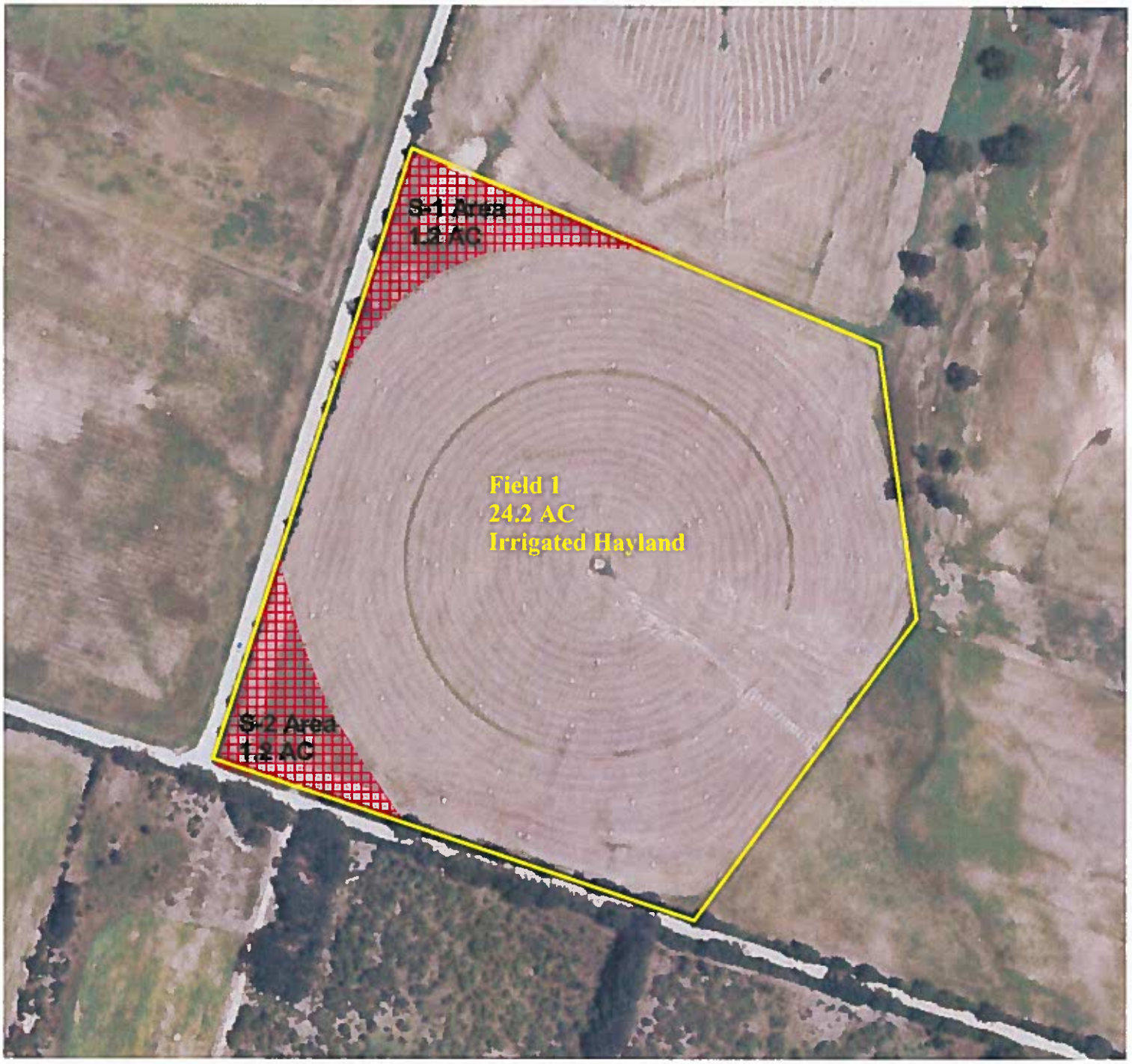
Monarch Habitat Restoration Map

Upper Leon Soil and Water Conservation District
24.2 Acres
Date: 04/12/2016

Texas State Soil and Water Conservation Board
Dublin Regional Office
Assisted By: Todd Oneth
(254) 445-4814



Legend

- Planned Land Units
- Special Treatment Area

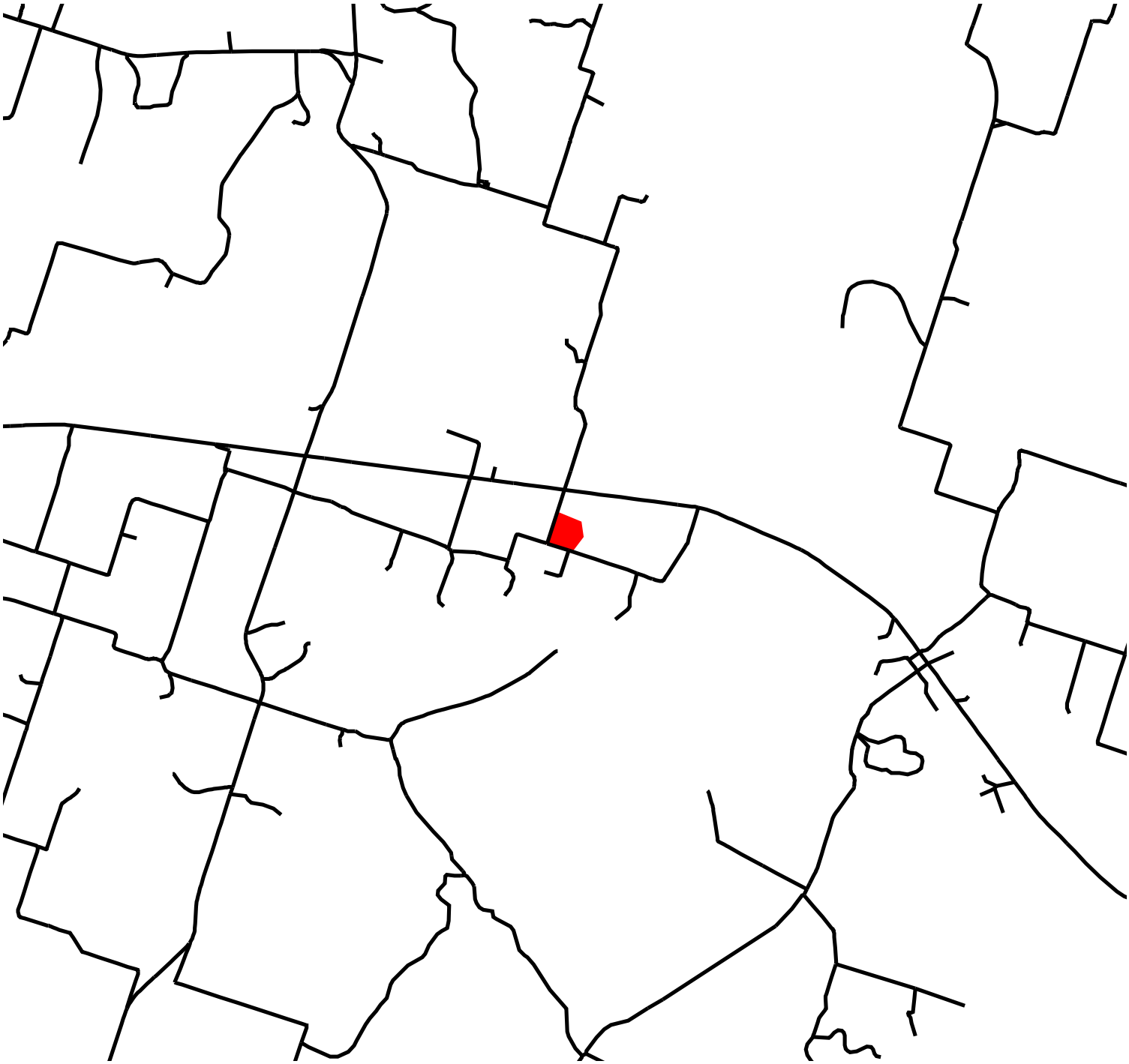
N

300 0 300 600 900 Feet

County Map

Upper Leon Soil and Water Conservation District
24.2 Acres
Date: 04/25/2016

Texas State Soil and Water Conservation Board
Dublin Regional Office
Assisted By: Todd Oneth
(254) 445-4814



Legend

Comanche TxDOT

Planned Land Units

N

1 0 1 2 3 4 Miles

Topographic Map

Upper Leon Soil and Water Conservation District
24.2 Acres
Date: 04/12/2016

Texas State Soil and Water Conservation Board
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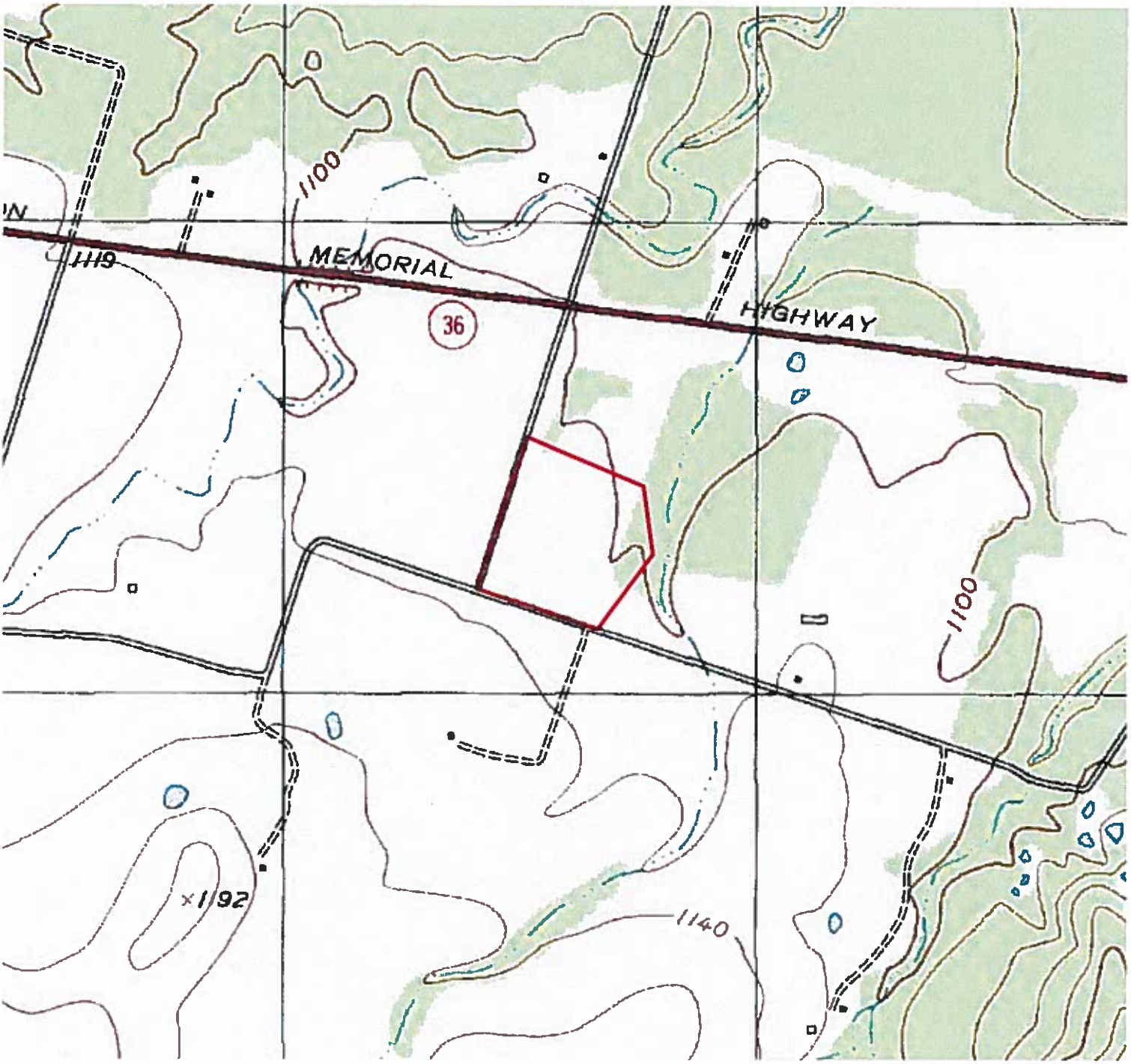

Legend

Planned Land Units

N

1000 0 1000 2000 Feet

Soils Map

Upper Leon Soil and Water Conservation District
24.2 Acres
Date: 04/12/2016

Texas State Soil and Water Conservation Board
Dublin Regional Office
Assisted By: Todd Oneth
(254) 445-4814

Legend

Soils Map

N

300 0 300 600 900 Feet

Non-Technical Descriptions

Soil Survey Area: Comanche County, Texas
Survey Status: -
Correlation Date: 08/01/1974
Distribution Date: 01/02/2007

Map Unit: AbB Abilene loam, 1 to 3 percent slopes
Description Category: AGR
Map Unit AbB, Component ABILENE is >60 - inches thick. Permeability is MODERATELY SLOW and available water holding capacity is HIGH. A water table when present is >6 - feet. The soil has a capability subclass of 2E dryland and 2E irrigated.
Description Category: PHG
7C - FRIABLE CLAYEY UPLAND - Moderately deep to very deep friable clayey uplands with slopes 0 to 5 percent; friable when moist; somewhat sticky when wet; high natural fertility; medium to high water holding capacity and fair to good plant-soil-moisture relationship; high production potential.
Description Category: RNG
CLAY LOAM PE 40-54 SITE - Nearly level to rolling uplands of clayey soils. Climax plants are predominantly little bluestem with indiangrass, big bluestem, switchgrass, vine-mesquite, sideoats grama, elm, live oak, hackberry; and many forbs such as maximilian sunflower, engelmanndaisy, bushsunflower, halfshrub sundrop, and ratany.
Description Category: SOI
THE ABILENE SERIES CONSISTS OF VERY DEEP WELL DRAINED, MODERATELY SLOWLY PERMEABLE SOILS ON UPLANDS. THEY HAVE DARK GRAYISH BROWN CLAY LOAM SURFACE LAYERS, VERY DARK GRAYISH BROWN TO DARK GRAYISH BROWN CLAY LOAM TO CLAY SUBSOILS AND PINK TO LIGHT BROWN UNDERLYING LAYERS THAT CONTAIN CALCIUM CARBONATE ACCUMULATIONS. THE SOILS FORMED IN ALKALINE LOAMY AND CLAYEY SEDIMENTS.

Map Unit: ChC Chaney loamy sand, 1 to 5 percent slopes
Description Category: AGR
Map Unit ChC, Component CHANEY is >60 - inches thick. Permeability is SLOW and available water holding capacity is MODERATE. A water table when present is >6 - feet. The soil has a capability subclass of 3E dryland and NONE irrigated.
Description Category: PHG
9A - SANDY UPLAND - Deep and very deep, sandy uplands with clayey or loamy subsoils within 40 inches; low natural fertility; low to medium water holding capacity with good plant-soil-moisture relationship; medium to high production potential.
Description Category: RNG
LOAMY SAND PE 36-52 SITE - Deep soils with loamy fine sand surfaces. Climax vegetation is a post oak, blackjack oak savannah with associated woody species and big and little bluestem, indiangrass, lespedezas, tickclovers, snoutbeans, butterflypea, partridge pea, bundleflower, and sensitivebrier.
Description Category: SOI
THE CHANEY SERIES CONSISTS OF VERY DEEP, MODERATELY WELL DRAINED NEARLY LEVEL TO MODERATELY SLOPING SOILS OF UPLANDS. THE SOIL FORMED IN CLAYEY DEPOSITS. IN A REPRESENTATIVE PROFILE, THE SURFACE LAYER IS LOAMY SAND 14 INCHES THICK. DARK GRAYISH BROWN IN THE UPPER PART AND LIGHT GRAY IN THE

LOWER PART. THE SUBSOIL IS DARK RED AND RED MOTTLED SANDY CLAY 20 INCHES THICK. THE NEXT LAYER IS SANDY CLAY LOAM 18 INCHES THICK; BROWNISH YELLOW IN THE UPPER PART AND LIGHT BROWNISH GRAY IN THE LOWER PART. BELOW 52 INCHES IS OLIVE GRAY SHALE THAT HAS CLAY TEXTURE.

Map Unit: PdC Pedernales loamy fine sand, 1 to 5 percent slopes

Description Category: AGR

Map Unit PdC, Component PEDERNALES is >60 - inches thick. Permeability is MODERATELY SLOW and available water holding capacity is MODERATE. A water table when present is >6 - feet. The soil has a capability subclass of 3E dryland and NONE irrigated.

Description Category: PHG

9A - SANDY UPLAND - Deep and very deep, sandy uplands with clayey or loamy subsoils within 40 inches; low natural fertility; low to medium water holding capacity with good plant-soil-moisture relationship; medium to high production potential.

Description Category: RNG

LOAMY SAND PE 36-52 SITE - Deep soils with loamy fine sand surfaces. Climax vegetation is a post oak, blackjack oak savannah with associated woody species and big and little bluestem, indiangrass, lespedezas, tickclovers, snoutbeans, butterflypea, partridge pea, bundleflower, and sensitivebrier.

Description Category: SOI

THE PEDERNALES SERIES CONSISTS OF VERY DEEP, WELL DRAINED, NEARLY LEVEL TO MODERATELY SLOPING SOILS OF UPLANDS. THIS SOIL FORMED IN LOAMY CALCAREOUS MATERIALS. IN A REPRESENTATIVE PROFILE, THE SURFACE LAYER IS A REDDISH BROWN FINE SANDY LOAM ABOUT 11 INCHES THICK. THE SUBSOIL IS RED SANDY CLAY FROM 11 TO 37 INCHES AND YELLOWISH RED SANDY CLAY LOAM FROM 37-43 INCHES. BELOW 43 INCHES IS LIGHT REDDISH BROWN SANDY CLAY LOAM.

Map Unit: PsC2 Pedernales soils, 1 to 5 percent slopes, eroded

Description Category: AGR

Map Unit PsC2, Component PEDERNALES is >60 - inches thick. Permeability is MODERATELY SLOW and available water holding capacity is HIGH. A water table when present is >6 - feet. The soil has a capability subclass of 3E dryland and NONE irrigated.

Description Category: PHG

8A - TIGHT LOAMY UPLAND - Moderately deep to very deep uplands with loamy surfaces and dense subsoils; slopes 0 to 5 percent; low natural fertility; seasonally wet or droughty; medium water holding capacity but poor to fair plant-soil-moisture relationship; medium to high production potential.

Description Category: RNG

TIGHT SANDY LOAM PE 36-52 SITE - A savannah of level to gently rolling sandy loams. Vegetation includes sideoats grama, vine-mesquite, buffalograss, texas wintergrass, sand dropseed, silver and little bluestem, hairy grama, ragweed, sagewort, dayflower, sensitivebrier, engelmanndaisy, gayfeather, heath aster, post oak, elbowbush, greenbrier, and bumelia.

Description Category: SOI

THE PEDERNALES SERIES CONSISTS OF VERY DEEP, WELL DRAINED, NEARLY LEVEL TO MODERATELY SLOPING SOILS OF UPLANDS. THIS SOIL FORMED IN LOAMY CALCAREOUS MATERIALS. IN A REPRESENTATIVE PROFILE, THE SURFACE LAYER IS A REDDISH BROWN FINE SANDY LOAM ABOUT 11 INCHES THICK. THE SUBSOIL IS RED SANDY CLAY FROM 11 TO 37 INCHES AND YELLOWISH RED SANDY CLAY LOAM FROM 37-43 INCHES. BELOW 43 INCHES IS LIGHT REDDISH BROWN SANDY CLAY LOAM.

Map Unit: VeB Venus loam, 1 to 3 percent slopes

Description Category: AGR

Map Unit VeB, Component VENUS is >60 - inches thick. Permeability is MODERATE and available water holding capacity is HIGH. A water table when present is >6 - feet. The soil has a capability subclass of 2E dryland and NONE irrigated.

Description Category: PHG

7C - FRIABLE CLAYEY UPLAND - Moderately deep to very deep friable clayey uplands with slopes 0 to 5 percent; friable when moist; somewhat sticky when wet; high natural fertility; medium to high water holding capacity and fair to good plant-soil-moisture relationship; high production potential.

Description Category: RNG

CLAY LOAM PE 40-54 SITE - Nearly level to rolling uplands of clayey soils. Climax plants are predominantly little bluestem with indiangrass, big bluestem, switchgrass, vine-mesquite, sideoats grama, elm, live oak, hackberry; and many forbs such as maximilian sunflower, engelmanndaisy, bushsunflower, halfshrub sundrop, and ratany.

Description Category: SOI

THE VENUS SERIES CONSISTS OF VERY DEEP, WELL DRAINED, NEARLY LEVEL TO STRONGLY SLOPING. CALCAREOUS SOILS OF UPLANDS. THE SOIL FORMED IN CALCAREOUS LOAMY SEDIMENTS. IN A REPRESENTATIVE PROFILE, THE SURFACE LAYER IS DARK GRAYISH BROWN LOAM ABOUT 14 INCHES THICK. BELOW THE SURFACE LAYER AND TO A DEPTH OF 50 INCHES IS LOAM THAT IS GRAYISH BROWN IN THE UPPER PART AND VERY PALE BROWN IN THE LOWER PART. BELOW 50 INCHES IS VERY PALE BROWN FINE SANDY LOAM.

Texas State Soil and Water Conservation Board
Dublin Regional Office
611 East Blackjack
Dublin, TX 76446
(254) 445-4814

Conservation Plan

Monarch Habitat Restoration Plan
611 East Blackjack
Dublin, TX 76446

Irrigated Hayland

HERBACEOUS WEED CONTROL (315)

Herbaceous weed control will be applied in a manner to achieve the desired control of the target species and protection of desired species. This will be accomplished by mechanical, chemical, burning or biological methods either alone or in combination. When burning is used as a method, the Prescribed Burning standard (338) will also be applied. Mechanical Control: Shred or mow weeds about one inch above the average height of the grass. In areas of heavy competition, remove piled material after mowing to prevent shading or smothering of desired vegetation. Chemical Control: Read and follow all product label directions. Calibrate application equipment prior to application to ensure proper application rates for the specific chemicals. Dispose of unused material according to label directions. Weeds should be controlled prior to bloom stage. **NOTE:** The areas designated on the plan map as S-1 and S-2, (2.4 acres), will be excluded from any form of chemical herbicides. Mechanical control of weeds will be utilized on these areas, if needed. With the monarch being the target animal and monarch larvae and/or nectaring forbs being the target plants, consider drift/movement of insecticides and prevent/mitigate on-site pesticide risks to pollinators and other beneficial species through direct contact.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	24.2 Ac.	5	2016		
Total:	24.2 Ac.				

IRRIGATION SYSTEM, SPRINKLER (442)

Maintain the existing sprinkler system according to design for the distribution of water without causing excessive erosion, waterloss, or reduction in water quality.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	1.0 No.	5	2016		
1	21.8 Ac.	5	2016		
Total:	1.0 No.	5	2016		
Total:	21.8 Ac.	5	2016		

IRRIGATION WATER MANAGEMENT (449)

Control the rate, amount and timing of irrigation water to minimize soil erosion and control water loss from runoff and deep percolation.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	21.8 ac.	5	2016		
Total:	21.8 ac.				

FORAGE HARVEST MANAGEMENT (511)

Cutting and removal of forages from the field will be managed to produce the desired quality and quanity, to promote vigorous regrowth, and to maintain stand life. When cutting yellow bluestems, bunchgrasses, or range grasses, (Caucasian, Plains, W.W. Spar, W.W. Ironmaster, **W.W. B-Dahl**, K.R., O.W. T-587), Kleingrass 75, Lovegrass (weeping, Common, Ermelo, Wilman), or Tall Wheatgrass, cut at the boot stage or pre bloom. Allow 30-45 days between last harvest and first killing frost. Leave stubble height of 4 to 6 inches.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	21.8 ac.	5	2016		
Total:	21.8 ac.				

RANGE PLANTING (550)

Establish Monarch habitat enhancing perennial vegetaion by preparing a clean, firm, weed-free seedbed and planting adapted species at recommended rates and within recommended dates. **NOTE:** Do not cut the seeded areas when harvesting the field for forage until established and after plants have gone to seed (first growing season). If grasses are not established during the first growing season, defer until established. This practice applies to the S-1 and S-2 areas shown on the Monarch Habitat Enhancement Map. See enclosed seeding worksheet for mix details.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	2.4 ac.	12	2016		
Total:	2.4 ac.				

NUTRIENT MANAGEMENT (590)

To maintain or improve the chemical and/or biological condition of the soil, manage the amount, form, placement, and timing of application of plant nutrients. Apply nutrients according to a current soils test. If animal waste is to be applied, a soils test will be pulled every year. If commercial fertilizer is to be applied, a soils test will be pulled every 3 years in areas with rainfall of 25 inches or more and every 5 years in areas with rainfall less than 25 inches. A detailed nutrient management plan will be developed prior to fertilizer application.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	24.2 ac.	5	2016		
Total:	24.2 ac.				

UPLAND WILDLIFE HABITAT MANAGEMENT (645)

The S-1 and S-2 areas of field 1 are planned for for seeding to enhance wildlife, pollinator, and beneficial organism habitat with the monarch being identified and the target widlife species.

Field	Planned Amount	Month	Year	Applied Amount	Date
1	24.2 ac.	5	2016		
Total:	24.2 ac.				

Texas Monarch & Pollinator Habitat Enhancement and Restoration Job Sheet

Conservation Practice Job Sheet - SWCD State District 5

Texas State Soil and Water Conservation Board **April, 2016**

Definition
This job sheet is developed for guidance in establishing and/or enhancing desired and beneficial habitat for winter and spring migrations of the Monarch Butterfly in Texas.

Purpose
Vegetation will be established or enhanced to provide desired plant communities for the monarch butterfly and other pollinator dependent species. Other benefits include reducing soil erosion, improving water quality and wildlife habitat.

Where Used:
This practice may be used in areas to increase monarch habitat such as: pastureland, rangeland, wildlife land or gardens.

Specifications:
A variety of herbaceous flowering species and grasses will be planted to provide food and shelter for monarch butterfly and other pollinator dependent species. Grasses shall make up 40% of the mix for new restoration plantings. **A minimum of 5 species** of flowering forbs will be included in the mix. A commercial wildflower mix may be used to count as 1 of the 5 required forbs. The commercial mix must be composed of Texas Native wildflower species only. Enhancement plantings shall be composed of 100% forbs.

Seeding Rates:
Seeding rates will be calculated on a pure live seed (PLS) basis unless noted otherwise.

Seeding Method:
Plants shall be seeded by broadcasting, drilling into a clean weed-free seedbed, or a no-till drilling method. Plants shall be seeded following the guidance listed below according to the method chosen.

Planting Dates:
Vegetation shall be planted according to the specifications dates listed below:

December 1 - June 1

Example Restoration Seeding Mixture:
The following seed mix is an example which meets the Monarch Habitat criteria: Where the total mix equals 100%.

10% sideoats grama
10% green sprangletop
10% switchgrass
10% little bluestem
15% bush sunflower (Spring, Summer, Fall)
15% Illinois bundleflower (Spring)
10% purple prairie clover (Spring)
10% Maximilian sunflower (Fall)
10% commercial Texas Native wildflower mix.
100%

Example Enhancement Seeding Mixture:
20% bush sunflower (Spring, Summer, Fall)
20% Illinois bundleflower (Spring)
15% purple prairie clover (Spring)
15% Engelmann daisy (Spring)
15% Maximilian sunflower (Fall)
15% commercial Texas Native wildflower mix.
100%

Many regional seed vendors have developed one or more wildflower mixes which usually contain 10 to 20 species with varying bloom periods. These will usually contain both annual and perennial species. **Some commercial mixes contain common and/or tropical milkweed. These species of milkweed are not beneficial to Monarch and should not be used.** The more desirable mixes will contain only natives which are found in the region. For planning purposes, use **10 lb per ac as the full seeding rate** for this component of the mix. For example, a 15% inclusion of a wildflower mix would equal 1.5 lb of this mix added to the rest of the seed. Calculation of PLS will not be required for the commercial wildflower mix portion of the pollinator mix.

Operation and Maintenance:
Weed control may be necessary however; **chemical weed control shall not be used** in association with planted forbs and legumes.

Conservation Practice Job Sheet - SWCD State District 5

Texas State Soil and Water Conservation Board — April, 2016

PLANTING SPECIFICATION SHEET

Client:	Monarch Habitat Restoration Plan	Planner:	Todd Oneth	Date:	4/12/2016

Seedbed Preparation Method(s)	Remarks
Conventional Tillage for Dead Litter Cover Crop	A seedbed shall be prepared for a dead litter cover crop using typical farming equipment such as tandem disks, chisels, etc. The seedbed shall be firm, free of weed competition and not have a restrictive layer such as a plowpan.

Conservation Practice Job Sheet - SWCD State District 5

Texas State Soil and Water Conservation Board — April, 2016

PLANTING SPECIFICATION SHEET

Agreed Planting Date (Print Date):

Seedbed Operation Method	Remarks
Drill	A grass drill equipped with double disk openers having depth bands followed by cultipacker, press wheels or drag chains is recommended. (Press wheels or cultipacking are preferred). Seed should be planted 1/4 to 3/4 inches deep. The distance between rows should not exceed 12 inches. Legumes shall be inoculated with the proper Rhizobia bacteria before planting.

Seed Amounts Required

Field Nos.	Acres to be Planted	Species	Planting Rate per Acre	% of Mix	Amount Required per Acre	Total Amount Required
1	2.4	Green sprangletop (Van Horn)	1.7 PLS	10%	0.2 PLS	0.4 PLS
		Bluestem: little (native harvest)	3.4 PLS	10%	0.3 PLS	0.8 PLS
		Grama: sideoats (El Reno, Haskell, Niner, Vaughn)	4.5 PLS	10%	0.5 PLS	1.1 PLS
		Switchgrass (Alamo)	2.0 PLS	10%	0.2 PLS	0.5 PLS
		Illinois bundleflower (Sabine, native harvest)	13.6 PLS	15%	2.0 PLS	4.9 PLS
		Maximilian sunflower (Aztec, native harvest)	3.0 PLS	10%	0.3 PLS	0.7 PLS
		purple prairie clover	5.5 PLS	10%	0.6 PLS	1.3 PLS
		Commercial Wildflower Mix	10.0 PLS	10%	1.0 PLS	2.4 PLS
		Bush sunflower	2.6 PLS	15%	0.4 PLS	0.9 PLS
		Total		**100%**	**5.4**	**13.1**

Management Activities to Ensure a Successfully Establish Plant Stand

Newly seeded grasses can take up to 3 years to establish (depending upon climatic conditions.) During this time frame, all considerations should be taken to ensure the best chances for success. This may include fertilization and mechanical weed control.

Fertilizer

Fertilizer may be needed when re-seeding retired cropland, it will most likely be necessary to apply nutrients to raise the fertilility level to support emerging vegetation. In this case, apply nutrients according the the NRCS Nutrient Management (590) standard. A soils test should be taken prior to fertilization. The soil test should note "for establishment" instead of listing a yield goal that would be for production purposes.

Weed Control Method	Remarks
Mowing	Mowing will be applied as needed to remove or control herbacious weeds or other vegetation competing with desired pollinator habitat. Timing and extent of mowing will be based on site conditions such as growth stage of desired vegetation and soil moisture.

Conservation Practice Job Sheet - SWCD State District 5

Texas State Soil and Water Conservation Board — April, 2016

PLANTING SPECIFICATION SHEET

Client's Acknowledgement

By signing below I acknowledge that:

- I have reviewed the site specific installation, operation and maintenance requirements in this job sheet and have an understanding of them; and my questions have been answered.

- I will install, operate, and maintain the conservation practice in accordance with the practice requirements.

- I will make no changes to the requirements, without prior written approval of TSSWCB.

- I understand that failure to follow these specifications may constitute a contract violation and forfeiture of incentive payments or repayment of received funds.

Signature _____ Date _____