Target	Impact Assessment
structure: natural regeneration	: pole ratio	age-classes occur in adequate proportions to ensure survival of woodland canopy.	
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation.	No impacts are predicted as surface water discharge from the Enva facility will not alter the hydrological/flooding regime. This is due to the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off and the fact that no barriers to alter natural flooding regime will be created by the discharge of storm water run-off from the site.
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).	No impacts are predicted as there will be no loss of habitat as a result of surface water discharge from the Enva facility and no alteration to hydrological/flooding regime that could wash out deadwood. This is due to the distance between the Enva site and the downstream location of the habitat (closest known distribution *c.* 50km downstream of the site, (NPWS, 2011)) and the natural capacity of the River Triogue and River Barrow to assimilate the relatively minor volumes of storm water run-off from the site.
Woodland structure: veteran trees	Number per hectare	No decline.	No impacts are predicted as there will be no loss of habitat as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the habitat (closest known distribution *c.* 50km downstream of the site, (NPWS, 2011)) and that if there was any suspended sediments in the discharge they would have dispersed to negligible levels on reaching the habitat downstream of the site.
Woodland structure: indicators of local distinctiveness	Occurrence	No decline.	See above.
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%.	See above.
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including ash (*Fraxinus excelsior*) alder (*Alnus glutinosa*), willows (*Salix spp*) and locally, oak (*Quercus robur*).	See above.
Vegetation composition: negative	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control.	See above.

Attribute	Measure	Target	Impact Assessment
indicator species			
Killarney fern (*Trichomanes speciosum*) [1421]: *To maintain the favourable conservation condition of Killarney Fern in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution	Location	No decline. Three locations known, with three colonies of gametophyte and one sporophyte colony.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (closest known distribution *c.* 109km downstream of the site near Graiguenamanagh, Co. Kilkenny, (NPWS, 2011)), that the species is typically found on elevated ground in damp caves, rock crevices, cliff faces and near waterfalls and on occasion as ground flora in damp woodlands (NRA, 2009), that if there was any suspended sediments in the discharge it would have dispersed to negligible levels on reaching the species location downstream of the site, and that there will be no changes to water chemistry/quality or hydrological regime over baseline conditions.
Population size	Number	Maintain at least three colonies of gametophyte, and at least one sporophyte colony of over 35 fronds.	See above.
Population structure: juvenile fronds	Occurrence	At least one of the locations to have a population structure comprising sporophyte, unfurling fronds, 'juvenile' sporophyte and gametophyte generations.	See above.
Habitat extent	m²	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in or near to, known colonies. No loss of woodland canopy at or near to known locations.	See above.
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations.	See above.
Hydrological conditions: humidity	Number of desiccated fronds	No increase. Presence of desiccated sporophyte fronds or gametophyte mats indicates	See above.

Attribute	Measure	Target	Impact Assessment
		conditions are unsuitable.	
Light levels: shading	Percentage	No changes due to anthropogenic impacts.	See above.
Invasive species	Occurrence	Absent or under control.	See above.
Desmoulin's whorl snail (*Vertigo moulinsiana*) [1016]: To maintain the favourable conservation condition of Desmoulin's whorl snail in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets			
Distribution: occupied sites	Number	No decline. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (closest known distribution *c.* 103km downstream of the site at Borris Bridge, Co. Carlow, (NPWS, 2011)), that if there was any suspended sediments in the discharge it would have dispersed to negligible levels on reaching the species location downstream of the site, and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions.
Population size: adults	Number per positive sample	At least 5 adults snails in at least 50% of samples.	See above.
Population density	Percentage positive samples	Adult snails present in at least 60% of samples per site.	See above.
Area of occupancy	Hectares	Minimum of 1ha of suitable habitat per site.	See above.
Habitat quality: vegetation	Percentage of samples with suitable vegetation	90% of samples in habitat classes I and II as defined in Moorkens & Killeen (2011).	See above.
Habitat quality: soil moisture levels	Percentage of samples with appropriate soil moisture levels	90% of samples in moisture class 3-4 as defined in Moorkens & Killeen (2011).	See above.
Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]: *The status of the Freshwater Pearl Mussel (Margaritifera margaritifera) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species.*			
According to the NPWS 'Margaritifera Sensitive Areas' mapping (NPWS, 2014), the Barrow catchment does not host an SAC population, but is a catchment '*with previous records of Margaritifiera, but current status unknown*'. S.I. 296 2009 lists the following rivers in the River Barrow and River Nore SAC as having Freshwater pearl mussel populations: • Aughavaud • Ballymurphy • Mountain			

Attribute	Measure	Target	Impact Assessment
The Aughavaud River is a tributary of the River Barrow and is located *c.* 120km downstream of the Enva site near Saint Mullin's, Co. Carlow. Therefore, there is no hydrological connectivity between the Enva site and the Freshwater pearl mussel population as they are located upstream on a tributary of the Barrow. The Ballymurphy population is located on the Ballyroughan Little River, which is a tributary of the River Barrow, located *c.* 199km downstream of the Enva site near Ballymurphy Co. Carlow. Therefore, there is no hydrological connectivity between the Enva site and the Freshwater pearl mussel population as they are located upstream on a tributary of the Barrow. The Mountain River is a tributary of the River Barrow and is located *c.* 106km downstream of the Enva site near Borris, Co. Carlow. Therefore, there is no hydrological connectivity between the Enva site and the Freshwater pearl mussel population as they are located upstream on a tributary of the Barrow. For reasons detailed above; that the status of the Freshwater pearl mussel as a qualifying interest species for the River Barrow and River Nore SAC is under review and that the known populations of Freshwater pearl mussel in the catchment have no hydrological connectivity to the Enva site, detailed conservation objectives for Freshwater pearl mussel have not been adapted from an alternative SAC. It is acknowledged that Freshwater pearl mussel are reliant on salmonids for dispersal of glochidia and as such any impact to salmonids in the Barrow system could impacts on the conservation status of the Freshwater pearl mussel. However, as Atlantic Salmon are a qualifying interest of the River Barrow and River Nore SAC, an assessment of effects of the surface water discharge from the Enva facility has been included for the species and as such any potential impacts on salmonids and hence Freshwater pearl mussel will be captured elsewhere in this assessment.			
White-clawed crayfish (*Austropotamobius pallipes*) [1092]: *To maintain the favourable conservation condition of White-clawed crayfish in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution	Occurrence	No reduction from baseline.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (closest known distribution *c.* 14km downstream of the site on the River Barrow (NPWS, 2011)), that if there was any suspended sediments in the discharge it would have dispersed to negligible levels on reaching the species location downstream of the site, and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions.
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples.	See above.
Negative indicator species	Occurrence	No alien crayfish species.	See above. And also the fact that the discharge is from surface water from the site and the site operates as an industrial site, so there is no potential for introduction of alien crayfish

Attribute	Measure	Target	Impact Assessment
			species or diseases.
Disease	Occurrence	No instances of disease.	See above.
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA.	No impacts are predicted as there will be no changes to the nature of the surface water discharge from historical conditions. Water quality values in the River Barrow, and within the SAC, downstream of the confluence with the River Triogue are of Q4 status. It is acknowledged that water quality values in the River Triogue north of Portlaoise at Kyle Bridge and Eyne Bridge are of Q2-3 status and Q3-4 further downstream east of Mountmellick at Triogue Bridge. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'maintaining' the favourable conservation of White-clawed crayfish downstream in the SAC.
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (closest known distribution *c.* 14km downstream of the site on the River Barrow (NPWS, 2011)), that if there was any suspended sediments in the discharge it would have dispersed to negligible levels on reaching the species location downstream of the site, and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions.
Sea lamprey (*Petromyzon marinus*) [1095]: *To restore the favourable conservation condition of Sea lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary.	No impacts predicted as surface water discharge from the Enva site and/or site operations will not create any barriers to access in surface waters.
Population structure of juveniles	Number of age/size groups	At least three age/size groups present.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (closest known distribution *c.* 14km downstream of the site on the River Barrow (NPWS, 2011)), that suspended solid averages for the surface water discharge are below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions.
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m².	See above.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds.	See above.

Attribute	Measure	Target	Impact Assessment
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	See above.
Brook lamprey (*Lampetra planeri*) [1096]: *To restore the favourable conservation condition of Brook lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution	% of river accessible	Access to all watercourses down to first order streams.	No impacts predicted as surface water discharge from the Enva site and/or site operations will not create any barriers to access in surface waters.
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (known distribution *c.* 14km downstream of the site on the River Barrow (King, 2006)), that suspended solid averages for the surface water discharge is below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions. It is acknowledged that water quality values in the River Triogue north of Portlaoise at Kyle Bridge and Eyne Bridge are of Q2-3 status and Q3-4 further downstream east of Mountmellick at Triogue Bridge. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'restoring' the favourable conservation of Brook lamprey downstream in the SAC.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m².	See above.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds.	See above.
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater),	More than 50% of sample sites positive.	See above.

Attribute	Measure	Target	Impact Assessment
	downstream of spawning areas		
River lamprey (*Lampetra fluviatilis*) [1099]: *To restore the favourable conservation condition of River lamprey in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary.	No impacts predicted as surface water discharge from the Enva site and/or site operations will not create any barriers to access in surface waters.
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream location of the species (known distribution *c.* 14km downstream of the site on the River Barrow (King, 2006)), that suspended solid averages for the surface water discharge is below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions. It is acknowledged that water quality values in the River Triogue north of Portlaoise at Kyle Bridge and Eyne Bridge are of Q2-3 status and Q3-4 further downstream east of Mountmellick at Triogue Bridge. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'restoring' the favourable conservation of Brook lamprey downstream in the SAC.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	See above.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds.	See above.
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive.	See above.
Twaite shad (*Alosa fallax*) [1103]: *To restore the favourable conservation condition of Twaite shad in the River Barrow and River Nore SAC, which is defined by the*			

Attribute	Measure	Target	Impact Assessment
following list of attributes and targets			
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary.	No impacts predicted as surface water discharge from the Enva site and/or site operations will not create any barriers to access in surface waters.
Population structure: age classes	Number of age classes	More than one age class present.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream SAC *c.* 14km distant, that suspended solid averages for the surface water discharge is below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions. It is acknowledged that water quality values in the River Triogue north of Portlaoise at Kyle Bridge and Eyne Bridge are of Q2-3 status and Q3-4 further downstream east of Mountmellick at Triogue Bridge. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'restoring' the favourable conservation of Brook lamprey downstream in the SAC.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats.	See above.
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l.	It is unlikely that surface water discharge from the Enva facility would result in oxygen levels lower than 5mg/l due to the COD monitoring carried out and the potential for dilution in the storm water network of any discharge with a high COD level prior to entering the Triogue River, and further dilution before entering the River Barrow further downstream. However, in the interest of best practice, mitigation has been proposed in Section 5 to ensure oxygen levels are maintained in surface waters.
Atlantic salmon (*Salmo salar*) (only in fresh water) [1106]: *To restore the favourable conservation condition of Atlantic salmon in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary.	No impacts predicted as surface water discharge from the Enva site and/or site operations will not create any barriers to access in surface waters.
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded.	No impacts are predicted as there will be no loss of habitat/species as a result of surface water discharge from the Enva facility. This is due to the distance between the Enva site and the downstream SAC *c.* 14km distant, that suspended solid averages for the surface water discharge is below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime

Attribute	Measure	Target	Impact Assessment
			over baseline conditions.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling.	See above.
Out-migrating smolt abundance	Number	No significant decline.	See above.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes.	See above.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA.	No impacts are predicted as there will be no changes to the nature of the surface water discharge from historical conditions. Water quality values in the River Barrow, within the SAC, downstream of the confluence with the River Triogue are of Q4 status. It is acknowledged that water quality values in the River Triogue north of Portlaoise and the storm water discharge location do not meet Q4 status and mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards 'restoring' the favourable conservation of Atlantic Salmon downstream in the SAC.
Otter (*Lutra lutra*) [1355]: *To restore the favourable conservation condition of Otter in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Distribution	Percentage positive survey sites	No significant decline.	No impacts are predicted due to the fact that there will be no loss of habitat/species as a result of surface water discharge from the Enva facility and/or site operations and no barriers to movement created.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around ponds.	See above.
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 857.7ha.	See above.
Extent of freshwater (river)	Kilometres	No significant decline. Length mapped and calculated as	See above.

Attribute	Measure	Target	Impact Assessment
habitat		616.6km.	
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha.	See above.
Couching sites and holts	Number	No significant decline.	No impacts are predicted due to the fact that there will be no loss of habitat as a result of surface water discharge from the Enva facility or site operations, no barriers to movement created and no alterations to hydrological regime.
Fish biomass available	Kilograms	No significant decline.	No impacts are predicted due to the fact that suspended solid averages for the surface water discharge is below the 25mg/l limit set in the Freshwater Fish Directive (2006/44/EC) and that there will be no changes to water chemistry/quality or hydrological/flooding regime over baseline conditions. It is acknowledged that water quality values in the River Triogue north of Portlaoise at Kyle Bridge and Eyne Bridge are of Q2-3 status and Q3-4 further downstream east of Mountmellick at Triogue Bridge, which may not be optimal for all fish species. Mitigation has been proposed in Section 5 to ensure that the quality of surface water discharge from the Enva site is enhanced to contribute towards enhancing water quality in the River Triogue and hence contributing to 'restoring' the favourable conservation status of Otter in the SAC.
Nore freshwater pearl mussel (*Margaritifera margaritifera durrovensis*) [1990]: *To restore the favourable conservation condition of Nore freshwater pearl mussel in the River Barrow and River Nore SAC, which is defined by the following list of attributes and targets*			
Water quality: Macroinvertebrates and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93.	No impacts predicted as a result of surface water discharge from the Enva site and/or site operations as this species is confined to the River Nore, having no hydrological connectivity to the Enva site.
Substratum quality: Filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality-filamentous algae: absent or trace (<5%).	
Substratum quality: sediment	Occurrence	Restore substratum quality-stable cobble and gravel	

Attribute	Measure	Target	Impact Assessment
		substrate with very little fine material; no artificially elevated levels of fine sediment.	
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate.	
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes.	
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae.	

4.5 CUMULATIVE AND IN-COMBINATION IMPACTS

The Enva site is located within the Clonminam Industrial Estate on the west of Portlaoise town. With the exception of the Glanbia grain and oat processing site to the south of Enva and Irish Rail to the east, the other operations in the area are generally light industry, commercial and retail. There are no other EPA licensed operations in the estate. None of the existing operations are considered to pose a risk of stormwater contamination based on the operations. All are largely inert or dry operations with no bulk storage or handling of fuels, chemicals or other materials. All of these operations will involve a degree of vehicle transport on the public road and internal road networks and parking. Typically, these operations are constructed with interceptors to prevent the egress of any minor fuel/oil spills to these are considered low risk operations.

The Triogue River is bordered by Portlaoise town for more than 1.5 km. From previous work carried out by RPS south of Portlaoise town, bank erosion on the Triogue is evidenced from cattle access to the water course. Therefore there is a degree of sediment and nutrients being released into the watercourse from agricultural practices before it reaches Portlaoise town. Through the town the river would also be subject to discharges of storm water from buildings and paved areas. To the north of the site the storm network predominately passes through residential areas where the network will be fed by municipal road and pavement drainage. These are low risk areas with no significant sources of pollutant loadings to the storm network.

Portlaoise WWTW discharges directly to the Triogue north of the town of Portlaoise. T2015, Irish Water reported that the final effluent from the Primary Discharge Point was compliant with the Emission Limit Values. For COD the ELV is 125mg/l and the average level in 2015 was 26mg/l. For Suspended Solids the ELV is 35mg/l and the average level in 2015 was 6.5mg/l. The EPA Inspectors Report for this plant indicates that based on a background of 6mg/l and continuous emissions at the Suspended Solids limit of 35mg/l, this would result in a downstream concentration of 24.8mg/l (still below the 25mgl limit in the Freshwater Fish Directive). Given that the site is currently discharging an average of 6.5mg/l providing adequate headroom capacity, the cumulative impact of the Enva site coupled with the WWTP would still not breach the 25mg/l limit.

North of the town the land use is mostly agriculture with some forestry in places. These land uses may have potential for nutrient loading to the Triogue but there is no risk of any nutrient loading directly from the Enva site.

5 MITIGATION MEASURES

This section outlines the existing mitigation measures applicable to the Enva site and specifies additional mitigation measures that have been devised following this assessment. Mitigation measures are presented for the stormwater network given that this is the area of connectivity established in this assessment.

The existing mitigation measures applicable to the management of stormwater at the Enva site are as follows:

- Separation of process effluent arising from all waste processing for either on-site treatment and discharge to sewer or export as necessary;
- Detergents are not used to clean yard surfaces unless these are fully captured and returned to process effluent (sewer discharge/off site treatment);
- Vehicle washing (involving detergents) is carried out off site at a commercially operated facility and not on the Enva site;
- Facility wheel wash operates on a closed loop system without discharging to storm drains;
- Roofing is employed over most waste storage/processing areas to prevent contamination of rainwater (additional roofing is proposed e.g. mixed fuel storage);
- Contaminated run off in the tanker dig out bay is all pumped to process, this area is to be roofed and hence will reduce the volume of contaminated stormwater generated;
- A road sweeper is regularly employed at the facility to remove surface grit/solids from facility roadways and help minimise this from entering the stormwater system;
- The sites stormwater drainage infrastructure includes silt traps in each gully as well as large underground silt traps and class 1 interceptors to remove solids and oil residues from stormwater discharges. These are subject to routine maintenance to remove settled residues and hence minimise the discharge to the municipal system.
- Discharges of stormwater are subject to a set of Trigger Values specified in Condition 6.4.1 of the current licence (W0184-01). While these trigger values are set for SW1 in the condition, they have been employed for both discharge points.

In addition, while the existing operation is not predicted to cause a significant impact the following best practice mitigation is advised to further manage and enhance the quality of the discharges:

1. There is currently a small fraction of the stormwater discharge at SW1 that consists of softened water from the boiler blow down (to the tank farm bund). While not a source of contaminant concern, this is not stormwater and this discharge should be diverted directly to foul sewer or the effluent treatment system. This measure will reduce the risk of discharge of potentially contaminated stormwater.

2. Currently bundwater (i.e. rainwater within the bund) from the bund in the main tank farm is automatically pumped out of the bund on a continuous basis to the sites stormwater drainage network and ultimately the SW1 discharge. The current controls include an automatic monitor to detect the presence of oil residue which shuts down the pumping. This operation poses a potential risk and it is suggested that the current approach to bund water be modified as follows:

   Automatic continuous pumping of bundwater should be discontinued and bundwater should be contained within the bund for testing prior to any discharge. Prior to any decision on

discharge the bundwater should undergo testing for the following parameters against a set of trigger values:

- Chemical Oxygen Demand (COD)
- Suspended Solids

Where available, trigger values should be set based on the limits specified in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 271 of 2009). Where bundwater shows a level detected above a trigger value, the bundwater should be diverted to the effluent system. This measure will reduce the risk of discharge of contaminated stormwater.

3. There are currently two silt traps located at the discharge points SW1 and SW2. Monitoring data demonstrates that on average the levels of Suspended Solids are below the limit specified in the Freshwater Fish Directive, however, periodic spikes are observed albeit infrequently. It is recommended that a more rigorous regime is applied to the cleaning of silt traps and this should be carried out at least bi-monthly during the winter months and the silt traps should be checked following any heavy rainfall event to ensure that the treatment capacity remains. This routine maintenance should be recorded as part of the sites management system. In the event that individual grab samples continue to show the occasional high level then the size and operation of the silt traps should be reviewed.

4. In addition to the cleaning of the silt traps, the routine road sweeping of the yard areas around the site should be more frequent. The frequency should be based on the nature of the operation and need but should be monthly as a minimum.

5. Similarly, the monitoring data shows that while mineral oil is rarely detected in the discharge, low levels can be discharged during the winter months (albeit at levels well below the BAT limit of 5mg/l). It is recommended that as a minimum the interceptors are cleaned in advance of the winter period to ensure maximum abatement capacity.

All of the mitigation measures listed will provide greater protection from the risk of any potentially contaminated stormwater.

6 CONCLUSIONS

This Natura Impact Statement has been prepared as part of the Appropriate Assessment process to identify any potential impacts arising from the Enva site operations at Portlaoise, Co. Laois and where these could adversely affect the integrity of European Sites.

The only potential impact identified was the potential for surface water discharges from the site to result in pollution impacts to the receiving water environment. The River Barrow and River Nore SAC was identified as the only European Site having connectivity to the Enva site by virtue of surface water discharges from the Enva site.

The assessment identified that in the main the surface water discharges from the Enva site would not lead to adverse effects on the River Barrow and River Nore SAC. Mitigation measures have been proposed in Section 5 to ensure that any potential adverse effects are avoided. Enva is aware of the importance of protection of European Sites and have put forward additional site maintenance measures in the interest of best site practice and to contribute towards enhancing water quality.

It is concluded that the site operations at Enva, Clonminam Industrial Estate, Portlaoise, Co. Laois will not adversely affect the integrity of the River Barrow and River Nore SAC either alone or in combination with other impact sources.

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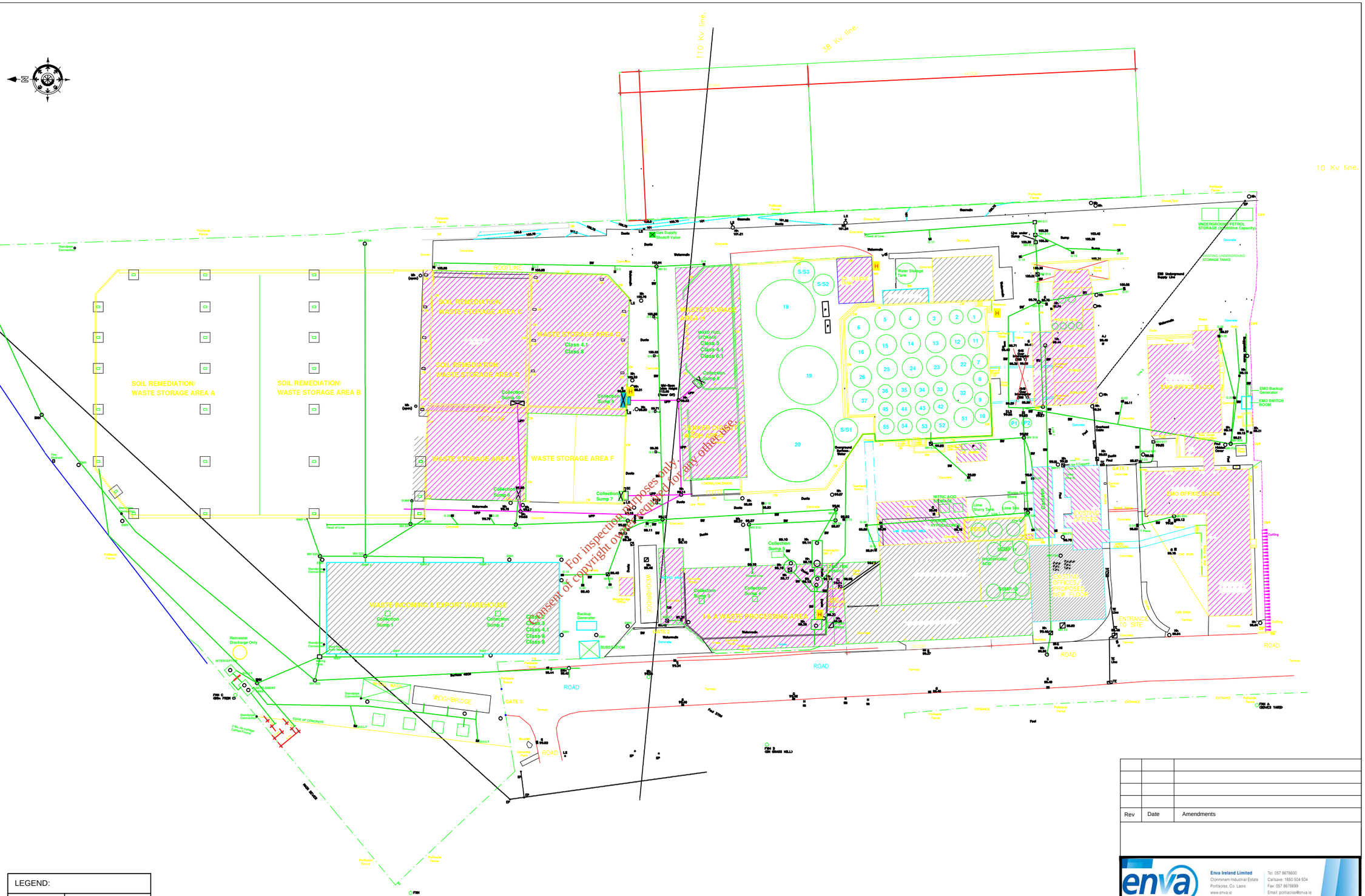
APPENDIX A

Storm Water Drainage Maps of the Site and the Portlaoise Area



LEGEND:

———	Surface Water (SW)

Rev	Date	Amendments

Enva Ireland Limited
Clonminam Industrial Estate
Portlaoise, Co. Laois.
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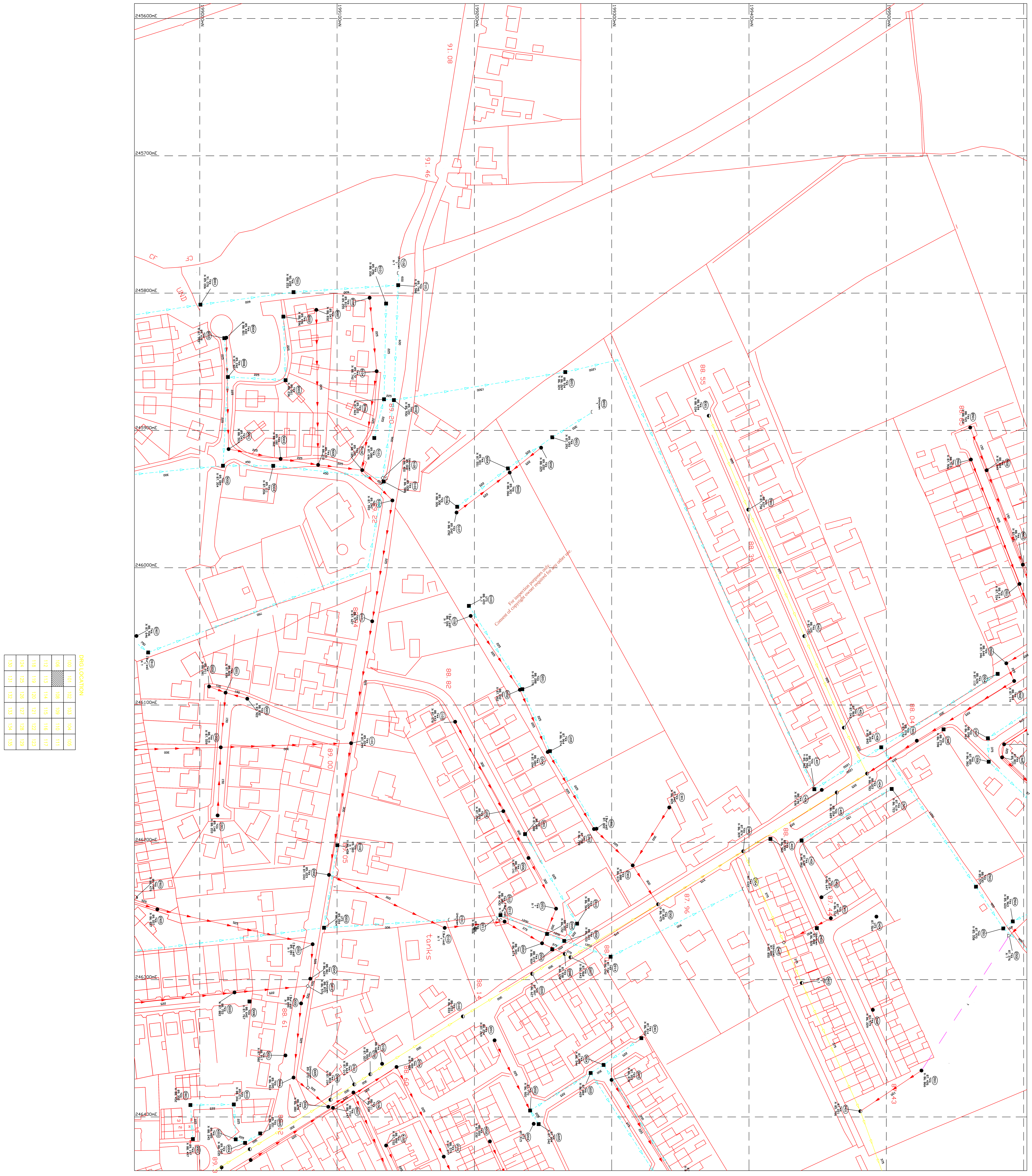
Title

Figure 36.2
Surface Water Drainage Plan

Drawn by.	Checked by.	Scale.	Sheet No.	Date.
CK	AP	1:750 @ A3	8	09-11-2016

Drawing no.
ENV-1605-16

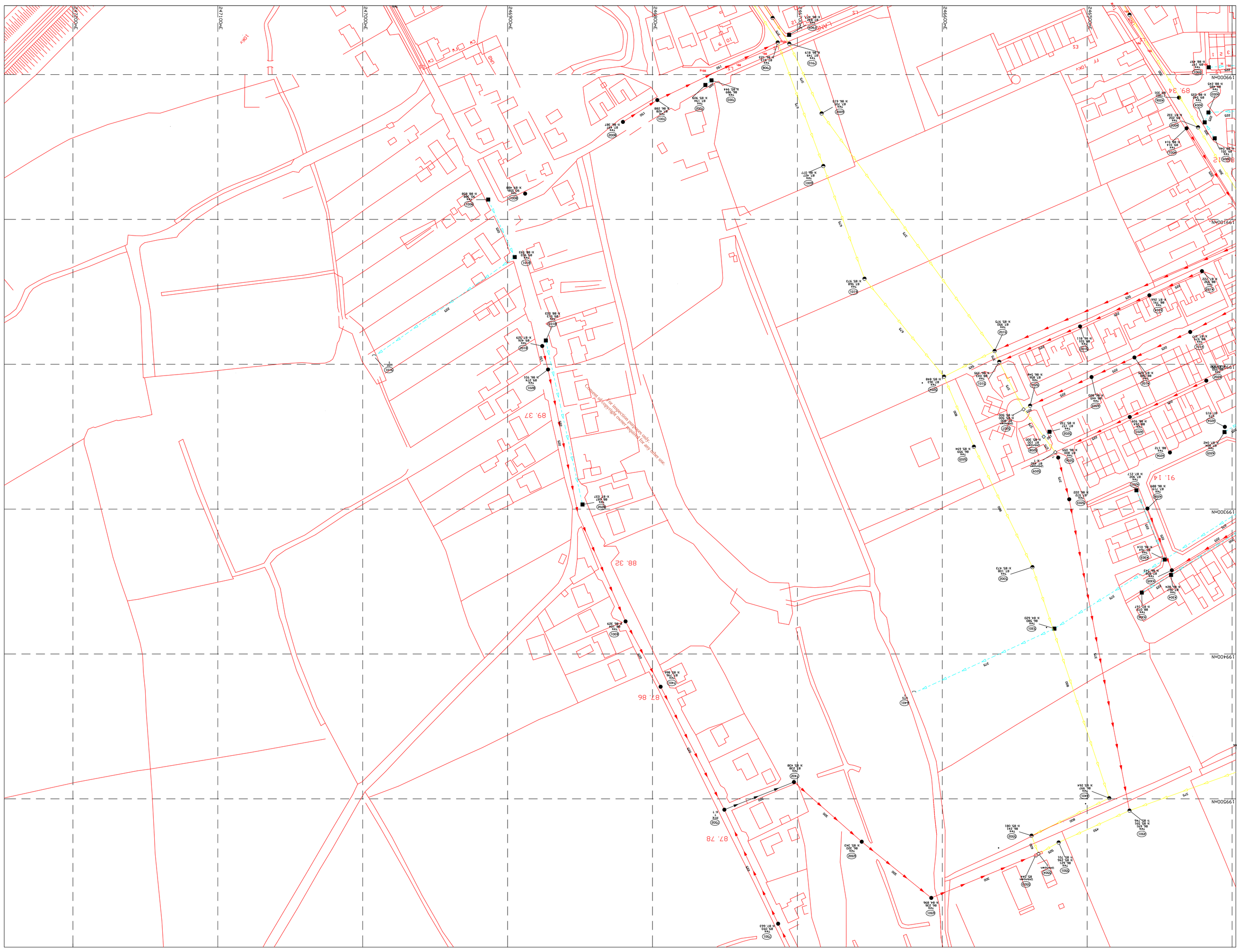


USA/107

USA/108

130	131	132	133	134	135
124	129	128	127	126	129
118	119	120	121	122	123
112	113	114	115	116	117
106	107		109	110	111
100	101	102	103	104	105

DRG LOCATION



DRG LOCATION

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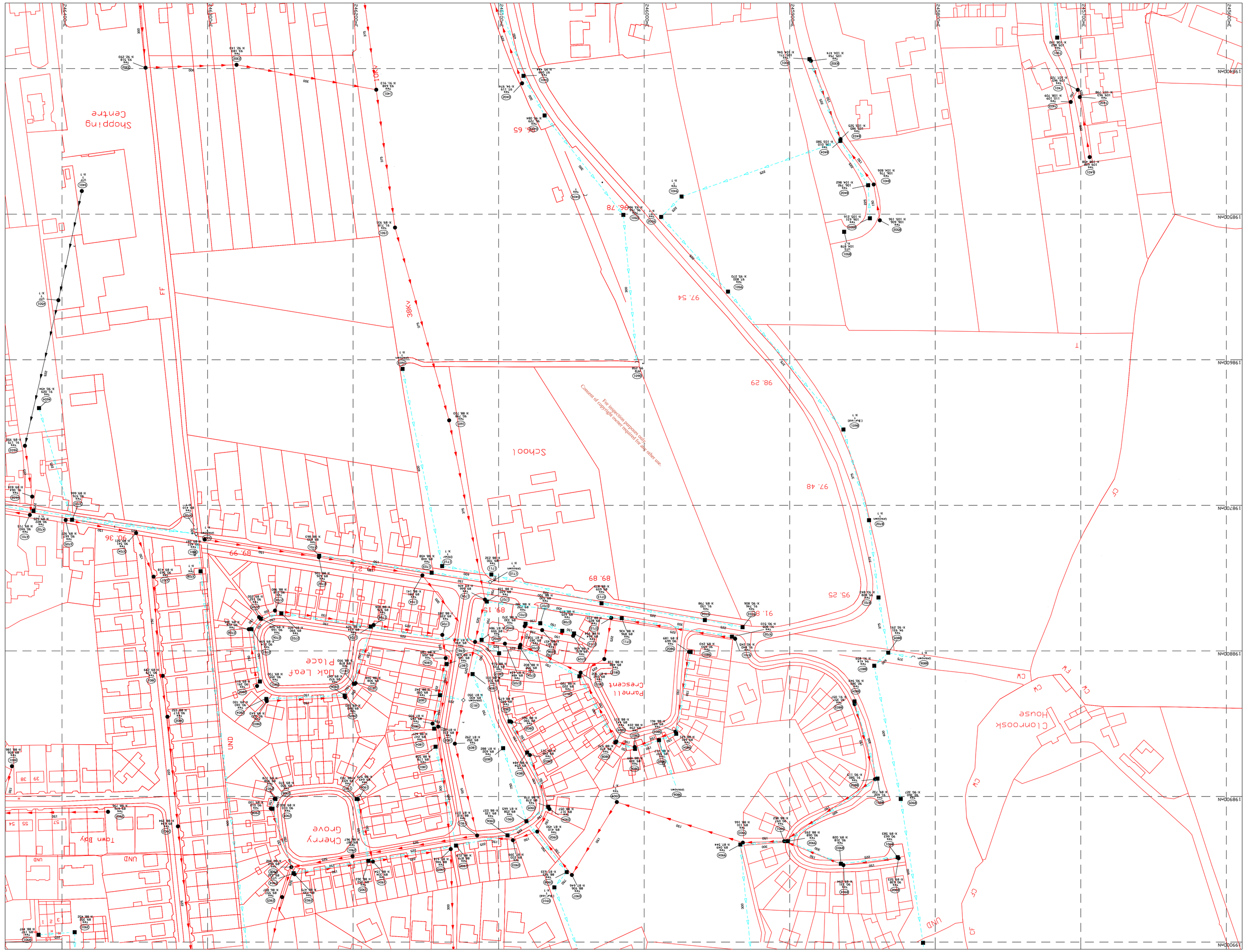

DRG LOCATION

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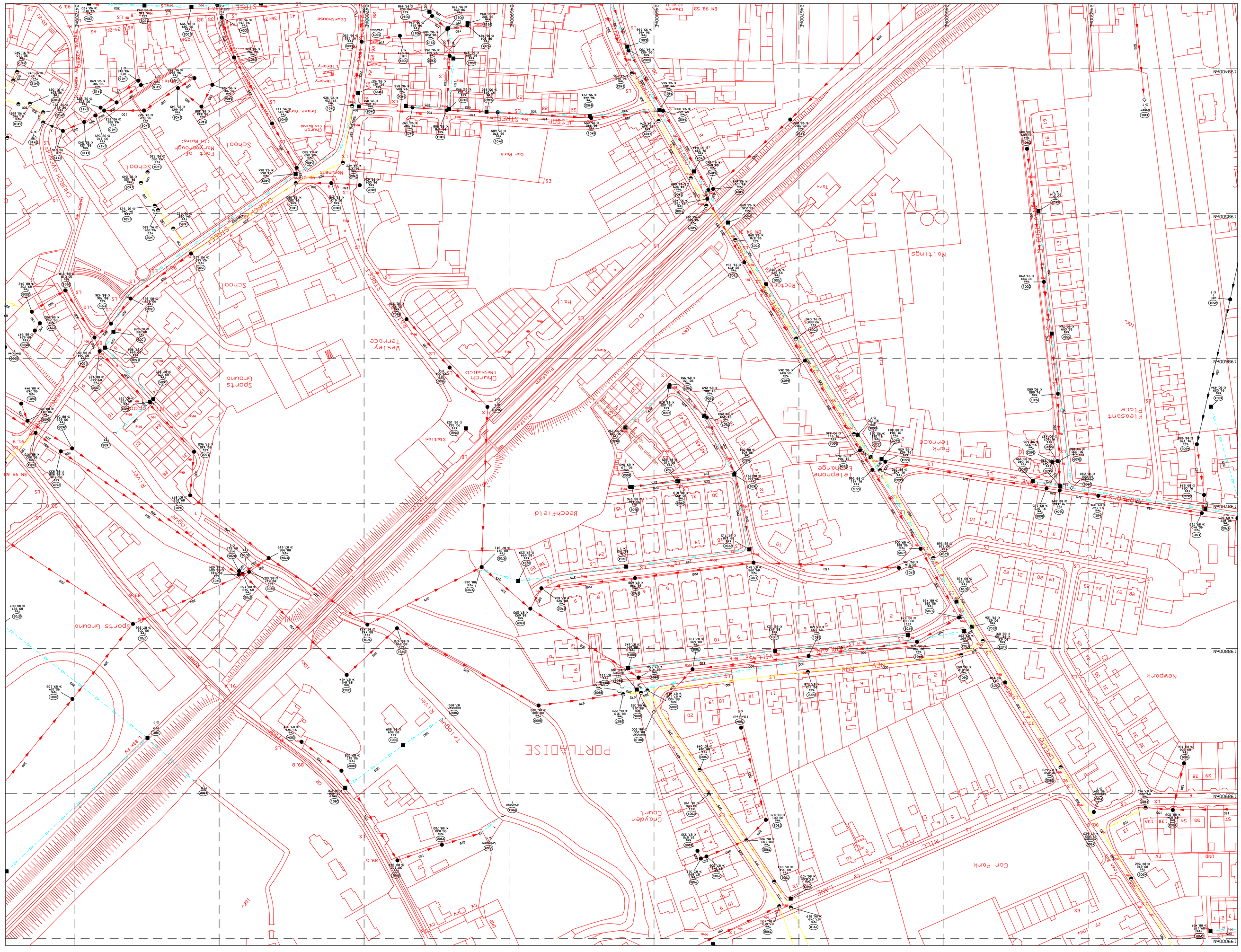

DRG LOCATION

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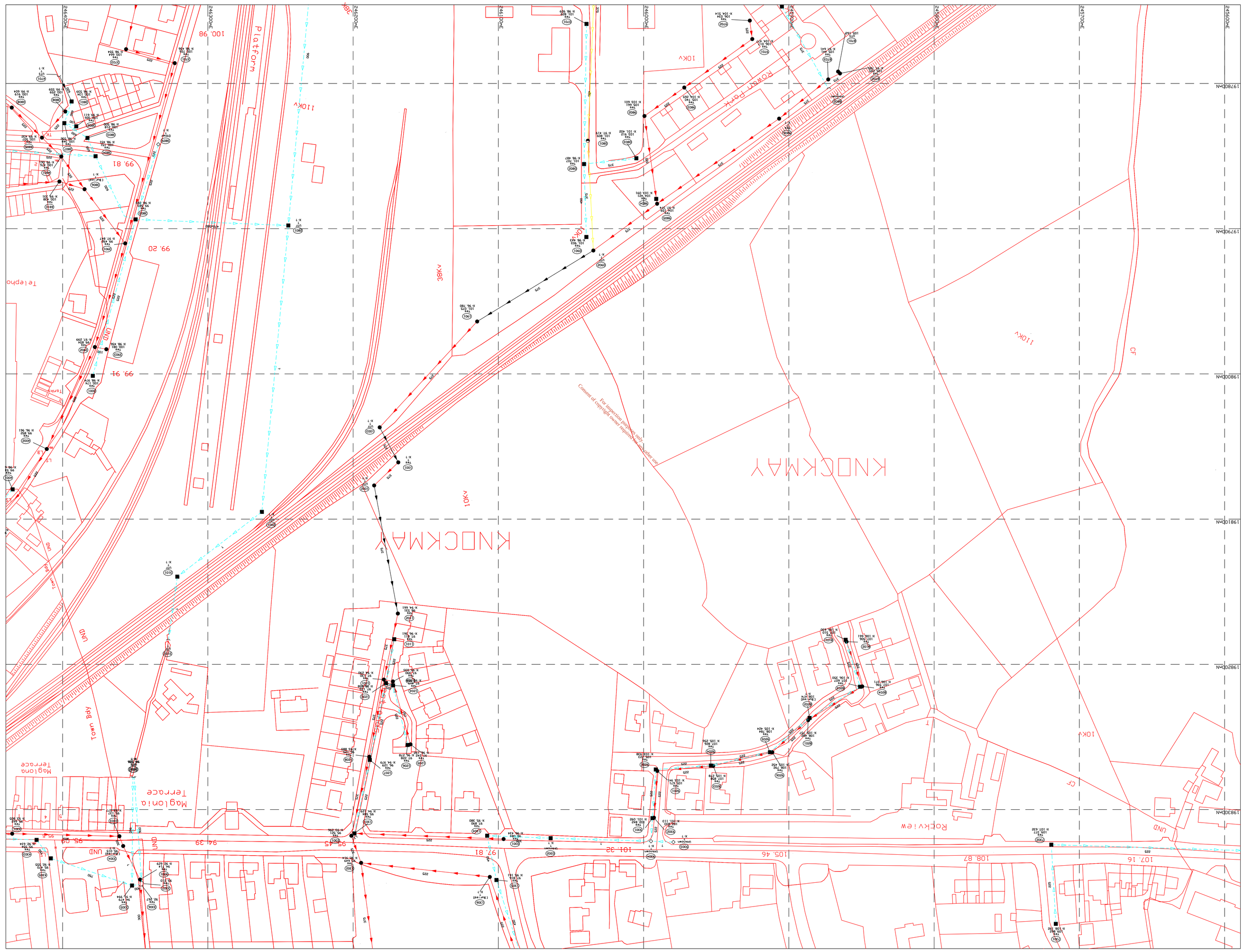

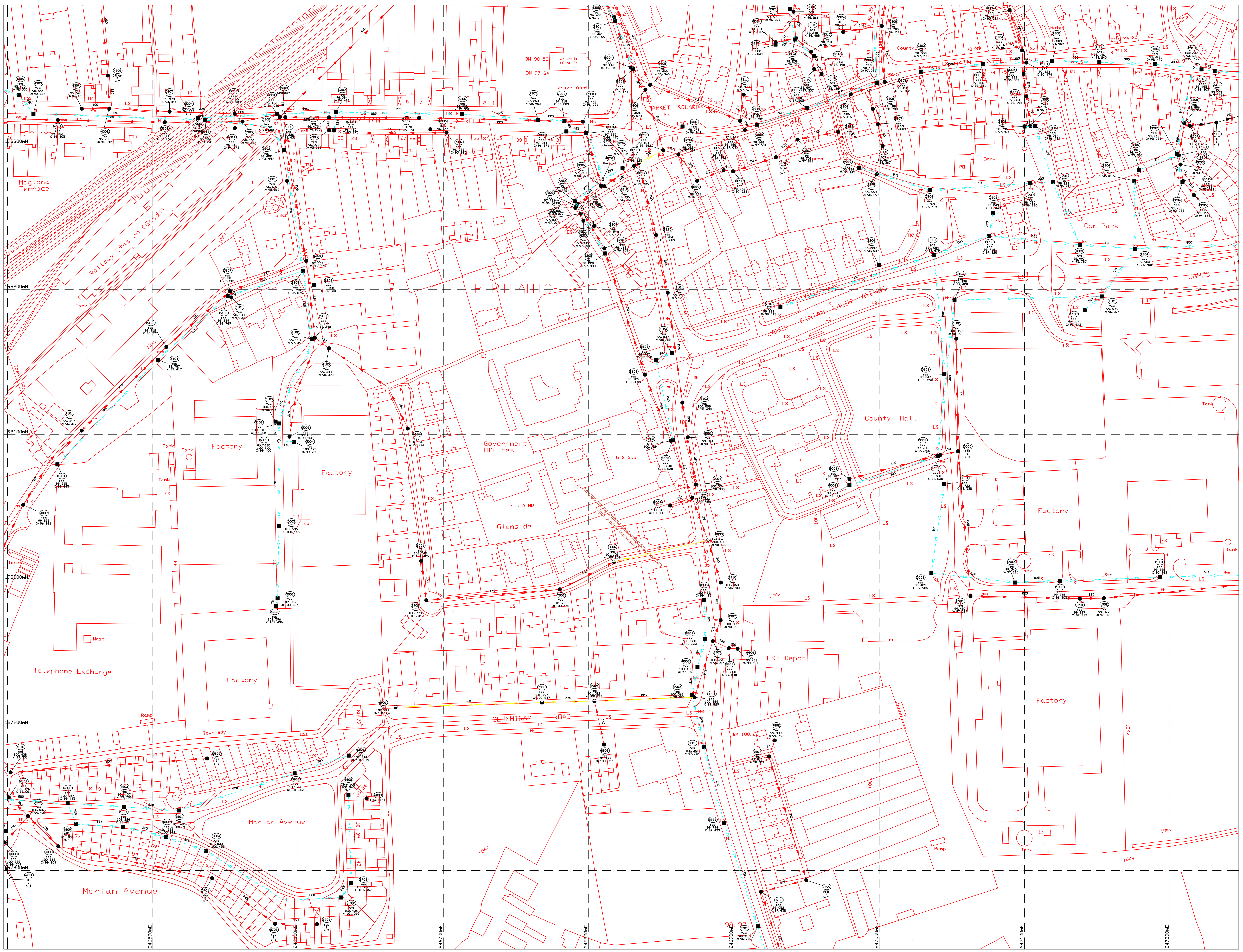

Maglona Terrace
Railway Station (Goods)
MAIN STREET
MARKET SQUARE
JAMES FINTAN LALOR AVENUE
KELLYVILLE PARK
JAMES
PORTLAOISE
Church (C of I)
Grave Yard
BM 98.53
BM 97.84
Car Park
Bank
PO
Toilets
Courthouse
County Hall
Government Offices
G S Sta
F C A HQ
Glenside
Factory
Tanks
Tank
ESB Depot
CLONMINAM ROAD
Telephone Exchange
Mast
Town Bay
Ramp
Marian Avenue
10Kv
198300mN
198200mN
198100mN
198000mN
197900mN
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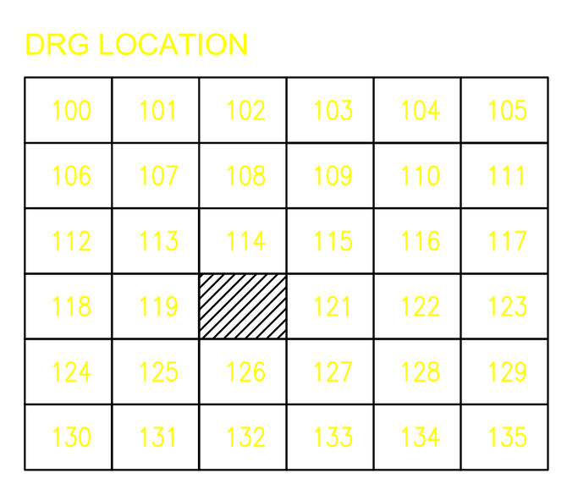

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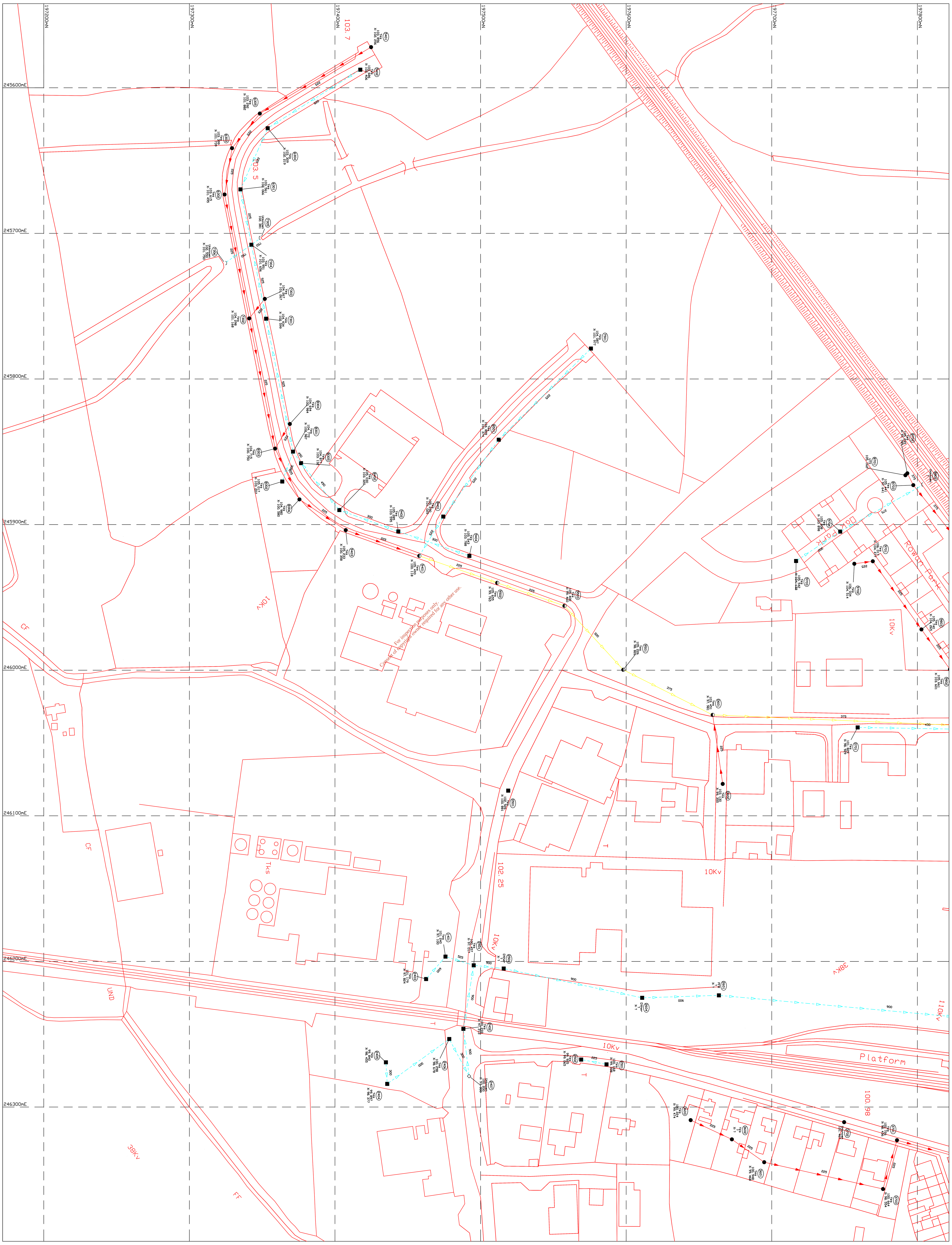

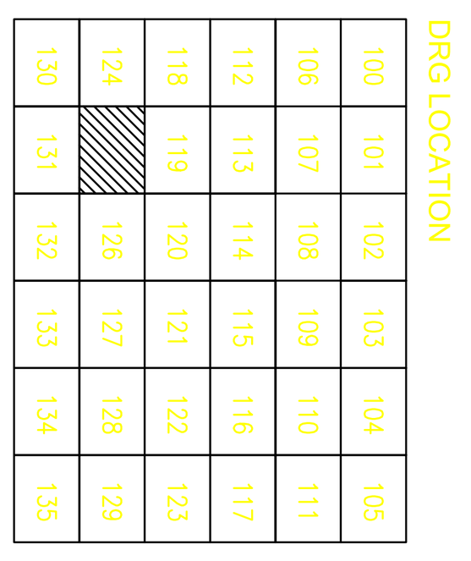

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