

ATTACHMENT B
Slide Presentation

Meeting and Field Visit Ecological Risk Assessment for North Pasture

November 29, 2007

Camp Stanley Storage Activity
Boerne, TX

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DEPARTMENT OF THE ARMY
CAMP STANLEY STORAGE ACTIVITY
2000 RALPH PAUL ROAD, BOERNE, TX 78005

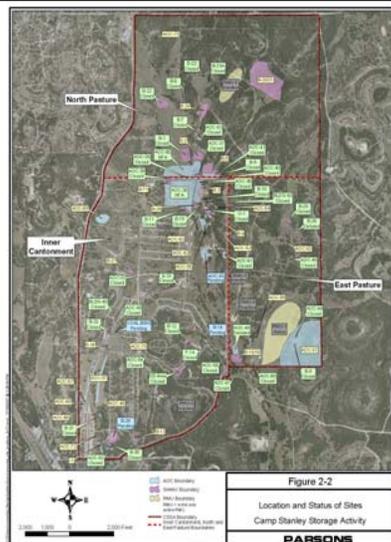
Agenda for November 29, 2007 Meeting
Ecological Risk Assessment
at
Camp Stanley Storage Activity - Boerne, Texas

Time: Thursday, November 29, 2007, 10:00 am to 2:00 pm
Place: Camp Stanley Storage Activity, Meeting and Field Visit

Proposed Order of Meeting and Field Visit

Topic
MEETING
Introduction and Opening Remarks
Overview of CSAA - North Pasture ERA
Overview of Contamination Sites
<ul style="list-style-type: none"> • Update of Key Finding Status of Sites • CSAA and North Pasture • Sources of Contamination and Chemicals of Potential Concern at CSAA • North Pasture • Funds and Interrelated Drainage Uninvestigated Area • North Pasture • Sites Near North Pasture • Other Contaminants, Sources of Contamination, COPCs, and Land Use
Ecological Risk Assessment
<ul style="list-style-type: none"> • Outline of ERA Work Plan • Habitat and Selection of Indicator Species • Ecological Conceptual Site Model • Estimation of Recipient Organisms
FIELD VISIT
FOLLOW-UP QUESTIONS FROM FIELD VISIT

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North Pasture APAR Sites

- APAR will include SWMUs B-2, B-8, B-20/21, and B-24
- RIR planned for AOC-73
- Limited hot spot removal actions planned
- Establish appropriate residential and ecological PCLs for closure



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Sources of Contamination and COPCs (North Pasture)

- Sources of Contamination:
 - past land disposal activities (B-2, B-24, & AOC-73);
 - an open burn/open detonation unit (B-20/21); and
 - reported small arms popping furnace (B-8).
- Chemicals of Potential Concern:

	Max Value (mg/kg)	CSSA Background (mg/kg)	Eco Screening (mg/kg)	Residential Tier 1 Human Health (mg/kg)
Lead	156,640	84.5	50	500
Barium	15,493	186	500	5,143
Copper	1,515.6	23.2	61	547.6
Mercury	0.69	0.77	0.1	0.091
Zinc	406.4	73.2	120	9,921.4
DNT	550	-	NA	0.157

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Additional Sampling and Potential Removal Actions at North Pasture Sites

	Estimated Removal Volume (yd ³)	Estimated Number of Additional Investigation Samples	Anticipated Analytes
B-2	50	10	Metals, Explosives
B-8	400	10	Metals
B-20/21	250	22	Metals, Explosives
B-24	150	24	VOC, SVOC, Metals, Explosives
AOC-73	150	10	VOCs, SVOCs, Metals

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North Pasture Photos



SWMU B-2



SWMU B-8



SWMU B-24



SWMU B-20

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Sites Near North Pasture

- Sites near North Pasture that have been investigated include: B-3, B-71, B-28, and AOC-64.
- Sites near North Pasture that have not been investigated include: B-4, AOC-62, AOC-52, AOC-42, and AOC-58.

Unit	COPC	Planned Actions	Land Use
B-3	CAHs, Lead	Removal Complete	Groundwater Remedial Activities
B-71	Benzene, Metals	Limited Removal	Pasture
B-28	Nickel	None	Pasture
AOC-64	Benzene, Metals	Limited Removal	Pasture

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Ponds and Intermittent Drainages (North Pasture)

- North Pasture is in the Salado and Cibolo Creek drainage basins
- Two small ponds (tanks) in North Pasture
- No recent sampling of surface water or sediment in this area

Environmental setting as it relates to the North Pasture ERA:

- All creeks at CSSA are intermittent and only support a water habitat following rain events
- Ponds are not considered significant habitat due to size and location



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North Pasture Tanks



Drop Zone Tank



Drop Zone Tank Influent



Windmill Tank



Windmill Tank Influent

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Pond & Salado Creek Photos



Pond near SWMU B-24



Salado Creek near SWMU B-11



Salado Creek Influent from NP areas



Salado Creek flooding near gate 8

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Uninvestigated Areas (North Pasture)

- **AOC-73**
 - Work plan drafted; field work currently not initiated.
 - Site is small (<0.5 acre).
 - Reportedly a rancher's old dump site (contaminant levels expected to be low).
 - Plan to remove waste material and sample for COPC.



AOC-73

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Ecological Risk Assessment

Draft Work Plan
Ecological Risk Assessment
for North Pasture
Camp Stanley Storage Activity

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WORK PLAN OUTLINE

SECTION

- 1) Introduction –
Background
Objectives
Overview of TCEQ Tiered Approach
Reference Documents
Work Plan Organization
- 2) Site Characteristics –
Sources of Information
North Pasture Sites
AOC-73 and Other Sites in North Pasture
- 3) Steps of the SLERA Process –
Problem Formulation
Exposure Characterization
Risk Characterization

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WORK PLAN OUTLINE

SECTION

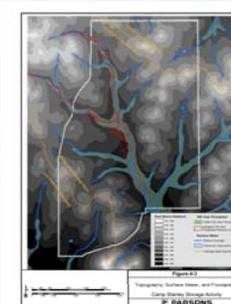
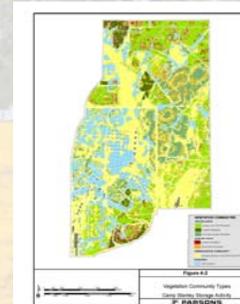
- 4) Problem Formulation –
Environmental Setting
Identification of Ecological Receptors at CSSA
Selection of Indicator Species
Contaminant Fate and Transport Analysis
Identification of Bioaccumulative COPCs
- 5) Characterization of Exposure –
Estimation of Environmental Exposure
Estimation of Receptor Uptake
- 6) Characterization of Ecological Effects –
Toxicity Data
Derivation of Toxicity Reference Values (TRVs)

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SECTION 4 PROBLEM FORMULATION

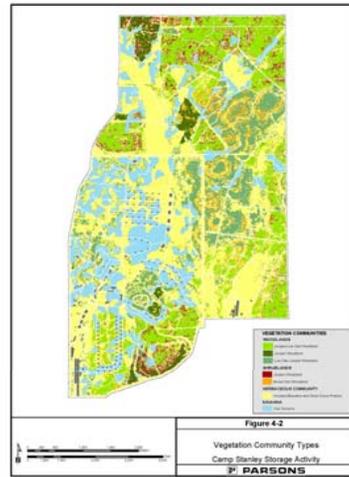
4.1 ENVIRONMENTAL SETTING

The terrestrial environment is the key habitat for the area. GW and SW exposure pathways are not considered complete. Depth to GW ranges from ~125' bgs to ~275' bgs in North Pasture area. Creeks are intermittent and usually only support a water habitat following rain events. Two ponds in North Pasture:
One is < 1/2 acre in size and ~2,400' from closest SWMU (B-24).
One is ~ 1/10th acre in size and ~650' upgradient from B-20/21.
No known caves in North Pasture – based on a Phase 1 Karst Hydrogeologic Investigation at CSSA (Veni, 2002).



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- **Overall CSSA Habitat Composition**
 - Oak-juniper woodland
 - Mixed shrubland
 - Oak savanna
 - Herbaceous (Bluestem-dominant)
- **North Pasture**
 - Area predominantly woodland
 - Herbaceous cover in sites



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SECTION 4 PROBLEM FORMULATION

4.2 IDENTIFICATION OF ECOLOGICAL SPECIES AT CSSA

Parsons (2007) reports: **Species and Habitat Distribution Report (Birds, T&E) Integrated Natural Resources Management Plan (INRMP)**

- Mammals:** White-tailed deer, wild turkey, dove, ducks, quail, rabbits, squirrel, raccoon, coyote
- Birds:** 106 species identified
- Reptiles:** Snakes, turtles, frogs, lizards – since toxicological data not available for reptiles and amphibians, bird with a similar habitat will be selected as a surrogate (indicator) species

Threatened or Endangered (T&E) Species:
 Black-capped vireo
 Golden-cheeked warbler



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SECTION 4 PROBLEM FORMULATION

4.3 SELECTION OF INDICATOR SPECIES

TCEQ Guidance: Key Receptors from Upland Forest Food Web

Mammals:

- White-footed mouse – represents the effects on herbivore mammals
- Short-tailed shrew – represents the effects on insectivorous mammals
- Gray fox – represents the effects on upper-trophic level mammals

Birds:

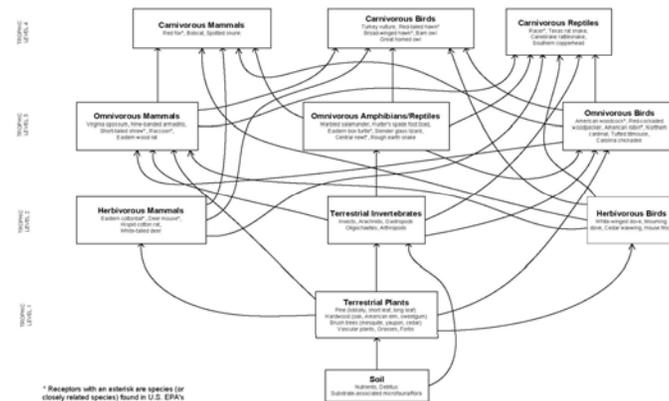
- American robin – represents the effects on omnivorous birds
- Bobwhite quail – represents the effects on herbivorous birds
- Red-tailed hawk – represents the effects on upper-trophic level carnivorous birds

T&E Species (Birds):

- Black-capped vireo – selected to represent the effects on insectivorous birds and because it is an endangered species
- Golden-cheeked warbler – selected to represent the effects on tree-dwelling insectivores and because it is an endangered species

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FIGURE 4-1
EXAMPLE TEXAS
UPLAND FOREST FOOD WEB



* Receptors with an asterisk are species (or closely related species) found in U.S. EPA's Wildlife Exposure Factors Handbook (1993).

From TCEQ (2001).

SECTION 4 PROBLEM FORMULATION

4.4 IDENTIFICATION OF COMPLETE EXPOSURE PATHWAYS

Oral – Primary exposure route

- Direct ingestion of source media
- Dietary ingestion of plant tissues
- Dietary ingestion of prey tissues containing COPCs that have bioaccumulated in tissue from the source media
- Adequate toxicological data

Dermal - negligible

- Toxicological data generally not available for wildlife

Inhalation - negligible

- COPCs not volatile (metals)
- Abundant vegetation
- Toxicological data generally not available for wildlife

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SECTION 4 PROBLEM FORMULATION

4.5 COPC FATE AND TRANSPORT ANALYSIS

4.6 IDENTIFICATION OF BIOACCUMULATIVE COPCs (metals)

Table 4.3 Example Modifying Factors in the Transfer of Inorganic COPCs from Soils to Plants and Herbivores

Element	Potential for Uptake by Vegetation	Potential for Toxicity to Herbivores
Mercury, lead	Not taken up by the roots, or not transported from roots to shoots.	Minimal potential: plants do not absorb the element or chelate it in the roots.
Copper and nickel	Minimum transfer from roots to shoots and leaves; root cell sap contains high levels of organic acids and amino acids that chelate (bind) many elements.	Low potential: element levels in plant foliage are generally safe for herbivores due to phytotoxicity limits.
Zinc	Readily transported from roots to shoots and leaves.	Moderate potential due to phytotoxicity limits.
Zinc	Variable transport to fruits and seeds: many plants restrict entry of various elements and compounds into reproductive structures.	Variable, depending on plant-specific concentration in fruits and seeds, and degree of consumption by birds and mammals.

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SECTION 5 CHARACTERIZATION OF EXPOSURE

5.1 ESTIMATION OF ENVIRONMENTAL EXPOSURE

5.1.1 Soil

5.1.2 Tissue

5.2 ESTIMATION OF RECEPTOR UPTAKE

Tissue Concentrations

- Soil-to-plant uptake factors
- Soil-to-mammal factors or multipliers

Dietary Composition – varies by species

Exposure Frequency (EF) – 100% for all species

Area Use Factor (AUF)

- Multi-site evaluation
- 100% for non-predator species
- Proportional to acreage for predator species

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SECTION 6 CHARACTERIZATION OF ECOLOGICAL EFFECTS

6.1 LITERATURE REVIEW OF TOXICITY DATA TOXICITY REFERENCE VALUES

6.2 DERIVATION OF TRVs FOR BIRDS AND MAMMALS

- ORNL – Conservative TRVs (Sample *et al.*, 1996)
- Allometric equation for intra-species extrapolations (Sample, 1999)
- PCL calculations
 - T&E species: NOAEL-based
 - Others: Mid-point NOAEL - LOAEL

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Open Discussion and Field Visit

- Overall Technical Approach of ERA Work Plan
- Field Visit
- Follow-up Questions from Field Visit

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