

# MINED LANDS INVENTORY, INDUSTRIAL MINERALS, SOUTH TEXAS

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Appendix 3. Texas Mined Lands Data Base (on floppy disk).

Appendix 4. U. S. Geological Survey topographic maps and index for South Texas.

Appendix 5. Priority site ownership.

# **MINED LANDS INVENTORY, INDUSTRIAL MINERALS, SOUTH TEXAS**

## **ABSTRACT**

The Bureau of Economic Geology, under an interagency cooperative contract with the Railroad Commission of Texas, conducted a comprehensive inventory of abandoned and active mining operations across 48 counties in South Texas. Project objectives were to characterize potential reclamation, or priority, sites, to create a surface-mining data base of industrial minerals, and to provide data to meet future legislative and regulatory needs.

Comprehensive procedures were established for identification and evaluation of mined lands using U.S. Geological Survey topographic maps, black-and-white and color-infrared aerial photographs, on site surveys, and low-altitude flyovers. The site location, mineral commodity, and relative size were recorded on a Mined Lands Inventory Form (MLIF) for each site greater than 2 acres in size. Data on health, safety, and environmental aspects were recorded for all priority sites. All data were entered into the Texas Mined Land Data Base (TMLDB), a computer data base that follows the format of the MLIF. Locations of all inventoried sites are shown on over 400 topographic maps.

In South Texas, 4,735 mined sites were identified, 2,839 greater than 2 acres in size, 1,878 less than 2 acres in size, and 18 of undetermined size. Among the sites larger than 2 acres, 1,328 are abandoned, 1,198 are active, and 313 are reclaimed. Approximately 100,000 acres have been disturbed by surface mining; about 70,000 acres were disturbed by sand and gravel mining, 15,000 acres by caliche mining, and 8,000 acres by limestone quarrying.

Bexar, Colorado, De Witt, Victoria, and Travis Counties contain 43 percent of the sites larger than 2 acres. Colorado, De Witt, and Victoria contain dominantly sand and gravel pits, whereas Bexar and Travis contain both sand and gravel pits and



limestone quarries. De Witt and Colorado Counties contain the most abandoned mined sites and Bexar and Karnes the most active sites. Few mined sites occur in coastal counties north of the Rio Grande Valley.

Approximately 90 priority sites were identified on the basis of size, presence of a highwall or wetland, proximity to public roads and populated areas, and surrounding urban land use. Priority sites occur in 18 of the 48 South Texas counties, the largest number (27) being in Colorado County. Because urban reclamation (development) is such an effective and rapid process, relatively few priority sites are located in metropolitan areas.

## INTRODUCTION

Surface mining of industrial minerals is a major mining activity in Texas. In 1988, for example, production of crushed stone and sand and gravel was 81 and 51 million short tons, at a value of \$293 and \$193 million, respectively, making Texas among the nation's top-ranking producers of these commodities. Texas also ranks among the top ten states in acreage disturbed by surface mining of industrial minerals (National Research Council, 1979).

Unreclaimed mined lands can become health, safety, and environmental hazards. For example, 3 of the 27 sites in the 1988 Texas Superfund Registry are located in abandoned sand and gravel and uranium pits (Texas Water Commission, 1989). Accidents in abandoned mines, pits, and quarries injure or kill many individuals each year (Mine Safety and Health Administration, undated), and erosion and sedimentation from mined sites can increase the incidence of flooding, decrease the quality of surface water, reduce the capacity of reservoirs, remove topsoil, and harm fish and wildlife (Soil Conservation Service, 1976). Thus, to address these potential problems an inventory of mined lands in South and East Texas was initiated in June 1988 under



an interagency cooperative contract with the Railroad Commission of Texas, the state regulatory agency for surface mining in Texas.

As a first phase, a comprehensive inventory of abandoned and active industrial-mineral mines in 48 South Texas counties (fig. 1) was conducted to characterize, on the basis of health, safety, and environmental considerations, potential reclamation sites, to create a surface-mining data base of industrial minerals, and to provide data to meet future legislative and regulatory needs. A second phase of the study will extend the inventory to an 84-county area in East Texas (fig. 1).

## PREVIOUS STUDIES

Prior to this study, there was no up-to-date, comprehensive inventory of abandoned and active mining operations in South Texas. Published mineral resource evaluations that cover all or part of South Texas include reports and maps by Phillips (1914), Parkinson and Barnes (1946), Perkins and Lonsdale (1955), Dietrich and Lonsdale (1958), Maxwell (1962), Rhodda and others (1966), Garner (1967), and Garner and others (1979). An unpublished inventory of Texas mines, pits, and quarries (Groat, 1973) is on open file at the University of Texas Bureau of Economic Geology. The Railroad Commission of Texas, Surface Mining and Reclamation Division has also completed preliminary surveys of abandoned coal (SMRD, undated) and non-permitted uranium mines (SMRD, written communication, 1989) in South Texas.

## METHODOLOGY

The inventory of mining operations in South Texas consisted of site identification and data acquisition. Inventory data were recorded on a form designed for this project, the Mined Lands Inventory Form (MLIF) (appendix 1). A complementary manual describes each field of the inventory form, explains codes, and





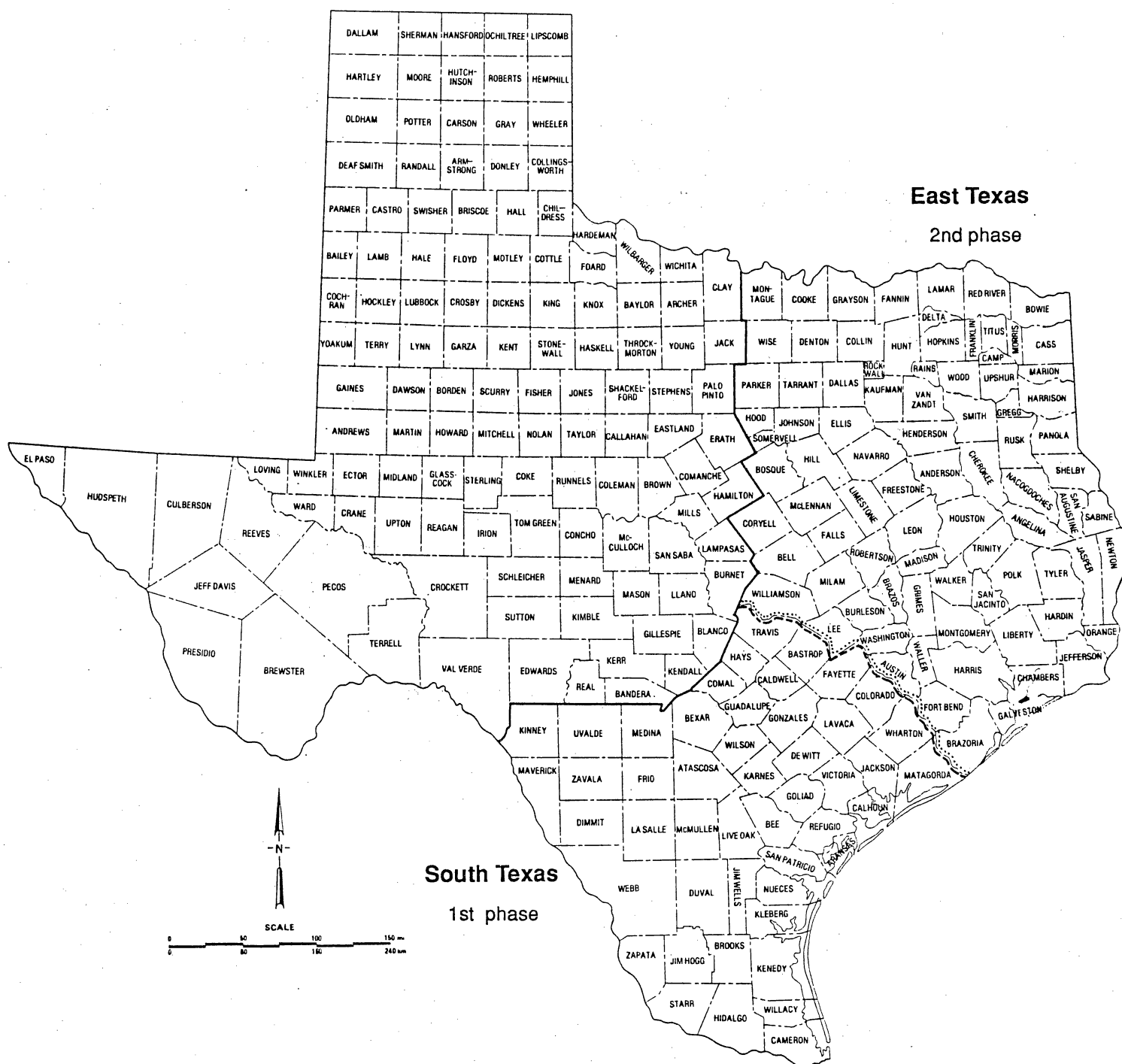


Figure 1. Inventory study areas for East and South Texas



defines key words (appendix 2). Inventory data were hierarchically divided into levels 1A, 1B, and 2, where each level represents greater detail of information about each mined site. Data were entered on the MLIF and recorded in a computer data base, the Texas Mined Lands Data Base (TMLDB), which follows the format of the MLIF. The MLIF and TMLDB contain data on site location and health, safety, and environmental characteristics. The MLIF contains 38 information fields divided into 4 sections: general information, remarks, health and safety considerations, and environmental considerations. It was adapted from forms used in an inventory and environmental evaluation of abandoned coal mines in North-Central Texas (Finley and others, 1979) and in federal mined-land inventories (Office of Surface Mining, 1984). Final definition of the MLIF was achieved in cooperation with the SMRD. The Texas Mined Lands Data Base resides on a VAX 11/780 computer at the Bureau of Economic Geology. All computerized data will be copied to MS-DOS floppy disks and translated to RCT Reflex format for use by the SMRD (appendix 3). Locations of all inventoried sites are shown on 417 topographic maps (appendix 4).

Initial identification, location, and inventory of mined sites was made using U.S. Geological Survey topographic maps (inventory level 1A). Sites smaller than 2 acres were not inventoried. The abandoned, active, or reclaimed status of each site greater than 2 acres was determined from aerial photographs (inventory level 1B). Health, safety, and environmental criteria, developed jointly with the SMRD, were then used to determine if sites were priority sites (potential candidates for reclamation). Field visits were made to confirm the characteristics of each potential priority site, and a site inventory was completed at level 2 for the selected priority sites.



## Identification of Mined Sites

### Topographic maps

Prior to entry on the MLIF, mined sites were identified from symbols, labels, and patterns on U.S. Geological Survey (USGS) topographic maps at a scale of 1:24,000 (7.5-minute quadrangles). Symbols on the topographic maps depict mines, pits, tunnels, shafts, dumps, tailings, and disturbed lands and were used to identify mined sites. Named mine dumps and cultural features, for example, "Quarry Park", were obviously active or abandoned mined sites. Specific map patterns for relief, woodland, and cultural features were used to identify abandoned mined sites. Relief patterns include closely spaced (highwall) or depression (pit) topographic contours and contours that follow straight lines or right-angle bends, indicating man's influence. Many of these patterns are located adjacent to roads, airports, or other features where road metal or aggregate was likely used in construction. Irregularly shaped or conical hills anomalous to surrounding landforms were identified as possible mine dumps and cleared areas of woodlands along crests of hills were designated as possible mined sites. Cultural features such as abandoned railroad lines and spurs and elevated abandoned haul roads were also useful in locating abandoned mined lands.

In the initial survey of USGS topographic maps, all potential sites were identified, regardless of size; however, only sites greater than 2 acres were inventoried. Identification of sites less than 2 acres was simplified because a pit or quarry shown on topographic maps by only a symbol (no mine outline or topographic expression) was commonly less than 2 acres (Thompson, 1988). Mined sites smaller than 2 acres were classified as below threshold (BT).



## Aerial photographs

The most recent aerial photographs available were used in classification and description of mined sites. Smaller scale, more expensive color-infrared photographs were purchased in monoscopic coverage, whereas larger scale, inexpensive black-and-white photographs were purchased in stereoscopic coverage.

Aerial photographs used in the site inventory include:

- (1) Color-infrared photographs at a scale of 1:58,000 purchased from the Agricultural Conservation and Stabilization Service (ASCS) of the U.S. Department of Agriculture. These photographs were taken between 1981 and 1988 as part of the National High Altitude Photography (NHAP) program and were used for most of the study area.
- (2) Black-and-white photographs at a scale of 1:24,000 purchased from the State Department of Highways and Public Transportation (TXHWY). These photographs were taken between 1979 and 1988 and were the primary source for site evaluation in Bexar, Comal, Hays, Matagorda, Nueces, San Patricio, Travis, and Victoria Counties.
- (3) Color-infrared photographs at a scale of 1:60,000 taken in 1987 by the National Aeronautics and Space Administration (NASA) on flight 88-016. These photographs are the property of the Texas Natural Resource Information System (TNRIS), and were the primary source for site evaluation in most of Cameron, Hidalgo, and Starr Counties.
- (4) Color-infrared photographs at a scale of 1:12,000 taken along the Colorado River between La Grange and Columbus in 1982. These photographs are the property of the Lower Colorado River Authority (LCRA), and were the primary source for site evaluation in most of northern Colorado and southern Fayette Counties.





- (5) Black-and-white photoindices (1979-1988) at a scale of 1:72,000 were purchased from the TXHWY for Bexar, Comal, Matagorda, Nueces, San Patricio, Travis, Victoria, and Wharton Counties. Each index covers the entire county and was scanned for recent mining activity.
- (6) U.S. Border Color Image Maps at a scale of 1:25,000 made by the U.S. Geological Survey for the U.S. Customs Service and published in 1982 and 1983. These maps were made from color-infrared photographs for land within 5 to 10 miles of the U.S. border and were used for sites along the Rio Grande Valley.

### Site Inventory

Site inventory data, as recorded on information fields in the MLIF, were hierarchically divided into levels of completion, 1A, 1B, and 2. All abandoned, active, and reclaimed sites greater than 2 acres in size were completed at levels 1A and 1B (table 1). All priority sites were completed at level 2, which consisted of inventory completion of as many fields as possible on the MLIF (appendix 1).

#### Level 1A

Upon identification on a USGS topographic map, a site was coded on the MLIF using six fields in the general information and remarks sections (level 1A, table 1). At this level of inventory, a unique identification number was recorded and latitude and longitude were determined for the approximate geographic center of each site. Commodity and size category were also determined to allow calculation of approximate mined acreage. Commodities for South Texas are listed in the TMLDB Manual (appendix 2). Major commodities are sand and gravel, caliche, and limestone. Mine size was estimated with an acetate template placed over the site as mapped on the



USGS topographic map. Three sizes were defined: small (greater than 2 to less than or equal to 10 acres), medium (greater than 10 to less than 200 acres), and large (greater than or equal to 200 acres). To complete level 1A inventory, data, name of preparer, and the date of preparation are entered on the MLIF.

## Level 1B

Level 1B inventory consisted of three steps: evaluation of mine status, determination of whether or not a site is within 1/2 mile of a public road, and determination of presence or absence of a highwall or wetland (table 1). Only abandoned sites were evaluated for proximity to a public road and presence of a highwall or wetland.

Mined sites larger than 2 acres were classified as abandoned, active, or reclaimed on the basis of aerial photographic interpretation. The boundaries of each mined site, outlined on topographic maps in level 1A inventory, were verified and updated if necessary. For most sites, revised mine boundaries were transferred directly to the topographic map from aerial photographs using a Bausch & Lomb Stereo Zoom Transfer Scope.

A site was designated as active if there was photographic evidence that mining activity, such as excavation, milling, or processing, had taken place in the recent past. Determination of active mine status relied on the following observations made by the photointerpreter:

- (1) High albedo or absence of vegetation in the excavation, adjacent to an access shaft, and/or along access roads. This criterion was less definitive in the drier southern and western portions of the project area, where revegetation of abandoned sites proceeds at a slower rate.



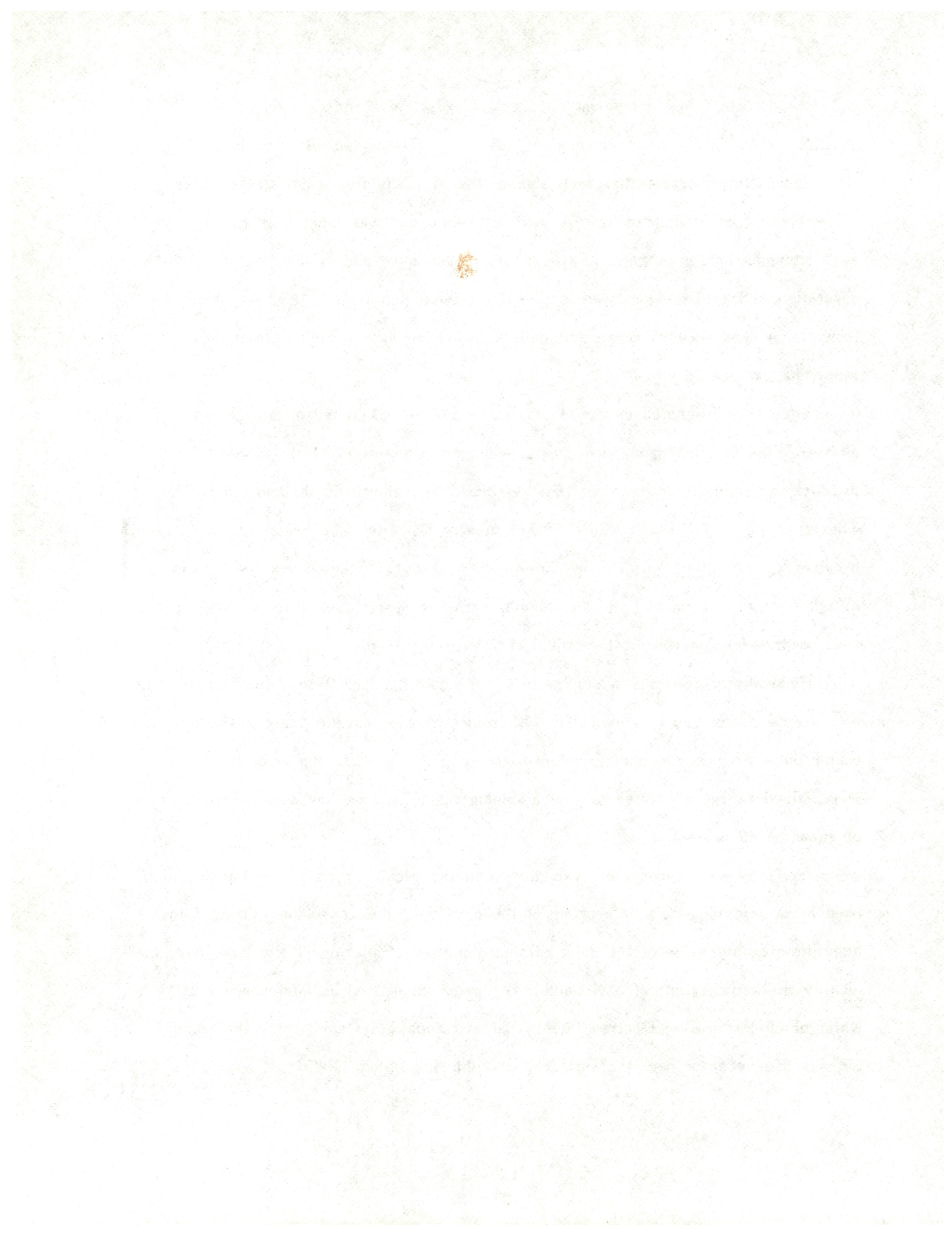
(2) Mining equipment observed in excavations and on haul roads, or railroad cars observed along sidings. If this equipment was observed on mined land with a high albedo, then the site was classified as active.

A site was designated as reclaimed if 1) land use was other than mining such as a shopping center or park, 2) the site had been filled and graded, and/or 3) native vegetation and gentle slopes were apparent on aerial photographs. Key words for reclamation type such as urban and natural are found in the TMLDB Manual (appendix 2).

Sites not designated as active or reclaimed were designated as abandoned and all such sites greater than 2 acres were evaluated, using aerial photographs, for proximity to public roads and for the presence of a highwall or wetland (table 1). The proximity criterion, a distance of 1/2 mile or less from a public road, was chosen because it was judged to be a distance easily walked by potential visitors; it was measured from any part of the site boundary to the nearest public road. Public roads were identified using the most recent TXHWY county maps.

Highwalls are obvious safety hazards, especially if adjacent to a public road. The presence of a highwall was indicated if the sides of an excavation cast a shadow visible on a single aerial photograph or stereoscopic image. In the field, the highwall was defined as the excavated face of a mining operation that has a slope greater than or equal to 45 degrees.

Wetlands were chosen for evaluation primarily because of the potential hazard if used as a swimming hole or because of the potential value to wildlife. Changes in hue, chroma, and value of the color-infrared signature of the mined site were used to identify the aerial extent of a wetland. Wetlands are defined as land covered by water or land transitional between terrestrial and aquatic systems where the water table is usually at or near the surface (Cowardin and others, 1979).



## Level 2

Level 2 inventory is the completion of the MLIF to the fullest extent possible. All available geographic, geologic, operator, end-use, health and safety, and environmental data are recorded. In addition to topographic maps and aerial photographs, data sources used were: geologic, county highway, planimetric, color image, land-use and land-cover, flood, water-well location, and surface-water intake maps, mineral producers lists, county soil survey reports, unpublished Bureau materials on mined lands, and published reports. Specific subdivisions and information fields completed at level 2 not completed at levels 1A and 1B are surrounding land use, wetlands classification, susceptibility to flooding, and nearest public water supply and aquifer.

### Selection of Priority Sites

All abandoned mined sites within 1/2 mile of a public road and having a highwall or wetland were considered for priority status. These sites, called potential priority sites, were further evaluated using proximity to populated areas and land-use criteria (table 2). A populated area was defined as a residential subdivision, an apartment complex, or 10 or more closely spaced dwellings along a street, road, or highway, where close spacing meant that most dwellings were within 200 ft of each other. Sites beyond 1 mile of a populated area were eliminated from further evaluation. Sites within 1 mile of a populated area were examined in a contiguous 1/2-mile area of the site for compliance with land-use criteria. Land use was classified using a modification of the U.S. Geological Survey land-use and land-cover classification for use with remote sensor data (Anderson and others, 1976; Loelkes and others, 1983) (appendix 2, table 5) and was determined on topographic maps and





aerial photographs with the aid of USGS land-use and land-cover maps. The land use of highest priority for this project was urban. Only those sites having residential, school, or recreational land use (park, recreation area, playground, zoo, golf course, public garden, or fairground) within 1/2 mile of the site were classified as potential priority sites. Potential status was also assigned to sites that contained waste materials or were large in size.

All inventory data for potential priority sites were verified in the field, and sites were eliminated or given priority status as appropriate. A reasonable effort was made to gain access to or approach the site boundary as closely as possible. Sites not accessible by land were flown over at low altitude (500 to 1,000 ft). From these data, a list of priority sites was compiled (table 3) and the MLIF was filled out for inventory level 2 as completely as possible. Selected sites that lacked a highwall or wetland but contained waste materials were also assigned priority status. Finally, at the request of the SMRD, all abandoned mined sites greater than 200 acres in size were also given priority status. The ownership of each priority site is presented in appendix 5 and was determined mainly from county tax, deed, or title records.

## RESULTS

### Sites Inventoried

In this study, 4,735 sites were identified and are tabulated by county on the basis of 7.5-minute quadrangle map (table 4). To facilitate data management, quadrangle boundaries instead of actual county boundaries were used to estimate county totals. A list of all quadrangles included in each county count and an alphabetical list of all quadrangles in the study area are given in tables 4 and 5. Among the 4,735 sites of all sizes, 35 percent, or 1,644, occur in Bexar (8.6%, 409).



Colorado (7.6%, 360), De Witt (6.9%, 326), Victoria (6.1%, 288), and Travis (5.5%, 261) Counties. Among the 2,839 sites greater than 2 acres, 43 percent, or 1,232, are found in Bexar (12.3%, 351), Colorado (10.3%, 295), De Witt (8.7%, 250), Victoria (6.5%, 187), and Travis (5.3%, 149) Counties. The total number of sites below threshold (BT) is 1,878 (table 4), and Medina (6.3%, 118), Travis (6.0%, 112), Duval (5.4%, 101), Victoria (5.4%, 101), and Hays (5.3%, 100) Counties contain the greatest percentages of these sites. In terms of mine status, abandoned sites total 1,328, active sites total 1,198, and reclaimed sites total 313 (table 6). De Witt and Colorado Counties contain the most abandoned sites, Bexar and Karnes the most active sites, and Bexar and Travis the most reclaimed sites (figs. 2 through 4).

#### Disturbed Acreage

Acreage estimates were made using the small, medium, and large size categories assigned in level 1A described above. A value of 10 acres was used for small sites. The acreage estimate for medium sites was split into two parts based on experience gained during estimation of site areas, 20 acres for two-thirds of the sites and 150 acres for the remaining third. Large sites were assumed to be 220 acres in size. Acreage of below threshold sites was calculated using 1.5 acres per site. Using these size assumptions, we estimate that a grand total of 102,864 acres has been disturbed by surface mining in South Texas (table 6). Estimates of disturbed acreage by mine status are: abandoned mined sites--36,985 acres, active sites--52,980 acres, and reclaimed sites--10,082 acres (table 6). Below threshold sites total approximately 2,817 acres. Disturbed acreage by mined commodity is estimated to be 69,500 acres for sand and gravel, 15,060 acres for caliche, 8,334 acres for limestone, and 7,153 acres for all other commodities (table 6).



### Mined Sites by Geologic Unit

The geologic unit of the mined commodity was determined for over 80 percent of the numbered sites (table 7). Most of the mined sites lie in Quaternary sand and gravel deposits along rivers and streams, consisting of fluvial terrace deposits and alluvium, and in the older Goliad and Willis Formations. The Leona, Lissie, and Uvalde gravels also contain many mine sites. Relatively few sites occur in limestone units (Glen Rose, Edwards, and Austin).

### Site Distribution

Bexar, Colorado, De Witt, Victoria, and Travis Counties have the highest number of mined sites in the study area (table 4, figs. 2 through 4). Relative distribution of abandoned, active, and reclaimed sites is shown on individual, large-scale maps for Bexar, Colorado, Victoria, and Travis Counties (figs. 5 through 8). In northern Bexar County, large, active limestone quarries predominate along the Balcones Escarpment (fig. 5). Numerous sand and gravel pits are aligned along tributary creeks of the San Antonio River. Clay pits in the Wilcox Group are common on the southeast side of the county. Colorado County has large deposits of sand and gravel in terrace and floodplain deposits along the Colorado River valley, shown by a dense, northwest-southeast trending cluster of mines (fig. 6) that extends into Fayette County. Other mined deposits lie in the Willis Formation in north-central Colorado County. Sand and gravel deposits in northern Victoria County are mined primarily from the Willis and Lissie Formations, composed of northwest-southeast trending Plio-Pleistocene fluvial deposits that occur on highlands paralleling the Guadalupe River (fig. 7). These deposits continue northwest into De Witt County, where they are extensively mined (figs. 2 and 3). Travis County has many sand and gravel pits along



the Colorado River valley, but also has many limestone quarries located in the northern and western part of the county along the Balcones Escarpment (fig. 8). Numerous sand and gravel and caliche pits occur in the Goliad Formation along the Rio Grande Valley; few mined sites occur in coastal counties north of the Valley (figs. 2 and 3). Caliche pits are particularly abundant in Bee, Karnes, and Goliad Counties.

Areal density of mining is presented in terms of number of sites 2 acres or more in size per quadrangle sector (table 8). Areas of densest mining occur in Fayette, Victoria, De Witt, Colorado, Travis, and Bexar Counties. Colorado and Victoria Counties have the greatest number of densely mined sectors. Nevertheless, sector statistics may not reflect actual disturbed acreage because a few large pits may cover more area than many small pits.

#### Reclaimed Sites

Most (41 percent) of the reclaimed sites identified in this study are in Bexar County (table 9, figs. 4 and 5). This reflects rapid growth in the San Antonio area, and corresponding urban reclamation. Reclaimed sites in Travis County make up an additional 19 percent of the total (figs. 4 and 8). No other counties contain more than 4 percent of the reclaimed sites. Other counties in the more populated eastern and southern parts of the study area that contain 3 or 4 percent of the reclaimed sites are Colorado, Fayette, Gonzales, De Witt, Victoria, Medina, Cameron, and Hidalgo (table 9).

#### Priority Sites

Approximately 90 priority sites were identified in field evaluation from an original list of approximately 300 potential priority sites. Key health, safety, and environmental characteristics have been tabulated for each priority site (table 3). Most priority sites are abandoned sand and gravel (72) and caliche (15) pits. Only five sites are





abandoned limestone quarries. Sites that contain highwalls total 58, and among these, 25 have highwalls that are considered unstable. Sites that contain wetlands total 57, and sites with both wetlands and highwalls number 32. Selected sites containing waste materials total eight and those larger than 200 acres number nine. All but 17 sites are completely or moderately vegetated, but most (75 percent) are visible from a public road. Over 80 percent of the priority sites lie within the recharge area of an aquifer. No sites had reasonable warning posted, but many were fenced and had "no trespassing" signs.

Priority sites occur in 18 of the 48 South Texas counties (fig. 8, table 3). The number of priority sites is highest in Colorado County (27), followed in decreasing order by Bexar, Hidalgo, Travis, Hays, Victoria, Cameron, Bee, Caldwell, Comal, Duval, Fayette, Guadalupe, Wharton, Bastrop, Matagorda, Medina, and Webb Counties. Because urban reclamation (development) is such an effective and rapid process, relatively few priority sites are located in metropolitan areas; only 11 and 15 occur in Travis and Bexar Counties, respectively.

## SUMMARY

This project was designed to identify for possible reclamation abandoned mined sites, or priority sites, and to inventory all mined sites in a 48-county area in South Texas. Mined sites were identified on U.S. Geological Survey topographic maps and aerial photographs. Site-specific information was recorded on a specially designed form, the MLIF, and entered into the Texas Mined Lands Data Base. Locations of all inventoried sites are shown on 417 topographic maps.

A total of 2,839 sites greater than 2 acres in size were identified in the study area, of which 1,328 are abandoned. All abandoned sites were examined for proximity (1/2 mile) to a public road and for the presence of a highwall or wetland. Sites close



to a public road and with a highwall or wetland were further examined for proximity to populated areas (within 1 mile) and surrounding urban land use (contiguous 1/2 mile area) to produce a short list of potential priority sites. Field visits were made to verify data for potential priority sites and to confirm their priority status. Priority status was also assigned to selected sites that lacked a highwall or wetland but contained waste materials, and to all large sites. A total of 93 priority sites (potential reclamation sites) were identified in 18 counties (table 3). The largest number (27) of priority sites is in Colorado County, where the mined commodity was sand and gravel. Relatively few sites occur in the metropolitan counties of Bexar (15) and Travis (11).

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Table 1. Levels 1A and 1B inventory consisted of completion of the MLIF fields listed below. All sites greater than 2 acres in size were completed at levels 1A and 1B. Priority sites were completed at level 2. A complete list of fields is given on the MLIF (appendix 1).

Level 1A inventory - sites over 2 acres are identified and coded on USGS 7.5 minute quadrangles, using the following fields:

- 1. County
- 2. Site No.
- 5. USGS 7.5 Quad. Name
- 8. Lat.-Long. of Site
- 18. Commodity
- 25.a.(1) Preparer

Level 1B inventory - geographic extent of sites is confirmed with aerial photographs, and the following fields are entered:

- 4.a. Active (Y/N)
- 4.c. Confirmed
- 4.d. Reclaimed
- 4.e. Type of Reclamation (if applicable)
- 4.f. Size Category
- 21. Mined area
- 22. Verification of Mine Status
- 23. Aerial Photos Used
- 25.a.(1) Preparer

If a site was abandoned (answer N in field 4a), the following level 1B fields were also filled out:

- 26.i. Presence of Highwall (Y/N)
- 27.j. Presence of Wetlands (Y/N)
- 31.c. Accessibility: site less than or equal to 0.5 mile from public road

Level 2 inventory - all available geographic, geologic, operator, end-use, health, safety, and environmental data are recorded, completing as many fields on the MLIF as possible.



Table 2. Steps in priority site selection process. If a site qualified for the criteria in a given step, then it was examined at the next step. If it did not qualify, it was eliminated from the selection process.

- Step 1. Determine if site is greater than 2 acres in size.  
(Level 1A inventory)
- Step 2. Determine if site is abandoned.  
(Level 1B inventory)
- Step 3. Determine if site has a highwall or a wetland and if site is within 0.5 mi of a public road.  
(Level 1B inventory)
- Step 4. Determine if site is within 1 mile of a populated area.
- Step 5. Determine if site has a land-use of residential, school, park, zoo, golf course, public garden, or fairground within 1/2 mile of the site.
- Step 6. Verify the characteristics listed in steps 1-5 by making a field visit to the site.
- Step 7. Classify site as priority and complete MLIF to Level 2.



Table 3. Priority site characteristics.

County	Site Number	Commodity	Type of Mine	Disturbed Area (acres)	Mine in Recharge Area of Aquifer	Max. Height of Highwall (feet)	Stability of Highwall	Type of Wetland <sup>1</sup>
Bastrop	021SML901	Sand & Gravel	Pit	8	Carrizo-Wilcox	5	Stable	None
Bee	025BEE702	Caliche	Pit	11	Lissie	0	na <sup>4</sup>	Pond
Bee	025BEW901	Caliche	Pit	18	Goliad	15	Unstable	None
Bexar	029CUL202	Sand & Gravel	Pit	61	No	10	Stable	None
Bexar	029CUL304	Sand & Gravel	Pit	23	No	12	Unstable	None
Bexar	029LAC503	Sand & Gravel	Pit	3	No	8	Unstable	Marsh
Bexar	029SCZ202	Sand & Gravel	Pit	6	No	12	Unstable	None
Bexar	029SCZ206	Sand & Gravel	Pit	18	No	10	Unstable	None
Bexar	029SCZ208	Sand & Gravel	Pit	16	No	15	Stable	None
Bexar	029SCZ209	Sand & Gravel	Pit	22	No	8	Unstable	None
Bexar	029SCZ502	Limestone-Cr	Quarry	10	No	20	Stable	None
Bexar	029SCZ503	Sand & Gravel	Pit	15	No	15	Unstable	None
Bexar	029STN504	Sand & Gravel	Pit	9	No	0	na	Pond
Bexar	029STN601	Sand & Gravel	Pit	19	No	0	na	Pond
Caldwell	055LKN801	Sand & Gravel	Pit	3	Leona	40	Stable	Swamp
Caldwell	055MDL101	Sand & Gravel	Pit	4	No	12	Stable	None
Cameron	061EAB701	Sand & Gravel	Pit	7	Chicot	8	Unstable	None
Cameron	061HAR401	Sand & Gravel	Pit	17	Chicot	6	Stable	Lake
Cameron	061WIS701	Caliche	Pit	20	Chicot	7	Stable	Lake
Colorado	089ALL102	Sand & Gravel	Strip	10	Chicot	10	Stable	Pond
Colorado	089ALL403	Sand & Gravel	Strip	90	Chicot	0	na	Pond
Colorado	089ALL405	Sand & Gravel	Pit	7	Chicot	10	Unstable	Pond
Colorado	089ALL414	Sand & Gravel	Strip	13	Chicot	0	na	Pond
Colorado	089ALT404	Sand & Gravel	Pit	14	Chicot	10	Stable	Marsh
Colorado	089ALT405	Sand & Gravel	Pit	12	Chicot	0	na	Swamp
Colorado	089ALT504	Sand & Gravel	Pit	46	Chicot	10	Unstable	Pond
Colorado	089ALT505	Sand & Gravel	Pit	5	Chicot	0	na	Swamp
Colorado	089ALT801	Sand & Gravel	Strip	35	Chicot	0	na	Swamp
Colorado	089ALT802	Sand & Gravel	Pit	37	Chicot	0	na	Marsh
Colorado	089ALT805	Sand & Gravel	Pit	4	Chicot	6	Unstable	Swamp
Colorado	089COL201	Sand & Gravel	Strip	53	Chicot	10	Stable	Pond

table 3, part 1



Site Number	Vegetation Density in Pit	Waste Dumping	Accessibility <sup>2</sup>	Posted	Visibility <sup>3</sup>	Human Visitation	Remarks
021SMI901	Complete	None	No	na	R/B	0-25%	
025BEE702	Sparse	None	F	N	PR, R/B	No	
025BEW901	Sparse	Trash, Garbage	R, TR, F	na	PR, R/B	51-75%	Construction debris.
029CUL202	Moderate	None	R, F, G	Y	PR, R/B	0-25%	
029CUL304	Complete	None	F	N	PR, R/B	No	Part of mined area is reclaimed—urban.
029LAC503	Moderate	None	R, F	N	PR	0-25%	
029SCZ202	Moderate	Const. Debris	R, RR, TR, F, G	N	PR, R/B	0-25%	Highwall next to road.
029SCZ206	Sparse	Trash	R, G, F	N	PR, R/B, PL	26-50%	Construction debris, next to trailer park.
029SCZ208	Moderate	None	R, F, G	Y	PR	0-25%	
029SCZ209	Moderate	None	G, F	N	PR, R/B	No	
029SCZ502	Moderate	Const. Debris	R, TR	Y	R/B	26-50%	
029SCZ503	Sparse	None	R, TR, F, G	Y	No	51-75%	
029STN504	Complete	None	R, F, G	Y	PR, R/B	0-25%	
029STN601	Complete	None	F	na	No	No	
055LKN801	Complete	Trash	F	Y	PR, R/B	0-25%	Construction debris, highwall next to road.
055MDL101	Complete	Trash	TR	N	PR, R/B	26-50%	Construction debris.
061EAB701	Moderate	Clean fill	R, G	N	PR, R/B, PL	0-25%	Next to public park.
061HAR401	Complete	None	R, TR	N	PR, R/B	0-25%	Adjacent to Lakewood Village.
061WIS701	Complete	None	R, TR, F, G	Y	No	0-25%	
089ALL102	Complete	None	R, F	N	PR, R/B	0-25%	
089ALL403	Complete	None	R, F, G	N	PR, R/B	0-25%	
089ALL405	Moderate	None	F	Y	PR, R/B	None	
089ALL414	Complete	None	R, TR, F, G	N	No	0-25%	
089ALT404	Moderate	None	R, F, G	N	PR, R/B	0-25%	
089ALT405	Complete	Constr. Debris	R, G, F	N	PR, R/B	0-25%	
089ALT504	Moderate	None	R, F, G	N	PR, R/B	0-25%	
089ALT505	Moderate	None	RR, F	N	No	No	
089ALT801	Sparse	None	R, F, G	N	PR, R/B	0-25%	
089ALT802	Moderate	None	R, F, G	N	R/B	0-25%	Small amount of trash.
089ALT805	Moderate	None	F	N	PR, R/B	No	
089COL201	Complete	Trash	R, F, G	N	PR, R/B	0-25%	Metal containers
089COL204	Complete	None	R, F, G	Y	PR, R/B	0-25%	

table 3, part 2

Colorado	089COL204	Sand & Gravel	Strip	115	Chicot	0	na	na
Colorado	089COL214	Sand & Gravel	Strip	32	Chicot	8	Stable	Marsh
Colorado	089COL501	Sand & Gravel	Strip	351	Chicot	10	Stable	Ponds
Colorado	089COL606	Sand & Gravel	Strip	88	Chicot	10	Stable	Pond
Colorado	089COL902	Sand & Gravel	Strip	460	Chicot	0	na	Lake
Colorado	089EAL102	Sand & Gravel	Pit	26	Chicot	15	Unstable	None
Comal	091NBE101	Sand & Gravel	Pit	10	Leona	15	Unstable	None
Comal	091NBE201	Sand & Gravel	Pit	8	Leona	20	Stable	Pond
Duval	131FRN701	Sand & Gravel	Pit	14	Evangeline	20	Unstable	Marsh
Duval	131REA602	Sand & Gravel	Pit	37	Evangeline	15	Stable	None
Fayette	149WEP501	Sand & Gravel	Strip	95	No	0	na	Pond
Guadalupe	187MCQ301	Sand & Gravel	Pit	3	Alluvium	40	Unstable	None
Guadalupe	187SEG201	Sand & Gravel	Pit	27	Edwards	8	Stable	Swamp
Hays	209BUD102	Sand & Gravel	Pit	18	Terrace Dep.	20	Stable	Swamp
Hays	209BUD103	Sand & Gravel	Pit	10	Terrace Dep.	10	Stable	Swamp
Hays	209SMN301	Limestone-Cr	Quarry	39	Edwards	75	Unstable	Pond
Hays	209SMN302	Sand & Gravel	Pit	10	Leona	20	Unstable	None
Hidalgo	215ALT501	Caliche	Pit	13	Evangeline	25	Stable	Lake
Hidalgo	215ALT901	Caliche	Pit	13	Evangeline	10	Stable	Marsh
Hidalgo	215ALT904	Caliche	Pit	2	Evangeline	20	Stable	Lake
Hidalgo	215ALT906	Caliche	Pit	3	Evangeline	5	Stable	Pond
Hidalgo	215ALT907	Caliche	Pit	3	Evangeline	0	na	Pond
Hidalgo	215EDI901	Caliche	Pit	11	Chicot	15	Unstable	Marsh
Hidalgo	215LIS604	Caliche	Pit	11	Evangeline	10	Unstable	Pond
Hidalgo	215LJO101	Caliche	Pit	2	Evangeline	0	na	Marsh
Hidalgo	215LJO102	Caliche	Pit	5	Evangeline	0	na	Marsh
Hidalgo	215MER901	Caliche	Pit	50	Chicot	10	Stable	Swamp
Hidalgo	215MIS201	Caliche	Pit	14	Chicot	13	Stable	Lake
Medina	325LAC501	Sand & Gravel	Pit	4	No	5	Stable	Ponds
Travis	453BUD206	Sand & Gravel	Pit	6	Terrace Dep.	8	Stable	None
Travis	453BUD207	Sand & Gravel	Pit	5	Terrace Dep.	12	Stable	None
Travis	453MON404	Sand & Gravel	Pit	4	Terrace Dep.	20	Stable	None
Travis	453MON504	Sand & Gravel	Pit	4	Terrace Dep.	7	Stable	None
Travis	453MON601	Sand & Gravel	Pit	11	Terrace Dep.	25	Unstable	None

table 3, part 1



089COL214	Moderate	None	R, F	N	PR, R/B	0-25%	
089COL501	Moderate	None	R, F, G	N	PR, R/B, PL	0-25%	City park, golf course, fairground and school within 0.5 mile.
089COL606	Moderate	None	R, F	N	PR, R/B	0-25%	
089COL902	Moderate	None	R, F, G	Y	PR, R/B	0-25%	
089EAL102	Complete	Const. Debris	R, F	N	PR, R/B	0-25%	
091NBE101	Moderate	Trash, Tires	R, F, G	N	PR, R/B	0-25%	Construction debris; Picnic area across the river.
091NBE201	Complete	None	F, G	N	PR, R/B	0-25%	
131FRN701	Sparse	None	R, F, G	N	PR, R/B	0-25%	
131REA602	Moderate	Garbage, Trash	R, F, G	N	No	0-25%	
149WEP501	Moderate	None	R, F, G	Y	PR, R/B	0-25%	
187MCQ301	Complete	None	TR	N	PR, R/B	0-25%	Owner would like pit reclaimed.
187SEG201	Moderate	Garbage	R, F, G	Y	PR	0-25%	
209BUD102	Complete	None	R, F, G	N	PR	0-25%	
209BUD103	Complete	None	F	N	PR, PL	No	
209SMN301	Moderate	None	R, F	Y	No	0-25%	
209SMN302	Moderate	None	R, F, G	N	PR, R/B	0-25%	
215ALT501	Complete	Trash, Fill	R, F, G	Y	PR, R/B	0-25%	
215ALT901	Complete	None	No	Y	PR, R/B	No	
215ALT904	Sparse	None	R	N	PR, R/B	0-25%	
215ALT906	Complete	None	F	N	PR, R/B	0-25%	Part of pit used for stock tank.
215ALT907	Complete	None	F, G	Y	No	No	
215EDI901	Sparse	Garbage, Tires	R, TR	N	PR, R/B	26-50%	Construction debris and rusted drums and cans.
215LIS604	Complete	None	F, G	N	PR	No	Adjacent to public school.
215LJO101	Sparse	None	R, TR	N	R/B	0-25%	
215LJO102	Moderate	Fill, Const. Debris	R, TR	N	PR, R/B	26-50%	
215MER901	Complete	None	TR	N	PR, R/B	0-25%	
215MIS201	Moderate	None	R, TR, F, G	Y	PR, R/B	0-25%	Abandoned equipment in pit area.
325LAC501	Complete	None	R, F, G	na	PR	0-25%	School and park within 0.5 mile.
453BUD206	Sparse	None	R, TR, F, G	Y	No	26-50%	
453BUD207	Sparse	None	R, F, G	Y	No	26-50%	
453MON404	Complete	None	None	N	PR, R/B, PL	No	Highwall next to road — no fence
453MON504	Complete	Cars, Fill	F	N	No	0-25%	Construction debris.
453MON601	Complete	Trash, Garbage	R, F	N	PR, R/B	0-25%	Construction debris. Adjacent to day care center

table 3, part 2

Travis	453MON701	Sand & Gravel	Pit	19	Terrace Dep.	30	Unstable	Marsh
Travis	453OAK902	Sand & Gravel	Pit	27	Terrace Dep.	20	Stable	None
Travis	453OAK904	Sand & Gravel	Pit	11	Terrace Dep.	30	Unstable	Swamp
Travis	453PAC302	Limestone-Cr	Quarry	3	Middle Trinity	12	Unstable	None
Travis	453PAC701	Limestone-Cr	Quarry	2	Middle Trinity	20	Unstable	None
Travis	453PFW701	Limestone-Cr	Quarry	17	Edwards	30	Stable	Lake
Victoria	469MIV808	Sand & Gravel	Pit	22	Chicot	0	na	Marsh
Victoria	469NUR405	Sand & Gravel	Pit	4	Chicot	0	na	Swamp
Victoria	469NUR506	Sand & Gravel	Pit	5	Chicot	0	na	Pond
Wharton	481EGY801	Sand & Gravel	Pit	29	Chicot	6	Unstable	Pond
Wharton	481EGY802	Sand & Gravel	Pit	9	Chicot	0	na	Marsh

These sites listed because of large size

Colorado	089ALL410	Sand & Gravel	Strip	520	Chicot	0	na	Pond
Colorado	089ALL701	Sand & Gravel	Strip	545	Chicot	0	na	Pond
Colorado	089ALL801	Sand & Gravel	Strip	275	Chicot	0	na	Pond
Colorado	089ALL802	Sand & Gravel	Strip	522	Chicot	0	na	Pond
Colorado	089ALT102	Sand & Gravel	Strip	454	Chicot	10	Stable	Pond
Colorado	089COL504	Sand & Gravel	Strip	307	Chicot	0	na	Pond
Colorado	089COL602	Sand & Gravel	Strip	373	Chicot	0	na	Pond
Fayette	149LED917	Sand & Gravel	Pit	384	No	0	na	Ponds
Matagorda	321MAT301	Sulfur	UM-Solution	1440	Gulf Coast	na	na	na

These sites listed because of the presence of waste dumping

Bexar	029HLT601	Sand & Gravel	Pit	8	No	0	na	None
Bexar	029THM501	Sand & Gravel	Pit	450	Carrizo	na	na	na
Bexar	029THM503	Sand & Gravel	Pit	5	Carrizo	0	na	None
Bexar	029TWL501	Sand & Gravel	Pit	4	No	0	na	None
Colorado	089COL202	Sand & Gravel	Strip	142	Chicot	0	na	None
Colorado	089COL208	Sand & Gravel	Pit	3	Chicot	0	na	None
Hidalgo	215MIS301	Caliche	Pit	4	Chicot	0	na	na
Webb	479LAW901	Sand & Gravel	Pit	75	Sparta-Laredo	0	na	None

453MON701	Complete	None	R, TR	N	No	0-25%	Overhangs on highwall.
453OAK902	Complete	Trash	R	N	No	0-25%	Construction debris, rusted drums.
453OAK904	Sparse	Garbage	R, F, G	N	PR, R/B	0-25%	Construction debris.
453PAC302	Complete	None	R, TR	N	PR, PL	0-25%	Located in Pace Bend Park.
453PAC701	Sparse	None	R, TR, F, G	N	PR, R/B	26-50%	Land is for sale.
453PFW701	Moderate	None	R, TR	N	PR, R/B	26-50%	
469MIV808	Sparse	None	R, F, G	N	No	0-25%	
469NUR405	Moderate	None	R, F	N	PR, R/B	0-25%	
469NUR506	Moderate	None	R, F, G	N	PR, R/B	0-25%	
481EGY801	Complete	None	R, TR, F, G	N	PR, R/B	0-25%	
481EGY802	Moderate	None	R, F, G	Y	R/B	0-25%	School within 0.5 mile

These sites listed because of large size

089ALL410	Complete	None	R, F	N	PR, R/B	0-25%	Small amount of trash.
089ALL701	Complete	None	R, F, G	N	R/B	0-25%	
089ALL801	Complete	None	R, TR, F, G	N	PR	0-25%	Partially reclaimed.
089ALL802	Complete	None	R, F, G	N	PR, R/B	0-25%	
089ALT102	Complete	None	R	N	PR, R/B	0-25%	
089COL504	Complete	None	R, TR, F, G	N	R/B	0-25%	
089COL602	Moderate	None	R, RR, F, G	N	PR, R/B	0-25%	
149LED917	Complete	None	R, TR	na	PR	0-25%	Large disturbed area.
321MAT301	na	na	na	na	na	na	Site not studied in detail.

These sites listed because of the presence of waste dumping

029HLT601	Moderate	Trash	R	N	PR	26-50%	Construction debris.
029THM501	na	Sulfuric Acid Tars	R	na	PR, R/B	na	Public water well within 0.5 mile.
029THM503	Complete	Trash, Tires	R, F, G	N	PR, R/B	0-25%	
029TWL501	Sparse	Trash, Garbage	R, F, G	na	R/B	26-50%	Construction debris.
089COL202	Complete	Trash	R, F, G	N	PR, R/B	0-25%	Construction debris.
089COL208	Sparse	Cars	R, G	N	PR, R/B	26-50%	Construction debris.
215MIS301	Sparse	Trash, Garbage	R, TR	Y	No	51-75%	Construction debris.
479LAW901	Moderate	Trash, Garbage	R, TR	N	PR, R/B	51-75%	Const. debris, Tires. Runoff enters Rio Grande River.



<sup>1</sup> Marsh — temporarily flooded  
Swamp — permanently flooded  
Pond — palustrine  
Lake — lacustrine  
(definitions adapted from Cowardin and others, 1979)

<sup>2</sup> R = road  
RR = railroad  
TR = trail  
F = fenced  
G = gated

<sup>3</sup> PR = public road  
R/B = residence and/or business  
PL = public land

<sup>4</sup> na = information is either not applicable or not available

Table 4. Quadrangles grouped by county and numbered and below threshold pit counts for each county. Percentages shown are number of pits in each county divided by total number of pits in the study area, multiplied by 100.

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits	County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
ARANSAS				Structure	0	0	0
Allyns Bight	0	0	0	County Totals	13 (0.5%)	7 (0.4%)	20 (0.4%)
Bayside	0	0	0				
Estes	0	0	0	BEE			
Mosquito Bay	0	0	0	Beeville E	18	5	23
Rockport	0	0	0	Beeville W	13	4	17
St. Charles Bay	0	0	0	Bullshead Creek	0	0	0
St. Charles				Burkes Ridge	0	0	0
Bay SE	0	0	0	Cadiz	3	2	5
St. Charles				Clareville	6	3	9
Bay SW	0	0	0	Mineral	7	5	12
County Totals	0 (0.0%)	0 (0.0%)	0 (0.0%)	Monteola	4	4	8
				Papalote	0	0	0
ATASCOSA				Refugio SW	0	0	0
Bigfoot	4	4	8	Skidmore	4	3	7
Caballos Creek	4	2	6	Skidmore NE	0	3	3
Charlotte	2	0	2	Tuleta	15	16	31
Christine East	0	1	1	Tulsita	9	12	21
Christine West	3	1	4	County Totals	79 (2.8%)	57 (3.0%)	136 (2.9%)
Coy City	8	2	10				
Cross NE	0	0	0	BEXAR			
Dobrowolski	0	0	0	Bat Cave	6	5	11
Fashing	10	7	17	Bulverde	7	3	10
Goldfinch	3	5	8	Camp Bullis	13	3	16
Hindes	8	2	10	Castle Hills	21	0	21
Jourdanton	0	0	0	Culebra Hill	22	6	28
Leming	0	2	2	Elmendorf	5	0	5
Lytle	0	0	0	Helotes	32	7	39
McCoy	1	1	2	Jack Mountain	1	0	1
Peggy	3	6	9	La Coste	9	2	11
Pleasanton	2	2	4	La Coste NE	3	2	5
Poteet	0	0	0	La Vernia SW	4	1	5
Rossville	2	7	9	Longhorn	23	0	23
San Miguel				Losoya	18	0	18
Ranch	1	1	2	Macdona	27	7	34
Schattel	0	1	1	Marion	6	4	10
Whitsett	10	7	17	Martinez	2	0	2
County Totals	61 (2.1%)	51 (2.7%)	112 (2.4%)	Saint Hedwig	7	4	11
				San Antonio			
BASTROP				East	12	0	12
Bastrop	1	1	2	San Antonio			
Bastrop SW	1	0	1	West	15	0	15
Elgin East	4	3	7	San Geronimo	3	0	3
Fedor	0	0	0	Sapamco	7	0	7
Lake Bastrop	2	1	3	Schertz	31	0	31
McDade	0	2	2	Somerset	3	0	3
Paige	1	0	1	Southton	25	7	32
Rosanky	0	0	0	Terrell Wells	28	3	31
Smithville	3	0	3	Thelma	14	4	18
Smithville NW	1	0	1	Van Raub	7	0	7
				County Totals	351 (12.3%)	58 (3.1%)	409 (8.6%)

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
BROOKS			
Cage Ranch	5	2	7
Callo Padromes	3	0	3
Encino	5	2	7
Falfurrias	2	4	6
Falfurrias SE	2	4	6
Flowella	1	1	2
Hartland	0	0	0
Palomas Ranch	0	6	6
Palomas			
Ranch NW	2	0	2
Palomas			
Ranch SE	0	2	2
Palomas			
Ranch SW	0	0	0
San Tomas Camp	0	0	0
Santa Elena	3	1	4
Santa Elena NW	0	1	1
Santa Elena SE	3	0	3
Tacubaya	4	3	7
County Totals	30 (1.1%)	26 (1.4%)	56 (1.2%)

CALDWELL			
Dale	0	0	0
Delhi	1	0	1
Harwood	6	4	10
Jeddo	0	1	1
Lockhart North	5	0	5
Lockhart South	15	2	17
Luling	6	1	7
Martindale	10	1	11
McMahan	8	1	9
Red Rock	0	0	0
Sandy Fork	7	1	8
County Totals	58 (2.0%)	11 (0.6%)	69 (1.5%)

CALHOUN			
Austwell	0	0	0
Green Lake	0	0	0
Kamey	1	2	3
Keller Bay	0	0	0
Long Island	0	0	0
Mosquito Point	0	0	0
Oliva	0	0	0
Panther Point	0	0	0
Panther Point NE	0	0	0
Pass Cavallo SW	0	0	0
Placedo	0	0	0
Point Comfort	0	0	0
Port Lavaca E	1	8	9
Port Lavaca W	0	0	0
Port O'Connor	0	0	0
Seadrift	0	0	0
Seadrift NE	0	0	0
Tivoli SE	0	0	0
County Totals	2 (0.1%)	10 (0.5%)	12 (0.3%)

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
CAMERON			
East Brownsville	3	0	3
Harlingen	4	1	5
La Coma	2	0	2
La Feria	3	0	3
La Leona	0	0	0
La Paloma	4	0	4
Laguna Atascosa	0	0	0
Laguna Vista	0	0	0
Los Fresnos	0	0	0
Mouth of			
Rio Grande	0	0	0
North of			
Port Isabel	0	0	0
Olmito	2	1	3
Palmito Hill	0	0	0
Paso Real	1	0	1
Port Isabel	0	0	0
Port Isabel NW	0	0	0
Rio Hondo	0	0	0
Santa Maria	6	0	6
Santa Rosa	2	0	2
Southmost	1	0	1
Three Islands	0	0	0
West Brownsville	17	0	17
Willamar SW	1	0	1
County Totals	46 (1.6%)	2 (0.1%)	48 (1.0%)

COLORADO			
Alleyton	36	7	43
Altair	46	3	49
Ammannsville	13	2	15
Bernardo	23	2	25
Bonus	8	0	8
Borden	1	0	1
Cat Spring	1	2	3
Columbus	47	0	47
Cordele	0	0	0
Eagle Lake	7	3	10
Eagle Lake NE	0	8	8
Ellinger	28	2	30
Fayetteville	41	10	51
Frelsburg	26	1	27
Garwood	1	6	7
Hahn	0	0	0
Industry	3	4	7
Lissie	0	0	0
New Ulm	0	0	0
Oakland	1	3	4
Rexville	0	0	0
Rock Island	7	3	10
Sawmill Branch	0	2	2
Sheridan	4	0	4
Sheridan NE	0	0	0
Sheridan SE	0	0	0
Speaks	1	0	1

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Weimar	1	7	8
County Totals	295 (10.3%)	65 (3.5%)	360 (7.6%)
COMAL			
Anhalt	10	17	27
Bergheim	3	6	9
Devils Backbone	1	14	15
Fischer	2	11	13
Hunter	3	0	3
New Braunfels			
East	4	1	5
New Braunfels			
West	2	0	2
Payton	0	1	1
Sattler	6	7	13
Smithson Valley	4	19	23
Spring Branch	3	1	4
Wimberly	0	0	0
County Totals	38 (1.4%)	77 (4.1%)	115 (2.4%)
DE WITT			
Blackwell Lake	0	0	0
Concrete	12	2	14
Cuero	25	2	27
Edgar	24	9	33
Hochheim	31	1	32
Meyersville	18	11	29
New Davy	17	1	18
Runge	14	10	24
Runge SE	0	19	19
Terryville	17	6	23
Verhelle	56	2	58
Westhoff	3	3	6
Yoakum	4	2	6
Yorktown E	14	5	19
Yorktown W	15	3	18
County Totals	250 (8.7%)	76 (4.0%)	326 (6.9%)
DIMMIT			
Asherton	1	0	1
Asherton NW	2	0	2
Big Wells	0	1	1
Blocker Tank	0	0	0
Brundage	0	4	4
Carrizo Springs E	0	2	2
Carrizo Springs W	4	1	5
Catarina	0	4	4
Cayetano Creek	0	0	0
Dabney Tank	0	0	0
Dentonio	0	0	0
Farias Tank	0	0	0
Flying W Ranch	0	0	0
Las Vegas	0	0	0
McDonald Lake	0	0	0
Palo Blanco Tank	1	1	2

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
San Pedro Creek	0	1	1
Valley Wells	0	0	0
County Totals	8 (0.3%)	14 (0.7%)	22 (0.5%)
DUVAL			
Benavides	10	2	12
Benavides NE	3	3	6
Benavides NW	3	2	5
Clegg	1	0	1
Clegg SW	4	4	8
Concepcion	7	3	10
Concepcion NW	4	6	10
Freer North	2	0	2
Freer NW	0	2	2
Freer South	6	4	10
Hebbronville NW	3	1	4
Laguna Del Toro	2	1	3
Loma Alta	4	0	4
Mirasol Creek	0	0	0
Parrilla Creek NE	4	0	4
Parrilla Creek NW	0	5	5
Parrilla Creek SE	1	10	11
Parrilla Creek SW	0	7	7
Ramirez	2	8	10
Realitos	7	6	13
Rosita	0	14	14
Rosita NE	0	4	4
Rosita NW	2	4	6
Rosita SE	8	5	13
San Jose	2	7	9
Sarnosa Hill	1	3	4
County Totals	76 (2.6%)	101 (5.4%)	177 (3.7%)
FAYETTE			
Carmine	5	3	8
Cistern	3	1	4
Flatonia	3	4	7
Flatonia NW	6	2	8
Greenvine	0	0	0
La Grange East	2	0	2
La Grange West	25	5	30
Ledbetter	20	2	24
Muldoon	7	1	8
Nechanitz	3	0	3
Round Top	12	1	13
Schulenburg	3	9	12
Swiss Alp	2	3	5
Togo	7	3	10
Waelder	1	0	1
Warda	3	1	4
West Point	11	1	12
Winchester	2	0	2
County Totals	115 (4.1%)	36 (1.9%)	153 (3.2%)



County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
FRIO			
Derby	17	6	23
Dilley	8	0	8
Dilley NE	3	1	4
Divot	0	1	1
Halff Ranch	1	1	2
Holcomb			
Reservoir	4	2	6
Keystone Ranch	0	6	6
Las Flores	0	2	2
Pearsall N	11	15	26
Pearsall S	1	4	5
Schattel NW	0	9	9
Woodward NE	2	0	2
County Totals	47 (1.6%)	47 (2.5%)	94 (2.0%)
GOLIAD			
Ander	0	9	9
Berclair	11	4	15
Berclair NW	9	3	12
Blanca	0	0	0
Charco	10	6	16
Goliad	14	8	22
Hensley Lake	4	5	9
Lazy F Ranch	1	7	8
Live Oak Lake	0	0	0
Lott Lake	0	0	0
Melo	0	0	0
Ryanville	0	0	0
Weesatche	0	25	25
County Totals	49 (1.7%)	67 (3.6%)	116 (2.4%)
GONZALES			
Cheapside	3	2	5
Cost	11	0	11
Dilworth	0	0	0
Gonzales North	0	3	3
Gonzales South	18	4	22
Hamon	8	0	8
Leesville	2	0	2
Moulton	10	0	10
Ottine	9	2	11
Pilgrim	2	0	2
Sample	6	1	7
Shiner	11	3	14
Smiley	0	0	0
County Totals	80 (2.8%)	15 (0.8%)	95 (2.0%)
GUADALUPE			
Belmont	8	4	12
Darst Creek	3	8	11
Dewville	0	1	1
Geronimo	6	0	6
Kingsbury	4	0	4
McQueeney	5	1	6

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
New Berlin	0	0	0
Seguin	22	2	24
Thomas Springs	0	1	1
County Totals	48 (1.7%)	17 (0.9%)	65 (1.4%)
HAYS			
Buda	15	7	22
Creedmoor	2	0	2
Driftwood	1	3	4
Dripping Springs	16	30	46
Hammetts			
Crossing	2	0	2
Henly	6	6	12
Mountain City	1	11	12
Rough Hollow	2	6	8
San Marcos North	9	1	10
San Marcos South	6	1	7
Shingle Hills	6	12	18
Signal Hill	4	17	21
Umland	7	6	13
County Totals	77 (2.7%)	100 (5.3%)	177 (3.7%)
HIDALGO			
Alton	17	0	17
Bentsen Ranch	3	0	3
Citrus City	23	33	56
Donna	0	0	0
Edcouch	1	0	1
Edinburg	6	0	6
Faysville	8	0	8
Hargill	0	2	2
Hidalgo	0	0	0
La Blanca	4	2	6
La Joya	3	0	3
La Reforma	0	1	1
Las Milpas	0	0	0
Lasara	0	0	0
Linn	3	0	3
Linn NE	1	0	1
Linn NW	0	2	2
Linn Siding	11	2	13
Los Ebanos	5	7	12
McAllen Ranch	1	1	2
McCook	1	0	1
Mercedes	2	0	2
Mission	7	0	7
Monte Christo	6	2	8
Pharr	1	0	1
Progreso	0	0	0
San Juan SE	0	0	0
Sullivan City	19	14	33
County Totals	122 (4.3%)	66 (3.5%)	188 (4.0%)
JACKSON			
Edna	0	0	0

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Francitas NW	0	0	0
Ganado	0	0	0
La Ward	0	0	0
Lolita	0	0	0
Manson	2	2	4
Mount Olive	1	0	1
County Totals	3 (0.1%)	2 (0.1%)	5 (0.1%)

#### JIM HOGG

Agua Nueva	0	6	6
Agua Nueva NW	0	1	1
Agua Nueva SE	0	3	3
Alta Vista Ranch	2	1	3
Alta Vista			
Ranch SW	0	2	2
Armstrong Ranch	0	7	7
Baluarto Ranch	3	1	4
Borregos Ranch	1	5	6
Cuevitas	0	3	3
Cuevitas SW	0	2	2
Guerra	0	5	5
Hebbronville	12	3	15
Hebbronville SE	0	7	7
McCampbell			
Ranch	0	1	1
Randado	0	6	6
San Antonio Viejo	0	1	1
San Pablo Ranch	0	1	1
Thompsonville	0	2	2
County Totals	18 (0.6%)	57 (3.0%)	75 (1.6%)

#### JIM WELLS

Alice N	9	0	9
Alice S	0	1	1
Ben Bolt NW	9	4	13
Ben Bolt SE	10	0	10
Ella	0	0	0
Orange Grove	7	0	7
Palito Blanco	3	0	3
Premont E	0	0	0
Premont W	4	0	4
San Diego	2	5	7
San Diego NE	14	5	19
Seeligson Ranch	5	0	5
Shaeffer Ranch	3	7	10
County Totals	66 (2.3%)	22 (1.2%)	88 (1.9%)

#### KARNES

Bald Mound	4	2	6
Choate	20	4	24
Ecletto	2	0	2
Garfield	10	8	18
Helena	8	7	15
Karnes City	17	4	21
Kenedy	12	3	15

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Lenz	15	0	15
Pawnee	0	7	7
County Totals	88 (3.1%)	35 (1.9%)	123 (2.6%)

#### KENEDY

Andrea Ranch	0	0	0
Armstrong	10	0	10
Julian	0	0	0
La Paloma Ranch	0	0	0
La Parra Ranch	0	0	0
La Parra			
Ranch NE	0	0	0
La Parra			
Ranch SE	0	0	0
La Parra			
Ranch SW	0	0	0
Los Amigos			
Windmill	0	0	0
Maria Estella			
Well	0	0	0
Norias	4	1	5
Pita Camp	0	0	0
Potrero Cortado	0	0	0
Potrero			
Lopeno NW	0	0	0
Potrero			
Lopeno SE	0	0	0
Potrero			
Lopeno SW	0	0	0
Rosita Lake	0	0	0
Rosita Lake NE	0	0	0
Rudolph	7	0	7
Saltillo Well	0	0	0
San Pedro Ranch	0	0	0
Sarita	0	0	0
Sarita SW	0	1	1
South of Potrero			
Lopeno NE	0	0	0
South of Potrero			
Lopeno NW	0	0	0
Turcotte	0	0	0
Yarborough Pass	0	0	0
County Totals	21 (0.7%)	2 (0.1%)	2. (0.5%)

#### KINNEY

Anacacho	0	5	5
Brackettville	3	9	12
Brackettville NE	1	0	1
Bull Waterhole	0	3	3
Cline	9	2	11
Cow Creek Tank	0	2	2
Del Rio SE	0	0	0
Elm Mountain	1	4	5
Flat Rock			
Creek South	0	0	0

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Flat Rock			
Creek SW	0	3	3
Goofy Lake	2	1	3
Imperialist Tank	1	2	3
Kickapoo Caverns	0	0	0
Laguna	0	2	2
Maverick Dam	0	0	0
Montell	0	0	0
Mud Creek North	2	1	3
Mud Creek South	0	2	2
Mud Springs	0	6	6
Mustang			
Waterhole	0	0	0
Odlaw	0	2	2
Olmos Creek	0	0	0
Peloncillo Peak	0	1	1
Pinto Mtn	0	3	3
Salmon Peak	0	2	2
Silver Lake	0	9	9
Spofford	1	13	14
Standart	1	2	3
Tequesquite			
Creek NE	0	7	7
Tequesquite			
Creek SW	1	0	1
Tequesquite			
Spring	0	2	2
Turkey Mtn	0	2	2
County Totals	22 (0.8%)	85 (4.5%)	107 (2.3%)

KLEBERG			
Escondido Lake	0	0	0
Kingsville W	1	0	1
Kleberg Point	0	0	0
Paisano Lake	0	0	0
Point of Rocks	0	0	0
Ricardo	1	0	1
Riviera	0	0	0
Riviera Beach	0	0	0
Riviera Beach NE	0	0	0
Riviera Beach NW	0	0	0
South Bird Island	0	0	0
South Bird			
Island NW	0	0	0
South Bird			
Island SE	0	0	0
County Totals	2 (0.1%)	0 (0.0%)	2 (0.0%)

LA SALLE			
Artesia Wells	0	0	0
Atlee	1	0	1
Briscoe Ranch	0	0	0
Burns Ranch	0	1	1
Caiman Creek NE	0	6	6
Caiman Creek NW	0	0	0
Caiman Creek SE	0	1	1

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Cayman Lake	0	2	2
Charco Mirando			
Creek	0	0	0
Cotulla	0	1	1
Dull	0	0	0
Encinal	0	0	0
Fowlerton	0	2	2
Harris Lake	0	0	0
Holland Dam	0	0	0
Live Oak Creek	0	0	0
Los Angeles	0	0	0
Millett	0	1	1
Piedra Creek NE	1	0	1
Piedra Creek NW	0	0	0
Piedra Creek SE	0	0	0
Piedra Creek SW	0	2	2
The White			
Kitchen	0	0	0
Woodward	0	2	2
Zella	2	1	3
County Totals	4 (0.1%)	19 (1.0%)	23 (0.5%)
LAVACA			
Ezzell	0	2	2
Hallettsville	5	4	9
Hallettsville SE	0	1	1
Hope	2	1	3
Komensky	0	3	3
Morales	0	1	1
Moravia	1	2	3
Navidad	0	0	0
Sublime	0	3	3
Sweet Home	0	5	5
Wied	0	1	1
County Totals	8 (0.3%)	23 (1.2%)	31 (0.7%)
LIVE OAK			
Anna Rose	0	9	9
Calliham	14	4	18
Clegg NE	3	0	3
Comanche Hills	7	11	18
Crater Ridge	3	4	7
Dinero	4	2	6
Elm Creek	2	2	4
George West	0	2	2
Live Oak Hollow	0	9	9
Midway	1	5	6
Mulos Hills	8	1	9
Oakville	7	5	12
Oakville SW	4	2	6
Ray Point	6	9	15
Sandia	5	1	6
Three Rivers	10	5	15
Willow Hollow			
Tank	3	4	7
County Totals	77 (2.7%)	75 (4.0%)	152 (3.2%)

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
MATAGORDA			
Ashwood	0	0	0
Bay City	0	0	0
Bay City NE	0	0	0
Blessing	0	0	0
Blessing SE	0	1	1
Brown Cedar Cut	0	0	0
Carancahua Pass	0	0	0
Cedar Lakes West	0	0	0
Cedar Lane	0	0	0
Cedar Lane NE	0	0	0
Decros Point	0	0	0
Dressing Point	0	0	0
Francitas	0	0	0
Lake Austin	0	0	0
Markham	0	0	0
Matagorda	1	0	1
Matagorda SW	0	0	0
Palacios	1	0	1
Palacios Point	0	0	0
Palacios SE	0	0	0
Palacios NE	0	0	0
Sargent	0	0	0
South of Palacios Point	0	0	0
Turtle Bay	0	0	0
Van Vleck	0	0	0
Wadsworth	0	0	0
County Totals	2 (0.1%)	1 (0.1%)	3 (0.1%)

MAVERICK			
Chacon Creek NW	2	2	4
Chacon Creek SW	1	0	1
Chupadera Creek	0	0	0
Deadmans Hill	7	4	11
Eagle Pass E	3	2	5
Eagle Pass NE	0	0	0
Eagle Pass SW	0	0	0
Eagle Pass W	1	3	4
El Indio	1	1	2
Farias Ranch	0	0	0
Indian Tank	0	0	0
Indio Creek	0	0	0
Indio Tank	0	2	2
Paloma	0	3	3
Quemado E	0	5	5
Quemado SE	7	5	12
Quemado W	0	0	0
Sacatosa Tank	0	1	1
Salt Well	0	1	1
San Ambrosia Creek 3NE	0	0	0
Tovar Creek E	0	0	0
Tovar Creek W	0	0	0
Trosado Tank	0	1	1
County Totals	22 (0.8%)	30 (1.6%)	52 (1.1%)

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
MCMULLEN			
Calliham NW	2	1	3
Cross	0	10	10
Crowther	0	4	4
Fitzpatrick Hollow	3	1	4
La Chusa Hill	0	1	1
Loma Alta NE	0	3	3
Loma Alta NW	0	2	2
Mule Creek	1	0	1
Pertle Creek	0	0	0
Rockaway Creek	3	0	3
San Caja Hill	0	2	2
Tilden	2	5	7
County Totals	11 (0.4%)	29 (1.5%)	40 (0.8%)

MEDINA			
Biry	6	7	13
Castroville	7	6	13
Comanche Waterhole	2	1	3
D'Hanis	4	3	7
Devine	13	6	19
Flatrock Crossing	0	4	4
Frio Town	0	5	5
Frio Town NE	2	1	3
Ghost Hill	12	6	18
Gross Tank	0	3	3
Hondo	10	3	13
Irishman Hill	0	1	1
Medina Lake	0	0	0
Moore	10	11	21
Murphy School	3	10	13
Mustang Valley	2	8	10
Quihi	0	8	8
Riomedina	0	10	10
Sabinal	0	4	4
Sabinal NE	1	0	1
Texas Mountain	0	1	1
Timber Creek	0	1	1
Twin Hollow	1	0	1
Wilson Ranch	0	7	7
Yancey	4	12	16
County Totals	77 (2.7%)	118 (6.3%)	195 (4.1%)

NUECES			
Agua Dulce	0	0	0
Annaville	3	0	3
Banquete	0	0	0
Chapman Ranch	0	0	0
Concordia	0	0	0
Corpus Christi	0	1	1
Crane Islands NW	0	0	0
Crane Islands SW	0	0	0
Driscoll East	0	0	0
Driscoll West	0	0	0
Kingsville East	1	0	1



County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Kingsville NW	0	0	0
Laureles Ranch	0	0	0
Oso Creek NE	1	0	1
Oso Creek NW	1	0	1
Petronila	0	0	0
Pita Island	1	0	1
Port Aransas	0	0	0
Port Ingleside	1	0	1
Portland	0	0	0
Robstown	0	0	0
County Totals	8 (0.3%)	1 (0.1%)	9 (0.2%)

#### REFUGIO

Cranell	0	0	0
Lake Pasture	0	0	0
Lamar	0	0	0
McFaddin	0	0	0
Mission Bay	0	0	0
Quintana	0	0	0
Refugio	3	0	3
Tivoli	0	0	0
Tivoli SW	0	0	0
Twin Mott Lake	0	0	0
Vidaurri	0	0	0
Woodsboro	0	0	0
County Totals	3 (0.1%)	0 (0.0%)	3 (0.1%)

#### SAN PATRICIO

Aransas Pass	0	0	0
Edroy	5	0	5
Gregory	1	0	1
Mathis	4	0	4
Odem	3	0	3
Rincon Bend	0	0	0
San Patricio	8	0	8
Sinton E	0	0	0
Sinton W	0	0	0
Taft	1	0	1
Tynan	9	0	9
West Sinton	0	0	0
County Totals	31 (1.1%)	0 (0.0%)	31 (0.7%)

#### STARR

Camp Garcia	0	2	2
El Chapote Creek	0	1	1
El Sauz	0	0	0
La Gloria	1	3	4
La Gloria SW	0	3	3
La Grulla	8	6	14
Las Escobas Ranch	0	0	0
Las Islas Ranch	0	0	0
Los Ebanos NW	0	0	0
Los Garza S	0	0	0
Rincon	0	8	8

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Rio Grande			
City N	5	1	6
Rio Grande			
City S	5	1	6
Roma-Los Saenz E	7	7	14
Roma-Los			
Saenz W	5	5	10
Sagunada Ranch	1	0	1
Salineno	4	4	8
San Isidro	6	2	8
Viboras	1	1	2
County Totals	43 (1.5%)	44 (2.3%)	87 (1.8%)

#### TRAVIS

Austin East	22	9	31
Austin West	4	9	13
Bee Cave	9	10	19
Coupland	0	0	0
Elgin West	5	2	7
Jollyville	2	3	5
Leander	4	1	5
Lytton Springs	0	0	0
Manor	3	3	6
Mansfield Dam	8	4	12
Montopolis	34	12	46
Nameless	7	14	21
Oak Hill	11	21	32
Pace Bend	7	8	15
Pflugerville East	3	2	5
Pflugerville West	14	9	23
Spicewood	0	0	0
Travis Peak	4	3	7
Uteley	3	1	4
Webberville	9	1	10
County Totals	149 (5.3%)	112 (6.0%)	261 (5.5%)

#### UVALDE

Batesville Hill	0	1	1
Blanco Lake	0	5	5
Chalk Bluff	0	1	1
Concan	3	1	4
Deep Creek	1	0	1
Garner Field	5	3	8
Garner Field NE	0	0	0
Hacienda	3	2	5
Knippa	4	2	6
Lake Creek	0	0	0
Magers Crossing	0	3	3
Reagan Wells	0	1	1
Sevenmile Hill	0	0	0
Sycamore			
Mountain	0	0	0
Trio	0	5	5
Utopia	3	2	5
Uvalde	7	1	8
County Totals	26 (0.9%)	27 (1.4%)	53 (1.1%)



County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
VICTORIA			
Bloomington	5	0	5
Bloomington SW	0	1	1
Fannin	3	1	4
Fordtran	40	8	48
Inez	0	0	0
Inez NW	0	0	0
La Salle	0	0	0
Marcado Creek	0	0	0
Mission Valley	47	13	60
Nursery	29	50	79
Peck Branch	39	9	48
Raisin	3	0	3
Schroeder	13	11	24
Victoria East	0	2	2
Victoria West	8	6	14
County Totals	187 (6.5%)	101 (5.4%)	288 (6.1%)

WEBB			
Agua Azul Creek E	0	0	0
Agua Azul Creek W	0	0	0
Alamito Creek	1	2	3
Alamito Creek NE	0	2	2
Albercas Ranch	0	6	6
Biel Lake N	0	0	0
Biel Lake NE	0	3	3
Biel Lake S	0	0	0
Biel Lake SE	0	0	0
Big Apache Hill	0	0	0
Blancas Creek N	0	0	0
Blancas Creek S	0	0	0
Bruni	1	2	3
Bruni SE	0	2	2
Bull Hollow Tank	0	0	0
Burrito Tank	0	3	3
Callaghan Ranch N	0	2	2
Callaghan Ranch S	0	0	0
Callaghan Ranch SE	0	0	0
Cerritos Blancos	0	0	0
Cibolo Ranch	0	0	0
Cuervo Creek	1	3	4
Dolores Ranch	5	0	5
Dos Hermanos Peaks	0	1	1
East Losa Tank	1	0	1
Fort McIntosh 3 NE	0	0	0
Galvan Ranch	0	0	0
Landrum Tank	0	0	0
Laredo E	1	5	6
Laredo S	6	4	10

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Laredo W	4	1	5
Las Tiendas	0	0	0
Mesteno Creek N	0	0	0
Mesteno Creek S	2	2	4
Mills Bennett	0	0	0
Mills Bennett NW	0	0	0
Mills Bennett SW	1	5	6
Mirando City	0	0	0
Nido Ranch	0	2	2
O'Keef Lake	0	6	6
Oilton	5	0	5
Orvil	11	7	18
Palafox SW	0	0	0
Pato Creek	0	2	2
Piedra Parada Ranch	0	3	3
Piedra Parada Tank	0	3	3
Piloncillo Hill	0	0	0
Pinto Creek	0	1	1
Retama Creek	0	0	0
San Pablo	0	2	2
San Pedro Hill	0	2	2
Shipp Ranch	0	0	0
Spohn Ranch	0	1	1
Telephone Tanks	4	2	6
Tios Creek	0	2	2
Tordillo Creek	0	1	1
Velenzuela Creek	0	0	0
Venado Creek E	0	0	0
Venado Creek W	0	0	0
County Totals	43 (1.5%)	77 (4.1%)	120 (2.5%)

WHARTON			
Boling	1	1	2
Danciger	0	0	0
Danevang	0	0	0
East Bernard	0	0	0
Egypt	2	4	6
El Campo	3	0	3
El Campo SE	0	0	0
Francitas NE	0	0	0
Ganado NE	0	0	0
Glen Flora	0	0	0
Gobbler Creek	0	0	0
Guy	0	0	0
Hungerford	1	0	1
Kendleton	0	0	0
Lane City	0	0	0
Lane City SE	0	1	1
Louise	0	1	1
Midfield	0	0	0
New Taiton	3	0	3
Pierce	0	0	0
Pledger	0	0	0



County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
Wharton	0	2	2
County Totals	10 (0.3%)	9 (0.5%)	19 (0.4%)
WILLACY			
El Jardin	0	0	0
Green Island	0	0	0
Hawk Island	0	0	0
La Sal Vieja	0	0	0
Port Mansfield	0	0	0
Raymondville	1	0	1
San Perlita N	0	0	0
San Perlita S	0	0	0
South of Potrero			
Lopeno SE	0	0	0
Willamar	0	0	0
Yturria	3	10	13
County Totals	4 (0.1%)	10 (0.5%)	14 (0.3%)
WILSON			
Alum	0	3	3
Deweese	9	2	11
Falls City	22	6	28
Floresville	5	5	10
Gillett	0	0	0
Kosciusko	4	2	6
La Vernia	6	2	8
Leal	0	4	4
Marcelinas Hills	7	1	8
Nixon	11	9	20
Poth	1	0	1
Saspamco SE	0	2	2
Stockdale	6	12	18
Three Oaks	2	1	3
County Totals	73 (2.5%)	49 (2.6%)	122 (2.6%)
ZAPATA			
Arroyo Burro	0	1	1
Arroyo Clarendo	0	6	6
Arroyo Huisache	0	0	0
Arroyo Miguel	0	2	2
Arroyo Salado E	0	0	0
Arroyo Salado W	0	1	1
Arroyo Veleno	1	0	1
Beckwith Arm	0	0	0
Chargos Creek	0	2	2
Escobas	0	0	0
Falcon Village	0	0	0
Las Ovejas Creek	0	0	0
Lopeno	0	0	0
Mogotes Hill	0	0	0
San Ygnacio	0	5	5
Zapata	0	5	5
Zapata NW	0	0	0
Zapata SW	0	0	0
County Totals	1 (0.0%)	22 (1.2%)	23 (0.5%)

County/ Quadrangle	Numbered pits	Below Threshold pits	Total pits
ZAVALA			
Batesville	0	2	2
Batesville NW	4	1	5
Batesville SW	1	1	2
Beef Hollow			
Creek	0	0	0
Carrizo			
Springs NW	0	0	0
Chacon Creek NE	0	2	2
Chacon Creek SE	0	0	0
Cometa	1	5	6
Crystal City	0	0	0
Johnnie Little			
Hill	0	1	1
La Pryor	0	0	0
La Pryor NW	1	0	1
La Pryor SE	0	0	0
Loma Vista	0	2	2
Lone Tree Hill	2	1	3
Pulliam Ranch	5	5	10
Sand Mountain	0	2	2
Snake Creek	3	0	3
Sugar Creek	0	0	0
West Ranch	0	3	3
Woodard Lake	0	0	0
County Totals	17 (0.6%)	25 (1.3%)	42 (0.9%)
GRAND TOTAL	2,839	1,878	4,735

Table 5. Alphabetical list of quadrangles in the South Texas study area.

Quadrangle	County	Quadrangle	County	Quadrangle	County
Agua Azul Creek E	WEBB	Bastrop	BASTROP	Briscoe Ranch	KINNEY
Agua Azul Creek W	WEBB	Bat Cave	BEXAR	Brown Cedar Cut	MATAGORDA
Agua Dulce	NUECES	Batesville Hill	UVALDE	Brundage	DIMMIT
Agua Nueva NW	JIM HOGG	Batesville NW	ZAVALA	Bruni SE	WEBB
Agua Nueva SE	JIM HOGG	Batesville SW	ZAVALA	Bruni	WEBB
Agua Nueva	JIM HOGG	Batesville	ZAVALA	Buda	HAYS
Alamito Creek NE	WEBB	Bay City NE	MATAGORDA	Bull Hollow Tank	WEBB
Alamito Creek	WEBB	Bay City	MATAGORDA	Bull Waterhole	KINNEY
Albercas Ranch	WEBB	Bayside	ARANSAS	Bullshead Creek	BEE
Alice N	JIM WELLS	Beckwith Arm	ZAPATA	Bulverde	BEXAR
Alice S	JIM WELLS	Bee Cave	TRAVIS	Burkes Ridge	BEE
Alleyton	COLORADO	Beef Hollow Creek	ZAVALA	Burns Ranch	LA SALLE
Allyns Bight	ARANSAS	Beeville E	BEE	Burrito Tank	WEBB
Alta Vista		Beeville W	BEE	Caballos Creek	ATASCOSA
Ranch SW	JIM HOGG	Belmont	GUADALUPE	Cadiz	BEE
Alta Vista Ranch	JIM HOGG	Ben Bolt NW	JIM WELLS	Cage Ranch	BROOKS
Altair	COLORADO	Ben Bolt SE	JIM WELLS	Caiman Creek NE	LA SALLE
Alton	HIDALGO	Benavides NE	DUVAL	Caiman Creek NW	LA SALLE
Alum	WILSON	Benavides NW	DUVAL	Caiman Creek SE	LA SALLE
Ammannsville	COLORADO	Benavides	DUVAL	Callaghan Ranch N	WEBB
Anacacho	KINNEY	Bentsen Ranch	HIDALGO	Callaghan	
Ander	GOLIAD	Berclair NW	GOLIAD	Ranch SE	WEBB
Andrea Ranch	KENEDY	Berclair	GOLIAD	Callaghan Ranch S	WEBB
Anhalt	COMAL	Bergheim	COMAL	Calliham NW	MCMULLEN
Anna Rose	LIVE OAK	Bernardo	COLORADO	Calliham	LIVE OAK
Annville	NUECES	Biel Lake NE	WEBB	Callo Padromes	BROOKS
Aransas Pass	SAN	Biel Lake N	WEBB	Camp Bullis	BEXAR
	PATRICIO	Biel Lake SE	WEBB	Camp Garcia	STARR
Armstrong Ranch	JIM HOGG	Biel Lake S	WEBB	Carancahua Pass	MATAGORDA
Armstrong	KENEDY	Big Apache Hill	WEBB	Carmine	FAYETTE
Arroyo Burro	ZAPATA	Big Wells	DIMMIT	Carrizo Springs E	DIMMIT
Arroyo Clarendo	ZAPATA	Bigfoot	ATASCOSA	Carrizo Springs NW	ZAVALA
Arroyo Huisache	ZAPATA	Biry	MEDINA	Carrizo Springs W	DIMMIT
Arroyo Miguel	ZAPATA	Blackwell Lake	DEWITT	Castle Hills	BEXAR
Arroyo Salado E	ZAPATA	Blancas Creek N	WEBB	Castroville	MEDINA
Arroyo Salado W	ZAPATA	Blancas Creek S	WEBB	Cat Spring	COLORADO
Arroyo Veleno	ZAPATA	Blanco Lake	UVALDE	Catarina	DIMMIT
Artesia Wells	LA SALLE	Blanconia	GOLIAD	Cayetano Creek	DIMMIT
Asherton NW	DIMMIT	Blessing SE	MATAGORDA	Cayman Lake	LA SALLE
Asherton	DIMMIT	Blessing	MATAGORDA	Cedar Lakes West	MATAGORDA
Ashwood	MATAGORDA	Blocker Tank	DIMMIT	Cedar Lane NE	MATAGORDA
Atlee	LA SALLE	Bloomington SW	VICTORIA	Cedar Lane	MATAGORDA
Austin East	TRAVIS	Bloomington	VICTORIA	Cerritos Blancos	WEBB
Austin West	TRAVIS	Boling	WHARTON	Chacon Creek NE	ZAVALA
Austwell	CALHOUN	Bonus	COLORADO	Chacon Creek NW	MAVERICK
Bald Mound	KARNES	Borden	COLORADO	Chacon Creek SE	ZAVALA
Baluarte Ranch	JIM HOGG	Borregos Ranch	JIM HOGG	Chacon Creek SW	MAVERICK
Banquete	NUECES	Brackettville NE	KINNEY	Chalk Bluff	UVALDE
Bastrop SW	BASTROP	Brackettville	KINNEY	Chapman Ranch	NUECES

Quadrangle	County	Quadrangle	County	Quadrangle	County
Charco Mirando Creek	LA SALLE	Darst Creek	GUADALUPE	Ellinger	COLORADO
Charco	GOLIAD	Deadmans Hill	MAVERICK	Elm Creek	LIVE OAK
Chargos Creek	ZAPATA	Decros Point	MATAGORDA	Elm Mountain	KINNEY
Charlotte	ATASCOSA	Deep Creek	UVALDE	Elmendorf	BEXAR
Cheapside	GONZALES	Del Rio SE	KINNEY	Encinal	LA SALLE
Choate	KARNES	Delhi	CALDWELL	Encino	BROOKS
Christine East	ATASCOSA	Dentonio	DIMMIT	Escobas	ZAPATA
Christine West	ATASCOSA	Derby	FRIO	Escondido Lake	KLEBERG
Chupadera Creek	MAVERICK	Devils Backbone	COMAL	Estes	ARANSAS
Cibolo Ranch	WEBB	Devine	MEDINA	Ezzell	LAVACA
Cistern	FAYETTE	Deweese	WILSON	Falcon Village	ZAPATA
Citrus City	HIDALGO	Dewville	GUADALUPE	Falfurrias SE	BROOKS
Clareville	BEE	Dilley NE	FRIO	Falfurrias	BROOKS
Clegg NE	LIVE OAK	Dilley	FRIO	Falls City	WILSON
Clegg SW	DUVAL	Dilworth	GONZALES	Fannin	VICTORIA
Clegg	DUVAL	Dinero	LIVE OAK	Farias Ranch	MAVERICK
Cline	KINNEY	Divot	FRIO	Farias Tank	DIMMIT
Columbus	COLORADO	Dobrowolski	ATASCOSA	Fashing	ATASCOSA
Comanche Hills	LIVE OAK	Dolores Ranch	WEBB	Fayetteville	COLORADO
Comanche Waterhole	MEDINA	Donna	HIDALGO	Faysville	HIDALGO
Cometa	ZAVALA	Dos Hermanos Peaks	WEBB	Fedor	BASTROP
Concan	UVALDE	Dressing Point	MATAGORDA	Fischer	COMAL
Concepcion NW	DUVAL	Driftwood	HAYS	Fitzpatrick Hollow	MCMULLEN
Concepcion	DUVAL	Dripping Springs	HAYS	Flat Rock Creek	KINNEY
Concordia	NUECES	Driscoil East	NUECES	Flat Rock Creek SW	KINNEY
Concrete	DEWITT	Driscoil West	NUECES	Flatonia NW	FAYETTE
Cordele	COLORADO	Dull	LA SALLE	Flatonia	FAYETTE
Corpus Christi	NUECES	Eagle Lake NE	COLORADO	Flatrock Crossing	MEDINA
Cost	GONZALES	Eagle Lake	COLORADO	Floresville	WILSON
Cotulla	LA SALLE	Eagle Pass E	MAVERICK	Flowella	BROOKS
Coupland	TRAVIS	Eagle Pass NE	MAVERICK	Flying W Ranch	DIMMIT
Cow Creek Tank	KINNEY	Eagle Pass SW	MAVERICK	Fordtran	VICTORIA
Coy City	ATASCOSA	Eagle Pass W	MAVERICK	Fort McIntosh	WEBB
Crane Islands NW	NUECES	East Bernard	WHARTON	3 NE	LA SALLE
Crane Islands SW	NUECES	East Brownsville	CAMERON	Fowlerton	WHARTON
Cranell	REFUGIO	East Losa Tank	WEBB	Francitas NE	JACKSON
Crater Ridge	LIVE OAK	Ecletio	KARNES	Francitas NW	MATAGORDA
Creedmoor	HAYS	Edcouch	HIDALGO	Francitas	DUVAL
Cross NE	ATASCOSA	Edgar	DEWITT	Freer N	DUVAL
Cross	MCMULLEN	Edinburg	HIDALGO	Freer NW	DUVAL
Crowther	MCMULLEN	Edna	JACKSON	Freer S	DUVAL
Crystal City	ZAVALA	Edroy	SAN	Frelsburg	COLORADO
Cuero	DEWITT	Egypt	PATRICIO	Frio Town NE	MEDINA
Cuervo Creek	WEBB	El Campo SE	WHARTON	Frio Town	MEDINA
Cuevitas SW	JIM HOGG	El Campo	WHARTON	Galvan Ranch	WEBB
Cuevitas	JIM HOGG	El Chapote Creek	WHARTON	Ganado NE	WHARTON
Culebra Hill	BEXAR	El Indio	STARR	Ganado	JACKSON
D'Hanis	MEDINA	El Jardin	MAVERICK	Garfield	KARNES
Dabney Tank	DIMMIT	El Sauz	WILLACY	Garner Field NE	UVALDE
Dale	CALDWELL	Elgin East	STARR	Garner Field	UVALDE
Danciger	WHARTON	Elgin West	BASTROP	Garwood	COLORADO
Danevang	WHARTON	Ella	TRAVIS	George West	LIVE OAK
			JIM WELLS		

Quadrangle	County	Quadrangle	County	Quadrangle	County
Geronimo	GUADALUPE	Irishman Hill	MEDINA	Lake Austin	MATAGORDA
Ghost Hill	MEDINA	Jack Mountain	BEXAR	Lake Bastrop	BASTROP
Gillett	WILSON	Jeddo	CALDWELL	Lake Creek	UVALDE
Glen Flora	WHARTON	Johnnie Little Hill	ZAVALA	Lake Pasture	REFUGIO
Gobbler Creek	WHARTON	Jollyville	TRAVIS	Lamar	REFUGIO
Goldfinch	ATASCOSA	Jourdanton	ATASCOSA	Landrum Tank	WEBB
Goliad	GOLIAD	Julian	KENEDY	Lane City SE	WHARTON
Gonzales North	GONZALES	Kamey	CALHOUN	Lane City	WHARTON
Gonzales South	GONZALES	Karnes City	KARNES	Laredo E	WEBB
Goofy Lake	KINNEY	Keller Bay	CALHOUN	Laredo S	WEBB
Green Island	WILLACY	Kendleton	WHARTON	Laredo W	WEBB
Green Lake	CALHOUN	Kenedy	KARNES	Las Escobas Ranch	STARR
Greenvine	FAYETTE	Keystone Ranch	FRIO	Las Flores	FRIO
Gregory	SAN PATRICIO	Kickapoo Caverns	KINNEY	Las Islas Ranch	STARR
Gross Tank	MEDINA	Kingsbury	GUADALUPE	Las Milpas	HIDALGO
Guerra	JIM HOGG	Kingsville East	NUECES	Las Ovejas Creek	ZAPATA
Guy	WHARTON	Kingsville NW	NUECES	Las Tiendas	WEBB
Hacienda	UVALDE	Kingsville W	KLEBERG	Las Vegas	DIMMIT
Hahn	COLORADO	Kleberg Point	KLEBERG	Lasara	HIDALGO
Halff Ranch	FRIO	Knippa	UVALDE	Laureles Ranch	NUECES
Hallettsville SE	LAVACA	Komensky	LAVACA	Lazy F Ranch	GOLIAD
Hallettsville	LAVACA	Kosciusko	WILSON	Leal	WILSON
Hammetts Crossing	HAYS	La Blanca	HIDALGO	Leander	TRAVIS
Hamon	GONZALES	La Chusa Hill	MCMULLEN	Ledbetter	FAYETTE
Hargill	HIDALGO	La Coma	CAMERON	Leesville	GONZALES
Harlingen	CAMERON	La Coste NE	BEXAR	Leming	ATASCOSA
Harris Lake	LA SALLE	La Coste	BEXAR	Lenz	KARNES
Hartland	BROOKS	La Feria	CAMERON	Linn NE	HIDALGO
Harwood	CALDWELL	La Gloria SW	STARR	Linn NW	HIDALGO
Hawk Island	WILLACY	La Gloria	STARR	Linn Siding	HIDALGO
Hebbronville NW	DUVAL	La Grange East	FAYETTE	Linn	HIDALGO
Hebbronville SE	JIM HOGG	La Grange West	FAYETTE	Lissie	COLORADO
Hebbronville	JIM HOGG	La Grulla	STARR	Live Oak Creek	LA SALLE
Helena	KARNES	La Joya	HIDALGO	Live Oak Hollow	LIVE OAK
Helotes	BEXAR	La Leona	CAMERON	Live Oak Lake	GOLIAD
Henly	HAYS	La Paloma Ranch	KENEDY	Lockhart North	CALDWELL
Hensley Lake	GOLIAD	La Paloma	CAMERON	Lockhart South	CALDWELL
Hidalgo	HIDALGO	La Parra Ranch NE	KENEDY	Lolita	JACKSON
Hindes	ATASCOSA	La Parra Ranch SE	KENEDY	Loma Alta NE	MCMULLEN
Hochheim	DEWITT	La Parra Ranch SW	KENEDY	Loma Alta NW	MCMULLEN
Holcomb Reservoir	FRIO	La Parra Ranch	KENEDY	Loma Alta	DUVAL
Holland Dam	LA SALLE	La Pryor NW	ZAVALA	Loma Vista	ZAVALA
Hondo	MEDINA	La Pryor SE	ZAVALA	Lone Tree Hill	ZAVALA
Hope	LAVACA	La Pryor	ZAVALA	Long Island	CALHOUN
Hungerford	WHARTON	La Reforma	HIDALGO	Longhorn	BEXAR
Hunter	COMAL	La Sal Vieja	WILLACY	Lopeno	ZAPATA
Imperialist Tank	KINNEY	La Salle	VICTORIA	Los Amigos	
Indian Tank	MAVERICK	La Vernia SW	BEXAR	Windmill	KENEDY
Indio Creek	MAVERICK	La Vernia	WILSON	Los Angeles	LA SALLE
Indio Tank	MAVERICK	La Ward	JACKSON	Los Ebanos NW	STARR
Industry	COLORADO	Laguna Atascosa	CAMERON	Los Ebanos	HIDALGO
Inez NW	VICTORIA	Laguna Del Toro	DUVAL	Los Fresnos	CAMERON
Inez	VICTORIA	Laguna Vista	CAMERON	Los Garza S	STARR
		Laguna	KINNEY	Losoya	BEXAR

Quadrangle	County	Quadrangle	County	Quadrangle	County
Lott Lake	GOLIAD	Montopolis	TRAVIS	Paige	BASTROP
Louise	WHARTON	Moore	MEDINA	Paisano Lake	KLEBERG
Luling	CALDWELL	Morales	LAVACA	Palacios Point	MATAGORDA
Lytle	ATASCOSA	Moravia	LAVACA	Palacios SE	MATAGORDA
Lytton Springs	TRAVIS	Mosquito Bay	ARANSAS	Palacios	MATAGORDA
Macdona	BEXAR	Mosquito Point	CALHOUN	Palafox SW	WEBB
Magers Crossing	UVALDE	Moulton	GONZALES	Palicios NE	MATAGORDA
Manor	TRAVIS	Mount Olive	JACKSON	Palito Blanco	JIM WELLS
Mansfield Dam	TRAVIS	Mountain City	HAYS	Palmito Hill	CAMERON
Manson	JACKSON	Mouth of		Palo Blanco Tank	DIMMIT
Marcado Creek	VICTORIA	Rio Grande	CAMERON	Paloma	MAVERICK
Marcelinas Hills	WILSON	Mud Creek North	KINNEY	Palomas Ranch NW	BROOKS
Maria Estella Well	KENEDY	Mud Creek South	KINNEY	Palomas Ranch SE	BROOKS
Marion	BEXAR	Mud Springs	KINNEY	Palomas Ranch SW	BROOKS
Markham	MATAGORDA	Muldoon	FAYETTE	Palomas Ranch	BROOKS
Martindale	CALDWELL	Mule Creek	MCMULLEN	Panther Point NE	CALHOUN
Martinez	BEXAR	Mulos Hills	LIVE OAK	Panther Point	CALHOUN
Matagorda SW	MATAGORDA	Murphy School	MEDINA	Papalote	BEE
Matagorda	MATAGORDA	Mustang Valley	MEDINA	Parrilla Creek NE	DUVAL
Mathis	SAN PATRICIO	Mustang Waterhole	KINNEY	Parrilla Creek NW	DUVAL
Maverick Dam	KINNEY	Nameless	TRAVIS	Parrilla Creek SE	DUVAL
McAllen Ranch	HIDALGO	Navidad	LAVACA	Parrilla Creek SW	DUVAL
McCampbell		Nechanitz	FAYETTE	Paso Real	CAMERON
Ranch	JIM HOGG	New Berlin	GUADALUPE	Pass Cavallo SW	CALHOUN
McCook	HIDALGO	New Braunfels East	COMAL	Pato Creek	WEBB
McCoy	ATASCOSA	New Braunfels		Pawnee	KARNES
McDade	BASTROP	West	COMAL	Payton	COMAL
McDonald Lake	DIMMIT	New Davy	DEWITT	Pearsall N	FRIO
McFaddin	REFUGIO	New Taiton	WHARTON	Pearsall S	FRIO
McMahan	CALDWELL	New Ulm	COLORADO	Peck Branch	VICTORIA
McQueeney	GUADALUPE	Nido Ranch	WEBB	Peggy	ATASCOSA
Medina Lake	MEDINA	Nixon	WILSON	Peloncillo Peak	KINNEY
Melo	GOLIAD	Norias	KENEDY	Pertle Creek	MCMULLEN
Mercedes	HIDALGO	North of Port		Petronila	NUECES
Mesteno Creek N	WEBB	Isabel	CAMERON	Pflugerville East	TRAVIS
Mesteno Creek S	WEBB	Nursery	VICTORIA	Pflugerville West	TRAVIS
Meyersville	DEWITT	O'Keef Lake	WEBB	Pharr	HIDALGO
Midfield	WHARTON	Oak Hill	TRAVIS	Piedra Creek NE	LA SALLE
Midway	LIVE OAK	Oakland	COLORADO	Piedra Creek NW	LA SALLE
Millett	LA SALLE	Oakville SW	LIVE OAK	Piedra Creek SE	LA SALLE
Mills Bennett NW	WEBB	Oakville	LIVE OAK	Piedra Creek SW	LA SALLE
Mills Bennett SW	WEBB	Odem	SAN PATRICIO	Piedra Parada	
Mills Bennett	WEBB	Odlaw	KINNEY	Ranch	WEBB
Mineral	BEE	Oilton	WEBB	Piedra Parada Tank	WEBB
Mirando City	WEBB	Oliva	CALHOUN	Pierce	WHARTON
Mirasol Creek	DUVAL	Olmito	CAMERON	Pilgrim	GONZALES
Mission Bay	REFUGIO	Olmos Creek	KINNEY	Piloncillo Hill	WEBB
Mission Valley	VICTORIA	Orange Grove	JIM WELLS	Pinto Creek	WEBB
Mission	HIDALGO	Orvil	WEBB	Pinto Mtn	KINNEY
Mogotes Hill	ZAPATA	Oso Creek NE	NUECES	Pita Camp	KENEDY
Monte Christo	HIDALGO	Oso Creek NW	NUECES	Pita Island	NUECES
Montell	KINNEY	Ottine	GONZALES	Placedo	CALHOUN
Monteola	BEE	Pace Bend	TRAVIS	Pleasanton	ATASCOSA
				Pledger	WHARTON

Quadrangle	County	Quadrangle	County	Quadrangle	County
Point Comfort	CALHOUN	Rockaway Creek	MCMULLEN	Sand Mountain	ZAVALA
Point of Rocks	KLEBERG	Rockport	ARANSAS	Sandia	LIVE OAK
Port Aransas	NUECES	Roma-Los Saenz E	STARR	Sandy Fork	CALDWELL
Port Ingleside	NUECES	Roma-Los Saenz W	STARR	Santa Elena NW	BROOKS
Port Isabel NW	CAMERON	Rosanky	BASTROP	Santa Elena SE	BROOKS
Port Isabel	CAMERON	Rosita Lake NE	KENEDY	Santa Elena	BROOKS
Port Lavaca E	CALHOUN	Rosita Lake	KENEDY	Santa Maria	CAMERON
Port Lavaca W	CALHOUN	Rosita NE	DUVAL	Santa Rosa	CAMERON
Port Mansfield	WILLACY	Rosita NW	DUVAL	Sapamco	BEXAR
Port O'Connor	CALHOUN	Rosita SE	DUVAL	Sargent	MATAGORDA
Portland	NUECES	Rosita	DUVAL	Sarita SW	KENEDY
Poteet	ATASCOSA	Rossville	ATASCOSA	Sarita	KENEDY
Poth	WILSON	Rough Hollow	HAYS	Sarnosa Hill	DUVAL
Potrero Cortado	KENEDY	Round Top	FAYETTE	Saspamco SE	WILSON
Potrero		Rudolph	KENEDY	Sattler	COMAL
Lopeno NW	KENEDY	Runge SE	DEWITT	Sawmill Branch	COLORADO
Potrero Lopeno SE	KENEDY	Runge	DEWITT	Schattel NW	FRIO
Potrero		Ryanville	GOLIAD	Schattel	ATASCOSA
Lopeno SW	KENEDY	Sabinal NE	MEDINA	Schertz	BEXAR
Premont E	JIM WELLS	Sabinal	MEDINA	Schroeder	VICTORIA
Premont W	JIM WELLS	Sacatosa Tank	MAVERICK	Schulenburg	FAYETTE
Progreso	HIDALGO	Sagunada Ranch	STARR	Seadrift NE	CALHOUN
Pulliam Ranch	ZAVALA	Saint Hedwig	BEXAR	Seadrift	CALHOUN
Quemado E	MAVERICK	Salineno	STARR	Seeligson Ranch	JIM WELLS
Quemado SE	MAVERICK	Salmon Peak	KINNEY	Seguin	GUADALUPE
Quemado W	MAVERICK	Salt Well	MAVERICK	Sevenmile Hill	UVALDE
Quihi	MEDINA	Saltillo Well	KENEDY	Shaeffer Ranch	JIM WELLS
Quintana	REFUGIO	Sample	GONZALES	Sheridan NE	COLORADO
Raisin	VICTORIA	San Ambrosia		Sheridan SE	COLORADO
Ramirez	DUVAL	Creek 3NE	MAVERICK	Sheridan	COLORADO
Randado	JIM HOGG	San Antonio East	BEXAR	Shiner	GONZALES
Ray Point	LIVE OAK	San Antonio Viejo	JIM HOGG	Shingle Hills	HAYS
Raymondville	WILLACY	San Antonio West	BEXAR	Shipp Ranch	WEBB
Reagan Wells	UVALDE	San Caja Hill	MCMULLEN	Signal Hill	HAYS
Realitos	DUVAL	San Diego NE	JIM WELLS	Silver Lake	KINNEY
Red Rock	CALDWELL	San Diego	JIM WELLS	Sinton E	SAN
Refugio SW	BEE	San Geronimo	BEXAR		PATRICIO
Refugio	REFUGIO	San Isidro	STARR	Sinton W	SAN
Retama Creek	WEBB	San Jose	DUVAL		PATRICIO
Rexville	COLORADO	San Juan SE	HIDALGO	Skidmore NE	BEE
Ricardo	KLEBERG	San Marcos North	HAYS	Skidmore	BEE
Rincon Bend	SAN	San Marcos South	HAYS	Smiley	GONZALES
	PATRICIO	San Miguel Ranch	ATASCOSA	Smithson Valley	COMAL
Rincon	STARR	San Pablo Ranch	JIM HOGG	Smithville NW	BASTROP
Rio Grande City N	STARR	San Pablo	WEBB	Smithville	BASTROP
Rio Grande City S	STARR	San Patricio	SAN	Snake Creek	ZAVALA
Rio Hondo	CAMERON		PATRICIO	Somerset	BEXAR
Riomedina	MEDINA	San Pedro Creek	DIMITT	South Bird	
Riviera Beach NE	KLEBERG	San Pedro Hill	WEBB	Island NW	KLEBERG
Riviera Beach NW	KLEBERG	San Pedro Ranch	KENEDY	South Bird	
Riviera Beach	KLEBERG	San Perlita N	WILLACY	Island SE	KLEBERG
Riviera	KLEBERG	San Perlita S	WILLACY	South Bird Island	KLEBERG
Robstown	NUECES	San Tomas Camp	BROOKS	South of Palacios	
Rock Island	COLORADO	San Ygnacio	ZAPATA	Point	MATAGORDA

Quadrangle	County	Quadrangle	County	Quadrangle	County
South of Potrero		Thomas Springs	GUADALUPE	Victoria West	VICTORIA
Lopeno NE	KENEDY	Thompsonville	JIM HOGG	Vidaurri	REFUGIO
South of Potrero		Three Islands	CAMERON	Wadsworth	MATAGORDA
Lopeno NW	KENEDY	Three Oaks	WILSON	Waelder	FAYETTE
South of Potrero		Three Rivers	LIVE OAK	Warda	FAYETTE
Lopeno SE	WILLACY	Tilden	MCMULLEN	Webberville	TRAVIS
Southmost	CAMERON	Timber Creek	MEDINA	Weesatche	GOLIAD
Southton	BEXAR	Tios Creek	WEBB	Weimar	COLORADO
Speaks	COLORADO	Tivoli SE	CALHOUN	West Brownsville	CAMERON
Spicewood	TRAVIS	Tivoli SW	REFUGIO	West Point	FAYETTE
Spofford	KINNEY	Tivoli	REFUGIO	West Ranch	ZAVALA
Spohn Ranch	WEBB	Togo	FAYETTE	West Sinton	SAN
Spring Branch	COMAL	Tordillo Creek	WEBB		PATRICIO
St. Charles Bay SE	ARANSAS	Tovar Creek E	MAVERICK	Westhoff	DEWITT
St. Charles Bay SW	ARANSAS	Tovar Creek W	MAVERICK	Wharton	WHARTON
St. Charles Bay	ARANSAS	Travis Peak	TRAVIS	Whitsett	ATASCOSA
Standart	KINNEY	Trio	UVALDE	Wied	LAVACA
Stockdale	WILSON	Trosado Tank	MAVERICK	Willamar SW	CAMERON
Structure	BASTROP	Tuleta	BEE	Willamar	WILLACY
Sublime	LAVACA	Tulsita	BEE	Willow Hollow	
Sugar Creek	ZAVALA	Turcotte	KENEDY	Tank	LIVE OAK
Sullivan City	HIDALGO	Turkey Mtn	KINNEY	Wilson Ranch	MEDINA
Sweet Home	LAVACA	Turtle Bay	MATAGORDA	Wimberly	COMAL
Swiss Alp	FAYETTE	Twin Hollow	MEDINA	Winchester	FAYETTE
Sycamore		Twin Mott Lake	REFUGIO	Woodard Lake	ZAVALA
Mountain	UVALDE	Tynan	SAN	Woodsboro	REFUGIO
Tacubaya	BROOKS		PATRICIO	Woodward NE	FRIO
Taft	SAN	Uhland	HAYS	Woodward	LA SALLE
	PATRICIO	Utlely	TRAVIS	Yancey	MEDINA
Telephone Tanks	WEBB	Utopia	UVALDE	Yarborough Pass	KENEDY
Tequesquite		Uvalde	UVALDE	Yoakum	DEWITT
Creek NE	KINNEY	Valley Wells	DIMITT	Yorktown E	DEWITT
Tequesquite		Van Raub	BEXAR	Yorktown W	DEWITT
Creek SW	KINNEY	Van Vleck	MATAGORDA	Yturria	WILLACY
Tequesquite Spring	KINNEY	Venezuela Creek	WEBB	Zapata NW	ZAPATA
Terrell Wells	BEXAR	Venado Creek E	WEBB	Zapata SW	ZAPATA
Terryville	DEWITT	Venado Creek W	WEBB	Zapata	ZAPATA
Texas Mountain	MEDINA	Verhelle	DEWITT	Zella	LA SALLE
The White Kitchen	LA SALLE	Viboras	STARR		
Thelma	BEXAR	Victoria East	VICTORIA		

Table 6. Acreage estimates for inventoried sites.

SIZE CATEGORY	COMMODITY	SITE STATUS: Abandoned		Active		Reclaimed	
		No. Sites	Size (ac.)	No. Sites	Size (ac.)	No. Sites	Size (ac.)
Small	Sand & Gravel	659	6,590	335	3,350	147	1,470
	Caliche	198	1,980	208	2,080	15	150
	Limestone	42	420	67	670	31	310
	Other	15	150	10	100	3	30
	Total	914	9,140	620	6,200	196	1,960
Medium	Sand & Gravel	330	20,691	318	19,939	89	5,580
	Caliche	44	2,759	106	6,646	2	125
	Limestone	9	564	45	2,822	18	1,129
	Other	19	1,191	42	2,633	3	188
	Total	402	25,205	511	32,040	112	7,022
Large	Sand & Gravel	10	2,200	40	8,800	4	880
	Caliche	0	0	6	1,320	0	0
	Limestone	0	0	10	2,200	1	220
	Other	2	440	11	2,420	0	0
	Total	12	2,640	67	14,740	5	1,100
TOTAL		1,328	36,985	1,198	52,980	313	10,082

	Size (ac.)		Size (ac.)
Total numbered sites	100,047	Total Sand and Gravel	69,500
Total below threshold sites	2,817	Total Caliche	15,060
Total all sites	102,864	Total Limestone	8,334
		Total other	7,153



Table 7. Mined sites by geologic unit.

<u>Formation Name</u>	<u>Number of Pits</u>
Fluvatile terrace deposits	379
Goliad	268
Willis	216
Alluvium	177
Leona	93
Lissie	93
Uvalde Gravel	91
Caddell, Deweesville, Manning, Wellborn, Whitsett (Jackson Group)	70
Glen Rose	59
Oakville	57
Fleming	56
Sand Sheet/Dune deposits	55
Bigford, Cook Mountain, El Pico, Laredo, Reklaw, Yegua (Claiborne Group, except Carrizo and Queen City)	55
Catahoula	52
Edwards	48
Carrizo	47
Beaumont	35
Queen City	34
Wilcox	28
Austin Chalk	25



Table 8. Densest areas of mine development by quadrangle sector. For explanation of sector area, see appendix 2, fig. 1.

County	Quadrangle	Sector	Number of sites per sector (> 2 ac.)
Fayette	Ledbetter	9	22
Victoria	Peck Branch	7	21
De Witt	Verhelle	9	20
De Witt	Hochheim	8	19
Victoria	Mission Valley	9	17
De Witt	Verhelle	6	17
Colorado	Bernardo	4	16
Colorado	Columbus	2	14
Fayette	Fayetteville	6	14
Colorado	Alleyton	4	13
Victoria	Mission Valley	5	13
Bexar	Helotes	9	11
Colorado	Ellinger	5	11
Fayette	Fayetteville	9	11
Bexar	Castle Hills	4	10
Bexar	Macdona	5	10
Bexar	San Antonio West	7	10
Colorado	Altair	5	10
Colorado	Columbus	1	10
De Witt	New Davy	7	10
Travis	Montopolis	2	10
Victoria	Fordtran	6	10
Victoria	Mission Valley	8	10
Victoria	Nursery	5	10

Table 9. Distribution of reclaimed sites by county

<u>County</u>	<u>Number of sites</u>	<u>Percent of total reclaimed sites</u>
Bexar	128	41
Travis	60	19
Atascosa	2	1
Bee	5	2
Brooks	1	0
Caldwell	5	2
Cameron	10	3
Colorado	13	4
Comal	5	2
De Witt	10	3
Duval	1	0
Fayette	11	4
Frio	4	1
Gonzales	8	2
Guadalupe	5	2
Hays	6	2
Hidalgo	9	3
Jackson	2	1
Karnes	1	0
Lavaca	1	0
Matagorda	1	0
Medina	8	3
Nueces	1	0
Starr	4	1
Victoria	9	3
Webb	2	1
Wharton	1	0
Total	313	100



# Appendix 1

## TEXAS MINED LANDS INVENTORY FORM PART 1

### A. GENERAL INFORMATION

1. County	2. Site No.	3. Congressional Dist.	4. Mine Status: a. Active (Y/N) b. Abandoned c. Confirmed (Y/N) d. Reclaimed (Y/N) e. Type of Reclamation f. Size Category	acres acres
5. USGS 7.5 Quad. Name	6. No. of Quads			
7. USGS Quad. No.	8. Lat.-Long. of Site N - - W - -			
9. Location				
10. Site Name	11. Operator			
12. Home Office Address	13. Field Office Address			
14. Home Office Telephone No.	15. Field Office Telephone No.			
16. Previous Operator	17. Type of Mine			
18a. Commodity	19. End-Use			
20. Rock/Sediment Type: a. Mined Material b. Overburden c. Mine Floor	(1) Lithology	(2) Formation	(3) Consolidated (Y/N)	(4) Aquifer (Y/N)
21. Mined Area a. Air Photo b. Topo Map c. Site Visit d. Flyover e. Soil Survey Report f.	acres / / / / / / /			
22. Verification of Mine Status: a. Air Photo b. Site Visit c. Flyover d. Interview e.				
23. Aerial Photos Used: a. Historical b. Historical c. Most Recent	(1) Date / / / / / /	(2) Frame I. D.	(3) Scale 1: 000 1: 000 1: 000	(4) Type (5) Agency

### B. REMARKS

24. Comments:

25. a. (1) Preparer(s) (2) Date Prepared / /

b. (1) Revised by (2) Date Revised / /

TEXAS MINED LANDS INVENTORY FORM  
PART 2

Site No.

C. HEALTH AND SAFETY CONSIDERATIONS

26. Disturbed Area:	(1) Spoil Pile	(2) Highwall	(3) Pit	(4) Shaft
a. Area	acres	N/A	acres	sq-yd
b. Slope Range (degrees)	-	-	-	-
c. Height (depth) Range (ft)	-	-	-	-
d. Length (ft)	N/A	N/A	N/A	N/A
e. Volume	cu-yd			
f. Unstable (Y/N)				
g. Density of Vegetation				
h. Types of Vegetation				
i. Existence of Highwall (Y/N)				
27. Wetlands:	(1)	(2)	(3)	
a. Classification				
b. Area (acres)				
c. Turbid (Y/N)				
d. Color (natural or IR)				
e. pH				
f. Conductance (micromhos)				
g. Temperature (deg F)				
h. Sample No.				
i. Current use				
j. Existence of Wetlands (Y/N)				
28. Site Condition:	(1) Type(s)			
a. Waste Dumping (Y/N)	(1) Condition			
b. Facilities (Y/N)	(1) Condition			
c. Equipment (Y/N)				
d. Susceptibility to flooding (Y/N)				
e. Ground Saturated (Y/N)				
f. Springs from Highwall (Y/N)				
29. Personal Injury or Accident:	b. Nature of Injury or Accident			
a. Known Injury or Accident (Y/N)	d. Number of Nonfatal Accidents			
c. Number of Fatal Accidents				
e. Verifying Evidence				
30. Human Visitation:	(1=trails, 2=roads, 3=gabrage/trash, 4=other)	(1) Other		
a. Evidence	(1=0-25%, 2=26-50%, 3=51-75%, 4=76-100%)			
b. Total area covered				
31. Accessibility:	b. roads gated (Y/N)	c. site less than or equal to 0.5 mile from public road		
a. roads to site (Y/N)	e. footpaths to site (Y/N)	f. site fenced (Y/N)		
d. railroads to site (Y/N)	i. reasonable warning (Y/N)	g. shaft sealed (Y/N)		
h. access maintained (Y/N)				
32. Visibility:	b. from residences/businesses (Y/N)	c. from public lands (Y/N)		
a. from public road (Y/N)				
33. Nearest resident:	b. Distance . miles			
a. Within 1 mile (Y/N) A				
34. Environmental Conditions:	D. ENVIRONMENTAL CONSIDERATIONS	(1) Disturbed Area	(2) Impact on Adjacent Property	
a. Surface Runoff (Y/N)				
b. Runoff received by a water body (Y/N)				
c. Name of water body				
d. Physical changes in water body				





- e. Existence of sheet wash (Y/N)
  - f. Vegetation Stress (Y/N)
  - g. Evidence of Stress
35. Erosion:
- a. Agent(s)
  - b. Extent  
(1=0-25%, 2=26-50%, 3=51-75%, 4=76-100%)
  - c. Severity
  - d. Susceptibility
36. Nearest Public Water Supply:
- a. Surface Source
  - b. Well Field
37. Surrounding Land-Use: (enter land-use codes)
- a. Land-Uses
38. Nearest Aquifer:
- a. Name
  - b. Mine in recharge area (Y/N)
  - c. Mine in downdip portion of aquifer (Y/N)

N/A

N/A

(1) Distance from site : miles  
(1) Distance from site : miles



## Appendix 2

### TEXAS MINED LANDS DATA BASE MANUAL

This manual for interpreting the Texas Mined Lands Data Base (TMLDB) was prepared by The University of Texas at Austin, Bureau of Economic Geology (BEG), under an interagency cooperation contract (IAC 88-89-0979) with the Surface Mining and Reclamation Division, Railroad Commission of Texas (SMRD).

Records in the TMLDB are divided into two parts, following the format of the Mined Lands Inventory Form (MLIF) (appendix 2). Part 1 contains general information and remarks, and part 2 provides information on health, safety, and environmental aspects. Some mined sites are inventoried only in part 1 of the data base. Together, parts 1 and 2 combined contain 38 consecutively numbered subdivisions. Each data entry in a subdivision is referred to as a field. Some subdivisions contain only one field, whereas others have multiple fields. Fields are identified in this manual by a combination of numbers and letters. Data entries in fields include proper names, alphanumeric codes, numerical measurements, dates, or key words.

This manual explains in detail each field in the TMLDB. The following text describes the source(s) for the data in each field and defines codes and key words.



## A. General Information

1. County. Field 1 contains the name of the county in which the site is located. Site location is defined by the latitude and longitude assigned in Field 8.
2. Site No. Field 2 contains a unique sequence of three digits, three letters, and three digits that identifies the area where a site is located and the specific number assigned to the site. The first three digits of this code are the Federal Information Processing Standards (FIPS) code for the county specified in Field 1. The FIPS county code is used in both the Railroad Commission of Texas (RRC) and U.S. Bureau of Mines (USBM) data bases.

The second part of the site designation is a three-letter abbreviation for the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle in which the site is located. The abbreviation selected is unique within each county and usually represents the first three letters of the quadrangle name. If the quadrangle name contains two words, the abbreviation usually represents the first two letters of the first word and the first letter of the second word. The full name of the quadrangle appears in Field 5.

The third portion of the site designation is a three-digit code for the site within a USGS 7.5-minute quadrangle. This code is derived from the well numbering system of the Texas Water Development Board (TWDB). In this system, each 7.5-minute quadrangle is subdivided into nine 2.5-minute sectors. Each 2.5-minute sector is numbered consecutively starting in the northwest corner of a 7.5-minute quadrangle (fig. 1). Sites are then numbered consecutively within

1 Beckman Quarry x 01  x 02	2	3
4	5	6
7	8	9 x 01  x 02  x 03

Figure 1. Sectors of a USGS 7.5-minute quadrangle used in the last three digits of the site designator (Field 2). Each sector is 2.5 minutes of latitude by 2.5 minutes of longitude. Site locations (shown here by the letter X) are numbered consecutively within each 2.5-minute sector. Site 101 is the Beckman Quarry northwest of San Antonio, Bexar County.

each 2.5-minute quadrangle. Thus, for the last three digits of the site designation, the first digit represents the 2.5-minute sector in which the site is located, and the last two digits are the individual site number within the 2.5-minute sector. For example, the Beckman Quarry northwest of San Antonio (fig. 1) has a site designation of 029 CAH 101. 029 is the FIPS code for Bexar County, CAH is the abbreviation for the Castle Hills 7.5-minute quadrangle, and 101 indicates that the site is the first one numbered (01) in the northwestern (1) 2.5-minute sector of the Castle Hills 7.5-minute quadrangle.

3. Congressional Dist. The two-digit number in Field 3 gives the U.S. Congressional District in which the site is located. Congressional District boundaries are those established on June 19, 1983.
4. Mine Status. Mined land is classified as active or abandoned on the basis of interpretation of remote-sensing imagery, a site visit, an aerial overflight, or a telephone interview with the site operator. A site is designated as active if there is evidence that mining activity, such as excavation, milling or processing, has taken place in any portion of the site during the recent past as determined by aerial photography, overflight, visit, or interview. A "Y" is placed in Field 4a if a site is active, and a "N" is placed in Field 4a if a site is abandoned. Active sites may contain abandoned portions where mining has ceased.

Field 4a contains the total acreage that is being actively mined, and Field 4b contains the total acreage that has been abandoned on the site. Confirmation that a site is being actively mined or is abandoned is indicated by a "Y" in Field 4c.

A "Y" for yes or an "N" for no appears in Field 4d to indicate whether a site has been reclaimed. The type of reclamation is indicated in Field 4e with one of the following key words:

Golf Course	Other
Lake	Park
Landfill	Pond
Natural	Reservoir
Natural, Filled	Stock Pond
Orchard	Urban

Urban reclamation comprises all of the urban or built-up land uses (residential, commercial, industrial, services, transportation, communications, and utilities) in the USGS Land-Use and Land-Cover Classification (Anderson and others, 1976). Natural reclamation indicates the return of the land to native vegetation, and a gentle or level slope. The "other" category in Field 4e includes mined land that is now agricultural land, rangeland, or water.

The overall area of the mined site is indicated by a size category in Field 4f: sites less than or equal to 10 acres are indicated by "S" for small; sites greater than 10 acres and less than 200 acres are designated "M" for medium; and sites greater than or equal to 200 acres are designated "L" for large. The size category is determined with a template after site boundaries have been drawn on a USGS 7.5-minute quadrangle. A "U" is entered in Field 4f for the sites (e.g., underground mines) where the extent of the mined land is unknown.

5. USGS 7.5 Quad. Name. Field 5 contains the name of the USGS 7.5-minute quadrangle in which a site is located. Compass directions (i.e., north, south, etc.) may be abbreviated in the quadrangle names.



6. No. of Quads. Field 6 indicates the number of USGS 7.5-minute quadrangles which contain acreage for the site.
7. USGS Quad. No. The number in Field 7 is the seven-digit code assigned by the USGS to 7.5-minute topographic quadrangles. The first four digits indicate the latitude and longitude of the southeast corner of the 1-degree quadrangle that includes the 7.5-minute quadrangle. The last three digits describe the location of the 7.5-minute quadrangle within the 1-degree quadrangle. This code is used by the RRC and the Texas Natural Resources Information System (TNRIS).
8. Lat.-Long. of Site. The latitude and longitude of each site (Field 8) is the approximate geographic center of the mined area. Latitude and longitude are measured in degrees, minutes, and seconds accurate to the nearest 5 seconds. Measurements are made with a clear mylar template on a USGS 7.5-minute topographic quadrangle. The values are based on the 1927 North American Datum.
9. Location. Field 9 gives directions to the site in tenths of miles from a road intersection, community, or other point of geographic reference. Names of these reference points are taken primarily from USGS 7.5-minute topographic quadrangles, and secondarily from the Texas State Department of Highways and Public Transportation (TDHPT) general highway maps. Common abbreviations used in this field are the following:

Co. = County

E = East

Hwy = Highway

N = North

I = Interstate

S = South

Rd. = Road

W = West

10. Site Name. This field contains a unique site name assigned by the BEG. For many active sites this project name will coincide with the name given to the mine, pit, or quarry by the operator. For other sites, the assigned name will refer to a geographic place name that appears on a USGS 7.5-minute topographic quadrangle or on TDHPT general highway maps.
11. Operator. Field 11 contains the name of the person(s), company, corporation, or governmental agency extracting raw materials from the site. This information comes from an on-site visit, a telephone interview with the mine operator, or from records of The University of Texas at Austin, Bureau of Economic Geology (BEG). The site operator is not necessarily the owner of the land on which the mine, pit, or quarry is located.
12. Home Office Address. This field contains a street or postal address of the site operator whose name appears in Field 11. An address will appear in this field if the operator has an office that is not located at or near the mine site.
13. Field Office Address. A street or postal address will appear in Field 13 if the operator has an office at or near the mine site.
14. Home Office Telephone No. This field contains the area code and telephone number of an operator's office that is not located at or near the mine site.

15. Field Office Telephone No. Field 15 contains the area code and telephone number of an operator's office located at or near the mine site.
16. Previous Operator. This field contains the name or names (if known) of the individual(s), firm, or governmental agency extracting raw materials from the site prior to the present operator shown in Field 11. This information comes from a variety of sources, including published reports, the BEG Mineral Industry Location Subsystem (MILS) data base, the Texas Air Control Board (TACB) data base, and from on-site visits.
17. Type of Mine. One of the following key words appear in Field 17 to indicate the primary mining method used at each site:

Pit - A surface mine in unconsolidated or loosely consolidated earth material that is not refilled during the mining process.

Quarry - A surface mine in rock that is not refilled during the mining process.

Strip - A surface mine in which spoil banks are piled immediately behind the advancing highwall. Distinguished from open-pit mines in that the excavation is filled concurrently with the extraction of the earth resource.

Dredge - A surface mine in which an earth resource is removed from below the surface of a body of water. Removal of earth materials from below the water surface may be land-based (i.e., by dragline, bulldozer, power shovel, scraper, front-end loader, or bucket wheel) or water-based (i.e., by floating suction or bucket-line dredge).

UM-shaft - An underground mine with a vertical access shaft and with lateral mining (drifts) at depth.

UM-slope - An underground mine with an inclined access tunnel and with lateral mining (drifts) at depth.

UM-adit - An underground mine with a horizontal access tunnel and with lateral and/or vertical mining at depth.

UM-solution - An underground mining operation that involves the dissolution or melting of an earth resource. After it is in solution, the earth resource is pumped as a liquid to the surface. These operations include the brining of halite, the solution mining of potash, the melting of sulfur (Frasch process), and the in situ leaching of metallic ore deposits (e.g., uranium).

18. Commodity. Field 18 contains key words for one of the following commodities.

These commodity designations generally follow those utilized by the USBM in the MILS data base:

Brine	Limestone-crushed
Caliche	Limestone-dimension
Clay-common	Oyster Shell
Clay-kaolin	Halite
Clay-bentonite	Sand-industrial
Coal-bituminous	Sand & Gravel
Coal-cannel	Sandstone
Coal-lignite	Sulfur
Dolomite-crushed	Tuff
Gypsum	Uranium
Limestone-asphaltic	

Only the first word of compound key words describing commodities may be used for sites where detailed information is not available. Other key words, such as barite, basalt, diatomite, fluorspar, gold, granite, graphite, iron ore, lead ore, marble, mercury ore, potash, slate, and silver ore, may be used for sites outside of South Texas.

19. End Use. A key word designating the most common end use will appear in Field 19. Most of these key words are also utilized by the USBM:

Aggregate	Flagstone
Agricultural	Industrial sand
Cement	Riprap
Ceramics	Road metal
Chemical/metallurgical	Rock asphalt
Construction sand	Specialty clay
Dimension stone	Structural clay
Energy	

20. Rock/Sediment Type. These fields characterize the lithology and stratigraphy of the mine site. Fields in this subdivision refer to the mineral resource being extracted (Fields 20a[1]-a[4]), the overlying soil, sediment, or rock (Fields 20b[1]-b[4]), and the underlying sediment or rock (Fields 20c[1]-c[4]).

Common rock and sediment names appear as key words under lithology (Fields 20a[1]-c[1]). The column "formation" (Fields 20a[2]-c[2]) refers to lithostratigraphic units mapped on the BEG Geologic Atlas of Texas. A formation name appears in this column unless a group or member was used in the BEG Geologic Atlas of Texas. Some entries in Fields 20a(2)-c(2) contain abbreviations for formation, Fm., for group, Gp., for member, Mem., and/or abbreviations for

lithology. Entries in Fields 20a(2)-c(2) for Quaternary alluvium and terrace deposits may contain the name of the associated river or creek. The column "consolidated" (Fields 20a[3]-c[3]) refers to the degree of lithification of the earth material. A basic test indicating lithification is whether a rock hammer is required to break apart a hand sample of the earth material. A "Y" appears in Fields 20a(3)-c(3) if the earth material is consolidated. The column "aquifer" (Fields 20a[4]-c[4]) refers to the capacity of the earth material to contain significant quantities of ground water that are suitable for domestic or industrial consumption. A "Y" in the aquifer field indicates that the earth material is classified as an aquifer in reports of the Texas Water Commission (TWC), TWDB, BEG, or USGS.

21. Mined Area. The total mined area, in acres, refers to the sum of the abandoned and active portions (Fields 4a and 4b) of the site. It includes all disturbed land (pits, shafts, spoil piles, etc.) related to the mining operation.

The basis for calculating the mined area is listed in Fields 21a-21f. Mine sites are first accurately outlined on 7.5-minute topographic quadrangles. Acreage measurements are then made with a digitizer and microcomputer.

Field 21e contains the published date of soil survey reports. The aerial photography and interpretations contained in the soil survey reports generally precede their publication date by several years. The blank subdivision (Field 21f) may contain citation information for the USGS Border Color Image Map (BCIM) series prepared for the U.S. Customs Service. These color infrared (CIR) orthophoto maps are centered on the U.S./Mexico Border and are numbered from west to east. The date of the map generally coincides with the date of the CIR

imagery used for its preparation.

22. Verification of Mine Status. The date and method of confirming that a mine is still active are indicated in Fields 22a-22e. For remotely sensed images, the date indicated is the one on which the image was taken. The blank subdivision (Field 22e) may include BCIM, soil survey reports, and other sources of verification.
23. Aerial Photos Used. This subdivision contains specific information on the vertical aerial photography used to delineate the extent of each mine site. Dates in Fields 23a(1)-c(1) are those on which the photographs were taken. The "Frame I.D." in Fields 23a(2)-c(2) is the unique code assigned by the agency or firm that took the aerial photographs. This frame identification generally includes the flight line and frame number and is unique for each image. Images from the National High Altitude Photography (NHAP) program are designated with the abbreviation NHAP, followed by the last two digits of the contract year (e.g., 81), and ending with a / and the flight line and frame numbers.

Scales for the aerial photography in Fields 23a(3)-c(3) are given as ratios in which one unit on the image equals thousands of equivalent units on the ground. The type of aerial photograph in Fields 23a(4)-c(4) is coded as BW for black and white, CIR for color infrared, and COL for color.

Agency codes in Fields 23a(5)-c(5) are the acronyms the USGS Aerial Photography Summary Record System (APSRS) assigns to the agency or firm that holds the original photographs. Commonly used codes are the following:

ASCS = Agricultural Stabilization and Conservation Service, U.S.

Department of Agriculture

NASA AM = National Aeronautics and Space Administration, Ames

Research Center

NASA JS = National Aeronautics and Space Administration, Johnson

Space Center

SCS = Soil Conservation Service, U. S. Department of Agriculture

TOBIN = Tobin Research, San Antonio, Texas

TXHWY = State Department of Highways and Public Transportation

USGS = U.S. Geological Survey, Department of Interior

#### B. Remarks

24. Comments. This field contains additional descriptive information not found in Sections A, C, or D.

25. Preparer/Reviser. Field 25a(1) contains the name(s) of the individual(s) who prepared the site report. The date on which the site report was completed is given in Field 25a(2). Field 25b(1) contains the name(s) of the individual(s) who have revised the site report. The date or dates of revisions are noted in Field 25b(2).

#### C. Health and Safety Considerations

26. Disturbed Area. The disturbed area is that portion of the mine site that has been altered by mining operations. This subdivision describes four portions of the



disturbed area: the spoil pile (Fields 26a[1]-h[1]), highwall (Fields 26a[2]-h[2]), pit (Fields 26a[3]-h[3]), and shaft (Fields 26a[4]-h[4]). Mine sites may contain more than one of these features.

Spoil piles are excavated material not removed from the site (overburden, low-grade ore, and/or unsold mined material) or waste material from milling and processing. A highwall is defined as an excavated face of a mining operation that has a slope greater than or equal to 45 degrees. Excavated faces that cast a shadow in aerial photographs are considered highwalls. A "Y" is placed in Field 26i if there is evidence of a highwall within the mine site.

A pit is defined as an excavations for mineral resources that has a width exceeding its depth. Shafts are those excavations for mining where the depth exceeds the width. Included in the category of shafts are adits.

The acreage of the spoil pile (Field 26a[1]) and of the pit (Field 26a[3]) is measured on maps or aerial photographs by a digitizer and microcomputer. For underground mines, the area of the main access shaft (Field 26a[4]) is given in square yards.

Slopes were visually estimated in degrees and the range in values is given in Fields 26b(1)-b(4). The range in height of spoil piles and highwalls is estimated in feet and indicated in Fields 26c(1) and 26c(2). The range in depth of pits and shafts is also given in feet in Fields 26c(3) and 26c(4). Field 26d contains the length of highwall and the length of the longest dimension of the pit in feet. Field 26e contains an estimate of the total volume of the spoil piles in cubic yards.

A spoil pile, highwall, pit, or shaft is considered unstable if it meets one or more of the criteria listed in Table 1. A "Y" in Fields 26f(1)-f(4) indicates that these features are unstable. In sites containing multiple spoil piles, highwalls,

pits, and/or shafts. Fields 26f(1)-f(4) contain a "Y" if one or more of the spoil piles, highwalls, pits, or shafts is unstable.

Table 1. Evidence for Instability in the Disturbed Area

A. Spoil pile

1. Slopes close to the angle of repose
2. Excavated toe slopes
3. Evidence of slumps or slides

B. Highwall

1. Overhanging ledges
2. Evidence of slumps or slides
3. Evidence of rockfalls
4. Tension cracks or fissures near the edge of the pit or quarry
5. Weakly consolidated sediment at greater than the angle of repose

C. Pit

1. Evidence of slumping
2. Evidence of liquefaction

D. Underground mine

1. Failed pillars, beams, ribs, or roof bolts
2. Evidence of rockfalls
3. Surface subsidence over underground workings or shaft

The density of plant growing on the disturbed area is indicated by one of following key words in Fields 26g(1)-g(4). For shafts, Field 26g(4) refers to vegetation surrounding and/or covering the shaft opening. Definitions for the key words used are modified from Finley and others (1979):

Barren - Living plants widely scattered or are entirely absent;  
bare ground, with only isolated plants.

Sparse - Isolated plants or small clusters of plants interspersed over essentially bare ground; normally, only low ground cover species (grasses, herbs, etc.) are represented. In portions of the region, natural vegetative cover is sparse.

Moderate - Incomplete but widespread vegetative cover, some bare ground, low ground cover species and woody plants are common.

Complete - Vegetative cover complete, to the extent that appears to have existed at the site prior to disturbance, and consistent with coverage of adjacent areas not affected by mining. Both low ground cover and larger woody species may be represented. Types of plants are indicated in Fields 26h(1) and 26h(2) by one or more of the following key words:

Grass/Grasses

Tree/Trees

Herb/Herbs

Cactus/Cacti

Shrub/Shrubs

Algae

Aquatic/Aquatics/Aquatic Plants

27. Wetlands. This subdivision describes wetlands on the mine site. Wetlands are classified according to the U.S. Fish and Wildlife Service system (Cowardin and others, 1979) as modified for photointerpretation (U.S. Fish and Wildlife, 1987). A "Y" is placed in Field 27j if there is a wetland on the mine site. The

alphanumeric code for the wetland classification appears in Field 27a. The level of the wetland classification is commensurate with the type of information obtained from photointerpretation and/or field observation.

The area of the wetland is shown in acres in Field 27b. A "Y" in Field 27c indicates that there is abundant suspended sediment and/or particulate organic matter in the water. An "N" in Field 27c indicates that the water is clear. Field 27d contains the Munsell code for color of the water. This color code is taken from the Rock Color Chart (Goddard and others, 1948) and is followed by the abbreviation "IR" if the observation was made from a color infrared photograph.

Field 27e contains the hydrogen ion activity of the water to the nearest 0.1 pH unit. Field 27f gives the specific conductance of the water measured in micromhos. This measurement provides an estimate of the total dissolved solids in the water. Temperature of the water is measured to the nearest degree Fahrenheit and is indicated in Field 27g.

Water samples taken for chemical analysis are assigned a sample number. This sample number appears in Field 27h, and can be used to locate a separate laboratory report.

The cultural use of wetlands, if applicable, appears in Field 27i and is described by one of the following key words:

Recreation	Industrial
Irrigation	Mine operations
Drinking water	Landfill
Stock pond	Other
Waste disposal	

For those wetlands that have been named, the formal name appears in the Comments (Field 24).

28. Site Condition. Fields under this subdivision designate factors at the mine site that can be used to evaluate hazards to health and/or safety. Evidence of waste dumping at the mine site is indicated by a "Y" in Field 28a. The type of waste dumping is described in Field 28a(1) by the following key words:

Garbage - Domestic or commercial waste containing food products

Trash - Plastic, metal, wood, ceramic and/or glass products or  
plant parts not used for food

Fill - Stone, dirt, and/or brush

Construction Debris - Brick, concrete, wallboard, lumber, and/or  
metal supports

Chemical - Contained or uncontained chemicals

Medical - Materials used in the practice of medicine other than  
containers of chemical or radioactive substances

Radioactive - Contained or uncontained concentrated radioactive  
substances

Animal - Manure and/or animal parts not used for food

Other

The presence of fixed mine facilities at the site is indicated by a "Y" in Field 28b. These facilities may be buildings, processing plants, rail lines, power plants, fixed scales, loading platforms, fixed conveyors, head frames, storage tanks, and fixed pump stations.

The presence of vehicles or mobile mining equipment at the site is indicated by a "Y" in Field 28c. This field indicates such equipment as dump trucks, mobile conveyors and excavating equipment, drilling equipment, tank trucks, railroad rolling stock, mobile processing equipment and pumps, cables, and utility vehicles.

The condition of the fixed mine-facilities (Field 28b[1]) and mobile equipment (Field 28c[1]) at the site is indicated by one of the following key words:

In use - Used by the current operator in mining.

Abandoned - No indication of recent use.

Degraded - Inactive and damaged by wind, water, fire, corrosion and/or vandalism.

Susceptibility of the mine site to flooding is indicated by a "Y" in Field 28d and was determined using the current Flood Hazard Boundary or Flood Insurance Rate Map published by the Federal Emergency Management Agency (FEMA).

Fields 28e and 28f indicate ground water conditions at the site that are determined from on-site visits. A near-surface water table is indicated by a "Y" in Field 28e, and evidence of springs issuing from the highwall is denoted by a "Y" in Field 28f.

29. Personal Injury or Accident. A "Y" in Field 29a indicates that evidence of a personal injury or accident at the mine site was encountered during this investigation. This field refers to incidents involving persons not connected with the mining operation. The nature of the accident is indicated in Field 29b unless the description(s) exceeds the space allotted. For lengthy descriptions or multiple incidents, the words "See Remarks" will appear in this field. The number of known fatal and nonfatal accidents is indicated in Fields 29c and 29d, respectively. Any verifying evidence, such as newspaper records or reports from governmental agencies, is noted in Field 29e.

30. Human Visitation. The type of evidence of human visitation is indicated by four codes in Field 30a:

- 0 = No evidence for visitation
- 1 = Trail(s)
- 2 = Road(s)
- 3 = Garbage/trash dumping
- 4 = Other

More than one of these codes may be listed in Field 30a. If a code 4 appears in Field 30a, then a description of the other type of evidence will be found in Field 30a(1).

The area covered by the evidence of human visitation is indicated in Field 30b. The following codes appear in Field 30b as estimates of the percentage of the total area showing evidence of human visitation:

- 1 = 0-25%
- 2 = 26-50%
- 3 = 51-75%
- 4 = 76-100%

31. Accessibility. A "Y" indicates that the mine site is accessible via roads (Field 31a), railroads (Field 31d), and/or footpaths (Field 31e). If barriers to accessibility are present, a "Y" indicates the presence of gates on roads (Field 31b), fencing around the site (Field 31f), and coverings of mine shaft entrances (Field 31g). The proximity (less than or equal to 0.5 mile) of a site to a public road is shown by a "Y" in Field 31c. Public roads are indicated on the current TXHWY county map. A "Y" appears in Field 31h if there is evidence of a conscious effort to maintain an access road to the site. Examples of evidence for access-road maintenance may be: grading, paving, clearing or cutting of plants, repair of potholes, filling of gullies, and/or installation of culverts. Field 31i



contains a "Y" if reasonable warning of mining operations is posted at the site. Reasonable warning is defined as a visible "no trespassing" or "posted" sign at probable entry points to the site.

32. Visibility. The visibility of a mine site to the general public is a factor in assessing aesthetic impact and influencing visitation. A "Y" indicates that the site is visible from a public road (Field 32a), a residence or business (Field 32b), and/or a park or recreation area (Field 32c).
33. Nearest Resident. The proximity (one mile or less) of a site to a private residence is indicated by a "Y" in Field 33a. Distance to the nearest residence (Field 33b) is shown in tenths of a mile for residences within a mile or less of the boundaries of the mine site.

#### D. Environmental Considerations

34. Environmental Conditions. Subdivision 34 describes the environment of the disturbed land on the mined property and any impact that mining has had on the adjacent property.

Devegetation of the landscape during mining operations commonly results in increased surface runoff (Toy and Hadley, 1987). A "Y" in Field 34a(1) indicates that surface runoff is leaving the mine site. A "Y" is shown in Field 34a(2) if surface runoff from the mine site appears to have caused a physical, biological, or chemical change on the adjacent property. This cause/effect relationship is inferred from observations listed in subdivisions 26, 27, 34, or 35. A "Y" in

Field 34b(1) indicates that significant runoff from the site is received by a water body in the disturbed area and a "Y" in Field 34b(2) indicates that significant runoff from the site is received by a water body on adjacent property. The name of the water body or bodies receiving the runoff is shown in Fields 34c(1) and 34c(2).

Physical changes in a flowing or standing body of water can occur when there are changes in sediment load or discharge (Toy and Hadley, 1987). Fields 34d(1) and 34d(2) contain key words describing physical changes to the water body or bodies noted in Fields 34c(1) and 34c(2). These key words may be:

Siltation	Channel shifting
Delta growth	Bank erosion
Bar formation	Scour
Channel aggradation	Other

Category 34e contains a "Y" if there is evidence of sheet wash in the disturbed area (Field 34e[1]) or of sheet wash that has drained from the disturbed area onto adjacent property (Field 34e[2]).

A "Y" in category 34f indicates that plants in the disturbed area (Field 34f[1]) show signs of stress or that plants on adjacent property (Field 34f[2]) have been lost or show signs of stress. Evidence for this stress or loss in plants is indicated in 34g by one of the following key words:

- Dusting (from fugitive dust)
- Turf compaction
- Color change
- CIR change (change in the color infrared signature)
- Wilt



Defoliation

Devegetation

Other

35. Erosion. Subdivision 35 indicates the nature and extent of physical erosion that has occurred on the mine site and the susceptibility of the site to future erosion. It also indicates the nature and severity of erosion on adjacent property that may have resulted from mining operations on the mine site.

Erosional agents are indicated in Fields 35a(1) and 35a(2) by the key words:

Water

Mass wasting

Wind

Other

The areal extent of eroded area on the site (Field 35b[1]) is expressed as a percentage of the total site acreage and is shown by the codes:

1 = 0-25%

2 = 26-50%

3 = 51-75%

4 = 76-100%

Severity of erosion is assessed by the abundance and scale of features produced by erosion and by the areal extent of denudation. The first step in this assessment is to classify the degree of denudation experienced by portions of the site and the adjacent property. The degree of denudation is determined by identifying the highest ranked category of feature produced by water erosion, wind erosion, and/or mass wasting (Table 2). Distribution and abundance of these erosional features are observed in the field or on aerial photographs. The second

step in this assessment is to estimate the area that has experienced minimal, substantial, or advanced denudation. Table 3 is then used to assign a key word to the severity of erosion in the disturbed area (Field 35c[1]) and the adjacent property (Field 35c[2]). Note that in most instances slight erosion is not detectable on aerial photographs.

Determining the susceptibility of a disturbed area to future erosion (Field 35d[1]) is based on a semiquantitative survey of the surface geology, soil, climate, runoff, topography, ground cover, land use, upland erosion (if applicable), and channel conditions (if applicable). The survey method used in determining susceptibility to erosion (Pacific Southwest Inter-Agency Committee, 1968) has worked well for estimating erosion on sloping, sparsely vegetated rangeland (Renard, 1980). It considers steep slopes and gully erosion that are not accounted for in the Universal Soil Loss Equation (National Research Council, 1981). Key words for Field 35d(1) are defined in Table 4.

Table 2. Criteria for Establishing the Degree of Denudation.

Advanced

- 3. Multiple, closely spaced gullies
- 3. Multiple landslides
- 3. Eolian dunes downwind of the eroded area

Substantial

- 2. Isolated gullies
- 2. Isolated landslides
- 2. Numerous wind ripples in and downwind of the eroded area

Minimal

- 1. Rills on slopes
- 1. Evidence of creep
- 1. Evidence of wind deflation and/or isolated wind ripples

Note 1: Erosional features are ranked in categories 1 through 3. The degree of denudation is determined by the highest ranked category of feature present in the eroded area. All features listed under each degree need not be present.

Note 2: A rill is defined as a channel that is less than 0.5 m wide and deep. A gully is defined as a channel that is greater than or equal to 0.5 m in width and depth.

Table 3. Key Words for the Severity of Erosion.

Severe - Advanced denudation covers more than 25% of the area.

Moderate - Advanced denudation covers less than 25% of the area and substantial denudation covers the remainder of the area.

Slight - Substantial denudation covers less than 25% of the area and/or minimal denudation covers 75 to 100% of the area.

Undetermined - Slight erosion may be present but the features cannot be observed on aerial photographs because of inadequate resolution or because of obscurement by foliage.

Table 4. Key Words for Describing Susceptibility of Disturbed Land to Erosion.

<u>Term</u>	<u>Sediment Yield Rating*</u>
Very High	Greater than 100
High	6-100
Moderately High	51-75
Moderate	26-50
Low	0-26

\*Calculated in the field using procedures described in Pacific Southwest Inter-Agency Committee (1968).



36. Nearest Public Water Supply. Field 36a contains the name or number of any surface water intake for a public water supply within one mile of the site. Field 36b contains the name or number of any water well for a public water supply within one mile of the site. If Fields 36a and/or 36b are completed, the distance from the site to the water intake or well is indicated in Fields 36a(1) and/ 36a(2) in tenths of a mile. Data on surface public water intakes are taken from Spill Response Maps of the TWC and from the Texas Department of Health (TDH) Division of Water Hygiene/Water System data base. Names of surface-water sources (Field 36a) are taken from the TDH water system data base or from the Spill Response Logistical Information data base of the TWC. The names of public water wells (Field 36b) are taken, when available, from published reports. Public water wells were located with current TWDB county maps of located wells or with maps in recent reports of the TWC and TWDB.
37. Surrounding Land Use. The land-use classification for all land within 0.5 mile of the mine site is indicated by two-digit codes in Field 37. These codes are taken, with two modifications, from the USGS Land-Use and Land-Cover Classification System (Table 5). In the first modification, all public and private schools are indicated by Code 18 rather than as part of Code 12 in the USGS system. The second modification classifies all parks, recreational areas, playgrounds, golf courses, fairgrounds, public gardens, and zoos as Code 19 rather than as part of Code 17 in the USGS system. Definitions for the USGS land-use classification codes are found in Anderson and others (1976). For many sites, the land-use classifications were compared with those on the 1:250,000 maps of the USGS Land Use Series.

38. Nearest Aquifer. Fields 38a-c indicate the relation of the mine site to the nearest aquifer. Aquifer designations (Field 38a) are taken from the most recent reports of the TWDB, TWC, and the USGS. A "Y" in Field 38b indicates that the mine site is in the recharge area of the aquifer. A "Y" in Field 38c indicates that the mine site is in the downdip portion of the aquifer.

Table 5. Land-Use and Land-Cover Classification for Use with Remote Sensor Data.  
(after Anderson and others, 1976)

Level I	Level II
10 Urban or built-up land	11 Residential
	12 Commercial and services
	13 Industrial
	14 Transportation, communications, and utilities
	15 Industrial and commercial complexes
	16 Mixed urban or built-up land
	17 Other urban or built-up land
	18 Public and private schools
	19 Parks, recreation areas, playgrounds, golf courses, fairgrounds, public gardens and zoos
20 Agricultural land	21 Cropland and pasture
	22 Orchards, groves, vineyards, nurseries, and ornamental horticultural areas
	23 Confined feeding operations
	24 Other agricultural land
30 Rangeland	31 Herbaceous rangeland
	32 Shrub and brush rangeland
	33 Mixed rangeland
40 Forest land	41 Deciduous forest land
	42 Evergreen forest land
	43 Mixed forest land
50 Water	51 Streams and canals
	52 Lakes
	53 Reservoirs
	54 Bays and estuaries
60 Wetland	61 Forested wetland
	62 Nonforested wetland
70 Barren land	71 Dry salt flats
	72 Beaches
	73 Sandy areas other than beaches
	74 Bare exposed rock
	75 Strip mines, quarries, and gravel pits
	76 Transitional areas
	77 Mixed barren land

## Appendix 5

### PRIORITY SITE OWNERSHIP

BASTROP	021SMI901	A. E. Rosanky P. O. Box 686 Smithville, TX 78957
BEE	025BEE702	George P. Morrill P. O. Box 610 Beeville, TX 78104-0610
BEE	025BEW901	City of Beeville
BEXAR	029CUL202	Santikos Investments
BEXAR	029CUL304	ACME Gravel Co. P. O. Box 2020 San Antonio, TX 78297-2020
BEXAR	029HLT601	Fidelity Bank (may have been repossessed) P. O. Box 47502 San Antonio, TX 78268-7502
BEXAR	029LAC503	Harvey Lee Kunze Box 357 La Coste, TX 78039-0357
BEXAR	029SCZ202	Sedalia Haufler Rt. 20 Box 214-D San Antonio, TX 78218-9658
BEXAR	029SCZ206	Theodore A. Coulter (may be more owners) 5639 Wood Climb San Antonio, TX 78233-5036
BEXAR	029SCZ208	William F. Mueller Lookout Road (lives at site, full address not avail.) San Antonio, TX
BEXAR	029SCZ209	Theodore A. Coulter (may be more owners) 5639 Wood Climb San Antonio, TX 78233-5036
BEXAR	029SCZ502	Augus Friesenhahn, Jr. no address available
BEXAR	029SCZ503	Augus Friesenhahn, Jr. no address available
BEXAR	029STN504	Fracis Lent (may be more owners) 9585 S. Hwy 181 San Antonio, TX 78223-4374



BEXAR	029STN601	Robert E. Jr. and Minnie Blount 10232 S. Hwy 181 San Antonio, TX 78223-9379
BEXAR	029THM501	Town East Baptist Church, J. H. Powers et al. trustees  Philip J. Martin 10203 Kotzebue #109 San Antonio, TX 78217  Mildred E. Wobler 118 Anne St. Baden, PA 15005
BEXAR	029THM503	Mildred E. Wobler 118 Anne St. Baden, PA 15005
BEXAR	029TWL501	Marty Ranch c/o Wayne D. Marty 1802 NE Loop 410 S-20 San Antonio, TX 78217-5202
CALDWELL	055LKN801	Emanuel H. Glockzin, Jr. P. O. Box 3144 Bryan, TX 77801
CALDWELL	055MDL101	Guadalupe County
CAMERON	061EAB701	David W. Flory 425 Retama Harlingen, TX 78550  Roy Jones et ux. Box 345 Combes, TX 78535
CAMERON	061HAR401	(Petersburg's Syndicate Subdivision Block 10) possibly owned by City of Harlingen
CAMERON	061WIS701	City of Brownsville
COLORADO	089ALL102	Gail S. Mitchell c/o Alan G. Sanderson 2607 Coatbridge Austin, TX 78745  Gene Evans Box 657 Columbus, TX 78934



W. Orise  
c/o Herman Fenix  
Box 443  
Dickinson, TX 77593

Thomas Bryant Sr. Est.  
c/o W. R. Bryant  
700 Dawson  
San Antonio, TX 78202

COLORADO 089ALL403

W. A. Schindler  
P. O. Box 842  
Columbus, TX 78934

Harrison and Clardy  
c/o Dittman Harrison  
P. O. Box 71  
Alleyton, TX 78935

COLORADO 089ALL405

Alan G. Sanderson  
2607 Coatbridge  
Austin, TX 78745

Laura A. Rau  
Box 86  
Columbus, TX 78934

COLORADO 089ALL410

Potter and Koch et al.  
no address available

C. H. Potter, Jr.  
311 Harbert  
Columbus, TX 78934

Willms Inc.  
c/o Jim Willms  
RR Box 1933  
Columbus, TX 78934

R. J. Kleimann  
c/o R. C. Kleimann  
RR Box 1938  
Columbus, TX 78934

COLORADO 089ALL414

Harrison and Clardy  
c/o Dittman Harrison  
P. O. Box 71  
Alleyton, TX 78935

COLORADO 089ALL701

Simmons Family Trust  
no address available

Craig Lee et ux.  
no address available





Warren Simmons  
231 Tait  
Columbus, TX 78934

COLORADO 089ALL801

Margaret Griffith Estate  
1506 Milam  
Columbus, TX 78934

R. M. Fitzgerald, Jr. et al.  
3700 Rice Blvd.  
Houston, TX 77005

Beth W. Fitzgerald trustee  
3700 Rice Blvd.  
Houston, TX 77005

COLORADO 089ALL802

John Massey et al.  
c/o Henry Massey  
P. O. Box 99  
Columbus, TX 78934

Fred F. Lyle (Jr.?) estate  
5727 Prentis Dr.  
San Antonio, TX 78240

Alma E. Lyle  
c/o Sam R. Lyle  
300 Norris Dr. West  
Converse, TX 78109

Elenor Sunderman  
Box 823  
Eagle Lake, TX 77434

J. H. Leedy  
914 W. Adoue St.  
Alvin, TX 77511

Rubin Lee Noska  
Rt. 2 Box 145  
Alleyton, TX 78935

Mary B. Obenhaus  
7110 Neff  
Houston, TX 77074

R. Obenhaus et al.

George Herder Allen  
P. O. Box 776  
La Porte, TX 77571



		<p>Everett C. Dutcher, Walter E. Dutcher et al., and  James K. and Frankie Jobe  no addresses available, except:  Walter E. Dutcher  P. O. Box 634  Lissie, TX 77454</p>
COLORADO	089ALT102	<p>Rita (Tait) Huffman et al.  no address available</p> <p>R. E. Tait, Jr.  RR Box 1972  Columbus, TX 78934</p>
COLORADO	089ALT404	<p>Bertha Johnson  Box 276  Altair, TX 77412</p>
COLORADO	089ALT405	<p>Walter L. Miller  Box 315  Altair, TX 77412</p>
COLORADO	089ALT504	<p>E. E. Werlla  Box 316  Altair, TX 77412</p>
COLORADO	089ALT505	<p>Jo Lou Parks and Virginia Morgan  c/o Jo Lou Parks  Box 785  Columbus, TX 78934</p>
COLORADO	089ALT801	<p>Freeman Dancy  Rt. 1 Box 126  Garwood, TX 77442</p> <p>John Hester  Box 312  Garwood, TX 77442</p> <p>Butler and McDonald  P. O. Box 275  Columbus, TX 78934</p> <p>Mary McGrew  Box 245  Altair, TX 77412</p>
COLORADO	089ALT802	<p>Margaret Bunge et al.  Rt. 1 Box 146  Garwood, TX 77442</p> <p>Geneva Bunge  Rt. 1 Box 146  Garwood, TX 77442</p>



COLORADO 089ALT805 Elda Ripple Est.  
13139 Newbrook  
Houston, TX 77072

COLORADO 089COL201 B. F. E. Property  
c/o Lee Hammons  
230 Tait  
Columbus, TX 78934

COLORADO 089COL202 Mary Hausner  
RR P. O. Box 3606  
Columbus, TX 78934

Louise Bodiford  
P. O. Box 3340  
Columbus, TX 78934

Eliza Connor Est.  
c/o Luevene Connor  
RR Box 3002  
Columbus, TX 78934

Joe Hanak  
RR Box 1947  
Columbus, TX 78934

Frances Pekar  
1820 Bowie  
Columbus, TX 78934

C. Etheridge  
4102 Blue Bonnet Blvd.  
Houston, TX 77025

James L. Hanak  
1304 Walnut  
Columbus, TX 78934

COLORADO 089COL204 Grover Gross  
Box 404  
Columbus, TX 78934

Manly Leyendecker  
RR Box 1301  
Columbus, TX 78934

E. C. Youens  
625 Second Ave.  
Saraland, Alabama 36571

Mrs. Paul Hansen  
Rt. 1 Box 1879  
Columbus, TX 78934



COLORADO	089COL208	S. Weido et al. 1204 Front St. Columbus, TX 78934
COLORADO	089COL214	B. F. E. Property c/o Lee Hammons 230 Tait Columbus, TX 78934
COLORADO	089COL501	Jerome Dvorak 111 Legion Circle Columbus, TX 78934
		Darrell and Frank Howell P. O. Box 178 Columbus, TX 78934
		Clarence Fowler Box 815 Columbus, TX 78934
		Jerry Mikeska 515 Walnut Columbus, TX 78934
		Gus Sronce P. O. Box 523 Columbus, TX 78934
		W. R. Sronce III 2116 Hwy 71 Columbus, TX 78934
		Lillian Mehrens 2126 Highway 71 South Columbus, TX 78934
		Southwest Testing Serv. no address available
		Glen Hoegmeyer P. O. Box 96 Weimar, TX 78962
		H. Gaylor P. O. Box 380503 Duncanville, TX 75318
		W. C. Carmichael 4700 Northwest 76th St. Oklahoma City, OK 73132
		Mary Hausner RR Box 3606 Columbus, TX 78934



COLORADO	089COL504	Phillip W. Youens et al. no address available, possibly owned by William T. Youens, Jr. 7 Oak Hill Dr. Columbus, TX 78934
COLORADO	089COL602	J. H. Wooten Jr. P. O. Box 655 Columbus, TX 78934  J. H. Wooten III 302 Bonham Columbus, TX 78934  Freddie L. Bunge Box 84 Columbus, TX 78934
COLORADO	089COL606	A. L. McCormick Est. c/o Myrah Jane Draper Box 365 Columbus, TX 78934
COLORADO	089COL902	Virgie M. Williamson P. O. Box 455 Columbus, TX 78934  W. T. Richardson and Eleanor RR Box 1921 Columbus, TX 78934  Richard and Ervin Heffley Box 27 Columbus, TX 78934  John Perry Est. c/o Cecelia Perry RR Box 1986 Columbus, TX 78934  D. A. Rutta Est. c/o J. M. Rutta Box 428 Columbus, TX 78934
COLORADO	089EAL102	McCreary and McCarty c/o Joe L. McCreary 603 S. McCarty Eagle Lake, TX 77434
COMAL	091NBE101	Goswin H. and Mirinda Kraft 1170 Gruene Loop New Braunfels, TX 78130



COMAL	091NBE201	Shirley A. Abel Kivlin 314 Prince New Braunfels, TX 78130
DUVAL	131FRN701	Freer Water Control and Improvement Dist. P. O. Box 329 Freer, TX 78357  Michael Edward Harper (may be an owner) Box 1245 Freer, TX 78357  Stephen Horner (may be an owner) P. O. Box 4167 Corpus Christi, TX 78408
DUVAL	131REA602	Rebecca Ramirez Gonzales 821 McDonald Corpus Christi, TX 78418
FAYETTE	149LED917	Marcus D. Null P. O. Box 218 Ledbetter, TX 78946  Clarence Mahoney 7714 Romney Dr. Houston, TX 77036  William Payne 4125 Osby Dr. Houston, TX 77025  Hughes and Son Family 12402 Westella Houston, TX 77077  Alfred Boeker, Jr. Rt. 6 Box 6231 Brenham, TX 77833  L. C. R. A. P. O. Box 220 Austin, TX 78767  Linnis A. Gibbons Est. 149 E. Echo Glen Houston, TX 77076  Gene C. Hughes trustee 14102 Cindywood Cir. Houston, TX 77079  Anthony J. Ross 14403 Magic River Cypress, TX 77429



FAYETTE	149WEP501	Will C. Moore Rt. 4 Box 18 La Grange, TX 78945  Frank C. Haynie et al. 6603 Moccasin Bend Spring, TX 77379  Amizi and Mae C. Haynie 254 Washington #4 Fairhaven, MA 02719
GUADALUPE	187MCQ301	Myron Hassinger Box 272 McQueeney, TX 78123
GUADALUPE	187SEG201	Mrs. Helen Grein 502 E. Krezdorn Seguin, TX 78155
HAYS	209BUD102	Elma C. White P. O. Box 157 Lockhart, TX 78644
HAYS	209BUD103	Elma C. White P. O. Box 157 Lockhart, TX 78644
HAYS	209SMN301	Robert G. Nance P. O. Box 262 Kyle, TX 78640
HAYS	209SMN302	Cecil C. Hughson 135 W. Sierra Circle San Marcos, TX 78666-2520
HIDALGO	215ALT501	V. K. Hall Rt. 3 Box 1350 McAllen, TX 78501  City of Alton Rt. 2 Box 12400 Mission, TX 78572
HIDALGO	215ALT901	Moises and Joseph Woldenberg Harry Woldenberg P. O. Box 2321 S. Padre Island, TX 78597
HIDALGO	215ALT904	ownership not obtained



HIDALGO	215ALT906	Moises and Joseph Woldenberg Harry Woldenberg P. O. Box 2321 S. Padre Island, TX 78597
HIDALGO	215ALT907	Moises and Joseph Woldenberg Harry Woldenberg P. O. Box 2321 S. Padre Island, TX 78597
HIDALGO	215EDI901	L & S Cattle Co. c/o L. B. Walker and Assocs. P. O. Box 16290 Houston, TX
HIDALGO	215LIS604	ownership not obtained
HIDALGO	215LJO101	Survey: W. L. Pickens et al., 2,000 ac., portion 47 Ownership could not be determined.
HIDALGO	215LJO102	Patricia Lleana Leo 115 Cumming Mission, TX 78572  Raul Martinez P. O. Box 43 La Joya, TX 78560-9527  Alfredo Gomez Box 42 La Joya, TX 78560-9527  Auturo and Amanda Hernandez Box 1325 La Joya, TX 78560-1325  Benito Ramirez Box 194 La Joya, TX 78560-0194  Florentino Mendoza Rt. 3 Box 174-A Mission, TX 78572  Abundio Garza Park Rt. 3 Box 124 Mission, TX 78572
HIDALGO	215MER901	Amelia Adame 271 3d St. Mercedes, TX 78570  Ruby Gladys Rauschenbach no address available





		Mary Ruth La Fond 129 Famingo Cr. Marble Falls, TX 78654
		may be more owners
HIDALGO	215MIS201	Earl Frankenburger 313 Joan Guil McAllen, TX 78501
		George S. Totah 4301 Miori Ln. Victoria, TX 77901-3663
		David S. Totah no address available
		Manuel Ortiz 2016 N. Inspiration Mission, TX 78572
HIDALGO	215MIS301	Wallace Anderson Rt. 4 Box 205 Mission, TX 78572
MATAGORDA	321MAT301	Texas Gulf Sulfur Co. telephone (409)657-4481 address not obtained
MEDINA	325LAC501	Laura Reicherzer or Bernard (Fernard?) Zinsmeyer Woman would not give out address.
TRAVIS	453BUD206	Suzanne W. Gasparotto 10103 Fondren Suite 170 Houston, TX 77096
TRAVIS	453BUD207	Kathryn Powers and Dorothy Larson 2217 Onion Creek Parkway #126 Austin, TX 78747
TRAVIS	453MON404	Austin Police Association 715 East 8th St. Austin, TX 78701-3395
TRAVIS	453MON504	Commercial Square c/o John V. Felter 3008 West Ave. Austin, TX 78705
TRAVIS	453MON601	Dan Berdoll et al. P. O. Box 550 Del Valle, TX 78617-0550



TRAVIS	453MON701	The Calcasieu Lumber Co. P. O. Box 17097 Austin, TX 78760-7097
TRAVIS	453OAK902	George W. Brewer 9104 Bluff Springs Road Austin, TX
TRAVIS	453OAK904	Harry Peterson 2405 Sweetbrush Drive Austin, TX 78703-1521
TRAVIS	453PAC302	Travis County
TRAVIS	453PAC701	Malcolm B. Levi Route 1 Box 19 Spicewood Springs, TX 78669
TRAVIS	453PFW701	Commonwealth Savings Association 10000 Memorial Drive Houston, TX 77024-3409
VICTORIA	469MIV808	Jane O. Bitterly Rt. 4 Box 45 Cuero, TX  Joyce O. Petering 1516 Andrea Dr. Bay City, TX
VICTORIA	469NUR405	L. E. Giese estate and Lester E. Giese, Jr. P. O. Box 14 Nursery, TX
VICTORIA	469NUR506	A. R. Kohutek 2306 East Loma Vista Victoria, TX 77901
WEBB	479LAW901	Mine area includes the following blocks of the Western Divison: 626 to 628*, 629 to 633*, 641* to 644 (all listed as Holding Institute), 645, 646, 647 (City of Laredo), 648*, 649*, 654 to 663, and 667 to 677. * indicates block owned by: T. M. Dye 11517 Newberry Dallas, TX 75229-2083 Also check with U. S. Boundary Commission for ownership.
WHARTON	481EGY801	Doris Marie Huebing McElroy P. O. Box 30 Wharton, TX 77488  Wharton County



T. P. Heyne  
P. O. Box 546  
Wharton, TX 77488

Jessie Lee Ustynik  
Rt. 1 Box 286  
Wharton, TX 77488

Alvin Davidson  
Rt. 3 Box 398  
Wharton, TX 77488

Will and Lonnie Hatton  
Rt. 1 Box 301  
Wharton, TX 77488

Atlas Subsidiaries of Texas, Inc.  
no address available

George Legler, Jr., et ux. Patricia R.  
(possible owners)  
110 Leger Lane  
Wharton, TX 77488

WHARTON 481EGY802

Jack Waters  
916 Hubecak Ln.  
Wharton, TX 77488

