HYDROLOGY B16/D3 NO PLANS

B16/D3

NO PLANS

LAWRENCE VIGIL & ASSOCIATES
Engineers

TERRAIN MANAGEMENT PLAN
FOR
AMERICAN FENCE COMPANY
AT
9634 No. Second St.
ALAMEDA GRANT
BERNALILLO CO., NEW MEXICO

April 25, 1984

B16/D3

P.O. BOX 565 CAMINO CAMPO E. CORRALES, NEW MEXICO 87048 (505) 898-1637

A. PURPOSE AND SCOPE

The purpose of this report is to present an evaluation of the existing and altered, if any, drainage affecting Tract No. 205 B, M.R.G.C.D. Map No. 23 at 9634 North Second Street, See Exhibit 1, Atlas Zone Map B-16-Z, Alameda Grant, Bernalillo County, New Mexico.

B. SITE LOCATION AND TOPOGRAPHY

The tract of land is located on the eastside of Second Street, westside of the A.T.&S.F. R.R., and approximately 800 feet north of the intersection of Corrales Rd. and Second Street; again, see Exhibit 1 and Map 1 (Aerial Photo & Contour Map). Topography and contours for this report utilizes the recently prepared contour and aerial photo maps for the City of Albuquerque Flood Insurance Study. The Map utilized is Community-Planel Number 350002 0003. The contour intervals are two feet.

Soils classification and characteristics are extracted from the publication entitled Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, and prepared by the U. S. Soil Conservation Service, Reference material extracted are Map 2, Exhibits 2 and 3 (Description of Soils).

C. DESIGN CRITERIA AND CALCULATIONS

1. In analyzing run-off, the rational formula,

$Q = CIA$, was used, where;

Q = Quantity in cfs

A = Area in acres

I = Intensity in inches/hour

$= 185/Tc + 25$

C = Run-off coefficient for undeveloped and developed stage.

Tc = Time of concentration

$= L/3600\ V$ where

L = Length of water course

V = Velocity in fps

2. Underdeveloped stage, onsite and offsite flows, are shown on the following table;

Area	Elev. Diff.	Flow Length	Tc Min.	I 100 yr. in./hr.	C	Area Acres	V fps	Q cfs	Vol cf
A_1	2'	500'	17	4.40	.35	4.53	0.50	7.0	12,673
A_2	3.4'	886'	30	3.40	.35	4.11	0.50	4.9	11,488
A_3	1.5'	200	2	6.85	.35	1.00	1.75	6.85	7,986

3. The tract under consideration herein is presently occupied by existing structures. It is planned to remove all existing structures and construct a new one. Plate 1, Plot Plan displays the location of said existing and new structures. The site is not projected to be under serious flooding. Reference is made to City of Albuquerque FIRM, Community-Panel Number 350002 0003. Flood area is designated C, area of minimal flooding.

It should be noted that the existing structures have a total roof area of 12,829 sq. ft. versus the new structure having a roof area of 17,877 sq. ft. Therefore, the net additional area is 5,048 sq. ft.

The following analysis displays the additional project surface run-off:

(a) Gross Site Area = 4.11 ac. = 179,032 S.F.

(b) Roof Area, C = 0.95, = 5,048 S.F.

(c) Walks, Patios, Paving, C = 1.0 = 0 S.F.

(d) Lawns, C = 0.25, = 2,000 S.F.

(e) Southwest Landscaping, C = 0.70, = 1,000 S.F.

(f) Undisturbed Area a - (b to e) C = 0.35 = 170,984 S.F.

C, Composite Calculations:

Gross Area	= 4.11 ac.	= 179.032 S.F.
Roof	= 5,048 S.F.	= 2.82%
Walks, Patios, Paving	= 0 S.F.	= 0.00%
Lawns	= 2,000 S.F.	= 1.12%
Southwest Landscaping	= 1,000 S.F.	= 0.56%
Undisturbed	= 170,984 S.F.	= 95.50%
	Total	=100.00%

$C = (.95 \times .0282) + (.25 \times .0112) + (.7 \times .0056)$

$+ (.35 \times .9550) = .3678$

Use $C = 0.37$

Developed run-off Q & V for site equals:

$Q = (.37 - .35)\ (3.4)\ (4.11) = 0.28$ cfs.

$V = (.37 - .35)\ (2.2/12)\ (179{,}032) = 656$ c.f.

The above run-off Q and Vol. added to A_2 $Q = 4.9 + 0.28 = 5.18$ cfs.

$V = 11{,}488 = 6.56 = 12{,}144$ c.f.

The combined volume of surface run-off, off-site and on-site is approximately 32,803 c.f. The combined surface area is approximately 9.64 acres or 419,918 S.F.

Existing on the eastside of the site, between the site and the A.T.& S.F. R.R., is a bar ditch or ponding area which receives respective run-off. This ditch or swale has the following approximate dimensions:

Average bottom width	=	10 ft.
Average top width	=	20 ft.
Average depth	=	2 ft.
Average length	=	463 ft.

Therefore, its volume =

$15 \times 2 \times 463$ = 13,890 c.f.

Thus, $32{,}803 - 13{,}890$ = 18,913 c.f.

Allowing for the slope of the three drainage areas, and on the assumption that due to the eastward slope, only ½ of the net area would be inundated due to the existing swale, or ponding area, to accommodate all the predicted run-off, the land would result in a depth of:

$$\frac{18{,}913 \text{ c.f.}}{419{,}918 / 2} = 0.09' \text{ or } 1\ 1/8''$$

D. CONCLUSIONS

The preceeding demonstration of site and area conditions in addition to the analysis indicates that the evaluation presented herein is adequate to accommodate a 100 year storm and its respective off-site and on-site flows, particularly since no physical alterations are occuring on the site other than eliminating existing structures and constructing a new one, resulting in an additional flow of only 0.28 c.f.s. and respective volume of 656 cu. ft. which is barely 2% over current conditions.

The combined off-site and on-site area of 9.64 acres exempts it from AMAFCA Resolution No. 1980-15, Section 8, which provides for issuance of a building permit by any local or state government agency, board, officer, employee, or commission, providing the lots and contributing water course of 100-year floodplain are under 20 acres.

E. RECOMMENDATIONS

No recommendations are made to alter the physical characteristics of the off-site and on-site areas.

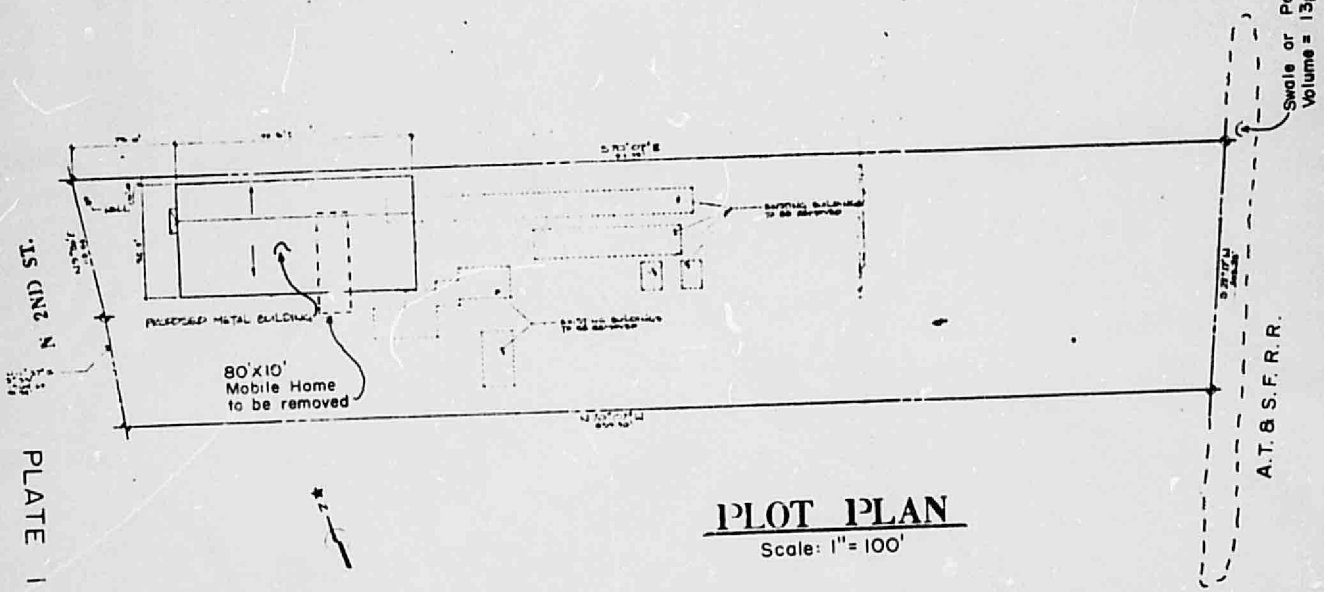
However, if desired and permissable, a small holding pond could be implemented to accommodate the additional flow volume of 656 c.f. This would require a minimum pond of approximately 25' x 25' x 1.5' resulting in 938 c.f.

METAL BUILDING
for
AMERICAN FENCE COMPANY

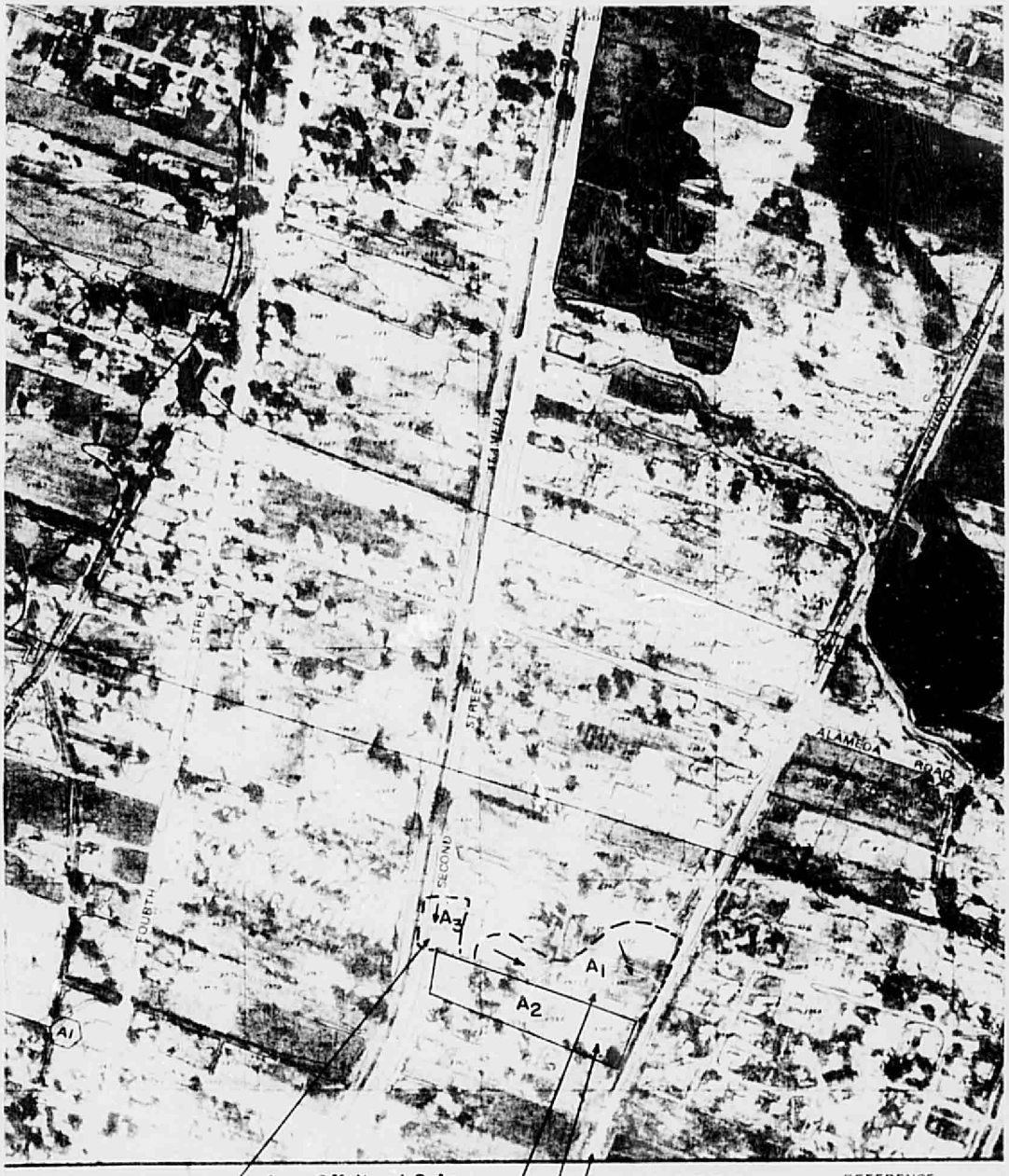
INDEX

C-1 PLOT PLAN
A-1 FLOOR PLANS
A-2 ELEVATIONS
S-1 FOUNDATION PLAN
S-2 ROOF FRAMING

BUILDING GROUP – B-4 USE
TYPE OF CONSTRUCTION – II-N USE
AREA'S : OFFICE 2000
WAREHOUSE 10324 (Includes canopy area)
ZONE EXISTING USE UNCHANGED
SETBACKS ESTABLISHED BY EXISTING BUILDING



PLOT PLAN
Scale: 1" = 100'



A_3 – Offsite = 1.0 Ac.
A_1 – Offsite = 4.53 Ac.
A_2 – Onsite = 4.11 Ac.

A.T. & S.F.R.R.

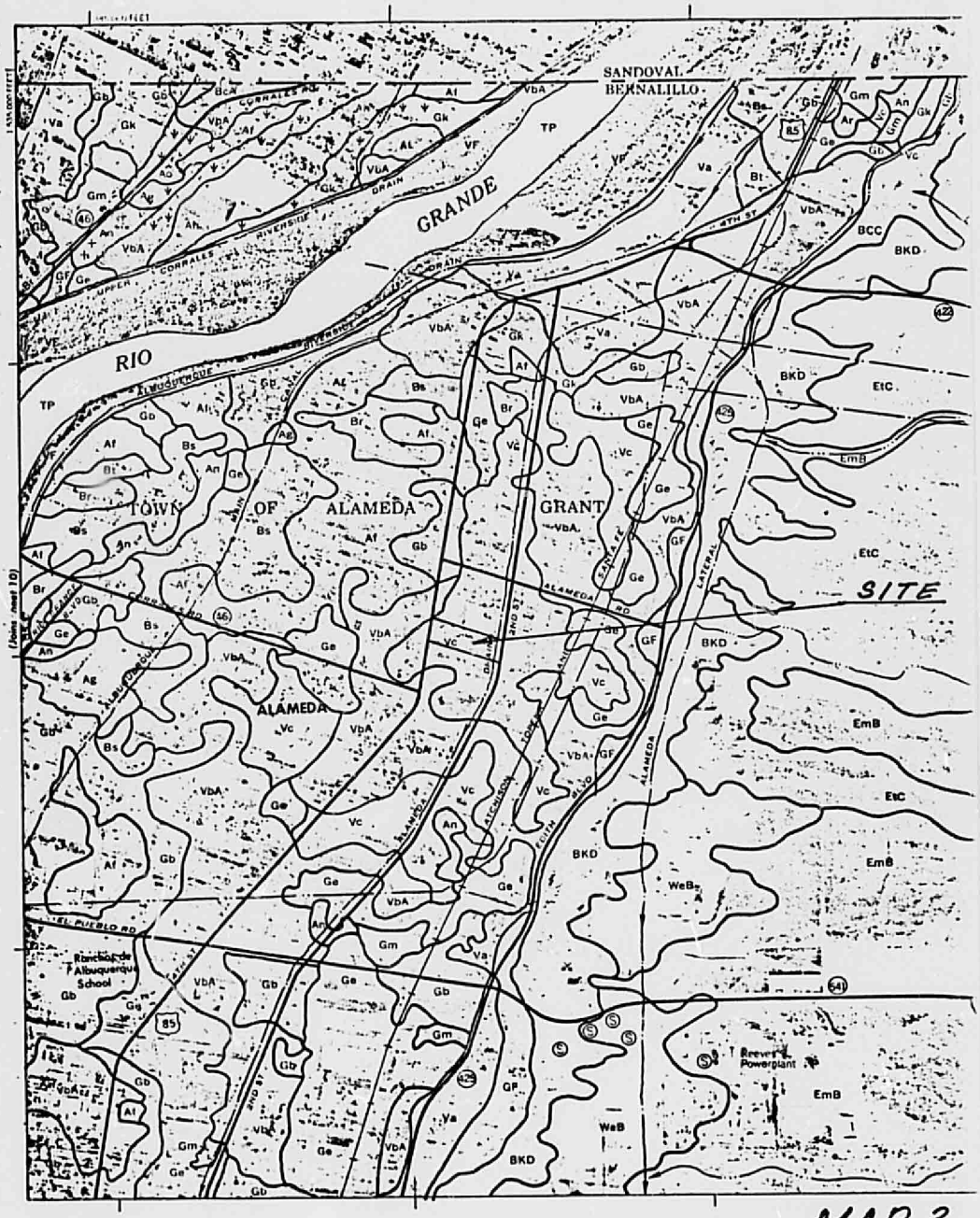
REFERENCE MARK

RM 5

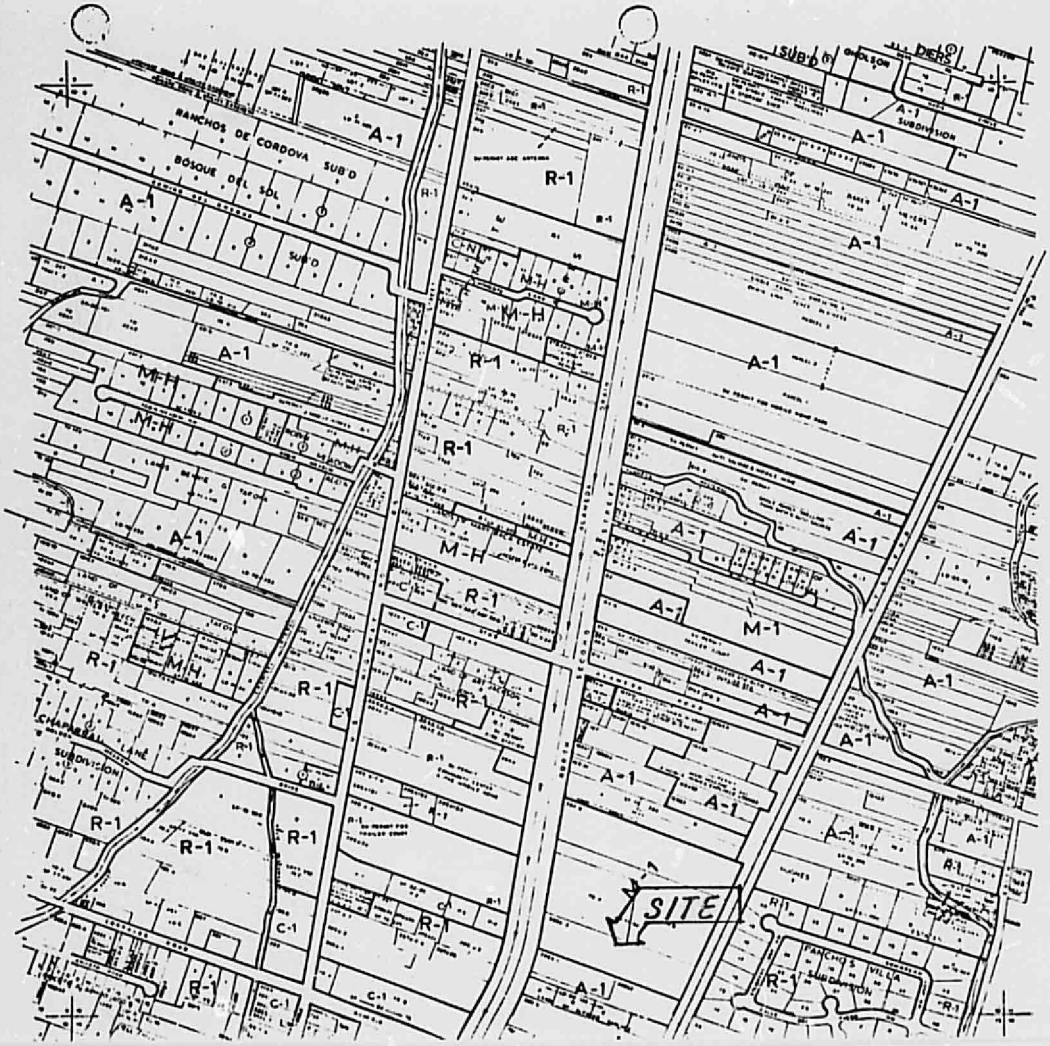
MAP I

Scale: 1" = 500'

BERNALILLO COUNTY, AND PARTS OF SANDOVAL AND VALEN..



MAP 2



B-16-Z

EXHIBIT 1

as hunting small game and birds, especially waterfowl, and in places fishing. Dryland capability subclass VIIIw.

Travessilla Series

The Travessilla series consists of shallow and very shallow, well drained soils that formed in material weathered from sandstone on uplands. Slopes are 1 to 15 percent. The native vegetation is principally blue grama, side-oats grama, winterfat, small soapweed, and oneseed juniper. Elevations range from 5,500 to 7,000 feet. The mean annual precipitation is 10 to 14 inches, the mean annual air temperature is 52° to 54° F, and the frost-free season is 145 to 155 days. Travessilla soils are associated with Penistaja and Bond soils and Rock outcrop.

In a representative profile, the surface layer is light yellowish brown fine sandy loam about 4 inches thick. The underlying layer is pale brown sandy loam about 6 inches thick. Sandstone bedrock is at a depth of about 10 inches. The soil is moderately calcareous and moderately alkaline.

Permeability is moderately rapid. Available water capacity is about 1 inch to 1.5 inches. Effective rooting depth is 6 to 18 inches.

Travessilla soils are used for range, wildlife habitat, and watershed.

Representative profile of Travessilla fine sandy loam, 1 to 15 percent slopes, unsectionized, but extended NE¼SW¼SW¼ sec. 9, T. 9 N., R. 2 W.

A1—0 to 4 inches, light yellowish brown (10YR 6/4) fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak, fine, granular structure; soft, very friable; many fine and very fine roots; many fine interstitial pores; moderately calcareous; moderately alkaline; clear, smooth boundary.

C—4 to 10 inches, pale brown (10YR 6/3) sandy loam, brown (10YR 4/3) moist; weak, medium, subangular blocky structure grading to massive; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots; many fine interstitial pores; moderately calcareous; moderately alkaline; abrupt, wavy boundary.

R—10 inches, sandstone bedrock.

Depth to bedrock ranges from 6 to 18 inches. The A horizon ranges from loamy fine sand to sandy loam. The A and C horizons have value of 4 to 7 dry and chroma of 3 to 4 dry and moist.

TQC—Travessilla fine sandy loam, 1 to 15 percent slopes. This nearly level to strongly sloping soil is on uplands west of the Rio Puerco. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Penistaja and Otero soils and sandstone rock outcrop.

Runoff is medium to rapid, and the hazard of water erosion is moderate to severe.

This soil is used for range, watershed, and wildlife habitat. Dryland capability subclass VIIs; native plant community 9.

TR—Travessilla-Rock outcrop association. This mapping unit is about 60 percent Travessilla fine sandy loam and 25 percent Rock outcrop. Slopes are 5 to 15 percent.

The Travessilla soil is on ridge crests and on ledges where runoff is medium to rapid and the hazard of water erosion is moderate to severe. Rock outcrop is mainly hard sandstone bedrock. Runoff is rapid, and the hazard of water erosion is slight.

Included in this unit in mapping are areas of Penistaja and Otero soils, which make up about 15 percent of the unit. Also included are a few narrow gravelly and sandy arroyo bottoms.

This mapping unit is used for watershed, wildlife habitat, and range. Dryland capability subclass VIIs for Travessilla soil and VIIIs for Rock outcrop; native plant community 9 for Travessilla soil.

Ustolls

Ustolls are shallow to deep, mainly very stony, well drained soils. They formed in residuum weathered from schist on sides of canyons and mountains. Slopes are 15 to 70 percent. The native vegetation is variable, but is mainly pinyon pine, oneseed juniper, black grama, and side-oats grama. Elevations range from 6,000 to 8,000 feet. The mean annual precipitation is 14 to 18 inches, the mean annual air temperature is 50° to 54° F, and the frost-free season is 110 to 150 days. Ustolls are associated mainly with Rock outcrop.

The soil characteristics of Ustolls are variable. The surface layer is brown, dark brown, or dark grayish brown stony loam, cobbly loam, or very stony loam. The subsoil is stony sandy clay loam to very stony clay. Depth to bedrock ranges from 10 to more than 60 inches. The soils are mainly slightly calcareous and mildly alkaline or moderately alkaline.

Permeability is moderate to slow. Available water capacity is about 1 inch to 6 inches. Effective rooting depth is 10 to 60 inches.

Ustolls are used for range, wildlife habitat, and watershed.

Vinton Series

The Vinton series consists of deep, well drained soils that formed in recent alluvium on flood plains of the Rio Grande. Slopes are 0 to 3 percent. The native vegetation is principally alkali sacaton, sand dropseed, and fourwing saltbush. Elevations range from 4,850 to 5,300 feet. The mean annual precipitation is 7 to 10 inches, the mean annual air temperature is 58° to 60° F, and the frost-free season is 165 to 185 days. Vinton soils are associated with Brazito, Bluepoint, Agua, and Gila soils.

In a representative profile, the surface layer is brown sandy loam about 10 inches thick. The underlying layers to a depth of 60 inches or more are pale brown and pinkish gray loamy sand and pinkish gray very fine sand. The soil is moderately alkaline throughout.

Permeability is moderately rapid. Available water capacity is 4 to 5 inches. Effective rooting depth is 60 inches or more.

Vinton soils are used for irrigated alfalfa, row crops, and pasture and for wildlife habitat and community development.

Representative profile of Vinton sandy loam, 0 to 1 percent slopes, one-fourth mile west of U.S. Highway 85 and 100 feet north of power line and farm road and south of the Club Canal, in south-central part of SE¼NW¼NW¼ sec. 10, T. 9 N., R. 2 E.

EXHIBIT 2

Ap—0 to 10 inches, brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots and interstitial pores; slightly calcareous; moderately alkaline; abrupt, smooth boundary.

C1—10 to 19 inches, pale brown (10YR 6/3) loamy sand and thin strata of sandy loam, brown (10YR 5/3) moist; massive; hard, firm; many fine and very fine roots and interstitial pores; slightly calcareous; moderately alkaline; abrupt, smooth boundary.

C2—19 to 25 inches, pinkish gray (7.5YR 6/2) loamy sand, dark brown (7.5YR 4/2) moist; massive; slightly hard, friable; many fine and very fine roots and interstitial pores; slightly calcareous; moderately alkaline; abrupt, smooth boundary.

C3—25 to 39 inches, pale brown (10YR 6/3) loamy sand, brown (10YR 5/3) moist; massive; soft, friable; many fine and very fine roots and interstitial pores; slightly calcareous; moderately alkaline; abrupt, smooth boundary.

C4—39 to 60 inches, pinkish gray (7.5YR 6/2) very fine sand, dark brown (7.5YR 4/2) moist; massive; hard, friable; many fine and very fine roots and interstitial pores; slightly calcareous; moderately alkaline.

The A horizon has hue of 7.5YR to 10YR, value of 5 or 6 dry and 4 to 6 moist, and chroma of 2 to 4 dry and moist. It is sandy loam, loamy fine sand, or clay loam. The C horizon has hue of 7.5YR and 10YR, value of 5 to 7 dry and 4 to 6 moist, and chroma of 2 or 3 dry and moist. Texture between depths of 10 and 40 inches averages loamy sand, but thin strata of loamy fine sand and sandy loam occur in this section.

Va—Vinton loamy sand. This level soil is in the irrigated Rio Grande Valley. It has a profile similar to that described as representative of the series, but the surface layer differs in texture and is pale brown. In most areas the water table is below 60 inches, but on about 1.5 percent of the acreage it fluctuates between 45 and 60 inches. Slopes are 0 to 1 percent.

Included with this soil in mapping are a few areas of a soil that is loamy in the substratum below a depth of 35 inches. Also included are small areas of Brazito, Gila, and Bluepoint soils.

Runoff is very slow, and the hazard of soil blowing is moderate or severe.

This soil is used for irrigated alfalfa, row crops, and pasture. It is also used for wildlife habitat and community development. Irrigated capability unit IIIe-11.

VbA—Vinton sandy loam, 0 to 1 percent slopes. This level soil is in the irrigated Rio Grande Valley. It has the profile described as representative of the series. In most areas the seasonal water table is below 60 inches, but on about 2 percent of the acreage it is between depths of 45 and 60 inches and the soil is moderately saline.

Included with this soil in mapping are small areas of Brazito and Gila soils and Vinton soils that have a surface layer of sandy clay loam, loam, or loamy fine sand.

Runoff is slow, and the hazard of soil blowing is severe.

This soil is used for irrigated alfalfa, row crops, and pasture. It is also used for wildlife habitat and community development. Irrigated capability unit IIIe-11.

VBB—Vinton sandy loam, 1 to 3 percent slopes. This nearly level soil is in the valley west of the Rio Puerco. Included in mapping are small areas of Gila and Hantz soils.

Runoff is slow. The hazard of water erosion is moderate, and the hazard of soil blowing is severe.

This soil is used for range, watershed, and wildlife habitat. Dryland capability subclass VIIe; native plant community 2.

Vc—Vinton clay loam. This level soil is in the irrigated Rio Grande Valley. It has a profile similar to that described as representative of the series, but the surface layer differs in texture, is reddish gray, and is about 12 inches thick. Slopes are 0 to 1 percent.

Included with this soil in mapping are small areas of Brazito, Gila, and Agua soils.

Runoff is slow, and the hazard of water erosion is slight.

This soil is used for irrigated alfalfa, row crops, and pasture. It is also used for wildlife habitat and community development. Irrigated capability unit IIs-4.

VF—Vinton and Brazito soils, occasionally flooded. This mapping unit is 35 percent Vinton soil and 30 percent Brazito soil. It is in the area unprotected by levees next to the Rio Grande. The soils are somewhat stabilized by cottonwoods, saltcedar, and willows. Although subject to change through periodic flooding, they have remained in place long enough for plants to become stabilized.

The Vinton soil has a profile similar to that described as representative of the Vinton series, but the surface layer ranges from sand to clay and is dominantly sand, loamy sand, or sandy loam. Runoff and the hazard of water erosion are slight, except during periods of flooding.

The Brazito soil is similar to that described as representative of the Brazito series, but the surface layer ranges from sand to clay and is dominantly sand, loamy sand, and sandy loam. Runoff and the hazard of water erosion are slight, except during periods of flooding.

The soils in this mapping unit are moderately alkali to strongly alkali affected and slightly saline to moderately saline. In most areas they have a seasonal water table above a depth of 60 inches.

Included in this unit in mapping are areas of the Agua variant, which make up 15 percent of the unit. Also included are areas of Gila, Anapra, and Agua soils and the frequently flooded Torrifluvents, which make up 20 percent of the unit.

This mapping unit is used for wildlife habitat and recreation. It has a potential use for wood products. Dryland capability subclass VIIw; native plant community 13.

Wink Series

The Wink series consists of deep, well drained soils that formed in old unconsolidated alluvium modified by wind on piedmonts. Slopes are 0 to 7 percent. The native vegetation is principally blue grama, broom snakeweed, and sand dropseed. Elevations range from about 5,000 to 6,000 feet. The mean annual precipitation is 7 to 10 inches, the mean annual air temperature is 58° to 60° F, and the frost-free season is 170 to 195 days. Wink soils are associated with Madurez, Latene, Bluepoint, and Embudo soils.

In a representative profile, the surface layer is brown fine sandy loam and sandy loam about 11 inches thick. The subsoil is light brown sandy loam about 16 inches thick. The substratum to a depth of 60 inches or more is pinkish gray and pinkish white sandy loam. The soil is calcareous and moderately alkaline.

EXHIBIT 2

TABLE 8.—*Engineer*

Soil series and map symbols	Degree and kind of limitations for—					
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sanitary landfill (trench type) [1]	Local roads and streets
*Silver: SmA, SnA, SwB, SwC. For Witt part of SwB and SwC, see Witt series.	Severe: percs slowly.	Slight if slope is less than 2 percent, moderate if 2 to 7, severe if more than 7.	Moderate: too clayey.	Moderate: low strength; shrink swell.	Moderate: too clayey.	Severe: low strength.
*Tesajo: Te. For Millett part, see Millet series.	Slight if slope is less than 8 percent, [2] moderate if 8 to 15, severe if more than 15.	Severe: seepage.	Severe: small stones.	Slight if slope is less than 8 percent, [2] moderate if 8 to 15, severe if more than 15.	Severe: seepage.	Slight if slope is less than 8 percent, [2] moderate if 8 to 15, severe if more than 15.
Tijeras: TgB.	Slight.	Severe: seepage.	Severe: small stones; cutbanks cave.	Moderate: shrink swell.	Severe: seepage.	Moderate: shrink swell; low strength.
Tome: To.	Severe: percs slowly.	Slight.	Moderate: floods.	Moderate: shrink swell.	Moderate: floods.	Moderate: shrink swell.
Torrifluvents: TP.	Severe: floods.	Severe: floods; seepage.	Severe: cutbanks cave; floods.	Severe: floods.	Severe: floods; seepage.	Severe: low strength.
*Travessilla: TQC, TR. For Rock outcrop part of TR, see Rock outcrop.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Ustolls. Mapped only with Rock outcrop.	Severe: slope; depth to rock.	Severe: slope.	Severe: slope.	Severe: slope; depth to rock.	Severe: depth to rock; slope.	Severe: slope; depth to rock.
*Vinton: Va, VbA, VBB, Vc, VF. For Brazito part of VF, see Brazito series.	Slight.	Severe: seepage.	Severe: cutbanks cave.	Slight.	Severe: seepage.	Slight.
*Wink: WaB, WeB, WM. For Embudo part of WeB, see Embudo series; for Madurez part of WM, see Madurez series.	Slight.	Severe: seepage.	Slight.	Slight.	Severe: seepage.	Slight.
Witt. Mapped only with Silver soils.	Severe: percs slowly.	Slight if slope is 1 to 2 percent, moderate if 2 to 7.	Moderate: too clayey.	Moderate: shrink swell.	Moderate: too clayey.	Moderate: shrink swell; low strength.

[1] On-site study of the underlying strata, the water table, and the hazards of aquifer pollution and drainage into ground water needs to be made for landfill deeper than [illegible] feet.

EXHIBIT 3

interpretations—Continued

Suitability as source of—				Soil features affecting—		Hydrologic soil group
Road fill	Sand	Gravel	Topsoil	Pond reservoir areas	Dikes, levees, and other embankments	
Poor: low strength.	Unsuited	Unsuited	Poor: too clayey.	Slope if more than 2 percent.	Low strength; compressible.	C
Good if slope is less than 15 percent, fair if more than 15.	Poor: excess fines.	Poor: excess fines.	Poor: small stones.	Seepage	Seepage; piping	A
Fair: shrink swell; low strength.	Poor: excess fines.	Poor: excess fines.	Poor: small stones.	Seepage	Low strength; piping.	B
Fair: shrink swell.	Unsuited	Unsuited	Fair: too clayey.	Favorable	Low strength; compressible; piping.	B
Poor: low strength.	Poor: excess fines.	Unsuited	Poor: excess alkali; excess salts; too sandy.	Seepage	Seepage; excess salts; excess alkali.	A
Poor: thin layer; slope.	Unsuited	Unsuited	Poor: area reclaim.	Depth to rock	Thin layer	D
Poor: area reclaim; large stones.	Unsuited	Unsuited	Poor: slope; large stones; thin layer.	Slope; depth to rock.	Large stones; thin layer.	D
Good	Poor: excess fines.	Unsuited	Poor: too sandy.	Seepage	Piping; seepage	B
Fair: low strength.	Unsuited	Unsuited	Good	Seepage	Piping; erodes easily.	B
Fair: low strength; shrink swell.	Unsuited	Unsuited	Fair: thin layer.	Favorable	Compressible; piping; low strength.	B

[1] Some local areas are subject to flooding.
[2] Soil is subject to consolidation under load.

EXHIBIT 3