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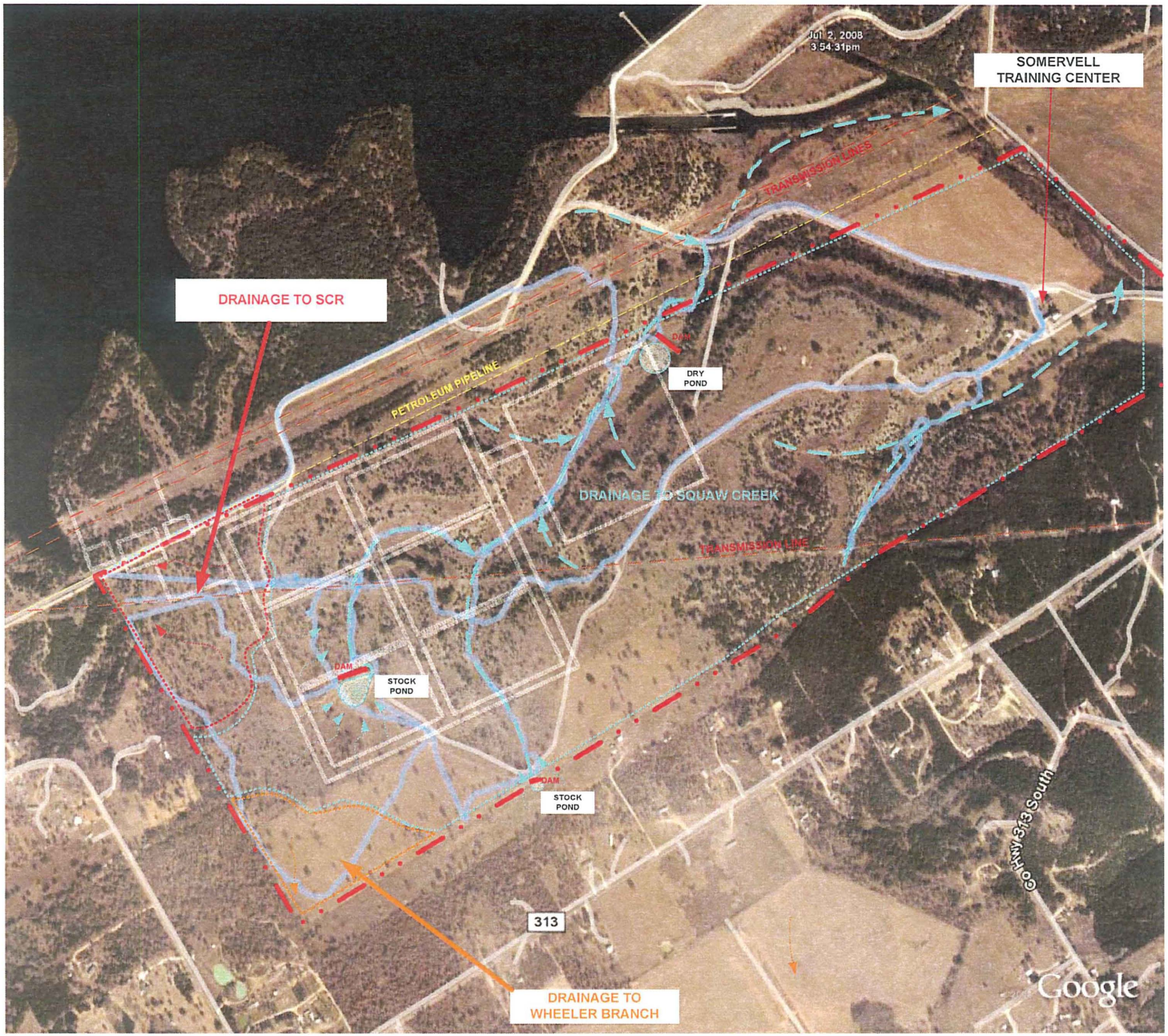
April 23, 2009

CPNPP HYDRO Package

NRC Needs List: HYD-07
Subject: BDTF Reconnaissance Study.

Signature

04-23-2009
Date



A site reconnaissance of the proposed CPNPP Units 3 and 4 blowdown treatment facility was conducted July 1 - 2, 2008. The purpose of the reconnaissance is to evaluate the proposed treatment facility area for hydrological, ecological, and cultural resource characteristics as they pertain to NUREG-1555 requirements and to incorporate the findings into the existing CPNPP Units 3 and 4 ER.

Hydrology Findings

The study area consists of approximately 390-acres of land located south of SCR and southwest of the Squaw Creek Dam. The study area tract is part of the CPNPP site and is owned by Luminant. Scattered grazing cattle were observed onsite during the reconnaissance, and cattle and goat heards were observed on pastureland on the southern adjoining properties. Aerial photographs and USGS topographic maps indicate transmission lines and petroleum pipelines on or adjacent to the site. The dominant drainage feature within the study area is an unnamed, intermittent stream channel of Squaw Creek the headwaters of which originate on the western and southern property boundaries. The headwaters consist of broad grass-covered swale areas, and stream channels become defined downstream (see map).

Two (2) dammed stock ponds are within the study area and one (1) pond was located adjacent south of the southern property boundary. A 1.0-acre (approximate) stock pond is located on the western central portion of the study area. The stock pond is fed by a broad swale area to the west. The stock pond dam is located on the north side of the impoundment, and water is discharged downstream over an earthen spillway on the east-side of the dam into the westernmost fork of the unnamed onsite stream channel.

A 0.5-acre (approximate) dammed dry stock pond is located on the northern central portion of the study area in a valley area adjacent south of the main branch of the unnamed onsite stream channel. The stock pond is fed by runoff into the valley; however was dry during the reconnaissance. The stock pond discharges to the north into the main branch of the unnamed onsite stream channel.

A 0.25-acre (approximate) dammed stock pond is located adjacent south of the southern property boundary in a swale area. The stock pond is fed by a broad swale area to the south. The stock pond discharges to the north from the east and west sides of the dam into the southwestern fork of the unnamed onsite stream channel.

The western and southwestern portions of the study area are relatively flat upland areas with sandy and sandy loam soils. The interior of the study area is dominated by incised drainage features within the Glen Rose Limestone. Outcroppings of the Glen Rose Limestone are observed along drainage area ridges and along cut banks of the onsite stream channels. No indications of groundwater springs or seeps were observed in the Glen Rose outcroppings during the reconnaissance. Scattered stagnant pools of water from recent rainfall were observed along the onsite stream channels.

The northwestern corner of the study areas slopes moderately to the northwest toward SCR. The southwest corner of the study area slopes gently to the southwest toward unnamed tributary of Wheeler Branch. The remainder of the study slopes to the east toward Squaw Creek. Slopes vary from moderate on uplands to very steep within draw areas.

A topographic map and soil properties maps for the study area are attached.

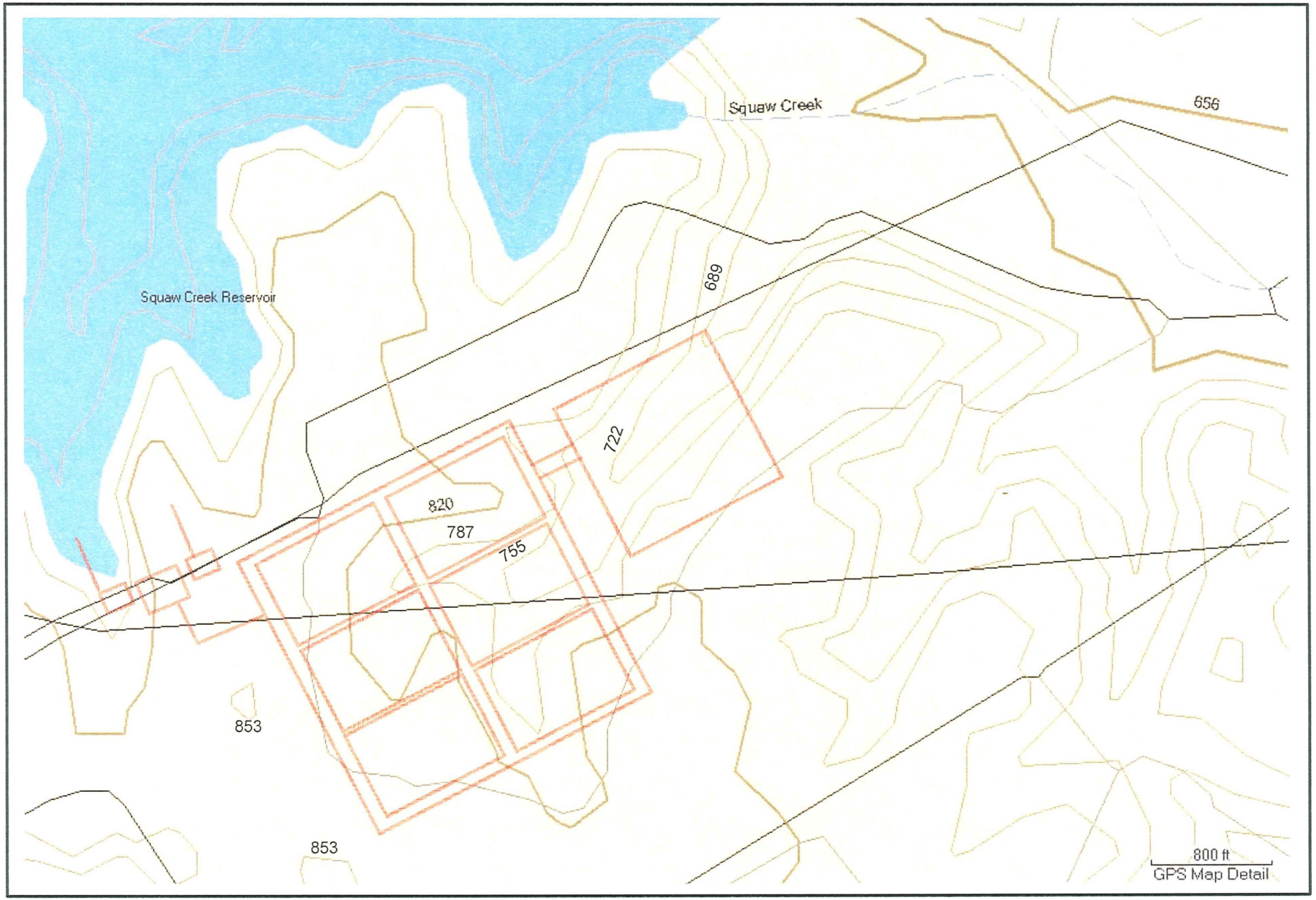
Ecology Findings

The vegetation in the study area was mostly Ashe Juniper; however there are some mixed hardwoods present as well. The majority of the Ashe Juniper species were not mature trees; and therefore, limit the chances for the GCW to be present in the study area. However consultation with the USFWS would be recommended as to whether a Breeding Bird Survey is required for the study area since the presences of possible habitat was found.

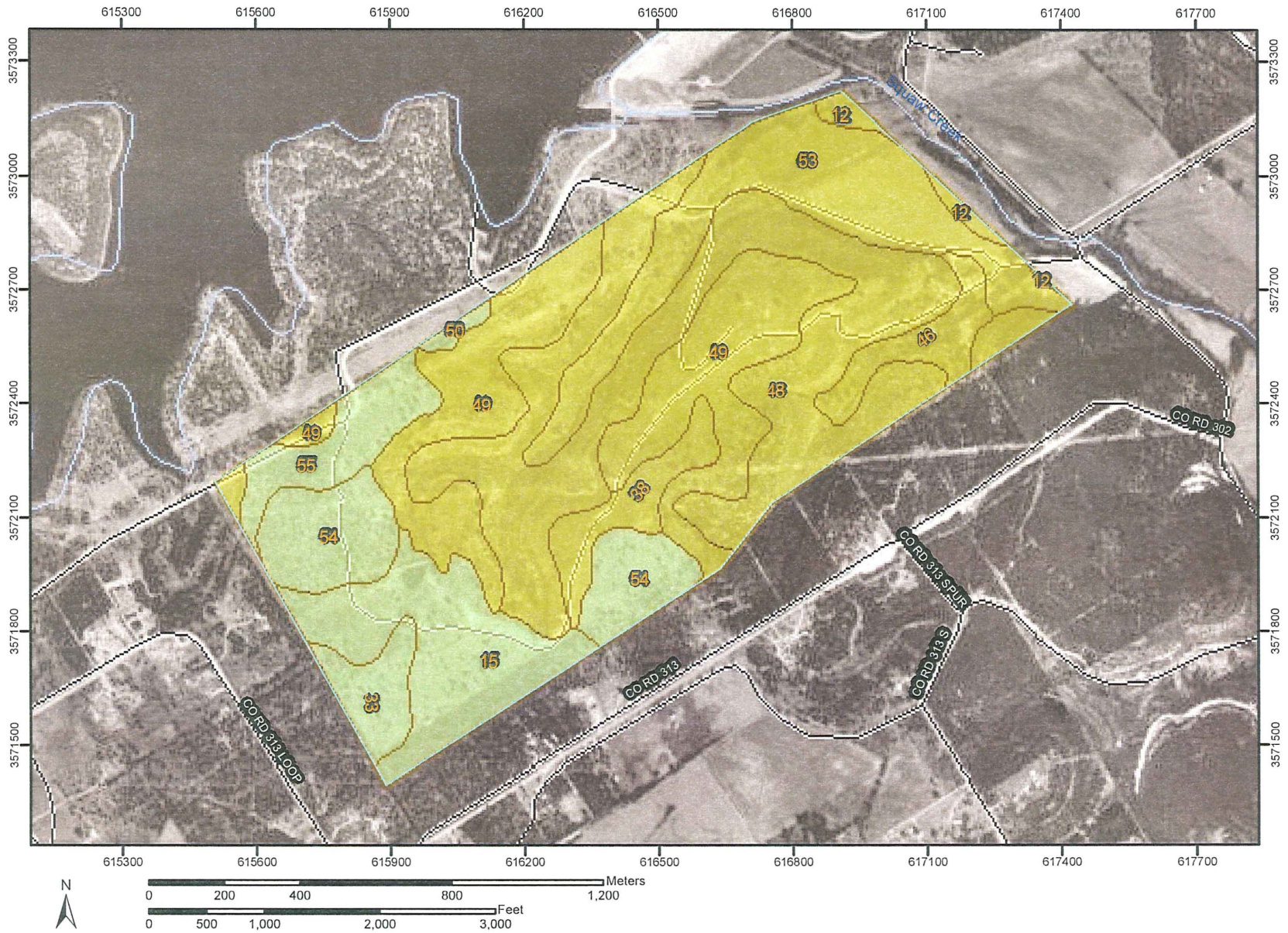
As for waters of The U.S., including wetlands; during site reconnaissance a water of the U.S. was confirmed. The unnamed confirmed intermittent tributary to Squaw Creek did not have water present during the site reconnaissance; however, a ordinary high water mark was observed throughout the length of the stream bed. At the headwaters to the unnamed tributary, a stock pond was identified that did contain surface water. The stock pond is a result of a dam on the headwaters of the unnamed tributary to Squaw Creek. On the backside of the dam (down gradient) a small wetland was identified. The size is unknown at this time but GPS data was collected in order to determine the size utilizing GIS. The wetland is a result of seepage from the stock pond below the dam. The wetland drains to the unnamed tributary of Squaw Creek. Due to the size of the pond (approximately 1 acre) and it's location in proximity to the unnamed tributary of Squaw Creek, as well as the undetermined size of the emergent wetland (≥0.5 acres); if these features are to be impacted along with any portion of the unnamed intermittent tributary to Squaw Creek a Section 404 Individual permit would be required prior to construction of the Evap pond facility.

Cultural Resource Findings

No indications of historic sites were identified during the reconnaissance. A training center (owned by Luminant), dwelling, and barn facilities were identified on the southeast corner of the property; however, these facilities are not expected to be impacted by the construction or operation of the water treatment facility.


Squaw Creek
656
Squaw Creek Reservoir
689
722
820
787
755
853
853
800 ft
GPS Map Detail

Drainage Class–Hood and Somervell Counties, Texas
(CPNPP UNITS 3 AND 4 EVAP AREA DRAINAGE)



MAP LEGEND

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

Soils
- Soil Map Units

Soil Ratings
- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N

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

Soil Survey Area: Hood and Somervell Counties, Texas
Survey Area Data: Version 6, Jan 12, 2007

Date(s) aerial images were photographed: 1995

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.

Drainage Class

Drainage Class— Summary by Map Unit — Hood and Somervell Counties, Texas				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
12	Bosque loam, occasionally flooded	Well drained	5.1	1.1%
15	Chaney loamy fine sand, 1 to 5 percent slopes	Moderately well drained	50.3	11.0%
33	Nimrod fine sand, 1 to 5 percent slopes	Moderately well drained	13.1	2.9%
38	Pedernales fine sandy loam, 1 to 3 percent slopes	Well drained	16.6	3.6%
46	Sunev clay loam, 3 to 5 percent slopes	Well drained	14.9	3.3%
48	Tarrant-Bolar association, hilly	Well drained	135.7	29.7%
49	Tarrant-Purves association, undulating	Well drained	95.4	20.9%
50	Thurber clay loam, 1 to 3 percent slopes	Moderately well drained	2.3	0.5%
53	Venus loam, 1 to 3 percent slopes	Well drained	64.2	14.0%
54	Windthorst loamy fine sand, 1 to 5 percent slopes	Moderately well drained	38.6	8.4%
55	Windthorst fine sandy loam, 1 to 3 percent slopes	Moderately well drained	21.4	4.7%
Totals for Area of Interest (AOI)			457.6	100.0%

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Soil Map–Hood and Somervell Counties, Texas
(CPNPP UNITS 3 AND 4 EVAP AREA)

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
- 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

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
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Date(s) aerial images were photographed: 1995

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Map Unit Legend

Hood and Somervell Counties, Texas (TX609)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
12	Bosque loam, occasionally flooded	5.1	1.1%
15	Chaney loamy fine sand, 1 to 5 percent slopes	50.3	11.0%
33	Nimrod fine sand, 1 to 5 percent slopes	13.1	2.9%
38	Pedernales fine sandy loam, 1 to 3 percent slopes	16.6	3.6%
46	Sunev clay loam, 3 to 5 percent slopes	14.9	3.3%
48	Tarrant-Bolar association, hilly	135.7	29.7%
49	Tarrant-Purves association, undulating	95.4	20.9%
50	Thurber clay loam, 1 to 3 percent slopes	2.3	0.5%
53	Venus loam, 1 to 3 percent slopes	64.2	14.0%
54	Windthorst loamy fine sand, 1 to 5 percent slopes	38.6	8.4%
55	Windthorst fine sandy loam, 1 to 3 percent slopes	21.4	4.7%
Totals for Area of Interest (AOI)		457.6	100.0%

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

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.

Report—Engineering Properties

Engineering Properties– Hood and Somervell Counties, Texas												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
12—Bosque loam, occasionally flooded												
Bosque	0-20	Loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	95-100	85-95	60-75	23-45	7-25
	20-50	Loam, clay loam, sandy clay loam	CL, CL-ML	A-4, A-6, A-7-6	0	0	100	95-100	80-90	50-85	23-45	7-25
	50-60	Loam, clay loam, clay	CL, CL-ML	A-4, A-6, A-7-6	0	0	98-100	95-100	85-100	65-94	23-49	7-29
15—Chaney loamy fine sand, 1 to 5 percent slopes												
Chaney	0-12	Loamy fine sand	SM, SP-SM	A-2-4, A-3, A-4	0	0	80-100	80-100	65-98	7-45	16-25	NP-5
	12-44	Clay, sandy clay	CH, CL, SC	A-6, A-7-6	0	0	90-100	90-100	90-100	43-85	39-60	24-42
	44-56	Sandy clay, clay, sandy clay loam	CH, CL, SC	A-6, A-7-6	0	0	90-100	90-100	80-100	45-85	25-55	11-40
	56-72	Shaly clay, sandy clay loam, sandy clay	CH, CL, SC, SC-SM	A-2, A-4, A-6, A-7-6	0	0	90-100	90-100	80-100	25-85	25-60	6-40

Engineering Properties– Hood and Somervell Counties, Texas												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
33—Nimrod fine sand, 1 to 5 percent slopes												
Nimrod	0-10	Fine sand	SC-SM, SM, SP-SM	A-2-4, A-3	0	0	95-100	95-100	90-100	8-28	0-25	NP-4
	10-26	Fine sand, loamy fine sand	SC, SC-SM, SM	A-2-4, A-3	0	0	95-100	95-100	90-100	8-28	0-25	NP-4
	26-72	Sandy clay loam	CL, SC	A-2-6, A-6	0	0	95-100	95-100	90-100	25-55	22-30	11-16
	72-80	Sandy loam, sandy clay loam, loamy fine sand	CL, CL-ML, SC, SC-SM	A-2-4, A-4, A-6	0	0	95-100	95-100	90-100	15-55	18-28	2-11
38—Pedernales fine sandy loam, 1 to 3 percent slopes												
Pedernales	0-12	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	95-100	90-100	70-85	35-55	0-25	NP-7
	12-49	Sandy clay, clay	CH, CL, SC	A-6, A-7	0	0	90-100	90-100	80-100	45-85	38-60	20-36
	49-62	Sandy clay loam, clay loam, sandy clay	CH, CL, SC	A-6, A-7	0	0-5	90-100	90-100	80-100	45-80	32-55	13-30

Engineering Properties– Hood and Somervell Counties, Texas												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
46—Sunev clay loam, 3 to 5 percent slopes												
Sunev	0-12	Clay loam	CH, CL	A-6, A-7-6	0	0	90-100	80-100	80-100	55-80	30-51	12-32
	12-42	Loam, clay loam, silty clay loam	CL	A-4, A-6	0	0	85-100	80-100	70-100	51-85	28-40	8-20
	42-62	Loam, clay loam, silty clay loam	CL	A-4, A-6, A-7-6	0	0	80-100	70-100	65-100	51-70	25-42	8-22
48—Tarrant-Bolar association, hilly												
Tarrant, pe >44	0-15	Stony clay	CH, GC, SC	A-7-5, A-7-6	8-20	20-55	55-100	51-100	48-99	36-95	51-75	25-44
	15-60	Bedrock	—	—	—	—	—	—	—	—	—	—
Bolar	0-13	Stony clay loam	CH, CL	A-6, A-7	5-15	5-10	65-94	60-89	60-89	50-79	34-57	18-34
	13-22	Loam, clay loam, silty clay loam	CH, CL	A-6, A-7	0-2	0-5	85-100	78-100	70-99	50-79	34-59	16-38
	22-28	Stony clay loam, very stony clay loam, stony loam	CH, CL	A-6, A-7	5-20	5-10	65-94	60-89	60-89	50-79	34-59	16-38
	28-40	Bedrock	—	—	—	—	—	—	—	—	—	—

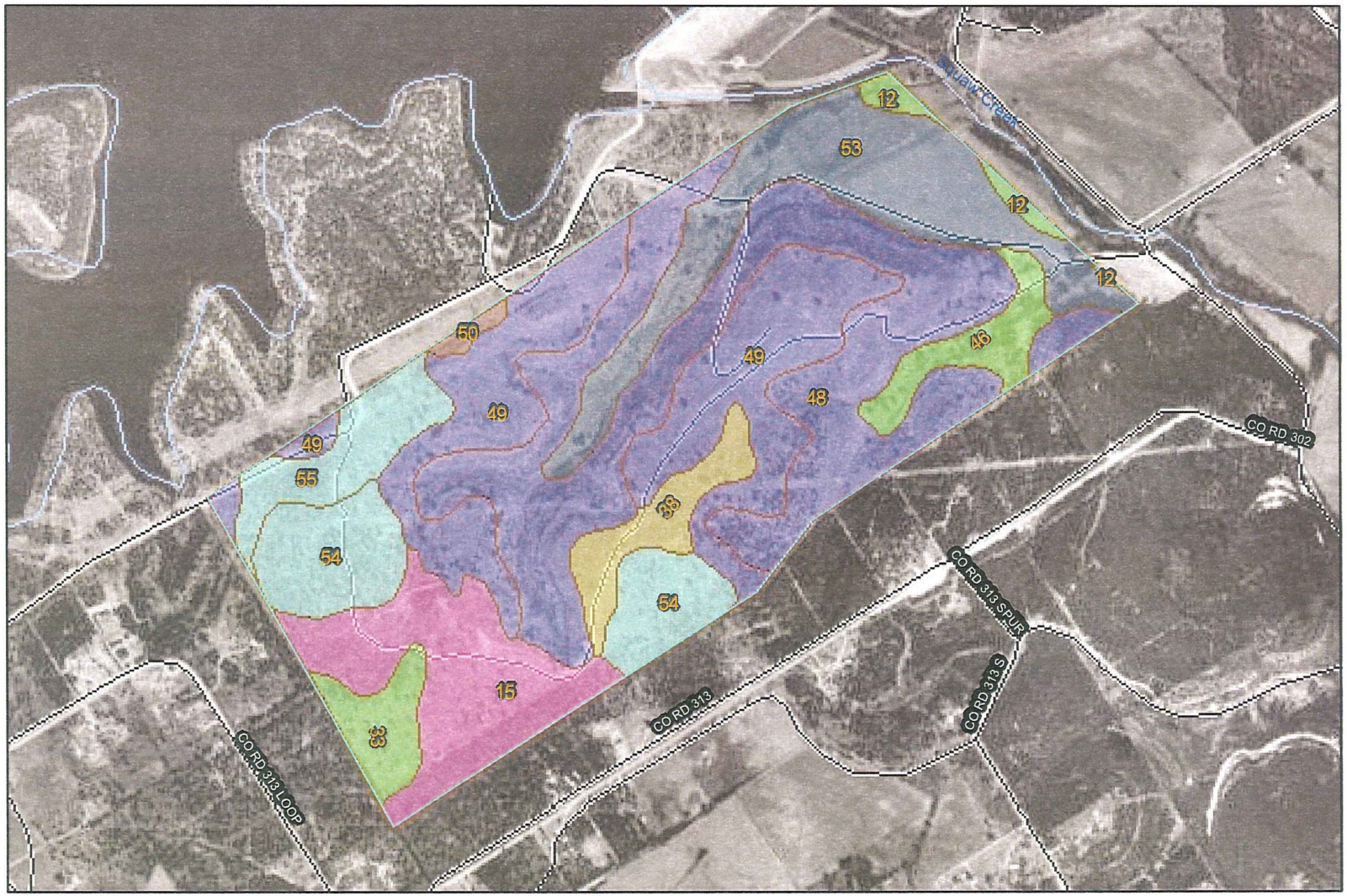
Engineering Properties– Hood and Somervell Counties, Texas												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
49—Tarrant-Purves association, undulating												
Tarrant, pe >44	0-13	Cobbly clay	CH, GC, SC	A-7-5, A-7-6	0-5	33-77	55-100	51-100	48-99	36-95	51-75	25-44
	13-20	Bedrock	—	—	—	—	—	—	—	—	—	—
Purves	0-12	Stony clay	CH	A-7-6	5-20	5-25	75-95	65-95	65-95	55-85	51-65	30-40
	12-14	Gravelly clay, very gravelly clay, gravelly clay loam	CH, GC	A-7-6	0-5	5-35	50-65	50-60	50-60	45-55	51-65	30-40
	14-20	Bedrock	—	—	—	—	—	—	—	—	—	—
50—Thurber clay loam, 1 to 3 percent slopes												
Thurber	0-10	Clay loam	CL	A-4, A-6	0	0	98-100	96-100	90-100	60-90	25-40	8-20
	10-35	Clay, clay loam	CH, CL	A-6, A-7-6	0	0	98-100	96-100	90-100	70-95	37-65	22-45
	35-62	Clay, clay loam, sandy clay loam	CL	A-6, A-7-6	0	0	95-100	85-100	75-100	50-85	35-50	20-35
53—Venus loam, 1 to 3 percent slopes												
Venus	0-13	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	85-100	50-80	20-40	5-22
	13-42	Loam, clay loam, sandy clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	95-100	85-100	50-80	20-40	5-24
	42-60	Fine sandy loam, loam, sandy clay loam	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0	80-100	70-100	65-100	44-73	20-40	5-20

Engineering Properties– Hood and Somervell Counties, Texas												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
54—Windthorst loamy fine sand, 1 to 5 percent slopes												
Windthorst	0-5	Loamy fine sand	SC-SM, SM	A-2-4, A-4	0	0	100	95-100	80-95	15-40	0-21	NP-4
	5-28	Clay, sandy clay, clay loam	CH, CL	A-6, A-7-6	0	0	95-100	95-100	85-100	60-89	35-53	20-35
	28-56	Sandy clay loam, sandy clay, clay loam	CL	A-4, A-6, A-7-6	0	0	95-100	90-100	75-100	55-84	25-45	8-28
	56-62	Sandy clay loam, fine sandy loam, shaly clay	CL, SC	A-4, A-6, A-7-6	0	0	90-100	90-100	75-100	45-74	25-45	8-28
55—Windthorst fine sandy loam, 1 to 3 percent slopes												
Windthorst	0-5	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-4	0	0	100	95-100	75-100	36-65	0-28	NP-7
	5-28	Clay, sandy clay, clay loam	CH, CL	A-6, A-7-6	0	0	95-100	95-100	85-100	60-89	35-53	20-35
	28-56	Sandy clay loam, sandy clay, clay loam	CL	A-4, A-6, A-7-6	0	0	95-100	90-100	75-100	55-84	25-45	8-28
	56-62	Sandy clay loam, fine sandy loam, shaly clay	CL, SC	A-4, A-6, A-7-6	0	0	90-100	90-100	75-100	45-74	25-45	8-28

Data Source Information

Soil Survey Area: Hood and Somervell Counties, Texas
Survey Area Data: Version 6, Jan 12, 2007

Parent Material Name–Hood and Somervell Counties, Texas
(CPNPP UNITS 3 AND 4 EVAP AREA PARENT MATERIAL)



N

0 200 400 800 1,200 Meters

0 500 1,000 2,000 3,000 Feet

MAP LEGEND

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

Soils
- Soil Map Units

Soil Ratings
- clayey slope alluvium derived from claystone
- loamy alluvium
- loamy residuum weathered from limestone
- loamy residuum weathered from sandstone
- loamy residuum weathered from sandstone and shale
- loamy slope alluvium
- sandy alluvium over clayey residuum weathered from sandstone and shale
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
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Parent Material Name

Parent Material Name— Summary by Map Unit — Hood and Somervell Counties, Texas				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
12	Bosque loam, occasionally flooded	loamy alluvium	5.1	1.1%
15	Chaney loamy fine sand, 1 to 5 percent slopes	sandy alluvium over clayey residuum weathered from sandstone and shale	50.3	11.0%
33	Nimrod fine sand, 1 to 5 percent slopes	loamy alluvium	13.1	2.9%
38	Pedernales fine sandy loam, 1 to 3 percent slopes	loamy residuum weathered from sandstone and shale	16.6	3.6%
46	Sunev clay loam, 3 to 5 percent slopes	loamy alluvium	14.9	3.3%
48	Tarrant-Bolar association, hilly	loamy residuum weathered from limestone	135.7	29.7%
49	Tarrant-Purves association, undulating	loamy residuum weathered from limestone	95.4	20.9%
50	Thurber clay loam, 1 to 3 percent slopes	clayey slope alluvium derived from claystone	2.3	0.5%
53	Venus loam, 1 to 3 percent slopes	loamy slope alluvium	64.2	14.0%
54	Windthorst loamy fine sand, 1 to 5 percent slopes	loamy residuum weathered from sandstone	38.6	8.4%
55	Windthorst fine sandy loam, 1 to 3 percent slopes	loamy residuum weathered from sandstone	21.4	4.7%
Totals for Area of Interest (AOI)			457.6	100.0%

Description

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

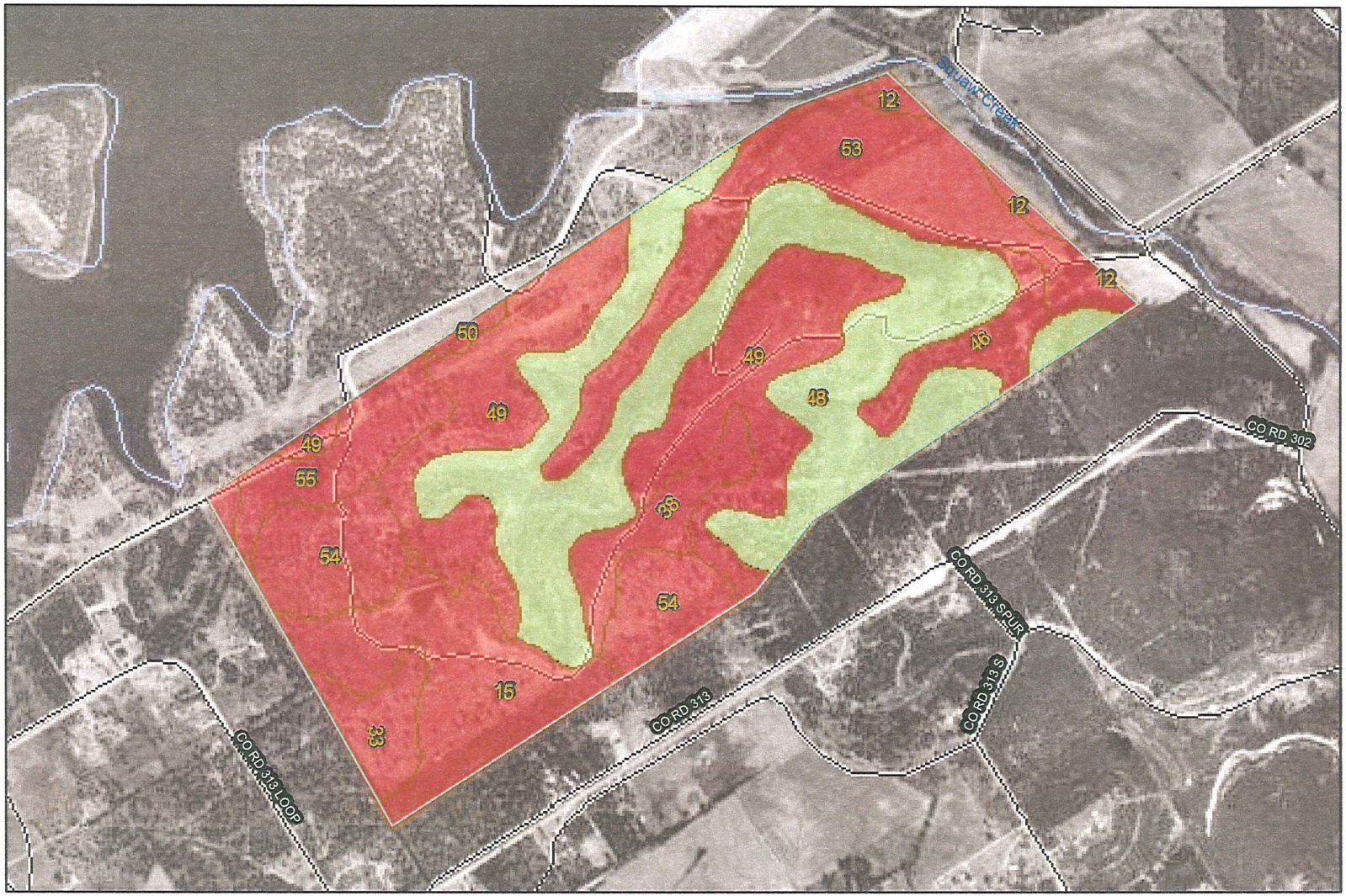
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Representative Slope–Hood and Somervell Counties, Texas
(CPNPP UNITS 3 AND 4 EVAP AREA REPRESENTATIVE SLOPE)



N

0 200 400 800 1,200 Meters

0 500 1,000 2,000 3,000 Feet

MAP LEGEND

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

Soils
- Soil Map Units

Soil Ratings
- 0 - 5
- 5 - 15
- 15 - 30
- 30 - 45
- 45 - 60
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N

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

Soil Survey Area: Hood and Somervell Counties, Texas
Survey Area Data: Version 6, Jan 12, 2007

Date(s) aerial images were photographed: 1995

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.

Representative Slope

Representative Slope— Summary by Map Unit — Hood and Somervell Counties, Texas				
Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
12	Bosque loam, occasionally flooded	0.5	5.1	1.1%
15	Chaney loamy fine sand, 1 to 5 percent slopes	3.0	50.3	11.0%
33	Nimrod fine sand, 1 to 5 percent slopes	3.0	13.1	2.9%
38	Pedernales fine sandy loam, 1 to 3 percent slopes	2.0	16.6	3.6%
46	Sunev clay loam, 3 to 5 percent slopes	4.0	14.9	3.3%
48	Tarrant-Bolar association, hilly	20.0	135.7	29.7%
49	Tarrant-Purves association, undulating	5.0	95.4	20.9%
50	Thurber clay loam, 1 to 3 percent slopes	2.0	2.3	0.5%
53	Venus loam, 1 to 3 percent slopes	2.0	64.2	14.0%
54	Windthorst loamy fine sand, 1 to 5 percent slopes	3.0	38.6	8.4%
55	Windthorst fine sandy loam, 1 to 3 percent slopes	2.0	21.4	4.7%
Totals for Area of Interest (AOI)			457.6	100.0%

Description

Slope gradient is the difference in elevation between two points, expressed as a percentage of the distance between those points.

The slope gradient is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

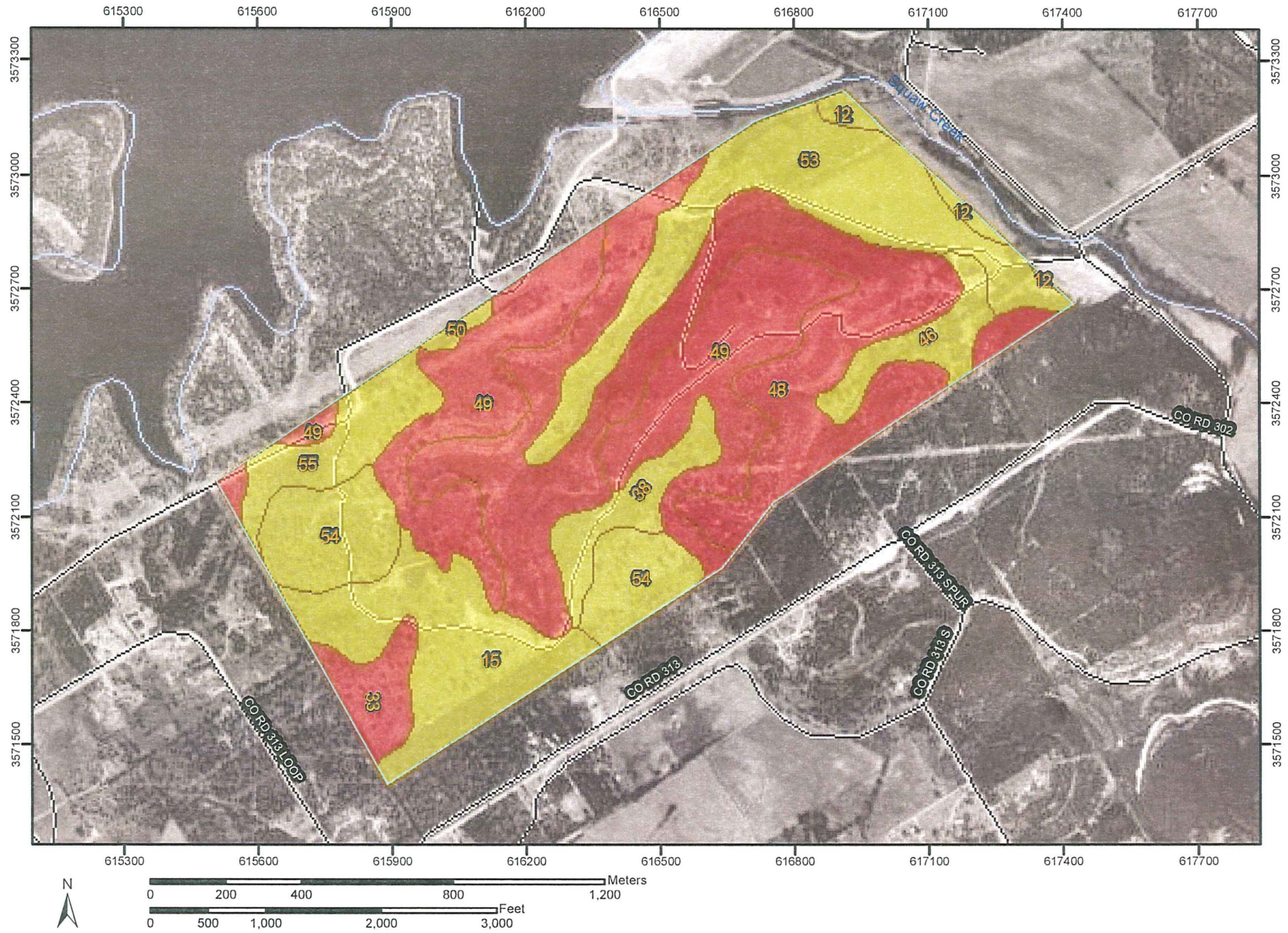
Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Shallow Excavations–Hood and Somervell Counties, Texas
(CPNPP UNITS 3 AND 4 EVAP AREA SHALLOW EXCAVATIONS)



MAP LEGEND

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

Soils
- Soil Map Units

Soil Ratings
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N

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

Soil Survey Area: Hood and Somervell Counties, Texas
Survey Area Data: Version 6, Jan 12, 2007

Date(s) aerial images were photographed: 1995

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.

Shallow Excavations

Shallow Excavations— Summary by Map Unit — Hood and Somervell Counties, Texas						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (rating values)**	**Acres in AOI**	**Percent of AOI**
12	Bosque loam, occasionally flooded	Somewhat limited	Bosque (80%)	Flooding (0.60)	5.1	1.1%
				Cutbanks cave (0.10)		
15	Chaney loamy fine sand, 1 to 5 percent slopes	Somewhat limited	Chaney (100%)	Dense layer (0.50)	50.3	11.0%
				Cutbanks cave (0.10)		
				Too clayey (0.03)		
33	Nimrod fine sand, 1 to 5 percent slopes	Very limited	Nimrod (100%)	Cutbanks cave (1.00)	13.1	2.9%
38	Pedernales fine sandy loam, 1 to 3 percent slopes	Somewhat limited	Pedernales (100%)	Too clayey (0.13)	16.6	3.6%
				Cutbanks cave (0.10)		
46	Sunev clay loam, 3 to 5 percent slopes	Somewhat limited	Sunev (100%)	Cutbanks cave (0.10)	14.9	3.3%
48	Tarrant-Bolar association, hilly	Very limited	Tarrant, PE >44 (60%)	Depth to hard bedrock (1.00)	135.7	29.7%
				Slope (1.00)		
				Large stones content (1.00)		
				Cutbanks cave (0.10)		
			Bolar (20%)	Depth to hard bedrock (1.00)		
				Slope (0.63)		
				Cutbanks cave (0.10)		
49	Tarrant-Purves association, undulating	Very limited	Tarrant, PE >44 (65%)	Depth to hard bedrock (1.00)	95.4	20.9%
				Large stones content (1.00)		
				Cutbanks cave (0.10)		
			Purves (25%)	Depth to hard bedrock (1.00)		
				Cutbanks cave (0.10)		
				Large stones content (0.02)		

Shallow Excavations— Summary by Map Unit — Hood and Somervell Counties, Texas						
Map unit symbol	**Map unit name**	**Rating**	**Component name (percent)**	**Rating reasons (rating values)**	**Acres in AOI**	**Percent of AOI**
50	Thurber clay loam, 1 to 3 percent slopes	Somewhat limited	Thurber (100%)	Too clayey (0.13) Cutbanks cave (0.10)	2.3	0.5%
53	Venus loam, 1 to 3 percent slopes	Somewhat limited	Venus (100%)	Cutbanks cave (0.10)	64.2	14.0%
54	Windthorst loamy fine sand, 1 to 5 percent slopes	Somewhat limited	Windthorst (100%)	Cutbanks cave (0.10) Too clayey (0.03)	38.6	8.4%
55	Windthorst fine sandy loam, 1 to 3 percent slopes	Somewhat limited	Windthorst (100%)	Cutbanks cave (0.10) Too clayey (0.03)	21.4	4.7%
Totals for Area of Interest (AOI)					457.6	100.0%

Shallow Excavations— Summary by Rating Value		
Rating	**Acres in AOI**	**Percent of AOI**
Very limited	244.2	53.4%
Somewhat limited	213.3	46.6%

Description

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating Options

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher