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**LETTER OF TRANSMITTAL**

Date: July 24, 2015	Job. #: 15928
Attention: Kathy Franscioni	
RE: Evaluation of Property for Conversion to Permanent Ag Land Easements	

To:

COPIES	DATE	NO.	DESCRIPTION
1	7/24/15		Review of Ag Production Viability

REMARKS: Kathy, here is a draft concept with attachments for your review and comments if additions or changes need to be done. Also please advise the number of signed copies that may be required. The report can also be converted into a pdf format.

File: 15928 RCT Report Trans.dot

COPY:	FROM: Frank PIERCE SIGNED: 
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**consulting engineers**  
ENVIRONMENTAL • CIVIL • AGRICULTURAL

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July 24, 2015

RCT LANDS, L.P.  
Kathy Francioni  
86 Monterey Salinas Hwy  
Salinas, CA. 93908

RE: Review of Agricultural Production Viability Comparison for RCT Lands, L.P.  
Monterey County  
APN's 137-151-009-000, 221-011-017-000, 221-011-040-000  
L&P A-15928

Dear Ms. Francioni,

The following review is to provide a comparison of production capabilities of three ranches that are being considered for Williamson Act Exchanges removal to permanent agriculture land easements and removal from Williamson Act. The west 120 acres of APN 221-011-017 is in process of annexation to the City of Greenfield and will be zoned Commercial, Industrial, and Mixed-Use. The east 51.6 acres will become a permanent agriculture land easement.

**SOMAVIA ROAD RANCH: APN 137-151-009-000, 66.09 acres**

This parcel will be designated permanent agriculture land easement. According to the 1978 Monterey County Soil Survey yield evaluation using cartons of lettuce for the soil types presently being farmed generally are 525/ 471b cartons per acre. See attached sheet #1. No current yield information was provided for this ranch.

**VANOLI RANCH: APN 221-011-017-000, 171.6 acres**

This parcel will be subject to a lot line adjustment that will divide it into a 120 acre portion on the west end that will be annexed by the City of Greenfield. This area contains high levels of rocks often identified as Greenfield potatoes. This condition requires extensive labor to pick up and remove rocks before every crop is planted. These rocks require expensive repairs and replacement of tillage equipment, disc blades, chisel points, top and side knives and equipment frames. This Arroyo Seco series AsA has generally produced 80,000lbs of cabbage or 25,000lbs of romaine lettuce. The soil in the eastern 51.6 acres is a croplly series CnA that is 40-50% clay fine textured soil that is easily cultivated. Production levels for cabbage are 120,000lbs and romaine lettuce, 43,000lbs. This 51.6 acres will be designated as a permanent agriculture

land easement. See attached sheet #2. An evaluation of yield data provided by Ric Causley for Church Brothers 2011 harvest of broccoli was an average of 620 cartons per acre. Average harvest yield for romaine lettuce was 983 cartons per acre.

**REDDING RANCH: APN 221-011-040-000, 317.97 acres**

This parcel will be designated as permanent agriculture land easement. According to the 1978 Monterey County Soil Survey the soil type is Rincon series RaA and RaC, a silty clay loam. Yield for lettuce range between 425 to 500/ 47lb cartons per acre. An evaluation of yield data provided by Ric Causley for Church Brothers 2011 harvest of broccoli was an average of 460 cartons per acre. Average harvest yield for romaine lettuce was 780 cartons per acre.

Based on yield data, a site inspection, and review of 1978 Monterey County Soil Survey, it is my opinion that the conversion of the properties to permanent agricultural land easement is appropriate. The west 120 acres of APN 221-011-017, the Vanoli Ranch are to be converted to commercial, industrial and mixed use when annexed by the City of Greenfield.



Sincerely,  
LEE & PIERCE INC.

*Frank D. Pierce*

Frank D. Pierce  
Registered Professional Engineer AG138  
Registered Environmental Property Assessor 704375

Attachments

FDP/kk

**FILE: 15928.Letter Report**



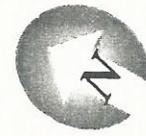
View looking SW from NE corner



View looking NW from SE corner



View looking NE from SW corner



Scale Approximate



View looking NW from SW corner

Somavia Road Ranch Yield per Acre APN 137-151-009-000

Soil Classification	Broccoli 21 Lb. Crates	Cauliflower 25 Lb. Cartons	Celery 60 Lb. Crates	Lettuce 47 Lb. Cartons
AeA	200	260	----	500
AeC	225	260	----	490
AeD	225	260	----	490
CnA	300	410	1035	525
CnC	275	215	850	550
PnA	300	450	900	450

The above yields are based on 1978 Monterey County Soil Survey Data

File: 15928 Ranch Soil Identification.GED

**Somavia Road Ranch**  
**APN 137-151-009-000 66.09 Acres**  
**RCT Lands, L.P. Agricultural Soils Evaluation**

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Job No. 15928  
 Date: July 21, 2015  
 Drawn By: Frank Pierce

Sheet No. **1**  
 of **3** Sheets

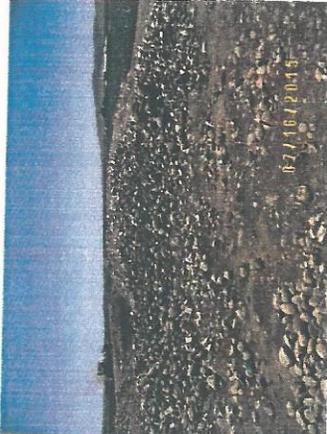
Date: 04/23/2013



View looking NE from NW corner



View of rocks in planted rows



Rock pile removed from surface of Commercial - Industrial Mixed-Use portion of Site

Vanoli Ranch Yield per Acre APN 221-011-017-000

Soil Classification	Broccoli 21 Lb. Crates	Cauliflower 25 Lb. Crates	Celery 60 Lb. Crates	Lettuce 47 Lb. Cartons
AsA	175	240	---	500
CnA	225	260	---	490
Eca	375	300	---	475

The above yeilds are based on 1978 Monterey County Soil Survey Data

File: 15928 Ranch Soil Identification.GED

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**Vanoli Ranch Lot Line Adjustment**  
APN 221-011-017-000 171.6 Acres  
RCT Lands, L.P. Agricultural Soils Evaluation

Job No. 15928  
Date: July 21, 2015  
Drawn By: Frank Pierce

Sheet No. **2**  
of 3 Sheets

Date: 04/23/2013



Permanent Ag Land Easement 317.97 Acres

Redding Ranch Yield per Acre APN 221--11-040-000

Soil Classification	Broccoli 21 Lb. Crates	Cauliflower 25 Lb. Cartons	Celery 60 Lb. Crates	Lettuce 47 Lb. Cartons
RaA	280	480	---	425
RaC	300	520	---	500
SBA	395	565	905	515
Xc	---	---	---	---

The above yields are based on 1978 Monterey County Soil Survey Data



View looking N from E corner

View of unplanted soil

View looking SW from SE corner

View looking NW from SW corner

View looking SE along NW side

View looking NW from SW corner

View looking NW from SW corner

Run-off Collection Pond at West Side

View looking NW from SW corner

View looking NW from SW corner

File: 15928 Ranch Soil Identification.GED

Job No. 15928

Date: July 21, 2015

Drawn By: Frank Pierce

Sheet No. 3

of 3 Sheets

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**Redding Ranch**  
**APN 221-011-040-000 317.97 Acres**  
**RCT Lands, L.P. Agricultural Soils Evaluation**

Date: 04/23/2013

Vanoli Ranch 2011 Yeilds Analysis  
Church Brothers LLC Data

Vanoli Ranch Yeilds		
Broccoli		
Date	Acres	Yeild
8/7/11	20	618
10/11/11	15	623
Total	35	1241
Average		620

Vanoli Ranch Yeilds		
Romaine		
Date	Acres	Yeild
6/13/2011	7	1189
6/17/2011	3	1260
6/20/2011	8	1178
6/21/11	10	962
7/7/11	10	1231
6/7/11	13	648
6/15/11	13	564
6/23/11	13	832
Total	77	7864
Average		983

Redding Ranch 2011 Yeilds Analysis  
Church Brothers LLC Data

Redding Ranch Yeilds		
Broccoli		
Date	Acres	Yeild
9/23/11	13	431
10/12/11	14	525
11/16/11	8.7	449
11/16/11	6.3	435
Total	42	1840
Average		460

Redding Ranch Yeilds		
Romaine		
Date	Acres	Yeild
7/18/11	8.7	858
7/18/11	1.3	886
7/22/11	9	1080
8/2/11	2	1680
8/3/11	7	918
8/10/11	8	273
8/11/11	13	451
8/16/11	5	669
8/18/11	7	643
8/20/11	13	315
Total	74	7773
Average		780

## ARROYO SECO SERIES AeA, AeC, AeD, AsA

Typically, Arroyo Seco soils have grayish brown, neutral and mildly alkaline, gravelly sandy loam A horizons underlain by brown and yellowish brown, stratified, gravelly sandy loam C horizons.

**TAXONOMIC CLASS:** Coarse-loamy, mixed, superactive, thermic Fluventic Haploxerolls

**TYPICAL PEDON:** Arroyo Seco gravelly sandy loam - irrigated crops (Colors are for dry soil unless otherwise stated.)

**Ap**--0 to 5 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; cloddy; slightly hard, very friable, nonsticky, nonplastic; common very fine roots; common very fine interstitial pores; 15 percent gravel and 2 percent cobbles; neutral (pH 6.8); clear smooth boundary. (5 to 10 inches thick)

**A12**--5 to 18 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; hard, friable, nonsticky, nonplastic; few very fine roots; common very fine tubular and interstitial pores; about 20 percent gravel and 5 percent cobbles; slightly alkaline (pH 7.5); gradual wavy boundary. (10 to 16 inches thick)

**A13**--18 to 29 inches; grayish brown (10YR 5/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, slightly sticky, nonplastic; few very fine roots; common very fine tubular pores; about 25 percent gravel and 8 percent cobbles; slightly alkaline (pH 7.5); gradual wavy boundary. (10 to 15 inches thick)

**RANGE IN CHARACTERISTICS:** Mean annual soil temperature is 59 to 64 degrees F. The soils are continuously dry between depths of about 8 and 24 inches from May to late October and usually are moist all the rest of the year. Pebbles and cobbles average 10 to 34 percent of the volume to a depth of 40 inches or more. Textures are sandy loam, fine sandy loam, or loam and average less than 18 percent clay. The soil is somewhat stratified. Organic matter content is 1.5 to 3 percent in the upper 10 inches and decreases irregularly. It averages less than 1 percent below a depth of 20 inches.

The A1 horizon is grayish brown, dark grayish brown, or brown in 10YR hue. Moist values are two units lower. This horizon has subangular blocky structure with hard or slightly hard dry consistence or it is massive and is slightly hard. It is slightly acid to moderately alkaline. Generally, the soil is increasingly alkaline with depth, but the profile is not calcareous.

**GEOGRAPHIC SETTING:** Arroyo Seco soils are on nearly level to moderately sloping flood plains and alluvial fans at elevations of 100 to 3,000 feet. The soils formed in alluvium dominantly from granitic sources, but include alluvium from schist, gneiss, sandstone, and siliceous shale. The climate is subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is

12 to 30 inches; mean annual temperature is 58 to 60 degrees F.; average January temperature is 48 to 50 degrees F.; average July temperature is 65 to 68 degrees F. Freeze-free season is 210 to 260 days.

**USE AND VEGETATION:** Used mostly for growing vegetables, field, and forage crops; also deciduous orchards, vineyards, and annual pasture. Vegetation on the uncultivated areas is annual grasses and forbs with scattered oaks.

**RANGE IN CHARACTERISTICS:** Mean annual soil temperature is 59 to 64 degrees F. The soils are continuously dry between depths of about 8 and 24 inches from May to late October and usually are moist all the rest of the year. Pebbles and cobblestones average 10 to 34 percent of the volume to a depth of 40 inches or more. Textures are sandy loam, fine sandy loam, or loam and average less than 18 percent clay. The soil is somewhat stratified. Organic matter content is 1.5 to 3 percent in the upper 10 inches and decreases irregularly. It averages less than 1 percent below a depth of 20 inches.

## **CROPLEY SERIES CnA, CnC,**

The Cropley series consists of very deep, moderately well and well drained soils that formed in alluvium from mixed rock sources. Cropley soils are on alluvial fans, floodplains and in small basins. Slopes range from 0 to 15 percent. The mean annual precipitation is about 16 inches and the mean annual temperature is about 60 degrees F.

**TAXONOMIC CLASS:** Fine, smectitic, thermic Aridic Haploxererts

**TYPICAL PEDON:** Cropley clay, 0 to 2 percent slopes, on a west facing 1 percent slope under a cover of annual grasses and forbs, at an elevation of 541 feet. When described on November 8, 2007, the soil was moist to 11 inches and dry below. (Colors are for dry soil unless otherwise noted).

**A1--**0 to 4 inches; very dark gray (10YR 3/1) broken face clay, black (10YR 2/1) broken face moist; 45 percent clay; strong coarse subangular blocky structure; hard, firm, very sticky, very plastic; common very fine roots; many very fine tubular pores; slightly acid, pH 6.2 by pH meter 1:1 water; clear smooth boundary.

**A2--**4 to 11 inches; very dark gray (10YR 3/1) broken face clay, black (10YR 2/1) broken face moist; 50 percent clay; strong coarse subangular blocky structure; hard, firm, very sticky, very plastic; common very fine roots; common very fine tubular pores; neutral, pH 6.9 by pH meter 1:1 water; clear smooth boundary. (combined A horizons 5 to 15 inches thick)

**Bss1--**11 to 24 inches; dark gray (2.5Y 4/1) broken face clay, black (2.5Y 2.5/1) broken face moist; 50 percent clay; strong coarse subangular blocky structure; hard, firm, very sticky, very plastic; common very fine roots; common very fine tubular pores; 20 percent pressure faces on slickensides and 70 percent clay films on all faces of peds; slightly alkaline, pH 7.6 by pH meter 1:1 water; gradual smooth boundary.

**RANGE IN CHARACTERISTICS:** Depth to segregated carbonate masses is 32 to 51 inches in most pedons, however some areas lack carbonates. The mean annual soil temperature at a depth of 20 inches is 59 to 64 degrees F. The particle size control section averages 40 to 60 percent clay, and 0 to 10 percent rock fragments, mostly gravel in size. Mineralogy is smectitic. Organic matter ranges from 1 to 3 percent to a depth of 10 inches. The soils usually are dry in the soil moisture control zone from May 1 to October 31, 180 days, and moist the rest of the year. Reversible surface- initiated cracks to 2 inches wide extend to a depth of 25 inches or more when the soil is not irrigated. Slickensides range from common to many in the Bss horizon from about 10 to 40 inches or more. Slopes are simple and are 0 to 15 percent.

The A horizons dry color is 10YR 4/2, 4/1, 3/2, 3/1, 2/1 or 5Y 3/1. Moist color is 10YR 3/2, 3/1, 2/2, 2/1 or N 2/. Texture is heavy clay loam, silty clay loam, silty clay or clay. Clay content ranges from 40 to 60 percent. Rock fragments range from 0 to 10 percent gravel. Reaction ranges from 5.6 to 8.4 and the horizon is non-calcareous. Some pedons have A/B horizons in which there is evidence of mixing of the A horizon and the Bss horizon soil material with small to large clumps of mixed soil material.

The Bss horizons dry color is 10YR 6/3, 6/2, 5/4, 5/3, 5/2, 4/3, 4/2, 4/1, 3/2, 3/1; 5Y 6/2, 3/1; 2.5Y 6/2, 5/2 or 4/1. Moist color is 10YR 4/4, 4/3, 4/2, 4/1, 3/3, 3/2, 3/1, 2/1; 5Y 4/2, 3/1; 2.5Y 4/2, 3/2, 3/1 or 2.5/1. Texture is clay loam, silty clay loam, silty clay or clay. Clay content ranges from 40 to 60 percent. Rock fragments range from 0 to 10 percent gravel. Reaction ranges from 6.1 to 8.4.

**GEOGRAPHIC SETTING:** Cropley soils are on alluvial fans, floodplains and in small basins. Slopes are smooth and are 0 to 15 percent. Cropley soils formed in fine textured alluvium weathered from shale, sandstone and mudstone. Elevation is 10 to 2100 feet. The climate is dry subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 12 to 30 inches. The mean annual temperature is 57 to 62 degrees F. Average January temperature is about 49 degrees F. in most areas, but is about 56 degrees F. close to the coast of California; average July temperatures is about 68 degrees f. Frost free season is 200 to 330 days and up to 360 days along the coast.

**USE AND VEGETATION:** This soil is used for irrigated row and truck crops, irrigated and dry pasture, apricots, prunes and for urban development. Vegetation in uncultivated or undeveloped areas is annual grasses and forbs with some scattered live oak

**RANGE IN CHARACTERISTICS:** Depth to segregated carbonate masses is 32 to 51 inches in most pedons, however some areas lack carbonates. The mean annual soil temperature at a depth of 20 inches is 59 to 64 degrees F. The particle size control section averages 40 to 60 percent clay, and 0 to 10 percent rock fragments, mostly gravel in size. Mineralogy is smectitic. Organic matter ranges from 1 to 3 percent to a depth of 10 inches. The soils usually are dry in the soil moisture control zone from May 1 to October 31, 180 days, and moist the rest of the year. Reversible surface- initiated cracks to 2 inches wide extend to a depth of 25 inches or more when the soil is not irrigated. Slickensides range from common to many in the Bss horizon from about 10 to 40 inches or more. Slopes are simple and are 0 to 15 percent.

## **ELDER SERIES EcA**

The Elder series consists of very deep and deep, well drained soils that formed in alluvial material derived from mixed rock sources. Elder soils are on alluvial fans and in flood plains and have slopes of 0 to 15 percent. The mean annual precipitation is about 20 inches and the mean annual air temperature is about 58 degrees F.

**TAXONOMIC CLASS:** Coarse-loamy, mixed, superactive, thermic Cumulic Haploxerolls

**TYPICAL PEDON:** Elder fine sandy loam, barley field. (Colors are for dry soil unless otherwise noted.)

**Ap--**0 to 8 inches; dark gray (10YR 4/1) fine sandy loam, very dark gray (10YR 3/1) moist; moderate medium and coarse granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine interstitial and few very fine tubular pores; about 10 percent gravel; moderately acid (pH 6.0); clear smooth boundary. (6 to 10 inches thick)

**A--**8 to 23 inches; dark gray (10YR 4/1) sandy loam, very dark gray (10YR 3/1) moist; weak fine and medium granular structure; hard, very friable, slightly sticky and slightly plastic; common very fine roots; many very fine interstitial, common very fine and fine, and many medium tubular pores; about 10 percent gravel; slightly acid (pH 6.5); gradual wavy boundary. (14 to 22 inches thick)

**RANGE IN CHARACTERISTICS:** The mean annual soil temperature is 59 degrees to 65 degrees F. and usually the soil temperature in winter is not below 47 degrees F. The soil between depths of about 8 and 25 inches is usually dry all the time from late April or May until November or early December and usually is moist in some or all parts all the rest of the year.

The soil has 1 to 4 percent organic matter that decreases irregularly to a depth of 20 to 30 inches or more. The 10- to 40-inch control section and usually all parts of the profile are sandy loam, coarse sandy loam, fine sandy loam or light loam and have less than 18 percent clay. The average combined silt, very fine sand, and clay is less than 50 percent. Weak to distinct stratification is present. Rock fragments in the control section are commonly 2 to 15 percent and range up to 35 percent. Shale fragments and gravel are usually less than 1/2 inch in diameter

The A horizon is 2.5Y 5/2, 4/2; 10YR 3/1, 4/1, 4/2, 4/3, 5/1, 5/2, 5/3. This horizon is slightly alkaline to moderately acid and the base saturation is 75 to 100 percent. It has weak or moderate granular or subangular blocky or angular blocky structure in most pedons. In some pedons, the soil is massive and dry consistence is slightly hard.

**GEOGRAPHIC SETTING:** Elder soils are on alluvial fans and flood plains. Elevations are 20 to 1,500 feet. The soils formed in moderately coarse textured alluvium derived from sedimentary, granitic, and basic igneous rock sources. Slopes are 0 to 15 percent. The climate is dry, subhumid mesothermal with warm, dry summers and cool, wet winters. The mean annual precipitation is 12 to 35 inches. The average January temperature is about 48 degrees F. and about 56 degrees along the coast of California; the

average July temperature is about 65 degrees F.; the average annual temperature is about 57 degrees to 61 degrees F. Freeze-free season is 175 to 325 days and as high as 350 days along the coast of California.

**USE AND VEGETATION:** With irrigation, Elder soils are intensively used for growing truck, field, and forage crops. Dry areas are used for growing small grain, hay, and small amounts of other crops. Some areas protected from flooding are used for urban development. Uncultivated areas have a cover of annual grasses and forbs with scattered live oak.

**DRAINAGE AND PERMEABILITY:** Well-drained; negligible to low runoff; small areas adjacent to drainageways often subject to overflow during severe storms; some areas are protected with dams and levees, moderately rapid permeability.

## RINCON SERIES RaA, RaC

The Rincon series consists of deep, well drained soils that formed in alluvium from sedimentary rocks. Rincon soils are on old alluvial fans and both stream and marine terraces, and have slopes of 0 to 30 percent. The mean annual precipitation is about 16 inches and the mean annual air temperature is about 60 degrees F.

**TAXONOMIC CLASS:** Fine, smectitic, thermic Mollic Haploxeralfs

**TYPICAL PEDON:** Rincon silty clay loam, dry farmed grain. (Colors are for dry soil unless otherwise noted.)

**Ap--**0 to 4 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; medium size clods; hard, firm, sticky and plastic; many very fine and few medium roots; common very fine tubular pores; slightly acid (pH 6.5); clear wavy boundary. (4 to 10 inches thick)

**A12--**4 to 16 inches; dark gray (10YR 4/1) silty clay loam, very dark gray (10YR 3/1) moist; massive; very hard, firm, sticky and plastic; many very fine and few medium roots; common very fine, few fine and very few medium tubular pores; slightly acid (pH 6.5); gradual wavy boundary. (10 to 13 inches thick)

**B21t--**16 to 25 inches; dark grayish brown (10YR 4/2) sandy clay, very dark grayish brown (10YR 3/2) moist; weak coarse prismatic structure and strong moderate angular blocky; extremely hard, very firm, sticky and very plastic; common very fine roots; common very fine and few fine and medium tubular pores; many thin clay films on faces of pedes and common moderately thick clay films lining pores; neutral (pH 7.0); gradual smooth boundary. (9 to 13 inches thick)

**RANGE IN CHARACTERISTICS:** The solum is 36 to 64 inches thick. Most pedons have essentially no gravel above the C horizon. The soils usually are moist in some or all parts between depths of 4 and 12 inches from November or early December until May. They usually are continuously dry the rest of the time. The mean annual soil temperature is between 59 degrees and 64 degrees F., and the soil temperature is continuously above 47 degrees F.

The A horizon is very dark gray, dark gray, gray, very dark grayish brown, dark grayish brown, or grayish brown; hue is mostly 10YR, in some pedons, it is 2.5Y. This horizon is loam, clay loam, or silty clay loam, and is usually clay loam. Usually the surface or all the A1 horizon is hard and massive. If not massive, structure is destroyed after several years of cultivation. This horizon is hard or very hard. It contains about 2 percent organic matter. The A horizon is usually slightly acid to neutral. Some pedons may be medium acid or moderately alkaline in part because of cultural measures.

The B2t horizon is dark gray, dark grayish brown, grayish brown, light brownish gray, brown, yellowish brown, pale brown, light yellowish brown or light olive brown with the higher values

and brighter chromas in the lower part in the interior of the peds. It is heavy clay loam, sandy clay or clay and has about 35 to 45 percent clay. The B2t horizon has about 6 to 10 percent more clay than the A horizon. It has weak prismatic to strong angular blocky structure. This horizon is neutral to moderately alkaline and alkalinity generally increases in the lower portion. Segregated lime is present in the lower part of the Bt horizon and upper C horizon. The boundary between the A horizon and B2t horizon is gradual or a transitional A3 or B1 horizon is present

**GEOGRAPHIC SETTING:** Rincon soils are on older alluvial fans and both stream and marine terraces at elevations of 20 to 2,000 feet. Gradient is 0 to 30 percent. The soils formed in alluvium from sedimentary rocks. The climate is subhumid, mesothermal with warm, dry summers and cool, moist winters. The mean annual precipitation is about 12 to 20 inches. Average January temperature is about 45 degrees to 52 degrees F., average July temperature is about 68 degrees to 75 degrees F., mean annual temperature is about 59 degrees to 61 degrees F. The freeze-free season averages 200 to 300 days.

**USE AND VEGETATION:** Used for irrigated citrus, deciduous fruits, row crops, and alfalfa. Some dry farming for grain and pasture. Natural vegetation is annual grasses and forbs.

**DRAINAGE AND PERMEABILITY:** Well drained; slow to rapid runoff; slow permeability.

## SALINAS SERIES SbA

The Salinas series consists of deep, well drained soils that formed in alluvium weathered from sandstone and shale. Salinas soils re on alluvial plains, fans, and terraces and have slopes of 0 to 9 percent. The mean annual precipitation is about 16 inches and the mean annual air temperature is about 59 degrees F.

**TAXONOMIC CLASS:** Fine-loamy, mixed, superactive, thermic Pachic Haploxerolls

**TYPICAL PEDON:** Salinas clay loam, cultivated. (Colors are for dry soil unless otherwise noted. When described, the soil was dry to 5 inches and moist below 5 inches.)

**Ap1**--0 to 5 inches; very dark gray (10YR 3/1) clay loam, black (10YR 2/1 rubbed) moist; weak coarse subangular ; very hard, firm, very sticky and plastic; common very fine roots; common very fine interstitial, few medium and fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 6 inches thick)

**Ap2**--5 to 13 inches; very dark gray (10YR 3/1 moist or dry) clay loam; weak coarse subangular blocky structure; very hard, firm, very sticky plastic; common very fine roots; common very fine interstitial, few medium and fine tubular pores; moderately alkaline (pH 8.0); clear smooth boundary. (7 to 9 inches thick)

**A13**--13 to 23 inches; very dark gray (10YR 3/1 moist or dry) clay loam; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; few very fine roots; common very fine interstitial and common very fine and few fine tubular pores; some dark grayish brown (10YR 4/2 moist) lumps and mottles, probably due to rodent activity, increasing with depth; moderately alkaline (pH 8.0); gradual wavy boundary. (10 to 12 inches thick)

**RANGE IN CHARACTERISTICS:** The mean annual soil temperature is 60 degrees to 64 degrees F. and the soil temperature usually is not below 47 degrees F. at any time. The soil between depths of about 5 to 15 inches usually is dry all of the time from about May until late November or early December and usually is moist all the rest of the year. Depth to lime is about 22 to 36 inches. Most of the lime is disseminated, with a few fine to medium lime masses in the lower part. Some pedons have Cca horizons. The soils are neutral to moderately alkaline to a depth of about 22 inches and moderately alkaline below. The 10 to 40 inch control section averages loam, silt loam, clay loam or silty clay loam. It contains 18 to 30 percent clay and more than 15 percent fine sand or coarser.

The A horizon is very dark gray, dark gray or gray (10YR 3/1, 4/1, 5/1) with a chroma of less than 2 to a depth of 22 inches or more. In some pedons, lower A horizons grade to C horizons and are grayish brown (10YR and 2.5Y 5/2). Organic matter content is 1 to 4 percent to a depth of more than 20 inches and decreases regularly to less than 1 percent within 30 inches of the surface

**GEOGRAPHIC SETTING:** Salinas soils are on alluvial plains, fans, and terraces not subject to current accretions. Slopes are 0 to 9 percent. The soils formed in mixed alluvium mostly from sandstone and shale. They are at elevations of 50 to 2,000 feet. The climate is dry subhumid mesothermal with cool to warm rainless summers with some fog and cool moist winters. Mean annual precipitation is 12 to 20 inches. The average January temperature is 46 degrees to 50 degrees F.; average July temperature is 62 degrees to 73 degrees F.; mean annual temperature is 57 degrees to 60 degrees F. The average frost-free season is 233 to 300 days

**USE AND VEGETATION:** Used mainly for growing irrigated truck, field, and forage crops. Some small valleys used for dry farmed small grain. Non-cultivated areas have annual grass and forbs with scattered oak and sycamore in places.

**DRAINAGE AND PERMEABILITY:** Well drained; slow to medium runoff; moderately slow permeability.

## MOCHO SERIES MoA

The Mocho series consists of very deep, well drained soils that formed in alluvium derived mostly from sandstone and shale rock sources. Mocho soils are on alluvial fans and have slopes of 0 to 9 percent. The mean annual precipitation is about 16 inches and the mean annual air temperature is about 59 degrees F.

**TAXONOMIC CLASS:** Fine-loamy, mixed, superactive, thermic Fluventic Haploxerolls

**TYPICAL PEDON:** Mocho loam, irrigated orchard. (Colors are for dry soil unless otherwise noted.)

**Ap--0 to 11 inches;** grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine and medium interstitial pores; slightly effervescent, carbonates disseminated; moderately alkaline; clear smooth boundary. (6 to 14 inches thick)

**A--11 to 18 inches;** grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine and fine tubular pores; strongly effervescent, carbonates disseminated; moderately alkaline; clear smooth boundary. (5 to 10 inches thick)

**RANGE IN CHARACTERISTICS:** The mean annual soil temperature at a depth of 20 inches is about 59 degrees to 64 degrees F. and usually the soil temperature is not below 47 degrees F. The soil between depths of about 5 and 15 inches usually is dry all of the time from May until November and usually is moist all the rest of the year. The 10- to 40-inch particle size control section averages loam, silt loam, clay loam or silty clay loam and has 18 to 35 percent clay and more than 15 percent fine sand or coarser. There is some stratification particularly below plow depth or below depth of 20 inches. Organic matter decreases irregularly in most parts. Rock fragments range from 1/2 to about 15 percent and are less than 35 percent to a depth of more than 40 inches. After plowing, the soils are weakly to strongly calcareous throughout. Some pedons have small to moderate amounts of fine segregated lime in some part between depths of 12 and 40 inches.

The A horizon is grayish brown, brown or dark grayish brown in 10YR or 2.5Y hue. Moist value and moist chroma are 3.5 or less. This horizon has weak to strong granular or subangular blocky structure. It contains 1 1/2 to 4 percent organic matter which decreases irregularly below the plow depth or below depth of 20 inches and averages less than 1 percent below a depth of 20 inches.

**GEOGRAPHIC SETTING:** Mocho soils are on alluvial fans at elevations of 20 to 3,500 feet. Slopes range from 0 to 9 percent. The soils formed in recent alluvium of medium texture derived mostly from sandstone or shale rock sources. The climate is dry subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 12 to 30 inches. Average January temperature is about 56 degrees F. near the coast and is 47 degrees to 50 degrees F. inland, average July temperature is about 67 degrees F. near the coast and about 78 degrees inland, and the average annual temperature is about 59 degrees F. The freeze-free season is 200 to 350 days

**USE AND VEGETATION:** Mostly irrigated and intensively used for forage, field and truck crops, some fruit and dry areas are used for grain and range. Nontilled areas have a cover of naturalized vegetation of annual grasses and forbs.

**DRAINAGE AND PERMEABILITY:** Well drained; slow or medium runoff; moderate or moderately slow permeability

## **SHEDD SERIES – Xerorthents, Xc Loamy**

The Shedd series is a member of the fine-silty, mixed (calcareous), thermic family of Typic Xerorthents. Typically, Shedd soils have gray, strongly and violently effervescent, silty clay loam A horizons and light gray, violently effervescent, silty clay loam Cca horizons over soft calcareous shale at a depth of 30 inches.

**TAXONOMIC CLASS:** Fine-silty, mixed, superactive, calcareous, thermic Typic Xerorthents

**TYPICAL PEDON:** Shedd silty clay loam - annual grass range. (Colors are for dry soil unless otherwise stated.)

**A11**--0 to 5 inches; gray (5Y 6/1) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium angular blocky structure; hard, very friable, sticky, plastic; common very fine roots; common very fine interstitial and common very fine tubular pores; strongly effervescent with disseminated lime; moderately alkaline (pH 8.0); clear smooth boundary. (4 to 7 inches thick)

**A12**--5 to 12 inches; gray (5Y 6/1) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; strong medium subangular blocky structure; slightly hard, very friable, slightly sticky, slightly plastic; common very fine roots; many very fine interstitial, common very fine, fine and medium tubular pores; strongly effervescent with disseminated lime; moderately alkaline (pH 8.0); gradual smooth boundary. (6 to 9 inches thick)

**A13**--12 to 23 inches; gray (5Y 6/1) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; strong medium subangular blocky structure; slightly hard, very friable, sticky, plastic; few very fine roots; many very fine interstitial and common very fine, fine and medium tubular pores; violently effervescent with disseminated lime; moderately alkaline (pH 8.0); abrupt wavy boundary. (8 to 11 inches thick)

**GEOGRAPHIC SETTING:** Shedd soils are moderately sloping to very steep and are on hills at elevations of 200 to 2,500 feet. The soils formed in residuum weathered from calcareous soft shale. The climate is semiarid to dry subhumid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 10 to 20 inches. Average January temperature is about 46 degrees F.; average July temperature is about 74 degrees F.; and the mean annual temperature is 58 degrees to 60 degrees F. The freeze-free season is about 250 days

**RANGE IN CHARACTERISTICS:** Depth to a paralithic contact of shale is 24 to 40 inches. The mean annual soil temperature is 60 degrees to 65 degrees F., and the soil temperature usually is not below 47 degrees F. at any time. Soil between the depths of about 4 to 12 inches usually is dry all of the time from sometime in April or May until November or early December and usually is moist in some or all parts all the rest of the year. Textures throughout are silt loam or silty clay loam with less than 15 percent fine sand or coarser and usually the clay content is about 27 to 35 percent. After the surface few inches have been disturbed the soils are weakly to violently effervescent and the amount of lime increases somewhat with depth.

**USE AND VEGETATION:** Used mostly for range; some grain with alternate fallow. Uncultivated areas have annual grasses and forbs and a few oak trees occur on north slopes in the area of higher rainfall

**DRAINAGE AND PERMEABILITY:** Well to somewhat excessively drained; medium to very rapid runoff; moderate or moderately slow permeability