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General Soil Map Units

Soils on the basin floor and flood plain of the San Joaquin Valley

1. Tachi-Armona-Wekoda

Very deep, nearly level, very poorly and poorly drained, saline-sodic soils formed in alluvium from igneous and/or sedimentary rock sources on flood plains and basin floors on the west side of the San Joaquin River and Fresno Slough

Soils on fan skirts of the San Joaquin Valley

2. Tranquillity-Ciervo, saline-sodic-Calflax

Very deep, nearly level, somewhat poorly and moderately well drained, saline-sodic soils formed in alluvium from calcareous sedimentary rock sources on fan skirts adjacent to the western edge of the basin floor

3. Ciervo

Very deep, nearly level, moderately well drained soils formed in alluvium from calcareous sedimentary rock sources on fan skirts

4. Deldota-Chateau

Very deep, nearly level, poorly and somewhat poorly drained soils formed in alluvium from sedimentary rock sources on fan skirts

Soils on alluvial fans of the San Joaquin Valley

5. Cerini-Excelsior-Westhaven

Very deep, nearly level to gently sloping, well drained soils formed in alluvium from sedimentary rock sources on alluvial fans

6. Panoche-subsided-Cerini, subsided

Very deep, undulating, well drained soils formed in alluvium from sedimentary rock sources on alluvial fans

Soils on fan remnants of the San Joaquin Valley

7. Lethent

Very deep, nearly level, moderately well drained soils formed in alluvium from sedimentary and igneous rock sources on nonburied fan remnants

8. Milham-Polvadero-Guijarral

Very deep, nearly level to rolling, well drained soils formed in alluvium from calcareous sedimentary rock sources on fan remnants

9. Los Banos-Pleito

Very deep, nearly level to hilly, well drained soils formed in calcareous gravelly alluvium from mixed rock sources on fan remnants

Soils on hills and in valleys of the California Coast Ranges

10. Delgado-Mercey-Kettleman

Shallow or moderately deep, undulating to steep, somewhat excessively and well drained soils formed in material weathered from marine sandstone or shale on hill slopes

11. Vernalis-Arburua

Moderately deep or very deep, nearly level to steep, well drained soils formed in alluvium from sandstone and shale and in material weathered from marine sandstone and shale on flood plains and hill slopes in the northwest part of Fresno County

Soils on mountains and in valleys of the California Coast Ranges

12. Exclose-Wisflat

Shallow or very deep, hilly to very steep, well drained soils formed in material weathered from marine sandstone or shale on mountain slopes

13. Grazer-Wisflat

Shallow or deep, hilly to very steep, well drained soils formed in material weathered from marine sandstone or shale on mountain slopes

14. Atravesada-Pits, asbestos

Shallow, gently sloping to very steep, well drained soils formed in material weathered from serpentinite with a very high content of chrysotile asbestos, on mountain slopes

15. Currymountain-Roacha-Borreguero

Shallow or moderately deep, steep or very steep, well drained soils formed in material weathered from shale and sandstone on mountain slopes and escarpments

16. Hentine-Climara

Shallow or moderately deep, moderately steep to very steep, well drained soils formed in material weathered from serpentinite and in mass movement colluvial deposits derived from Franciscan melange rocks on mountain slopes

120--Altaslough clay loam, 0 to 1 percent slopes. This very deep, somewhat poorly drained soil is on flood plains. It formed in mixed alluvium derived dominantly from granitic rock. Slope ranges from 0 to 1 percent. Elevation is 115 to 165 feet. The mean annual precipitation is 8 to 9 inches, the mean annual temperature is 62 to 64 degrees F, and the frost-free period is 240 to 270 days.

Typically, the upper 13 inches of the surface layer is dark gray clay loam, and the lower part to a depth of 24 inches is mixed dark gray and light olive gray clay loam. The upper 27 inches of the subsoil is light olive gray and light gray highly calcareous clay loam, and the lower part to a depth of 72 inches is pale yellow and light gray loam and fine sandy loam. Redoximorphic features occur in all layers. This soil is calcareous throughout and saline-sodic below the surface layer.

Included in this unit is 7 percent Tachi clay, 5 percent Gepford clay and 3 percent Lillis clay. Included areas make up about 15 percent of the total acreage.

Permeability of this Altaslough soil is slow. Available water capacity is moderate to very high because of the varying levels of salinity. Effective rooting depth is 60 inches or more. Runoff is low, and the hazard of water erosion is slight. This soil is considered to be drained because of the presence of dams and reservoirs in the Sierra Nevada, pumping from the water table, use of tile and interceptor drains and the filling and leveling of the sloughs in the vicinity. It is protected from major flooding by control levees and reservoirs. This unit is subject to brief periods of flooding in December through March in years of abnormally high precipitation.

Most areas of this unit are used for irrigated crops, mainly cotton, alfalfa hay, sugar beets and tomatoes. Among other crops grown are cantaloupes and seed alfalfa. Some areas are used for home site development.

This unit is suited to irrigated saline-sodic tolerant crops. It is limited mainly by the saline-sodic condition of the soil, slow permeability and excess lime. Intensive management is required to reduce the salinity and maintain soil productivity. Content of toxic salts can be reduced by leaching salts below the root zone, applying proper amounts of soil amendments and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer. Furrow, border and sprinkler irrigation systems are suited to this unit. The method used generally is governed by the crop grown. Because of the slow permeability of this soil, the length of runs should be adjusted to permit adequate infiltration of water. The application of water should be regulated so that water does not stand on the surface and damage the crops. To avoid overirrigating, applications of irrigation water should be adjusted to the available water capacity, the water intake rate and the needs of the crop grown. Subsoiling increases the infiltration of water and the permeability of this soil. The excess lime can cause iron chlorosis in some crops. Adding iron supplements can correct this condition.

A cropping system that includes crop rotation, cover crops, the return of crop residue to the soil, or the regular addition of other organic matter, and proper tillage improves or maintains soil tilth and increases fertility and the water intake rate. Tillage when the soil is wet results in compaction of the surface layer, poor tilth and increased ponding.

If this unit is used for home site development, the main limitations are flooding on rare occasions, slow permeability, limited load supporting capacity, moderate shrink-swell potential, the saline-sodic condition of the soil and high corrosivity to steel and concrete. Roads and streets should be located above the expected flood levels. Building sites should be graded to divert water away from foundations and to prevent ponding in adjacent areas. The slow permeability increases the possibility of failure of septic tank absorption fields. Use of long absorption lines and sandy backfill for the trench helps to compensate for this. Buildings and roads should be designed to offset the limited ability of the soil in this unit to support a load. The high shrink-swell potential needs to be considered when designing and constructing foundations, concrete structures and paved areas. The effects of shrinking and swelling can be minimized by using proper engineering designs, by maintaining a constant moisture content around the foundation area and by backfilling with material that has low shrink-swell potential. Selection of salt and sodium tolerant plants is important for the establishment of lawns, shrubs, trees and vegetable gardens. The saline-sodic condition of the soil causes high corrosivity to steel and concrete. To protect against high corrosivity to steel and concrete, treated steel pipe and sulfate-resistant concrete should be used.

This map unit is in capability unit IIIs-6, irrigated, and capability subclass IVs, nonirrigated. The MLRA is 17.

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130--Gepford clay, 0 to 1 percent slopes. This very deep, poorly drained, saline-sodic soil is on flood plains. It formed in alluvium derived from igneous and sedimentary rock. Elevation is 120 to 210 feet. The mean annual precipitation is 7 to 8 inches, the mean annual air temperature is 62 to 64 degrees F, and the frost-free period is 250 to 275 days.

Typically, the surface layer is dark gray and light olive gray clay about 13 inches thick. The upper part of the subsoil is gray, light olive gray and olive gray clay about 30 inches thick. The lower part of the subsoil is olive clay loam. Redoximorphic features are present in the subsoil. The profile is calcareous throughout, and it is saline-sodic in some part. Gypsum crystals are often present in the subsoil. In some areas the surface layer is clay loam.

Included in this unit are 5 percent small areas of Tachi clay, 4 percent small areas of Armona loam, 1 percent Lethent clay loam, and 2 percent small areas of soil which are not saline-sodic, and do not have a high table. Also included are 3 percent small areas which flood on rare occasions, located primarily near the Fresno Slough and Kings County line. Included areas make up about 15 percent of the total acreage.

Permeability of this Gepford soil is very slow. Available water capacity is moderate to high because of varying levels of salinity. Effective rooting depth of the crops commonly grown in the area is limited by an apparent water table that occurs from 60 to 72 inches from the soil surface. This unit is considered to be partially drained because of the presence of dams and reservoirs in the Sierra Nevada, pumping from the water table, use of tile and interceptor drains and the filling and leveling of the sloughs in the vicinity. Runoff is ponded, and the hazard of water erosion is slight.

This unit is used mainly for irrigated crops. It is also used for pasture and home site development.

This unit is best suited to irrigated, saline-sodic tolerant crops. It is limited mainly by the saline-sodic condition of the soil, a high water table, and very slow permeability.

If this unit is irrigated, salinity influences the choice of crops. Intensive management is required to reduce the salinity and maintain soil productivity. Content of toxic salts can be reduced by applying proper amounts of soil amendments, leaching and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer. Tile drainage can be used to lower the water table if a suitable outlet is available.

Furrow, border and sprinkler irrigation systems are suited to this unit. Because of the very slow permeability of this soil, the application of water should be regulated so that water does not stand on the surface and damage the crops.

A cropping system that includes crop rotation and return of crop residue to the soil or regular addition of other organic matter improves fertility, reduces crusting and increases water intake rate.

If this unit is used for hay and pasture, the main limitations are the saline-sodic conditions of the soil, and a high water table. The concentration of salts and sodium in the surface layer limits the production of plants suitable for hay and pasture. Leaching the salts from the surface layer is limited by the high water table. Drainage and irrigation water management reduce the concentration of salts. Salt-tolerant species are most suitable for planting. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer.

Irrigation water can be applied by the sprinkler and border methods. Leveling helps to ensure the uniform application of water. Proper stocking rates, pasture rotation and restricted grazing during wet periods help to keep the pasture in good condition and to protect the soil from erosion. Use of nitrogen and phosphorus fertilizer promotes good growth of forage plants.

Population growth has resulted in increased construction of homes on this soil. If this unit is used for home site development, the main limitations are a high water table, the saline-sodic condition of the soil, very slow permeability, and high potential of shrinking and swelling.

Deep drainage reduces wetness. Tile drainage can be used to lower the water table if a suitable outlet is available. Plants that tolerate a seasonal high water table and droughtiness should be selected unless drainage and irrigation are provided. The saline-sodic condition causes high corrosivity to steel and concrete. Treated steel pipe and sulfate-resistant concrete should be used. Content of toxic salts can be reduced by applying proper amounts of soil amendments, leaching and returning crop residue to the soil. Selection of adapted vegetation is critical for the establishment of lawns, shrubs, trees and vegetable gardens.

Very slow permeability and the high water table increase the possibility of failure of septic tank absorption fields. Absorption lines should be placed below the very slow permeable layer. Increasing the size of the absorption area helps to compensate for the very slow permeability. The effects of shrinking and swelling can be minimized by using proper engineering designs and by backfilling with material that has low shrink-swell potential.

This map unit is in capability unit IIIW-6, irrigated, and capability subclass VIw, nonirrigated. The MLRA is 17

06/11/97

282--Tachi clay, 0 to 1 percent slopes. This very deep, very poorly drained, saline-sodic soil is on flood plains and in basins. It formed in alluvium derived dominantly from igneous and sedimentary rock. Elevation is 120 to 210 feet. The mean annual precipitation is about 8 inches, the mean annual air temperature is 62 to 64 degrees F, and the frost-free period is 245 days to 255 days.

Typically, the surface layer is very dark gray, dark gray, and olive gray clay about 14 inches thick. The underlying material to a depth of 60 inches is dark gray, olive gray, light olive gray, light gray and gray clay. Redoximorphic features are present in all layers below a depth of 14 inches. Tachi soils are calcareous throughout and are saline-sodic in some parts of the soil profile.

Small areas of Lillis soil are included along the western edge of this unit. Also included, near Fresno Slough, are small areas of coarser textured, stratified soil. In the N 1/2 of the NE 1/4 of sec. 8, T.14 S., R.15 E., there are small areas of Tachi soil with a 3 to 10-inch overwash of silt loam or silty clay loam texture. Included areas make up about 7 percent of the total acreage.

Permeability of this Tachi soil is very slow. The water infiltration rate is high when the soil is dry and the cracks are open. As the soil becomes wet and the cracks close, the infiltration rate greatly decreases. The available water capacity is moderate or high. Effective rooting depth of the crops commonly grown in the area is limited by an apparent water table at a depth of 4 to 6 feet. Runoff is ponded and the hazard of water erosion is slight. These soils are purposefully flooded in the Mendota Wildlife Management Area from October through April for recreational and wildlife habitat purposes.

This unit is used mainly for wildlife habitat and recreation. It is also used for irrigated crops.

This unit is suited to irrigated, saline-sodic tolerant crops. It is limited mainly by saline-sodic conditions, an apparent water table, and very slow permeability. Intensive management is required to reduce the salinity and maintain soil productivity. Reduction of high salinity may be achieved by applying specific soil amendments and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer.

A cropping system that includes crop rotation and the return of crop residue to the soil or the regular addition of other organic matter improves fertility, reduces crusting and increases the water intake rate. Furrow, border and sprinkler irrigation systems are suited to this unit. Because of the very slow permeability of this soil, the application of water should be regulated so that water does not stand on the surface and damage the crops. Subterranean Tile drainage may be used to lower the water table if a suitable outlet is available.

This map is in capability unit IIIw-6, irrigated, and capability subclass VIIw, nonirrigated. The MLRA is 17.

08/06/98

284--Lillis clay, 0 to 1 percent slopes. This very deep, poorly drained, saline-sodic soil is on flood plains and basins. It formed in alluvium derived dominantly from igneous and sedimentary rock. Elevation is 160 to 185 feet. The mean annual precipitation is about 7 to 8 inches, the mean annual air temperature is 62 to 64 degrees F, and the frost-free period is 245 to 255 days.

Typically, the surface layer is light olive gray, pale olive, light olive brown, gray and olive brown clay about 13 inches thick. The subsoil to a depth of 60 inches is light yellowish brown, light olive gray and olive gray clay. It is calcareous throughout and is saline-sodic in all parts of the soil profile.

Included in this unit are 8 percent small areas of Tachi clay, 3 percent Tranquillity clay, saline-sodic, wet, 2 percent Lethent silt loam, and 2 percent Ciervo clay, saline-sodic, wet. Included areas make up about 15 percent of the total acreage.

Permeability of this Lillis soil is extremely slow. The water infiltration rate is high, however, when the soil is dry and the cracks are open. As the soil becomes wet and the cracks close, the infiltration rate greatly decreases. The available water capacity is very low due to strongly saline-sodic conditions. Effective rooting depth of the crops commonly grown in the area is limited by a high water table approximately 4 to 6 feet from the soil surface. Runoff is low, and the hazard of water erosion is slight. Flooding is rare, however in the Mendota Wildlife Management Area, the soil is subject to very long periods of managed flooding from October through April for recreational and wildlife habitat purposes.

This unit is used mainly for wildlife habitat and recreation. It is also used for irrigated crops.

This unit is suited to irrigated, saline-sodic tolerant crops. It is limited mainly by saline-sodic conditions, a high water table and extremely slow permeability. Intensive management is required to reduce the salinity and maintain soil productivity. Strongly saline-sodic levels can be reduced by applying proper amounts of soil amendments, leaching, and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer.

A cropping system that includes crop rotation and the return of crop residue to the soil or the regular addition of other organic matter improves fertility, reduces crusting and increases the water intake rate. Furrow, border and sprinkler irrigation systems are suited to this unit. Because of the extremely slow permeability of this soil, the application of water should be regulated so that water does not stand on the surface and damage the crops. Tile drainage can be used to lower the water table if a suitable outlet is available.

This map unit is in capability unit IIIw-6, irrigated, and capability subclass VIIw, nonirrigated. The MLRA is 17.

04/10/96

285--Tranquillity-Tranquillity, wet, complex, saline-sodic, 0 to 1 percent slopes. This map unit is on low-lying alluvial fans and flood plains. Elevation is 135 to 360 feet. The mean annual precipitation is 7 to 8 inches, the mean annual temperature is 62 to 64 degrees F, and the frost-free period is 245 to 255 days.

This unit is 60 percent Tranquillity clay, saline-sodic and 25 percent Tranquillity clay, saline-sodic, wet. The percentage of these components is subject to change. The components of this unit are so intricately intermingled that it was not practical to map them separately at the scale used.

Included in this unit are 4 percent Ciervo clay, some of which are saline-sodic with a high water table, 2 percent Cerini clay loam, some of which are saline-sodic with a high water table, 2 percent Tachi clay, and 2 percent Armona loam. Also included are 2 percent small areas of soil that are subject to rare periods of flooding, 2 percent Deldota clay, partially drained, and 1 percent areas that are similar to this Tranquillity soil that have a high water table very close to the surface in the proximity of the Main, Deldota-Mendota and Outside Canals. Included areas make up about 15 percent of the total acreage.

The Tranquillity, saline-sodic soil is very deep and somewhat poorly drained. It formed in alluvium derived dominantly from igneous and sedimentary rock. Typically, the surface layer is light brownish gray clay about 22 inches thick. The subsoil to a depth of 60 inches is light yellowish brown clay. It is calcareous throughout and is saline-sodic below a depth of 32 inches.

Permeability of this Tranquillity soil is very slow. The available water capacity is moderate. Effective rooting depth is 72 inches or more. Runoff is low, and the hazard of water erosion is slight.

The Tranquillity, saline-sodic, wet soil is very deep and somewhat poorly drained. It formed in alluvium derived dominantly from igneous and sedimentary rock. Typically, the surface layer is grayish brown clay about 16 inches thick. The upper 32 inches of the subsoil is grayish brown clay. The lower part to a depth of 60 inches is light yellowish brown, highly gypsiferous, silty clay. It is calcareous throughout and is saline-sodic below a depth of 6 inches. Redoximorphic features occur in some layer below a depth of 16 inches. A transient high water table occurs at a depth of 48 to 72 inches. The high water table is influenced by irrigation as well as the geographic orientation in the landscape and texture of soil layers. The high water table has a direct impact on the salinity and sodicity of this soil. Drainage and reclamation practices have an effect on the depth to the water table and salinity. The depth to a high water table varies during the year and is commonly highest during irrigation applications in the winter and early spring.

Permeability of this Tranquillity soil is very slow. The available water capacity is moderate. Effective rooting depth of the crops commonly grown in the area is limited by a high water table that is at a depth of 48 to 72 inches. Runoff is low, and the hazard of water erosion is slight.

This unit is used mainly for irrigated crops. It is also used for wildlife habitat.

This unit is suited to irrigated, saline-sodic tolerant crops. It is limited mainly by saline-sodic conditions, a high water table in the

Tranquillity, saline-sodic, wet soil, and very slow permeability. Intensive management is required to reduce the salinity and maintain soil productivity. Content of toxic salts can be reduced by applying proper amounts of soil amendments, leaching and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer.

Excess irrigation water can cause a high water table to develop above a layer with different texture. To avoid over-irrigating because of the high water table, applications of irrigation water should be adjusted to the available water capacity, the water intake rate and the crop needs. Drainage can be provided by using tile systems to intercept water from higher-lying areas. Tile drainage can be used to remove excess water and salts from the soil if a suitable outlet is available.

Furrow, border and sprinkler irrigation systems are suited to this unit. Because of the slow or very slow permeability of this soil, the application of water should be regulated so that water does not stand on the surface and damage the crops.

A cropping system that includes crop rotation and the return of crop residue to the soil or the regular addition of other organic matter improves fertility, reduces crusting and increases the water intake rate.

If this unit is used for home site development, the main limitations are the saline-sodic condition of the soil, highly gypsiferous underlying material, very slow permeability, a high water table on the Tranquillity, saline-sodic, wet soil, and high shrink-swell potential. The saline-sodic condition causes high corrosivity to steel and concrete. High content of gypsum is highly corrosive to concrete where wetting and drying occur. The Tranquillity, saline-sodic, wet soil contains 5 to 10 percent gypsum below a depth of 48 inches. Treated steel pipe and sulfate-resistant concrete should be used. Selection of salt and sodium tolerant plants is important for the establishment of lawns, shrubs, trees and vegetable gardens.

The very slow permeability and the high water table can cause septic tank absorption fields to fail. Onsite investigation is needed to determine whether the area considered for a septic tank absorption field is underlain by a high water table. Use of long absorption lines and sandy backfill for the trench helps to compensate for this. The high shrink-swell potential needs to be considered when designing and constructing foundations, concrete structures, and paved areas. The effects of shrinking and swelling can be minimized by maintaining a constant moisture content around the foundation area or by backfilling with material that has low shrink-swell potential.

Tranquillity, saline-sodic soils are in capability unit IIs-6, irrigated, and capability subclass VIIs nonirrigated. Tranquillity, saline-sodic, wet, soils are in capability unit IIIw-6, irrigated, and capability subclass VIIw, nonirrigated. The MLRA is 17.

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08/11/98

482--Calflax clay loam, saline-sodic, wet, 0 to 1 percent slopes. This very deep, well drained soil is on low lying alluvial fans. It formed in alluvium derived dominantly from sedimentary rock. Elevation is 155 to 315 feet. The mean annual precipitation is 6 to 8 inches, the mean annual temperature is 62 to 64 degrees F, and the frost-free period is 240 to 270 days.

Typically, the surface layer is light yellowish brown clay loam about 8 inches thick. The upper 18 inches of the subsoil is light olive brown clay loam. The next 7 inches is light yellowish brown loam. The lower part to a depth of 65 inches is stratified pale yellow silt loam and loam. The profile is calcareous throughout, and it is saline-sodic in some part. Salts are usually concentrated below the surface layer because of reclamation practices. A transient high water table occurs at a depth 48 to 72 inches. The high water table is influenced by irrigation as well as the geographic orientation in the landscape and texture of soil layers. The high water table has a direct impact on the salinity and sodicity of this soil. Drainage and reclamation practices have an effect on the depth to the water table and salinity and sodicity. The depth to a high water table varies during the year and is commonly highest during irrigation applications in the winter and early spring.

Included in this unit are 4 percent small areas of Ciervo clay, 3 percent each Cerini clay loam, Lethent clay loam, and Posochanet clay loam. There are also 2 percent soils near the northwest corner of Lemoore Naval Air Station that are subject to rare periods of flooding from the Arroyo Pasajero. Included areas make up about 15 percent of the total acreage.

Permeability of this Calflax soil is moderately slow. Available water capacity is high. Effective rooting depth of the crops commonly grown in the area is limited by a high water table that is at a depth of 48 to 72 inches. Runoff is low, and the hazard of water erosion is slight.

Most areas of this unit are used for irrigated crops, mainly cotton, seed alfalfa and sugar beets. Among the other crops grown are wheat and safflower. Some areas are used for home site development.

If this unit is used for irrigated crops, the main limitations are the saline-sodic condition of the soil, moderately slow permeability and lateral subterranean water movement on stratified layers which has created a high water table. Localized reduction in the growth and vigor of crops is characteristic of this unit. The amount of salts present, the crop planted and the reclamation procedures used affect crop yields.

If this unit is used for irrigated crops, salinity and the high water table influences the choice of crops. Intensive management is required to reduce the salinity and maintain soil productivity. Content of toxic salts can be reduced by applying proper amounts of soil amendments, leaching, and returning crop residue to the soil. Gypsum, sulfur and sulfuric acid are among the soil amendments that can be used to reclaim this soil. If sulfur or sulfuric acid is used, lime should be present in the surface layer. If the saline-sodic condition is significantly reduced by reclamation, the permeability and available water capacity increase.

Furrow, border and sprinkler irrigation systems are suited to this unit. Because of the moderately slow permeability of this soil, the length of runs should be adjusted to permit adequate infiltration of water. The application of water should be regulated so that water does not stand on the surface and damage the crops. Subsoiling increases the infiltration of water and the permeability of this soil.

Excess irrigation water can cause a high water table to develop above a layer with different texture. High water table conditions are usually related to excess irrigation water and soils with a sequence of horizons or strata with different hydraulic conductivity. Because of the high water table, pre-irrigation may not be necessary. Applications of irrigation water should be adjusted to the available water capacity, the water intake rate and the crop needs. Sprinkler, trickle and alternate row irrigation can reduce the amount of water entering the soil. The variability of the soil influences the design of drainage systems. Drainage can be provided by using tile systems to intercept water from higher lying areas. Tile or open drains can be used to remove excess water and salts from the soil, if a suitable outlet is available.

A cropping system that includes crop rotation and return of crop residue to the soil or regular addition of other organic matter improves fertility, reduces crusting and increases the water intake rate.

If this unit is used for home site development, the main limitations are the saline-sodic condition of the soil, moderately slow permeability, and a high water table. The saline-sodic condition causes high corrosivity to steel and concrete. Treated steel pipe and sulfate-resistant concrete should be used. Selection of salt and sodium tolerant plants is important for the establishment of lawns, shrubs, trees and vegetable gardens. The moderately slow permeability and the high water table increase the possibility of failure of septic tank absorption fields. Use of long absorption lines and sandy backfill for the trench helps to compensate for this. On site investigation is needed to determine whether the area considered for a septic tank absorption field is underlain by a high water table. If a high water table is present, other specially designed sewage disposal systems may be required.

This map unit is in capability unit IIIw-6, irrigated, and capability subclass VIIw, nonirrigated. The MLRA is 17.