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PLANNING APPLICATION WSCC/028/21
ADDITIONAL INFORMATION (1)

OCTOBER 2022

INTRODUCTION

Following the submission of an application to enable the "*continued winning, working and processing of sand...the importation of inert classified engineering and restoration material...and the restoration and landscaping of the quarry*" (subsequently registered as Application Ref WSCC/028/21), further additional information in support of the application has been requested by West Sussex County Council[1].

The requested additional, supporting information refers to the comments made by various consultees and submitted to the County Council.

The Council's letter also refers to the provision of additional information not requested under Regulation 25. This is also provided as part of this submission.

In addition to that information requested in the County Council's letter, this submission will also include the applicants' response to the main concerns raised by local residents and other parties as part of the consultation process.

INFORMATION REQUESTED UNDER REGULATION 25

Reference should be made to the letter from West Sussex County Council dated 21 December 2021, a copy of which can be found at Appendix 1 to this submission. For ease of reference, the following headings mirror those in the Council's letter.

Plans

Under this heading reference is made to the Hydrogeological Conceptual Site Model submitted with the planning application and comments made in that document to the installation of an engineered clay liner. A plan which shows the placement of this natural liner has been requested.

The reference to the provision of a liner in Section 3.3 of the Hydrogeological Conceptual Site Model was included in error and should have been deleted (see further comments below). The application is submitted on the basis that an engineered clay liner will not be required and therefore there is no need for a plan showing the liner to be provided.

Highways

GTA Civils & Transport have considered the comments made by WSCC Highways in their consultation response dated 23 August 2021 (as set out in the Council's letter) and have provided an Addendum to the originally submitted Transport Statement. This is provided at Appendix 2 to this submission.

[1] In accordance with Regulation 25 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017

Ecology

It is noted that the County Ecologist has "no objection" to the proposed scheme. Comments regarding minor changes to the final habitats, landforms and the like are addressed as part of the additional comments made by the landscape consultant.

Landscape and trees

Lizard Landscape Design and Ecology have produced a response to address the various queries raised by consultees and their full response is provided at Appendix 3 to this submission. As indicated above, this includes comments on the County Ecologist's response.

Applicants' comments on SDNPA response dated 6 September 2021

Whereas the County Ecologist raised no objection to the proposed scheme and only suggested minor changes (which have been dealt with in the response by the applicants' landscape consultant) landscape and ecological comments have been made by the SDNPA (refer to letter dated 6 September 2021) and these are addressed below.

Amongst other things, the SDNPA response set out recommendations for one of two alternative approaches to restoration of the site,

> Option 1
> A nature-led restoration that allows the site to restore "naturally" with limited design/management input broadly following a "rewilding" approach
>
> or
>
> Option 2
> A "faithful landscape restoration" which would use inert fill to restore the site to its former (pre-quarrying) landform in order to facilitate a "naturally functioning landscape" that would see the restoration of streams, hydrological patterns, field patterns, species rich grassland and hedgerows.

Applicants' response to Option 1: Rewilding

The current approved restoration scheme envisages the regrading of the sides of the quarry to a slope of 50 degrees down to a level of some 42 metres AOD, at which point a flat level bench would be created before then battering down further to the anticipated natural groundwater level at 40 metres AOD. From this point, the slopes of the quarry which would be underwater would batter down at a 20 degree angle.

The approved restoration scheme would allow the natural groundwater water levels to "flood" the void to its natural standing level of some 40 metres AOD. As the permitted sand extraction occurs to a quarry floor level of some 10 metres AOD the resulting waterbody would have a maximum depth of around 30 metres.

At present, groundwater is prevented from entering the site by the daily pumping of groundwater from the floor of the quarry into the adjacent Honeybridge Stream.

The permitted level of daily water extraction is some 6,000 cubic metres. Monitoring of actual pumping in 2018 indicated an abstraction rate of some 4,000 cubic metres per day.

The rewilding suggested by the SDNPA could not occur unless water pumping continued from the site in perpetuity. The rewilding option is thus a man-made and contrived restoration scheme that would require significant intervention into the hydrogeological condition of the site and the wider area on a permanent basis. Not least, to maintain the pumping operation would require a significant consumption of energy a wholly unsustainable approach being even more incongruous given the current circumstances surrounding energy pricing, availability and usage.

A more faithful reflection of natural rewilding would be to follow the approved restoration approach which would see a cessation of water pumping so allowing groundwater levels to naturally return to circa 40 metres AOD. However, as already set out in the application this would not create a landscape reflective of the locality or setting to the National Park.

Furthermore, the resulting waterbody would be at high risk of contamination from the adjacent former municipal waste landfill sites and would be an ecologically poor, deep waterbody.

Finally, the creation of a deep waterbody would be a potential health and safety hazard and would fail to provide the public accessibility envisaged under the application proposals.

It is therefore the applicants' view that Option 1 suggested by the SDNPA is neither practicable nor deliverable and would not represent a natural (or sustainable) restoration of the site.

Applicants' response to Option 2: Infill to pre-extraction levels

To restore the quarry to pre-excavation levels would necessitate the importation of a significant amount of additional material over and above that proposed under the planning application.

To recreate the pre-excavation landform would require raising levels to around 60 metres AOD across the current void. This is an increase of between 10 to 15 metres when compared with the proposed landform, and would require the importation of an additional circa 3 million cubic metres of material, beyond that currently proposed (that is, a total of 5.7 million cubic metres of material to be imported).

The estimated volume of material required to implement the scheme under the planning application is some 2,700,000 cubic metres of material. It is proposed that some 345,000 cubic metres of material would be imported annually thus enabling the restoration of the quarry to be implemented over a period of some 8 years. To import the additional material required to restore to pre-excavation levels would at least double this development period.

The restoration scheme under Option 2 as suggested by the SDNPA would therefore involve a doubling of the material required to be imported and a doubling of the time before the site was restored and whilst the resulting landform may (in the Authority's opinion) more easily assimilate into the surrounding landscape, it is likely to be less ecologically diverse than the application scheme.

Overall, it is the applicants' view that the reduced level of importation proposed under the current application would deliver improved net benefits to Option 2.

The proposed restoration scheme envisages the creation of a series of shallow waterbodies providing added biodiversity within the site. In order that the waterbodies are hydrologically linked (required in the interests of the long-term management of the waterbodies) these need to be set at tiered levels.

The lowest waterbody (at the southern end of the site) would have a bottom level of some 43 metres AOD and a lake perimeter edge of some 45 metres AOD thus creating a shallow lake a maximum of 2 metres in depth. The bottom level has been designed to be a little above the natural groundwater level of 40 metres AOD. In order to ensure hydrologically linked lakes the other two lakes would be located on marginally higher ground.

It is considered that the application proposal has significant material advantages over the two alternative options proposed by the SDNPA.

Notwithstanding comments above, the applicants' acknowledge the merit of the broader "rewilding" concept advocated by the SDNPA and dry areas of the proposed restoration scheme could be brought forward in accordance with these principles.

As noted by the SDNPA, there would need to be a requirement to manage the landscape restoration scheme. This could be undertaken in accordance with the rewilding approach, that is light touch intervention and management. This approach would be consistent with the management detailed in the submitted Landscape Design Strategy which, for example, notes the intent for "*acid grassland establishment targeted with areas of bare ground left for natural succession to take place*".

In summary, therefore, it is the applicants' view that the proposed restoration scheme will not only result in a much improved (and safer) restoration of the quarry (as compared with the currently approved scheme) but will deliver a diverse range of habitats, will be sympathetic to its surrounds and will be completed within a realistic timescale.

Drainage

Further to those comments made by the Environment Agency and WSCC as the Lead Local Flood Authority, H2Ogeo Hydrogeology & Environmental Consultancy have produced a Flood Risk Assessment (Version 1.5) which is appended to this submission at Appendix 4.

Air quality and emissions

Southdowns Environmental Consultants have produced a response to the comments made by Horsham District Council and the Environmental Health Department. This response has been provided in the form of a letter a copy of which is appended at Appendix 5 to this submission.

NON-REGULATION 25 ADDITIONAL INFORMATION

Water neutrality

Subsequent to the planning application being submitted/registered a "Position Statement" was issued by Natural England relating to the impact of (new) development on designated sites within the Arun Valley, more specifically impact brought about by increased water consumption, abstraction, etc associated with new development. The "Position Statement" requires that any development proposal situated within the Sussex North Water Supply Zone must be accompanied by an Appropriate Assessment under the Habitats Regulation to demonstrate that the proposed development would not adversely affect the integrity of the Arun Valley protected sites.

H2Ogeo Hydrogeology & Environmental Consultancy have been commissioned by the applicants to provide an assessment and their report is appended to this submission at Appendix 6.

Other matters - Clay liner

To clarify seemingly conflicting statements in the planning application it is confirmed that the reference to the installation of a "*1m thick engineered clay liner*" in Section 3.3 (Page 13) of the *Hydrogeological Conceptual Site Model v0.4* (dated 18 November 2019) was an incorrect statement which should have been deleted having been carried over from earlier drafts.

The application as submitted does not include provision for a clay liner to be engineered prior to the placement of restoration material. The provision or otherwise of a liner was considered at the design stage by geotechnical consultants Key Geo Solutions Limited who concluded that a liner would not be necessary.

It should be noted that the conceptual site model does not simulate any liner so that groundwater has free access into the restoration. This approach was taken to demonstrate that despite there being no liner groundwater elevations could be controlled through pumping.

Other matters - Local residents and other parties

Comments raised by local residents and other parties will be addressed in the following section.

THIRD-PARTY REPRESENTATIONS

This section will consider those representations made by non-statutory consultees, those representations submitted by third-party stakeholders, generally made by local residents and comments will be made on the main, key objections.

Table 1 below provides a generalised summary of the key objections made by third-party submissions during the period July to September 2021.

NOTE: This "objection matrix" was made by reviewing each individual submission and allocating each objection raised to a generic heading. All objections in a representation have been separately accounted for in the matrix.

TABLE 1

Summary of third-party objections (July-September 2021)

Brief description of objection	Number of times objection is raised (During July)	Number of times objection is raised (During August)	Number of times objection is raised (During Sept)
Increased traffic (noise, pollution, impact on road surface, danger to other users (pedestrians, cyclists))	11	149	36
Impact on biodiversity (general impact)	7	53	13
Impact of aquifer and water courses (contamination)	7	69	21
Impact on existing species (sand martin, peregrine, GCN, sand lizards)	6	32	8
Health and safety of local residents	4	29	3
GCN's (survey incorrectly carried out, ponds infilled)	4	5	1
Reinstatement of conveyor will impact The Hollow and cause slippage of quarry faces and is contrary to earlier planning condition not to re-open	4	10	2
Extraction below water table has already had a damaging impact	3	–	–
No reference to nationally important moth	3	–	–
Cumulative traffic impact (Ham Farm, new housing in Lancing, Toad Hall (Hove) development, wind farm)	2	6	–
Adverse impact on local businesses (business park, Rock campsite, tourism in general)	2	23	5
Air quality (health hazard)	1	6	4
Noise and air pollution from quarry operations (other than traffic related)	1	17	5
Visual impact	1	24	6
Impact on Geological interest	1	3	–
Felling of trees	1	3	–
Flood risk	1	12	2
Existing restoration scheme not dangerous/ acceptable	1	12	2
Impact on air quality	1	5	1
Impact on SSSI's	1	–	–
Biodiversity Net Gain not identified	1	–	–
Increased carbon emissions/climate impact	1	9	–
Environmental impact (general, non specific)	1	35	6
Restoration guarantees (financial bond)	–	21	1
Time extension request (to allow comments)	–	6	–
Ensuring only inert, difficult to monitor/control	–	14	7
Impact on local heritage assets (listed buildings, etc)	–	8	2
Odour	–	20	–
Objection to increased working hours	–	4	–
Vibration	–	2	1
Traffic accident data when Biffa sites operating should be factored in	–	6	1
Inaccurate timescale for proposal	–	7	2
Lack of supply of material (competing sites)	–	9	1
Monitoring of traffic movements, noise and dust limits, etc	–	1	–
Storage of hazardous substances (diesel, oil)	–	–	1
Loss of light	–	–	1

Traffic

Concerns raised that are related to traffic associated with the proposed development (be that vehicle numbers, noise, pollution, road safety and so on) were by far the greatest number of objections submitted by local residents and other stakeholders.

The impact of traffic on the local communities is fully understood by the applicants' who do not want to promote a "dangerous" development. Accordingly the impacts of vehicle movements associated with the proposal have been rigorously assessed using the appropriate modelling all of which takes into account existing and predicted traffic flows. The modelling is designed to ensure that any traffic associated with development can be safely accommodated by the existing road infrastructure which includes ensuring that the capacity of roads and junctions is not compromised.

Additional information was asked for by the Highways Authority and this has been provided as part of this submission (Appendix 2).

Concerns regarding any environmental impacts of traffic (noise and air pollution for example) have been considered as part of the separate environmental assessment of these issues. Additional information relating to the Storrington Air Quality Management Area has been provided as part of this submission (Appendix 5).

Management and monitoring of HGV's

This is an appropriate point to refer to the management and monitoring of HGV movements associated with the proposed development.

All trucks will be fitted with "real time", GPS vehicle tracking devices. Vehicle tracking by GPS works using a global positioning system enabling users to monitor vehicles relative to their geographical location. This information will enable the quarry operator to manage and monitor vehicle movements to ensure, for example, compliance with any routing agreements/restrictions that might be associated with the grant of any planning permission.

In addition, all haulage companies and individual drivers either delivering to, or departing from, the site will be issued with full details of any routing restrictions and will be required to acknowledge that such directions have been received and understood. Penalties will apply should haulage companies fail to follow these directions, including companies being banned from the development.

Biodiversity

Many responses by third-parties concerned the impact of the proposed development on existing biodiversity within the quarry and the surrounding area.

The Environmental Assessment which accompanied the application included detailed surveys of the application area, designed to provide an accurate baseline and knowledge base for the site.

The applicants' ecologist subsequently worked closely with the landscape architect and other consultants when it came to considering the design of the final landform and restoration in order to ensure that not only was the site restored in a way which would be sympathetic to its immediate surroundings (both in terms of landscaping and planting) but also biodiversity would be maximised across the restored site.

It is noted that the County Ecologist has not raised any objection to what has been proposed. Comments made regarding the possible provision of larger areas of bare sand as part of the final landscaping have been addressed as part of the additional information provided by the landscape consultants (Appendix 3 to this submission).

As a final comment on biodiversity, one of the key drivers behind this application was the need to provide a more sustainable and ecologically diverse restoration of a large area of land which lies close to the National Park boundary than what would be provided by the existing (approved) restoration scheme. The existing restoration would create a single, large body of deep water which would not only be an alien feature in the landscape but would also provide limited ecological interest, the lake itself having destroyed much of the existing biodiversity.

Contamination

Concerns have been raised regarding the potential for the development to contaminate ground and surface water. In many cases the question of contamination has arisen because of a misunderstanding of the type of material intended to be used in order to raise levels within the quarry and so create the proposed "dry" restored landform.

Material placed within the quarry void will be "inert". Inert material is unreactive either biologically or chemically. This means that inert material will not break down or decompose and so there are no components that can pass into, or contaminate, either the ground or surface water.

The alternative restoration of the quarry is the scheme which is already approved. The approved scheme would retain the quarry void and allow the groundwater to recover to its natural level, so flooding the void creating a single, deep water body. One of the key reasons for changing the restoration is that there is a real risk that this large body of water would become contaminated with leachate flowing from the former, domestic refuse landfill sites which lie immediately to the-east of the quarry. If this were to happen then contamination of the underlying aquifer and surface waters would be a certainty.

Existing species

A similar concern to the more generic "impact on biodiversity" issue dealt with above, representations which mentioned "existing species" were more specific referring to sand martin, peregrine falcon, great crested newts and others.

Whilst the proposed restoration may well have an impact on some of these species it should not be forgotten that the existing, approved restoration would have a similar, if not worse, impact. This application to restore the quarry should not be considered in isolation. This application is to provide a restoration of the site which is safer, more sustainable and which will provide the opportunity to replace lost habitat and/or create new habitat so that existing and new species can flourish across the site.

Following extensive ecological surveys (as reported in the Environmental Statement which accompanied the application) the species and habitats currently present across the site have been properly and fully recorded.

Comments have been made regarding the methodology used to record great crested newts. The comments provided are incorrect, not recognising that a negative eDNA result negates the need for any further surveys. The largest, permanent pond in the base of the quarry was tested (eDNA) and the results were negative. Other, much smaller "ponds" in the base of the site are all temporary (ephemeral) in nature and therefore not considered to be suitable to support great crested newts.

Health and Safety

The applicants take the protection of the health, safety and well-being of local communities and the workforce extremely seriously.

Environmental issues which can impact on the health, safety and well-being such as noise, air-quality and traffic have been rigorously examined as part of the planning application with additional information being provided as part of this submission. Emissions will be minimised and kept well within nationally recognised safe limits.

One of the key drivers behind the application was to ensure a safe site after restoration. The current approved restoration scheme would create a large body of deep, open water. The dangers associated with deep (cold) open water are well documented. The proposed "dry" restoration will ensure a safe site which can be accessed and enjoyed by the local communities making a positive contribution towards improved health and well-being.

Local businesses

The possible effect of the proposal on local businesses is a genuine concern particularly as these are already struggling to emerge from the effects of the pandemic and currently suffering from increased costs brought about by the "cost of living crisis" and the impacts of the war in the Ukraine.

Of course, these businesses are already operating alongside a working quarry and, in some cases, have been doing so for many years. Whilst sand extraction will come to an end, the site needs to be restored which will mean a further period of activity within the site.

The proposal to deliver a "dry" restored quarry will, in the longer term, be beneficial to local businesses, particularly those that are tourism related. The restored site will be more sympathetic to the surrounding landscape and so more "attractive", will be able to offer public access, will provide a wide range of wildlife habitats giving enhanced ecological interest and will be inherently safer (no deep water lakes).

Visual

The proposal cannot be considered in isolation from the currently approved restoration.

The landscape consultants have carefully considered the visual impact and suitability of the approved restoration (as a single, large lake) and the conclusions can be found in the landscape assessment report(s) in the Environmental Statement. In brief, the currently approved restoration would result in an alien feature within the landscape and be one devoid of interest.

The restored landform and habitat creation proposed in the application have been carefully designed having regard to the site's location and its proximity to the National Park so that following restoration the site will be a visually positive part of the landscape.

Flood risk

An updated Flood Risk Assessment has been provided as part of this submission (Appendix 4).

Environmental impact

Concerns under this heading were generic in nature and have been dealt with under specific environmental impact topics, either as part of the Environmental Statement which accompanied the application or through the provision of additional information as part of this submission.

Odour

A number of third-parties raised the issue of odour, seemingly because of a misunderstanding of the nature of the restoration material to be imported. Odour arises during the breakdown of organic material. The only material that will be used as part of the restoration will be inert (refer to the comments above under the heading "Contamination") which is non-organic and therefore there will be no odour.

APPENDIX 1
WSCC Letter (December 2021)

Michael Elkington
Strategic Planning Manager

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County Planning

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Mr. Michael Metcalfe
MGM Consulting
(By email only)

21st December 2021

Dear Mr. Metcalfe,

Application Number:	**WSCC/028/21**
Address:	**Rock Common Quarry, The Hollow, Washington, Pulborough, RH20 3DA**
Proposal:	**The continued winning, working and processing of sand from the existing Rock Common Quarry, the importation of inert classified engineering and restoration material, the stockpiling and treating of the imported material, the placement of the imported material within the quarry void and the restoration and landscaping of the quarry**

Town and County Planning Act 1990 (as amended)

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

Regulation 25 Further Information and Evidence Respecting Environmental Statements

I refer to the above application and write, in accordance with Regulation 25 of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, to formally request that further information be submitted to West Sussex County Council ("the Council").

The submission of the following information is seen to be essential further information in respect of the application to verify the particulars of the submitted development proposals, and to enable proper consideration of the likely environmental effects. Notwithstanding any further information that may later be deemed necessary, the following information will be required to enable the Council to determine the application.

Where possible the following request refers to the comments of selected consultees and provides a summary of the additional information requested. For full details please see the full comment from each consultee available on the County Council's website at: https://westsussex.planning-register.co.uk/Planning/Display/WSCC/028/21

In addition, further information that is requested in support of the planning application, but not requested under Regulation 25, is listed.

If you consider that the requested information has already been submitted, please provide details of where in the submitted information it can be found.

Plans

- The Hydrological Conceptual Site Model states that a 1m thick engineered clay liner would be installed, incorporating the existing Marehill Clay on the eastern boundary. Please provide a plan which shows the placement of said clay liner.

Highways

Please refer to the full comments of WSCC Highways dated 23rd August 2021. All requested information/clarification as set out below is required.

- In terms of access, deliveries will only be made via the A283/The Hollow access and then use a re-opened existing access for the currently closed Windmill Landfill site which is located 125m to the northwest of the A283/The Hollow junction. This access is currently not in operation therefore some maintenance work will be required to the Windmill Landfill access to make it suitable for deliveries. Old Hollow is subject to a 60 mph 'National' speed limit. It is advised that a speed survey is undertaken along Old Hollow to ascertain the 85th percentile road speeds.

- The Transport Statement acknowledges that visibility to the west is currently impeded by overgrown foliage on the verge on the south-eastern side of the A283. This is within public highway according to the latest Highway Boundary information. The applicant has confirmed that they will undertake a speed survey to ascertain 85th percentile road speeds in order to provide the correct visibility splays. It has been indicated that 160 metres could be achieved, which would accord with a 50 mph posted limit in line with Design Manual for Roads and Bridges (DMRB) guidance.

- Speed surveys in the current climate are accepted by the Local Highways Authority. There has not been any embargo on undertaking these. It's only those surveys recording flows where there's been some further information required. Speeds surveys do not need to be verified. Survey results only need to be verified if the flows are being used for traffic modelling purpose. Assuming School/Public Holiday periods are avoided surveying then surveys can take place. We would advise that two Speed Surveys are undertaken:

    - Along Old Hollow
    - A283 junction with Old Hollow

- These are undertaken in order to ascertain the 85th percentile road speeds in order to apply the correct requirement for visibility at the access.

- Stage 1 Road Safety Audit - Whilst it is accepted that the Landfill access was used by Biffa for some years the Local Highways Authority would request that a Stage 1 Road Safety Audit is commissioned on the Old Hollow landfill access in line with GG119 parameters given the likely increase in vehicular activity.

- Swept Path Analysis (SPA) Diagrams - Within Appendix C of the Transport Statement, SPA diagrams have been provided which show two larger tipper trucks passing one another onto Old Hollow, whilst this is shown as workable it is observed that this could be constrained if the two vehicles were to enter the highway at the same time. It is advised that a traffic light system operates to ensure that the two tippers do not enter and exit and the same time.

- Capacity - Previously the Landfill access was used for approximately 500 2-way movements associated with the previous Landfill usage which ceased operation in 2004. As such with appropriate restoration the proposal will generate on average approximately 300 2-way movements, with a potential maximum of 500. The Transport Statement includes modelling of the A283/The Hollow junction via

Junction 9 software. This demonstrates that the junction operates within capacity with a Ratio Flow to Capacity (RFC) under 0.85.

Ecology

Please refer to full comments of the County Ecologist dated 29th October 2021. Although raising no objection, the Ecologist notes that they *"would have liked to see more emphasis on large areas of bare sand with a benign disturbance regime to benefit scarcer pioneer communities and aculeates".*

Landscape and Trees

Please refer to full comments of WSCC Arboriculturist consultant dated 10th August 2021. In summary clarification/further information is sought in respect of the following;

- The level of the quarry floor will be above that of the natural groundwater level, so the shallow lakes will be 'perched', i.e., there will be no hydraulic continuity with ground water (the concerns regarding avoiding leachate from the adjacent landfill site are acknowledged). Does this mean the lakes will be solely reliant on surface water / rainfall? How can their ecological benefit and integrity be maintained if there is a risk of them drying out, even with using pumped water from a proposed well? Is that sufficient and can that be maintained in perpetuity? Would recreational activity such as swimming and kayaking be compatible with the wildlife habitat vision for the lakes?

- Natural regeneration would be the preferred method of restoration rather than intensive intervention, but this will still require management to provide the habitat mosaic envisaged by the landscape design strategy: everything from open sand faces to woodland and all successional stages in between. This appears to be the intention of the first landscape objective and applied design principle 3. I would question the need to plant birch and willow, for example, given that they are pioneer species and will readily colonise areas. Biosecurity is critically important, and it would be better to minimise the plant material brought to site unless it is UK sourced and grown and complies with all biosecurity regulations.

- The arboricultural impact assessment (AIA) notes that the removal of several woodland areas and tree groups. The proposed tree planting should mitigate and compensate for this loss but should also seek overall habitat enhancement throughout the site in the long term.

- It will be very important to retain, protect and sensitively manage the existing trees and woodland around the perimeter of the site, not only for their own sake but due to the reliance placed on this for screening. One of the areas of remaining sand reserves is alongside TPO 0204 to the north-west of the site and another alongside the whole western boundary which currently has good tree cover, providing important screening for the site. There would have to be a substantial stand-off from these areas – not just at the root protection area boundary – to avoid harmful root loss and damage. Page 1 and 3 for example, of the tree retention and protection plan appears to require clearance very close to retained category B trees which is of concern. It is very difficult to make out the tree protection barrier on any of the plans – is it actually shown?

- The proposed tree protection plan is satisfactory but given the very long-term nature of the site activity through to final restoration, a phased, sequential approach to tree protection is likely together with site-specific method statement preparation to be agreed for certain elements, e.g., the pump construction and power supply installation. This would also be subject to regular monitoring and review at a frequency to be agreed within a detailed implementation programme.

- Better integration into the wider landscape would be achieved by the inclusion of a well-connected hedgerow network across the site. Hedgerows were the subject of a condition (21) determined in 2004.

In addition to those matters raised by the WSCC Arboriculturist, South Downs National Park also commented and raised issue with the proposal. Their comments dated 6th September 2021 should be read in full, but in summary they state;

- The application is lacking on a few key points of information:

    - Restoration scheme has no legend
    - What was the pre-worked landform
    - Whether a clay liner is needed or not is fundamental to help us understand the potential negative effects and therefore acceptability of the scheme. i.e. potential for leachate to pollute as a result of the use of inert material.
    - There are no context plans – so we have no concept of how the restored levels knit into context, thus delivering an integrating approach to restoring landform character.

- The National Park believes the restoration scheme has certain short-comings and doesn't achieve a distinct and characteristic response to the landscape. In their conclusion they state that whilst the proposal in visual terms represents an improvement upon the previous outdated scheme, it is not a scheme characteristic of the landscape, it appears to have been designed with 'fill' as a pre-requisite as opposed to what scheme might deliver the best overall outcome for the landscape. A low level of intervention is recommended for the restoration of this site, to help this site contribute positively to the National Park's setting, Purposes and wider partnership ambitions around Nature Recovery, Green Infrastructure (People and Nature Network), landscape enhancement and improved access Clarify what land identified as 'temporary land use' would be used for. Also clarify how/if this land and contractor compounds would be reinstated and the programme/measures to achieve this.

Drainage

Please refer to full comments of the Environment Agency (EA) dated 17th August 2021 and WSCC as Lead Local Flood Authority (LLFA) dated 13th August 2021. In summary clarification/further information is sought in respect of the following;

- The EA states that the FRA submitted with this application is unacceptable and does not comply with the requirements set out in paragraph 9 of the Technical Guide to the National Planning Policy Framework. The submitted FRA does not therefore, provide a suitable basis for assessment to be made of the flood risks arising from the proposed development. In particular, the submitted FRA fails to:

    1. Take the impacts of climate change into account
    2. Consider the effect of a range of flooding events including extreme events on people and property.
    3. Detail the how the ground levels will change in the flood risk area.
    4. Show provision of compensatory flood storage

- The LLFA states that no FRA was cross referenced in the EIA so it is unclear whether or not an FRA has been completed as required by National Planning Practice Guidance. The LLFA would wish to see a comprehensive FRA in support of this revised proposal as it considers that there are potentially catchment wide implications for the change in restoration plan that have potential flood risk implications beyond the boundary of the site compared with the original restoration plan.

Air Quality and Emissions

Please refer to full comments of Horsham District Councils' response, which includes the comments of the Environmental Health Department, dated 30th November 2021. In summary clarification/further information is sought in respect of the following:

- Having reviewed the Air Quality Assessment and Dust Management Plan Final Report (Southdowns Environmental Consultants, December 2020), Storrington AQMA is not included in the model. The report doesn't address the issue of traffic routing to avoid the Storrington AQMA. One mention of routing was made, which was proposed to ensure that the vehicles leave via the junction of The Hollow/A283 and head southbound towards the Washington Roundabout. This measure is indeed welcome as it would reduce air pollution impacts on the residential properties at the A24/The Hollow junction. Still, its implementation should be enforced, e.g. through the proposed GPS tracking for all the vehicles leaving the site.

- It is expected that the model results carry high uncertainty as the model was verified with the monitoring sites on the A283, the latter having different traffic characteristics to the A24. In order to ensure better model accuracy, it would have helped if the applicant had carried out short-term monitoring in the modelled area at locations adjacent to the A24.

- Finally, the report does not make reference to the Air Quality and Emissions Mitigation Guidance for Sussex (2021) and no mitigation was proposed to reduce emissions from the additional traffic. The Sussex guidance takes a low-emission strategies' approach to avoiding cumulative impacts of new development, by seeking to mitigate or offset emissions from the additional traffic and buildings. Hence, applicants are required to submit a mitigation plan detailing measures to mitigate and/or offset the impacts and setting out itemised costing for each proposed measure, with the total estimated value of all the measures being equal to the total damage costs.

Additional Information to be supplied (not requested under Regulation 25)

Water Neutrality

- The application site is situated in an area of serious water stress where mains water is supplied by Southern Water from its Sussex North Water Resource Zone. This supply is sourced from abstraction points in the Arun Valley, which includes locations such as Amberley Wild Brooks Site of Special Scientific Interest (SSSI), Pulborough Brooks SSSI and Arun Valley Special Protection Area/Special Area of Conservation and Ramsar site. On 14 September 2021, a Position Statement was issued by Natural England that sets out it cannot be concluded that the existing abstraction within the Sussex North Water Supply Zone is not having an impact on the Arun Valley sites. It advises that development within this zone must not add to this impact.

- The proposed development will result in an increase in water consumption, and as a result there will be a need for the County Council to carry out an Appropriate Assessment under the Habitats Regulations to demonstrate the proposal would not adversely affect the integrity of the protected sites. If an application cannot demonstrate water neutrality is reasonably achievable, the development will not meet the requirements of section 63 of the Habitats Regulations, and the application could not be determined positively.

- For an appropriate assessment to be made, you are required to provide a 'water neutrality statement' setting out the strategy for achieving water neutrality within the development. This should include full details of any proposed water usage, including consideration of any new or increased occupancy/staff which may be

required to support the development. This may include consideration of measures such as building significant water efficiency measures into the development and by providing offsetting measures to reduce water consumption from existing development, to ensure neutrality is achieved. The mechanism for securing any offsetting/reduction measures should also be clearly set out (including draft legal agreements for any off-site offsetting proposed).

Other matters

- Although the use of a 1m clay liner is mentioned in the Hydrogeological Conceptual Site Model document on page 13, the Planning and Environmental Statement (Vol. 1 June 2021) states that "whether or not an engineered clay liner will be necessary prior to general infilling will be considered in consultation with the Environment Agency". Please can you clarify which is correct.

- In addition to specific consultation responses referred to in this letter, the applicant is encouraged to review all consultation responses and third-party representations received in respect of the planning application (available on the WSCC website) and provide responses to the key issues raised.

Where the further information sought would require amended plans, they should be allocated a new 'revision' number and any plans to be superseded should be identified. It is also advised that the information should be presented in a single supplementary submission.

We would be grateful for your confirmation of the likely timescale necessary to allow the applicant to respond to the above request and comments received from third parties/consultees, in order that an extended target determination date may be agreed.

If you require any further clarification or if you wish to discuss the information requested, please feel free to contact me.

Yours sincerely

Chris Bartlett
Principal Planner
County Planning

APPENDIX 2
Transport Statement Addendum

Transport Statement Addendum

Development at: Rock Common Quarry

The Hollow

Washington

West Sussex

RH20 3DA

Client: Dudman (Rock Common) Limited

Ref: 10684

Date: March 2022

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Schedule of Appendices

A West Sussex Highways Comments

B Designers Response

Issue	Issue date	Compiled	Checked	Authorised
1	October 2021	EM	RW	LS
1a	March 2022	EM	LS	LS

1 Introduction

1.1 This Addendum has been prepared for Dudman (Rock Common) Limited in conjunction with the above development and no responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

1.2 GTA Civils and Transport has been commissioned by Dudman (Rock Common) Limited to prepare a Transport Statement Addendum in connection with the restoration of the quarry by importing 2,700,000m^3 of engineering inert restoration material over a period of between 8 to 10 years.

1.3 Specifically, this Addendum has been prepared to address the recent objections raised in the 23/08/2021 consultation comments for planning application: WSCC/028/21.

1.4 The comments raised can be seen below and the full document can be viewed in **Appendix A**.

1. **Access and Visibility**: Old Hollow is subject to a 60 mph 'National' speed limit. It is advised that a speed survey is undertaken along Old Hollow to ascertain the 85th percentile road speeds. It has been indicated that 160 metres could be achieved, which would accord with a 50 mph posted limit in line with Design Manual for Roads and Bridges (DMRB) guidance. We would advise that two speed surveys are undertaken: along Old Hollow; and A283 junction with Old Hollow.
2. **Stage 1 Road Safety Audit:** Whilst it is accepted that the Landfill access was used by Biffa for some years the LHA would request that a Stage 1 RSA is commissioned on the Old Hollow landfill access in line with GG119 parameters given the likely increase in vehicular activity.
3. **Swept Path Analysis (SPA) Diagrams**: Within Appendix C of the TS SPA diagrams have been provided which show two larger tipper trucks passing one another onto Old Hollow, whilst this is shown as workable it is observed that this could be constrained if the two vehicles were to enter the highway at the same time. It is advised that a traffic light system operates to ensure that the two tippers do not enter and exit and the same time.

2 Access

Speed Survey and Visibility

2.1 An ATC survey was carried out on the road 'The Hollow' between the 6th of October and the 12th of October (2021). The Hollow is subject to a national speed limit. This demonstrated 85%ile speeds of 36mph for westbound traffic, and 42mph for eastbound traffic (see **Table 2.1**).

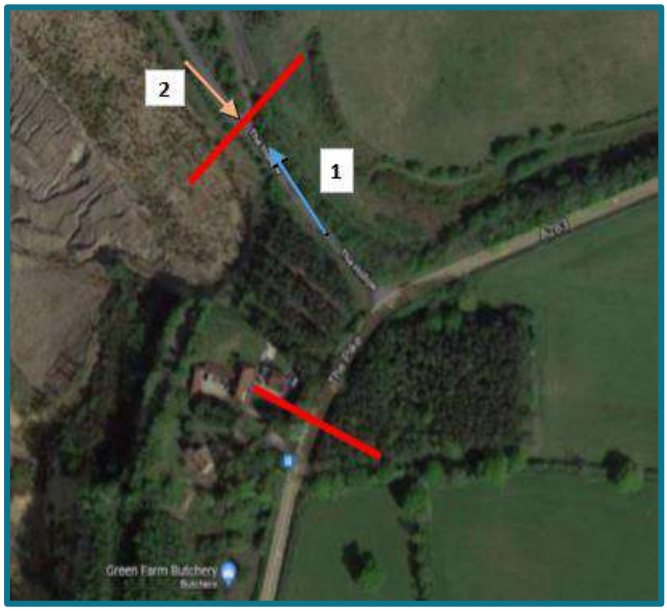

Table 2.1 – The Hollow ATC

			Direction 1			Direction 2		
		Summary	West Bound			East Bound		
			Total Vehicles	Average Speed	85% Speed	Total Vehicles	Average Speed	85% Speed
Day 1	Wednesday	06/10/2021	159	30.2	35.5	268	35	41.5
Day 2	Thursday	07/10/2021	146	28.6	34.3	248	35.4	41.4
Day 3	Friday	08/10/2021	184	29.7	35	196	35.5	40.9
Day 4	Saturday	09/10/2021	205	31.3	36.6	109	35.3	41.1
Day 5	Sunday	10/10/2021	109	31.1	36.6	90	34.6	41
Day 6	Monday	11/10/2021	129	30	35.7	211	35.1	41.6
Day 7	Tuesday	12/10/2021	171	29.5	36.4	228	34.7	42.1
		Week Total	**1103**	**30.1**	**35.6**	**1350**	**35.1**	**41.4**

2.2 An ATC survey was also carried out on The Pike (A283). The Pike is subject to a 50mph speed limit. This demonstrated 85%ile speeds of 47mph for westbound traffic and 42mph for eastbound traffic (see **Table 2.2**).

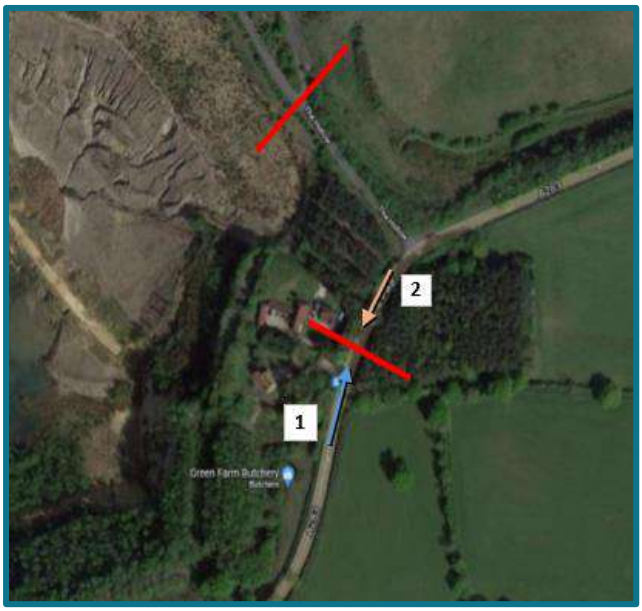

Table 2.2 – The Pike ATC

			Direction 1			Direction 2		
		Summary	North Bound			South Bound		
			Total Vehicles	Average Speed	85% Speed	Total Vehicles	Average Speed	85% Speed
Day 1	Wednesday	06/10/2021	5459	43	47.4	6872	39.2	42.8
Day 2	Thursday	07/10/2021	5445	41.9	46	6971	38	41.6
Day 3	Friday	08/10/2021	5597	42.4	46.6	7843	38.2	42.2
Day 4	Saturday	09/10/2021	5158	42.4	46.6	10016	35.8	40.4
Day 5	Sunday	10/10/2021	4597	42.2	46.6	8201	36	40.9
Day 6	Monday	11/10/2021	5379	42.7	46.8	6594	38.9	42.8
Day 7	Tuesday	12/10/2021	5443	42	46.4	7288	37.8	42.2
		Week Total	**37078**	**42.4**	**46.6**	**53785**	**37.6**	**41.8**

2.3 Accordingly, the achievable visibility splays from the A283 / The Hollow junction (2.4m x 160m) are acceptable.

Swept Path Analysis

2.4 As advised by WSCC Highways Authority, a traffic light system will be in operation to ensure that tipper trucks do not enter and exit onto Old Hollow at the same time which could result in a side-on-side collision.

3 Stage 1 RSA

3.1 A Stage 1 RSA was undertaken by EC Road safety on the 22nd of September 2021. There was one problem raised through the RSA1 process which has now been addressed (see **Appendix B**). Therefore, the RSA1 has not raised any fundamental problems that cannot be resolved.

Appendix A

West Sussex Highways Comments

WEST SUSSEX COUNTY COUNCIL CONSULTATION

TO:	West Sussex County Council FAO: Chris Bartlett
FROM:	WSCC - Highways Authority
DATE:	23 August 2021
LOCATION:	Rock Common Quarry, The Hollow, Washington, Pulborough, RH20 3DA
SUBJECT:	WSCC/028/21 The continued winning, working and processing of sand from the existing Rock Common Quarry, the importation of inert classified engineering and restoration material, the stockpiling and treating of the imported material, the placement of the imported material within the quarry void and the restoration and landscaping of the quarry.
DATE OF SITE VISIT:	n/a
RECOMMENDATION:	More Information
S106 CONTRIBUTION TOTAL:	n/a / £ See below for breakdown.

Background

WSCC in its role of Local Highway Authority (LHA) has been consulted on the above application for comments on highway safety, capacity and access.

The application is to restore the site by importing 2,700,000m3 of engineering inert restoration material over a period of between 8 to 10 years. The transport aspects of the proposals are supported by way of a Transport Statement (TS).

The proposals will involve restoration material being bought to the site by a combination of 20-tonne tippers and a variety of smaller delivery vehicles and offload at a new 'restoration material reception area' to be constructed on land forming part of the former Windmill Landfill site.

Previous Usage

When operational, the Windmill landfill site generated over 500 movements a day. These ceased in 2004. This proposal's access junction is identical to the 500 daily movements previously associated with the Landfill.

Access and Visibility

In terms of access, deliveries will only be made via the A283/The Hollow access and then use a re-opened existing access for the currently closed Windmill Landfill site which is located 125m to the northwest of the A283/The Hollow junction. This access is currently not in operation therefore some maintenance work will be required to the Windmill Landfill access to make it suitable for deliveries. Old Hollow is subject to a 60 mph

'National' speed limit. It is advised that a speed survey is undertaken along Old Hollow to ascertain the 85th percentile road speeds.

The TS acknowledges that visibility to the west is currently impeded by overgrown foliage on the verge on the south-eastern side of the A283. This is within public highway according to the latest Highway Boundary information. The applicant has confirmed that they will undertake a speed survey to ascertain 85th percentile road speeds in order to provide the correct visibility splays. It has been indicated that 160 metres could be achieved, which would accord with a 50 mph posted limit in line with Design Manual for Roads and Bridges (DMRB) guidance.

Speed surveys in the current climate are accepted by the LHA. There has not been any embargo on undertaking these. Its' only those surveys recording flows where there's been some further information required. Speeds surveys do not need to be verified. Survey results only need to be verified if the flows are being used for traffic modelling purpose. Assuming School/Public Holiday periods are avoided surveying then surveys can take place.

We would advise that two Speed Surveys are undertaken:

- Along Old Hollow
- A283 junction with Old Hollow

These are undertaken in order to ascertain the 85th percentile road speeds in order to apply the correct requirement for visibility at the access.

Stage 1 Road Safety Audit

Whilst it is accepted that the Landfill access was used by Biffa for some years the LHA would request that a Stage 1 RSA is commissioned on the Old Hollow landfill access in line with GG119 parameters given the likely increase in vehicular activity.

Swept Path Analysis (SPA) Diagrams

Within Appendix C of the TS SPA diagrams have been provided which show two larger tipper trucks passing one another onto Old Hollow, whilst this is shown as workable it is observed that this could be constrained if the two vehicles were to enter the highway at the same time. It is advised that a traffic light system operates to ensure that the two tippers do not enter and exit and the same time.

Capacity

Previously the Landfill access was used for approximately 500 2-way movements associated with the previous Landfill usage which ceased operation in 2004. As such with appropriate restoration the proposal will generate on average approximately 300 2-way movements, with a potential maximum of 500. The TS includes modelling of the A283/The Hollow junction via Junction 9 software. This demonstrates that the junction operates within capacity with a Ratio Flow to Capacity (RFC) under 0.85.

Conclusion

At this stage the LHA would request some additional information from the applicant on the points raised above within this report. We would be satisfied with the justification

provided on the sites capacity impact however. Once the information has been submitted the LHA would be happy to comment once again on the suitability of the proposals.

Jamie Brown
West Sussex County Council – Planning Services

Appendix B

Designers Response

Designer's Response

Proposed Development: Rock Common Quarry

The Hollow

Washington

West Sussex

RH20 3DA

Client: Dudman (Rock Common) Limited

Ref: 10684

Date: March 2022

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Schedule of Appendices

Issue	Issue date	Compiled	Checked	Authorised
1	October 2021	EM	LNS	LNS
1a	March 2022	EM	LNS	LNS

1 Introduction

1.1 EC Road Safety Limited has been commissioned by GTA Civils Ltd on behalf of Dudman (Rock Common) Limited to undertake a Stage 1 Road Safety Audit on junction associated with Rock Common, in Washington, West Sussex.

1.2 The proposal is for the restoration of the quarry by importing 2,700,000m^3 of engineering inert restoration material over a period of between 8 to 10 years.

1.3 The Stage 1 Road Safety Audit (RSA) was undertaken by EC Road safety on the 22nd of September 2021. The purpose of the RSA was to assess the proposed access arrangements associated with the site in terms of road safety and the likely impact on the public highway network.

2 Designers response to the RSA1

2.1 One point was raised through the RSA1 process. This is listed in **Table 2.1** below, together with the recommendation and Designer's Response.

2.2 The full Stage 1 RSA can be viewed in **Appendix A.**

Table 2.1 – RSA1 Problems, Recommendations & Designer's Response

RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
3.1.1: Risk of side swipe collisions due to lack of visibility. Although some recent maintenance of the overhanging vegetation and grass verges must have occurred at the junction, visibility was slightly restricted at the A283 junction with The Hollows. Speed surveys would be required to ascertain sufficient sightlines and visibility splays at the junction.	Given the increased number of vehicles movements, any obstructions to visibility splays should be cleared and maintained going forward.	Agreed. Overhanging vegetation will be cut back and maintained to ensure that adequate visibility splays are retained. An ATC survey was carried out and demonstrated that 85%ile speeds did not exceed 43mph in any direction on any given day.		

On behalf of the Design Organisation I certify that the RSA actions identified in response to the RSA problems have been discussed and agreed with the Overseeing Organisation	On behalf of the Overseeing Organisation I certify that
Name: Edward Mullins	Name:
Signed: Edward Mullins	Signed:
Position: Transport Planner	Position:
Organisation: GTA Civils and Transport	Organisation: West Sussex County Council
Date: 24/03/2022	Date:

3 Conclusion

3.1 There was one problem raised through the RSA1 process which has now been addressed. Therefore, the RSA1 has not raised any fundamental problems that cannot be resolved.

- End of Report -

Appendix A

Stage 1 Road Safety Audit

Rock Common Quarry
The Hollow
Washington
West Sussex
RH20 3DA

PROPOSED SITE ACCESS

STAGE 1 ROAD SAFETY AUDIT

Report No. EC/2021/09/GTA5

September 2021

Prepared by:

EC ROAD SAFETY LIMITED

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Hayes, Bromley, Kent
BR2 7PN
United Kingdom

Tel: 07508 76 76 96

Email: **audits@ecroadsafety.co.uk**

Web: **www.ecroadsafety.co.uk**

AUTHORISATION SHEET

Client: Lawrence Stringer - GTA Civils & Transport Limited

Project: Access at Rock Common Quarry

Address: Rock Common Quarry
The Hollows
Washington
West Sussex, RH20

PREPARED BY

Name: Paul Nevard
Position: Director – EC Road Safety Limited
Date: 26 September 2021

AGREED BY

Name: Vinny Rey
Position: Traffic Engineer / Road Safety Auditor
Date: 27 September 2021

AUTHORISED FOR ISSUE

Name: Paul Nevard
Position: Director – EC Road Safety Limited
Date: 27 September 2021

DISTRIBUTION

Issue No.	Issued To	Date Issued
1.	Lawrence Stringer – GTA Civils & Transport Limited	27/09/2021
2.	Office Copy	27/09/2021

CONTENTS

APPENDICES

1. INTRODUCTION

1.1 General

1.1.1 EC Road Safety Limited has been commissioned by GTA Civils & Transport Limited to undertake a Stage 1 Road Safety Audit on the proposed re-use of an existing access and site. The proposal is for restoration materials to be brought to the site by a combination of 20-tonne tippers and a variety of smaller delivery vehicles and offload at a new 'restoration material reception area' to be constructed on land forming part of the former Windmill Landfill site. Deliveries will only be made via the A283/The Hollow access and then use a re-opened existing access for the currently closed Windmill Landfill site which is located 125m to the northwest of the A283/The Hollow junction. Some maintenance work is proposed to the Windmill Landfill access to make it suitable for deliveries.

1.1.2 The scope of the Audit is to assess the proposed access arrangements associated with the site in terms of road safety and the likely impact on the public highway network.

1.1.3 The existing Rock Common Quarry is located to the north of the village of Washington in West Sussex. The site lies to the north of the A283 and to the east of the A24, on either side of a minor public road called The Hollow. The A283/The Hollow junction is a simple priority T-junction. The A283 is subject to a 50mph speed limit in this location.

1.1.4 The Road Safety Audit Team (approved by Lawrence Stringer - GTA Civils & Transport Limited) consisted of:

Paul Nevard **MSc**, **BA (Hons) CMILT, MCIHT, MSoRSA** **RSA, Cert. Comp**	Director – EC Road Safety Ltd Principal Traffic Engineer Road Safety Audit Team Leader
Vinny Rey **BEng (Hons) MCIHT, MSoRSA** **RSA, Cert. Comp**	Traffic Engineer Road Safety Audit Team Member

1.1.5 The Road Safety Audit Brief issued by Lawrence Stringer (GTA Civils & Transport Ltd) to the Audit Team and subsequently accepted by the Audit Team consisted of the following:

- **10684 - The Hollow Washington - Transport Statement FINAL**

1.1.6 The Audit Team examined the Audit Brief and plans, and the site was subsequently examined by Paul Nevard and Vinny Rey together on Wednesday 22nd September 2021 between 12.00 and 12.30 hours. The weather during the daytime site visit was dry and bright. The carriageway surface was dry. Traffic flows were low and vehicle speeds were observed as also being low.

1.1.7 No details of drainage, or strategic signage have been provided. These issues are not, therefore, considered further in this report except where it is considered that the absence of them could contribute to a road safety concern.

1.1.8 The Road Safety Audit also comprised of an examination of the documents forming the Audit Brief supplied to the Road Safety Audit Team and are referenced in Appendix A of this report. The location of any problems raised can be found within the report, photographed for reference, or referenced in Appendix B of this report. If no problems are identified, only a location plan will be provided for reference in Appendix B.

1.1.9 The terms of reference of the Road Safety Audit are as described in the Highways England General Principles and Scheme Governance General information GG 119 Road Safety Audit. The Road Safety Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria. This Road Safety Audit has not considered structural safety or checked for compliance to standards. This safety audit does not perform any "Technical Check" function on these proposals. It is assumed that the Project Sponsor is satisfied that such a "Technical Check" has been successfully completed prior to requesting this safety audit.

1.1.10 This Road Safety Audit has been undertaken based on the Road Safety Audit Team's previous experience and knowledge in undertaking Accident Investigation, Road Safety Engineering and Road Safety Audits. No member of the Road Safety Audit Team has had any previous input to the design of the scheme. The audit has been carried out with the sole purpose of identifying any features of the design that could be removed or modified to improve the safety of the scheme. The problems identified have been noted in this report together with suggestions for safety improvements, which we recommend should be studied for implementation.

1.2 Purpose of Scheme

The purpose of the scheme is a proposed re-opening and use of the existing vehicle access. The total number of daily movements associated with the importation of the inert restoration material is likely to be 300 daily 2-way movements on average. The number of movements from the associated sales of sand will remain unchanged from the currently permitted usage.

2. PROBLEMS IDENTIFIED IN PREVIOUS ROAD SAFETY AUDITS

No previous audits have been supplied to the Audit Team and the Audit Team believe that none have been produced.

3. PROBLEMS IDENTIFIED AT THIS STAGE 1 ROAD SAFETY AUDIT

3.1 General

3.1.1 PROBLEM

Location: Proposed site access – visibility / sightlines – A283

Summary: Risk of side swipe collisions due to lack of visibility.

Detail: Although some recent maintenance of the overhanging vegetation and grass verges must have occurred at the junction, visibility was slightly restricted at the A283 junction with The Hollows. Speed surveys would be required to ascertain sufficient sightlines and visibility splays at the junction.

RECOMMENDATION

Given the increased number of vehicles movements, any obstructions to visibility splays should be cleared and maintained going forward.

3.2 Local Alignment

No problems identified in this category at this stage.

3.3 Junctions

No Problems identified in this category at this Stage.

3.4 Non-Motorised User Provision

No Problems identified in this category at this Stage.

3.5 Road Signs, Carriageway Markings & Street Lighting

No Problems identified in this category at this Stage.

End of list of Problems identified and Recommendations offered in this Stage 1 Audit

4. AUDIT TEAM STATEMENT

We certify that this audit has been carried out in accordance with GG119.

AUDIT TEAM LEADER

Paul Nevard

Signed: 

Date: 27/09/2021

AUDIT TEAM MEMBER

Vinny Rey

Signed: 

EC Road Safety Ltd
1 Draven Close
Hayes
Bromley
Kent
BR2 7PN
United Kingdom

Date: 27/09/2021

Tel: 07508 76 76 96

Email: audits@ecroadsafety.co.uk

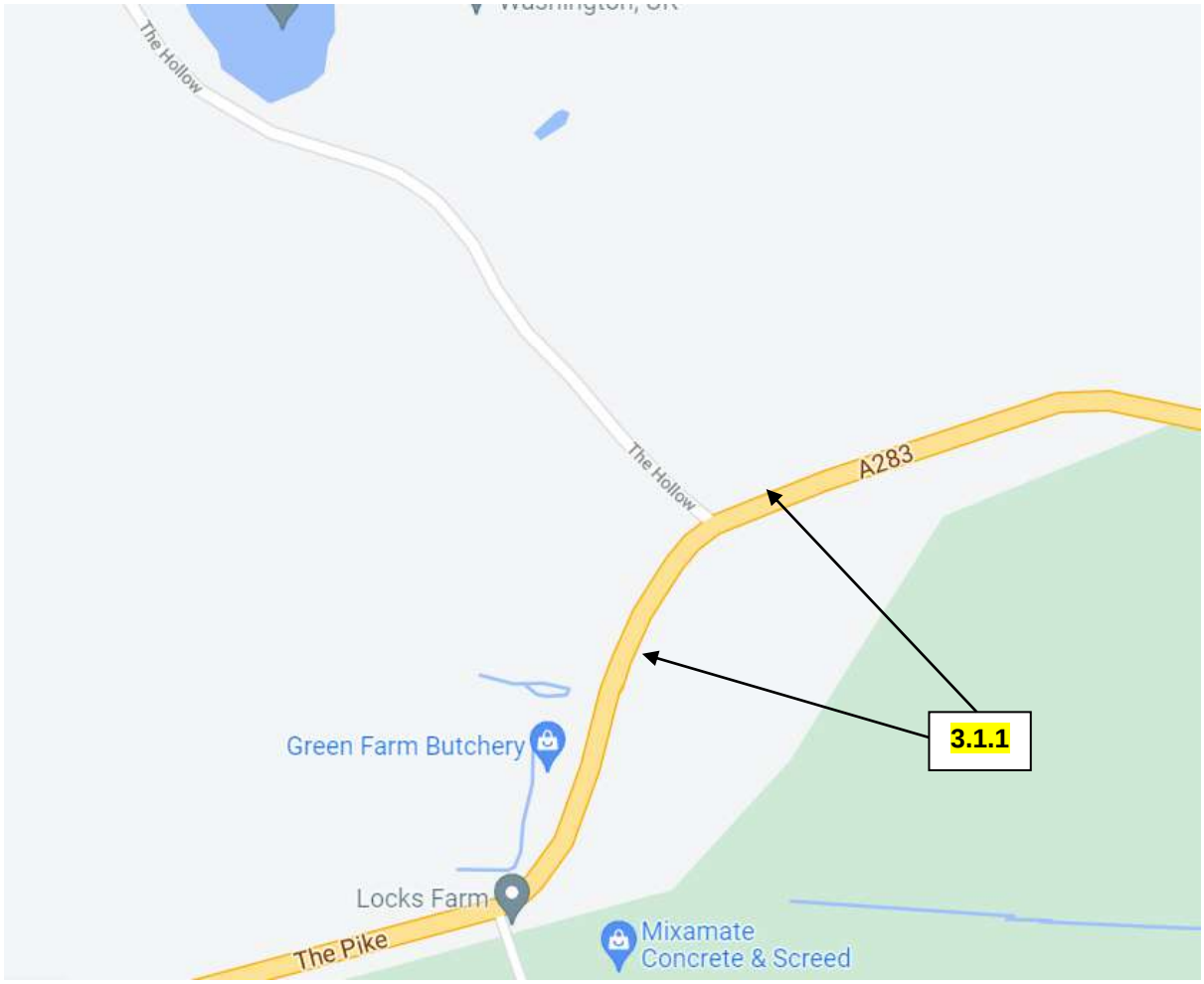
APPENDIX A

List of documents and plans considered during this Stage 1 Road Safety Audit:

- **10684 - The Hollow Washington - Transport Statement FINAL**

APPENDIX B

Location of problems identified during this Stage 1 Road Safety Audit:



Civil Engineering - Transport Planning - Flood Risk

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GTA Civils & Transport Limited, Registered in England No. 11917461. VAT Registration No. 319 2609 02

Civil Engineering - Transport Planning - Flood Risk

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GTA Civils & Transport Limited, Registered in England No. 11917461. VAT Registration No. 319 2609 02

APPENDIX 3
Additional Comments - Landscape and Ecology

NOTE

For ease of reference, reports submitted as part of the Environmental Statement have been included in this Appendix. Not all appendices have been provided where these are not specifically relevant to the provision of Additional Information. They can, however, be viewed as part of the Environmental Statement.

ROCK COMMON QUARRY, THE HOLLOW, WASHINGTON

RESPONSE TO PRINCIPAL PLANNER, WSCC ON LANDSCAPE AND ARBORICULTURE

1.0 GENERAL

1.1 My name is Joshua Peacock. I am Technical Director of Landscape Planning at Lizard Landscape Design and Ecology (Lizard) and a Chartered Landscape Architect with over 19 years professional experience in Landscape and Visual Impact Assessment (LVIA).

1.2 This statement responds to a request for additional information regarding Planning Application Reference No. WSCC/028/21 provided within a letter dated 21 December 2021 from Chris Bartlett, Principal Planner at County Planning for West Sussex County Council, (WSCC) which includes reference to consultation responses received from the South Down National Park, (SDNP).

1.3 I make reference to a number of documents, including the Lizard produced Landscape and Visual Impact, (LVIA) (Reference no: LLD1955-LPL-REP-001-02, dated 11 December 2020) undertaken by myself. The LVIA was submitted as part of the planning application. However, unfortunately having reviewed the submitted application available on the planning portal, it is clear that the Landscape documents submitted show corrupted text, with lines of blocks in place of occasional lines of text across Appendices A-AA-AB.

1.4 In providing this response key documents submitted as part of the planning application are referenced, to either highlight consideration which may have been overlooked in formulating the response, or to highlight areas of the documents submitted which have been updated in response to comments received. Alongside of the relevant Appendices highlighted above, albeit without any corruption showing, otherwise minor updates have been undertaken across the Landscape Masterplan, Strategy and Landscape and Woodland Management Plan, which are issued alongside of this response.

1.5 The response incorporates responses collated from my colleague, George Sayer who undertook the Arboricultural scope and Paul Whitby at The Ecology Co-op who undertook the Ecological scope.

1.0 RESPONSE TO COMMENTS RAISED BY - WSCC

1.1 WSCC raise the following key concern:

*'**The Hydrological Conceptual Site Model states that a 1m thick engineered clay liner would be installed, incorporating the existing Marehill Clay on the eastern boundary. Please provide a plan which shows the placement of said clay liner**.'* – Also highlighted discrepancy as a bullet point under *'Other Matters' (p6)*

1.2 The discrepancy results from the Terrestria Planning and Environmental Statement Volume 1 – June 2021, which identifies under Section 3 - The Application / Section 3.2 Detailed Proposals / Restoration, that: *'Whether or not an engineered clay liner will be necessary prior to general infilling will be considered in consultation with the Environment Agency.'* (Ibid, p22).

1.3 However: Terrestria Planning and Environmental Statement Volume 2, Part 1, Appendix B – Hydrological / Hydrogeological assessment, v.04, undertaken by H20 Geo, identifies under Section 3 - Hydrogeological Conceptual Site Model / Section 3.3 Proposed Restoration Scheme that: *'A 1m thick engineered clay liner would be installed, incorporating the existing Marehill Clay on the eastern boundary, with inert restoration materials deposited on top. This liner will prevent potentially contaminated groundwater from entering the Site and so remove many of the potential pollution linkages.'* (Ibid, p13). Figure 15 of the H20 Geo Chapter shows the Proposed Restoration Scheme – Hydrogeological Conceptual Site Model, which identifies the liner overlying the quarry prior to infill, with the "well" enabling groundwater to continue to be pumped and discharged into the Honeybridge Stream arising through this.

1.4 Regardless of whether the clay liner is considered to be required further to ongoing consultation with the Environment Agency, for the resilience of the water bodies suitable clay material or artificial liner is recommended for retaining water. The Landscape Strategy, Section 4.0, Applied Design Principle 1, (as amended) includes the following:

'Suitable clay material where available or artificial liner is anticipated to provide an impervious layer for the proposed water bodies); (A depth of at least 400mm of sandy material is anticipated to be required overlying the slowly permeable layer);'

2.0 RESPONSE TO COMMENTS RAISED BY - WSCC CONSULTEES

2.1 WSCC consultees raise a number of concerns including the following from the County Ecologist, followed by requests from the County Arboriculturalist:

***'[…] Although raising no objection, the Ecologist notes that they "would have liked to see more emphasis on large areas of bare sand with a benign disturbance regime to benefit scarcer pioneer communities and aculeates**'.*

2.2 Whilst not identified on the Illustrative Landscape Masterplan, there will be large area of bare sand across the landform, as supported within the Landscape Design Strategy, Section 4.0, Applied Design Principle 3, which includes the following: *'Maintain areas of bare sandy ground, of varied topography and vegetation cover through the 8 year transitional phases, and throughout the final restoration to support invertebrate diversity. Retain undisturbed 'refuge' areas throughout the restoration to allow insects to complete their life cycles;' 'Leave some areas as bare ground to allow a process of natural colonisation and successional growth.' (Ibid, p11).*

'[…] The level of the quarry floor will be above that of the natural groundwater level, so the shallow lakes will be 'perched', i.e., there will be no hydraulic continuity with ground water (the concerns regarding avoiding leachate from the adjacent landfill site are acknowledged). Does this mean the lakes will be solely reliant on surface water / rainfall? How can their ecological benefit and integrity be maintained if there is a risk of them drying out, even with using pumped water from a proposed well? is that sufficient and can that be maintained in perpetuity? Would recreational activity such as swimming and kayaking be compatible with the wildlife habitat vision for the lakes?'

2.3 The Landscape Design Strategy, Section 4.0, Applied Design Principle 3 includes the following, (as amended):

'Water levels within the ponds to be sustained, (with some seasonal fluctuation anticipated to be beneficial to habitat from opening up of muddy banks) where required, using pumped water from a proposed well south west of the lower pond, under an existing agreement to maintain water levels within the Honeywell Stream. This might be pumped to the northern pond from which it could then trickle feed to the middle and southern ponds through linking sunken pipes, due to the tiered level of the lakes.' (Ibid, p11)

2.4 The Landscape Design Strategy, Design Principle 2 limits the anticipated open water swimming, or perhaps kayaking, to the northern pond only. The Landscape Masterplan and Strategy have been updated to remove the proposed shallow vertical face of rock gabions, (to provide additional Sand Martin habitat) from the northern pond where anticipated open water swimming, or perhaps kayaking could be undertaken.

'Natural regeneration would be the preferred method of restoration rather than intensive intervention, but this will still require management to provide the habitat mosaic envisaged by the landscape design strategy: everything from open sand faces to woodland and all successional stages in between. This appears to be the intention of the first landscape objective and applied design principle 3. I would question the need to plant birch and willow, for example, given that they are pioneer species and will readily colonise areas. Biosecurity is critically important, and it would be better to minimise the plant material brought to site unless it is UK sourced and grown and complies with all biosecurity regulations.'

2.5 The Landscape Masterplan and Landscape Design Strategy have been updated to recommend natural regeneration in the short term. Where planting of scrub and tree species is required to achieve the habitat objectives, this would only be considered in the mid-term and would be specified using local provenance stock which complies with all UK plant biosecurity guidance.

'One of the areas of remaining sand reserves is alongside TPO 0204 to the north-west of the site and another alongside the whole western boundary which currently has good tree cover, providing important screening for the site. There would have to be a substantial stand-off from these areas – not just at the root protection area boundary – to avoid harmful root loss and damage. Page 1 and 3 for example, of the tree retention and protection plan appears to require clearance very close to retained category B trees which is of concern. It is very difficult to make out the tree protection barrier on any of the plans – is it actually shown?'

2.6 There is some relatively significant clearance of C grade woodland next to B grade woodland. The intention is for the landform to be sculpted round the B grade woodland, with the removal of C grade trees going beyond the proposed works areas to allow space for works without harm to B grade woodland. In reality the C grade woodland will rapidly regenerate.

2.7 Protective barriers have only been proposed around discrete proposals such as the pumping station and handling platform. Given the extent of low-value tree removal and the site topography; it has not been proposed to fence the remainder off; instead, the arboriculturalist would determine and agree the extent of removal on site with the contractors using tape or similar.

'The proposed tree protection plan is satisfactory but given the very long-term nature of the site activity through to final restoration, a phased, sequential approach to tree protection is likely together with site-specific method statement preparation to be agreed for certain elements, e.g., the pump construction and power supply installation. This would also be subject to regular monitoring and review at a frequency to be agreed within a detailed implementation programme?'

2.1 Regarding the phased nature of the restoration Terrestria Planning and Environmental Statement Vol.1 – June 2021 highlight:

'Whilst reference should be made to the phased working and restoration drawings which accompany this application it should be noted that whilst every effort has been made to ensure that these accurately show the phasing and restoration of the quarry, for a development of this scale and nature a measure of flexibility is necessary to account for changing circumstances as the development proceeds. For example, whilst internal access roads are shown on the drawings, conditions on site may require these routes to be changed as the restoration proceeds.'

2.2 Where there are amendments to access roads as indicated by Terrestria, the TRPP plans which have been produced at 1:500 at A1 could be updated. However, there seems little benefit from reproducing these plans tailored to respective phases only, other than where an amendment is required in response to site-specific method statement preparation for certain elements, for example the pump construction and power supply installation.

2.3 A detailed implementation programme, (subject to regular monitoring and review) is yet to be agreed which would provide the opportunity for these components to be highlighted for agreement.

'Better integration into the wider landscape would be achieved by the inclusion of a well-connected hedgerow network across the site. Hedgerows were the subject of a condition (21) determined in 2004.'

2.4 Hedgerow planting can be a useful tool for providing connectivity, but as the intention is to create a naturalistic mosaic of sandy habitat about a series of ponds within a sunken quarry landscape, this is not appropriate to the landform. However extensive belts of scrub would be maintained about the southern and eastern areas of the quarry in advance of adjacent perimeter areas succession to woodland.

3.0 RESPONSE TO COMMENTS RAISED BY - THE SDNP

3.1 The South Downs National Park, (SDNP) raise a number of concerns, including the following quoted text raised under a sub heading of 'The Proposed Restoration Scheme':

'Exploration of the site's role in providing the setting to the National Park has not been undertaken'

3.2 The contribution of the Site to the setting of the National Park is identified across a number of areas within the LVIA. Within the LVIA, the Site's situation relative to the adjacent landscape character within the National Park is described through reference to published evidence within Section 5.0, through reference to the South Downs National Park Integrated Landscape Character Assessment, (LUC, Updated 2020), and The South Downs National Park: View Characterisation and Analysis Study, (LUC, 2015).

3.3 This evidence is used to inform the descriptive language used within the LVIA Section 6.0, regarding the existing conditions informed by the field survey - Perceptual qualities in views to and from the South Downs from publicly accessible areas described across Paras 6.28 – 6.37, through reference to Viewpoint Photographs. The outlook to the South Downs from within the Site is further detailed across Paras 6.46 – 6.50 in particular. Landscape Receptors are subsequently defined relative to their contribution to the setting of the National Park, including:

'Contribution from the treed boundary to south west and north in framing views for users of the Public Footpaths in these locations towards the Landmark feature of the wooded Chanctonbury Ring atop the chalk escarpment and the sense of place and special qualities of the South Downs National Park;

[…] Contribution to sense of place within the quarry from visibility towards the Landmark feature of the wooded Chanctonbury Ring atop the chalk escarpment and the special qualities of the South Downs National Park; Primarily from the grassed plateau to the north east of the quarry, but also from elevated parts of the quarry to the north west;

3.4 The contribution from the restoration of the Site in views from elevated ground to the setting of the South Downs is noted as an enhancement within Opportunity 9 and 10 on Page 61 / 62 of the LVIA and compared relative to the approved restoration within the landscape assessment within Section 8.0 across Paras 8.9 – 8.18. Opportunity 10 is repeated below for convenience:

'Enhance - Potential to achieve a quality of habitat across a larger area of the Site than previous, which would achieve Priority Habitat of Acid Grassland and Lowland Heath in support of overlying Lower Arun Watershed BOA potential for habitat including: Lowland heathland; Lowland meadows; Reedbeds and Woodland; In common with Sullington Warren this could achieve: 'a range of heathland habitats including both wet and dry heath, grassland, scrub and woodland.'; This would be in keeping with the: 'heavily wooded ridges, interspersed with small patches of heathland', identified as characteristic for the West Sussex Storrington Woods and Heaths, (LCA WG7); This would enhance the setting of the South Downs National Park, through reinforcing multifunctional networks of spaces and features which connect with surrounding and existing biodiversity corridors in line with Horsham District Planning Framework (2015) Strategic Policy 25: The Natural Environment and Landscape Character and Policy 31: Green Infrastructure and Biodiversity and Storrington, Sullington & Washington Neighbourhood Plan 2018-2031, (September, 2019) Policy 15: Green Infrastructure & Biodiversity;' (Ibid, p62)

***'A low level of intervention is recommended for the restoration of this site** [...]'*

3.5 There are constraints from the consented restoration which have influenced the approach taken to the revised restoration proposal including the avoidance of unstable cliff faces, public health hazard from deep water and the pathway for leachates that the depth of water body would present. These are detailed within Section 3 of the Terrestria Planning and Environmental Statement Volume 1 – June 2021.

'Whilst the current scheme proposes to create new habitats, these habitats bear little relationship to landscape character.' - 'There are no context plans – so we have no concept of how the restored levels knit into context, thus delivering an integrating approach to restoring landform character.'' 'What was the pre-worked landform?'

3.6 The Landscape Design Strategy, Para 3.2 identifies objectives, from which design principles are subsequently developed, including: 'A high quality mosaic of habitats across a larger area of the Site'. Para 3.3 identifies that:

'This would be in keeping with the heavily wooded ridges, interspersed with small patches of heathland, identified as characteristic for the West Sussex Storrington Woods and Heaths, (LCA WG7, 2020) which surrounds to the north, whilst extending a mosaic of habitat into the Central Scarp Footslopes, (LCA WG8, 2020) which surrounds to the south.

3.7 Regarding restored levels, the quarry would be retained as a sunken landform, albeit raised to the north. The approach to landform is shown on the Terrestria Limited, Final Restoration, Drawing No. RDCL/RCRA/WP-11. The aim is not to restore the pre excavation landform. Through reference to the historic map regression provided within the LVIA, the LVIA, Appendix E Historic Maps from 1783 – 1961 show landform prior to works south of the Hollow, but with the clearest indication of this from reference to the 1783 map.

'Whether a clay liner is needed or not is fundamental to help us understand the potential negative effects and therefore acceptability of the scheme. i.e. potential for leachate to pollute as a result of the use of inert material.'

3.8 See consideration against WSCC request above.

'Restoration scheme has no legend'

3.9 The corruption to the submitted documents impacted on this. Please see the resubmitted documents, issued alongside of this response.

Joshua Peacock
Technical Director I Landscape Planning
Landscape Architect, BA (Hons) MALA CMLI

LIZARD
Landscape Design and Ecology

LIZARD

Landscape Design and Ecology

DUDMAN ROCK COMMON LIMITED

ROCK COMMON QUARRY, THE HOLLOW
WASHINGTON

Landscape Design Strategy

Project Reference	LLD1955-LAN-REP-001
Prepared by:	JP
Checked By:	GS
Revision	04
Date:	11.02.2022

Planning Issue

CONTENTS

BASEMAP PRODUCED BY MAGIC ON 07/01/2019 (C) CROWN COPYRIGHT AND DATABASE RIGHTS 2019. ORDNANCE SURVEY 100022861

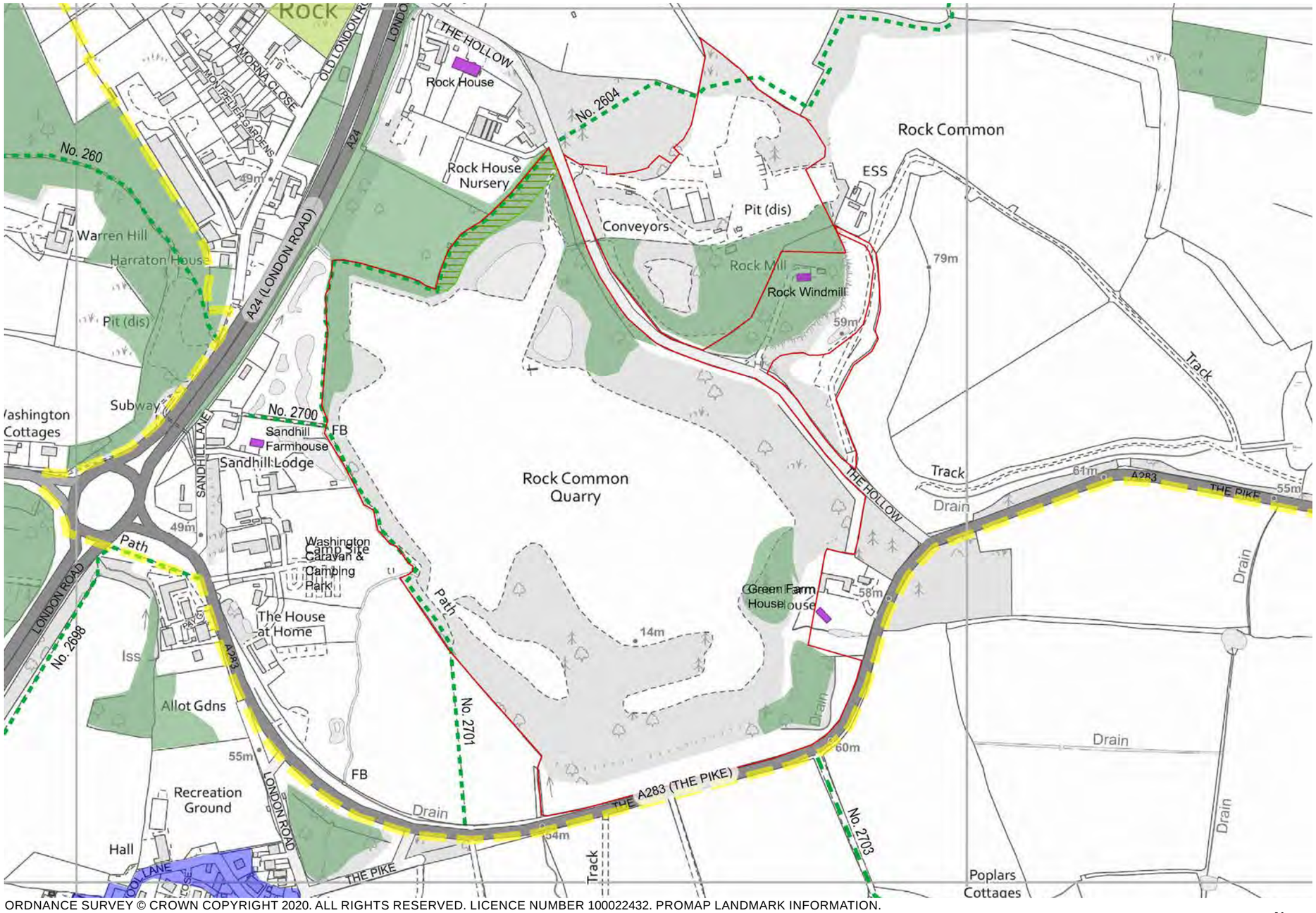
NTS

0 500 1000 2000 m

Metres

N

Figure 1.1. Development Site Location.



ORDNANCE SURVEY © CROWN COPYRIGHT 2020. ALL RIGHTS RESERVED. LICENCE NUMBER 100022432. PROMAP LANDMARK INFORMATION.

NTS

0 100 200 500

Metres

N

Legend

- Site Boundary.
- South Downs National Park, (*south of the dashed yellow line*).
- Public Footpath.
- Public Bridleway.
- Listed Building *(Grade II).*
- Conservation Area.
- Deciduous Woodland UK Priority Habitat.
- Traditional Orchard UK Priority Habitat.
- Tree Preservation Order.

Figure 1.2. Site and Surrounds.

1.0 INTRODUCTION AND BACKGROUND

General

1.1 Lizard Landscape Design and Ecology (*LLD*) has been commissioned by Dudman Rock Common Limited to develop a Landscape Design Strategy *(LDS)* and Illustrative Landscape Masterplan *(LM)* for the proposed restoration project at Rock Common Quarry, The Hollow, Washington *(Grid Reference: TQ 12507 13493)*.

1.2 The LDS was informed by the Landscape and Visual Impact Assessment *(LVIA) (LLD1955-LPL-REP-001-02)* prepared by LLD, further to a site visit to appraise the Site and the surrounding area on the 16th and 19th June 2020, when vegetation was in leaf, followed up by a further site visit on the 1 October 2020, when vegetation was substantially in leaf. The LDS has been undertaken by Joshua Peacock, an Associate Landscape Planner at Lizard Landscape Design and Ecology and a Chartered Landscape Architect, supported by Kian Gharchedaghi, Landscape Architect.

1.3 The LDS has been developed out from the constraints and opportunities developed within the LVIA, defined through reference to planning policy, designations and landscape character. This has been further informed through collaboration with The Ecology Co-op, who are the ecological consultants for the Scheme and developed alongside of this LDS through an Illustrative Landscape Masterplan, *(LLD1955-LAN-REP-001-03)* and a Landscape and Woodland Implementation and Long-Term Management Plan, *(LLD1955-LAN-REP-002-03)*.

The Scheme

1.4 A description of the proposed restoration scheme is provided within Section 3 of the Terrestria Application, which the reader is advised to read alongside of this report.

The Design Strategy

1.5 Through reference to the context of the Site ***(Section 2.0)***, design principles are identified as part of a landscape vision statement, ***(Section 3.0)***. The principles are then applied within a strategic landscape framework, ***(Section 4.0)*** which has been spatially developed alongside of the Illustrative Landscape Masterplan for the Site, supported by outline planting schedule within **Appendix A**, and the Landscape and Woodland Implementation and Long-Term Management Plan.

The Site and Surrounds

1.6 Through reference to **Figure 1.2**, the Site is best described through reference to Section 3 of the Terrestria Application, which the reader is advised to read alongside of this report.

Soil and Topography

1.7 Through reference to the Soilscapes Map *(developed by Cranfield University and sponsored by the Department for Environment, Food and Rural Affairs)* soil type across the southern half of the main quarry to the south of The Hollow *(in keeping with that to east and west)* is shown to have comprised: *'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'*.

1.8 The soil type to the remainder of the unexcavated Site to the north is understood to comprise: *'Freely draining slightly acid loamy soils'*.

2.0 LANDSCAPE CHARACTER - APPROACH

2.1 An understanding of the contribution of the Site to landscape character is provided within **Section 6.0** of the LLD produced Landscape and Visual Impact Assessment.

2.2 The key landscape constraints, identified for the Site, *(with allocation of sensitivity taking into account the susceptibility of the component to the proposals)* are considered to be:

- ***Medium*** *- Contribution from the remnant latitudinal landform of the low sandstone ridgeline, (and to which the landform immediately surrounding Hollow Lane is representative), to landscape character, as a continuation of that to the west about Warren Hill, both with wooded crests, and the coherence and structure this provides individually and sequentially with that to the west as a landscape feature with time depth, about which field pattern, hydrology, historic built form and the alignment of roadways including the A24 (London Road) and the A283, (The Pike) have been influenced and defined;*

- ***Medium*** *- Contribution from the remnant latitudinal landform of the low sandstone ridgeline, to visual character in combination with that to the west about Warren Hill, both with wooded crests, as a compositional element when viewed from the upper scarp and downland crest to the south, south east and south west; Contribution of this to the visual integrity, identity, scenic quality and tranquillity of the South Downs National Park associated with elevated views from the scarp, looking north across the low weald, (including from the South Downs Way to the south west) under the South Downs Local Plan, (July 2019) Strategic Policy SD6: Safeguarding Views and SD7: Relative Tranquillity);*

- ***Low*** *- Contribution from the woodland belt north of the A283, (The Pike) to concealing the quarry working beyond and preserving the setting of both the Washingtion Conservation Area and (Grade II Listed Buildings within), including that of Green Farm House to the south east;*

- ***Low*** *- Contribution from the treed embankment to the west of the quarry to concealing the quarry working from the wider setting of the (Grade II Listed) Sandhill Farmhouse and to a lesser extent that further to the north subject to Area TPO No. 0204 of the (Grade II Listed) Rock House;*

- ***Low*** *- Contribution from the woodland to the east of the sand processing facility at elevation to concealing the processing facility from the setting of the (Grade II Listed) Rock Windmill;*

- ***Low*** *- Contribution from the treed boundary to south west and north in framing views for users of the Public Footpaths in these locations towards the Landmark feature of the wooded Chanctonbury Ring atop the chalk escarpment and the sense of place and special qualities of the South Downs National Park;*
- ***Medium*** *- Contribution to sense of place within the quarry from visibility towards the Landmark feature of the wooded Chanctonbury Ring atop the chalk escarpment and the special qualities of the South Downs National Park; Primarily from the grassed plateau to the north east of the quarry, but also from elevated parts of the quarry to the north west;*
- ***Medium*** *- Contribution to sense of place from the natural qualities of the patches of habitat present within the quarry and its perimeter, including reed fringed water bodies, gorse scrub, birch woodland and mixed deciduous woodland, introduce visual variety and complexity within the quarry;*
- ***Medium*** *- High level of relative tranquillity and sense of place associated with the chalk escarpment and scenic, panoramic northerly views across the weald from this, due to the elevation of the views and the mosaic of woodland and fields which form a tapestry, increasingly wooded before fading to blue along the far horizon line and the perspective this provides in line with the South Downs National Park Special Quality of a 'Diverse, inspirational landscapes and breath-taking views', (SQ1);*
- ***Low*** *- A moderate level of relative tranquillity along Public Footpath No. 2701, due to the natural elements of flowing water along the Honeybridge Stream, (albeit artificially supplemented by pumping from Rock Common);*
- ***Low*** *- Time depth associated with the sunken lane of The Hollow and its association with the underling remnant landform over which it rises and falls; Including the presence of a veteran oak tree along the southern bank of the sunken profile of The Hollow;*
- ***Low*** *- Contribution of maturing coniferous trees to the north west of the Sand Processing Area, north of The Hollow as part of coniferous woodland habitat consistent with the sandstone ridgeline, particularly in southerly views from Public Footpaths within open fields to the north of the Site;*
- ***Medium*** *- Contribution from the large clean exposures of sand from the Folkestone Beds of the Lower Greensand to some 40m in elevation about the south of the quarry to educational interest in palaeoenvironmental studies, non statutorily designated for geological value as Rock Common Quarry, Sussex Regionally Important Geological Site, (RIGS) No. TQ11/41.*

2.3 Through consultation with the Ecology Co-op the following are considered to be ecologically valuable, ordered in priority:

- *The sand cliffs along the south eastern and eastern section of the quarry. The faces support many thousands of solitary bees with a full species list to be created.*
- *Dormice have also been identified on the southern border of the quarry and it remains possible that they may be present within the woodland in the quarry itself.*
- *There is a large sand martin nesting site, which has repositioned itself to the eastern face of the quarry*
- *There is a population of common reptiles also present on site.*

2.4 Through reference to the Arboricultural Impact Assessment and Method Statement, undertaken by Lizard further to a tree survey, the land surrounding the quarry contains areas of mature woodland described as follows:

'[...] dominated by sycamore, birch, sweet chestnut and Scots pine. Areas of more established native woodland containing oaks, alders and hazels are present further out. Several shelter belts of moderate value, containing mainly poplar trees and Scots pine are also present to field and road edges. Roads and footpaths contain mixed tree and hedge lines, with a number of mature feature trees, mostly oaks. These trees are of moderate to high value, being much older specimens of reasonable form.' (Ibid, p5)

2.5 The majority of the trees surrounding and within the Site are classified as Grade C, other than those to the western boundary which are Grade B and groups to the north which are additionally classified as Grade B.

Landscape Opportunities

2.6 Various opportunities are identified within the Landscape and Visual Impact Assessment, *(LLD1955-LPL-REP-001-02)* for mitigation measures which would avoid, reduce and if possible remedy potential adverse effects from the Proposed Restoration, but also to define Site specific enhancement measures. Measures, including those identified as forming secondary mitigation and enhancement measures are developed within this Landscape Strategy alongside of the Illustrative Landscape Masterplan within the Landscape Framework within **Section 4.0**.

Photograph A. *Private wetland area with ducks to the north of Sandhill Farmhouse from Public Footpath No. 2700, surrounded by grey poplar trees.*

Photograph B. Warren Hill. *Public footpath 2630 across National Trust woodland, Washington Common © Peter Holmes. Licensed for reuse under Creative Commons Licence. Source: https://www.geograph.org.uk/photo/3565137*

Photograph C. *Westerly view, within pine and birch woodland, within a longitudinal belt about the perimeter of the former waste sites, from Public Footpath No. 2604.*

Photograph D. *Sullington Warren - Heathland with larch, fringed with mixed deciduous and coniferous trees - (Located some 3km to the north west along the Sandstone Folkestone Formation), (Location shown on* ***Figure 6.1*** *within the LVIA).*

3.0 LANDSCAPE DESIGN STRATEGY

Landscape Vision

3.1 The Landscape Vision develops that defined within the Concept Restoration Scheme, *(Pleydell Smithyman Limited / R32/06)* submitted as part of the Approved restoration scheme under WS/15/97 as follows:

To create an integrated ecological and amenity resource at the foot of the South Downs National Park escarpment, which integrates the Site into the surrounding landscape whilst enhancing sense of place.

Landscape Objectives

3.2 To achieve this the following objectives would be pursued as presented within the Illustrative Landscape Masterplan, *(LLD1955-LAN-REP-001-03)* incorporated as **Figure 4.1**:

- ***A high quality mosaic of habitats across a larger area of the Site*** *- Including a mosaic of lowland heath, acid grassland, scrub and woodland, marginal habitat and patches of open water, within which islands of shingle would protect nesting birds. Areas of sand cliffs along the south eastern and eastern section of the quarry would be retained, which support many thousands of solitary bees, whilst also retaining the upper levels of the Folkestone Formation for educational purposes, protected as a Regionally Important Geological and Geomorphological Site;*

- ***A strong sense of place, accessed through a network of footpaths with varied outlooks*** *- Including viewpoints which provide prospects over the mosaic of habitat within the Site towards the landmark of Chanctonbury Ring to the south east and Highden Hill to the south west. Footpaths within the Site would explore the mosaic of habitats, whilst leading towards sandy beach areas along the waters edge, otherwise fringed with reeds, from which paths would generally be offset to reduce disturbance.*

3.3 This would be in keeping with the heavily wooded ridges, interspersed with small patches of heathland, identified as characteristic for the West Sussex Storrington Woods and Heaths, *(LCA WG7, 2020)* which surrounds to the north, whilst extending a mosaic of habitat into the Central Scarp Footslopes, *(LCA WG8, 2020)* which surrounds to the south.

3.4 It would also enable an aspect and habitat comparable to the lowland dwarf shrub heath of Sullington Warren Site of Special Scientific Interest, located some 2.5km to the west along the local outcrop of the Folkestone Formation, with a smaller area about Washington Common some 800m to the west.

3.5 The setting and recreational access to the South Downs National Park, would be enhanced through establishing a multifunctional networks of spaces and features which connect with surrounding and existing biodiversity corridors. This would support the following policies in particular:

- *Horsham District Planning Framework (2015) Strategic Policy 25: The Natural Environment and Landscape Character;*
- *Horsham District Planning Framework (2015) Strategic Policy 31: Green Infrastructure and Biodiversity, and;*
- *Storrington, Sullington & Washington Neighbourhood Plan 2018-2031, (September, 2019) Policy 15: Green Infrastructure & Biodiversity.*

Design Principles

3.6 The following Design Principles, *(DP)* structure the approach taken within the outline landscape framework, which includes ecological recommendations provided by The Ecology Co-op, *(provided within **Section 4.0**).*

- ***Design Principle 1*** *- Materials Management and profiling to utilise suitable materials, including natural materials arising on site to ensure suitable substrate at suitable depth to support proposed habitat, characteristic of the area;*

- ***Design Principle 2*** *- Suitable gradients to be achieved for access for all along pathways and to viewing platforms. About the sandy waters edge this would additionally reduce health and safety risk for potential open water swimming, or perhaps kayaking, limited to the northern pond;*

- ***Design Principle 3*** *- Allow natural regeneration in the short term, followed by planting in the mid term where desired habitat types would benefit. Ensure habitat mix specification, (see **Table 1**) and method of establishment are suitable for the long term objectives of the Site, informed through consideration of short - mid - long term management actions presented within the Landscape and Woodland Implementation and Long-Term Management Plan, (LLD1955-LAN-REP-002-03).*

MAP DATA ©2019 GOOGLE. IMAGE CAPTURE: JUNE 2018, LANDSAT / COPERNICUS.

1:8,000 at A3

0m 100m 200m 300m

Metres

N

Legend

- Development Site Location.
- Existing Broadleaved Woodland - To be retained and enhanced.
- Broadleaved Acid Woodland - To be planted out.
- Native scrub planting - Self seeded / managed.
- Lowland Heathland species to be targeted for establishment, further to trials early in phased restoration.
- Acid grassland establishment targeted with areas of bare ground left for natural succession to take place.
- Existing Standing water.
- Proposed Standing water.
- Marginal planting to areas of standing water.
- Gravel Islands created above standing water level to provide habitat for ground nesting birds.
- Sand/Gravel 'Beach' areas to allow interaction with the waterside by visitors.
- Shallow vertical faces to be created using gabions or similar filled with rock and reclaimed material to provide additional sand Martin habitat.
- Soft Cliff faces to be retained as habitat to solitary bees. Any enhancement planting within the proximity should avoid these faces as well as sand Martin nesting sites found to the east.
- Footpaths for informal public access
- Private use access for maintenance and habitat management
- Retained hardstanding/site maintenance area
- Viewpoints from high ground across the Site to surrounding chalk escarpment landform including the wooded Chanctonbury Ring.

Figure 4.1. Landscape Masterplan (Illustrative).

4.0 OUTLINE LANDSCAPE FRAMEWORK

4.1 The Landscape Framework is structured through reference to the Design Principles identified within **Section 3.0** and informed by recommendations provided by The Ecology Co-op. These recommendations have been applied iteratively in the development of the final Site layout and presented within the Illustrative Landscape Masterplan produced by LLD.

4.2 The high quality and practicable restoration to be guided through reference to the LLD produced Woodland and Landscape Management Plan, *(in line with West Sussex Joint Minerals Local Plan (July 2018) Policy Policy M24(b): Restoration and Aftercare).*

Applied Design Principle 1 *-* ***Materials Management and profiling to utilise suitable materials, including natural materials arising on site to ensure suitable substrate at suitable depth to support proposed habitat characteristic of the area:***

- *Retention of Site materials for use as substrate to ensure the habitats developing at the site are characteristic of the area (A depth of at least 400mm of sandy material is anticipated to be required across much of the site); For example lower grade sand materials stockpiled on the site that are not suitable for mineral extraction, (could be a mix of stones, gravels and natural sediments that would otherwise not be used) may still be suitable for use as capping over the imported fill to provide a substrate for habitat creation; (A description of the type of soil profile found underlying heathland habitat is provided within an extract from 'The Habitats and Vegetation in Sussex, (Rose, 1995) - (see* ***Appendix E,*** *within the Woodland and Landscape Management Plan);*
- *Suitable clay material where available or artificial liner is anticipated to provide an impervious layer for the proposed ponds); (A depth of at least 400mm of sandy material is anticipated to be required overlying the slowly permeable layer);*
- *Gently graded edges and a varied pond profile to suit marginal, emergent and submerged flora within the proposed water bodies with a general slope of 1:10 providing a large draw-down zone with a depth of 10-30 cm, (Through reference to the Amphibian Habitat Management Handbook (ARC, 2011) this is the optimal depth for amphibians and invertebrates);*
- *Proposed sandy beach areas to be designed to a crenellated plan form with grassy banks forming small, enclosed sandy bays. (This should discourage Canada geese through preventing their ability to move from grazing/nesting areas to water without flying and by breaking clear line of sight against predation);*
- *The islands within the two southern water bodies should incorporate a south facing low cliff of 1m in elevation directly over the water, formed out of compacted earth substrate, (perhaps supported by a gabion basket) along their southern edge. This would provide suitable nesting habitat for sand martins amongst other species. (It is understood from The Ecology Co-op that this species has a large nesting site within the quarry, which has recently repositioned itself to the eastern face of the quarry, which is likely to be disturbed by the restoration);*
- *The existing deep pond to the north of the quarry to be partly infilled with material of low mineral content, (to prevent algal blooms) to create a shallower pond than existing, with marginal areas, to improve both biodiversity and health and safety. Use of natural bank stabilisation is anticipated, such as brushwood 'faggots' secured with chestnut stakes; Surrounding ground levels otherwise to be maintained;*
- *Retention of 2m sandy cliff to east and incorporation to south east above restored levels for use as habitat for insects, (As advised by the Ecology Co-op, at present this supports many thousands of solitary bees); The cliff would retain the upper levels of the Folkestone Beds, with some benefit to the educational interest from this, designated as part of the Regionally Important Geological and Geomorphological Site;*
- *Provide a stepped profile to the east, and otherwise where proposed restored landform is relatively steep - This would benefit both substrate retention and invertebrate habitat;*
- *Retain larger stones and gravels to create dispersed features as part of south facing sandy banks, which would introduce variable heating and shading for the surrounding substrate and invertebrate populations.*

Applied Design Principle 2 *-* ***Suitable gradients to be achieved for access for all along pathways and to viewing platforms. About the sandy waters edge this would additionally reduce health and safety risk for potential open water swimming, or perhaps kayaking, limited to the northern pond:***

- *Improve connectivity off the western boundary of the Site to the Rights of Way Network for members of the wider community wishing to access the proposed perimeter walk and viewing areas;*
- *Incorporate viewing areas or points from elevated points within the restored landscape towards the Landmark feature of the wooded Chanctonbury Ring atop the chalk escarpment to reinforce and enhance the contribution to sense of place within the quarry and the special qualities of the South Downs National Park this affords;*
- *Provide a number of enclosed, sandy beach areas, to a crenellated plan form with grassy banks forming small, enclosed sandy bays, to enable areas where access to the naturalised waters edge might be gained;*
- *Gradients of sloping paths and maximum distance between landings (dependent upon the vertical climb), to be informed by the Countryside for All Good Practice Guide, (Fieldfare Trust, 1997, p21) which provides guidance for countryside environments, including rural and working landscapes. This should be referred to in defining the approach to pathways, particularly up the steeper eastern slope, where the gradient should not be greater than 1:10.*

Applied Design Principle 3 *-* ***Allow natural regeneration in the short term, followed by planting in the mid term where desired habitat types would benefit. Ensure habitat mix specification, (See Table 1) and method of establishment are suitable for the long term objectives of the Site, informed through consideration of short - mid - long term management actions presented within the Landscape and Woodland Implementation and Long-Term Management Plan:***

- *Conserve and enhance areas of good condition and quality deciduous and coniferous woodland (including that to the north western edge of the Site under Area TPO No. 0204), with some thinning as anticipated for recommendation within the Landscape and Woodland Implementation and Long-Term Management Plan, (LLD, 2020);*
- *Reinforce the contribution presented by oak trees along the remnant ridge, (as with Warren Hill and Sullington Warren further to the west) through planting trees and making space for trees to establish about the part reinstated crest, (whilst accommodating the areas of sand cliffs to the east of the Site); This would reinforce the wooded skyline of the south facing ridgeline and help assimilate the A283 Storrington to Washington section of the Low Folkestone Sand Ridgeline;*
- *Trial using differing materials and techniques throughout the early phased restoration of the Site to determine suitability for achieving establishment of acid grassland / lowland heathland communities;*
- *Maintain areas of bare sandy ground, of varied topography and vegetation cover through the 8 year transitional phases, and throughout the final restoration to support invertebrate diversity. Retain undisturbed 'refuge' areas throughout the restoration to allow insects to complete their life cycles;*
- *Approach to planting mixes to ensure resilience and enable adaptation to a changing climate...' (in line with West Sussex Joint Minerals Local Plan (July 2018) Policy M23(c): Design and Operation of Mineral Developments);*
- *Acid woodland type habitat comprising of an Oak-Hazel woodland fringed with Birch and Wych Elm, to be established about the edges of the habitat mosaic and in patches to reinforce areas of existing woodland; with patches of myrtle underlying;*
- *Enable scrub to establish naturally within areas to improve structural heterogeneity and edge across the habitat mosaic to provide foraging and refuge opportunities for birds, small mammals and other wildlife; Potentially introduce a small amount of Ulex minor, (Dward furze) as a component of the scrub habitat. This should be managed as clumps, to prevent broader encroachment;*
- *Across the acid grassland area introduce informally dispersed swathes sown with a tussocky grass mix with a high percentage of forbs to incorporate a mosaic of vegetation overlying the Site, whilst encouraging exploration along the resulting edge of grassed and bare ground habitats resulting; This may well maintain areas of bare ground, from resulting recreational disturbance;*
- *Manage staged disturbance of the substrate to support the ecological value and visual interest of the supported invertebrate populations; For example carry out a mowing / strimming maintenance regime of some 20% of the area per year, whilst allowing patches of scrub and tree groups to establish;*
- *The network of paths would additionally benefit the recommended approach to maintaining an open mosaic type habitat in places across the quarry site, through the informal disturbance of the substrate which would result about the acid grassland and heathland areas;*
- ***H****eathland habitat to be established on south facing profiles, with slopes managed to promote a low fertility open sward suitable for allowing the natural regeneration of acid grassland and heathland species through a management plan, with resulting advantageous species to aid pollination and reduce pest species for the agricultural land within the surrounding area and support reptiles;*
- *Leave some areas as bare ground to allow a process of natural colonisation and successional growth;*
- *Establish reedbed within marginal areas of the ponded habitats to reinforce a mosaic of habitat across the Site area; Clumps might be lifted from the existing ponded area to the north of the quarry area, where reedbeds are already well established, (and through advice received from The Ecology Co-op; supports read warblers;*
- *Water levels within the ponds to be sustained, (with some seasonal fluctuation anticipated to be beneficial to habitat from opening up of muddy banks) where required, using pumped water from a proposed well south west of the lower pond, under an existing agreement to maintain water levels within the Honeywell Stream. This might be pumped to the northern pond from which it could then trickle feed to the middle and southern ponds through linking sunken pipes, due to the tiered level of the lakes.*


Betula pendula (Silver birch)


Salix cinerea (Grey Willow)


Frangula alnus (Alder Buckthorn)


Vaccinium myrtillus (Billbery)


Deschampsia flexuosa (Wavy hair grass)


Sorbus Aucuparia (Rowan)


Quercus robur (Pedunculate oak)


Salix caprea (Goat Willow)


Ulmus glabra (Wych elm)


Corylus avellana (Hazel)


Potentilla erecta (Tormentil)


Betula pubescens (Downy Birch)


Myosotis scorpioides
(Water Forget-Me-Not)


Festuca ovina
(fine-leaved sheep fescue)


Ilex aquifolium (English Holly)


Erica tetralix (Cross leaved heath)


Viola lactea (Pale Dog-Violet)


Cerastium arvense (Field Mouse-Ear)


Molinia caerulea (Purple Moor Grass)


Rumex acetosella (Sheeps Sorrel)


Calluna vulgaris (Common heather)


Erica cinerea (Bell Heather)


Ulex minor (Dward furze / gorse)


Mentha aquatica (Water Mint)


Sagittaria sagittifolia (Arrowhead)

Table 1 - Habitat Planting Specification

Group	Species / Product Name	Origins	Root Stock	Mix	Specification
Mixed Broadleaved Acid Woodland	*Quercus robur (Pedunculate oak)*	N	BR	30%	Transplant, 40-60cm height.
	Bilberry, (Vaccinium myrtillus)	N	BR	10%	Transplant, 40-60cm height
	Corylus avellana (Hazel)	N	BR	20%	Transplant, 20-40cm height
	Betula pubescens (Downy birch)	N	BR	5%	Transplant, 40-60cm height
	Betula pendula (Silver birch)	N	BR	5%	Transplant, 40-60cm height
	Sorbus aucuparia (Rowan)	N	BR	5%	Transplant, 40-60cm height
	Ulmus glabra (Wych elm)	N	BR	5%	Transplant, 40-60cm height
	Frangula Alnus (Alder buckthorn)	N	BR	5%	Transplant, 40-60cm height
	Ilex aquifolium (Holly)	N	BR	5%	Transplant, 40-60cm height
	Salix cinerea (Grey willow)	N	BR	5%	Transplant, 40-60cm height
	Salix caprea (Goat willow)	N	BR	5%	Transplant, 40-60cm height
Scrub	*Ulex minor, (Dward furze)*	N	BR	Dispersed patches	Transplant, 20-40cm height
	Bilberry, (Vaccinium myrtillus)	N	BR	Dispersed patches	Transplant, 20-40cm height
	Calluna vulgaris (Ling)	N	BR	Dispersed patches	Transplant, 20-40cm height
Where planting of scrub and tree species is required to achieve the habitat objectives, this would only be considered in the mid term and would be specified using local provenance stock which complies with all UK plant biosecurity guidance.					
Marginal Planting, *(reedfen habitat)*	*Alisma plantago-aquatica (Water plantain)*				Plug planted in dispersed groups of 5-7 plants
	Mentha aquatica (Water mint)				
	Myositis scorpioides (Water forget-me-not)				
	Ranunculus flammula (Lesser spearwort)				
	Sagittaria sagittifolia (Arrowhead)				
	Veronica anagallis-aquatica (Water speedwell)				
	Veronica beccabunga (Brooklime)				
TARGET HEATHLAND HABITAT SPECIES					
Acid heathland	*Calluna vulgaris (Common Heather / Ling)*	Approach to be defined further to the trials using differing materials and techniques throughout the early phased restoration of the Site to determine suitability for achieving establishment of acid grassland / heathland communities.			
	Erica cinerea (Bell Heather)				
	Erica tetralix (Cross-Leaved Heath)				
	Ulex europaeus (Common Gorse)				
	Ulex gallii (Dwarf Gorse)				

Table 1 - Habitat Planting Specification

Group	Species / Product Name	Origins	Root Stock	Mix	Specification
Acid Grassland	*Agrostis capillaris (Common bent grass)*	Approach to be defined further to the trials using differing materials and techniques throughout the early phased restoration of the Site to determine suitability for achieving establishment of acid grassland / lowland heathland communities.			
	Agrostis curtisii (Bristle bent grass)				
	Agrostis vinealis (Brown bent)				
	Anthoxanthum odoratum (Sweet Vernal-Grass)				
	Aphanes arvensis (Parsley Piert)				
	Carex arenaria (Sand Sedge)				
	Cerastium arvense (Field Mouse-Ear)				
	Chamaemlum nobile (Chamomile)				
	Cynosurus cristasus (Crested Dogstail)				
	Deschampsia flexuosa (Wavy Hair Grass)				
	Erodium cicutarium (Common Storksbill)				
	Festuca ovina (Sheep's Fescue)				
	Festuca rubra (Slender Creeping Red Fescue)				
	Filago minima (Small Cudweed)				
	Galium saxatile (Heath Bedstraw)				
	Galium verum (Lady's Bedstraw)				
	Hypochaeris glabra (Smooth Cat's Ear)				
	Hypochaeris radicata (Tomentil)				
	Koeleria macrantha (Crested Hair Grass)				
	Lotus corniculatus (Birds-foot Trefoil)				
	Moenchia erecta (Upright Chickweed)				
	Molinia caerulea (Purple Moor Grass)				
	Myosotis discolor (Changing Forget-me-not)				
	Ornithopus Perpusillus (Little White Birds-foot)				
	Phleum bertolonii (Smaller Cats Tail)				
	Pilosella officinarum (Mouse Ear Hawkweed)				
	Polygala serpyllifolia (Heath Milkwort)				
	Potentilla argentea (Hoary Cinquefoil)				
	Potentilla erecta (Tormentil)				
	Rumex acetosella (Sheep's Sorrel)				
	Silene vulgaris (Bladder Campion)				
	Stellaria pallida (Lesser Chickweed)				
	Teesdalia nudicaulis (Shepherd's Cress)				
	Trifolium ornithoiodes (Lesser Birds-foot Clover)				
	Trifolium scabrum (Rough Clover)				
	Trifolium striatum (Knotted Clover)				
	Trifolium subterraneum (Subterranean Clover)				
	Viola lactea (Pale Dog-Violet)				

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Landscape Vision:

To create an integrated ecological and amenity resource at the foot of the South Downs National Park escarpment, which integrates the Site into the surrounding landscape whilst enhancing sense of place.

MAP DATA ©2019 GOOGLE. IMAGE CAPTURE: JUNE 2018, LANDSAT / COPERNICUS.

N

0m 100m 200m 300m

Metres

LEGEND

Site Boundary

RESTORATION PROPOSALS

- Existing Broadleaved Woodland - To be retained and enhanced.
- Broadleaved Acid Woodland - To be planted out.
- Native scrub planting - Self seeded / managed.
- Lowland Heathland species to be targeted for establishment, further to trials early in phased restoration.
- Acid grassland establishment targeted with areas of bare ground left for natural succession to take place.
- Existing Standing water.
- Proposed Standing water.
- Marginal planting to areas of standing water.
- Gravel Islands created above standing water level to provide habitat for ground nesting birds.
- Sand/Gravel 'Beach' areas to allow interaction with the waterside by visitors.
- Shallow vertical faces to be created using gabions or similar filled with rock and reclaimed material to provide additional Sand Martin habitat.
- Soft Cliff faces to be retained as habitat to solitary bees. Any enhancement planting within the proximity should avoid these faces as well as sand Martin nesting sites found to the east.
- Footpaths for informal public access.
- Private use access for maintenance and habitat management.
- Retained hardstanding/site maintenance area.
- Viewpoints from high ground across the Site to surrounding chalk escarpment landform including the wooded Chanctonbury Ring.

PLANNING

Rev	Description	Date	Initials
04	Minor update to n. pond habitat.	11.02.22	JP
03	Minor update to pathways	22.12.20	JP
02	Planning Issue	11.12.20	KG
01	Planning Issue	18.11.20	KG
00	Draft Issue	16.10.20	KG

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Client
Dudman Rock Common Limited

Project Title
Rock Common Quarry
The Hollow, Washington

Drawing Title
Landscape Masterplan Strategy (Illustrative)

Scale	*Drawn*	*Approved*	*Date*
1:2000@A1	KG	JP	11.02.2022

Drawing No. **LLD1955-LAN-DWG-001** *Revision* 04

Landscape Masterplan Strategy (Illustrative)
Rock Common Quarry, The Hollow, Washington

LIZARD

Landscape Design and Ecology

DUDMAN ROCK COMMON LIMITED

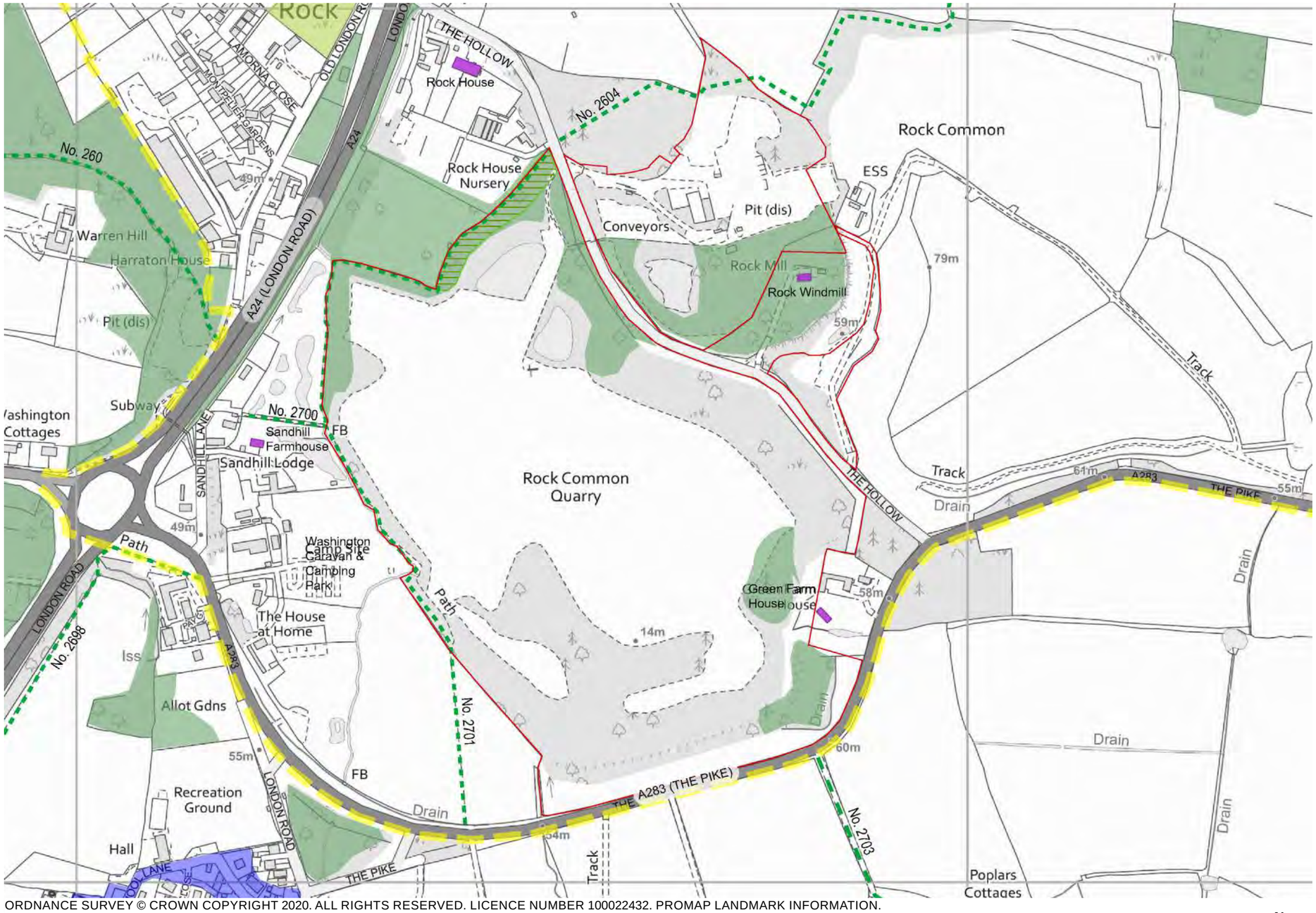
ROCK COMMON QUARRY, THE HOLLOW
WASHINGTON

Landscape and Woodland Long Term Management Plan

Project Reference	LLD1955-LAN-REP-001
Prepared by:	JP
Checked By:	GS
Revision	04
Date:	11.02.2022

Planning Issue

CONTENTS



ORDNANCE SURVEY © CROWN COPYRIGHT 2020. ALL RIGHTS RESERVED. LICENCE NUMBER 100022432. PROMAP LANDMARK INFORMATION.

NTS

0 100 200 500

Metres

N

Legend

- Site Boundary.
- South Downs National Park, (*south of the dashed yellow line*).
- Public Footpath.
- Public Bridleway.
- Listed Building *(Grade II).*
- Conservation Area.
- Deciduous Woodland UK Priority Habitat.
- Traditional Orchard UK Priority Habitat.
- Tree Preservation Order.

Figure 1.2. Site and Surrounds.

1.0 INTRODUCTION AND BACKGROUND

General

1.1 Lizard Landscape Design and Ecology (*LLD*) has been commissioned by Dudman Rock Common Limited to develop a Long Term Woodland and Landscape Management Plan, *(LMP).*

1.2 The LMP should be read alongside of the Landscape Design Strategy *(LDS)* and Illustrative Landscape Masterplan *(LM)* for the proposed restoration project at Rock Common Quarry, The Hollow, Washington *(Grid Reference: TQ 12507 13493).*

1.3 The approach has been informed by recommendations from both the Lizard produced Tree Survey and the involvement of the Ecology Co-op.

1.4 The LMP has been undertaken by Joshua Peacock, an Associate Landscape Planner at Lizard Landscape Design and Ecology and a Chartered Landscape Architect, supported by Kian Gharchedaghi, Landscape Architect.

The Scheme

1.5 A description of the proposed restoration scheme is provided within Section 3 of the Terrestria Application, which the reader is advised to read alongside of this report.

The Site and Surrounds

1.6 The Site is best described through reference to Section 3 of the Terrestria Application, which the reader is advised to read alongside of this report.

Soil and Topography

1.7 Through reference to the Soilscapes Map *(developed by Cranfield University and sponsored by the Department for Environment, Food and Rural Affairs)* soil type across the southern half of the main quarry to the south of The Hollow *(in keeping with that to east and west)* is shown to have comprised: *'slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils'*.

1.8 The soil type to the remainder of the unexcavated Site to the north is understood to comprise: *'Freely draining slightly acid loamy soils'*.

Association of habitat with the Folkestone Beds of the Lower Greensand

1.9 Through reference to an extract from: 'The Habitats and Vegetation in Sussex, *(Rose, 1995, published by The Booth Museum of Natural History), (see* ***Appendix E****)* the landscape of the Folkestone beds are identified as being likely historically wooded with an Oak-Lime-Hazel woodland, which would have been cleared throughout the Mesolithic and by the Bronze age. Associated species of dry heath and wet heath and short sandy turf are provided within the extract.

1.10 In aspect and geology, dependent upon appropriate substrate formation, the Site is considered to have potential for heathland habitat comparable to the lowland dwarf shrub heath of Sullington Warren Site of Special Scientific Interest, located some 2.5km to the west along the local outcrop of the Folkestone Formation, with a smaller area about Washington Common some 800m to the west.

1.11 Through reference to Sandgate Conservation Society webpage, *(visited at: https://www.sandgate-conservation.org.uk/work-sites/sullington-warren-flora/),* the following is identified:

'Much of the work done by the National Trust at Sullington Warren is focused on maintaining, improving and extending the areas of heathland. As well as clearing scrub, brambles, saplings and bracken this also involves the removal of some trees, mainly Scots pine. [...] As well as the heathers and trees here are a number of other plants in the area such as the Hare's Tail Cotton Grass which is found in the wet heath areas, numerous lichen in the dry heaths and the Field Mouse-ear, a plant of dry grassland and therefore relatively rare throughout Sussex. [...] The trees include Scots Pine, Silver Birch and Pedunculate Oak as well as Hazel with the occasional Ash, Mountain Ash (Rowan), Holly and Alder Buckthorn.'

2.0 EXISTING GUIDANCE

General

2.1 A review of relevant guidance has been undertaken including the following, and extracts from the:

- *Lowland Heathland Establishment on Mineral Sites - Nature After Minerals (RSBP / Natural England), (see* ***Appendix B****);*
- *DoE Reclamation of Damaged Land for Nature Conservation (LUC / Wardell Armstrong, 1996), (see* ***Appendix C****);*
- *Sussex Wildlife Trusts Pond Creation & Enhancement for Landowners Guidance Note (Mar 2014), (see* ***Appendix D****).*

Great Crested Newt Conservation Handbook (2001)

2.2 Regarding management of grassland surrounding ponds the Froglife produced Handbook advises that: *'..Where possible it is beneficial to leave a margin of uncut vegetation up to five metres or so in width around some of the pond margins and alongside hedges, streams or other boundaries to ensure the presence of some dense cover throughout the year.'*

Amphibian Habitat Management Handbook (ARC, 2011)

2.3 With regards to pond design, the handbook recommends that: *'Amphibian ponds should ideally contain a range of microhabitats. To create microhabitat diversity within a pond, the design should incorporate: Gently sloping sides; A range of pond depths; An irregular shape.'*

2.4 Regarding the Gently sloping sides the 2011 report recommends a: *'(gradient of 1 in 10 or if possible 1 in 20) to create a wide drawdown zone which encourages a diversity of plants and invertebrates. Shallow areas, less than 10 cm and certainly less than 30 cm deep, support the greatest range of pond plants which in turn create the habitat for most of the pond's invertebrates. Beds of submerged aquatic vegetation provide egg-laying substrates for newts, microhabitat for prey species and refuge from predators. For amphibian ponds it is not necessary for the greatest water depth to exceed 1.2 m.'*

2.5 Regarding management the 2011 report recommends that any pond maintenance works should take place in the winter *(November-February)* when Great Crested Newts will be absent from the pond.

2.6 The presence of any invasive plant species should be carefully controlled. Non-native, pest pond plants include*:*

- *New Zealand pygmyweed, (Crassula helmsii);*
- *Parrot's feather, (Myriophyllum aquaticum);*
- *Floating pennywort, (Hydrocotyle ranunculoides);*
- *Water fern, (Azolla filiculoides);*
- *Waterweeds, (Elodea species);*
- *Curly waterweed, (Lagarosiphon major).*

2.7 Regarding the surrounding terrestrial habitat for amphibians the handbook advises that: '*Juveniles will spend 2/3 years on land before reaching sexual maturity. A varied habitat of tussocky grassland, scrub and trees provide optimal habitat. Fallen deadwood, piles of rubble, tree stumps and mammal holes all provide hibernation sites. Ponds should be linked by strips of optimal habitat to allow migration between them. A belt of trees or scrub several metres to the north of a pond can act as a windbreak and create a warm microclimate around the pond.*'

2.8 Regarding long term management the handbook advises that: *'the pond site should incorporate measures to control scrub and trees to avoid excessive shading. No more than 60% of the pond shoreline, or 25% of the surface of smaller ponds, should be shaded and in most cases less shading is preferable. The southern shoreline is best unshaded.'*

Dormouse Conservation Handbook (2006)

2.9 The 2006 Handbook includes the following advice regarding hedgerows and woodland, paraphrased for clarity: *W*oodland:

- *'New woodland planting should include a dense understorey of hazel. Woodland should be maintained to create a high species diversity, mosaic of age classes and multi-storey canopy;*
- *Woodland should be managed through coppicing in an 8 years rotation, with young coppice next to old to ensure easy re-colonisation by dormice. Where a high population of deer are present hazel may be pollarded at 1.5m height;*
- *Standards should be thinned when necessary to prevent excessive shading which would reduce understorey density;*
- *Rides within woodland should have a narrow point at least every 70m where trees meet overhead to allow dormouse movement.*

MAP DATA ©2019 GOOGLE. IMAGE CAPTURE: JUNE 2018, LANDSAT / COPERNICUS.

1:8,000 at A3

0m 100m 200m 300m

Metres

N

Legend

- Development Site Location.
- **Existing Broadleaved Woodland - To be retained and enhanced.**
- **Broadleaved Acid Woodland - To be planted out.**
- **Native scrub planting - Self seeded / managed.**
- **Lowland Heathland species to be targeted for establishment, further to trials early in phased restoration.**
- **Acid grassland establishment targeted with areas of bare ground left for natural succession to take place.**
- **Existing Standing water.**
- **Proposed Standing water.**
- **Marginal planting to areas of standing water.**
- **Gravel Islands created above standing water level to provide habitat for ground nesting birds.**
- **Sand/Gravel 'Beach' areas to allow interaction with the waterside by visitors.**
- **Shallow vertical faces to be created using gabions or similar filled with rock and reclaimed material to provide additional sand Martin habitat.**
- **Soft Cliff faces to be retained as habitat to solitary bees. Any enhancement planting within the proximity should avoid these faces as well as sand Martin nesting sites found to the east.**
- **Footpaths for informal public access**
- **Private use access for maintenance and habitat management**
- **Retained hardstanding/site maintenance area**
- **Viewpoints from high ground across the Site to surrounding chalk escarpment landform including the wooded Chanctonbury Ring.**

Figure 3.1. Landscape Masterplan, (Illustrative).

3.0 LANDSCAPE AND WOODLAND MANAGEMENT LONG TERM PLAN

Landscape Vision

3.1 The Landscape Vision defined within the LDS is repeated below:

'To create an integrated ecological and amenity resource at the foot of the South Downs National Park escarpment, which integrates the Site into the surrounding landscape whilst enhancing sense of place.'

Landscape Objectives

3.2 To achieve this the following objectives would be pursued as presented within the LDS, *(and LMS incorporated as **Figure 3.1**)*:

- ***A high quality mosaic of habitats across a larger area of the Site** - Including a mosaic of lowland heath, acid grassland, scrub and woodland, marginal habitat and patches of open water, within which islands of shingle would protect nesting birds. Areas of sand cliffs along the south eastern and eastern section of the quarry would be retained, which support many thousands of solitary bees, whilst also retaining the upper levels of the Folkestone Formation for educational purposes, protected as a Regionally Important Geological and Geomorphological Site;*

- ***A strong sense of place, accessed through a network of footpaths with varied outlooks** - Including viewpoints which provide prospects over the mosaic of habitat within the Site towards the landmark of Chanctonbury Ring to the south east and Highden Hill to the south west. Footpaths within the Site would explore the mosaic of habitats, whilst leading towards sandy beach areas along the waters edge, otherwise fringed with reeds, from which paths would generally be offset to reduce disturbance.*

3.3 This would be in keeping with the heavily wooded ridges, interspersed with small patches of heathland, identified as characteristic for the West Sussex Storrington Woods and Heaths, *(LCA WG7, 2020)* which surrounds to the north, whilst extending a mosaic of habitat into the Central Scarp Footslopes, *(LCA WG8, 2020)* which surrounds to the south.

3.4 The setting and recreational access to the South Downs National Park, would be enhanced through establishing a multifunctional networks of spaces and features which connect with surrounding and existing biodiversity corridors.

Design Principles

3.5 Three Design Principles, *(DP)* are used within the LDS to structure the approach taken within the outline landscape framework, which includes ecological recommendations provided by The Ecology Co-op. The third principle is focused upon within this document:

- ***Design Principle 3** - Allow natural regeneration in the short term, followed by planting in the mid term where desired habitat types would benefit. Ensure habitat mix specification and method of establishment are suitable for the long term objectives of the Site, informed through consideration of short - mid - long term management actions presented within the Landscape and Woodland Implementation and Long-Term Management Plan, (LLD1955-LAN-REP-002-03).*

Woodland and Landscape Management Objectives

3.6 The long term objectives for the Habitat types identified within the Illustrative Landscape Masterplan, *(see **Figure 3.1**)* are defined as follows, incorporating the biodiversity targets which might be anticipated:

- Habitat Type 1 - Wetland: *Layered submerged and emergent pond habitat with open water and biodiverse marginal habitat to support bustling activity from darting dragonflies, birds and amphibians, with anticipated open water swimming, or perhaps kayaking limited to the northern pond;*

- Habitat Type 2: Heathland: *Biodiverse grasslands with areas of bare ground, heath, acid grassland, short turf, tussocky grasses and flowering plants, to sustain a food source and habitat for moths, bees, butterflies, birds and bats; Swathes of colour and subtle movement of insects moving over and within the diverse grassland mosaic and areas of open ground;*

- Habitat Type 3: Woodland: *Extended woodland edge with transitional vegetation and intervening glades for the use of mammals, birds, bats, reptiles, and amphibians; Butterflies and hedgehogs moving along the dappled light about transitional vegetation;*

- Habitat Type 3: Scrub: *Areas of self colonising scrub managed for the use of mammals, birds, bats, reptiles, and amphibians; Nesting birds feeding on brightly coloured berries, foraging newts and hedgehogs in the leaf litter; Diverse transitional edges supporting busy butterflies and moths;*

3.7 The achievement of the long term objectives for each broad habitat type is considered through recommended actions within The Woodland and Landscape Management Schedules, provided within **Appendix A**, supported by the planting lists within Table 1 of the Landscape Design Strategy, *(LLD1955-LAN-REP-001-03).*

3.8 The Phasing of the restoration of the Site, should enable the respective areas within the Illustrative Landscape Masterplan to be established as they come forward. It is assumed that upon phased restoration that the priority within the restored area would be for habitat creation, albeit with allowance for continued access routes. As such, the timeframe within the Schedules provided within **Appendix A**, would occur across a staggered timeframe.

3.9 Where planting of scrub and tree species is required to achieve the habitat objectives, this would only be considered in the mid term and would be specified using local provenance stock which complies with all UK plant biosecurity guidance.

APPENDIX A - WOODLAND AND LANDSCAPE MANAGEMENT SCHEDULES

AIM	SHORT TERM ACTION (0-5 Yrs)	MID TERM ACTION (5-15 Yrs)	LONG TERM ACTION (15 Yrs +)
Habitat Type 1 - Wetland:			
"Layered submerged and emergent pond habitat with open water and biodiverse marginal habitat to support bustling activity from darting dragonflies, birds and amphibians, with anticipated open water swimming, or perhaps kayaking limited to the northern pond;	**1.1** - Where ponds are to be planted ensure only native species are selected through reference to the Sussex Wildlife Trusts Pond Guidance Note, *(March 2014)* - See **Appendix D** for extract as developed within the outline planting list within the Landscape Design Strategy; Plug planted at 500mm centres.	**1.8** - Clear aquatic plants in Autumn / Winter if necessary to ensure no more than 80% coverage to allow clear water for Great Crested Newt displaying;	
	1.2 - Establish reeds through natural expansion,using reeds pulled from the existing pond to the north to establish small patches where required in late winter/early spring before shoots emerge. Optimal planting time is May/ June, when shoots are green with 2-4 leaves or immediately after harvesting; Consider active deterrence of problem birds *(i.e. geese)* during the vital first year of vegetation establishment. i.e. by covering reed with blackthorn cuttings for example;	**1.9 -** Cut and remove different areas of reeds on a 4–7 year rotation to prevent the build-up of nutrients and dead plant material, which dries out the habitat and causes nutrient enrichment, whilst keeping some reed young and healthy. Use arisings to create debris piles within adjacent areas of scrub.	
	1.3 - Monitor the pond for any Schedule 9 aquatic plants such as waterweed and pigmyweed to ensure that the spread of these plants is prevented; Remove if identified;		
	1.4 - Clear accumulated leaves from the pond surface in autumn; build up of rotting vegetation may lead to algal blooms;		
	1.5 - Utilise a cutting regime to prevent scrub encroachment and any self colonising trees from pond margins, including upon the islands;		
	1.6 - Water levels within the pond to be sustained where required, *(with some seasonal fluctuation anticipated to be beneficial to habitat from opening up of muddy banks)* using pumped water from a proposed well south west of the lower pond, under an existing agreement to maintain water levels within the Honeywell Stream. This might be pumped to the northern pond where required from which it could then trickle feed to the middle and southern ponds through sunken pipes.		
	1.7 - Monitor ponds for signs of fish colonisation; presence of fish are majorly detrimental to GCN breeding success. Remove fish if moderate/large numbers are present.		

AIM	SHORT TERM ACTION (0-5 Yrs)	MID TERM ACTION (5-15 Yrs)	LONG TERM ACTION (15 Yrs +)
Habitat Type 2: Heathland:			
"Biodiverse grasslands with areas of bare ground, heath, acid grassland, short turf, tussocky grasses and flowering plants, to sustain a food source and habitat for moths, bees, butterflies, birds and bats; [...]."	**2.1** - Trial using differing materials and techniques throughout the early phased restoration of the Site on an annual basis to determine suitability for achieving establishment of acid grassland / lowland heathland communities; Such as using seed-rich litter and green hay.	**2.5** - Manage staged disturbance of the substrate to support the ecological value and visual interest of the supported invertebrate populations; For example carry out a mowing / strimming maintenance regime of some 20% of the area per year in March, whilst allowing patches of scrub and tree groups to establish; The network of paths would additionally benefit the recommended approach to maintaining an open mosaic type habitat in places across the quarry site, through the informal disturbance of the substrate which would result about the acid grassland and heathland areas; Leave some areas as bare ground to allow a process of natural colonisation and successional growth;	
	2.2 - Maintain areas of bare sandy ground, of varied topography and vegetation cover through the 8 year transitional phases, and throughout the final restoration to support invertebrate diversity. Retain undisturbed 'refuge' areas throughout the restoration to allow insects to complete their life cycle;		
	2.3 - Across the acid grassland area introduce informally dispersed swathes sown with a tussocky grass mix with a high percentage of forbs to incorporate a mosaic of vegetation overlying the Site, whilst encouraging exploration along the resulting edge of grassed and bare ground habitats resulting; This may well maintain areas of bare ground, from resulting recreational disturbance;		
	2.4 - Heathland habitat to be established on south facing profiles, with slopes managed to promote a low fertility open sward suitable for allowing the natural regeneration of acid grassland and heathland species through a management plan, with resulting advantageous species to aid pollination and reduce pest species for the agricultural land within the surrounding area;	**2.6** - Continuous or periodic disturbance of heathland is needed even within the initial 5-year after-care period. Sussex Wildlife Trust or the National Trust should advise and perhaps extend existing management to that within the Site further to their experience at Sullington Warren and Warren Hill.	

<table>
<tr><th>AIM</th><th>SHORT TERM ACTION (0-5 Yrs)</th><th>MID TERM ACTION (5-15 Yrs)</th><th>LONG TERM ACTION (15 Yrs +)</th></tr>
<tr><td>Habitat Type 3: Woodland:</td><td></td><td></td><td></td></tr>
<tr><td rowspan="4">“Extended woodland edge with an acid woodland mix for the use of mammals, birds, bats, reptiles, and amphibians; [...]"</td><td rowspan="3">3.1 - Allow natural regeneration in the short term in line with succession towards woodland. Birch and willow will naturally regenerate rapidly and should be retained as nurse species through succession of scrub towards woodland.</td><td>3.3 - Consider planting in the mid term where desired habitat types would benefit, through reference to the habitat mix specification, (see Table 1 within the Landscape Strategy). Extend woodland edge with woodland mix and species in keeping with that existing to the northern and southern areas of the Site boundaries respectively, including understorey planting of hazel, to provide dormouse habitat. It is understood that rabbits occur to the east of the Site and deer are frequent visitors within the area. Recommended approach as follows, with additional guidance on making space for hazel coppice. Planting of woodland areas to be guided by the Woodland Trust with potential for woodland grant to part fund tree supply:
• Trees should also be planted within 7 days of delivery to ensure the best success rate;
• Bare root saplings (between 40 – 60cm) are to be planted with 1.2m tubes and stakes with the shrubs species planted with 75cm spirals and canes, to protect against mammal damage;
• Tree species planted in groups of 5-10 at an average 2.5m spacing, within staggered wavy lines. Some can be closer together and some further apart;
• Plant trees at a wide enough spacing to allow the establishment of hazel understorey. Protect young hazel with deer proof fence.</td><td>3.5 - Once woodland has established, tree density can be reduced by actively removing certain trees, (thinning). Some species benefit from a closed canopy providing high levels of shade and humidity whilst others benefit from a more open canopy. Creating some central areas of closed canopy and a more open-structured perimeter can maximize woodland habitat diversity. The latter can be managed by thinning some trees, regular coppicing, (cutting stems near ground level) or pollarding, (cutting stems at ca. 2 m height). Thin trees to ensure adequate light for understorey of hazel to be sustained.</td></tr>
<tr><td>3.4 - Remove rabbit and deer-proof fencing once the trees have become established;</td><td>3.6 - Coppice or pollard hazel on an 8 year rotation.

3.7 - Remove poorer specimen large trees without obvious ecological features e.g. bat cavities which are casting excessive shade and reducing understorey density.</td></tr>
<tr><td colspan="3">3.2 - Leave fallen tree trunks or branches, especially large ones, where they are whenever possible, preferably on the edge of shade or in dappled sunlight, which can help to create habitat for a range of species including woodpeckers, bats, insects, amphibians, (frogs/toads/newts) and reptiles, (snakes, slow worms and lizards)</td></tr>
</table>

AIM	SHORT TERM ACTION (0-5 Yrs)	MID TERM ACTION (5-15 Yrs)	LONG TERM ACTION (15 Yrs +)
Habitat Type 4: Scrub:			
'Areas of self colonising scrub managed for the use of mammals, birds, bats, reptiles, and amphibians; [...]"	**4.1** - Enable scrub to establish naturally within areas to improve structural heterogeneity and edge across the habitat mosaic to provide foraging and refuge opportunities for birds, small mammals and other wildlife.	**4.2** - Potentially introduce a small amount of Ulex minor, (Dwarf furze), Bilberry, (Vaccinium myrtillus) Calluna vulgaris (Ling) in same species clumps as a component of the scrub habitat about the woodland edges;	
		4.3 - Cut back any vegetation from overhanging the pathway or preventing access to some 2m from the path-side;	
		4.4 - Woody vegetation managed as clumps to prevent broader encroachment;	
		4.5 - Dead wood is valuable to a large number of invertebrates. Leave or create scrub piles on the ground.	

APPENDIX B - LOWLAND HEATHLAND ESTABLISHMENT ON MINERAL SITES (RSBP / NE)

APPENDIX C - DOE RECLAMATION OF DAMAGED LAND FOR NATURE CONSERVATION - EXTRACTS

APPENDIX D - WETLAND SPECIES LIST (SUSSEX WILDLIFE TRUST)

APPENDIX E - THE HABITATS AND VEGETATION IN SUSSEX, (ROSE, 1995) - EXTRACT

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APPENDIX 4
Flood Risk Assessment (v1.5)

Rock Common
Flood Risk Assessment
ISSUED Version 1.5

For: Dudman Rock Common Ltd
Date: 27 September 2022

Issued v1.4: 27/09/2022

H2Ogeo
Hydrogeology & Environmental Consultancy

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Version Control & Issue Register

Report	***Version***	***Issued***
Draft	0.1	3 December 2020
Final	1.3	22 December 2020
Final	1.4	7 April 2022
Final	1.5	27 September 2022

Statement of Limitations

This report was prepared in accordance with the scope of work outlined within this report and is subject to the applicable cost, time and other constraints.

H2Ogeo performed the services on behalf of the Client in a manner consistent with the normal level of care and expertise exercised by members of the environmental profession. No warranties, expressed or implied, are made.

Except as otherwise stated, H2Ogeo's assessment is limited strictly to the scope of work outlined in the Scope of Work section and does not evaluate structural or geotechnical conditions of any part of the Site (including any buildings, equipment or infrastructure) or outside the Site boundary.

All conclusions and recommendations made in the report are the professional opinions of H2Ogeo personnel involved with the project and, while normal checking of the accuracy of data has been conducted, H2Ogeo assumes no responsibility or liability for errors in data obtained from external sources, regulatory agencies or any other external sources, nor from occurrences outside the scope of this project.

H2Ogeo is not engaged in environmental consulting and reporting for the purpose of advertising, sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity or investment purposes.

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Executive Summary

This Flood Risk Assessment has been prepared to accompany a planning application for an alternative restoration scheme at Rock Common Quarry in West Sussex. As the proposed *development* is greater than 1 Hectare a Flood Risk Assessment is required in accordance with the National Planning Policy Framework and Planning Policy Guidance to support the application.

The proposal is to permit the importation of suitable, inert classified engineering and restoration materials which will be used to restore the quarry void to a level which would be above the recovery level of the natural ground water and so provide a "dry" restoration landform.

The National Planning Policy Framework states that the flood risk assessment should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

The types of flood risk that have been considered in this report are:

- Risk of flooding from Rivers and the Sea (RoFRaS);
- Surface Water Flooding; and
- Groundwater Flooding.

Parts of the site are in a designated Flood Zone 3 with a summary of the estimated percentage % area of site impacted by the theoretically worst-case scenarios:

Flood Risk Summary

Type of Flood Risk	***Highest/Most Significant Potential Risk***	***Probability of Occurrence (%)/Impact***	***Modelled Area of Site Impacted (%)[1]***
RoFRaS	Medium	<3.3% and	2.15%
Surface Water Flooding	Significant	>3.3%	9.41%
Groundwater Flooding	High	In the event of a 1 in 100 year groundwater flood event levels could rise up to 25cm above ground level with basements becoming inundated	9.35%

In conclusion, due to the proposed restoration and increase in land form elevation, the most likely potential risk of flooding from Groundwater is not considered significant as the finished restoration is not considered Vulnerable with parts of it, lakes, considered Water Compatible.

In line with Horsham District Council's Strategic Flood Risk Assessment, AECOM, April 2020, the proposed development will result in either Water Compatible land use or informal open space within the currently designated Flood Zone 3. As a result the risk posed by flooding from the Rivers and Surface Water are not considered significant.

Allowances for Climate Change have been made and the proposed development does not increase flood risk. The proposed restoration is not considered to exacerbate the potential for flooding down-stream as perimeter elevations are not changing therefore potential storage capacity is not being used up by the development and will remain on site for flood waters. Attenuation will be provided by the proposed lakes and low points on site.

Additional flows from the Rock Common Site are not anticipated as a result of the proposed restoration therefore no catchment-wide flood implications are foreseen.

[1] Based on area (Ha) of most significant potential risk

Based on the information presented in this report the estimated Flood Risk posed to and by this development and restoration project is deemed acceptable.

1 Introduction

1.1 Background

The currently approved restoration scheme (WS/15/97) for Rock Common Quarry is no longer considered appropriate in terms of the final, very deep body of water and the potential for leachate pollution to pass into the lake from the now closed Windmill, Rough and The Rock Landfill sites.

An alternative restoration scheme is being considered whereby clean material would be imported to infill the void, to agreed levels, thereby cutting off the potential pollution linkage. As the proposed *development* is greater than 1 Hectare a Flood Risk Assessment (FRA) is required in accordance with the National Planning Policy Framework (NPPF) and Planning Policy Guidance (PPG) to support the application.

Terrestria Ltd contacted H2Ogeo and requested a FRA be prepared to accompany the application, the following report presents the findings of this FRA.

1.2 Scope of Work

The following scope of work has been undertaken:

- Obtain public and commercially available data sets on historic flooding (if any), flood risk considering surface, river and groundwater;
- Carry out a site visit and walkover;
- Review of the LLFA Strategic Flood Risk Assessment (SFRA), Policies and mitigation measures;
- If necessary, liaise with LLFA and Environment Agency (EA); and
- Prepare and issue a Flood Risk Assessment report for submission.

A Statement of Limitations is presented at the start of this report.

To prepare this report consideration has been given to the following legislation and documents:

1.3 Policy and Legislation

1.3.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG)

The FRA has been undertaken in accordance with the statutory requirements of the NPPF and PPG with regard to development and flood risk, to ensure that flood risk is taken into account at all stages of the planning process and to avoid inappropriate development in areas potentially at risk of flooding.

The PPG classifies the flood risk vulnerability of sites used for minerals working and processing as ‘less vulnerable’ development.

1.3.2 Local Policy

West Sussex County Council (WSCC), is the Lead Local Flood Authority (LLFA) responsible for local flood risk defined as flooding from surface water, groundwater and ordinary watercourses.

The LLFA is required to provide consultation responses on the surface water drainage provisions associated with major development. The principles of West Sussex’s policy & drainage strategy have been considered in the preparation of this FRA along with Horsham District Council’s Strategic Flood Risk Assessment, 2020.

2 The Site

2.1 Location

The Site is situated within the District of Horsham, West Sussex (NGR TQ12460 13520) approximately 350 metres to the north-east of the village of Washington. At its nearest point the boundary of the South Downs National Park lies approximately 50 metres to the south of the Site following the line of the A283 road.

The Site location is shown in Figure 1.

The A24 (Worthing to Dorking Road) runs within 100 metres of the western boundary. A narrow, unclassified road (which connects the A283 and A24 and known as "The Hollow") runs along the north-east boundary of the Quarry. Access to the site is via the Hollow road off the A24/A283.

The application site has a total area of 33.64Ha consisting of:

- The Quarry = 27.19Ha;
- The Processing Area = 5.52Ha; and
- The Reception Area = 0.93Ha.

2.2 Land Use

The site, west of the Hollow, is currently used for the extraction of sand.

The area east of the Hollow is known as the Processing Area and consists of a weighbridge, offices, stocking areas, mobile plant, garages a processing plant and car parking.

Figure 1 shows the red line boundary and layout of the Site, the surrounding land uses are summarised in Table 1 below:

Table 1 Surrounding Land Use

Direction	***Land Use Description***
North	The Hollow Road, former landfill sites – The Rough, The Rock and the Windmill, Rock Farm and the Rock Business Park.
East	Butchers and residential premises, The Pyke (A283), woodlands and agricultural land.
South	Woodland, A283, agricultural land and the South Downs National Park.
West	The Honeybridge Stream, Woodlands, fields, the Washington Caravan and Camping Park, the A283 and A24.

2.3 Proposed Development

The proposal is to permit the importation of suitable, inert classified engineering and restoration materials which will be used to restore the quarry void to a level which would be above the recovery level of the natural ground water (Approximately 40mAOD[2]) and so provide a "dry" restoration landform.

The finished landform will consist of water compatible land use and informal open space ranging from 43m Above Ordnance Datum (mAOD) to existing ground levels around the extremities of the site.

[2] Rock Common Hydrogeological Assessment, H2Ogeo, 2020

This proposal equates to approximately 2.7 Million cubic metres of material imported over 8 years[3]. The imported material, once processed, will be placed in 5 metre thick, engineered layers. Material will be placed in the lowest part of the void first, at the southern end of the Quarry.

As levels are raised and as they begin to merge with adjoining, existing quarry floor levels then the "footprint" of the area of fill will increase (spread out). In this way, infilling will generally proceed south to north across the site. The void will be progressively restored similarly in a south to north direction.

Drawings showing the phasing of the proposed restoration are presented in Appendix 4 of Volume 1 in the Environmental Statement and the proposed final restoration is shown in Annex A.

2.4 Topography

2.4.1 Existing

Regional topography is dominated by the Chalk escarpment of the South Downs that runs east west at over 200mAOD (Chanctonbury Hill c240mAOD) 1km south of the Site.

The regional topography presented in Figure 2 is based on the Ordnance Survey OS Terrain 50 data set.

The existing topography on Site is presented in Figure 2. Ground levels surrounding the Site range from 72mAOD on the Hollow Road in the north east of the Site to 52mAOD south of the Site.

There are steep, near vertical sides, on the southern and western boundary with falls of 20m+ over less than 50m.

The north and north eastern boundaries have gentler slopes into the Quarry and the maximum base level is approximately 12mAOD in the central southern portion of the pit.

2.4.2 Proposed

The proposed topography is presented in Annex A showing the Final Restoration Drawing and Cross Sections through the proposed restored site.

Surface elevations fall east of the Hollow in the processing area from around 60mAOD to 56mAOD in the very north of the site.

Elevations in the former quarry range from 60mAOD in the north to a low of 43mAOD in the south.

The three main lakes proposed as part of the development show water levels at 51, 47 and 45mAOD with lake beds at 49, 45 and 43mAOD respectively.

The proposed western boundary is at an elevation between 47.96 and 49.26mAOD, there are no elevation changes along this boundary. The proposed landform climbs c3.0m up to the bank of the most westerly lake at an elevation of 52mAOD.

[3] Section 3 - Terrestria Limited Application Document

3 Environmental Setting

3.1 Geology and Hydrogeology

The Site is located within the Lower Greensand Bedrock positioned on the southern limb of the Pyecombe Anticline.

To the south the Chalk forms the South Downs that overlie the Upper Greensand and Gault Clay. The Gault Clay confines the top section of the Lower Greensand in the south leaving only around 1km to the north unconfined. Further north, approximately 1km the Weald Clay Outcrops.

Structurally the beds dip between 5° and 10° to the south.

The Lower Greensand can be subdivided into Folkestone Formation in the south and the Sandgate and Hythe Beds in the north of the Site. These sediments are interpreted as having been deposited in shallow marine environments with strong tidal currents.

The Folkestone Formation is present on Site with faces up to 30m high overlain by Gault Clay. The Folkestone Formation is a yellow and red fine to medium grained cross-bedded sand with sets ranging from 1 to 3m. The Sandgate and Hythe Beds are grey green, fine grained sandstones and siltstones. The Folkestone Formation and Sandgate Beds are divided in this region by the Marehill Clay.

The geology is presented in Figure 3 and consists of the following sequence:

- Gault Clay;
- Folkestone Formation;
- Marehill Clay;
- Hythe Beds; and
- Weald Clay.

There are Superficial Deposits to the west of the Site that run north along a valley feature, which have been classified as Head Deposits. Head Deposits consist of poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes[4].

The table below indicates the aquifer designation for each of the geological sequences in the vicinity:

Table 2 Aquifer Designations

Group	***Geology***	***Aquifer Designation***	***Definition***
Superficial	Head Deposits	Secondary Undifferentiated	Assigned in cases where it has not been possible to attribute either category Secondary A or B to a rock type
NA	Gault Clay	Unproductive Strata	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.
Lower Greensand Group	Folkestone Formation	Principal	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
	Marehill Clay	Unproductive Strata	When in situ these deposits have low permeability that have negligible significance for water supply or river base flow.
	Hythe Beds	Principal	Consisting of permeable layers capable of supporting

[4] https://www.bgs.ac.uk/lexicon/lexicon.cfm?pub=HEAD

Group	Geology	Aquifer Designation	Definition
			water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
	Weald Clay	Unproductive Strata	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

There are no Source Protection Zones within 1000 metres of the site with the closest being 1.5km south of the Site.

3.2 Hydrology

The site lies in the River Adur and Ouse Management Catchment, presented in Figure 4, it covers an area of 600 square kilometres and is home to around 550,000 people. The main urban centres are located along the coast, including Worthing, Shoreham, Brighton and Hove. Inland towns include Burgess Hill, Steyning and Upper Beeding, as well as smaller settlements such as Hassocks, Henfield, and Partridge Green.

The watercourses within the catchment include the main River Adur and its tributaries that drain the Low Weald area through the South Downs, flowing out to sea at Shoreham[5]. The Site lies in the sub-catchment of the Honeybridge Stream, a tributary to the River Adur. The Honeybridge Stream flows from the south and passes the western boundary of the site before joining the Buncton Stream approximately 3km north east of the Site.

Limited flow data for the Honeybridge Stream has been obtained from the Environment Agency for the period between 1963 and 1991 (Annex B). It shows a peak flow of 0.329m^3/second in January 1965 and a mean average flow rate of approximately 0.09m^3/second during this incomplete 28-year period.

[5] River Adur Catchment Flood Management Plan Summary Report, Environment Agency, December 2009

4 Flood Risk

4.1 Flood Zones

The western boundary and base of Rock Common Quarry is located in a Flood Zone 2 and 3, the processing area and proposed reception area are not in Flood Zones.

Flood Zones are presented in Figure 5 and defined in Table 3.

Table 3 Flood Zone Definitions[6]

Flood Zone	***Definition***
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

The National Planning Policy Framework (NPPF) states that the flood risk assessment should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed so that the development remains safe throughout its lifetime, taking climate change into account.

The types of flood risk that have been considered in this report are:

- Risk of flooding from Rivers and the Sea (RoFRaS);
- Surface Water Flooding; and
- Groundwater Flooding.

4.2 Risk of Flooding from Rivers and the Sea

Figure 6 presents the Risk of Flooding from Rivers and the Sea (RoFRaS), the majority of the site does not fall into any flood risk classification.

The modelled data indicates that there is a Medium Risk of flooding occurring from rivers along the western boundary of the Quarry and into its base, i.e. The chance of flooding from rivers is considered to be less than 1 in 30 (3.3%) but greater than 1 in 100 (1%) in any given year.

The flood risk is assessed using local data and expertise and shows the chance of flooding from rivers or the sea, taking account of flood defences and the condition those defences are in.

The RoFRaS model uses local water levels and flood defence data to model flood risk.

[6] Flood risk and coastal change - GOV.UK (www.gov.uk)

4.3 Surface Water Flooding

Surface water flooding considers precipitation and runoff from the site.

A small area in the Processing Area is considered to have a Significant Risk of surface water flooding, Figure 7. This area is considered to have a 1 in 30 probability of surface water flooding due to rainfall in a given year to a depth of between 0.3m and 1.0m.

Within the Quarry the risk of surface water flooding ranges from Low to Highly Significant at the low points within the excavation.

Anecdotal evidence, based on the Client's recollection, suggests the site has not flooded from water derived from the Honeybridge Stream.

4.4 Groundwater Flooding

Groundwater flooding is flooding caused by unusually high groundwater levels. It occurs as excess water emerging at the ground surface or within underground structures such as basements.

The flood risk posed by groundwater is presented in Figure 8 and indicates a Negligible Risk in the Processing Area and Moderate-High to High Risk in the low points of Rock Common Quarry.

A High classification means that should a 1 in 100-year groundwater flood event occur, groundwater levels could rise above ground level to depth of up to 25cm with basement areas becoming inundated.

There are no basements on site or below ground structures vulnerable to flooding.

4.5 Historic Flooding

The Environment Agency's Historic Flood Map GIS Layer has been assessed to understand the presence of any historic flooding in the area. Figure 9 presents the data and indicates that no historic flooding has been recorded on site.

The closest historic flooding record is over 1700m north of the site close to Hole Street and the A24.

The only flooding on site has been due to groundwater rebound during outages of the active dewatering system.

5 Climate Change

5.1 Peak River Flows

To assess the site's resilience to flooding, allowances for climate change should be made in the Flood Risk Assessment. Planning Policy Statement 25 (PPS25) requires that the effects of climate change are taken into account in the Strategic Flood Risk Assessment (SFRA) and that flood outlines delineating climate change should be presented.

The 2020 SFRA for Horsham District[7] presents allowances for climate change in Peak River Flows and the map is presented in Annex C.

As the site is located at the headwaters of the Honeybridge Stream catchment there are no anticipated increases in Peak River Flows due to modelled climate change in the area, therefore no additional flood risk assumed on site.

5.2 Risk of Flooding from Surface Water (RoSWF) & Climate Change

The RoFSW mapping in the SFRA does not include a specific scenario to determine the impact of climate change on the risk of surface water flooding. The Environment Agency has undertaken modelling of surface water flood risk at a national scale and produced mapping identifying and classifying those areas at risk of surface water flooding:

- 3.33% annual probability (1 in 30 year), 'high'
- 1% annual probability (1 in 100 year), 'medium'
- 0.1% annual probability (1 in 1,000 year) 'low'

It is recommended in the SFRA that, when used with caution, the 0.1% outline (Low) can be used as a substitute dataset to provide an indication of how the risk of surface water flooding may increase in the future as a result of climate change.

The map presented in Figure 7 indicates the potential impacts of Climate Change on the extent of Flood Risk from Surface Water (0.1% annual probability). The area covers the extent of the existing open water in the base of the pit and enters the site from the western boundary. Surface water is also modelled entering the reception area north of the Hollow and passing through the site to the north east.

The modelling indicates one building in the reception area being impacted and surface flood waters contacting the northern boundary wall of the main building. Where present, the depths of surface flood waters based on the Low probability scenario range from 0.15 to 1.2m deep in the reception area and <0.15m and >1.2m in the main excavation.

[7] https://www.horsham.gov.uk/__data/assets/pdf_file/0018/80127/Strategic-Flood-Risk-Assessment-main-report.pdf

6 Flood Zones and Operations

In the south of the site the surface water flood zones identified in Section 4.3 are predominantly in the same locations as the proposed lakes and the lakes from west to east are 51, 47 and 45mAOD respectively.

In the body of the former sand pit there are no operations proposed. North of the Hollow is the site entrance to the sand processing area and proposed reception area.

The existing Office and Mobile Bagging Plant are present in the Risk of Flooding from Surface Water 1 in 30 zone as presented in Figure 7. There are no proposed operations in this section of the site in the future. Any new site buildings, reception cabins and/or facilities will be placed outside the boundary of the 1 in 30 extent of risk of flooding from surface water.

6.1 Compensatory Flood Storage

Compensatory flood storage will be provided by the proposed lakes and low lying areas on site within the former pit.

Surface water flooding from overland runoff or the Honeybridge Stream is not anticipated and has never been reported however, the new proposed lakes, will have adequate storage on site to attenuate any flood waters that may occur.

7 Catchment-Wide Implications

This section addresses the potential catchment-wide implications of the proposed restoration scheme.

As stated in Section 3.2 the Site lies in the Adur Upper Operational Catchment made up of several rivers and streams including the Honeybridge Stream Water Body. Figure 4 presents the catchment boundary of the Honeybridge Stream.

The Honeybridge Stream Catchment is 2,284ha, with the Rock Common site representing 1.5% of the total catchment (33.64ha).

To understand the potential catchment-wide implications it is important to understand the existing Hydrological Conceptual Site Model for the catchment.

7.1 Catchment Recharge

The hydrological system in the catchment is made up from sources of Recharge, Storage and Discharge. The catchment receives recharge from three main sources:

- Precipitation;
- Groundwater Recharge; and
- Spring Flows.

7.1.1 Precipitation

The Standard Average Annual Rainfall for the region is 899mm/year derived from data in the 1970 Flood Studies Report (NERC 1975). This value equates to 20,533,160m^3/rainfall per year over the whole Honeybridge Stream Catchment.

7.1.2 Groundwater Recharge

Groundwater recharge occurs into the catchment via the north facing scarp of the Chalk South Downs. There is the potential for lateral migration of groundwater into the catchment from the Upper and Lower Greensand aquifers as well as some contribution from sandstones within the Weald Clay Formation.

Additional groundwater contributions made to the Honeybridge Stream come from the existing discharge of dewatering groundwater at Rock Common.

7.1.3 Spring Flows

There are six spring locations shown on historic 1875 mapping in proximity to the site, these also appear on more recent 2020 Ordnance Survey maps[8] and are presented in Figure 10.

7.2 Catchment Discharge

The hydrological catchment discharges approximately 6.5km north east of the site at the confluence of the Buncton Stream and River Adur, south west of Partridge Green.

There is also the potential for groundwater to discharge from the hydrological catchment laterally within the Greensand aquifer units.

Evaporation and Transpiration are key mechanisms of discharge from the hydrological catchment.

[8] Rock Common, Hydrogeological Assessment, Issued v1.4, H2Ogeo, 22/12/2020

7.3 Catchment-Wide Discussion

The existing on-site hydrological regime consists of precipitation and groundwater entering the Rock Common site.

The current dewatering operations abstract groundwater, suppressing the water table and discharge it to the Honeybridge Stream. The Honeybridge Stream discharges into the Buncton Stream and then the River Adur, approximately 6.5km north east of the site.

The proposed development will not change the hydrological regime on site as precipitation falling on site will continue to recharge groundwater that is abstracted and discharged to the Honeybridge Stream.

Over time there will be planned reduction in dewatering allowing groundwater levels to recover (In line with the nearby Waste Licence requirements). This rise in groundwater will occur over a phased period and in a controlled fashion. The anticipated final groundwater elevation is around 40mAOD, precipitation in the proposed restoration site will continue to recharge groundwater, that will move off site laterally in the aquifer units with some additional contribution to existing springs.

The reactivation of historic/former springs is unlikely as springs identified on the 1875 mapping have remained in situ and active throughout the dewatering process at Rock Common. In the event that new springs are formed, they are most likely to appear in areas that already have functioning local discharges into the environment.

Additional flows from the Rock Common Site are not anticipated therefore no catchment-wide flood implications are foreseen.

8 Summary

A summary of the current flood risks identified have been presented in Table 4 along with the estimated percentage % area of site impacted by the theoretically worst-case scenarios:

Table 4 Flood Risk Summary

Type of Flood Risk	***Highest/Most Significant Potential Risk***	***Probability of Occurrence (%)/Impact***	***Modelled Area of Site Impacted (%)[9]***
RoFRaS	Medium	<3.3% and	2.15%
Surface Water Flooding	Significant	>3.3%	9.41%
Groundwater Flooding	High	In the event of a 1 in 100 year groundwater flood event levels could rise up to 25cm above ground level with basements becoming inundated	9.35%

The hierarchy of Flood Risk is used to assess the vulnerability of development types within different Flood Risk Zones and is shown in Table 5:

Table 5 Flood Risk Vulnerability Classification

Flood Risk Vulnerability Classification	***Essential Infrastructure***	***Water Compatible***	***Highly Vulnerable***	***More Vulnerable***	***Less Vulnerable***
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	×	Exception Test Required	✓
Zone 3b	Exception Test Required	✓	×	×	×

✓ Acceptable, × Unacceptable

The proposal is to restore the Quarry floor to a low level of 43mAOD and a high of 60mAOD therefore the most likely potential risk of flooding from Groundwater is not considered significant.

The finished restoration is not considered Vulnerable and is considered Water Compatible. In line with Horsham District Council's Strategic Flood Risk Assessment, AECOM, January 2020, the proposed development will result in either Water Compatible land use or informal open space within the currently designated Flood Zone 3.

Current buildings in the reception area are impacted by surface water flooding when the effect of Climate Change is incorporated (1 in 1000 probability). It is recommended that new buildings proposed in the reception area are designed with flood levels in mind and floors exceed the Low Probability design criteria.

In line with the National Planning Policy Framework the proposed restoration is not considered to exacerbate the potential for flooding down-stream. This is because the western boundary will remain in Flood Zone 2 and Flood Zone 3 as perimeter elevations are not changing. This means potential storage capacity is not being used up by the development and will remain on site for flood waters.

Additional flows from the Rock Common Site are not anticipated as a result of the proposed restoration therefore no catchment-wide flood implications are foreseen.
Based on the information presented in this report the estimated Flood Risk posed to and by this development and restoration project is deemed acceptable.

[9] Based on area (Ha) of most significant potential risk

8.1 Recommendations

Emergency access and egress zones are not within the Flood Zones identified and must be kept well maintained during the course of the proposed development.

9 References

- National Planning Policy Framework – Flood Risk and Coastal Change Guidance, March 2014;
- Planning Policy Statement 25: Development and Flood Risk Practice Guide; DCLG, December 2009, updated 2022;
- Flood and Water Management Act 2010;
- River Adur Catchment Flood Management Plan, Summary Report, Environment Agency, December 2009;
- Horsham District Council's Strategic Flood Risk Assessment, Scott Wilson, April 2010;
- Horsham District Council's Strategic Flood Risk Assessment, AECOM, 2020;
- Local Flood Risk Management Strategy, West Sussex County Council, 2013.

10 Figures

Figure 1 Site Location

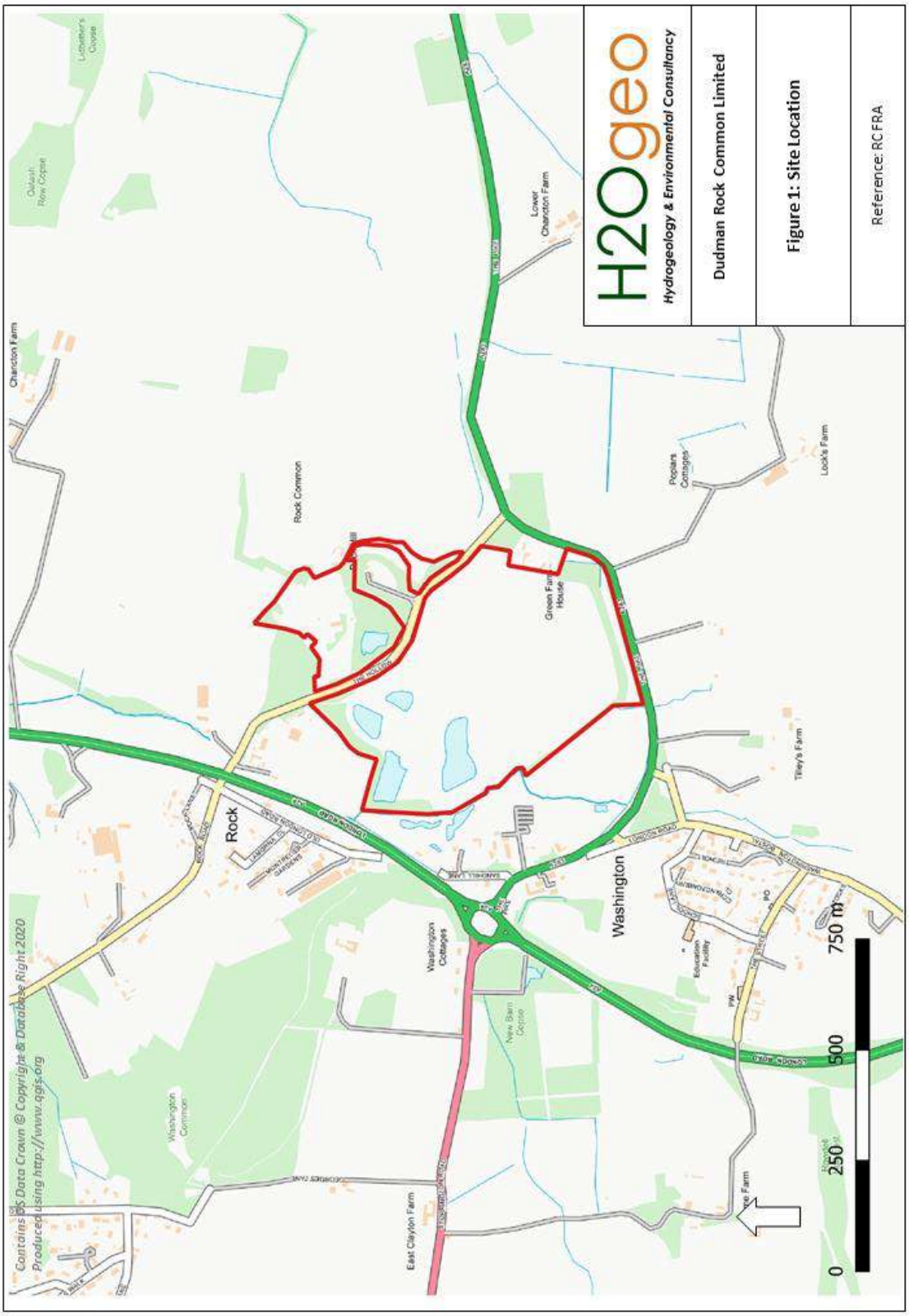


Figure 2 Topography

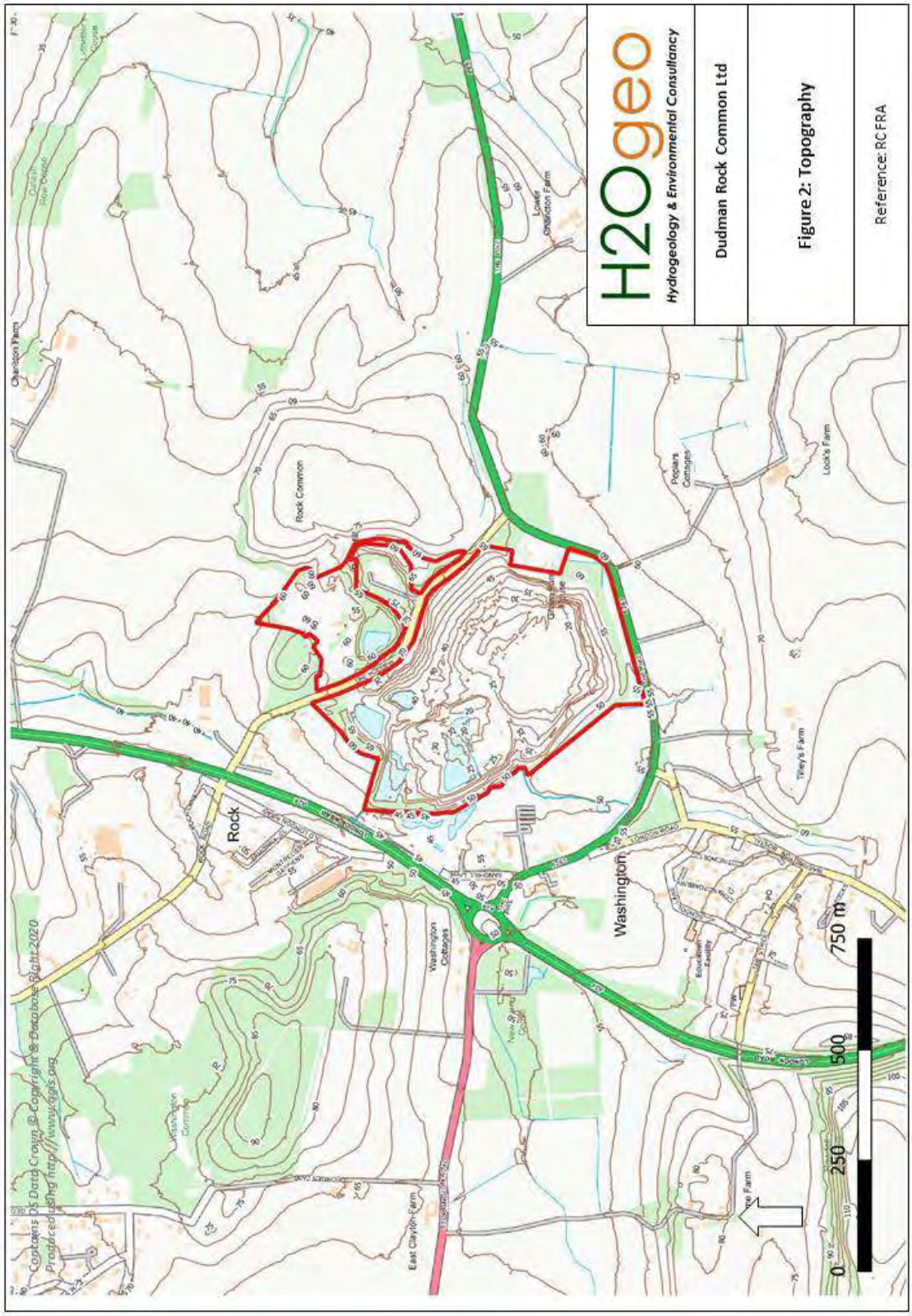


Figure 3 Geology

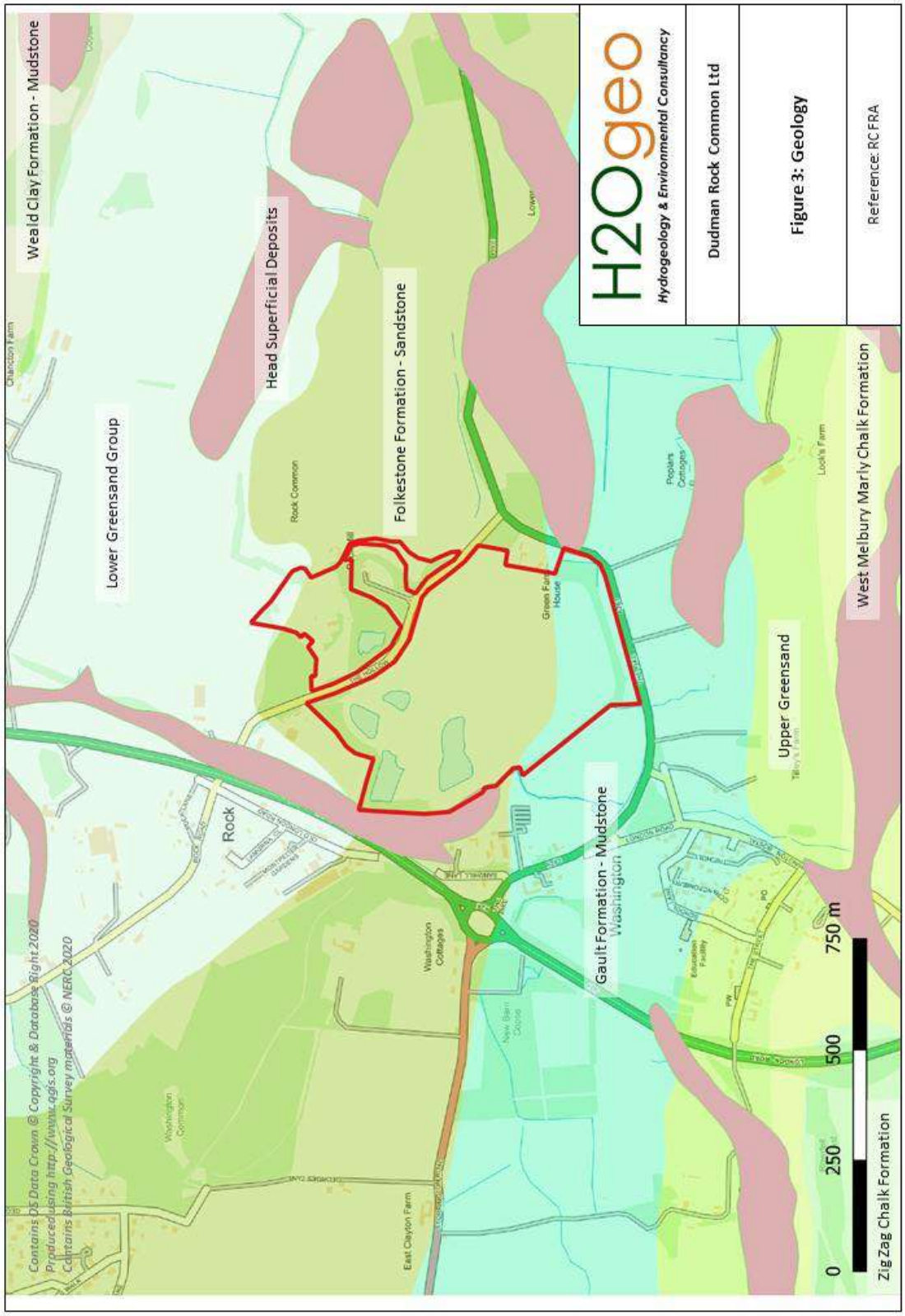


Figure 4 Catchments

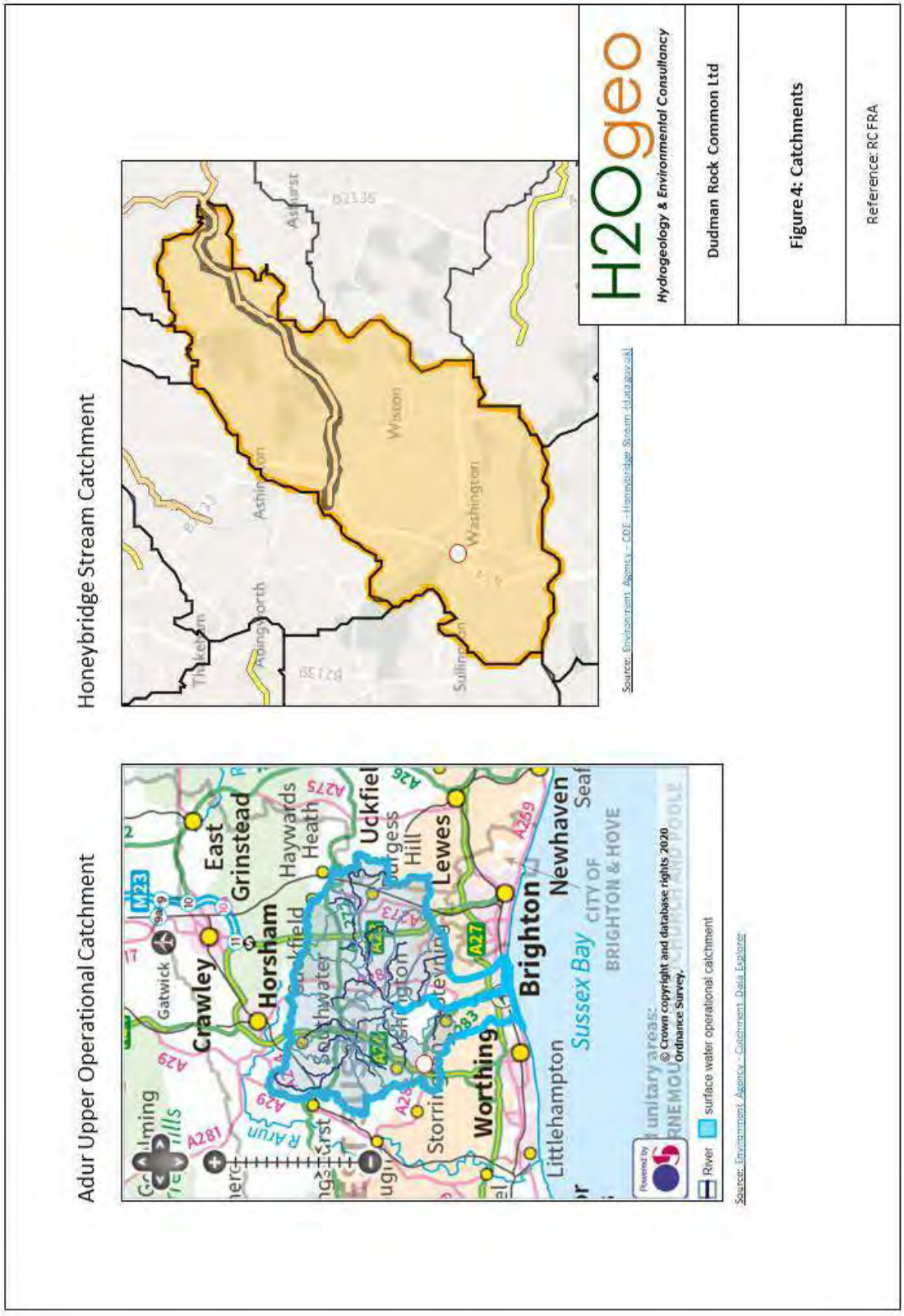


Figure 5 Flood Zone Map

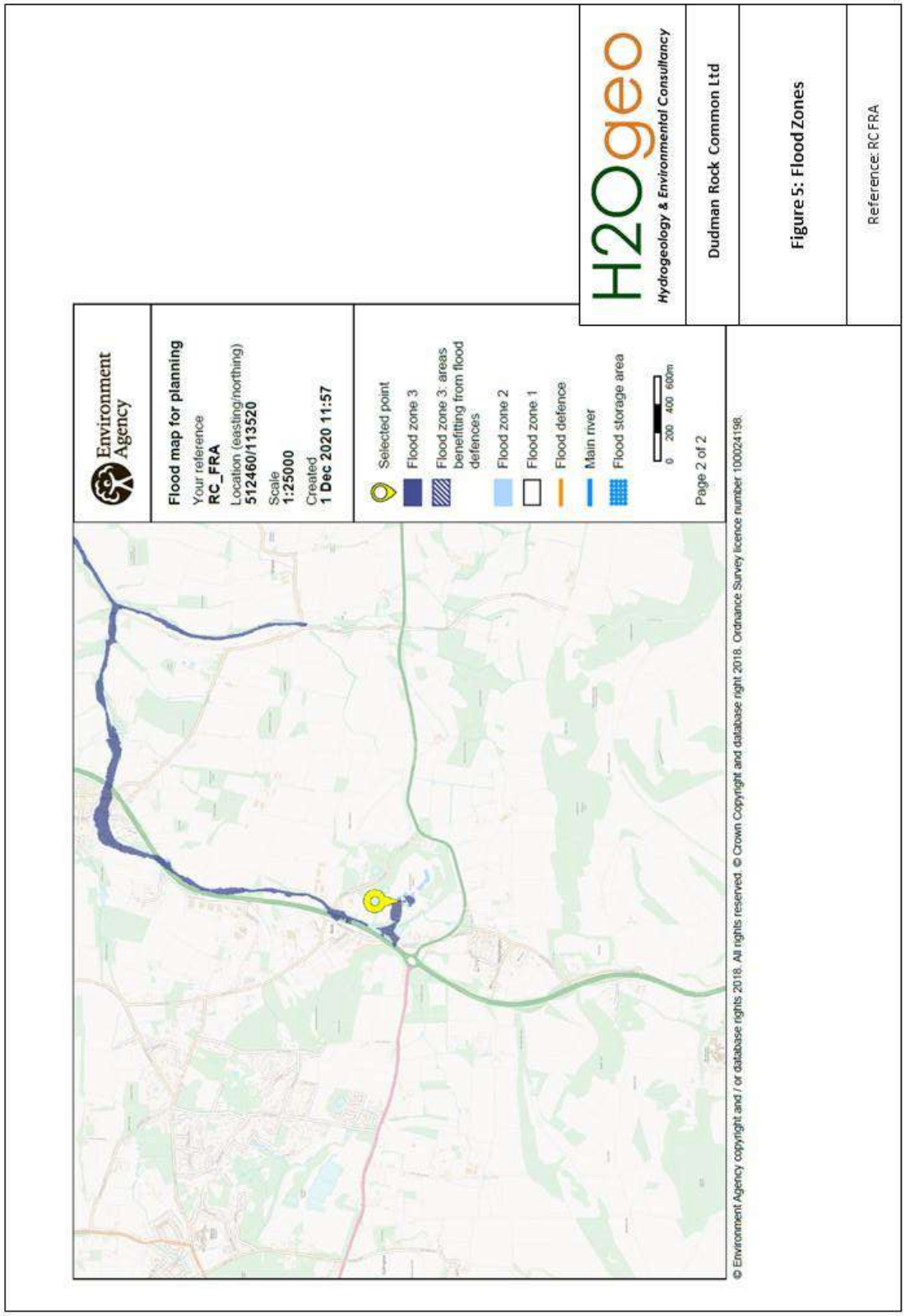


Figure 6 Risk of Flooding From Rivers and Sea (RoFRaS)

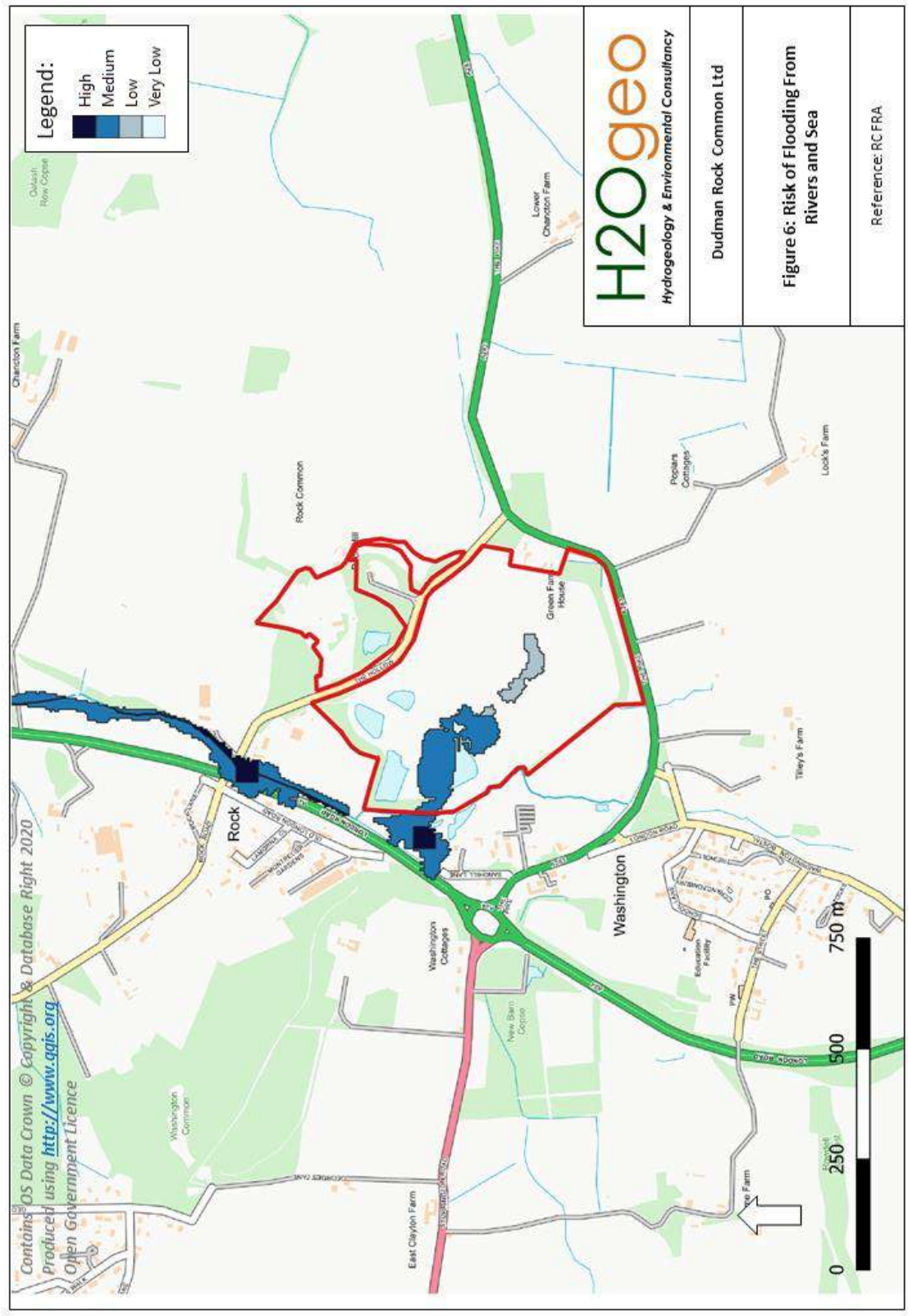


Figure 7 Surface Water Flooding Risk

Figure 8 Risk of Groundwater Flooding

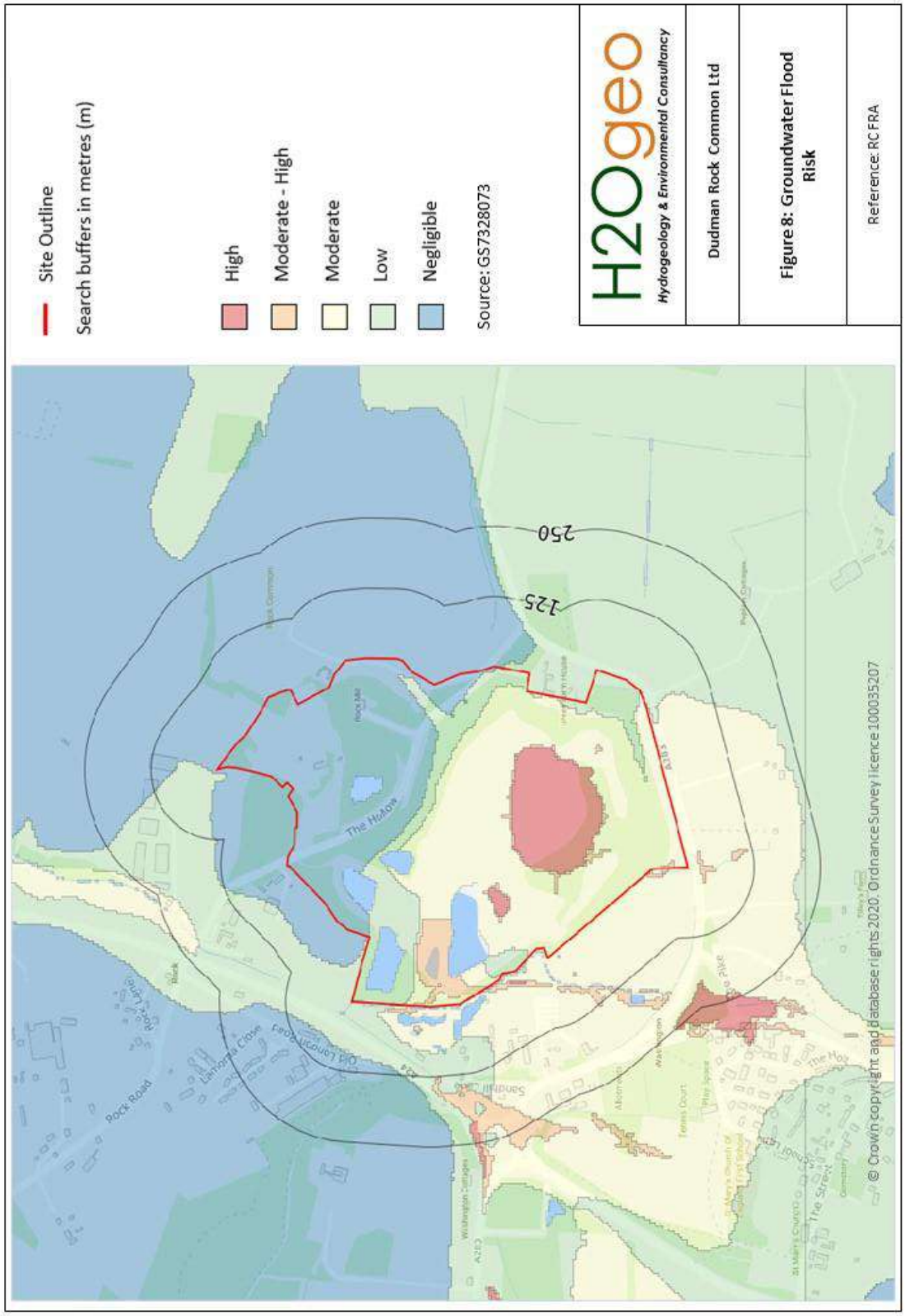


Figure 9 Historic Flooding

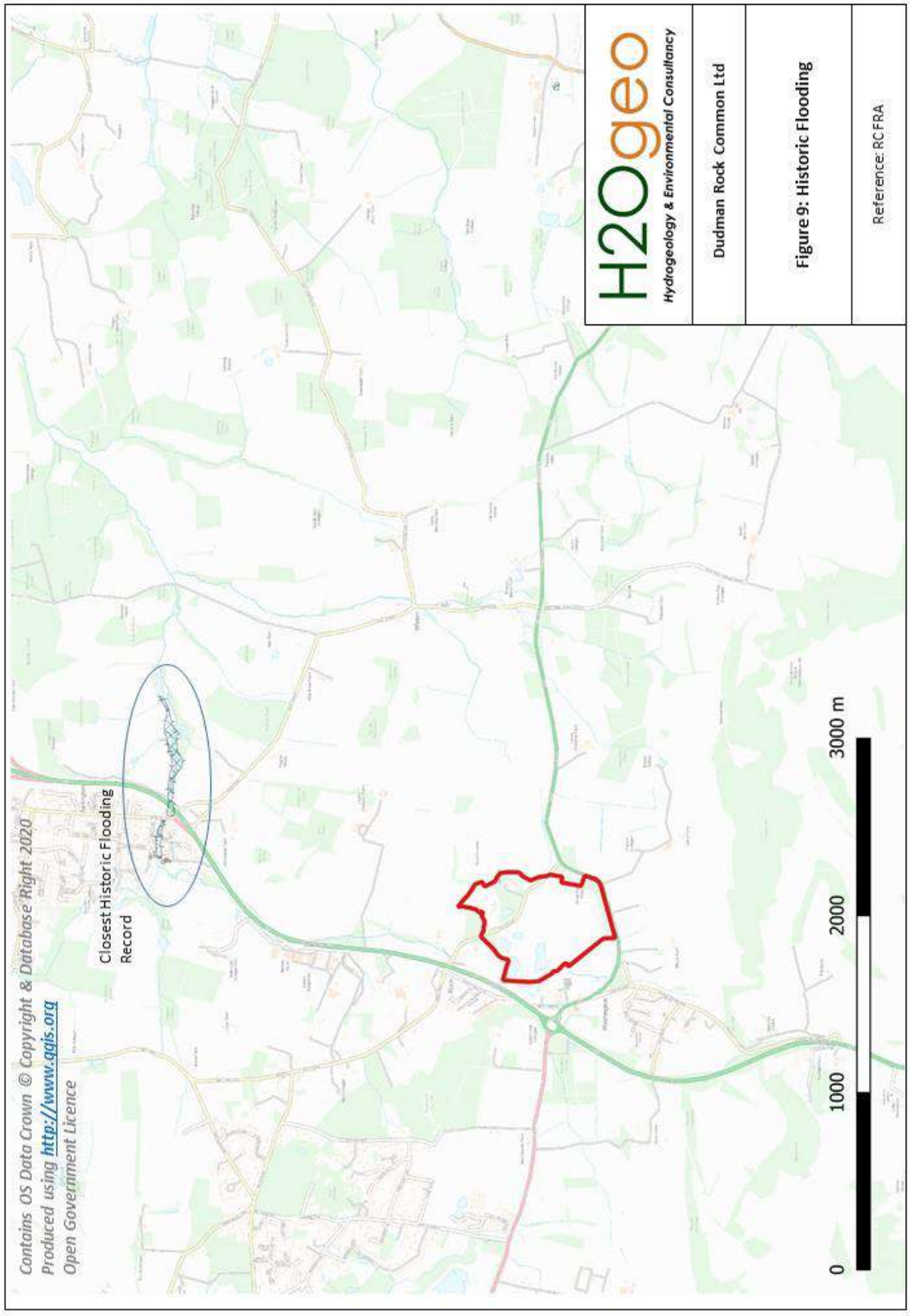
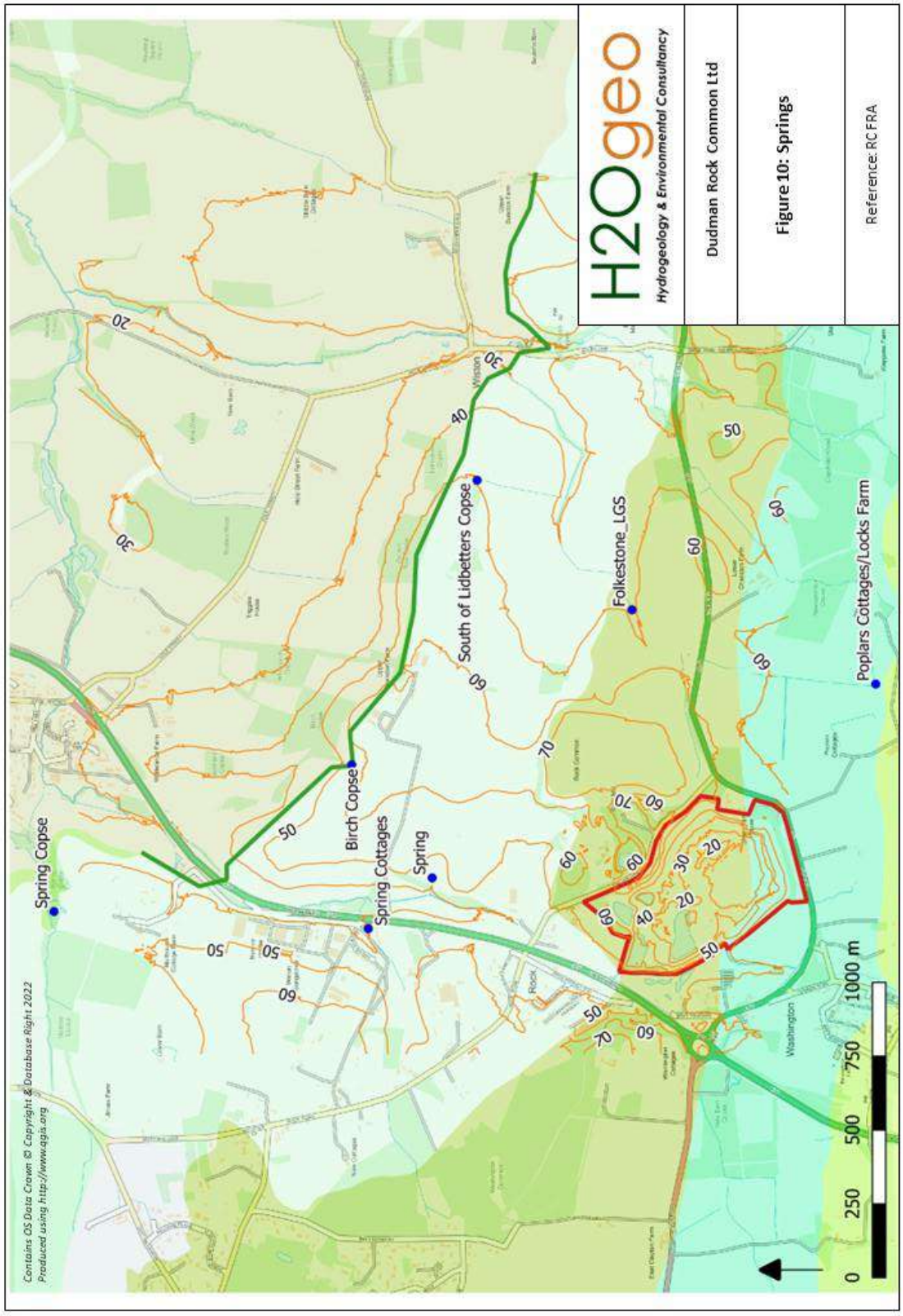


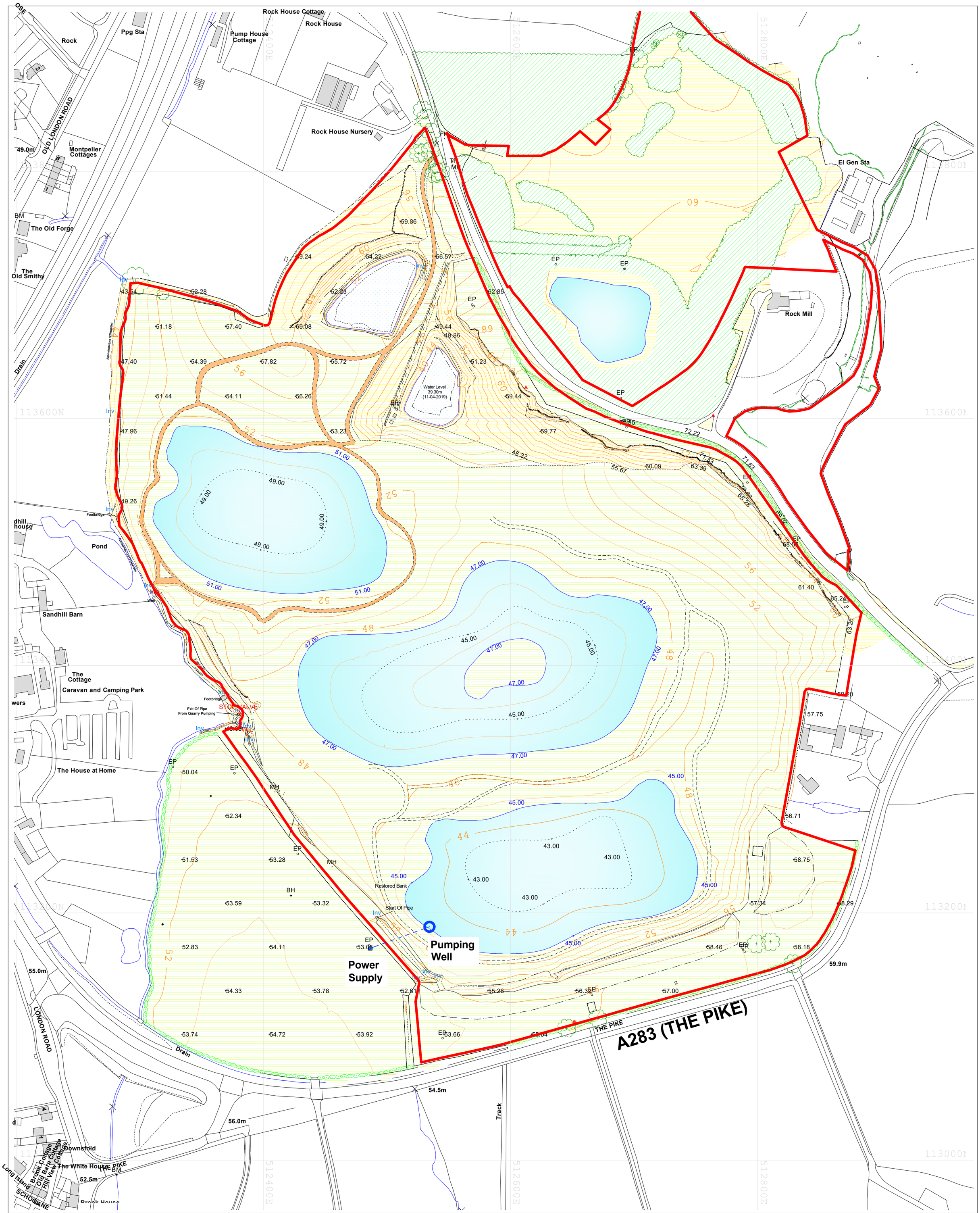
Figure 10 Spring Locations



11 Annexes

Annex A Drawings
Annex B Environment Agency Data
Annex C Horsham District Strategic Flood Risk Assessment (SFRA) 2020 Map

Annex A Drawings



Legend:

- Application Area
- Footpath for informal public access
- Private use access for maintenance and habitat management

The final routing of footpaths both for informal public access and for private use may change subject to consultation during the application process

SCALE BAR

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REVISIONS

	Date	Description	By
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N

TERRESTRIA LIMITED

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Mob - 07712779525
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Client

DUDMAN ROCK COMMON LIMITED

Job Title: Rock Common Quarry

Project Title: Planning application to vary approved restoration

Scale	Date	Drawn by	Checked
1:2000	DEC 20 (v4)	SW	MM

Dwg. title: Final restoration

DWG No. DRCL/RCRA/WP-11

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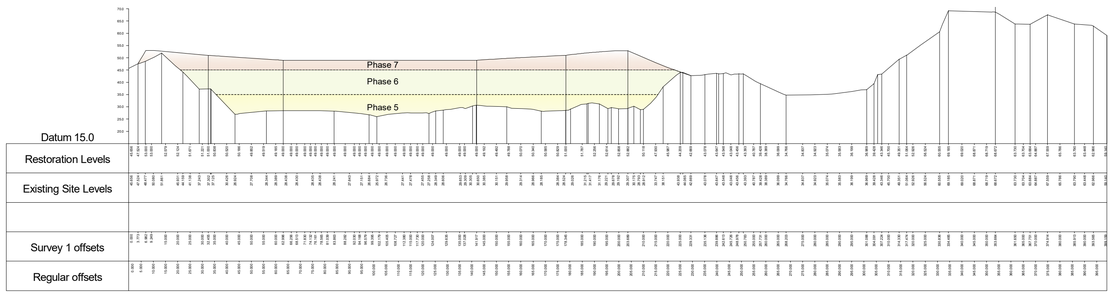

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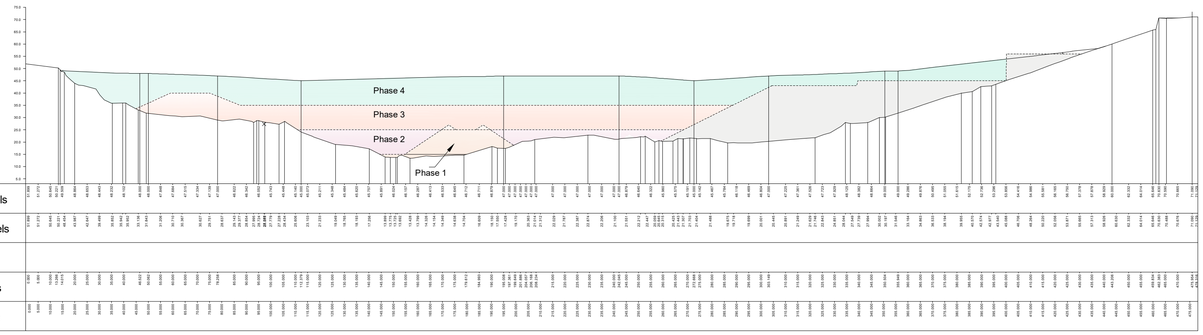

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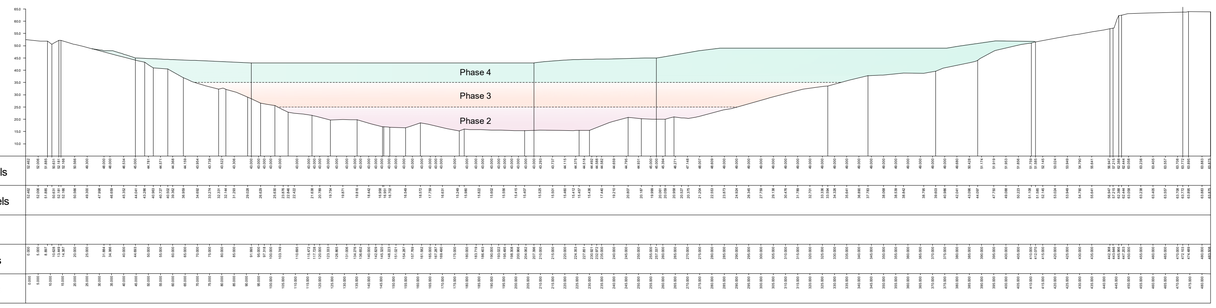

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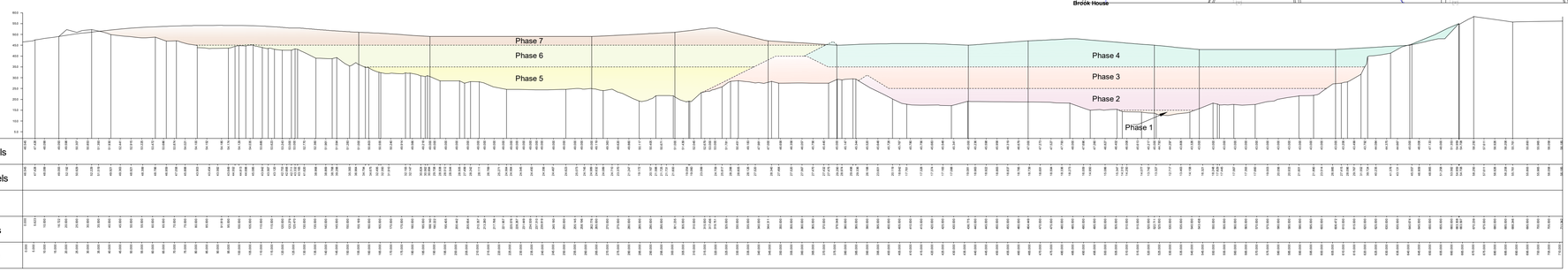

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Regular offsets	

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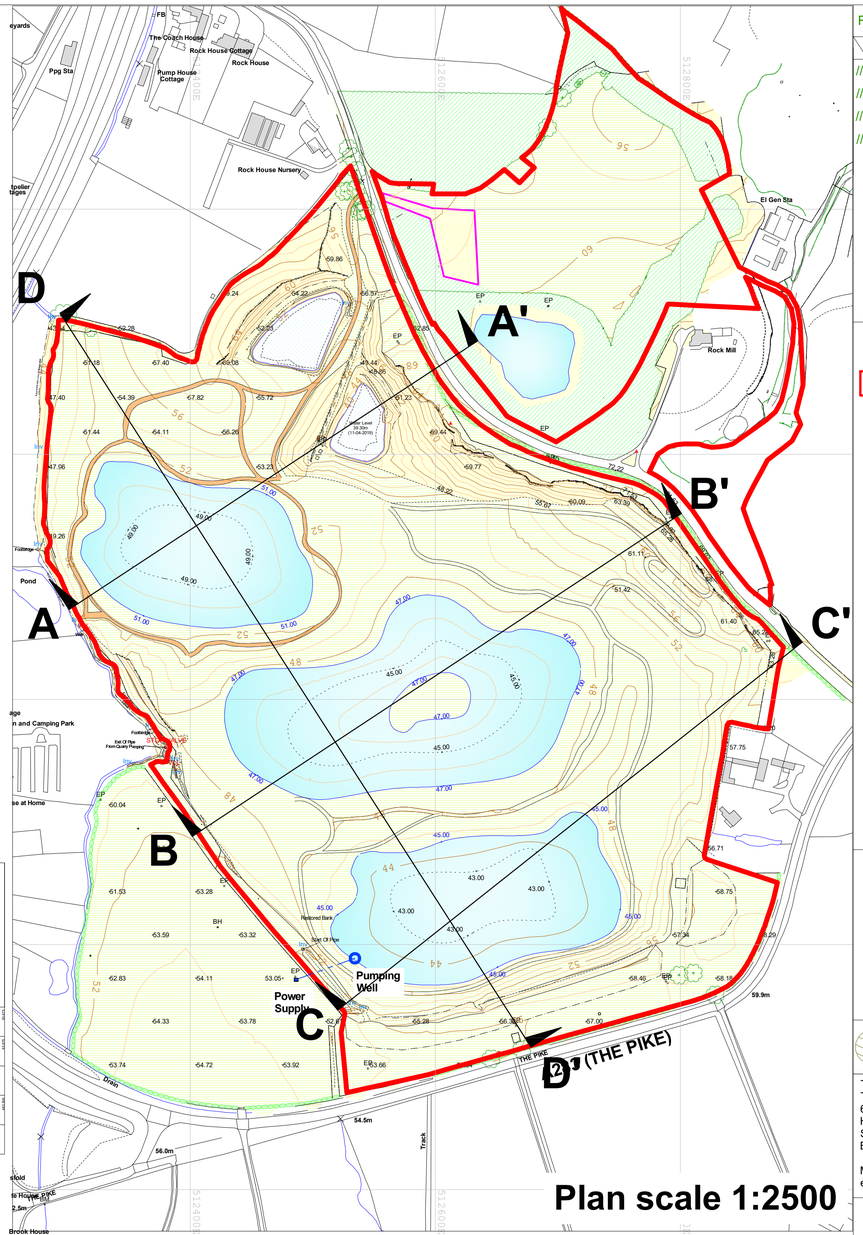

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REVISIONS

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Legend:

Application Area

N

TERRESTRIA LIMITED

TERRESTRIA LIMITED
T/A MgM Consulting
6 Engine Mews,
Hampton-in-Arden,
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Mob - 07712779525
e-mail - mick@terrestria.co.uk

Client

DUDMAN ROCK COMMON LIMITED

Job Title

ROCK COMMON QUARRY

Project Title

Planning application to vary approved restoration

Scale	Date	Drawn by	Checked
1:1250	June 2021	SW	MM

Dwg. title

Cross sections

DWG No.

DRCL/RCRA/WP-12

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Annex B Environment Agency Data

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21/10/1963	00:07:00	0.129
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08/01/1964	00:08:00	0.13
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04/03/1964	00:06:00	0.107
05/05/1964	00:03:00	0.193
05/05/1964	00:09:00	0.193
29/05/1964	00:08:00	0.2
29/05/1964	00:17:00	0.2
12/06/1964	00:04:00	0.146
12/06/1964	00:15:00	0.146
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07/07/1964	00:09:00	0.076
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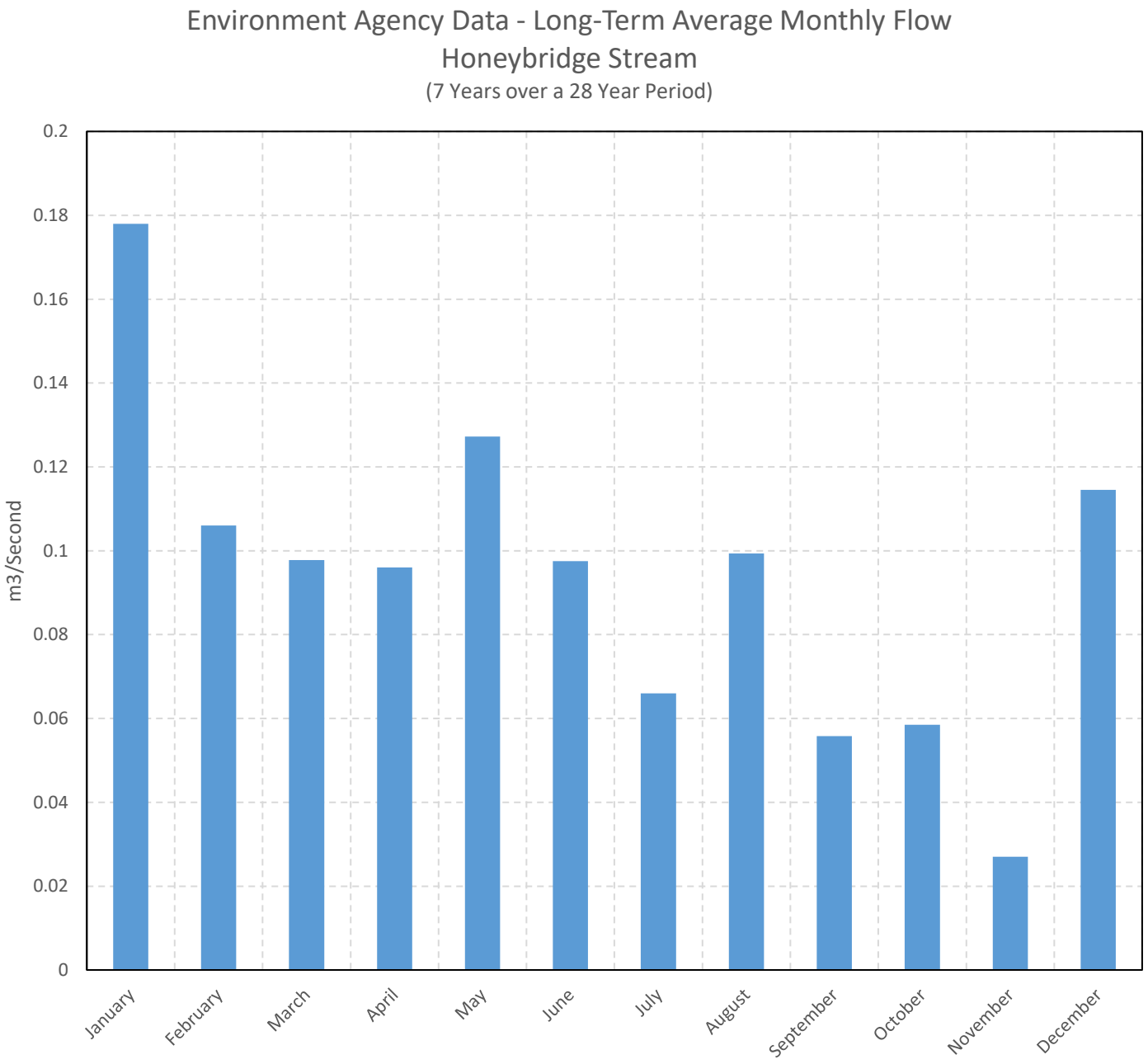
Environment Agency Data

H2Ogeo
Hydrogeology & Environmental Consultancy

Dudman Rock Common Ltd

Annex B: Honeybridge Stream Historic Gauging Data

Reference: RC FRA



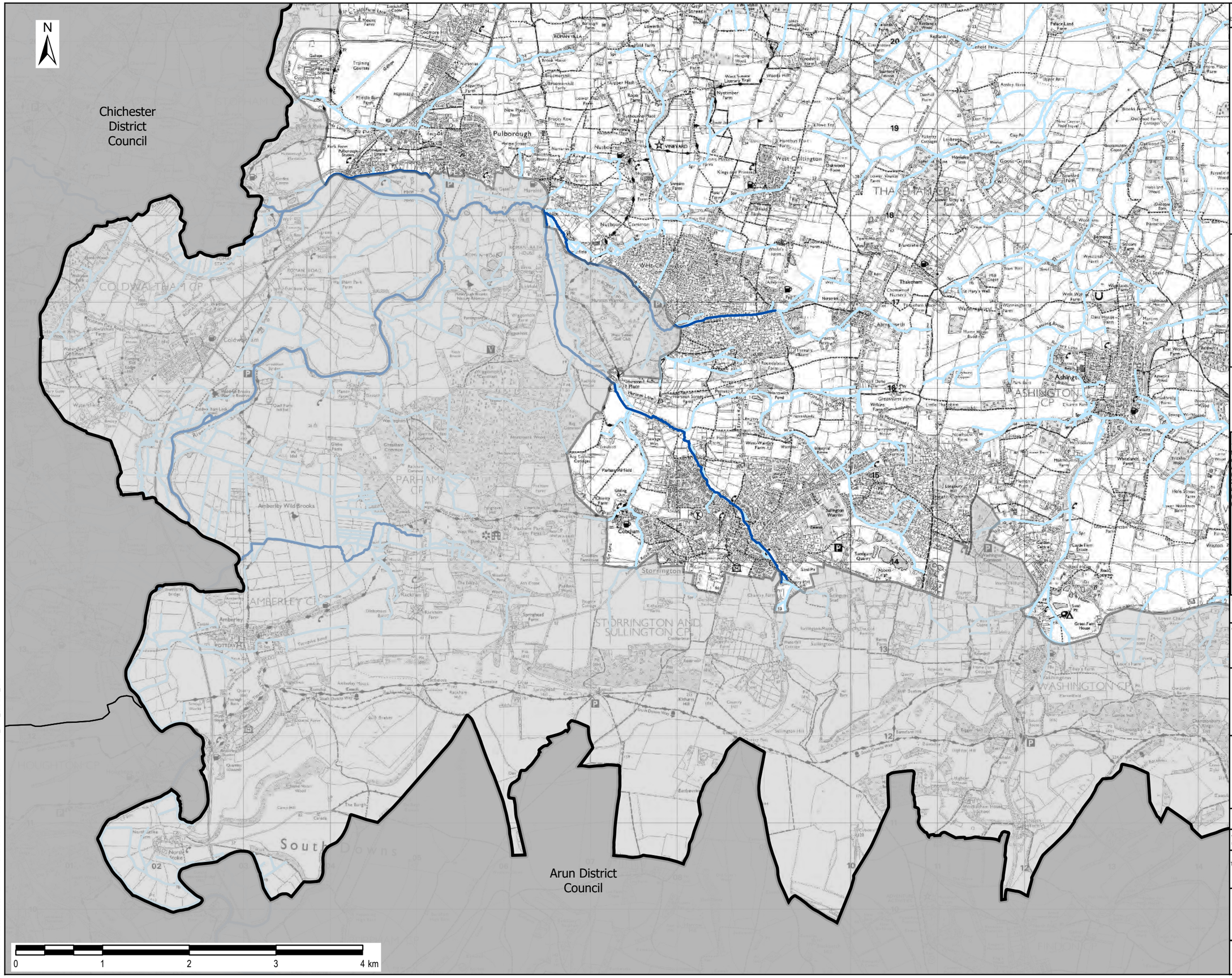
H2Ogeo
Hydrogeology & Environmental Consultancy

Dudman Rock Common Ltd

Annex B: Honeybridge Stream Historic Gauging

Reference: RC FRA

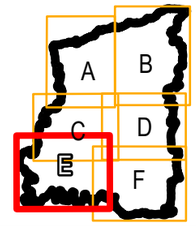
Annex C Horsham District Strategic Flood Risk Assessment Map



THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

- Horsham District Boundary
- South Downs National Park
- Main Rivers
- Ordinary Watercourses
- Climate Change 35%
- Climate Change 45%
- Climate Change 105%



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Contains Environment Agency data © Environment Agency and database right 2020

Notes

1. This map shows the modelled scenarios for the 1 in 100 year fluvial flooding with additional allowances for climate change based on the Environment Agency's Flood Risk Assessments: Climate Change Allowances. This is provided on the Environment Agency Website (www.gov.uk/environment-agency).
2. The modelling of the main rivers defines the extent of flooding with additional allowances for climate change anticipated for the 2080s (2070 to 2115) during the 1% AEP (1 in 100 chance each year) plus 35% (Central), 45% (Higher Central) and 105% (Upper End).

Purpose of Issue: FINAL

Client: HORSHAM DISTRICT COUNCIL

Project Title: HORSHAM DISTRICT COUNCIL SFRA

Drawing Title: FIGURE 9E- CLIMATE CHANGE

Drawn	Checked	Approved	Date
SB	SL	EC	09/01/2020

AECOM Internal Project No.	Scale @ A3
60613369	1:40,000

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Drawing Number	Rev
FIGURE 9E	02

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APPENDIX 5
Additional Comments - Air Quality

By E-mail

Michael Metcalfe
LLB (Hons) DipArb FRICS
Chartered Minerals Surveyor
RICS Registered Valuer
6 Engine Mews,
Hampton in Arden B92 0AZ

Our Ref: 2380w-SEC-00002-01

22 April 2022

Dear Michael,

Rock Common Quarry, The Hollow, Washington, West Sussex/ Air Quality

We are writing this letter in relation to the request for clarifications issued by Horsham District Council (HDC) (Ref. No. NC/21/0018- 30th November 2021) and West Sussex County Council (WSCC) (WSCC/028/21 21st December 2021) about Southdowns Environmental Consultants (SEC) air quality assessment report (2380w-SEC-00001-03, December 2020).

The comments from HDC and WSCC are the same in relation to air quality and are presented below.

"Having reviewed the Air Quality Assessment and Dust Management Plan Final Report (Southdowns Environmental Consultants, December 2020), Storrington AQMA is not included in the model. The report doesn't address the issue of traffic routing to avoid the Storrington AQMA. One mention of routing was made, which was proposed to ensure that the vehicles leave via the junction of The Hollow/A283 and head southbound towards the Washington Roundabout. This measure is indeed welcome as it would reduce air pollution impacts on the residential properties at the A24/The Hollow junction. Still, its implementation should be enforced, e.g. through the proposed GPS tracking for all the vehicles leaving the site.

It is expected that the model results carry high uncertainty as the model was verified with the monitoring sites on the A283, the latter having different traffic characteristics to the A24. In order to ensure better model accuracy it would have helped if the applicant had carried out short-term monitoring in the modelled area at locations adjacent to the A24.

Finally, the report does not make reference to the Air Quality and Emissions Mitigation Guidance for Sussex (2021) and no mitigation was proposed to reduce emissions from the additional traffic. The Sussex guidance takes a low-emission strategies' approach to avoiding cumulative impacts of new development, by seeking to mitigate or offset emissions from the additional traffic and buildings. Hence, applicants are required to submit a mitigation plan detailing measures to mitigate and/or offset the impacts and setting out itemised costing for each proposed measure, with the total estimated value of all the measures being equal to the total damage costs."

Our response for the additional clarification is presented overleaf.

Storrington-Air Quality Management Area (AQMA)

The transport team has confirmed that there is no change in the Annual Average Daily Traffic (AADT) data presented in the Southdowns air quality assessment report (2380w-SEC-00001-03, December 2020). The trip generation associated with the proposed development is not expected to affect the Storrington-AQMA as it is not anticipated that there will be any additional trips within the area. The proposed development trips will be distributed across the road network to avoid Storrington-AQMA. Therefore, no air quality impacts are expected in this area and therefore no further assessment was required at the time of the air quality assessment.

Model Verification

The model verification presented in SEC air quality assessment report, December 2020, followed guidance in Defra LAQM - TG16. At the time of the preparation of this assessment, suitable and long-term monitoring data was available in HDC 2020 Air Quality Annual Status Report (ASR). NO_2 annual mean concentrations were reported in 2020 with a 15% reduction when compared to 2019[1]. Therefore, the year used for the model verification was 2019.

Verification of ADMS-Roads using a short-term NO_2 diffusion tube survey during 2020 was likely to be unrepresentative of normal conditions due to social and travel restrictions associated with the first year of the COVID-19 pandemic.

Mitigation measures to reduce emissions from the additional traffic

The Southdowns' air quality assessment report was submitted in December 2020 and followed the most recent Sussex guidance available at the time. We understand Sussex 2021 guidance was released around April 2021. There are no significant differences between these two versions of the Sussex guidance and the conclusions presented in the air quality assessment report, December 2020, will remain valid. Section 8.2 of the air quality assessment report, December 2020, shows the exposure damage cost associated with emissions (£14,938).

The developer is aware of the request made by the WSCC and HDC to incorporate mitigation measures and cover the damage cost associated with operational emissions. The current proposals being exploring include an electric vehicle charging point, solar panels and bicycle facilities/infrastructure within the staff/office area. Once the final design is available, a list of the mitigation measures will be made available.

We hope the information presented in this letter provides sufficient clarification to the comments made by WSCC and HDC. If you have any further questions, please do not hesitate to contact us.

Yours sincerely
on behalf of Southdowns Environmental Consultants Ltd

Jorge Gomez Perales
Principal Air Quality Consultants

[1] Horsham District Council. 2021. Air Quality Annual Status Report.

APPENDIX 6
Water Neutrality Statement

WATER NEUTRALITY STATEMENT FOR ROCK COMMON, NEAR WASHINGTON, WEST SUSSEX

Reference: 20220805

H2Ogeo Reference: 20220401P1

Date: 16 September 2022

Version: Final v1.0

Author	***Date***	***Issued***
David Walker	16/09/2022	16/09/2022

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Statement of Limitations

The report will be prepared in accordance with the scope of work outlined within this proposal and is subject to the applicable cost, time and other constraints. It has been prepared for the sole use of the Client and H2Ogeo accepts no liability as a result of the use or reliance of this report by any other parties.

The advice and opinions in the report should be read and relied on only in the context of the report as a whole. As with any environmental appraisal or investigation, the conclusions and observations are based on limited data. The risk of undiscovered environmental impairment of the site cannot be ruled out. H2Ogeo cannot therefore warrant the actual conditions or LPA responses for the site and advice given is limited to those conditions for which information is held by H2Ogeo at the time. The findings are based on the information made available to H2Ogeo at the date of the report and will have been assumed to be correct.

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This report does not constitute legal advice.

Contents

Executive Summary

A planning application was submitted to West Sussex County Council, 14 July 2021, for the *continued winning, working and processing of sand from the existing Rock Common Quarry, the importation of inert classified engineering and restoration material, the stockpiling and treating of the imported material, the placement of the imported material within the quarry void and the restoration and landscaping of the quarry.*

Since the original submission, the requirement for a Water Neutrality Statement has been introduced to the area.

Water Neutrality Statements are required as Natural England cannot, with certainty, conclude that the Sussex North Water Supply Zone (WSZ), that includes supplies from a groundwater abstraction, is not having an adverse effect on the integrity of:

- Arun Valley Special Area Conservation (SAC);
- Arun Valley Special Protection Area (SPA); and
- Arun Valley Ramsar Site.

As it cannot be concluded that the existing abstraction is not having an impact on the Arun Valley site, Natural England have advised that developments within the Sussex North WSZ must not add to this impact.

H2Ogeo has provided this Water Neutrality Statement to accompany the planning applications to demonstrate that the proposed development does not increase the mains water consumption above existing levels.

The proposed development's water consumption will be lower than the existing baseline consumption.

In addition:

- All the fittings in the proposed development will be new and low flow and dual flush technology;
- Groundwater will be used to flush toilets and provide fresh water to the wheel wash;
- Rainwater harvesting can be utilised to augment water required for landscaping.

Based on the findings of this Water Neutrality Statement the proposed development will not contribute to an existing adverse effect upon the integrity of the internationally designated Arun Valley Special Area of Conservation, Special Protection Area and Ramsar sites by way of increased water abstraction.

1 Introduction

1.1 Background

A planning application was submitted to West Sussex County Council, 14 July 2021, for the *continued winning, working and processing of sand from the existing Rock Common Quarry, the importation of inert classified engineering and restoration material, the stockpiling and treating of the imported material, the placement of the imported material within the quarry void and the restoration and landscaping of the quarry.*

Since the original submission, the requirement for a Water Neutrality Statement has been introduced to the area.

Water Neutrality Statements are required as Natural England cannot, with certainty, conclude that the Sussex North Water Supply Zone (WSZ), that includes supplies from a groundwater abstraction, is not having an adverse effect on the integrity of:

- Arun Valley Special Area Conservation (SAC);
- Arun Valley Special Protection Area (SPA); and
- Arun Valley Ramsar Site.

As it cannot be concluded that the existing abstraction is not having an impact on the Arun Valley site, Natural England have advised that developments within the Sussex North WSZ must not add to this impact.

Rock Common Quarry has been active since the 1920's and has been the subject of many planning permissions granted for sand extraction since the 1950's. The Quarry is currently working in accordance with a permission granted on 16 September 2004 (Ref WS/15/97) which was an application submitted by the then operator, Tarmac Limited, under the provisions of Environment Act 1995 requiring the review of "old mining permissions".

This application is being made firstly, to enable the recovery of the remaining reserves of sand and secondly, to permit the importation and placement of suitable, inert classified engineering and restoration materials in order to change the approved restoration of the Quarry and create a "dry", restored landform.

The current approved restoration is to create a body of deep water within the final excavated void described as a landscaped lake with the associated quarry margins managed for amenity and nature conservation use. Whilst the creation of deep bodies of water in quarries was acceptable at the time that the restoration was approved, restoring (and creating) large bodies of deep, open water with steep underwater slopes is no longer considered to be "best practice", not least because they are a danger to the public. An additional issue with deep water is that it does not provide suitable conditions for the creation of a wide and variable range of ecological interest.

Significant environmental concerns with the approved scheme also exist, in relation to the pollution of Controlled Waters, through the cessation of dewatering at Rock Common.

The restoration scheme is proposed to ensure that the quarry is restored to a safe, sustainable and ecologically varied landform. This Water Neutrality Statement is provided to accompany the planning application to demonstrate that the proposed development does not increase the requirements for mains water above existing levels within the supply zone.

1.2 Scope of Work

The scope of work is to provide a Water Neutrality Statement to understand if the proposed development will contribute to an existing adverse effect upon the integrity of the internationally designated Arun Valley Special Area of Conservation, Special Protection Area and Ramsar sites by way of increased water abstraction.

2 The Site

2.1 Location

The Site is situated within the District of Horsham, West Sussex (NGR TQ12460 13520) approximately 350 metres to the north-east of the village of Washington. At its nearest point the boundary of the South Downs National Park lies approximately 50 metres to the south of the Site following the line of the A283 road.

The Site location is shown in Figure 1.

The A24 (Worthing to Dorking Road) runs within 100 metres of the western boundary. A narrow, unclassified road (which connects the A283 and A24 and known as “The Hollow”) runs along the north-east boundary of the Quarry. Access to the site is via the Hollow road off the A24/A283.

2.2 Existing Site

The layout of the existing site is shown in Annex A. The existing mains water consumption on site was confirme during a site visit on 22 June 2022 and comprises:

- A toilet block consisting of two toilets, two urinals and one sink with separate hot and cold taps;
- One kitchen sink with a mixer tap in the workshop kitchen; and
- One outside tap used at the reception for drinking and washing down vehicles.

The washing plant in the existing processing area uses groundwater abstracted from the pit, Rock Common is licensed to abstract 6000m^3/day for the purposes of dewatering and processing.

2.3 Proposed Development

The proposed development is for the continued winning, working and processing of sand from the existing Rock Common Quarry, the importation of inert classified engineering and restoration material, the stockpiling and treating of the imported material, the placement of the imported material within the quarry void and the restoration and landscaping of the quarry.

The areas under consideration for the purposes of the Water Neutrality Statement is the material reception area. There is no mains water consumption in the Quarry Area and therefore the volume will not change as a result of the revised scheme.

The existing reception area for the quarry will be decommissioned including the toilet blocks, reception building and workshop kitchen.

In the proposed material reception area there will be:

- Staff Welfare Buildings will comprise one kitchen sink with a mixer tap, 1x dishwasher, two male and one female dual-flush toilet;
- Two urinals;
- Four wash-hand basins; and
- A wheel-wash and general vehicle cleaning facility.

3 Baseline Calculations

3.1 Existing Consumption

This section estimates the existing water consumption at Rock Common.

The BREEAM 2018 Wat 01 Water Consumption Calculator has been used to estimate the Litres/Day/Person consumption, reported below and presented in Annex B:

48.89Litres/Day/Person

3.2 Proposed Consumption

The calculated proposed consumption is summarised below and presented in Annex B. This includes the:

- One kitchen mixer tap, one dishwasher, two male dual flush and one female dual-flush toilet each with a wash-hand basin; and
- Two urinals.

The proposed consumption is:

34.86Litres/Day/Person

3.3 Water Consumption Summary

By using dual flush and low flow fittings, the proposed consumption per person is a reduction of 14 Litres/Day/Person.

It has been assumed five Full Time Employees (FTEs) are present on site and therefore the total daily consumption is 244.45 Litres/Day and proposed will be 174.3 Litres/Day.

In addition to the new facilities a wheel-wash is proposed and details are presented in Annex C. The wheel wash is a Garic Enviro Wheel Wash with water filtration technology combined with a 100 percent water recirculation system.

3.4 Water Reduction & Additional Mitigation

It is proposed to use low flow fixtures on site and alternative to mains sources of water for toilet flushing and the wheel wash.

Rock Common currently operates a dewatering system that is licensed to abstract 6000m^3/day to safely win and work the sands, the Site has been actively dewatered since at least 1986.

Data presented in Figure 2 is the daily pumping volumes achieved on Site in 2018.

Pump 1 ran for 257 days and Pump 2 for 278. The average combined daily pumping rate was 4033m^3/day (46.7 Litres/second) with Pump 2 averaging a slightly higher rate than Pump 1, 2590m^3 and 1440m^3 respectively.

There is a deficit between the licensed volume (6000m^3/day) and the actual (4033m^3/day) of 1967m^3.

It is proposed to use an insignificant portion (2m^3/Day Max) of this excess to provide groundwater to the toilets and wheel wash therefore mitigating any additional consumption from the site. The infrastructure is already on site and connecting the toilets, urinals and wheel wash will be part of the development.

There is additional scope to use rainwater harvesting from the welfare facilities for landscaping, particularly in the summer months, when watering is increased.

4 Conclusion

The existing water consumption is 48.89Litres/Day/Person equating to 244.45 Litres/Day. The proposed development through low flow fixtures and dual flush taps will reduce to 34.86Litres/Day/Person, a total of 174.3 Litres/Day (assuming 5x FTEs).

The additional requirement for wheel wash water and the proposed toilets and urinals will be met by using groundwater from the existing licensed abstraction. Rainwater harvesting from the welfare roof space will also add mitigation for landscaping reducing the overall demand for mains water.

Due to the significant environmental and health and safety risks associated with the currently approved restoration scheme, the use of the existing groundwater abstraction to offset mains water consumption, is a legitimate approach to achieving water neutrality.

Based on the findings of this Water Neutrality Statement the proposed development will not contribute to an existing adverse effect upon the integrity of the internationally designated Arun Valley Special Area of Conservation, Special Protection Area and Ramsar sites by way of increased water abstraction.

5 Figures

Figure 1 Site Location

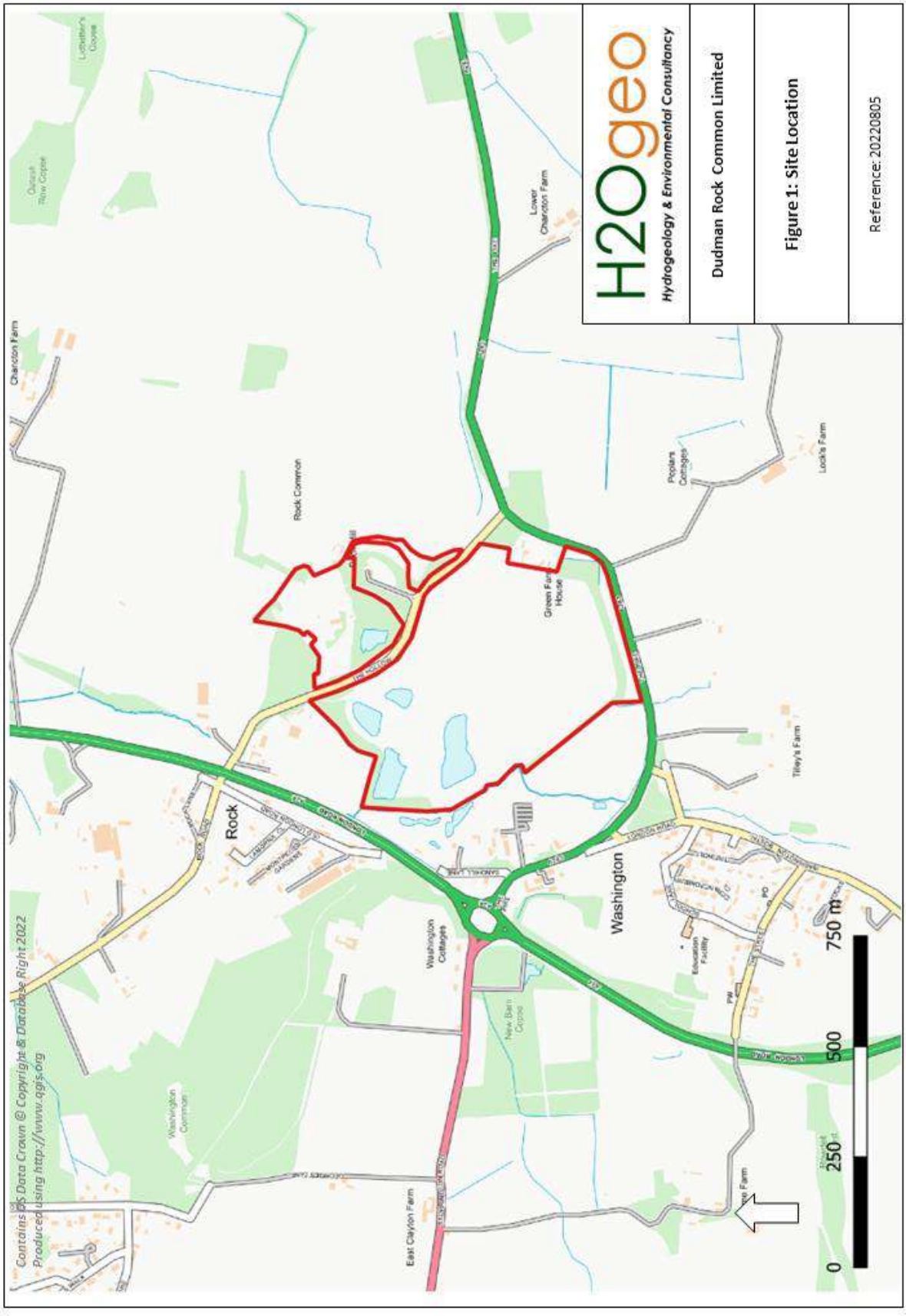
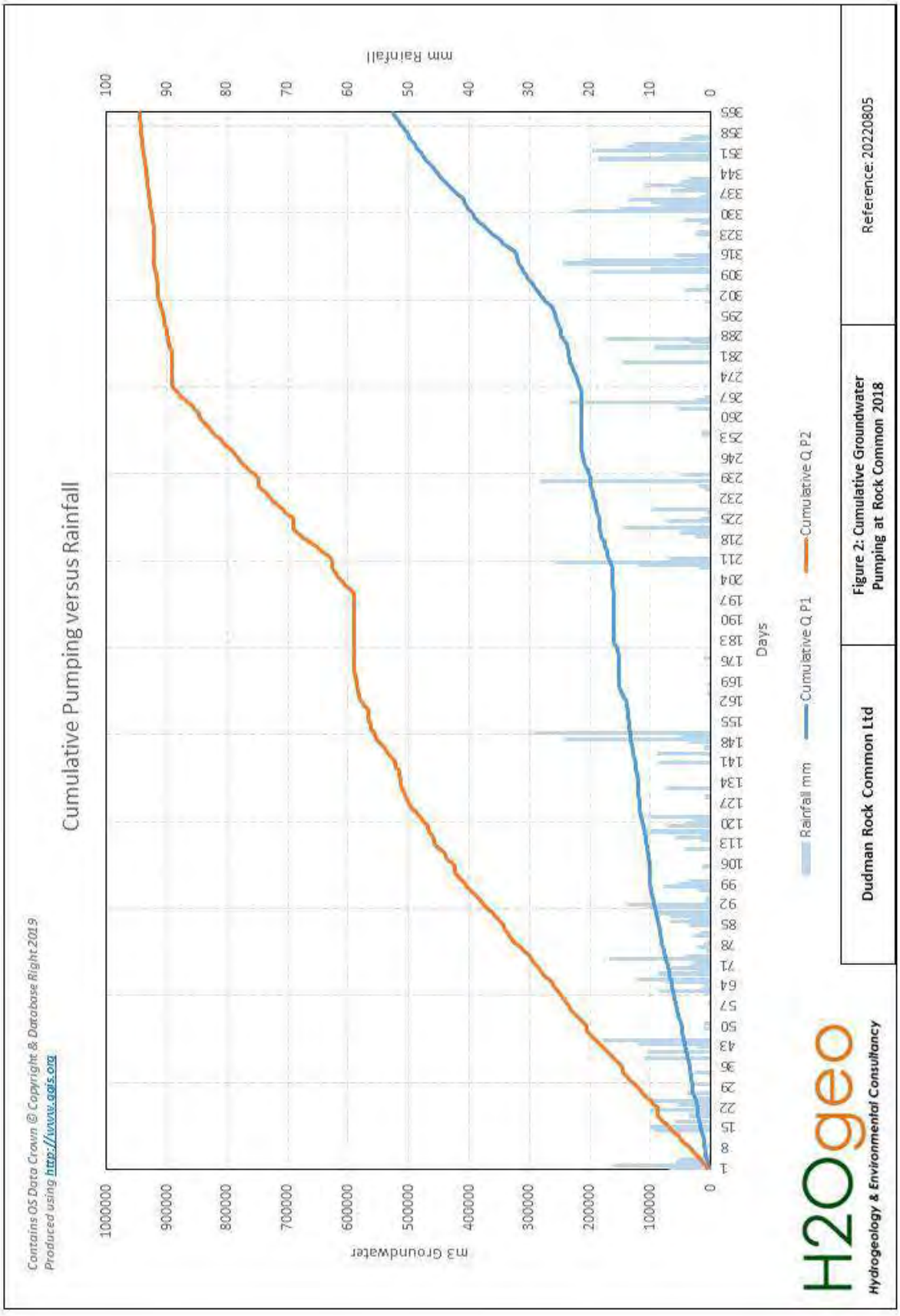


Figure 2 Daily Pumping Rates



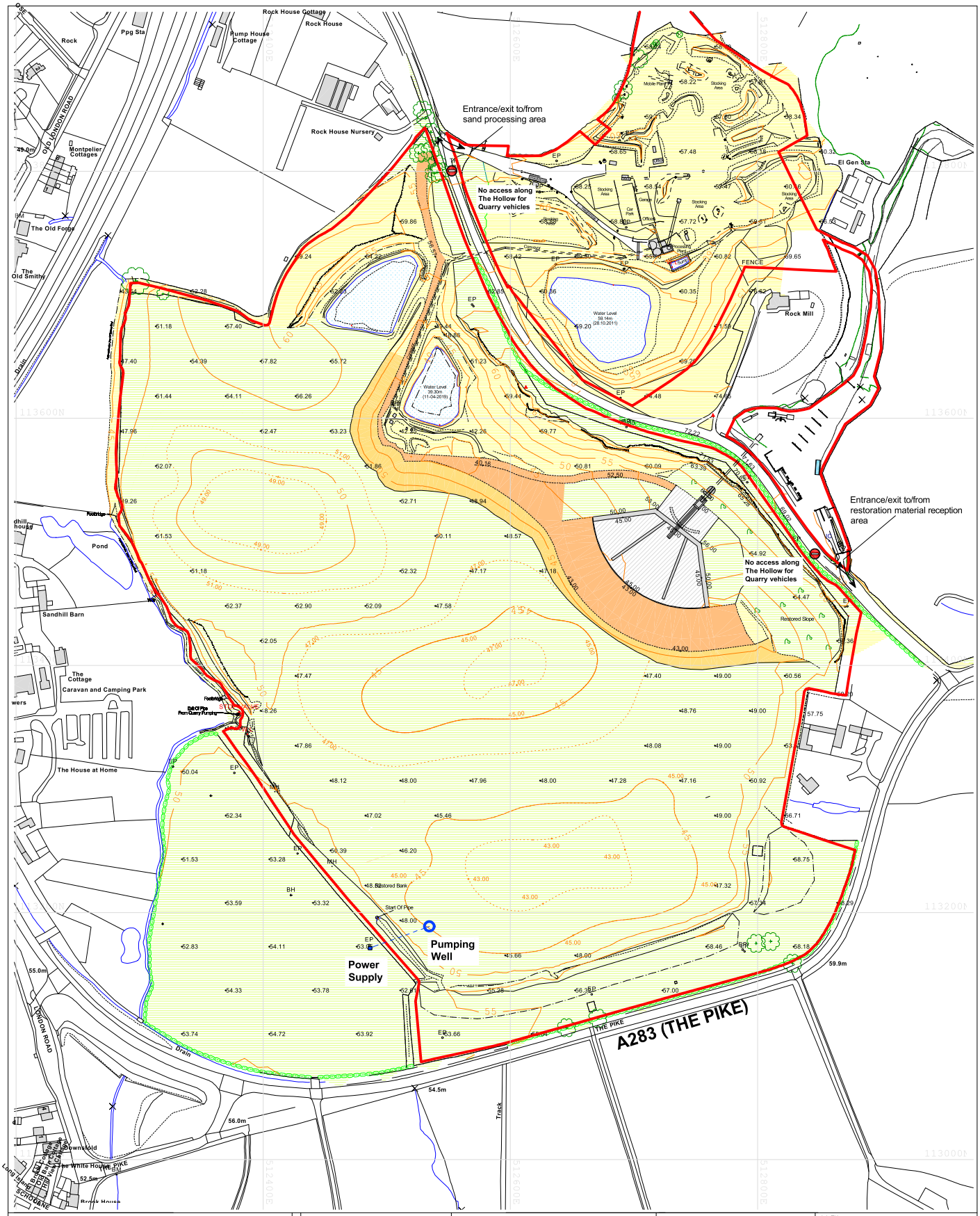
6 Annexes

Annex A – Site Layout Drawing

Annex B – BREEAM Calculations

Annex C Wheel Wash Specifications

Annex A – Site Layout Drawing



Legend:

Application Area

SCALE BAR

0 50 100 200

N

REVISIONS			
	Date	Description	By
	//		
	//		
	//		
	//		

TERRESTRIA LIMITED

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Mob - 07712779525
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Client

DUDMAN ROCK COMMON LIMITED

Job Title: Rock Common Quarry

Project Title: Planning application to vary approved restoration

Scale	Date	Drawn by	Checked
1:2000	June 2021	SW	MM

Dwg. title: Phase 7 Restoring to final landform

DWG No. DRCL/RCRA/WP-10

Annex B – BREEAM Calculations

BREEAM 2018 Wat 01 Water consumption: Water efficiency calculator for new non domestic office buildings

BREEAM® UK delivered by bre

Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Office	Offices and workshop business (including those with a basic (category 1) laboratory area)	3.774	253	10

	Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m^2)
	Office - Office areas	Cellular or open plan office space, including staff kitchen where present/adjacent and reception areas. Exlcude meeting rooms, visitor waiting or circulation areas.	Yes	34
>	Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area	Please select	
>	Office - Staff canteen dining area	Seated dining areas that accompany a permanently staffed kitchen preparing food for consumption on the premises (excludes small un-staffed kitchen's used by office staff to re-heat food, make tea etc.)	Please select	
>	Office - Fitness suite/gym (with changing facility and showers)	A fitness suite or gym that is part of the office building/development and used by the building's employees only. The gym will have its own changing facility with showers.	Please select	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (no urinals installed)	Effective flush volume (Litres)	9.00	4.00	1.00	18.00
WC - female	Effective flush volume (Litres)	9.00	4.00	1.00	18.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	10.00	4.00	0.25	6.77
Shower use	Flow rate (litres/min)	0.00	0.154	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	10.00	1.00	0.67	4.54
Dishwasher	Litres/cycle	0.00	0.04	1.00	0.00
Tap components (cleaning and food preparation) - staff canteen food preparation area					
Kitchen taps - pre-rinse nozzle	Flow rate (litres/min)	0.00	-	60.00	0.00
Dishwasher	Litres/rack	0.00	-	0.217	0.00
Waste disposal unit	Flow rate (litres/min)	0.00	-	30.00	0.00
Fixed use - food preparation	Litres/person/day	-	-	-	0.00
Fixed use - kitchen cleaning	Litres/person/day	-	-	-	0.00

	Microcomponent consumption (L/person/day)
Total	48.89

Minimum requirements according to EU taxonomy for sustainable finance

Do all the installed wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min?	System not specified
Do all the installed showers have a maximum water flow of 8 litres/min?	System not specified
Do all WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres?	System not specified
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	System not specified
Is all the EU taxonomy requirements for sanitary equipment met?	Yes

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice	No

Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (L/person/day)

Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (L/person/day)

	Greywater yield (L/person/day)
Total	0.00

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 16941-1:2018 Rainwater Harvesting Systems - Code of practice	No
How has the storage capacity for the proposed system been calculated?	

Rainwater yield if basic approach:

Collection area (m2)	Rainfall (average mm/yr)	Hydraulic filter efficiency (%)	Yield co-efficient (%)	Annual rainwater yield (Litres)	Rainwater yield (L/person/day)

Rainwater yield if detailed:

Daily rainfall collection (litres)	Rainwater yield (L/person/day)

Non Potable Water Demand - Building Components

	Greywater and/or rainwater yield (L/person/day)
Total	

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (L/person/day)

	Demand met by yield (L/person/day)
Total	

Other permissible components

	Maximum permissible demand (L/day)

	Demand met by yield (L/person/day)
Total	

	Greywater and/or rainwater demand met by yield (L/person/day)
Total	

Water consumption calculation results

	Litres/person/day	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**345.22**	**87.34**
Microcomponent water consumption - modelled performance (excludes fixed uses)	**47.31**	**11.97**
Modelled water demand met via greywater and rainwater sources	**0.00**	**0.00**
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met	**System not specified**	
Net modelled water consumption (excludes fixed uses)	**47.31**	**11.97**
Percentage improvement	**86.29%**	
Total Wat 01 BREEAM credits achieved, before checking minimum requirements according to EU taxonomy for sustainable finance.	**5 credits**	
Total Wat 01 BREEAM credits achieved	**5 credits**	
Total Wat 01 BREEAM Exemplary credits achieved	**1 innovation credit achieved**	
Key performance indicator - use of freshwater resource (includes fixed uses)	**48.89**	**12.37**

BREEAM 2018 Wat 01 Water consumption: Water efficiency calculator for new non domestic office buildings

BREEAM® UK delivered by bre

Building type	Description of building type	Default occupancy	Default annual days/operation	Default daily hours of operation
Office	Offices and workshop business (including those with a basic (category 1) laboratory area)	5.328	253	10

	Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m^2)
	Office - Office areas	Cellular or open plan office space, including staff kitchen where present/adjacent and reception areas. Exlcude meeting rooms, visitor waiting or circulation areas.	Yes	48
>	Office - Small workshop / laboratory space	Small scale workshop or category 1 laboratory area	Please select	
>	Office - Staff canteen dining area	Seated dining areas that accompany a permanently staffed kitchen preparing food for consumption on the premises (excludes small un-staffed kitchen's used by office staff to re-heat food, make tea etc.)	Please select	
>	Office - Fitness suite/gym (with changing facility and showers)	A fitness suite or gym that is part of the office building/development and used by the building's employees only. The gym will have its own changing facility with showers.	Please select	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (no urinals installed)	Effective flush volume (Litres)	6.00	4.00	1.00	12.00
WC - female	Effective flush volume (Litres)	6.00	4.00	1.00	12.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	6.00	4.00	0.25	4.06
Shower use	Flow rate (litres/min)	0.00	0.154	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	10.00	1.00	0.67	4.54
Dishwasher	Litres/cycle	17.00	0.04	1.00	0.68
Tap components (cleaning and food preparation) - staff canteen food preparation area					
Kitchen taps - pre-rinse nozzle	Flow rate (litres/min)	0.00	-	60.00	0.00
Dishwasher	Litres/rack	0.00	-	0.217	0.00
Waste disposal unit	Flow rate (litres/min)	0.00	-	30.00	0.00
Fixed use - food preparation	Litres/person/day	-	-	-	0.00
Fixed use - kitchen cleaning	Litres/person/day	-	-	-	0.00

	Microcomponent consumption (L/person/day)
Total	34.86

Minimum requirements according to EU taxonomy for sustainable finance

Do all the installed wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min?	System not specified
Do all the installed showers have a maximum water flow of 8 litres/min?	System not specified
Do all WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres?	System not specified
Do all urinals use a maximum of 2 litres/bowl/hour and flushing urinals have a maximum full flush volume of 1 litre?	System not specified
Is all the EU taxonomy requirements for sanitary equipment met?	Yes

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice	No

Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (L/person/day)

Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (L/person/day)

	Greywater yield (L/person/day)
Total	0.00

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS EN 16941-1:2018 Rainwater Harvesting Systems - Code of practice	No
How has the storage capacity for the proposed system been calculated?	

Rainwater yield if basic approach:

Collection area (m2)	Rainfall (average mm/yr)	Hydraulic filter efficiency (%)	Yield co-efficient (%)	Annual rainwater yield (Litres)	Rainwater yield (L/person/day)

Rainwater yield if detailed:

Daily rainfall collection (litres)	Rainwater yield (L/person/day)

Non Potable Water Demand - Building Components

	Greywater and/or rainwater yield (L/person/day)
Total	

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (L/person/day)

	Demand met by yield (L/person/day)
Total	

Other permissible components

	Maximum permissible demand (L/day)

	Demand met by yield (L/person/day)
Total	

	Greywater and/or rainwater demand met by yield (L/person/day)
Total	

Water consumption calculation results

	Litres/person/day	m^3/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**258.05**	**65.29**
Microcomponent water consumption - modelled performance (excludes fixed uses)	**33.28**	**8.42**
Modelled water demand met via greywater and rainwater sources	**0.00**	**0.00**
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met	**System not specified**	
Net modelled water consumption (excludes fixed uses)	**33.28**	**8.42**
Percentage improvement	**87.10%**	
Total Wat 01 BREEAM credits achieved, before checking minimum requirements according to EU taxonomy for sustainable finance.	**5 credits**	
Total Wat 01 BREEAM credits achieved	**5 credits**	
Total Wat 01 BREEAM Exemplary credits achieved	**1 innovation credit achieved**	
Key performance indicator - use of freshwater resource (includes fixed uses)	**34.86**	**8.82**

Annex C Wheel Wash Specifications

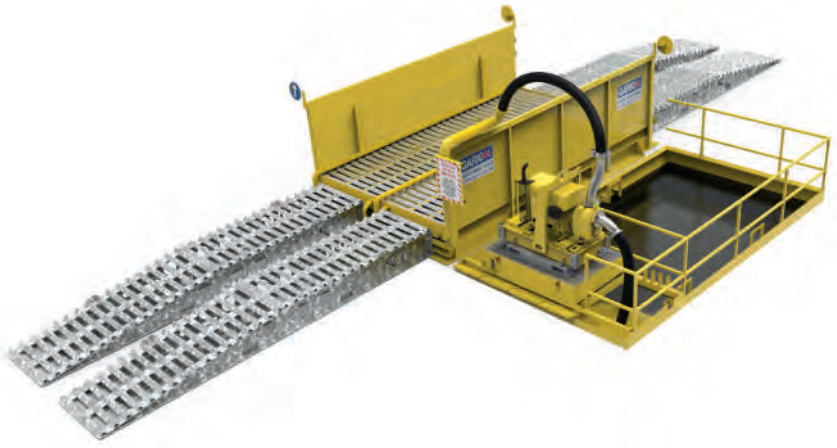
GARIC

ON-DEMAND, ON-SITE, ON-TIME.

SALE ITEM
BUY ME TODAY

ENVIRO WHEEL WASH

A HISTORY OF INNOVATION



STANDARD SPECIFICATIONS:

Product Code	300002
Unit Name	Enviro Wheel Wash
Dimensions with ramps	62 x 24ft / 20 x 7.3m
Dimensions without ramps	22 x 24ft / 6.7 x 7.3m
Weight	12,200Kg
Weight (with ramps)	14,200Kg
Power type	6" Diesel water pump
Steel fabricated wash area	✔
Internal removable rumble road sections	✔
25mm water inlet (c/w ball cock fitted)	✔
Heavy duty lifting/lashing points	✔
Automated magic eye system	✔
Dig Measurements	6.3m length x 1.02m depth x 3.5m width

Our enviro wheel wash is the ideal solution for demolition, quarrying and ground works sites where trucks, dumpers and lorries are regularly passing through heavy duty mud, dirt and debris.

Our fully automated and totally self-sufficient enviro wheel wash is perfect for sites where sticky clay and mud can be a big problem. As vehicles pass through the wheel wash, exceptionally powerful jets spray water onto the wheels, chassis and undersides, cleaning the vehicles without them even needing to stop. The wheel wash is environmentally friendly and utilises the latest water filtration technology combined with a 100 percent water recirculation system.

It doesn't require an operative and is easy to maintain due to an innovative easy-clean water catchment area. Furthermore, it requires no electricity power source because it runs off a simple yet reliable 6" diesel pump.

The enviro wheel wash can be elevated and placed directly onto a surfaced area with ramps or excavated into the ground making it suitable for a large variety of sites.

KEY FEATURES:

- Powered heavy duty wheel wash
- Steel fabricated wash area
- Heavy duty lifting and lashing points
- Cleaning area with vertical spray jets
- Automatic sensors

OPTIONAL EXTRAS AVAILABLE

- Remote lagoon
- Upgrade max load
- Upgrade - Additional spray/wash nozzles
- Upgrade - duel pump system
- Electric pump
- Corporate paint spec.