

GWRHYD QUARRY, PONTARDAWE

APPENDIX 5.0

DRAINAGE AND SURFACE WATER MANAGEMENT PLAN

APPENDICES			
A	J0054597-22-09b	Water Management Plan	October 2023
	J0054597-22-10b	Water Management Plan (Detail)	
B	J0054597-22-08c	Water Catchments Plan	
C	Details of Process Water Management System & Control of Other Surface Water		Jul 2017
D	Greenfield Run-off Estimation for Sites		

October 2023

Carter Jonas

DRAINAGE AND SURFACE WATER MANAGEMENT PLAN

Overview of previously approved Surface Water Management Plan

1. In 2012/2013 a water settlement lagoon system was installed to manage process water associated with the site stone cutting operation which, prior to this date, was not fit for purpose. The installed system is located at the southern end of the site and comprises a series of interlinked settling lagoons (x 4No.) which process water passes through to be finally discharged into the minor watercourse/ditch which runs along the southern boundary of the site.
2. Prior to the installation of the water settlement lagoon system, process water from the stone cutting area originally flowed via a culverted pipeline underneath the yard and along the east side of the product stocking area into a rudimentary settling lagoon. From here it was discharged into the adjacent ditch/minor watercourse. As part of the 2012/2013 water settlement lagoon system works this water was re-directed to flow into the newly constructed water treatment lagoons.
3. Additional works undertaken in 2012/2013 involved the isolation of 'clean' water which entered the site from the catchment area to the north-west of the site via a minor watercourse at a point (adjacent to the site welfare facilities) along the north-western boundary. This water originally flowed into a harvesting tank and was then used in the stone cutting operation. This water now flows from the tank via a 450mm diameter culvert passing beneath the site area running in a broadly southerly direction to its point of discharge into the western boundary ditch/minor watercourse.
4. Following discussions between Natural Resources Wales (NRW) and the Applicant in 2017, a surface water plan was compiled by UTC Consultants. This addressed concerns with respect to the potential impact of fine clay sediment laden water from the processing/stocking areas migrating into the lagoonal system following periods of heavy rainfall. The plan also assessed the requirement to control surface water run-off from off-site catchment areas and the adequacy of the existing management system.
5. As part of the UTC report, assessments for the surface water run-off from various adjacent catchments (as identified in drawing number D-08-a Catchment Areas Plan¹) were undertaken using the HR Wallingford IH124 methodology for 1 in 100 years rainfall events (Appendix D). These confirmed that the existing site drainage structures would be capable of accommodating projected storm event flows. This assessment is still considered to be relevant, as are assessments of the surface water run-off for the stocking and processing areas undertaken and included in the July 2017 report compiled by UTC consultants. These details of the drainage and surface water management were approved in connection with the working programme and phasing required by Condition 4 of planning application reference (PA ref.) 2017/0036 (2018 consent).
6. Each of the following documents and drawings approved under details pursuant to the ref. 2010/0026 (2011) and 2018 consents has been reviewed in detail in the context of current drainage and surface water management practices at the quarry.

Details pursuant to 2011 consent, approved July 2012

- Pollution Prevention Measures and Surface Water Arrangements

Details pursuant to 2018 consent, approved June 2019

- Surface Water Management Plan, Revision A

¹ Planning Application Reference (PA ref: P2018/0580) – Condition 4

- Additional Drainage Information, dated March 2019
- Dwg. No. D-08-A: Catchment Areas Plan
- Dwg. No. D-09-A Surface Water Management Plan

Amendments have been made to provide an updated suite of documents in this Drainage and Surface Water Management Plan.

7. As described in more detail below, the amendments are minor and relate to the installation of a rainwater harvesting and process water collection system and surface water management which reflects the up-to-date buildings layout, approved post the 2011 consent. The proposed Water Catchments Plan (Dwg No. J0054597-22-08c), Water Management (J0054597-22-09b) and Water Management Plan – Detail (J0054597-22-10b) show the approved building layout and the process water collection infrastructure at the site on a recent survey base (May 2022).
8. The following pollution prevention measures approved in July 2012² remain relevant.
 - i) *Fuel is currently stored in a double bunded storage tank that has the capacity to contain the maximum possible volume of spillage. The storage tank also has an alarm fitted to warn of any fuel spillage and enable an immediate response. All other chemicals, hydraulic oil etc that are used in the works are stored on a bunded tray within the office complex. It is proposed that these existing arrangements will continue for the life of the quarry.*
 - iv) *All Gwrhyd Specialist Stone Quarry employees have received environmental spillage and hazardous waste training. Any contaminated materials are/will be disposed in accordance with strict site procedures and sent to select specialist centres by licensed carriers. These are kept under review and may be added to or amended in the future.*

Control of Process Water – Current System

9. Rainwater harvesting systems have been installed which significantly reduce the requirement for process water initially supplied by an abstraction borehole located adjacent to the farmhouse. The daily water usage from this borehole is now limited to an average of 6.5 cubic metres (m³) per day and therefore, does not require an abstraction permit.
10. The rock sawing process utilises water sourced from the rainwater harvesting tanks that collect rain from the roof of the cutting buildings to cool the cutting saw blades. This results in the creation of very fine-grained “rock-flour” becoming suspended in the process water, which requires removal from the process water before discharge from site.
11. The current system involves the process water passing through a collection system, which involves the channelling of process water from inside the cutting buildings (Buildings B9 – Main Cutting Shed; B10 – Band Saw; B11 – Wire Saw; and B15a & B15b – Special Cuts Shed as illustrated on the Water Management Plan – Detail - J0054597-22-10b attached at Appendix A) via concrete drainage gulleys into a series of settlement pits, which are shown on the Water Management Plan J0054597-22-09b (attached at Appendix A). The process water system is shown in orange on the Plan.
12. The additional settlement tank capacity with re-circulation of process-water has significantly reduced the requirement for abstracted water and reduced the volume of water passing through the site processing lagoons.
13. Tank W9a comprises an overflow facility which outfalls into a culverted drainage system (shown on the Water Management Plans J0054597-22-09b and J0054597-22-10b (both attached at Appendix A)

² PA ref. P2010/0270

as pipeline W13) which flows beneath the site to the series of water treatment settlement lagoons located at the southern end of the site.

14. In 2014, on advice from NRW, the site started using flocculant in the settling lagoons and all subsequent settlement tanks. The recommended flocculant being used is Rutpen A9 Flocculant Block.
15. The discharge of clean process water (in compliance with license conditions) is made from the easternmost of the settlement lagoons into the boundary ditch/watercourse.
16. The process water system is in accordance with the NRW approved designs and operates efficiently, discharging water which complies with the consent conditions.
17. Details of the infrastructure associated with the process water management system is provided at Appendix D and should be read in conjunction with Water Management Plans J0054597-22-09b and J0054597-22-10b (Appendix A).

Control of other Surface Water

18. An assessment of the surface water run-off from various adjacent catchments (as identified in approved drawing number D-08-a – Catchment Areas Plan) was undertaken by UTC Consultants in 2017, using the HR Wallingford IH124 methodology for 1 in 100 years rainfall events. This confirmed that the existing site drainage structures at that time would be capable of accommodating projected storm event flows.
19. This approved assessment, along with drawing D-08-a – Catchment Areas Plan (updated version attached at Appendix B as Water Catchments Plan J0054597-22-08c) remain relevant, as are assessments of the surface water run-off for the stocking and processing areas undertaken and included in the July 2017 report compiled by UTC consultants as the parameters which informed the assessment have not changed.
20. The Water Management Plans J0054597-22-09b and J0054597-22-10b show (in turquoise colour) how surface run-off water continues to be managed within the site area and the adjacent catchments as described below.
21. Details of how other surface water is controlled are provided at Appendix D.
22. In conclusion, the systems in place at Gwrhyd Quarry ensure that surface water can be managed appropriately to enable the continued extraction of mineral at the quarry, through the implementation of the key elements described below.
23. Rainwater harvesting systems have been installed which significantly reduce the requirement for process water for stone cutting to be supplied via the abstraction borehole on site.
24. Additional primary settlement tank capacity with re-circulation of process-water has been installed in several locations. This has improved the management of process water on site by significantly reducing the requirement for abstracted water and reducing the volume of water passing through the site processing lagoons.
25. All access roads and processed and un-processed stone stocking areas are engineered such that surface water flows are directed towards the quarry void and do not enter the site process water settlement lagoonal system, or discharge from site in an un-controlled manner.
26. The management of surface water runoff from adjacent catchment areas continues to be well managed through an established water management system. This ensures that clean water is separated from process water and routed along dedicated watercourses/ditches and culverts away from operational

areas.

27. Water from the product stocking and processing areas, quarry access roads and slopes is directed towards the quarry void and does not enter the site process water settlement lagoonal system, or discharge from site in an un-controlled manner. Surface water from the product stocking and processing area flows either directly, or by gradual seepage, into the bedrock and then into the quarry void.
28. Water within the quarry void is directed to a sump within the bedrock of the quarry at the lowest point within the quarry void, from where it free-drains from the quarry void, passing into the groundwater system and Cwmllynfell Fault.
29. Management of the quarry void will continue in this manner throughout the phased extraction of the quarry, with the installation and management of a secondary longer-term sump.
30. Any restored surfaces will be grass seeded as soon as is practicable to reduce the potential for silt/soil laden waters flowing from the site as un-controlled discharges.
31. The restored area at the south-eastern end of the site, located between the active quarry area and site boundary has been restored and will have 'swales' incorporated into the final landform. The swales will be incorporated to direct surface water flows into the attenuation pond feature located in the far south-eastern corner of the site (W18). The grass sward in this area is establishing well and it is considered unlikely that any significant level of soil erosion will occur.