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|  | **Isles of Scilly – Lower Moors SSSI Management Plan**  - Brief for Delivery of Hydrological Monitoring and Topographic Survey  REF LMS 071 |
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|  | September 2016 |
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**Appendix 1 – Lower Moors SSSI Topographic Survey Technical Brief**

**Appendix 2 – Lower Moors SSSI Hydrological Monitoring Technical Brief**

**Key Reference Material**

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| **Title** | **Source / Location of Document** |
| Lower Moors SSSI – Improved Hydrological Management: Scoping Study, Milestone Environmental 2016 | See Folder Specification and Supplementary Info |
| Scoping-Level Hydrological Assessment of Lower Moors SSSI, Isles of Scilly, Rigare Ltd 2015 | See Folder Specification and Supplementary Info |
| Natural England Designated Sites Website; Natural England Designated Sites View – Lower Moors (St. Mary’s) SSSI | https://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001273&SiteName=lower moors&countyCode=23&responsiblePerson= |
| A statement of English Nature’s views about the management of Lower Moors (St. Mary’s) Site of Special Scientific Interest (SSSI). | <http://www.sssi.naturalengland.org.uk/Special/sssi/vam/VAM%201001273.pdf> |

# 1. Introduction

The Council of the Isles of Scilly (the Council) is seeking to improve its understanding of the hydrology of the Lower Moors Site of Special Scientific Interest (SSSI). This is with a specific view to improved understanding for the management of this site and alleviating surface water issues in the area, including; flooding of the adjacent industrial site and waste site; increased freshwater run off from the industrial and waste sites into the Lower Moors; potential water quality issues originating from the waste site and saline intrusion into the site primarily from the south.

To this end the Council is seeking tenders to undertake both a topographic survey and a hydrological monitoring study of the Lower Moors.

The details for the briefs for both these studies have been provided by Milestone Environmental, who completed a scoping study for the Improved Hydrological Management of the Lower Moors SSSI in early 2016 (see key reference material list on page 3).

Specifically the topographic survey will enable calculation of the following;

* Areas contributing flow into the central ditch at the top of the site;
* Flow hydraulics through the ditches (central ditch, ring ditches and other minor channels) at given hydraulic gradients within the wetland and adjacent marginal areas;
* Above ground water storage within the wetland at different water levels:
  + Within the ditches
  + Across the wetland surface;
* Assessment of the potential for runoff generation from and the industrial and waste sites, and the potential for storage of this runoff in these sites and the wetland itself;
* Identify transmission pathways for saline intrusion and pollution; and
* Culvert outlet flow at different water levels.

The hydrological monitoring will provide the following;

* Hydraulic gradients (and in conjunction with a theoretical rating, water transfers) relative to surface topography;
  + Along the central ditch;
  + Through the eastern and western ring ditches;
  + Through other minor ditches;
* Surface water storage across the wetland site, and subsurface hydraulic gradients;
* Inflows from the industrial and waste sites;
* Other minor flow pathways through the wetland, including associated water quality issues;
* Outflows from the wetland through the culvert outlet;
* Extent of saline intrusion; and
* Assess the impact of management regime changes, including the seasonal use of the stop plank structure at the downstream end of the site boundary.

Together these reports will enable the development of a hydrological management plan for the Lower Moors SSSI.

# 2. Project Scope

BACKGROUND INFROMATION

The Isles of Scilly is an archipelago of over 200 low lying granite islands and rocks located some 28 miles south west of Land’s End. The Islands have a combined land mass of 16km2.

There are 5 inhabited islands. The largest is St Mary’s with a land mass of 6.29km2 and a population of 1670, out of a total of 2,253 residents across all 5 inhabited islands. In the summer season the population increases to over 6,000 people.

Lower Moors is located immediately to the east of Hugh Town on the island of St Mary’s. The site is owned and managed by the Isles of Scilly Wildlife Trust and is within the Isles of Scilly Area of Outstanding Natural Beauty. It is a designated Site of Special Scientific Interest (SSSI) under Section 28 of the Wildlife and Countryside Act, 1981, (as amended). The site comprises a topogenous mire, exhibiting a range of wetland habitats, developed on alluvium and peat overlying the granite bedrock. Streams and drainage ditches flow southwards towards Old Town Bay. The Natural England condition summary for the SSSI currently states that the site is in an “Unfavourable – Recovering” state.

Figure 1; Location of the Lower Moors SSSI



In Spring 2016, Milestone Environmental completed a scoping study assessing the requirements for increasing understanding of the surface water hydrology. This is with a view to alleviating surface water issues including flooding of the adjacent industrial site and waste site; potential water quality issues originating from the waste site; and saline intrusion. Two key recommendations from this study were;

1. the completion of a detailed topographic survey to elucidate flow pathways, flow capacities of surface drainage channels and structures, inflows from the industrial and waste sites, and likely hydro-ecological interactions.
2. the installation of a structured network of hydrological monitoring to increase the understanding of surface water dynamics at the site, and thus facilitate improved site management.

As part of that work Milestone Environmental have provided the technical briefs for this tender. These briefs are provided as Appendix 1 and Appendix 2.

# 3. Project Specification

**3a Topographic Survey**

The brief for the Hydrological Monitoring is provided as Appendix 1.

**3b Hydrological Monitoring**

The brief for the Hydrological Monitoring is provided as Appendix 2.

The Isles of Scilly Wildlife Trust will be undertaking their usual land management duties across the Lower Moors area throughout the duration of the project. Information concerning these land management activities will be provided during the project so that any works that affect the site conditions during the monitoring phase can be taken into account.

It should be noted that the Isles of Scilly Wildlife Trust have agreed that, as part of their routine duties in the area, they will be able to undertake the manual measurements on the dip wells and monitoring wells to help in the ongoing hydrological monitoring and to provide suitable verification of data logged values. There is a need for tenderers to provide the required level of training and instruction to enable this to be carried out. The cost of this training and instruction should be specified as an additional item in the cost narrative. The frequency and time commitment for the manual measurement requirements should be clearly specified in the proposed tender.

# 4. Outputs and Objectives

**4a Topographic Survey**

As detailed in the brief for the Topographic Survey, Appendix 1, Section 3.1 Output, the following should be provided;

Prior to work commencing:

* Risk assessment outlining perceived operational risks and appropriate mitigation, to be updated throughout the project.
* Method statement required outlining a planned technical approach and logistics.

Upon completion of the survey:

* Short report, including:
  + Survey conditions;
  + Access problems;
  + Survey coverage;
  + Accuracy of measurements;
* xyz files in csv format and pdf format;
* Lateral locations should be provided using the Ordnance Survey National Grid reference system;
* Vertical elevation should be provided in metres above Ordnance Datum (maOD);
* Map of survey points in pdf and dwg format; and
* Photos of all features surveyed, indexed to features.

**4b Hydrological Monitoring**

As detailed in the brief for the Hydrological Monitoring, Appendix 2, Sections 3.1 Output, 3.5 Data Analysis and Interpretation the following should be provided;

Prior to installation of monitoring network;

* A full risk assessment for the works and project, continually updated throughout the project
* A work method statement

Upon Completion of installation of monitoring network;

* Short Report detailing the installation
* Field Sheet for manual dip well readings

At the completion of data collection over each 12 monthly interval the data will be subject to analysis and interpretation. This will be completed to increase the understanding of the site’s surface water flow pathways and mechanisms. Specific requirements will be to;

* Analyse water levels from the monitoring programme and infer flow rates under different conditions in the central ditch and minor ditches across the site;
* Analyse water storage and movement via the wetland surface (including areas of open water) and shallow subsurface profile using the data from the network of dip wells arranged in north-south and east-west transects;
* Develop a theoretical rating for the stop plank structure, enabling flow to be estimated from upstream water level at the point of monitoring;
* Develop a theoretical rating for the outlet culvert, enabling outflow to be estimated from upstream water level at the point of monitoring;
* Assess the likely flow pathways originating from the waste site and the industrial site, with implications for pollution distribution across the wetland site, noting the potable water abstraction borehole site;
* In collaboration with any available runoff calculations, develop an assessment of runoff contribution from the industrial and waste sites, and implications for flooding;
* In conjunction with botanical and water quality surveying, assess the hydro-ecological interactions across the wetland site, including saltwater intrusion points; and
* Develop and update a proposed site management plan in collaboration with all stakeholders, using the development of hydro-ecological understanding and to include assessing the effectiveness of potential management options.

At the end of the project,

* Use the monitoring programme and topographic survey to derive the following:
  + Hydraulic gradients (and in conjunction with a theoretical rating, water transfers) relative to surface topography;
    - Along the central ditch;
    - Through the eastern and western ring ditches;
    - Through other minor ditches;
  + Surface water storage across the wetland site, and subsurface hydraulic gradients;
  + Inflows from the industrial and waste sites;
  + Other minor flow pathways through the wetland, including associated water quality issues;
  + Outflows from the wetland through the culvert outlet
  + Assessment of the potential for runoff generation from and the industrial and waste sites, and the potential for storage of this runoff in these sites and the wetland itself;
  + Identify transmission pathways for pollution and saline intrusion during different seasons; and
  + Assess the impact of management regime changes, including the recommended seasonal use of the stop plank structure at the downstream end of the site boundary or the potential for use of additional stop plank structures at other locations across the site.
* Provide a hydrological site management plan in collaboration with all stakeholders.

# 5. Programme & Costs

PROGRAMME

It is anticipated that the project would start as soon as possible with initial set up and installation taking place during the last quarter of 2016.

The topographic survey is fundamental to the understanding of the site and will help in the monitoring part of the project. It is anticipated that this study would take place at the part of the study preferably in late summer / early autumn of 2016 whilst the area is less likely to be saturated and when the vegetation cover is at its least problematic.

The hydrological monitoring will follow the more detailed option, Option c, as detailed in the Hydrological Monitoring Technical Brief. The tender is required for a 24 month monitoring project and should include quarterly service and download visits. A description of the methodology and a proposed work programme, including proposed dates, should be provided. A proposal and suggested methodology should also be provided for the provision of a long term (5 year period) dataset to monitor longer term changes, including sea level rise and salt water intrusion, after the completion of the 24 month project.

Prior knowledge of the site is preferable and it is therefore suggested that tenderers should arrange to visit the site prior to submission. Arrangements can be made by contacting Julian Pearce, 01720 424806, jpearce@scilly.gov.uk

COSTS

All submissions will be required to provide lump sum prices for the delivery of each of the two aspects, the hydrological monitoring and the topographic survey, of the project.

Costs should be provided for a 24 month project following the option c of the Hydrological Monitoring Brief. An additional estimated guide price should also be included for provision of a long term (5 year period) dataset at key locations to monitor longer term changes including sea level rise and salt water intrusion after the completion of the project.

The lump sum prices will need to include any and all costs the potential providers feel are necessary for meeting the technical briefs and providing the information detailed in the briefs and Section 4 – Outputs and Objectives, above. Tenderers should include a narrative in their submissions laying out the basis of their costs.

The Hydrological Monitoring cost narrative should be presented with reference the requirements listed in Section 3 of the brief by Milestone Environmental using the headings;

1. Installation of Dipwells
2. Data Logging
3. Monitoring Points – Installation
4. Monitoring Points - Data Recording
5. Data Analysis, Interpretation and Reporting.

This will help the Council understand the basis of the tender. The pricing summary table in the Quotation Opportunity Form must be used to provide a summary breakdown of costs.

The Council will make payments to the appointed tenderer on an invoice basis for work completed. The topographic survey should be invoiced on completion of that element of the project. The hydrologic monitoring should be invoiced at staged periods throughout the study.

Estimated Contract Value = £30-35,000

# 5. Tender Process

This tender shall be run under an open tender process. It will be awarded on the basis of cost (70%), the proposed methodology (10%), the work programme (10%) and relevant experience and capability (10%).

Tenders must be in hard copy and should be sent to the address specified in the ITT. Tenderers are reminded that envelopes containing the submissions should be clearly marked as “TENDER FOR LOWER MOORS SSSI MANAGEMENT PLAN – DO NOT OPEN ON RECEIPT”. Specifics relating to the formatting of the submission and the tender envelopes are described in more detail in the ITT.

All participants are required to fill out the Expression of Interest (EOI) form for the tender and return this to Sean Parsons at the following address; [LowerMoorsTender@scilly.gov.uk](mailto:LowerMoorsTender@scilly.gov.uk)

Tenderers shall insure that an electronic copy is provided with the submission on a CD/DVD.