



Environmental Data Management Solutions Needs Assessment Report 2025

Town of Nantucket

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Prepared For:

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ATTACHMENT

Attachment A: Solution Requirements Matrix

1.0 Project Overview

The Town of Nantucket (the Town) is committed to advancing data-driven environmental stewardship for the health and well-being of its residents. In support of this goal, Nantucket is interested in implementing a data management, visualization, and geospatial solution to address current and future data needs related to PFAS and other environmental datasets. Therefore, the Town has contracted TRC to conduct a Needs Assessment and supporting data inventory.

For this Needs Assessment the TRC team gathered information by working with Town staff from the Health & Human Services, Town Administration, and Information Technology departments, conducting several meetings focused on the Town's current practices, desired functionality, and workflows for a new environmental data management system (EDMS). In order to systematically assess the needs and goals of the Town, a detailed Solution Requirements Matrix (Attachment A) was created. The matrix captures the business, technical, and functional requirements and defines the overall prioritization of each requirement in relation to the Town's goals.

The assessment identified opportunities to improve data quality, accessibility, and integration with existing Town systems. Stakeholder input has informed the identification of needs, priorities and gaps, laying the foundation for a seamless transition to a future system.

The assessment highlights three core themes for the identification, development, and implementation of the EDMS platform:

- **A scalable solution** that can adapt to evolving environmental monitoring needs, including PFAS assessment, mitigation, and remediation, as well as integration of future environmental and geospatial datasets.
- **Strong data governance and management practices**, including quality assurance, consistency, security, and usability of data.
- **A flexible platform** that can integrate with existing Town systems and procedures and support cross-departmental data sharing and collaboration.

2.0 Business Needs

The Town seeks to implement an enterprise EDMS to standardize and centralize existing ad hoc systems and processes across multiple boards, commissions, and departments. The EDMS will provide the Town with a more sustainable, centralized approach to environmental data management that is accessible across divisions, well documented, consistent, and secure. Such a system will increase efficiencies in collecting, managing, searching, and reporting environmental data into the future.

The emergence of per- and polyfluoroalkyl substances (PFAS) as critical environmental and public health concerns means regulatory agencies, stakeholders, and the public need accurate, timely, and accessible PFAS data to inform risk management, regulatory compliance, and remediation decisions. The EDMS should improve cost control in the mitigation and remediation of PFAS by enabling tools needed for better forecasting, progress tracking, and adaptive management. The ability to rapidly access and analyze reliable PFAS data will enhance the Town's responsiveness to community concerns and changes in regulatory requirements.

The development of an EDMS for PFAS data is a strategic investment that mitigates legal and financial risks, ensures regulatory compliance, enhances data integrity, enables data-driven decision-making, and reinforces the Town's commitment to long-term environmental stewardship.

The following sections describe the minimum technical and functional requirements of an EDMS based on the objectives of the Town. Only those features identified as "high priority" in the matrix found in Attachment A are listed below. These are the minimum requirements for the Town.

3.0 Technical Needs

Technical needs are those system requirements that meet IT governance and security standards, hardware and software requirements, and level of performance expectations.

- Hosting and Infrastructure Requirements
 - Cloud-hosted solution that can be supported and maintained by Nantucket long-term, following initial configuration and training.
 - Development/test and production database and Enterprise environments must be available.
 - Scalability, allowing for growth of information and increasing user base without infrastructure expansion.
- Security Requirements
 - Integration with Microsoft Active Directory for team creation and member authentication with standard security measures for logging into the platform(s).
 - Protection of Personally Identifiable Information (PII).
 - Accessible through the organization's network using existing employee credentials or a secured user login account.
 - Role-based access control should be enforced, ensuring only authorized users can access the system or submit data.
- General Requirements
 - Configurable, off-the-shelf solution with a relational database schema that

supports environmental tasks and data (i.e., media, operational units, sampling events, sampler, etc.).

- Intuitive and user-friendly.
- Reliable operation with minimal downtime.
- Allows for customization to meet the needs of the Town.
- Low code/no code interface for data loading, querying, and configuration.
- Integration with other solutions owned by the Town, specifically, an enterprise ArcGIS deployment currently under development and potentially with PowerBI.
- Web-based dashboard solution to allow users to access and interact with the data without having the ability to alter the data.
- Forms and dashboards must load and respond quickly even during peak usage periods.
- Rest API available
- Standard workflow for new data acquisition
 - Nantucket needs an electronic data deliverable (EDD) format to receive sampling and analytical data from internal and external data providers. This includes an EDD format and a process by which data providers can submit data to Nantucket.
 - Process to check/validate data submissions to ensure that they conform to the database integrity requirements.

4.0 Functional Needs

Functional needs describe how the EDMS should operate to meet the goals identified by the Town. Functional needs pertain to the various data types to be managed and the user roles who will work with the data through the various steps in the EDMS workflow. The following is a list of functional needs identified during the assessment.

- Accommodate historical data from the following data sets identified during the data inventory discussion with the Town. These data are categorized as either part of the initial migration into the chosen EDMS or part of a future migration. Regardless of migration phase, the EDMS must be able to support the types of data listed. Data sets considered for initial and future migration include:

Data Source	Data Format	Estimated Volume	Migration Phase
MassDEP - Island-wide Investigation	PDF documents and Excel spreadsheets	100-150 laboratory reports	Initial

Data Source	Data Format	Estimated Volume	Migration Phase
Surface Water Sampling Data	EQulS compliant EDD	50 samples	Initial
Water Supplier Data	PDF documents, Excel spreadsheets may be available	50 samples	Initial
Health Department - Private Well Data	Excel spreadsheet	1 spreadsheet containing approximately 350 locations	Initial
Subconsultants - Landfill Data	Unknown/Mixed formats	Large volume but exact amount is currently unknown	Initial
Waste Water Treatment Plant	Excel spreadsheet or EQulS EDD possible	600 samples	Initial
Health Department - Private Well Water Quality Parameters	Excel spreadsheet	500 Samples	Future
Airport Data	PDF documents currently	1,500 samples	Future

- TRC will work with the Town to determine whether any data currently available in PDF format only can be obtained in an alternate digital format such as Excel or EQulS EDD before attempting to transcribe and migrate.
- Workflow for defining and managing reference values, the controlled terminology used to ensure data meets referential integrity requirements prior to entering the database. These reference values will be managed by the Town's EDMS Power User who will be responsible for maintaining data management standards, ensuring timely upload of field and analytical data and performing reporting and analysis as required.
- Track the confidence and metadata associated with each sample or result and have a mechanism to track the original source of the data. These metadata may include sampling methods, sampling purpose, sampling company or individual, source of the data (lab report, 3rd party summary table, etc.), chain of custody information, etc.
- Automated data validation and qualification following National Functional Guidelines (<https://www.epa.gov/clp/superfund-clp-national-functional-guidelines-data-review>) or similar is desired for future implementation.
- Reporting Needs
 - Out of the box reports used to tabulate data, aggregate min/max/average and compare concentrations against the MA state regulatory limits.
 - Low-code/No-code reporting options should be part of the out of the box solution but allow for custom queries should the out of the box reports not be sufficient.

- Support graphical reporting including summary statistics, time series, bar charts and box plots of any data extent
- Support statistical analysis using R, ProUCL or other statistical software packages.
- Triggered reporting capabilities that allow for reports to be automatically generated either by date or some other trigger.
- Enterprise Dashboards and Integration with 3rd Party Systems
 - Allow for data presentation via dashboards for the display of field and analytical data, time series charts, data validation results, and GIS maps.
 - Dashboards should be configurable and customizable to meet the needs of each user and have the potential for providing a public-facing dashboard.
 - Integrate with Esri ArcGIS to get a smooth surface, isocontours, heat maps, etc. with the ability to change visualization by selective filtering.
 - Serve data to PowerBI or other dashboard tools with the ability to schedule refresh rates of less than 24 hours.
- Training and Documentation Needs
 - Town EDMS Users need to have access to online training materials, webinars, and an official training implementation for Town Users specific to data workflows pertaining to each Town Division.

5.0 Recommendations and Next Steps

Based on the business, technical and functional needs, TRC recommends review of Locus EIM and EarthSoft EQUIS commercial-off-the-shelf environmental data management solutions. TRC believes that both solutions fit most if not all of the requirements identified through the needs assessment.

Locus

Locus's environmental information management (EIM) software, developed in 1999, handles environmental data ranging from soil, air quality, tissue, water, and associated field information. EIM provides administrators, consultants, and scientists with far greater control of the data than is possible with spreadsheets and many databases.

EIM allows users to quickly load field, laboratory, or any other analytical data via multiple EDD formats, FTP, Excel® imports, surveys, mobile devices, email, or manual entry. EIM converts units, flags potential errors, and offers automated data validation to protect integrity. And pre-built, complex calculations accelerate the analysis. Locus EIM and EIMone (a reduced version of EIM), scales to fit the largest enterprises to the smallest water utilities.

EIM is used by Fortune 500 companies, water utilities, and the US Department of Energy.

EarthSoft EQUiS

EarthSoft is a global leader for data management systems and the producer of EQUiS™. EQUiS offers two centralized environmental and geotechnical data management systems on one platform. EQUiS is scalable and configurable with an automated end-to-end workflow solution that enforces data standardization in a secure and collaborative workspace.

Industry, government, consultants, and laboratories use EQUiS to make critical decisions about their liability, environmental social governance (ESG), sustainability, and compliance goals and requirements. EQUiS manages data types in the areas of chemistry, biology, geology, geotechnical, limnology, water, air quality, soil, sediment, noise, radiological, waste, and associated compliance monitoring. EQUiS and integrated third party applications support comprehensive environmental and geotechnical project workflows, providing solutions for a variety of project requirements.

The following matrix summarizes the high priority requirements identified through the needs assessment and describes the ability of each software to meet that requirement. Fields populated with an “X” indicate that the feature is a standard part of the out of the box solution. Fields populated with a “~” indicate that vendor involvement and additional cost for customization or configuration may be required. Fields populated with a “*” indicate that the feature is not available and may require manual workflows or custom-built tools to meet the requirement.

Features / Software	Locus	EarthSoft EQUiS
Cloud-hosted	X	X
Scalable	X	X
Configurable, off-the-shelf solution	~	X
Active Directory Integration	X	X
Accessible through the organization's network using existing employee credentials or a secured user login account	X	X
Role-based access control	X	X
Protection of Personally Identifiable Information (PII)	X	X
Intuitive and user-friendly	X	X
Reliable operation with minimal downtime	X	X
Customizable	~	X
Low code/no code interface for data loading, querying, and configuration	X	X
Integration with Esri tools	*	X

Features / Software	Locus	EarthSoft EQUIS
Integration with PowerBI	*	X
Web-based dashboard	X	X
Rest API	X	X
Process to check/validate for data integrity	X	X
Have a process for defining and managing controlled terminology	X	X
Accommodate historical data from different sources	X	X
Track the confidence and metadata including sampling methods, sampling purpose, sampling company or individual, source of the data (lab report, 3rd party summary table, etc.), chain of custody information, etc.	X	X
Automated data validation and qualification	X	X
Out of the box report templates used to tabulate data and aggregate min/max/average and compare concentrations against the MA state regulatory limits	~	X
Low-code/No-code reporting options	X	X
Custom query development	~	X
Support graphical reporting including summary statistics, time series, bar charts and box plots of any data extent	X	X
Support statistical analysis using R, ProUCL and other statistical software packages	~	X
Triggered reporting capabilities that allow for reports to be automatically generated either by date or by some other trigger	~	X
Dashboards should be configurable and customizable to meet the needs of each user and have the potential for providing a public-facing dashboard	~	X
Access to online training materials, webinars	X	X
Helpdesk for troubleshooting	X	X

5.1 Next Steps

After reviewing the requirements of the Town and the capabilities of each EDMS, TRC believes that the EarthSoft EQUIS solution will best serve the current and future needs of the Town. While choosing the appropriate data management solution is important, ensuring the proper configuration and implementation of the software is critical to long term success. TRC recommends a comprehensive approach to EDMS implementations which include the following phases:

- Project Setup

- Workflow Documentation
- System Configuration
- Data Migration
- Reporting and Visualization Configuration
- Training and Governance Documentation

The following sections of this document describe the recommended next steps for the Town to successfully implement the EQUIS EDMS.

5.1.1 Phase 1 - Project Setup

A kickoff meeting to introduce all project team members is strongly recommended. The meeting creates an opportunity to review tasks, roles and responsibilities, define expectations and rules for communication, such as points of contact and frequency of communication. Some activities associated with the System Configuration, Data Migration and Reporting and Visualization tasks including the software licensing requirements, compilation of datasets, example report deliverables and dashboard expectations will be discussed.

As part of the software licensing discussion, the Town will need to determine whether to immediately purchase software licensing and have all tasks performed within the Town-owned EQUIS environment, or delay purchasing and have portions of these tasks performed within TRC's EQUIS environment. The following tasks could be completed using TRC's environment without creating rework:

- Defining reference values
- Defining and customizing EDD formats
- Migration of data

Performing the above tasks within TRC's EQUIS environment will delay the Town's need to purchase licensing, providing some cost savings, however, this approach may extend the timeline to project completion due to the additional task of transferring the database from TRC to EarthSoft. EarthSoft also charges a nominal fee to perform the transfer.

Should the Town choose to purchase licenses immediately, TRC recommends that the Town initiate discussions with the software vendor prior to the kickoff meeting to procure any licensing and access credentials to the software. This will help to shorten the time between the kickoff meeting and system configuration.

5.1.2 Phase 2 - Workflow Documentation

Before the system configuration can begin, a Data Management Workflow, defining how the data will be managed in EQulS, should be created. Any existing workflows should be discussed and reviewed to determine how EQulS can best be optimized for those workflows. The team will walk through business cases to document requirements for planning, collecting, managing, and reporting field and analytical data.

Workflow details defined in this phase will include, but are not limited to, mapping data requirements for specific reports, establishing synonyms, and defining reference values. Prioritization of specific items in each of these workflows, such as electronic data deliverable (EDD) formats and reports will be determined during this phase.

5.1.3 Phase 3 - System Configuration

The technical configuration of EQulS completed in this phase will use the Data Management Workflow definitions, requirements, and procedures developed in the previous phase. The configuration includes but is not limited to:

- Installation, setup, and configuration of EQulS
 - Configuring application database service account(s)
 - Configure Windows Authentication login(s)
- Configure EQulS Enterprise Roles and Application Level Security (ALS) roles based on user responsibilities.
 - An EQulS permissions matrix will be included as part of the Governance documentation discussed in Phase 6. This includes Read Only, Read Write and Systems Admin permissions.
- Create facilities and facility groups as needed.
- Establish the Electronic Data Deliverable (EDD) format for use in loading all field and laboratory data into EQulS.
 - Depending on the format chosen and the state of historical data, this EDD format may also be used to support the data migration effort.
- Establish the initial reference values used to control data validity in the EQulS database to be adhered to by laboratories and contractors.
- Define and load Method Analyte Groups (MAGs).
- Action levels will be compiled and loaded
- Reports will be configured
- Dashboard views will be created as prescribed within the scope

- Configured to export data for regulatory data submissions
- Any other configuration steps identified as part of the Data Management Workflow.

Each task will be prioritized based on dependencies of other subsequent tasks and level of effort. The configuration is completed when the system is operational and supports the data workflow defined in Phase 2.

5.1.4 Phase 4 - Data Migration

TRC understands that the data to be migrated comes from multiple sources and is in inconsistent formats. For each data migration design task, decisions on how to transform and harmonize the data into a single EQUIS data structure and resolve any repetitive data quality issues will be documented. Should data of poor or questionable quality be identified, the data will be flagged for review, the Town will be notified and ultimately make the determination on how to address the data prior to loading into EQUIS. Data mapping will include remapping reference values that will be used going forward for the collection and reporting of new data.

Data migration tasks include:

- EDD Format Definition
 - TRC will work with the Town to define an appropriate EDD format for loading all historical data. It is possible that the format used to load historical data may be different than the format identified for future data loading.
- Data Mapping
 - TRC will use EQUIS Link, EarthSoft's data mapping tool to map the data from the source format to the chosen EQUIS EDD format. Link allows for the use of functions, formulas and parser functionality to transform the data into an EQUIS compatible format that meets data quality requirements, without the need for manual edits, reducing the likelihood of introducing erroneous data.
- Data Processing
 - TRC processes the source data using the EQUIS Data Processor. Due to the size and formats of the datasets to be migrated, TRC anticipates creating multiple EDDs.
 - TRC will automate the data loading task wherever possible using Enterprise EDP which automatically checks the data against database requirements and business rules defined in the EDD format before loading the data directly to EQUIS.
 - Any EDDs that fail to load will be reviewed by TRC to determine the cause of data quality errors and resolve errors that are deemed "minor", as described below.

- Processing actual data usually reveals issues that are not identified through the data inventory and EDD design phase. This discovery process is assisted by the error checking capabilities of EDP.
- In the process of migration, data deficiencies are often discovered that may require intervention to be able to complete the migration. Should TRC discover a major or pervasive issue, the Town will be alerted at the earliest opportunity to allow informed decisions to be made. Minor issues include:
 - Improper identification of field duplicate/parent sample pairings
 - Improper identification of sample types (field blank, trip blank, normal sample)
 - Missing location and coordinating information
 - Incomplete pairing of sample names with locations
 - Missing sample depths (if relevant)
 - Reference value adjustments

The data migration assumes the data in the source datasets are consistent and of good known quality. When consolidating multiple datasets into EQuIS, the data will use approved reference values consistently. This process requires the use of the EarthSoft Data Processor (EDP), which will check all incoming data against the EDD format business rules and Town reference values. Sometimes data quality issues arise due to the inconsistent use of fields, duplicated data, or other unanticipated obstacles in the source data that are often encountered when evaluating data for inclusion. In some cases, there may be data quality issues that are not easily resolved by the TRC data migration team, and the Town will need to decide if fixing the data by review of source documentation is worth the effort for certain potential data challenges.

Data migration challenges may include:

- Source data referential integrity.
- Source data duplications or multiple reported results per sample.
- Source data correctness.
- Source data completeness.
- Laboratory quality control data issues
- Data inventory considerations
- Documentation
 - Throughout the data migration, TRC will document any data quality findings and data transformations to meet the Town's data quality requirements in a Data Migration Tracking Matrix.

- The Data Migration Tracking Matrix may include:
 - Data mapping from source files to chosen EDD format
 - Details of correspondence between TRC and the Town
 - Special data quality issue handling
 - Decision making processes and results to complete data migration.
- Data Migration Correctness and Completeness Checks
 - Throughout data migration, TRC undertakes Migration Correctness and Completeness Checks. These include:
 - Mapping Checks – to confirm the data has been migrated to the correct fields in EQulS.
 - Check the physical mapping against the approved mapping document.
 - Check the special case mapping, e.g., data transformation using conditional mapping.
 - Row count checks – to confirm all the data records in EDDs loaded properly.
 - Checksum – aggregating and verifying data values.
- Data Deliverable
 - Once the data migration to the Test environment has been completed and confirmed to be correct, TRC loads the data to the Production environment.
 - If requested, TRC can provide the migrated data in the final EDD format.

5.1.5 Phase 5 - Reporting and Visualization Configuration

Once the historical data has been migrated successfully, development and configuration of reports and Enterprise dashboards can be completed. Report configurations will meet the requirements for analysis and reporting and be published to the database for use via EQulS Enterprise. Tasks associated with report and Enterprise configuration include:

- Enterprise report management and folder configuration for report organization.
- User permissions support associated with reporting capabilities.
- Establish a base library of EQulS System Reports to be used for the majority of the Town's data management and reporting needs.
- Report and cross-tab configuration including setting parameters and best practices for use of Analytical Results II and Action Level Exceedance II Reports.

- Configuration of a standard table output for laboratory analytical results and for analytical results screened against an action level.
- Export to support statistical analysis using ProUCL or R.
- Regulatory data submission to MassDEP
- Publish reports to EQUS for Enterprise and RestAPI consumption.
- Configure an EQUS Enterprise dashboard including an embedded PowerBI dashboard as appropriate for internal Town use to perform the following functions:
 - Load laboratory analytical data using designated Town EDD format.
 - Export standard reports described above.
 - View locations via Map widget
 - View analyte exceedances for select PFAS compounds using Traffic Light widget
 - View analyte concentrations for select PFAS compounds using Time Series Chart widget.

Esri Integration

Once reports have been configured and published, a process will be established to integrate that data into the Town's Esri ArcGIS platform to support seamless spatial visualization, analysis, and reporting of the environmental data.

Scope of Integration

The integration will leverage EarthSoft's EQUS Enterprise and/or Professional in combination with Esri's ArcGIS Online, Enterprise, or Desktop environments. Key components include:

- **Spatial Data Mapping:** Develop standard GIS layers and schema used to establish the synchronization between EQUS and ArcGIS.
- **Data Synchronization:** Configure automated data flows from EQUS to ArcGIS feature layers using EQUS Link, REST services, or scheduled exports to geodatabases (e.g., file GDB or ArcSDE).
- **Visualization Tools:** Enable interactive dashboards, time-enabled data displays, and thematic mapping within ArcGIS using real-time or near-real-time EQUS data.
- **Bidirectional Support (optional):** Explore workflows for ArcGIS users to submit or annotate data that feeds back into EQUS with appropriate data governance.

Technical Approach

- Utilize EQUS formats and EDP for structured data ingestion, ensuring data quality before integration.

- Develop standardized feature services and map services for recurring use in desktop, web apps, and dashboards.
- Configure EQUIS Enterprise's REST API or EQUIS for ArcGIS tools to publish relevant datasets (e.g., groundwater levels, lab results) to ArcGIS Online or ArcGIS Enterprise.
- Ensure metadata alignment and coordinate system compatibility to maintain spatial accuracy.

5.1.6 Phase 6 - Documentation & Training

Throughout the implementation process, decisions, procedures and workflows will be documented and used to draft an EQUIS Data Governance Policy which will be used to assist and guide new departments, divisions, and users in the use of EQUIS as their environmental data management system.

TRC will work with the Town to draft and review and provide input into the final EQUIS Data Governance Policy and provide drafts of the following sections to be included (first draft due date):

- Vision and Project Charter for EQUIS
- EQUIS Data Governance Policy Purpose and Objectives
- Overview of EQUIS Data Management Workflow Terms and Definitions
- EQUIS Data Governance Team Organization
- EQUIS Leadership and EQUIS User Roles and Responsibilities
- EQUIS Enterprise User Roles, Security, and Permissions
- EQUIS Software Installation and Setup
- EQUIS Facility Management and New Project Setup
- EQUIS Reference Value Management Plan
 - Standard naming conventions for facility, sub-facility, location, sample codes, chain of custody information, and Electronic Data Deliverable (EDD) file names.
 - Spatial coordinate system requirements.
 - Field sample metadata parameter codes.
 - Standard laboratory analyte, analytical method, and prep method naming convention and organization.
 - Action levels management plan.
- EDD Format Organization and Change Management Plan
 - Processes for defining changes needed to EDD format, approval, development, testing, and release to update the Town's EDD Format download page.
- EQUIS Upgrade Procedures

- EQuIS Enterprise Dashboard and Report Management Plan
- Data Sharing Plans with Partner Agencies and the Public

All Town EQuIS data governance policies and procedures will be defined, reviewed, and approved by the Town designee. The EQuIS data management processes and procedures defined in the Town EQuIS Data Governance Policy will define the framework to be followed by all Town EQuIS Data Management users. This framework will be used to inform where more detailed documentation, standard operating procedures, detailed workflows, and supplemental materials will be needed. Policies to be defined in the EQuIS Data Governance Policy will evolve over time as more data types begin to be managed in EQuIS.

TRC will develop and provide training for all implemented EQuIS products and workflows. The EarthSoft Community Center also offers many training videos on the use of EQuIS. TRC will use these training videos where appropriate to supplement trainings developed by TRC. TRC-led trainings will be provided virtually, recorded and provided to the Town as part of the training deliverable. Throughout the project, TRC will work to develop the appropriate level of documentation needed specific to the Town's data management processes, procedures and terminology, such as workflow diagrams and SOPs to accompany other training materials. The EarthSoft Community Center offers a large Online Documentation repository that provides relevant documentation for all EarthSoft products. While TRC will develop focused documentation, EarthSoft's available documentation will be used or referenced whenever appropriate.

Attachment A: Solution Requirements Matrix

Attachment A
2025 Environmental Data Management System Requirements
Town of Nantucket

Req. No.	Requirement Name	Requirement Description / Approach	Priority	Requirement Type	Category
1	Single system	A single system that can be supported and maintained by Nantucket, long term, after initial configuration and training	1 - High	Technical	Overall
2	System hosting	System should be either hosted by TRC or software vendor for initial implementation and transferrable.	1 - High	Technical	Hosting
3	On-premise vs cloud hosted solution	Cloud solution preferable.	1 - High	Technical	Hosting
4	Track and analyze temporal and spatial data	Relational database with a schema that supports environmental tasks and data.	1 - High	Functional	Overall
5	Support multi-media samples and information	Solution should support the management of all environmental media, op units, sampling events, sampler, etc	1 - High	Functional	Workflow Task
6	Supports Single Sign On capabilities	Internal employees should be able to log into the system using their Microsoft logins	1 - High	Technical	Security
7	Permissions based credentials	Standard security based measures for logging in to TRC and Nantucket platforms	1 - High	Technical	Security
8	Scalability	Allow for growth of information being collected and to accommodate an increasing user base without infrastructure expansion.	1 - High	Functional	Overall
9	Robust meta-data tracking	What was collected, what sampling & testing methodology, who collected and where?	1 - High	Functional	Preferred Solution Feature
10	Document management	Manage chain of custody or other documents. Specifically being able to link documents to locations or specific events and make the link a downloadable file.	2 - Medium	Functional	Document Management
11	Photo management	Photos or video files may be valuable to store in the future, especially if using mobile data collection.	3 - Low	Functional	Document Management
12	Assigning confidence to data	Should be able to define the confidence in the data and identify the source of that data.	1 - High	Functional	Workflow Task
13	Public data access	Appropriate filtering of data for public consumption	1 - High	Technical	Security
14	Enterprise - web based data access	Customizable dashboards for internal use, data entry and potentially external use.	1 - High	Technical	Preferred Solution Feature
15	Automated data loading capabilities	Data from contractors and potentially residents	2 - Medium	Functional	Workflow Task
16	Prevent duplicate entries	For each ops and compliance type have a way to prevent duplicate entries. Location and Compliance Item Type could be two of the primary key fields to prevent duplicate entry.	1 - High	Functional	Workflow Task
17	Capture photos	Allow for photos to be captured by mobile device and assign these photos to a place in the Data Management system as supplemental information	3 - Low	Functional	Mobile Tech
18	Dynamic reporting	Flexible and dynamic reporting options that can be easily configured to meet the changing needs of the town.	1 - High	Functional	Workflow Task
19	Pre-configured reports	Low-code/no-code reporting capabilities. Should have reports available that meet the majority of the needs of the Town.	1 - High	Functional	Preferred Solution Feature
20	Automated reporting options	Triggered reporting capabilities that allow for reports to be automatically generated either by date or by some other trigger.	2 - Medium	Functional	Preferred Solution Feature
21	Data analysis and visualization capabilities	Summary statistics, bar charts, box plots of any data extent. Integrating with GIS to get a smooth surface, isocontours, heat maps, etc. Static imagery and dynamic images that can be changed with selective filtering.	1 - High	Functional	System Analytics
22	Data review/validation capabilities	Should allow for automated data review to protect the integrity of the database but also define the reliability of the data based on configurable rules.	2 - Medium	Functional	Workflow Task
23	GIS integration	Integration of environmental data into Nantucket's ArcGIS environment.	1 - High	Functional	GIS Integration
24	Geospatial visualization	Temporal and concentration levels. Integrating with GIS to get a smooth surface, isocontours, heat maps, etc.	1 - High	Functional	GIS Integration

Attachment A
2025 Environmental Data Management System Requirements
Town of Nantucket

Req. No.	Requirement Name	Requirement Description / Approach	Priority	Requirement Type	Category
25	Mobile data collection capabilities	May be interested in mobile solution for department staff to collect information but the majority of data managed by Nantucket comes from external sources.	3 - Low	Functional	Mobile Tech
26	Offline data collection	Mobile solution should allow for data collection with or without connectivity.	3 - Low	Functional	Mobile Tech
27	Sync capabilities	Sync data collection activities between multiple data collectors using the same form.	3 - Low	Functional	Mobile Tech
28	Configurable data forms	Mobile data collection forms should be configurable to meet the needs of the Town.	3 - Low	Functional	Mobile Tech
29	External data access	Provide access to Contractors in different roles - allow data submission but not data access. May want to give individual contractor read only data access, but not widely distributed.	2 - Medium	Technical	Security
30	Technical helpdesk support	Helpdesk support response times should correlate with the priority of the issue.	1 - High	Technical	Overall
31	Access to online documentation and training resources	Vendor maintained documentation and training repository is highly desirable.	1 - High	Technical	Overall
32	Personally Identifiable Information (PII) protections	Solution should have the ability to make certain information unavailable or aggregated to protect identity and specific locations.	2 - Medium	Functional	Security
33	Other software integrations besides GIS	May have a need to integrate with other software such as PowerBI, R, 3-D modeling tools, statistical software, etc.	3 - Low	Technical	Preferred Solution Feature
34	Statistical evaluations	Currently using R for statistical analysis but may be interested in other platforms in the future.	3 - Low	Technical	Workflow Task
35	Performance considerations (refresh rate or triggered report frequency)	24 hr refresh rate is sufficient	2 - Medium	Technical	Overall
36	Financial considerations	No formal financial procurement requirements	3 - Low	Business	Overall
37	Mobile device considerations	The Town currently uses iOS and Windows devices	3 - Low	Technical	Mobile Tech
38	Database administration considerations	Solutions should provide a user interface for administrators to manage users and other functionality and have the ability to delegate administration to more than one user	2 - Medium	Functional	Preferred Solution Feature
39	Support batch data importing	If large volumes of data submissions are received, the solution should allow for those data submissions to be loaded in bulk rather than individually.	2 - Medium	Functional	Preferred Solution Feature
40	Rest API	A Rest API would be preferred to support software interoperability.	2 - Medium	Technical	GIS Integration
41	Change management tracking	The system should have the ability to audit the database and provide a change log.	2 - Medium	Functional	System Analytics
42	Sample planning tracking	Ability to plan and retain field sampling events including planned samples, the analysis being performed for each sample and the chemical constituents expected under each analysis. This should allow for the tracking and reporting of the completeness of each sampling event.	3 - Low	Functional	Workflow Task
43	Lab contract management	Manage laboratory contracts including bottleware types and pricing.	3 - Low	Functional	Preferred Solution Feature
44	Bottleware Orders	Allow for the placement of laboratory bottleware orders.	3 - Low	Functional	Preferred Solution Feature
45	Chain of Custody generation	Allow for the automatic generation of chain of custody documentation for field sample collection events.	3 - Low	Functional	Preferred Solution Feature
46	Real-time alerting to outages/thresholds	The Town should be notified anytime the system is offline or if performance thresholds are exceeded.	2 - Medium	Technical	System Analytics
47	Commercial Off the Shelf (COTS) vs Custom Solution	COTS desired as opposed to custom development to limit short and long term development needs.	1 - High	Technical	Overall
48	Sample location referencing	Ability to record and retain the sample coordinate data consistently and identify other location features (by well coord, parcel no., address, GPS, etc.).	1 - High	Functional	Workflow Task
49	IT requirements	No ISO/SOC2 requirements but vendors should include any security information with capabilities.	1 - High	Technical	Overall
50	GIS architecture	To be provided by the Town's GIS consultant.	1 - High	Technical	Overall
51	Other system considerations	No other system considerations were identified.		Functional/ Technical	Overall