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Hitson, C&L and Washburn Draws Watershed
Hudspeth County, Texas

FINAL ENVIRONMENTAL STATEMENT

Kenneth E. Grant, Administrator
Soil Conservation Service

Sponsoring Local Organizations:

El Paso-Hudspeth Soil and Water Conservation District, Texas
6326 Gateway East, El Paso, Texas 79905

Hudspeth County Commissioners Court, Texas
Sierra Blanca, Texas 79851

Hudspeth County Underground Water Conservation District No. 1, Texas
Dell City, Texas 79837

City of Dell City, Texas
~~P. O. Box 175~~
Dell City, Texas 79837

November 1972

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Washington, D. C. 20250

USDA SOIL CONSERVATION SERVICE ENVIRONMENTAL STATEMENT

Type of Statement: Draft () Final (X)

Date: November 1972

Type of Action: Administrative

Title of Statement: The Hitson, C&L and Washburn Draws Watershed Project
Hudspeth County, Texas

1. Description

Authority for Project: Federal assistance through P.L. 566, 83rd Congress, 68 Stat. 666, as amended.

Sponsoring Local Organizations: El Paso-Hudspeth Soil and Water Conservation District, Hudspeth County Commissioners Court, Hudspeth County Underground Water Conservation District No. 1 and the City of Dell City, Texas

Project Measures: The project plan provides for conservation land treatment measures and the construction of one floodwater retarding structure, two multiple-purpose structures, and 25,150 feet of diversions.

Environmental Setting:

Hitson, C&L and Washburn Draws watershed comprises an area of 200,000 acres or 312.5 square miles. This project area is a portion of a larger watershed which also includes Cornudas, North and Culp Draws. Hitson, C&L and Washburn Draws are located wholly within Hudspeth County, Texas. Cornudas, North and Culp Draws are located in Otero County, New Mexico, and Hudspeth County, Texas.

The watershed is located about 75 miles east of El Paso and 25 miles west of Guadalupe Peak, the highest point in Texas. The aforementioned draws contribute floodwaters to a broad alluvial plain known as Dell Valley. The flood plain, which is intensively cultivated and irrigated, lies on the west side of the Dry Salt Lakes in the semi-desert enclosed Salt Basin of western Texas and southern New Mexico.

Dell City, population 500, is the only town within the watershed. It provides needed services for its residents and about 500 rural residents in the surrounding Dell Valley.

The watershed lies in a closed basin area within the Rio Grande Water Resource Region. All runoff as well as natural discharge from the ground water aquifer of the watershed and surrounding areas of the enclosed basin flow into the Dry Salt Lakes. This water is quickly lost by evaporation, leaving the dissolved solids as salts.

Approximately 22,500 acres of intensively irrigated flood plain land and the urban area of Dell City are subject to frequent flooding and floodwater damage. A total of 2,900 acres in the flood plain has been damaged to varying degrees by scour. An additional 1,030 acres have been damaged by sand and gravel deposits ranging from one-half to more than one foot deep. The problem of flooding is compounded in that there are no defined natural channels in the irrigated cropland areas. Erosion in the uplands of this arid area is quite low, averaging only about 0.30 acre-foot per square mile each year.

The topography ranges from mountainous in the west to gently sloping on the Dell Valley flood plain. Prominent igneous peaks in the Sierra Tinaja Pinta and Cornudas Mountains rise from 1,000 to 2,000 feet above the surrounding steeply rolling limestone uplands in the western part. The bed of the Dry Salt Lakes on the eastern side is about 40 feet lower than the low eastern edge of the flood plain. Elevations above mean sea level range from 7,091 feet on San Antonio Peak in the Cornudas Mountains to 3,614 feet in the Dry Salt Lakes.

The bedrock exposed in the watershed consists of sedimentary and igneous rocks ranging from Permian to Recent age. The Hueco Limestone and Victorio Peak Limestone are Permian formations which crop out over most of the sloping uplands and part of the mountain area. Tertiary age intrusive igneous rocks form most of the prominent peaks in the mountains. Quaternary age gravel, outwash, alluvial, and lacustrine deposits cover large areas in the southwestern, central, and eastern parts. Salty lacustrine sediments, mainly sulfates, have been covered by Recent calcareous alluvial sediments in parts of the valley. The geologic structure of the limestone beds has been greatly affected by regional block faulting and igneous intrusion. Faulting occurs near the Dry Salt Lakes and south of Dell City. Folded limestone beds of an anticline south of Round Mountain form a chain of low hills rising above the flood plain. Faulted and tilted beds also occur in the vicinity of the mountains in the western part.

The soils of the watershed are of the Southern Desertic Basins, Plains and Mountains Land Resource Area. Small areas of inaccessible mountain soils, important only for wildlife, occur in the western part. Most of the upland soils support a short grass vegetation at elevations above 4,500 feet and are used for grazing of livestock. At lower elevations these soils produce only a low value, desert-shrub type vegetation. Large areas of alluvial soils occur on the alluvial plains below the mountains and along the draws. These deep soils are watered by runoff from the surrounding steeper uplands and produce good yields of grass for livestock production. The intensively irrigated alluvial plain surrounding Dell City is made up of soils having good permeability and no restrictive horizons or a high water table which restricts leaching of salts. Gypseous soils occur in an area along the Dry Salt Lakes on the eastern side of Dell Valley. These soils support salt tolerant vegetation which is used for limited grazing.

The average annual precipitation in the watershed varies from 8 inches in the low-lying desert valley to 12 inches in the mountainous and upland area. Most of the floods result from high intensity, short duration storms during late summer and early fall; however, rainfall is fairly well distributed throughout the year. The mean annual temperature is 61° Fahrenheit. Temperatures range from 12° to 108° Fahrenheit. The average frost-free season is approximately 230 days in the highly intensified irrigated area, resulting in an average growing season lasting from the latter part of March until the middle of November.

Mineral production in the Dell Valley area is minor. There is no oil or gas production. Gravel deposits are extensive and some gravel has been produced from a pit located about 4 miles northwest of Dell City. Materials for county road construction and maintenance are obtained from numerous small pits scattered throughout the valley. There is no mining of salt products from the Dry Salt Lakes lying east of Dell City.

All cropland and pastureland in the watershed are irrigated with ground water obtained from a shallow aquifer under Dell Valley. The ground water occurs in a cavernous formation, the Victorio Peak Limestone, at depths of 40 feet in the eastern part to 150 feet or more west and northwest of Dell City. The area of the aquifer is extensive and productive capacity is high. Wells producing as much as 6,000 gallons per minute, with little apparent drawdown, are common throughout the valley. Some deep irrigation wells west of Dell City penetrate more than 800 feet of water-bearing cavernous limestone. Oil test wells in the limestone uplands farther west indicate that cavernous fresh water may occur to depths of several thousand feet. Water movement in the aquifer is rapid. The natural recharge area includes the limestone uplands lying west and northwest of the Dell Valley and the Sacramento River area in New Mexico. The water surface in the cavernous aquifer is nearly level and, before irrigation began, was higher in elevation than the beds of the Dry Salt Lakes. Ground water from the aquifer was discharged through springs such as the historic Crow Springs at the old Butterfield Stage Station on the east side of the lakes, and by evaporation of capillary water from the surface of the lake beds. It is estimated that more than 40,000 acre-feet of water annually can be discharged by evaporation of capillary water from the Dry Salt Lakes area (page U67, Bulletin 6502, Texas Water Commission, 1965).

The quality of the ground water under Dell Valley has slowly deteriorated over the past 20 years because of pollution by salts leached from the irrigated soils. This problem is most severe in the central part of the irrigated area, where the dissolved solids content of the ground water has increased from less than 1,500 p.p.m. at the beginning of irrigation development to more than 5,000 p.p.m. 20 years later. Dell City uses the electro-dialysis process to remove salts from the ground water to produce a potable water containing 600 p.p.m. solids.

Irrigation demand exceeds the natural rate of recharge and has resulted in lowering of the water table by about 25 feet in 20 years. The exact amount of this overdraft cannot be accurately determined but could amount to as much as 40,000 acre-feet annually in the valley. Natural recharge of the Dell Valley aquifer resulting from the large flood of 1966 caused about 3 feet of recovery of the water table. It also resulted in a reduction of the dissolved solids content of the ground water in parts of the area and a general halt for a period of time of the progressive salinity increase throughout the Dell Valley area.

The over-all land use in the watershed is as follows:

<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>
Cropland	20,689	10.3
Pastureland	1,238	0.6
Rangeland	175,971	88.0
Miscellaneous ^{1/}	2,102	1.1
Total	200,000	100.0

^{1/} Includes roads, highways, town, farmsteads, and wildlife areas

The higher lying uplands, above 4,500 feet m.s.l., support a short grass vegetation consisting of grama grasses, burrograss, sand dropseed, and scattered woody plants, including mesquite. The lower lying uplands support very little vegetation other than creosote bush. The draws support heavier growths of vegetation, including vine mesquite, cane blue-stem, plains bristlegrass, bush muhly, alkali sacaton, and scattered woody plants.

Development around Dell City reached its peak several years ago and has declined slightly as agricultural mechanization has reduced the need for hand labor. Many landowners reside in Dell City and commute daily to their farms and ranches.

The streams of the watershed are ephemeral, consisting mainly of natural, wide, flat grassed waterways or draws which do not have a defined channel. These draws originate in three mountain areas lying to the west of Dell City: the Sixteen Mountains, the Cornudas Mountains, and the Sierra Tinaja Pinta. Hitson Draw heads on the south side of the Sixteen Mountains about 24 miles west of Dell City and flows eastward around the south side of Sierra Tinaja Pinta. The flow divides into draws on an alluvial plain about 10 miles southwest of Dell City. One of these draws enters Dell Valley 5 miles south of Dell City and the other 4 miles south-southwest. Discharge from both draws joins as overland flow into the Dell Valley. A number of smaller draws, including C&L Draw, head on the east side of Sierra Tinaja Pinta near Cerro Diablo Peak and flow into Dell Valley 3 to 4 miles southwest of Dell City. Washburn Draw heads on the north side of

the Sixteen Mountains, and on the south side of the Cornudas Mountains near the Texas-New Mexico state line. It flows around the north side of Sierra Tinaja Pinta and into Dell Valley about 5 miles west of Dell City. Floodwaters from this draw and from Cornudas Draw, which originates in New Mexico, merge into an overland-type flow on the flood plain west of Dell City. There are no defined channels for flows across the Dell Valley flood plain. The paths of floods are unpredictable because they are blocked, temporarily impounded, and diverted by physical improvements such as irrigation ditches, roads, and diversions.

There are about 68 farms, averaging 322 acres in size, either wholly or partially within the watershed. Several large ranches comprise the balance of the watershed. Thirty-nine units are family-type farms employing less than 1½ years of outside labor. Three are small, low-income farms whose operators must work off the farm in order to maintain an adequate standard of living. All suffer damages from flooding.

There is no federal land in the watershed.

The majority of the agricultural income is derived from crops such as grain sorghum, cotton, alfalfa, corn, small grain, and truck crops. The balance of the agricultural income results from the cattle industry.

Normal flood-free yields expected from grain sorghum are 6,000 pounds per acre; from Pima long staple cotton, 700 pounds; Kala upland long staple cotton, 1,000 pounds; alfalfa, 7.5 tons; corn for ensilage, 25 tons; barley, 80 bushels plus 1.5 animal unit months of grazing; onions, 25 tons; and tomatoes, 10 tons.

The estimated current market price of agricultural land in the watershed ranges from \$20 per acre for rangeland to \$500 per acre for irrigated cropland. Urban land values in Dell City range from a few hundred dollars for a residential lot to many thousands of dollars for commercial property.

Good highways link Dell City with other population and marketing centers in all directions except north into New Mexico. Approximately 24 miles of paved roads and 64 miles of other all-weather roads serve the watershed residents.

The "Work Force Estimates for Nonmetropolitan Counties in Texas for April, 1971," the latest statistics which are available, show a labor force of 1,540 and a population of 2,392 for Hudspeth County, within which the watershed is located. The labor force represents 64 percent of the total populace. Approximately 2.6 percent, or 40 workers, are unemployed. This is below the state and national rate of unemployment. Approximately 62 percent, 925 workers, are employed in the agricultural sector. A problem of underemployment exists because much of the labor force is employed in seasonal occupations within the agricultural sector. The major source of

income in the watershed is from the direct sale of agricultural commodities and retail and wholesale agricultural oriented businesses. The average gross return from crop production is about \$55,000 per farm. Additional revenue results from the sale of livestock products. These farm and ranch units support businesses in Dell City which provide supplies and services required for farming and ranching operations.

The conservation of the underground water supply for Dell Valley, which is the lifeblood of the residents, is essential to the farm economy.

Wildlife resources are very limited in the project area. The most common game animal is the scaled quail. Small numbers of pronghorn antelope and muledeer are found, but very little hunting is allowed by the landowners because of the scarcity of game. Fishery resources are insignificant because of lack of permanent water.

The watershed is not within the range of any of the known rare or endangered species of mammals, reptiles and amphibians, or fishes. It is within the range of three species of rare or endangered birds. The Mexican duck may occasionally migrate through the area. The watershed may also be within the migration route and winter range of the American peregrine falcon and the Prairie falcon.

The lack of permanent bodies of water, absence of fishery resources, and scarcity of wildlife and game animals greatly limit most forms of outdoor recreation in the watershed. The nearby newly created Guadalupe Mountains National Park, lying about 25 miles to the east of Dell City, provides excellent opportunities for many forms of outdoor recreation but only limited forms of water-based recreation. Opportunities for water-based recreation occur only at great distances from the watershed.

There are no historic sites listed or in process of nomination for the National Register of Historic Places, according to the Texas State Historical Survey Committee. Known archeological sites in the western foothills of the Guadalupe Mountains and Crow Springs on the Old Butterfield Stage Route lie on the east side of the Dry Salt Lakes outside of the watershed.

Development of irrigation in Dell Valley began in the late 1940's. Maximum development was probably reached several years ago. Land use adjustments have reduced the total annual acreage irrigated in recent years. These changes were due mainly to abandonment of soils of marginal productivity and abandonment of smaller areas of soils damaged severely by the 1966 flood. Development of new areas for irrigation is limited because of lack of sizeable blocks of soils suitable for irrigation.

The watershed is in the El Paso-Hudspeth Soil and Water Conservation District. Technical assistance to the district is supplied by Soil Conservation Service

personnel headquartered at Dell City. There are 74 operating units located wholly or partially within the watershed. Soil and water conservation plans have been developed on 63 of these, representing 93 percent of the agricultural land in the watershed.

Financial assistance for the application of land treatment measures has also been provided by the Rural Environmental Assistance Program, administered by the Agricultural Stabilization and Conservation Service, USDA.

Land treatment practices have been installed on 79 percent of the land and nearly all of the land is adequately protected from erosion. Nearly all of the needed land treatment practices have been applied to rangeland, but only about one-half of the needed practices have been installed and are effective on irrigated cropland.

Water and Related Land Resource Problems

The application of conservation measures on the cropland has lagged behind that of the rangeland. Slightly less than half of the needed measures have been applied and are effective. The flood of 1966 severely damaged most of the installed measures and the high cost and vast amount of technical assistance needed for re-application has slowed re-installation.

The major land treatment need on the irrigated cropland is protecting the quality of and conserving the irrigation water, on which the economy of the valley primarily depends. Although the quality and quantity of water appear adequate for the foreseeable future, increased salinity and lowered water table increase production costs and reduce yields.

Additional measures such as conservation cropping system, irrigation water management, and irrigation ditch and canal lining are needed to increase efficiency and conserve water. Other measures such as cover crops to reduce wind erosion and crop residue management to return organic matter to the soil are also needed on the cropland.

Better distribution of water is needed on the rangeland to permit proper grazing.

The principal problem in the watershed is flood damage to 22,500 acres of flood plain. This is the acreage which was inundated by the 1966 flood, the largest of record. Flooding is caused by floodwaters originating in the mountainous and upland areas of Hitson, C&L, Washburn, Cornudas, and North Draws. Flooding cannot be separated by origin. Floodwaters from Washburn Draw also cause damages to the flood plain of the adjacent Cornudas, North and Culp Draws watershed. The following description of watershed problems concerns the problems in the Hitson, C&L and Washburn Draws watershed, regardless of origin. There are about 68 farms and 105 residences and businesses in this watershed which suffer damages from floodwater.

The land use of the 22,500 acres of flood plain is as follows: grain sorghum, 31 percent; cotton, 28 percent; alfalfa, 14 percent; corn, 10 percent; small grain, 8 percent; truck crops such as onions and tomatoes, 1 percent; pasture, 2 percent; and miscellaneous uses such as farmsteads, Dell City, roads, etc., 6 percent. It is not anticipated that the land use in the project area will change significantly with or without the project.

The value of the agricultural flood plain lands, marketwise, varies from \$250 to \$500 per acre, depending upon location and soil capability.

Very little authentic information pertaining to flooding is available for this area prior to the drilling of irrigation wells and the beginning of farming operations in 1948. Damaging floods are known to have occurred in 1949, 1952, 1954, 1955, 1957, 1958, 1960, 1962, 1963, 1964, 1965, 1966, and 1968. Damaging floods can be expected on an average of at least once every two years. Flooding begins in the Dell Valley when the local runoff exceeds the capacity of the highway and county road ditches and other manmade means of conveying the flow of water. The problem of flooding is compounded in that there are no defined natural channels in the irrigated cropland areas. The acreage inundated by the larger floods is dependent upon the areal extent, intensity, and amount of precipitation falling in the upland and mountainous areas.

It is estimated that a 1 percent chance flood will inundate about 14,600 acres. Most floods occur during the months of July and August when most crops are highly susceptible to damage. Damage to other agricultural property is extremely severe. An acre of irrigated cropland represents an extremely high monetary investment in concrete-lined ditches, concrete pipelines, appurtenances for water control, and land leveling.

Runoff from the storm of August 22 and 23, 1966, resulted in the largest flood in Dell Valley's recorded history. Recorded rainfall amounts for this storm period varied from 2.58 inches at the Weather Bureau station at Cornudas Service Station, located just south of the watershed, to unofficial reports of over 12 inches at the center of the storm, located about 10 miles northwest of Dell City. This storm has less than 1 percent chance of occurring in any year. Runoff from this storm devastated the irrigation systems. Concrete-lined ditches were broken as if by giant hammers. Large sections of these ditches were washed away. Underground irrigation pipelines were ruined by pressure created by the floodwaters. Many miles of concrete irrigation ditches required replacement and thousands of acres of irrigated cropland required re-leveling in order that the business of farming could be continued. This financial blow was so severe that not all of the irrigation systems have been rehabilitated at this time. Livestock was lost, fences obliterated, stored feed and farming equipment washed away, and roads severely damaged. Floodwater damages to Dell City were high, both to business establishments and residences, but actually were a small portion of total watershed damages. Water was polluted in the well

furnishing water to the school, thus delaying the opening of school. Dell Valley was isolated for three days. There was no travel to or from the area except for helicopters from Fort Bliss, Texas, which set up headquarters at Cornudas about 33 miles south of Dell City. When travel was resumed, Red Cross and Salvation Army personnel set up stations to aid families whose homes were flooded. Dell Valley was declared a major disaster area by the President and funds were allocated to relieve the suffering of the residents. The Small Business Administration made loans to businesses damaged by the floodwaters and the Agricultural Stabilization and Conservation Service provided funds to enable farm operators to rehabilitate irrigation systems.

Dell City receives significant flooding only when both Washburn and Cornudas Draws are flooding. When only one of these draws is flooding, the water bypasses Dell City. The 1966 flood damages to Dell City were estimated at approximately \$361,000. Damages other than urban throughout the watershed were estimated at approximately \$2,849,000.

Under nonproject conditions, the estimated average annual direct monetary damage by floodwater is \$349,261. Of this amount, \$177,889 is crop and pasture; \$163,481, other agricultural; \$3,391, road and bridge; and \$4,500, urban damage to Dell City.

Upland erosion in the watershed is low. The estimated average annual rate of gross erosion is 0.30 acre-foot per square mile.

Flood plain erosion in the irrigated Dell Valley is high. Scouring resulting from the 1966 flood damaged 2,900 acres within the project area. Sheet scour on broad areas and channel type scour in smaller areas removed the productive loamy surface soils and exposed less productive subsoil. In some areas the topsoil was removed to highly calcareous materials. Damages in terms of reduced productivity were distributed as follows: 2,035 acres, 10 percent; 690 acres, 20 percent; and 175 acres, 40 percent.

The average annual value of erosion damage resulting in reduced production is estimated to be \$21,021.

Sediment damages in the watershed are moderate. The major damage by sediment is associated with the floodwater damage in the urban area. The silt and mud deposited in homes and businesses and on equipment and machinery make cleanup operations very difficult after a flood. Sediment deposited on roads and highways and in irrigation ditches requires cleanup and removal after flooding.

Deposits of coarse grained materials on the flood plain soils damaged 1,030 acres of land in the 1966 flood. This material was transported from other flood plain locations that were scoured by floodwater. The fine soil particles were transported to the Dry Salt Lakes and the coarse particles

were deposited in bar-like deposits from one-half to more than one foot deep. These deposits must be removed or leveled after flooding so that the land can be irrigated. Damage by the deposition of sandy and gravelly materials of low fertility ranges from 10 to 20 percent in terms of reduced productivity. The average annual value of loss of productivity is estimated to be \$2,505.

Approximately 39,000 acres of cropland and improved pasture are irrigated from the ground water under the Dell Valley. Of this, 21,927 acres are located within the project area. The water is pumped from a high yielding cavernous limestone aquifer at depths ranging from 40 to 200 feet. It is estimated that more than 100,000 acre-feet of water are pumped annually in the Dell Valley to irrigate growing crops and leach salts from the soil.

Ground water problems which are expected to affect future irrigation costs, yields, and cropping systems include increasing salinity of the water in the aquifer under Dell Valley and decline in the water table. The water recharging the aquifer under the valley is only slightly saline, containing less than 1,500 parts per million dissolved solids. The ground water under the valley, however, has become increasingly saline because of contamination by salts leached from the permeable irrigated soils and the underlying porous, gypsum and salt bearing bedrock. This contamination is most pronounced in the center of the valley where the least mixing with the less saline recharge water occurs. A good example of this salinity increase is shown in tests made of water from a well located one mile east of Dell City. Test of water from this well in 1948, at the beginning of irrigation development, shows a specific conductance (E.C.) of 2,210 (micromhos at 25° centigrade). Subsequent tests of water from this well after 15 years of irrigation and again after 20 years show an increase to E. C. 5,650 in 1963 and E. C. 6,100 in 1968. These tests indicate that the greatest increase in salinity occurred during the period immediately after irrigation development.

Ground water studies show that the water table has lowered about 25 feet since 1948. Approximately 3 feet of recovery of the water table occurred from recharge by the 1966 flood. There is some indication that the rate of annual decline was slowing down before the 1966 flood. An average drop of about 1.7 feet per year is indicated during the 10-year period from 1950 to 1960. An average drop of 1.2 feet per year is indicated from 1960 to 1966 before recharge by the 1966 flood. Most of this reduction in rate of decline can probably be attributed to the cessation of water outflow from the aquifer into the Dry Salt Lakes because of the lowered water table.

Continued lowering of the water table may create another source of salt pollution. Highly saline ground water in the sediment under the Dry Salt Lakes could possibly move into the Dell Valley aquifer as it continues to be lowered below the elevation of the water table in the lake sediments. The rate of movement through the fine-grained lake sediments, however, would be slow.

Most of the crops grown in the Dell Valley are of medium to high salt tolerance. There are no indications that the water with the higher salt content has seriously affected production at the present time. This is attributed to the type of salts present in the water, the permeability of the irrigated soil, and the mineralogical composition of the soil.

Ground water sources are utilized for municipal and industrial purposes. Most of the ground water under the Dell Valley is too saline for municipal and domestic uses without treatment. Dell City uses the electro dialysis process for conversion of ground water containing about 2,500 parts per million dissolved solids to water with 600 parts per million dissolved solids. This plant serves the municipal needs of Dell City as well as the domestic needs of most of the surrounding area. The supply of ground water is more than adequate for future needs; however, the problem of increasing salinity may increase treatment costs or require piping less saline water from wells which could be drilled north and northwest of the irrigated area.

Opportunities for water-based recreation are virtually nonexistent in this area. The nearby Salt Lakes are used for swimming and water skiing on the rare occasions when they have water in them. Local interest is high in developing recreational facilities to serve the residents of the area; however, the opportunities are very scarce.

There is no sport or commercial fishing in the project area due to the lack of permanent water. Game species are not abundant in this area due to the lack of adequate habitat. Permanent water is not available nor is food or cover to support large populations.

Planned Project:

The project measures to be installed in order to achieve the sponsors' objectives consist of a combination of conservation land treatment measures and structural measures. The objective of the land treatment phase is the use of each acre within its capabilities and the treatment of each acre in accordance with its needs. The structural measures will be installed to provide flood protection to the flood plain lands and irrigation water storage.

Conservation land treatment measures will be applied on about 15,400 acres of grassland and 14,500 acres of irrigated cropland during a 10-year accelerated installation period. Proper grazing use, deferred grazing, pasture and hayland planting, and pasture and hayland management will be established on the grassland. Pipelines and ponds will be installed to provide permanent watering facilities for livestock and wildlife. Conservation cropping system, crop residue management, and grassed waterways are to be applied to the cropland for protection of the soil against water and wind erosion and for soil improvement. Irrigation water management, irrigation land leveling, irrigation ditch and canal lining, irrigation pipeline, and

structures for water control will be applied to the cropland to facilitate proper application of irrigation water.

A system of one floodwater retarding structure, two multiple-purpose structures, and about 25,150 feet of diversion will be installed to provide protection to the flood plain lands and irrigation water storage.

Multiple-purpose structures Nos. 1 and 2 will have 192 and 151 acre-feet capacity, respectively, included for storage of irrigation water. The high quality water will be used, when available, in place of the slightly saline ground water, which contains more than 2,000 p.p.m. dissolved solids. The water is to be delivered to existing irrigation facilities used for application of pumped ground water. An estimated average annual yield of 250 acre-feet of water will be available for this use.

Runoff from 80.53 percent of the watershed will be detained by the floodwater retarding structure and multiple-purpose structures. The total storage capacity of these structures is 18,205 acre-feet, of which 1,736 acre-feet are for sediment storage, 16,126 acre-feet are for floodwater detention storage, and 343 acre-feet are for irrigation storage. These structures will detain an average of 1.20 inches of runoff from the drainage area above them. In addition, an average of 0.13 inch of storage has been allocated for the expected 100-year accumulation of sediment. The principal spillway crest elevation for floodwater retarding structure No. 3 will be set at the 100-year sediment capacity and ported at the 200 acre-feet capacity. The principal spillway crest elevation for multiple-purpose structures Nos. 1 and 2 will be set at elevation 3776.2 and 3837.3, respectively. These are the elevations of the 100-year submerged sediment capacity plus the irrigation storage capacity. The maximum height of the three water impounding structures ranges from 50 to 66 feet.

A combination of principal spillway capacity and retarding storage will assure that emergency spillways of floodwater retarding structures will have less than 1 percent chance of use at the end of their design life. The principal spillways will be the drop inlet type with cantilever outlets.

Injection wells will be installed as appurtenances to the water impounding structures to dispose of principal spillway discharges. Principal spillway discharges will be conveyed to the injection wells by concrete-lined channels. The wells will be cased through the alluvium. Wellheads will be devised to remove foreign matter and unacceptable pollutive factors to safeguard the quality of water introduced into the aquifer. Additional studies to define the predictable water quality and details of wellhead treatment will be made during the operational stage. The depths of the wells will vary from 250 to 800 feet, depending upon geologic conditions. Preliminary studies indicate that diameter of the wells will be about 21 inches.

All of the water impounding structure sites are located on hard limestone bedrock of the Victorio Peak Limestone formation, Permian age. These beds have been affected by regional block faulting and igneous intrusion. The dip is generally downstream toward Dell Valley but is not excessive at any site. Faulting occurs in the vicinity of Site 2 and immediately downstream from Site 1. A large amount of jointing occurs in all of the beds and along with the prominent bedding planes has created highly permeable foundation conditions.

A large volume of alluvial clay and gravelly material occurs in the valley at Site 3. However, only a small volume is found at Site 1 and none occurs in either of the two streams at Site 2. The principal spillways at all sites can be located on hard limestone bedrock. Scattered sinkholes in the uplands and logs of irrigation wells downstream indicate that cavernous conditions exist in the bedrock. Field investigations, however, indicate that there should not be any foundation problems resulting from cavernous conditions at any site.

Rock excavation will be required in the emergency spillways at all sites. The rock will be utilized as riprap to protect the embankment from wind erosion during dry periods and wave action during periods of impoundment. The rock and on-site gravel will also be used for construction of a blanket drain on the permeable bedrock foundation.

Diversion No. 1 will be installed at the bifurcation of Hitson Draw to divert the flood flows into floodwater retarding structure No. 1. Three 24-inch metal pipes will be installed in the diversion as appurtenances to the diversion. The purpose of the pipes will be to allow the low flows to continue along the present course, thereby watering the grass in the draw. The pipes will be ungated.

Diversion No. 2 will be installed to divert runoff from C&L Draw into floodwater retarding structure No. 2. These diversions are ridge type and will be constructed on terrace and alluvial materials. These materials consist of one to two feet of silty material over clay and gravel. Materials will be obtained from the downstream side in order to preserve the existing vegetation on the upstream side and to prevent formation of overfalls in the excavated areas. The gravel will be utilized in the outer shell for protection against wind erosion.

The installation of the project will not result in the displacement of any person, business, or farming operation. It will be necessary to move a county road and a utility line in order to install floodwater retarding structure No. 2.

A total of 1,568 acres may be needed for installation of the project. The diversions will require 52 acres. The construction of the dams, spillways, conveyance channels and the injection wells will require 129 acres. The sediment pools, water supply pools, and floodwater detention pools will

require 44, 158, and 944 acres, respectively. An additional 241 acres located outside the pool areas have been designated as supplemental borrow area to be used only if needed.

The land use of the 1,568 acres is all rangeland. Approximately 1,290 acres support little more than creosote bush and 278 acres are in the draws and support vegetation consisting primarily of grasses and scattered woody plants.

The existing vegetation may be destroyed on about 624 acres. This consists of 449 acres of creosote bush and 175 acres of the vegetation in the draws. All areas denuded of vegetation during construction will be revegetated where practicable to suitable plants to prevent erosion and provide habitat for wildlife.

The environment will be protected from soil erosion and water and air pollution during construction. Contracts will be required to adhere to strict guidelines set forth in each construction contract to minimize soil erosion and water and air pollution during construction. Excavation and construction operations will be scheduled and controlled to prevent exposure of extraneous amounts of unprotected soil to erosion and the resulting translocation of sediment. Measures to control erosion will be uniquely specified at each work site and will include, as applicable, use of temporary vegetation or mulches, diversions, mechanical retardation of runoff, and traps. Harmful dust and other pollutants inherent to the construction process will be held to minimum practical limits. Haul roads and excavation areas and other work sites will be sprinkled as needed to keep dust within tolerable limits. Contract specifications will require that fuel, lubricants, and chemicals be adequately labeled and stored safely in protected areas, and disposal at work sites will be by approved methods and procedures. Clearing and disposal of brush and vegetation will be carried out in accordance with applicable laws, ordinances, and regulations in respect to burning. Each contract will set forth specific stipulations to prevent uncontrolled grass or brush fires. Disposal of brush and vegetation will be by burying, hauling to approved off-site locations, or controlled burning, as applicable.

Stringent requirements for safety and health in conformance with the Construction Safety Act will be included in each construction contract.

Necessary sanitary facilities, including garbage disposal facilities, will be located to prohibit such facilities from being a pollution hazard to wells in conformance with federal, state, and local water pollution control regulations. Conformance to all environment control requirements will be monitored constantly by a construction inspector who will be on-site during all periods of construction operation.

The environment will continue to be protected from erosion and water pollution following completion of construction. Project sponsors will operate

and maintain the structural measures in accordance with a specific operation and maintenance agreement. The agreement will set forth the inspections to be made and the maintenance to be performed to prevent soil erosion and water pollution. Sponsors have given assurance that adequate sanitary facilities meeting local and state health standards will be provided at reservoirs prior to any recreational use.

All applicable state water laws will be complied with in the design and construction of the structural measures, as well as those pertaining to storage, maintenance of quality, and use of water.

The estimated cost of installing the project is \$3,772,588. This includes \$1,965,023 for applying land treatment measures and \$1,807,565 for installation of the structural measures.

2. Environmental Impact

In the uplands, the application of land treatment measures such as proper grazing use, deferred grazing and permanent water facilities will increase the vigor, stand, and productivity of the forage plants, thereby protecting the soil from erosion through increased cover and providing a better habitat for livestock and wildlife. These measures are not expected to significantly influence over-all wildlife population trends.

On irrigated cropland and pastureland, the installation of land treatment measures such as conservation cropping system, crop residue management, and pasture and hayland management will help protect the soil from erosion by water and wind and help maintain the productivity of the soil for a sustained agriculture. The proper management of the irrigation water through better distribution facilities and methods of application will reduce the annual volume of ground water being pumped from 6 acre-feet to 4 acre-feet per acre, thereby reducing the depletion of the ground water resource. The lower application rate will result in less water seeping back into the aquifer through underlying saline bedrock, thereby reducing the rate of salinity increase. It also will reduce the loss of water by evaporation.

The effect of the installation of all structural measures planned for this watershed and those planned for Cornudas and North Draws in the adjacent watershed upon flooding in this watershed are described below.

Structural measures will control 94 percent and 91 percent of the mountainous and upland area of the Hitson, C&L and Washburn Draws watershed and the Cornudas, North and Culp Draws watershed, respectively. This mountainous and upland area is the major source of damaging floodwater. Structural measures are designed to control the runoff from storms larger than the 100-year event.

About 22,500 acres of valuable flood plain land will be protected by structural measures. Average annual flooding will be reduced from 4,248 acres to 767 acres, a reduction of 82 percent. Land treatment and structural measures will reduce average annual damages from \$410,066 to \$60,838, a reduction of 85 percent.

Average annual floodwater damages will be reduced by 87 percent for crop and pasture, 85 percent for other agricultural, 90 percent for roads and bridges, 100 percent for urban damages up to the 100-year frequency event to Dell City, and 85 percent for indirect damages. It should be noted that the reduction in damages to Dell City, as well as the reduction of other damages, is dependent upon the installation of structural measures in both watersheds; however, damage may be expected from floods exceeding the 100-year event.

Had the project been installed at the time of the disastrous 1966 flood, urban damages would have been eliminated and damages other than urban would have been reduced from \$2,849,000 to \$585,000, or 79 percent.

Flood plain scour damages will be reduced by 66 percent and sediment deposition damages will be reduced by 88 percent.

The flood damage remaining after installation of the project results primarily from runoff from the irrigated cropland, roads, and miscellaneous areas.

The installation of structural measures planned in this watershed and in the adjacent Cornudas, North and Culp Draws watershed will provide flood protection to the owners and operators of 68 farms in the watershed. In addition, the owners and occupants of approximately 105 residential and business units in Dell City will be benefited by the elimination of all damages from floods up to and including a 100-year frequency event. Of the farms receiving flood protection, 39 are family-type farms employing less than 1½ man-years of outside labor.

Incidental ground water recharge from structural measures installed in this watershed is expected to average about 3,300 acre-feet annually. Seepage losses in the highly permeable pool areas of the structures and use of injection wells to dispose of released floodwaters will recharge the aquifer with water which normally flows into the Dry Salt Lakes and evaporates. This incidental recharge will help maintain water quality and reduce the annual rate of water level decline, which will keep irrigation pumping costs from rising as rapidly as might otherwise be expected with the lowering water table. This recharge, in addition to the expected 2,700 acre-feet recharge in the nearby Cornudas, North and Culp Draws watershed project, will reduce the rate of water table decline by about 15 percent. It will also cause a reduction in the present progressive increase in dissolved solids content of the ground water through the dilutive effects of introducing a higher quality water into the aquifer. This is important in preventing reduced future crop yields resulting from use of highly saline ground water. Increased future energy needs associated with higher lift of water from a declining water table and the desalinization of saltier ground water for municipal needs by Dell City will also be reduced.

The 202 acres of surface water in the pool areas of structures may provide some incidental recreation for watershed residents during periods of above normal rainfall. This may be in the form of boating, water skiing, and picnicking.

The installation of the measures in the Hitson, C&L and Washburn Draws watershed will also reduce flooding in the adjacent Cornudas, North and Culp Draws watershed.

It is estimated that the two multiple-purpose structures will have an average annual yield of 250 acre-feet of irrigation water. Studies indicate that some water will be available about two years in three and that the average annual yield will be available about one year in two. Irrigation is not dependent upon availability of water from the multiple-purpose structures. An adequate quantity of water for all acres irrigated is available from ground water sources. Yields of water from the multiple-purpose structures will be used, as available, in lieu of well water, thereby effecting a savings in pumping costs. Water from the multiple-purpose structures will be of excellent quality for irrigation.

The project is not expected to affect the fish and wildlife populations in the project area. The habitat for big game and upland game will be improved through the application of land treatment measures such as conservation cropping system, deferred and proper grazing use, and the establishment of more livestock watering facilities in the uplands.

Approximately 202 acres of water will be created by the sediment and water supply pools associated with the structural measures. Although not expected to be permanent bodies of water, they will provide some limited habitat for migratory waterfowl and some opportunities for water-based recreation to the local residents.

Approximately 2 miles of ephemeral waterway-like draws will be inundated by the sediment and water supply pools and used for the dams, conveyance channels, injection wells, and borrow areas. The existing vegetation will be disturbed on this area. The affected 2 miles of draws are a small part of the several hundred miles of similar draws in the remainder of the watershed.

The watershed lies within range of the migration route of the endangered Mexican duck, American peregrine falcon, and the Prairie falcon. Any body of water created by the sediment pool of the floodwater retarding structure or multiple-purpose structures would provide habitat for the Mexican duck. Installation of the project, however, should have no significant adverse or beneficial effect on these species.

Installation of the structural measures will require the commitment of up to 1,568 acres of rangeland. The existing vegetation may be destroyed on up to 624 acres during construction. This consists of 449 acres of upland having little vegetation other than creosote bush and 175 acres of draws having a good cover of grasses and scattered woody plants. Although it will not be practicable to replace all vegetative cover destroyed during construction, the revegetation of the areas where it is practicable will replace some of the habitat lost as a result of construction. The remaining 944 acres are in the detention pools and will be subject to occasional inundation by floodwater. This occasional inundation will provide additional moisture and increase the growth of vegetation.

The recreational opportunities of the area are not expected to change significantly as a result of the project. Limited opportunities for water-based recreation at the sediment and water supply pools will be created.

The total economic impact of the project on the local economy from the increased production resulting from the reduction of crop and pasture, sediment, and erosion damages will amount to an increase in household income of over \$370,000 annually and will provide employment opportunities for local residents by creating approximately 50 new jobs. In addition, the expenditure of funds for the construction of the works of improvement will create approximately 70 man-years of employment.

The reduction of flooding in the agricultural flood plain will ensure more dependable crop yields and help to stabilize the agricultural sector of the local economy. This improvement in farm income will help the local ranchers and farmers stay in business and slow the migration of farmers and their families from this area to heavily populated areas. Also, farmers will be able to shift funds previously used to repair flood damages to other items that improve their standard of living.

Significant intangible public health benefits will accrue in the project area, including increased sense of security, elimination of health hazards associated with water supply and waste disposal systems, improved vector control, and the prevention of other factors accompanying floods which tend to disrupt the maintenance of public health. Additional intangible benefits will accrue to the project, allowing an opportunity for the shifting of public funds from the repair of damage to streets and other public facilities to investment in schools, libraries, and other public facilities that improve the quality of living.

The total average annual cost of structural measures (amortized total installation cost plus operation and maintenance) is \$93,852. These measures are

expected to produce average annual primary benefits of \$363,800. The benefit-cost ratio without secondary benefits is 3.9 to 1.0. The ratio of total annual project benefits accruing to structural measures, \$397,447, to the average annual cost of structural measures, \$93,852, is 4.2 to 1.0. A summary of economic findings is shown on table 6, which is attached.

3. Favorable Environmental Effects

- a. Reduce erosion and runoff.
- b. Increasing the efficiency of using irrigation water.
- c. Provide an improved food and water supply for upland wildlife.
- d. Reduce flood damages in the project area by 82 percent in conjunction with the adjoining Cornudas, North and Culp Draws watershed project.
- e. Reduce sediment damages to flood plain lands by about 88 percent.
- f. Reduce scour damages to flood plain lands by about 67 percent.
- g. Provide flood protection to owners and occupants of about 105 residential and business units in the urban area of Dell City.
- h. Provide flood protection to 68 farm owners and operators.
- i. Provide supplemental irrigation water supply in two multiple-purpose structures.
- j. Provide beneficial incidental recharge of the ground water aquifer through use of injection wells for disposing of floodwater evacuated from the retarding pools.
- k. Reduce future pumping costs through reduction of rate of water table drop and required additional energy needed to lift ground water to the surface.
- l. Maintain crop yields by reducing the rate of salinity increase of the ground water.
- m. Maintain the quality of the ground water and reduce the amount of future increased energy required for desalinization of ground water with higher salt content for municipal use by Dell City.
- n. Effect an over-all future reduction in air pollution associated with increased energy production which will be needed to lift water from a declining water table and to desalt water with increased salt content.

- o. Create opportunities for occasional water-related recreation for short periods of time following above normal rainfall.
- p. Increase household income by over \$370,000 annually.
- q. Provide employment opportunities for local residents by creating approximately 50 new jobs.
- r. Create about 70 man-years of employment by the expenditure of funds for construction of the works of improvement.

4. Adverse Environmental Effects Which Cannot Be Avoided

- a. Damage up to 449 acres of creosote-bush covered rangeland used primarily by scaled quail for cover.
- b. Damage up to 175 acres (2 miles) of draws having a good cover of grasses and scattered woody plants used by cattle and wildlife.

5. Alternatives

The adverse impacts of the planned project are minor and there appear to be no unresolved conflicts concerning the use of available resources. Therefore the alternatives which would minimize adverse effects are extremely limited.

One alternative would be conservation land treatment measures for watershed protection in the uplands without being supplemented by structural works. This alternative would not damage the existing wildlife habitat or rangeland in the vicinity of the planned structural measures and would result in a small reduction in flood damage. The intensively used flood plain would continue to be damaged by frequent flooding and the area would forego the beneficial effects of incidental ground water recharge provided by the project.

Alternative structural systems involving concrete-lined channels and/or floodwater diversions to carry flood flows or structure release flows through the irrigated flood plain were considered. These alternatives had serious adverse effects such as high cost, taking valuable irrigated land out of production, and disrupting existing irrigation systems.

The alternative of not implementing the project would permit floodwater damages to continue at an average annual rate of approximately \$412,000 and would result in the foregoing of \$289,350 in average annual net benefits.

6. Relationship Between Local Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity

The project will provide a level of protection consistent with the needs of a highly developed agriculture and provide the protection needed by the town of Dell City, which is totally dependent upon the agricultural income of the immediate area. The relative isolation of the area precludes uses of the land for other than agriculture. Urban development and growth of Dell City will be limited to supplying the needed services to sustain the agricultural community.

The project provides the foundation for the protection and conservation of the land and water resources of the area and will complement any future water resource development programs which may be undertaken to utilize runoff from other parts of the closed basin now being wasted in the Dry Salt Lakes or provide for the importation of outside water to solve problems resulting from overdraft of the aquifer.

The future usefulness of the structural measures for protecting the flood plain of Dell Valley will continue into the future far past the 100-year life of the sediment pools, as the annual rate of sediment accumulation is low, averaging less than 0.07 acre-foot per square mile. Also, ordinary earth-moving equipment could be utilized to remove the small volume of accumulated sediment in order to restore the structures to their full effectiveness.

7. Irreversible and Irretrievable Commitments of Resources

Construction of the project will require up to 1,568 acres of rangeland. The existing vegetation may be destroyed on about 624 acres of rangeland required for the sediment and water supply pools, dams, emergency spillways, injection wells and conveyance channels, the diversions, and borrow pits. Approximately 175 acres of draws containing good grass and scattered shrub vegetation lie within the construction area. The remaining land consists of poor creosote bush vegetation of low ecological value. The vegetation on the 944 acres lying mainly in the detention pools will not be destroyed by construction nor by the infrequent impoundment of floodwater.

None of the land committed for construction of the project is suitable for intensive irrigation use because of soil limitations. Suitable soils for irrigation are limited to narrow strips of uneconomical widths along the draws.

Other commitments of resources include the labor, materials, and energy required for construction of the project.

8. Consultation with Appropriate Federal Agencies and Review by State and Local Agencies Developing and Enforcing Environmental Standards

a. General

The application for assistance for the Hitson, C&L and Washburn Draws watershed was submitted to and approved by the Texas State Soil and Water Conservation Board. The plan was developed in full consultation and coordination with all interested agencies and individuals. Written notification of initiation of work plan development was sent to all federal, state, and local agencies that might have an interest in the project, soliciting information and comments. Contacts were made with several agencies during planning to obtain information and assistance on various phases. Public meetings were held during planning to explain the program and solicit public reaction. On January 21, 1971, prior to the preparation of the final plan, an informal field level review was held in the watershed, at which time interested agencies were invited to present their views and recommendations either orally or in writing. The plan and environmental statement have been prepared in consideration of such comments and recommendations as were provided by the agencies who reviewed the plan.

b. Discussions and Disposition of Each Problem, Objection, or Issue Raised on the Draft Environmental Statement by Federal, State, and Local Agencies, and Private Organizations and Individuals

Following is a list of the agencies that were requested to review and comment on the draft environmental statement:

U. S. Department of the Army, Corps of Engineers
 U. S. Department of Commerce
 U. S. Department of Health, Education, and Welfare
 Environmental Protection Agency
 U. S. Department of the Interior
 Federal Power Commission
 Division of Planning Coordination (State agency designated by Governor and State Clearinghouse)
 El Paso Council of Governments (Metropolitan Area Clearinghouse)

All of the above agencies, with the exception of the Federal Power Commission, responded. The comments and disposition for each is as follows:

U. S. Department of the Army, Corps of Engineers

Comment: The Department did not foresee any conflict with any of its projects or current proposals. The Department stated that the statement satisfied the requirements of Public Law 91-190, 91st Congress, insofar as the Department of the Army was concerned.

Response: Noted.

U. S. Department of Commerce

The Department had no comment.

U. S. Department of Health, Education and Welfare

The Department had no comment.

Environmental Protection Agency

Comment: The Agency stated that the project is a desirable one and will be of benefit to the area by controlling flood flows and improving the ground water supply, both in quantity and quality, by well injection of flood flows.

Response: Noted

Comment: The Agency stated that the labor and materials used in construction of the project is an irretrievable commitment of resources and should be included in the statement.

Response: This fact has been included in the final statement.

Comment: The Agency enumerated four items pertaining to air and water pollution during construction that should be discussed in the final statement.

Response: The statement has been modified to describe the practices and measures that will be used to prevent air and water pollution during construction.

Comment: The Agency recommended that proper water and land use controls be established to stop the mining of the aquifer to obtain the full benefits of ground water recharge. They also recommended the control established for this watershed be coordinated with those established for the interrelated Cornudas, North and Culp Draws Watershed, Texas and New Mexico.

Response: To stop the gradual decline in the water table of the aquifer would require limiting the number of acres irrigated and/or the amount of water withdrawn and used for irrigating crops. The sponsoring local organizations in Texas do not presently have the legal authority to limit the acres irrigated or the amount of water withdrawn from a ground water source.

The only loss to the resource base is the water used to grow plants and that lost by evaporation. Water leached from the fields or that seeped out of unlined ditches, etc., is returned to the resource base and is available for future withdrawal. All of the sponsoring local organizations recognize the importance of the ground water resource to the economy of the area and promote wise and efficient use of the water to prevent the deterioration of its quality and quantity. The El Paso-Hudspeth Soil and Water Conservation District is urging landowners and operators to install and maintain conservation irrigation systems so that the greatest

U. S. Department of the Interior

Comment: The Department commented that the statement appeared to have had a limited distribution for review purposes and suggested that it be circulated to local agencies and conservation groups for review and comment.

Response: It was considered that a review by the El Paso Council of Governments, which represents the local governmental agencies, and the Division of Planning Coordination (State agency designated by the Governor and state clearinghouse) was adequate. This state clearinghouse circulated the draft environmental statement to appropriate state agencies for review.

Comment: The Department stated that the statement should show evidence of compliance with Section 106 of the National Historic Preservation Act of 1966 by indicating that the National Register of Historic Places had been consulted to determine whether National Register properties would be affected by this project; further, that the statement should also indicate whether or not any properties being considered for nomination to the National Register would be affected by the project.

Response: Determination was obtained from the Texas State Historical Survey Committee that no National Register properties will be affected by the project and that there are no properties being considered for nomination to the National Register in the project area. The statement has been modified to reflect this determination.

Comment: The Department stated that the statement should include an evaluation of the project on the archeological values which may exist in the project area and identify the measures to be employed to minimize or eliminate any adverse effects on the resource. The Department also recommended that the State Archeologist be consulted and his correspondence and views reflected in the appropriate sections of the statement.

Response: The Texas Archeological Salvage Project and the Texas State Building Commission were informed of work plan development but did not make a survey of the project. Also, the Texas State Historical Survey Committee, which is the responsible state agency, was contacted to determine if it had any information pertaining to archeological features which might be present. This agency's only recommendation was to make an archeological survey of the project, especially with regard to the impoundment structures, to locate and appraise cultural resources that might be irreversibly committed.

Inasmuch as no evidence was discovered during normal field investigations of the sites by the Soil Conservation Service which would indicate the presence of important archeological features and no agency contacted had reports of any in this area, an archeological survey was not deemed necessary. However, as required by Public Law 86-523, the Service will keep the Secretary of the Interior informed of the construction

schedule so that the Secretary can cause a survey to be made of the sites to ascertain whether such sites contain historical and archeological data which should be preserved in the public interest.

Comment: The Department stated: "Although no ecological analysis of the project objectives has been undertaken, we note the provisions for passage of runoff flows for purposes of maintaining existing vegetation below the floodwater diversion. We fully support mitigation measures of this nature."

Response: Noted.

Comment: The Department stated that the discussion on land treatment should be modified to identify the method used to obtain a source of water for big game since the project structures associated with flood control are designed to hold water for relatively short periods of time.

Response: The statement was modified to reflect that ponds and wells constructed in the rangeland in order to practice proper grazing use can be used by wildlife. However, it is expected that the sediment and water supply pools associated with the structural measures will provide water on an intermittent basis.

Comment: The Department stated that since game is not overly abundant in the project area and the project is not expected to significantly influence the present populations of either game or fish, the marginal nature of this gain should be set forth in item 3 under "Favorable Environmental Effects."

Response: The statement has been modified to reflect this recommendation.

Division of Planning Coordination (State agency designated by Governor and state clearinghouse)

Comment: The Division found the work plan to be consistent with the planning and development policies and objectives of the State of Texas. The division stated that each phase of the project should continue to be closely coordinated with Texas state agencies and local governments whose plans and programs are affected.

Response: Noted.

El Paso Council of Governments (Metropolitan Area Clearinghouse)

Comment: The Council of Governments reaffirmed their endorsement of the work plan and agreed with the Soil Conservation Service assessment that no adverse environmental impact is probable.

Response: Noted.

9. Appendix A - Comparison of Benefits and Costs for Structural Measures
10. Appendix B - Letters of Comment on Draft Environmental Statement
11. Appendix C - Project Map

APPROVED BY

Kenneth E. Grant
Kenneth E. Grant, Administrator

DATE NOV 24 1972

TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES
 Hitson, C&L and Washburn Draws Watershed, Texas
 (Dollars) 1/

Evaluation Unit	Average Annual Benefits					Average Annual Cost	Benefit-Cost Ratio
	Damage Reduction ^{2/}	Incidental	Ground Water	Recharge	Irrigation		
Floodwater Retarding Structure, Multiple-Purpose Structures, and 25,150 feet of Diversion	300,713	60,075	3,012	33,647	397,447	82,540	4.8:1.0
Object Administration	xxx	xxx	xxx	xxx	xxx	11,312	xxx
AND TOTAL ^{4/}	300,713	60,075	3,012	5/33,647	397,447	93,852	4.2:1.0

Annual benefits and operation and maintenance costs based on adjusted normalized prices, April 1966; construction costs based on 1969 prices. Includes \$104,025 damage reduction benefits in Cornudas, North and Culp Draws watershed accruing to structural measures in this watershed. From table 4. In addition, it is estimated that land treatment installed in this watershed and in the Cornudas, North and Culp Draws watershed will provide \$3,979 damage reduction benefits in the project area. Resulting from \$24,190 secondary benefits from damage reduction, incidental ground water recharge, and irrigation water benefits in Hitson, C&L and Washburn Draws watershed and \$9,457 secondary benefits from damage reduction in Cornudas, North and Culp Draws watershed.

Appendix B - Letters of Comment on Draft Environmental Statement

Agencies Commenting on the Draft Environmental Statement are:

1. Department of the Army
2. Department of Commerce
3. Department of Health, Education and Welfare
4. Department of the Interior
5. Environmental Protection Agency
6. Texas Division of Planning Coordination (State Clearinghouse, also Agency designated by the Governor)
7. El Paso Council of Governments (Metropolitan Area Clearinghouse)



DEPARTMENT OF THE ARMY

WASHINGTON, D.C. 20310

27 JAN 1972

Honorable Thomas K. Cowden
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Dr. Cowden:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the Administrator of the Soil Conservation Service, by letter of 1 December 1971, requested the views of the Secretary of the Army on the work plan for Hitson, C&L and Washburn Draws Watershed, Hudspeth County, Texas.

We have reviewed this work plan and foresee no conflict with any projects or current proposals of this Department. The draft of the environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned.

Sincerely,

Charles R. Ford
for Kenneth E. Belieu
Under Secretary of the Army

SOIL CONSERVATION SVC.
WASHINGTON, D.C.

JAN 27 1972

100-100000



THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

February 9, 1972

Mr. Kenneth E. Grant
Administrator
U.S. Department of Agriculture
Soil Conservation Service
Washington, D. C. 20250

REGISTRATION SVC.
WASH. D.C.

Dear Mr. Grant:

In response to your letter of December 3, 1971, we have received copies of the work plan and draft environmental impact statement for the "Hitson, C & L and Washburn Draws Watershed, Texas" for review and comment.

The Department of Commerce has reviewed the draft environmental impact statement and has no comment.

I apologize for the delay in responding to your request.

Sincerely,

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

WASHINGTON, D.C. 20201

OFFICE OF THE SECRETARY

REGISTRATION SVC.
WASHINGTON, D.C.

DEC 9 06

DEC 9 1971

Mr. Kenneth E. Grant
Administrator
Soil Conservation Service
U. S. Department of Agriculture
Washington, D. C. 20250

Dear Mr. Grant:

Secretary Richardson has asked me to respond to your letter dated December 1, 1971, wherein you requested comments on the Watershed Work Plan and draft environmental impact statement for the Hitson, C&L and Washburn Draws Watershed, Texas.

This Department has reviewed the public health and safety aspects of the above project as presented in the documents submitted. We offer no comments.

The opportunity to review the Watershed Work Plan and draft environmental impact statement is appreciated.

Sincerely yours,

Merlin K. DuVal, M.D.
Assistant Secretary for
Health and Scientific Affairs



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

MAR 20 1972

RECEIVED
MAR 11 1972
U.S. DEPARTMENT OF THE INTERIOR
WASHINGTON, D.C.

Dear Mr. Secretary:

This is in reply to your letter of December 1, 1971, ~~furnishing us with copies of a work plan for the Hitson, C & L and Washburn Draws Watershed, Texas,~~ for review and comment. We have completed our review and submit the following comments for your consideration and use.

The proposed work plan will not impact on any existing or potential development in our Reclamation program, nor will it impact on any existing or proposed unit of the National Park System or any properties eligible as National Landmarks. Mineral production in the watershed is minor. Virtually all of the important mineral production is in the southern half of Hudspeth County. It is possible that sand and gravel are produced in the watershed, but the limited areal extent of the proposed structures should have no adverse effects on the mineral industry or mineral resources of the area. The work plan provides an adequate discussion of the project's impact on the fish and wildlife resources.

On page 28 of the work plan it states that no known archeological, paleontological or historic features will be affected by this project. Such a statement, without a supporting basis, is considered to be inadequate. To satisfy the policies of NEPA the work plan should discuss, in detail, the impact of the project on the archeological and historic resources. Consultation with the State Archeologist and the State Historical Preservation Officer is recommended and their correspondence and views reflected in the appropriate sections of the statement.

The work plan should also recognize that proposed structures 1, 2, and 3 will require compliance with the Federal Reservoir Salvage Act of 1960 and include, where necessary, a program for the salvage of archeological materials at these sites. The Director, Southwest Region, National Park Service, P.O. Box 728, Santa Fe, New Mexico 87501, should be kept informed of the progress of this work so that any necessary archeological work can be accomplished in advance of construction.

We have noted that all of the planned floodwater retarding structures for this work plan will be located on hard limestone that is considerably jointed and highly permeable (see pages 21, 22 and 51 in the work plan). The report should provide an adequate discussion as to whether the limestone can be treated to avoid bothersome or serious leakage beneath the structures whenever they contain water. Specifically, will the water that leaks beneath the structure surface again on the downstream side of the structure?

We have reviewed the draft environmental statement accompanying this proposal for compliance with the requirements of the National Environmental Policy Act of 1969. The following comments are submitted for your consideration and use.

The environmental statement appears to have had a limited distribution for review purposes. We would suggest that it also be circulated to local agencies and conservation groups for review and comment.

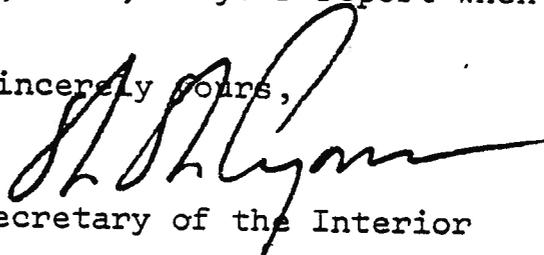
The statement should show evidence of compliance with Section 106 of the National Historic Preservation Act of 1966 by indicating that the National Register of Historic Places has been consulted to determine whether National Register properties will be affected by this project. The statement should also indicate whether or not any properties being considered for nomination to the National Register would be affected by the project. This determination can be obtained from the Executive Director, Texas State Historical Survey Committee, P.O. Box 12276, Capitol Station, Austin, Texas 78701, as he is the State Liaison Officer for Historic Preservation. The statement should also evaluate the impact of this project on the archeological values which may exist in the project area and identify the measures to be employed to minimize or eliminate any adverse effects on this resource.

Although an ecological analysis of the project objectives has not been undertaken, we note the provisions for passage of runoff flows for purposes of maintaining existing vegetation below the floodwater diversion. We fully support mitigation measures of this nature.

Item 3 under Favorable Environmental Effects claims that the project will provide more permanent food supply for big game and a permanent water supply for all upland game. The discussion on land treatment should be modified to identify the method used to obtain a source of water since the project structures associated with flood control are designed to hold water for relatively short periods of time. Since game is not overly abundant in the project area and the project, including its water supply features, is not expected to significantly influence present populations of either game or fish, the beneficial effect is, at best, marginal. We believe the marginal nature of this gain should be set forth in Item 3.

We wish to thank you for the opportunity to review the work plan and environmental statement for this project. We also request that you attach a copy of the enclosed reconnaissance report of the Bureau of Sport Fisheries and Wildlife dated February 13, 1969, to your report when it is forwarded to Congress.

Sincerely yours,



Deputy Assistant

Secretary of the Interior

Honorable Earl Butz
Secretary of Agriculture
Washington, D. C. 20250

Enclosure



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
POST OFFICE BOX 1306
ALBUQUERQUE, NEW MEXICO 87103

February 13, 1969

Mr. H. N. Smith, State Conservationist
Soil Conservation Service
P. O. Box 648
Temple, Texas 76501

Dear Mr. Smith:

The Bureau of Sport Fisheries and Wildlife in cooperation with the Texas Parks and Wildlife Department has completed a reconnaissance study of the Hitson, C&L, and Washburn Draws Watershed in Hudspeth County, Texas. The project is sponsored by the El Paso-Hudspeth Soil and Water Conservation District, Hudspeth County Underground Water District No. 1, Hudspeth County Commissioners Court, and the city of Dell City in cooperation with your Service under the authority of the Watershed Protection and Flood Prevention Act (68 Stat. 666, as amended; 16 U.S.C. 1008).

This report was prepared in accordance with the provisions of Section 12 of the above Act. It has the concurrence of the Texas Parks and Wildlife Department as indicated in the enclosed copy of a letter dated November 27, 1968, signed by Executive Director J. R. Singleton.

All of the streams in the watershed are intermittent. The draws head at the western edge of the watershed in the Sixteen and Coronadas Mountains and flow into Dry Salt Lake at the eastern edge of the watershed. The project area encompasses about 191,000 acres.

The Hitson, C&L, and Washburn Draws Watershed lies in the Southern Desertic Basins, Plains, and Mountains Land Resource Area. The elevation of the project area varies from about 3,700 feet in the lowlands to 7,000 feet at the northwest divide. The topography ranges from steep mountains and escarpments in the headwaters area to a flat alluvial plain at the lower portion of the watershed. The soils of the mountain area are stony and very shallow. The soils in the lowlands are loams and silty clay loams.

About 167,000 acres of the project area are upland, all of which is used for range. The lowland area comprises 24,000 acres, of which 88 percent is irrigated cropland, 8 percent is pasture, and 4 percent is in miscellaneous uses. The major crops, cotton, alfalfa, and small grains, are irrigated from wells.

Natural vegetation on the uplands consists of mesquite, creosote bush, grama grasses, sand dropseed, and burrograss. The upland draws support growths of vine mesquite, plains bristlegrass, cane bluestem, bush muhly, and alkali sacaton. An insignificant amount of natural vegetation grows in the lowlands.

The average annual precipitation in the watershed is about nine inches, most of which occurs from July through October. A major flood occurs about once every eight years and one minor flood occurs annually.

Land treatment measures for the project area would include conservation cropping systems, crop residue use, irrigation water management, pasture and hayland planting and management, deferred and proper grazing use, livestock pipelines, and farm ponds. Of the 22 farm ponds planned, 14 have been built. Structural measures would include three floodwater retarding structures located in the lower portion of the uplands. Possibly a few of the structure sediment pools would hold permanent water. About five miles of floodwater diversions would be installed in the uplands.

There is not enough permanent water in the project area to provide significant sport or commercial fishing.

No game species is abundant in the project area. The most common game animal is the scaled quail, with a few pronghorn antelope and mule deer in some areas. There is no hunting in the project area because of the scarcity of game and a reluctance on the part of the landowners to allow hunting.

Without the project, future wildlife populations would be expected to remain at their present levels.

In general, the project would not significantly influence game population trends. Land treatment measures such as conservation

cropping systems, and deferred and proper grazing use would be beneficial to big game and upland game. Scaled quail would not be favored by increasing the density of grass cover in the project area.

Losses of brush resulting from the installation of project measures could be partly offset by planting herbs or shrubs of value to wildlife at appropriate locations such as idle lands, eroded areas, gullies, along fencerows, and around the floodwater retarding structures. The wildlife plantings would also aid in erosion control.

The small amount of surface water in the uplands of the watershed may limit the abundance of game animals there. If interested, the landowners could consult the Texas Parks and Wildlife Department regarding the feasibility of installing wildlife watering devices in the uplands. Such rain catchment devices can be built and installed for about \$1,000 each. Possibly some of the cost could be shared under the Agricultural Stabilization and Conservation Service's G-4 program.

In view of the above, it is recommended that:

1. The losses of brush due to the building of structural measures be compensated for by planting herbs and shrubs suitable for wildlife at appropriate locations such as idle lands, eroded areas, gullies, along fencerows, and around reservoirs.
2. Landowners consult the Texas Parks and Wildlife Department regarding the feasibility of installing wildlife watering devices on the uplands of the watershed.

The above recommendations are in conformance with the U.S.D.A. Soil Conservation Service Plant Sciences Memorandum-5, National Standards and Guides to Specifications for Conservation Practices in the Plant Sciences. If adopted as a part of the plan of development, losses of wildlife habitat would be mitigated and, additionally, fish and wildlife benefits would accrue to the project.

A detailed study of the watershed by the Bureau of Sport Fisheries and Wildlife is not considered necessary at this time. Should the sponsors desire, our Bureau, in cooperation with the Texas Parks and Wildlife Department, would be happy to be of further assistance.

Thank you for your cooperation in providing project information.

Sincerely yours,



William T. Krummes
Regional Director

Enclosure

Copies (7)

Distribution:

- (5) Executive Director, Tex. Parks and Wild. Dept., Austin, Tex.
- (1) President, Tex. Soil & Water Cons. Board, Temple, Tex.
- (1) Chairman, El Paso-Hudspeth Soil & Water Cons. Dist., El Paso, Tex.
- (1) Judge, Hudspeth County Commissioners Court, Sierra Blanca, Tex.
- (1) Mayor, Dell City, Tex.
- (1) President, Hudspeth Co. Undergrd Water Dist. No. 1, Dell City, Tex.
- (2) Regional Director, FWPCA, South Central Region, Dallas, Tex.
- (2) Regional Director, BOR, Mid-Continent Region, Denver, Colo.
- (1) Regional Coordinator, USDI, Southwest Region, Muskogee, Okla.
- (1) Regional Biologist, SCS, Fort Worth, Tex.
- (2) Field Supervisor, BSFW, Div. of River Basin Studies, Fort Worth, Tex.

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**JOHN H. REAGAN BUILDING
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November 27, 1968

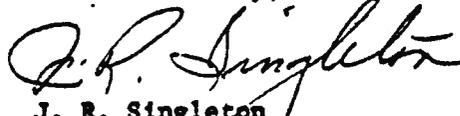
**Mr. William T. Krummes
Regional Director
Bureau of Sport Fisheries & Wildlife
P. O. Box 1306
Albuquerque, New Mexico 87103**

Dear Mr. Krummes:

This is in response to your letter of November 25, 1968, and the attached review draft of a report concerning the Soil Conservation Service proposed Hitson, C&L, and Washburn Draws Watershed, Texas.

We have reviewed this draft and concur with the report as presented.

Yours sincerely,


**J. R. Singleton
Executive Director**

JRS:K CJ:jw

cc: Mr. John Degani

ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1600 PATTERSON, SUITE 1100

DALLAS, TEXAS 75201

JAN 19 1972

Administrator
Soil Conservation Service
U. S. Department of Agriculture
Washington, D. C. 20250

Dear Sir:

We have reviewed the Work Plan and the Draft Environmental Statement for the Hitson, C&L and Washburn Draws Watershed, Texas.

The project is a desirable one and will be of benefit to the area by controlling flood flows and improving the ground water supply, both in quantity and quality, by well injection of flood flows.

The Work Plan gives the installation cost for each flood-water retarding structure. This figure includes the cost of the injection well and the conveyance channel. To obtain a true structure cost figure, it is suggested that the cost of the injection well be shown as a separate item.

The estimated average annual cost of operation and maintenance is \$600.00. This figure appears low, if it includes floodwater injection cost. By separating the installation cost, as suggested above, the operation and maintenance cost should also be separated for the two structures, giving a well injection cost.

To obtain the full benefits for the groundwater recharge and to stop the mining of the aquifer, proper water use and land use controls should be established, coordinating such controls with those established for the Cornudas, North and Culp Draws Watershed, Texas and New Mexico.

The labor and materials used in the construction of the project is a irretrievable commitment of resources and should be included in paragraph (VI) of the statement.

The following general comments are made and should be included in the Final Environmental Statement:

Soil Conservation Service

Excavation and construction operations should be scheduled to prevent exposing large amounts of unprotected soil at one time to erosion and resultant siltation of streams. The soil erosion practices and measures that will be used should be described.

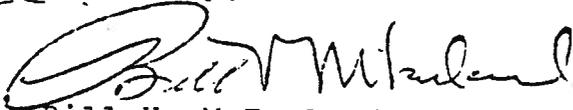
Dust and other pollutants inherent in the construction process need to be held to a minimum. All preventive measures available should be discussed in the Environmental Statement.

Clearing and disposing of the brush and vegetation along the right-of-way of the proposed project should include provisions for prevention of undue effects on the environment. Methods of disposal should be given in the statement. Open uncontrolled burning should not be permitted in order to meet the requirements of 42 CFR 76.8.

Where appropriate, sanitary facilities should be provided and operated to treat and dispose of domestic wastes in conformance with state and Federal water pollution control regulations.

We appreciate the opportunity to review this Work Plan and Environmental Statement.

Sincerely,



Bill V. McFarland

Assistant Regional Administrator for Management



EXECUTIVE DEPARTMENT
AUSTIN, TEXAS 78711

RESTON SMITH
GOVERNOR

December 10, 1971

Mr. Kenneth E. Grant
Administrator
United States Department
of Agriculture
Soil Conservation Service
Washington, D.C. 20250

SOIL CONSERVATION SVC.
WASH., D.C.
1971 DEC 20 AM 11 38

Dear Mr. Grant:

The work plan for Hitson, C&L and Washburn Draws Watershed has been received by the Division of Planning Coordination, Office of the Governor (the State Planning and Development Clearinghouse). The draft of this work plan was favorably reviewed by the State Clearinghouse on January 25, 1971.

As there appears to be no substantive change between the draft and final work plans, and since no unfavorable information concerning the project had been received subsequent to our review of the draft work plan, the State Clearinghouse finds the work plan to be consistent with planning and development policies and objectives of the State of Texas.

Each phase of this project should continue to be closely coordinated with Texas State agencies and local governments whose plans and programs are affected.

Thank you for the opportunity to review this work plan.

Sincerely,

Ed Grisham
Director, Division of
Planning Coordination

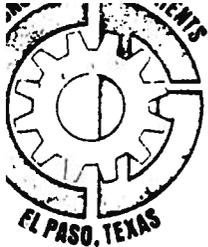
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cc: Mr. Clyde Graham
State Director, SCS

Hon. Allen Hill
Mayor, Dell City

Mr. James Lynch, Sec.
Watershed Steering Committee

Mr. Leslie G. Smyth
Exec. Dir., EPCOG



**THE EL PASO
COUNCIL OF
GOVERNMENTS**
1019 SOUTHWEST CENTER BUILDING
EL PASO, TEXAS 79901 (915) 544-3827

December 15, 1971

Mr. Clyde W. Graham
State Conservationist
United States Department of Agriculture
P. O. Box 648
Temple, Texas 76501

Dear Mr. Graham:

We have received for review and comment the work plans and drafts of environmental statements for Hitson, C & L and Washburn Draws Watershed, Hudspeth County, Texas; and Cornudas, North and Culp Draws Watershed, Hudspeth County, Texas, and Otero County, New Mexico. The draft of the work plans was favorably reviewed by our office as the Metropolitan Clearing House on January 29, 1971.

The work plans submitted by your letter of December 13, 1971 appear to be substantially the same as the earlier draft work plan. This office has received no unfavorable comment and the draft environmental statements indicate only favorable impact on the area.

The El Paso Council of Governments has reviewed the draft work plans and environmental statements. We re-affirm our endorsement of the work plan and agree with the Soil Conservation Service assessment that no adverse environmental impact is probable.

Cordially,

Leslie G. Smyth
Executive Director

LRB:LGS/dj

cc: Mr. James Lynch
P. O. Box 182
Dell City, Texas 79837

Honorable Doyle L. Ziler
Hudspeth County Judge

Mr. Walter Tibbitts III
State Clearing House Coordinator

Honorable Allen Hill
Mayor, Dell City