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**Subject:** Red Bluff Draw Sampling Plan  
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**Attachments:** [NM\\_SLO\\_red\\_bluff\\_draw\\_sample\\_plan\\_05\\_19\\_15.pdf](#)

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To all:

I have attached the finalized sampling plan that we will implement next week beginning on Wednesday, May 27th. We have added a few soil sample locations that may require an extra day of sampling, but that will depend on sample site accessibility and other field conditions. Matthew Lane will be directing the sampling activities next week. He can be contacted at [glmatt@flash.net](mailto:glmatt@flash.net), 505-350-5141. Thanks for your comments on the draft plan.

Regards,  
Tim

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# Site Sampling Plan of Oil and Gas-Related Spills in Red Bluff Draw

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**May 19, 2015**

*PREPARED FOR*



*THE NEW MEXICO STATE LAND OFFICE*

*PREPARED BY*



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## 1 INTRODUCTION

The purpose of this document is to provide a brief summary of the observations made during GL Environmental, Inc.'s May 4 – May 6, 2014 site reconnaissance and identify selected sample locations and sample media. Environmental sample media will include surface water, soil and channel sediments (Map 1. Red Bluff Draw – Environmental Sampling Plan). Soil samples will be collected from identified locations at five discrete depths with a geo-probe coring device. Sample depths include the surface, one foot, two feet, three feet and four feet below the ground surface (bgs). Coring may be terminated at a shallower depth if laterally continuous consolidated material is encountered at the sample site. Additionally, a hand coring device may be implemented if a proposed sample location is inaccessible to the geo-probe rig. Surface water and sediment samples will be collected by hand. All samples will be collected and shipped to an analytical laboratory according to GL's standard operating procedures and quality assurance plan. Sample collection is currently scheduled for the week of May 25, 2015.

## 2 REFERENCE AREA AND IMPACTED LOCATIONS DESCRIPTIONS AND SAMPLE SITES

### 2.1 Reference Area

#### Soil

Soils along the channel banks and adjacent floodplain consist of fine sand/silty soils. The channel bottom is sandy with evaporite and sedimentary gravel and cobbles. Some white precipitates were observed on the banks. Three soil samples will be collected at Soil1, Soil2, and Soil3 in order to characterize soil conditions in cross-section across the draw. A fourth soil sample (Soil4) will be collected downstream along the channel bottom (Map 2. Red Bluff Draw – Reference Area Sampling).

#### Surface Water

An open stretch of water is present just south of the reference area soil sample location. The water was flowing slowly and had a slight brown tinge. A surface water and sediment sample (SW1 and Sed1) will be collected from this location.

#### Vegetation

Vegetation within the reference area is characteristic of saltcedar successional-disturbance vegetation type on a water course that likely formerly supported plains riparian vegetation. Recent precipitation has produced a flush of flowering annuals within and around the channel and floodplain.



## 2.2 Concho Site(s)

### 2.2.1 Well Pad Area

The well pad was partially built in the channel bottom and appears to be at least partially made from imported material (gravel and cobble are rocks that do not occur locally). Remnants of the pad are highly eroded with ongoing erosion as a result of storm events. A small body of open water is present within the channel immediately above the well pad. No obvious petroleum deposits were observed on the pad or within its immediate vicinity.

Vegetation in the channel bottom was characteristic of a saltcedar successional-disturbance vegetation type. Flowering annuals are present within and around the channel, although no vegetation is present on the constructed and eroded pad.

One composite soil sample (Soil5C) will be collected from the well pad (Map 3. Red Bluff Draw – Concho Well Pad Sampling). One soil sample (Soil6) will be collected from the braided channels east and directly down-gradient of the well. Three soil samples will be collected at Soil7, Soil8, and Soil9 in order to characterize soil conditions in cross-section. A surface water and sediment sample (SW2 and Sed2) will be collected from the pool immediately west of the well pad. A surface water sample and sediment sample (SW3 and Sed3) will also be collected at the nearest downstream surface water location approximately 3,500ft to the east.

### 2.2.2 Tanks #1 and #2

Two of the three displaced Concho steel oil tanks came to rest within 550ft of each other approximately 1.8mi downstream of the well pad within the floodplain, but north and east of the deeper channel. Small amounts of petroleum product were present at the tank locations as well as in vegetation down-gradient (downstream) of the tanks (Map 4. Red Bluff Draw – Concho Tank Location Sampling).

Vegetation is characteristic of floodplain riparian vegetation with some scattered saltcedar (partially burned). Flowering annuals interspersed with mesquite and sand dropseed dominate this part of the floodplain. Small patches of vegetation within this area were recently burned.

One soil sample will be collected directly up-gradient of tank #1 (Soil10), one in between the tanks (Soil11), one directly up-gradient of tank #2 (Soil12), and one down-gradient of the tanks (Soil13). Soil13 and three additional soil samples will be collected at Soil14, Soil15, and Soil16 in order to characterize soil conditions in cross-section across the draw.

### 2.2.3 Steel Tank #3

One of the three displaced Concho steel oil tanks came to rest approximately 1.4mi downstream from the well pad within the floodplain, but south of the deeper channel. Minor oil staining was observed at the tank site. According to Concho representatives the removal crew was unable to plug the tank openings and the remaining tank contents, which likely consisted of a mixture of



water and petroleum products, were released into the draw channel during removal. This release occurred near the intersection of the draw channel and a nearby pipeline right-of-way.

Mesquite and sand dropseed dominate this part of the floodplain, with numerous flowering annuals dispersed throughout. Saltcedar is concentrated within the deeper channel. One large pile of burned material was observed north of the channel and west of the pipeline road, and very small, isolated burns (less than a single plant individual) were seen along the channel edges (but not within the channel) east of the pipeline road.

One soil sample will be collected directly up-gradient of the tank site and one down-gradient (Soil17 and Soil18). A third soil sample (Soil19) will be collected within the channel bottom near the location where the tank's contents were drained during removal activities.

## **2.3 Yates Release Site**

### **2.3.1 Upland Release Area**

This area consists of the portion of the Yates release that occurred upstream of the bridge and south of the draw. An earthen berm has been constructed north of the release area along the south bank of the channel in an attempt to isolate the up-land release area. Patches of a white crust were visible on soil surface throughout the release area. According to a Yates representative, soil that was visibly contaminated with petroleum products were excavated and disposed of off-site. Several small open pits used for Yates sample collection were present.

Two soil samples (Soil21 and Soil22) will be collected from between the release location and the earthen berm (Map 4. Red Bluff Draw – Yates/Mewbourne Sampling). Sample locations have been placed in order to avoid duplication of previous sampling efforts.

### **2.3.2 Bermed Channel Area**

The bermed area includes the portion of the channel bottom that contains the largest visible petroleum deposits between the Yates release site and the highway bridge. The earthen berm is connected to the northern channel bank, surrounds the contaminated sites and diverts channel surface flows toward an excavated canal. Significant petroleum product deposits were not observed in the area immediately upstream (west) of Yates release.

Vegetation is absent within the bermed channel area and saltcedar and flowering annuals are abundant within the channel.

A soil sample and sediment sample (Soil20 and Sed4) will be collected within the channel bottom upstream of where the Yates release entered into the draw. One soil sample (Soil23) will be collected from the channel within the bermed area. The sample location within the bermed area has been placed to avoid duplication of previous sampling efforts. A surface water sample will be collected from a spring upstream of the Yates release (SW4) and a surface water and sediment sample (SW5 and Sed5) will be collected in the canal outside of the bermed area and upstream of the bridge.



## 2.4 Yates / Mewbourne Release Area

Below the bridge, significant petroleum product deposits were concentrated within the channel-proper and scattered through the braided channels. The deposits are generally covered with salt crust, although some exceptions exist, especially at higher flood elevations. A potential deposit of petroleum products at least four to six inches thick was observed within a water-containing portion of the channel approximately 750ft downstream of the bridge. Additionally, petroleum absorbent pads were observed approximately 2,000ft downstream of bridge. Visible petroleum product staining and deposits continue up to a sizable expanse of open water (Big Water) on Cooksey Ranch, including minor staining and deposits on the northern extremity of the pool. No significant petroleum deposition was observed from the eastern extremity of the Big Water to Cooksey ranch house in channel nor in upland floodplain.

Mesquite and sand dropseed dominate this part of the floodplain, with numerous flowering annuals dispersed throughout. Saltcedar is abundant, but concentrated within the deeper channel. The burn rate was highest in the area between highway 285 and the big water; burned mesquite, yucca, and saltcedar were observed on the both banks of the draw. A relatively large area of burned salt cedar was observed on the southern bank of the draw in the southeastern reaches of the Big Water area.

Six soil samples and three sediment samples will be collected downstream of the bridge (Soil24-29 and Sed6-8). Three of the soil samples (Soil25, Soil26, and Soil27) will be collected in order to characterize soil conditions in cross-section across the draw. A water sample will be collected at the Big Water (SW6) and at a second location 1.75mi downstream from the big water above the confluence of Red Bluff Draw and the Pecos River (SW7, Map1 – Environmental Sampling Plan).

## 3 SUMMARY AND JUSTIFICATION OF SAMPLING PLAN

Following the May 4-6, 2015 site reconnaissance, GL Environmental, Inc. has identified the above sampling plan as the most appropriate method of delineating site conditions within Red Bluff Draw. A total of 29 soil samples (1 composite and 28 at five depths), 8 water samples, and 8 sediment samples are *planned*. 22 soil samples (1 composite and 21 at five depths), 9 water samples, and no sediment samples were *proposed*.

Because of the very limited observed success of the mid-April prescribed burn, and because only the impacted release area was treated, sampling will proceed under the No-Burn assumption contained in GL's original proposal; i.e. the reference area chosen was not part of the prescribed burn, soil sampling is more intensive, and sediment samples have been added to the project scope in order to assess potentially petroleum-contaminated material located at the surface of the channel bottoms.

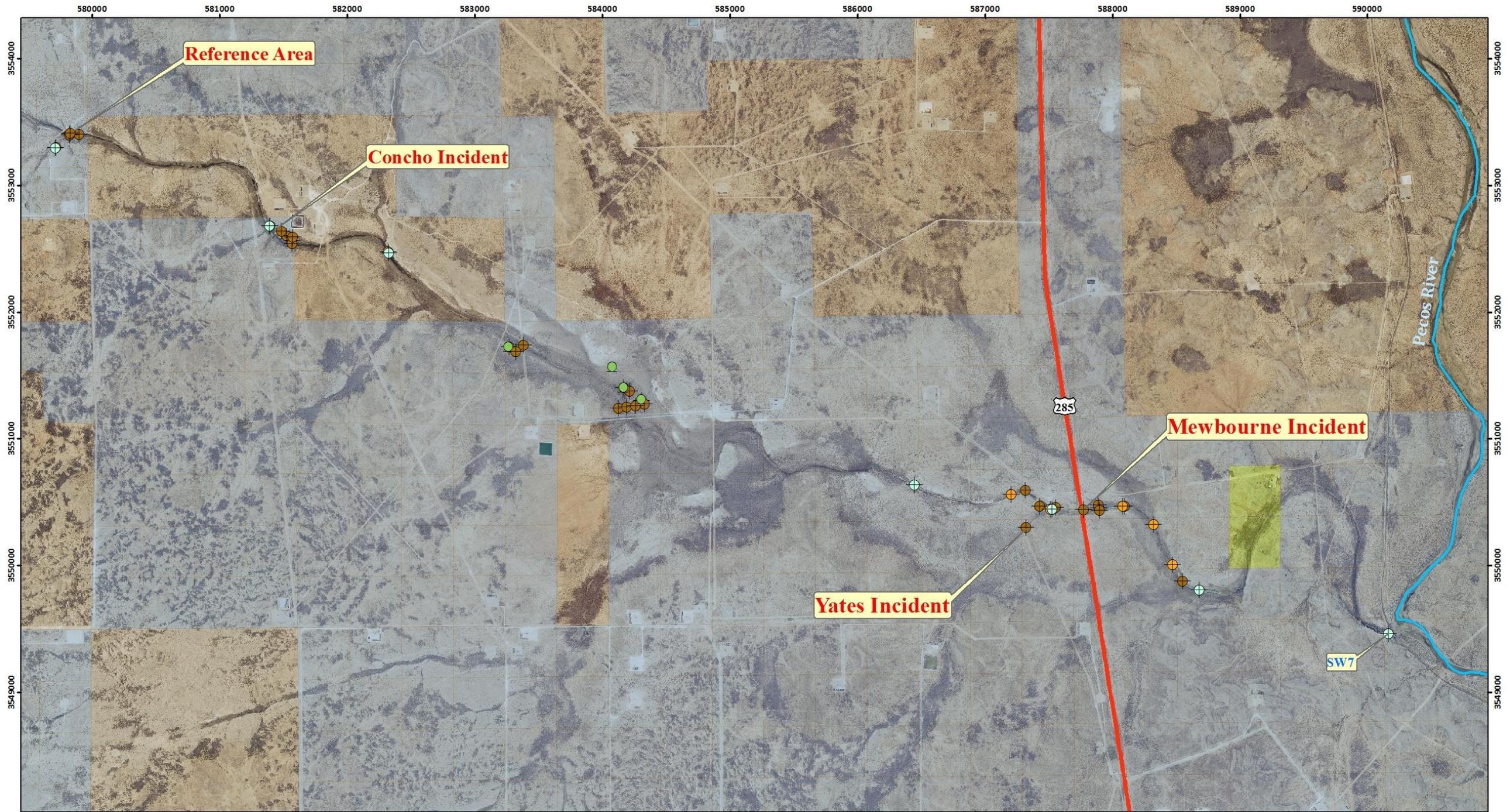
Soil sampling locations are intended to confirm and expand earlier sampling efforts and conform to the proposed number of samples. One extra soil sample is planned downstream of the Yates/Mewbourne release area because the site reconnaissance indicated that this area was more heavily impacted than previously assumed. Surface water sample locations have been selected for



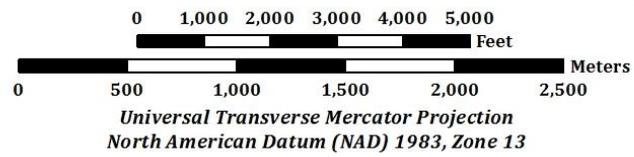
their relative permanence and likely low residence time of water. This yielded one less sample than was originally proposed. Additionally, because vegetation within the entire release area appeared healthy and not stressed overall, it will not be inventoried by quantitative methods as indicated in GL's original proposal. None of the vegetation observed is particularly salt-tolerant; no obligate halophiles were observed. Very few burned and/or uprooted individuals appeared dead, but saltcedar, mesquite, and sand dropseed within the release area is emerging from winter dormancy and leafing out.



### Map 1



## Red Bluff Draw - Environmental Sampling Plan

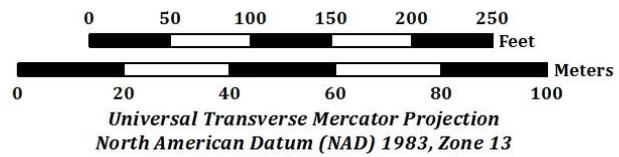


- Final Tank Location
  - Soil Sample
  - Sediment Sample
  - + Surface Water Sample
- State Trust Lands**  
(Surface, subsurface)
- State, State
  - Federal, State

### Map 2



### Red Bluff Draw - Reference Area Sampling

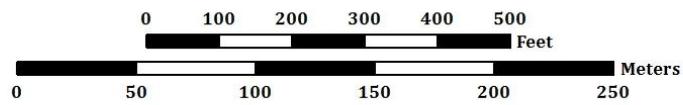


-  Water Sample
-  Sediment Sample
-  Soil Sample

### Map 3



### Red Bluff Draw - Concho Well Pad Sampling



Universal Transverse Mercator Projection  
North American Datum (NAD) 1983, Zone 13

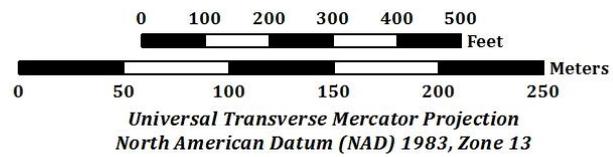


-  Water Sample
-  Sediment Sample
-  Soil Sample

### Map 4

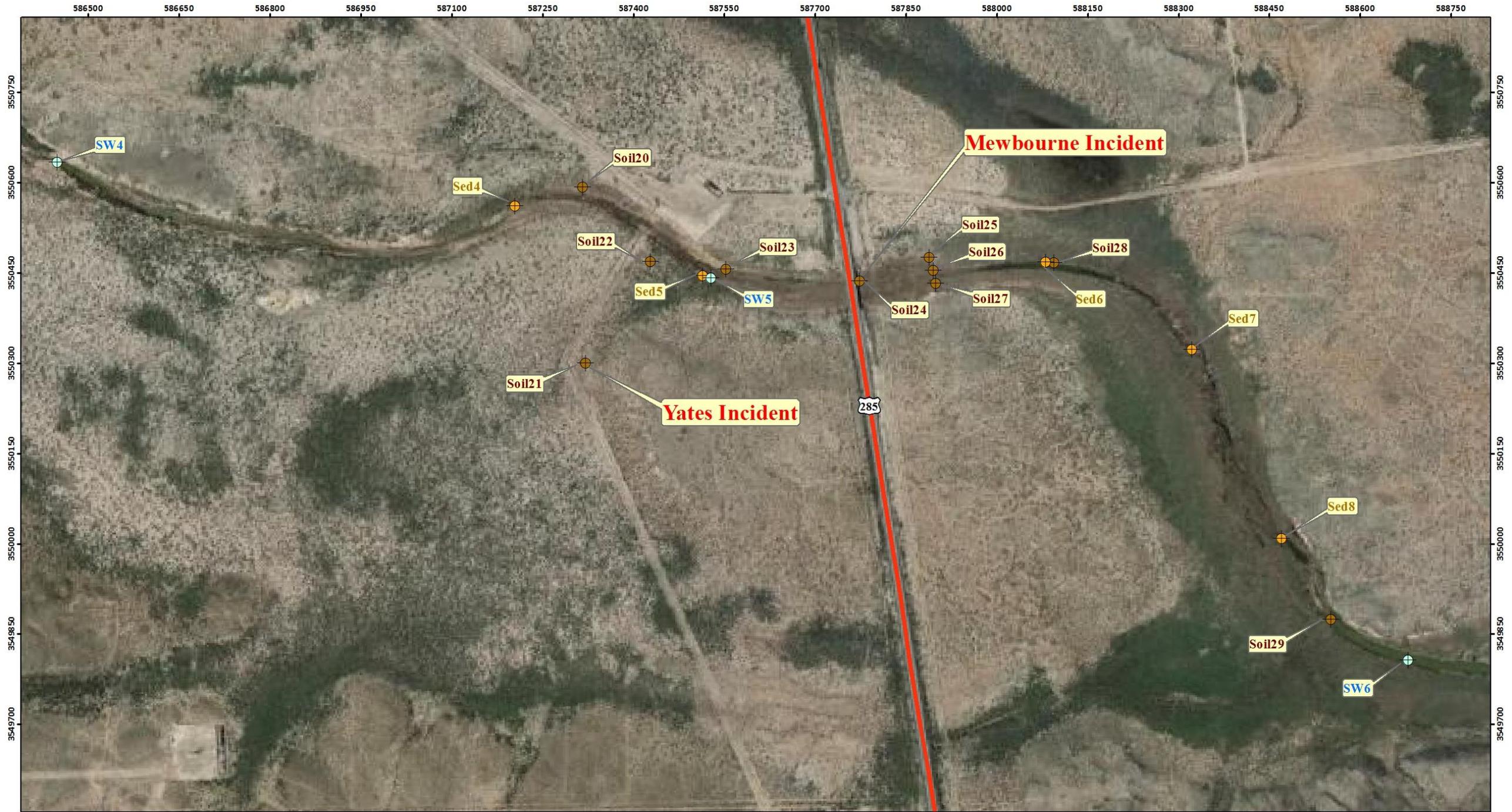


### Red Bluff Draw - Concho Tank Location Sampling

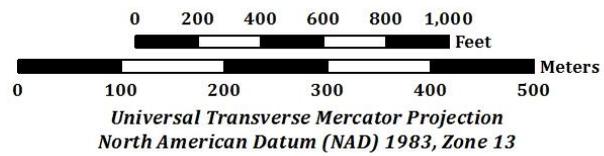


- Final Tank Location
- Soil Sample

### Map 5



## Red Bluff Draw - Yates/Mewbourne Sampling



- Soil Sample
- Sediment Sample
- Surface Water Sample

GL Environmental, Inc