Environmental Protection Agency

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Date: 14/03/2018

Reference: REG. No. W-0296: Notice in accordance with Article 14(2) (b) (ii) of the Waste Management (Licensing) Regulations: Correspondence received 08th December 2017

Dear Ms Babiarczyk

In response to the above referenced notification please see attached the considered and detailed submission on behalf of Kilsaran Concrete the applicant. It is the intention of this document to fully comply with the requirements of Article 12 in respect of the above referenced application. Each individual question will be addressed individually below.

1. State the type and amount of waste, in tonnes, that has been deposited at the facility to date. Mark on a sketch or existing map the locations of the deposited waste. Provide a copy of waste authorisations for such waste activities.

In the period before the 2012 closure of the quarry Kilsaran Concrete trialled a number of different products including the reuse of production generated by-products at their main facility in Piercetown, Dunboyne. This research and development led to a particular line of thinking around the reuse of "out – of – specification" paving slabs and other paving materials. The rationale at that time was to be able to process the paving slabs and off cuts etc. by crushing them to 14mm-down product and reuse them as a sub-fill bedding material for under paving products. An amount of concrete paving product was brought to the Kilmessan site for crushing prior to the quarry closing in 2012. This material remained on site in stockpiles on the quarry floor.

On foot of a public complaint regarding the presence of this material Meath County Council investigated the site in January and February of 2017 and issued a Section 14 Direction in March of 2017. Meath also identified an amount of asphalt type material which had also remained on the site. The Local Authority instructed that the material be removed and taken to fully authorised facilities.

In total 60 loads of crushed concrete products used in the trialling of potentially new products for the Kilsaran range was removed off-site over 2 days between 26th April 2017 and 28th April 2017.

In addition to the material mentioned above there was also 68 tonnes of asphalt type material. This material originated when the roadway at the main offices was upgraded and the operational crew tipped the planings from the machine to a pile which was never subsequently recovered. Again this material was deposited pre-2012.

All the above referenced material was taken off site using vehicles with valid Collection Permits to a recovery facility with a valid Certificate of Registration.

By letter dated 25/05/2017 Meath County Council indicated that they were satisfied that Kilsaran had fully complied with the Section 14 Direction. Please see attached correspondence reference Appendix 1.

In terms of other material / fills deposited on site Kilsaran Concrete wish to state clearly that there has been no other importation of material to the site in any form. There are two stockpiles of material on the site which are representative of the storage of overburden which was previously stripped from the surface of the quarry. These are located to the north and south of the site. The material to the north of the site is overburden which was constructed into a screening mound to screen all activities from the direction of the Hill of Tara. The mound to the south of the site is simply overburden that was moved around the site and deposited across the old southern quarry face. It would be the intention of Kilsaran Concrete to reuse the material in the northern screening mound as final cover in the latter stages of completion of this project.

2. Given that waste has been deposited in the quarry void, provide evidence in the form of groundwater sampling and analysis that no groundwater pollution has been caused.

In terms of queries 2,7,10 11 and 12 please refer to Appendix 4 report from Hydro-Environmental services dated 28/02/2017.

3. In relation to the stated volume of the void proposed to be filled (5.6 million m^3), state the manner in which this was calculated.

There were 2 methods used for calculating the void space at this quarry. The first was carried out by the project architect Mr Sean Boyle and the second calculation was carried out by Kilsaran Concrete using digital terrain modelling software.

Method No 1. Surface area calculation at 1 metre depths from the topographical survey

The 3.712 million cubic metre volume was calculated using the topographical survey of the site and the known surface area. The site profile was split into circa18x1 metre plates and the relevant surface area calculated at each interval in line with the topographical survey reference at each lift. A total of 17 volumes were then added together to get to the total void volume. Using the volumes generated per lift and averaging the top lift and the bottom lift to remove the uncertainty around the uneven nature (zig – zag nature or indented nature) of the quarry walls the void space calculation was deemed to be 3,712,000 cubic metres.

The figure 3.712 million cubic metres represents the total available free void space in the quarry. The calculation of specific mass for the total volume required to fill the void was 1.5 tonnes per cubic metre thereby giving a total required volume of **5,5568,000** tonnes required.

In support of this methodology please refer to Appendix 5 of this document which contains the following drawings (i) Section-AA (6985(A3)), (ii) Section-BB (6986 (A3)), (iii) Quarry Area (6989 (A1)), (iv)Phasing Map (6980 (A3)).

Method No 2. Digital Terrain modelling software

Kilsaran Concrete utilised digital terrain modelling software called LSS from McCarthy Taylor Systems Limited to calculate the potential void volume. Topographic survey data was used to create a 3D digital terrain model (DTM) of the full site including the quarry void, as it stands following cessation of quarrying. A second DTM of the anticipated final backfilled landform was created in LSS. LSS compared the two triangulated DTM's and calculated the volume of the space between the two models. The reported volume of the void was 3,673,846 cubic metres. There follows a copy of LSS volume report giving the volume between these two models. Screenshots of the two DTM models with cross-section follow that.

McCarthy Taylor Systems Ltd. KILSARAN BUILD Page : 001
LSS v10.00.14 / 290.01 2018.03.06 14:07

QUARRY VOID MODEL - Void Survey Post Quarrying

AREA AND VOLUME CALCULATION

Volume between current survey : QUARRY VOID MODEL - Void Survey Post Quarrying
and other survey : RESTORED PROFILE - Restored Ground Model

Volumes by surface feature in the current survey :

Surface	Description	Cut area (m²)	Cut volume (m³)	Fill area (m²)	Fill volume (m³)	Total area (m²)	Net volume (m³)
None		2836.758	-7227.276	254324.203	3681072.884	257160.961	3673845.607
	(Undetermined :					245699.041	n/a)

Note : "FILL" when the OTHER survey is above the CURRENT. All areas are plan areas.

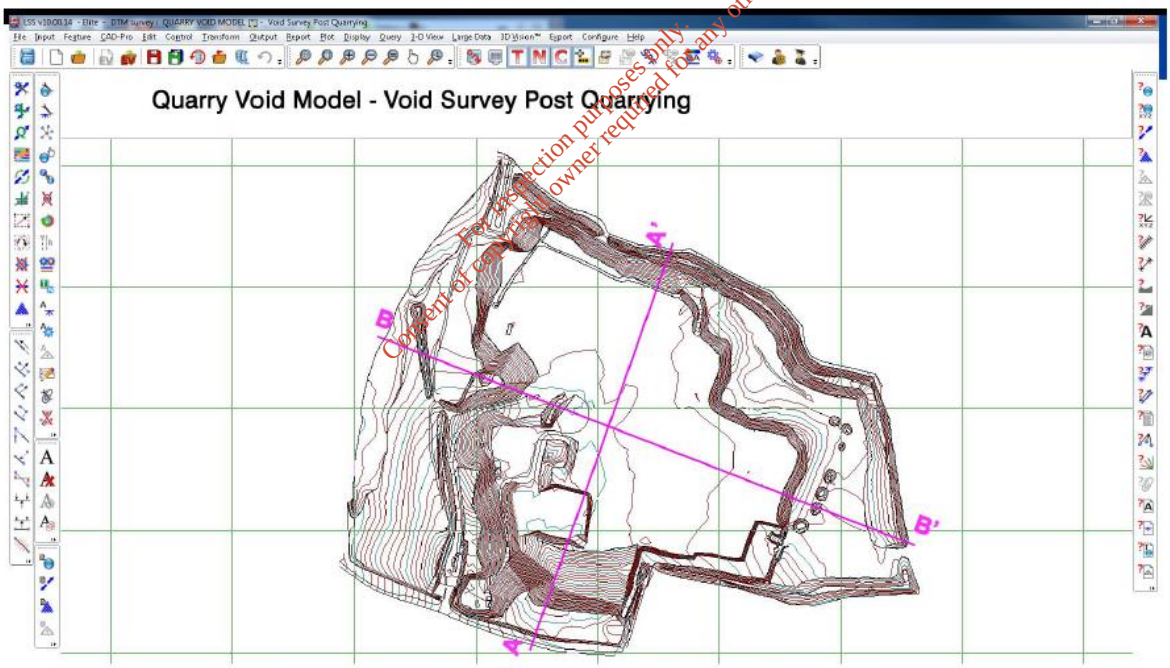
*** WARNING *** no volume determined for the following areas :

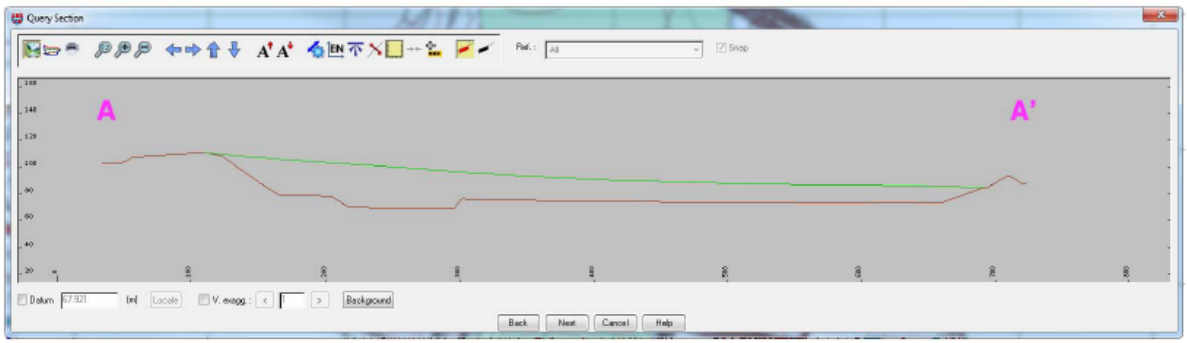
Current survey valid, other "void" : 186.745

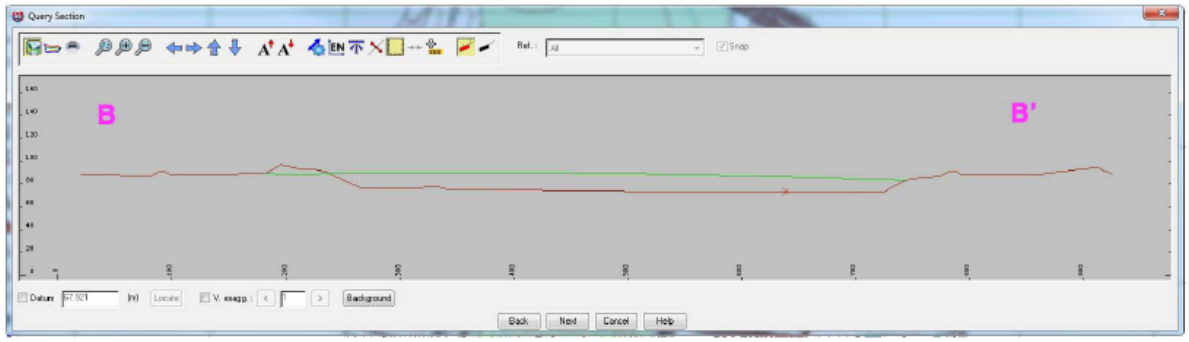
Current survey valid, outside other : 245411.274

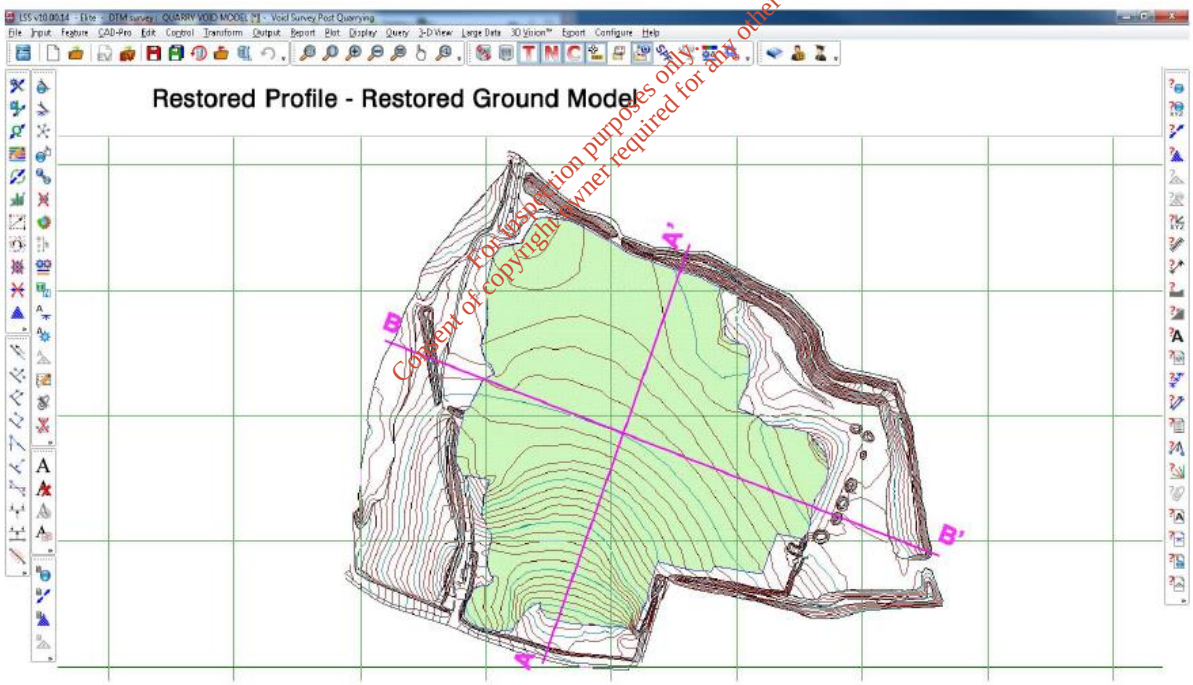
Surveys identical (no cut or fill) : 101.022

The calculation of specific mass for the total volume required to fill the void was 1.5 tonnes per cubic metre thereby giving a total required volume of **5,510,769** tonnes required.









Taking the difference between the two calculation methodologies Method 1 - 5,556,800 and Method 2- 5,510,769 there is a difference of only circa 57,231 tonnes.

In the case of the application for planning permission and waste licence application it was considered prudent to apply for 5.6 million tonnes which would ensure adequate volumes for completion of the project. It is also noted that a camber has been allowed for run-off on the finished profile which can absorb easily the full 5.6 million tonnes.

4. The waste licence application is for the filling of the existing quarry void. Please clarify whether authorisation is sought under a waste licence for further quarrying activities within the proposed boundary of the waste facility.

No further quarrying activities are proposed within the proposed boundary of the waste facility

5. Provide all monitoring results from the analysis of groundwater, the discharge from the facility to the adjacent surface water and the receiving water obtained in the last 5 years, including 2013 to date. Include a summary of these monitoring results and the locations where the monitoring was carried out.

Please see attached Appendix 3 for copies of all Monitoring results for the facility

6. Provide a drawing showing existing and proposed new groundwater monitoring wells. Indicate on this drawing which wells are proposed.

I refer the Agency to page 31 of the Hydrogeology report as submitted with the Environmental Impact assessment for the planning permission and subsequently to the Environmental Protection Agency where the proposed Water Monitoring Plan is proposed.

5. PROPOSED WATER MONITORING PLAN

5.1 GROUNDWATER MONITORING PLAN

There is an extensive network of monitoring wells at the site. They will serve two purposes. They will firstly allow the groundwater levels at the site to be monitored. Secondly the wells will allow ongoing monitoring of groundwater quality (by allowing extraction of groundwater samples for laboratory analysis) to demonstrate that any proposed future backfilling is not impacting on local groundwater quality. Groundwater quality monitoring should be completed quarterly during backfilling, and annually thereafter for two years. The proposed monitoring suite is shown in Table J. The locations of the proposed groundwater monitoring wells are shown on Figure 8.

Table J. Groundwater Quality Monitoring Suite

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	quarterly	pH electrode/meter
BOD	quarterly	Standard method
Ammonia (as N)	quarterly	Standard method
Nitrate	quarterly	Standard method
Total N (as N)	quarterly	Standard method
Ortho –P (as P)	quarterly	Standard method
Total Dissolved Solids (TDS)	quarterly	Standard method
Total Petroleum Hydrocarbons (TPH)	quarterly	Standard method
DRO	quarterly	Standard method
PRO	quarterly	Standard method
Total Coliforms	quarterly	Standard method
Faecal Coliforms	quarterly	Standard method

5.2 SURFACE WATER MONITORING PLAN

Monitoring of quarry discharge quality/volumes and local surface water quality (*i.e.* Stream S1) is currently undertaken at the site. Monitoring of discharge volumes is continuously monitored using a v-notch weir and data logger and water quality monitoring is carried out monthly in accordance with the discharge licence. It is proposed to continue this monitoring during the backfilling phase and for a period of two years thereafter.

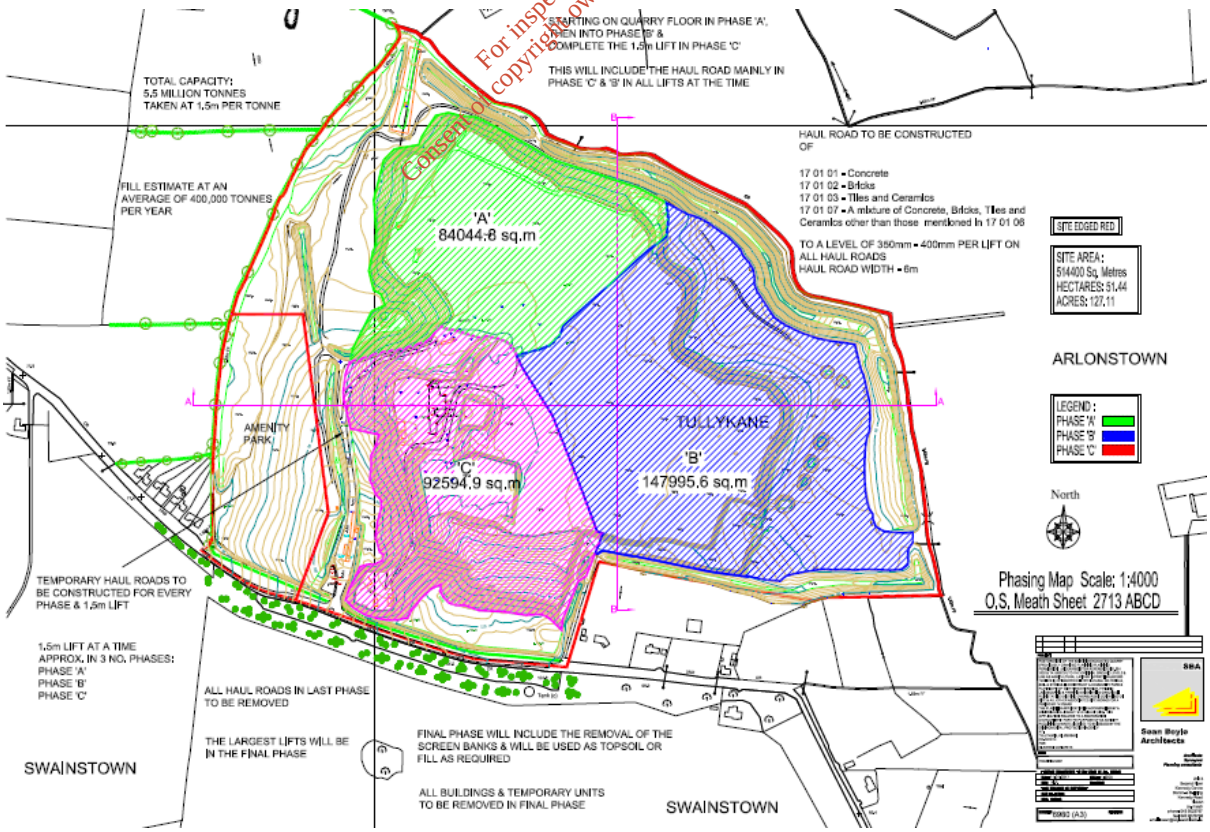
Please also refer to Appendix 4 which is Figure 8 of same report which indicated the proposed locations of those proposed monitoring points

7. State the direction of groundwater flow and which of the existing or proposed new groundwater monitoring wells can or will be used to represent the up-gradient and down-gradient groundwater quality.

In terms of queries 2,7,10 11 and 12 please refer to Appendix 2 report from Hydro-Environmental services dated 28/02/2017.

8. State the dimensions of the proposed settlement ponds. State the design objectives regarding flow velocity and removal of deposited sediment. Provide a drawing showing the location of these settlement ponds.

In terms of the proposed settlement ponds and the objectives regarding flow velocity the first point of reference is to assess the proposed phasing plan as addressed in the EIS. Please see a screen shot below and reference Appendix 5 Phasing Map (6980 (A3)) attached.



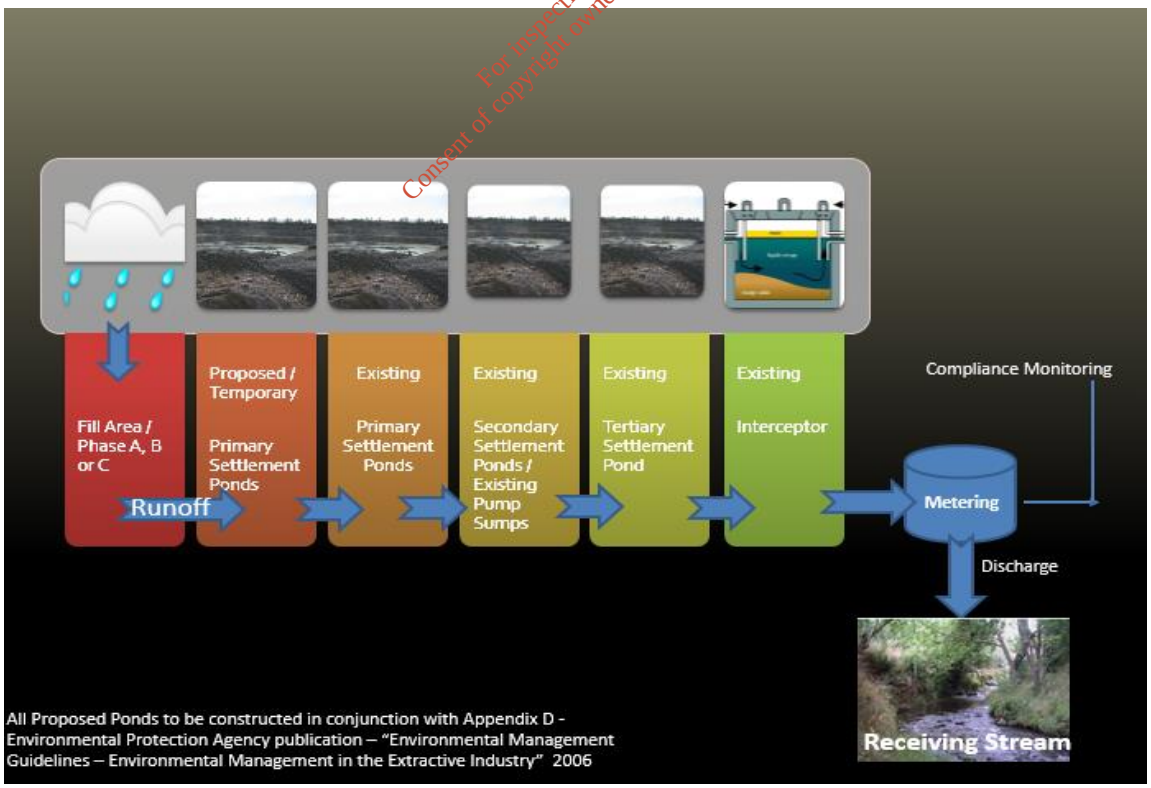
From the proposed phasing plan there will be three very distinct production zones (Backfill zones) operational within the quarry restoration. In this vain it is thought that each zone will have a minimum of 1 but up to 3 distinct settlement zones. This is subject to design review and should be decided prior to commencement on site.

Secondly the proposal is to retain the pumping stations located at the facility for groundwater and bring the levels of these stations up with each lift to allow for the dewatering of the void. These pumping stations will continue in operation until the ground water level (water table) is reached at which point no more groundwater will be required to be pumped from the void.

Both Groundwater and surface water run-off will be pumped to the final discharge settlement pond which exists and the discharge volume and quality will be subject to conditions similar to those in the existing surface water discharge licence.

In terms of the design of the settlement of the ponds specific reference will be made to the Environmental Protection Agency publication – "Environmental Management Guidelines – Environmental Management in the Extractive Industry" Appendix D refers to the Design of Settlement Ponds. Given the nature of the material being brought to the site i.e. inert soil and stone 170504 and the very low projected levels of potential contaminants present the primary consideration is thought to be total solids and particle size. The exact levels and concentration of solids in the run-off will be very variable. The variation will be caused by the nature of the material used for infill, the level of compaction on site and the amount of rainfall prevalent at the time of working. The settlement pond design will have to be dynamic and as discussed above it is envisaged that there may be multiple settle ponds required.

The plan at present is reflected at in the diagram below:



Full quantitative and qualitative assessments will have to be carried out upon commencement of project to ascertain the exact size, depth and flow/retention capacities of the settlement ponds and

also to ascertain the inflow and outflow qualitative (Particle size) requirements for each pond in each filling phase.

The ultimate arbiter in terms of compliance with the requirements of discharge to surface water will be adherence to the surface water discharge monitoring requirements as presented in the waste licence when issued. It is not expected given the extent of surface water modelling carried out that these emissions levels will alter for the backfilling operation.

9. Provide a drawing showing the location of SW1 referred to in Table E.2(i) of the application form.

Please refer to Appendix 3 and Appendix 5 which illustrate the location of SW1.

10. Provide a hydraulic model of the volumetric discharge from pumping the quarry so that there is sufficient evidence to demonstrate that the pumping will not cause flooding in the ephemeral stream (EPA name: Balreask Stream) or Skane River downstream. Propose volumetric pumping limit values, seasonally varied if necessary, that are not disruptive to the natural environment regarding protection of species and habitats and contribution to flood risk.

In terms of queries 2,7,10 11 and 12 please refer to Appendix 4 report from Hydro-Environmental services dated 28/02/2017.

11. Provide an analysis that demonstrates that the low temperature of the pumped water will not have an impact on species and habitats in the Balreask Stream and Skane River.

In terms of queries 2,7,10 11 and 12 please refer to Appendix 4 report from Hydro-Environmental services dated 28/02/2017.

12. Propose limit values for parameters in the discharge from the quarry and demonstrate that these are protective of water quality in the receiving waters.

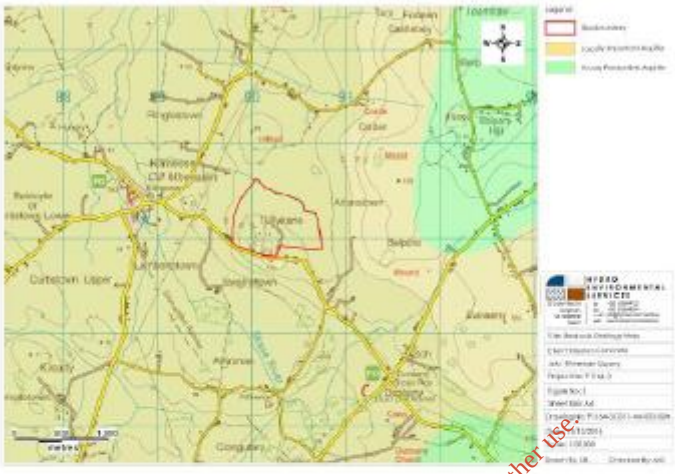
In terms of queries 2,7,10 11 and 12 please refer to Appendix 4 report from Hydro-Environmental services dated 28/02/2017.

13. Explain the meaning of the statement ".. *to 111'' the quarry from the quarry walls*" in Section 3.3.3 of the EIS.

The section below reflects the context and section within the EIS in which the above statement occurs. This section addresses two issues; (i) the aquifer Classification and (ii) the visual on the ground status from a groundwater and aquifer perspective at the time of the site inspection.

Aquifer Classification

Reference to the National Aquifer Map, prepared by the Geological Survey of Ireland, the Loughshinny and the Lucan Formation are both classified as Locally Important Aquifers, which are moderately productive (Lm). The Donore Formation is classified as a Poorly Productive Aquifer, which is generally unproductive except in localised zones (Pl). Figure 3.3.3 shows the aquifer distribution, as extracted from the National Aquifer Map of Ireland, prepared by the GSI.



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KILSARAN CONCRETE
TULLYKANE QUARRY RESTORATION
KILMESSAN, CO MEATH

During assessments within the site no groundwater inflows were noted to 111" the quarry from the quarry walls. During periods of very heavy rainfall, seepages from the surface adjacent to the quarry were noted along 119- discrete joints within the quarry. The estimated yields from the boreholes are generally low, however inflows were noted along some fracture zones.

The current quarry floor is dry and rainwater ponding on the floor dissipates into the floor over time (i.e. hours to days). A number of water collection sumps have been excavated within the quarry to allow for drainage of rainwater from the site. These sumps and their water level are relatively constant and considered to represent the regional water table.

It was stated that during assessment within the site “no groundwater inflows were noted entering the quarry via seepage through the quarry walls. It was also noted however that during periods of very heavy rainfall, seepages from the surface adjacent to the quarry were noted along 199 discrete joints within the quarry. The estimated yields from the boreholes are generally low however inflows were noted long some fracture zones.

The section discusses infiltration to the quarry from groundwater and surface water external to the quarry void entering the quarry.

The context of the text is this part of section 3.3.3 of the EIS is that during observations onsite no groundwater seepage / inflows were noted “entering the quarry from the quarry walls”.

The section “111” is a typographical error and should have been struck out.

14. Provide evidence of ownership by the applicant of the site.

Please refer to Appendix 6 for the proof of ownership of the freehold of the lands in question at Tullykane, Kilmessan Co Meath.

15. Provide details of environmental complaints received in 2015, 2016 and 2017.

ARTICLE 13 COMPLIANCE REQUIREMENTS

16. It is noted that the submitted EIS does not refer to any previously deposited waste. Update relevant parts of the EIS to incorporate information on the relevant environmental aspects of any previous fill using waste.

No previous fill activities were carried out on this site using waste and in particular that waste which is referred to in items 1 and 2 of this article 14 request. The material was never intended as fill and was never intended to be onsite and certainly not regarded as a waste. It is demonstrated in items 2 and 5 above that there was no environmental pollution caused by this material.

The material referred to in the northern and southern Areas of the site is simply overburden stripped during quarrying and is onsite generated and not a waste.

Given the fact that the responses herein clarify the all the substantive issues arising but make no significant additions to the substance of the EIS as submitted it is not considered necessary to update the EIS or the non-technical summary at this stage.

I trust this is to your satisfaction.

Yours Faithfully,

Raphael Mc Evoy

_____,

Raphael Mc Evoy MSc

RME Environmental