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| *Soils Interpretations Generator FY19* |
| **High Level Business Requirement (HLBR)** |
| Office of the Chief Information Officer  Natural Resources Conservation Service  Washington, D.C.  June 6, 2019  DRAFT Version 1.1 |

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**Revision History**

| Version # | Implemented By | Revision Date | Approved By | Approval Date | Description of Change |
| --- | --- | --- | --- | --- | --- |
| 1.0 | Robert Dobos | 06/30/2016 |  |  | Initial version from FY17 Signed HLBR |
| 1.1 | Lisa Nicol | 6/7/2019 |  |  | Revisions from SIG Team |

**Project Stakeholders**

| S.No. | | Name | | Title | Role |
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|  | Lisa Nicol | *Team Lead Requirements Management Team* | | Application Architect |

# Requirements Document Approval

The undersigned acknowledge that they have reviewed the High Level Business Requirements (HLBR) Specification document for Soils Interpretations Generator l and agree with the information presented within this document. Changes to this Requirement Specification document will be coordinated with, and approved by, the undersigned, or their designated representatives.

*The following approval signatures are needed:*

*•* ***Business Sponsor*** *–* ***Mandatory****. These stakeholders may be signing on behalf of the Subject Matter Experts (SMEs)*

*•* ***Project Manager*** *–* ***Mandatory****.*

*• Business Liaison – Optional. Signatures from these stakeholders are not required. However, if they want to sign then add the appropriate signature block.*

*• Subject Matter Experts – Optional. These stakeholders may delegate the approval ‘signing’ to the Business Sponsor. These are the people who actual contribute the content of the requirements and at a minimum their verbal approval is needed even if they don’t ‘sign’.*

| Approver Name /  Title | Project Role | Signature and Date |
| --- | --- | --- |
| **David Lindbo**  Soil and Plant Science Division Director | Business Sponsor |  |
| **Michael Robotham**  National Leader Soil Information | Business Sponsor |  |
| **Dave Hoover**  Director of National Soil Survey Center (NSSC) | Business Sponsor |  |

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# Overview

## Purpose

The purpose of this document is to define the high-level business requirements for a Soils Interpretations Generator. An Interpretations Generator is a type of decision tool that uses soil and site property data from the soils database to generate soil ratings for land use based on specific interpretation criteria. The criteria used are based on the proposed use of the soil and the result is usually provided as a list of soil limitations or characteristics for the intended use. An example would be a soil used for landfill. If a soil has properties that would result in contamination of groundwater, the soil would have limitations for landfill. Soil properties affecting groundwater contamination would be particle–size (water would flow through sandy soils quickly and contaminate groundwater), or the soil may be on a steep slope resulting in water running off from the landfill and contaminating the surface water.

The current Interpretations Generator operates solely within the NASIS transactional database (as opposed to the public-facing Web Soil Survey Database) by generating interpretive output based on evaluations and ratings of soil properties stored in the database. The evaluations and rules as well as the properties are available only to those who have permissions to use the transactional database. Improvements to the whole process of modeling soil properties could be improved allowing users within the agency, outside users, and cooperators to develop their own interpretations using data from the public-facing database. Internal users would have the option to use either database, as needed. The new Interpretations Generator will be able to assist the public and the agency conservation planners by providing custom interpretive output that they prefer in a timely and more flexible manner.

* Ability to adjust the soil properties from site specific locations and generate on the fly interpretations (from ready-to-use interpretations) for desktop and mobile applications.
* Ability for users to create new interpretations outside of the transactional NASIS database.
* Ability to use geospatial layers from many formats to integrate into the soils data for developing more spatially explicit interpretations.
* Ability to design and build engaging maps for our partners, both within and outside the NRCS, using a variety of technologies including using some open source statistical, GIS, and model building tools This document is further supported by the NRCS Requirements Development and Management Plan. This effort will give the Investment Review Board (IRB) the necessary information for project prioritization and approve the project for funding.

## Background

A soil interpretation is a model that will rate a soil’s suitability for some use, such as the likelihood of finding usable gravel, or the potential for problems when building a manure pit. Interpretations are derived from the soil properties in the National Soil Information System (NASIS) database using a set of algorithms which can be tailored to model an interdisciplinary expert decision making process. There are three components of an interpretation, which are called

• Properties

• Evaluations

• Rules

Each of these is a class of business object in NASIS and has a specialized data entry module in the application.

Interpretations are usually developed and tested by highly trained and experienced users. They can then be used to produce a report of selected interpretations. Interpretation results or ratings are also computed and stored during the process of exporting data from NASIS. Instructions on developing and using interpretations are found in the NASIS documentation.

The current Interpretations Generator operates solely within the NASIS transactional database (as opposed to the public-facing Web Soil Survey Application) by generating interpretive output based on evaluations and ratings of soil properties stored in the database. The evaluations and rules as well as the properties are available only to those who have permissions to use the transactional database. Improvements to the whole process of modeling soil properties could be improved allowing users within the agency, outside users, and cooperators to develop their own interpretations using data from the public-facing database. Internal users would have the option to use either database, as needed. The new Interpretations Generator will be able to assist the public and the agency conservation planners by providing custom interpretive output that they prefer in a timely and more flexible manner.

• Have the ability to adjust the soil properties from site specific locations and generate on the fly interpretations (from ready-to-use interpretations) for desktop and mobile applications.

• Modernize the technology and platforms to provide enhanced ability for users to create new interpretations using soils data.

• Improved ability to use geospatial layers from many formats as input into for developing more spatially explicit interpretations.

• Provide enhanced geospatial technologies to design and build maps as exportable products for our partners.

## Scope

The intent of this document is to provide high-level requirements for an Interpretations Generator that will allow individuals to develop and test soil interpretations using the “official” published soil data as well as related data from external sources and perform an analysis in sufficient detail to support the following:

* IT impact analysis by the Enterprise Architecture Team
* An estimate for the Level of Effort (LOE) and cost for the remaining phases of the project: requirements, analysis, design, development, testing, and implementation.

### In Scope

#### Current System Features

The current NASIS Interpretations Generator has these the following functions to be included in a new solution:

1. Generation of National, State, and Local Interpretation ratings using the transactional Soils Survey database (NASIS). Official data is defined by the National Soil Survey Handbook 644.02a.
2. Ability to deliver the interpretation ratings on the public-facing database with a yearly refresh .
3. The official source of soil information to the public is the Web Soil Survey, a part of the National Soil Information System. This system provides for the collection, storage, manipulation, and dissemination of detailed and general soil survey information. The system includes certified tabular and spatial data at various scales. The new SIG will not replace Web Soil Survey, but will deliver public facing data to the Web Soil Survey.
4. The Interpretations Generator has a graphical user interface.
5. Rule based fuzzy logic model is used for generating interpretations.
6. The system must have the ability to allow the user to have the option to see what value of each soil attribute was fed into the evaluation system so as to be clear what numbers are being used to derive the ratings. For example, “Depth to Bedrock 46 cm”.
7. Allow users to store interpretive model components and allow access to interpretation rules created and managed by other internal and external users in order to share and to use the interpretations effectively.
8. Interpretation model components must be searchable by keywords to allow effective sharing and reduce redundancy across the system.
9. Have functionality to facilitate troubleshooting of interpretive criteria.
10. Reports in text or html format of interpretive output appropriate for export to PDF or other formats.
11. Although the interpretations have to be consistent at any given point in time, the ability to update interpretations based upon new criteria (response curve,  examples?) must be maintained.
12. The interpretations are delivered in several forms in different applications. The Interpretation Generator support sthe following types of data distribution, as described in detail below:
    1. Hard copy reports (Print Capability) for both internal use and external distribution.
    2. Creation of maps using exported data from NASIS top MS Access.
    3. Electronic transfer of interpretation results to other applications such as APEX and Toolkit.
    4. Distribution process using exports to provide data to other applications, such as Web Soil Survey, Soil Data Viewer Microsoft Access databases and downloads of gridded SSURGO (raster based representation of the vector data).
13. The interpretations generator provides the user the ability to parse out the reasons for a given interpretation and show them graphically on a map. As an example, providing the “very limited” rating along with its reason of ‘flooding’, ‘shrink-swell’, ‘depth to bedrock’, and/or ‘slope’.
14. The Interpretation Generator has to allow users to preview results using data from the transactional NASIS.  Notes: not sure what this is asking for.  Is this for current system or is there new functionality being requested?
15. Allow internal users with authorization access the NASIS transactional database for generating interpretations and to test against newly developed data.
16. External users to not have access to the NASIS transactional data. External users will view and utilize only public facing data sources such as WSS and Soil Data Access (SDA).
17. Note:  are there any other features or functionality in the current NASIS system that need to be included in the new system?

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#### New Features

The New Soil Interpretations Generator must also have these additional features:

1. Generation of National, State, and Local Interpretation ratings using additional sources of data, not just NASIS transactional Soils Survey Data, including public-facing Web Soil Survey (WSS) data (WSS includes SSURGO).
2. Ability to deliver the interpretation ratings on the public-facing database prior to the yearly refresh date. Official data is defined by the National Soil Survey Handbook 644.02a. The official source of soil information is the Web Soil Survey, a part of the National Soil Information System. This system provides for the collection, storage, manipulation, and dissemination of detailed and general soil survey information. The system includes certified tabular and spatial data at various scales.
3. The system must allow integration of the laboratory data into the interpretive process.
4. Use Pedon data to generate a zonal statistics interpretation map.  NASIS aggregates Pedon soil analysis results for a county level.  SIG should allow use of Pedon for a single location rather than aggregated data.
5. The system shall allow use most authoritative data available for attributes from spatial layers  in order to provide spatially explicit data for interpretation.such as:
6. PRISM data - The new system must be able to use PRISM spatial and tabular climate data.
   1. LIDAR data - topographic data.
   2. Hydrologic Layer - proximity to other features like wells and surface water, streams and rivers,
7. The new system should be more efficient and be able to process large volumes of data efficiently and quickly.
8. The system must allow forms-based input of data into the interpretive system to allow generation of Interpretation ratings “on the fly” using:
   1. national criteria on locally collected site specific information,
   2. allowing measured and point data to be inserted into the system, such as slope, depth to bedrock, Saturated Hydraulic Conductivity ksat, Cation Exchange Capacity (CEC), and dynamic soil properties from desktop or mobile applications.
9. Create documentation to fully document the rules, evaluations, and properties used to generate a particular interpretation.  Use a content management system so that graphics as well as text can be used to explain the assumptions and document the methods for the child rules and parent rules and allow storage of notes related to each part of the interpretation.
10. During an interpretation process, data  should exists temporarily for multiple soil component iterations which can be queried during the process, but is not retained after the interpretation has completed.
11. The delivery of interpretations to various different applications needs to be improved. The Interpretation Generator should support the following types of data distribution, as described in detail below:
    1. Improved reporting capability for interpretations results resulting in hard copy reports (Print Capability) for both internal use and external distribution.
    2. Mapping reports integrated with the application and allowing direct query and on-screen viewing of maps and tables.
    3. Automated integration to provide data from interpretation results to other applications such as APEX (note: define APEX), Conservation Desktop (CD) (replacement for CST), Soil Data Access application, and Web Soil Survey.
    4. Improved integration and distribution of data to other products, such as Web Soil Survey, Soil Data Viewer Microsoft Access databases and downloads of gSSURGO.  Simply the processes and automate where possible.
    5. The current interpretations generator provides the user the ability to parse out the reasons for a given interpretation and show them graphically on a map. As an example, providing the “very limited” rating along with its reason of ‘flooding’, ‘shrink-swell’, ‘depth to bedrock’, and/or ‘slope’.  Additional features need to provide the capability to map the collective ‘rating and reasons’ for a given interpretation.
12. In addition to fuzzy logic model the system should provide additional options to  process the input data, such as neural networks, and others to be determined.
13. Ability to run multiple versions of interpretations using the same data, but with different modeling criteria and/or different modeling techniques (fuzzy logic, neural networks, etc.).  Ability to compare tabular or mapping display of versions of related interpretive results using same data but different methodology. The current system will allow this, but the relationship between the version is not captured, it has to be defined manually by the user.
14. Ability to use previous criteria and modeling techniques with new set of updated data, create a new version, to compare with an older version.
15. The system utilization of Web Soil Survey data should not impact the performance, responsiveness, or user experience of WSS.
16. Interpretations are for determination of outcome for land use with soil types.  The system needs to allow optimization for a soil type for a land use in a specific interpretation, by calibrating and fine-tuning the model criteria.  Then finding the best fit of the model for the measured responses  (e.g. interpretation weights).  The current system runs the interpretation manually many times, with manual tweaking of criteria.  The new system should allow automated multiple runs with pre-determined inputs for alternative criteria.   for example:  a criteria defining a response curve might need to be tweaked using different scenarios.
17. The current system utilizes aggregated generalized data.  The new system would also allow option to integrate point data (specific location soil samples with characterization test results) for model development.
18. The System should allow external users to export the interpretive results, and/or WSS data for use within other systems or tools.
    1. Larger volumes of data for export will first allow the user to define the data to be exported using filter criteria, such as location, soil type, land use, etc.  The user will then select an export format or thematic map requests.  Format options currently are pipe delimited text or html.  Other formats are needed such as MS Access, SQL, XML, etc.
    2. Data for a single point, soil sample with soil characterization composition test results, could be exported to a mobile platform in a web service input formation such as json, geojson, html, REST, SOAP.  Note: need clarification from Dylan B. (graduate student at Davis working with Professor Bear, who is now and NRCS employee).  NRCS contracts with Davis to do this kind of mobile application.
19. The Interpretations Generator must have an easy to use graphical interface that walks the user through the process of developing interpretations, running them, and obtaining the output.
20. The Interpretations Generator must have the capability to support more complex interpretations by interfacing with external applications that already contain logic to perform part of the interpretation.
21. The Interpretations Generator must have the ability to support both maps generated on the web as well as the ability to supply data to stand alone GIS systems and statistical analysis systems.

### Out of Scope

* The Soils Interpretations Generator does not include delivery of completed models and Interpreted data to the public and end users.
* The Data Delivery to the public and end users is a separate solution.
* Initially the Soils Interpretations may be delivered via existing applications such as Web Soils Survey (WSS), Soil Data Access (SDA) or Soil Data Viewer (SDV) which use the Soil Data Mart (SDM) as the data source.
* As the existing Data Delivery applications are modernized, the Soils Interpretations Generator may need to be enhanced to accommodate new requirements defined for end user.

## Intended Audience

This document is intended to be used by the decision-makers, IT Governance, IT Management, Investment Managers, Project Managers Architects, Security, QA, Operations and other stakeholders. These requirements will also be reviewed and approved by the Project Manager, Business Sponsor and Subject Matter Experts (SME).

## Assumptions

* Web based Application will be piloted and or prototyped internally to validate and improve the solution prior to making it available to external users.
* Application will ultimately serve all user types; employees, affiliates, customers, TSPs and general public.
* Authentication is required for all users who have ability to create or modify records using a USDA Enterprise Authentication method.
* Role based authorization sing an enterprise solution will be used to distinguish users with permissions to create, modify or run interpretations.
* Users of the interpretation generator include administrators, soil scientists, data stewards, and external customers.
* The Soils Interpretations Generator will be used to create ‘models’ as rule sets that will be used users to create Soils Interpretations by submitting different data sets. Official Soils Interpretations will be delivered to the public and other users via a public access Data Delivery solution separate from the Interpretations Generator.
* Solution must conform to enterprise technical requirements examples of which are not limited to authentication, authorization, security, PII, 508 compliance, performance, availability, etc. .

## Constraints

1. None known at this time.

## Risks and Dependencies

### Risks

1. The ability to link to external data sources such as:
   1. plant characteristics currently in the USDA PLANTS Database with an existing climate database.
   2. Ecosystem Dynamic Data
2. Developers needed for tool customization or interfacing with other systems (e.g. NASIS, WSS, or SDA) may need to be available.
3. Changing business requirements could require a re-thinking of the solution or solutions.

### Dependencies

* Buy-in by critical stakeholders.
* Architectural group concurrence.
* Security group concurrence.
* Allowing external users to use the interpretations generator depends on being able to run interpretations using the public facing database, since external users may not use the transactional database.
* The documentation manager depends on the Enterprise Content Manager being available, since graphics are essential for comprehensive documentation.
* The Soils Interpretations Generator will interface with the NASIS database.
* The Soils Interpretations Generator will interface with the Soil Data Mart and possibly the Soil Data Warehouse.
* The Soils Interpretations Generator with other defined new external data sources.

## Prioritization of Requirements

Table 1 – Prioritization of Requirements

|  |  |
| --- | --- |
| **Priority** | **Description** |
| **MUST** | Describes a requirement that must be satisfied in the final solution for the solution to be considered a success. |
| **SHOULD** | Represents a high-priority item that should be included in the solution if it is possible. This is often a critical requirement but one which can be satisfied in other ways if strictly necessary. |
| **COULD** | Describes a requirement which is considered desirable but not necessary. This will be included if time and resources permit. |
| **WON’T** | Represents a requirement that stakeholders have agreed will not be implemented in a given release, but may be considered for the future. (Note: occasionally the word "Would" is substituted for "Won't" to give a clearer understanding of this choice). |

## Phases of work

**Table 2. Phases of Work**

|  |  |  |
| --- | --- | --- |
| **Phase** | **Description of Key Product Features by Phase** | **Dependencies** |
| Phase I | Performance and storage issues addressed. Includes the functionalities of the present Interpretations Generator. The Interpretations Generator stores criteria and not output to reduce storage overhead. Interpretations Generator can be run by internal users against either the public or the transactional databases. | Funding for the project. |
| Phase II | The Interpretations Generator can be accessed by users who do not have access to the NASIS for use against the public database. Interface enhancements to ease the process of developing interpretations. The Interpretations generator can readily accept data from external sources.  Interpretive criteria can be documented using graphics as well as text. | Needs Enterprise Content Manager. Enhanced performance of the ability to bring (or input) external data into NASIS, or similar functionality. |
| Phase III | The Interpretations Generator will be integrated with statistical and geographic data systems.  Any geographic data can be used as layers in the interpretive process. The Interpretations generator will be able to produce tabular output data or display maps. | This depends on the Interpretations Generator being able to accept data from outside sources. |

# Business Features and High Level Requirements

## User Interface

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Rec ID** | **FY17 ID** | **Name** | **Primary Text** | **Priority** | **Target Phase** |
| 80804 |  | Fuzzy Logic and Neural Networks | Rule based fuzzy logic model will be used for generating interpretations.  Currently, a proprietary scripting language is used to extract data and submit to the interpretations, evaluations and fuzzy logic step. New methods could be used in the new system, but the functionality of extraction, submission, and use of fuzzy logic still need to exist in the new system.  In addition to fuzzy logic model the system should provide additional options to process the input data, such as neural networks, and others to be determined. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} - Existing Features bullet 5, New Features bullet 11 | Must | 1 |
| 80805 |  | Searchable Components by Keyword | Interpretation model components must be searchable by keywords to allow effective sharing and reduce redundancy across the system. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} | Must | 1 |
| 80806 |  | Troubleshooting | Have functionality to facilitate troubleshooting of interpretive criteria. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} | Must | 1 |
| 80810 |  | Interpretations Reasons | The interpretations generator will provide the user the ability to parse out the reasons for a given interpretation and show them graphically on a map. As an example, providing the “very limited” rating along with its reason of ‘flooding’, ‘shrink-swell’, ‘depth to bedrock’, and/or ‘slope’. Additional features need to provide the capability to map the collective ‘rating and reasons’ for a given interpretation. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} - Current features bullet 13 - new feature bullet 10e Question: should there also be a requirement for this in the Reporting Category 2.7? | Must | 1 |
| 80812 |  | Public Interpretations Availability | Ability to deliver the public facing interpretation ratings as soon as they are approved for release.  Current System has a yearly refresh and release of public interpretations is not timely. Official data is defined by the National Soil Survey Handbook 644.02a. The official source of soil information is the Web Soil Survey, a part of the National Soil Information System. This system provides for the collection, storage, manipulation, and dissemination of detailed and general soil survey information. The system includes certified tabular and spatial data at various scales. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} | Must | 2 |
| 80816 |  | Temporary Iterations Data | During an interpretation process, data should exist temporarily for multiple soil component iterations which can be queried during the process, but is not retained after the interpretation has completed. Upon completion of the interpretation one iteration is selected as the final and other iteration data will be discarded. The user will have the option to discard then entire run, all iterations.  {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} | Must | 1 |
| 80831 |  | Use Previous Criteria and Modeling Techniques | Ability to use previous criteria and modeling techniques with new set of updated data, create a new version, to compare with an older version.  {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} - New Features bullet 13 | Should | 2 |
| 80832 |  | Optimization for Soil Type by Land Use | Interpretations are for determination of outcome for land use with soil types. The system needs to allow optimization for a soil type for a land use in a specific interpretation, by calibrating and fine-tuning the model criteria. Then finding the best fit of the model for the measured responses (e.g. interpretation weights). The current system runs the interpretation manually many times, with manual tweaking of criteria. The new system should allow automated multiple runs with pre-determined inputs for alternative criteria. for example: a criteria defining a response curve might need to be tweaked using different scenarios. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} - New Features bullet 15 | Must | 2 |
| 80834 |  | Graphical Interface | The Interpretations Generator must have an easy to use graphical interface that walks the user through the process of developing interpretations, running them, and obtaining the output. {LINK id=80767 title="80767: Project Scope Content" uri=https://clm.cert.sc.egov.usda.gov/rm/resources/\_cCo1wcDdEei3kJQcNo3s8A} - New Features bullet 18 | Must | 1 |
| 79576 | 2.1.1 | eAuthentication | User authentication shall be based on eAuthentication login. Comment: Additional level of Permission identified by Role. | Must | 1 |
| 79587 | 2.1.10 | Download | System shall allow casual users to download results and store them on their own hard drives or in the cloud. | Must | 2 |
| 79588 | 2.1.11 | Compare Interpretations | System shall allow users to compare results of interpretations run with slightly different input parameters. | Should | 1 |
| 79589 | 2.1.12 | Spatial layers | System shall have the ability to ingest spatial layers for use in interpretations. | Must | 3 |
| 79590 | 2.1.13 | Run Immediately | The Interpretations Generator shall have the ability to be run immediately/real time | Must | 1 |
| 79591 | 2.1.13 | Run offline | The Interpretations Generator shall have the ability to run offline as some interpretations on large areas could take a long time to complete. | Must | 1 |
| 79592 | 2.1.14 | DB Queries | System shall allow authorized internal users the option to query the database for properties, rules, interpretations, layers, and the underlying data used in the interpretations, and edit all of the above. | Must | 1 |
| 79593 | 2.1.14 | Edit Capability | System shall allow authorized internal users the option to seletc a record in a DB queryresult and edit. | Must | 1 |
| 79594 | 2.1.15 | Standard Interpretations | System shall permit authorized users to develop standard interpretations to share with individuals that might be less knowledgeable of soils or the interpretation system. | Must | 1 |
| 79595 | 2.1.16 | Export Interpretation Models and Data | System shall allow authorized users to store official interpretations models for export with the official data so that the generated data need not be stored. | Must | 1 |
| 79596 | 2.1.17 | Certify Interpretations | System shall allow authorized users to certify official data and interpretations. | Must | 1 |
| 79597 | 2.1.18 | Date of Run | System shall automatically record the date that the interpretation was run. | Must | 1 |
| 79598 | 2.1.19 | Export a Group of Interpretations | System shall allow the users to run a group of interpretations during an export. | Must | 1 |
| 79577 | 2.1.2 | Interpretation Notes | The interface shall provide the ability to add Notes to help document each interpretation as to author, intent, and whether it is considered ready for use or is in development. | Must | 1 |
| 79599 | 2.1.20 | Default Lists for Export | System shall have the ability to store default lists of interpretations to be run during export of the official data. | Must | 1 |
| 79600 | 2.1.21 | Related Documentation | The interface shall provide a way to generate documentation and metadata about the interpretation:  Literature review,,How it was created, Documentation background, How it should be used, process, input method, logic. This documentation will be available for printing a report with or without the interpretation results. | Must | 1 |
| 79601 | 2.1.22 | Add Documentation | The interface shall allow to add documentation regarding the area being interpreted. The information allowed will include the location, and a description of the site. | Should | 3 |
| 79602 | 2.1.23 | Report Generation | The interface shall allow the user to send the interpretation to a shopping cart for inclusion in a report. | Must | 3 |
| 79603 | 2.1.24 | Report Format | System shall allow to print the report directly or store the report as a pdf file for download. | Must | 1 |
| 79604 | 2.1.25 | Commonly Used Interpretations | System shall allow to store lists of commonly used interpretations so that they can run a group of interpretations against different points or areas. | Must | 1 |
| 79605 | 2.1.26 | Administrator | System shall allow an administrator to view the progress of various interpretations and manage them based upon the resources available and the number of users. | Must | 1 |
| 79606 | 2.1.27 | Report Metrics | System shall provide metric reports of types of uses, types of interpretations run and the sizes of areas that the interpretations are being run on. | Should | 1 |
| 79607 | 2.1.28 | Warnings | System shall have the capability to identify outrageous interpretations and provide warnings to users. Ex: Interpreting for a ball field across a cliff or drop-off. | Could | 2 |
| 79608 | 2.1.29 | Options for multiple interpretations | System shall allow to add site specific input and rerun interpretations, or run the same interpretation using different input layers from a desktop or mobile environment. Examples would be to use dependent soil properties or 10, 30 or 90 meter grids for slope. Proposed: System shall allow to add site specific input and rerun interpretations, or run the same interpretation using different input layers. The interpretations done for this purpose would be input for planning purpose used by Conservation Desktop (CD) or Mobile Planner applications. Examples would be to use dependent soil properties or 10, 30 or 90 meter grids for slope. | Must | 2 |
| 79578 | 2.1.3 | Create New | System shall automatically provide authorized users the capability to create a new official interpretation. | Must | 1 |
| 79579 | 2.1.3 | Update Existing Interpretation | System shall automatically provide authorized users the capability to find an existing interpretation and update. | Must | 1 |
| 79609 | 2.1.30 | Link Metadata for Data Layers | System shall allow linkage to the metadata of the various data layers being accessed. | Must | 2 |
| 79610 | 2.1.31 | Manage Concurrent Users ans size limitations | System shall allow users with appropriate permissions to modify the number of concurrent users or to modify any size limitations to the area of interest that is allowed. | Must | 1 |
| 79611 | 2.1.32 | Document Interpretations | System shall allow users with appropriate permissions to document the interpretations, properties, or rules that are created. | Must | 1 |
| 79612 | 2.1.33 | Preview Interpretations | System shall allow authorized users with appropriate permissions to preview official interpretations prior to exporting them for storage in the Soil Data Warehouse. | Must | 1 |
| 79613 | 2.1.34 | Select GIS Layers | System shall allow to select GIS layers for inclusion in a particular interpretation. Ex: PRISM data for X period of time. | Should | 3 |
| 79614 | 2.1.35 | Allow external data for interpretations | System shall allow interpretations to point to external applications to obtain data to use in the interpretations and to export data for other applications to use in Decision Support systems. | Should | 3 |
| 79615 | 2.1.36 | External Applications Data | System shall allow authorized users with appropriate permissions to review interpretations and identify them as National Interpretations or Regional Interpretations , and/or required interpretations for export. | Must | 1 |
| 79616 | 2.1.37 | Query format | System shall allow the capability to query using tabular queries or spatial queries. | Should | 3 |
| 79617 | 2.1.38 | Official Layer Identification | System shall provide the capability to authorized users with appropriate permissions to identify specific layers as official sources of data. | Must | 3 |
| 79580 | 2.1.4 | Create using Graphical Interface | System shall allow all users to create and store interpretations via a graphical interface. | Must | 1 |
| 79581 | 2.1.4 | Public or Private | Users can designate the interpretations as public or private as well as ready to use or not ready to use. | Must | 1 |
| 79582 | 2.1.5 | Search Capability | System shall provide Search capability to allow users to find all interpretations with similar names or using similar properties or by category. E.g. Agriculture; Forestry; Military; Recreation. | Should | 1 |
| 79583 | 2.1.6 | View Tabular or Map | System shall provide users the ability to view interpretation results either as tabular output or as maps. | Must | 3 |
| 79584 | 2.1.7 | GIS Connectivity | System shall allow the users to connect to GIS systems or other applications that ingest the interpretations. | Must | 3 |
| 79585 | 2.1.8 | Save to Corporate DB | System shall allow authorized users to store the results of official interpretations in the corporate database. | Must | 1 |
| 79586 | 2.1.9 | Print Reports and Maps | System shall provide capability to print reports and maps. | Must | 3 |
|  |  |  | The system must have the option for the user (interpretaton developer) to review the results of an individual Property, Evaluation, or Rule of an interpretation (after runing on a soil component). This is similar to the following: The Interpretation Generator has to allow users to preview results using data from the transactional NASIS. |  |  |
|  |  |  | Users must have the ability to view Properties, Evaluation, and Rules created and managed by other internal and external users |  |  |
|  |  |  | Have ability to compare results from mulitple versions of an interpretation (tabular and graphic desplays) run on the same data. The verson needs to be captured in the outputs. |  |  |
|  |  |  | During an interpretation process (running the interpretaton model), data (generated by the interp) should exists temporarily (in tempory tables) for multiple soil component iterations which can then be queried during the process, but is not retained after the interpretation has completed. |  |  |

## Data Requirements

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Rec ID** | **FY17 ID** | **Name** | **Primary Text** | **Priority** | | **Target Phase** | |
| 79618 | 2.2.1 | Data Download | System shall allow users to download data and interpretations for reuse at a future date. | | Must | | 1 |
| 79619 | 2.2.2 | Server Capacity | System shall require database server space/hosting facility. | | Must | | 1 |
| 79620 | 2.2.3 | Official Interpretations | System shall store, archive and provide access to official interpretations that have been approved and signed off on by the State Conservationist or equivalent administrator for public lands. | | Must | | 1 |
| 79621 | 2.2.4 | External Data Sources | System shall be able to glean/ extract data from external sources for use in interpretations. Examples are distances from water bodies, PRISM data, LIDAR data - topographic data, tabular descriptive data, and distance from major roads. | | Must | | 3 |
| 79622 | 2.2.5 | Site Specific Data Substitution | System shall have the ability to accept site specific data to substitute for the properties required in the interpretation. The site specific data may be supplied in a tabular form or in the form of a map. | | Must | | 2 |
| 79623 | 2.2.6 | Data Backups | System shall provide a backup system to allow for the storage of custom interpretations for future use. | | Must | | 2 |
| 79624 | 2.2.7 | Restricted Data | System shall recognize data in the transactional database that cannot be shared and will not use it for interpretations to be generated by outside NRCS users such as point data containing information on threatened and endangered species. | | Must | | 2 |
| 79625 | 2.2.8 | Excluded Spatial Areas | System shall recognize spatial areas that have been excluded from the official dataset and will not provide interpretations for those areas. | | Must | | 3 |
| 79626 | 2.2.9 | Naming Conventions | System shall manage the naming convention of the interpretations so that it is possible to store, search and sort them. | | Should | | 2 |
| 79627 | 2.2.10 | Update Official Interpretations | System shall allow authorized users with appropriate permissions to update the official interpretations. | | Must | | 1 |
| 79628 | 2.2.11 | Add New Properties and Rules | System shall allow authorized users with appropriate permissions to add new properties, rules and interpretations to the official data set. | | Must | | 1 |
| 79629 | 2.2.12 | Archive | The system must archive the interpretive criteria (properties, evaluations, and rules) for Official interpretation for each annual refresh of the contemporary SSURGO data, rather than archive yearly interpretive output. | | Must | | 1 |
| 79630 | 2.2.13 | User Profile Data | System shall have the capability to store enough information about users so that they can return to the system to check on the results of an interpretation, to update an interpretation or to delete an interpretation. | | Must | | 1 |
| 79631 | 2.2.14 | Measurement Units | System shall have the ability to accept parameters in English or Metric units, however all calculations will be performed in Metric Units and the storage of any data will be in Metric Units. | | Must | | 2 |
| 79632 | 2.2.15 | Maximum Size | System shall allow for the designation of a maximum size of a spatial layer to be interpreted. Maximum will be defined based on system capabilities which may change with technology. | | Must | | 3 |
| 79633 | 2.2.16 | Data Export | System shall allow for data to be exported to external modeling applications. Data includes soil property data as well as generated interpretive output. | | Must | | 1 |
| 79634 | 2.2.17 | Link Data Layers | System shall allow for establishing linkages between data layers such as PRISM, SSURGO, gSSURGO, STATSGO. | | Must | | 3 |
| 79635 | 2.2.18 | Concurrent User Overlapping Areas | System shall have the capability to allow different users to work concurrently on overlapping areas of interest. | | Should | | 3 |
| 79636 | 2.2.19 | Public Read Only | System shall provide read only access to the public facing data which is used in contemporary resource planning, such as Web Soil Survey. | | Must | | 2 |
| 79637 | 2.2.20 | Official Data Updates | System shall permit interpretations to be stored/appended to the Official Dataset by authorized individuals. | | Must | | 1 |
| 79638 | 2.2.21 | Batch Processing for Large Areas | System shall allow batch processing of interpretations for large areas such as National Parks or MLRAs or any other area having a boundary. As in the case of end of year preparation of the next FY s official data. Maximum will be defined based on system capabilities which may change with technology. | | Must | | 1 |
| 79639 | 2.2.22 | Test Data | System shall provide the capability to calculate interpretations from transactional data for testing, or from official data without the use of the Project Object. | | Must | | 1 |
| 79640 | 2.2.23 | Migrate NASIS Data | Existing interpretations in NASIS need to be migrated to the new system so that they are in sync and stay in sync. | | Must | | 1 |
|  |  |  |  | |  | |  |

## Communications Requirements

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| --- | --- | --- | --- |
| **2.3** | **Communications Requirements** | **Priority** | **Phase** |
| 2.3.1 | System shall have the ability to notify individuals about the status of the system. (Whether it is on line, or under maintenance) | Must | 2 |
| 2.3.2 | System shall have the capability of sending email notifications to designated user groups. | Should | 2 |
| 2.3.3 | System shall have the capability of sending email notifications to designated user groups/ customer to be alerted when changes are made to “official interpretations”. | Should | 2 |
| 2.3.4 | System shall generate emails when an offline interpretation job is complete along with a link for the user to download the results. | Must | 2 |
| 2.3.5 | System shall allow users to communicate amongst themselves during the development of an interpretation. A blog can be created for each interpretation. | Should | 3 |

## Tracking Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.4** | **Tracking Requirements** | **Priority** | **Phase** |
| 2.4.1 | System shall communicate to users the status of interpretations. Whether they are ready for use, under development, or not being maintained. | Must | 1 |
| 2.4.2 | System shall provide the capability of tracking how many users are on the system and which interpretations are most often used. Metrics will be communicated to Soil Business. | Should | 3 |
| 2.4.3 | System shall provide the capability of tracking the number of National Interpretations included with the SSURGO data and communicate to users which and how many there are. | Must | 1 |
| 2.4.4 | System shall provide the capability to track changes made to interpretations and time stamp the changes. | Must | 1 |
| 2.4.5 | System shall have the ability to date stamp interpretation products so that users can verify which version of an interpretation was used and whether or not it has geographic applicability to where it was just used. | Must | 1 |
| 2.4.6 | System shall have the capability to track how long it takes for requests to be filled. | Must | 1 |
| 2.4.7 | System shall have the ability to track requests at different stages. This will allow administrators to monitor use of the system and implement restrictions on number of concurrent users, number of off line requests, or size of requests allowed to be accepted. | Must | 1 |
| 2.4.8 | System shall update the logs of processes and completion of products. | Must | 1 |
| 2.4.9 | System shall allow an administrator to assign a priority to certain processes to ensure that the yearly update of interpretations will complete on time. | Should | 2 |
| 2.4.10 | System needs to allow calibration via real data and parameters (e.g. interpretation weights) optimization. This would allow the interpretation model to be fine-tuned. The interpretation would run over and over (e.g. 1000 times) using different scenarios from the real data and then fine tuning the interpretation. | Should | 2 |
| 2.4.11 | System shall allow a way to store previous versions of the interpretations to allow users to know which version was used to create output. | Should | 2 |

## Roles and Permissions Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.5** | **Roles and Permissions Requirements** | **Priority** | **Phase** |
| 2.5.1 | Users shall have permissions based on the roles. | Must | 1 |
| 2.5.2 | Users shall include external customers. | Must | 1 |
| 2.5.3 | Data actions may be restricted at field level, not just at screen level. | Must | 1 |
| 2.5.4 | Data entry fields may be editable for some roles, view only for others, or even hidden for others. | Must | 1 |
| 2.5.5 | System shall permit different data entry actions based on user role permission. | Must | 1 |
| 2.5.6 | System shall permit granular permission levels according to user roles. | Must | 1 |
| 2.5.7 | System shall allow a user to have more than one role and more than one section.  User types can be employee, consultants, TSP’s, Affiliates. | Must | 1 |
| 2.5.8 | System shall allow user role with appropriate permissions to serve as Administrators to create and monitor user accounts and set storage limits. | Must | 1 |
| 2.5.9 | System shall allow user role with appropriate permissions to serve as Interpretation Owner to allow users to create and share criteria and output. | Must | 1 |
| 2.5.10 | System shall allow user role with appropriate permissions to serve as Data Steward to optimize storage and performance by encouraging criteria sharing and reducing redundancies. | Must | 1 |
| 2.5.11 | System shall allow processor partitions and time-outs based on the level of permissions, such that some users could run a CONUS-sized areas of interest. Maximum-sized areas will be defined based on system capabilities which may change with technology. | Should | 1 |

## Document Management Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.6** | **Document Management Requirements** | **Priority** | **Phase** |
| 2.6.1 | System shall allow the users to upload documents to the project folder repository. | Must | 1 |
| 2.6.2 | System shall allow authorized users with appropriate roles to view previously uploaded documents. | Must | 1 |
| 2.6.3 | Authorized users with appropriate permissions shall be able to associate documents with specific interpretations/projects. | Must | 1 |
| 2.6.4 | System shall allow the users to search for documents. | Must | 1 |
| 2.6.5 | System shall allow upload of several standard document types.  **Ex:** .doc .xls pdf, .html, and .png file | Must | 1 |
| 2.6.6 | System shall allow authorized users with appropriate roles to edit a document when required. | Must | 1 |

## Reporting Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.7** | **Reporting Requirements** | **Priority** | **Phase** |
| 2.7.1 | System shall have the capability to generate custom reports.  **Comment:**  Custom reports for the parameters defined by business like breaking it down by geographical region/countries, counties, or completed /incomplete project. | Must | 1 |
| 2.7.2 | System shall have the ability to generate reports on ad-hoc basis. | Must | 1 |
| 2.7.3 | System shall have the capability to run monthly/ quarterly reports as mandated by policies. | Must | 1 |
| 2.7.4 | System shall have the capability to run reports on annual basis for defined parameters. | Must | 1 |
| 2.7.5 | System shall be able to generate reports by Administrative unit such as State or Regional Office or Soil and Water Conservation Districts. The system will have the ability to export interpretations for SSURGO across our own regional boundaries and by National Cooperative Soil Survey partners’ boundaries, regions, and networks, especially if the interpretation was designed for or by them. | Must | 3 |
| 2.7.6 | System shall be able to generate various standard reports as defined by the National Soil Survey Center. | Must | 1 |
| 2.4.7 | System shall have the capability to obtain reports regarding the number of interpretations in various categories such as “official  – ready for use” when requested. | Must | 2 |
| 2.7.8 | System shall provide the capability to export, print and email the generated reports. | Must | 1 |
| 2.7.9 | System shall allow the user to attach reports to the projects. | Must | 1 |
| 2.7.10 | System have the capability to generate Reports in PDF, Excel, Word and HTML format. | Must | 1 |
| 2.7.11 | System shall allow the authorized user with appropriate permissions to edit the format of reports and include images. | Must | 2 |
| 2.7.12 | System shall allow the user to save reports on the Desktop. | Must | 1 |
| 2.7.13 | System shall allow the user to view the previously generated reports. | Must | 1 |
| 2.7.14 | System shall allow the user the capability to make reports public or private. | Must | 2 |
| 2.7.15 | The reports categorized as end user report shall be available for the internal and external clients.  Comment:  Internal product reports shall not be available to the external users. (Examples would be interpretations run on the transactional database for test purposes.) | Must | 2 |
| 2.7.16 | Reports categorized as internal reports shall be accessible only to authorized users with appropriate permissions. | Must | 2 |
| 2.7.17 | System shall allow the user to run reports to test an interpretation. | Must | 1 |
| 2.7.18 | System shall have the capability to run reports in batches or on specific times and dates. | Must | 1 |
| 2.7.19 | System shall allow the capability to run reports for QA/QC. Example reports are ranges of clay content, depths to wetness, soil organic carbon contents, data plots, and distributions. | Must | 1 |
| 2.7.20 | System shall have the capability to run reports based on user, user type and type of interpretation product (export, tabular, spatial, map). | Must | 1 |
| 2.7.21 | System shall have the capability to generate graphs and charts from the report metrics. | Should | 1 |
| 2.7.22 | System shall have the ability to link interpretive output to spatial data for automated mapping and also allow to annotate a map with additional information to document the interpretation. | Must | 3 |
| 2.7.23 | System shall have the capability to generate interpretations and reports on laboratory (point) data for comparison to component data. | Should | 1 |

## Workflow Requirements

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| --- | --- | --- | --- |
| **2.8** | **Workflow Requirements** | **Priority** | **Phase** |
| 2.8.1 | System shall have the ability to have interpretation statuses updated in real time as per the sequence of events detailed.  **Comments:**  Sequence of events will be as follows:  -In development- testing (not ready for use) – Ready for use – Assigned to SSURGO as an exported National or Regional Interpretation. | Must | 1 |
| 2.8.2 | System shall update database and maintain log for the same on real time. | Must | 1 |
| 2.8.3 | System shall have a check point/ validation as applicable through business rules. – If there are issues with the input data the interpretation will not run. Example – NotCom areas where no soils information exists.  **Comment:**  If conditions/ pre-requisites not met, system sends out an alert/ error message/ notification and does not allow the request to process further. | Should | 1 |
| 2.8.4 | System shall support Risk Assessment and Risk Mitigation for business scenarios where precondition is not met. | Should | 1 |
| 2.8.5 | System shall allow user to attach/ link notes to records when applicable. | Must | 1 |
| 2.8.6 | System shall support review and approval of submitted interpretations and documentation by authorized users. | Must | 1 |
| 2.8.7 | Shall have the capability to receive and process various documents. | Must | 1 |

## External Interface Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.9** | **External Interface Requirements** | **Priority** | **Phase** |
| 2.9.1 | System shall interface with the NASIS, WSS, and Soil Data Warehouse Database to allow results of interpretations to be exported. | Must | 2 |
| 2.9.2 | The Interpretation Generator shall be integrated with NASIS Database to import transactional data for testing.  **Comment:**  This shall be a 2-way integration.  To allow for NASIS database to be updated with external information for public use. It’s not automated but authorized personnel have read-write access. | Must | 2 |
| 2.9.3 | System shall have the capability to be integrated with Enterprise Content Management (ECM). | Must | 2 |
| 2.9.4 | System shall have export functionality when interacting with external entities.  Comment:  System shall have the capability of sending reports/data from interacting external entities. | Must | 2 |
| 2.9.5 | System shall have import functionality when interacting with external entities.  Comment:  System shall have the capability of receiving reports/data from interacting external entities. | Should | 2 |

## xxReference Data

|  |  |  |  |
| --- | --- | --- | --- |
| **2.1** | **Reference Data** | **Priority** | **Phase** |
| **2.1.1** | **Authenticated users with appropriate roles & permission will be provisioned with a web based application for managing <name of reference data > reference data. The users will be plant specialists or other knowledgeable users with data stewardship role.**  This data is currently maintained….  Phase Considerations: |  | 1 |
| **2.1.2** | **The reference data will have the following attributes:** |  | 1 |
| **2.1.3** | **The solution will allow data stewards to provision ….** |  | 1 |
| **2.1.4** | **The Solution will allow data stewards to define** |  | 1 |

## xx Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| **2.2** | **Data Requirements** | **Priority** | **Phase** |
| 2.2.1 | System shall allow users to download data and interpretations for reuse at a future date. | Must | 1 |
| 2.2.2 | System shall require database server space/hosting facility. | Must | 1 |
| 2.2.3 | System shall store, archive and provide access to “official interpretations” that have been approved and signed off on by the State Conservationist or equivalent administrator for public lands. | Must | 1 |
| 2.2.4 | System shall be able to glean/ extract data from external sources for use in interpretations. Examples are distances from water bodies, PRISM data, tabular descriptive data, and distance from major roads. | Must | 3 |

## Pxxroject Specific Section

|  |  |  |  |
| --- | --- | --- | --- |
| **2.5** | **<Project Name> Analysis and Calculation Results** | **Priority** | **Phase** |
| **2.5.1** | **The solution shall < >**:  Note: The… |  | 1 |
| **2.3.7** | **The solution shall calculate < >.**  Comments:  This calculation would include (but not be limited to):   * < > |  | 1 |
| **2.3.8** | **The solution shall assist the user in the calculation of < >.**  Comments:  This calculation would include (but not be limited to):   * < > |  | 1 |

## xxExternal Data Sources

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2.6** | | **External Data Sources** | | **Priority** | | **Phase** | |
| **2.6.1** | | **Requires properties from <data source> database:** | |  | | 1 | |
| **2.6.2** | | **Requires properties from <data source>** | |  | | 1 | |
| **2.6.3** | | **Requires data from NRCS Enterprise Reference data**   1. Practice Data – including practice standards 2. Resource Concerns | |  | | 1 | |
| **2.6.4** | | **Requires properties from soil database.**  The assessment algorithm requires a set of attributes for the soil components at the location of the land being planned for vegetative practices. This data would be obtained from Soil Data Access. To retrieve the data it is necessary to identify the soil map unit at the location. This could be done by:   * Pre-determined from the planning land unit (PLU) * manually entering a map unit key, provided the user knows that information * using an interactive map to zoom to the location and select the soil map unit polygon at the location * using GPS coordinates to retrieve the map unit with a spatial query | |  | | 1 | |
| **2.6.5** | | **Climate Data from a climate database to be determined.**  Note: LMOD climate zones defined for RUSLE2 provide rainfall and temperature day by day and month. Current climate in LMOD is configured for the wind and water erosion predicted tools. The LMOD data might be used for <app> in Phase 1. Phase 2 climate data could be provisioned specific to <app> needs. | |  | | 2 | |
| **2.6.6** | | **The solution shall be capable of accessing NRCS enterprise sources of information, to be used in the analysis process, and used to display or report results in the following categories (but not limited to):**   * List applicable. Examples below * National Conservation Practice Standards * National Ecological Site Descriptions * National Plant Species and Plant Characteristics * National Soil Types and Soil Characteristics * (National … Lime & Nutrients, O&M) * Climate Information * Topological Information | |  | | 1 | |
| **2.6.7** | | **The solution shall be capable of obtaining data about the customer for display on reports. Customer data will be obtained from the FSA Customer Data SCIMS.**  For example – The name of the “Client” (who the report was developed for) and their mailing address or other contact information, but would not be maintained in the on line tool. | |  | | 1 | |
| **2.6.8** | | **Integration with Customer Service Toolkit (CST)**   1. This option will be available to authenticated users of <Name of app >Toolkit with appropriate roles & permission 2. Will allow user to invoke from Toolkit for specific practice 3. Invoking from Toolkit will provide pre-identification of the following examples of data needed by <Name of app >:  * Location(s) information – Planning Land Unit (PLU) as geospatial shape * Resource concern information * Conservation Practices(s) selected by the planner for the land * Land Use information * Soil Type if different from soil derived from soil layer * Land Use specific information such as crop type, herd type, herd size or wildlife * Special Area information (crop boarder, pollinator area) * The client input and output data will then be stored in NPAD | |  | | 1 | |
| **2.6.9** | | **Potential future integration with CDSI.**  There is an interest in incorporating this tool with other CDSI applications for use in on-site planning. The details of this interaction can't be determined at this time but there should be consideration of potential data sharing to avoid redundant data entry. | |  | | 1 | |
| **2.6.10** | | **Enterprise Geospatial Components**  Re-usable geospatial user interface components have been developed and will continue to be enhanced. These standard components should be integrated with <Name of app > for users who will need to define land location when it cannot be derived from planning data sources | |  | | 1 | |
| **2.4.11** | | **Maximize ECM integration.**  The application uses many documents that describe such things as guidance on doing an assessment and interpreting the results. There will need to be a way to update and distribute these documents to devices that have the application installed. Enterprise Content Management could be of value in meeting this requirement. | |  | |  | |

## Reporting Requirements

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| --- | --- | --- | --- |
| **2.7** | **Reporting Requirements** | **Priority** | **Phase** |
| **2.7.1** | **The solution shall support the generation of predefined reports including but not limited to:**   * < > |  | 1 |
| **2.7.2** | **The solution shall support, limited customization of the predefined reports.**  Comments:  It is assumed that there will be a need to customize predefined reports (e.g., headers/footers, organization, etc.) |  | 2 |
| **2.7.3** | **The solution shall support the delivery of generated reports through a variety of methods including (but not limited to):**   * **To a display device,** * **As a collection of exported data,** * **As a file (or attachment to an email)**   Comments:  The ability to export the “report” in a form that is useful to the user is very important. This is even more important when you consider anonymous users (non-authenticated) who are not able to retain information. See section on Data Export Requirements for additional information. |  | 1 |

## xxImport Previous Requirements

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| --- | --- | --- | --- |
| **2.8** | **Import Requirements** | **Priority** | **Phase** |
| **2.8.1** | **The solution shall support upload of <previously defined input data from a file exported during a prior session. This options is available for any user.>**  **Note:**  The solution must provide the user the ability to download < > |  | 1 |
| **2.8.2** | **For users with appropriate roles & permissions the solution shall support reuse of previously defined input data from saved during a prior session.** |  | 1 |
| **2.8.3** | **For users with appropriate roles & permissions the solution shall support reuse of analysis results saved during a prior session.** |  | 1 |
| **2.8.3** | **The solution shall enable a NRCS authenticated users with appropriate roles & permission to import the results from a predefined data export for re-use.**  Expectation:  This would enable an authenticated user to perform scenarios similar to the following:   * Let Me See That Again: Repeat a previous analysis (Run, Save, Reload) * Let’s Try Something a Little Different: Load a previous analysis for a client, then modify the criteria, and run the new analysis. * Comparative Analysis: Perform multiple analyses (saving the outcome of each) and then perform some type of comparative analysis outside of the solution environment. * Jump Start Analysis for a NEW Client: … |  | 1 |

## Exxxport Requirements

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| --- | --- | --- | --- |
| **2.9** | **Export Requirements** | **Priority** | **Phase** |
| **2.9.1** | **The solution shall enable any user to export the results from any generated report.**  Expectation:   * Any report generated by the solution should be available in a format that is visually equivalent to the displayed report (e.g. a PDF file) * When supported a choice of common document type formats will be made available (e.g. RTF, DOC, TXT, XLS, etc.) |  | 1 |
| **2.9.2** | **The solution shall enable any user to export the data resulting from using a predefined data export.**  Expectation:  A series of “data reports’ will be defined that any user can “run” to retrieve information associated with their interaction with the solution (e.g., get a data dump of my site analysis information) |  | 1 |
| **2.9.3** | **The solution shall enable a NRCS authenticated user (employees, affiliates and customers), when possible, to export the results from a generated report in the NPAD format.** |  | 1 |

## xxRoles and Permissions

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| --- | --- | --- | --- |
| **2.1** | **Roles and Permissions** | **Priority** | **Phase** |
| **2.1.2** | **The solution will allow authenticated user access.**  Types of authenticated users:   * NRCS Employees * NRCS Affiliates * Customers: for example Farmers and Ranchers and other NRCS client producers * Technical Service Providers * Specialized Soils Science experts from universities, institutes, etc. |  | 1 |
| **2.1.3** | **The solution will support authenticated NRCS employee and affiliate users with appropriate roles & permission accessing the application from integrated applications such as CST or CD based upon Roles & Permissions.**  Comments:  An example would be a NRCS employee or Affiliate using the CST or CD/CDSI to assist a customer.  Expectation:  Integrated access users may invoke <app name> directly or from an integrated application. If invoked directly <app name> will not have access to planning data from NPAD. If invoked from CST or CD then it will be in the context of a Client Planning Land Unit where data related to location, resource concerns, land use, practices etc are available to <app name>. |  | 1 |
| **2.8.4** | **The solution shall support access by Technical Service Providers (TSP) based upon their roles and permissions.**   * TSP do not currently have permission to use TK or CD, but this could change in future and then they would have similar access based upon roles and permissions as other Toolkit and CD users: * TSPs will user <app name> in the initial phases without benefit of access to client planning data. The will have a user interface that allows entry of input data needed for <app name> such as location, land use, resource concerns, & practices. |  | 1 |
| **2.8.5** | **The solution will allow authenticated employee and affiliate users with appropriate data stewardship roles and permissions to create and update Vegetative Reference Data used for the analysis and calculations.**  This role may have national or state jurisdiction. The jurisdiction might also be at the resource area level, such as MLRA, or resource area defined specifically for <app name>. |  | 1 |
| **2.8.6** | **The solution will allow authenticated employee users with appropriate approval role to activate** <app name>  **Data.** |  | 2 |

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# Appendix A – Acronyms, Terms and Definitions

*Modify this section as needed. The acronyms, terms and definition will be specific to the project.*

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| **Acronyms and Terms** | **Definitions** |
| National Conservation Practice Standards | A conservation practice standard contains information on why and where the practice is applied, and it sets forth the minimum quality criteria that must be met during the application of that practice in order for it to achieve its intended purpose(s)  <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/references/?cid=nrcsdev11_001020> |
| Practice Purpose | The specific intent of applying this practice (usually associated to address a resource concern) and follows general criteria applicable to all purposes and specific criteria for the unique purpose. |
| CST | Conservation Service Toolkit |
| CD | Conservation Desktop |
| PLU | Planning Land Unit |
| Conservation Practice Standard (CPS) | CPS establish the minimum level of acceptable quality for designing, installing, operating, and maintaining conservation practices. A CPS contains specific treatment, such as a structural or vegetative measure or management technique, commonly used to meet specific needs in planning and implementing conservation, for which standards and specifications have been developed. |
| Resource Concern | An expected degradation of the soil, water, air, plant, or animal resource base to the extent that the sustainability or intended use of the resource is impaired. |
| Area of Interest | A user defined geospatial shape. |
| MLRA | Major Land Resource Area (MLRA) This is a polygon coverage of the Land Resource Regions and Major Land Resource Areas of the conterminous United States. Land resource regions are geographic areas that are characterized by a particular pattern of soils, climate, water resources and land uses. (USDA, Soil Conservation Service, 1981). Major land resource areas are subregions of the land resource regions and comprise smaller homogeneous areas. The scale of this coverage is 1:2,000,000. Note: The Soil Conservation Service now (1995) is called the Natural Resources Conservation Service. Descriptors: Land Resource Regions Major Land Resource Areas United States. Provisioned by the USGS. <https://catalog.data.gov/dataset/major-land-resource-areas-mlra> |
| AWM | Animal Waste Management |
| CDSI | Conservation Delivery Streamlining Initiative |
| CED | Conservation Engineering Division |
| CIO | Chief Information Officer |
| COTS | Commercial Off-The Shelf |
| CNMP | Comprehensive Nutrient Management Plan |
| DBMS | Database Management System |
| ECM | Enterprise Content Management |
| FY | Fiscal Year |
| GNT | Geospatial Nutrient Data |
| HLBR | High Level Business Requirement |
| IRB | Investment Review Board |
| IT | Information Technology |
| ITC | Information Technology Center |
| LIMS | Laboratory Information Management System |
| LMOD | Land Management Operations Database |
| LOE | Level of Effort |
| MMP | Manure Management Planner |
| NASIS | National Soil Information System |
| NRCS | Natural Resources Conservation Service |
| OCIO NIST | Office of the Chief Information Officer National Institute of Standards and Technology |
| PII NRCS | Personally Identifiable Information Natural Resources Conservation Service |
| QC OCIO | Quality Control Office of the Chief Information Officer |
| RMT | Requirements Management Team |
| Site | A “site” is a physical spot on the Earth (latitude/longitude and other geological features) |
| S&T | Science and Technology |
| SME | Subject Matter Expert |
| SRS QC | SYSTEM Requirements Specification Quality Control |
| TSPs | Technical Service Providers |
| USDA SRS | United States Department of Agriculture Systems Requirements Specification |
| WEPP | Water Erosion Prediction Project |
| WEPS | Wind Erosion Prediction System |
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# Appendix B – References

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| --- | --- | --- | --- |
| **Ref #** | **Title** | **Version #/Date** | **Publisher** |
| 1 | NRCS Requirements Development and Management Plan | 1.0 | NRCS |
| 2 | NRCS Change Control Process | 1.0 | NRCS |