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# **APPENDIX 11.2.1 SITE SELECTION REPORT**

**ATTACHMENT II**  
**SITE SELECTION REPORT**

**FEBRUARY 2004**

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## 1.0 INTRODUCTION

This report provides the information relative to Part B, Section II – Facility Siting Criteria which includes all information regarding Unsuitable Site Characteristics found in 30 TAC 335 Subchapter G, as well as the Additional Informational Requirements found in Section II.G. The specific requirements of 30 TAC 335 Subchapter G will be identified and the appropriate information presented for each provision. Those provisions that are not applicable will be so identified. Following the discussion of each rule provision, the Additional Informational Requirements will be identified and information presented for each.

### §335.204 Unsuitable Site Characteristics

(a) Storage or processing facilities

- (1) ...may not be located in the 100-year floodplain unless it is designed...

**The storage and processing facilities are not located in the 100-year floodplain. Attachment II.F presents the Flood Plain Study and Figure II.F.4 in that report identifies the 100-year floodplain at the facility.**

- (2) ...may not be located in wetlands.

**The storage and processing facilities are not located in wetlands. Appendix A presents a U.S. Fish and Wildlife map delineating aerial photo interpreted wetland areas in the vicinity of the site.**

- (3) ... may not be located on the recharge zone of a sole-source aquifer unless....

**The storage and processing facilities are not located on the recharge zone of a sole-source aquifer. Appendix B presents a map of the southwest United States delineating the sole-source aquifers, as identified by the U.S. EPA.**

- (4) ...may not be located in areas overlying regional aquifers, unless:
- (A) the regional aquifer is separated from the facility by a minimum of ten feet of material with a hydraulic conductivity toward the aquifer not greater than  $10^{-7}$  centimeters per second, or a thicker interval....

**The storage and processing facilities overlay the Santa Rosa aquifer, a regional aquifer. The aquifer is at a depth of approximately 1100 feet below ground surface. Above the aquifer is the Lower Dockum group of shales and mudstones, which have a hydraulic conductivity of  $10^{-8}$  to  $10^{-9}$  centimeters per second (refer to Attachment VI – Geology Report).**

- (5) ...may not be located in areas where soil unit(s) within five feet of the containment structure have a Unified Soil Classification of GW, GP, GM, GC, SW, SP, or SM, or a hydraulic conductivity greater than  $10^{-5}$  cm/sec unless:
- (A) Secondary containment is provided to preclude migration to groundwater or surface water from spills, leaks or discharges....

**Surface soils at the locations of the storage and processing units include some or all of the Unified Soil Classifications noted. Storage and processing units either have secondary containment structures designed to contain spills, leaks or discharges to preclude migration to surface water or groundwater or are only used for the storage of hazardous wastes that contain no free liquids (refer to Attachments V.A, V.B and V.C-- Engineering Reports for the storage and processing units).**

- (6) ...may not be located in areas of direct drainage within one mile of a lake at its maximum conservation pool level, if the lake is used to supply public drinking water through a public water system....

**There are no lakes within one mile of the storage and processing facilities that supply public drinking water (Refer to Part A, Figure C.1).**

- (7) ...may not be located in areas of active geologic processes unless the design, construction, and operational features of the facility will prevent adverse effects resulting from the geologic processes.

**The seismic hazard at a particular geographic position is due to ground motion or shaking. Seismic hazard is based on historical seismic activity and is frequently presented as Peak Ground Acceleration (PGA) maps. The maps present the probability of the PGA due to earthquakes exceeding a particular value of acceleration (expressed as a fraction or percent of gravitational acceleration [g]) over a particular time period. A PGA of greater than about 0.2 g is considered the acceleration level at which considerable damage can begin to occur to weakly built structures. A seismic hazard map of the western United States prepared by the USGS (October 2002 revision) indicates that at the 90% probability level over a 50 year time period, the PGA of the southeastern New Mexico/Andrews County area would not exceed approximately 0.03 to 0.04 g (site specific search yields 0.0322 g). A similar seismic hazard map of the western United States, which indicates that at the 98% probability level over a 50 year time period, the PGA of the southeastern New Mexico/Andrews County area would not exceed approximately 0.14 to 0.16 g (site specific search yields 0.1535 g). Golder Associates calculated the PGA at the WCS site for the Rattlesnake Canyon earthquake in the range of 0.06 to 0.07 g, which is well below the PGA of 0.2 g where considerable damage can begin to occur to weakly built structures. Golder Associates further indicate that these low estimated accelerations are “generally considered to be insignificant to well designed and constructed engineered structures or**

facilities.” The above is an excerpt from Attachment VI – Geology Report. The seismic hazard is the only active geologic process identified. The storage and processing units are engineered structures designed with secondary containments to prevent adverse impacts from spills or leaks. The ground acceleration does not impact structural foundations in and on top of the ground, therefore the foundation containment structures of the storage and processing units will not be impacted (refer to Attachment V.C, Appendix F).

- (8) ...may not be located in the critical habitat of an endangered species of plant or animal unless the design, construction and operational features of the facility will prevent adverse effects on the critical habitat of the endangered species.

The Texas Parks and Wildlife Department provided an annotated county list of rare species for Andrews County (refer to Appendix C) on 5 February 2004, which was last revised 29 October 2003. The list of endangered species includes the American Peregrine Falcon, the Whooping Crane and the Black-footed Ferret. Of these, the Whooping Crane is a migrant only and therefore the area is not considered habitat. The Black-footed Ferret is considered to be extirpated in Texas, but is an inhabitant of prairie dog towns. There are no prairie dog towns in the permitted area. The American Peregrine Falcon is the only endangered species that is a habitant, as it is known to nest in West Texas. The storage and processing units however consume less than 35 acres out of in excess of 15,000 acres of property that WCS owns surrounding the storage and processing facilities.

- (9) ...may not be located within 30 feet of the upthrown side or 50 feet of the downthrown side of the actual or inferred surface expression of a fault....

The storage and processing units are not located within 50 feet of a fault (refer to Attachment VI – Geology Report).

- (b) Land treatment facilities

**Not Applicable**

- (c) Waste piles

**Not Applicable**

- (d) Storage surface impoundments

**Not Applicable**

- (e) Landfills

- (1) ...may not be located in the 100-year floodplain existing prior to site development....

**The storage and processing facilities are not located in the 100-year floodplain. Attachment II.F presents the Flood Plain Study and Figure II.F.4 in that report identifies the 100-year floodplain at the facility.**

- (2) ...may not be located in wetlands.

**The landfills are not located in wetlands. Appendix A presents a U.S. Fish and Wildlife map delineating aerial photo interpreted wetland areas in the vicinity of the site.**

- (3) ...may not be located on the recharge zone of a sole-source aquifer.

**The storage and processing facilities are not located on the recharge zone of a sole-source aquifer. Appendix B presents a map of the southwest United States delineating the sole-source aquifers, as identified by the U.S. EPA.**

- (4) ...may not be located in areas overlying regional aquifers, unless:

- (A) the regional aquifer is separated from the facility by a minimum of ten feet of material with a hydraulic conductivity toward the aquifer not greater than  $10^{-7}$  centimeters per second, or a thicker interval....

**The landfills overlay the Santa Rosa aquifer, a regional aquifer. The aquifer is at a depth of approximately 1100 feet below ground surface. Above the aquifer is the Lower Dockum group of shales and mudstones, which have a hydraulic conductivity of  $10^{-8}$  to  $10^{-9}$  centimeters per second (refer to Attachment VI – Geology Report).**

- (5) ...may not be located in areas where soil unit(s) within five feet of the containment structure have a Unified Soil Classification of GW, GP, GM, GC, SW, SP, or SM, or a hydraulic conductivity greater than  $10^{-5}$ cm/sec unless:
  - (A) Secondary containment is provided to preclude migration to groundwater or surface water from spills, leaks or discharges....

**Surface soils at the locations of the landfills include some or all of the Unified Soil Classifications noted. The landfills are designed to contain spills, leaks or discharges to preclude migration to surface water or groundwater (refer to Attachment V.G – Landfill Engineering Report).**

- (6) ...may not be located within 1,000 feet of an established residence, church, school, day care center, surface water body used for a public drinking water supply, or dedicated public park which is in use....

**There are no residences, churches, schools, day care centers, surface water bodies used for a public drinking water supply, or dedicated public parks within 1000 feet of the landfills. WCS owns all the property within 1000 feet of the landfills. Figure V.A.9 depicts the area 1000 feet surrounding the permit boundary. The only property that WCS does not own within 1000 feet of the permit boundary is the northeast corner of the property occupied by the Lea County Landfill.**

- (7) ...may not be located in the 100-year floodplain of a perennial stream, delineated on a flood map adopted by the Federal Emergency Management Agency ....

**There are no perennial streams at the site.**

- (8) ...may not be located in areas of direct drainage within one mile of a lake at its maximum conservation pool level, if the lake is used to supply public drinking water through a public water system...

**There are no lakes within one mile of the landfills that supply public drinking water (Refer to Part A, Attachment C, Figure C.1).**

- (9) ...may not be located in areas of active geologic processes unless the design, construction, and operational features of the facility will prevent adverse effects resulting from the geologic processes.

**The seismic hazard at a particular geographic position is due to ground motion or shaking. Seismic hazard is based on historical seismic activity and is frequently presented as Peak Ground Acceleration (PGA) maps. The maps present the probability of the PGA due to earthquakes exceeding a particular value of acceleration (expressed as a fraction or percent of gravitational acceleration) over a particular time period. A PGA of greater than about 0.2 g is considered the acceleration level at which considerable damage can begin to occur to weakly built structures. A seismic hazard map of the western United States prepared by the USGS (October 2002 revision) indicates that at the 90% probability level over a 50 year time period, the PGA of the southeastern New Mexico/Andrews County area would not exceed approximately 0.03 to 0.04 g (site specific search yields 0.0322 g). A similar seismic hazard map of the western United States, which indicates that at the 98% probability level over a 50 year time period, the PGA of the southeastern New Mexico/Andrews County area would not exceed approximately 0.14 to 0.16 g (site specific search yields 0.1535 g). Golder Associates calculated the PGA at the WCS site for the Rattlesnake Canyon earthquake in the range of**

0.06 to 0.07 g, which is well below the PGA of 0.2 g where considerable damage can begin to occur to weakly built structures. Golder Associates further indicate that these low estimated accelerations are “generally considered to be insignificant to well designed and constructed engineered structures or facilities.” The above is an excerpt from Attachment VI – Geology Report. The seismic hazard is the only active geologic process identified. The landfills have a raw red bed slope stability safety factor of 2:1 and a static load safety factor of 2.36:1. EPA recommends a seismic slope stability safety factor of 1.5:1 (EPA 625/6-88/018, Guide to Technical Resources for Design of Land Disposal Facilities, 1988). Experience with earthen materials with similar characteristics suggests that determination of the seismic safety factor with ground accelerations in the range of 0.06 – 0.15 would result in a reduction of the static load safety factor of approximately 25%. Thus, the approximated seismic safety factor is 1.7.

(10) ...may not be located within 1,000 feet of an area subject to active costal shoreline erosion....

**The facility is not located with 1,000 feet of a costal shoreline.**

(11) ...may not be located in the critical habitat of an endangered species of plant or animal unless....

The Texas Parks and Wildlife Department provided an annotated county list of rare species for Andrews County (refer to Appendix C) on 5 February 2004, which was last revised 29 October 2003. The list of endangered species includes the American Peregrine Falcon, the Whooping Crane and the Black-footed Ferret. Of these, the Whooping Crane is a migrant only and therefore the area is not considered habitat. The Black-footed Ferret is considered to be extirpated in Texas, but is an inhabitant of prairie dog towns. There are no prairie dog towns in the permitted area. The American Peregrine Falcon is the only endangered species that is a habitant, as it is known to nest in West Texas. The largest landfill area open at any time is approximately 46 acres out

**of in excess of 15,000 acres of property that WCS owns surrounding the landfill facility.**

(12) ...may not be located on a barrier island....

**The facility is not located on a barrier island.**

(13) ...may not be located within 30 feet of the upthrown side or 50 feet of the downthrown side of the actual or inferred surface expression of a fault....

**The landfills are not located within 50 feet of a fault (Refer to Attachment VI – Geology Report).**

(14) ...any surface impoundment to be closed as a landfill....

**Not applicable.**

(f) Injection Wells

**Not applicable.**

## 2.0 ADDITIONAL INFORMATION REQUIREMENTS

1. ...include a map of relevant local land-use plans and descriptions of the major routes of travel in the vicinity of the facility to be used for the transportation of hazardous waste to and from the facility covering at least a five mile radius from the boundaries of the facility.

### Reference Figure II.1

2. ...indicate on the map the nearest established residence, church, school, day care center, surface water body used for a public drinking water supply, and dedicated public park.

### Reference Figure II.1

3. ...identify the public roadways used by vehicles traveling to and from the facility within a minimum radius of 2.5 miles from the facility as well as the following:
  - a. the major highways nearest the facility irrespective of distance;

### Reference Figure II.1

- b. the average number, gross weight, type and size of vehicles used to transport hazardous waste.

### Reference Table II.1

4. ...Include the names and locations of industrial and other waste-generating facilities within 0.5 miles for a new commercial hazardous waste management facility and the approximate quantity of hazardous waste generated or received annually at those facilities.

**The Lea County (New Mexico) Municipal Landfill is located approximately ¼ mile from the facility. The facility does not generate or receive hazardous waste.**

5. Include the names and locations of industrial and other waste-generating facilities within 1.0 miles for a new commercial hazardous waste management facility and the approximate quantity of hazardous waste generated or received annually at those facilities.

**The only industrial facilities located within one mile of the facility boundary are Wallach Concrete, Inc. and Sundance Services, Inc. (Identified on Figure II.1).**

**Wallach Concrete, Inc. operates a quarry and crushing operation, wherein caliche, sand and gravel are mined, crushed and screened for commercial sales and use in making concrete.**

**Sundance Services, Inc. operates a waste oil collection and treating plant. Sundance Services is authorized by the New Mexico Energy, Minerals and Natural Resources Department to operate the waste oil treating plant and also manages produced water, solids and drilling muds. Sundance Services is also authorized to landfarm solids.**

**WCS has no information relative to the amount of hazardous waste that either facility generates. Neither facility is authorized to receive hazardous waste.**

6. ...provide documentation that the information required by 30 TAC 335.5 has been placed in the county deed records.

#### **Reference Appendix D**

7. ...provide exposure information to accompany this application and in accordance with 30 TAC 305.50(8) and 40 CFR 270.10(j).

#### **Reference Appendix E**

8. For a requested capacity expansion of an existing hazardous waste management facility, please provide in Section VI.A.1.a the requested fault delineation information.

**Not Applicable**

**TABLE II.1 TRANSPORT VEHICLE INFORMATION (NOT INCLUDED)**

**FIGURE II.1 FIVE MILE LAND USE (NOT INCLUDED)**

# APPENDICES

**APPENDIX A**  
**WETLANDS DELINEATIONS (NOT INCLUDED)**

**APPENDIX B**  
**SOLE SOURCE AQUIFERS (NOT INCLUDED)**

**APPENDIX C**  
**ENDANGERED SPECIES**

## ANDREWS COUNTY

### \*\*\* BIRDS \*\*\*

	Federal Status	State Status
<b>American Peregrine Falcon (<i>Falco peregrinus anatum</i>)</b> - potential migrant; nests in west Texas	DL	E
<b>Arctic Peregrine Falcon (<i>Falco peregrinus tundrius</i>)</b> - potential migrant	DL	T
<b>Baird's Sparrow (<i>Ammodramus bairdii</i>)</b> – shortgrass prairie with scattered low bushes and matted vegetation		
<b>Bald Eagle (<i>Haliaeetus leucocephalus</i>)</b> – found primarily near coasts, rivers, and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	LT-PDL	T
<b>Ferruginous Hawk (<i>Buteo regalis</i>)</b> - open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers		
<b>Lesser Prairie Chicken (<i>Tympanuchus pallidicinctus</i>)</b> - arid grasslands, generally interspersed with shrubs and dwarf trees; nests in a scrape lined with grasses	C1	
<b>Mountain Plover (<i>Charadrius montanus</i>)</b> – breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous		
<b>Snowy Plover (<i>Charadrius alexandrinus</i>)</b> – formerly an uncommon breeder in the Panhandle; potential migrant		
<b>Western Burrowing Owl (<i>Athene cunicularia hypugaea</i>)</b> - open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows and man-made structures, such as culverts		
<b>Whooping Crane (<i>Grus americana</i>)</b> - potential migrant; winters in and around Aransas National Wildlife Refuge and migrates to Canada for breeding; only remaining natural breeding population of this species	LE	E

### \*\*\* MAMMALS \*\*\*

<b>Black-footed Ferret (<i>Mustela nigripes</i>)</b> – considered extirpated in Texas; potential inhabitant of any prairie dog towns in the general area	LE	E
<b>Black-tailed Prairie Dog (<i>Cynomys ludovicianus</i>)</b> - dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups	C1	
<b>Cave Myotis Bat (<i>Myotis velifer</i>)</b> - roosts colonially in caves, rock crevices, old buildings, carports, under bridges, and even in abandoned Cliff Swallow ( <i>Petrochelidon pyrrhonota</i> ) nests; roosts in clusters of up to thousands of individuals;		

hibernates in limestone caves of Edwards Plateau and gypsum caves of Panhandle during winter; opportunistic insectivore

**Jones' Pocket Gopher (*Geomys knoxjonesi*)** – southwestern plains of Texas; deep sandy soils of aeolian origin; small isolated population vulnerable to land use changes

**Swift Fox (*Vulpes velox*)** - restricted to current and historic shortgrass prairie; western and northern portions of Panhandle

### \*\*\* REPTILES \*\*\*

**Sand Dune Lizard (*Sceloporus arenicolus*)** – confined to active sand dunes near Monahans; dwarf shin-oak sandhills with sagebrush and yucca; opportunistic insectivore; “sit and wait” predator; burrows in sand or plant litter to escape enemies C1

**Spot-tailed Earless Lizard (*Holbrookia lacerata*)** - central & southern Texas & adjacent Mexico; moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eats small invertebrates; eggs laid underground

**Texas Horned Lizard (*Phrynosoma cornutum*)** - open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September T

### \*\*\* VASCULAR PLANTS \*\*\*

**Dune umbrella-sedge (*Cyperus onerosus*)** – moist to wet sand in depressions among active or partially stabilized sand dunes; flowering/fruitlet late summer-fall

**Dune unicorn-plant (*Proboscidea sabulosa*)** – deep, dry to seasonally moist loose sands of Quaternary sand sheet, in sparsely vegetated unstabilized dunes and opening in Havard oak shinneries; also occurs as a secondary successional species in fallow fields; flowering July-August, with fruits maturing in fall

#### Status Key:

LE,LT - Federally Listed Endangered/Threatened

PE,PT - Federally Proposed Endangered/Threatened

E/SA,T/SA - Federally Endangered/Threatened by Similarity of Appearance

C1 - Federal Candidate, Category 1; information supports proposing to list as endangered/threatened

DL,PDL - Federally Delisted/Proposed for Delisting

NL - Not Federally Listed

E,T - State Endangered/Threatened

“blank” - Rare, but with no regulatory listing status

***Species appearing on these lists do not all share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.***

**APPENDIX D**  
**DEED RECORDATION (NOT INCLUDED)**

**APPENDIX E**  
**EXPOSURE INFORMATION**

## APPENDIX E

### *Exposure Information*

If a surface impoundment or landfill is to be permitted, 30 TAC §305.50(8) and 40 CFR §270.10(j) require the submission of exposure information for the unit. 40 CFR §270.10(j) states as follows:

- (1) After August 8, 1985, any Part B permit application submitted by an owner or operator of a facility that stores, treats, or disposes of hazardous waste in a surface impoundment or a landfill must be accompanied by information, reasonably ascertainable by the owner or operator, on the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the unit. At a minimum, such information must address:
  - (i) Reasonably foreseeable potential releases from both normal operations and accidents at the unit, including releases associated with transportation to or from the unit:
  - (ii) The potential pathways of human exposure to hazardous wastes or constituents resulting from the releases described under paragraph (j)(1)(i) of this section; and,
  - (iii) The potential magnitude and nature of the human exposure resulting from such releases.

WCS seeks to permit two landfills and no surface impoundments at the facility. The potential pathways for a release from the landfill units include:

- air,
- surface water,
- ground water, and
- food chain contamination.

Each of the pathways and the potential for exposure of the public to releases for that pathway are discussed below.

### **air pathway**

The air pathway is one that is addressed by the Texas Clean Air Act. As such, a permit for the facility is required that assesses the potential for air emissions from the facility units. The Texas Clean Air Act (the Act) and the regulations resulting from the Act establish a system for evaluating the emissions from a facility unit (the landfills) and determining the worst case property-line concentrations of constituents reasonably expected to be present in the landfill. The landfill is required to meet the U.S. EPA Land Disposal Restriction requirements (LDRs) for organic constituents, which limit the concentrations of organic constituents that can be land disposed. Operational requirements are also imposed in the RCRA permit that are intended to minimize the windblown particulate from the landfill. These factors are taken into consideration when modeling the property line impacts of the landfills. The modeled property line concentrations of the constituents reasonably expected to be present in the landfill are compared to the screening levels for each of the constituents. These levels are established to be protective of the public health, given that a one hour exposure level is generally established as one one-hundredth of the 8-hour occupational exposure level. Acceptable property line concentrations of the modeled constituents are determined relative to the risk to the public and the setting of the facility. The nearest residence is in excess of 3.5 miles from the landfills. The nearest property line is in excess of 3,000 feet from the landfills.

Potential transportation related emissions to and from the units would be no different than the emissions from the units. The worst case accident scenario would be a fire in the landfill, which might result in constituents being emitted into the air as a result of burning, in which case the emissions would likely rise to a greater height above the landfill than fugitive air emissions from the landfill and actually have greater dispersion, and thus lower ground level concentrations at the property line or beyond.

### **surface water pathway**

The facility is located adjacent to the Texas – New Mexico border in northern Andrews County. The average annual rainfall is 14 inches. The 100-year 24-hour rainfall event is 6.1 inches. The 10-year 24-hour rainfall event is 4.2 inches. The annual average evaporation is 78 inches per

year. There are no perennial streams within many miles of the facility. The landfills are protected from surface water run-on and run-off by above grade berms and perimeter diversion ditches. The waste is disposed of no closer than three feet below the top of the multi-component liner system. The landfill must maintain storage capacity for the 100-year 24-hour rainfall event within the landfill liner system. Most waste that is disposed in the landfill must pass the paint filter test and contain no free liquids. The material that is transported to the landfill must meet the LDRs, therefore, most material is solidified and/or stabilized. Any spill or release of solid waste from a transport vehicle is immediately cleaned up. From a practical standpoint and under normal operating practices, landfill operations are not conducted in heavy rainfall conditions, therefore transportation related releases between the Stabilization Building or the container storage units and the landfill are minimized. It is approximately 8,000 feet from the exit of the Stabilization Building to the property boundary and approximately 8,800 feet from the landfill to the property boundary where the stormwater leaves the property. From that point it is approximately 2.5 miles to Monument Draw in New Mexico, across uninhabited land. At the discharge point, the 100-year 24-hour stormwater flow is approximately 840 cubic feet per second (6,280 gallons per second). As mentioned previously, all waste that is destined for the landfill must meet the LDRs, which means that the individual organic constituent concentrations are very low and that the metals are tied up into a non-leachable form. Potential for exposure resulting from surface water runoff is low.

### **groundwater pathway**

The uppermost aquifer under the facility is located at approximately 225 feet below the ground and approximately 165 feet below the landfill bottom. The hydraulic conductivity of the redbed clay material in which the landfill is constructed is approximately  $10^{-9}$  cm/sec. It is conservatively estimated that it would take approximately 19,000 years for water from the landfill to reach the uppermost saturated transmissive zone. The velocity of water movement in the uppermost saturated transmissive zone is approximately 0.0074 ft/yr. The property line is approximately 4,000 feet from the closest point of the landfills in the direction of the groundwater gradient. The groundwater pathway is not a reasonably expected exposure route for the public.

### **food chain contamination pathway**

There are no food crops grown in the vicinity of the landfills. The only potential food chain pathway is from the raising of cattle on the ranch land outside the RCRA permitted area. The

closest area that is accessible to cattle is approximately 2,800 feet from the northern most landfill boundary. This approximates the distance to the nearest property boundary, at which the air pathway levels of contaminants have to be protective of human health directly. As such, the potential of indirect exposure through consumption of cattle that have grazed at approximately the same distance from the landfills is remote. The grazing is so sparse in the area that the ranchland will only support approximately 5 to 10 cattle for every section of land. Thus, the cattle move and graze over a wide area and actually consume very little of the forage within the area closest to the landfills. The potential for public exposure from food chain contamination is very low.