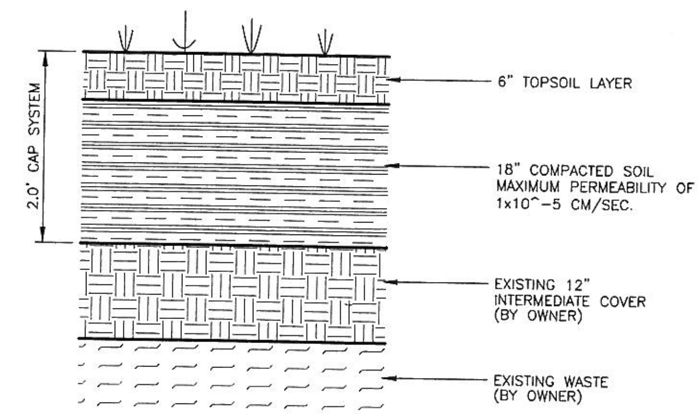


HATCH PIT COVER SYSTEM

NOT TO SCALE

F:\1-08147-Bonneville Co. Landfill\CADD-1-08147\Exhibits\hatchpit\1-08147-Fig 7 - ClosureSection.dwg

GreatWest engineering

Figure 7
Closure Cover Section

BONNEVILLE COUNTY HATCH PIT
NON-MUNICIPAL WASTE LANDFILL

Appendix 3

Well Abandonment Correspondence

DENNING WELL DRILLING, INC.
BOX 460, UCON, IDAHO 83454
523-4600

Bonneville County Transfer Station
ATTN: Paul
605 N Capital
Idaho Falls, Idaho 83402

RE: Hatch Pit Abandonment

Paul,

In regards to the Abandonment of the Hatch Pit Well, enclosed is a copy of the Current State of Idaho Regulations for Abandonment of Wells.

To Abandon this well, a M-Scope was used to determine the Static Water Level and bottom of well depth.

The Well was filled with 3/4" minus washed rock to static water level. The well was then filled to the top with concrete according to API Class A-H Specs. The washed rock was put in to static water level because the State Water Resource Director in our area has asked us to do so. Everything else done was according to current Idaho Well Abandonment Specs.

No contamination is possible down the inside of the well casing, and no upward or downward movement of water is possible.

If DEQ feels like it would have been better to seal outside voids from the casing, the concrete could be drilled out, the casing perforated, and we could have Haliburton Pressure Grout the well. Of course, this would be at the expense of the state.

If you have any questions, please contact me at the number above.

Sincerely,

Mike Denning

Mike Denning
Denning Drilling, Inc.

MD/bf
encl

12/29/2008

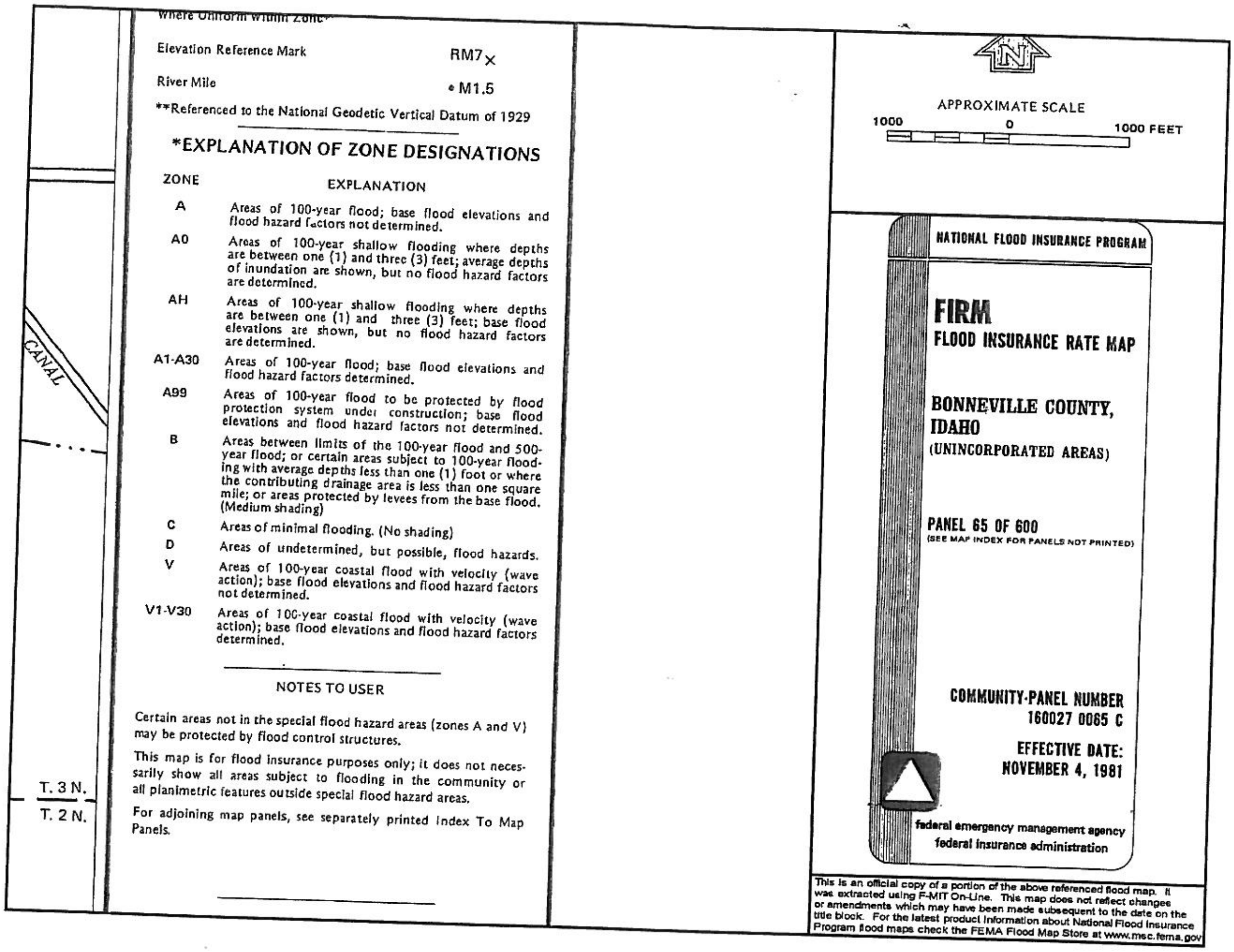
3,12. Abandoning of wells.

3,12,1. The well owner is charged with maintaining and abandoning a well in a manner that will prevent waste and/or contamination of the ground water. Permanently abandoned wells may have the casing removed or left in place and shall be filled with bentonite grout, cement grout, concrete, or puddling clay or other material as required to stop the upward or downward movement of water. If the well is artesian, cement grout, concrete or a packer approved by the Director shall be placed across the confining stratum overlying the artesian zone so as to prevent subsurface leakage from the artesian zone. The remainder of the well shall be filled with cement grout, concrete, or other approved material.

Appendix 4

FEMA Flood Maps

FEMA FLOOD MAPS



Where Uniform within Zone**

Elevation Reference Mark RM7×

River Mile • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

BONNEVILLE COUNTY, IDAHO

(UNINCORPORATED AREAS)

PANEL 65 OF 600

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

160027 0065 C

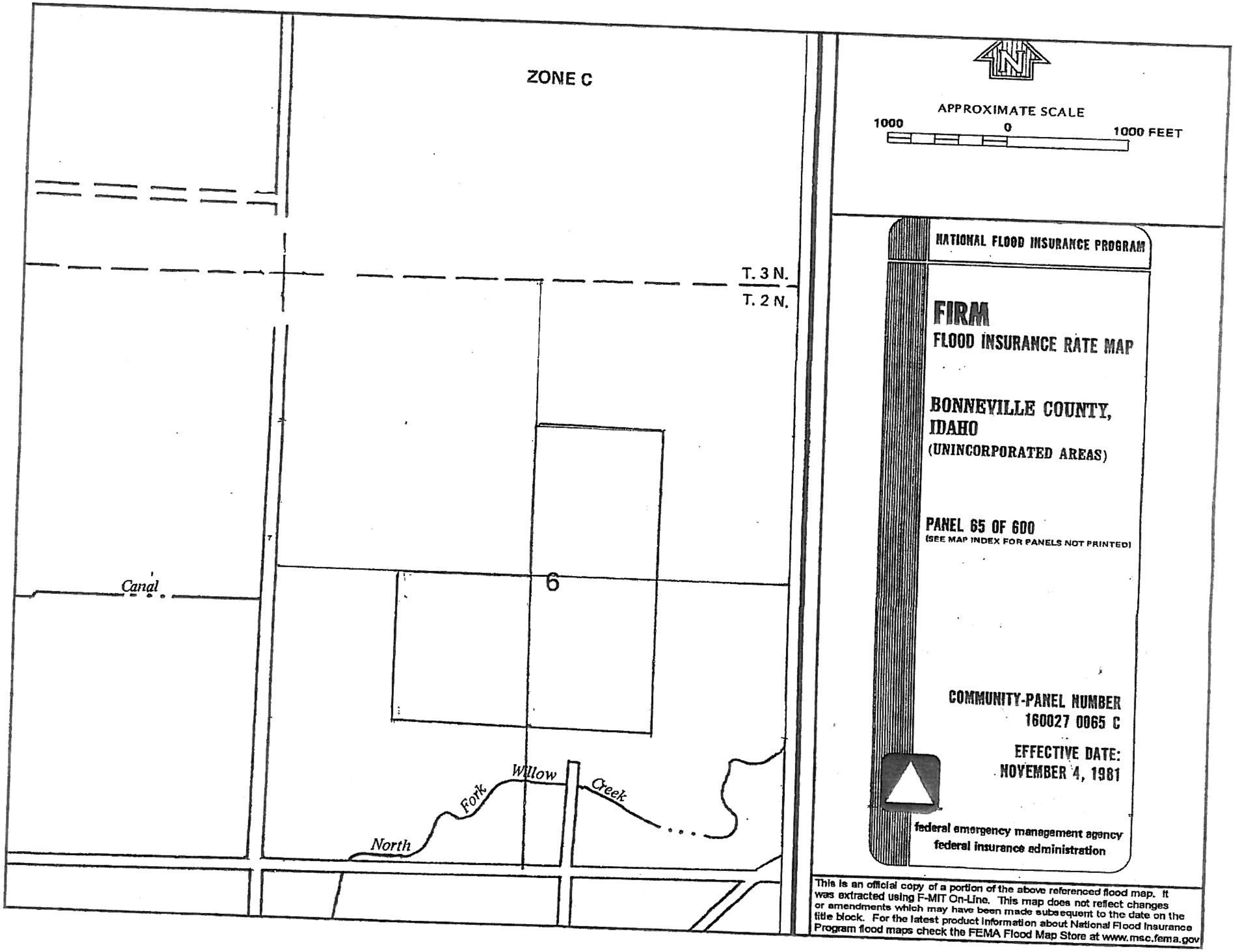
EFFECTIVE DATE:

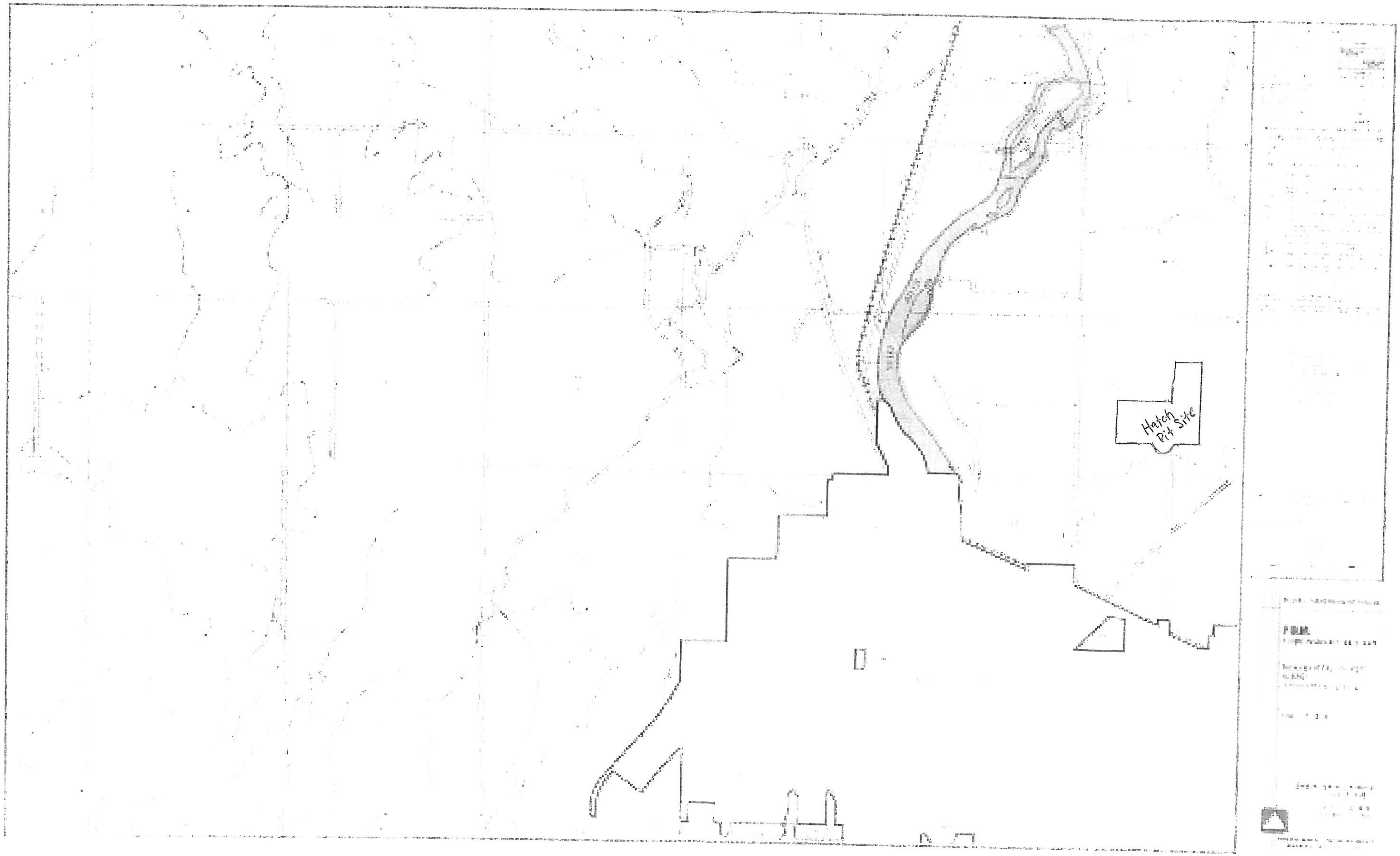
NOVEMBER 4, 1981

federal emergency management agency

federal insurance administration

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


ZONE C
T. 3 N.
T. 2 N.
Canal
6
North Fork Willow Creek
APPROXIMATE SCALE
1000
0
1000 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
BONNEVILLE COUNTY,
IDAHO
(UNINCORPORATED AREAS)
PANEL 65 OF 600
(SEE MAP INDEX FOR PANELS NOT PRINTED)
COMMUNITY-PANEL NUMBER
160027 0065 C
EFFECTIVE DATE:
NOVEMBER 4, 1981
federal emergency management agency
federal insurance administration
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov


Hatch Pit Site

Appendix 5

Endangered Species

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Eastern Idaho Field Office
4425 Burley Dr., Suite A
Chubbuck, Idaho 83202
Telephone (208) 237-6975
http://IdahoES.fws.gov

Paul Snarr
Bonneville County
Road & Bridge Department
605 North Capital Ave.
Idaho Falls, Idaho 83402

DEC 13 2007

Subject: Proposed Bonneville County Non-Municipal Solid Waste Landfill.
SL # 2008-0109

Dear Mr. Snarr:

The U.S. Fish and Wildlife Service (Service) is writing in response to your request for information about the potential impacts to endangered, threatened, proposed, and/or candidate species from the proposed Bonneville County non-municipal solid waste landfill. The Service has not identified any issues that indicate that consultation under section 7 of the Endangered Species Act of 1973, as amended, is needed for this project. This finding is based on our understanding of the nature of the project, local conditions, and/or current information indicating that no listed species are present. If you determine otherwise or require further assistance, please contact Sandi Arena of this office at (208)237-6975 ext 34. Thank you for your interest in endangered species conservation.

Sincerely,

Damien Miller
Supervisor, Eastern Idaho Field Office

Appendix 6

Wetland Documents with Map

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
IDAHO FALLS REGULATORY OFFICE
900 NORTH SKYLINE DRIVE, SUITE A
IDAHO FALLS, IDAHO 83402-1718

REPLY TO
ATTENTION OF

January 15, 2008

Regulatory Division

SUBJECT: NWW-2007-1327-I02

Mr. Paul Snarr
Bonneville County Road and Bridge Department
605 North Capital Avenue
Idaho Falls, Idaho 83402

Dear Mr. Snarr:

This is in response to your December 6, 2007, letter requesting our comments on the county's proposed non-municipal solid waste landfill. The proposed project area is located in Section 6, Township 2 North, Range 38 East, B.M., Bonneville County, Idaho.

Section 404 of the Clean Water Act (33 U.S.C. 1344) requires a Department of the Arm permit be obtained for the discharge of dredged or fill material into waters of the United States This includes most perennial and intermittent rivers and streams, natural and man-made lakes and ponds, and wetlands, as well as irrigation and drainage canals and ditches that are tributari to other waters._Activities regulated under Section 404 include excavation and mechanized landclearing activities which result in the discharge of dredged material and destroy or degrade waters of the United States.

Based on the information provided, it appears the proposed project will not involve work areas subject to our jurisdiction, e.g. wetlands or other waters of the U.S., and a Department of the Army permit will not be required. If you have any questions concerning these regulatory matters, please contact me at (208) 522-1676.

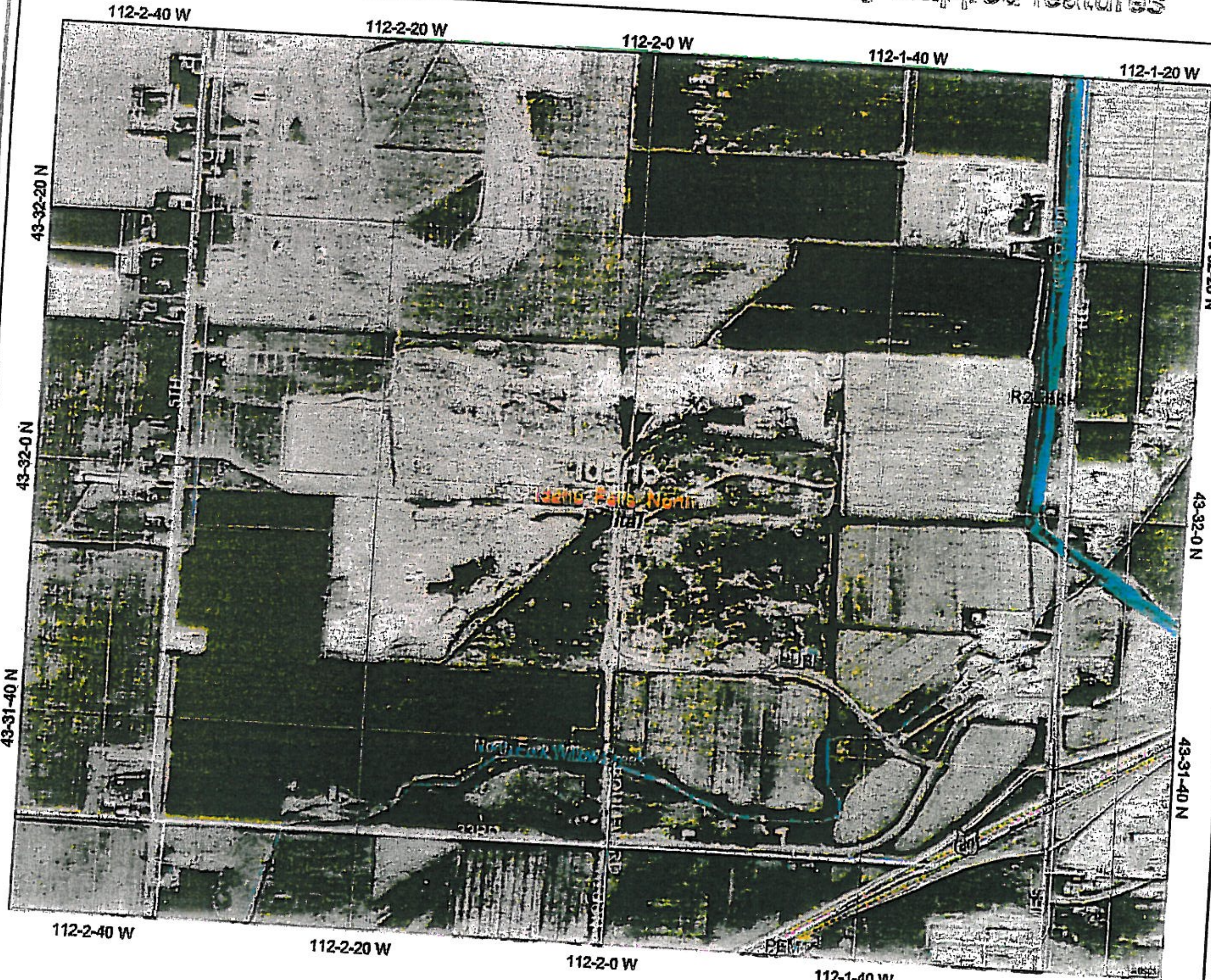
Sincerely,

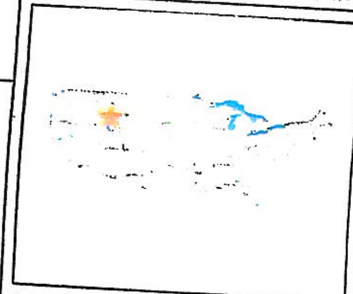
James M. Joyner

James M. Joyner
Regulatory Project Manager

Enclosures

Hatch Pit: National Wetland Inventory Mapped features





Legend

CONUS_wet_scan
- 0
- 1
- Out of range

Interstate
Major Roads

Other Road
- Interstate
- State highway
- US highway

Roads
Cities
USGS Quad Index 24K
Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan

NHD Streams
Counties 100K
States 100K
South America
North America

Map center: 43° 32' 0" N, 112° 2' 1" W

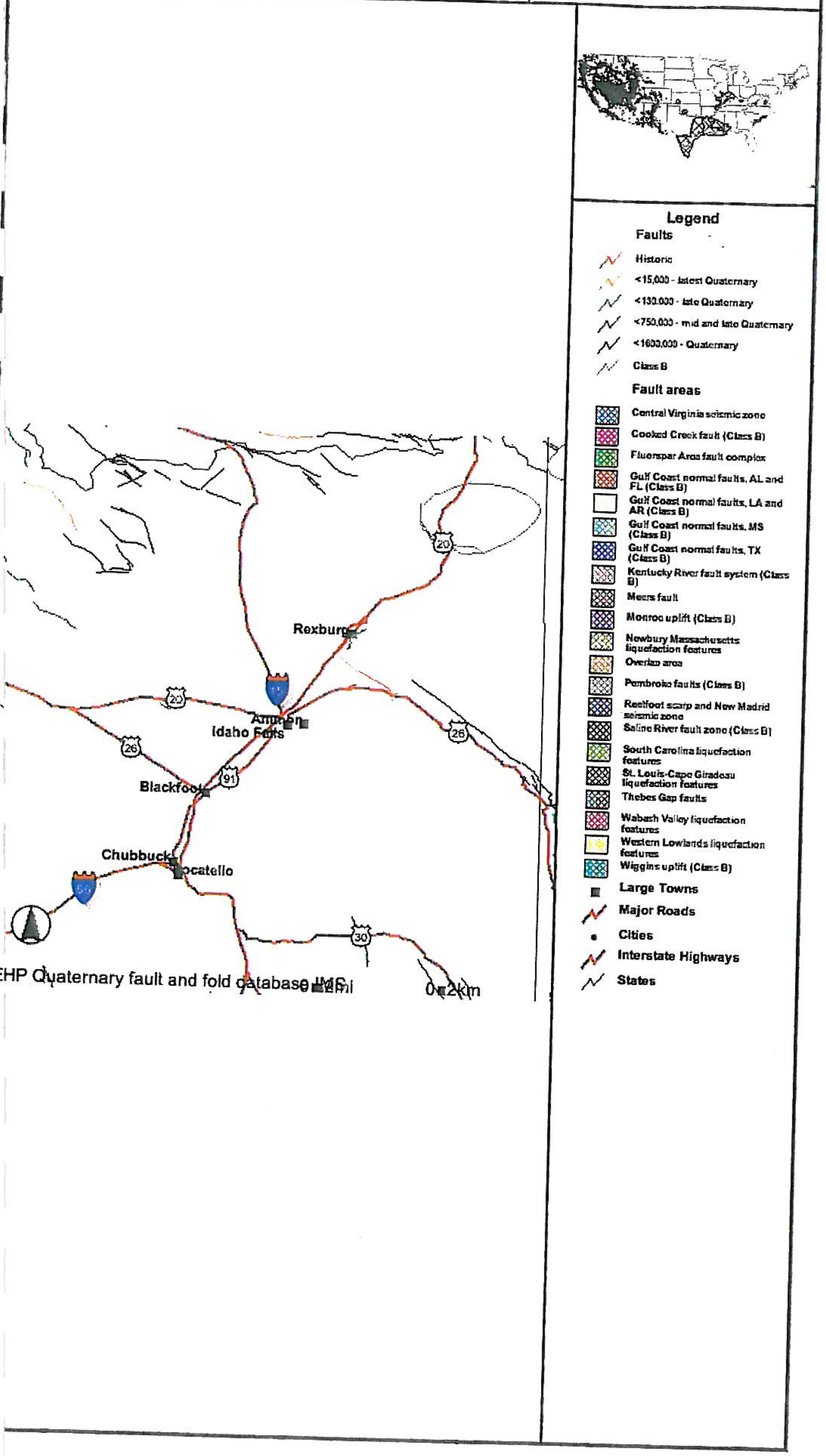
Scale: 1:15,144

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

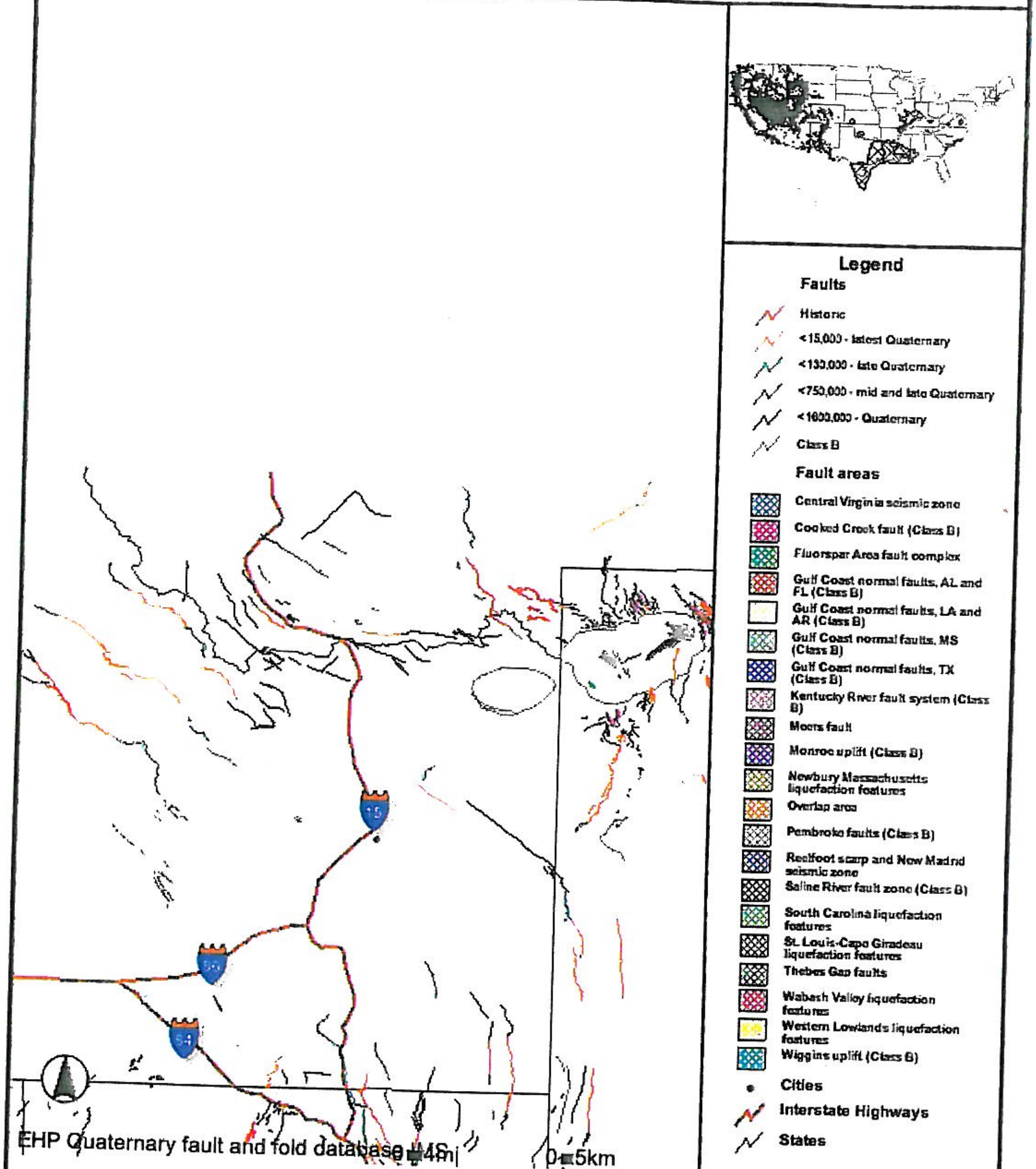
Appendix 7

Fault Maps & Soil Reports

ArcIMS HTML Viewer Map



ArcIMS HTML Viewer Map



USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Bonneville County Area, Idaho

Hatch Pit

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

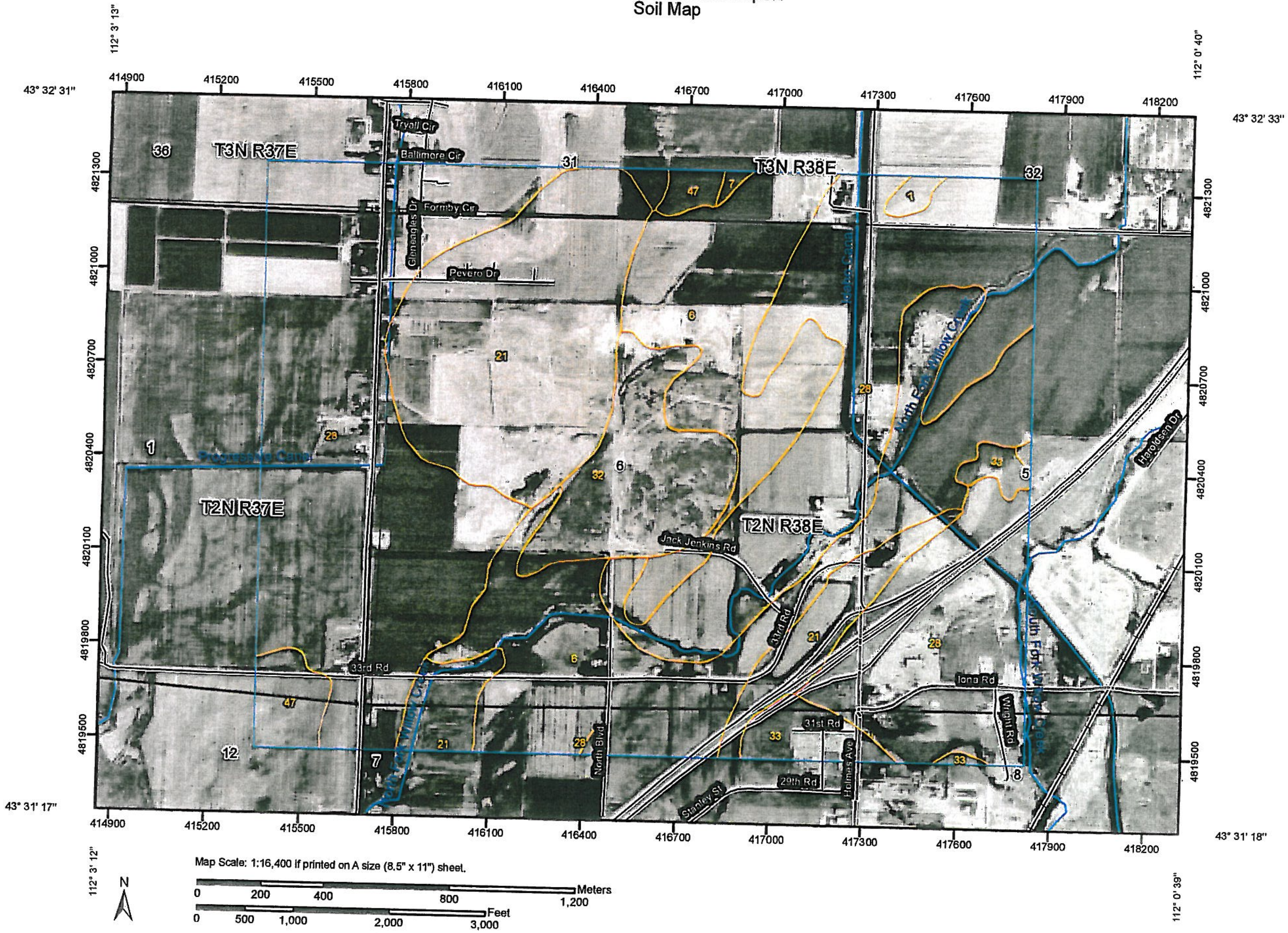
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map


112° 3' 13"
112° 0' 40"
43° 32' 31"
43° 32' 33"
43° 31' 17"
43° 31' 18"
112° 3' 12"
112° 0' 39"
414900
415200
415500
415800
416100
416400
416700
417000
417300
417600
417900
418200
4821300
4821000
4820700
4820400
4820100
4819800
4819500
T3N R37E
T3N R38E
T2N R37E
T2N R38E
36
31
32
1
12
7
8
5
6
Tryall Cir
Baltimore Cir
Formby Cir
Gleneagles Dr
Pevero Dr
Jack Jenkins Rd
33rd Rd
North Blvd
31st Rd
29th Rd
Holmes Ave
Stanley St
Iona Rd
Wright Rd
Haroldsen Dr
North Fork Willow Creek
South Fork Willow Creek
47
21
28
32
33
Map Scale: 1:16,400 if printed on A size (8.5" x 11") sheet.
0
200
400
800
1,200
Meters
0
500
1,000
2,000
3,000
Feet
N

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities
- PLSS Township and Range
- PLSS Section

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:16,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bonneville County Area, Idaho
Survey Area Data: Version 7, Jan 31, 2008

Date(s) aerial images were photographed: 7/30/1992

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Bonneville County Area, Idaho (ID769)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Bannock loam	274.3	24.0%
7	Bock loam	5.2	0.5%
21	Paesl silty clay loam	197.4	17.3%
28	Paul silty clay loam	552.3	48.4%
32	Pits	67.4	5.9%
33	Polatis-Rock outcrop complex, 2 to 25 percent slopes	23.5	2.1%
47	Stan sandy loam	21.4	1.9%
Totals for Area of Interest		**1,141.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Bonneville County Area, Idaho

6—Bannock loam

Map Unit Setting

Elevation: 4,200 to 5,900 feet
Mean annual precipitation: 8 to 13 inches
Mean annual air temperature: 39 to 46 degrees F
Frost-free period: 90 to 130 days

Map Unit Composition

Bannock and similar soils: 75 percent

Description of Bannock

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Typical profile

0 to 2 inches: Loam
2 to 7 inches: Loam
7 to 13 inches: Silt loam
13 to 23 inches: Gravelly loam
23 to 60 inches: Extremely gravelly coarse sand

7—Bock loam

Map Unit Setting

Elevation: 3,800 to 6,600 feet
Mean annual precipitation: 8 to 13 inches

Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 70 to 126 days

Map Unit Composition

Bock and similar soils: 90 percent

Description of Bock

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Sodium adsorption ratio, maximum: 5.0
Available water capacity: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 2c
Land capability (nonirrigated): 6c

Typical profile

0 to 4 inches: Loam
4 to 10 inches: Fine sandy loam
10 to 24 inches: Fine sandy loam
24 to 33 inches: Fine sandy loam
33 to 45 inches: Fine sandy loam
45 to 60 inches: Very gravelly loamy sand

21—Paesl silty clay loam

Map Unit Setting

Elevation: 4,000 to 4,800 feet
Mean annual precipitation: 8 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 130 days

Map Unit Composition

Paesl and similar soils: 90 percent

Description of Paesl

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 5.0
Available water capacity: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 2s

Typical profile

0 to 5 inches: Silty clay loam
5 to 10 inches: Silty clay loam
10 to 17 inches: Silty clay loam
17 to 25 inches: Silty clay loam
25 to 60 inches: Very gravelly loamy coarse sand

28—Paul silty clay loam

Map Unit Setting

Elevation: 4,500 to 5,000 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 41 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Paul and similar soils: 90 percent

Description of Paul

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 8.0
Available water capacity: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): 2c

Typical profile

0 to 5 inches: Silty clay loam
5 to 13 inches: Silty clay loam
13 to 45 inches: Silty clay loam
45 to 60 inches: Silt loam

32—Pits

Map Unit Composition

Pits: 100 percent

Description of Pits

Typical profile

0 to 60 inches: Error

33—Polatis-Rock outcrop complex, 2 to 25 percent slopes

Map Unit Setting

Elevation: 4,600 to 6,000 feet
Mean annual precipitation: 8 to 11 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 95 to 120 days

Map Unit Composition

Polatis and similar soils: 65 percent
Rock outcrop: 25 percent

Description of Polatis

Setting

Landform: Lava fields

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over bedrock derived from basalt

Properties and qualities

Slope: 2 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (2.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: Moderate (about 6.2 inches)

Interpretive groups

Land capability (nonirrigated): 6e
Ecological site: LOAMY 8-12 ARTRW8/PSSPS (R011BY001ID)

Typical profile

0 to 6 inches: Silt loam
6 to 9 inches: Silt loam
9 to 22 inches: Silt loam
22 to 31 inches: Silt loam
31 to 41 inches: Unweathered bedrock

Description of Rock Outcrop

Properties and qualities

Slope: 2 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Typical profile

0 to 60 inches: Unweathered bedrock

47—Stan sandy loam

Map Unit Setting

Elevation: 4,600 to 5,500 feet
Mean annual precipitation: 11 to 13 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 100 to 125 days

Map Unit Composition

Stan and similar soils: 85 percent

Description of Stan

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: Moderate (about 7.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e

Typical profile

0 to 13 inches: Sandy loam
13 to 26 inches: Sandy loam
26 to 34 inches: Fine sandy loam
34 to 51 inches: Fine sandy loam
51 to 55 inches: Fine sandy loam
55 to 60 inches: Very gravelly coarse sand

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://soils.usda.gov/

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://soils.usda.gov/

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://soils.usda.gov/

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.glti.nrcs.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://soils.usda.gov/

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://soils.usda.gov/

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.