A Limited Site Characterization on Abandoned Oil & Gas Exploration and Production Sites

(Order # 1443PX700095680 and Order # 1443PX700095678)

By

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in cooperation with

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Executive Summary

Results of the work performed in the limited site characterization of the abandoned exploration and production sites located within the Padre Island National Seashores national park returned some surprisingly high concentrations for monitored constituents. Fifty-eight sites were identified for inclusion within the confines of the national park. Eighteen of the identified sites qualified as candidate sites for electromagnetic conductivity surveys. Seventeen of these surveyed sites returned anomalous findings and were included in the first sample collection phase of the project.

In the first sample collection phase, eighty-three sediment samples were collected from soil borings and submitted for a combined TPH and TSF analysis. Thirty-seven sediment samples were analyzed for lead, chromium and barium. TPH concentrations ranged from 0.6 ug/g to 6,145.9 ug/g. The average concentration was 150.9 ug/g. Detectable levels of barium were returned on all samples submitted. Many of theses values represented background levels. The average concentration was 490 ug/g and the high was 3,110 ug/g. Many concentrations for lead and chromium were below detection levels. Chromium levels ranged to 60 ug/g with an average of 20 ug/g. The highest concentration for lead was 140 ug/g and the average value was 32 ug/g.

In accordance with the project design, ten sites exhibiting the greatest concerns from the first sample collection results were determined for inclusion in the second sample collection phase. TPH sample returns were used to isolate the ten candidate sites.

Thirty soil and groundwater samples were collected and were analyzed for TPH and TSF. TPH sediment results ranged from 0.8 ug/g to 25,304 ug/g. Groundwater results ranged from 0.0203 mg/L to 3.6132 mg/L. Fourty sample were analyzed for PAH, thirty sediment sample and ten down gradient groundwater samples. The sediment sample results ranged from 17.1 ng/g to 24,724 ng/g. Groundwater returns ranged from 95.1 ng/L to 6,053.4 ng/L.

All sites included in the second phase of the limited site characterization returned one or more significant finding and may warrant additional attention. Three sites (38, 41 and 44) emerged as leading sites where high concentrations of TPH and other monitored constituents were encountered in several representative samples.

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I. Introduction

Oil and natural gas exploration in the national park area has been ongoing since 1951. A preliminary assessment was conducted in 1987 at oil and gas operation sites. Findings of this study included recommendations for an extensive survey of groundwater conditions directed at potential subsurface contamination. In 1993 hydrocarbon releases were discovered at two production site locations. Existing hydrologic conditions include a shallow water table and numerous wetlands and freshwater ponds that serve as sensitive habitat areas. Concerns over long-term cumulative impacts attributable to past activities at abandoned exploration and production well locations, spurred the need for an investigation to determine existing conditions in these areas. The limited site characterizations documented in the following report are not comprehensive evaluations of the subject areas. Work was directed towards ranking subject sites based on a limited investigation of subsurface conditions to assist in the determination of future delineation and remediation work.

Potential sites identified through records research were investigated in the field. Located sites qualifying for inclusion in the project underwent electromagnetic conductivity (EM) surveys. The site characterization work involved two sample collection phases. In the first phase, all candidate sites were screened for potential petroleum and metal releases. This phase of the investigation was limited to sediment sample collection and analysis. Ten sites exhibiting the highest concentrations of monitored constituents entered an additional sample collection phase. This phase was directed primarily at groundwater conditions at the subject sites, and potential off-site migration of released products.

The project has been a multi phased cooperative project involving the Center for Water Supply Studies at Texas A & M University-Corpus Christi and a private contractor, Hunter Environmental Consulting. Analytical work was performed by Geochemical and Environmental Research Group (GERG) at Texas A & M University at College Station, and CORE laboratories in Corpus Christi. Both labs received separate and independent contracts for their respective analytical work. The project was designed to be multi-phased, calling for the sequential completion of respective portions of the contract. The sequence and general description of the work performed is outlined under the scope of work section of the report.

The following report documents all work performed, and the subsequent findings of such work, for the limited site characterization of the abandoned oil and natural gas exploration and production sites located within the Padre Island National Seashore (PINS) park boundaries. The contract was approved by the United States Department of Interior, National Park Service, on June 27, 1995. Originally scheduled for completion in December, 1996, numerous unforeseen delays required two six month extensions.

Scope of work

- Search available records and compile a list of sites shown to be located within the park boundaries and on the barrier island.
- Confirm sites in the field.
- Inspect confirmed site locations.
- Separate candidate sites using criteria agreed on by PINS and investigating parties.
- Perform electromagnetic conductivity surveys at qualifying sites using EM-31.
- Process and present field data collected during the site surveys.
- Perform phase I sample (sediment) collection events at all included site locations.
- Review phase I sample results and the separate the ten highest ranked sites.
- Perform phase II sample (groundwater) collection events at the ten highest ranked site locations.
- Review of all sample results from both sample collection phases.
- Identify and analyze preserved samples for Polycyclic Aromatic Hydrocarbon (PAH) using preserved extracts collected from samples during the TPH analysis from both Phase I and II sampling events.
- Compile maps: site maps, locations maps, sample locations maps, sample result maps and gradient maps.
- Submit final reports. Submit electronic database.

II. Inventory of Sites

Inventory of Sites

A list of oil and natural gas exploration and production sites was compiled from records supplied by national park personnel and other sources. National park records searches included site reports, site location maps, site maps and aerial photographs kept on file at the Padre Island National Seashore. Other sources of information include maps from the Corpus Christi Geological Library and data supplied by Frontier surveys. Geographic coordinates addressing these sites were determined from the existing records, interpolated from location maps, or from general areas indicated by knowledgeable park personnel.

In a report by Carls et al. (1987), forty four sites are identified as located within the confines of the national park. Research of records identified 14 additional site locations within the park. Some modifications have been made to the Carls et al. (1987) list of sites. These include renaming of some sites, corrections of some site locations, and the addition of some pre-1987 sites unaccounted for. Also, sites constructed since the Carls et al. (1987) report have been identified and included in this report. Some abandoned facilities included in the Carls et al. (1987) report are not located on the barrier island and are not included in this investigation due to access restrictions, but have been included in the new cumulative list for the record (**Table 2.1**).

Field Confirmation of Abandoned Site Locations

Hand held global positioning system receivers, or GPS receivers were used to navigate to the respective site locations. Many of the coordinates for the site locations led the investigating parties to the general site areas. Finding the actual sites required a methodical search of the area until surface evidence of the well location was encountered. Some coordinates were inaccurate, or all evidence had been covered or removed. All Terrain Vehicles were provided by PINS, and were the primary mode of transportation. These vehicles were used to traverse the dunes and open vegetated flats with minimal impact to these environmentally sensitive areas. All accessible site locations were investigated in the field, with thirty three site locations confirmed. Sites physically located in the field included sites **6, 10, 11, 14, 15, 16, 20, 21, 24, 27, 28, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 46, 48, 49, 55, 56, 57, and 58.** All these sites were on the barrier island and located within the PINS park boundary.



Figure 2.1. View looking north up the North Padre Island. beach from Yarborough Pass

Site areas were reached by traveling along the North Padre island beach and then west inland (**Figure 2.1**). Most sites are located behind the fore-

Site ID	Site Name	Latitude	Longitude
1	Sun Oil Dunn et al. 4-B	27 31' 12"	97 16' 21"
2	Colorado Henderson	27 31' 36"	97 17' 36"
3	Sun Oil Dunn et al. 5-B	27 30' 39"	97 16' 46"
4	Sun Dunn et al. No.1	27 28' 41"	97 16' 28"
5	Standard Oil of Texas State Tract 945 No. 7	27 28' 29"	97 16' 30"
6	Sun Oil Dunn Kerlin well No. 2	27 28' 24"	97 17' 50"
7	Standard Oil Company of Texas Dunn-McCampbell No. 1	27 27' 57"	97 18' 47"
8	Standard Oil State Tract 949 No's. 42 and 63	27 27' 43"	97 16' 36"
9	McMoran Exploration Company	27 27' 27"	97 16' 50"
10	Ensearch Dunn-McCampbell No. 17	27 27' 49"	97 16' 56"
11	Chevron Oil of California, A. Jones et al. 30292 (I-WD)	27 27' 42"	97 17' 08"
12	Standard Oil of Texas State Tract 949 No. 87 & State Tract 951 No. 22	27 27' 15"	97 17' 05"
13	Sun Oil State Tract 975 well No. 1	27 22' 42"	97 19' 01"
14	Houston Pipeline Company	27 22' 33"	97 20' 26"
15	Coral Petroleum and Development well No. 1	27 21' 47"	97 19' 31"
16	Sun Oil well No. A-2	27 21' 43"	97 19' 20"
17	Sun Oil State Tract 976 well No. 1	27 21' 42"	97 19' 18"
18	Sun Oil State Tract 976 well No. 2	27 21' 42"	97 19' 23"
19	Sun Oil Dunn-McCampbell A-1 (water)	27 20' 53"	97 19' 37"
20	Bright and Company Dunn-McCampbell well No. 1	27 20' 35"?	97 20' 56"
21	Amoco Production No. 1	27 20' 01"	97 20' 04"
22	McMoran Exploration State Tract 985-S well No. 1	27 19' 07"	97 20' 13"
23	Sun A-6	*	*
24	Sun Oil Dunn-McCampbell A-6	27 18' 27"	97 21' 04"
25	Sun A-5	*	*
26	Sun Dunn-McCampbell CT-2	27 17' 56"	97 20' 34"
27	Sun Oil Dunn-McCampbell well No. A-3	27 17' 57"	97 21' 24"
28	Sun Oil Dunn-McCampbell well No. A-8	27 17' 57"	97 21' 24"
29	Pelto No. 1 State Tract 986	27 17' 44"	97 20' 39"

Site ID	Site Name	Latitude	Longitude
30	Sun Oil Dunn-McCampbell well No. A-7	27 17' 21"	97 21' 13"
31	Sun Oil Dunn-McCampbell well No. A-4	27 17' 52"	97 21' 52"
32	Sun Dunn-McCampbell 3-CT	27 17' 03"	97 21' 11"
33	Sun Oil Dunn-McCampbell 5-A	27 16' 30"	97 22' 25"
34	Sun Dunn-McCampbell CT-1	27 15' 39"	97 21' 07"
35	Samedan ST 1000, Samedan Oil et al. State (1)	27 14' 49"	97 21' 22"
36	Samedan No. 1, Samedan Oil Dunn No. 1	27 14' 04"	97 21' 38"
37	Carrl Oil Dunn et al. No. 3	27 13' 05"	97 23' 14"
38	Carrl Oil Dunn et al. No. 1	27 12' 36"	97 21' 56"
39	Carrl Oil Dunn et al. No. 4.	27 12' 58"	97 22' 53"
40	McCormick Oil and Gas State Tract 1009 well No. 1	27 12' 54"	97 21' 59"
41	Carrl Oil Dunn et al. No. 2	27 12' 36"	97 23' 02"
42	Union Oil Company of California No. 1	27 12' 25"	97 22' 16"
43	Sun Oil Compound	27 12' 18"	97 22' 40"
44	Sun Oil well No. 8	27 12' 11"	97 23' 02"
45	Sun Oil well No. 1 (Yarborough Pass)	27 12' 03"	97 22' 30"
46	Sun Oil well No. 9	27 11' 47"	97 22' 58"
47	Sun Oil State Gulf No. 1 606 Ac.	*	*
48	Sun Oil Dunn-McCampbell well No. 6	27 11' 05"	97 22' 11"
49	Sun Oil Dunn-McCampbell well No. 10	27 10' 47"	97 22' 08"
50	Sun Oil Dunn-McCampbell well No. 7	27 10' 06"	97 22' 14"
51	Sun Oil well No. 2	27 10' 18"	97 23' 57"
52	Sun Oil well No. 5	27 09' 47"	97 23' 01"
53	Sun Oil well No. 3	27 09' 07"	97 23' 37"
54	Sun Oil well No. 12	27 00' 41"	97 25' 24"
55	Sun Oil State Gulf 30001 (I-E) State Tract 1048	27 00' 11"	97 22' 47"
56	Sun Oil Dunn-McCampbell No. 11	27 00' 06"	97 23' 16"
57	Union Oil of California W.V. Jones, et al. 30036 (1)	26 52' 48"	97 22' 06"
58	McMoran Exploration, Jones 30130 (1)	26 51' 23"	97 21' 52"

Table 2.1 All sites identified through records research. Sites are ordered by their relative locations from north to south. * Sites either not on the barrier island, located outside the park boundaries, not found in the field, or insufficient evidence encountered.

Site ID	Site Name
15	Coral Petroleum and Development well No. 1
16	Sun Oil well No. A-2
29	Pelto No. 1 State Tract 986
30	Sun Oil Dunn-McCampbell well No. A-7
35	Samedan ST 1000, Samedan Oil et al. State (1)
36	Samedan No. 1, Samedan Oil Dunn No. 1
38	Carrl Oil Dunn et al. No. 1
39	Carrl Oil Dunn et al. No. 4.
40	McCormick Oil and Gas State Tract 1009 well No. 1
41	Carrl Oil Dunn et al. No. 2
42	Union Oil Company of California No. 1
44	Sun Oil well No. 8
48	Sun Oil Dunn-McCampbell well No. 6
49	Sun Oil Dunn-McCampbell well No. 10
55	Sun Oil State Gulf 30001 (I-E) State Tract 1048
56	Sun Oil Dunn-McCampbell No. 11
57	Union Oil of California W.V. Jones, et al. 30036 (1)
58	McMoran Exploration, Jones 30130 (1)

Table 2.2 Sites qualified for Electromagnetic Survey Investigation.



Figure 2.2 View across vegetated flats from Carrl Dunn et al. well No. 4

island dune ridge, between the stabilized blowout dunes and the back island along the Laguna Madre wind tidal flats. In areas without maintained cuts through the dunes, access to the back island was facilitated by crossing over the dunes. This was kept to a minimum to prevent unnecessary impact to the natural environment. Some sites could be arrived at by crossing the dune lines through maintained passes and utilizing existing access roads. Many of the passes and access roads are associated with presently active sites, or maintained by the PINS for access to the back island. These sites were easily reached and identified in the field. Access roads for many sites had been removed and reaching them required traversing the dune line and vegetated flats (**Figure 2.2**).

Due to the age of many of the sites, little surface evidence remains. Many of the exploration and production pads along with access roads have been covered by drifting dunes and revegetated. Structures associated with these activities have been removed, and in many cases the road (see **Figure 2.3**) and pad materials had also been removed. Some sites used temporary access roads and drilling pads consisting of wooden boards. Once exploration activities has ceased these were removed.

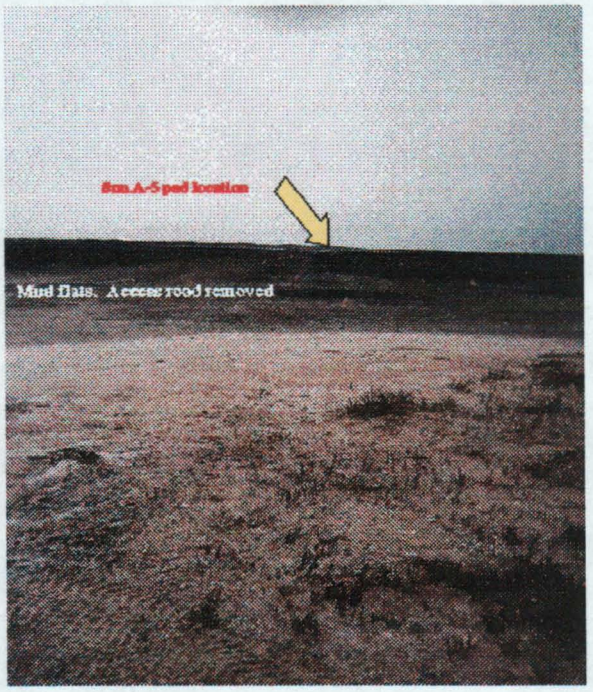


Figure 2.3 View south from Sun Oil No. A-4 towards Sun Oil A-5. The access road was removed along with the elevated spit used to traverse the wind tidal flats.

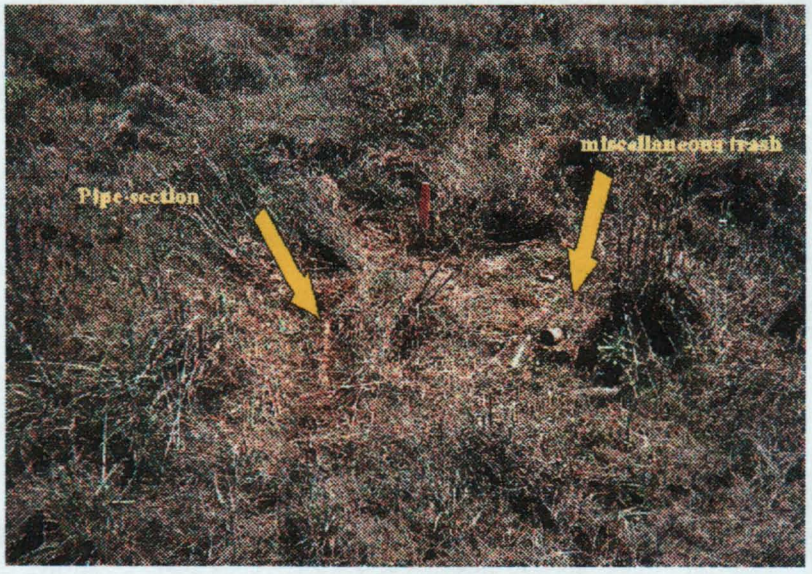


Figure 2.4 A pipe section and miscellaneous items located in a suspected pit area on the Union of California W. V. Jones site.

In some cases, standing structures were abandoned in place. At sites number 15 and 30 pipe risers were found located on site. Discarded cables and pipe sections along with other miscellaneous trash (see **Figure 2.4**) were typical items found on sites investigated in the field. Some sites had what appeared to be markers or stakes on them. Some sites had ponds or pits located next to them. These facilitated finding the site out on the vegetated flats.

Sites Qualifying for EM Survey Investigation

Confirmed sites qualifying for entry into the EM survey and sample collection phases of the investigation had to meet additional criteria which excluded active site locations from the limited site characterization work and required reasonable accessibility to the site locations (to facilitate the transportation sensitive electronic equipment to the sites). Sites with a history of previous site characterization work or remediation work were also excluded from the investigation. Five site locations were excluded due to access problems. These sites were locations where access roads had been removed, or new dunes and vegetation had encroached and reclaimed the areas. Sites included are site identification numbers **6, 32, 33, 37 and 46**. Five additional confirmed sites were active sites. The investigating parties were instructed by the lead park representative to consider these sites excluded from the investigation. Site locations included number **21, 23, 25, 26, and 29.** The investigating parties were instructed by PINS to consider five additional located sites excluded from the investigation, due to previous site characterization work and ongoing mitigation. Sites with the identification numbers **10** and **20** have a history of previous site characterization work at their respective locations. Sites number **11** and **40** were undergoing remediation for confirmed releases. Site number **14** was undergoing a spill incident mitigation.

After reviewing all the confirmed site locations, eighteen sites qualified to go on to the EM survey phase of the project. **Table 2.2** lists the sites that have been located in the field, are abandoned, are



Figure 2.5 View to the southwest across the Site 15 from the top of a bordering dune.

reasonably accessible and had no history of previous site characterization work .



Figure 2.6 View to the north east across Site 16 area from top of surrounding dunes.

Site 15 (see **Figure 2.5**), Coral Petroleum and Development well No. 1 is located west of the primary dunes in the mid-island vegetated flats. The remnants of an oyster shell access road connect to the site from the west. This road is covered by the primary dune line preventing access from the beach. The road is shown in a site report map extending beyond the site to the west. This portion of the road appears to have been removed. An irregular shaped pad consisting of oyster shell with some caliche, remains in place at the site location. The pad width ranges from approximately 210 feet across the southwestern end of the site, narrowing to 82 feet at the northeastern end of site and approximately 177 feet long. Area coverage is approximately 18572 feet^2. The pad surface is vegetated and is surrounded on the western and northern boundaries by intermittent wetlands. Two pipe risers are present in the north western corner of the site. A suspect pit is located to north east of the pad. Debris found on the site included dry cement and mud.

Site 16 (see **Figure 2.6**), Sun Oil well No. A-2, is located among the coppice dunes and can be reached from the beach. The site consists of the remnants of an oyster shell pad that is partially covered by drifting sand and vegetation. A small section of the pad remains exposed. The relative area and boundary dimensions could not be adequately determined. The site is surrounded and largely covered by vegetated dunes along the northern, western and southern sides of the site. Historical inundations caused by tidal events are likely to have occurred in this area. A small concrete support pad (2 feet x 2 feet), and some miscellaneous debris were found in the site area

Site 29 (see **Figure 2.7**), Pelto No. 1 State Tract 986 can be reached by driving down the beach and then crossing the fore-island dune line into the stabilized blowout dune area. An access cut once used to pass through the dune line has been filled by drifting sand. No evidence of the access road was encountered. The pad material for this site reportedly consisted of wooden boards which were removed after exploration activities ceased. Oyster shell was encountered scattered throughout the site area. The origins of this shell material is unclear,



Figure 2.7 Site 29 Pelto No. 1 State Tract 986.

but may be related to a previously existing access road unrelated to this site. The site is approximately 300 feet by 300 feet, giving an approximate surface area of 90, 000 feet^2. Scattered debris found on the site included dry cement and mud, gaskets and miscellaneous debris. The site area is heavily vegetated. In the assumed central portion of the site vegetation consists of a dense cactus cover. The site is bounded to the east by the primary stabilized dune line. The remainder of the site is surrounded by vegetated flats.



Figure 2.9 View to the north west across Site 30. Pipe riser can be seen in the distance.

Site 30 (see **Figure 2.8**), Sun Oil Dunn-McCampbell well No. A-7 is located on the vegetated barrier flats. An oyster shell access road once extended to the west connecting to the American Exploration road. This road has been removed in places and surface ponds now occupy the area. This site was difficult to reach, requiring a detour far to the south from the Sun A-4 location over the vegetated flats following the ponds. The pad area consists of an oyster shell caliche mix and vegetation. A pipe riser associated with a collection pipe was located on the site. This pipe was latter removed prior to the sample collection events. The approximate site dimensions are 134 feet by 120 feet, giving an approximate surface area of 16,800 feet^2. A discarded cable was encountered in the north eastern corner of the site. The site is bordered by ponds and marshes to the west and north west. A large mound of dry cement was located south of the site next to a suspect pit. A suspect sump is located just off site to the west.

Site 35 (see **Figure 2.9**), Samedan ST 1000, Samedan Oil et al. State (1) is reached from the beach by crossing the primary dunes into the vegetated flats. The remnants of an oyster shell access road extended from the site to the northeast. This road has been covered by drifting dunes and vegetation. The pad consists of oyster shell that has been covered by sand and vegetation. Scattered oyster shell was found throughout the site area. The shell has been carried up to surface through the sand cover. Several suspect pit areas were found to



Figure 2.10 View to the south west from stabilized blowout dunes overlooking Site 35.

the west of the site. Dry cement and mud was found scattered over the site area. Miscellaneous debris was encountered along the southern boundary. The site is surrounded by vegetated flats. Dimensions for this site were difficult to determine. No distinct boundaries were evident. An approximate area was determined from the data collected during the EM site survey. The site dimensions are approximately 300 feet by 300 feet, resulting in an area of 90,000 feet^2.



Figure 2.10 View of Site 36, to the south, from stabilized blowout dunes.

Site 36 (see **Figure 2.10**), Samedan Oil Dunn No. 1 is reached from the beach by crossing the primary dunes onto the vegetated flats. The remnants of an oyster shell access road extended from the site. This road has been covered by drifting sand and vegetation. Oyster shell pad material is scattered throughout the site area. The oyster shell appears to have been carried up the surface through a sand cover. The site area is heavily vegetated. A discarded cable was found at the northern side of the site. Dry cement and mud was scattered throughout the site area. Site boundaries were not easily discernible, site dimension were estimated. The approximate dimensions are 280 feet by 300 feet, giving an area of 84,000 feet^2. The site area appears to be slightly elevated from surrounding area, which is vegetated flats.

Site 38 (see **Figure 2.11**), Carl Oil Dunn et al. No. 1, is reached by the beach access road at Yarborough pass and then turning north after the Sun Compound. The access road cuts through the center of the site and terminates at the mud flats on the back of the island, along the Laguna Madre shoreline. The pad and access road were constructed with oyster shell. Vegetation covers the pad area. The remaining oyster shell pad is approximately 100 feet wide and 180 feet long equaling an area of 18,000 feet^2. A discarded cable was encountered on the southern side of the site. A stake was located centrally on site in an area suspected of being the well head area.



Figure 2.11 View looking west along access road towards Site 38.

Scattered dry cement and mud were found on site and along the side of the access road. The pad area is surrounded by periodically submerged wind tidal flats.

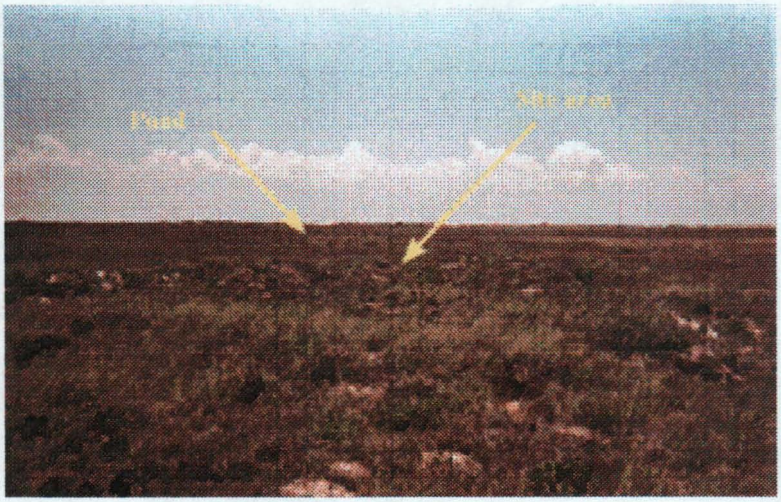


Figure 2.12 Carrl Oil Dunn et al. No. 4. View of site from the northeast.

Site 39 (see **Figure 2.12**), Carl Oil Dunn et al. No. 4 is located on the vegetated flats behind the primary dunes. The remains of an oyster shell access road that has been reclaimed by drifting sand and vegetation extends off the site to the east. Access through the dune line to the beach has been filled in by sand. The pad area consists of oyster shell covered by vegetation. Two ponds are located along the southern boundary of the site. Site dimensions are approximately 130 feet by 180 feet, giving an area of 23,400 feet^2. The site is surrounded by vegetated barren land. An access road may have once extended west beyond the site to the back island. This road appears to have been covered. Miscellaneous debris was found throughout the site area.

Site 40 (see **Figure 2.13**), McCormick Oil and Gas State Tract 1009 well No. 1 is located just over the fore-island dune ridge within the stabilized blowout dunes. No access route exists at the present time from the beach. High tidal events appear to have altered the site and scattered much of the pad material. The remains of an oyster shell pad consisting of two small oyster shell mounds are still in place at the site. Oyster shell, pipe sections, a cable and other miscellaneous materials were found located scattered around and behind the site to the west. The area is surrounded to the south, west and north by vegetated land. Site dimensions are approximately 160 feet by 205 feet, corresponding to an area of 32,800 feet^2.



Figure 2.13 Site 40 McCormick Oil and Gas State Tract 1009 well No.1. View from the dune line looking to the north west. Note the oyster shell mound.

Site 41 (see **Figure 2.14**), Carl Oil Dunn et al. No. 2 can be reached using the Yarborough Pass access road, turning north after the Sun Compound and then

west at the next intersection. The access road and pad are constructed with oyster shell. This site is located at the end of the access road along the shoreline of the Laguna Madre. A suspect pit is located off site to the northwest on the wind tidal flats. Miscellaneous debris were encountered on the mud flats just west of the site. The debris included pipe sections and lumber located next to the suspect pit. Other debris was found on site including pressure gauges, tar, and dry cement. The site is lightly vegetated and bordered on the southern and western boundaries by wind tidal flats. The pad is approximately 145 feet by 230 feet giving an area of 33,350 feet^2.

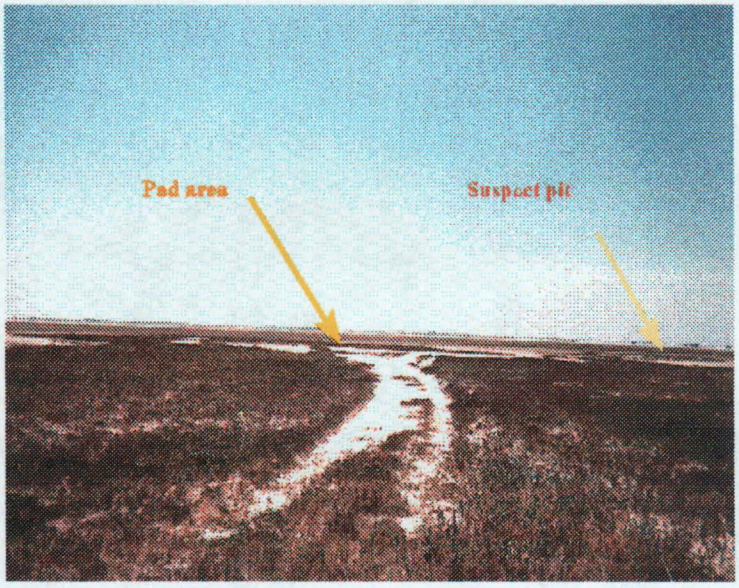


Figure 2.14 Site 41, Carrl Oil Dunn et al. No. 2. View to the west along the access road. Suspect pit area to the north on mud flats.

Site 42 (see **Figure 2.15**), Union Oil Company of California No. 1 has its southern border along the Yarborough

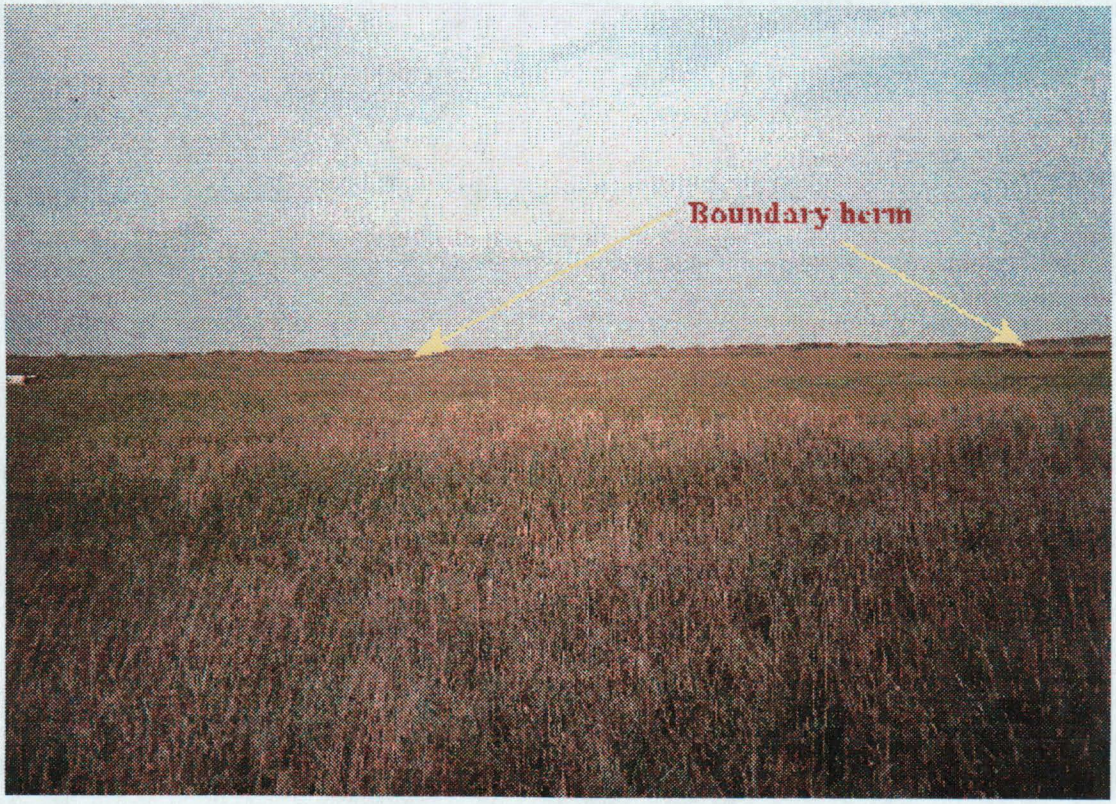


Figure 2.15 View across site 42 to the west

Pass access road. The site is located along the access road just prior to the curve in the road before the Sun Compound. The site was constructed with temporary boards that were removed after exploration/ production activities ceased. Site boundaries can be determined from remains of man made berms running the length and width of the site. The site area is slightly depressed and subject to intermittent inundation. Some scattered debris was located around the site. A trash pit is located in the northeastern corner. Site dimensions are approximately 300 feet by 400 feet giving an area 120,000 feet^2.

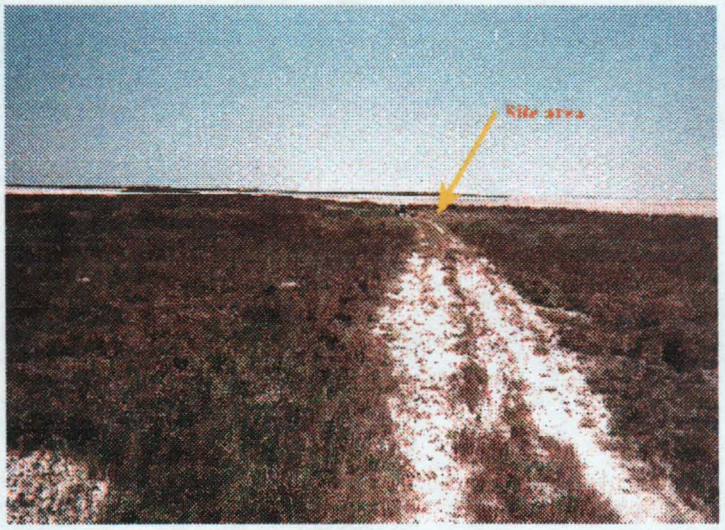


Figure 2.16 View from the earthen baricade south towards site 44.

Site 44 (see **Figure 2.16**), the Sun Oil well No. 8 site is reached along the Yarborough Pass road beyond the Sun Oil compound, east, past the Carl No. 2 and 4 sites turnoff. The access road for this site connects to the Yarborough Pass road from the south and is cutoff by an earthen barricade. The site and access road are constructed with oyster shell. A raised pad area is surrounded to the east, west and south by wind tidal flats. Two suspect pit areas are located to the northeast of the pad. Site dimensions are approximately 245 feet by 195 ft. The approximate area covered by the pad is 47,775 feet^2. Dry cement and mud along with other drilling debris was encountered over the western side of the site.

Site 49 (see **Figure 2.17**), the Sun Oil Dunn-McCampbell well No. 10 site is located along the shoreline in the fore-island dune line area. This site has been altered by high tidal activity and only the remnants of the pad remain. The pad was constructed with oyster shell and the surrounding area is scattered with this material. The dimensions of the remaining section of the pad are approximately 260 feet by 35 feet resulting in a pad area of about 9,100 feet^2.

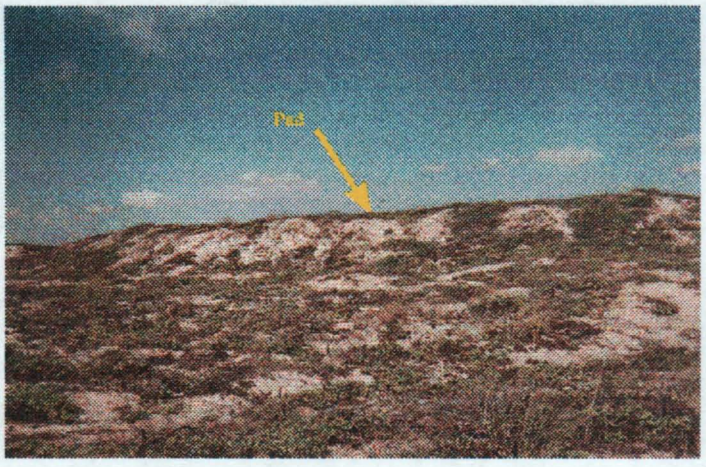


Figure 2.17 Looking southwest at site 49 from the beach.

Site 55 (see **Figure 2.18**), the Sun Oil State Gulf 30001 (I-E) State Tract 1048 is reached from the beach through a maintained cut in the stabilized dune line. The site is located among the primary dune line. The pad area consists of oyster shell. The access road extends beyond the site towards the back island. The area is surrounded by stabilized vegetated dunes to

the north, south and west. The approximate dimensions are 230 feet 250 feet. The resulting area of coverage is approximately 57,500 feet^2.



Figure 2.18 View from the south across site 55.

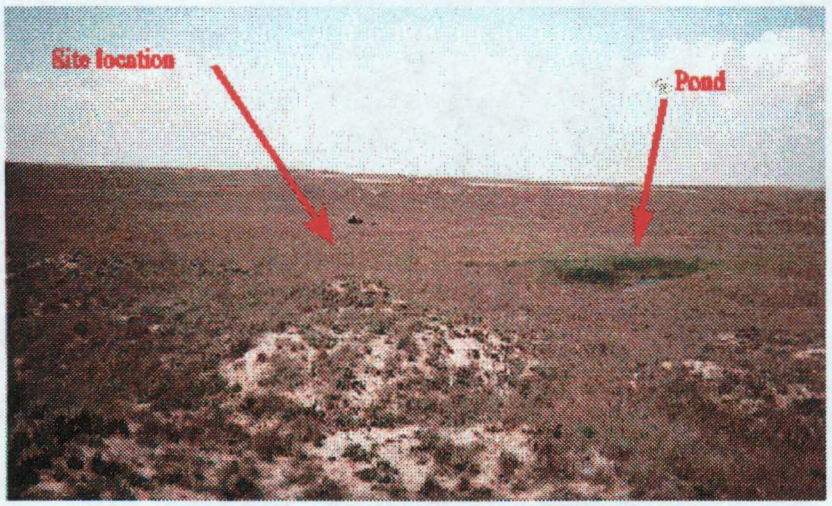
Site 56 (see **Figure 2.19**), Sun Oil Dunn-McCampbell No. 11 is reached along the shoreline beach and then west through the maintained cut at the Sun ST 1048 site. The access road creates the southern boundary of the site. The site is located on the vegetated flats near the back island bay area. The pad was constructed with temporary wooden boards that were removed after activities ceased. The site is heavily vegetated with tall grass. Evidence encountered on site included cable, tree bark, dry cement, and pea gravel. The dimensions are approximately 165 feet by 295 feet resulting in an approximate surface area of, 48,675 feet^2.

Site 57 (see **Figure 2.20**), Union Oil of California, W.V. Jones et al. 30036 (1) is located west of the dune line on the stabilized vegetated flats. This location consists of a large pad of oyster shell. Oyster shell is scattered on the surface carried up from below the sand cover. There are remnants of an access road extending south towards a washover/ blowout area approximately one half mile south of the well location. A stake or marker was located towards the northern end of the site in the suspected well head location. A pond is located on the northern boundary. The area is densely vegetated. A suspected burn pit was encountered in the north west corner of the site. Other trash and miscellaneous debris was also encountered in the southern portion of site. The dimensions of the site are approximately 350 feet from the south to north and 260 feet from the west to east. The site covers an approximate area of 91,000 feet^2.



Figure 2.19 Sun Oil Dunn-McCampbell No. 11. Site 56.

Reaching **Site 58** (see **Figure 2.21**), McMoran Exploration, Jones 30130 (1) site requires crossing the primary dunes and crossing the vegetated flats. No maintained pass is present through the dune line. The site is located on the vegetated flats next to a pond and wind-deflation area. Evidence of an oyster



Site 57 (see **Figure 2.20**), Union Oil of California, W.V. Jones et al. 30036 (1)

shell access road that extended from the site back towards the fore-island dunes can be traced from the remaining oyster shell material used in construction. The road materials have been partially removed or carried to the surface of the sand. The remnants of an oyster shell pad remain in place. A channel runs along the northern boundary of the site. The surrounding area is subject to periodic inundation. Debris encountered on the site included a discarded cable, and some pipe sections. Site dimensions are 310 feet by 160 feet resulting in an area of 49,600 feet^2.

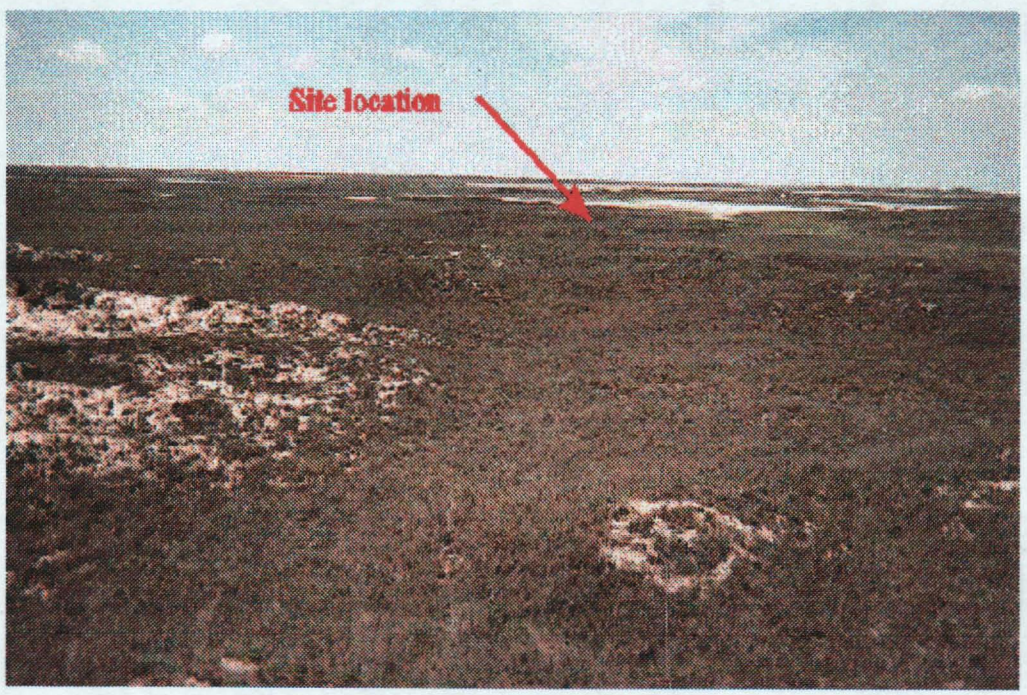


Figure 2.21 View of Site 58 from the east atop of the dunes.

III. Electromagnetic Surveys.

Introduction

Abandoned oil and gas sites at PINS retain few surface features as evidence of the exploration/production programs, leaving investigators few clues as to where to advance soil borings. The Geonics Ltd. EM-31 Ground Conductivity Meter (EM-31) was selected to provide indirect non-intrusive measurements of terrain conductivity. These data can then be used to determine aerial extent of oil/gas production sites and identify possible locations for the collection of soil samples based on electromagnetic anomalies indicated by the survey results.

Terrain conductivity was measured in-situ using a Geonics Ltd. EM-31 Ground Conductivity Meter. This device uses electromagnetic inductive techniques to determine bulk ground conductivity. Typical applications for this device are (McNeill 1980):

i. Delineating regions of permafrost
ii. Locating gravel
iii. Extending known gravel deposits
iv. Mapping saline intrusions
v. Detecting cavities in carbonate rocks
vi. Mapping pollution plumes in groundwater
vii. Mapping bedrock topography
viii. Mapping terrain conductivity for electrical grounding
ix. General geologic mapping (i.e. soil types, faults and fracture zones)
x. Archaeological exploration
xi. Locating buried pipes and metal conductors.

The electromagnetic induction techniques utilized by the EM-31 employ a transmitter coil energized with an alternating current at an audio frequency (e.g. 9.8 kHz) placed on the earth, and a receiver coil placed a short distance (3.7 meters) away. The transmitter coil produces a time-varying magnetic field (primary field) which induces small currents to flow in the earth. These small currents generate a secondary magnetic field that is measured, along with the primary field, by the receiver coil. The ratio of the secondary to the primary magnetic fields, under certain constraints which are incorporated into the EM-31 design, is linearly proportional to terrain conductivity (McNeill 1980). The intercoil spacing of the EM-31 permits a depth of investigation to 6 meters (about 20').

Many components of the soil contribute to the total electrical conductivity measured by this instrument. The most influential components are moisture content, salinity, porosity, pore fluid type, soil matrix, clay content, and clay type. Conductivity values typically increase in response to increasing moisture content, salinity, clay content, and dissolved solids in the pore fluid (groundwater). Higher porosity generally increases conductivity; however, pore fluid properties and soil matrix properties may reverse this relationship. Because of these relationships, certain reasonable assumptions must be made about the soil to associate changes in ground conductivity with any one soil component.

Cultural features can interfere significantly with measurements made by the EM-31 (Milsom 1989). Although buried metal objects do not typically affect conductivity measurements, if the metal object is

sufficiently large it can reduce conductivity values. The horizontal or inphase component of the secondary magnetic field is particularly sensitive to buried metal objects and will generally indicate an anomalous depression where buried metal objects are located. Since the inphase data is collected simultaneously with the conductivity data, it may be used to screen ground conductivity anomalies that may be the result of interference from buried metal objects. Metal objects on the surface do not generally affect ground conductivity measurements.

Procedure

A central point was established on each site in a way that would place the major components or areas of interest on the oil/gas production site within a 25 meter radius of this point. The central point was assigned the geographic coordinates for the site (Table 2.1). From the central point an east line (magnetic) was staked using a Brunton Pocket Transit and a series of radial lines (like spokes) were marked, progressing from the east line in a counterclockwise manner rotating each line at an angle of approximately 10 degrees. A 50 meter rope marked at 2 meter intervals was used as a guide to locate data collection points along each line. Due to stretch/shrinkage of the rope, exact locations of the data collection points may contain errors as high as 20 centimeters (8 inches). Terrain conductivity and inphase measurements were recorded at each data collection point. This data was automatically recorded in a data logger and processed at a later date. Significant visual observations such as well head location or other surface features were noted and entered as comments with respect to the data points into the data logger. The determination of the coordinates associated with discrete data points, including sample collection locations was based on the central point of this procedure. Bearings were all corrected to true north before converting points to the Universal Transverse Mercator (UTM) grid.

Site Interpretation

Data was reduced from radial to rectangular coordinates and then processed using radial basis functions gridding method with Golden Software Surfer V5.00 for Windows. The processed grids were then contoured or surface plotted for interpretation and presentation.

Figures 3.1 - 3.18 can be found at the end of this section.

On **Site 15 - Coral 1 (Figure 3.1)**, six areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.1**). These locations repre-

LOCATION	Specific Cond.
Cor_1_WP1	1430.0000
Cor_1_WP2	710.0000
Cor_1_WP4	490.0000
Cor_1_WP3	630.0000
Average:	815.0000

Table 3.2 Specific Conductance for Groundwater at Site 15.

LOCATION	EASTING	NORTHING
001B †	665624.12	3027753.2
002D †	665622.32	3027745.1
003A †	665606.82	3027749.6
004A †	665629.4	3027779.1
005C †	665644.39	3027782.8
006C †	665648.68	3027776.5
031A	665626.64	3027788.8
Cor_1_WP1	665633.46	3027744.1
Cor_1_WP2	665644.34	3027794.7
Cor_1_WP3	665671.94	3027758.3
Cor_1_WP4	665712.03	3027703.1

Table 3.1 Sampling locations on Site 15. † indicates location chosen by geophysical data. Northing and easting are UTM.

sent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Low concentrations of total petroleum hydrocarbons in soils (TPH_{SOIL}) were identified on all EM anomalies except Id 002D which exhibited moderate concentration of TPH_{SOIL}. Five sampling locations were not associated with EM anomalies at this site which also showed low concentrations of TPH_{SOIL}, with the exception of Id Cor*1*WP2 which showed a moderate concentration of TPH_{SOIL}. Total scanning fluorescence in soils ($TSF\ Max_{SOIL}$) was low for all sampling locations on this site. Detectable levels of metals were found at six locations, two of which were on EM anomalies (Id 005C and Id 002D) and one location that was not in the surveyed area (Id Cor*1*WP4). Specific conductance for the groundwater at this site averaged 815 mS/cm (**Table 3.2**).

On **Site 16 - Sun 2A (Figure 3.2)**, only one area was indicated as a possible sampling location by geophysical data collection at the site, however three samples were taken from this area (**Table 3.3**). This location represents an electromagnetic anomaly or significant surface features such as a depression, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Specific conductance of groundwater at this site averaged 1397 mS/cm and ranged from 740 to 2640 mS/cm (**Table 3.4**). Low concentrations of TPH_{SOIL} were identified at all sampling locations on this site, including three samples not associated with any EM anomalies. Total scanning fluorescence was low for all samples on this site. Metals were indicated at two locations only (Id 051A, Id 052A) both associated with EM anomalies.

On **Site 29 - Pelto 1 (Figure 3.3)**, five areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.5**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Low concentrations of TPH_{SOIL} were found at all sampling locations except for Id 058C, which tested high for TPH_{SOIL}. Location Id 058C is associated with an EM anomaly. $TSF\ Max_{SOIL}$ was low for all loca-

LOCATION	EASTING	NORTHING
051A†	665939.28	3027664.7
052A†	665945.92	3027660.6
053A†	665955.44	3027655.8
053B†	665955.44	3027655.8
054A	665947.95	3027619.8
Sun_A2_WP1	665936.73	3027633.4
Sun_A2_WP2	665946.12	3027668
Sun_A2_WP3	665979.92	3027659.8

Table 3.3 Sampling locations on Site 16. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	Specific Cond.
Sun_A2_WP1	740.0000
Sun_A2_WP2	810.0000
Sun_A2_WP3	2640.0000
Average:	1396.6667

Table 3.4 Specific Conductance for Groundwater at Site 16.

LOCATION	EASTING	NORTHING
055A†	663877.67	3020300.6
056B	663874.37	3020289.1
057B†	663879.89	3020250.9
058C†	663870.13	3020252.3
058D†	663870.13	3020252.3
059B†	663827.97	3020264.6
60	663813.5	3020235
PEL_WP1	663883.18	3020245.3
PEL_WP2	663840.98	3020273.8
PEL_WP3	663865.27	3020294.4

Table 3.5 Sampling locations on Site 29. † indicates location chosen by geophysical data. Northing and easting are UTM.

tions except for Id 058C. Metals were detected at four sites, with the highest concentrations at Id 058D. Only one of these locations was not associated with an EM anomaly (Id 056B).

On **Site 30 - Sun A7 (Figure 3.4),** six areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.6**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Specific conductance for the groundwater at this site averaged 2557 mS/cm (**Table 3.7**). Other sampling locations (069A, 070A, Sun_A7_WP1, and Sun_A7_WP2) were also associated with EM anomalies although they were selected based on other field data. THP values for all samples collected at the site were low except for Id 072A (299 mg/g) and Id 076B (1364 mg/g) which were both associated with EM anomalies. TSF Max_{SOIL} values were low for this site, with the exception of Id076B. Metals were detected at five locations (Id Sun_A7_WP2, Id 071A, Id 070A, Id 076A, and 074A) on this site. All of these locations were associated with EM anomalies.

On **Site 35 - Samedan ST1000 (Figure 3.5),** five areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.8**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or

LOCATION	EASTING	NORTHING
069A	662924.72	3019529.3
070A	662928.14	3019534.2
071A†	662930.98	3019542.2
072A†	662935.57	3019556.9
073A†	662978.23	3019564.3
074A†	662940.43	3019527.4
075B	662805.15	3019575.9
076B†	662917.81	3019535.4
Sun_A7_WP1	662919.54	3019536.6
Sun_A7_WP2	662937.72	3019556.4
Sun_A7_WP3	662932.51	3019512.1

Table 3.6 Sampling locations on Site 30. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	Specific Cond.
Sun_A7_WP1	680.0000
Sun_A7_WP3	6140.0000
Sun_A7_WP2	850.0000
Average:	2556.6667

Table 3.7 Specific Conductance for Groundwater at Site 30.

LOCATION	EASTING	NORTHING
066B†	662326.62	3013484.2
067B†	662320.19	3013488.6
068B†	662318.61	3013464.8

Table 3.9 Sampling locations on Site 36. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
061B†	662742.08	3014870.7
062A†	662744.04	3014866.4
063C†	662751.86	3014840.9
064B	662719.06	3014842
065B†	662716.32	3014867.1

Table 3.8 Sampling locations on Site 35. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
027†	660328.47	3011422.1
028†	660319.9	3011382.3
029B†	660294.47	3011391.5
030†	660295.09	3011407.5
Carl_1_WP1	660310.8	3011391.7
Carl_1_WP2	660319.7	3011425
Carl_1_WP3	660293.5	3011407.3
Carl_1_WP4	660257.73	3011415.5

Table 3.10 Sampling locations on Site 38. † indicates location chosen by geophysical data. Northing and easting are UTM.

gravel packing. All sample locations displayed low TPH_{SOIL} concentrations and low TSF Max_{SOIL} values. Metals were detected at only one site (Id 065B). This location corresponded with an EM anomaly.

On **Site 36 - Samedan #1 (Figure 3.6),** three areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.9**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. All sample locations displayed low TPH_{SOIL} concentrations and low TSF Max_{SOIL} values. Metals were detected at two of the sites.

On **Site 38 - Carl #1 (Figure 3.7),** four areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.10**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Specific conductance of the groundwater was in excess of 1000000 mS/cm (**Table 3.11**). All sample locations displayed low TPH_{SOIL} concentrations except for site Id 030 (705 mg/g) and low TSF Max_{SOIL} values except for Id 030 (559000), Id 028 (35280), and Id Carl_1_WP4 (379400). High values

LOCATION	Specific Cond.
Carl_1_WP1	>1000000.0000
Carl_1_WP2	>1000000.0000
Carl_1_WP3	>1000000.0000
Carl_1_WP4	>1000000.0000
Average:	>1000000.0000

Table 3.11 Specific Conductance for Groundwater at Site 38.

LOCATION	EASTING	NORTHING
045B †	661765.95	3011302
045C †	661765.95	3011302
46 †	661774.9	3011304.1
047A †	661749.94	3011322.8
Carl_4_WP1 †	661774.12	3011305
Carl_4_WP2	661762.05	3011322
Carl_4_WP3	661743.2	3011300.4
Carl_4_WP4	661835.66	3011258.4

Table 3.12 Sampling locations on Site 39. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	Specific Cond.
Carl_4_WP1	1110.0000
Carl_4_WP2	850.0000
Carl_4_WP3	1510.0000
Carl_4_WP4	1170.0000
Average:	1160.0000

Table 3.13 Specific Conductance for Groundwater at Site 39.

correspond with EM anomalies with the exception of Carl_1_WP4. Metals were detected at five of the sites all of which coincide with EM anomalies except Carl_1_WP4.

On **Site 39 - Carl #4 (Figure 3.8),** three areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.12**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Soil samples from sample location 046 were not analyzed but Id Carl_4_WP1 was taken from approximately the same location.

Specific conductance of the groundwater at this site averaged 1160 mS/cm Specific conductance of the groundwater at this site averaged 1160 mS/cm (**Table 3.13**).

Soil samples from sample location 046 were not analyzed but Id Carl_4_WP1 was taken from approximately the same location. Sample locations associated with EM anomalies displayed high TPH_{SOIL} concentrations and high TSF Max_{SOIL} values. Low values of TPH_{SOIL} and TSF Max_{SOIL} were measured at locations not associated with EM anomalies. Metals were detected at two sampling locations, only one of which is associated with an EM anomaly.

On **Site 40 - McCormick ST1009 (Figure 3.9),** two areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.14**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. All sampling locations on this site had low TPH_{SOIL} and TSF Max_{SOIL} values. No samples were submitted for metals analysis from this site.

On **Site 41 - Carl #2 (Figure 3.10),** the sampling locations at this site were based on surface observations.

LOCATION	EASTING	NORTHING
043F †	661877.12	3010754.6
044B †	661870.5	3010744.9

Table 3.14 Sampling locations on Site 40. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
32	660024.15	3010752.5
033B	660043.5	3010741.1
034B	660057.58	3010743.2
035A	660070.81	3010722.8
036A	660044.24	3010722.8
037A	660039.82	3010732.6
Carl_2_WP1	660081.65	3010728.1
Carl_2_WP2	660039.47	3010724.5
Carl_2_WP3	660019.5	3010765.5
Carl_2_WP4	659976.26	3010739.9

Table 3.15 Sampling locations on Site 41. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	Specific Cond.
Carl_2_WP1	92100.0000
Carl_2_WP3	194875.0000
Carl_2_WP4	274000.0000
Carl_2_WP2	63682.0000
Average:	156164.2500

Table 3.16 Specific Conductance for Groundwater at Site 41.

Inphase measurements were not possible at this site due to high terrain conductivity (**Table 3.15**). Specific conductance of the groundwater at this site averaged 156164 mS/cm (**Table 3.16**).

On **Site 42 - Unical at Yarborough Pass (Figure 3.11),** seven areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.17**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Low TPH_{SOIL} and TSF Max_{SOIL} values were found at all sampling locations except for Id 009B (158 mg/g). Metals were detected at location Id 013B, 011B, 009B and 008B, all of which were EM anomalies.

LOCATION	EASTING	NORTHING
007B †	661338.79	3010453.6
008B †	661391.6	3010421.5
009B †	661379.99	3010405.6
010B †	661411.72	3010371.6
011B †	661467.69	3010390.7
012B	661484.22	3010431.9
013B †	661320.79	3010371.6

Table 3.17 Sampling locations on Site 42. † indicates location chosen by geophysical data. Northing and easting are UTM.

On **Site 44 - Sun Oil #8 (Figure 3.12),** three areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.18**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Although location Id 039B was not selected initially it is located near an EM anomaly. Specific conductance for groundwater at this site averaged 4643 mS/cm (**Table 3.19**). All TPH_{SOIL} and TSF Max_{SOIL} values were low on this site except for Id 038B, Id 039 B (both associated with EM anomalies) and Id Sun_8_WP3. Metals were detected only in locations associated with EM anomalies (Id 038B, Id 039B, Id 040B).

LOCATION	EASTING	NORTHING
038B †	660099.15	3009981
039B †	660104.13	3009976.5
040B †	660061.18	3009933.6
041B	660056.93	3009965.4
Sun_8_WP1	660084.67	3009971.8
Sun_8_WP2	660063.33	3009945.8
Sun_8_WP3	660049.77	3009970.6

Table 3.18 Sampling locations on Site 44. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
048F †	661598.55	3007401
048G †	661598.55	3007401
049D †	661570.1	3007404.4
050A	661559.01	3007389.3
050B	661559.01	3007389.3

Table 3.20 Sampling locations on Site 49. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	Specific Cond.
Sun_8_WP1	7860.0000
Sun_8_WP2	4130.0000
Sun_8_WP3	1940.0000
Average:	4643.3333

Table 3.19 Specific Conductance for Groundwater at Site 44.

On **Site 48 - Sun Oil #6 (Figure 3.13),** no areas were indicated as possible sampling locations by geophysical data collection at the site. As seen in **Figure 3.13**, geophysical data does not reveal any variations that are not reflective of variations in the vertical relief of the site. No significant surface features such as surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing was noted at this site.

On **Site 49 - Sun Oil #10 (Figure 3.14),** three areas were indicated as possible sampling locations by geophysical data collection at the site **(Table 3.20)**. These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. TPH_{SOIL} and TSF Max_{SOIL} were found in low concentrations on this site. Metals were detected at all three locations. Only one of the locations was selected by surface features (050A/B).

On **Site 55 - Sun 1048 (Figure 3.15),** two areas were indicated as possible sampling locations by geophysical data collection at the site **(Table 3.21)**. These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. TPH_{SOIL} and TSF Max_{SOIL} values were low for both locations on this site. Metals were detected at only on of the sites (Id 077A).

On **Site 56 - Sun 11 (Figure 3.16),** five areas were indi-

LOCATION	Specific Cond.
Sun_11_WP1	3800
Sun_11_WP2	1990
Sun_11_WP4	1910
Average:	2566.6667

Table 3.23 Specific Conductance for Groundwater at Site 56.

LOCATION	EASTING	NORTHING
077A †	660778.33	2987818.3
078B †	660764.33	2987819.9

Table 3.21 Sampling locations on Site 55. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
079B†	659955.83	2987644.4
080A	659956.66	2987675.8
081A†	659964.9	2987618
082A†	659976.54	2987627.7
83	659955.83	2987644.4
84	659984.95	2987579.4
Sun_11_WP1	659948.02	2987644.5
Sun_11_WP2	659995.47	2987657
Sun_11_WP3	659951.68	2987618.2
Sun_11_WP4	659895.12	2987639

Table 3.22 Sampling locations on Site 56. † indicates location chosen by geophysical data. Northing and easting are UTM.

LOCATION	EASTING	NORTHING
014B†	662074.42	2974192.5
015A†	662059.72	2974196.1
16	662021.49	2974221.9
017B†	662070.6	2974149.9
018C†	662060.08	2974140.4
019B†	662058.22	2974145.7
020A†	662044.27	2974179
021B†	662099.17	2974152.8
UCal_J_WP1	662109.72	2974206.6
UCal_J_WP2	662123	2974166.6
UCal_J_WP3	662040.08	2974182.8

Table 3.24 Sampling locations on Site 57. † indicates location chosen by geophysical data. Northing and easting are UTM.

cated as possible sampling locations by geophysical data collection at the site (**Table 3.22**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. TPH_{SOIL} was low at this site except for locations Id 082, Id 079, and Id 083 , all associated with EM anomalies, although Id 083 was not selected initially it is located very near to Id 079, which was selected by geophysical data. TPH_{SOIL} was low at the third Id 081, also a site selected from geophysical data. TSF Max_{SOIL} was high at the same sites as TPH. Metals were detected at sampling locations Id 079 and Id 083, both associated with EM anomalies. Specific conductance of the groundwater at this site averaged 2566 mS/cm (**Table 3.23**).

Location	Specific. Cond.
UCal_J_WP1	710
UCal_J_WP2	840
UCal_J_WP1	1060
Average:	870

Table 3.25 Specific Conductance for Groundwater at Site 57

On **Site 57 - Unical Jones et al. (Figure 3.17),** eight areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.24**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Specific conductance of the groundwater at this site averaged 870 mS/cm (**Table 3.25**). Low concentrations of TPH_{SOIL} were identified at all EM anomalies except for Id 015A, which had a concentration of 454 mg/g. Four sites not associated with anomalies were sampled at this site (Id Ucal*J*WP2, Id Ucal*J*WP1, Id Ucal*J*WP3, and Id 016). TPH_{SOIL} concentrations on these locations were found to be low. TSF Max_{SOIL} values were low for all sampling locations on this site except for Id 020A, Id 015A, Id 016, and Id Ucal*J*WP2. Only Id 015A and Id 020A were associated with EM anomalies.

LOCATION	EASTING	NORTHING
022C†	662511.65	2971567.5
023D†	662495.06	2971573.9
024B†	662530.55	2971547.7
025C	662515.73	2971612.6
026B	662481.96	2971565.1

Table 3.26 Sampling locations on Site 58. † indicates location chosen by geophysical data. Northing and easting are UTM.

On **Site 58 - McMoran Jones et al. (Figure 3.18)**, three areas were indicated as possible sampling locations by geophysical data collection at the site (**Table 3.26**). These locations represent electromagnetic anomalies or significant surface features such as depressions, surface debris indicative of oil and gas operations, or the appearance of tar, cement, or gravel packing. Electromagnetic anomalies investigated on this site for TPH_{SOIL} and TSF Max_{SOIL} showed low concentrations of hydrocarbons. Site Id 026B was sampled because surface debris was observed during the survey and also showed low hydrocarbon concentrations. Metals analysis were not performed on this site.

Summary

The EM-31 performed well on all sites except for site 38, 41, 44, and 37. These sites were located along the wind tidal flats, where the groundwater is close to the surface and hypersaline. These prop-

erties resulted in terrain conductivity values near the upper limits of the tool. This prevented proper calibration of inphase measurements and quadrature response was somewhat muted for several sites. No calibration at all could be achieved on site 37 and so it was not surveyed. Although inphase measurements could not be made, quadrature did respond to subsurface anomalies and provided locations for the collection of soil samples.

All soil samples submitted for analysis returned positive results for hydrocarbons on this project, but higher values (except for sites 38, 41, and 44) were generally (but not always) associated with electromagnetic anomalies. Metals results suggest a slightly stronger correlation between the electromagnetic anomalies and metals concentrations.

Subsurface features were detected but not confirmed on most of the sites since confirmation would require large excavations in an environmentally sensitive area. Unconfirmed features include well heads (29,35,36,39,40,49,55 and 58), pipes (16,58,30,15), and cables (38). Site 16, 58, and 42 had many large anomalies suggesting on-site burial of large metallic items.

Analysis of water samples, other that Specific Conductance, revealed very low concentrations of hydrocarbons and metals. These low concentrations have little effect on bulk conductivity and so were not considered in the evaluation of the EM-31 performance.

Conclusions

The use of electromagnetic survey techniques on this project provided useful information for each site investigated that was not limited to quadrature and inphase measurements. This procedure provided detailed site maps complete with observations of various surface features like depressions, ponds, dunes, roads, pad area, and location of debris. In many cases, quadrature reflected variations in vertical relief at the site, and helped interpret the extent of the pad area. Without the use of the EM-31, investigators would have made decisions based on surface features alone, in an area where little evidence remains on the oil/gas operations. The EM-31 allowed investigators to develop a better understanding of the sites extent and layout, which allowed them to maximize the sample allocations for each site and avoid completely random sampling procedures. EM site maps plotted with analytical results may be found in Section VI.

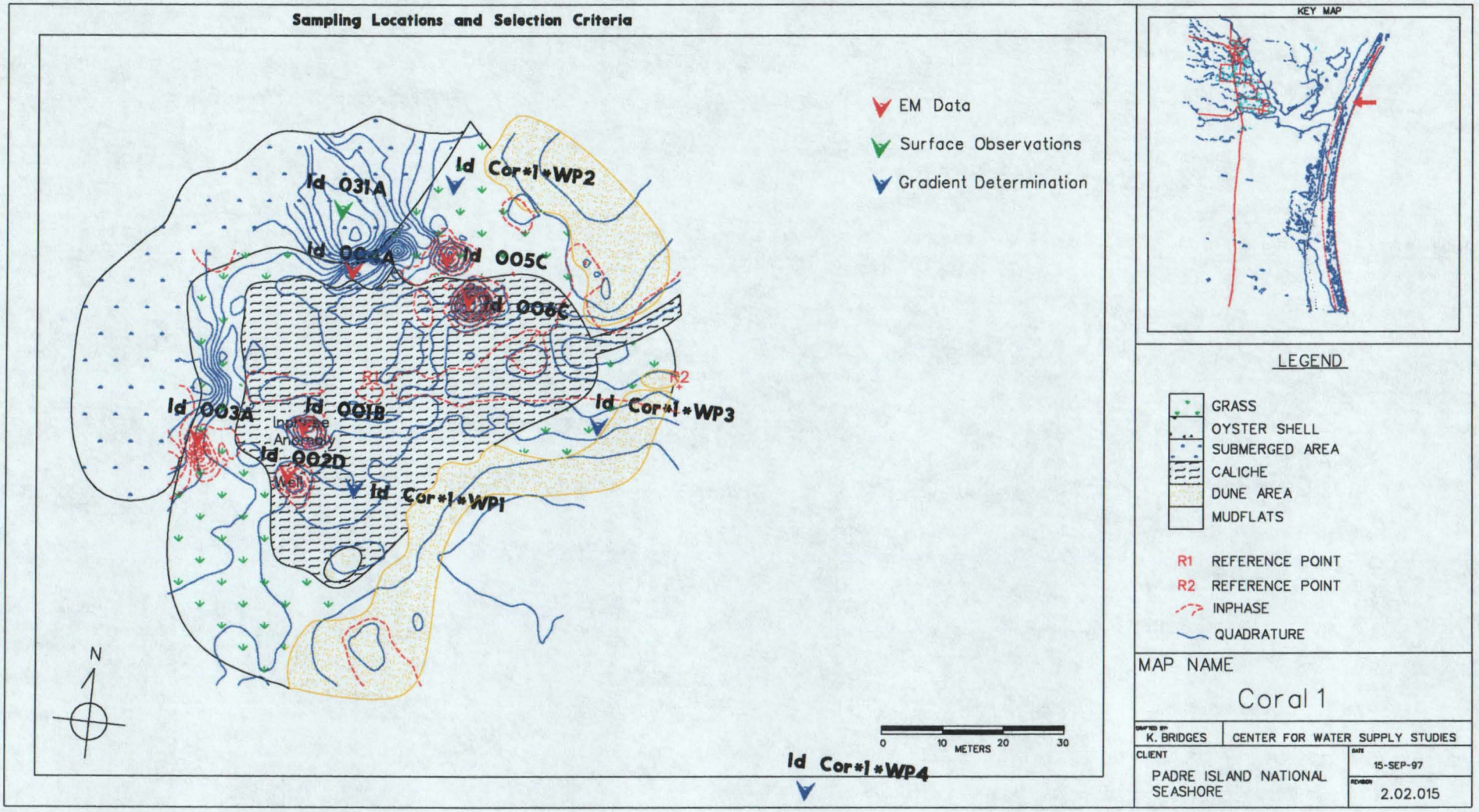


Figure 3.1 Site Id 15 - Coral Oil #1

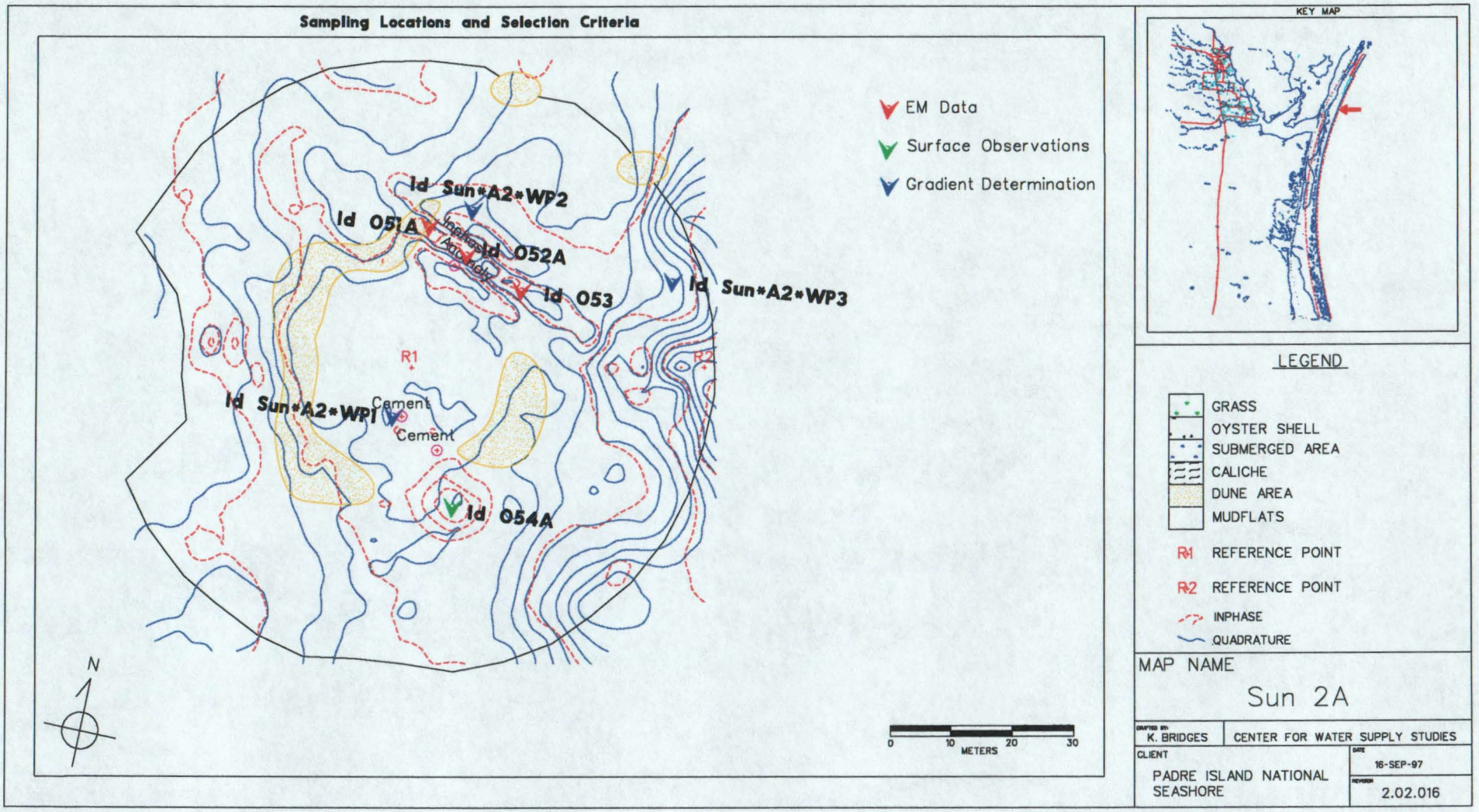


Figure 3.2 Site Id 16 - Sun Oil #2-A

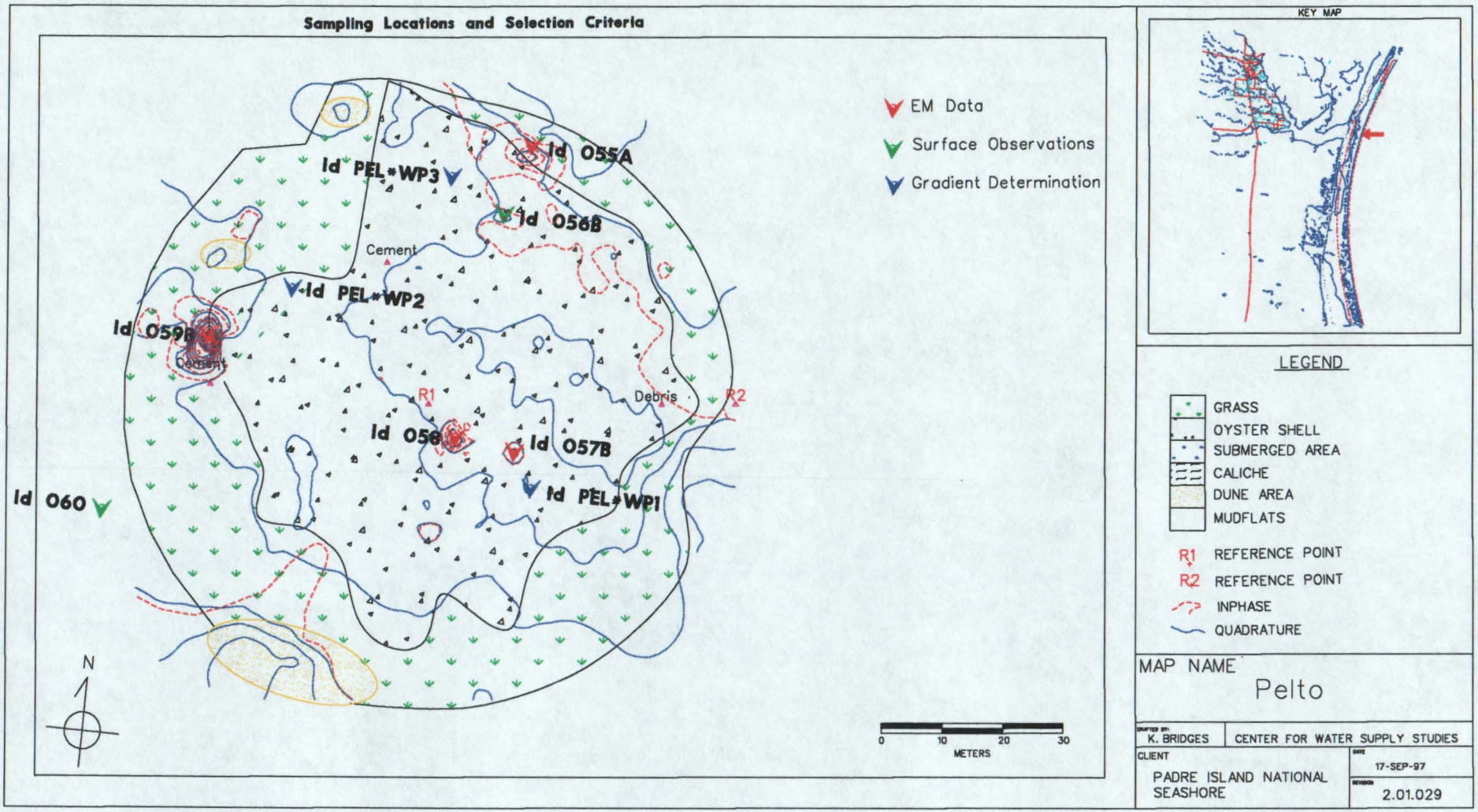


Figure 3.3 Site Id 29 - Pelto #1

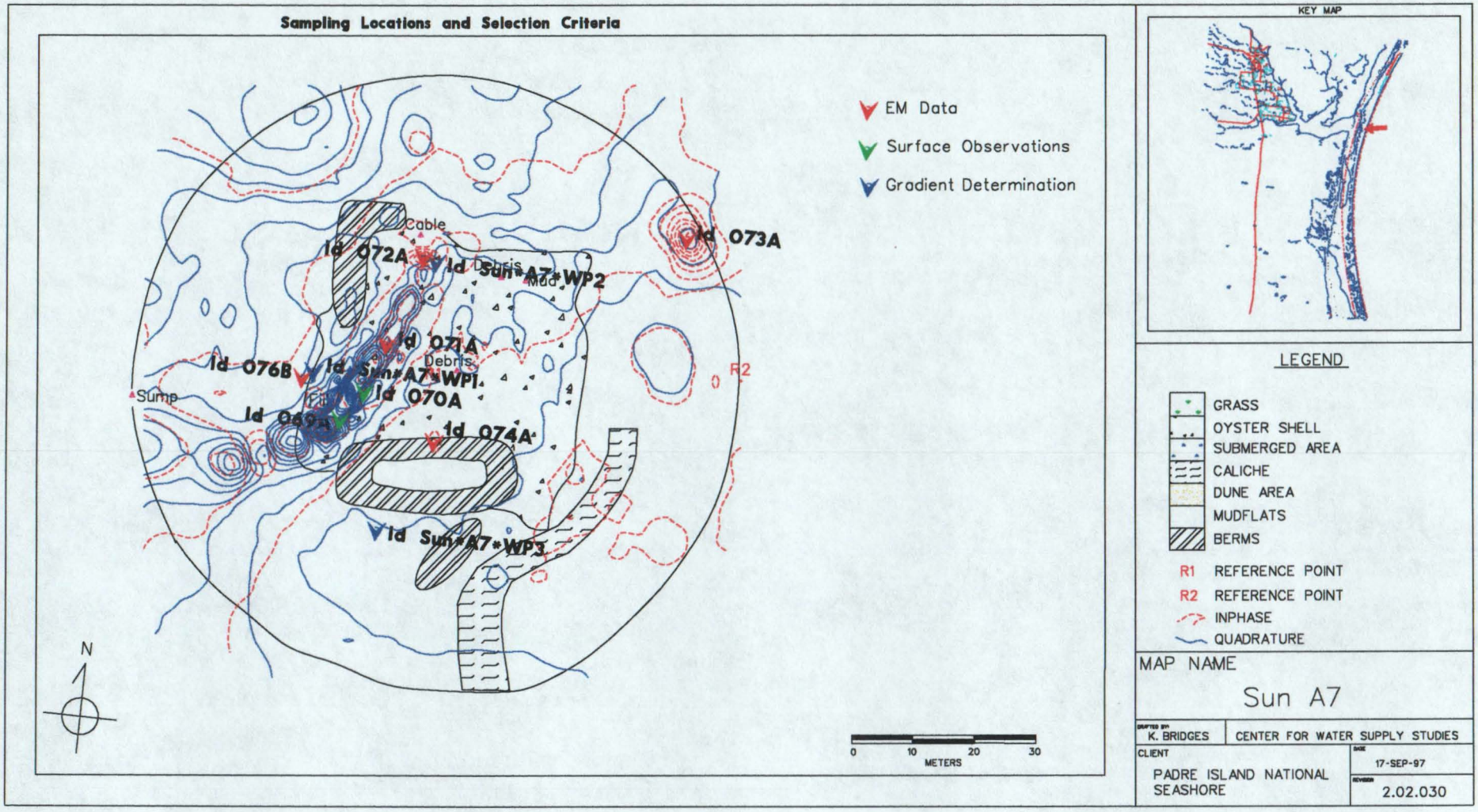


Figure 3.4 Site Id 30 - Sun Oil A-7

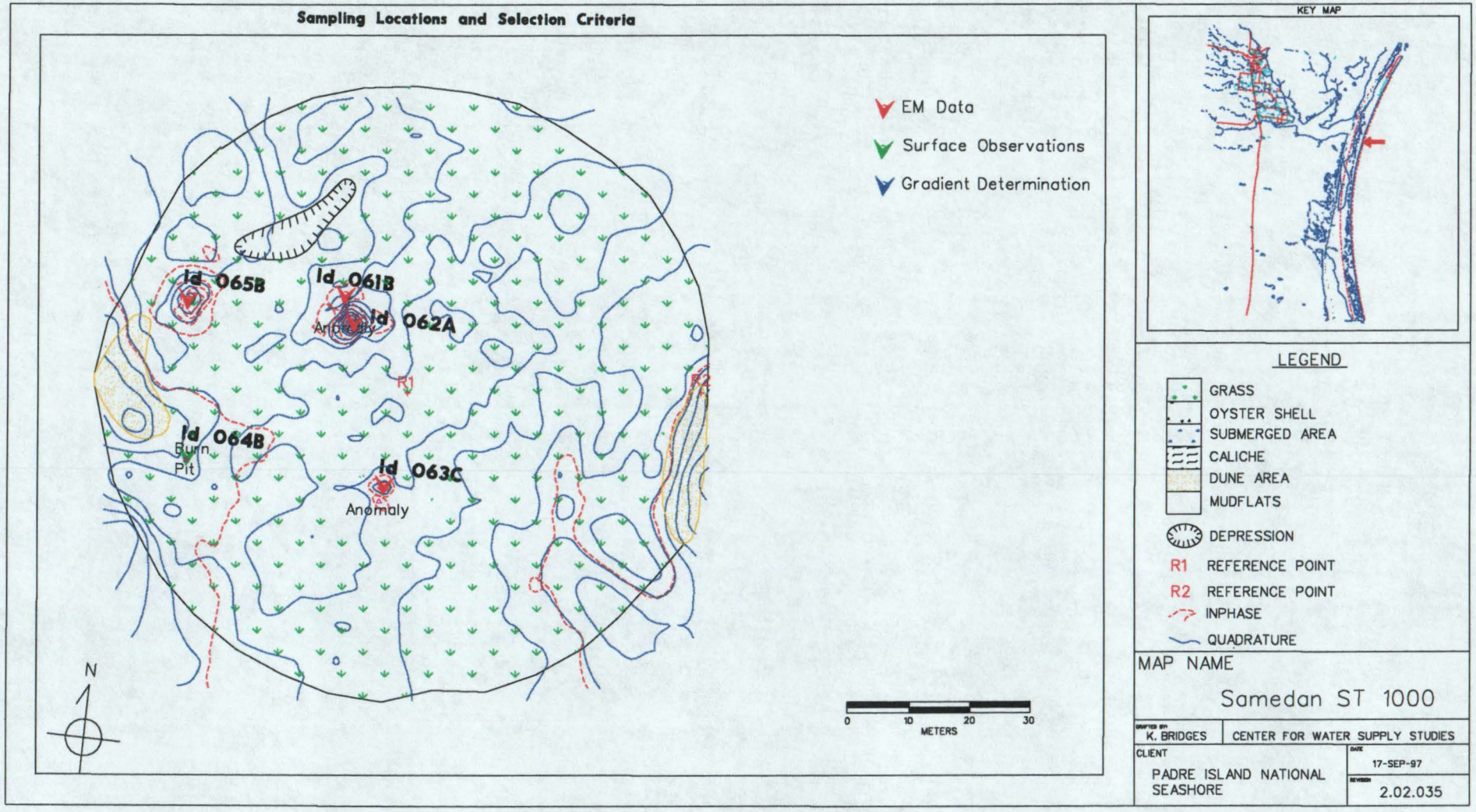


Figure 3.5 Site Id 35 - Samedan ST 1000

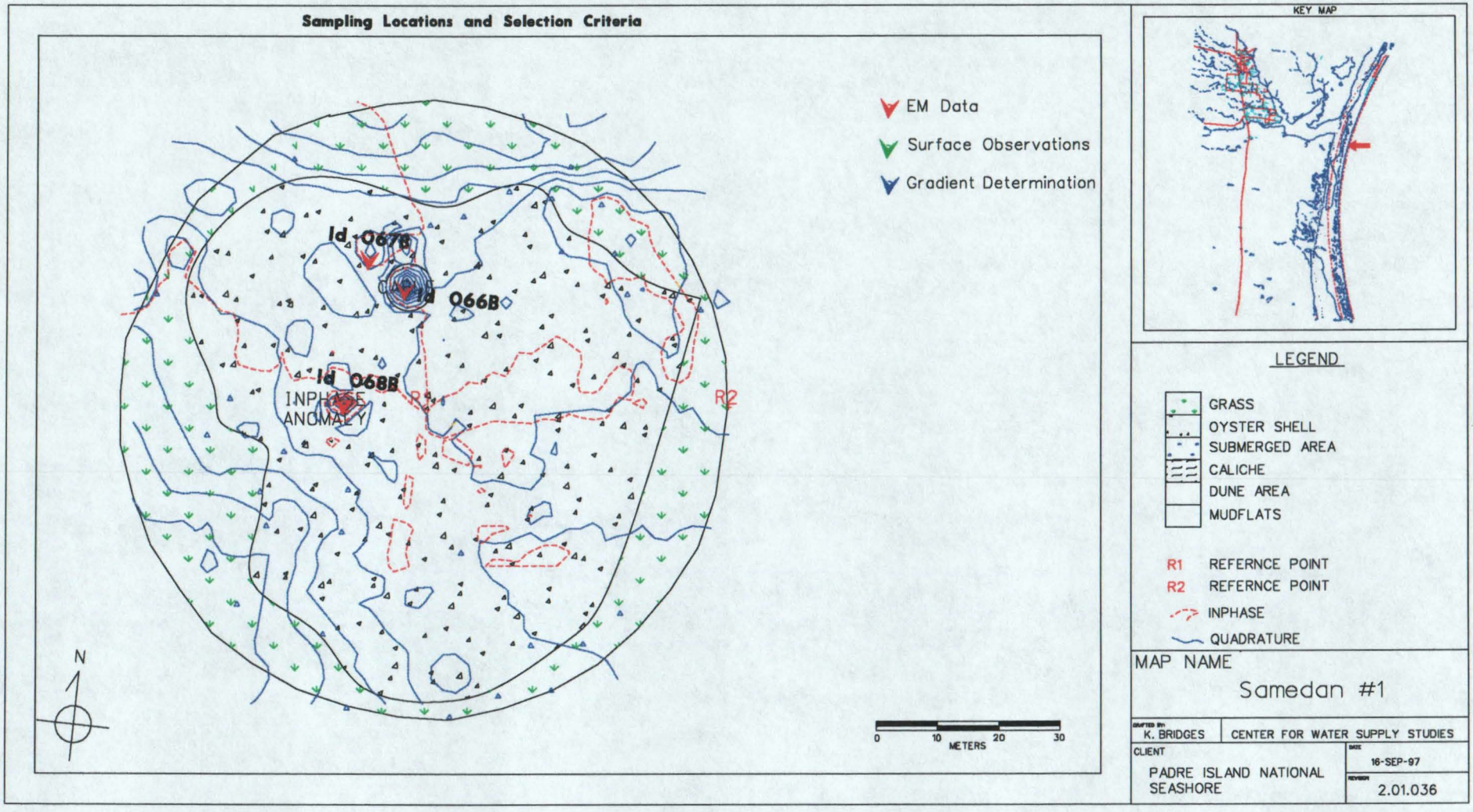


Figure 3.6 Site Id 36 - Samedan #1

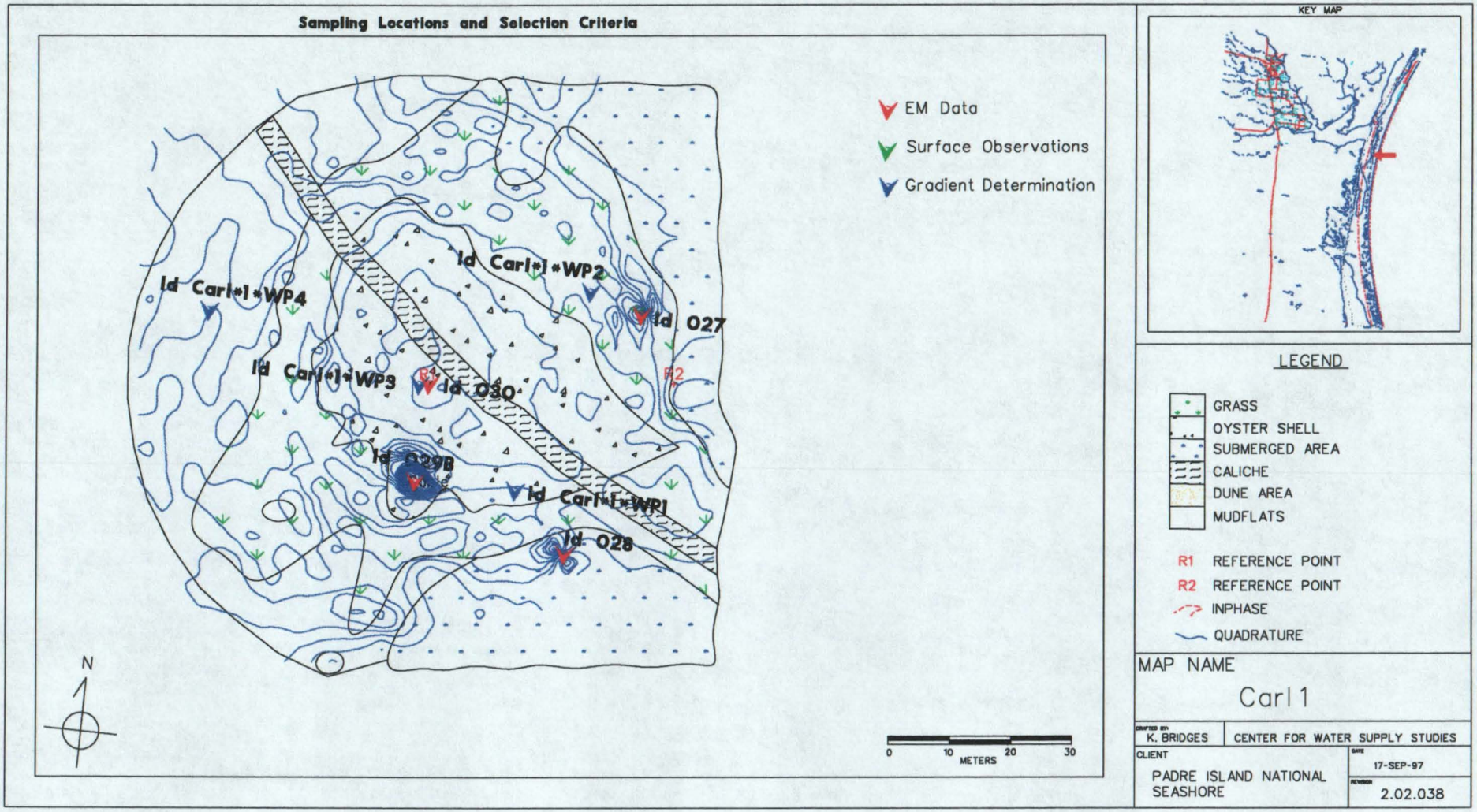


Figure 3.7 Site Id 38 - Carl #1

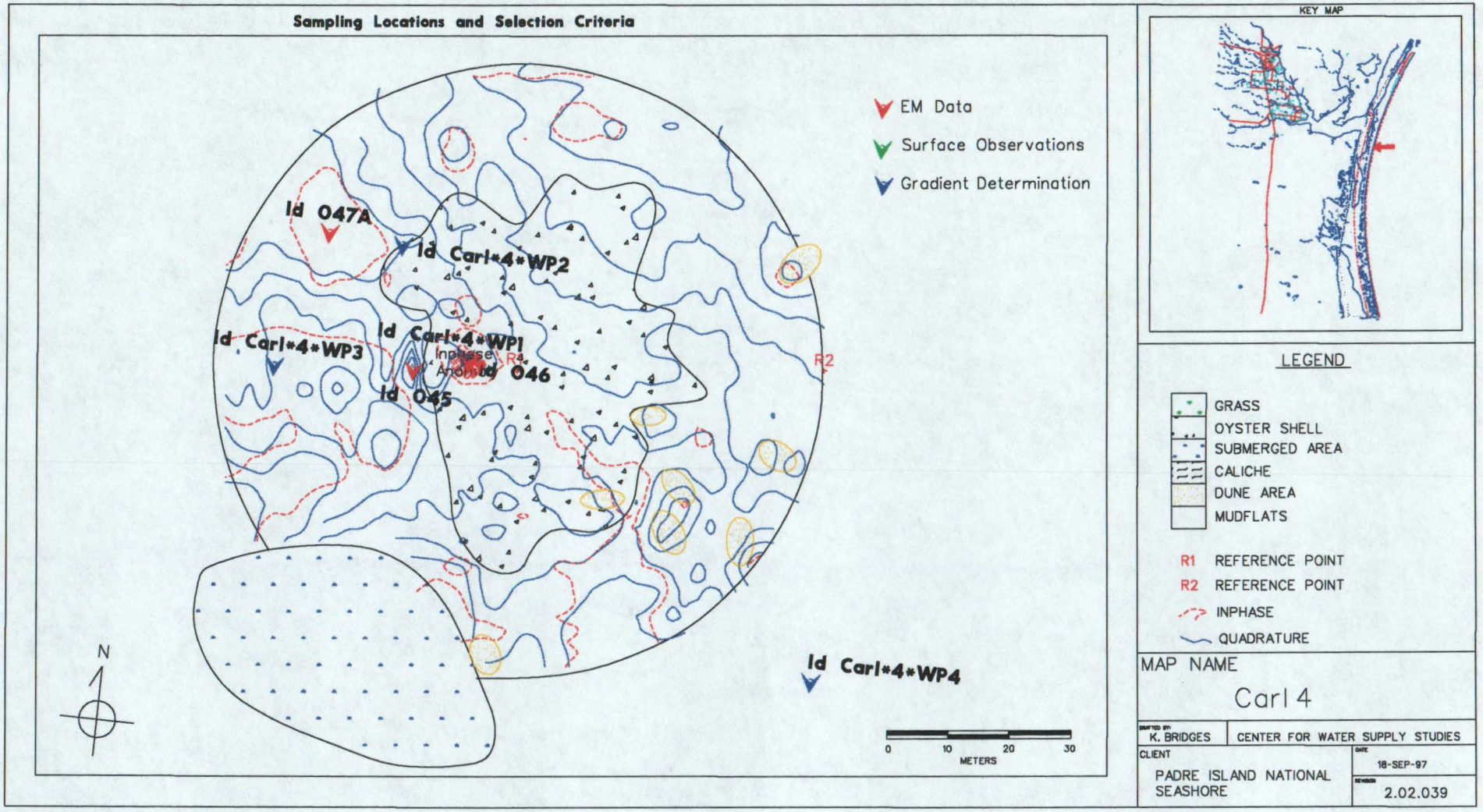


Figure 3.8 Site Id 39 -Carl #4

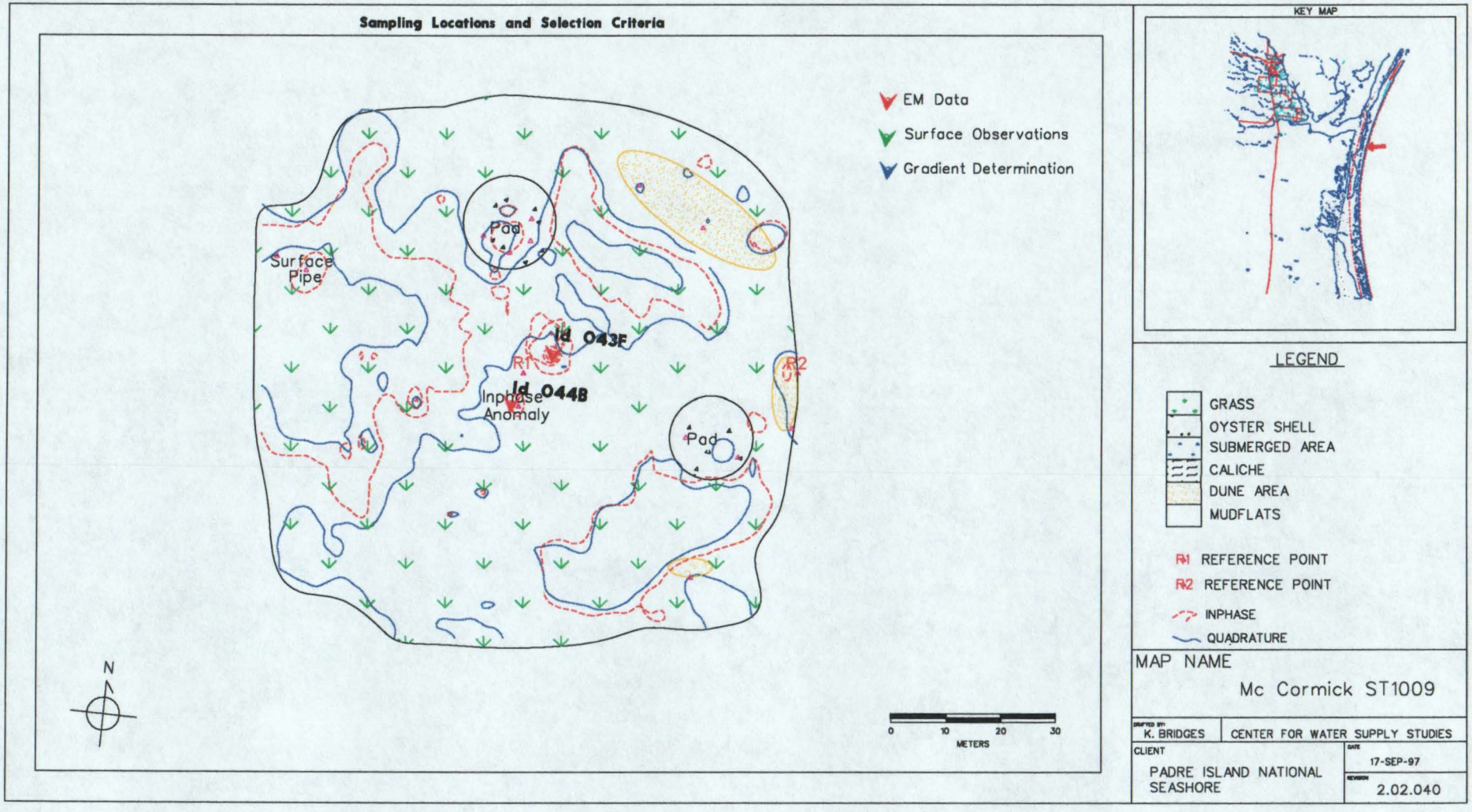


Figure 3.9 Site Id 40 - McCormick ST 1009

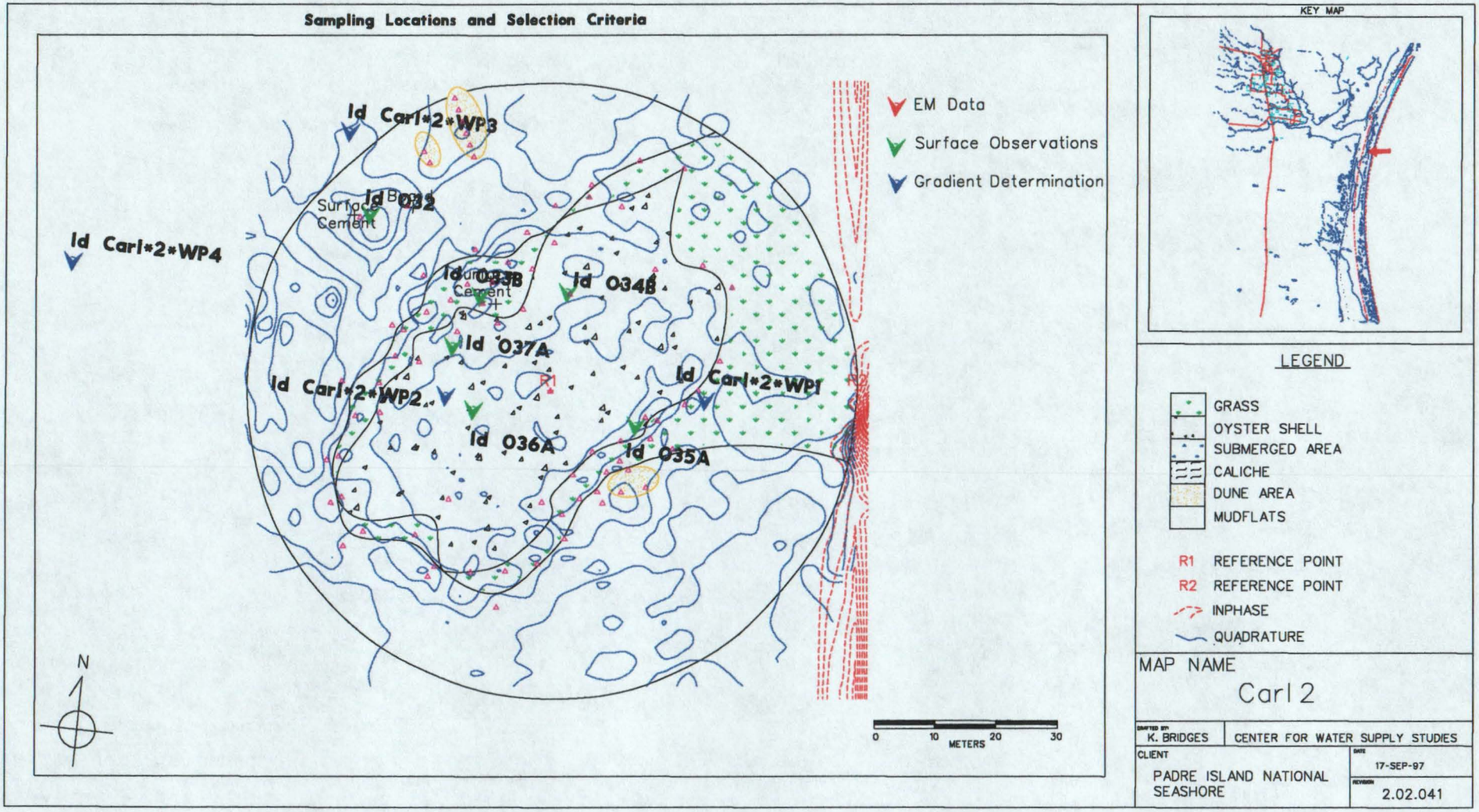


Figure 3.10 Site Id 41 - Carl #2

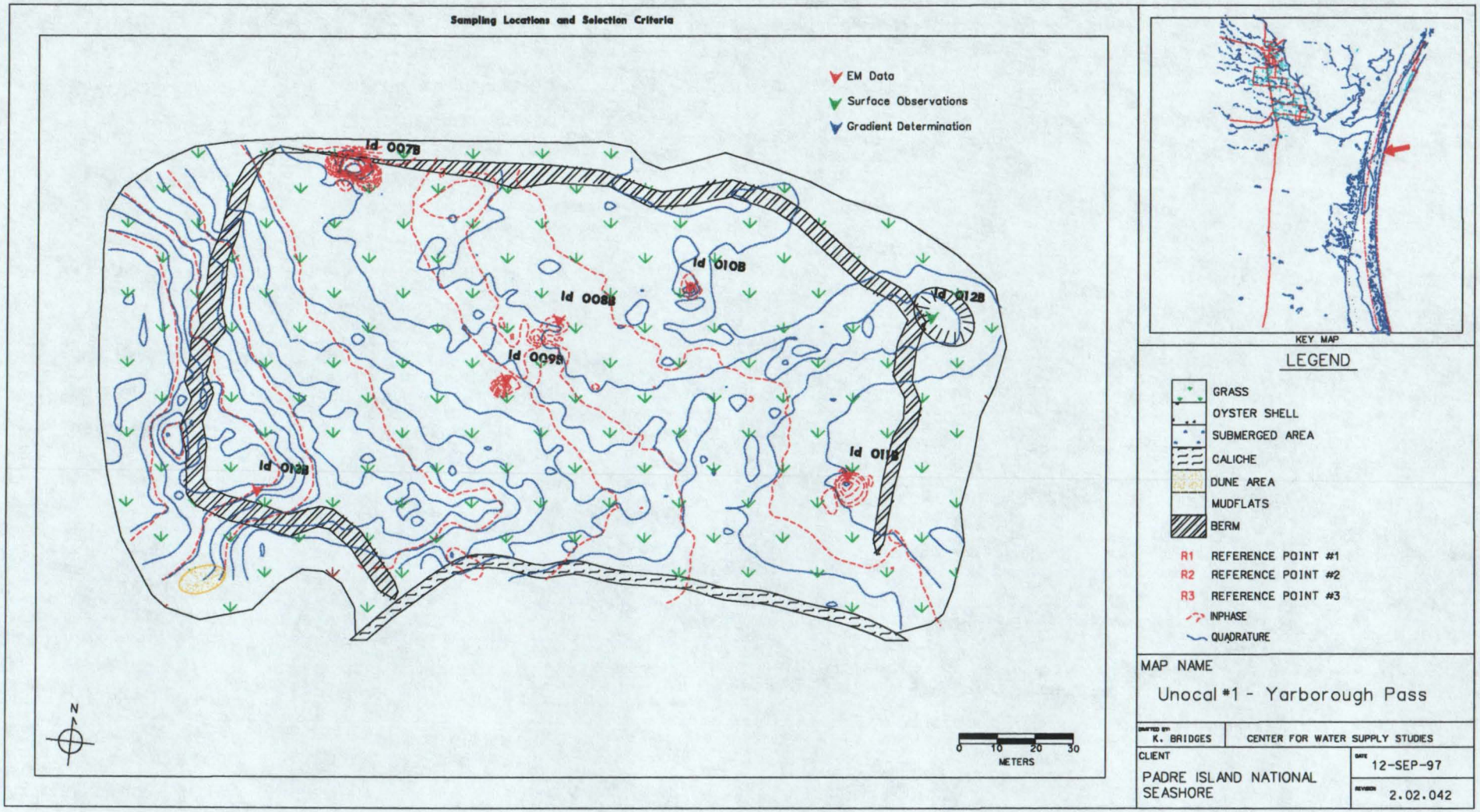


Figure 3.11 Site Id 42 - Unical #1 Yarborough Pass

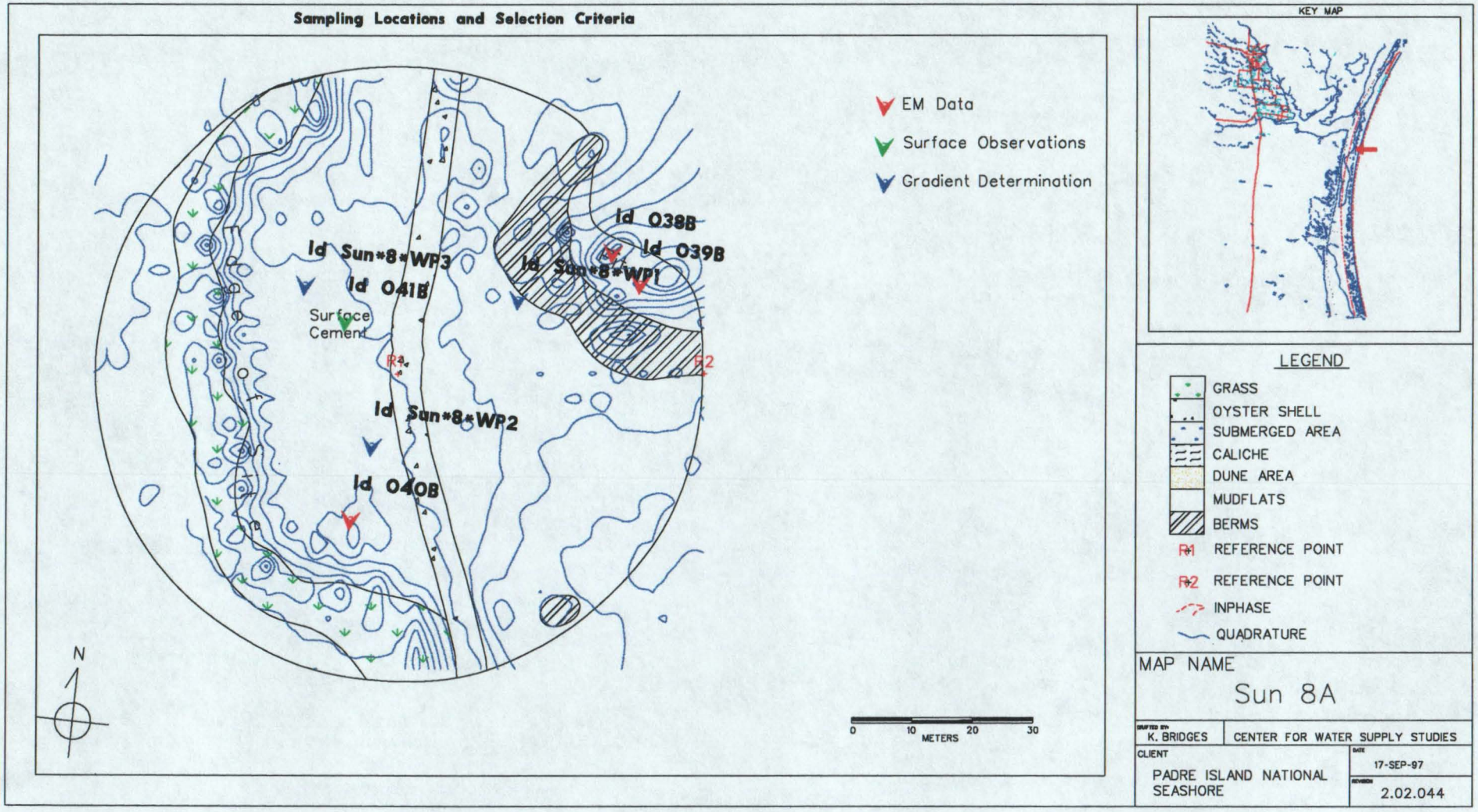


Figure 3.12 Site Id 44 - Sun 8A

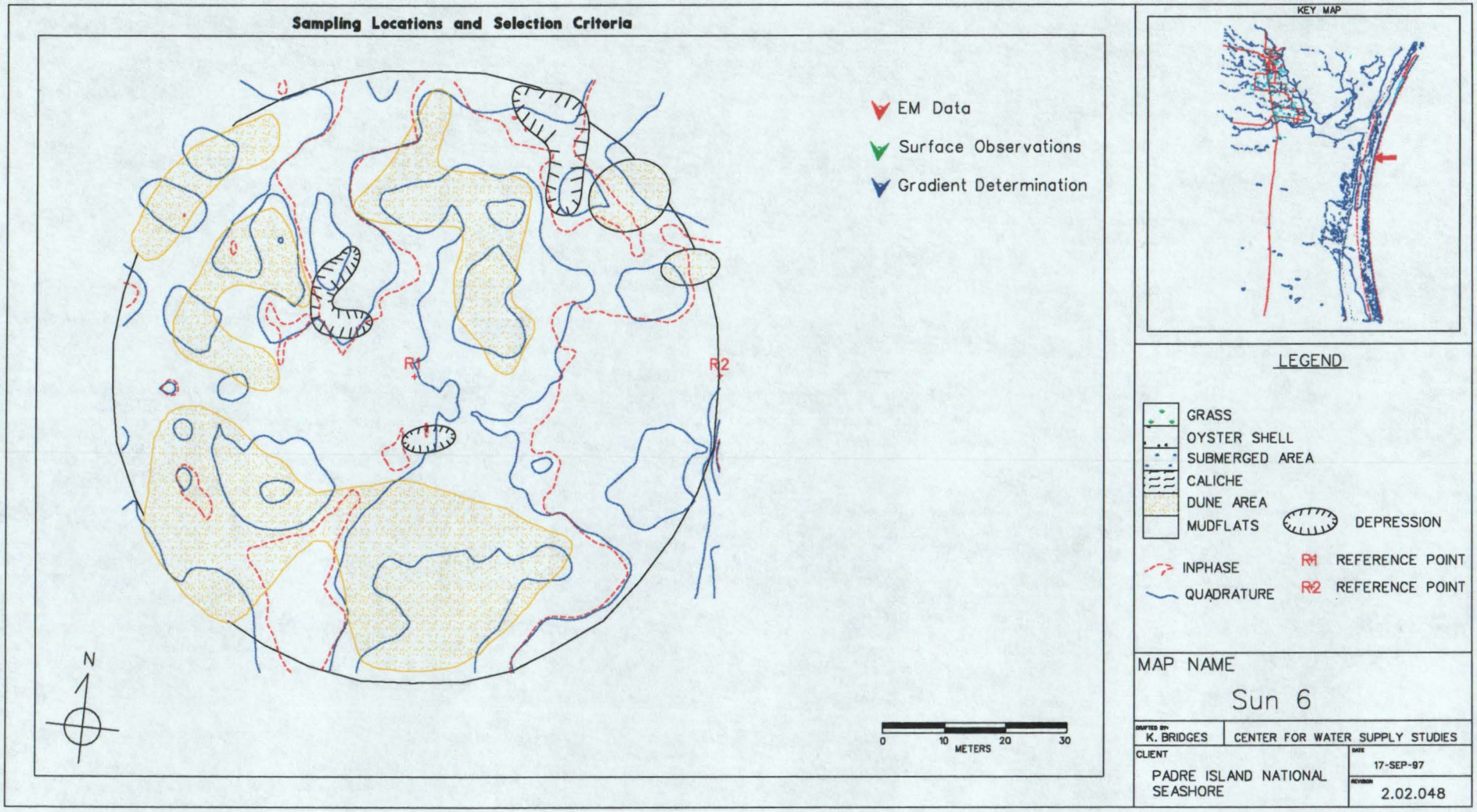


Figure 3.13 Site Id 48 - Sun #6

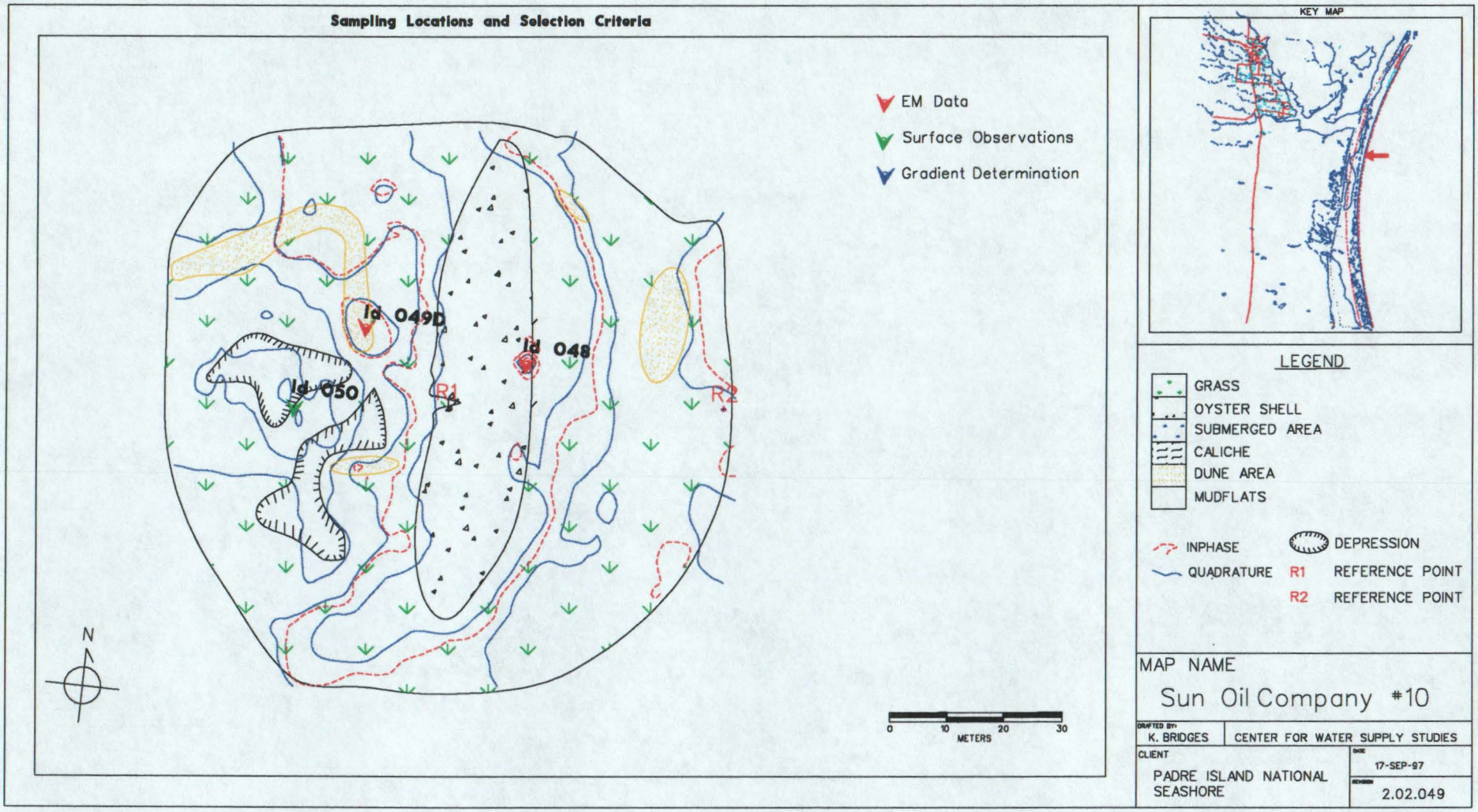


Figure 3.14 Site Id 49 - Sun #10

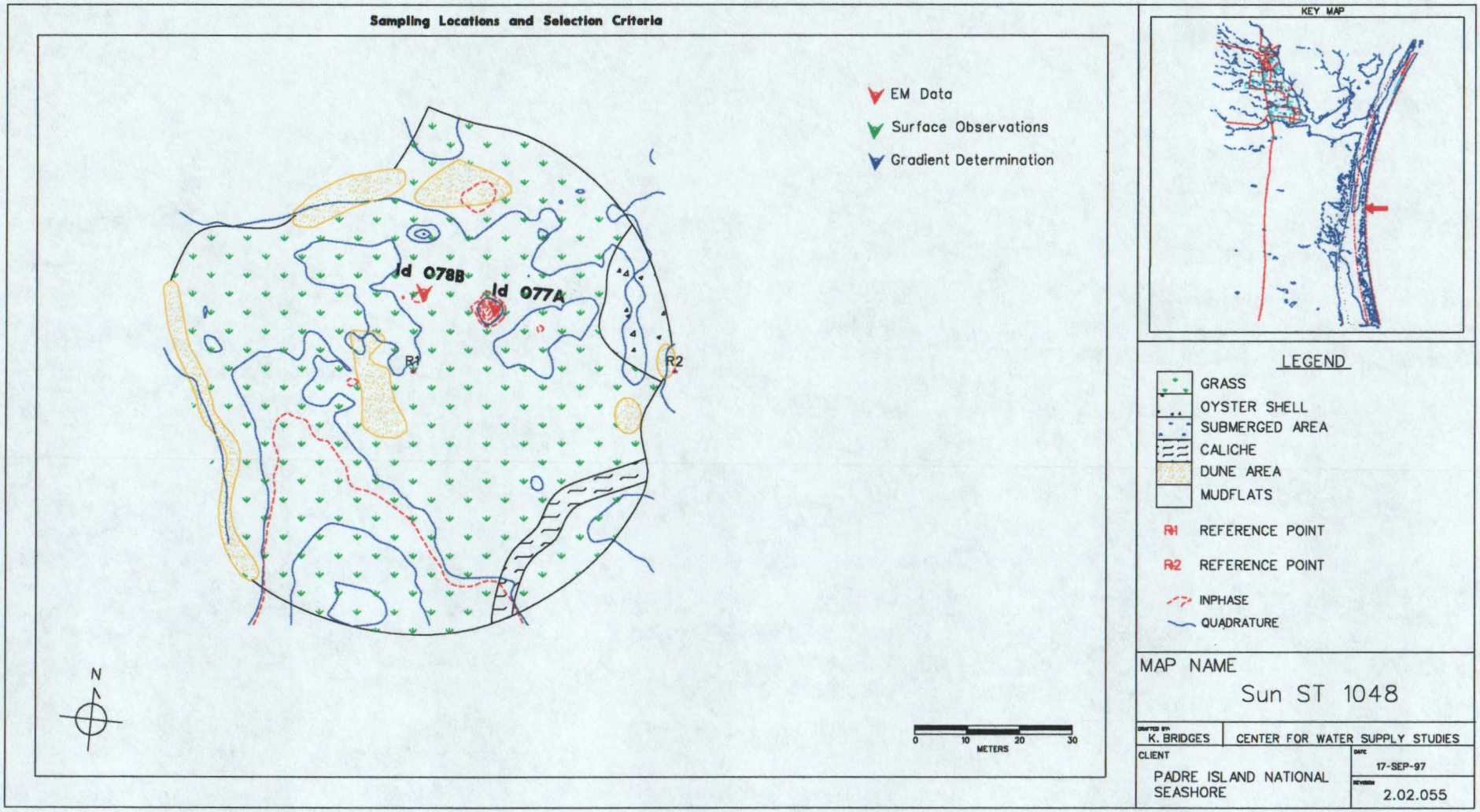


Figure 3.15 Site Id 55 - Sun ST 1048

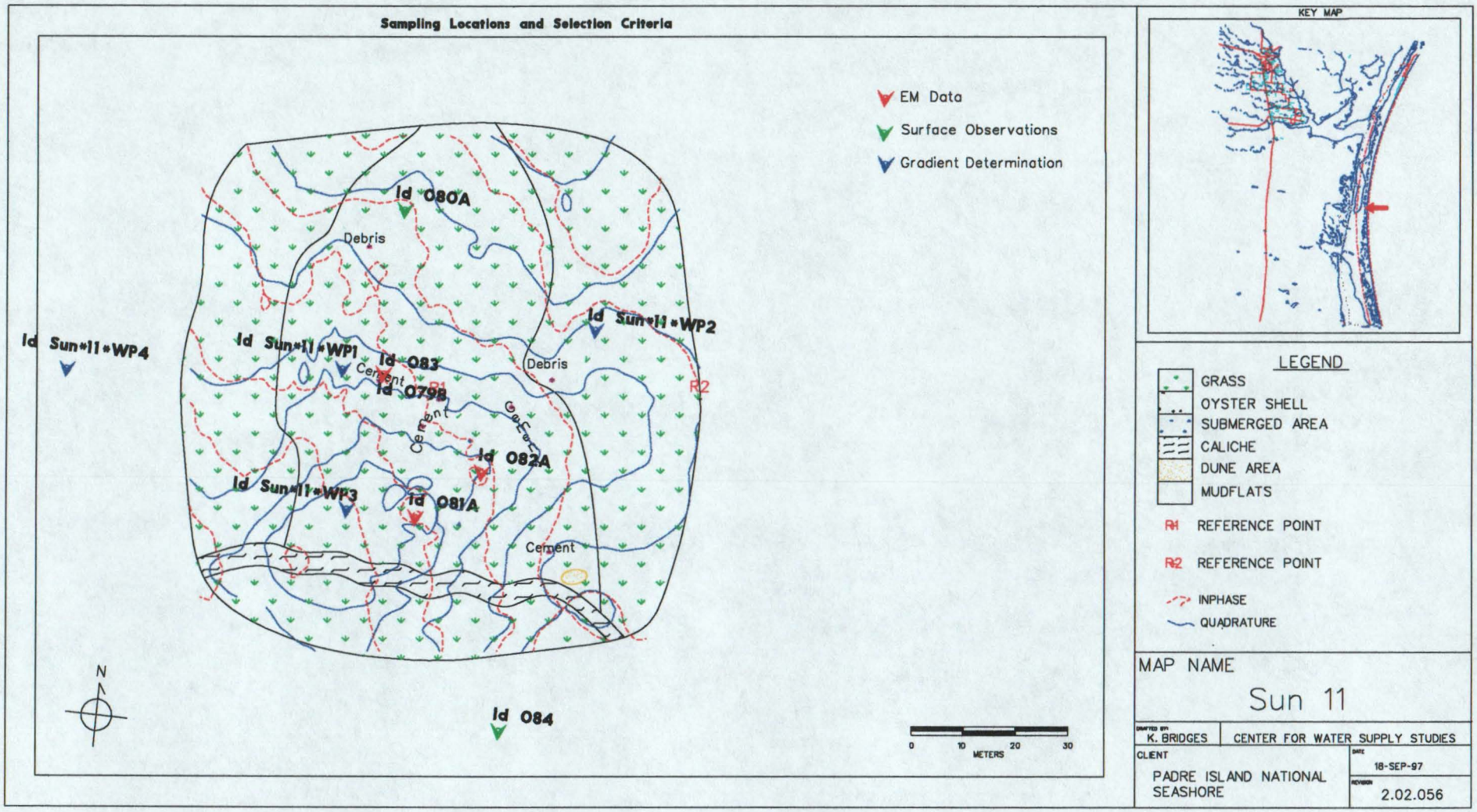


Figure 3.16 Site Id 56 - Sun #11

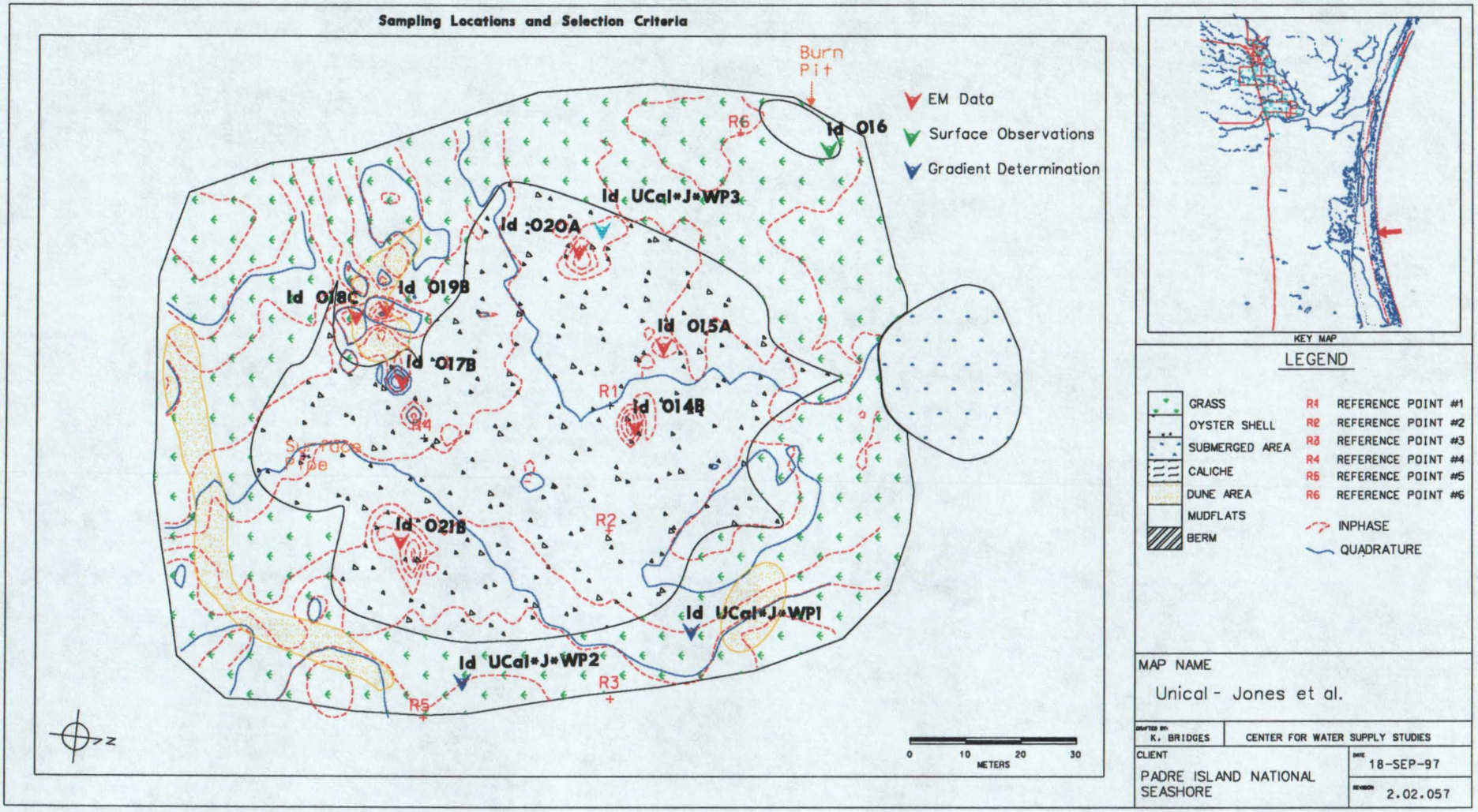


Figure 3.17 Site Id 57 - Unical Jones et al. #1

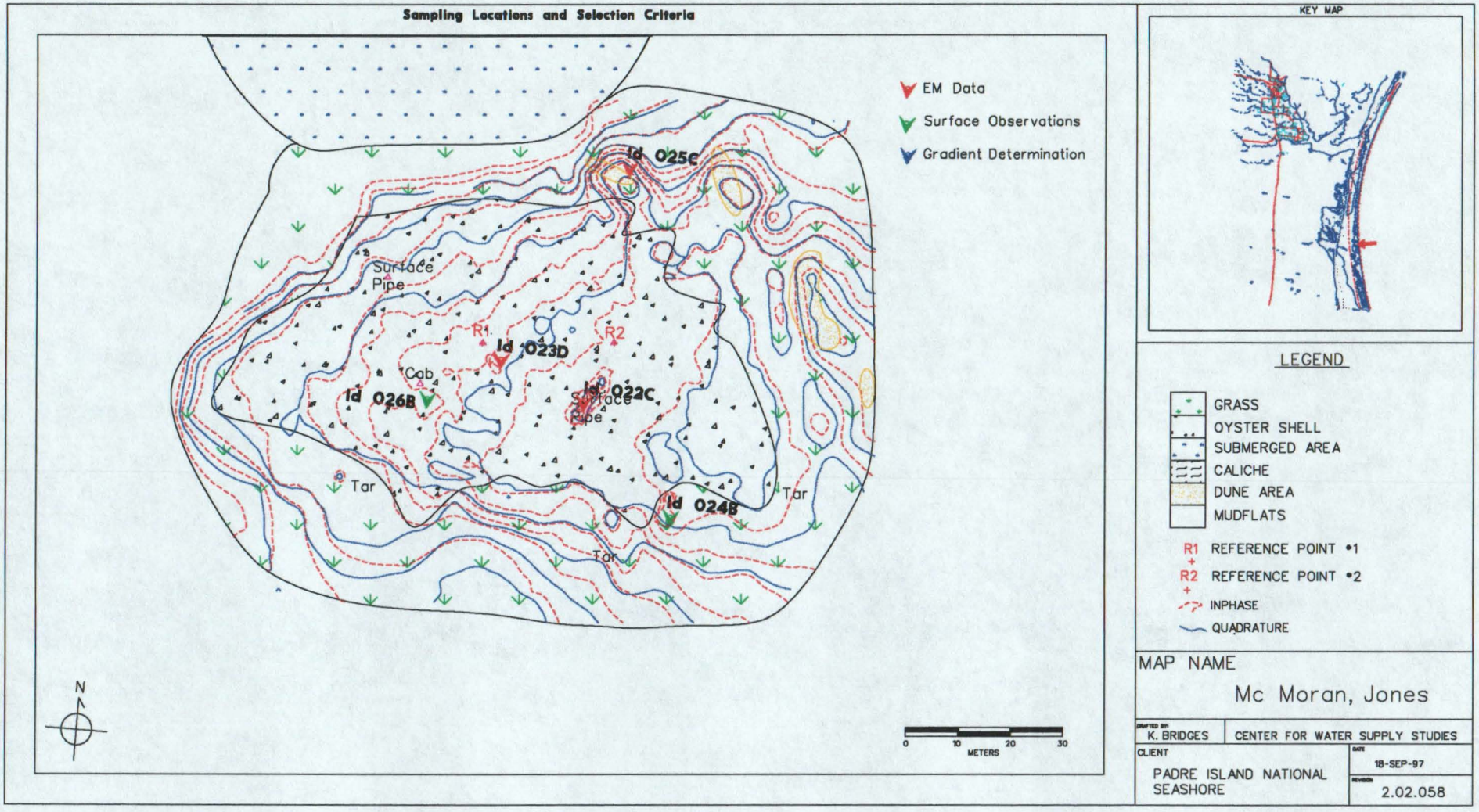


Figure 3.18 Site Id 58 - McMoran Jones et al. #1

IV. Sample Collection

Approach to Sample Collection Objective

During the contract proposal, PINS representatives separated the analytical expenses from the overall budget. In the initial scope of work the actual number of sites included in the sample collection portion of the investigation was uncertain, so park officials estimated that there may be as many as 40 sites entering Phase I of the investigation. This number was used to determine the minimum number of samples, along with the respective types of analysis, that would be required to conduct a limited site characterization. To optimize the site characterization results, two separate sample collection events were planned. In the first phase all sites would be sampled. The ten sites returning the highest results in the first sampling phase would graduate to further characterization in the second phase. Sample extracts would be preserved from soil samples submitted in both phases for TPH analysis and the three samples with the greatest TPH concentrations, from the ten highest ranked sites, would be analyzed for PAH.

Sample allocations for forty sites entering the site characterization phases required three soil samples from all sites for TPH and TSF analysis (120 total samples). A single sample from each of the forty sites would be submitted and analyzed for lead, chromium, and barium (40 total samples). In the second phase sample collection events, three groundwater samples from each of the ten sites would be analyzed for TSF (30 total samples) and two TPH groundwater samples were to be submitted from each of the sites (20 total samples). Three soil samples and one groundwater sample would be analyzed for PAH from each site (total 40 samples). Three groundwater and one soil sample would be submitted for 13 priority metals for each site (40 total samples), and one sample from each site would be analyzed for PCBs (10 total samples).

The allocations made during the proposal stage of the project were intended as a minimum requirement. At the commencement of the project the total number of sites that would graduate into the sample collection phases of the project was unknown. Latitude was allowed for configuring the samples to the actual number of sites entering the sample collection phases optimizing the site characterization results.

Only seventeen sites actually entered the first sample collection phase. A total of 83 sediment samples were submitted from the included sites. Thirty seven samples were submitted for the metals analysis (barium, lead, and chromium). The actual number of samples submitted from each site varied. Some sites had a greater number of samples submitted due to a greater amount of anomalous areas encountered in the EM surveys. At some sites, additional samples were collected in suspect surface areas not indicated by the EM surveys.

Analysis of samples collected during the first sample collection events were used to confirm the presence of released hydrocarbons and metals at the subject sites. Only soil samples were collected during this stage. The analytical methods used for petroleum hydrocarbons are a combined analysis utilizing Total Scanning Fluorescence (TSF) and Gas Chromatography-Total Recoverable Hydrocarbons (GC-TRH) methods. The TSF analysis targeted the presence of aromatic hydrocarbons. GC-TRH analysis further identified the hydrocarbon compounds present and furnished quantitative values for each site investigated. The presence of metals was determined by targeting barium, chromium and lead as indicator species, using standard method 200.7.

Based on the results of the initial sampling phase, further characterization work was conducted on the ten sites identified by the investigating parties to be of greatest concern. Sampling events during this phase were directed towards further delineating impact areas and identifying potential release sources. Groundwater and additional soil samples were collected during this stage. TSF combined with GC-TRH analysis was conducted on groundwater samples and the additional sediment samples. Gas-Chromatography Mass Spectrometry (GC/MS) for Polycyclic aromatic hydrocarbons (PAH) using an extended scan was conducted on soil and ground water samples. EPA 13 priority metals (40 CFR 122, appendix D, Table III, excluding phenol and cyanide) was performed on both groundwater and sediment samples. PCB analysis were conducted on soil samples and chloride concentrations were determined in the field for groundwater samples.

Ten sites were selected to enter the second sample collection phase of the investigation. In this phase thirty additional TPH and TSF sediment samples were submitted for analysis (30 total sample). These samples were collected from three well point locations at each of the subject sites. Thirty groundwater samples were submitted for TPH and TSF analysis (30 total samples). These were collected from three screened well points from each of the sites. Ten down gradient groundwater samples were submitted for TSF, TPH and PAH analysis from the respective wells at each site (10 total samples). Thirty preserved extracts from soil samples collected during both sample collection phases were analyzed for PAH (30 total samples). Thirty groundwater samples, three from each of the subject sites (30 total samples) and ten soil samples, one from each site (10 total samples) were submitted for EPA 13 priority metals analysis. One additional single species metal sample was submitted from three of the sites (3 total samples). Each site had one sediment sample analyzed for PCBs (10 total samples).

The total number of samples submitted for analysis remained the same with the exception of TSF and TPH. Originally 150 samples were to be analyzed for TSF, however only 143 samples were submitted. The remaining seven budgeted TSF samples were applied towards three additional TPH samples. Originally 140 TPH samples were budgeted but with the three additional samples the total for TPH came to 143 samples.

Sample collection methodology

Soil borings were advanced utilizing a three inch hand auger and constructed to a total depth just above the saturated zone. Soil samples were collected from discrete half foot or one foot intervals and field screened continually for volatile organic vapors from the sample head space. Field screening was accomplished with a photoionization detector (PID) and enhanced by visual and olfactory observations. One representative sample from each soil boring was submitted for analysis based on the field screening results.

Some modifications were made to the original work plan. During the early stages of the first sample collection phase a two inch split spoon sampler was utilized to collect the samples. This method was found to be ineffective. Sample capture of the loose dry unconsolidated fine grained sand matrix was unreliable. A sand trap was introduced but did not improve sample recovery in most cases. The force of pushing the sampler past obstacles such as shell material and caliche damaged the sand trap and either allowed the sample to escape, or prevented the sample from entering the collection tool. An auger tip

placed on the leading end of the split spoon improved sample capture in moist sediments. Drought conditions and evapotranspiration resulted in a very dry matrix to a considerable depth. The two inch diameter split spoon sampler with the auger tip would push through the sample interval without collecting a representative sample. The same results were encountered with dry and wet clays. This occurred when the auger clogged preventing additional portions of the depth interval from entering the collection chamber. The adopted method for sample collection utilized a three inch auger sampler. In wet conditions samples were captured utilizing a three inch mud or sludge sampler.

Relative groundwater gradients at each site were determined in the field by installing three temporary well points at each of the ten locations scheduled in the second phase of sampling. The well points were installed by constructing a soil boring through the vadose zone and driving screened well points into the saturated zone. The potentiometric water level in each well was gauged after the groundwater in the wells had fully recovered. Localized mounding encountered at some site locations with elevated pad areas, made determining the direction of the groundwater gradient difficult due to radial flow patterns. A minimum of three well points from each of the subject sites were sampled using a peristaltic pump. Two samples corresponded to up gradient locations and the third sample was drawn from the well point with the greatest depth to water in a down gradient location.

The hand auger was decontaminated between construction of individual soil boring's and between sample collection days. The sample collection tools were decontaminated between each sample collection interval. Decontamination was accomplished using a solution of water and alconox followed by a deionized water rinse. At the end of the sample collection days all equipment was pressure washed. Disposable gloves were utilized for each discreet sample collected. Sample collection and documentation followed standard methods 1060 B and C. These methods detail sample collection, preservation, labeling and chain-of-custody requirements.

V. Review of Phase I Results.

Summary of Sample Returns from the First Sample Collection Phase

Eighty three samples collected at the seventeen site locations included in the first phase of the limited site characterization project were submitted for a combined TPH and TSF analysis. The results for TPH ranged from 6,145.9 ug/g at Site 56 (Sun Oil Dunn-McCampbell No. 11), to 0.6 ug/g at Site 15 (Coral Petroleum and Development well No. 1). The average result for all TPH samples is 150.9 ug/g. Of the 83 samples submitted, 39 returned with TPH concentrations below 5 ug/g. An additional 16 samples returned with TPH results between 5 ug/g and 10 ug/g. A total of 55 samples, out of the 83 samples submitted returned TPH results below 10 ug/g.

The results for TSF ranged from 58 relative fluorescence units (rfu) in sample 027 at Site 38 (Carrl Oil Dunn et al. No. 1), to 3,974,000 rfu in sample 045C at Site 39 (Carrl Oil Dunn et al. No. 4). The average TSF result for all samples is 139,624 rfu, well above the average value for many of the included subject sites. Sites 15, 16, 35, 36, 40, 49, 55, and 58 all had values below 6,000 rfu. The remaining sites had a range for their highest values of 9,837 rfu to 3,974,000 rfu. Sites, 29, 30, 38, 39, 41, 42, 56, and 57, all demonstrated high values for TFS in one or more samples.

Most sample results for TSF appear to correspond to the results for TPH on the same samples within the same sites. Variances appear when samples with similar TPH values from separate sites are compared. The corresponding magnitudes for the TSF varies for similar TPH values from different sites. At times the difference in magnitude between two similar TPH sample results is great. Since TSF analysis looks at aromatic compounds with resulting magnitudes based on intensity readings, the samples from different sites with similar TPH values may have greater aromatic constituents due to a different petroleum makeup.

In addition to the eighty three sediment samples submitted for TPH and TSF analysis thirty seven were analyzed for barium, chromium and lead. Many of the samples returned below detection levels for the analyzed constituents. To see the complete list of sample results refer to the sample results in Appendix (1). Some sites had a greater number of samples submitted than others. The number of samples submitted for each site was determined from field observations and EM survey anomalies.

Barium was present at all subject sites. This metal is naturally occurring and many of the concentrations reflect background levels. Sample results ranged from 5 ug/g in sample 005C at Site 15 (Coral Petroleum and Development well No. 1), to 3110 ug/g in sample 015A at Site 57 (Union of California W V Jones et al.). The average barium concentration for all the samples is 490 ug/g. Chromium appeared at Sites 29, 38, 39, 41, 44 and 57. Levels were relatively low, and values ranged from 8 ug/g in sample 038B at Site 44 (Sun Oil Well No. 8), to 60 ug/g in sample 015A at Site 57 (Union of California W V Jones et al.). The average chromium concentration for all the samples is 20 ug/g. Lead appeared at Sites 16, 29, 30, 38, 39, 41, 42, 44, 56 and 57. Values ranged from 6 ug/g in sample 039B at Site 44 (Sun Oil Well No. 8), to140 ug/g in sample 045B at Site 39 (Carl Oil Dunn et al. No. 4). The average lead concentration for all sites returning above detection levels is 32 ug/g. Site 38 (Carl Oil Dunn et al. No.1) returned a significant lead concentration (84 ug/g) in sample 028. This sample result was the highest concentration encountered at the remaining sites where lead concentration was encountered in above detection levels.

All sample returns from the first sample collection events were reviewed. The TPH results were used

to separate the ten sites of greatest concern for inclusion in the second phase of the site characterization work. Nine sites from the original seventeen sites returned one or more sample with concentrations for TPH in excess of 100 ug/g. In addition to the nine sites listed in **Table 5.1**, Site 15 (Coral Petroleum and Development No. 1) was included. Sample 002D collected at this site returned the highest concentration for TPH (34.7 ug/g) from the remaining sites.

Heavy precipitation events from September, 1996 through to January, 1997 delayed the commencement of the second sample collection phase of the investigation. During the second phase additional rainfall during May and March inundated low-lying sites resulting in surface ponding in these areas. Unfortunately, Site 42 (Union of California at Yarborough Pass) could not be included in the second phase due to surface ponding over the site. Site number 16 was substituted into the second phase after consulting with park officials.

Site ID	Site Location Name	Maximum TPH
56	Sun Oil Dunn-McCampbell No. 11	6145.9
38	Carl Oil Dunn et al. No. 1	704.9
44	Sun Oil well No.8	539.3
57	Union of California V W Jones et al. No.1	434.1
29	Pelto No. 1 State Tract 986	306.8
30	Sun Oil Dunn-McCampbell well No. A-7	299
39	Carl Oil Dunn et al. No. 4	171.8
41	Carl Oil Dunn et al. No. 2	157.7
42	Union Oil Company of California No. 1	152.4

Table 5.1 Sites with THP over 100 ug/g in Phase I sampling events.

VI. Review of Combined Results.

Review of Combined Sample Results

A total of 113 sediment samples were submitted for a combined TPH and TSF analysis. Contributions were made from all subject sites included in both sample collection phases of the limited site characterization. Eighty three of the samples were collected in the first phase, and an additional 30 samples were collected from well point locations in the second stage. Thirty samples submitted during both sample collection phases from the ten highest ranking sites were analyzed for PAH. Thirty groundwater samples consisting of three samples from each the ten highest ranking sites were analyzed for TPH and TSF. One down gradient water sample from each of the ten sites was further analyzed for PAH. Phase I sites were screened for chromium, barium and lead. The ten sites included in the second phase had three sediment samples and one groundwater sample analyzed for EPA 13 priority metals.

Individual Site Analysis of Phase II Sites

On Site 15 (**Coral Petroleum and Development well No. 1**), ten sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.1a**), total scanning fluorescence (**Figure 6.1b**), metals (**Figure 6.1c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls . Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.1d**), total scanning fluorescence (**Figure 6.1e**), metals (**Figure 6.1f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS
Phase I
TPH Soil: 34.7 ug/g
Phase II
TPH, Groundwater: 3.6132 mg/L
TPH, Soil: 50 ng/g
PAH Total, Soil: 450.6 ng/g

Total petroleum hydrocarbons (TPH) during Phase I sampling ranged from 0.6 ug/g to 34.7 ug/g with an average of 8.5 ug/g (**Table 6.1**). Sample 002D returned a significantly higher than average concentration of 34.7 ug/g. This sample was collected from a location thought to be a well

Sample ID	Results	Units
001B	2.6	ug/g
002D	34.7	ug/g
003A	0.6	ug/g
004A	8.8	ug/g
005C	6.7	ug/g
006C	3	ug/g
031A	2.8	ug/g

Table 6.1. TPH Results for Phase I Sediment Samples. Site 15.

Sample ID	Results	Units
001B	573	TSF MAX
002D	2840	TSF MAX
003A	457	TSF MAX
004A	323	TSF MAX
005C	1467	TSF MAX
006C	201	TSF MAX
031A	134	TSF MAX

Table 6.3. TSF Results for Phase I Sediment Samples. Site 15.

Sample ID	Results	Units
COR_1_WP1_S	3.2	ug/g
COR_1_WP2_S	50	ug/g
COR_1_WP4_S	4.6	ug/g

Table 6.2. TPH Results for Phase II. Site 15.

head area. The Phase II sample results for TPH ranged from 3.2 ug/g to 50 ug/g, with an average of 19.3 ug/g (**Table 6.2**). Sample COR_1_WP2 returned the highest TPH concentration encountered at the site.

Total scanning fluorescence at this site (see **Figure 6.1b**) for Phase I samples reflected those returned for TPH. Values ranged from 134 rfu to 2,840 rfu, averaging 856 rfu (**Table 6.3**). Sample 002D returned the highest value, matching the results from the TPH

Compound	Results	Units
PAHTOT	17.1	ng/g
NAPHC3	7.2	ng/g
NAPHC2	3.1	ng/g
NAPHC1	2.3	ng/g
MTNPH2	1.7	ng/g
NAPH	1.4	ng/g
BIPHENYL	0.9	ng/g
MTNPH1	0.6	ng/g
DMNPH26	0.5	ng/g
FL	0.3	ng/g
PYR	0.3	ng/g
TMNPH167	0.3	ng/g
MTPHAN1	0.3	ng/g
PHAN	0.3	ng/g
ANTH	0.2	ng/g
ACNP	0.1	ng/g
BZAP	0.1	ng/g
ACNPY	0.1	ng/g
CHRYSENE	0.1	ng/g
DBF	0.1	ng/g
FLA	0.1	ng/g
BZEP	0.1	ng/g
BZGHIP	0.1	ng/g
BZAA	0.1	ng/g
PERY	0.1	ng/g
INP123	0.1	ng/g

Table 6.5. PAH Results for Sample 002D. Site 15.

Sample ID	Results	Units
COR_1_WP1_S	2547	TSF MAX
COR_1_WP2_S	3807	TSF MAX
COR_1_WP4_S	2228	TSF MAX

Table 6.4. TSF Results for Phase II Well Point Sediment Samples. Site 15.

Compound	Results	Units
PAHTOT	20.6	ng/g
NAPHC2	5.6	ng/g
NAPH	4	ng/g
NAPHC1	2.9	ng/g
MTNPH2	1.8	ng/g
BIPHENYL	1.2	ng/g
MTNPH1	1.1	ng/g
FLA	0.9	ng/g
DMNPH26	0.7	ng/g
PERY	0.7	ng/g
PYR	0.7	ng/g
BZBF	0.6	ng/g
PHAN	0.5	ng/g
CHRYSENE	0.5	ng/g
BZGHIP	0.4	ng/g
BZEP	0.4	ng/g
BZAP	0.3	ng/g
INP123	0.3	ng/g
TMNPH167	0.3	ng/g
FL	0.3	ng/g
BZAA	0.3	ng/g
BZKF	0.2	ng/g
ANTH	0.2	ng/g
ACNPY	0.2	ng/g
DBF	0.2	ng/g
MTPHAN1	0.1	ng/g
ACNP	0.1	ng/g
DBAHA	0.1	ng/g

Table 6.6. PAH Results for Sample 004A. Site 15.

analysis. Phase II sample results for TSF reflected those encountered in the TPH results with sample location Cor_1_WP2_S having the highest value (**Table 6.4**).

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample Cor_1_WP2_S had a markedly higher total PAH concentration than the other soil samples analyzed (**Table 6.7**). The values for all three soil samples ranged from 17.1 ng/g to 450.6 ng/g, with an average of 162.8 ng/g. The average was considerably higher than the total PAH concentrations in samples 002D (**Table 6.5**) and 004A (**Table 6.6**). Naphtha compounds contributed greatly to the total PAH makeup for all three samples. Naphtha compounds contributed 353.8 ng/g out of the 450.6 ng/g's returned for the Cor_1_WP2_S sample.

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples (see **Figure 6.1d**) ranged from 0.0839 mg/L to 3.6132 mg/L, with an average of 1.407 mg/L (**Table 6.8**). Sample COR_1_WP2_W returned with the highest TPH groundwater concentration for all the subject sites.

TSF values in groundwater (see **Figure 6.1e**) samples ranged from 783 rfu to 92500 rfu, with an average of 37,484 rfu (**Table 6.9**). The values returned for TSF were consistent for those returned for TPH.

Compound	Results	Units
PAHTOT	4805.3	ng/g
NAPHC4	2573.9	ng/g
NAPHC3	1770.5	ng/g
NAPHC2	143.5	ng/g
TMNPH167	75.6	ng/g
PHANANTHC2	58.7	ng/g
PHANANTHC3	47.5	ng/g
DBFC2	41	ng/g
DBFC1	32.3	ng/g
DBFC3	27.9	ng/g
PHANANTHC4	22.7	ng/g
FLAPYRC1	11.6	ng/g
PYR	10.9	ng/g
FLC3	10.4	ng/g
ACNPY	9.2	ng/g
FLC2	7.5	ng/g
FLA	4.9	ng/g
ACNP	4.7	ng/g

Compound	Results	Units
NAPHC1	4.1	ng/g
MTPHAN1	3.8	ng/g
CHRYSENEC2	2.8	ng/g
DBF	2.7	ng/g
PHAN	2.5	ng/g
MTNPH2	2.3	ng/g
NAPH	2.3	ng/g
CHRYSENE	2	ng/g
FLC1	1.9	ng/g
MTNPH1	1.8	ng/g
FL	1.6	ng/g
BZEP	1.5	ng/g
BIPHENYL	1.3	ng/g
BZGHIP	1.2	ng/g
ANTH	1.1	ng/g
BZBF	0.7	ng/g
DMNPH26	0.7	ng/g
PHANANTHC1	0.6	ng/g

Table 6.7. PAH Results for COR_1_WP2_W. Site 15.

Sample ID	Results	Units
COR_1_WP1_W	0.524	mg/L
COR_1_WP2_W	3.6132	mg/L
COR_1_WP4_W	0.0839	mg/L

Table 6.8. TPH Results for the Phase II Well Point Groundwater Samples. Site 15.

Sample ID	Results	Units
COR_1_WP1_W	19170	TSF MAX
COR_1_WP2_W	92500	TSF MAX
COR_1_WP4_W	783	TSF MAX

Table 6.9. TSF Results for the Phase II Well Point Groundwater Samples. Site 15.

The PAH analysis was conducted on one down gradient groundwater sample. A total PAH concentration of 522.8 ng/g was returned for the Cor_1_WP4_W sample (**Table 6.10**). This sample is the fourth highest PAH concentration returned for all the subject sites. This concentration is below the average concentration calculated for all the subject sites. The average for all sites is 1,056.73 ng/g.

Compound	Results	Units
PAHTOT	522.8	ng/L
DBFC3	58.5	ng/L
FLC3	44.6	ng/L
NAPHC4	39.9	ng/L
NAPH	38.8	ng/L
NAPHC3	37	ng/L
FLC2	35	ng/L
PHAN_ANTHC3	26.8	ng/L
FLA_PYRC1	20.7	ng/L
FLA	19	ng/L
DBFC2	17.9	ng/L
PYR	17.5	ng/L
NAPHC2	15.1	ng/L
PHAN_ANTHC2	15	ng/L
PHAN	14	ng/L
PHAN_ANTHC1	13	ng/L
BZBF	11	ng/L
CHRYSENE	9.6	ng/L
ACNP	9.1	ng/L
BZAP	7.5	ng/L
TMNPH167	7	ng/L

Compound	Results	Units
BZGHIP	6.9	ng/L
NAPHC1	6.8	ng/L
CHRYSENE_C1	6.7	ng/L
BZEP	6.4	ng/L
INP123	5.9	ng/L
DBFC1	5.7	ng/L
BZAA	5.7	ng/L
PHAN_ANTHC4	5.3	ng/L
BZKF	4.6	ng/L
MTNPH2	4.6	ng/L
PERY	4.5	ng/L
BIPHENYL	3.2	ng/L
ACNPY	3.2	ng/L
ANTH	3	ng/L
MTPHAN1	2.4	ng/L
DBAHA	2.3	ng/L
MTNPH1	2.2	ng/L
DMNPH26	1.9	ng/L
FL	1.6	ng/L
DBF	1	ng/L

Table 6.10 PAH Results for Cor_1_WP4_W. Site 15.

Compound	Sample ID	Results	Units
Ba	002D	14	ug/g
Ba	031A	6	ug/g
Ba	005C	5	ug/g

Table 6.11. Sample Results for the Phase I Metals Analysis. Site 15.

Phase I sediment samples were analyzed for barium, chromium and lead. Samples from three locations (002D, 005C and 031A) were submitted for the metals analysis in Phase I (**Table 6.11**). Barium was the only metal encountered in concentrations above detection limits. Barium levels were low.

One Phase II sediment samples from each site was analyzed for the EPA 13 priority metals. This sample was collected from the down gradient well point location. All metals, with the exception of zinc (8 mg/ Kg) were at or below detection limits in sample Cor_1_WP4_W.

Compound	Sample ID	Results	Units
Zn	Cor_1_WP2_W	0.09	mg/L
Zn	Cor_1_WP4_W	0.08	mg/L
Ni	Cor_1_WP4_W	0.07	mg/L
Ni	Cor_1_WP2_W	0.06	mg/L
Cr	Cor_1_WP1_W	0.05	mg/L
Cr	Cor_1_WP4_W	0.05	mg/L

Table 6.12 13 Metals in Groundwater Samples. Site 15.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals. Zinc, nickel and chromium concentrations were above detection levels (**Table 6.12**). These concentrations are low. All three elements were present in the down gradient well (Cor_1_WP 4).

The specific conductance of groundwater was measured on site. Values ranged from 490 to 1430 µS/cm, with an average of 815 µS/cm (**Table 6.13**).

Sample ID	Results
Cor_1_WP2_F	710
Cor_1_WP4_F	490
Cor_1_WP3_F	630
Cor_1_WP1_F	1430
Average:	815

Table 6.13 Specific Conductance for Groundwater. Site 15.

NOTABLE FINDINGS
Phase I
TPH, Soil: 2.7 ug/g
Phase II
TPH, Soil: 21.6 ug/g
TPH, GW: 0.4731 mg/L
PAH, Soil: 32.2 ng/g
PAH Total, GW: 95.1 ng/g

On Site 16 (**Sun Oil well No. A-2**), nine sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.2a**), total scanning fluorescence (**Figure 6.2b**), metals (**Figure 6.2c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls . Three groundwater samples were collected and submitted for analysis. Groundwater samples were

Sample ID	Results	Units
051A	2.6	ug/g
052A	1.2	ug/g
053A	2.4	ug/g
053B	2.7	ug/g
054A	2.4	ug/g

Table 6.14. TPH Results for Phase I Sediment Samples. Site 16.

Sample ID	Results	Units
SUN_A2_WP1_S	21.6	ug/g
SUN_A2_WP2_S	7.8	ug/g
SUN_A2_WP3_S	2.5	ug/g

Table 6.15. TPH Results for Phase II Sediment Samples. Site 16.

Sample ID	Results	Units
051A	1180	TSF MAX
052A	109	TSF MAX
053A	2728	TSF MAX
053B	273	TSF MAX
054A	779	TSF MAX

Table 6.16. TSF Results for Phase I Sediment Samples. Site 16.

Sample ID	Results	Units
SUN_A2_WP1_S	23570	TSF MAX
SUN_A2_WP2_S	1062	TSF MAX
SUN_A2_WP3_S	347	TSF MAX

Table 6.17. TSF Results for Phase II Sediment Samples. Site 16.

also analyzed for total petroleum hydrocarbons (**Figure 6.2d**), total scanning fluorescence (**Figure 6.2e**), metals (**Figure 6.2f**), and polycyclic aromatic hydrocarbons.

Total petroleum hydrocarbons (TPH) during Phase I sampling ranged from 1.2 ug/g to 2.7 ug/g with an average of 2.3 ug/g (**Table 6.14**). Sample 053B returned the highest concentration at 2.7 ug/g. This sample was collected from a suspect pipeline area. All values for TPH are low. The Phase II sample results for TPH ranged from 2.5 ug/g to 21.6 ug/g, with an average of 10.6 ug/g (**Table 6.15**). Sample SUN_A2_WP1_S returned the highest TPH concentration in sediments for the site. The concentration of 21.6 ug/g was considerably higher than all other returns. The sample was collected from the center of the exposed pad area (**Figure 6.2a**).

Total Scanning Fluorescence (**Figure 6.2b**) for Phase I samples did not reflect those returned for TPH. Values ranged from 109 rfu to 2,728 rfu, with an average of 1,112 rfu (**Table 6.16**). Sample 053A has a significantly higher value than sample 053B. These samples were collected from the same sample location and their TPH concentrations were similar. Values returned from the Phase II sediment samples reflected the TPH results with sample SUN_A2_WP1_S having the highest TSF value (**Table 6.17**).

Sediment samples were analyzed for polycyclic aromatic hydrocarbons with sample 054A returning the highest concentration for total PAH (**Table 6.18**). The variance between sample results was small. Values ranged from 26.2 ng/g to 32.2 ng/g, with an average of 28.5 ng/g. All total PAH concentrations were similar and relatively low (**Table 6.19 - 6.20**).

Compound	Results	Units
PAHTOT	32.2	ng/g
NAPHC3	8.5	ng/g
NAPHC4	7.1	ng/g
NAPHC1	4.5	ng/g
NAPHC2	4.5	ng/g
NAPH	3.6	ng/g
MTNPH2	2.5	ng/g
MTNPH1	2.1	ng/g
BIPHENYL	1.5	ng/g
DMNPH26	0.7	ng/g
FLA	0.5	ng/g
TMNPH167	0.3	ng/g
PYR	0.3	ng/g
PHAN	0.3	ng/g
BZBF	0.2	ng/g
BZGHIP	0.2	ng/g
INP123	0.1	ng/g
BZKF	0.1	ng/g
ANTH	0.1	ng/g
BZAP	0.1	ng/g
PERY	0.1	ng/g
ACNPY	0.1	ng/g
ACNP	0.1	ng/g
BZEP	0.1	ng/g
CHRYSENE	0.1	ng/g
DBF	0.1	ng/g
BZAA	0.1	ng/g
FL	0.1	ng/g
MTPHAN1	0.1	ng/g

Table 6.18. PAH Results for Sample 054A. Site 16.

Compound	Results	Units
PAHTOT	27	ng/g
NAPHC3	8.2	ng/g
NAPHC2	5.6	ng/g
NAPHC1	3	ng/g
MTNPH2	1.9	ng/g
NAPH	1.7	ng/g
FLC1	1.6	ng/g
BIPHENYL	1.2	ng/g
MTNPH1	1.1	ng/g
FL	0.7	ng/g
PERY	0.5	ng/g
FLA	0.5	ng/g
TMNPH167	0.5	ng/g
DMNPH26	0.5	ng/g
PHAN	0.4	ng/g
ANTH	0.4	ng/g
PYR	0.4	ng/g
ACNPY	0.3	ng/g
DBF	0.3	ng/g
ACNP	0.3	ng/g
CHRYSENE	0.3	ng/g
BZKF	0.3	ng/g
BZAP	0.3	ng/g
BZGHIP	0.3	ng/g
MTPHAN1	0.3	ng/g
BZEP	0.2	ng/g
INP123	0.2	ng/g
DBAHA	0.2	ng/g
BZBF	0.2	ng/g
BZAA	0.2	ng/g

Table 6.19. PAH results for Sample SUN_A2_WP2_S at Site 16.

Compound	Results	Units
PAHTOT	26.2	ng/g
NAPHC3	8.7	ng/g
NAPHC2	3.4	ng/g
PHAN_ANTHC3	1.8	ng/g
NAPHC1	1.7	ng/g
PHAN_ANTHC4	1.7	ng/g
FLA_PYRC1	1.6	ng/g
NAPH	1.2	ng/g
PHAN_ANTHC2	1.1	ng/g
BIPHENYL	1.1	ng/g
MTNPH2	1.1	ng/g
FLC1	1	ng/g
PHAN_ANTHC1	0.7	ng/g
MTNPH1	0.6	ng/g
TMNPH167	0.4	ng/g
DMNPH26	0.4	ng/g
PYR	0.3	ng/g

Compound	Results	Units
FLA	0.3	ng/g
CHRYSENE	0.2	ng/g
PHAN	0.2	ng/g
INP123	0.1	ng/g
PERY	0.1	ng/g
BZGHIP	0.1	ng/g
ANTH	0.1	ng/g
ACNPY	0.1	ng/g
DBF	0.1	ng/g
DBAHA	0.1	ng/g
FL	0.1	ng/g
BZBF	0.1	ng/g
ACNP	0.1	ng/g
BZKF	0.1	ng/g
BZEP	0.1	ng/g
BZAP	0.1	ng/g

Table 6.20. PAH Results for Sample SUN_A2_WP1_S. Site 16.

Three groundwater samples were analyzed for petroleum constituents (**Table 6.21**). TPH values in groundwater samples ranged from 0.1282 mg/L to 0.4731 mg/L, with an average of 0.2577 mg/L. Sample SUN_A2_WP3_W returned with the highest TPH concentration in groundwater found at the subject site (**Figure 6.2d**). This concentration was low, but located down gradient from the site.

Sample ID	Results	Units
SUN_A2_WP1_W	0.1282	mg/L
SUN_A2_WP2_W	0.1718	mg/L
SUN_A2_WP3_W	0.4731	mg/L

Table 6.21. TPH Results for the Phase II Well Point Groundwater Samples. Site 16.

TSF values in groundwater samples ranged from 2010 rfu to 2557 rfu, with an average of 2,382 rfu (**Table 6.22**). The range of values returned for TSF were the opposite of that shown for TPH. The sample locations with the higher TPH concentrations are shown with the lowest TSF values (**Figure 6.2d - Figure 6.2e**).

Sample ID	Results	Units
SUN_A2_WP1_W	2657	TSF MAX
SUN_A2_WP2_W	2478	TSF MAX
SUN_A2_WP3_W	2010	TSF MAX

Table 6.22. TSF Results for Phase II Well Point Groundwater Samples. Site

The PAH analysis was conducted on one down gradient groundwater sample. A total concentration of 95.1 ng/g was returned for the

Compound	Results	Units
PAHTOT	95.1	ng/L
NAPH	39.7	ng/L
PHAN	9.1	ng/L
FLA	9.1	ng/L
PYR	5.7	ng/L
ANTH	4.8	ng/L
CHRYSENE	3.8	ng/L
BZEP	3	ng/L
BZBF	2.9	ng/L
BZGHIP	2.8	ng/L
FL	2.5	ng/L
BZAA	1.9	ng/L
BZAP	1.9	ng/L
ACNPY	1.7	ng/L
INP123	1.4	ng/L
ACNP	1.3	ng/L
BZKF	1.2	ng/L
DBF	0.7	ng/L
PERY	0.7	ng/L
BIPHENYL	0.6	ng/L
DBAHA	0.4	ng/L

Table 6.23 Results for Sample Sun_A2_WP3_W. Site 16.

Compound	Sample ID	Results	Units
Ba	051A	391	ug/g
Ba	052A	11	ug/g
Pb	051A	7	ug/g

Table 6.24. Results for the Phase I Metals Analysis. Site 16.

Compound	Sample ID	Results	Units
Zn	Sun_A2_WP2_W	0.17	mg/L
Zn	Sun_A2_WP1_W	0.15	mg/L
Cu	Sun_A2_WP1_W	0.13	mg/L
Ni	Sun_A2_WP1_W	0.12	mg/L
Cr	Sun_A2_WP1_W	0.08	mg/L
Ag	Sun_A2_WP3_W	0.06	mg/L

Table 6.25. 13 Metals in groundwater samples. Site 16.

SUN_A2_WP3_W sample (**Table 6.23**). This sample had the lowest total PAH concentration returned for all the subject sites and is well below the average of 1,056.73 ng/g for all sites. The concentration was the highest total PAH returned for all PAH samples submitted for this site and may indicate off site migration.

Phase I sediment samples were analyzed for barium, chromium and lead. Two sample locations (051A and 052) were submitted for analysis (**Table 6.24**). Barium was detected in both samples. Barium levels in sample 051A were somewhat elevated. Lead concentrations in sample 051A were above detection levels. All concentrations are low. One Phase II sediment sample was analyzed for EPA 13 priority metals. This sample was collected from the down gradient well point location. All metals results were below detection limits.

Three Phase II groundwater samples were submitted for EPA 13 priority metals analysis. Sample Sun_A2_WP1_W had zinc, copper, nickel and chromium concentrations above detection levels (**Table 6.25**). Sample Sun_A2_WP2_W returned above detection concentrations for zinc only. Sample Sun_A2_WP3_W returned a low concentration for silver. All concentrations were very low and probably only reflect background concentrations

Sample ID	Results
Sun_A2_WP2_F	810
Sun_A2_WP3_F	2640
Sun_A2_WP1_F	740
Average	1396.6666

Table 6.26. Specific Conductance. Site 16.

The specific conductance of the groundwater was measured on site. Values ranged from 740 to 2,640 µS/cm, with an average of 1396.7 µS/cm (**Table 6.26**).

On Site 29 (Pelto No. 1 State Tract 986), nine sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.3a**), total scanning fluorescence (**Figure 6.3b**), metals (**Figure 6.3c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls . Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.3d**), total scanning fluorescence (**Figure 6.3e**), metals (**Figure 6.3f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS
Phase I
TPH, Soil: 306.8 ug/g
Phase II
TPH, Soil: 21.5 ug/g
TPH, GW: 0.1562 mg/L
PAH, Soil: 6,092 ng/g & 1,236 ng/g.
PAH, GW: 296 ng/g

TPH values during the Phase I sampling ranged from 3.0 ug/g to 306.8 ug/g with an average of 56.4 ug/g (**Table 6.27**). Sample location 058C returned a significantly higher concentration of 306.8 ug/g. This sample was collected from a location thought to be a well head area. The remaining samples returned values below 11 ug/g. The Phase II TPH sediment sample returns ranged from 7.8 ug/g to 21.5 ug/g, with an average of 13.6 ug/g. The Phase II values are relatively low but higher than many of the samples submitted in the first sampling phase (**Table 6.28**). The well point locations were random locations where neither the EM survey data or surface evidence were utilized to determine their placement (**Figure 6.3a**).

Sample ID	Results	Units
055A	3	ug/g
056B	10.7	ug/g
057B	5.1	ug/g
058C	306.8	ug/g
059B	5.8	ug/g
60	7	ug/g

Table 6.27. TPH Results for Phase I

Total scanning fluorescence values at this site for Phase I samples reflected those returned for TPH (**Figure 6.3b**). Values ranged from 311 rfu to 38,600 rfu. The average is 7,235 rfu (**Table 6.29**). Sample 058C returned the

Sample ID	Results	Units
PEL(2)WP1_S	7.8	ug/g
PEL(2)WP2_S	11.6	ug/g
PEL(2)WP3_S	21.5	ug/g

Table 6.28. TPH Results for Phase II Sediment Samples. Site 29.

Sample ID	Results	Units
055A	530	TSF MAX
056B	1664	TSF MAX
057B	1884	TSF MAX
058C	38600	TSF MAX
059B	422	TSF MAX
60	311	TSF MAX

Table 6.29. TSF Results for Phase I Sediment Samples. Site 29.

Sample ID	Results	Units
PEL(2)WP1_S	4814	TSF MAX
PEL(2)WP2_S	3266	TSF MAX
PEL(2)WP3_S	2092	TSF MAX

Table 6.30. TSF Results for Phase II Sediment Samples. Site 29.

Compound	Results	Units
PAHTOT	6092.4	ng/g
NAPHC3	2698.3	ng/g
NAPHC2	1531.1	ng/g
NAPHC4	1454.2	ng/g
NAPHC1	297.7	ng/g
MTNPH2	158.7	ng/g
MTNPH1	139.1	ng/g
TMNPH167	61.4	ng/g
DMNPH26	49.6	ng/g
FLC2	14.7	ng/g
PHAN_ANTHC1	11.9	ng/g
FLC3	11.7	ng/g
FLC1	11.2	ng/g
NAPH	10.9	ng/g
PHAN_ANTHC2	7.3	ng/g
BIPHENYL	6.9	ng/g
FL	5.1	ng/g
PHAN	5	ng/g
DBFC1	4.7	ng/g
ACNPY	4.5	ng/g

Compound	Results	Units
DBFC2	4	ng/g
MTPHAN1	2.6	ng/g
DBFC3	2.3	ng/g
ACNP	2.1	ng/g
PHAN_ANTHC3	1.9	ng/g
DBF	1.5	ng/g
PHAN_ANTHC4	1.3	ng/g
PYR	0.7	ng/g
FLA	0.7	ng/g
CHRYSENE	0.4	ng/g
BZGHIP	0.4	ng/g
BZBF	0.4	ng/g
PERY	0.4	ng/g
BZAP	0.3	ng/g
INP123	0.3	ng/g
ANTH	0.2	ng/g
BZAA	0.2	ng/g
BZEP	0.2	ng/g
DBAHA	0.1	ng/g
BZKF	0.1	ng/g

Table 6.31. PAH Results for Sample PEL(2)WP2_W. Site 29.

highest value, matching the result from the TPH analysis. Phase II sample results did not reflect those encountered in the TPH results found in Phase I. The lowest TPH had the highest TSF and the highest TPH had the lowest TSF value (**Table 6.30**).

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found two sediment samples, PEL(2)WP2_S and 058C, with relatively high concentrations for total PAH. Sample PEL(2)WP2_S had the highest concentration at 6,092 ng/g (**Table 6.31**). Sample 058C, located in a suspected well head area returned 1,236 ng/g (**Table 6.32**). The third sample PEL(2)WP3_S returned a relative low concentration (**Table 6.33**). Naphtha compounds contributed the largest proportion to the overall concentration with all sample results at this site. Naphtha concentrations were 5,981.3 ng/g in sample PEL(2)WP2_S and 1,018.6 ng/g in sample 058C. The concentration returned for sample PEL(2)WP2_S

Compound	Results	Units	Compound	Results	Units
PAHTOT	182.4	ng/g	PHAN	0.8	ng/g
NAPHC3	78.3	ng/g	DBFC3	0.6	ng/g
NAPHC2	37.2	ng/g	MTPHAN1	0.5	ng/g
NAPHC4	32.1	ng/g	FLA	0.4	ng/g
TMNPH167	9.1	ng/g	DBF	0.4	ng/g
NAPHC1	7	ng/g	ACNPY	0.4	ng/g
FLC3	5.9	ng/g	PERY	0.3	ng/g
FLC2	5	ng/g	PYR	0.3	ng/g
DMNPH26	4.5	ng/g	ACNP	0.2	ng/g
MTNPH2	3.8	ng/g	BZAP	0.1	ng/g
MTNPH1	3.2	ng/g	BZKF	0.1	ng/g
NAPH	2.6	ng/g	BZGHIP	0.1	ng/g
FLC1	2.1	ng/g	DBAHA	0.1	ng/g
PHAN_ANTHC1	1.6	ng/g	CHRYSENE	0.1	ng/g
BIPHENYL	1.6	ng/g	BZEP	0.1	ng/g
DBFC2	1.3	ng/g	BZBF	0.1	ng/g
DBFC1	1.3	ng/g	BZAA	0.1	ng/g
FL	1.2	ng/g	INP123	0.1	ng/g
PHAN_ANTHC2	0.9	ng/g			

Table 6.32. PAH Results for Sample PEL(2)WP3_S. Site 29.

Compound	Results	Units	Compound	Results	Units
PAHTOT	1236	ng/g	FL	4.1	ng/g
NAPHC3	439	ng/g	DBFC2	4	ng/g
NAPHC4	312	ng/g	MTPHAN1	4	ng/g
NAPHC2	195	ng/g	PYR	3.3	ng/g
NAPHC1	72.8	ng/g	ANTH	2	ng/g
MTNPH2	56.3	ng/g	FLA	1.7	ng/g
TMNPH167	33.3	ng/g	ACNP	1.7	ng/g
PHAN_ANTHC2	28.7	ng/g	DBF	1.5	ng/g
FLC3	25.5	ng/g	CHRYSENE_C2	1.5	ng/g
DMNPH26	20.4	ng/g	PERY	1.4	ng/g
PHAN_ANTHC1	20.2	ng/g	CHRYSENE_C1	1.2	ng/g
NAPH	20.2	ng/g	BZGHIP	1.2	ng/g
FLC2	19.8	ng/g	CHRYSENE	1	ng/g
PHAN_ANTHC3	17.6	ng/g	BZEP	0.8	ng/g
MTNPH1	16.5	ng/g	INP123	0.4	ng/g
FLC1	10.6	ng/g	CHRYSENE_C4	0.4	ng/g
PHAN_ANTHC4	9.2	ng/g	CHRYSENE_C3	0.4	ng/g
DBFC3	8.6	ng/g	BZAP	0.3	ng/g
BIPHENYL	8	ng/g	BZBF	0.3	ng/g
PHAN	7	ng/g	BZAA	0.3	ng/g
FLA_PYRC1	5.3	ng/g	DBAHA	0.2	ng/g
ACNPY	4.9	ng/g	BZKF	0.1	ng/g
DBFC1	4.4	ng/g			

Table 6.33. PAH Results for Sample 058C. Site 29.

was far greater than that returned for sample 058C. Sample PEL(2)WP2_S only returned a slightly lower concentration (11.6 ug/g) than sample PEL(2)WP3_S (21.5 ug/g) and a significantly lower concentration than sample 058C (306.8 ug/g)

Three groundwater samples were analyzed for petroleum constituents (**Figure 6.3d**). TPH values in groundwater ranged from 0.081 mg/L to 0.1562 mg/L, with an average of 0.1207 mg/L (**Table 6.34**).

TSF values in groundwater samples (**Figure 6.3e**) ranged from 807 rfu to 1542 rfu, with an average of 1,207 rfu (**Table 6.35**). The values returned for TSF were consistent for those returned for TPH at this site.

The PAH analysis was conducted on one down gradient groundwater sample. A total concentration of 296 ng/g was returned for sample

Sample ID	Results	Units
PEL(2)WP1_W	0.1562	mg/L
PEL(2)WP2_W	0.1251	mg/L
PEL(2)WP3_W	0.081	mg/L

Table 6.34. TPH for Phase II Well Point Groundwater Samples. Site 29.

Sample ID	Results	Units
PEL(2)WP1_W	1274	TSF MAX
PEL(2)WP2_W	1542	TSF MAX
PEL(2)WP3_W	807	TSF MAX

Table 6.35. TSF Results for Phase II Well Point Groundwater Samples. Site 29.

Compound	Results	Units
PAHTOT	296	ng/L
NAPH	42.1	ng/L
NAPHC3	36.1	ng/L
FLC3	34.8	ng/L
FLC2	30.9	ng/L
NAPHC4	21.4	ng/L
PHAN_ANTHC2	19.2	ng/L
DBFC3	17.2	ng/L
PHAN_ANTHC1	15.1	ng/L
DBFC2	11.7	ng/L
NAPHC2	10.4	ng/L
PHAN	8.1	ng/L
DMNPH26	7.6	ng/L
NAPHC1	7.1	ng/L
FLA	6.8	ng/L
DBFC1	6.2	ng/L
PYR	5	ng/L

Compound	Results	Units
ANTH	4.3	ng/L
MTPHAN1	4.2	ng/L
MTNPH1	3.9	ng/L
TMNPH167	3.9	ng/L
MTNPH2	3.2	ng/L
BZBF	2.4	ng/L
BZAA	2.3	ng/L
CHRYSENE	2.3	ng/L
BZEP	2.1	ng/L
BZGHIP	1.5	ng/L
INP123	1.4	ng/L
FL	1.2	ng/L
BIPHENYL	1.1	ng/L
ACNPY	1.1	ng/L
ACNP	0.9	ng/L
BZKF	0.8	ng/L
BZAP	0.8	ng/L

Table 6.36. PAH Sample Results for Pel_RW_P1_W. Site 29.

PEL_RW_P1_W (**Table 6.36**). This concentration is well below the average of 1,056.73 ng/g for all sites. The presence of PAH constituents in this well may indicate off-site migration.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.3c**). Three sample locations (058D, 056B and 055A) were submitted for the metals analysis (**Table 6.37**). Barium and chromium were present in above detection levels. Sample 058D was the only sample to return a significant concentration of barium (2,670 ug/g). This sample was collected in a suspected well head area of the site. One Phase II sediment sample was analyzed for EPA 13 priority metals. The sediment sample from the down gradient well point location was submitted for analysis. Only zinc returned a concentration above detection limits of 6 mg/Kg.

Compound	Sample ID	Results	Units
Ba	058D	2670	ug/g
Ba	056B	16	ug/g
Ba	055A	14	ug/g
Cr	058D	12	ug/g
Pb	058D	10	ug/g

Table 6.37. Sample Returns for the Phase I Metals Analysis. Site 29.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.38**). Pel_WP3_W had zinc, nickel and chromium concentrations above detection levels. Pel_WP2_W returned above detection concentrations for zinc only. Pel_WP1_W returned no concentrations above detection levels. All concentrations were very low and probably only reflect background concentrations (**Figure 6.3f**).

Compound	Sample ID	Results	Units
Cr	Pel_WP3_W	0.14	mg/L
Ni	Pel_WP3_W	0.09	mg/L
Zn	Pel_WP2_W	0.06	mg/L
Zn	Pel_WP3_W	0.05	mg/L

Table 6.38. 13 Metal Results in Groundwater Samples. Site 29.

Specific conductance was not determined for this site due to complications with equipment in the field during the time of the sample collection.

On **Site 30** (Sun Dunn-McCampbell well No. A-7), ten sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.4a**), total scanning fluorescence (**Figure 6.4b**), metals (**Figure 6.4c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls . Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.4d**), total scanning fluorescence (**Figure 6.4e**), metals (**Figure 6.4f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS

Phase I
TPH, Soil: 1363.9 ug/g & 299.0 ug/g
Metals, PB, Soil: 11 ug/g
Phase II
TPH, Soil: 24 ug/g
TPH, GW: 0.0931 mg/L
PAH, Soil: 1,239.6 ng/g
PAH, GW: 350.4 ng/g

Sample ID	Results	Units
069A	2.1	ug/g
070A	21.2	ug/g
071A	2.7	ug/g
072A	299	ug/g
073A	2.6	ug/g
074A	1.2	ug/g
075B	3.5	ug/g
076B	1363.9	ug/g

Table 6.39. TPH Results for Phase I Sediment Samples. Site 30.

Sample ID	Results	Units
SUN_A7_WP1_ S	3.1	ug/g
SUN_A7_WP2_ S	24	ug/g
SUN_A7_WP3_ S	4.7	ug/g

Table 6.40. TPH Results for Phase II Sediment Samples. Site 30.

TPH values during the Phase I sampling ranged from 1.2 ug/g to 1,363.9 ug/g with an average of 212.0 ug/g (**Table 6.39**). Sample 076B returned a significantly high concentration of 1363.9 ug/g. This sample was collected from a disturbed backfill area where an abandoned collection pipe had been removed (**Figure 6.4a**). Sample 072A returned a TPH concentration of 299.0 ug/g. This sample was located in a suspect pit area in the north western corner of the site. The remaining sample results were relatively low. The Phase II sample returns ranged from 3.1 ug/g to 24.0 ug/g, with an average of 10.6 ug/g (**Table 6.40**). These results were consistent with the lower concentrations encountered in the first phase sediment samples. All concentration are relatively low.

Sample ID	Results	Units
069A	143	TSF MAX
070A	2083	TSF MAX
071A	346	TSF MAX
072A	2296	TSF MAX
073A	252	TSF MAX
074A	77	TSF MAX
075B	249	TSF MAX
076B	24110	TSF MAX

Table 6.41. TSF Results for Phase I Sediment Samples. Site 30.

Total scanning fluorescence values at this site for Phase I samples reflected those returned for TPH (**Figure 6.4b**). Values range from 77 rfu to 24,110 rfu, and averaged 3,694.5 rfu (**Table 6.41**). At sample locations 069, 071, 073 and 075, sample magnitudes varied slightly with the TPH results. Phase II values reflected those encountered in the TPH results. Sample SUN_A7_ WP2_S had the highest TSF value (**Table 6.42**).

Sample ID	Results	Units
SUN_A7_WP1_ S	72	TSF MAX
SUN_A7_WP2_ S	2581	TSF MAX
SUN_A7_WP3_ S	126	TSF MAX

Table 6.42. TSF Results for Phase II Sediment Samples. Site 30.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample 072A (**Table 6.43**) had the highest concentration for total PAH. The variance between sample results was large. Total PAH values ranged

Compound	Results	Units
PAHTOT	1239.6	ng/g
NAPHC4	590.3	ng/g
NAPHC3	313.2	ng/g
NAPHC2	65.9	ng/g
FLA	30.5	ng/g
PYR	25.3	ng/g
NAPHC1	24.5	ng/g
PHAN	13.9	ng/g
CHRYSENE	13.1	ng/g
PHAN_ANTHC 2	13.1	ng/g
MTNPH2	13	ng/g
BZBF	12.9	ng/g
FLA_PYRC1	12.2	ng/g
MTNPH1	11.5	ng/g
BZAA	11.1	ng/g
BZGHIP	10.6	ng/g
DBFC1	9.1	ng/g
NAPH	9.1	ng/g
PERY	8.7	ng/g
BZAP	8.1	ng/g
PHAN_ANTHC 3	7.7	ng/g

Compound	Results	Units
PHAN_ANTHC 4	7.5	ng/g
BZEP	7.5	ng/g
INP123	7.3	ng/g
FLC3	6.8	ng/g
PHAN_ANTHC 1	5.2	ng/g
DBFC2	4.7	ng/g
ANTH	4.5	ng/g
ACNPY	3.8	ng/g
BZKF	3.2	ng/g
TMNPH167	3.2	ng/g
DBFC3	2.5	ng/g
BIPHENYL	2.1	ng/g
ACNP	1.7	ng/g
DBAHA	1.6	ng/g
MTPHAN1	1.6	ng/g
DBF	1.1	ng/g
DMNPH26	1.1	ng/g
FL	0.8	ng/g
CHRYSENE_C2	0.2	ng/g
CHRYSENE_C1	0.1	ng/g
CHRYSENE_C4	0.1	ng/g

Table 6.43. Sample 072A

Compound	Results	Units
PAHTOT	70.3	ng/g
FLA	8.9	ng/g
PYR	7.6	ng/g
BZBF	4.1	ng/g
NAPHC4	4.1	ng/g
PHAN	3.9	ng/g
CHRYSENE	3.7	ng/g
FLA_PYRC1	3.5	ng/g
BZAA	3.1	ng/g
BZAP	2.9	ng/g
FLC3	2.6	ng/g
NAPHC3	2.6	ng/g
NAPHC1	2.4	ng/g
BZEP	2.3	ng/g
BZGHIP	2.3	ng/g
PERY	1.9	ng/g
INP123	1.8	ng/g
NAPHC2	1.7	ng/g

Compound	Results	Units
PHAN_ANTHC 1	1.6	ng/g
NAPH	1.5	ng/g
MTNPH2	1.4	ng/g
PHAN_ANTHC 2	1.3	ng/g
BZKF	1.3	ng/g
CHRYSENE_C1	1.3	ng/g
ANTH	1.1	ng/g
BIPHENYL	1	ng/g
MTNPH1	1	ng/g
DMNPH26	0.7	ng/g
MTPHAN1	0.6	ng/g
DBAHA	0.5	ng/g
FL	0.5	ng/g
TMNPH167	0.4	ng/g
DBF	0.3	ng/g
ACNP	0.3	ng/g
ACNPY	0.1	ng/g

Table 6.44. Sample SUN_A7_WP2_S

Compound	Results	Units
PAHTOT	32.3	ng/g
ACNP	6.4	ng/g
NAPHC1	6.1	ng/g
NAPH	4.8	ng/g
ACNPY	4.2	ng/g
FL	3.8	ng/g
MTNPH1	3.3	ng/g
MTNPH2	2.7	ng/g
PHAN	1.5	ng/g
PYR	1.3	ng/g
FLA	1.1	ng/g
DMNPH26	0.7	ng/g
BIPHENYL	0.7	ng/g
TMNPH167	0.6	ng/g
PERY	0.4	ng/g
DBF	0.4	ng/g
CHRYSEN E	0.3	ng/g
MTPHAN1	0.3	ng/g
BZEP	0.3	ng/g
BZBF	0.3	ng/g
BZGHIP	0.2	ng/g
BZAP	0.2	ng/g
INP123	0.2	ng/g
BZAA	0.1	ng/g
DBAHA	0.1	ng/g
BZKF	0.1	ng/g

Table 6.45. Sample 076B.

Sample ID	Results	Units
SUN_A7_WP1_ W	0.0931	mg/L
SUN_A7_WP2_ W	0.0481	mg/L
SUN_A7_WP3_ W	0.0618	mg/L

Table 6.46. TPH Results for Phase II Groundwater Samples. Site 30.

Sample ID	Results	Units
SUN_A7_WP1_ W	600	TSF MAX
SUN_A7_WP2_ W	476	TSF MAX
SUN_A7_WP3_ W	1157	TSF MAX

Table 6.47. TSF Results for Phase II Groundwater Samples. Site 30.

from 32.3 ng/g to 1239.6 ng/g, with an average of 447.4 ng/g. Sample SUN_A7_WP2_S returned 70.3 ng/g total PAH (**Table 6.44**). The high PAH concentration in sample 072A reflected the high TPH concentration found in the first sample collection phase. Sample 076B returned an abnormally low concentration for PAH when comparing the value to the relative concentration for TPH returned in the first sample phase (**Table 6.45**).

Three groundwater samples were analyzed for petroleum constituents (**Figure 6.4d**). TPH values ranged from 0.0481 mg/L to 0.0931 mg/L, with an average of 0.0677 mg/L. Sample SUN_A7_WP1_W returned with the highest TPH concentration. All sample returns had low concentrations of TPH (**Table 6.46**).

TSF values in groundwater (**Figure 6.4e**) ranged from 476 to 1,157 rfu, with an average of 744.3 rfu (**Table 6.47**). Sample SUN_A7_WP3_W returned the highest value. This location had a lower TPH concentration than the sample location SUN_A7_WP1_W. The relative TSF magnitude for samples SUN_A7_WP1_W and SUN_A7_WP3_W are reversed with respect to the TPH concentrations reported for the same samples.

The PAH analysis was conducted on one down gradient groundwater sample (**Table 6.48**). A total PAH concentration of 350.4 ng/g was returned for the sample SUN_A7_WP2_W. This value is relatively high compared to all the sites. The magnitude is proportionally higher than would be expected

Compound	Results	Units
PAHTOT	350.4	ng/L
FLC3	49.6	ng/L
NAPHC3	44.8	ng/L
NAPH	38.9	ng/L
PHAN_ANTHC 3	23.1	ng/L
FLC2	22.6	ng/L
NAPHC4	22.4	ng/L
TMNPH167	18.8	ng/L
DBFC2	17.5	ng/L
DBFC3	17.2	ng/L
PHAN_ANTHC 2	13	ng/L
NAPHC2	10.8	ng/L
FLA_PYRC1	9.5	ng/L
FLA	8.7	ng/L
PHAN_ANTHC 1	8.2	ng/L
PHAN	7.8	ng/L
PYR	6.6	ng/L
DBFC1	6.3	ng/L
NAPHC1	5.7	ng/L
BZBF	4.7	ng/L

Compound	Results	Units
PHAN_ANTHC 4	4.4	ng/L
MTNPH2	4.4	ng/L
CHRYSENE	3.4	ng/L
BZAP	3.3	ng/L
BZEP	2.9	ng/L
BZGHIP	2.7	ng/L
INP123	2.4	ng/L
DMNPH26	2.3	ng/L
BIPHENYL	2.2	ng/L
BZAA	2.2	ng/L
MTPHAN1	2.1	ng/L
DBF	1.7	ng/L
FL	1.6	ng/L
ACNP	1.5	ng/L
BZKF	1.4	ng/L
PERY	1.3	ng/L
MTNPH1	1.3	ng/L
ANTH	0.9	ng/L
DBAHA	0.7	ng/L
ACNPY	0.6	ng/L

Table 6.48. PAH Sample Results for SUN_A7_WP2_S. Site 30.

when comparing it to the TPH concentration reported from the same sample. The TPH concentration was the lowest returned from all of the groundwater samples submitted from all subject sites. This total PAH concentration is below the average of 1,056.73 ng/g for all sites. The presence of PAH in this sample may indicate off-site migration.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.4c**). Four samples were submitted for the metals analysis during Phase I sampling (**Table 6.49**). Low concentrations of barium were

Compound	Sample ID	Results	Units
Ba	070A	287	ug/g
Ba	076B	107	ug/g
Ba	071A	16	ug/g
Pb	074A	11	ug/g
Ba	074A	9	ug/g

Table 6.49. Sample Results for the Phase I Metals Analysis. Site 30.

Compound	Sample ID	Results	Units
Cu	Sun_A7_WP3_W	0.18	mg/L
Zn	Sun_A7_WP3_W	0.1	mg/L
Zn	Sun_A7_WP2_W	0.09	mg/L
Cr	Sun_A7_WP3_W	0.06	mg/L

Table 6.50. 13 Metal Results in Groundwater Samples. Site 30.

Sample ID	Results
Sun_A7_WP1_F	680
Sun_A7_WP3_F	6140
Sun_A7_WP2_F	850

Table 6.51 Specific conductance of groundwater at Site 30.

encountered in all samples. Sample 074A returned 11 ug/g of lead. This sample came from the suspect berm area. All other metals were below detection levels.

One Phase II sediment sample was analyzed for EPA 13 priority metals. The sediment sample collected at the SUN_A7_WP2 location was submitted for analysis. Low concentrations for zinc (9 mg/Kg) and lead (8 mg/Kg) were detected (**Table 6.50**). No other metals were reported in concentrations above detection levels.

The specific conductance of the groundwater was measured on site. Values ranged from 680 to 6,140 µS/cm with an average of 2,557µS/cm (**Table 6.51**).

On Site 38 (**Carl Oil Dunn et al. Well No. 1**), seven sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.7a**), total scanning fluorescence (**Figure 6.7b**), metals (**Figure 6.7c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls. Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.7d**), total scanning fluorescence (**Figure 6.7e**), metals (**Figure 6.7f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS

Phase I
TPH, Soil: 704.9 ug/g & 62.7 ug/g
Metal, lead: 84 ug/g
Phase II
TPH, Soil: 1,880.7 ug/g
TPH, GW: 0.5618 mg/L
PAH, Soil: 4,205.5 ng/g & 223.7 ng/g
PAH, GW: 114.2 ng/g
Metal, Soil: 9 mg/g (Lead)
Metal, GW: 0.16 mg/L (nickel) & 0.09 mg/L

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 4.5 ug/g to 704.9 ug/g with an average of 197.4 ug/g (**Table 6.52**). Sample 030 returned a significantly higher concentration of 704.9 ug/g. This sample was collected from a suspect well head area located centrally on site. Sample 028 returned a TPH concentration of 62.4 ug/g. This sample was located at an EM survey anomalous area just off site. The remaining sample results were relatively

Sample ID	Results	Units
27	4.5	ug/g
28	62.4	ug/g
029B	17.8	ug/g
30	704.9	ug/g

Table 6.52 TPH results for Phase I samples on site 38.

Sample ID	Results	Units
CARL_1_WP1_S	1880.7	ug/g
CARL_1_WP2_S	7.9	ug/g
CARL_1_WP4_S	13.6	ug/g

Table 6.53 TPH-Phase II Sediment Samples.

Compound	Results	Units
PAHTOT	29.6	ng/g
BZGHIP	11.7	ng/g
NAPHC2	5	ng/g
NAPHC1	3.5	ng/g
MTNPH2	2.3	ng/g
NAPH	1.8	ng/g
DBAHA	1.5	ng/g
BIPHENYL	1.3	ng/g
MTNPH1	1.2	ng/g
PERY	0.9	ng/g
DBF	0.7	ng/g
DMNPH26	0.7	ng/g
PHAN	0.5	ng/g
MTPHAN1	0.5	ng/g
BZAP	0.4	ng/g
TMNPH167	0.4	ng/g
PYR	0.4	ng/g
BZAA	0.3	ng/g
ANTH	0.3	ng/g
FL	0.2	ng/g
FLA	0.2	ng/g
INP123	0.2	ng/g
CHRYSEN E	0.2	ng/g
ACNPY	0.2	ng/g
ACNP	0.1	ng/g
BZEP	0.1	ng/g
BZBF	0.1	ng/g
BZKF	0.1	ng/g

Table 6.57. Sample 30. Site 38.

Sample ID	Results	Units
27	58	rtf
28	35280	rtf
029B	699	rtf
30	559000	rtf

Table 6.54. TSF-Phase I Sediment Samples

Sample ID	Results	Units
CARL_1_WP1_S	3114	rtf
CARL_1_WP2_S	3705	rtf
CARL_1_WP4_S	379400	rtf

Table 6.55. TSF-Phase II Sediment Samples.

low. The Phase II sample returns ranged from 7.9 ug/g to 1880.7 ug/g, with an average of 634 ug/g. Sample CARL_1_WP1_S returned the highest TPH concentration for all samples submitted for this site. This sample was collected from an area close to sample 030. Field screening observations indicted that the CARL_1_WP4_S location would return a greater concentration than occurred. The remaining sample collected at the site returned low concentrations (**Table 6.53**).

Total scanning fluorescence values at this site for Phase I samples reflected those returned from the TPH analysis. TSF values range from 58 rfu to 559,000 rfu. They averaged 148,759 rfu (**Table 6.54**). Sample 030 and 028 returned the highest values, corresponding to the results returned for TPH. Phase II TSF sample returns indicate that sample CARL_1_WP4_S had the greatest magnitude for the three samples submitted in Phase II for this site. This would be consistent with field observations during the sample collection. The lowest value was returned for the sample CARL_1_WP1_S which was shown to have the highest TPH concentration (**Table 6.55**).

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample CARL_1_WP4_S had the highest concentration for total PAH (**Table 6.56**). The variance between sample results was large. The values ranged from 29.6 ng/g to 4,205.5

Compound	Results	Units	Compound	Results	Units
PAHTOT	223.7	ng/g	NAPH	1.2	ng/g
NAPHC4	100.2	ng/g	DMNPH26	1	ng/g
NAPHC3	44.1	ng/g	PHAN_ANTHC 4	1	ng/g
FLC3	16.1	ng/g	MTNPH1	0.7	ng/g
FLC2	11.5	ng/g	FLA	0.6	ng/g
TMNPH167	11	ng/g	DBF	0.6	ng/g
PHAN_ANTHC 2	9.7	ng/g	ACNP	0.6	ng/g
PHAN_ANTHC 1	5.5	ng/g	CHRYSENE_C2	0.6	ng/g
PHAN_ANTHC 3	4.7	ng/g	PYR	0.5	ng/g
DBFC1	4.2	ng/g	CHRYSENE_C1	0.4	ng/g
FLC1	3.7	ng/g	CHRYSENE	0.4	ng/g
DBFC2	3	ng/g	ANTH	0.4	ng/g
NAPHC2	2.4	ng/g	BZEP	0.3	ng/g
DBFC3	2.1	ng/g	BZBF	0.3	ng/g
NAPHC1	2	ng/g	BZGHIP	0.3	ng/g
FLA_PYRC1	1.9	ng/g	PERY	0.2	ng/g
FL	1.9	ng/g	BZAA	0.2	ng/g
BIPHENYL	1.6	ng/g	ACNPY	0.2	ng/g
MTPHAN1	1.3	ng/g	BZKF	0.1	ng/g
MTNPH2	1.3	ng/g	DBAHA	0.1	ng/g
PHAN	1.3	ng/g	INP123	0.1	ng/g

Table 6.56. Sample 28. Site 38.

Compound	Results	Units	Compound	Results	Units
PAHTOT	4205.5	ng/g	BIPHENYL	10.6	ng/g
NAPHC3	1752.2	ng/g	MTNPH1	8.8	ng/g
NAPHC4	1309.7	ng/g	FLA_PYRC1	6.8	ng/g
NAPHC2	462.2	ng/g	NAPH	4.7	ng/g
TMNPH167	287.8	ng/g	DBF	4.6	ng/g
DMNPH26	128.9	ng/g	PYR	4.3	ng/g
PHAN_ANTHC 2	121	ng/g	ACNP	2.8	ng/g
PHAN_ANTHC 1	110.8	ng/g	FLA	2.6	ng/g
FLC2	75.4	ng/g	CHRYSENE_C1	1.5	ng/g
FLC3	70.3	ng/g	CHRYSENE	1.4	ng/g
DBFC1	40.2	ng/g	ANTH	1.3	ng/g
PHAN_ANTHC 3	35.6	ng/g	CHRYSENE_C2	1.3	ng/g
DBFC2	35	ng/g	BZEP	0.5	ng/g
NAPHC1	29.6	ng/g	BZGHIP	0.5	ng/g
FLC1	28.6	ng/g	PERY	0.4	ng/g
MTPHAN1	28.5	ng/g	BZBF	0.4	ng/g
PHAN	22.6	ng/g	CHRYSENE_C4	0.3	ng/g
MTNPH2	20.8	ng/g	BZAA	0.3	ng/g
ACNPY	20.7	ng/g	BZAP	0.2	ng/g
FL	20.2	ng/g	INP123	0.2	ng/g
DBFC3	15	ng/g	DBAHA	0.1	ng/g
PHAN_ANTHC 4	11.7	ng/g	BZKF	0.1	ng/g

Table 6.58. Sample CARL_1_WP4_S. Site 38.

Sample ID	Results	Units
CARL_1_WP1_ W	0.0698	mg/L
CARL_1_WP2_ W	0.5618	mg/L
CARL_1_WP4_ W	0.3104	mg/L

Table 6.59. TPH-Phase II Groundwater Samples.

Sample ID	Results	Units
CARL_1_WP1_W	3345	rtf
CARL_1_WP2_W	104850	rtf
CARL_1_WP4_W	10000	rtf

Table 6.60. TSF-Phase II Groundwater Samples

Compound	Results	Units
PAHTOT	114.2	ng/L
NAPH	43.3	ng/L
FLA	11.4	ng/L
PHAN	7.1	ng/L
PYR	5.4	ng/L
CHRYSEN E	5.4	ng/L
ANTH	5.2	ng/L
ACNP	5	ng/L
BZBF	5	ng/L
FL	4	ng/L
BZAA	3.2	ng/L
BZEP	3.2	ng/L
BZGHIP	3	ng/L
INP123	2.5	ng/L
BZKF	2.1	ng/L
ACNPY	2	ng/L
BZAP	1.9	ng/L
BIPHENYL	1.6	ng/L
PERY	1.3	ng/L
DBAHA	0.9	ng/L
DBF	0.8	ng/L

Table 6.61. Sample Carl_1_WP4_S

ng/g, with an average of 1,561 ng/g. The PAH concentration in sample CARL_1_WP4_S was high and does not reflect the low TPH concentration reported in Phase I sample collection. Values returned for samples 028 (**Table 6.57**) and 030 (**Table 6.58**) have reversed magnitudes for the respective samples. Sample 028 returned a significantly higher PAH result than sample 030, but sample 030 returned a significantly higher TPH concentration than sample 028.

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples ranged from 0.0689 mg/L in CARL_1_WP1_W to 0.5618 mg/L in CARL_1_WP2_W, with an average of 0.3140 mg/L (**Table 6.59**) . Sample CARL_1_WP2_W returned with the fourth highest TPH concentration in groundwater for all the subject sites.

TSF values in groundwater samples ranged from 3,345 rfu to 104,850 rfu, with an average of 39,398 rfu (**Table 6.60**) . Values returned for TSF appear to correspond with those returned for TPH on the same samples.

The PAH analysis was conducted on one down gradient groundwater sample (**Table 6.61**). A total PAH concentration of 114.2 ng/g was returned for sample CARL_1_WP4_W sample. This value was well below the average for all sites of 1,056.7 ng/g and was lower than would be expected from the TPH reported for the same sample (fourth highest). The PAH result is the second lowest returned for all sites.

Compound	Sample ID	Results	Units
Ba	28	3610	ug/g
Ba	30	136	ug/g
Ba	029B	120	ug/g
Pb	28	84	ug/g
Ba	27	54	ug/g
Cr	28	16	ug/g

Table 6.62. Sample Returns for the Phase I Metals Analy-

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.7c**). Four sample locations were submitted for the metals analysis in Phase I (**Table 6.62**). With the exception of sample 028, which returned a relatively high concentration for barium, all other submitted samples returned low concentrations of barium and

chromium. Sample 028 returned the second highest concentration of lead encountered at all the subject sites. This sample was collected in an EM survey anomalous area suspected of possibly being a buried drum.

Compound	Sample ID	Results	Units
Cr	Carl_1_WP2_W	0.28	mg/L
Cr	Carl_1_WP1_W	0.22	mg/L
Cu	Carl_1_WP2_W	0.19	mg/L
Ni	Carl_1_WP2_W	0.16	mg/L
Pb	Carl_1_WP2_W	0.09	mg/L
Pb	Carl_1_WP4_W	0.07	mg/L

Table 6.63. 13 Metal Results in Groundwater Samples

One Phase II sediment sample was analyzed for EPA 13 priority metals. The sediment sample submitted was Carl_1_WP4_S. Only lead was detected in concentrations greater than detection levels (9 mg/Kg). This sample was collected on the mud flats off-site and down gradient.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.63**). Chromium, copper, nickel and lead were encountered in above detection levels. All four species of metals were encountered in the Carl_1_WP2_W sample. All values are relatively low but the copper and lead presence may be a concern even in low concentrations.

The specific conductance of the groundwater was measured on site. All water samples drawn from well points had a specific conductance in excess of 1,000,000,000 µS/cm.

On Site 39 (**Carl Dunn et al. Well No. 4**), six sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.8a**), total scanning fluorescence (**Figure 6.8b**), metals (**Figure 6.8c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls. Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.8d**), total scanning fluorescence (**Figure 6.8e**), metals (**Figure 6.8f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS

Phase I
TPH, Soil: 2,171.8 ug/g & 947.2 ug/g
Metal, lead: 140 ug/g
Phase II
PAH, Soil: 24,734.9 ng/g & 4,805.3 ng/g
PAH, GW: 1,352.3 ng/g
TPH, GW: 0.4642 mg/L

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 915.1 ug/g to 2,171.8 ug/g with an average of 1,344.7 ug/g (**Table 6.64**). Sample 045 returned a significantly higher TPH concentration of 704.9 ug/g. This sample was collected from a an EM survey anomaly area. These sample results are significantly higher than those

Sample ID	Results	Units
045B	915.1	ug/g
045C	2171.8	ug/g
047A	947.2	ug/g

Table 6.64. TPH Results for Phase II Sediment Samples. Site 39.

Sample ID	Results	Units
CARL_4_146_S	2.4	ug/g
WP2C4_S	5.8	ug/g
WP3C4_S	10.3	ug/g

Table 6.65. TPH Results for Phase II Sediment Samples. Site 39.

Sample ID	Results	Units
045B	843000	rtf
045C	3974000	rtf
047A	395000	rtf

Table 6.66. TSF-Phase I Sediment Samples. Site 39.

Sample ID	Results	Units
CARL_4_146_S	630	rtf
WP2C4_S	3737	rtf
WP3C4_S	2962	rtf

Table 6.67. TSF-Phase II Sediment Samples. Site 39.

returned from the second phase samples collected at the well point locations. TPH values from Phase II sampling ranged from 2.4 ug/g to 10.3 ug/g, with an average 6.2 ug/g (**Table 6.65**). Two of these samples were collected near the general locations of the two samples submitted in the first phase. They were collected from a shallower depth interval due to an elevated water table.

Total scanning fluorescence values at this site for Phase I samples reflected those returned from the TPH analysis. TSF values were high and ranged from 395,000 rfu to 3,974,000 rfu. The average is 1,737,333 rfu (**Table 6.66**). All sample values were high, corresponding with the high TPH values. The Phase II TSF sample returns were consistent with those returned for TPH (**Table 6.67**). All sample values are considerably lower than those encountered in Phase I.

Compound	Results	Units	Compound	Results	Units
PAHTOT	124.5	ng/g	BZAA	1.8	ng/g
NAPHC3	38.7	ng/g	PHAN_ANTHC2	1.6	ng/g
NAPHC4	28.1	ng/g	BZAP	1.6	ng/g
NAPHC2	11	ng/g	NAPH	1.5	ng/g
NAPHC1	5	ng/g	BZGHIP	1.5	ng/g
BZBF	3.5	ng/g	DMNPH26	1.5	ng/g
PYR	3.4	ng/g	PHAN_ANTHC1	1.3	ng/g
MTNPH2	3	ng/g	BZKF	1.2	ng/g
TMNPH167	2.6	ng/g	INP123	1.2	ng/g
ACNPY	2.5	ng/g	CHRYSENE_C2	1.1	ng/g
FLA	2.5	ng/g	PERY	1.1	ng/g
FLC3	2.4	ng/g	CHRYSENE_C1	0.9	ng/g
CHRYSENE	2.3	ng/g	ACNP	0.9	ng/g
PHAN_ANTHC3	2.2	ng/g	PHAN	0.6	ng/g
FLA_PYRC1	2.1	ng/g	FL	0.4	ng/g
BZEP	2	ng/g	MTPHAN1	0.3	ng/g
MTNPH1	1.9	ng/g	DBAHA	0.3	ng/g
BIPHENYL	1.9	ng/g	ANTH	0.2	ng/g

Table 6.68. Sample WP3C4_S. Site 39.

Compound	Results	Units
PAHTOT	24734.9	ng/g
NAPHC3	8990.2	ng/g
NAPHC4	6491.2	ng/g
NAPHC2	3743.7	ng/g
FLC2	1279.1	ng/g
TMNPH167	1008.1	ng/g
FLC3	885.5	ng/g
FLC1	680.5	ng/g
DMNPH26	497.6	ng/g
PHAN_ANTHC1	428.7	ng/g
PHAN_ANTHC2	405	ng/g
DBFC1	335.8	ng/g
ACNPY	335.8	ng/g
PHAN_ANTHC3	210.9	ng/g
PHAN	189.1	ng/g
DBFC2	169.3	ng/g
MTPHAN1	129.1	ng/g
DBF	121.7	ng/g

Compound	Results	Units
FL	119.8	ng/g
PHAN_ANTHC4	63.1	ng/g
NAPHC1	61.4	ng/g
DBFC3	51.4	ng/g
FLA_PYRC1	42.8	ng/g
MTNPH2	37.8	ng/g
ACNP	33.1	ng/g
ANTH	31.6	ng/g
MTNPH1	23.7	ng/g
PYR	11.3	ng/g
NAPH	10.7	ng/g
FLA	9.7	ng/g
CHRYSENE_C2	9.7	ng/g
CHRYSENE_C1	9.5	ng/g
CHRYSENE	3.2	ng/g
BZBF	2.1	ng/g
BZGHIP	2.1	ng/g
BZEP	1.7	ng/g

Table 6.69. Sample 045C. Site 39.

Compound	Results	Units
PAHTOT	4805.3	ng/g
NAPHC4	2573.9	ng/g
NAPHC3	1770.5	ng/g
NAPHC2	143.5	ng/g
TMNPH167	75.6	ng/g
PHANANTHC2	58.7	ng/g
PHANANTHC3	47.5	ng/g
DBFC2	41	ng/g
DBFC1	32.3	ng/g
DBFC3	27.9	ng/g
PHANANTHC4	22.7	ng/g
FLAPYRC1	11.6	ng/g
PYR	10.9	ng/g
FLC3	10.4	ng/g
ACNPY	9.2	ng/g
FLC2	7.5	ng/g
FLA	4.9	ng/g
ACNP	4.7	ng/g

Compound	Results	Units
NAPHC1	4.1	ng/g
MTPHAN1	3.8	ng/g
CHRYSENEC2	2.8	ng/g
DBF	2.7	ng/g
PHAN	2.5	ng/g
MTNPH2	2.3	ng/g
NAPH	2.3	ng/g
CHRYSENE	2	ng/g
FLC1	1.9	ng/g
MTNPH1	1.8	ng/g
FL	1.6	ng/g
BZEP	1.5	ng/g
BIPHENYL	1.3	ng/g
BZGHIP	1.2	ng/g
ANTH	1.1	ng/g
BZBF	0.7	ng/g
DMNPH26	0.7	ng/g
PHANANTHC1	0.6	ng/g

Table 6.70. Sample 47A. Site 39.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found values ranging from 124.5 ng/g to 24,734.9 ng/g, with an average of 9,888.2 ng/g. All sample returns are consistent with their respective TPH sample results (**Table 6.68 - Table 6.70**). The TPH value returned on sample 045C was the highest concentration of total PAH returned for all of the subject sites.

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples ranged from 0.1038 mg/L in Carl_4_WP2_W to 0.4642 mg/L in Carl_4_WP3_W, with an average of 0.3428 mg/L (**Table 6.71**). All groundwater samples submitted returned relatively high concentrations of TPH.

TSF values in groundwater samples ranged from 462 rfu to 16,555 rfu, with an average of 6,391 rfu (**Table 6.72**). Values returned for TSF do not correspond with the TPH results. High TPH values have lower TSF values and vise versa for the sample samples.

Sample ID	Results	Units
CARL_4_WP3_W	0.4642	mg/L
CARL_4_WP4_W	0.4603	mg/L
WP2_W	0.1038	mg/L

Table 6.71. TPH-Phase II Groundwater Samples. Site 39.

Sample ID	Results	Units
CARL_4_WP3_W	462	rtf
CARL_4_WP4_W	16555	rtf
WP2_W	2155	rtf

Table 6.72. TSF-Phase II Groundwater Samples. Site 39.

Compound	Results	Units
PAHTOT	1352.3	ng/L
FLC2	244.1	ng/L
PHANANTHC1	176	ng/L
NAPHC4	125.2	ng/L
FLAPYRC1	107.6	ng/L
PHANANTHC3	80.3	ng/L
NAPHC3	71.8	ng/L
PHANANTHC2	65.1	ng/L
NAPHC2	61.1	ng/L
DMNPH26	60.2	ng/L
PHAN	49.8	ng/L
NAPH	44.8	ng/L
DBFC2	44.4	ng/L
FLC3	42.6	ng/L
FLA	38.7	ng/L
PYR	31.3	ng/L
MTPHAN1	29.2	ng/L

Compound	Results	Units
FLC1	25.5	ng/L
ANTH	25.3	ng/L
DBFC1	19.4	ng/L
BZBF	11.8	ng/L
CHRYSENE	11.2	ng/L
NAPHC1	8.8	ng/L
BZAP	7.5	ng/L
ACNP	7.3	ng/L
FL	7.1	ng/L
BZAA	7	ng/L
BZEP	6.9	ng/L
DBF	6.7	ng/L
BZGHIP	6.7	ng/L
INP123	5.3	ng/L
MTNPH2	5.2	ng/L
BZKF	4.3	ng/L

Table 6.73. Sample Carl4_WP4_W. Site 39.

The PAH analysis was conducted on one down gradient groundwater sample. A total PAH concentration of 1352.3 ng/g was returned for the Carl_4_WP4_W sample (**Table 6.73**), the second highest PAH concentration returned for all the subject sites.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.8c**). A single sample from this site was submitted for analysis (**Table 6.74**). Above detection levels for all three metals species were encountered. This sample returned the highest concentration of lead for all the samples analyzed. The lead levels are relatively high at 140 ug/g. This sample was collected in an EM survey anomaly centrally located on the site.

One Phase II sediment sample was analyzed for EPA 13 priority metals. Only zinc returned concentrations in excess of detection limits. The concentration was low, at 7 mg/Kg .

Compound	Sample ID	Results	Units
Ba	045B	3590	ug/g
Pb	045B	140	ug/g
Cr	045B	22	ug/g

Table 6.74. Sample Returns for the Phase I Metals Analysis. Site 39.

Compound	Sample ID	Results	Units
Ni	Carl_4_WP4_W	1.61	mg/L
Cr	Carl_4_WP4_W	1.12	mg/L
Ni	Carl_4_WP3_W	0.17	mg/L
Cu	Carl_4_WP4_W	0.12	mg/L
Ni	Carl_4_WP1_W	0.06	mg/L
Cr	Carl_4_WP1_W	0.06	mg/L

Table 6.75. 13 Metal Results in Groundwater Samples. Site 39.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.75**). Nickel, chromium and copper were present in concentrations above detection limits. All concentrations were relatively low.

The specific conductance of the groundwater was measured on site. Values ranged from 850 to 1510 μS/cm with an average of 1160 μS/cm (**Table 6.76**).

On Site 41 (**Carl Oil Dunn et al. Well No. 2**), nine sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.10a**), total scanning fluorescence (**Figure 6.10b**), metals (**Figure 6.10c**), polycyclic aromatic hydrocarbons and

Sample ID	Results
Carl_4_WP1_F	1110
Carl_4_WP2_F	850
Carl_4_WP3_F	1510
Carl_4_WP4_F	1170
Average	1160

Table 6.76. Specific Conductance. Site 39.

NOTABLE FINDINGS

Phase I
TPH, Soil: 157.7 ug/g & 52 ug/g
Metals, lead: Pb 15 ug/g, Ba 723 ug/g
Phase II
TPH, Soil: 25,304 ug/g & 6,534 ug/g
TPH, GW: 3.6038 mg/L & 1.3526 mg/L
PAH, Soil: 14,688.2 ng/g & 11,599.2 ng/g
PAH, GW: 6,053.4 ng/g
Metals, Pb 23 ng/g

Sample ID	Results	Units
32	52	ug/g
033B	5.8	ug/g
034B	6.2	ug/g
035A	6.3	ug/g
036A	24.6	ug/g
037A	157.7	ug/g

Table 6.77. TPH-Phase I Sediment Samples

Sample ID	Results	Units
CARL_2_WP2	25.8	ug/g
CARL_2_WP3	25304.7	ug/g
CARL_2_WP4	6534	ug/g

Table 6. 78. TPH-Phase II Sediment Samples.

polychlorinated biphenyls. Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.10d**), total scanning fluorescence (**Figure 6.10e**), metals (**Figure 6.10f**), and polycyclic aromatic hydrocarbons.

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 5.8 ug/g to 157.7 ug/g with an average of 42.1 ug/g (**Table 6.77**). Sample 037A and 032 returned higher concentrations of 157.7 ug/g and 52 ug/g respectively. Sample 032 was collected on the mud flats in an area covered with miscellaneous debris. Sample 036A and 037A were collected on site below the pad. The Phase II sample returns for TPH ranged from 25.8 ug/g to 25,304.7 ug/g, with an average of 10,621.5 ug/g (**Table 6.78**). Sample CARL_2_WP3_S returned the highest TPH concentration for all sites sampled. This sample was collected in a suspect pit area off-site on the mud flats. In addition to this sample, CARL_2_WP4_S returned a concentration of 6,534 ug/g. This sample was down gradient and some distance off site, also on the mud flats.

Sample ID	Results	Units
32	48600	ntf
033B	91	ntf
034B	145	ntf
035A	84	ntf
036A	31760	ntf
037A	144000	ntf

Table 6.79. TSF-Phase I Sediment Samples

Sample ID	Results	Units
CARL_2_WP2	1786	ntf
CARL_2_WP3	6e+06	ntf
CARL_2_WP4	1e+06	ntf

Table 6.80. TSF-Phase II Sediment Sample

Total scanning fluorescence values at this site for Phase I (**Table 6.79**) and Phase II (**Table 6.80**) samples reflected those returned from the TPH analysis.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample CARL_2_WP3_S had the highest concentration for total PAH (**Table 6.81 - Table 6.83**). The variance between sample results was large. Total PAH values ranged from 268.5 ng/g to 14,688.2 ng/g, with an average of 8,851.9 ng/g. The PAH magnitudes reflect the TPH concentrations reported in Phase I sample collection. Surprisingly, the sample CARL_2_WP3_S had the second highest Total PAH return for all sites investigated while it had the highest TPH concentration encountered at all the site locations.

Compound	Results	Units
PAHTOT	268.5	ng/g
FLA	36.1	ng/g
PYR	29.1	ng/g
BZBF	18.8	ng/g
BZAA	18.1	ng/g
PHAN	16.7	ng/g
CHRYSENE	15.1	ng/g
FLA_PYRC1	14.3	ng/g
FLC3	11.9	ng/g
BZAP	11.6	ng/g
BZEP	9.3	ng/g
NAPHC4	8.5	ng/g
BZGHIP	7.9	ng/g
INP123	7.4	ng/g
NAPHC3	6.8	ng/g
CHRYSENE_C1	6.6	ng/g
PERY	5.7	ng/g
NAPHC2	5.2	ng/g
PHAN_ANTHC2	5.1	ng/g
PHAN_ANTHC1	4.9	ng/g

Compound	Results	Units
ANTH	4.7	ng/g
BZKF	4.4	ng/g
FLC2	3.4	ng/g
CHRYSENE_C2	2.9	ng/g
DBAHA	2.2	ng/g
ACNP	2.1	ng/g
NAPH	1.9	ng/g
FL	1.7	ng/g
NAPHC1	1.7	ng/g
FLC1	1.5	ng/g
CHRYSENE_C4	1.3	ng/g
MTPHAN1	0.9	ng/g
MTNPH2	0.9	ng/g
BIPHENYL	0.8	ng/g
MTNPH1	0.8	ng/g
DBF	0.7	ng/g
DMNPH26	0.5	ng/g
TMNPH167	0.4	ng/g
ACNPY	0.1	ng/g

Table 6.81. Sample 037A

Compound	Results	Units
PAHTOT	14688.2	ng/g
DMNPH26	3649.7	ng/g
TMNPH167	3589.1	ng/g
NAPHC1	2758.5	ng/g
NAPHC3	2075.3	ng/g
MTNPH2	1499.2	ng/g
PHANANTHC1	1324.2	ng/g
NAPHC2	1286.4	ng/g
MTNPH1	1259.3	ng/g
NAPHC4	1247.8	ng/g
FLC2	904.7	ng/g
PHANANTHC2	825.1	ng/g
FLC1	679.9	ng/g
FLC3	672.5	ng/g
PHAN	503.7	ng/g
DBFC1	458.9	ng/g
PHANANTHC3	321.4	ng/g
MTPHAN1	316.9	ng/g
ACNPY	300.7	ng/g
FL	271.9	ng/g
BIPHENYL	216	ng/g

Compound	Results	Units
DBFC2	189.6	ng/g
DBF	131.5	ng/g
FLAPYRC1	110	ng/g
PHANANTHC4	102.9	ng/g
DBFC3	90.9	ng/g
ACNP	63.7	ng/g
NAPH	46.5	ng/g
ANTH	27	ng/g
PYR	19.9	ng/g
FLA	17.4	ng/g
BZAA	8.2	ng/g
CHRYSENE	6.2	ng/g
PERY	5.9	ng/g
BZGHIP	5.6	ng/g
BZEP	4.2	ng/g
INP123	3.8	ng/g
BZBF	2.6	ng/g
BZAP	2.5	ng/g
DBAHA	1.7	ng/g
BZKF	1.4	ng/g

Table 6.82. Sample Carl_2_WP3_S

Compound	Results	Units	Compound	Results	Units
PAHTOT	11599.2	ng/g	FL	49.5	ng/g
NAPHC4	3150.3	ng/g	NAPHC3	44.29	ng/g
NAPHC2	1669.3	ng/g	DBF	35.3	ng/g
TMNPH167	813.9	ng/g	PHAN_ANTHC4	32.2	ng/g
DMNPH26	494.2	ng/g	FLA_PYRC1	19.1	ng/g
PHAN_ANTHC1	442	ng/g	BIPHENYL	17	ng/g
FLC3	424.4	ng/g	CHRYSENE_C2	10	ng/g
PHAN_ANTHC2	367.2	ng/g	PYR	8.3	ng/g
DBFC1	137.1	ng/g	CHRYSENE_C1	5.8	ng/g
NAPHC1	133.1	ng/g	FLA	5.6	ng/g
FLC2	131.3	ng/g	CHRYSENE	4.2	ng/g
PHAN	102.6	ng/g	BZBF	2.9	ng/g
DBFC2	97.6	ng/g	NAPH	2.9	ng/g
PHAN_ANTHC3	95	ng/g	BZGHIP	2.1	ng/g
MTPHAN1	94.6	ng/g	BZEP	1.7	ng/g
MTNPH2	74.5	ng/g	BZAP	1.7	ng/g
ACNP	62	ng/g	INP123	1.2	ng/g
MTNPH1	58.6	ng/g	PERY	1	ng/g
DBFC3	53	ng/g	BZAA	0.7	ng/g
FLC1	52.3	ng/g	BZKF	0.7	ng/g
ACNPY	50.8	ng/g	DBAHA	0.3	ng/g

Table 6.83. Sample Carl_2_WP4_S

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples ranged from 0.1819 mg/L in CARL_2_WP1 to 3.6038 mg/L in CARL_2_WP2_W, with an average of 1.7128 mg/L (**Table 6.84**). Sample CARL_2_WP3_W returned the highest TPH concentration in groundwater for all the subject sites. CARL_2_WP3_W had the second highest concentration returned.

Sample ID	Results	Units
CARL_2_WP2_W	0.1819	mg/L
CARL_2_WP3_W	3.6038	mg/L
CARL_2_WP4_W	1.3526	mg/L

Table 6.84. TPH-Phase II Groundwater Samples. Site 41.

TSF values in groundwater samples ranged from 5,491 rfu to 95,520 rfu, with an average of 46,520 rfu (**Table 6.85**). The TSF magnitude reflects the TPH concentration in the CARL_2_WP3_W sample. The TSF magnitudes for the CARL_2_WP2_W and CARL_2_WP4_W seem to be switched.

Sample ID	Results	Units
CARL_2_WP2_W	38550	rtf
CARL_2_WP3_W	95520	rtf
CARL_2_WP4_W	5491	rtf

Table 6.85. TSF-Phase II Groundwater Samples. Site 41.

Compound	Results	Units
PAHTOT	6053.4	ng/L
NAPHC3	1756.1	ng/L
NAPHC4	1405.8	ng/L
NAPHC2	676.8	ng/L
FLC3	342.4	ng/L
TMNPH167	320	ng/L
DMNPH26	265.1	ng/L
PHAN_ANTHC2	232.8	ng/L
DBFC3	222.5	ng/L
PHAN_ANTHC1	171.4	ng/L
FLC2	161	ng/L
PHAN_ANTHC3	144.2	ng/L
NAPHC1	98.9	ng/L
PHAN_ANTHC4	94.6	ng/L
DBFC2	81.9	ng/L
FLA	65	ng/L
PYR	64.4	ng/L
PHAN	61.9	ng/L
DBFC1	59.5	ng/L
MTNPH2	55.2	ng/L
FLA_PYRC1	49.5	ng/L
MTPHAN1	47.9	ng/L

Compound	Results	Units
MTNPH1	43.6	ng/L
BZBF	41	ng/L
CHRYSENE	36.2	ng/L
FLC1	34.5	ng/L
NAPH	30.2	ng/L
BZAP	26.3	ng/L
BZEP	22.2	ng/L
BZGHIP	20.9	ng/L
INP123	20.6	ng/L
BZAA	19.9	ng/L
BIPHENYL	16.9	ng/L
CHRYSENE_C1	16.6	ng/L
BZKF	15.9	ng/L
CHRYSENE_C2	14.6	ng/L
FL	10	ng/L
DBF	8.5	ng/L
CHRYSENE_C4	8.2	ng/L
PERY	7	ng/L
DBAHA	5	ng/L
ACNP	4.2	ng/L
ANTH	3.7	ng/L
ACNPY	2.6	ng/L

Table 6.86. Sample CARL_2_WP4_W groundwater. Site 41.

The PAH analysis was conducted on one down gradient groundwater sample (**Table 6.86**). A total PAH concentration of 6,053.4 ng/g was returned for the CARL_2_WP4_W sample. This was the highest total PAH concentration in a groundwater sample returned for all sites. The TPH concentration in groundwater for this sample was the second highest return, the highest being CARL_2_WP3_W from the same site.

Compound	Sample ID	Results	Units
Pb	Carl_2_WP4_S	23	mg/Kg
Zn	Carl_2_WP4_S	13	mg/Kg
Cr	Carl_2_WP4_S	6	mg/Kg

Table 6.87. 13 Metal Results in Sediment Samples. Site 41.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.10c**). Two sample locations was submitted for the metals analysis (032 and 036A). Barium, chromium and lead returned

Sample ID	Results
Carl_2_WP3_F	194875
Carl_2_WP4_F	274000
Carl_2_WP2_F	63682
Carl_2_WP1_F	92100
Average	156164.25

Table 6.90. Specific Conductance. Site 41.

Compound	Sample ID	Results	Units
Ba	32	723	ug/g
Pb	32	15	ug/g
Cr	32	9	ug/g

Table 6.88. Sample Results for the Phase I Metals Analysis. Site 41.

Compound	Sample ID	Results	Units
Zn	Carl_2_WP2_W	0.54	mg/L
Cr	Carl_2_WP3_W	0.21	mg/L
Cr	Carl_2_WP2_W	0.11	mg/L
Cu	Carl_2_WP2_W	0.09	mg/L
Cr	Carl_2_WP4_W	0.07	mg/L
Ni	Carl_2_WP2_W	0.06	mg/L

Table 6.89. 13 Metal Results in Groundwater samples. Site 41.

in concentrations above detection levels in sample 032 (**Table 6.87**). This sample was collected off-site on the mud flats in the area where the miscellaneous debris was encountered. Barium was slightly higher than some of the other sites.

One Phase II sediment sample was analyzed for EPA 13 priority metals. Sample Carl_2_WP4_S was submitted for this analysis. Lead, zinc and chromium were detected in concentration greater than detection levels (**Table 6.88**). Sample Carl_2_WP4_S, which was collected on the mud flats off-site and down gradient, returned 23 mg/Kg of lead.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.89**). Chromium, Copper, nickel and zinc were encountered in above detection levels. All four species of metals were encountered in the Carl_2_WP2_W sample. All values are relatively low but the presence of copper may be a concern even in low concentrations.

The specific conductance of the groundwater was measured on site. Values ranged from 63,682 µS/cm to 274,000 µS/cm. The average conductivity was 156,164.25 µS/cm (**Table 6.90**).

On Site 44 (**Sun Oil well No. 8**), seven sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.12a**), total scanning fluorescence (**Figure 6.12b**), metals (**Figure 6.12c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls. Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.12d**), total scanning fluorescence (**Figure 6.12e**), metals (**Figure 6.12f**), and polycyclic aromatic hydrocarbons.

NOTABLE FINDINGS

Phase I
TPH, Soil: 6,145.9 ug/g & 521 ug/g
Metals, Soil: Pb 20 ug/g
Phase II
TPH, Soil: 53 ug/g
TPH, GW: 0.2296 mg/L
PAH, Soil: 146.3 ng/g
PAH, GW: 443.7 ng/g

Sample ID	Results	Units
038B	539.3	ug/g
039B	111.6	ug/g
040B	2.1	ug/g
041B	2.7	ug/g

Table 6.91. TPH Results for Phase I Sediment Samples. Site 44.

Sample ID	Results	Units
SUN_8_WP1	0.9	ug/g
SUN_8_WP2	0.8	ug/g
SUN_8_WP3	3347.7	ug/g

Table 6.92. TPH Results for Phase II Sediment Samples. Site 44.

Sample ID	Results	Units
038B	245300	ntf
039B	23880	ntf
040B	222	ntf
041B	330	ntf

Table 6.93. TSF-Phase I Sediment Samples. Site 44.

Sample ID	Results	Units
SUN_8_WP1	161	ntf
SUN_8_WP2	178	ntf
SUN_8_WP3	218000	ntf

Table 6.94. TSF-Phase II Sediment Samples. Site 44.

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 2.1 ug/g to 539.3 ug/g with an average of 218.6 ug/g (**Table 6.91**). Sample locations 038B and 039B returned higher concentrations 539.3 ug/g and 111.6 ug/g respectively. Sample 038B was collected in a suspect pit area. Sample 039B was collected just southeast of the suspect pit. The Phase II sample returns ranged from 0.8 ug/g to 3347.7 ug/g, with an average of 1,116.5 ug/g (**Table 6.92**). Sample SUN_8_WP3_S returned the highest TPH concentration for this site and the third highest for all samples submitted. This sample may have been switched with sample SUN_8_WP1_S. Field observations and the high TPH concentration in the groundwater sample returned for the SUN_8_WP1_S location appear anomalous.

Compound	Results	Units	Compound	Results	Units
PAHTOT	642.5	ng/g	MTNPH1	1	ng/g
NAPHC3	109.8	ng/g	ANTH	0.9	ng/g
NAPHC4	68.9	ng/g	PHAN	0.9	ng/g
NAPHC2	66.1	ng/g	PYR	0.9	ng/g
FLA	36.8	ng/g	DMNPH26	0.9	ng/g
TMNPH167	31.7	ng/g	MTPHAN1	0.8	ng/g
DMNPH26	31.2	ng/g	ACNPY	0.6	ng/g
PYR	29.1	ng/g	DBFC3	0.5	ng/g
FLC3	28.1	ng/g	FLA	0.5	ng/g
BZBF	26	ng/g	FL	0.4	ng/g
FLC2	25.4	ng/g	DBF	0.2	ng/g
PHAN	25.2	ng/g	DBFC1	0.2	ng/g
BZAA	20.7	ng/g	PERY	0.1	ng/g
NAPHC1	19.9	ng/g	BZGHIP	0.1	ng/g
CHRYSENE	19	ng/g	CHRYSENE	0.1	ng/g
FLA_PYRC1	18.9	ng/g	BZKF	0.1	ng/g
BZAP	17.2	ng/g	BZEP	0.1	ng/g
PHAN_ANTHC 1	16.1	ng/g	DBFC2	0.1	ng/g
PHAN_ANTHC 2	13.8	ng/g			

Table 6.95. Sample 039B. Site 44.

Compound	Results	Units
PAHTOT	642.5	ng/g
NAPHC3	109.8	ng/g
NAPHC4	68.9	ng/g
NAPHC2	66.1	ng/g
FLA	36.8	ng/g
TMNPH167	31.7	ng/g
DMNPH26	31.2	ng/g
PYR	29.1	ng/g
FLC3	28.1	ng/g
BZBF	26	ng/g
FLC2	25.4	ng/g
PHAN	25.2	ng/g
BZAA	20.7	ng/g
NAPHC1	19.9	ng/g
CHRYSENE	19	ng/g
FLA_PYRC1	18.9	ng/g
BZAP	17.2	ng/g
PHAN_ANTHC 1	16.1	ng/g
PHAN_ANTHC 2	13.8	ng/g
ACNP	13.4	ng/g
BZEP	12.6	ng/g
INP123	12	ng/g
BZGHIP	11.9	ng/g
MTNPH2	10.2	ng/g
MTNPH1	9.7	ng/g
BZKF	8.5	ng/g
FLC1	7.6	ng/g
FL	7.2	ng/g
ANTH	5.9	ng/g
PERY	5.6	ng/g
BIPHENYL	4.7	ng/g
MTPHAN1	4.5	ng/g
ACNPY	3.3	ng/g
DBAHA	2.8	ng/g
NAPH	2.4	ng/g
DBFC1	2	ng/g
DBF	1.8	ng/g

Table 6.96. Sample SUN_8_WP3_S. Site 44.

Compound	Results	Units
PAHTOT	9570.2	ng/g
NAPHC3	3616.9	ng/g
NAPHC4	2088	ng/g
TMNPH167	1214.5	ng/g
NAPHC2	772.3	ng/g
PHAN_ANTHC 1	562.4	ng/g
FLC2	518.5	ng/g
PHAN_ANTHC 2	443.8	ng/g
FLC3	392.3	ng/g
FLC1	262.3	ng/g
DMNPH26	209.6	ng/g
PHAN	208	ng/g
PHAN_ANTHC 3	124.9	ng/g
MTPHAN1	111	ng/g
DBFC1	84	ng/g
FL	82.4	ng/g
DBFC2	72.9	ng/g
DBFC3	53.8	ng/g
ACNP	50.8	ng/g
PHAN_ANTHC 4	39.9	ng/g
NAPHC1	39.7	ng/g
BIPHENYL	28.3	ng/g
DBF	27.3	ng/g
FLA_PYRC1	26.3	ng/g
MTNPH2	22.2	ng/g
ANTH	19.4	ng/g
MTNPH1	17.5	ng/g
PYR	17.2	ng/g
ACNPY	12.2	ng/g
FLA	8.4	ng/g
NAPH	7.4	ng/g
CHRYSENE_C1	2.9	ng/g
CHRYSENE_C2	2.7	ng/g
CHRYSENE	1.7	ng/g
PERY	1.3	ng/g
BZAA	0.7	ng/g
BZGHIP	0.4	ng/g
BZBF	0.4	ng/g
BZEP	0.4	ng/g
INP123	0.3	ng/g
BZAP	0.2	ng/g
DBAHA	0.1	ng/g
BZKF	0.1	ng/g

Table 6.97. Sample 038B. Site 44.

Sample ID	Results	Units
SUN_8_WP1_W	2.3261	mg/L
SUN_8_WP2_W	0.9267	mg/L
SUN_8_WP3_W	0.0203	mg/L

Table 6.98. TPH-Phase II Groundwater Samples. Site 44.

Sample ID	Results	Units
SUN_8_WP1_W	141300	rtf
SUN_8_WP2_W	5110	rtf
SUN_8_WP3_W	1933	rtf

Table 6.99. TSF-Phase II Groundwater Samples. Site 44.

Total scanning fluorescence values at this site for Phase I (**Table 6.93**) and Phase II (**Table 6.94**) samples reflected those returned from the TPH analysis. TSF values ranged from 161 rfu to 245,300 rfu.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample 038B had the highest concentration for total PAH. The variance between sample results was large. The values ranged from 217.4 ng/g to 9,570.2 ng/g, with an average of 3,476.7 ng/g (**Table 6.95 - Table 6.97**). The PAH magnitudes reflect the TPH concentrations derived in the first sample collection phase. Sample SUN_8_WP3_S returned a lower total PAH concentration than would be expected when comparing the TPH results. This sample returned a significantly higher TPH concentration than that returned for sample 038B. This sample may in fact be the SUN_8_WP1_S sample.

Compound	Results	Units	Compound	Results	Units
PAHTOT	943.5	ng/L	DBFC3	15.5	ng/L
NAPHC1	108.3	ng/L	TMNPH167	15.1	ng/L
FLC3	83.3	ng/L	CHRYSENE_C1	13.6	ng/L
NAPH	76.3	ng/L	CHRYSENE_C2	13	ng/L
NAPHC3	73.5	ng/L	BZAP	11.9	ng/L
MTNPH2	69.3	ng/L	CHRYSENE	11.2	ng/L
NAPHC2	52.5	ng/L	BZGHIP	10.2	ng/L
PHAN_ANTHC 3	43.3	ng/L	ACNP	9.8	ng/L
PHAN_ANTHC 1	42	ng/L	MTPHAN1	9.4	ng/L
FLC2	41.2	ng/L	BZEP	9.1	ng/L
PHAN_ANTHC 2	39.4	ng/L	INP123	8.2	ng/L
MTNPH1	39	ng/L	BZAA	7.8	ng/L
NAPHC4	38.2	ng/L	FL	7.4	ng/L
FLA_PYRC1	33.8	ng/L	DBFC1	5.5	ng/L
PHAN_ANTHC 4	32.2	ng/L	ANTH	4.7	ng/L
PHAN	31.1	ng/L	PERY	4.5	ng/L
PYR	25.7	ng/L	BIPHENYL	3.7	ng/L
DMNPH26	25.6	ng/L	BZKF	3.5	ng/L
FLA	22.3	ng/L	DBF	3.1	ng/L
FLC1	20.8	ng/L	DBAHA	2.1	ng/L
DBFC2	18.2	ng/L	ACNPY	1.2	ng/L
BZBF	15.8	ng/L			

Table 6.100. Sample SUN_8_WP3_W. Site 44.

Three groundwater samples were analyzed

Sample ID	Results
Sun_8_WP2_F	4130
Sun_8_WP1_F	7860
Sun_8_WP3_F	1940
Average	4643.3333

Table 6.103. Specific Conductance. Site 44.

Compound	Sample ID	Results	Units
Ba	038B	1680	ug/g
Ba	039B	943	ug/g
Pb	038B	31	ug/g
Ba	040B	26	ug/g
Cr	039B	15	ug/g
Cr	038B	8	ug/g
Pb	039B	6	ug/g

Table 6.101. Sample Results for the Phase I Metals Analysis. Site 44.

for petroleum constituents. TPH values in groundwater samples ranged from 0.0203 mg/L in SUN_8_WP1_W to 2.3261 mg/L in SUN_8_WP2_W, with an average of 1.091 mg/L (Table **6.98**). Sample SUN_8_WP1_W returned the third highest TPH concentration in groundwater for all the subject sites. This sample may in fact be the SUN_8_WP3_W sample.

TSF values in groundwater samples ranged from 1,933 rfu to 141,300 rfu, with an average of 49,447 rfu (**Table 6.99**). The TSF magnitudes reflect the TPH concentrations returned on the same samples.

Compound	Sample ID	Results	Units
Zn	Sun_8_WP1_W	1.25	mg/L
Cr	Sun_8_WP1_W	0.9	mg/L
Pb	Sun_8_WP1_W	0.61	mg/L
Zn	Sun_8_WP2_W	0.45	mg/L
Cr	Sun_8_WP2_W	0.19	mg/L
Cu	Sun_8_WP1_W	0.16	mg/L
Ni	Sun_8_WP2_W	0.15	mg/L
Ni	Sun_8_WP1_W	0.11	mg/L
Hg	Sun_8_WP1_W	0.003	mg/L

Table 6.102. 13 Metals Results in Groundwater Samples. Site 44.

The PAH analysis was conducted on one down gradient groundwater sample (**Table 6.100**). A total PAH concentration of 943.5 ng/g was returned for the SUN_8_WP3_W sample. This was the third highest total PAH concentration in a groundwater sample returned for all the sites. The TPH concentration in groundwater for this sample was the lowest concentration returned for all the subject sites. This sample may have been switched with the SUN_8_WP1_W sample.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.7c**). Three samples were submitted for metals analysis in the first phase (**Table 6.101**). Sample 038B, located in a suspect pit area returned high barium and lead concentrations. Sample 039B located to the southeast of the pit also returned values for these metals, although lower.

One Phase II sediment sample was analyzed for EPA 13 priority metals. No monitored metals were found in concentrations above detect levels for this sample.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.102**). Concentrations for zinc, chromium, lead, copper, nickel and mercury were detected at the site location in

above detection levels. The lead and mercury were detected in SUN_8_WP1_W. Although the concentrations are low, the presence of these metals may be cause of concern due to their usage in the petroleum exploration industry.

The specific conductance of the groundwater was measured on site. Values ranged from 1940 µS/cm to 7,860 µS/cm with an average of 4644 µS/cm (**Table 6.103**).

On Site 56 (**Sun Oil Dunn-McCampbell No. 11**), nine sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.15a**), total scanning fluorescence (**Figure 6.15b**), metals (**Figure 6.15c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls. Three groundwater samples were collected and submitted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.15d**), total scanning fluorescence (**Figure 6.15e**), metals (**Figure 6.15f**), and polycyclic aromatic hydrocarbons.

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 1.5 ug/g to 6,145.9 ug/g with an average of 1,152.8 ug/g (**Table 6.104**). Sample location 083 returned the highest TPH concentration for this site and all site samples analyzed for TPH. This sample along with 079B were collected in a suspect well head work area. Also significant is the 239.4 ug/g TPH encountered in the 082A sample. This sample was collected from an anomalous area indicted by the EM survey. The Phase II samples were collected from well point locations on and off the subject site. TPH values ranged

NOTABLE FINDINGS

Phase I
TPH, Soil: 6,145.9 ug/g & 521 ug/g
Metals, Soil: Pb 20 ug/g
Phase II
TPH, Soil: 53 ug/g
TPH, GW: 0.2296 mg/L
PAH, Soil: 146.3 ng/g
PAH, GW: 443.7 ng/g

Sample ID	Results	Units
079B	521	ug/g
080A	3.2	ug/g
081A	1.5	ug/g
082A	239.4	ug/g
83	6146	ug/g
84	5.9	ug/g

Table 6.104. TPH Results for Phase I Sediment Samples. Site 56.

Sample ID	Results	Units
SUN_II_WP1_S	53	ug/g
SUN_II_WP2_S	7.2	ug/g
SUN_II_WP4_S	48.9	ug/g

Table 6.105. TPH Results Phase II Sediment Sample. Site 56.

Sample ID	Results	Units
079B	581000	ntf
080A	105	ntf
081A	151	ntf
082A	342000	ntf
83	3742500	ntf
84	176	ntf

Table 6.106. TSF Results for Phase I Sediment Sample. Site 56.

Sample ID	Results	Units
SUN_II_WP1_S	13280	ntf
SUN_II_WP2_S	327	ntf
SUN_II_WP4_S	5860	ntf

Table 6.107. TSF Results for Phase II Sediment Samples. Site 56.

Compound	Results	Units	Compound	Results	Units
PAHTOT	146.3	ng/g	ANTH	1.6	ng/g
NAPHC3	53.5	ng/g	ACNP	0.9	ng/g
NAPHC2	30.2	ng/g	BZAP	0.8	ng/g
NAPHC1	23.9	ng/g	BZAA	0.8	ng/g
NAPH	16.6	ng/g	PHAN	0.8	ng/g
MTNPH2	14	ng/g	BZKF	0.8	ng/g
MTNPH1	9.9	ng/g	CHRYSENE	0.6	ng/g
TMNPH167	5.2	ng/g	FLA	0.5	ng/g
BIPHENYL	3.7	ng/g	PYR	0.5	ng/g
DMNPH26	3.5	ng/g	INP123	0.5	ng/g
MTPHAN1	3.2	ng/g	BZEP	0.4	ng/g
DBF	3.2	ng/g	BZBF	0.4	ng/g
PERY	3	ng/g	DBAHA	0.3	ng/g
ACNPY	1.8	ng/g	BZGHIP	0.3	ng/g
FL	1.7	ng/g			

Table 6.108. Sample 083. Site 56.

Compound	Results	Units	Compound	Results	Units
PAHTOT	56.5	ng/g	CHRYSENE	1	ng/g
FLA_PYRC1	20.8	ng/g	NAPH	1	ng/g
PYR	11.1	ng/g	ACNP	0.9	ng/g
FLA	4	ng/g	FL	0.8	ng/g
PHAN	3.6	ng/g	BZBF	0.8	ng/g
ANTH	2.4	ng/g	MTNPH1	0.7	ng/g
ACNPY	2.3	ng/g	BZEP	0.6	ng/g
NAPHC1	1.8	ng/g	BZAP	0.6	ng/g
BIPHENYL	1.3	ng/g	INP123	0.5	ng/g
TMNPH167	1.3	ng/g	DMNPH26	0.5	ng/g
MTPHAN1	1.2	ng/g	BZKF	0.4	ng/g
MTNPH2	1.1	ng/g	DBF	0.4	ng/g
PERY	1	ng/g	BZAA	0.4	ng/g
BZGHIP	1	ng/g	DBAHA	0.1	ng/g

Table 6.109. Sample 082. Site 56.

Compound	Results	Units
PAHTOT	42.3	ng/g
NAPHC3	11.2	ng/g
NAPHC2	6.2	ng/g
NAPHC4	5.4	ng/g
NAPHC1	5	ng/g
NAPH	3.4	ng/g
MTNPH2	3	ng/g
MTNPH1	2	ng/g
FLA_PYRC1	1.3	ng/g
FLA	1.1	ng/g
BZBF	1	ng/g
DMNPH26	1	ng/g
CHRYSENE	1	ng/g
BIPHENYL	1	ng/g
PYR	1	ng/g
TMNPH167	0.9	ng/g

Compound	Results	Units
PHAN	0.7	ng/g
BZGHIP	0.6	ng/g
INP123	0.5	ng/g
BZEP	0.5	ng/g
BZAP	0.5	ng/g
BZAA	0.4	ng/g
PERY	0.3	ng/g
ACNPY	0.3	ng/g
BZKF	0.2	ng/g
ACNP	0.2	ng/g
ANTH	0.2	ng/g
FL	0.1	ng/g
MTPHAN1	0.1	ng/g
DBAHA	0.1	ng/g
DBF	0.1	ng/g

Table 6.110. Sample SUN_II_WP1_W. Site 56.

from 7.2 ug/g to 53 ug/g (**Table 6.105**). These results are significant in that they suggest wide spread releases of these monitored constituents both on-site and off-site.

Total scanning fluorescence values at this site for Phase I (**Table 6.106**) and Phase II (**Table 6.107**) samples reflected those returned from the TPH analysis. TSF values range from 105 rfu to 3,742,500 rfu.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample 082 returned the highest concentration for total PAH (**Table 6.108 - Table 6.110**). The variance between sample results was small. The values ranged from 42.3 ng/g to 146.3 ng/g, with an average of 81.7 ng/g. The results appear low compared to the concentrations of TPH encountered in the same sample. Some of these samples had very high TPH concentrations with respect to all sample returns from all sites, and the PAH values appear to be some of the lowest returned for all samples submitted . Most TPH sample results for this site had a high proportion of unresolved complex which could possibly be an indication of weathering or some other form of degradation of the products.

Sample ID	Results	Units
SUN_II_WP1_W	0.2296	mg/L
SUN_II_WP2_W	0.1658	mg/L
SUN_II_WP4_W	0.1235	mg/L

Table 6.111. TPH Results for Phase II Groundwater Samples. Site 56.

Sample ID	Results	Units
SUN_II_WP1_W	2208	rtf
SUN_II_WP2_W	574	rtf
SUN_II_WP4_W	623	rtf

Table 6.112. TSF Results for Phase II Groundwater Samples. Site 56.

Compound	Results	Units	Compound	Results	Units
PAHTOT	443.7	ng/L	BZBF	3.1	ng/L
FLA_PYRC1	52.9	ng/L	ANTH	2.7	ng/L
FLC3	51.4	ng/L	CHRYSENE	2.6	ng/L
PHAN_ANTHC 4	46.3	ng/L	FL	2.4	ng/L
NAPH	45.4	ng/L	INP123	2	ng/L
FLC2	39.5	ng/L	BZGHIP	2	ng/L
NAPHC3	38.9	ng/L	BZAA	1.9	ng/L
NAPHC4	38.2	ng/L	BZEP	1.9	ng/L
PHAN_ANTHC 3	34.1	ng/L	BZAP	1.7	ng/L
NAPHC2	20	ng/L	DMNPH26	1.6	ng/L
PHAN_ANTHC 2	14.4	ng/L	MTPHAN1	1.4	ng/L
PHAN_ANTHC 1	11.2	ng/L	BZKF	1.3	ng/L
NAPHC1	8.2	ng/L	PERY	0.9	ng/L
FLA	6.4	ng/L	DBF	0.7	ng/L
PHAN	6.1	ng/L	DBAHA	0.7	ng/L
PYR	5.4	ng/L	BIPHENYL	0.6	ng/L
MTNPH2	4.4	ng/L	ACNPY	0.5	ng/L
TMNPH167	3.9	ng/L	ACNP	0.5	ng/L
MTNPH1	3.8	ng/L			

Table 6.113. PAH for SUN_11_WP4_W groundwater sample at Site 56.

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples ranged from 0.1235 mg/L in SUN_II_WP1_W to 0.2296 mg/L in SUN_II_WP2_W, with an average of 0.1730 mg/L (**Table 6.111**). These were below average concentrations of all the subject sites.

TSF values in groundwater samples ranged from 574 rfu to 2,208 rfu, with an average of 1,135 rfu (**Table 6.112**). The TSF values are consistent with the TPH concentrations returned on the same samples.

The PAH analysis was conducted on one down gradient groundwater sample. A total PAH concentra-

Compound	Sample ID	Results	Units
Ba	079B	1020	ug/g
Pb	079B	20	ug/g
Ba	082A	18	ug/g

Table 6.114. Sample Results for the Phase I Metals Analysis. Site 56.

Sample ID	Results
Sun_11_WP2_F	1990
Sun_11_WP4_F	1910
Sun_11_WP1_F	3800
Average	2566.6666

Table 6.115. Specific Conductance. Site 56.

tion of 443.7 ng/g was returned for the SUN_11_WP4_W sample (**Table 6.113**). This was the third highest total PAH concentration in a groundwater sample returned for all the sites. The TPH concentration in groundwater for this sample was the lowest concentration returned for all the subject sites. This sample may have been switched with the SUN_11_WP1_W sample.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.15c**). Two samples 079B and 082A were submitted for analysis in this phase of the investigation (**Table 6.114**). Barium was encountered in both sample, but in low levels for the 082A sample and relatively high concentrations in sample 079B. Lead was detected at 20 ug/g, not a very high concentration but still a source for concern. This sample was collected in a suspect work area.

Sample ID	Results	Units
014B	4.5	ug/g
015A	434.1	ug/g
16	45	ug/g
017B	10.9	ug/g
018C	4.3	ug/g
019B	5	ug/g
020A	16.9	ug/g
021B	30.1	ug/g

Table 6.116. TPH Results for Phase I Sediment Samples. Site 57.

NOTABLE FINDINGS

Phase I
TPH, Soil: 434.1 ug/g
Metals, Pb: 24 ug/L
Phase II
TPH, Soil: 82 ug/g
TPH, GW: 0.2922 mg/L
PAH, Soil: 320.3 ng/g

One Phase II sediment sample was analyzed for EPA 13 priority metals. No monitored metals were found in concentrations above detect levels for this sample.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals. Only a very low concentration of chromium was detected in sample Sun_11_WP4_W. All other metals were below detection levels.

The specific conductance of the groundwater was measured on site. Values ranged from 1910 µS/cm to 3800 µS/cm with an average of 2567 µS/cm (**Table 6.115**).

On Site 57 (**Union of California W. V. Jones, et al. 30036 (1)**), eleven sediment samples were collected and submitted for analysis. Sediment samples were analyzed for total petroleum hydrocarbons (**Figure 6.16a**), total scanning fluorescence (**Figure 6.16b**), metals (**Figure 6.12c**), polycyclic aromatic hydrocarbons and polychlorinated biphenyls.
Three groundwater samples were collected and submit-

Sample ID	Results	Units
UCAL_J_WP1_S	6.6	ug/g
UCAL_J_WP2_S	82	ug/g
UCAL_J_WP3_S	25.4	ug/g

Table 6.117. TPH-Phase II Sediment Samples. Site 57.

Sample ID	Results	Units
014B	384	ntf
015A	394500	ntf
16	24250	ntf
017B	558	ntf
018C	110	ntf
019B	292	ntf
020A	2768	ntf
021B	436	ntf

Table 6.118. TSF-Phase I Sediment Samples. Site 57.

ted for analysis. Groundwater samples were also analyzed for total petroleum hydrocarbons (**Figure 6.16d**), total scanning fluorescence (**Figure 6.16e**), metals (**Figure 6.16f**), and polycyclic aromatic hydrocarbons.

Sample ID	Results	Units
UCAL_J_WP1_S	6.6	ug/g
UCAL_J_WP2_S	82	ug/g
UCAL_J_WP3_S	25.4	ug/g

Table 6.119. TSF-Phase II Sediment Samples. Site 57.

Total petroleum hydrocarbons (TPH) for samples collected during Phase I ranged from 4.3 ug/g to 434.1 ug/g with an average of 68.9 ug/g (**Table 6.116**). Sample location 015A returned the highest TPH concentration. This sample was collected near a suspect well head area. The next highest sample return was sample 16 with 45 ug/g TPH. This sample was collected from a suspect burn pit located off-site. The Phase II values ranged from 6.6 ug/g to 82 ug/g (**Table 6.117**). The UCAL_J_WP2_S sample returned the highest concentration of TPH in sediment sample for the second phase. This sample was down gradient and off-site.

Compound	Results	Units	Compound	Results	Units
PAHTOT	320.3	ng/g	NAPH	3.6	ng/g
NAPHC4	74.6	ng/g	CHRYSENE_C2	3.6	ng/g
NAPHC3	60	ng/g	CHRYSENE_C1	3	ng/g
TMNPH167	22	ng/g	PYR	2.3	ng/g
PHAN_ANTHC 2	20.6	ng/g	PERY	2.2	ng/g
FLC3	18	ng/g	BIPHENYL	2	ng/g
NAPHC2	17.7	ng/g	DBF	1.7	ng/g
PHAN_ANTHC 3	15.1	ng/g	CHRYSENE	1.7	ng/g
FLC2	14.2	ng/g	FL	1.6	ng/g
DBFC3	13.3	ng/g	FLA	1.1	ng/g
PHAN_ANTHC 1	11.8	ng/g	ACNPY	1	ng/g
NAPHC1	9.8	ng/g	BZEP	0.8	ng/g
DBFC2	9.1	ng/g	ANTH	0.8	ng/g
DBFC1	6.9	ng/g	BZGHIP	0.7	ng/g
PHAN_ANTHC 4	6.8	ng/g	BZBF	0.6	ng/g
DMNPH26	6.1	ng/g	ACNP	0.5	ng/g
MTNPH2	5.9	ng/g	BZAA	0.4	ng/g
FLC1	5.2	ng/g	BZAP	0.3	ng/g
FLA_PYRC1	5	ng/g	INP123	0.2	ng/g
MTNPH1	4	ng/g	DBAHA	0.1	ng/g
PHAN	3.8	ng/g	BZKF	0.1	ng/g
MTPHAN1	3.7	ng/g			

Table 6.120. Sample 015A. Site 57.

Compound	Results	Units	Compound	Results	Units
PAHTOT	42.8	ng/g	DMNPH26	0.8	ng/g
NAPHC3	7.5	ng/g	BZGHIP	0.8	ng/g
NAPHC2	6.9	ng/g	ACNPY	0.6	ng/g
NAPHC1	5.8	ng/g	ANTH	0.6	ng/g
NAPH	5.4	ng/g	INP123	0.5	ng/g
MTNPH2	3.8	ng/g	FL	0.5	ng/g
FLA_PYRC1	3.3	ng/g	BZAP	0.5	ng/g
BIPHENYL	2.4	ng/g	PERY	0.4	ng/g
MTNPH1	2	ng/g	BZAA	0.4	ng/g
PYR	1.5	ng/g	BZKF	0.4	ng/g
PHAN	1.3	ng/g	TMNPH167	0.3	ng/g
CHRYSENE	1	ng/g	MTPHAN1	0.3	ng/g
BZEP	0.9	ng/g	ACNP	0.3	ng/g
FLA	0.9	ng/g	DBAHA	0.2	ng/g
BZBF	0.8	ng/g	DBF	0.1	ng/g

Table 6.121. Sample 16. Site 57.

Compound	Results	Units	Compound	Results	Units
PAHTOT	155.7	ng/g	FL	0.7	ng/g
NAPHC3	56.7	ng/g	ACNPY	0.6	ng/g
NAPHC4	39.8	ng/g	DBFC1	0.5	ng/g
NAPHC2	22.3	ng/g	MTPHAN1	0.5	ng/g
NAPHC1	10.2	ng/g	FLA	0.4	ng/g
MTNPH2	6.2	ng/g	PERY	0.4	ng/g
FLC3	4.9	ng/g	BZGHIP	0.3	ng/g
TMNPH167	4.6	ng/g	PYR	0.3	ng/g
NAPH	4	ng/g	ACNP	0.3	ng/g
MTNPH1	4	ng/g	DBF	0.2	ng/g
FLC2	3.2	ng/g	BZBF	0.2	ng/g
DMNPH26	2.9	ng/g	BZEP	0.2	ng/g
PHAN_ANTHC 2	2	ng/g	CHRYSENE	0.2	ng/g
BIPHENYL	1.9	ng/g	BZAP	0.1	ng/g
FLC1	1.8	ng/g	BZAA	0.1	ng/g
PHAN_ANTHC 1	1.8	ng/g	INP123	0.1	ng/g
PHAN_ANTHC 3	1.6	ng/g	ANTH	0.1	ng/g
PHAN	0.7	ng/g			

Table 6.122. Sample UCAL_J_WP2. Site 57.

Total scanning fluorescence values at this site for Phase I (**Table 6.118**) and Phase II (**Table 6.119**) reflect the relative magnitudes seen in the higher TPH concentration sample returns. Samples with lower values of TSF are, at times, higher for lower TPH concentrations and lower for slightly higher TPH concentrations.

Polycyclic aromatic hydrocarbons (PAH) analysis at this site found sample 015A returned the highest concentration matching the TPH results. Total PAH values ranged from 42.8 ng/g to 320.3 ng/g, with an average of 172.9 ng/g (**Table 6.120 - Table 6.122**). These values are relatively low.

Three groundwater samples were analyzed for petroleum constituents. TPH values in groundwater samples ranged from 0.0594 mg/L in UCAL_J_WP1_W to 0.2922 mg/L

Sample ID	Results	Units
UCAL_J_WP1_W	0.2922	mg/L
UCAL_J_WP2_W	0.1135	mg/L
UCAL_J_WP3_W	0.0594	mg/L

Table 6.123. TPH-Phase II Groundwater Sample. Site 57.

Sample ID	Results	Units
UCAL_J_WP1_W	1346	rtf
UCAL_J_WP2_W	2072	rtf
UCAL_J_WP3_W	240	rtf

Table 6.124. TPH-Phase II Groundwater Samples. Site 57.

Compound	Results	Units
PAHTOT	395.9	ng/L
NAPH	38.9	ng/L
NAPHC3	34.7	ng/L
FLC3	34.1	ng/L
NAPHC4	30.5	ng/L
NAPHC2	29.4	ng/L
PHAN_ANTHC3	21.2	ng/L
PHAN_ANTHC4	20.5	ng/L
DBFC3	17.6	ng/L
DBFC2	13.3	ng/L
FLC2	12.6	ng/L
PHAN_ANTHC2	12.6	ng/L
FLA	11.6	ng/L
FLA_PYRC1	11.6	ng/L
PHAN	10	ng/L
PHAN_ANTHC1	9.7	ng/L
NAPHC1	9.5	ng/L
PYR	9.1	ng/L
BZBF	8	ng/L
CHRYSENE_C2	6.6	ng/L
CHRYSENE	6.4	ng/L

Compound	Results	Units
MTNPH2	5.8	ng/L
DBFC1	5.4	ng/L
BZAP	5.1	ng/L
TMNPH167	4.7	ng/L
BZEP	4.6	ng/L
INP123	4.4	ng/L
BZGHIP	4.3	ng/L
DMNPH26	4.2	ng/L
BZAA	3.9	ng/L
MTNPH1	3.8	ng/L
BZKF	3.4	ng/L
FL	3.2	ng/L
CHRYSENE_C1	3.2	ng/L
PERY	2.2	ng/L
BIPHENYL	2	ng/L
MTPHAN1	2	ng/L
ANTH	2	ng/L
DBF	1.5	ng/L
DBAHA	1.4	ng/L
ACNPY	0.7	ng/L
ACNP	0.7	ng/L

Table 6.125. Sample Ucal_J_WP1_W. Site 57.

Sample ID	Results
UCal_J_WP2_F	840
UCal_J_WP3_F	1060
UCal_J_WP1_F	710
Average	870

Table 6.128. Specific Conductance. Site 57.

Compound	Sample ID	Results	Units
Ba	015A	3110	ug/g
Cr	015A	60	ug/g
Ba	014B	50	ug/g
Pb	015A	24	ug/g

Table 6.126. Sample Results for the Phase I Metals Analysis. Site 57.

in UCAL_J_WP2_W, with an average of 0.1550 mg/L (**Table 6.123**). UCAL_J_WP1_W and UCAL_J_WP2_W were in down gradient locations at the subject sites.

Compound	Sample ID	Results	Units
Cr	UCal_J_WP1_W	0.34	mg/L
Zn	UCal_J_WP3_W	0.34	mg/L
Zn	UCal_J_WP1_W	0.11	mg/L
Ni	UCal_J_WP1_W	0.07	mg/L

Table 6.127. 13 Metal Results in Groundwater Samples. Site 57.

TSF values in groundwater samples ranged from 240 rfu to 2,072 rfu, with an average of 1,219 rfu (**Table 6.124**). The TSF values for UCAL_J_WP1_W and UCAL_J_WP2_W are reversed in magnitude compared to their returns for TPH.

The PAH analysis was conducted on one down gradient groundwater sample. A total PAH concentration of 395.9 ng/g was returned for the UCAL_J_WP1_W sample (**Table 6.125**). This appears to correspond to the TPH returns for the sample.

Phase I sediment samples were analyzed for barium, chromium and lead (**Figure 6.16c**). Two samples 014B and 015A were submitted for analysis in this phase of the investigation (**Table 6.126**). Barium was encountered in both samples, but in low levels for the 014B sample and relatively high concentrations in sample 015A. 24 ug/g of lead was detected in sample 015A, not a very high concentration but still a source for concern. This sample was collected in a suspect work area.

One Phase II sediment sample was analyzed for EPA 13 priority metals. No monitored metals were found in concentrations above detect levels for this sample.

Three Phase II groundwater samples were analyzed for EPA 13 priority metals (**Table 6.127**). Above detection levels for some of the analyzed metals were returned in UCal_J_WP1_W and UCal_J_WP3_W. Only zinc was present in UCal_J_WP3_W. Chromium, zinc and nickel were present in the UCal_J_WP1_W sample.

The specific conductance of the groundwater was measured on site. Values ranged from 710 mS/cm to 1060 mS/cm with an average of 870 mS/cm (**Table 6.128**).

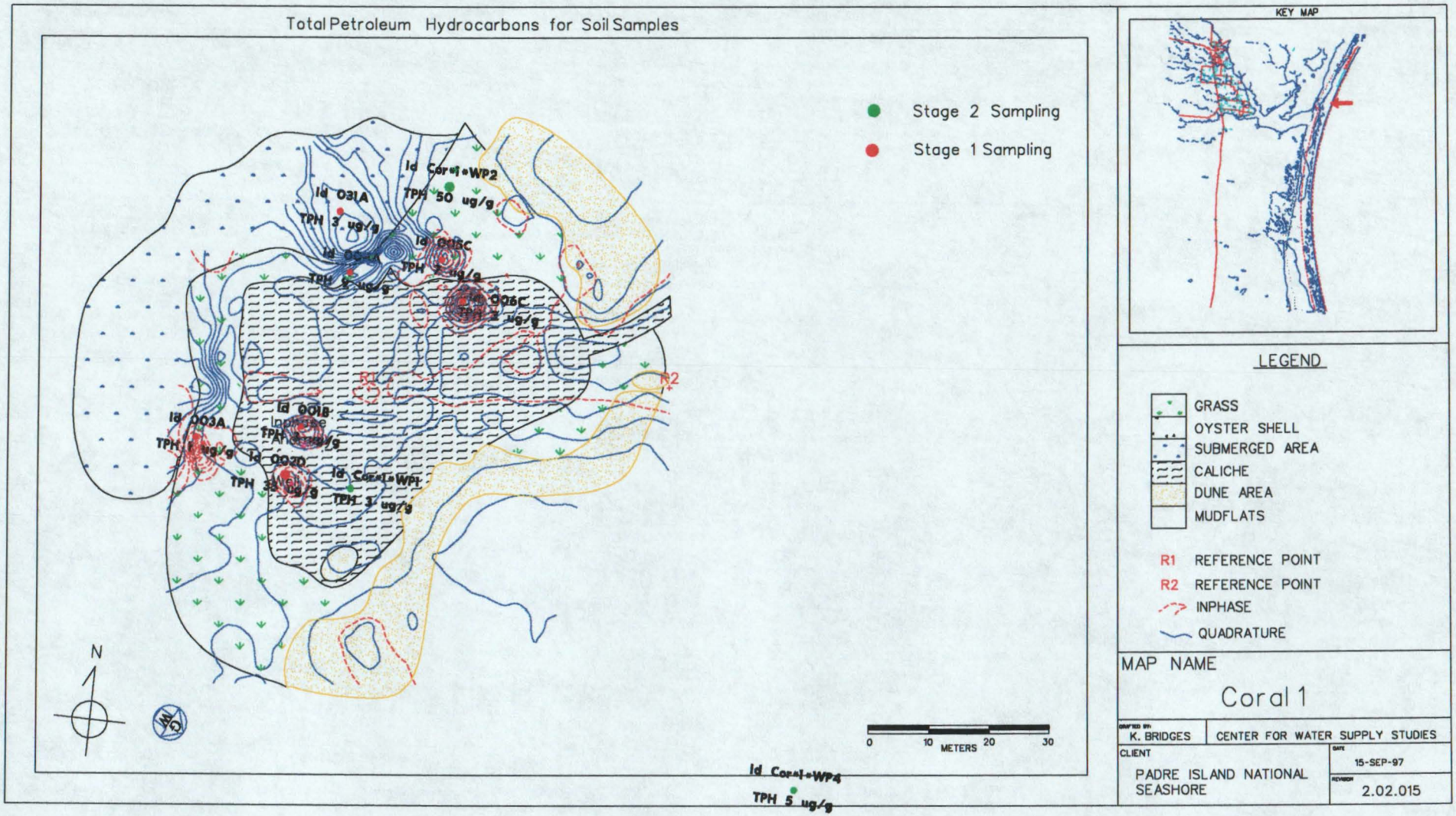


Figure 6.1a Total Petroleum Hydrocarbon Results for Soils at Site Id 15 - Coral Oil #1

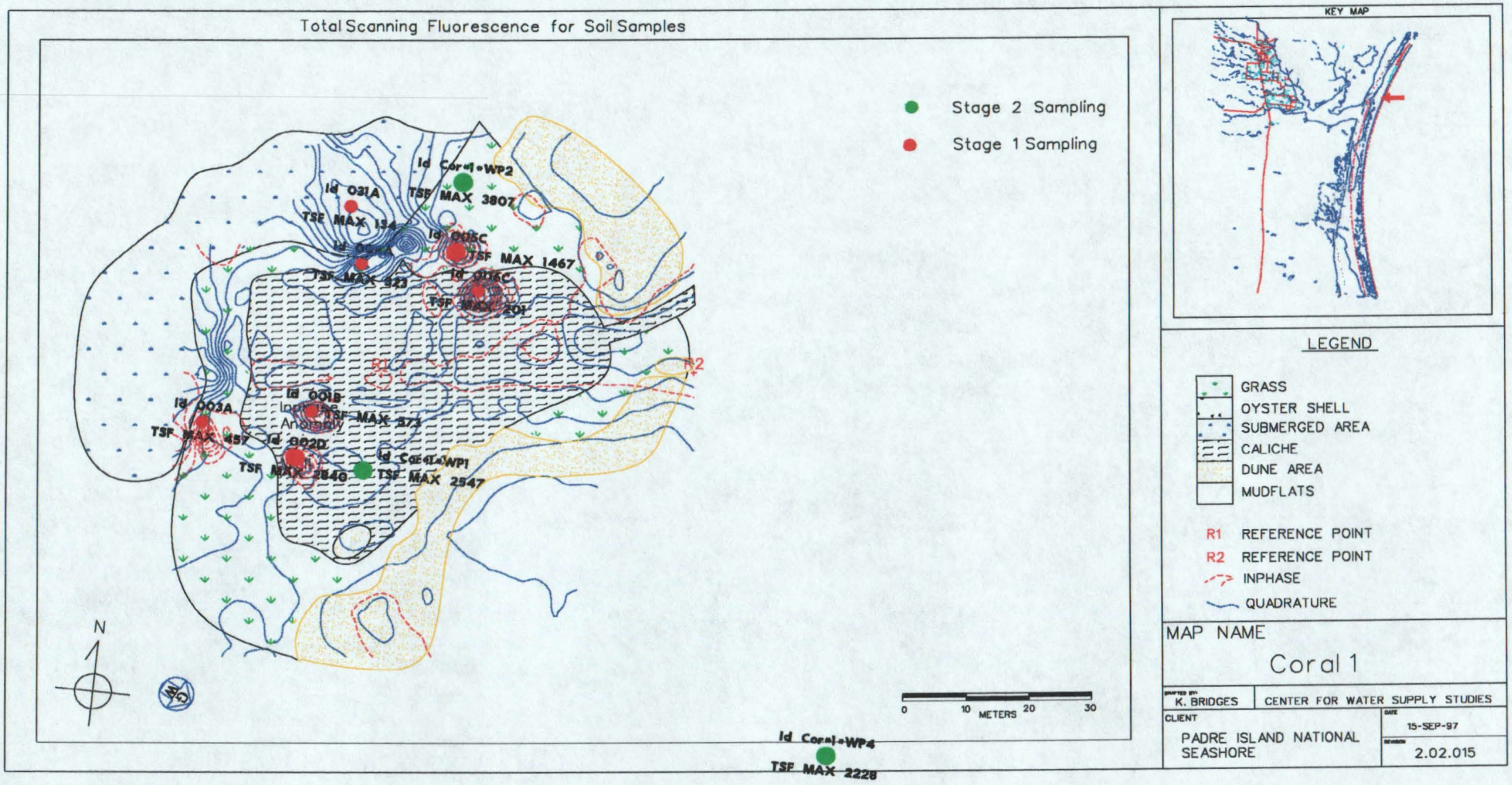


Figure 6.1b Total Scanning Flourescence (Max.) Results for Soils at Site Id 15 - Coral Oil #1

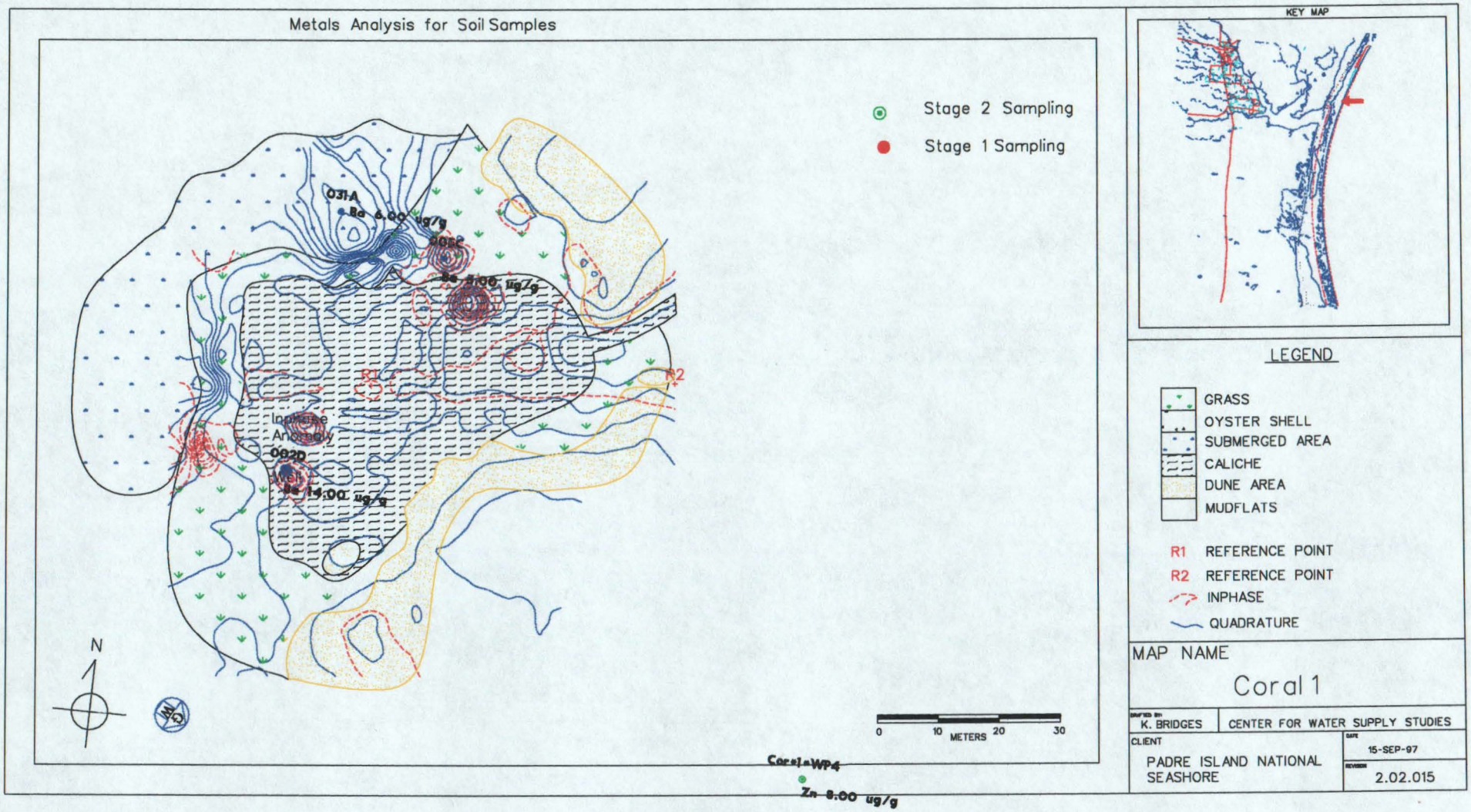


Figure 6.1c Metals Results for Soils at Site Id 15 - Coral Oil #1

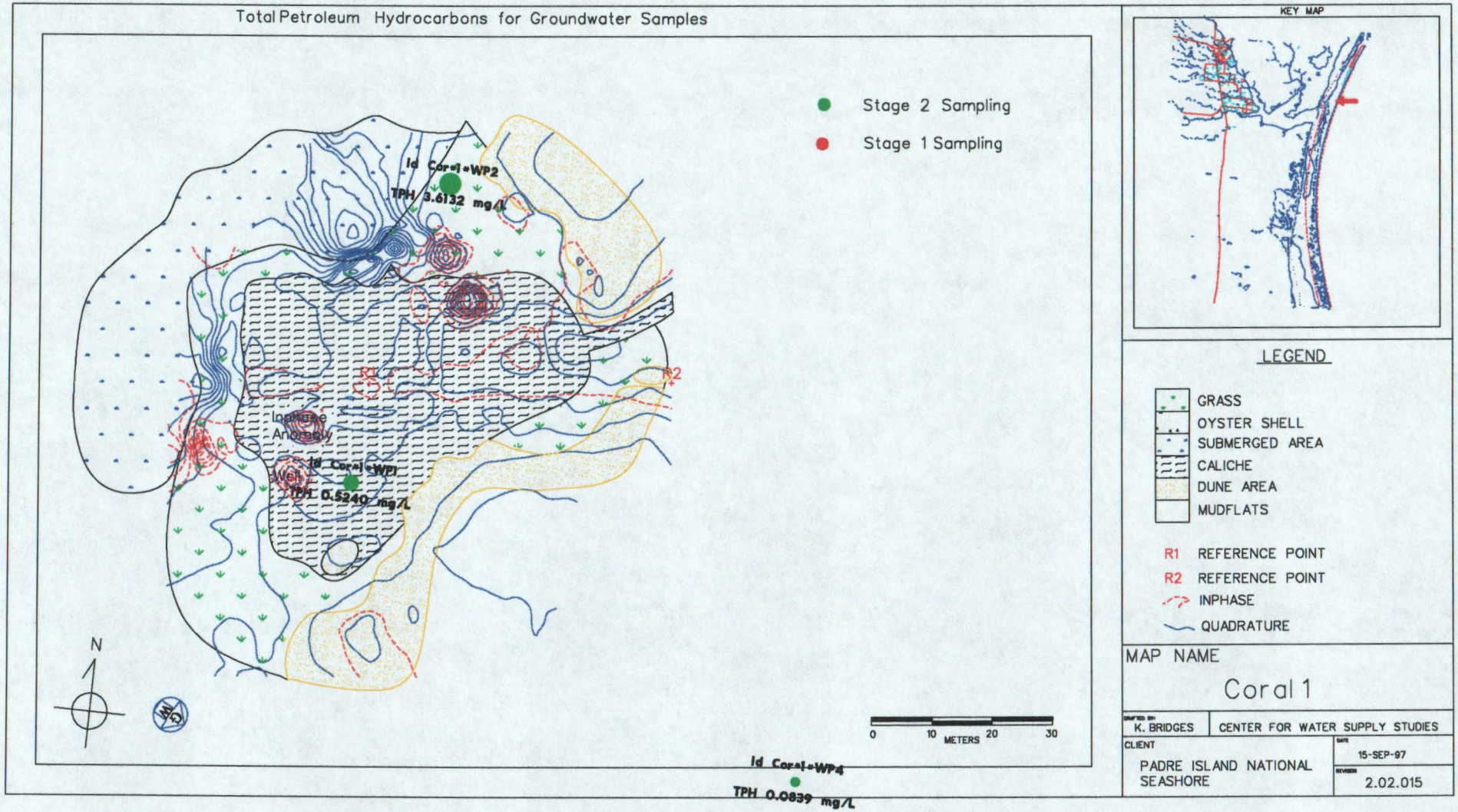


Figure 6.1d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 15 - Coral Oil #1

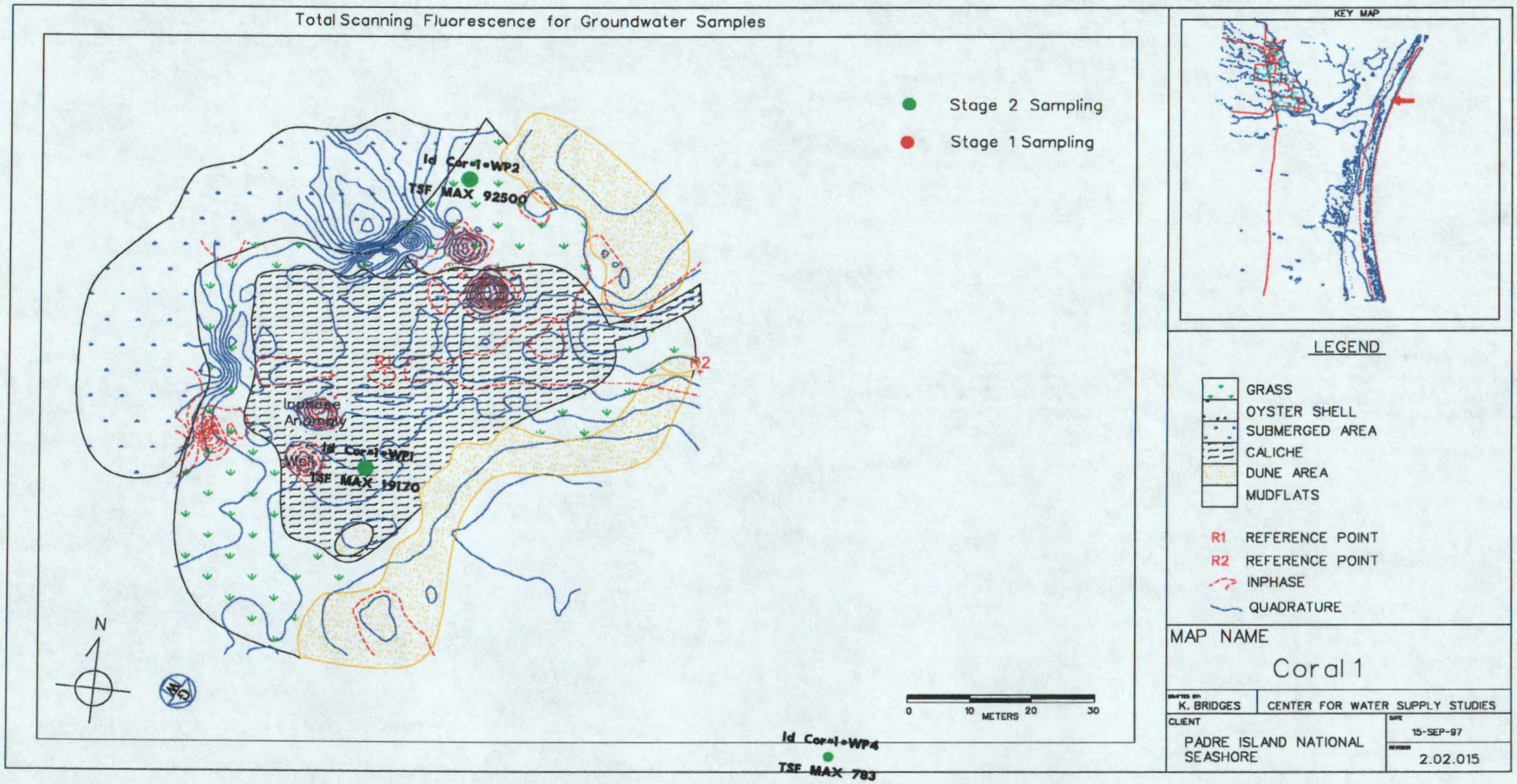


Figure 6.1e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 15 - Coral Oil #1

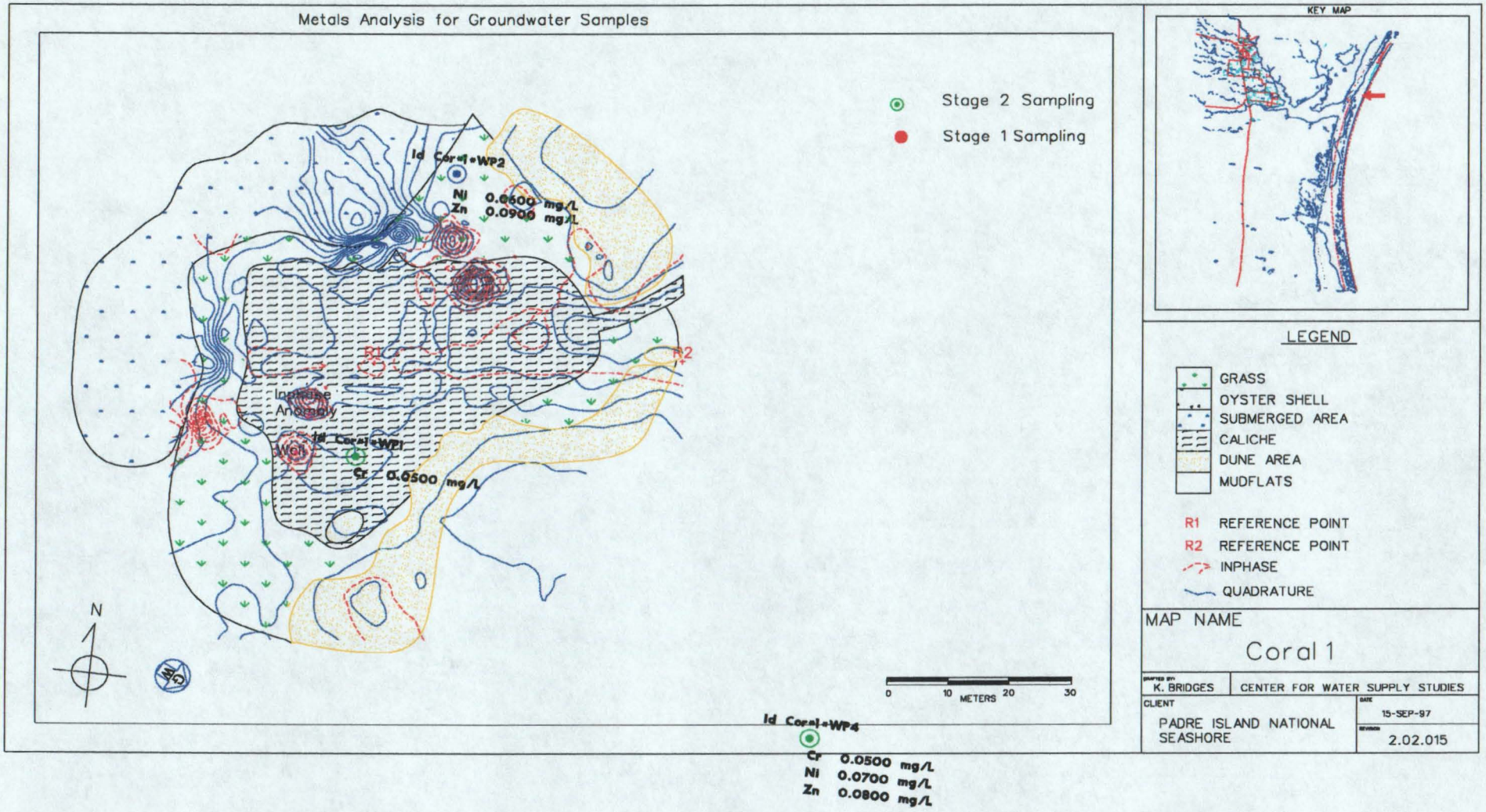


Figure 6.1f Metals Results for Groundwater at Site Id 15 - Coral Oil #1

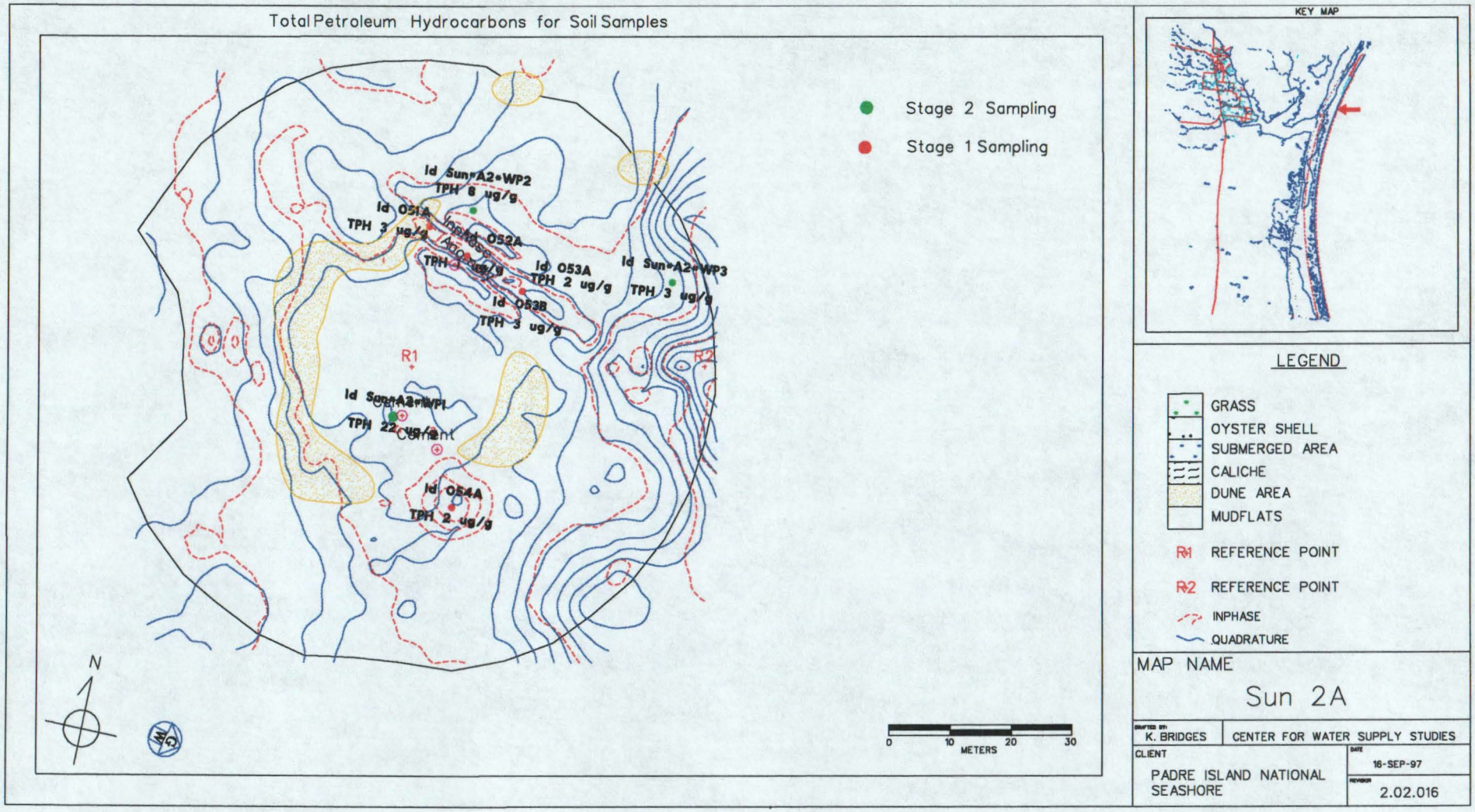


Figure 6.2a Total Petroleum Hydrocarbon Results for Soils at Site Id 16 - Sun Oil #2-A

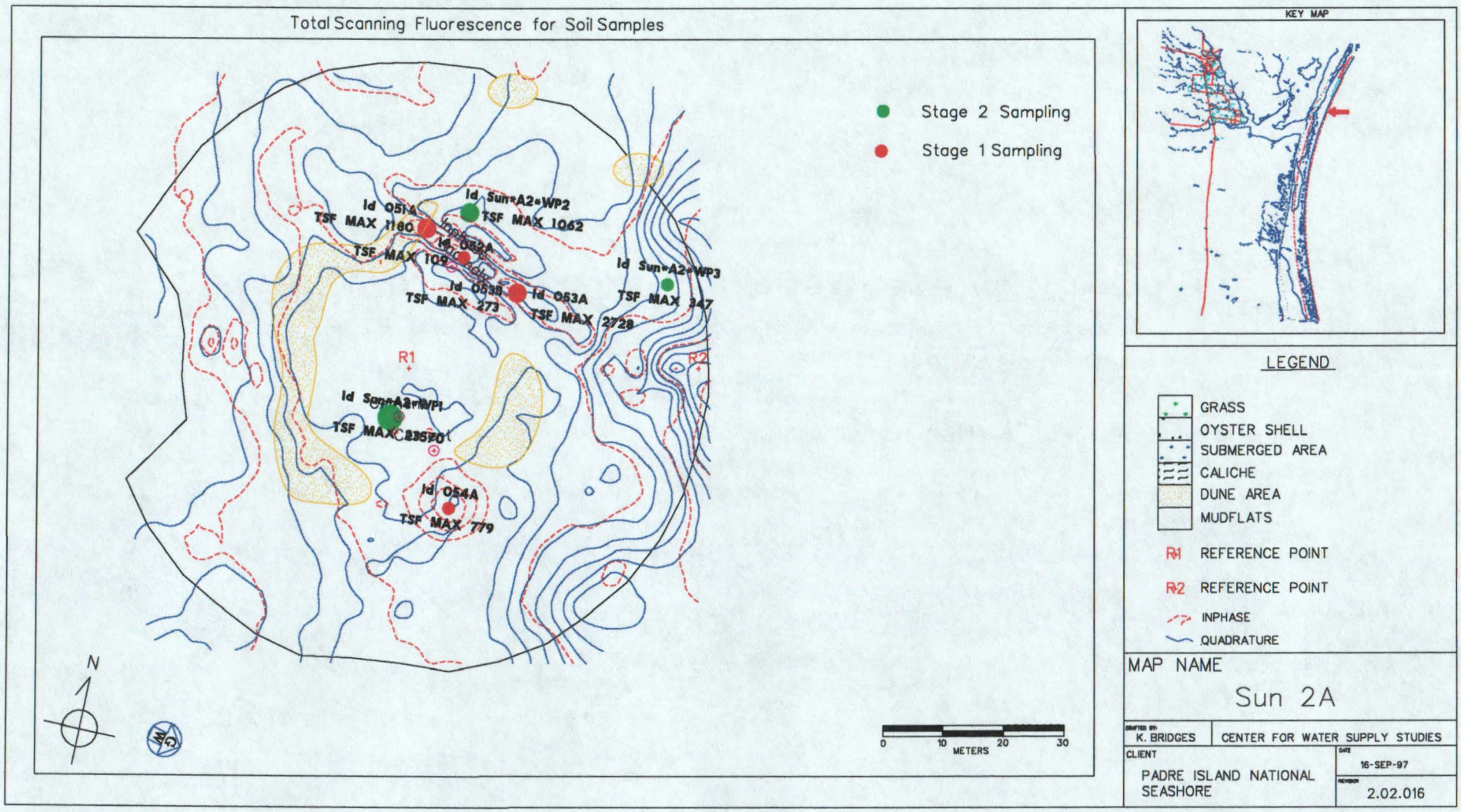


Figure 6.2b Total Scanning Flourescence (Max.) Results for Soils at Site Id 16 - Sun Oil #2-A

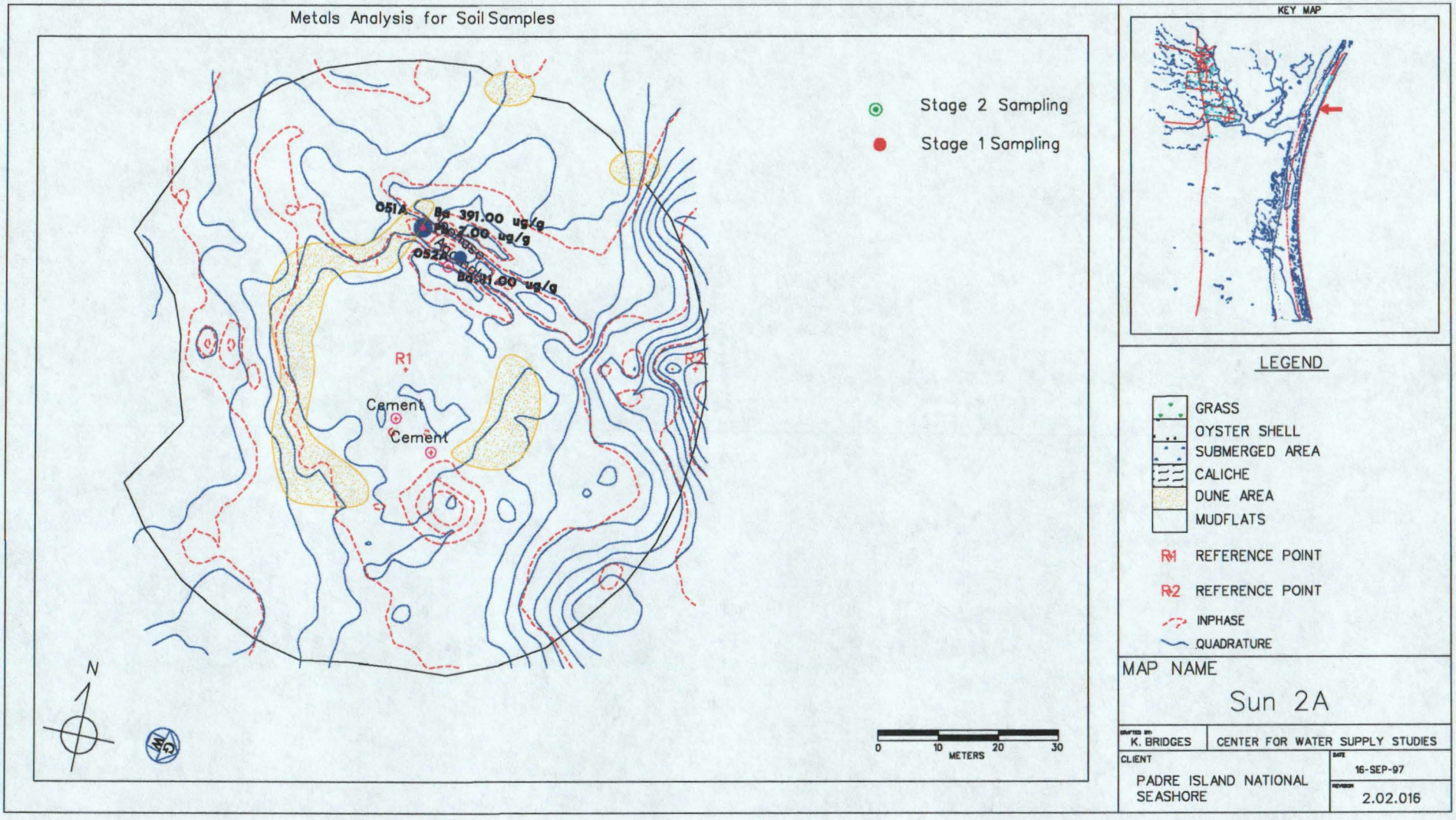


Figure 6.2c Metals Results for Soils at Site Id 16 - Sun Oil #2-A

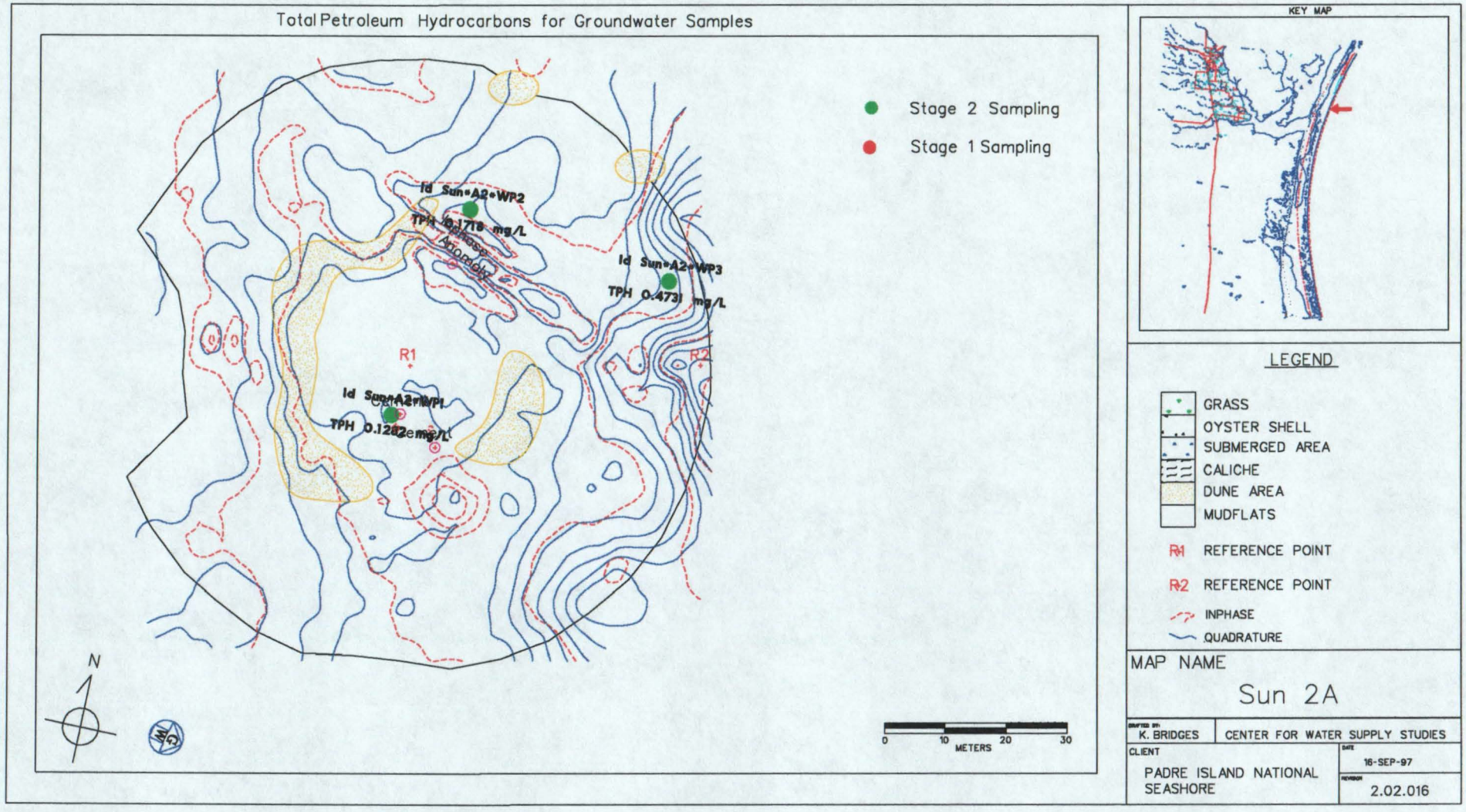


Figure 6.2d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 16 - Sun Oil #2-A

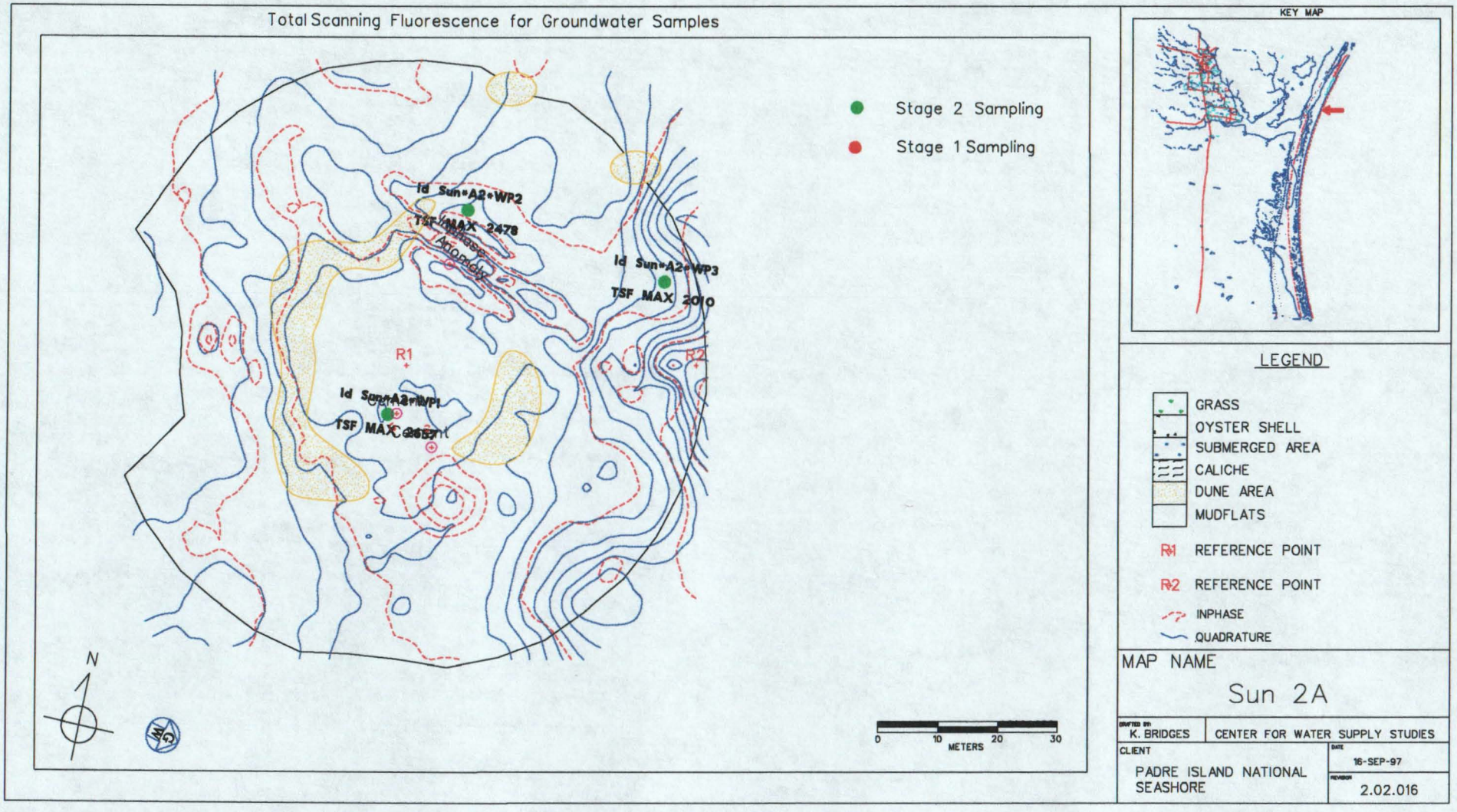


Figure 6.2e Total Scanning Fluorescence (Max) Result for Groundwater at Site Id 16 - Sun Oil #2-A

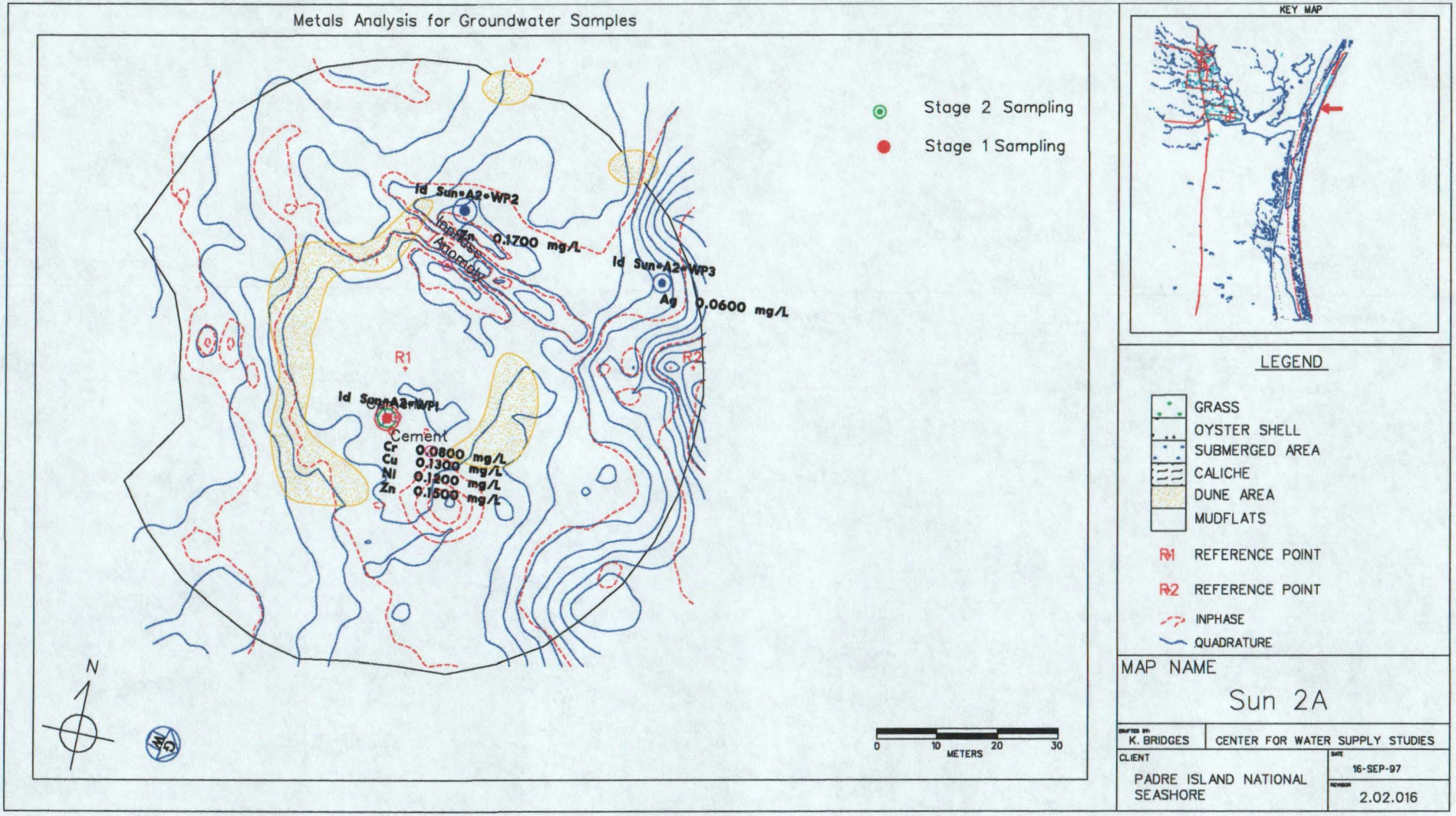


Figure 6.2f Metals Results for Groundwater at Site Id 16 - Sun Oil #2-A

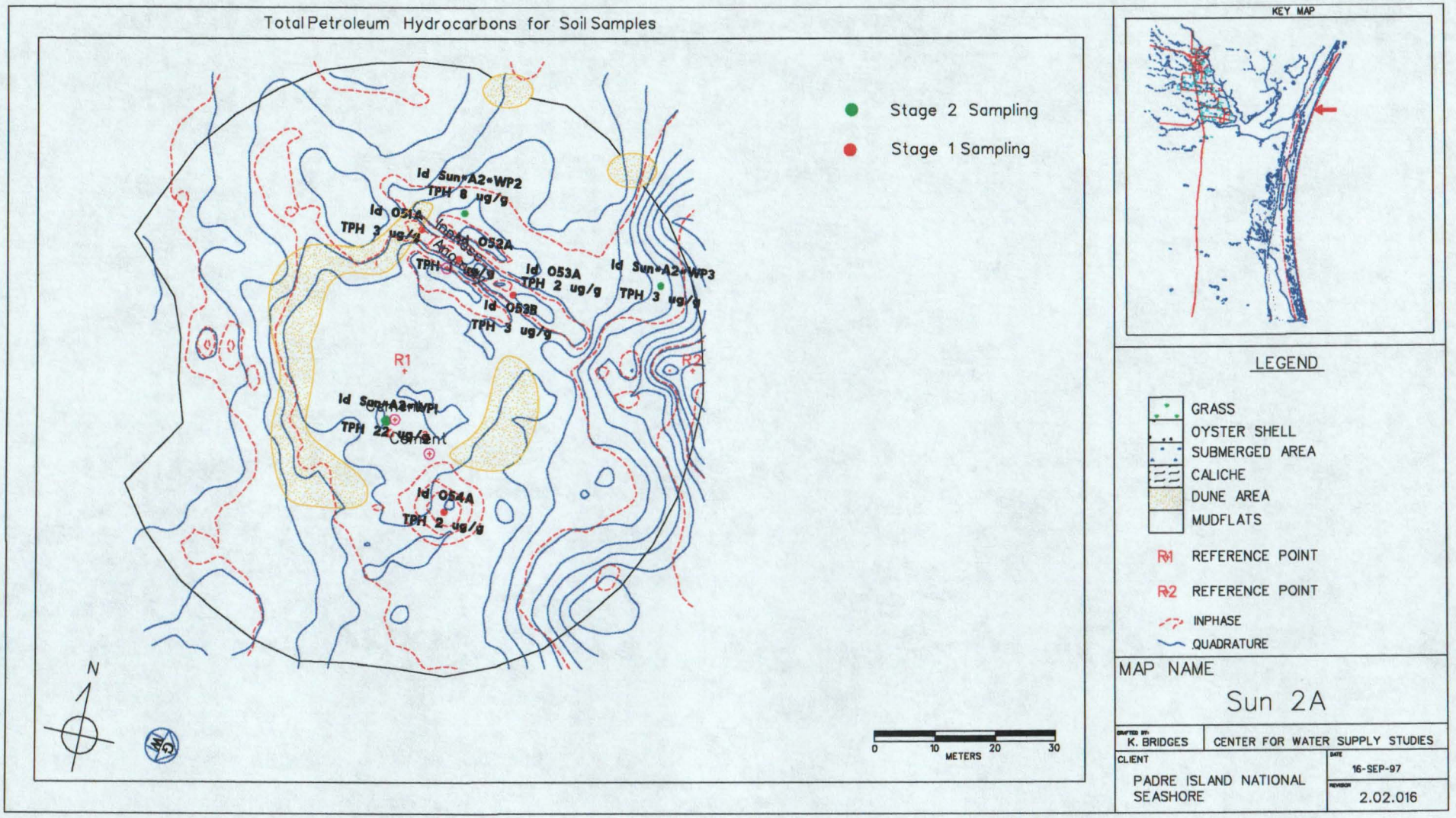


Figure 6.3a Total Petroleum Hydrocarbon Results for Soils at Site Id 29 - Pelto #1

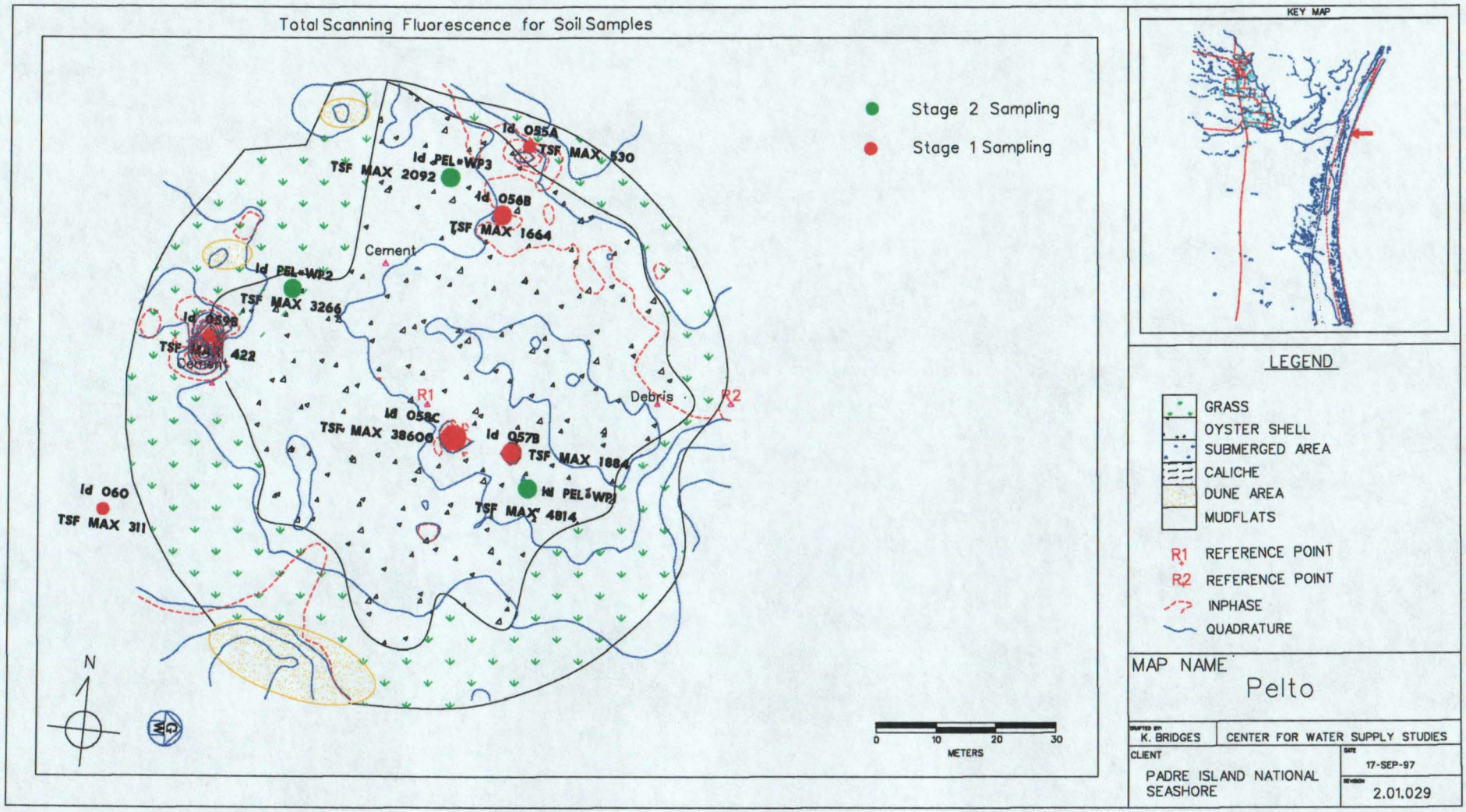


Figure 6.3b Total Scanning Flourescence (Max.) Results for Soils at Site Id 29 - Pelto #1

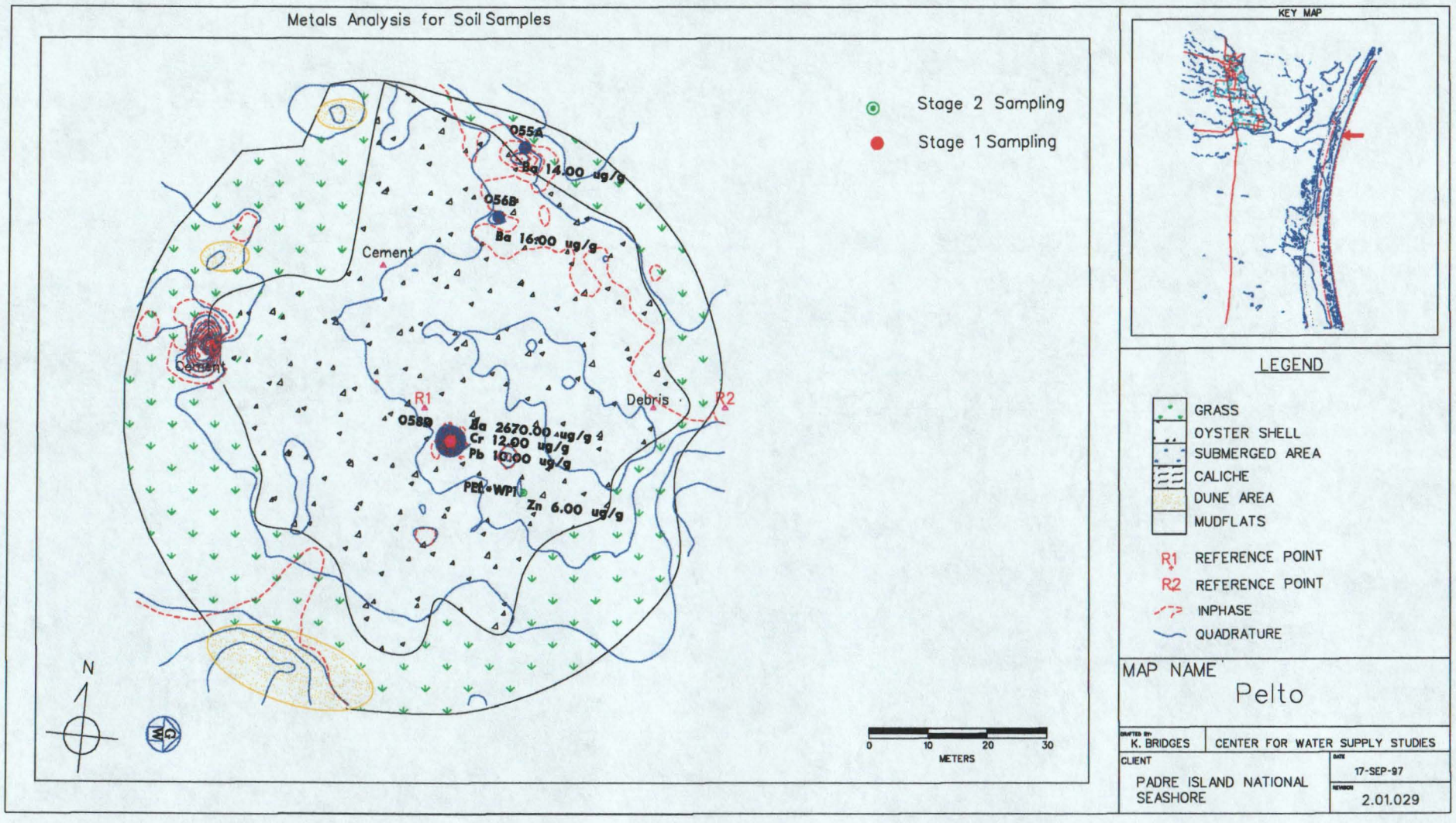


Figure 6.3c Metals Results for Soils at Site Id 29 - Pelto #1

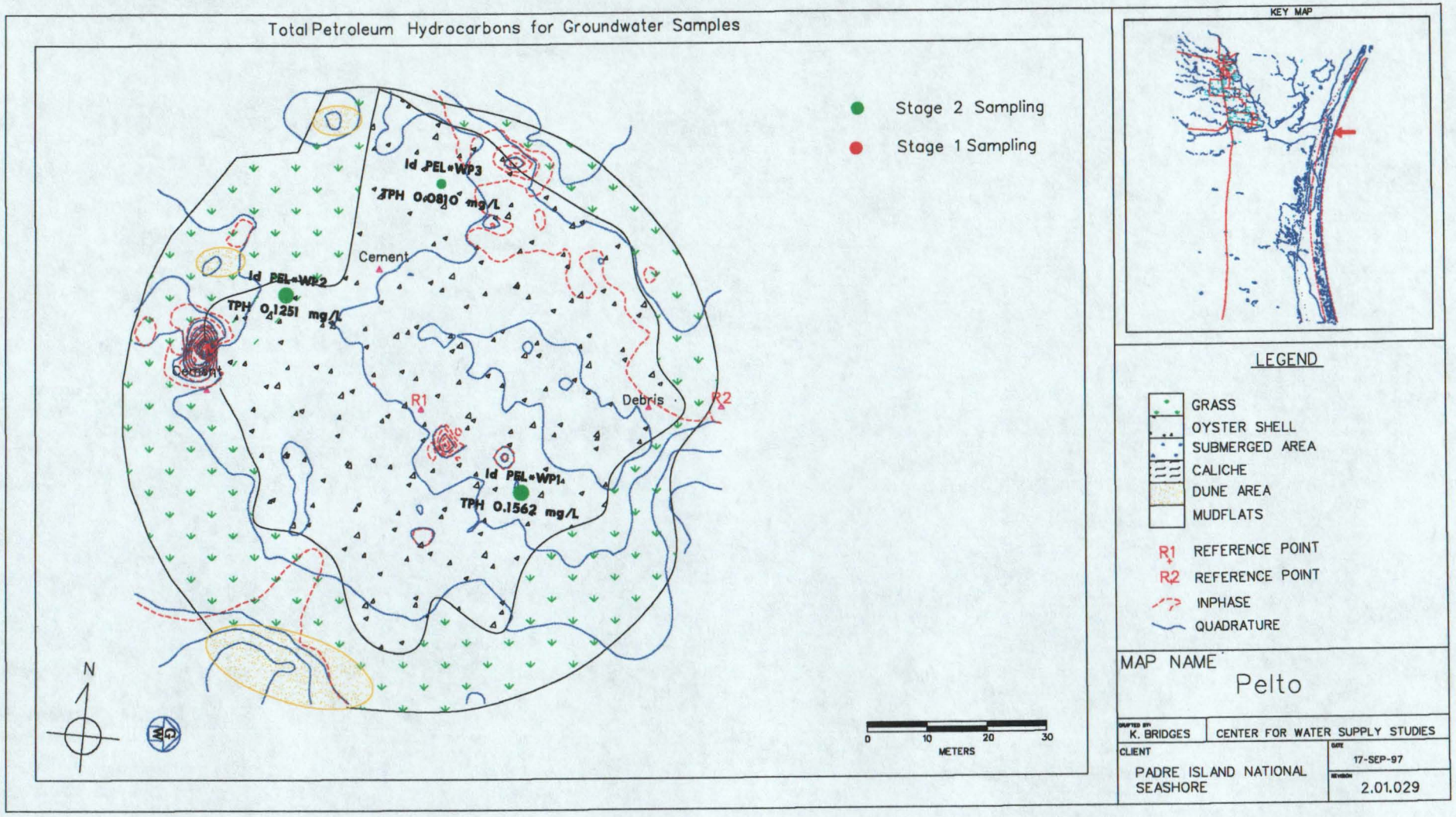


Figure 6.3d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 29 - Pelto #1

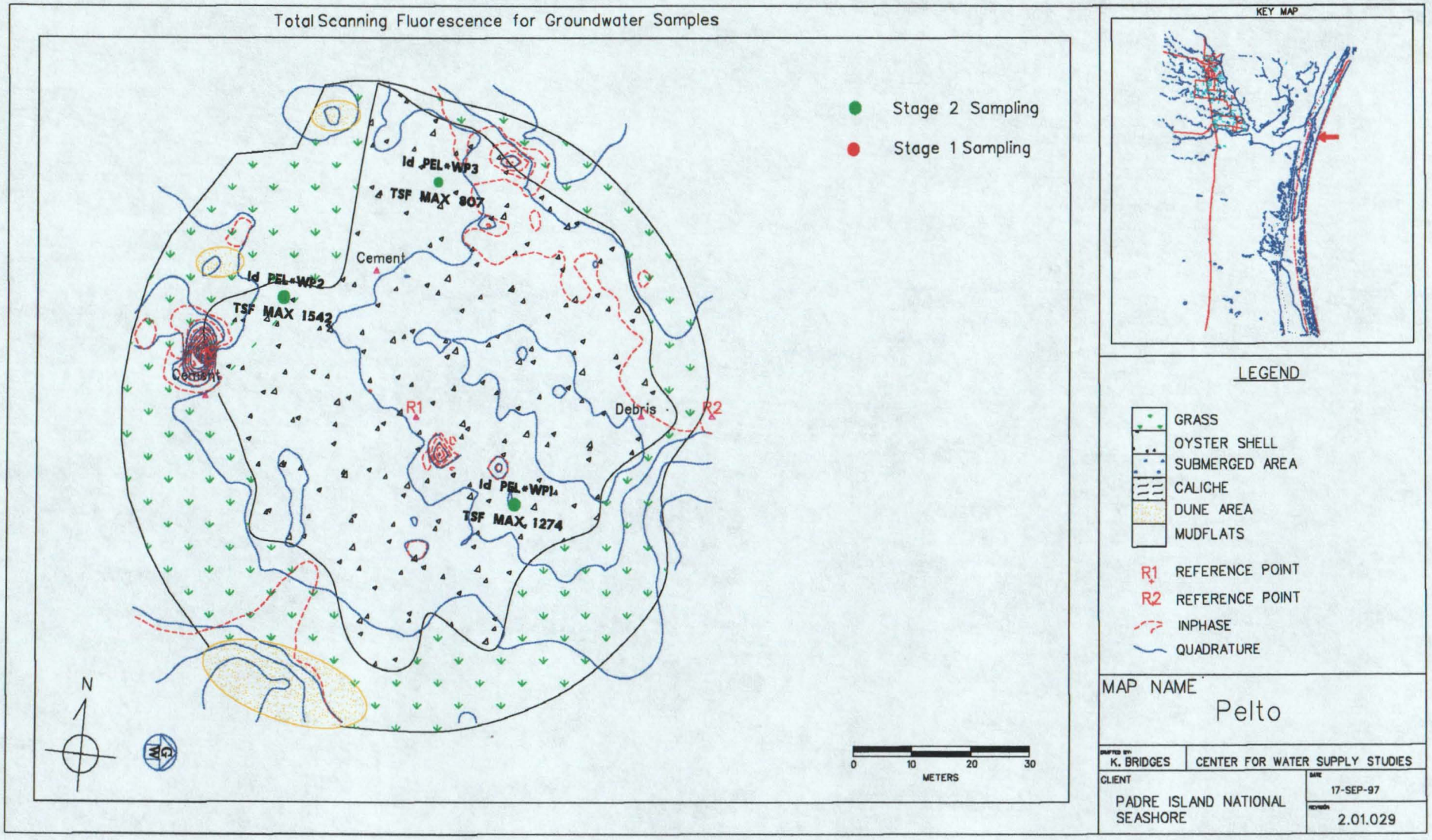


Figure 6.3e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 29 - Pelto #1

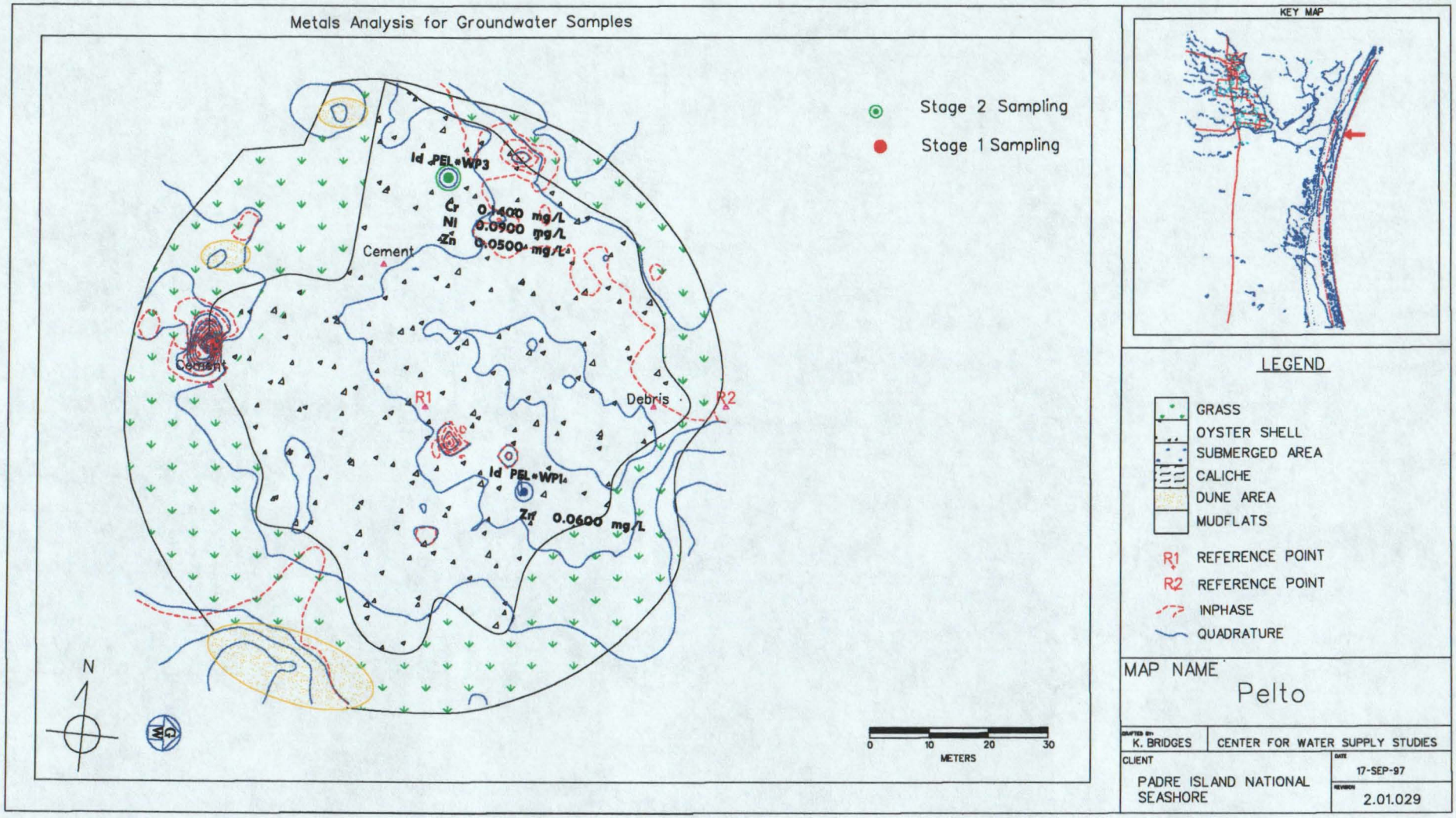


Figure 6.3f Metals Results for Groundwater at Site Id 29 - Pelto #1

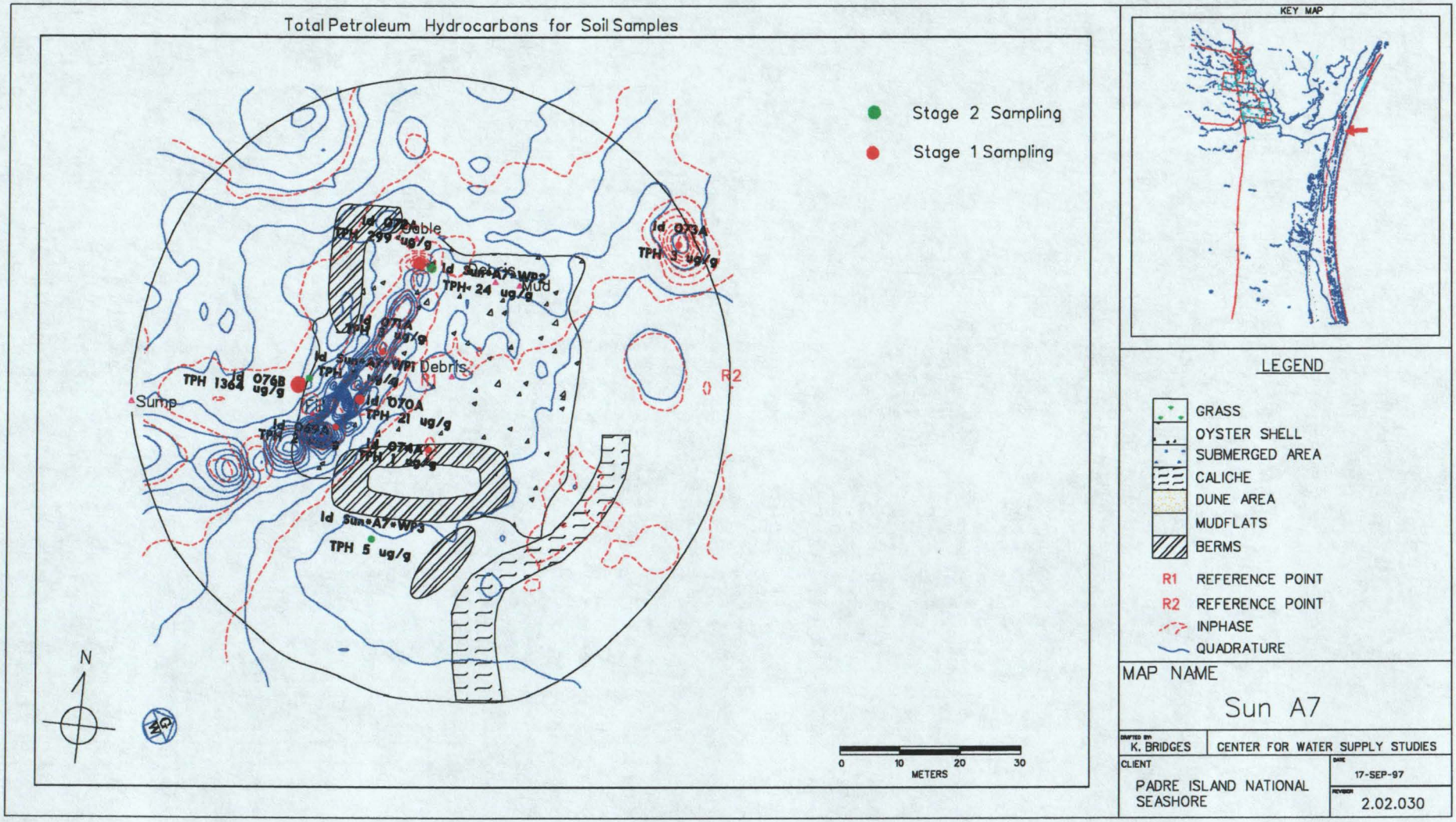


Figure 6.4a Total Petroleum Hydrocarbon Results for Soils at Site Id 30 - Sun Oil A-7

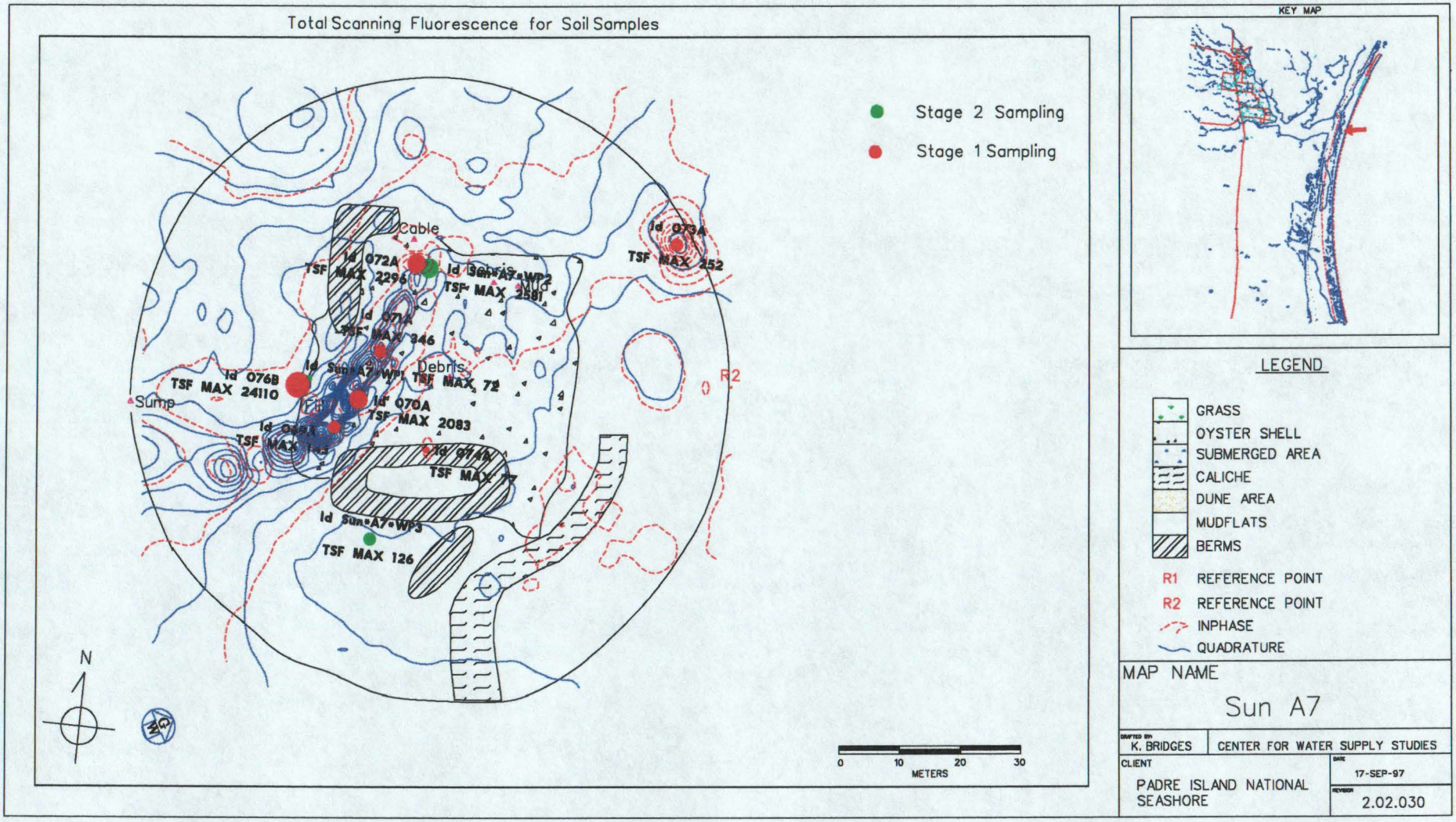


Figure 6.4b Total Scanning Flourescence (Max.) Results for Soils at Site Id 30 - Sun Oil A-7

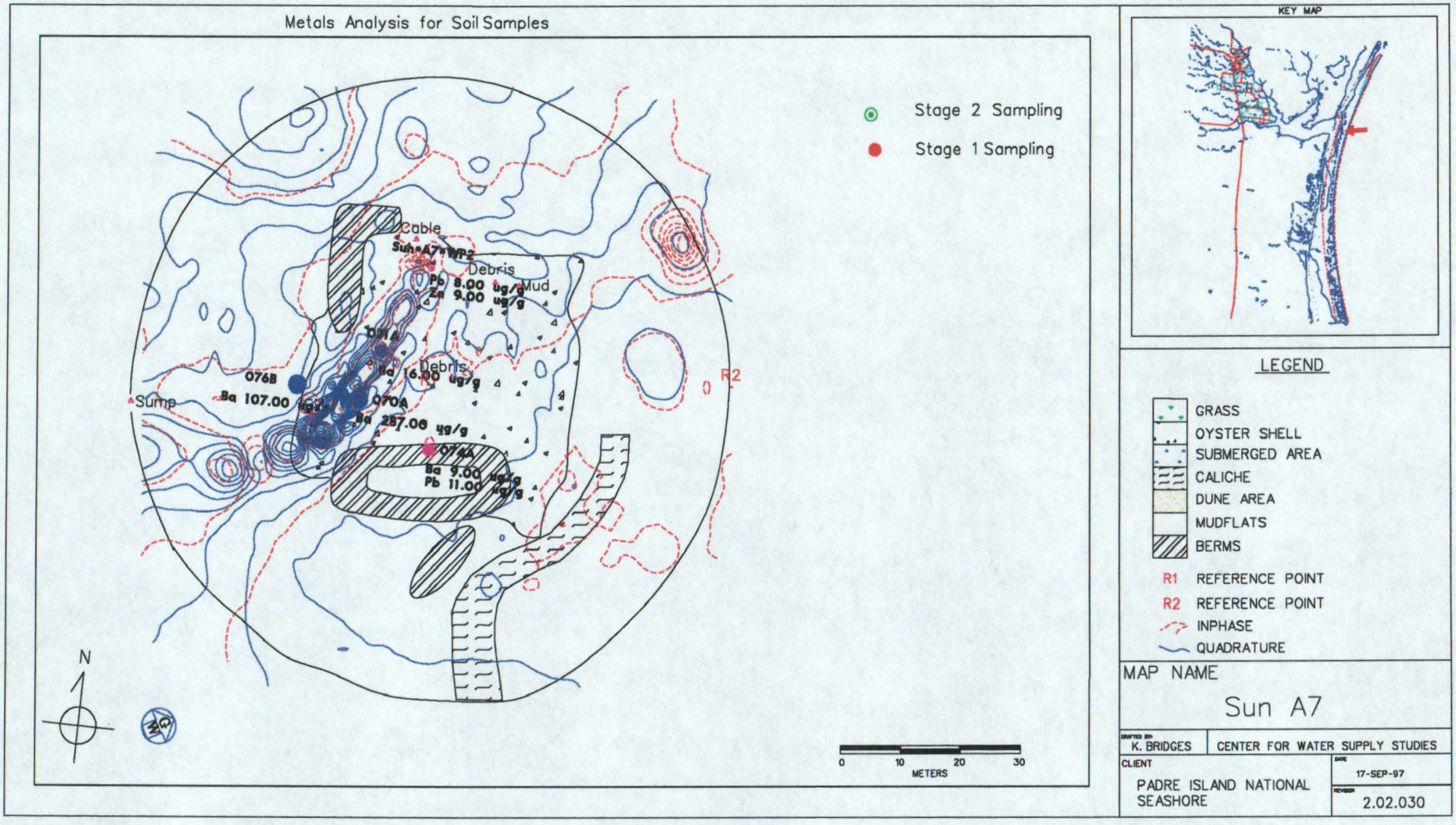


Figure 6.4c Metals Results for Soils at Site Id 30 - Sun Oil A-7

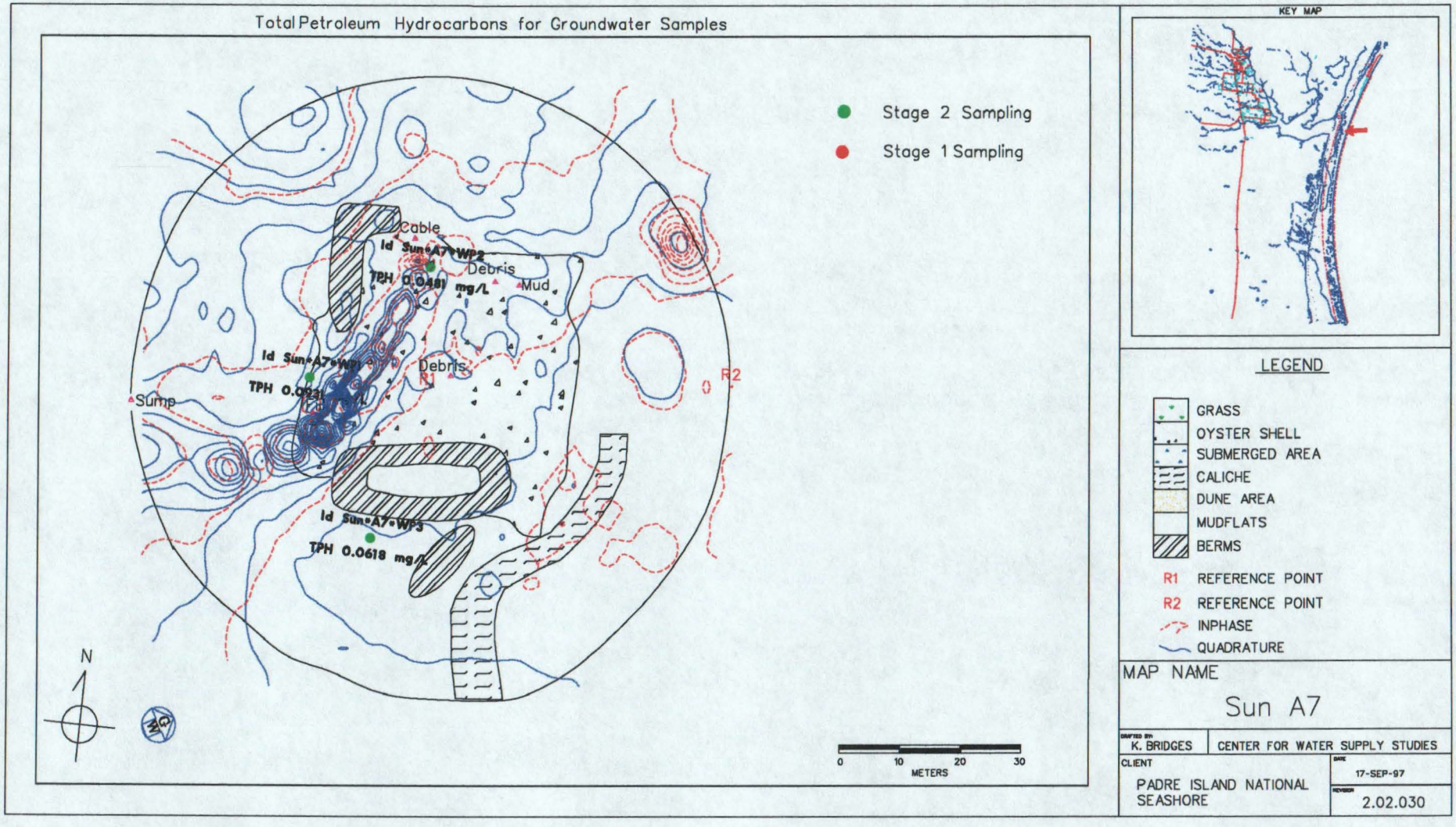


Figure 6.4d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 30 - Sun Oil A-7

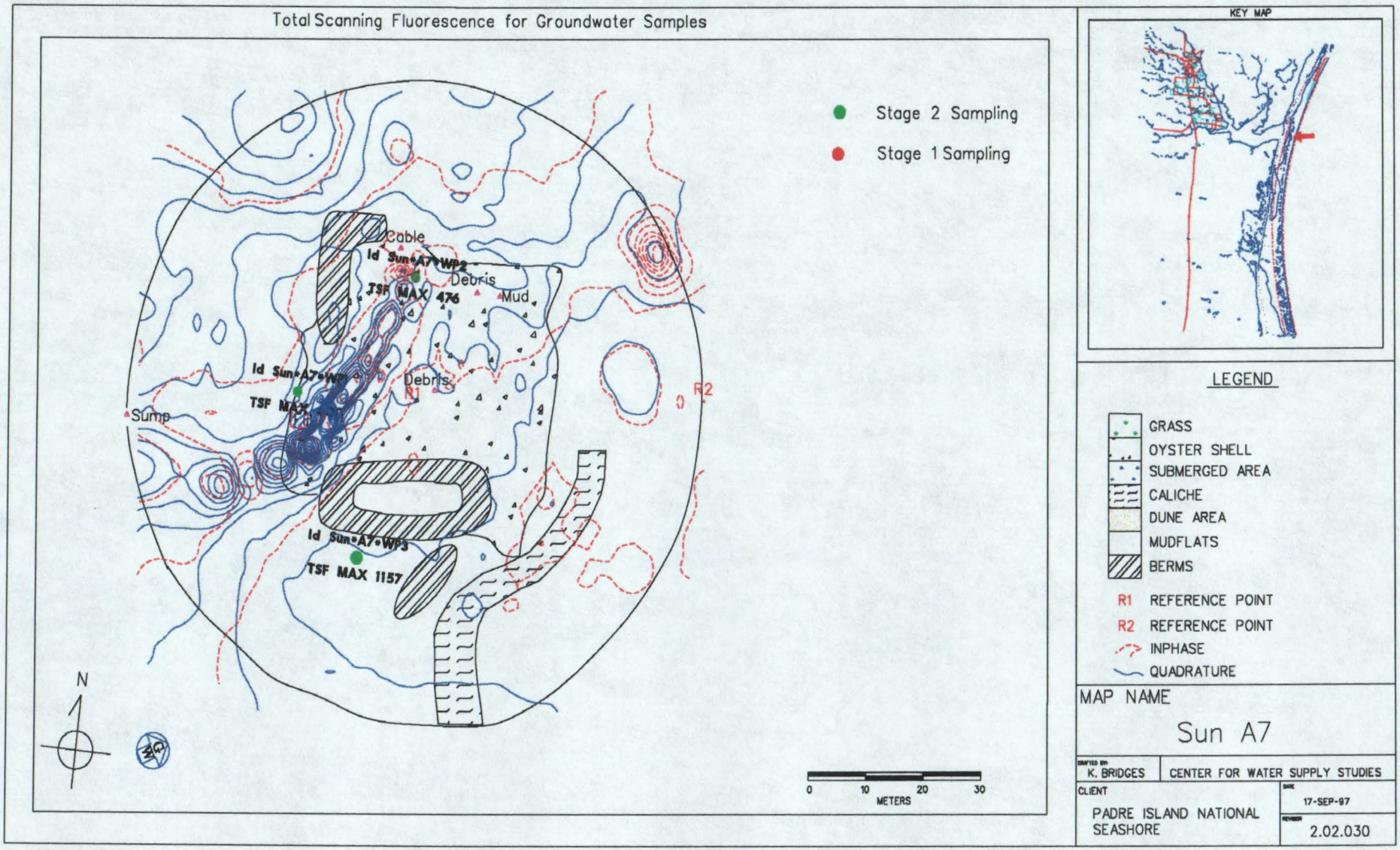


Figure 6.4e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 30 - Sun Oil A-7

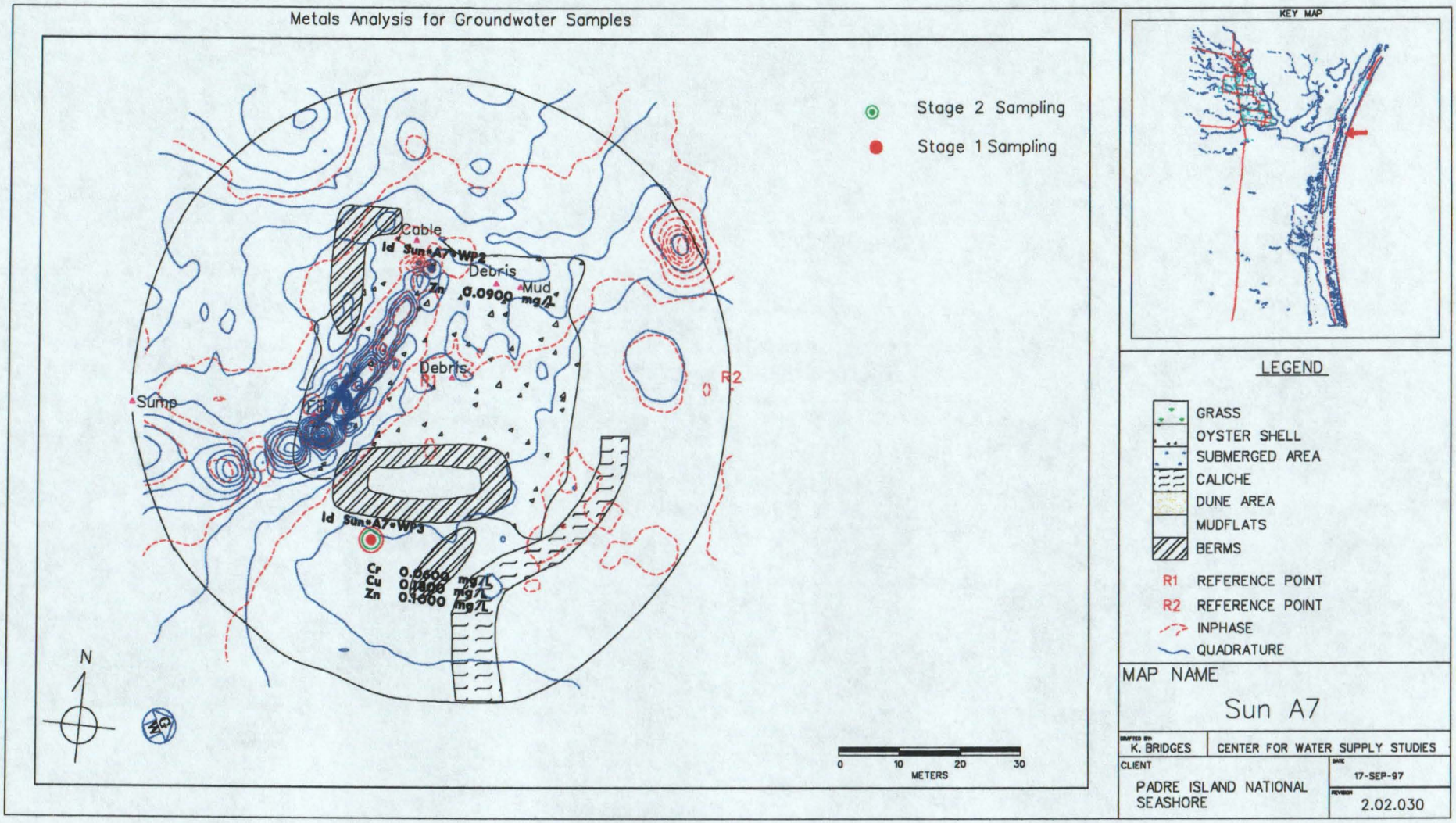


Figure 6.4f Metals Results for Groundwater at Site Id 30 - Sun Oil A-7

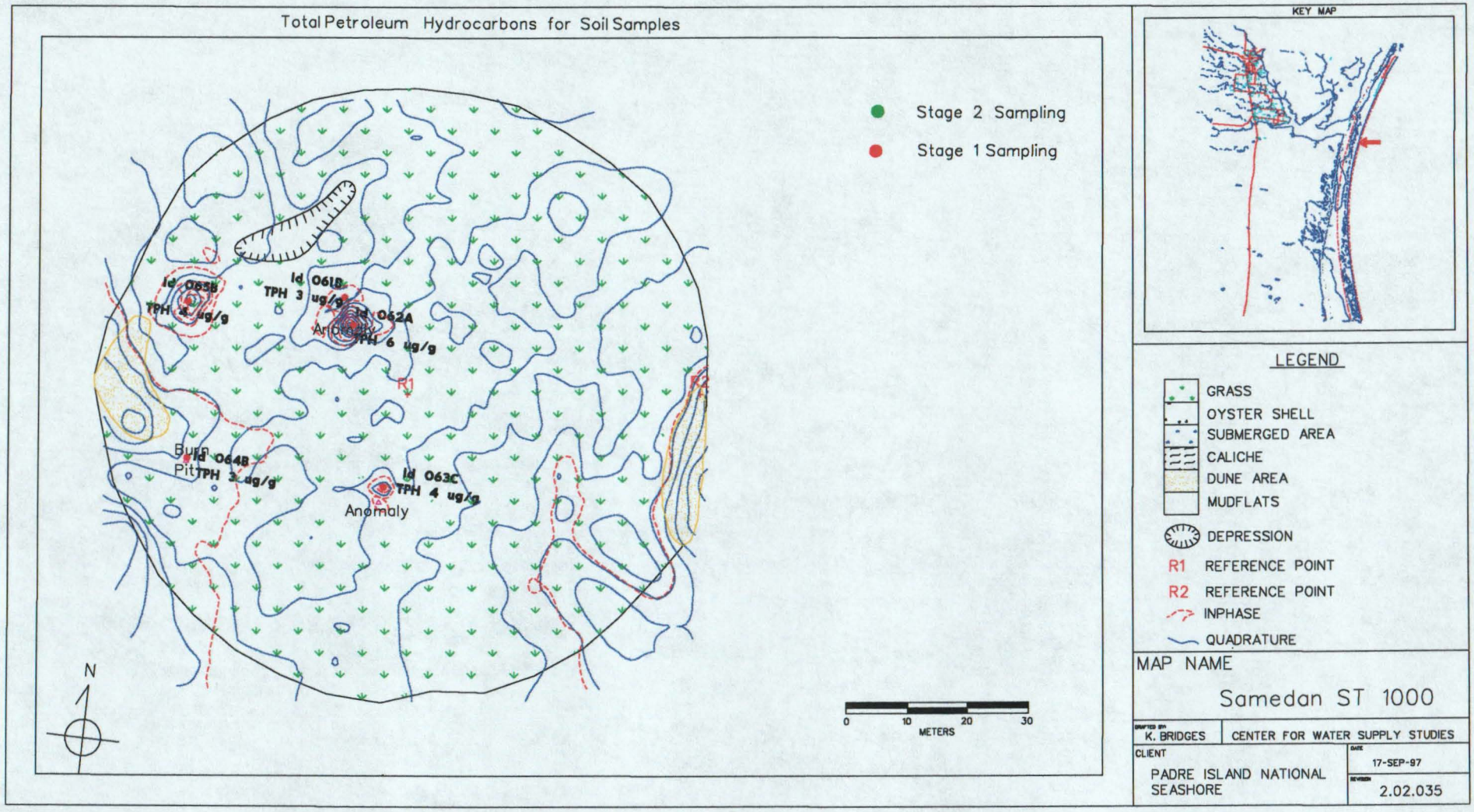


Figure 6.5a Total Petroleum Hydrocarbon Results for Soils at Site Id 35 - Samedan ST 1000

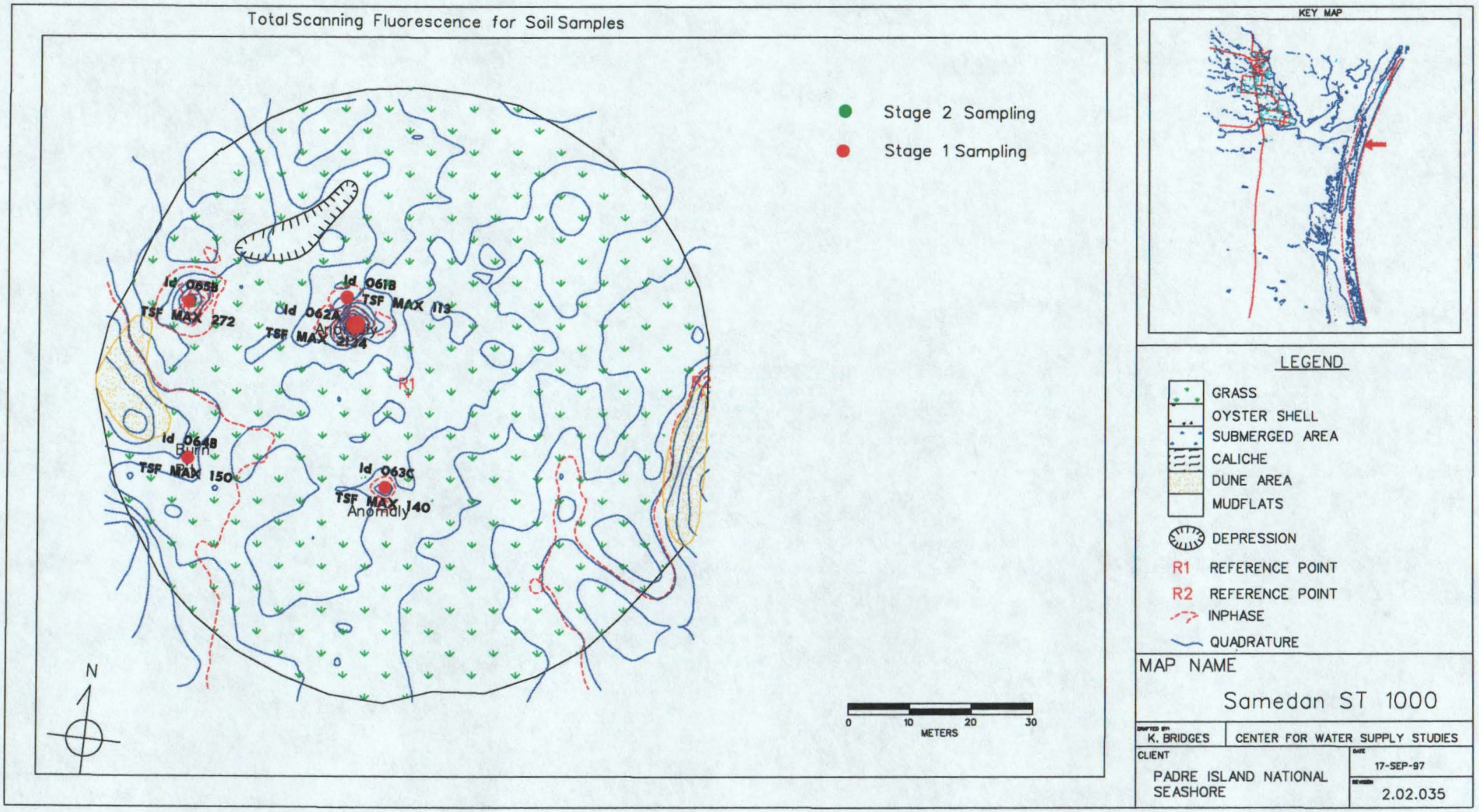


Figure 6.5b Total Scanning Flourescence (Max.) Results for Soils at Site Id 35 - Samedan ST 1000

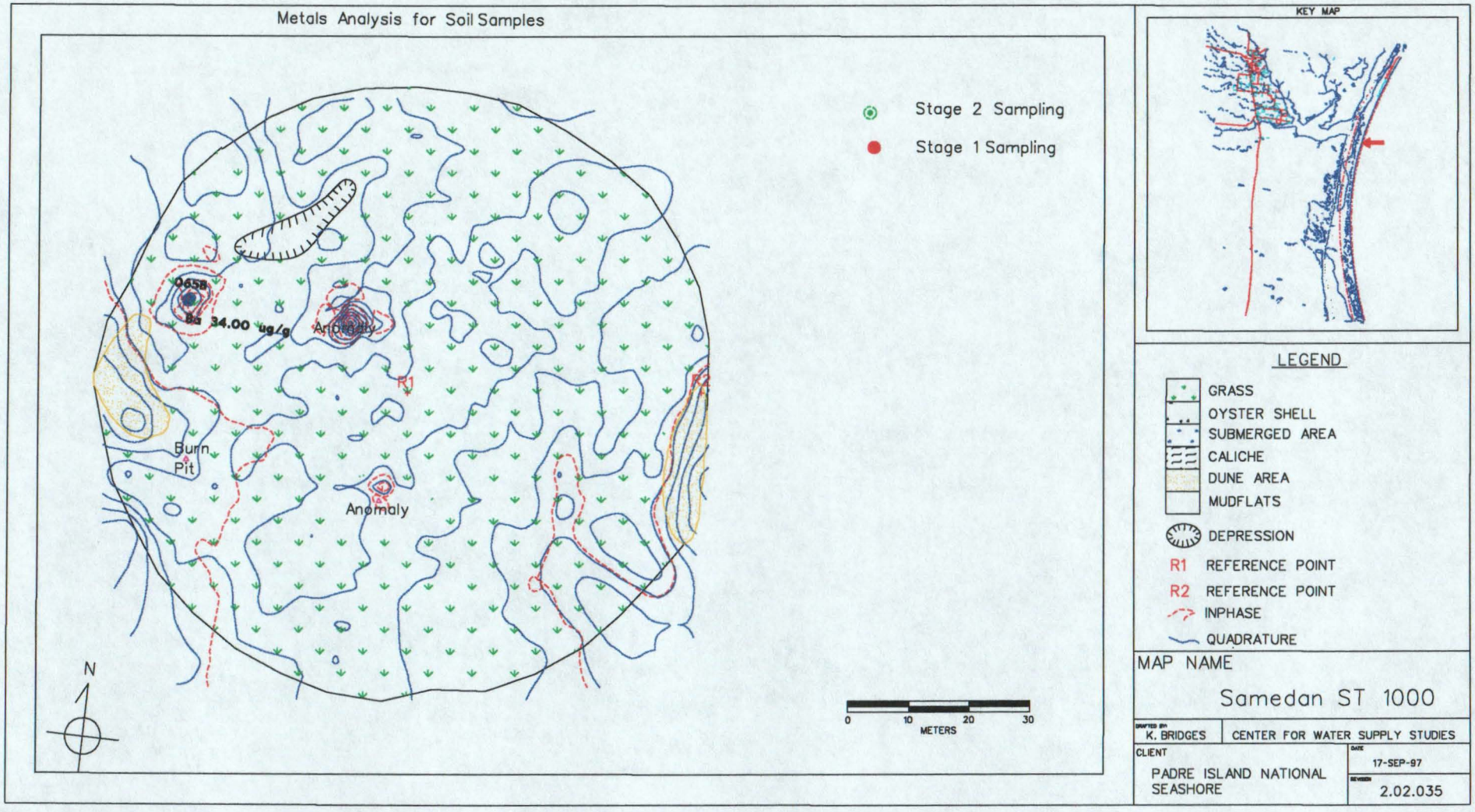


Figure 6.5c Metals Results for Soils at Site Id 35 - Samedan ST 1000

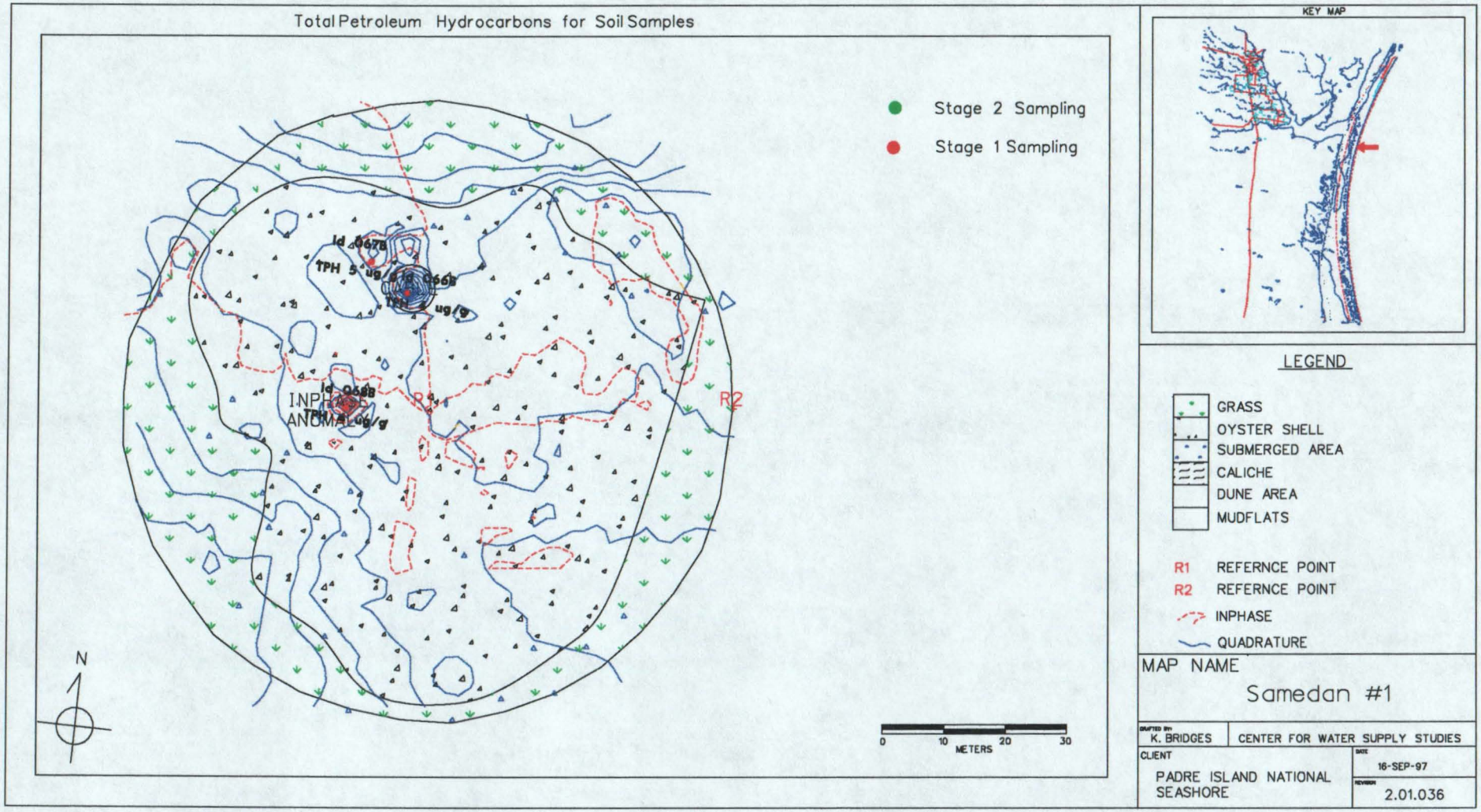


Figure 6.6a Total Petroleum Hydrocarbon Results for Soils at Site Id 36 - Samedan #1

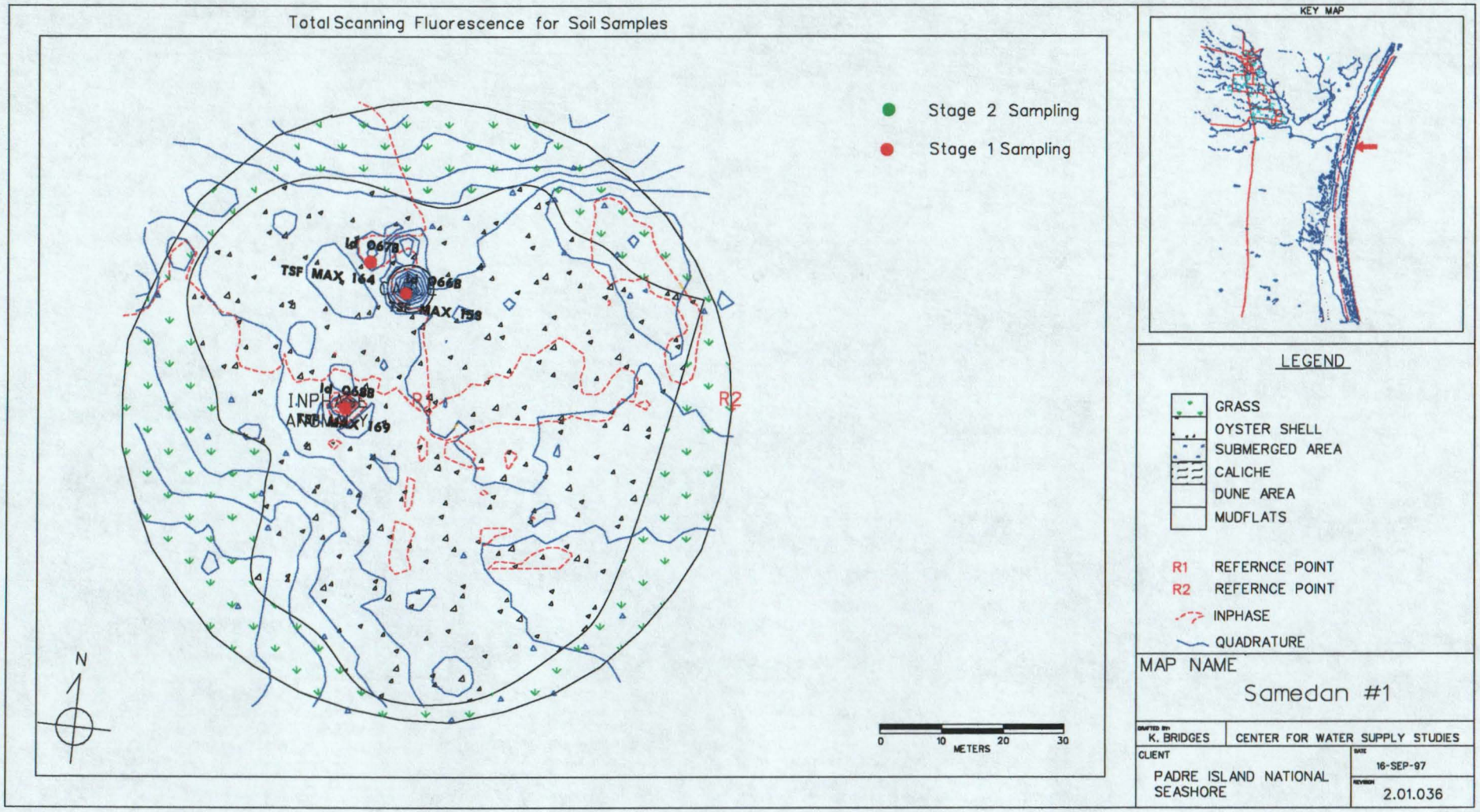


Figure 6.6b Total Scanning Flourescence (Max.) Results for Soils at Site Id 36 - Samedan #1

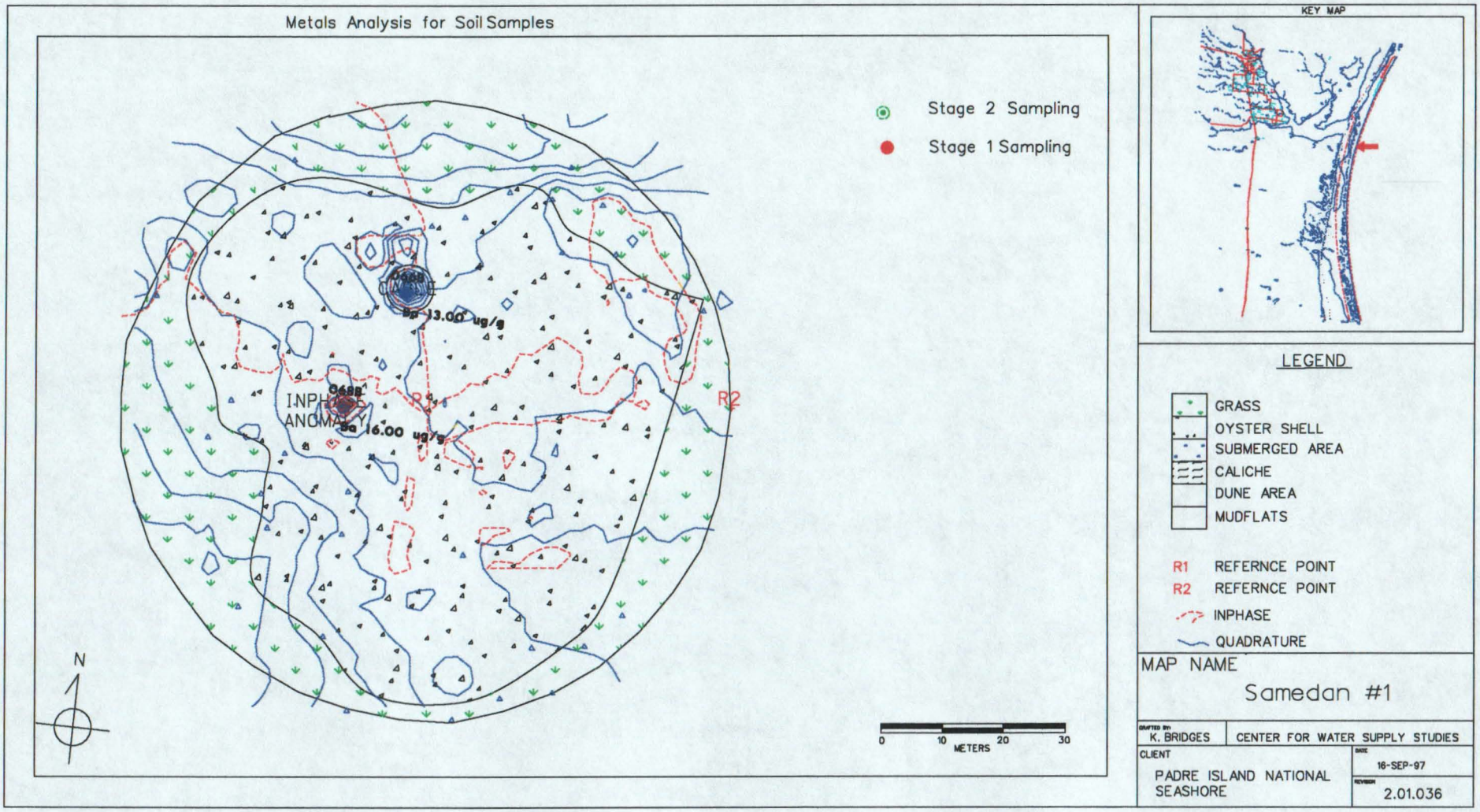


Figure 6.6c Metals Results for Soils at Site Id 36 - Samedan #1

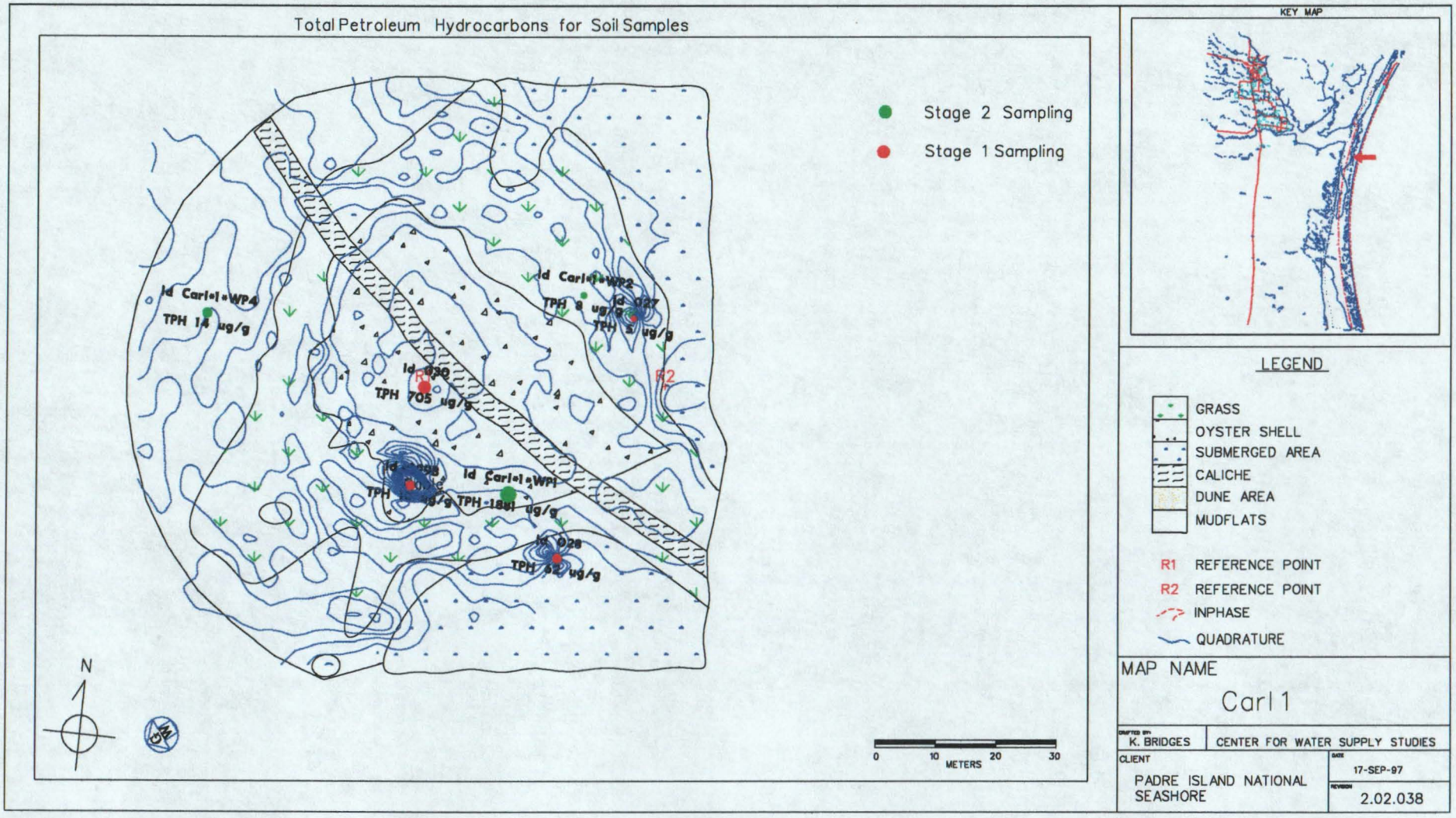


Figure 6.7a Total Petroleum Hydrocarbon Results for Soils at Site Id 38 - Carl #1

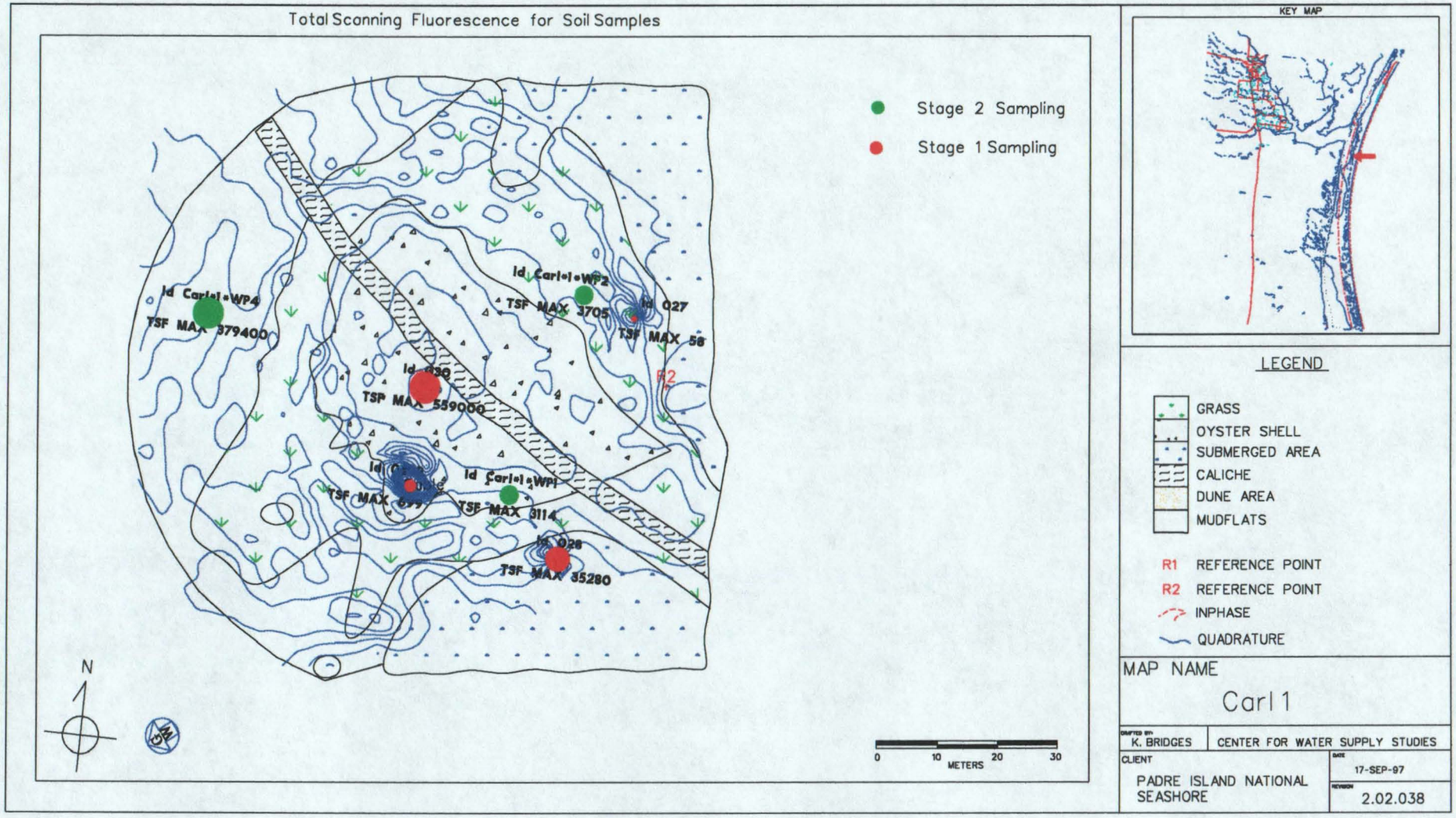


Figure 6.7b Total Scanning Flourescence (Max.) Results for Soils at Site Id 38 - Carl #1

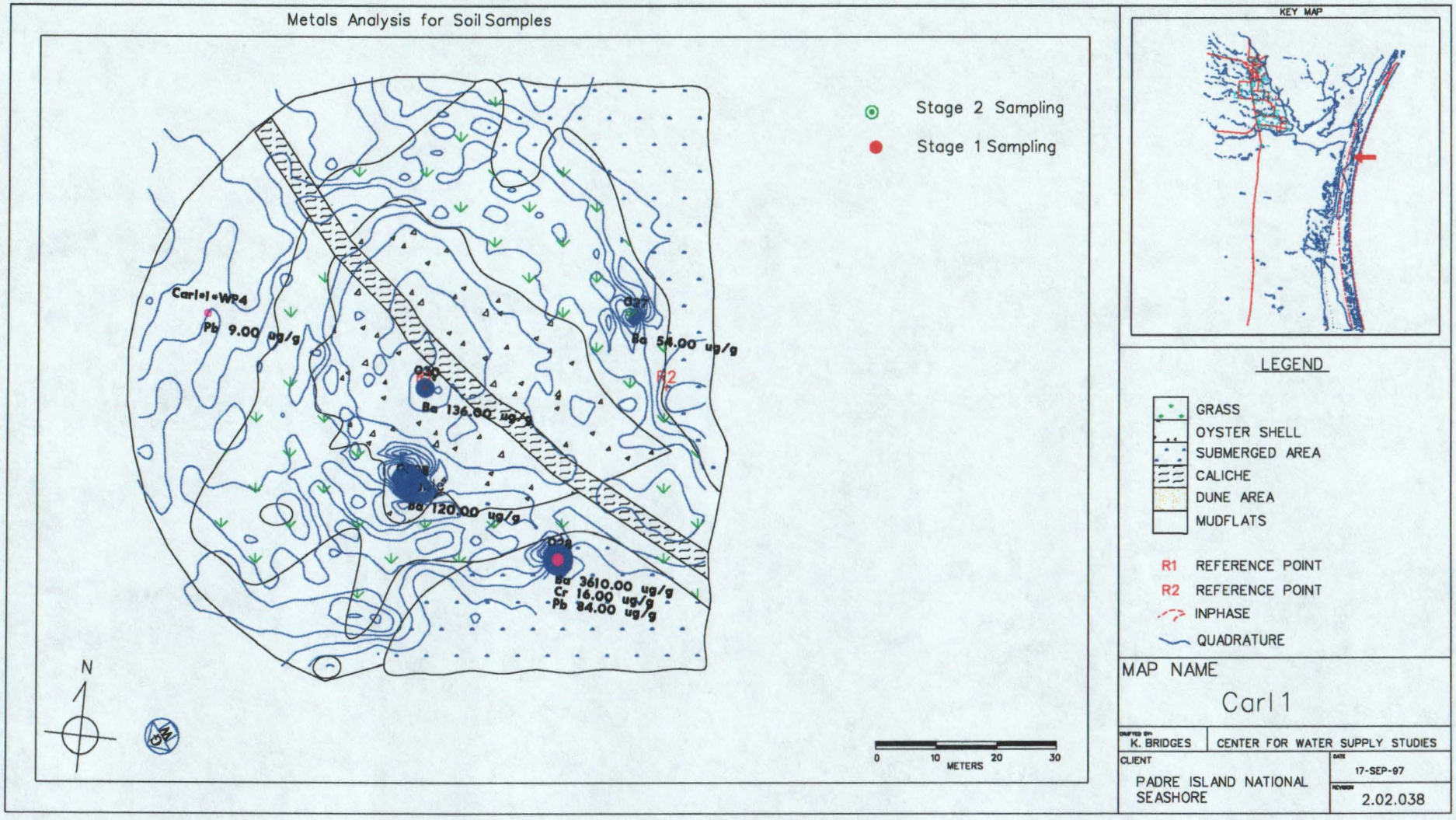


Figure 6.7c Metals Results for Soils at Site Id 38 - Carl #1

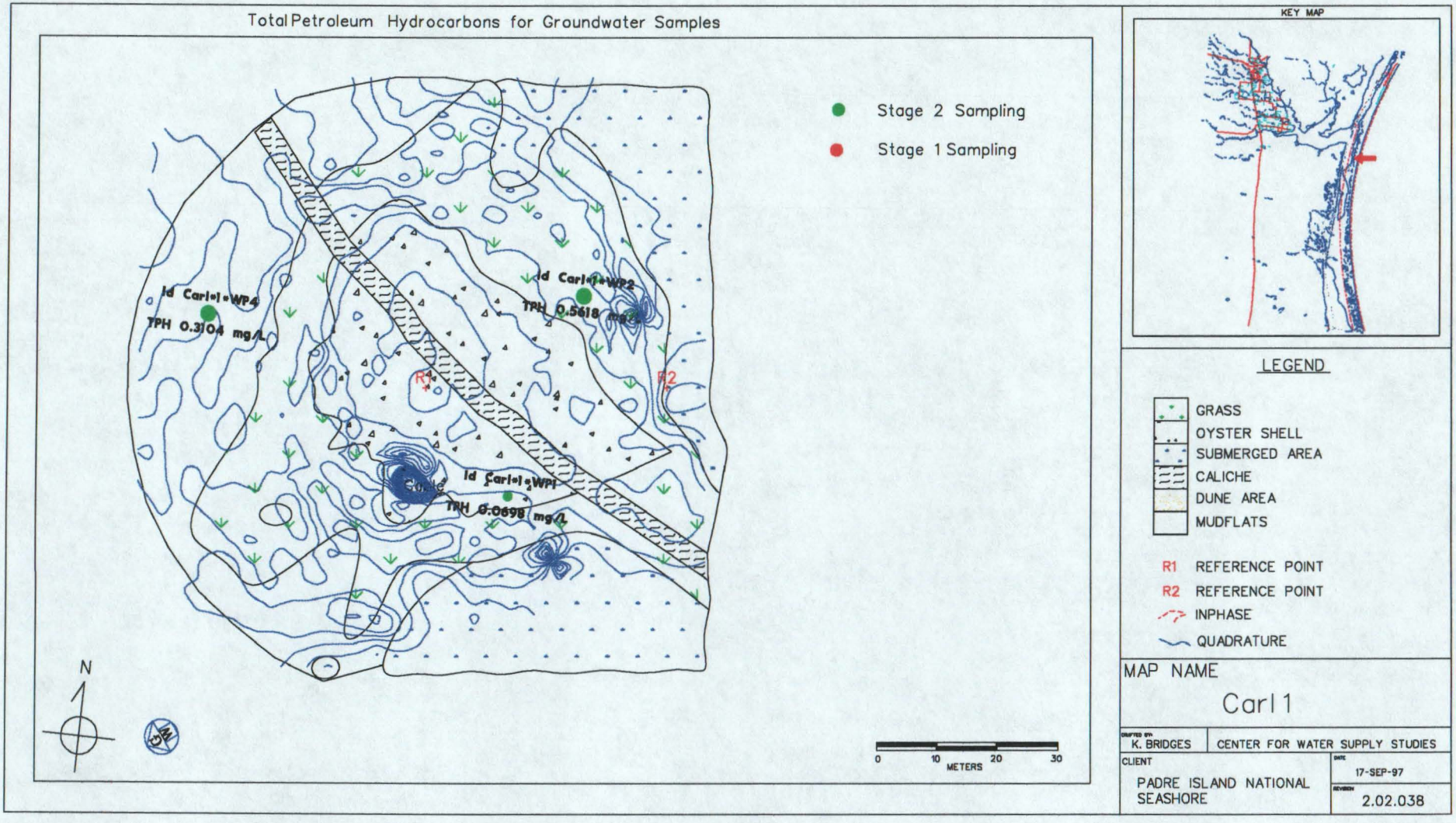


Figure 6.7d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 38 - Carl #1

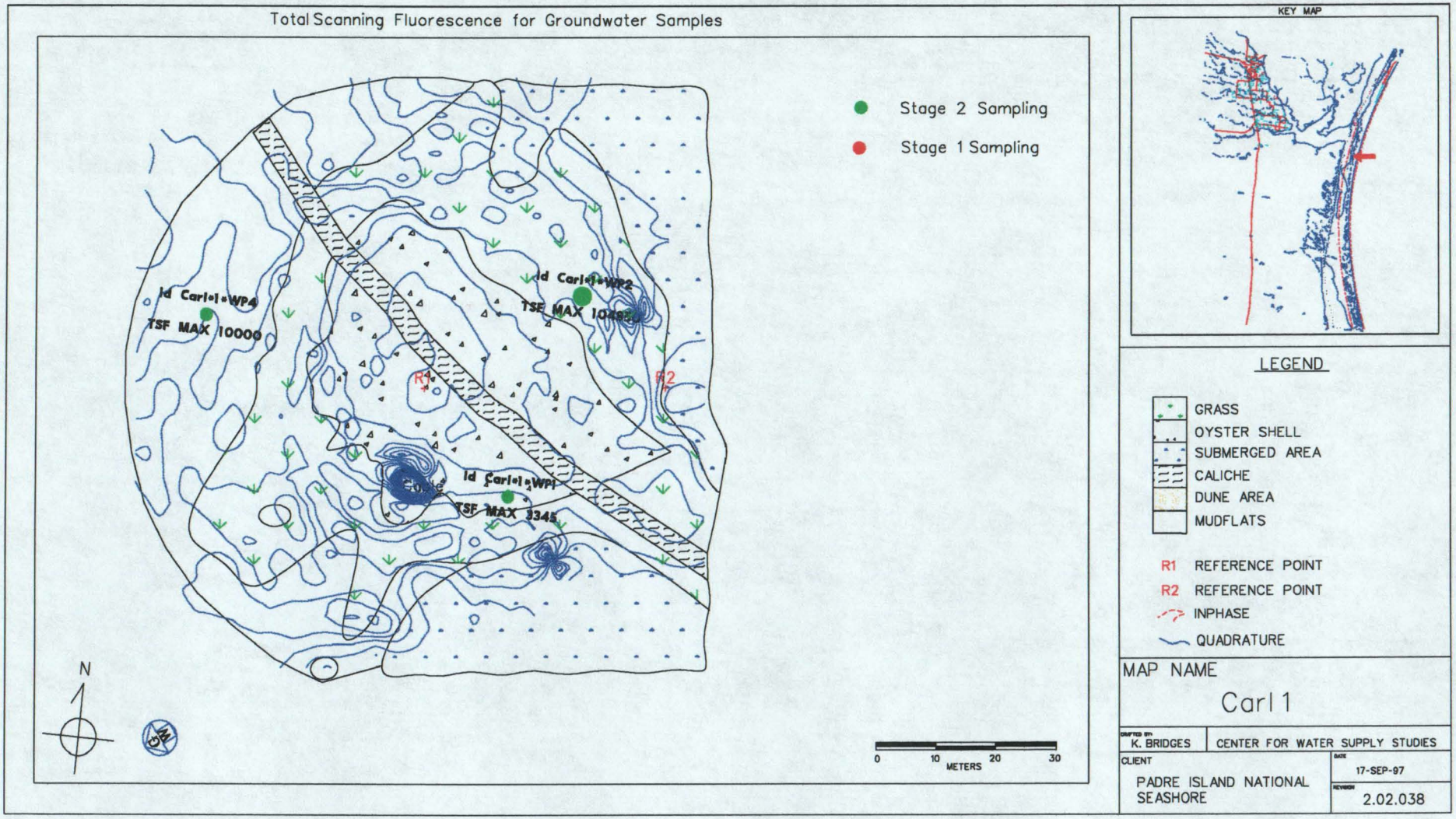


Figure 6.7e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 38 - Carl #1

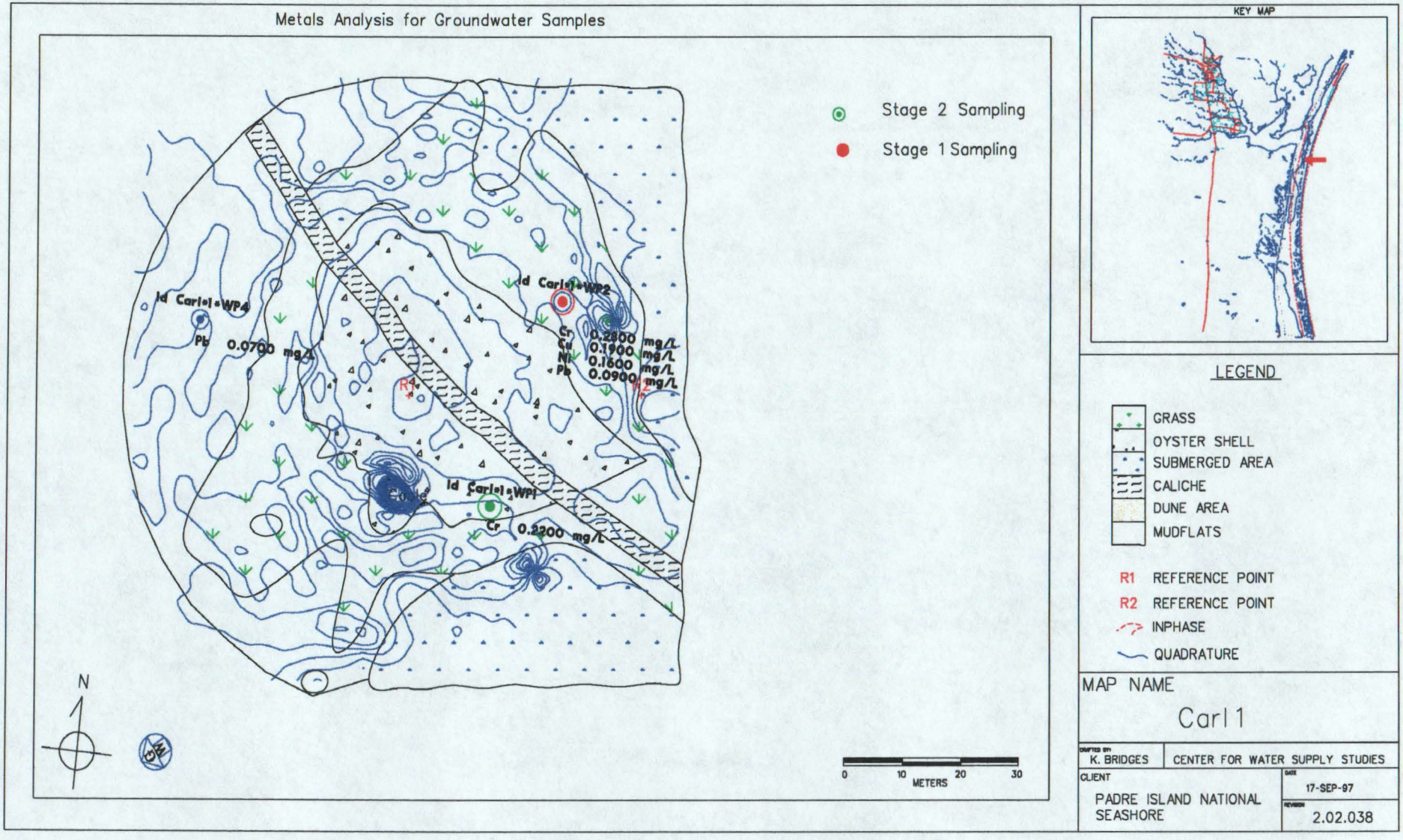


Figure 6.7f Metals Results for Groundwater at Site Id 38 - Carl #1

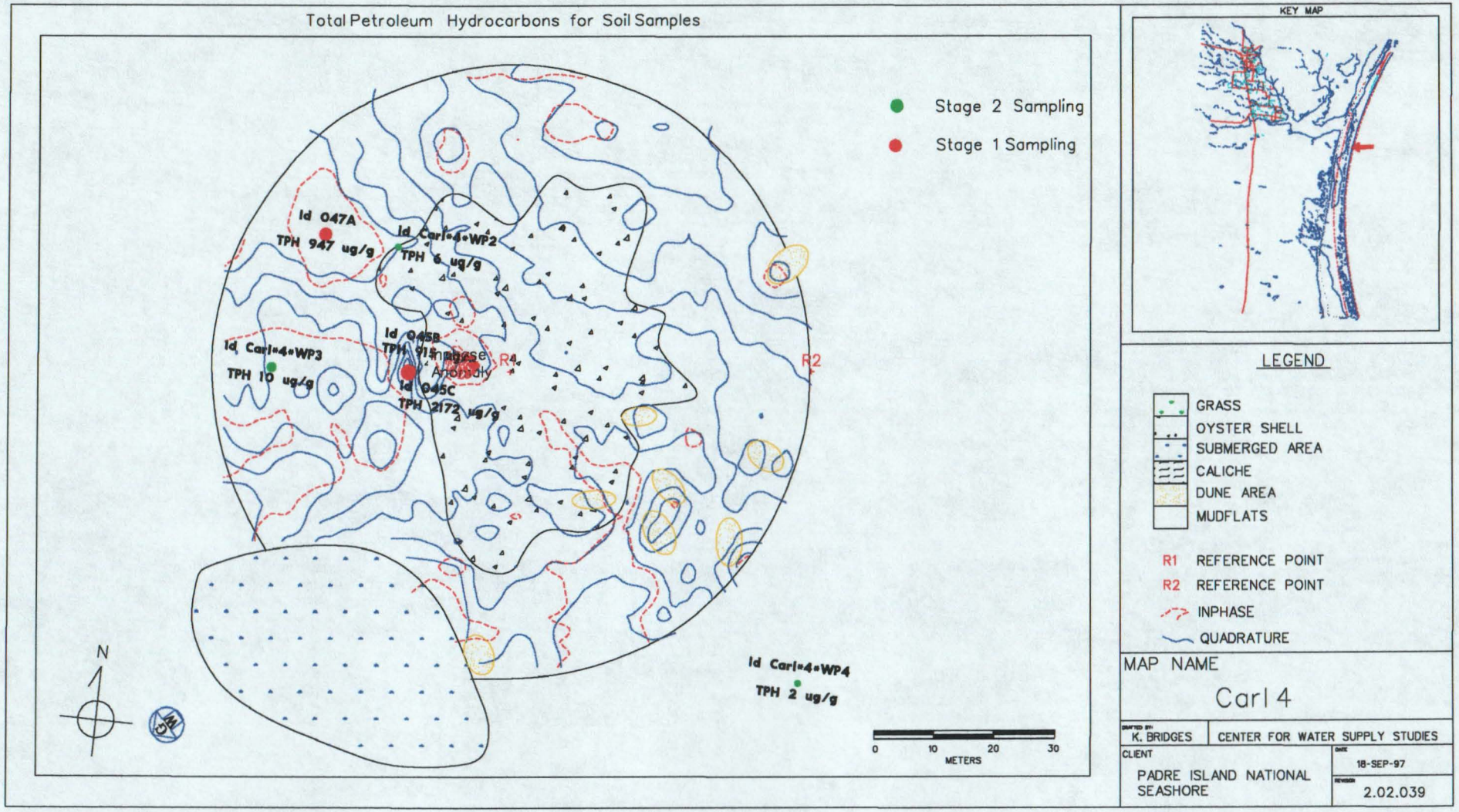


Figure 6.8a Total Petroleum Hydrocarbon Results for Soils at Site Id 39 -Carl #4

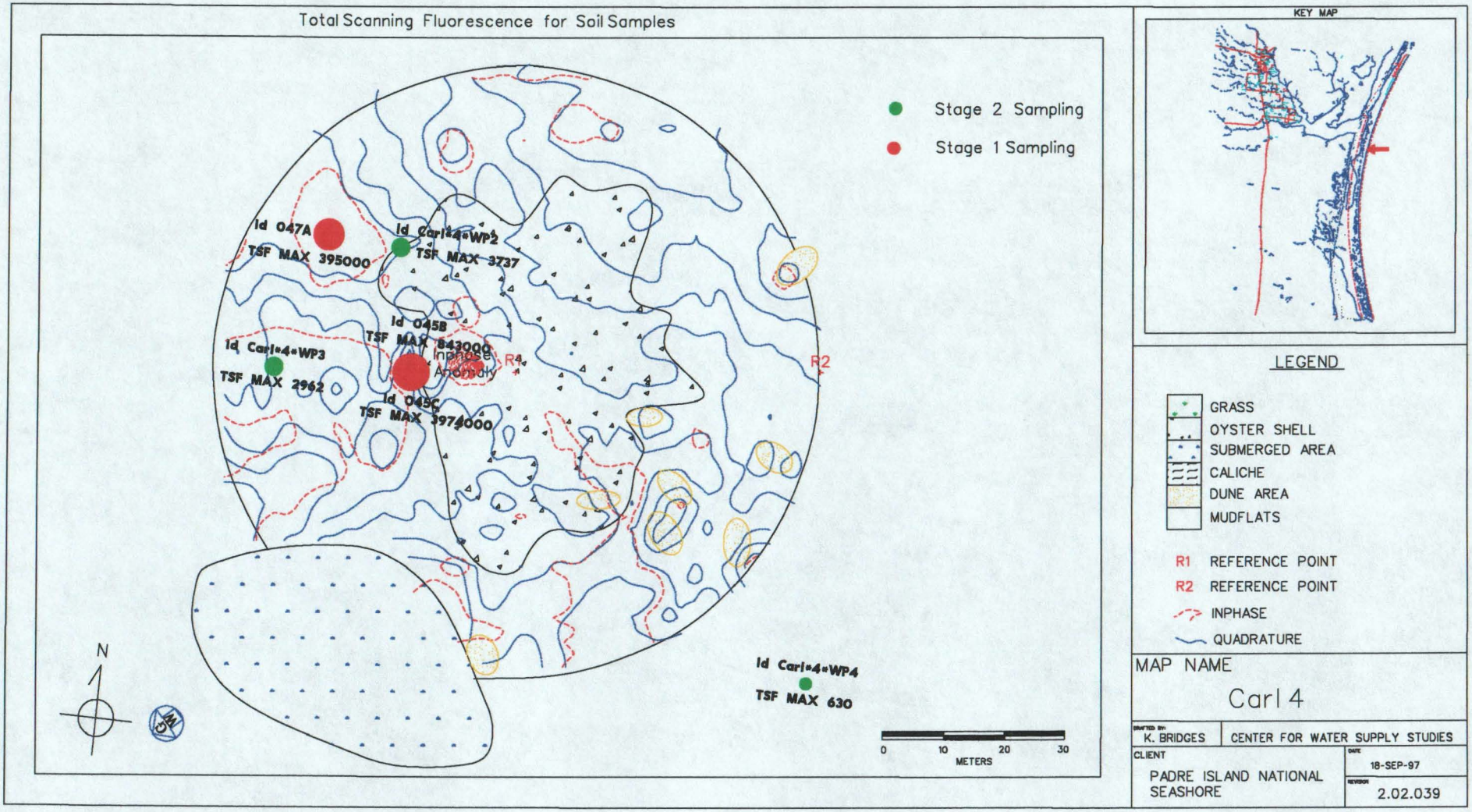


Figure 6.8b Total Scanning Flourescence (Max.) Results for Soils at Site Id 39 -Carl #4

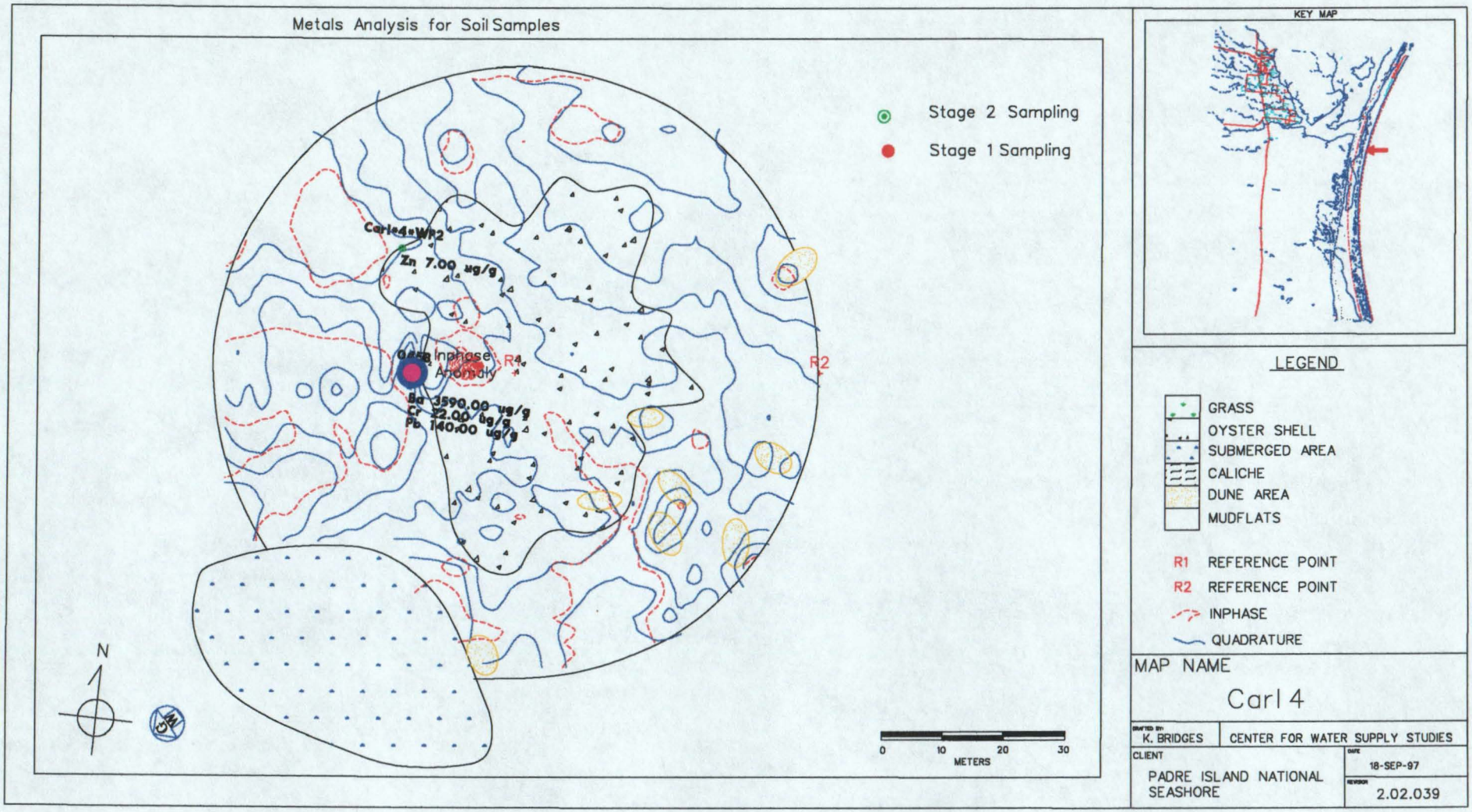


Figure 6.8c Metals Results for Soils at Site Id 39 -Carl #4

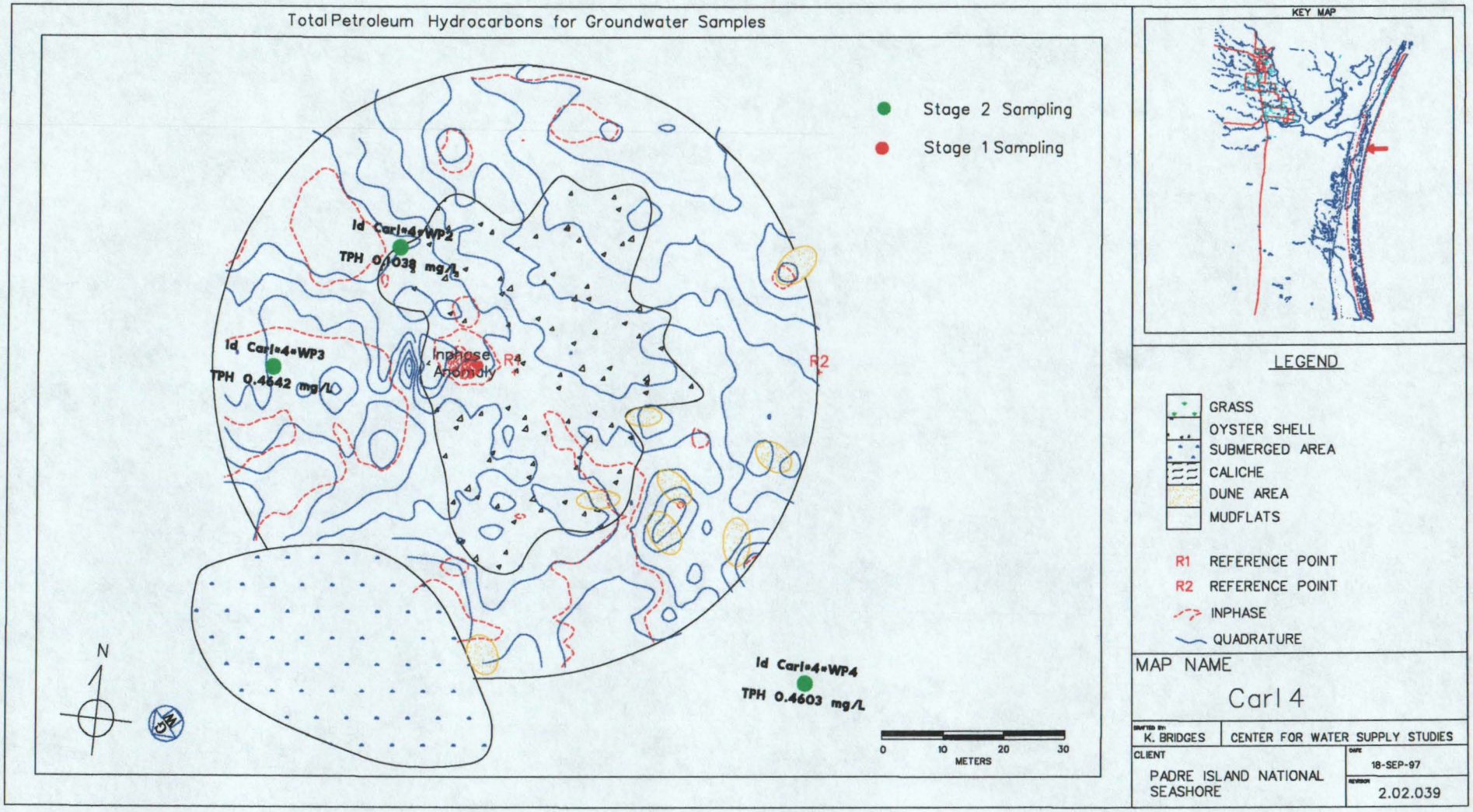


Figure 6.8d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 39 -Carl #4

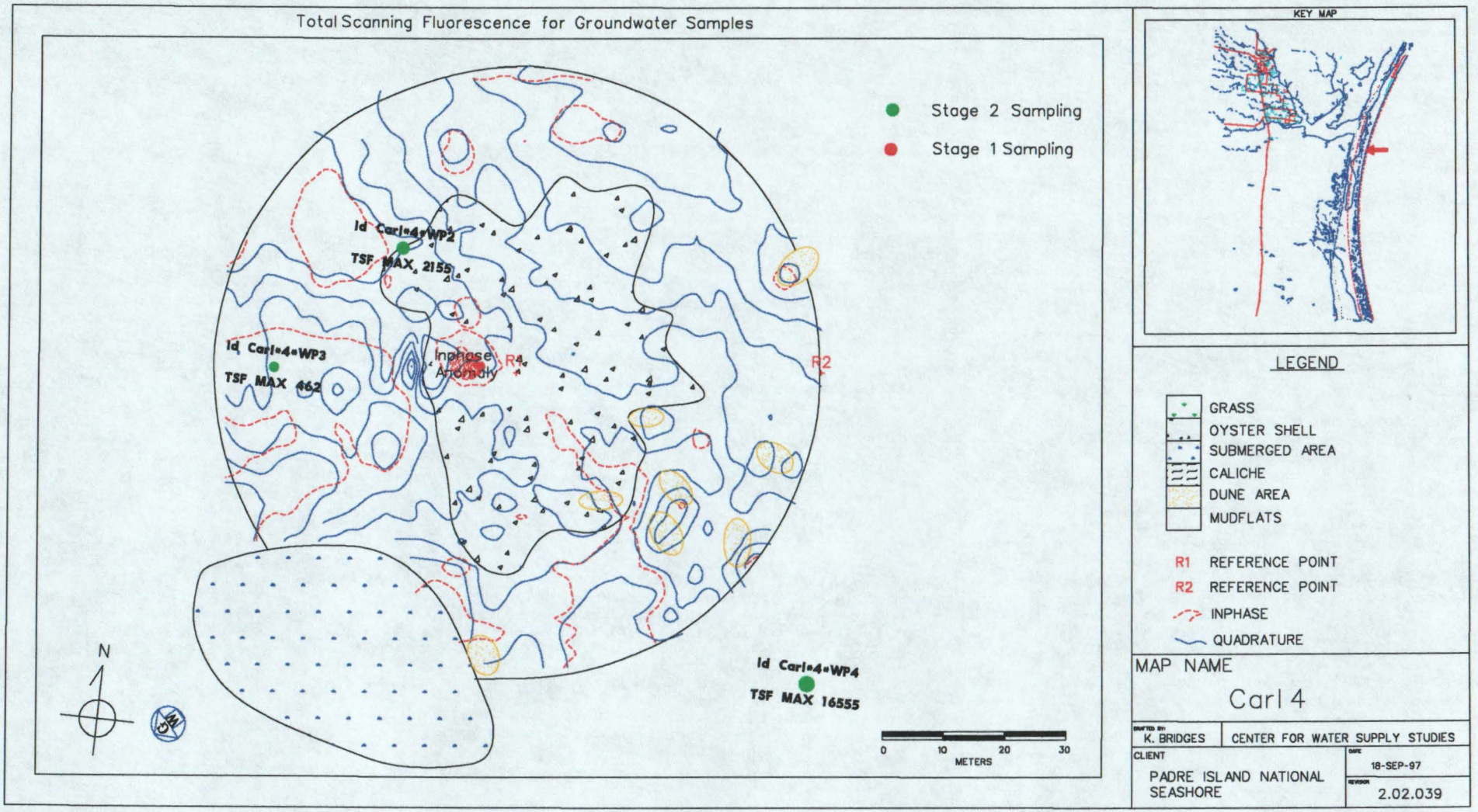


Figure 6.8e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 39 -Carl #4

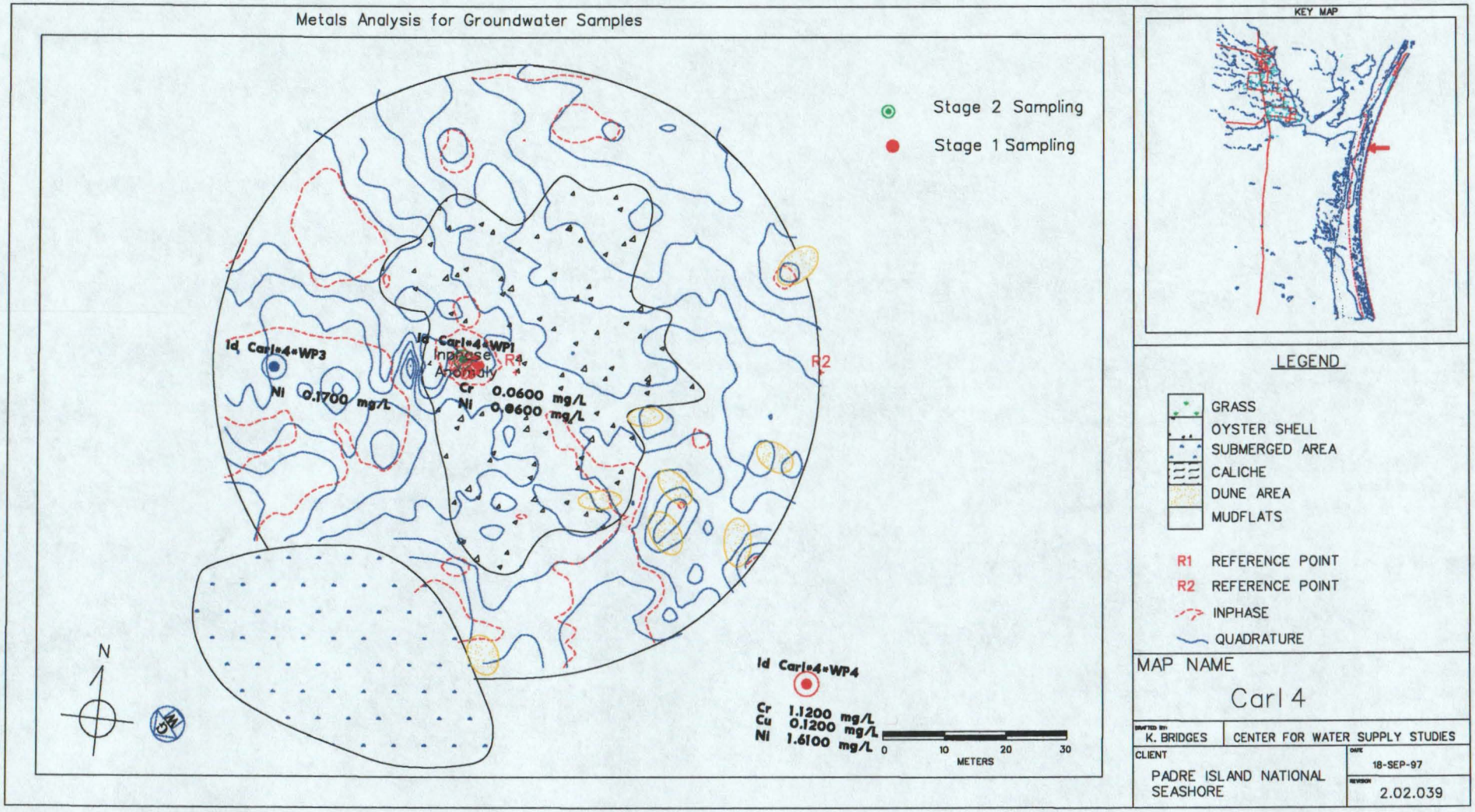


Figure 6.8f Metals Results for Groundwater at Site Id 39 -Carl #4

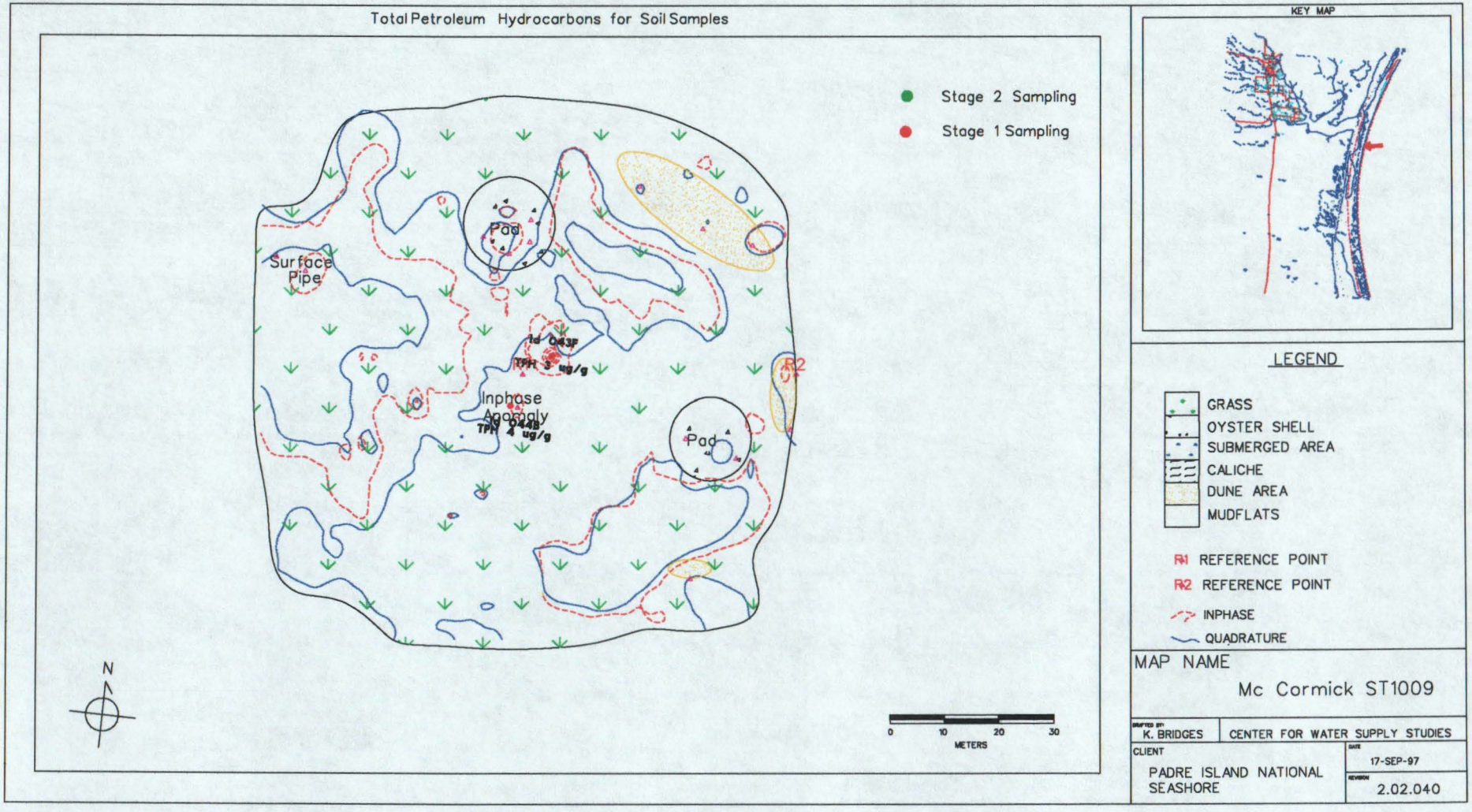


Figure 6.9a Total Petroleum Hydrocarbon Results for Soils at Site Id 40 - McCormick ST 1009

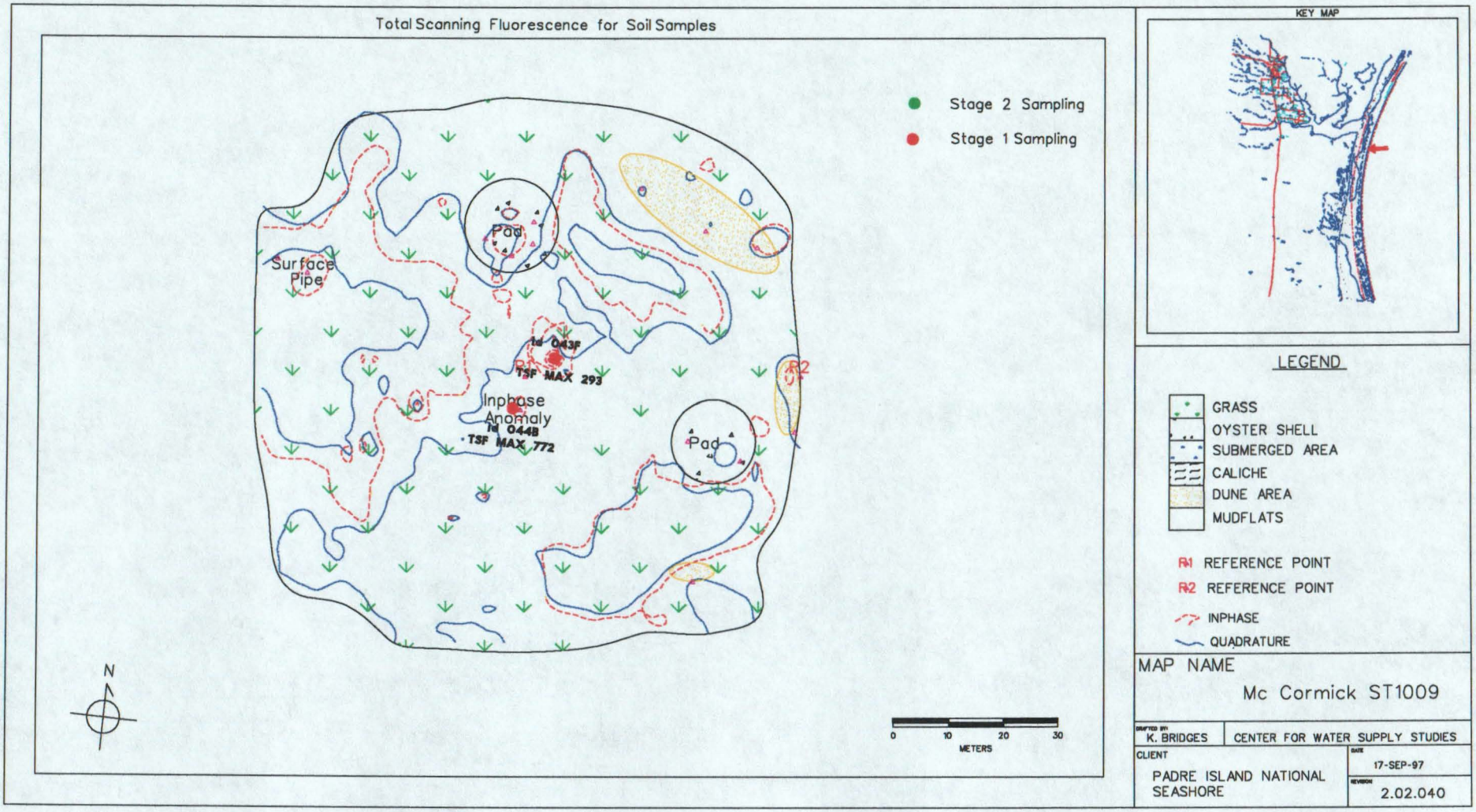


Figure 6.9b Total Scanning Flourescence (Max.) Results for Soilsat Site Id 40 - McCormick ST 1009

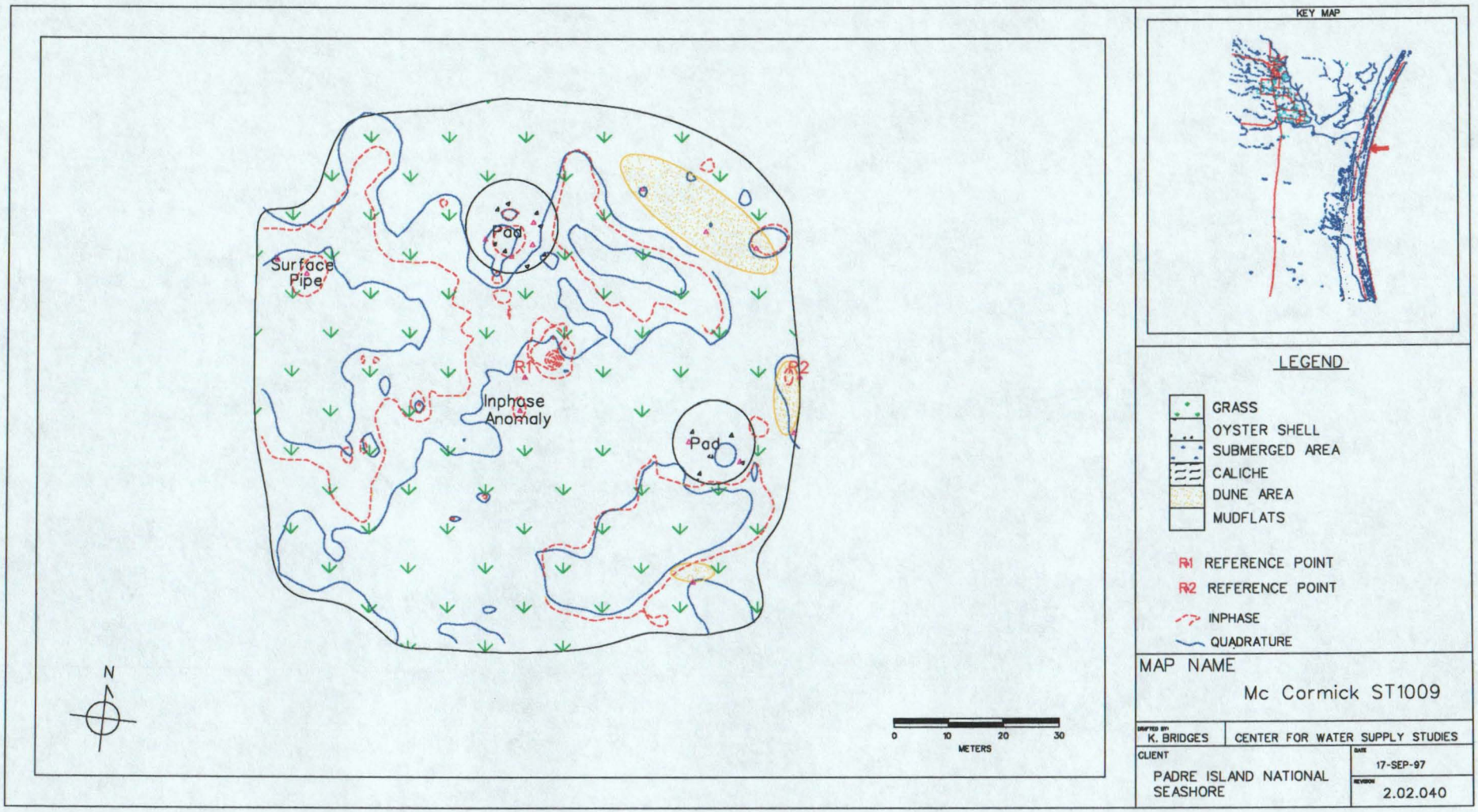


Figure 6.9c Metals Results for Soils at Site Id 40 - McCormick ST 1009

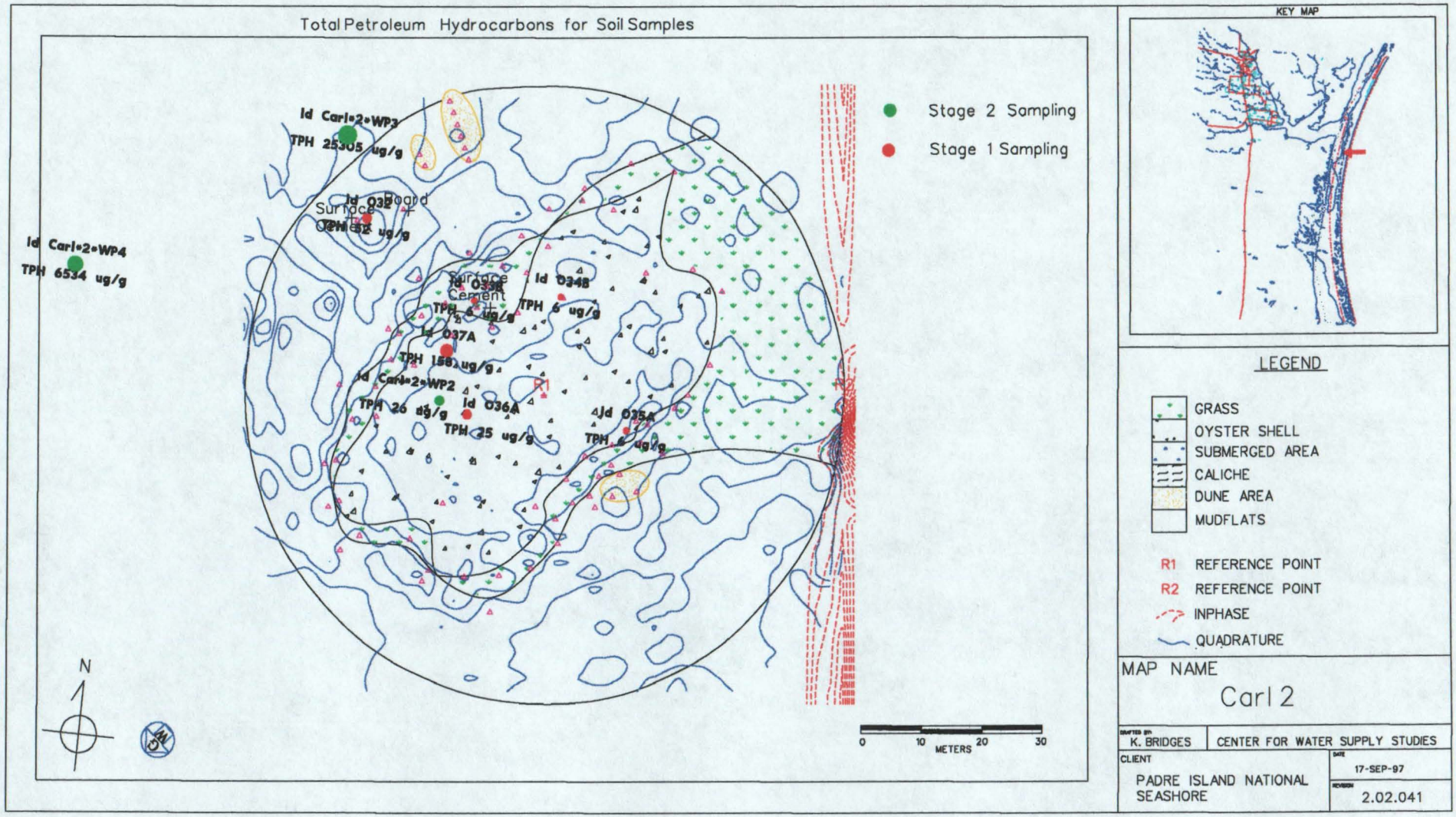


Figure 6.10a Total Petroleum Hydrocarbon Results for Soils at Site Id 41 - Carl #2

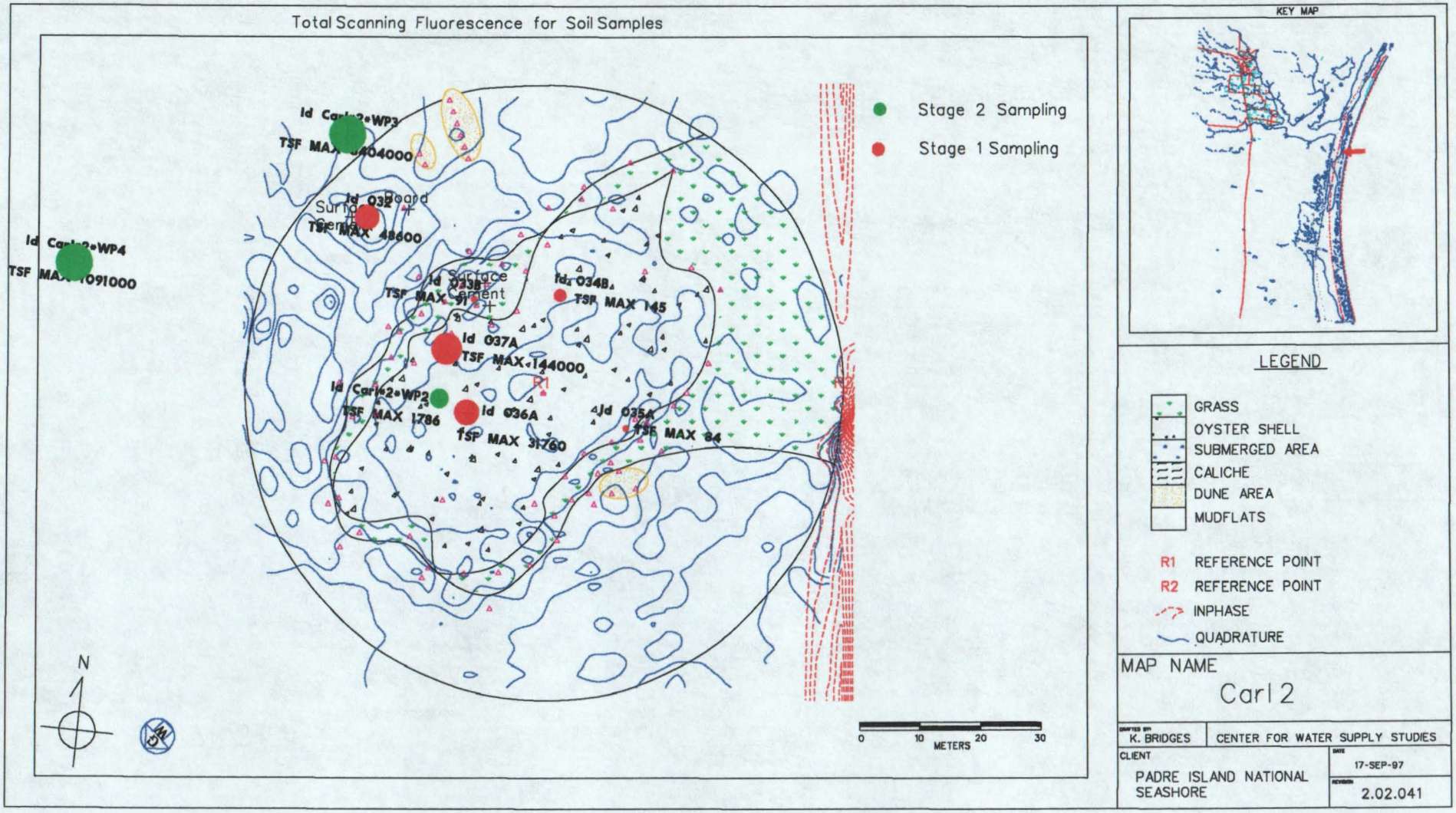


Figure 6.10b Total Scanning Flourescence (Max.) Results for Soils at Site Id 41 - Carl #2

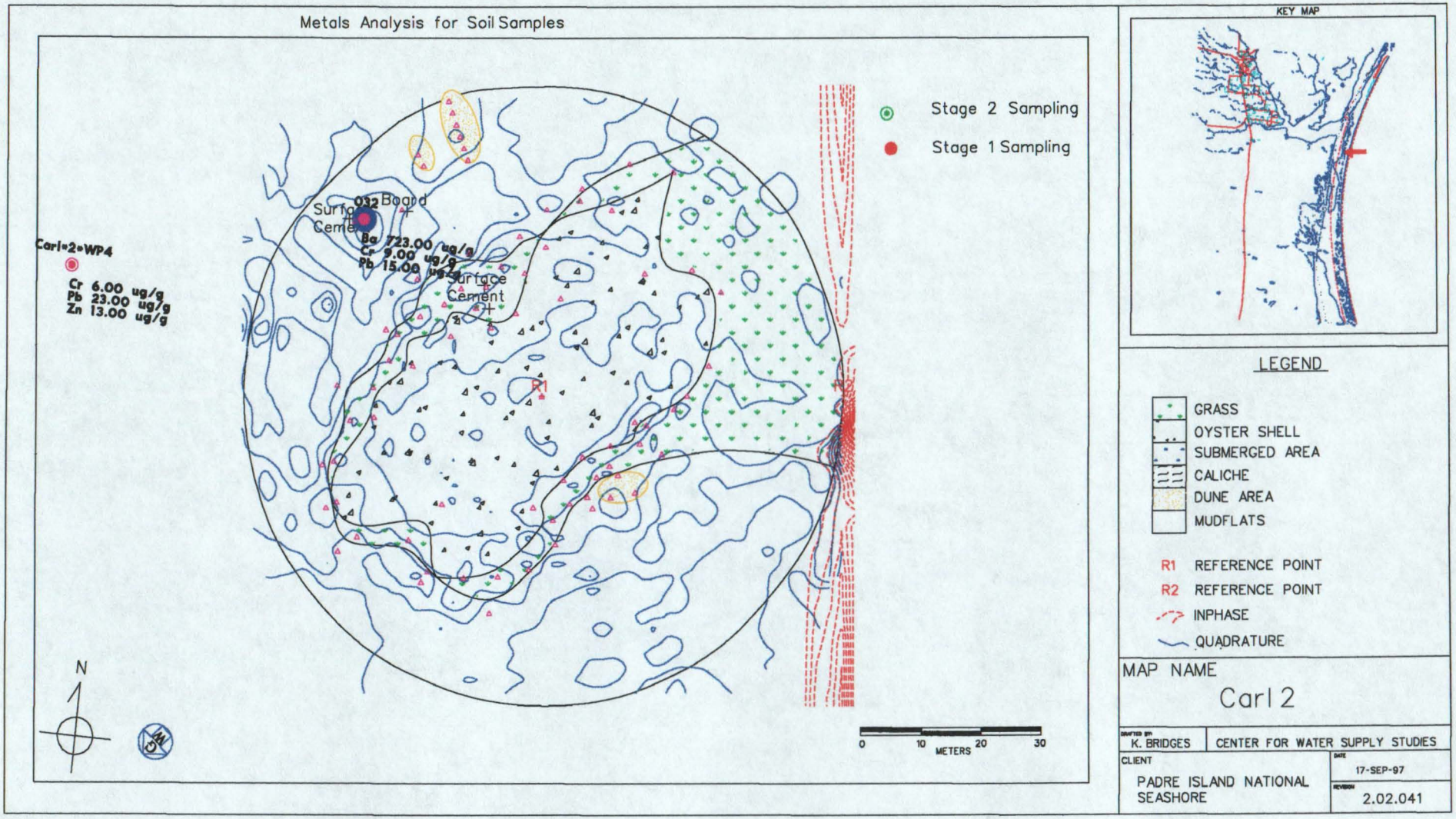


Figure 6.10c Metals Results for Soils at Site Id 41 - Carl #2

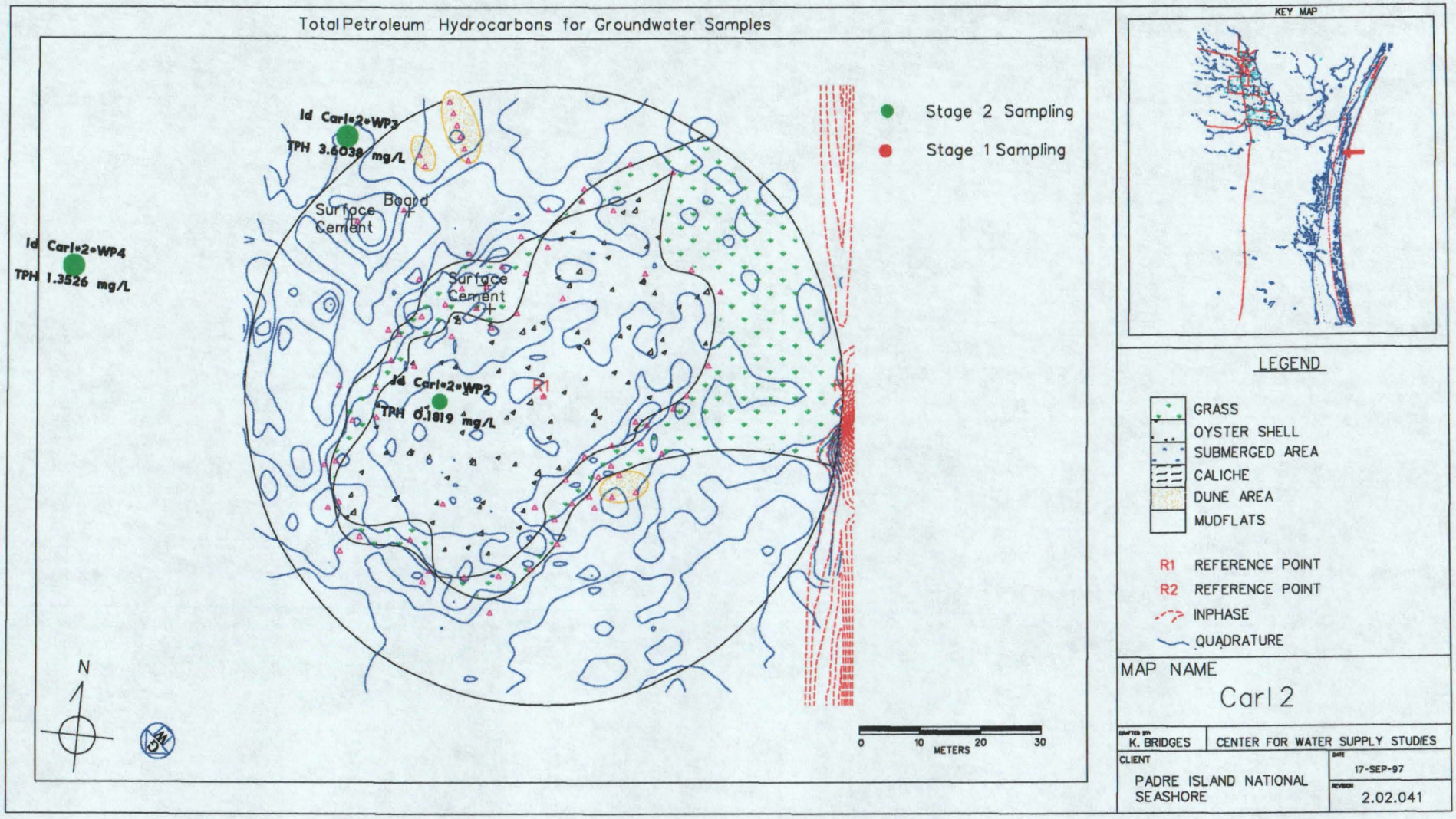


Figure 6.10d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 41 - Carl #2

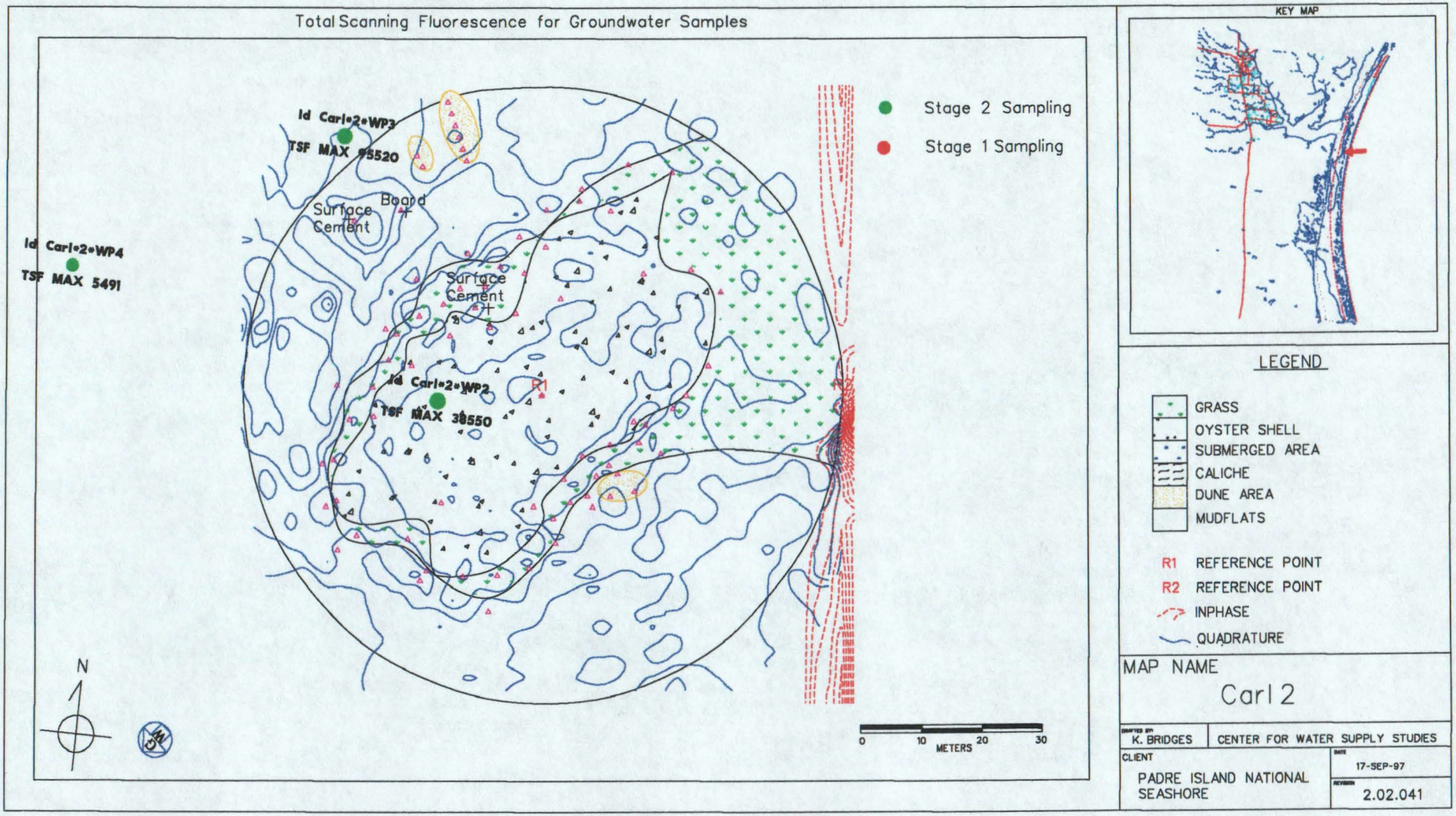


Figure 6.10e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 41 - Carl #2

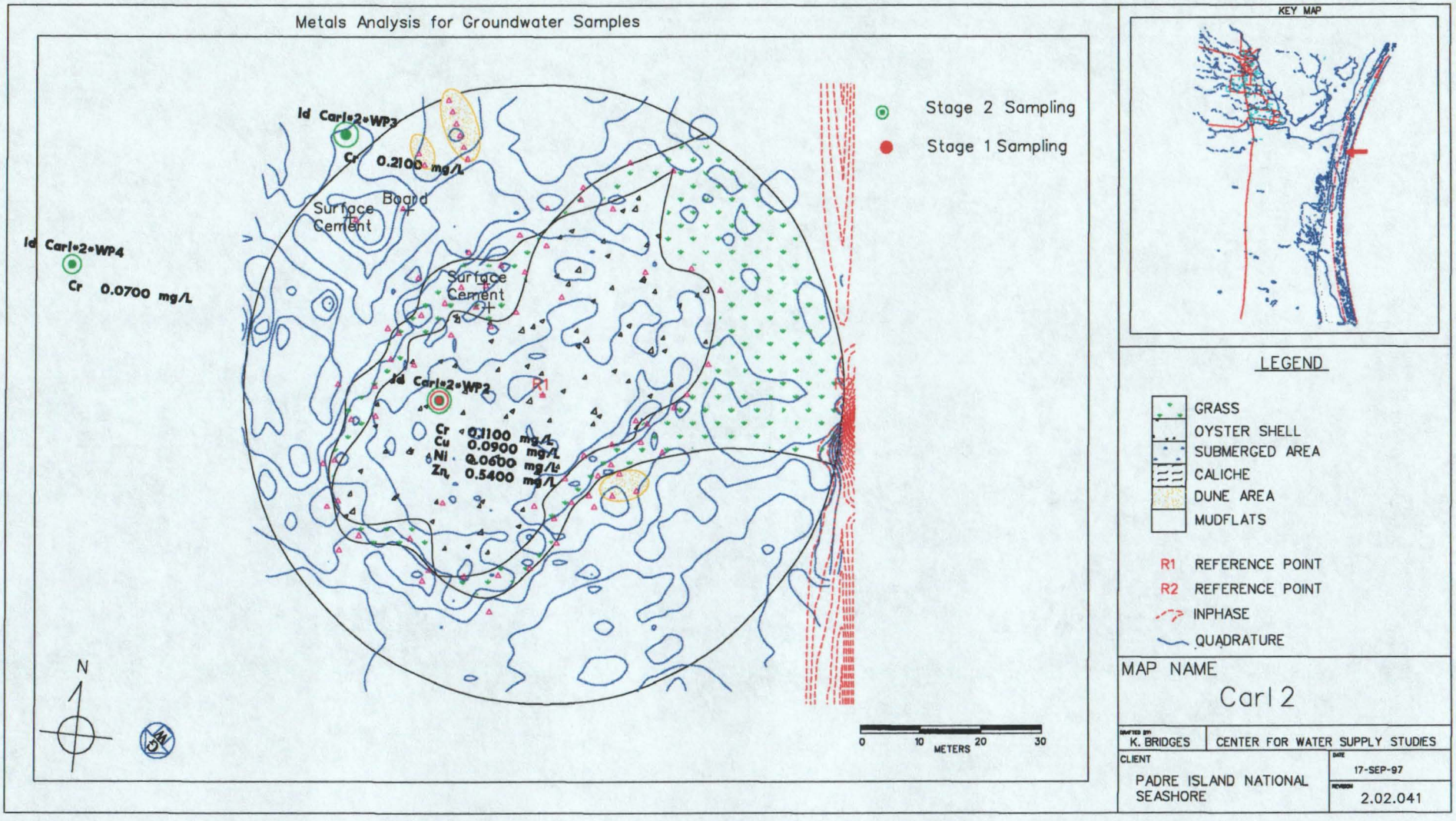


Figure 6.10f Metals Results for Groundwater at Site Id 41 - Carl #2

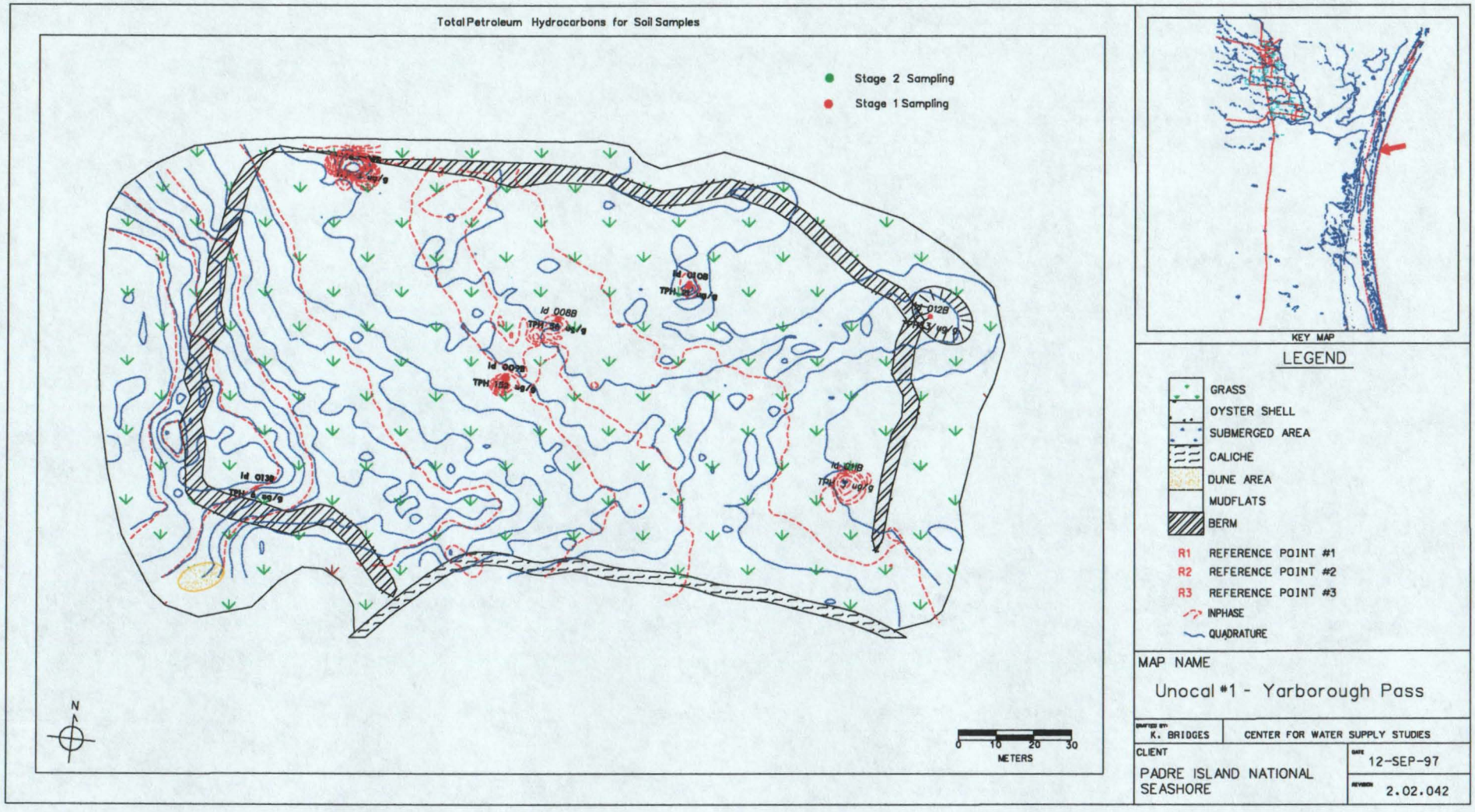


Figure 6.11a Total Petroleum Hydrocarbon Results for Soils at Site Id 42 - Unical #1 Yarborough Pass

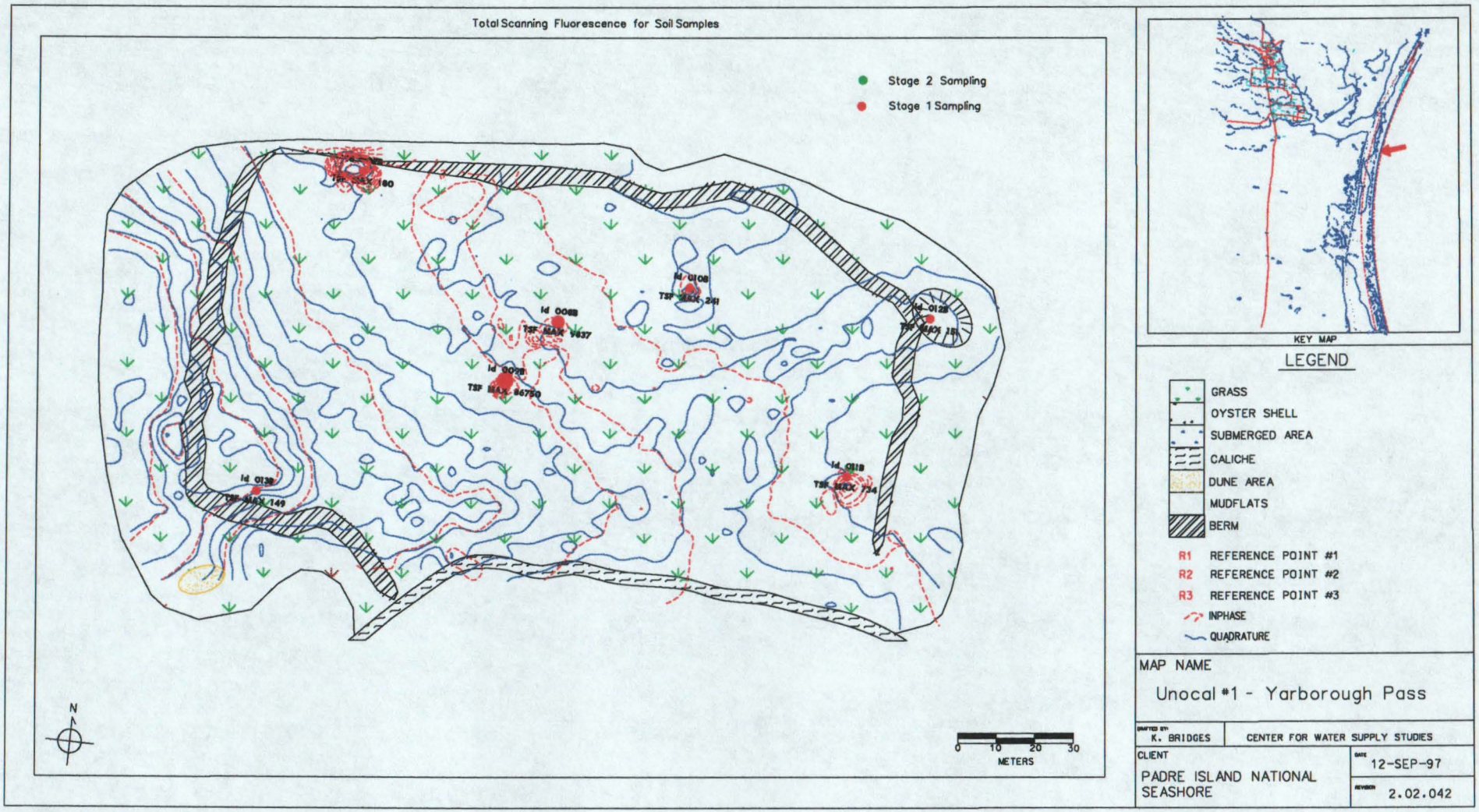


Figure 6.11b Total Scanning Flourescence (Max.) Results for Soils at Site Id 42 - Unical #1 Yarborough Pass

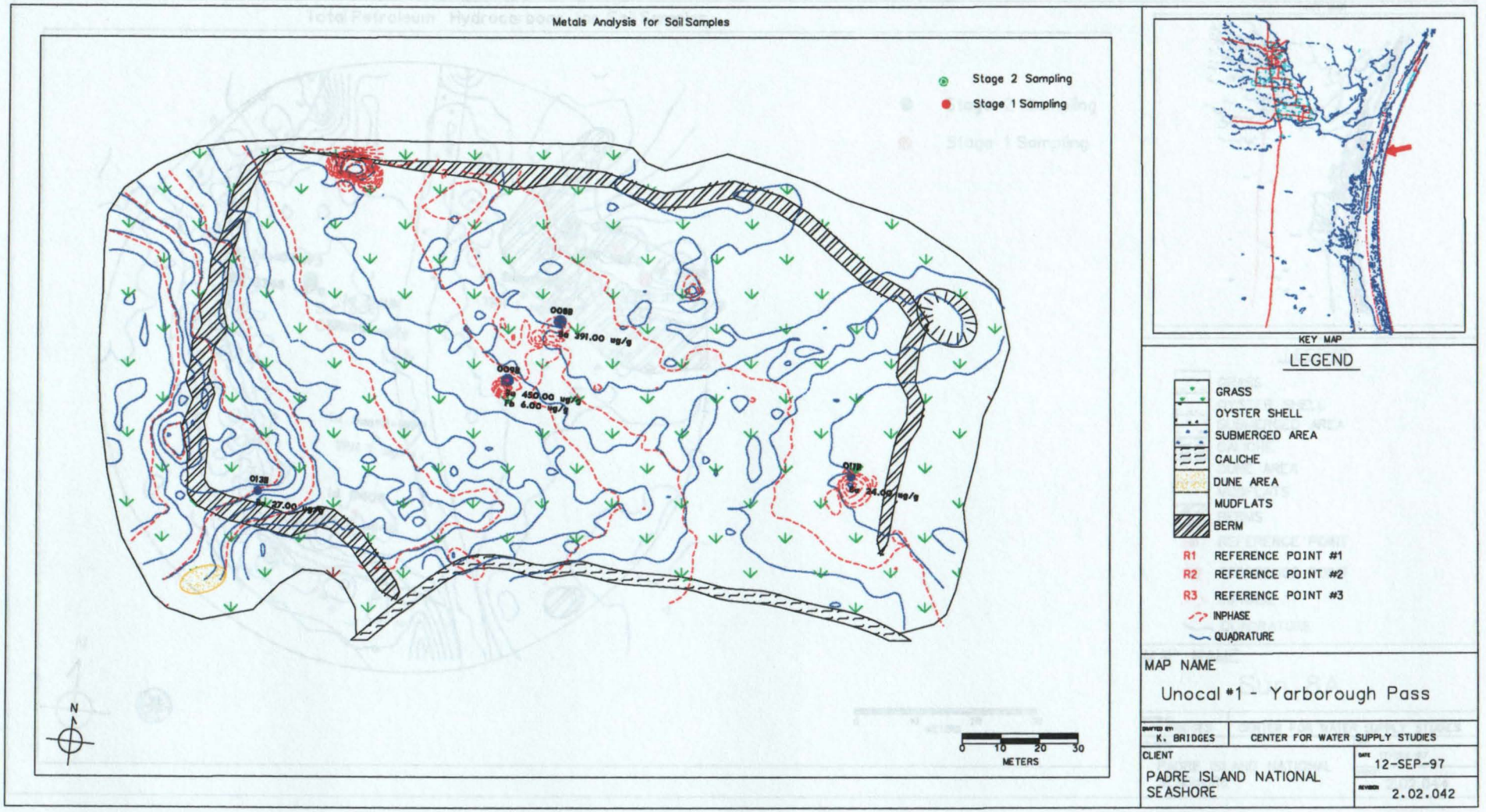


Figure 6.11c Metals Results for Soils at Site Id 42 - Unical #1 Yarborough Pass

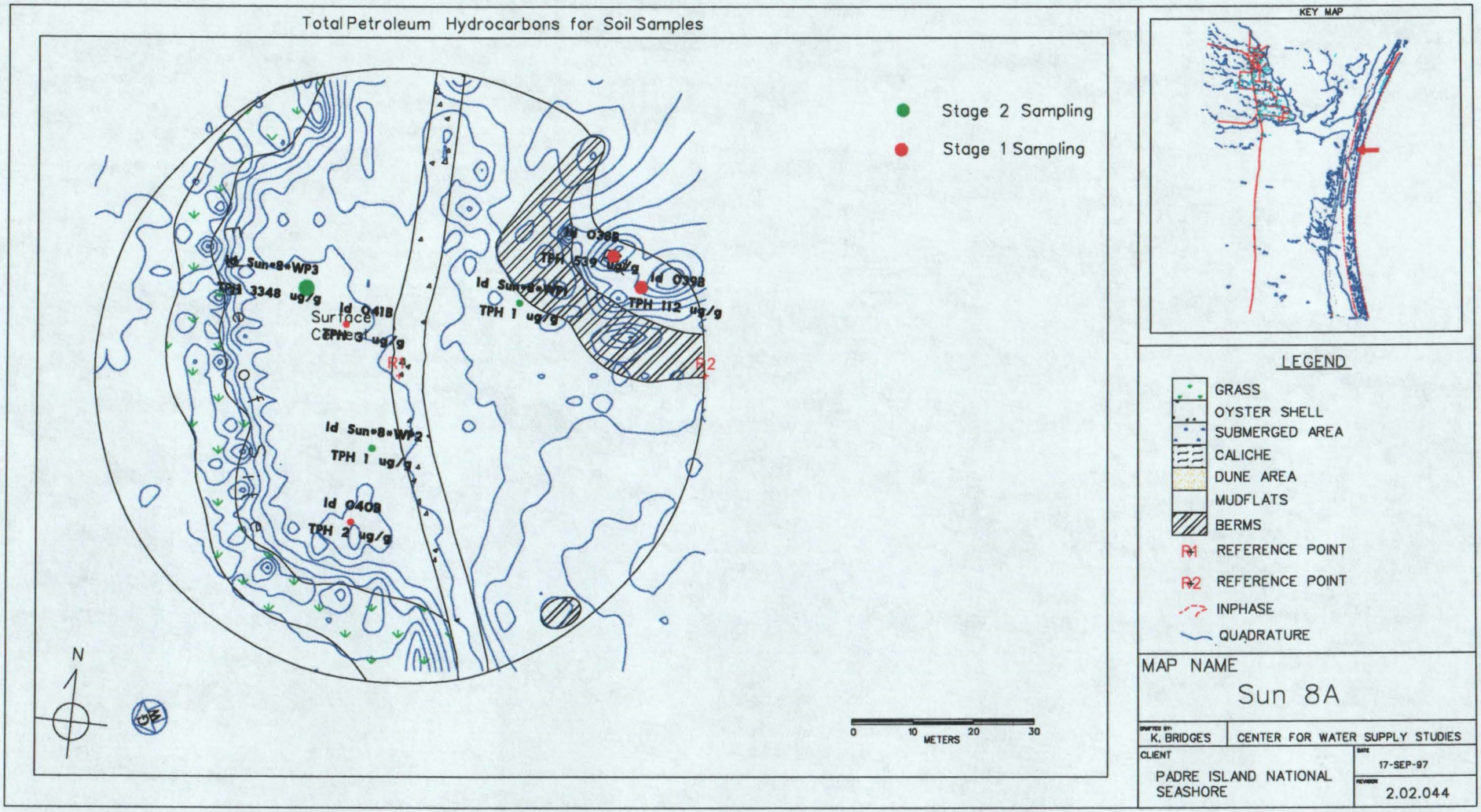


Figure 6.12a Total Petroleum Hydrocarbon Results for Soils at Site Id 44 - Sun 8A

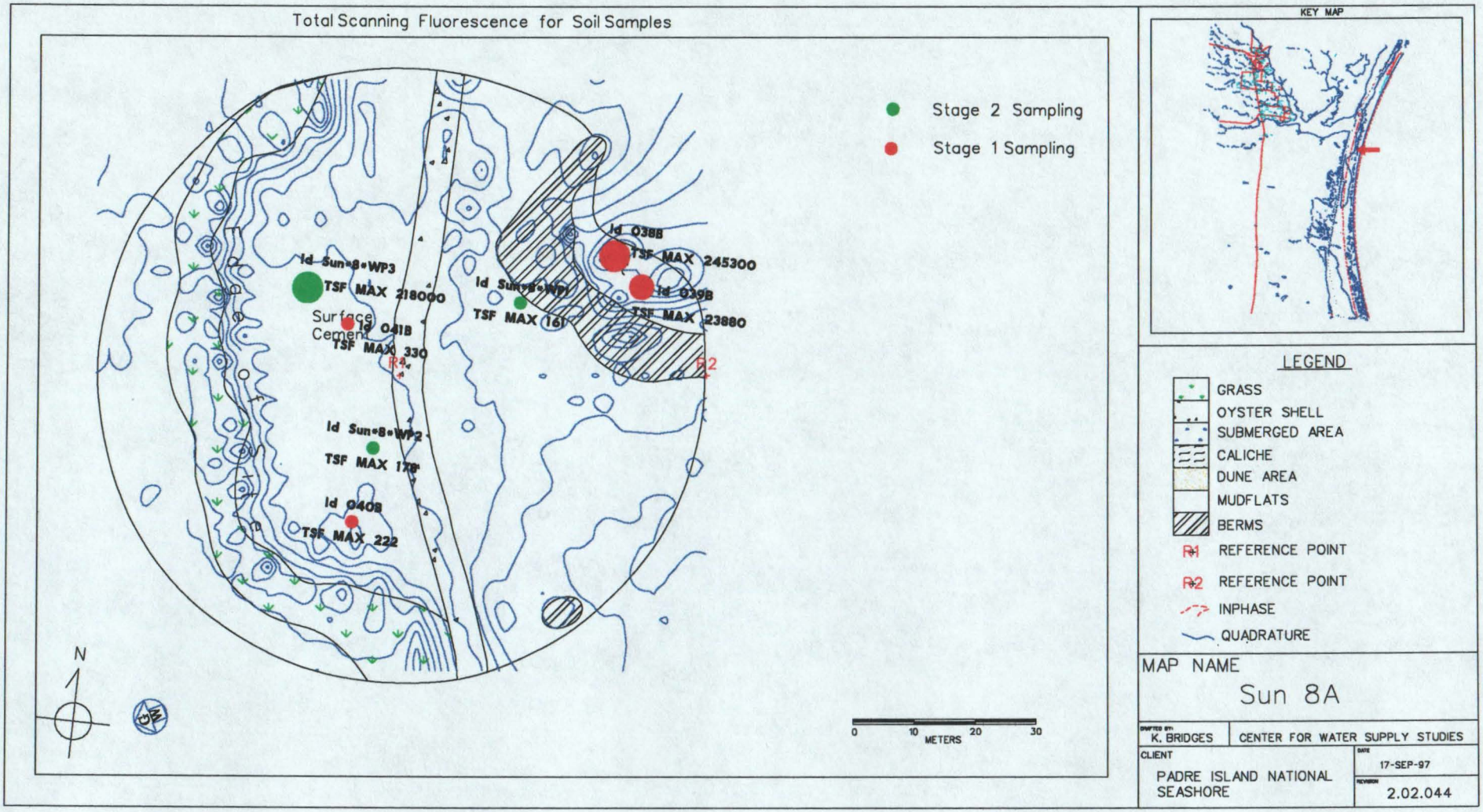


Figure 6.12b Total Scanning Flourescence (Max.) Results for Soils at Site Id 44 - Sun 8A

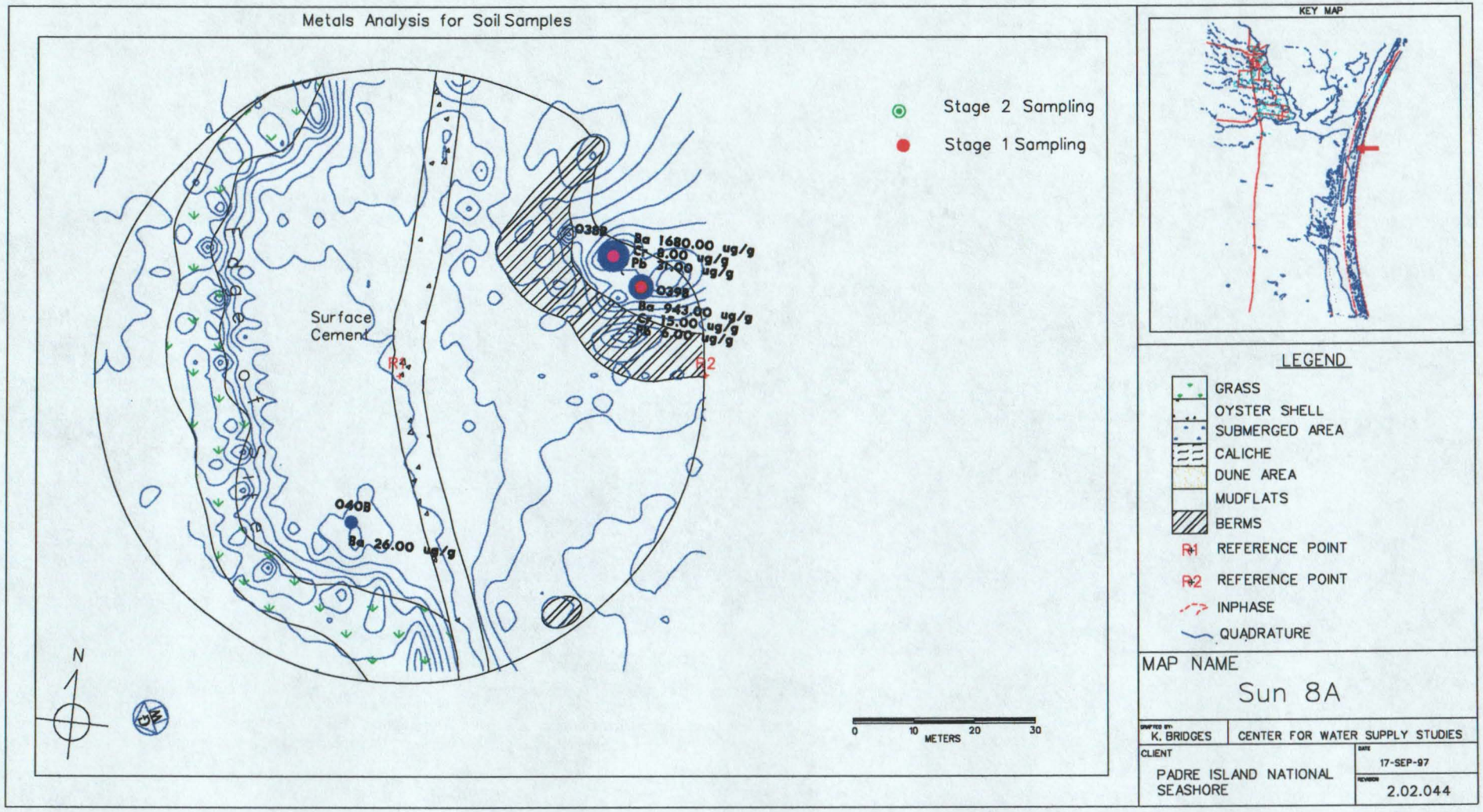


Figure 6.12c Metals Results for Soils at Site Id 44 - Sun 8A

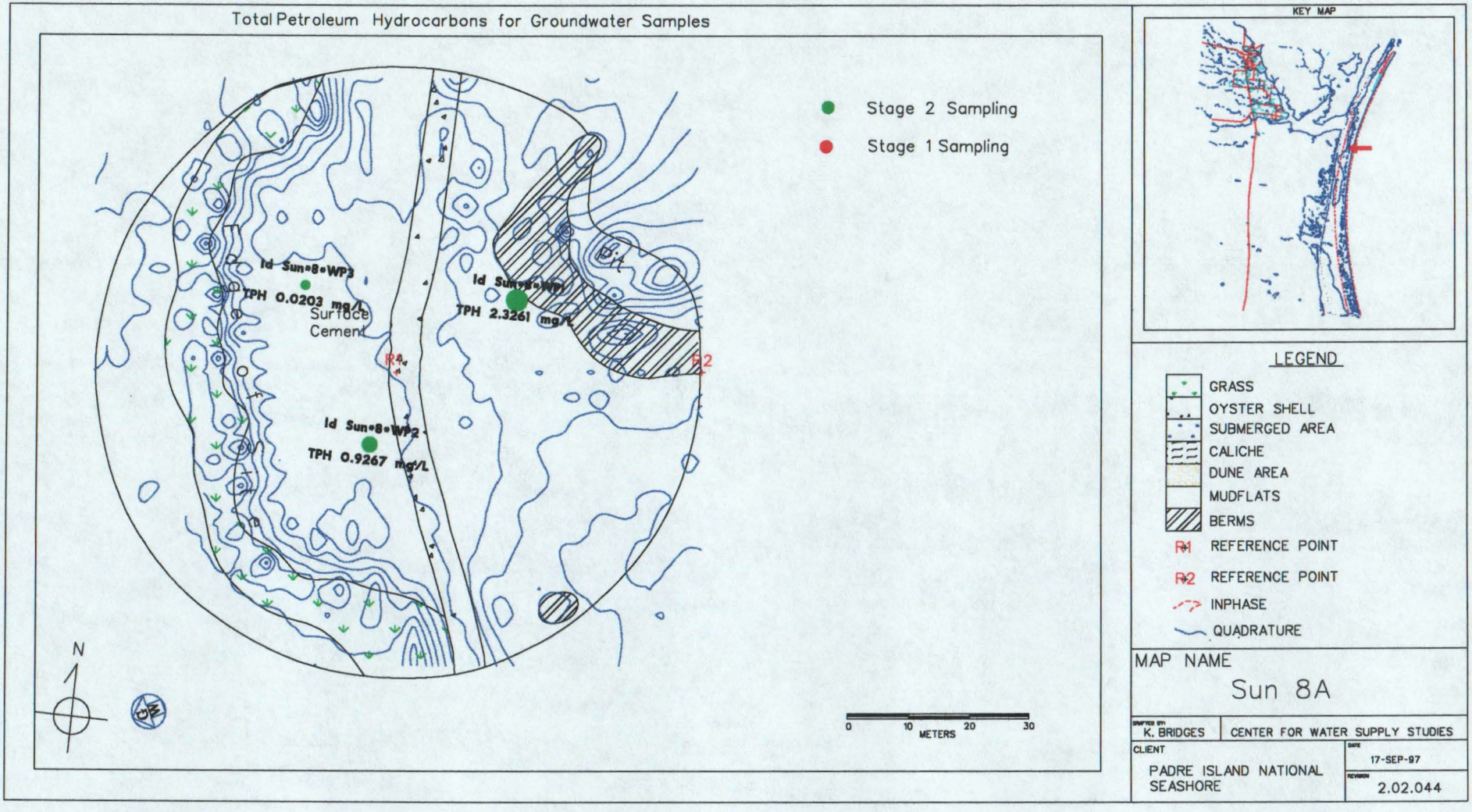


Figure 6.12d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 44 - Sun 8A

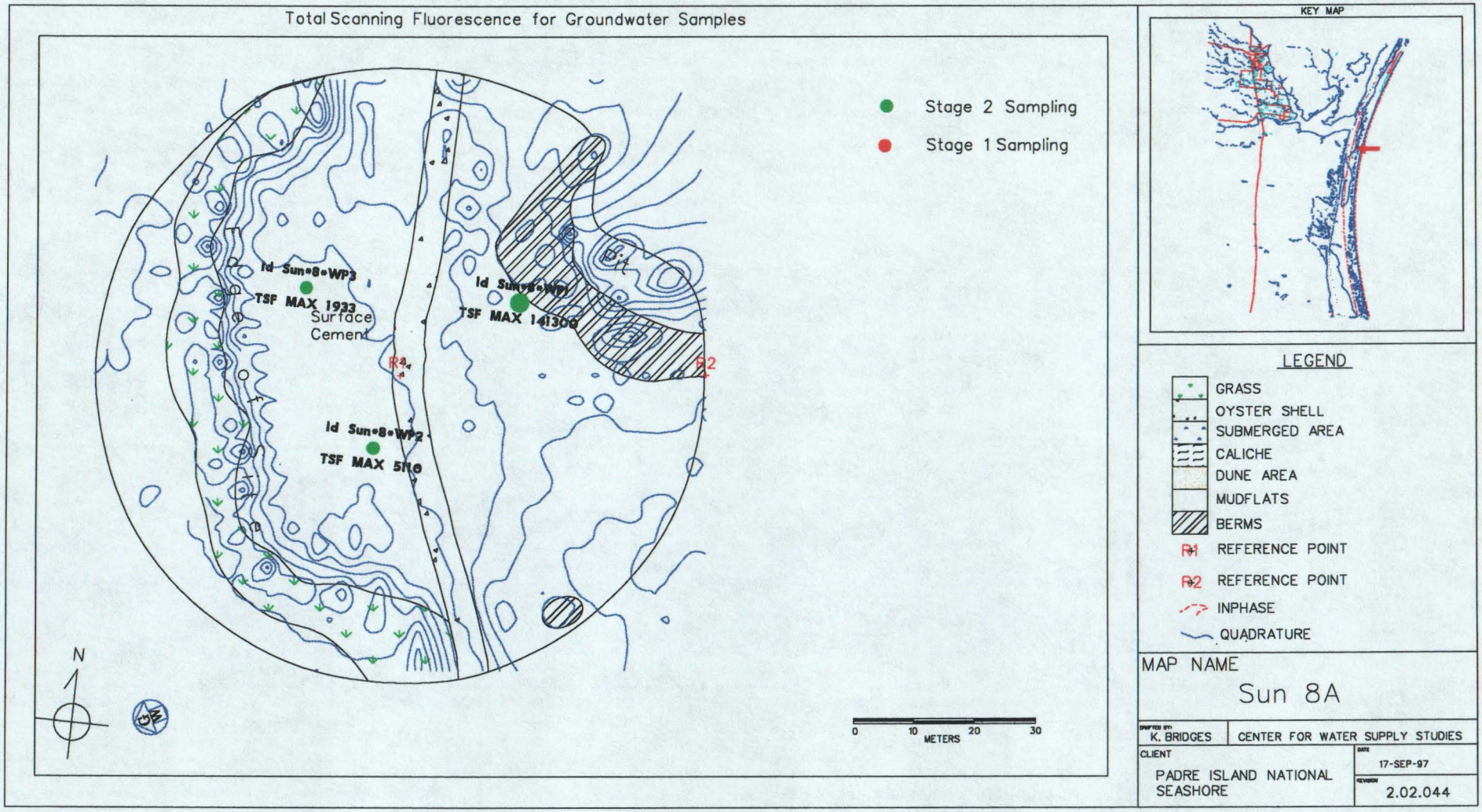


Figure 6.12e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 44 - Sun 8A

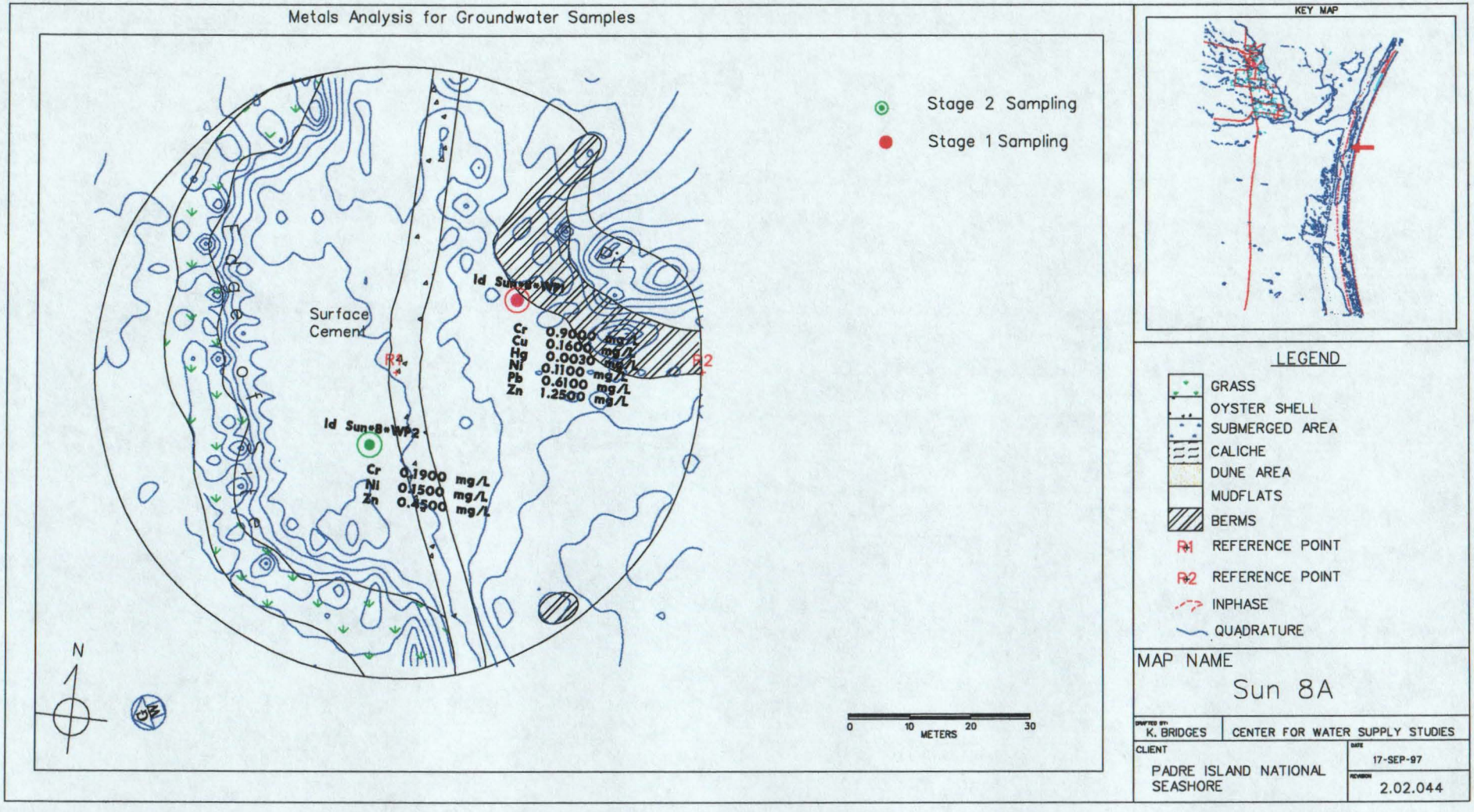


Figure 6.12f Metals Results for Groundwater at Site Id 44 - Sun 8A

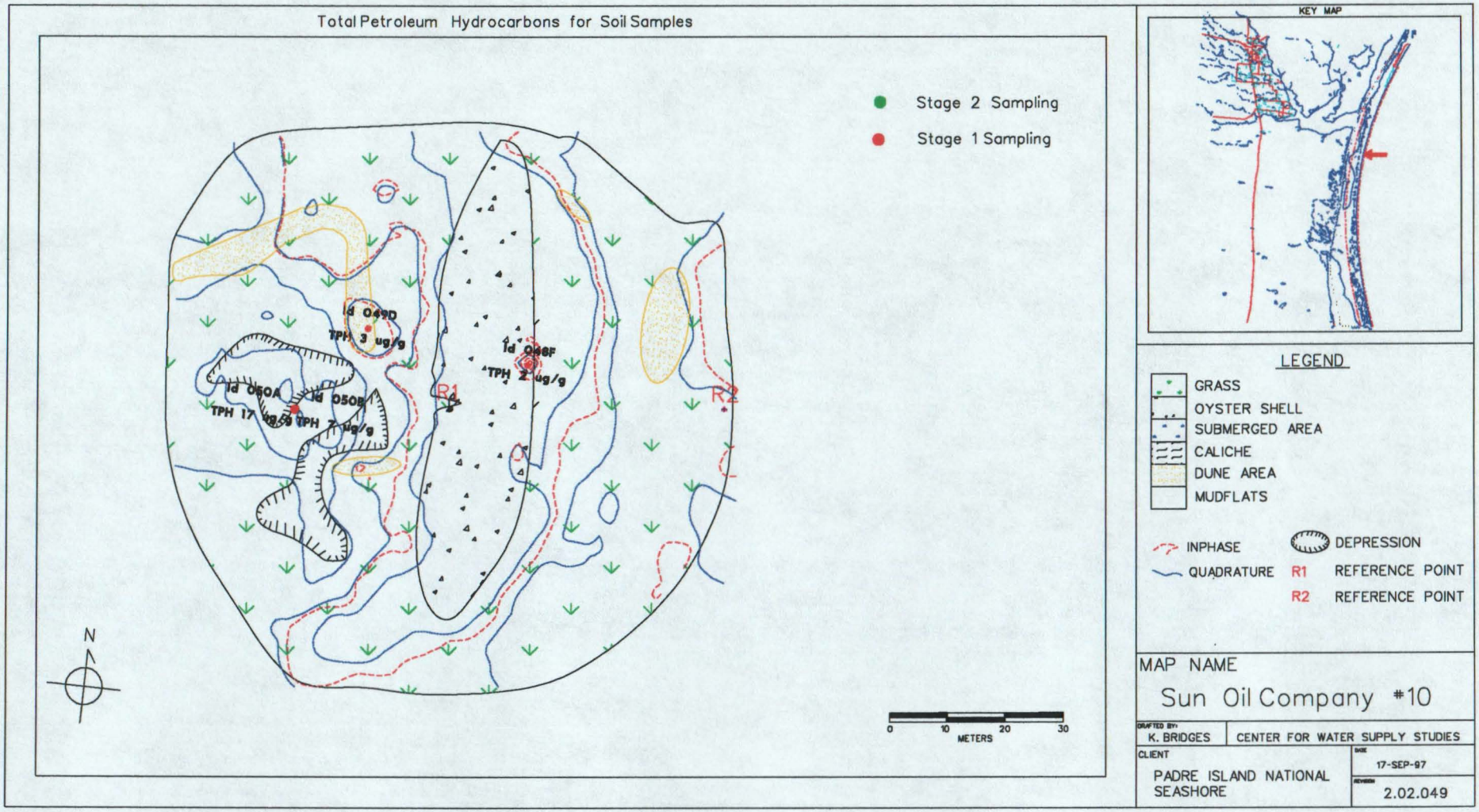


Figure 6.13a Total Petroleum Hydrocarbon Results for soils at Site Id 49 - Sun #10

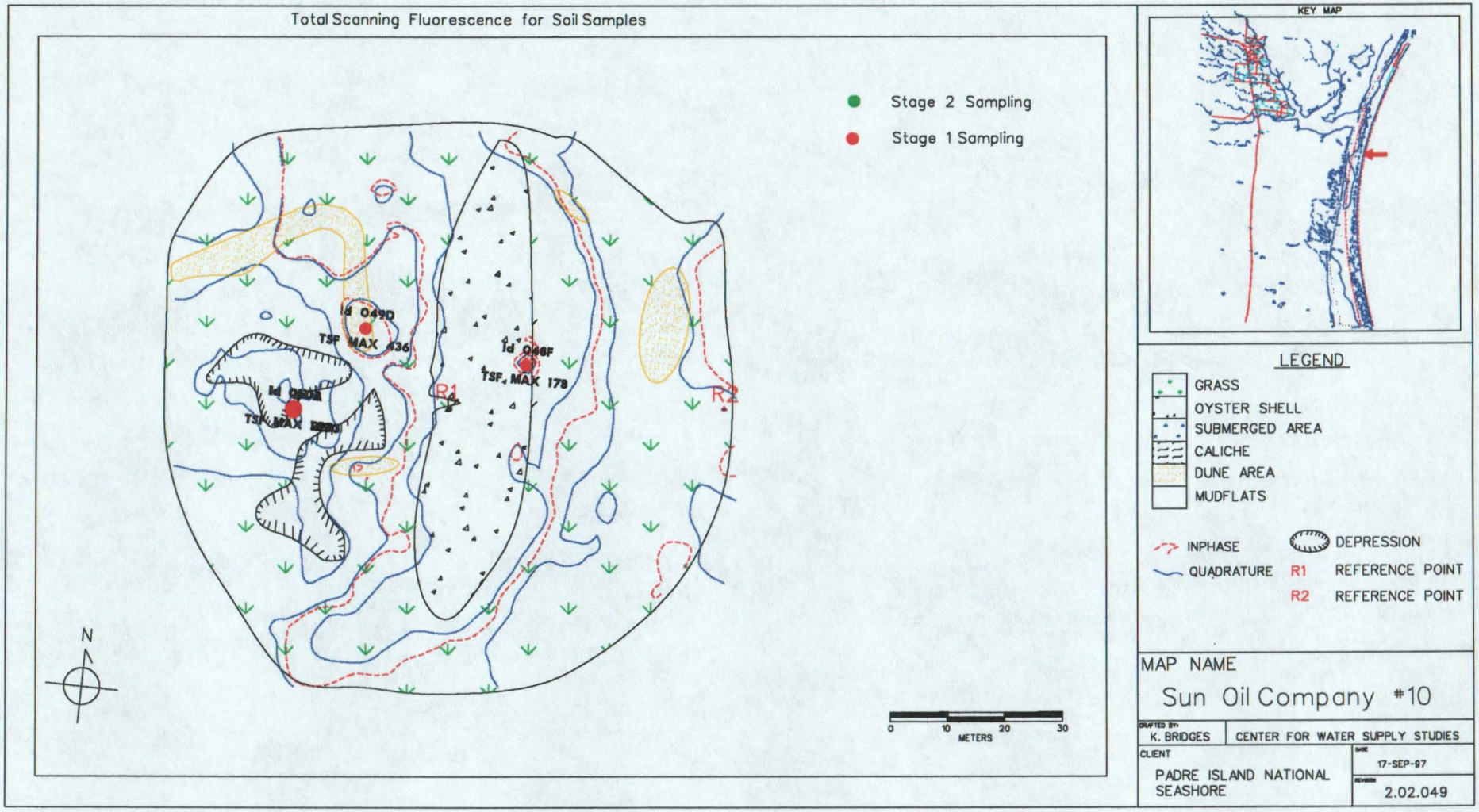


Figure 6.13b Total Scanning Flourescence (Max.) Results for Soils at Site Id 49 - Sun #10

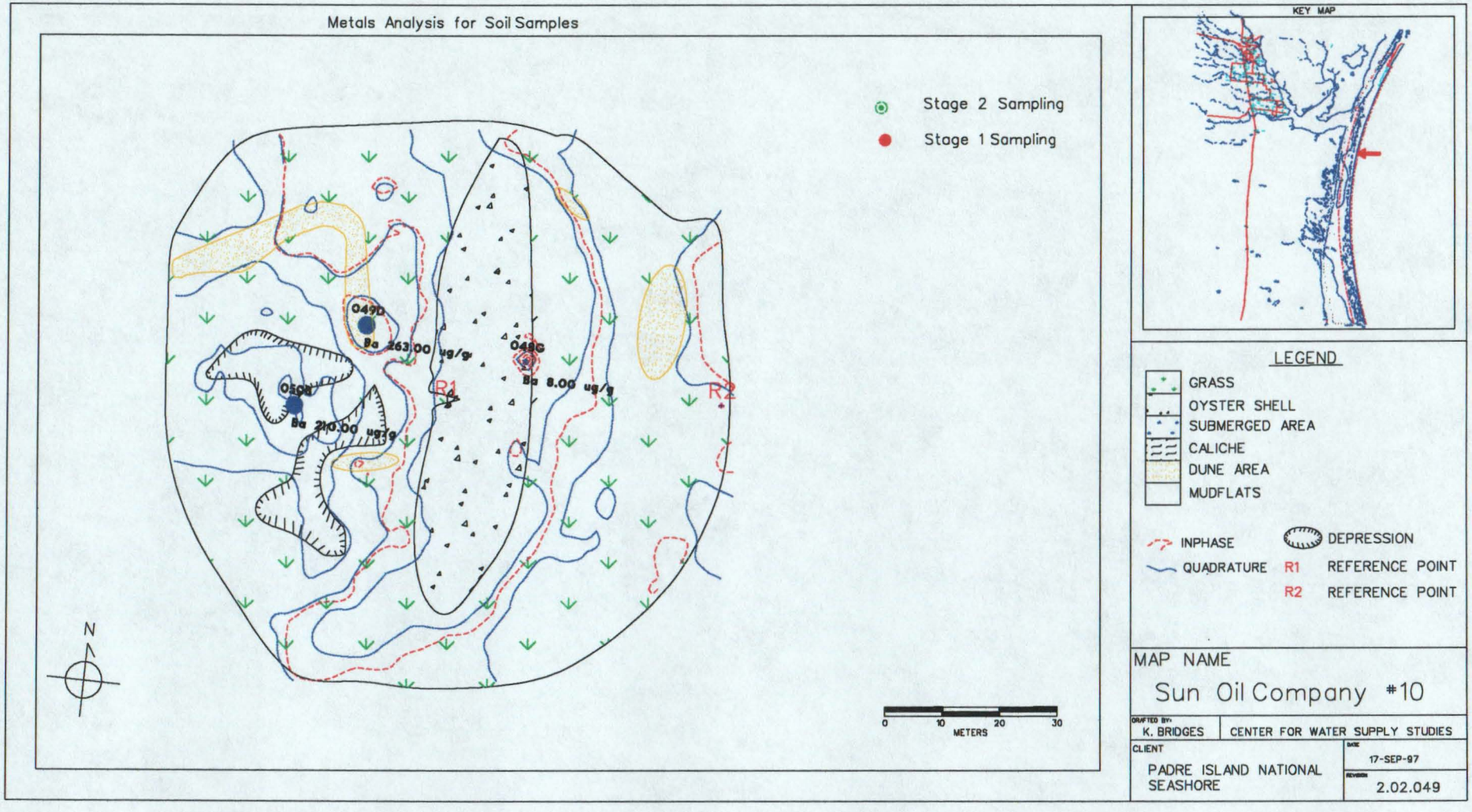


Figure 6.13c Metals Results for Soils at Site Id 49 - Sun #10

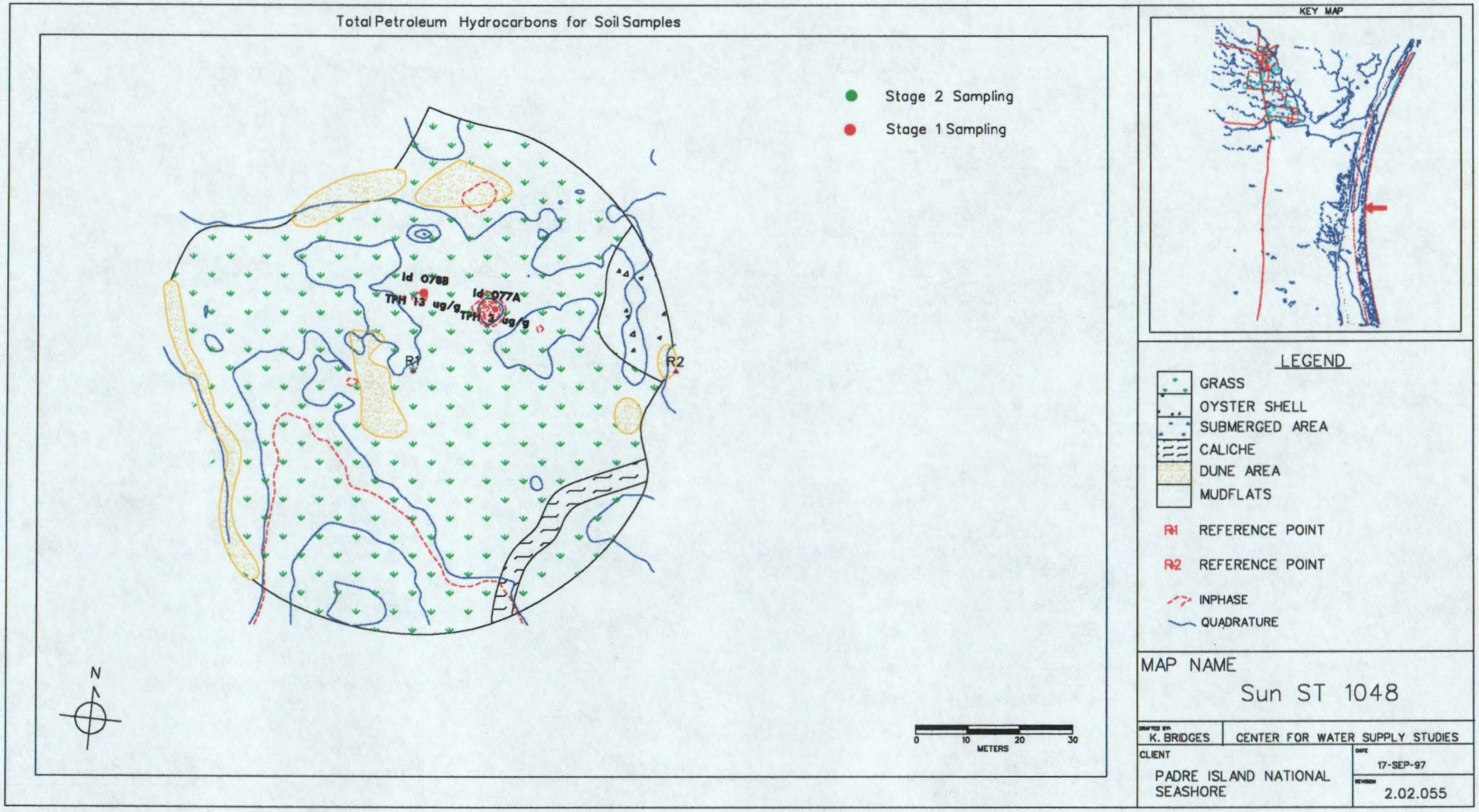


Figure 6.14a Total Petroleum Hydrocarbon Results for soils at Site Id 55 - Sun ST 1048

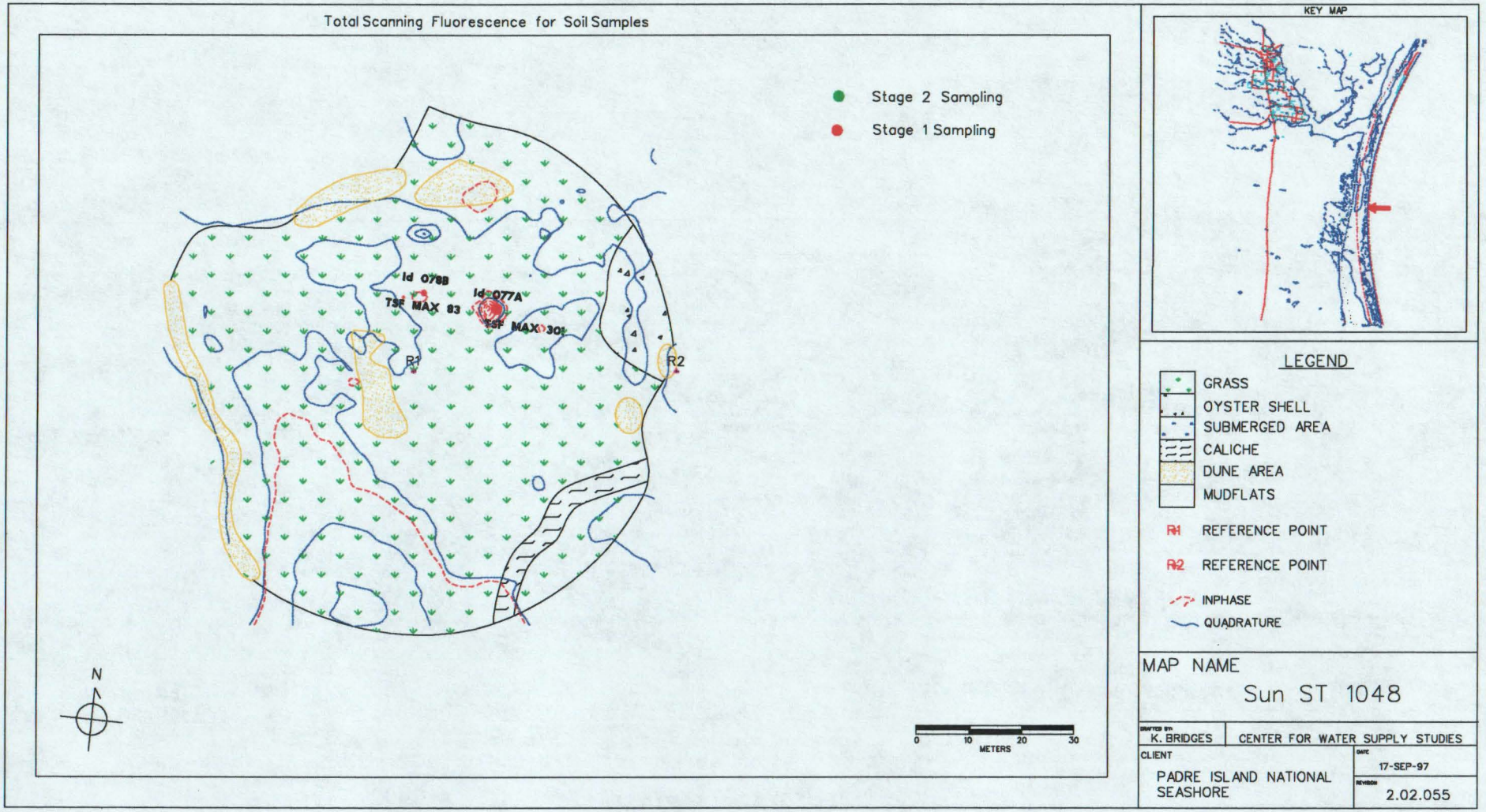


Figure 6.14b Total Scanning Flourescence (Max.) Results for Soils at Site Id 55 - Sun ST 1048

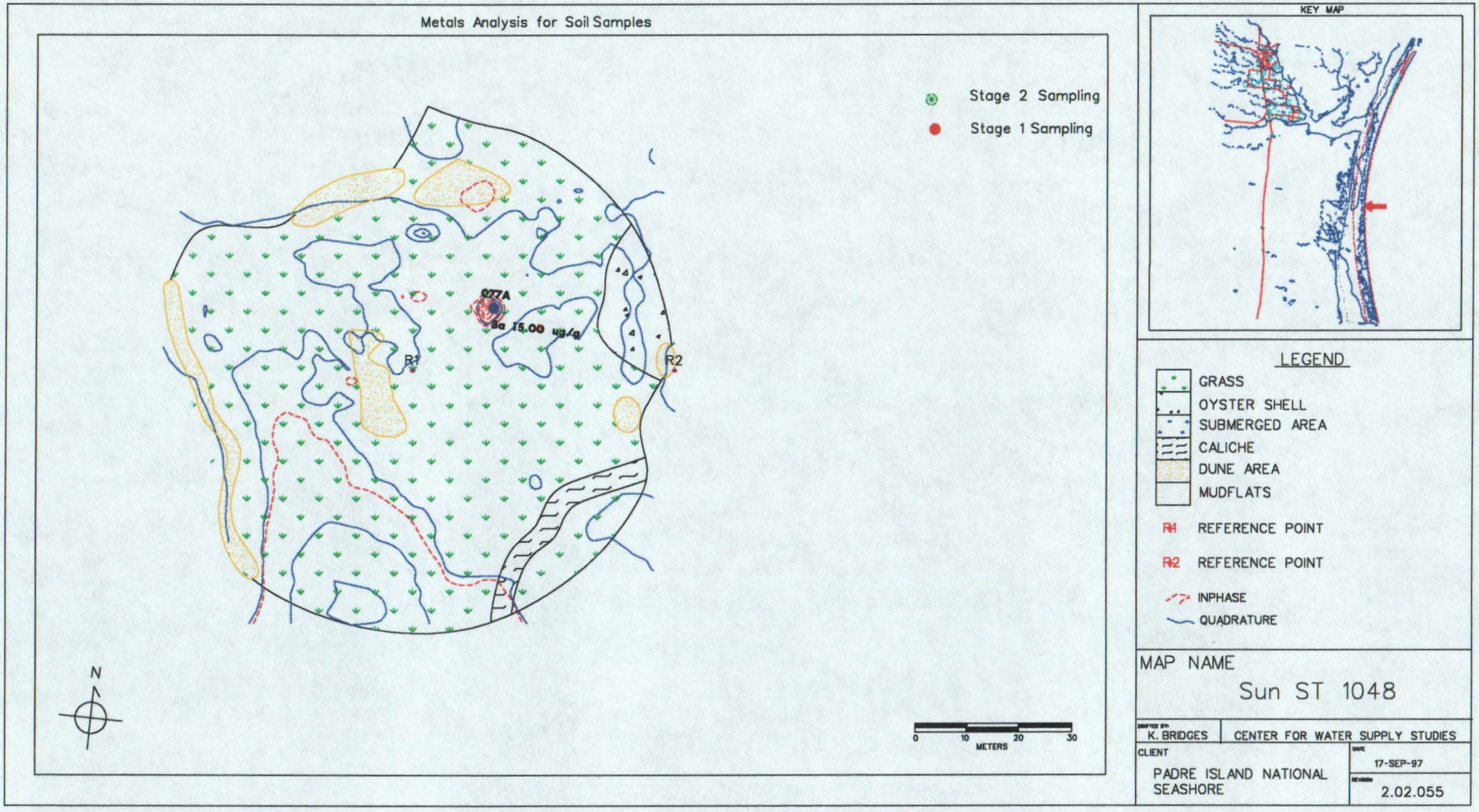


Figure 6.14c Metals Results for Soils at Site Id 55 - Sun ST 1048

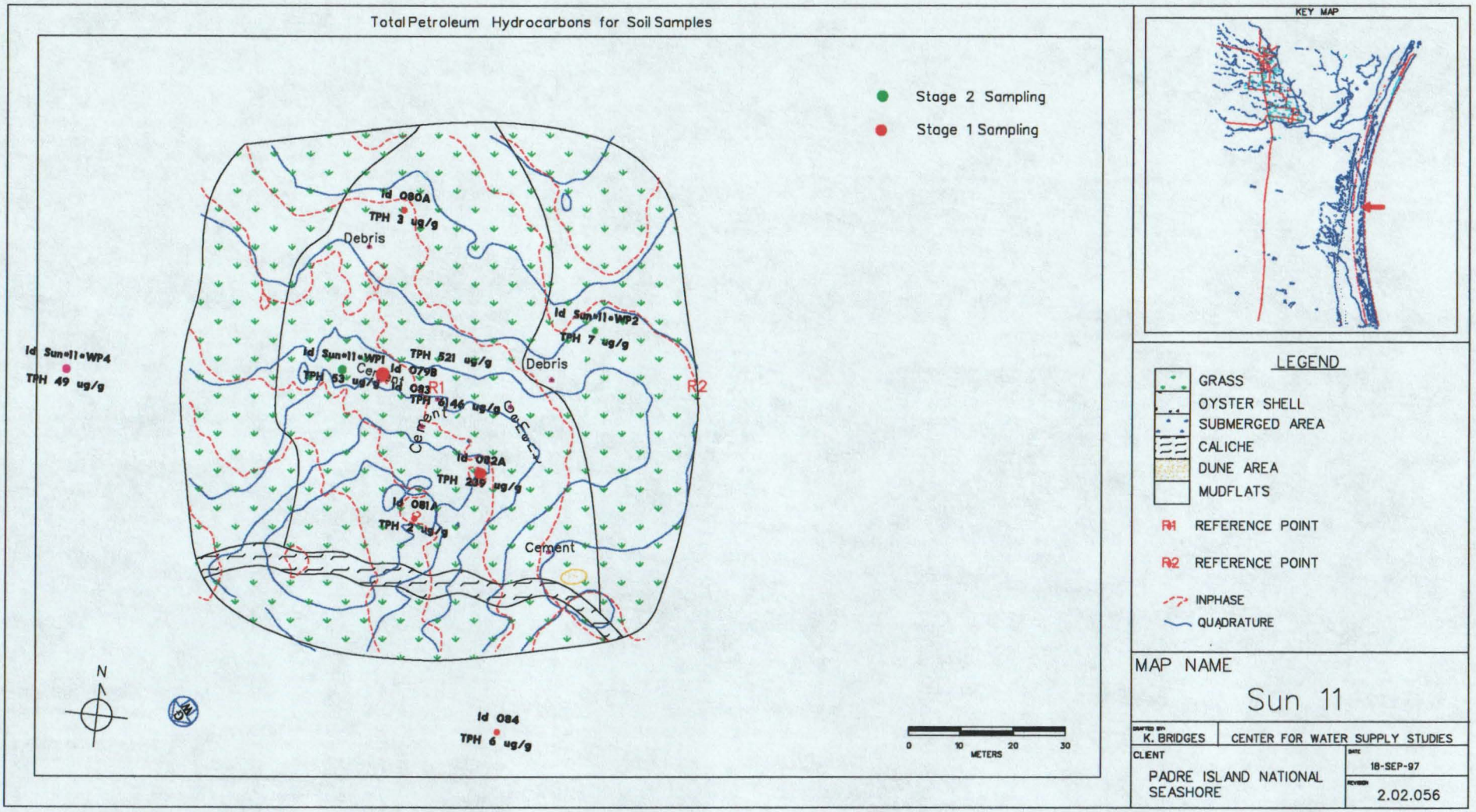


Figure 6.15a Total Petroleum Hydrocarbon Results for soils at Site Id 56 - Sun #11

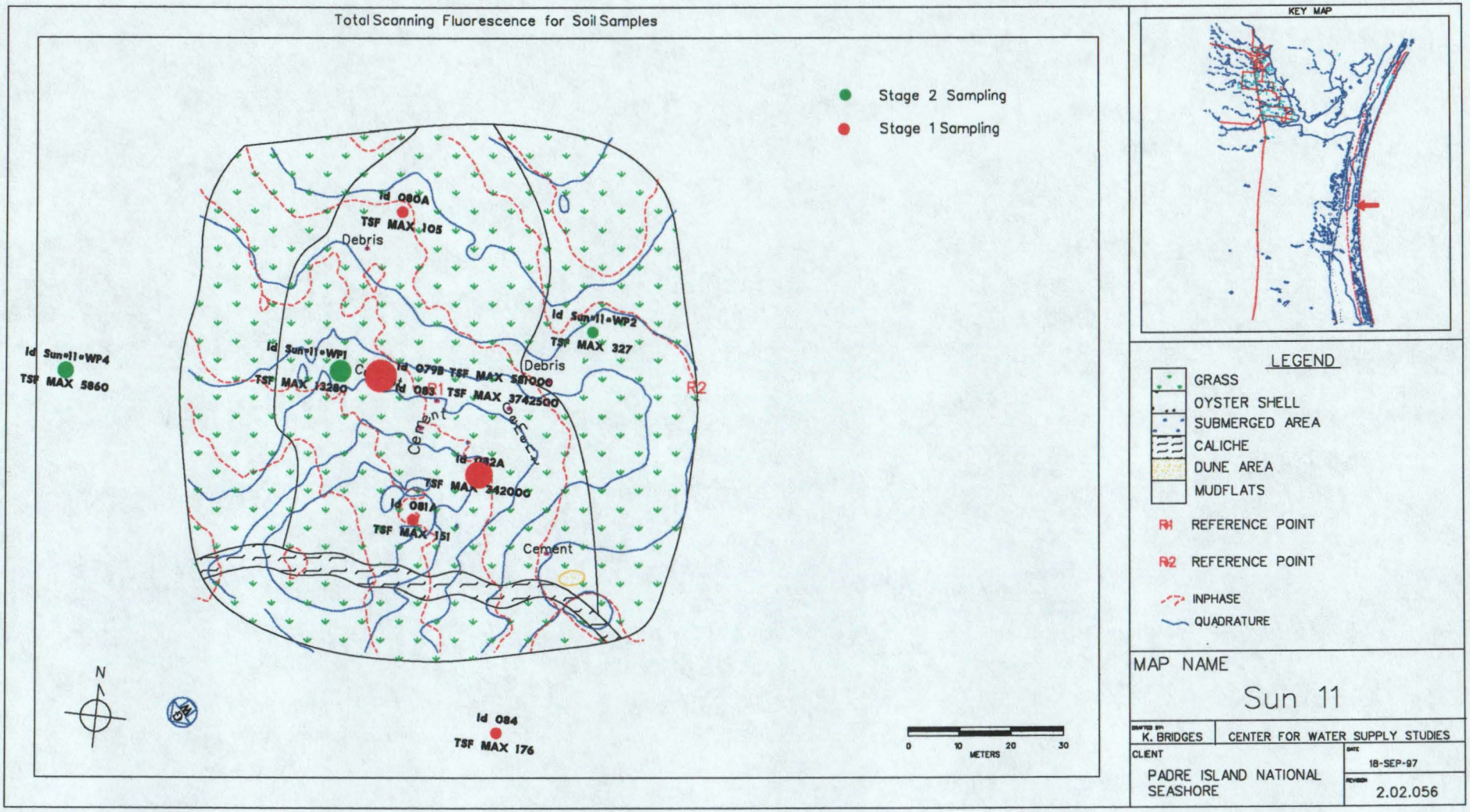


Figure 6.15b Total Scanning Flourescence (Max.) Results for Soils at Site Id 56 - Sun #11

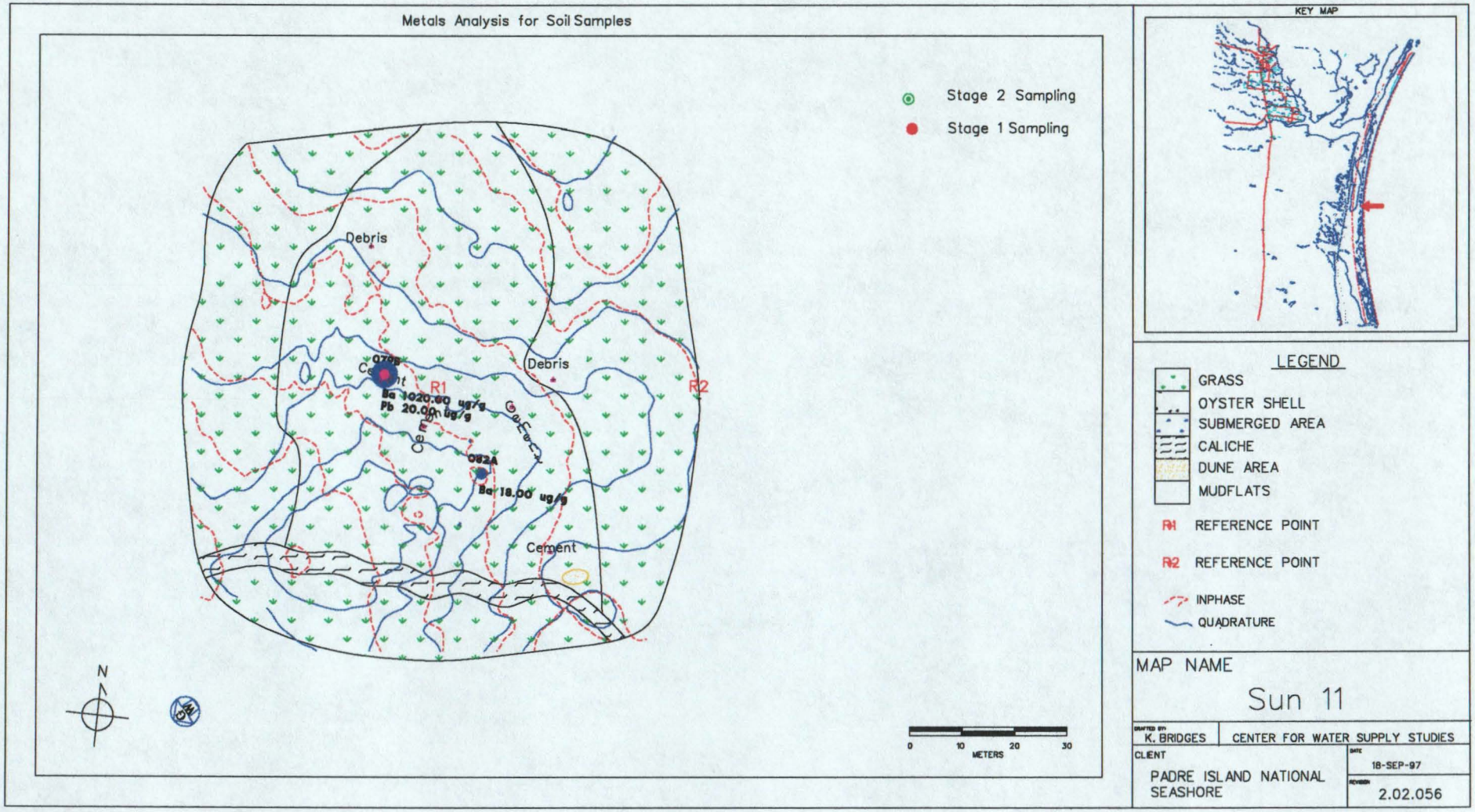


Figure 6.15c Metals Results for Soils at Site Id 56 - Sun #11

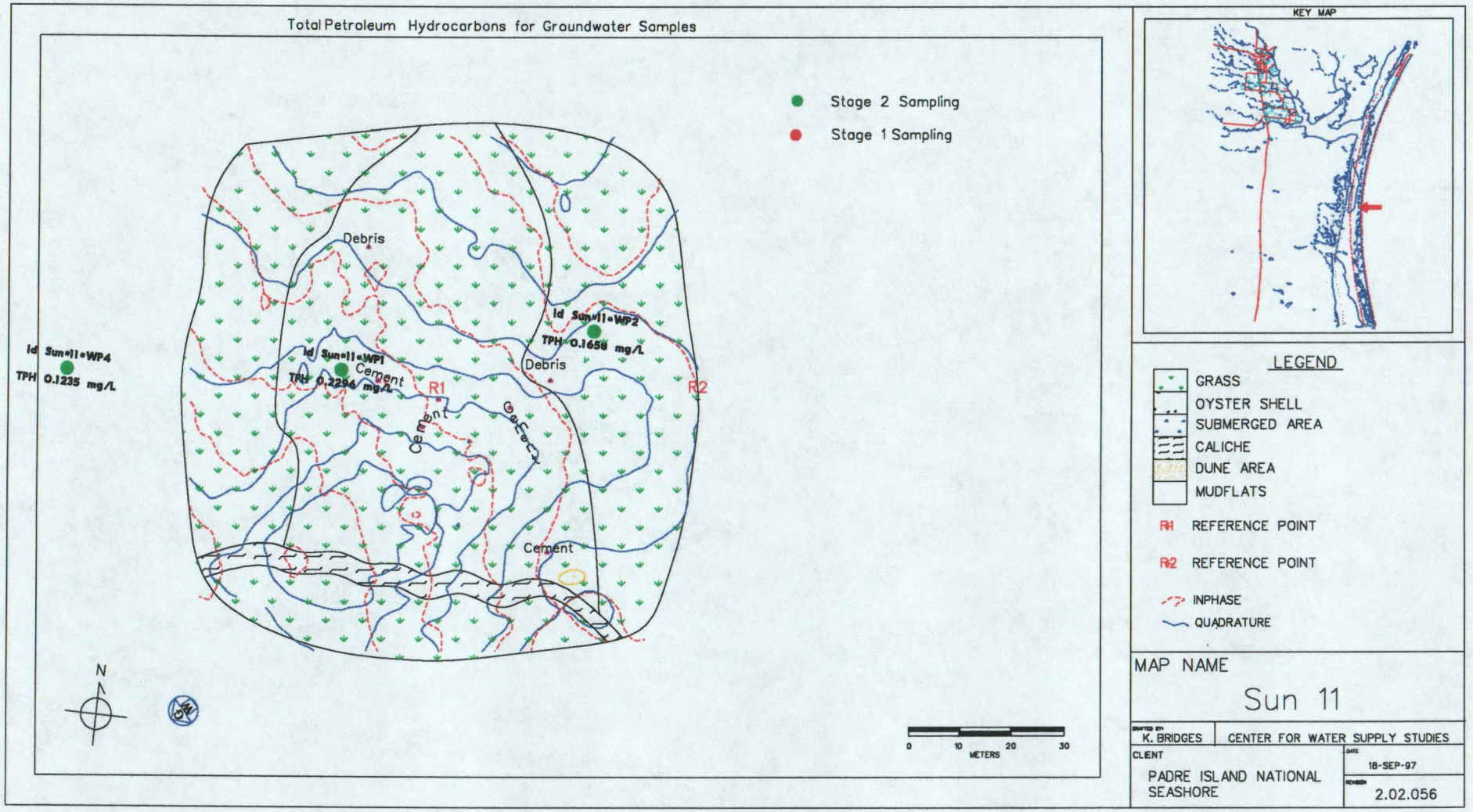


Figure 6.15d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 56 - Sun #11

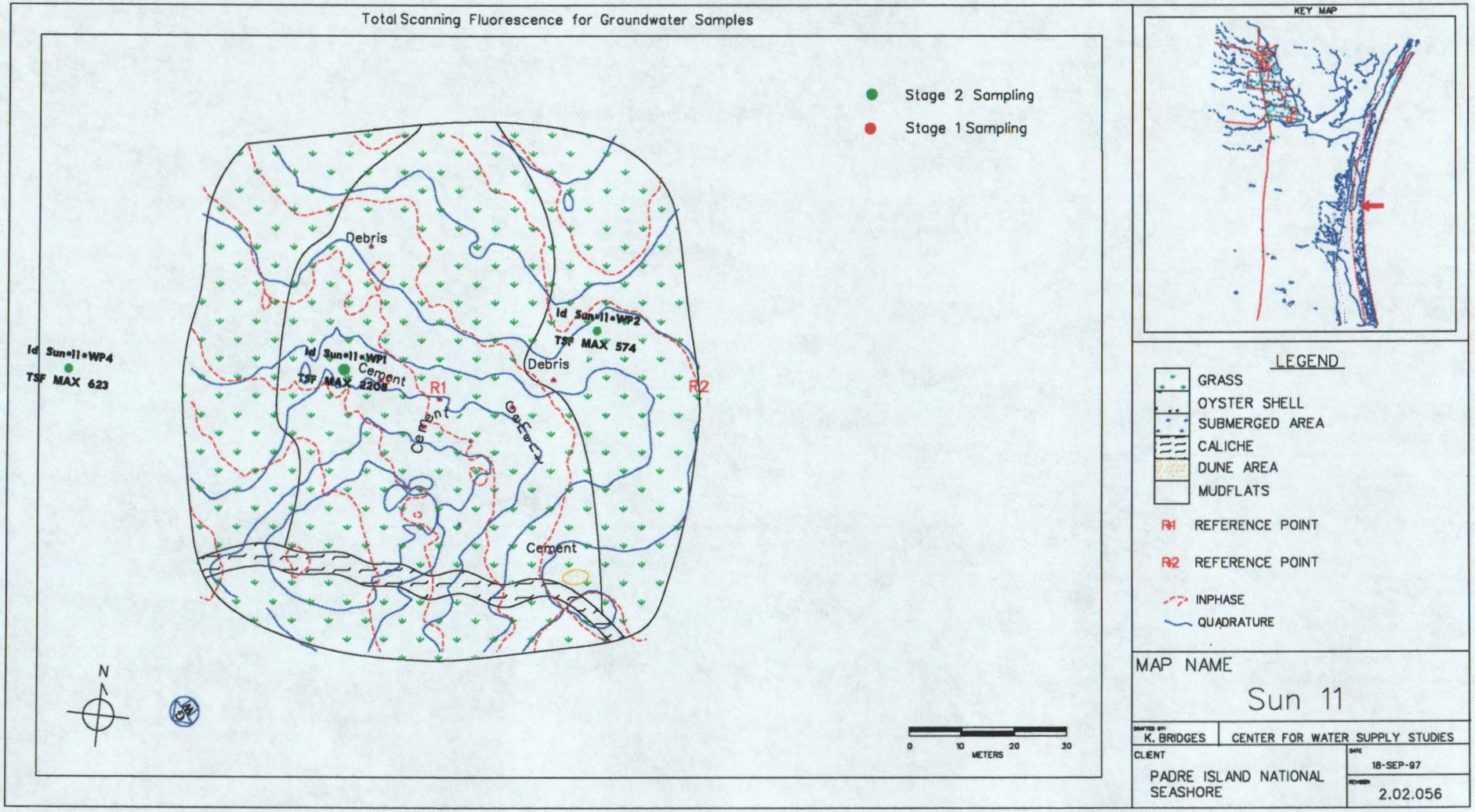


Figure 6.15e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 56 - Sun #11

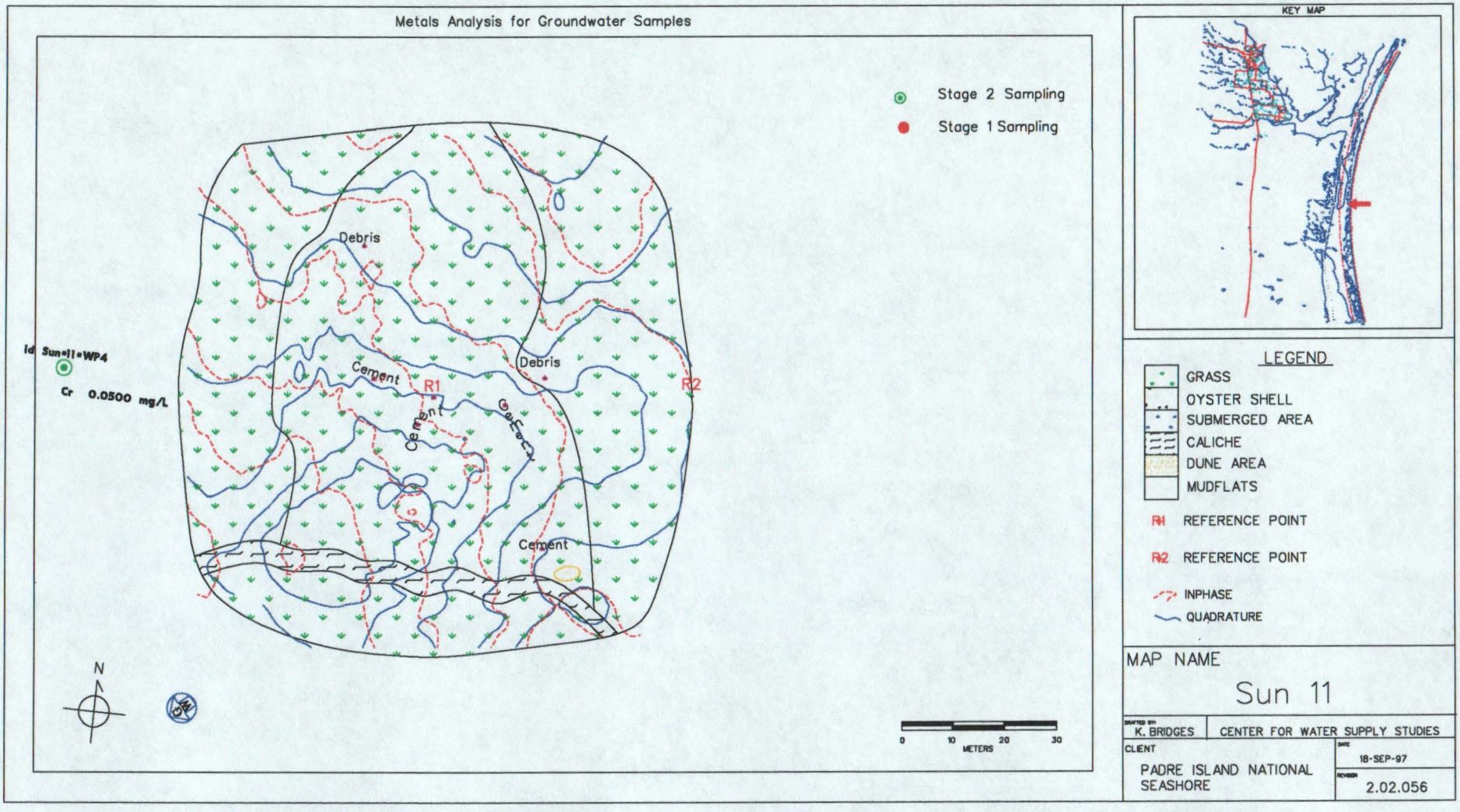


Figure 6.15f Metals Results for Groundwater at Site Id 56 - Sun #11

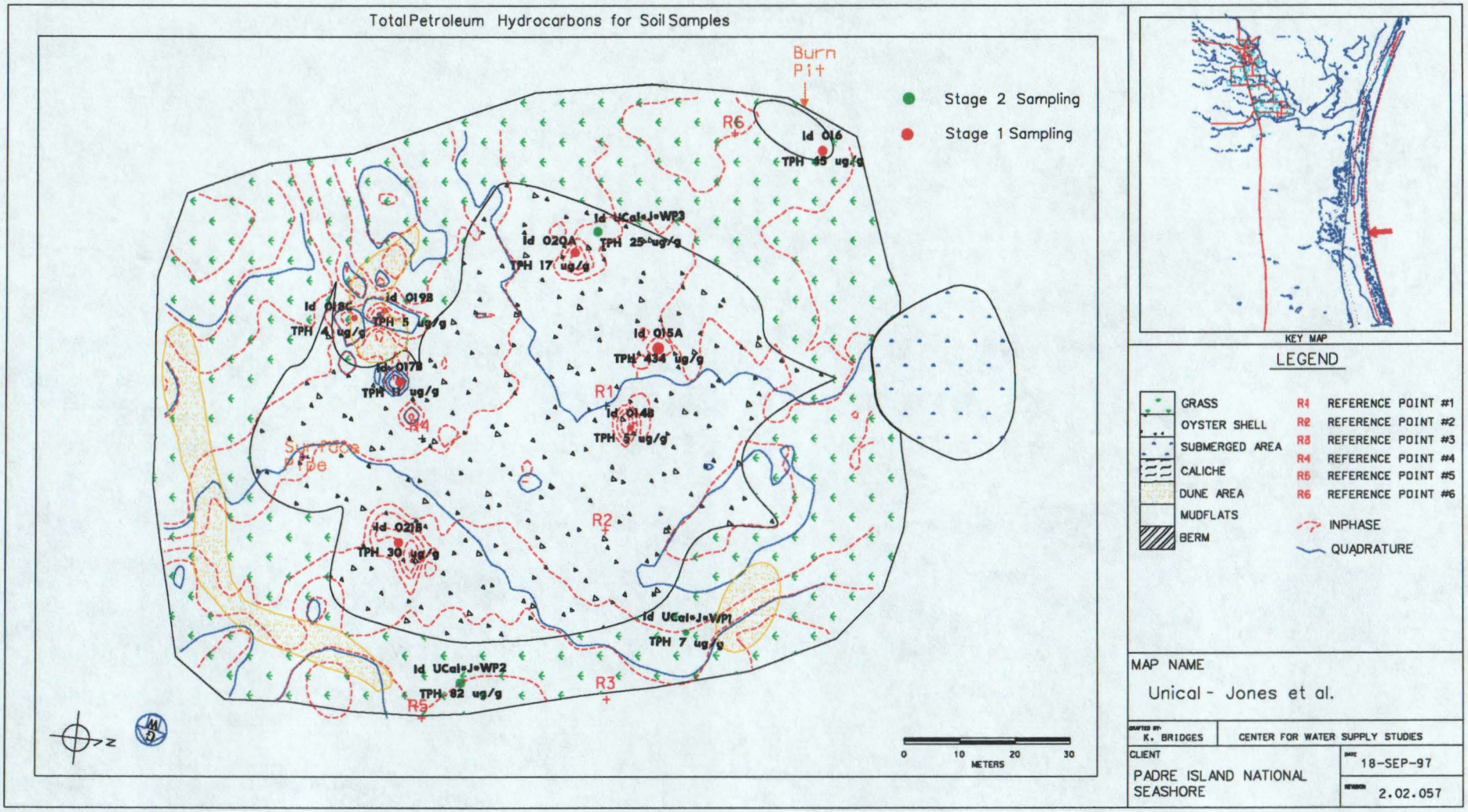


Figure 6.16a Total Petroleum Hydrocarbon Results for Soils at Site Id 57 - Unical Jones et al. #1

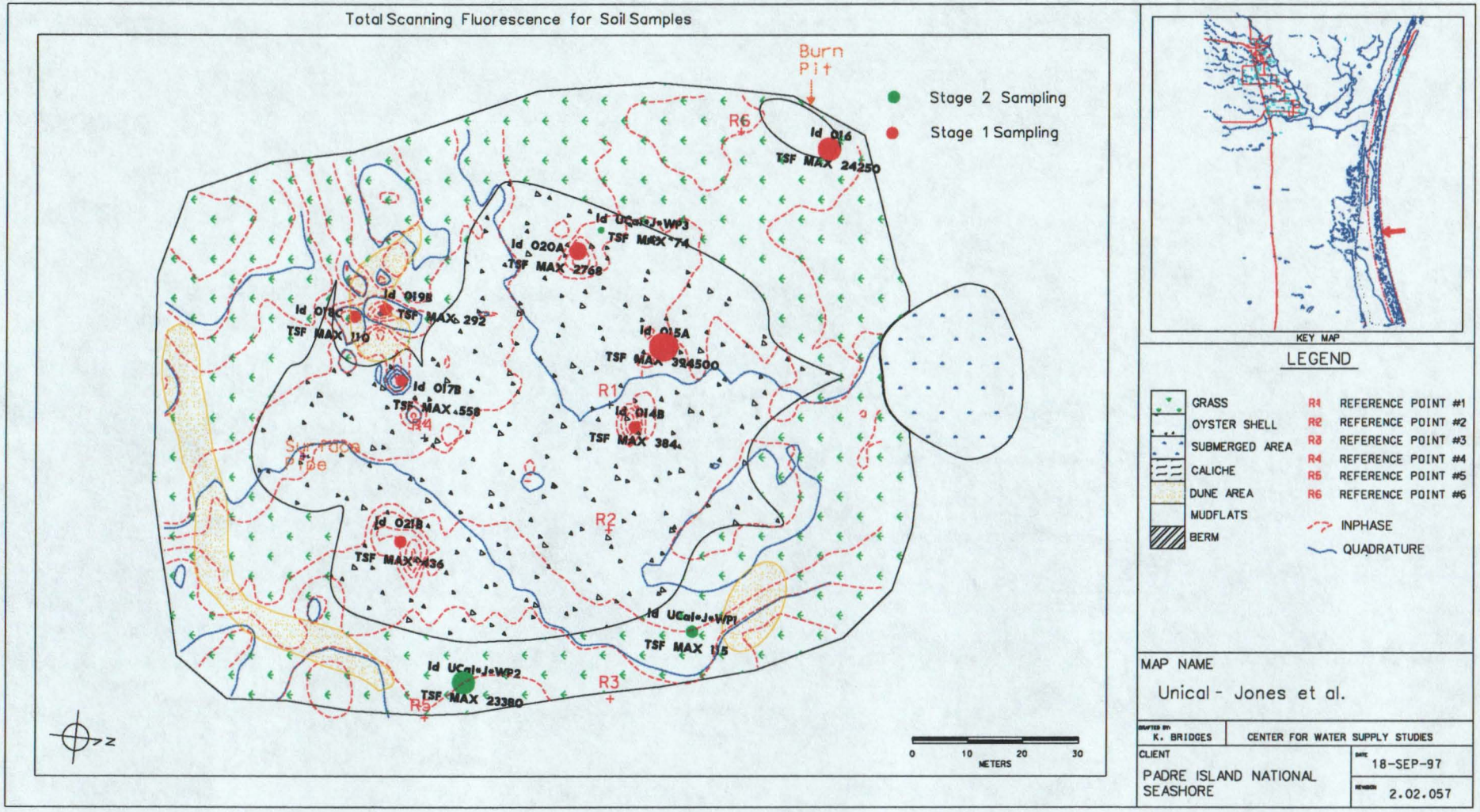


Figure 6.16b Total Scanning Fluorescence (Max) Results for Soils at Site Id 57 - Unical Jones et al. #1

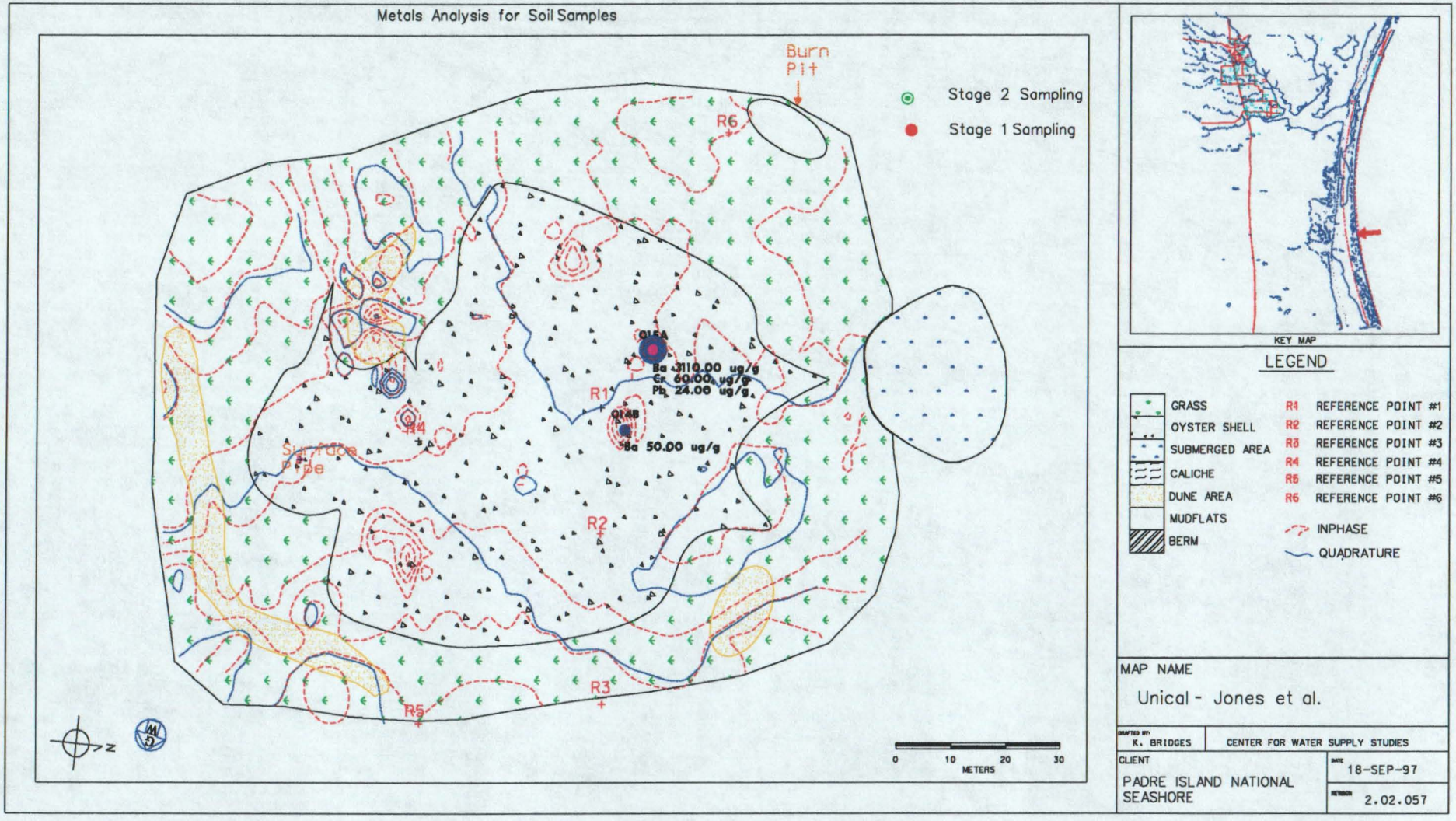


Figure 6.16c Metals Results for Soils at Site Id 57 - Unical Jones et al. #1

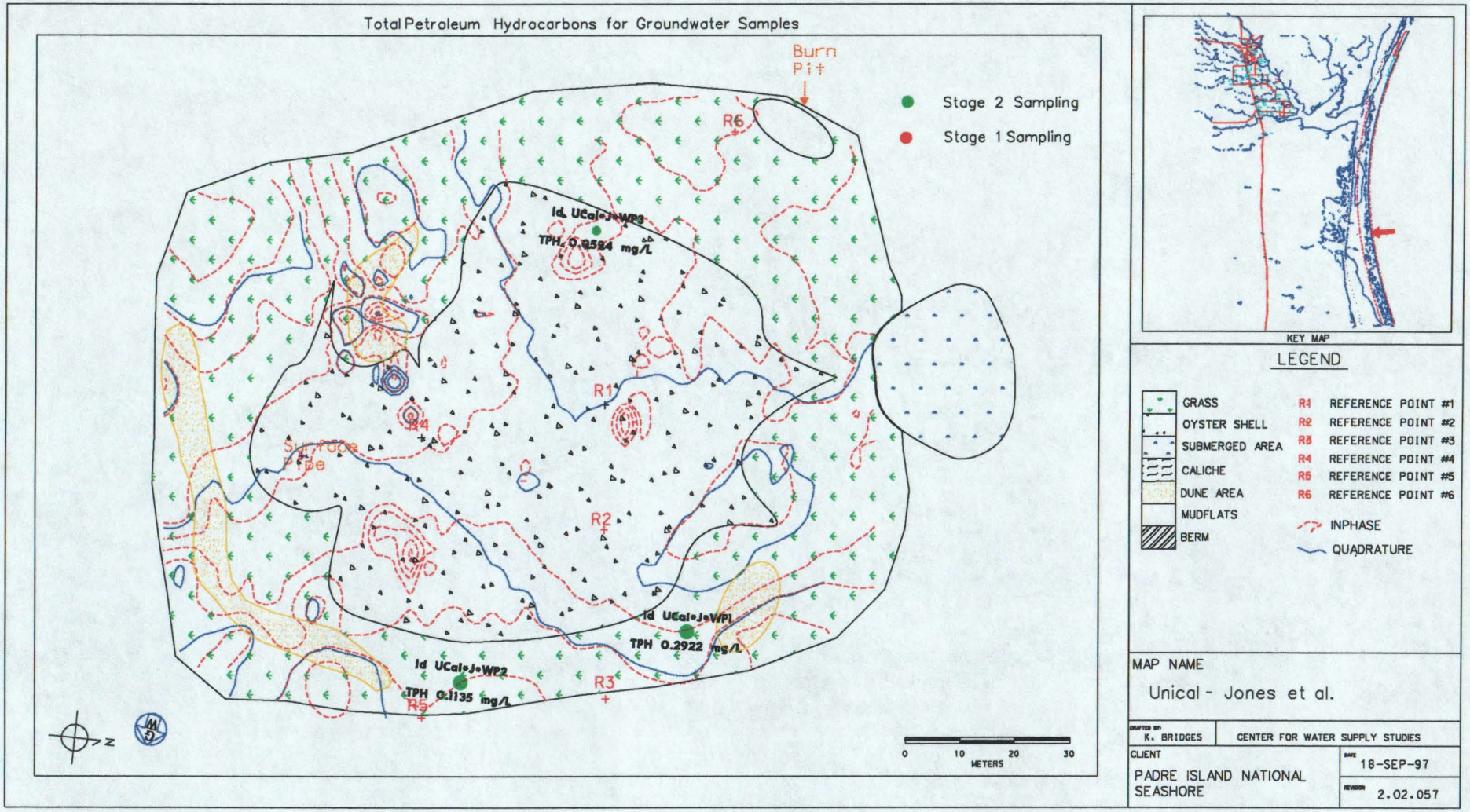


Figure 6.16d Total Petroleum Hydrocarbon Results for Groundwater at Site Id 57 - Unical Jones et al. #1

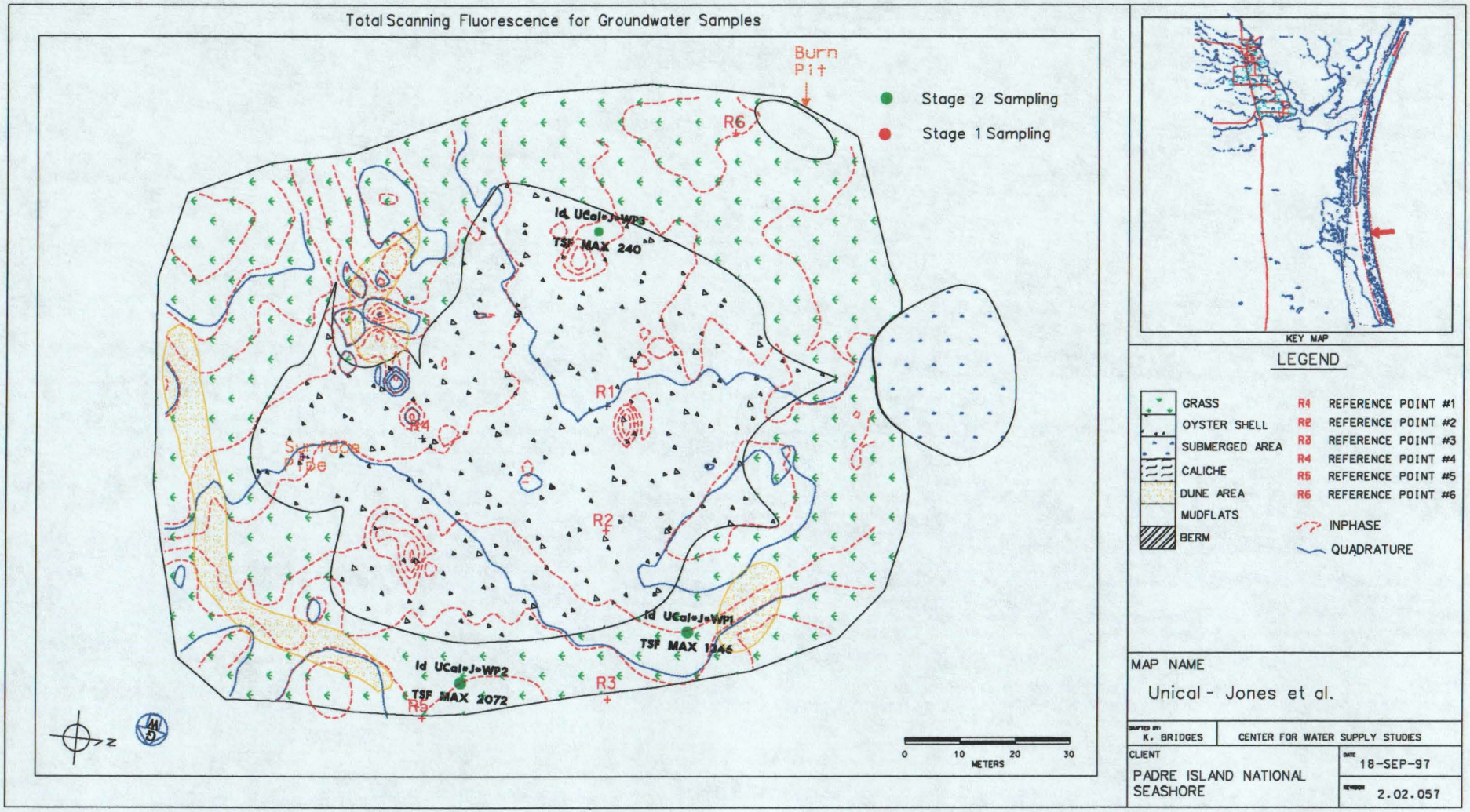


Figure 6.16e Total Scanning Fluorescence (Max) Result Results for Groundwater at Site Id 57 - Unical Jones et al. #1

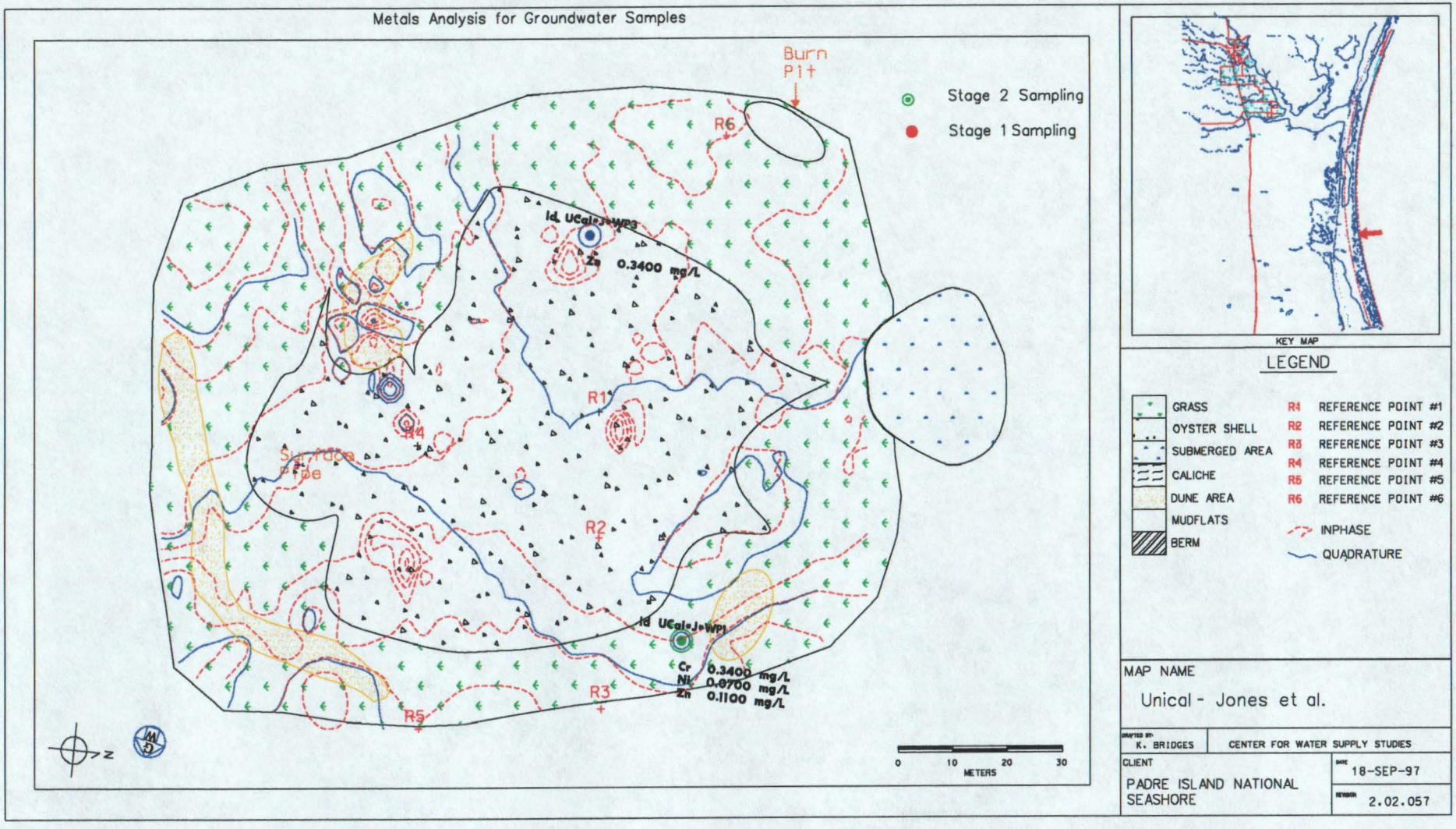


Figure 6.16f Metals Results for Groundwater at Site Id 57 - Unical Jones et al. #1

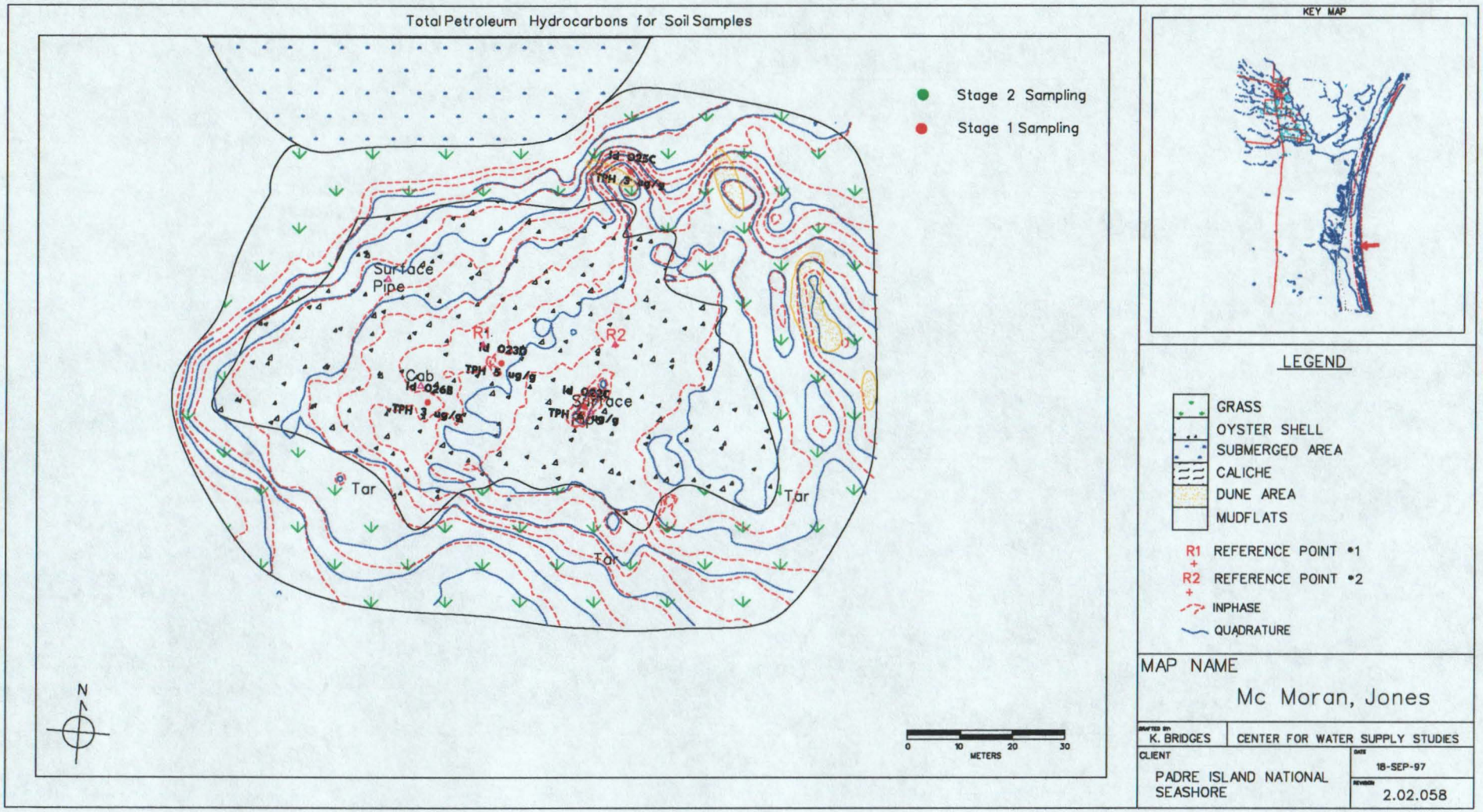


Figure 6.17a Total Petroleum Hydrocarbon Results for soils at Site Id 58 - McMoran Jones et al. #1

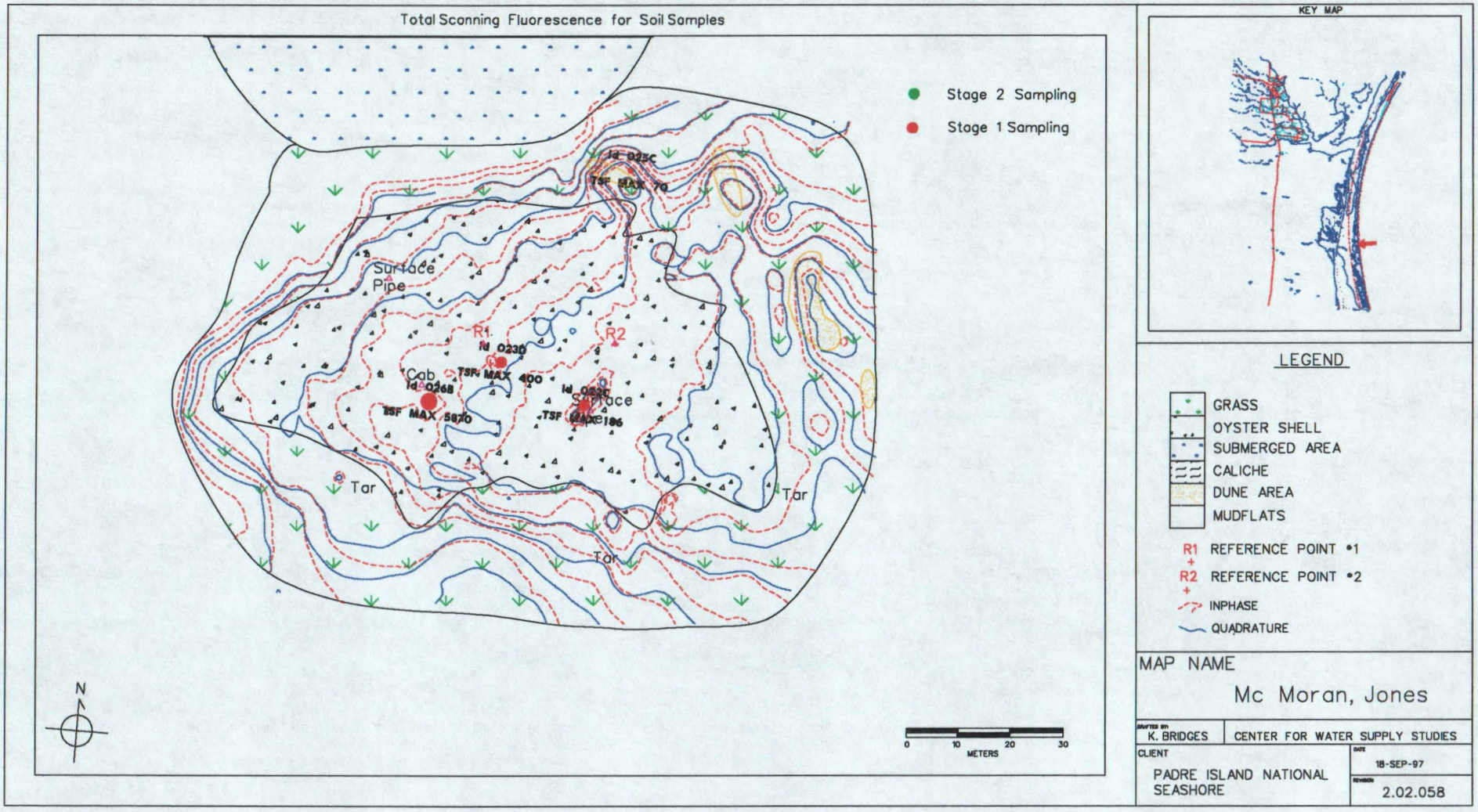


Figure 6.17b Total Scanning Fluorescence (Max) Results for Soils at Site Id 58 - McMoran Jones et al. #1

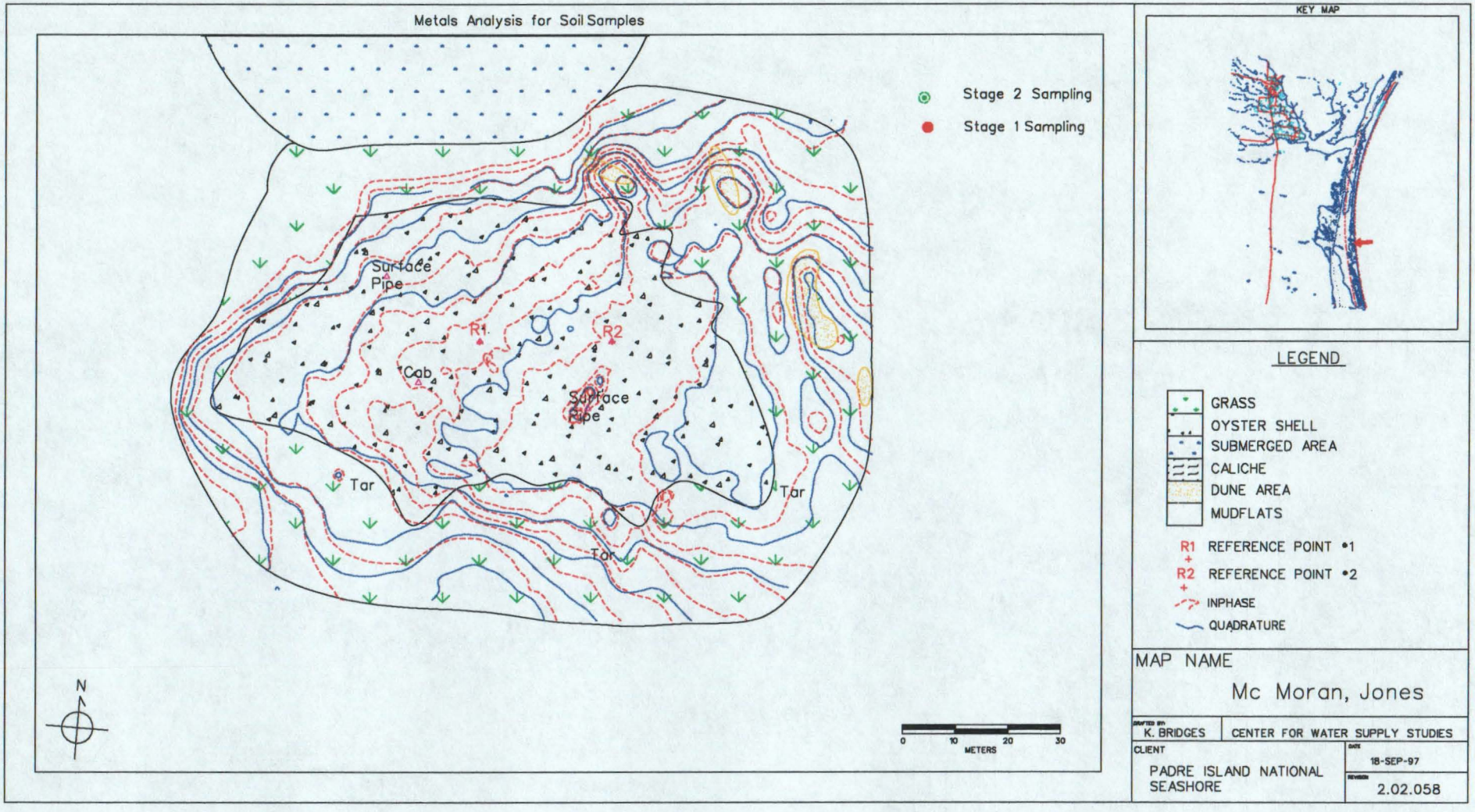


Figure 6.17c Metals Results for Soils at Site Id 58 - McMoran Jones et al. #1

VII. Conclusions

The budget did not allow for a comprehensive analytical coverage of all samples submitted. PAH, metals and PCB analysis was limited to select samples. Relative ranking of the sites was accomplished by using the sample returns for TPH. The TPH results reflect both resolved and unresolved complexes. Unresolved complexes may indicate long-term weathering of released products. These samples results furnished the only quantitative method for determining relative conditions at the subject sites, both individually and collectively.

When ranking the sites the magnitude of the sample returns and the number and distribution of the samples at each of the sites was considered. The location of the respective samples, both on-site and off-site influenced both of the preceding criteria. The environmental setting with respect to potential surface delivery of migrating released product was a concern and factors in. Surface features included sites locations with ponds, marshes and wind tidal flats bordering them or in close proximity. Due to the age of many of these sites and the subsurface geology encountered in the park, off-site migration of the primary body of released product may have occurred . Conditions reflected by the samples collected in this limited site characterization may only reflect absorbed and adsorbed remnants of releases that have migrated off site.

Phase one results for TPH ranged from 6,145.9 ug/g at Site 56 (Sun Oil Dunn-McCampbell No. 11), to 0.6 ug/g at Site 15 (Coral Petroleum and Development well No. 1). Fifty five of the samples returned results below 10 ug/g and nine sites from the original seventeen sites returned one or more sample with concentrations for TPH in excess of 100 ug/g. These included the following sites in order of magnitude; 56, 38, 44, 57, 29, 30, 39, 41, and 42. Site 15 returned the tenth highest TPH concentration of 34.7 ug/g and completed the ten site locations scheduled for the second sample collection phase. Conditions in the field during the second sample collection events prevented additional work at Site 57. Site 16 was substitute in lieu of this site. The results for TPH returned in the Phase II samples bolstered the conditions documented in the first phase. Higher concentrations for TPH were encountered with much of this coming from off-site sample locations. Values ranged from 0.8 ug/g in sample Sun_8_WP3_S at Site 44 (Sun Oil well No. 8), to 25304.7 ug/g in sample Carl_2_WP3_S at Site 41 (Carl Oil Dunn et al. No. 2). Seven sites (15, 16, 29, 30, 39, 56, and 57) had values for TPH that ranged from 0.8 ug/g to 53 ug/g. The remaining three sites (38, 41 and 44) returned results in excess of 1000 ug/g. Both Site 39 (Carl Oil Dunn et al. No. 1) and Site 44 (Sun Oil well No. 8) had high TPH concentrations in a single well point location. These values ranged from 1880.7 ug/g in sample CARL_1_WP1_S at Site 39, to 3347.7 ug/g in sample SUN_8_WP3 at Site 44. Two samples submitted from two independent sample locations from Site 39 (Carl Oil Dunn et al. No. 2) exceeded 1000 ug/g. Sample CARL_2_WP3_S returned 25,304.7 ug/g TPH, and Sample CARL_2_WP4_S returned 6,534 ug/g TPH.

Thirty groundwater samples were submitted for analysis. Three sample from each of the ten sites included in the second sample collection phase. Each result represents groundwater conditions at the respective sample location on the subject site at the time of the well point installation. No submitted samples returned high value of TPH, and no free product was encountered in the field during the sample collection events. The sample results for TPH ranged from 0.0203 mg/L in Sun 8_WP3_W at

Site 44 (Sun Oil well No. 8), to 3.6132 mg/L in COR_1_WP2_W at Site 15 (Coral Petroleum and Development well No. 1). The average result for all samples is 0.5642 mg/L. Site 15 (Coral Petroleum and Development well No. 1), Site 41 (Carl Oil Dunn et al. No. 2) and Site 44 (Sun Oil well No. 8) stand out as sites with the highest concentrations of TPH. Site 44 (Sun Oil well No. 8) appears as the site with the lowest returned TPH concentration (0.0203 mg/L) and one of the highest TPH concentrations (2.3261 mg/L). High values ranged from 3.6132 mg/L in COR_1_WP2_W at Site 15 (Coral Petroleum and Development well No. 1) to 2.3261 mg/L in Sun_8_WP1_W at Site 44 (Sun Oil well No. 8).

All sample submitted for TPH analysis were analyzed for TSF. For the most part TSF results reflected the conditions indicated by their corresponding TPH results, but many times these values appeared to reciprocate condition shown to exist by the TPH results. This was evident when comparing similar TPH sample results from different sites and at times for individual sites. TPH remained the primary tool for determining relative conditions at all the subject sites for comparison purposes. The results for TSF ranged from 240 rfu in UCAL_J_WP3_W at Site 57 (Union of California W V Jones et al. No. 1) to 141,300 rfu in Sun 8_WP1_W at Site 44 (Sun Oil well No. 8). The average results for all samples is 18,593 rfu. This average is considerably higher than many of the sample results. Site 16, 29, 30, 56, and 57 have sample results well below 5,000 rfu. Sites 15 (Coral Petroleum and Development well No. 1) , site 38 (Carl Oil Dunn et al. No. 1), Site 41 (Carl Oil Dunn et al. No. 2), and Site 44 (Sun Oil well No. 8) have sample results in excess of 50,000 rfu.

30 sediment samples and 10 water samples were submitted for analysis. PAH values returned on the preserved extracts ranged from 17.1 ng/g at Site 15 to 24,724 ng/g at Site 39. Six sites returned one or more sample result with a concentration above 1,000 ng/g. These sites in descending order were sites; 39, 41, 44, 29, 38 and 30. PAH values usually reflected the respective TPH concentrations. At times the PAH value would is larger than the TPH value and at other times it under expresses these concentration. Concentrations returned on groundwater samples were expressed in ng/L or parts per trillion. Values ranged from 95.1 ng/L at Site 16 to 6,053.4 ng/L at Site 41. Sites 15, 39, 41, and 44 had concentrations in excess of 500 ng/L in down gradient well point locations.

All sites included in the Phase II of the limited site characterization had one or more significant findings and may warrant further attention.. Three sites (38, 41 and 44) emerged as leading sites where high concentrations of TPH and other monitored constituents were encountered in several representative samples. Sites 41 and 38 appear to have the highest concentrations of TPH in off-site and on-site sampling locations. No off-site samples were collected from Site 44. Sites 56 and 39 returned high TPH concentrations in some samples, the magnitudes and distribution appear to be lower than that encountered in the three leading sites. Sites 30, 57 and 29 have some samples with high TPH concentrations but most are of low concentration. Site 15 and 16 had the lowest range of TPH concentrations but still returned some isolated returns which are a concern. Site 15 returned the highest TPH concentration in groundwater well point samples. Groundwater monitoring wells were installed to provide access for long tern monitoring on Sites 15, 38, 41, 44, and 39.

Some surprising high sample results were encountered at the subject sites, many off these sample may represent isolated areas at respective sites where released products are adsorbed or absorbed and migration off-site has already occurred or is unlikely to occur in high concentrations. Groundwater sample returned lower concentrations compared to those returned for sediment sample. Many of the

high sample returns were associated with clays. The limited nature of the investigation does not allow for a comprehensive determination of existing conditions at the respective sites. Additional deliniation work is recommended to confirm any wide spread effects.

VIII. Bibliography

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Acknowledgments

We would like to acknowledge Alan Berkebile, Richard Hay, Karen Bridges, Alexander Medvedev, and Robin Schubauer of the Center for Water Supply Studies for assisting in field work, report and map preparation, and performing, interpreting and presenting the electromagnetic surveys used in this investigation. Padre Island National Seashore personnel, John Miller, Paul Eubank, and Darrell Echols gave us invaluable assistance and logistical support throughout the investigation.

Appendices

A Limited Site Characterization on Abandoned Oil & Gas Exploration and Production Sites

Appendix I
Analytical Results

Key to Analytes

ACNP	Acenapthene
ACNPY	Acenapthylene
Ag	Silver
ANTH	Anthracene
BIPHENYL	Biphenyl (Diphenyl)
Ba	Barium
BZAA	Benzo(A)Anthracene
BZAP	Benzo(A)Pyrene
BZBF	Benzo(B)Fluoranthene
BZEP	Benzo(E)Pyrene
BZGHIP	Benzo(G.H.)Perylene
BZKF	Benzo(K)Fluoranthene
CHRYSENE	Chrysene
CHRYSENE_C1	C1-Chrysene
CHRYSENE_C2	C2-Chrysene
CHRYSENE_C3	C3-Chrysene
CHRYSENE_C4	C4-Chrysene
Cr	Chromium
Cu	Copper
DBAHA	Dibenz(a.h)Anthracene
DBF	Dibenzofuran
DBFC1	C1-Dibenzofuran
DBFC2	C2-Dibenzofuran
DBFC3	C3-Dibenzofuran
DMNPH26	2,6-Dimethyl Phthalate
FL	Fluorene
FLA	Fluoranthene
FLAPYRC1	C1-Fluoranthenes/Pyrenes
FLA_PYRC1	C1-Fluoranthenes/Pyrenes
FLC1	C1-Fluorene
FLC2	C2-Fluorene
FLC3	C3-Fluorene
Hg	Mercury
INP123	Indeno(1,2,3-C,D)Pyrene
MTNPH1	1-Methylnaphthalene
MTNPH2	2-Methylnaphthalene
MTPHAN1	1-Methyl Phenanthrene
NAPH	Naphthalene
NAPHC1	C1-Naphthalenes
NAPHC2	C2-Naphthalenes
NAPHC3	C3-Naphthalenes
NAPHC4	C4-Naphthalenes
Ni	Nickel

PAHTOT	Total PAH's with Perylene
PERY	Perylene
PHAN	Phenanthrene
PHANANTHC1	C1-Phenanthrenes/Anthracenes
PHANANTHC2	C2-Phenanthrenes/Anthracenes
PHANANTHC3	C3-Phenanthrenes/Anthracenes
PHANANTHC4	C4-Phenanthrenes/Anthracenes
PHAN_ANTHC1	C1-Phenanthrenes/Anthracenes
PHAN_ANTHC2	C2-Phenanthrenes/Anthracenes
PHAN_ANTHC3	C3-Phenanthrenes/Anthracenes
PHAN_ANTHC4	C4-Phenanthrenes/Anthracenes
PYR	Pyrene
Pb	Lead
SC	Specific Conductance
TMNPH167	1,6,7-Trimethylnaphthalene
TPH	Total Petroleum Hydrocarbons
TPH-R	Total Petroleum Hydrocarbons Result
TPH-U	Total Petroleum Hydrocarbons Unresolved
TSF MAX	Total Scanning Fluorescence Maximum
Zn	Zinc

Key to Matrix

DC	Drilled Cuttings
SO	Soil
WG	Ground Water

Key to Value Qualifier

>	Reported Data is Greater Than Detection Limits
<	Reported Data is Less Than Detection Limits
J	Value is an Estimated Quantity
ND	Not Detected
TR	Trace

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
001B	STAGE_1	SO	TPH	2.6	ug/g	
	STAGE_1	SO	TPH-R	1	ug/g	
	STAGE_1	SO	TPH-U	1.6	ug/g	
	STAGE_1	SO	TSF MAX	573	intens	
002D	STAGE_1	SO	ACNP	.1	ng/g	J
	STAGE_1	SO	ACNPY	.1	ng/g	J
	STAGE_1	SO	ANTH	.2	ng/g	J
	STAGE_1	SO	BIPHENYL	.9	ng/g	
	STAGE_1	SO	BZAA	.1	ng/g	J
	STAGE_1	SO	BZAP	.1	ng/g	J
	STAGE_1	SO	BZEP	.1	ng/g	J
	STAGE_1	SO	BZGHIP	.1	ng/g	J
	STAGE_1	SO	Ba	14	ug/g	
	STAGE_1	SO	CHRYSENE	.1	ng/g	J
	STAGE_1	SO	DBF	.1	ng/g	J
	STAGE_1	SO	DMNPH26	.5	ng/g	J
	STAGE_1	SO	FL	.3	ng/g	J
	STAGE_1	SO	FLA	.1	ng/g	J
	STAGE_1	SO	INP123	.1	ng/g	J
	STAGE_1	SO	MTNPH1	.6	ng/g	J
	STAGE_1	SO	MTNPH2	1.7	ng/g	J
	STAGE_1	SO	MTPHAN1	.3	ng/g	
	STAGE_1	SO	NAPH	1.4	ng/g	J
	STAGE_1	SO	NAPHC1	2.3	ng/g	J
	STAGE_1	SO	NAPHC2	3.1	ng/g	
	STAGE_1	SO	NAPHC3	7.2	ng/g	
	STAGE_1	SO	PAHTOT	17.1	ng/g	
	STAGE_1	SO	PERY	.1	ng/g	J
	STAGE_1	SO	PHAN	.3	ng/g	J
	STAGE_1	SO	PYR	.3	ng/g	J
	STAGE_1	SO	TMNPH167	.3	ng/g	J
	STAGE_1	SO	TPH	34.7	ug/g	
	STAGE_1	SO	TPH-R	1.4	ug/g	
	STAGE_1	SO	TPH-U	33.3	ug/g	
	STAGE_1	SO	TSF MAX	2840	intens	
003A	STAGE_1	SO	TPH	.6	ug/g	
	STAGE_1	SO	TPH-R	.4	ug/g	
	STAGE_1	SO	TPH-U	.2	ug/g	
	STAGE_1	SO	TSF MAX	457	intens	
004A	STAGE_1	SO	ACNP	.1	ng/g	J
	STAGE_1	SO	ACNPY	.2	ng/g	J
	STAGE_1	SO	ANTH	.2	ng/g	J
	STAGE_1	SO	BIPHENYL	1.2	ng/g	
	STAGE_1	SO	BZAA	.3	ng/g	
	STAGE_1	SO	BZAP	.3	ng/g	J
	STAGE_1	SO	BZBF	.6	ng/g	J
	STAGE_1	SO	BZEP	.4	ng/g	J
	STAGE_1	SO	BZGHIP	.4	ng/g	J
	STAGE_1	SO	BZKF	.2	ng/g	J
	STAGE_1	SO	CHRYSENE	.5	ng/g	J
	STAGE_1	SO	DBAHA	.1	ng/g	J
	STAGE_1	SO	DBF	.2	ng/g	J
	STAGE_1	SO	DMNPH26	.7	ng/g	
	STAGE_1	SO	FL	.3	ng/g	J
	STAGE_1	SO	FLA	.9	ng/g	J
	STAGE_1	SO	INP123	.3	ng/g	J
	STAGE_1	SO	MTNPH1	1.1	ng/g	
	STAGE_1	SO	MTNPH2	1.8	ng/g	
	STAGE_1	SO	MTPHAN1	.1	ng/g	J
	STAGE_1	SO	NAPH	4	ng/g	
	STAGE_1	SO	NAPHC1	2.9	ng/g	
	STAGE_1	SO	NAPHC2	5.6	ng/g	
	STAGE_1	SO	PAHTOT	20.6	ng/g	
	STAGE_1	SO	PERY	.7	ng/g	
	STAGE_1	SO	PHAN	.5	ng/g	J
	STAGE_1	SO	PYR	.7	ng/g	J
	STAGE_1	SO	TMNPH167	.3	ng/g	J
	STAGE_1	SO	TPH	8.8	ug/g	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	TPH-R	3.7	ug/g	
	STAGE_1	SO	TPH-U	5	ug/g	
	STAGE_1	SO	TSF MAX	323	intens	
005C	STAGE_1	SO	Ba	5	ug/g	
	STAGE_1	SO	TPH	6.7	ug/g	
	STAGE_1	SO	TPH-R	2	ug/g	
	STAGE_1	SO	TPH-U	4.7	ug/g	
	STAGE_1	SO	TSF MAX	1467	intens	
006C	STAGE_1	SO	TPH	3	ug/g	
	STAGE_1	SO	TPH-R	.6	ug/g	
	STAGE_1	SO	TPH-U	2.4	ug/g	
	STAGE_1	SO	TSF MAX	201	intens	
031A	STAGE_1	SO	Ba	6	ug/g	
	STAGE_1	SO	TPH	2.8	ug/g	
	STAGE_1	SO	TPH-R	1.4	ug/g	
	STAGE_1	SO	TPH-U	1.5	ug/g	
	STAGE_1	SO	TSF MAX	134	intens	
COR_1_WP1_S	STAGE_2	DC	TPH	3.2	ug/g	
	STAGE_2	DC	TPH-R	1.2	ug/g	
	STAGE_2	DC	TPH-U	2	ug/g	
	STAGE_2	DC	TSF MAX	2547	intens	
COR_1_WP1_W	STAGE_2	WG	TPH	.524	mg/L	
	STAGE_2	WG	TPH-R	.5	mg/L	
	STAGE_2	WG	TPH-U	.0242	mg/L	
	STAGE_2	WG	TSF MAX	19170	intens	
COR_1_WP2_S	STAGE_2	DC	TPH	50	ug/g	
	STAGE_2	DC	TPH-R	4	ug/g	
	STAGE_2	DC	TPH-U	46	ug/g	
	STAGE_2	DC	TSF MAX	3807	intens	
COR_1_WP2_W	STAGE_2	WG	TPH	3.6132	mg/L	
	STAGE_2	WG	TPH-R	3.6	mg/L	
	STAGE_2	WG	TPH-U	.0132	mg/L	
	STAGE_2	WG	TSF MAX	92500	intens	
COR_1_WP4_S	STAGE_2	DC	TPH	4.6	ug/g	
	STAGE_2	DC	TPH-R	1.6	ug/g	
	STAGE_2	DC	TPH-U	3	ug/g	
	STAGE_2	DC	TSF MAX	2228	intens	
COR_1_WP4_W	STAGE_2	WG	TPH	.0839	mg/L	
	STAGE_2	WG	TPH-R	.082	mg/L	
	STAGE_2	WG	TPH-U	.0019	mg/L	
	STAGE_2	WG	TSF MAX	783	intens	
Cor_1_WP1_F	STAGE_2	WG	SC	1430	mS/cm	
Cor_1_WP1_W	STAGE_2	WG	Cr	.05	mg/L	
Cor_1_WP2_F	STAGE_2	WG	SC	710	mS/cm	
Cor_1_WP2_S	STAGE_2	DC	ACNP	.8	ng/g	
	STAGE_2	DC	ACNPY	1.6	ng/g	
	STAGE_2	DC	ANTH	33.2	ng/g	
	STAGE_2	DC	BIPHENYL	3.1	ng/g	
	STAGE_2	DC	BZAA	1.7	ng/g	
	STAGE_2	DC	BZAP	1.1	ng/g	
	STAGE_2	DC	BZBF	2.8	ng/g	
	STAGE_2	DC	BZEP	1.8	ng/g	
	STAGE_2	DC	BZGHIP	1.3	ng/g	J
	STAGE_2	DC	BZKF	.6	ng/g	
	STAGE_2	DC	CHRYSENE	2.5	ng/g	
	STAGE_2	DC	CHRYSENE_C1	.8	ng/g	J
	STAGE_2	DC	DBAHA	.3	ng/g	
	STAGE_2	DC	DBF	1.3	ng/g	
	STAGE_2	DC	DBFC1	1.7	ng/g	
	STAGE_2	DC	DBFC2	2.2	ng/g	
	STAGE_2	DC	DBFC3	3.5	ng/g	
	STAGE_2	DC	DMNPH26	22.9	ng/g	
	STAGE_2	DC	FL	2.3	ng/g	
	STAGE_2	DC	FLA	3.5	ng/g	
	STAGE_2	DC	FLA_PYRC1	1.4	ng/g	J
	STAGE_2	DC	FLC1	3.9	ng/g	
	STAGE_2	DC	FLC2	5.1	ng/g	
	STAGE_2	DC	FLC3	4.8	ng/g	

Non-null results of all samples submitted for Site 15.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	INP123	1.1	ng/g	
	STAGE_2	DC	MTNPH1	22.9	ng/g	
	STAGE_2	DC	MTNPH2	25.5	ng/g	
	STAGE_2	DC	MTPHAN1	1.9	ng/g	
	STAGE_2	DC	NAPH	3.7	ng/g	
	STAGE_2	DC	NAPHC1	48.4	ng/g	
	STAGE_2	DC	NAPHC2	122.7	ng/g	
	STAGE_2	DC	NAPHC3	133.5	ng/g	
	STAGE_2	DC	NAPHC4	49.2	ng/g	
	STAGE_2	DC	PAHTOT	450.6	ng/g	
	STAGE_2	DC	PERY	.8	ng/g	
	STAGE_2	DC	PHAN	2.1	ng/g	
	STAGE_2	DC	PHAN_ANTHC1	3.4	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	1.8	ng/g	
	STAGE_2	DC	PYR	2.9	ng/g	
	STAGE_2	DC	TMNPH167	18.1	ng/g	
Cor_1_WP2_W	STAGE_2	WG	Ni	.06	mg/L	
	STAGE_2	WG	Zn	.09	mg/L	
Cor_1_WP3_F	STAGE_2	WG	SC	630	mS/cm	
Cor_1_WP4_F	STAGE_2	WG	SC	490	mS/cm	
Cor_1_WP4_S	STAGE_2	DC	Zn	8	mg/Kg	
Cor_1_WP4_W	STAGE_2	WG	ACNP	9.1	ng/L	J
	STAGE_2	WG	ACNPY	3.2	ng/L	J
	STAGE_2	WG	ANTH	3	ng/L	J
	STAGE_2	WG	BIPHENYL	3.2	ng/L	J
	STAGE_2	WG	BZAA	5.7	ng/L	J
	STAGE_2	WG	BZAP	7.5	ng/L	J
	STAGE_2	WG	BZBF	11	ng/L	
	STAGE_2	WG	BZEP	6.4	ng/L	
	STAGE_2	WG	BZGHIP	6.9	ng/L	J
	STAGE_2	WG	BZKF	4.6	ng/L	J
	STAGE_2	WG	CHRYSENE	9.6	ng/L	
	STAGE_2	WG	CHRYSENE_C1	6.7	ng/L	J
	STAGE_2	WG	Cr	.05	mg/L	
	STAGE_2	WG	DBAHA	2.3	ng/L	J
	STAGE_2	WG	DBF	1	ng/L	J
	STAGE_2	WG	DBFC1	5.7	ng/L	J
	STAGE_2	WG	DBFC2	17.9	ng/L	
	STAGE_2	WG	DBFC3	58.5	ng/L	
	STAGE_2	WG	DMNPH26	1.9	ng/L	J
	STAGE_2	WG	FL	1.6	ng/L	J
	STAGE_2	WG	FLA	19	ng/L	
	STAGE_2	WG	FLA_PYRC1	20.7	ng/L	
	STAGE_2	WG	FLC2	35	ng/L	
	STAGE_2	WG	FLC3	44.6	ng/L	
	STAGE_2	WG	INP123	5.9	ng/L	J
	STAGE_2	WG	MTNPH1	2.2	ng/L	J
	STAGE_2	WG	MTNPH2	4.6	ng/L	J
	STAGE_2	WG	MTPHAN1	2.4	ng/L	J
	STAGE_2	WG	NAPH	38.8	ng/L	
	STAGE_2	WG	NAPHC1	6.8	ng/L	J
	STAGE_2	WG	NAPHC2	15.1	ng/L	J
	STAGE_2	WG	NAPHC3	37	ng/L	
	STAGE_2	WG	NAPHC4	39.9	ng/L	
	STAGE_2	WG	Ni	.07	mg/L	
	STAGE_2	WG	PAHTOT	522.8	ng/L	
	STAGE_2	WG	PERY	4.5	ng/L	J
	STAGE_2	WG	PHAN	14	ng/L	
	STAGE_2	WG	PHAN_ANTHC1	13	ng/L	J
	STAGE_2	WG	PHAN_ANTHC2	15	ng/L	J
	STAGE_2	WG	PHAN_ANTHC3	26.8	ng/L	
	STAGE_2	WG	PHAN_ANTHC4	5.3	ng/L	J
	STAGE_2	WG	PYR	17.5	ng/L	
	STAGE_2	WG	TMNPH167	7	ng/L	J
	STAGE_2	WG	Zn	.08	mg/L	

Non-null results of all samples submitted for Site 15 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
051A	STAGE_1	SO	Ba	391	ug/g	
	STAGE_1	SO	Pb	7	ug/g	
	STAGE_1	SO	TPH	2.6	ug/g	
	STAGE_1	SO	TPH-R	.7	ug/g	
	STAGE_1	SO	TPH-U	1.9	ug/g	
	STAGE_1	SO	TSF MAX	1180	intens	
052A	STAGE_1	SO	Ba	11	ug/g	
	STAGE_1	SO	TPH	1.2	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	.4	ug/g	
	STAGE_1	SO	TSF MAX	109	intens	
053A	STAGE_1	SO	TPH	2.4	ug/g	
	STAGE_1	SO	TPH-R	1.1	ug/g	
	STAGE_1	SO	TPH-U	1.3	ug/g	
	STAGE_1	SO	TSF MAX	2728	intens	
053B	STAGE_1	SO	TPH	2.7	ug/g	
	STAGE_1	SO	TPH-R	.7	ug/g	
	STAGE_1	SO	TPH-U	2	ug/g	
	STAGE_1	SO	TSF MAX	273	intens	
054A	STAGE_1	SO	ACNP	.1	ng/g	J
	STAGE_1	SO	ACNPY	.1	ng/g	J
	STAGE_1	SO	ANTH	.1	ng/g	J
	STAGE_1	SO	BIPHENYL	1.5	ng/g	
	STAGE_1	SO	BZAA	.1	ng/g	J
	STAGE_1	SO	BZAP	.1	ng/g	J
	STAGE_1	SO	BZBF	.2	ng/g	J
	STAGE_1	SO	BZEP	.1	ng/g	J
	STAGE_1	SO	BZGHIP	.2	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	CHRYSENE	.1	ng/g	J
	STAGE_1	SO	DBF	.1	ng/g	J
	STAGE_1	SO	DMNPH26	.7	ng/g	
	STAGE_1	SO	FL	.1	ng/g	J
	STAGE_1	SO	FLA	.5	ng/g	J
	STAGE_1	SO	INP123	.1	ng/g	J
	STAGE_1	SO	MTNPH1	2.1	ng/g	
	STAGE_1	SO	MTNPH2	2.5	ng/g	
	STAGE_1	SO	MTPHAN1	.1	ng/g	J
	STAGE_1	SO	NAPH	3.6	ng/g	
	STAGE_1	SO	NAPHC1	4.5	ng/g	
	STAGE_1	SO	NAPHC2	4.5	ng/g	
	STAGE_1	SO	NAPHC3	8.5	ng/g	
	STAGE_1	SO	NAPHC4	7.1	ng/g	
	STAGE_1	SO	PAHTOT	32.2	ng/g	
	STAGE_1	SO	PERY	.1	ng/g	J
	STAGE_1	SO	PHAN	.3	ng/g	J
	STAGE_1	SO	PYR	.3	ng/g	J
	STAGE_1	SO	TMNPH167	.3	ng/g	J
	STAGE_1	SO	TPH	2.4	ug/g	
	STAGE_1	SO	TPH-R	.6	ug/g	
	STAGE_1	SO	TPH-U	1.8	ug/g	
	STAGE_1	SO	TSF MAX	779	intens	
SUN_A2_WP1_S	STAGE_2	DC	ACNP	.1	ng/g	J
	STAGE_2	DC	ACNPY	.1	ng/g	J
	STAGE_2	DC	ANTH	.1	ng/g	J
	STAGE_2	DC	BIPHENYL	1.1	ng/g	
	STAGE_2	DC	BZAP	.1	ng/g	J
	STAGE_2	DC	BZBF	.1	ng/g	J
	STAGE_2	DC	BZEP	.1	ng/g	J
	STAGE_2	DC	BZGHIP	.1	ng/g	J
	STAGE_2	DC	BZKF	.1	ng/g	J
	STAGE_2	DC	CHRYSENE	.2	ng/g	J
	STAGE_2	DC	DBAHA	.1	ng/g	J
	STAGE_2	DC	DBF	.1	ng/g	J
	STAGE_2	DC	DMNPH26	.4	ng/g	J
	STAGE_2	DC	FL	.1	ng/g	J
	STAGE_2	DC	FLA	.3	ng/g	J
	STAGE_2	DC	FLA_PYRC1	1.6	ng/g	J

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	FLC1	1	ng/g	J
	STAGE_2	DC	INP123	.1	ng/g	J
	STAGE_2	DC	MTNPH1	.6	ng/g	J
	STAGE_2	DC	MTNPH2	1.1	ng/g	J
	STAGE_2	DC	NAPH	1.2	ng/g	J
	STAGE_2	DC	NAPHC1	1.7	ng/g	J
	STAGE_2	DC	NAPHC2	3.4	ng/g	
	STAGE_2	DC	NAPHC3	8.7	ng/g	
	STAGE_2	DC	PAHTOT	26.2	ng/g	
	STAGE_2	DC	PERY	.1	ng/g	J
	STAGE_2	DC	PHAN	.2	ng/g	J
	STAGE_2	DC	PHAN_ANTHC1	.7	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	1.1	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	1.8	ng/g	
	STAGE_2	DC	PHAN_ANTHC4	1.7	ng/g	
	STAGE_2	DC	PYR	.3	ng/g	J
	STAGE_2	DC	TMNPH167	.4	ng/g	J
	STAGE_2	DC	TPH	21.6	ug/g	
	STAGE_2	DC	TPH-R	2.6	ug/g	
	STAGE_2	DC	TPH-U	19	ug/g	
	STAGE_2	DC	TSF MAX	23570	intens	
SUN_A2_WP1_W	STAGE_2	WG	TPH	.1282	mg/L	
	STAGE_2	WG	TPH-R	.106	mg/L	
	STAGE_2	WG	TPH-U	.0222	mg/L	
	STAGE_2	WG	TSF MAX	2657	intens	
SUN_A2_WP2_S	STAGE_2	DC	ACNP	.3	ng/g	J
	STAGE_2	DC	ACNPY	.3	ng/g	J
	STAGE_2	DC	ANTH	.4	ng/g	J
	STAGE_2	DC	BIPHENYL	1.2	ng/g	
	STAGE_2	DC	BZAA	.2	ng/g	J
	STAGE_2	DC	BZAP	.3	ng/g	J
	STAGE_2	DC	BZBF	.2	ng/g	J
	STAGE_2	DC	BZEP	.2	ng/g	J
	STAGE_2	DC	BZGHIP	.3	ng/g	J
	STAGE_2	DC	BZKF	.3	ng/g	J
	STAGE_2	DC	CHRYSENE	.3	ng/g	J
	STAGE_2	DC	DBAHA	.2	ng/g	J
	STAGE_2	DC	DBF	.3	ng/g	J
	STAGE_2	DC	DMNPH26	.5	ng/g	J
	STAGE_2	DC	FL	.7	ng/g	
	STAGE_2	DC	FLA	.5	ng/g	J
	STAGE_2	DC	FLC1	1.6	ng/g	
	STAGE_2	DC	INP123	.2	ng/g	J
	STAGE_2	DC	MTNPH1	1.1	ng/g	
	STAGE_2	DC	MTNPH2	1.9	ng/g	
	STAGE_2	DC	MTPHAN1	.3	ng/g	
	STAGE_2	DC	NAPH	1.7	ng/g	J
	STAGE_2	DC	NAPHC1	3	ng/g	
	STAGE_2	DC	NAPHC2	5.6	ng/g	
	STAGE_2	DC	NAPHC3	8.2	ng/g	
	STAGE_2	DC	PAHTOT	27	ng/g	
	STAGE_2	DC	PERY	.5	ng/g	J
	STAGE_2	DC	PHAN	.4	ng/g	J
	STAGE_2	DC	PYR	.4	ng/g	J
	STAGE_2	DC	TMNPH167	.5	ng/g	
	STAGE_2	DC	TPH	7.8	ug/g	
	STAGE_2	DC	TPH-R	1.8	ug/g	
	STAGE_2	DC	TPH-U	6	ug/g	
	STAGE_2	DC	TSF MAX	1062	intens	
SUN_A2_WP2_W	STAGE_2	WG	TPH	.1718	mg/L	
	STAGE_2	WG	TPH-R	.153	mg/L	
	STAGE_2	WG	TPH-U	.0188	mg/L	
	STAGE_2	WG	TSF MAX	2478	intens	
SUN_A2_WP3_S	STAGE_2	DC	TPH	2.5	ug/g	
	STAGE_2	DC	TPH-R	1.5	ug/g	
	STAGE_2	DC	TPH-U	1	ug/g	
	STAGE_2	DC	TSF MAX	347	intens	
SUN_A2_WP3_W	STAGE_2	WG	TPH	.4731	mg/L	

Non-null results of all samples submitted for Site 16.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	TPH-R	.446	mg/L	
	STAGE_2	WG	TPH-U	.0271	mg/L	
	STAGE_2	WG	TSF MAX	2010	intens	
Sun_A2_WP1_F	STAGE_2	WG	SC	740	mS/cm	
Sun_A2_WP1_W	STAGE_2	WG	Cr	.08	mg/L	
	STAGE_2	WG	Cu	.13	mg/L	
	STAGE_2	WG	Ni	.12	mg/L	
	STAGE_2	WG	Zn	.15	mg/L	
Sun_A2_WP2_F	STAGE_2	WG	SC	810	mS/cm	
Sun_A2_WP2_W	STAGE_2	WG	Zn	.17	mg/L	
Sun_A2_WP3_F	STAGE_2	WG	SC	2640	mS/cm	
Sun_A2_WP3_W	STAGE_2	WG	ACNP	1.3	ng/L	J
	STAGE_2	WG	ACNPY	1.7	ng/L	J
	STAGE_2	WG	ANTH	4.8	ng/L	J
	STAGE_2	WG	Ag	.06	mg/L	
	STAGE_2	WG	BIPHENYL	.6	ng/L	J
	STAGE_2	WG	BZAA	1.9	ng/L	J
	STAGE_2	WG	BZAP	1.9	ng/L	J
	STAGE_2	WG	BZBF	2.9	ng/L	J
	STAGE_2	WG	BZEP	3	ng/L	J
	STAGE_2	WG	BZGHIP	2.8	ng/L	J
	STAGE_2	WG	BZKF	1.2	ng/L	J
	STAGE_2	WG	CHRYSENE	3.8	ng/L	J
	STAGE_2	WG	DBAHA	.4	ng/L	J
	STAGE_2	WG	DBF	.7	ng/L	J
	STAGE_2	WG	FL	2.5	ng/L	J
	STAGE_2	WG	FLA	9.1	ng/L	
	STAGE_2	WG	INP123	1.4	ng/L	J
	STAGE_2	WG	NAPH	39.7	ng/L	
	STAGE_2	WG	PAHTOT	95.1	ng/L	
	STAGE_2	WG	PERY	.7	ng/L	J
	STAGE_2	WG	PHAN	9.1	ng/L	
	STAGE_2	WG	PYR	5.7	ng/L	J

Non-null results of all samples submitted for Site 16 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
055A	STAGE_1	SO	Ba	14	ug/g	
	STAGE_1	SO	TPH	3	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	2.1	ug/g	
	STAGE_1	SO	TSF MAX	530	intens	
056B	STAGE_1	SO	Ba	16	ug/g	
	STAGE_1	SO	TPH	10.7	ug/g	
	STAGE_1	SO	TPH-R	1.6	ug/g	
	STAGE_1	SO	TPH-U	9.1	ug/g	
	STAGE_1	SO	TSF MAX	1664	intens	
057B	STAGE_1	SO	TPH	5.1	ug/g	
	STAGE_1	SO	TPH-R	.7	ug/g	
	STAGE_1	SO	TPH-U	4.4	ug/g	
	STAGE_1	SO	TSF MAX	1884	intens	
058C	STAGE_1	SO	ACNP	1.7	ng/g	
	STAGE_1	SO	ACNPY	4.9	ng/g	
	STAGE_1	SO	ANTH	2	ng/g	
	STAGE_1	SO	BIPHENYL	8	ng/g	
	STAGE_1	SO	BZAA	.3	ng/g	
	STAGE_1	SO	BZAP	.3	ng/g	J
	STAGE_1	SO	BZBF	.3	ng/g	J
	STAGE_1	SO	BZEP	.8	ng/g	
	STAGE_1	SO	BZGHIP	1.2	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	CHRYSENE	1	ng/g	
	STAGE_1	SO	CHRYSENE_C1	1.2	ng/g	J
	STAGE_1	SO	CHRYSENE_C2	1.5	ng/g	
	STAGE_1	SO	CHRYSENE_C3	.4	ng/g	J
	STAGE_1	SO	CHRYSENE_C4	.4	ng/g	J
	STAGE_1	SO	DBAHA	.2	ng/g	J
	STAGE_1	SO	DBF	1.5	ng/g	
	STAGE_1	SO	DBFC1	4.4	ng/g	
	STAGE_1	SO	DBFC2	4	ng/g	
	STAGE_1	SO	DBFC3	8.6	ng/g	
	STAGE_1	SO	DMNPH26	20.4	ng/g	
	STAGE_1	SO	FL	4.1	ng/g	
	STAGE_1	SO	FLA	1.7	ng/g	
	STAGE_1	SO	FLA_PYRC1	5.3	ng/g	
	STAGE_1	SO	FLC1	10.6	ng/g	
	STAGE_1	SO	FLC2	19.8	ng/g	
	STAGE_1	SO	FLC3	25.5	ng/g	
	STAGE_1	SO	INP123	.4	ng/g	
	STAGE_1	SO	MTNPH1	16.5	ng/g	
	STAGE_1	SO	MTNPH2	56.3	ng/g	
	STAGE_1	SO	MTPHAN1	4	ng/g	
	STAGE_1	SO	NAPH	20.2	ng/g	
	STAGE_1	SO	NAPHC1	72.8	ng/g	
	STAGE_1	SO	NAPHC2	195.2	ng/g	
	STAGE_1	SO	NAPHC3	438.8	ng/g	
	STAGE_1	SO	NAPHC4	311.8	ng/g	
	STAGE_1	SO	PAHTOT	1236.3	ng/g	
	STAGE_1	SO	PERY	1.4	ng/g	
	STAGE_1	SO	PHAN	7	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	20.2	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	28.7	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	17.6	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	9.2	ng/g	
	STAGE_1	SO	PYR	3.3	ng/g	
	STAGE_1	SO	TMNPH167	33.3	ng/g	
	STAGE_1	SO	TPH	306.8	ug/g	
	STAGE_1	SO	TPH-R	11.4	ug/g	
	STAGE_1	SO	TPH-U	295.4	ug/g	
	STAGE_1	SO	TSF MAX	38600	intens	
058D	STAGE_1	SO	Ba	2670	ug/g	
	STAGE_1	SO	Cr	12	ug/g	
	STAGE_1	SO	Pb	10	ug/g	
059B	STAGE_1	SO	TPH	5.8	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	5	ug/g	
	STAGE_1	SO	TSF MAX	422	intens	
060	STAGE_1	SO	TPH	7	ug/g	
	STAGE_1	SO	TPH-R	1.1	ug/g	
	STAGE_1	SO	TPH-U	5.9	ug/g	
	STAGE_1	SO	TSF MAX	311	intens	
PEL(2)WP1_S	STAGE_2	DC	TPH	7.8	ug/g	
	STAGE_2	DC	TPH-R	1.8	ug/g	
	STAGE_2	DC	TPH-U	6	ug/g	
	STAGE_2	DC	TSF MAX	4814	intens	
PEL(2)WP1_W	STAGE_2	WG	TPH	.1562	mg/L	
	STAGE_2	WG	TPH-R	.109	mg/L	
	STAGE_2	WG	TPH-U	.0472	mg/L	
	STAGE_2	WG	TSF MAX	1274	intens	
PEL(2)WP2_S	STAGE_2	DC	ACNP	2.1	ng/g	
	STAGE_2	DC	ACNPY	4.5	ng/g	
	STAGE_2	DC	ANTH	.2	ng/g	J
	STAGE_2	DC	BIPHENYL	6.9	ng/g	
	STAGE_2	DC	BZAA	.2	ng/g	J
	STAGE_2	DC	BZAP	.3	ng/g	J
	STAGE_2	DC	BZBF	.4	ng/g	J
	STAGE_2	DC	BZEP	.2	ng/g	J
	STAGE_2	DC	BZGHIP	.4	ng/g	J
	STAGE_2	DC	BZKF	.1	ng/g	J
	STAGE_2	DC	CHRYSENE	.4	ng/g	J
	STAGE_2	DC	DBAHA	.1	ng/g	J
	STAGE_2	DC	DBF	1.5	ng/g	
	STAGE_2	DC	DBFC1	4.7	ng/g	
	STAGE_2	DC	DBFC2	4	ng/g	
	STAGE_2	DC	DBFC3	2.3	ng/g	
	STAGE_2	DC	DMNPH26	49.6	ng/g	
	STAGE_2	DC	FL	5.1	ng/g	
	STAGE_2	DC	FLA	.7	ng/g	J
	STAGE_2	DC	FLC1	11.2	ng/g	
	STAGE_2	DC	FLC2	14.7	ng/g	
	STAGE_2	DC	FLC3	11.7	ng/g	
	STAGE_2	DC	INP123	.3	ng/g	J
	STAGE_2	DC	MTNPH1	139.1	ng/g	
	STAGE_2	DC	MTNPH2	158.7	ng/g	
	STAGE_2	DC	MTPHAN1	2.6	ng/g	
	STAGE_2	DC	NAPH	10.9	ng/g	
	STAGE_2	DC	NAPHC1	297.7	ng/g	
	STAGE_2	DC	NAPHC2	1531.1	ng/g	
	STAGE_2	DC	NAPHC3	2698.3	ng/g	
	STAGE_2	DC	NAPHC4	1454.2	ng/g	
	STAGE_2	DC	PAHTOT	6092.4	ng/g	
	STAGE_2	DC	PERY	.4	ng/g	J
	STAGE_2	DC	PHAN	5	ng/g	
	STAGE_2	DC	PHAN_ANTHC1	11.9	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	7.3	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	1.9	ng/g	
	STAGE_2	DC	PHAN_ANTHC4	1.3	ng/g	
	STAGE_2	DC	PYR	.7	ng/g	J
	STAGE_2	DC	TMNPH167	61.4	ng/g	
	STAGE_2	DC	TPH	11.6	ug/g	
	STAGE_2	DC	TPH-R	6.6	ug/g	
	STAGE_2	DC	TPH-U	5	ug/g	
	STAGE_2	DC	TSF MAX	3266	intens	
PEL(2)WP2_W	STAGE_2	WG	TPH	.1251	mg/L	
	STAGE_2	WG	TPH-R	.072	mg/L	
	STAGE_2	WG	TPH-U	.0531	mg/L	
	STAGE_2	WG	TSF MAX	1542	intens	
PEL(2)WP3_S	STAGE_2	DC	ACNP	.2	ng/g	J
	STAGE_2	DC	ACNPY	.4	ng/g	
	STAGE_2	DC	BIPHENYL	1.6	ng/g	
	STAGE_2	DC	BZAA	.1	ng/g	J
	STAGE_2	DC	BZAP	.1	ng/g	J
	STAGE_2	DC	BZBF	.1	ng/g	J

Non-null results of all samples submitted for Site 29.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	NAPHC3	36.1	ng/L	
	STAGE_2	WG	NAPHC4	21.4	ng/L	J
	STAGE_2	WG	PAHTOT	296	ng/L	
	STAGE_2	WG	PERY	.7	ng/L	J
	STAGE_2	WG	PHAN	8.1	ng/L	J
	STAGE_2	WG	PHAN_ANTHC1	15.1	ng/L	J
	STAGE_2	WG	PHAN_ANTHC2	19.2	ng/L	J
	STAGE_2	WG	PYR	5	ng/L	J
	STAGE_2	WG	TMNPH167	3.9	ng/L	J
Pel_WP2_W	STAGE_2	WG	Zn	.06	mg/L	
Pel_WP3_W	STAGE_2	WG	Cr	.14	mg/L	
	STAGE_2	WG	Ni	.09	mg/L	
	STAGE_2	WG	Zn	.05	mg/L	

Non-null results of all samples submitted for Site 29 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
061B	STAGE_1	SO	TPH	2.5	ug/g	
	STAGE_1	SO	TPH-R	.3	ug/g	
	STAGE_1	SO	TPH-U	2.2	ug/g	
	STAGE_1	SO	TSF MAX	113	intens	
062A	STAGE_1	SO	TPH	5.5	ug/g	
	STAGE_1	SO	TPH-R	1.5	ug/g	
	STAGE_1	SO	TPH-U	4	ug/g	
	STAGE_1	SO	TSF MAX	2134	intens	
063C	STAGE_1	SO	TPH	3.5	ug/g	
	STAGE_1	SO	TPH-R	.7	ug/g	
	STAGE_1	SO	TPH-U	2.8	ug/g	
	STAGE_1	SO	TSF MAX	140	intens	
064B	STAGE_1	SO	TPH	2.6	ug/g	
	STAGE_1	SO	TPH-R	.4	ug/g	
	STAGE_1	SO	TPH-U	2.1	ug/g	
	STAGE_1	SO	TSF MAX	150	intens	
065B	STAGE_1	SO	Ba	34	ug/g	
	STAGE_1	SO	TPH	3.5	ug/g	
	STAGE_1	SO	TPH-R	1.1	ug/g	
	STAGE_1	SO	TPH-U	2.4	ug/g	
	STAGE_1	SO	TSF MAX	272	intens	

Non-null results of all samples submitted for Site 35.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
066B	STAGE_1	SO	Ba	13	ug/g	
	STAGE_1	SO	TPH	4.4	ug/g	
	STAGE_1	SO	TPH-R	.6	ug/g	
	STAGE_1	SO	TPH-U	3.8	ug/g	
	STAGE_1	SO	TSF MAX	158	intens	
067B	STAGE_1	SO	TPH	4.5	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	3.8	ug/g	
	STAGE_1	SO	TSF MAX	164	intens	
068B	STAGE_1	SO	Ba	16	ug/g	
	STAGE_1	SO	TPH	4.3	ug/g	
	STAGE_1	SO	TPH-R	1.2	ug/g	
	STAGE_1	SO	TPH-U	3.1	ug/g	
	STAGE_1	SO	TSF MAX	169	intens	

Non-null results of all samples submitted for Site 36.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
027	STAGE_1	SO	Ba	54	ug/g	
	STAGE_1	SO	TPH	4.5	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	3.7	ug/g	
	STAGE_1	SO	TSF MAX	58	intens	
028	STAGE_1	SO	ACNP	.6	ng/g	
	STAGE_1	SO	ACNPY	.2	ng/g	J
	STAGE_1	SO	ANTH	.4	ng/g	J
	STAGE_1	SO	BIPHENYL	1.6	ng/g	
	STAGE_1	SO	BZAA	.2	ng/g	J
	STAGE_1	SO	BZBF	.3	ng/g	J
	STAGE_1	SO	BZEP	.3	ng/g	J
	STAGE_1	SO	BZGHIP	.3	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	Ba	3610	ug/g	
	STAGE_1	SO	CHRYSENE	.4	ng/g	J
	STAGE_1	SO	CHRYSENE_C1	.4	ng/g	J
	STAGE_1	SO	CHRYSENE_C2	.6	ng/g	J
	STAGE_1	SO	Cr	16	ug/g	
	STAGE_1	SO	DBAHA	.1	ng/g	J
	STAGE_1	SO	DBF	.6	ng/g	
	STAGE_1	SO	DBFC1	4.2	ng/g	
	STAGE_1	SO	DBFC2	3	ng/g	
	STAGE_1	SO	DBFC3	2.1	ng/g	
	STAGE_1	SO	DMNPH26	1	ng/g	
	STAGE_1	SO	FL	1.9	ng/g	
	STAGE_1	SO	FLA	.6	ng/g	J
	STAGE_1	SO	FLA_PYRC1	1.9	ng/g	J
	STAGE_1	SO	FLC1	3.7	ng/g	
	STAGE_1	SO	FLC2	11.5	ng/g	
	STAGE_1	SO	FLC3	16.1	ng/g	
	STAGE_1	SO	INP123	.1	ng/g	J
	STAGE_1	SO	MTNPH1	.7	ng/g	J
	STAGE_1	SO	MTNPH2	1.3	ng/g	J
	STAGE_1	SO	MTPHAN1	1.3	ng/g	
	STAGE_1	SO	NAPH	1.2	ng/g	J
	STAGE_1	SO	NAPHC1	2	ng/g	J
	STAGE_1	SO	NAPHC2	2.4	ng/g	
	STAGE_1	SO	NAPHC3	44.1	ng/g	
	STAGE_1	SO	NAPHC4	100.2	ng/g	
	STAGE_1	SO	PAHTOT	223.7	ng/g	
	STAGE_1	SO	PERY	.2	ng/g	J
	STAGE_1	SO	PHAN	1.3	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	5.5	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	9.7	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	4.7	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	1	ng/g	
	STAGE_1	SO	PYR	.5	ng/g	J
	STAGE_1	SO	Pb	84	ug/g	
	STAGE_1	SO	TMNPH167	11	ng/g	
	STAGE_1	SO	TPH	62.4	ug/g	
	STAGE_1	SO	TPH-R	7.5	ug/g	
	STAGE_1	SO	TPH-U	54.9	ug/g	
	STAGE_1	SO	TSF MAX	35280	intens	
029B	STAGE_1	SO	Ba	120	ug/g	
	STAGE_1	SO	TPH	17.8	ug/g	
	STAGE_1	SO	TPH-R	8	ug/g	
	STAGE_1	SO	TPH-U	9.8	ug/g	
	STAGE_1	SO	TSF MAX	699	intens	
030	STAGE_1	SO	ACNP	.1	ng/g	J
	STAGE_1	SO	ACNPY	.2	ng/g	J
	STAGE_1	SO	ANTH	.3	ng/g	J
	STAGE_1	SO	BIPHENYL	1.3	ng/g	
	STAGE_1	SO	BZAA	.3	ng/g	
	STAGE_1	SO	BZAP	.4	ng/g	J
	STAGE_1	SO	BZBF	.1	ng/g	J
	STAGE_1	SO	BZEP	.1	ng/g	J
	STAGE_1	SO	BZGHIP	11.7	ng/g	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	Ba	136	ug/g	
	STAGE_1	SO	CHRYSENE	.2	ng/g	J
	STAGE_1	SO	DBAHA	1.5	ng/g	
	STAGE_1	SO	DBF	.7	ng/g	
	STAGE_1	SO	DMNPH26	.7	ng/g	
	STAGE_1	SO	FL	.2	ng/g	J
	STAGE_1	SO	FLA	.2	ng/g	J
	STAGE_1	SO	INP123	.2	ng/g	J
	STAGE_1	SO	MTNPH1	1.2	ng/g	
	STAGE_1	SO	MTNPH2	2.3	ng/g	
	STAGE_1	SO	MTPHAN1	.5	ng/g	
	STAGE_1	SO	NAPH	1.8	ng/g	J
	STAGE_1	SO	NAPHC1	3.5	ng/g	
	STAGE_1	SO	NAPHC2	5	ng/g	
	STAGE_1	SO	PAHTOT	29.6	ng/g	
	STAGE_1	SO	PERY	.9	ng/g	
	STAGE_1	SO	PHAN	.5	ng/g	J
	STAGE_1	SO	PYR	.4	ng/g	J
	STAGE_1	SO	TMNPH167	.4	ng/g	J
	STAGE_1	SO	TPH	704.9	ug/g	
	STAGE_1	SO	TPH-R	22.6	ug/g	
	STAGE_1	SO	TPH-U	682.3	ug/g	
	STAGE_1	SO	TSF MAX	559000	intens	
CARL_1_WP1_S	STAGE_2	DC	TPH	1880.7	ug/g	
	STAGE_2	DC	TPH-R	341	ug/g	
	STAGE_2	DC	TPH-U	1540	ug/g	
	STAGE_2	DC	TSF MAX	3114	intens	
CARL_1_WP1_W	STAGE_2	WG	TPH	.0698	mg/L	
	STAGE_2	WG	TPH-R	.051	mg/L	
	STAGE_2	WG	TPH-U	.0188	mg/L	
	STAGE_2	WG	TSF MAX	3345	intens	
CARL_1_WP2_S	STAGE_2	DC	TPH	7.9	ug/g	
	STAGE_2	DC	TPH-R	1.9	ug/g	
	STAGE_2	DC	TPH-U	6	ug/g	
	STAGE_2	DC	TSF MAX	3705	intens	
CARL_1_WP2_W	STAGE_2	WG	TPH	.5618	mg/L	
	STAGE_2	WG	TPH-R	.513	mg/L	
	STAGE_2	WG	TPH-U	.0488	mg/L	
	STAGE_2	WG	TSF MAX	104850	intens	
CARL_1_WP4_S	STAGE_2	DC	ACNP	2.8	ng/g	
	STAGE_2	DC	ACNPY	20.7	ng/g	
	STAGE_2	DC	ANTH	1.3	ng/g	
	STAGE_2	DC	BIPHENYL	10.6	ng/g	
	STAGE_2	DC	BZAA	.3	ng/g	
	STAGE_2	DC	BZAP	.2	ng/g	J
	STAGE_2	DC	BZBF	.4	ng/g	J
	STAGE_2	DC	BZEP	.5	ng/g	J
	STAGE_2	DC	BZGHIP	.5	ng/g	J
	STAGE_2	DC	BZKF	.1	ng/g	J
	STAGE_2	DC	CHRYSENE	1.4	ng/g	
	STAGE_2	DC	CHRYSENE_C1	1.5	ng/g	
	STAGE_2	DC	CHRYSENE_C2	1.3	ng/g	J
	STAGE_2	DC	CHRYSENE_C4	.3	ng/g	J
	STAGE_2	DC	DBAHA	.1	ng/g	J
	STAGE_2	DC	DBF	4.6	ng/g	
	STAGE_2	DC	DBFC1	40.2	ng/g	
	STAGE_2	DC	DBFC2	35	ng/g	
	STAGE_2	DC	DBFC3	15	ng/g	
	STAGE_2	DC	DMNPH26	128.9	ng/g	
	STAGE_2	DC	FL	20.2	ng/g	
	STAGE_2	DC	FLA	2.6	ng/g	
	STAGE_2	DC	FLA_PYRC1	6.8	ng/g	
	STAGE_2	DC	FLC1	28.6	ng/g	
	STAGE_2	DC	FLC2	75.4	ng/g	
	STAGE_2	DC	FLC3	70.3	ng/g	
	STAGE_2	DC	INP123	.2	ng/g	J
	STAGE_2	DC	MTNPH1	8.8	ng/g	

Non-null results of all samples submitted for Site 38.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	MTNPH2	20.8	ng/g	
	STAGE_2	DC	MTPHAN1	28.5	ng/g	
	STAGE_2	DC	NAPH	4.7	ng/g	
	STAGE_2	DC	NAPHC1	29.6	ng/g	
	STAGE_2	DC	NAPHC2	462.2	ng/g	
	STAGE_2	DC	NAPHC3	1752.2	ng/g	
	STAGE_2	DC	NAPHC4	1309.7	ng/g	
	STAGE_2	DC	PAHTOT	4205.5	ng/g	
	STAGE_2	DC	PERY	.4	ng/g	J
	STAGE_2	DC	PHAN	22.6	ng/g	
	STAGE_2	DC	PHAN_ANTHC1	110.8	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	121	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	35.6	ng/g	
	STAGE_2	DC	PHAN_ANTHC4	11.7	ng/g	
	STAGE_2	DC	PYR	4.3	ng/g	
	STAGE_2	DC	TMNPH167	287.8	ng/g	
	STAGE_2	DC	TPH	13.6	ug/g	
	STAGE_2	DC	TPH-R	4.6	ug/g	
	STAGE_2	DC	TPH-U	9	ug/g	
	STAGE_2	DC	TSF MAX	379400	intens	
CARL_1_WP4_W	STAGE_2	WG	TPH	.3104	mg/L	
	STAGE_2	WG	TPH-R	.27	mg/L	
	STAGE_2	WG	TPH-U	.0404	mg/L	
	STAGE_2	WG	TSF MAX	10000	intens	
Carl_1_WP1_F	STAGE_2	WG	SC	1000000	mS/cm	>
Carl_1_WP1_W	STAGE_2	WG	Cr	.22	mg/L	
Carl_1_WP2_F	STAGE_2	WG	SC	1000000	mS/cm	>
Carl_1_WP2_W	STAGE_2	WG	Cr	.28	mg/L	
	STAGE_2	WG	Cu	.19	mg/L	
	STAGE_2	WG	Ni	.16	mg/L	
	STAGE_2	WG	Pb	.09	mg/L	
Carl_1_WP3_F	STAGE_2	WG	SC	1000000	mS/cm	>
Carl_1_WP4_F	STAGE_2	WG	SC	1000000	mS/cm	>
Carl_1_WP4_S	STAGE_2	DC	Pb	9	mg/Kg	
Carl_1_WP4_W	STAGE_2	WG	ACNP	5	ng/L	J
	STAGE_2	WG	ACNPY	2	ng/L	J
	STAGE_2	WG	ANTH	5.2	ng/L	J
	STAGE_2	WG	BIPHENYL	1.6	ng/L	J
	STAGE_2	WG	BZAA	3.2	ng/L	J
	STAGE_2	WG	BZAP	1.9	ng/L	J
	STAGE_2	WG	BZBF	5	ng/L	J
	STAGE_2	WG	BZEP	3.2	ng/L	J
	STAGE_2	WG	BZGHIP	3	ng/L	J
	STAGE_2	WG	BZKF	2.1	ng/L	J
	STAGE_2	WG	CHRYSENE	5.4	ng/L	J
	STAGE_2	WG	DBAHA	.9	ng/L	J
	STAGE_2	WG	DBF	.8	ng/L	J
	STAGE_2	WG	FL	4	ng/L	J
	STAGE_2	WG	FLA	11.4	ng/L	
	STAGE_2	WG	INP123	2.5	ng/L	J
	STAGE_2	WG	NAPH	43.3	ng/L	
	STAGE_2	WG	PAHTOT	114.2	ng/L	
	STAGE_2	WG	PERY	1.3	ng/L	J
	STAGE_2	WG	PHAN	7.1	ng/L	J
	STAGE_2	WG	PYR	5.4	ng/L	J
	STAGE_2	WG	Pb	.07	mg/L	

Non-null results of all samples submitted for Site 38 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
045B	STAGE_1	SO	Ba	3590	ug/g	
	STAGE_1	SO	Cr	22	ug/g	
	STAGE_1	SO	Pb	140	ug/g	
	STAGE_1	SO	TPH	915.1	ug/g	
	STAGE_1	SO	TPH-R	67.7	ug/g	
	STAGE_1	SO	TPH-U	847.5	ug/g	
	STAGE_1	SO	TSF MAX	843000	intens	
045C	STAGE_1	SO	ACNP	33.1	ng/g	
	STAGE_1	SO	ACNPY	335.8	ng/g	
	STAGE_1	SO	ANTH	31.6	ng/g	
	STAGE_1	SO	BIPHENYL	.9	ng/g	
	STAGE_1	SO	BZAA	.7	ng/g	
	STAGE_1	SO	BZAP	1.1	ng/g	
	STAGE_1	SO	BZBF	2.1	ng/g	
	STAGE_1	SO	BZEP	1.7	ng/g	
	STAGE_1	SO	BZGHIP	2.1	ng/g	
	STAGE_1	SO	BZKF	.4	ng/g	J
	STAGE_1	SO	CHRYSENE	3.2	ng/g	
	STAGE_1	SO	CHRYSENE_C1	9.5	ng/g	
	STAGE_1	SO	CHRYSENE_C2	9.7	ng/g	
	STAGE_1	SO	DBAHA	.4	ng/g	J
	STAGE_1	SO	DBF	121.7	ng/g	
	STAGE_1	SO	DBFC1	335.8	ng/g	
	STAGE_1	SO	DBFC2	169.3	ng/g	
	STAGE_1	SO	DBFC3	51.4	ng/g	
	STAGE_1	SO	DMNPH26	497.6	ng/g	
	STAGE_1	SO	FL	119.8	ng/g	
	STAGE_1	SO	FLA	9.7	ng/g	
	STAGE_1	SO	FLA_PYRC1	42.8	ng/g	
	STAGE_1	SO	FLC1	680.5	ng/g	
	STAGE_1	SO	FLC2	1279.1	ng/g	
	STAGE_1	SO	FLC3	885.5	ng/g	
	STAGE_1	SO	INP123	.8	ng/g	
	STAGE_1	SO	MTNPH1	23.7	ng/g	
	STAGE_1	SO	MTNPH2	37.8	ng/g	
	STAGE_1	SO	MTPHAN1	129.1	ng/g	
	STAGE_1	SO	NAPH	10.7	ng/g	
	STAGE_1	SO	NAPHC1	61.4	ng/g	
	STAGE_1	SO	NAPHC2	3743.7	ng/g	
	STAGE_1	SO	NAPHC3	8990.2	ng/g	
	STAGE_1	SO	NAPHC4	6491.2	ng/g	
	STAGE_1	SO	PAHTOT	24734.9	ng/g	
	STAGE_1	SO	PERY	.8	ng/g	
	STAGE_1	SO	PHAN	189.1	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	428.7	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	405	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	210.9	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	63.1	ng/g	
	STAGE_1	SO	PYR	11.3	ng/g	
	STAGE_1	SO	TMNPH167	1008.1	ng/g	
	STAGE_1	SO	TPH	2171.8	ug/g	
	STAGE_1	SO	TPH-R	345.9	ug/g	
	STAGE_1	SO	TPH-U	1825.8	ug/g	
	STAGE_1	SO	TSF MAX	3974000	intens	
047A	STAGE_1	SO	ACNP	4.7	ng/g	
	STAGE_1	SO	ACNPY	9.2	ng/g	
	STAGE_1	SO	ANTH	1.1	ng/g	
	STAGE_1	SO	BIPHENYL	1.3	ng/g	
	STAGE_1	SO	BZAA	.5	ng/g	
	STAGE_1	SO	BZAP	.1	ng/g	
	STAGE_1	SO	BZBF	.7	ng/g	J
	STAGE_1	SO	BZEP	1.5	ng/g	J
	STAGE_1	SO	BZGHIP	1.2	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	CHRYSENE	2	ng/g	
	STAGE_1	SO	CHRYSENEC1	.3	ng/g	J
	STAGE_1	SO	CHRYSENEC2	2.8	ng/g	
	STAGE_1	SO	CHRYSENEC3	.1	ng/g	J

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	CHRYSENEC4	.3	ng/g	J
	STAGE_1	SO	DBAHA	.2	ng/g	
	STAGE_1	SO	DBF	2.7	ng/g	
	STAGE_1	SO	DBFC1	32.3	ng/g	
	STAGE_1	SO	DBFC2	41	ng/g	
	STAGE_1	SO	DBFC3	27.9	ng/g	
	STAGE_1	SO	DMNPH26	.7	ng/g	
	STAGE_1	SO	FL	1.6	ng/g	
	STAGE_1	SO	FLA	4.9	ng/g	
	STAGE_1	SO	FLAPYRC1	11.6	ng/g	
	STAGE_1	SO	FLC1	1.9	ng/g	
	STAGE_1	SO	FLC2	7.5	ng/g	
	STAGE_1	SO	FLC3	10.4	ng/g	
	STAGE_1	SO	INP123	.4	ng/g	J
	STAGE_1	SO	MTNPH1	1.8	ng/g	
	STAGE_1	SO	MTNPH2	2.3	ng/g	J
	STAGE_1	SO	MTPHAN1	3.8	ng/g	
	STAGE_1	SO	NAPH	2.3	ng/g	
	STAGE_1	SO	NAPHC1	4.1	ng/g	
	STAGE_1	SO	NAPHC2	143.5	ng/g	
	STAGE_1	SO	NAPHC3	1770.5	ng/g	
	STAGE_1	SO	NAPHC4	2573.9	ng/g	
	STAGE_1	SO	PAHTOT	4805.3	ng/g	
	STAGE_1	SO	PERY	.3	ng/g	J
	STAGE_1	SO	PHAN	2.5	ng/g	
	STAGE_1	SO	PHANANTHC1	.6	ng/g	
	STAGE_1	SO	PHANANTHC2	58.7	ng/g	
	STAGE_1	SO	PHANANTHC3	47.5	ng/g	
	STAGE_1	SO	PHANANTHC4	22.7	ng/g	
	STAGE_1	SO	PYR	10.9	ng/g	
	STAGE_1	SO	TMNPH167	75.6	ng/g	
	STAGE_1	SO	TPH	947.2	ug/g	
	STAGE_1	SO	TPH-R	67.2	ug/g	
	STAGE_1	SO	TPH-U	880	ug/g	
	STAGE_1	SO	TSF MAX	395000	intens	
CARL_4_146_S	STAGE_2	DC	TPH	2.4	ug/g	
	STAGE_2	DC	TPH-R	1.4	ug/g	
	STAGE_2	DC	TPH-U	1	ug/g	
	STAGE_2	DC	TSF MAX	630	intens	
CARL_4_WP3_W	STAGE_2	WG	TPH	.4642	mg/L	
	STAGE_2	WG	TPH-R	.035	mg/L	
	STAGE_2	WG	TPH-U	.4292	mg/L	
	STAGE_2	WG	TSF MAX	462	intens	
CARL_4_WP4_W	STAGE_2	WG	TPH	.4603	mg/L	
	STAGE_2	WG	TPH-R	.404	mg/L	
	STAGE_2	WG	TPH-U	.0563	mg/L	
	STAGE_2	WG	TSF MAX	16555	intens	
Carl_4_146_S	STAGE_2	DC	Zn	7	mg/Kg	
Carl_4_WP1_F	STAGE_2	WG	SC	1110	mS/cm	
Carl_4_WP1_W	STAGE_2	WG	Cr	.06	mg/L	
	STAGE_2	WG	Ni	.06	mg/L	
Carl_4_WP2_F	STAGE_2	WG	SC	850	mS/cm	
Carl_4_WP3_F	STAGE_2	WG	SC	1510	mS/cm	
Carl_4_WP3_W	STAGE_2	WG	Ni	.17	mg/L	
Carl_4_WP4_F	STAGE_2	WG	SC	1170	mS/cm	
Carl_4_WP4_W	STAGE_2	WG	ACNP	7.3	ng/L	J
	STAGE_2	WG	ACNPY	2.8	ng/L	J
	STAGE_2	WG	ANTH	25.3	ng/L	
	STAGE_2	WG	BIPHENYL	1.9	ng/L	J
	STAGE_2	WG	BZAA	7	ng/L	J
	STAGE_2	WG	BZAP	7.5	ng/L	J
	STAGE_2	WG	BZBF	11.8	ng/L	
	STAGE_2	WG	BZEP	6.9	ng/L	
	STAGE_2	WG	BZGHIP	6.7	ng/L	J
	STAGE_2	WG	BZKF	4.3	ng/L	J
	STAGE_2	WG	CHRYSENE	11.2	ng/L	
	STAGE_2	WG	Cr	1.12	mg/L	
	STAGE_2	WG	Cu	.12	mg/L	

Non-null results of all samples submitted for Site 39.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	DBAHA	1.7	ng/L	J
	STAGE_2	WG	DBF	6.7	ng/L	
	STAGE_2	WG	DBFC1	19.4	ng/L	
	STAGE_2	WG	DBFC2	44.4	ng/L	
	STAGE_2	WG	DMNPH26	60.2	ng/L	
	STAGE_2	WG	FL	7.1	ng/L	
	STAGE_2	WG	FLA	38.7	ng/L	
	STAGE_2	WG	FLAPYRC1	107.6	ng/L	
	STAGE_2	WG	FLC1	25.5	ng/L	
	STAGE_2	WG	FLC2	244.1	ng/L	
	STAGE_2	WG	FLC3	42.6	ng/L	
	STAGE_2	WG	INP123	5.3	ng/L	J
	STAGE_2	WG	MTNPH1	3.6	ng/L	J
	STAGE_2	WG	MTNPH2	5.2	ng/L	J
	STAGE_2	WG	MTPHAN1	29.2	ng/L	
	STAGE_2	WG	NAPH	44.8	ng/L	
	STAGE_2	WG	NAPHC1	8.8	ng/L	
	STAGE_2	WG	NAPHC2	61.1	ng/L	
	STAGE_2	WG	NAPHC3	71.8	ng/L	
	STAGE_2	WG	NAPHC4	125.2	ng/L	
	STAGE_2	WG	Ni	1.61	mg/L	
	STAGE_2	WG	PAHTOT	1352.3	ng/L	
	STAGE_2	WG	PERY	2.6	ng/L	J
	STAGE_2	WG	PHAN	49.8	ng/L	
	STAGE_2	WG	PHANANTHC1	176	ng/L	
	STAGE_2	WG	PHANANTHC2	65.1	ng/L	
	STAGE_2	WG	PHANANTHC3	80.3	ng/L	
	STAGE_2	WG	PYR	31.3	ng/L	
	STAGE_2	WG	TMNPH167	3	ng/L	J
WP2C4_S	STAGE_2	DC	TPH	5.8	ug/g	
	STAGE_2	DC	TPH-R	.8	ug/g	
	STAGE_2	DC	TPH-U	5	ug/g	
	STAGE_2	DC	TSF MAX	3737	intens	
WP2_W	STAGE_2	WG	TPH	.1038	mg/L	
	STAGE_2	WG	TPH-R	.061	mg/L	
	STAGE_2	WG	TPH-U	.0428	mg/L	
	STAGE_2	WG	TSF MAX	2155	intens	
WP3C4_S	STAGE_2	DC	ACNP	.9	ng/g	
	STAGE_2	DC	ACNPY	2.5	ng/g	
	STAGE_2	DC	ANTH	.2	ng/g	J
	STAGE_2	DC	BIPHENYL	1.9	ng/g	
	STAGE_2	DC	BZAA	1.8	ng/g	
	STAGE_2	DC	BZAP	1.6	ng/g	
	STAGE_2	DC	BZBF	3.5	ng/g	
	STAGE_2	DC	BZEP	2	ng/g	
	STAGE_2	DC	BZGHIP	1.5	ng/g	
	STAGE_2	DC	BZKF	1.2	ng/g	
	STAGE_2	DC	CHRYSENE	2.3	ng/g	
	STAGE_2	DC	CHRYSENE_C1	.9	ng/g	J
	STAGE_2	DC	CHRYSENE_C2	1.1	ng/g	J
	STAGE_2	DC	DBAHA	.3	ng/g	
	STAGE_2	DC	DBF	.1	ng/g	J
	STAGE_2	DC	DMNPH26	1.5	ng/g	
	STAGE_2	DC	FL	.4	ng/g	J
	STAGE_2	DC	FLA	2.5	ng/g	
	STAGE_2	DC	FLA_PYRC1	2.1	ng/g	J
	STAGE_2	DC	FLC3	2.4	ng/g	
	STAGE_2	DC	INP123	1.2	ng/g	
	STAGE_2	DC	MTNPH1	1.9	ng/g	
	STAGE_2	DC	MTNPH2	3	ng/g	
	STAGE_2	DC	MTPHAN1	.3	ng/g	
	STAGE_2	DC	NAPH	1.5	ng/g	J
	STAGE_2	DC	NAPHC1	5	ng/g	
	STAGE_2	DC	NAPHC2	11	ng/g	
	STAGE_2	DC	NAPHC3	38.7	ng/g	
	STAGE_2	DC	NAPHC4	28.1	ng/g	
	STAGE_2	DC	PAHTOT	124.5	ng/g	
	STAGE_2	DC	PERY	1.1	ng/g	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	PHAN	.6	ng/g	J
	STAGE_2	DC	PHAN_ANTHC1	1.3	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	1.6	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	2.2	ng/g	
	STAGE_2	DC	PYR	3.4	ng/g	
	STAGE_2	DC	TMNPH167	2.6	ng/g	
	STAGE_2	DC	TPH	10.3	ug/g	
	STAGE_2	DC	TPH-R	3.3	ug/g	
	STAGE_2	DC	TPH-U	7	ug/g	
	STAGE_2	DC	TSF MAX	2962	intens	

Non-null results of all samples submitted for Site 39 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
043F	STAGE_1	SO	TPH	2.7	ug/g	
	STAGE_1	SO	TPH-R	.5	ug/g	
	STAGE_1	SO	TPH-U	2.2	ug/g	
	STAGE_1	SO	TSF MAX	293	intens	
044B	STAGE_1	SO	TPH	3.5	ug/g	
	STAGE_1	SO	TPH-R	1	ug/g	
	STAGE_1	SO	TPH-U	2.5	ug/g	
	STAGE_1	SO	TSF MAX	772	intens	

Non-null results of all samples submitted for Site 40.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
032	STAGE_1	SO	Ba	723	ug/g	
	STAGE_1	SO	Cr	9	ug/g	<
	STAGE_1	SO	Pb	15	ug/g	
	STAGE_1	SO	TPH	52	ug/g	
	STAGE_1	SO	TPH-R	5.3	ug/g	
	STAGE_1	SO	TPH-U	46.8	ug/g	
	STAGE_1	SO	TSF MAX	48600	intens	
033B	STAGE_1	SO	TPH	5.8	ug/g	
	STAGE_1	SO	TPH-R	.7	ug/g	
	STAGE_1	SO	TPH-U	5.1	ug/g	
	STAGE_1	SO	TSF MAX	91	intens	
034B	STAGE_1	SO	TPH	6.2	ug/g	
	STAGE_1	SO	TPH-R	.5	ug/g	
	STAGE_1	SO	TPH-U	5.7	ug/g	
	STAGE_1	SO	TSF MAX	145	intens	
035A	STAGE_1	SO	TPH	6.3	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	5.4	ug/g	
	STAGE_1	SO	TSF MAX	84	intens	
036A	STAGE_1	SO	TPH	24.6	ug/g	
	STAGE_1	SO	TPH-R	1.4	ug/g	
	STAGE_1	SO	TPH-U	23.2	ug/g	
	STAGE_1	SO	TSF MAX	31760	intens	
037A	STAGE_1	SO	ACNP	2.1	ng/g	
	STAGE_1	SO	ACNPY	.1	ng/g	J
	STAGE_1	SO	ANTH	4.7	ng/g	
	STAGE_1	SO	BIPHENYL	.8	ng/g	
	STAGE_1	SO	BZAA	18.1	ng/g	
	STAGE_1	SO	BZAP	11.6	ng/g	
	STAGE_1	SO	BZBF	18.8	ng/g	
	STAGE_1	SO	BZEP	9.3	ng/g	
	STAGE_1	SO	BZGHIP	7.9	ng/g	
	STAGE_1	SO	BZKF	4.4	ng/g	
	STAGE_1	SO	CHRYSENE	15.1	ng/g	
	STAGE_1	SO	CHRYSENE_C1	6.6	ng/g	
	STAGE_1	SO	CHRYSENE_C2	2.9	ng/g	
	STAGE_1	SO	CHRYSENE_C4	1.3	ng/g	J
	STAGE_1	SO	DBAHA	2.2	ng/g	
	STAGE_1	SO	DBF	.7	ng/g	
	STAGE_1	SO	DMNPH26	.5	ng/g	J
	STAGE_1	SO	FL	1.7	ng/g	
	STAGE_1	SO	FLA	36.1	ng/g	
	STAGE_1	SO	FLA_PYRC1	14.3	ng/g	
	STAGE_1	SO	FLC1	1.5	ng/g	
	STAGE_1	SO	FLC2	3.4	ng/g	
	STAGE_1	SO	FLC3	11.9	ng/g	
	STAGE_1	SO	INP123	7.4	ng/g	
	STAGE_1	SO	MTNPH1	.8	ng/g	J
	STAGE_1	SO	MTNPH2	.9	ng/g	J
	STAGE_1	SO	MTPHAN1	.9	ng/g	
	STAGE_1	SO	NAPH	1.9	ng/g	J
	STAGE_1	SO	NAPHC1	1.7	ng/g	J
	STAGE_1	SO	NAPHC2	5.2	ng/g	
	STAGE_1	SO	NAPHC3	6.8	ng/g	
	STAGE_1	SO	NAPHC4	8.5	ng/g	
	STAGE_1	SO	PAHTOT	268.5	ng/g	
	STAGE_1	SO	PERY	5.7	ng/g	
	STAGE_1	SO	PHAN	16.7	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	4.9	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	5.1	ng/g	
	STAGE_1	SO	PYR	29.1	ng/g	
	STAGE_1	SO	TMNPH167	.4	ng/g	
	STAGE_1	SO	TPH	157.7	ug/g	
	STAGE_1	SO	TPH-R	5.5	ug/g	
	STAGE_1	SO	TPH-U	152.2	ug/g	
	STAGE_1	SO	TSF MAX	144000	intens	
CARL_2_WP2	STAGE_2	DC	TPH	25.8	ug/g	
	STAGE_2	DC	TPH-R	17.8	ug/g	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	TPH-U	8	ug/g	
	STAGE_2	DC	TSF MAX	1786	intens	
CARL_2_WP2_W	STAGE_2	WG	TPH	.1619	mg/L	
	STAGE_2	WG	TPH-R	.176	mg/L	
	STAGE_2	WG	TPH-U	.0059	mg/L	
	STAGE_2	WG	TSF MAX	38550	intens	
CARL_2_WP3	STAGE_2	DC	ACNP	63.7	ng/g	
	STAGE_2	DC	ACNPY	300.7	ng/g	
	STAGE_2	DC	ANTH	27	ng/g	
	STAGE_2	DC	BIPHENYL	216	ng/g	
	STAGE_2	DC	BZAA	8.2	ng/g	
	STAGE_2	DC	BZAP	2.5	ng/g	
	STAGE_2	DC	BZBF	2.6	ng/g	
	STAGE_2	DC	BZEP	4.2	ng/g	
	STAGE_2	DC	BZGHIP	5.8	ng/g	
	STAGE_2	DC	BZKF	1.4	ng/g	
	STAGE_2	DC	CHRYSENE	6.2	ng/g	
	STAGE_2	DC	DBAHA	1.7	ng/g	
	STAGE_2	DC	DBF	131.5	ng/g	
	STAGE_2	DC	DBFC1	458.9	ng/g	
	STAGE_2	DC	DBFC2	189.6	ng/g	
	STAGE_2	DC	DBFC3	90.9	ng/g	
	STAGE_2	DC	DMNPH26	3649.7	ng/g	
	STAGE_2	DC	FL	271.9	ng/g	
	STAGE_2	DC	FLA	17.4	ng/g	
	STAGE_2	DC	FLAPYRC1	110	ng/g	
	STAGE_2	DC	FLC1	679.9	ng/g	
	STAGE_2	DC	FLC2	904.7	ng/g	
	STAGE_2	DC	FLC3	672.5	ng/g	
	STAGE_2	DC	INP123	3.8	ng/g	
	STAGE_2	DC	MTNPH1	1259.3	ng/g	
	STAGE_2	DC	MTNPH2	1499.2	ng/g	
	STAGE_2	DC	MTPHAN1	316.9	ng/g	
	STAGE_2	DC	NAPH	46.5	ng/g	
	STAGE_2	DC	NAPHC1	2758.5	ng/g	
	STAGE_2	DC	NAPHC2	1286.4	ng/g	
	STAGE_2	DC	NAPHC3	2075.3	ng/g	
	STAGE_2	DC	NAPHC4	1247.8	ng/g	
	STAGE_2	DC	PAHTOT	14688.2	ng/g	
	STAGE_2	DC	PERY	5.9	ng/g	
	STAGE_2	DC	PHAN	503.7	ng/g	
	STAGE_2	DC	PHANANTHC1	1324.2	ng/g	
	STAGE_2	DC	PHANANTHC2	825.1	ng/g	
	STAGE_2	DC	PHANANTHC3	321.4	ng/g	
	STAGE_2	DC	PHANANTHC4	102.9	ng/g	
	STAGE_2	DC	PYR	19.9	ng/g	
	STAGE_2	DC	TMNPH167	3589.1	ng/g	
	STAGE_2	DC	TPH	25304.7	ug/g	
	STAGE_2	DC	TPH-R	1205	ug/g	
	STAGE_2	DC	TPH-U	24100	ug/g	
	STAGE_2	DC	TSF MAX	6404000	intens	
CARL_2_WP3_W	STAGE_2	WG	TPH	3.6038	mg/L	
	STAGE_2	WG	TPH-R	3.52	mg/L	
	STAGE_2	WG	TPH-U	.0838	mg/L	
	STAGE_2	WG	TSF MAX	95520	intens	
CARL_2_WP4	STAGE_2	DC	ACNP	62	ng/g	
	STAGE_2	DC	ACNPY	50.8	ng/g	
	STAGE_2	DC	BIPHENYL	17	ng/g	
	STAGE_2	DC	BZAA	.7	ng/g	
	STAGE_2	DC	BZAP	1.7	ng/g	
	STAGE_2	DC	BZBF	2.9	ng/g	
	STAGE_2	DC	BZEP	1.7	ng/g	
	STAGE_2	DC	BZGHIP	2.1	ng/g	
	STAGE_2	DC	BZKF	.7	ng/g	
	STAGE_2	DC	CHRYSENE	4.2	ng/g	
	STAGE_2	DC	CHRYSENE_C1	5.8	ng/g	
	STAGE_2	DC	CHRYSENE_C2	10	ng/g	
	STAGE_2	DC	DBAHA	.3	ng/g	J

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	DBF	35.3	ng/g	
	STAGE_2	DC	DBFC1	137.1	ng/g	
	STAGE_2	DC	DBFC2	97.6	ng/g	
	STAGE_2	DC	DBFC3	53	ng/g	
	STAGE_2	DC	DMNPH26	494.2	ng/g	
	STAGE_2	DC	FL	49.5	ng/g	
	STAGE_2	DC	FLA	5.6	ng/g	
	STAGE_2	DC	FLA_PYRC1	19.1	ng/g	
	STAGE_2	DC	FLC1	52.3	ng/g	
	STAGE_2	DC	FLC2	131.3	ng/g	
	STAGE_2	DC	FLC3	424.4	ng/g	
	STAGE_2	DC	INP123	1.2	ng/g	
	STAGE_2	DC	MTNPH1	58.6	ng/g	
	STAGE_2	DC	MTNPH2	74.5	ng/g	
	STAGE_2	DC	MTPHAN1	94.6	ng/g	
	STAGE_2	DC	NAPH	2.9	ng/g	
	STAGE_2	DC	NAPHC1	133.1	ng/g	
	STAGE_2	DC	NAPHC2	1669.3	ng/g	
	STAGE_2	DC	NAPHC3	44.29	ng/g	
	STAGE_2	DC	NAPHC4	3150.3	ng/g	
	STAGE_2	DC	PAHTOT	11599.2	ng/g	
	STAGE_2	DC	PERY	1	ng/g	
	STAGE_2	DC	PHAN	102.6	ng/g	
	STAGE_2	DC	PHAN_ANTHC1	442	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	367.2	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	95	ng/g	
	STAGE_2	DC	PHAN_ANTHC4	32.2	ng/g	
	STAGE_2	DC	PYR	8.3	ng/g	
	STAGE_2	DC	TMNPH167	813.9	ng/g	
	STAGE_2	DC	TPH	6534	ug/g	
	STAGE_2	DC	TPH-R	1509	ug/g	
	STAGE_2	DC	TPH-U	5025	ug/g	
	STAGE_2	DC	TSF MAX	1091000	intens	
CARL_2_WP4_W	STAGE_2	WG	TPH	1.3526	mg/L	
	STAGE_2	WG	TPH-R	1.083	mg/L	
	STAGE_2	WG	TPH-U	.2696	mg/L	
	STAGE_2	WG	TSF MAX	5491	intens	
Carl_2_WP1_F	STAGE_2	WG	SC	92100	mS/cm	
Carl_2_WP2_F	STAGE_2	WG	SC	63682	mS/cm	
Carl_2_WP2_W	STAGE_2	WG	Cr	.11	mg/L	
	STAGE_2	WG	Cu	.09	mg/L	
	STAGE_2	WG	Ni	.06	mg/L	
	STAGE_2	WG	Zn	.54	mg/L	
Carl_2_WP3_F	STAGE_2	WG	SC	194875	mS/cm	
Carl_2_WP3_W	STAGE_2	WG	Cr	.21	mg/L	
Carl_2_WP4_F	STAGE_2	WG	SC	274000	mS/cm	
Carl_2_WP4_S	STAGE_2	DC	Cr	6	mg/Kg	
	STAGE_2	DC	Pb	23	mg/Kg	
	STAGE_2	DC	Zn	13	mg/Kg	
Carl_2_WP4_W	STAGE_2	WG	ACNP	4.2	ng/L	J
	STAGE_2	WG	ACNPY	2.6	ng/L	J
	STAGE_2	WG	ANTH	3.7	ng/L	J
	STAGE_2	WG	BIPHENYL	16.9	ng/L	
	STAGE_2	WG	BZAA	19.9	ng/L	
	STAGE_2	WG	BZAP	26.3	ng/L	
	STAGE_2	WG	BZBF	41	ng/L	
	STAGE_2	WG	BZEP	22.2	ng/L	
	STAGE_2	WG	BZGHIP	20.9	ng/L	
	STAGE_2	WG	BZKF	15.9	ng/L	
	STAGE_2	WG	CHRYSENE	36.2	ng/L	
	STAGE_2	WG	CHRYSENE_C1	16.6	ng/L	
	STAGE_2	WG	CHRYSENE_C2	14.6	ng/L	J
	STAGE_2	WG	CHRYSENE_C4	8.2	ng/L	J
	STAGE_2	WG	Cr	.07	mg/L	
	STAGE_2	WG	DBAHA	5	ng/L	J
	STAGE_2	WG	DBF	8.5	ng/L	
	STAGE_2	WG	DBFC1	59.5	ng/L	
	STAGE_2	WG	DBFC2	81.9	ng/L	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	DBFC3	222.5	ng/L	
	STAGE_2	WG	DMNPH26	265.1	ng/L	
	STAGE_2	WG	FL	10	ng/L	
	STAGE_2	WG	FLA	65	ng/L	
	STAGE_2	WG	FLA_PYRC1	49.5	ng/L	
	STAGE_2	WG	FLC1	34.5	ng/L	
	STAGE_2	WG	FLC2	161	ng/L	
	STAGE_2	WG	FLC3	342.4	ng/L	
	STAGE_2	WG	INP123	20.6	ng/L	
	STAGE_2	WG	MTNPH1	43.6	ng/L	
	STAGE_2	WG	MTNPH2	55.2	ng/L	
	STAGE_2	WG	MTPHAN1	47.9	ng/L	
	STAGE_2	WG	NAPH	30.2	ng/L	
	STAGE_2	WG	NAPHC1	98.9	ng/L	
	STAGE_2	WG	NAPHC2	676.8	ng/L	
	STAGE_2	WG	NAPHC3	1756.1	ng/L	
	STAGE_2	WG	NAPHC4	1405.8	ng/L	
	STAGE_2	WG	PAHTOT	6053.4	ng/L	
	STAGE_2	WG	PERY	7	ng/L	J
	STAGE_2	WG	PHAN	61.9	ng/L	
	STAGE_2	WG	PHAN_ANTHC1	171.4	ng/L	
	STAGE_2	WG	PHAN_ANTHC2	232.8	ng/L	
	STAGE_2	WG	PHAN_ANTHC3	144.2	ng/L	
	STAGE_2	WG	PHAN_ANTHC4	94.6	ng/L	
	STAGE_2	WG	PYR	64.4	ng/L	
	STAGE_2	WG	TMNPH167	320	ng/L	

Non-null results of all samples submitted for Site 41 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
007B	STAGE_1	SO	TPH	3.3	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	2.5	ug/g	
	STAGE_1	SO	TSF MAX	180	intens	
008B	STAGE_1	SO	Ba	391	ug/g	
	STAGE_1	SO	TPH	56.4	ug/g	
	STAGE_1	SO	TPH-R	2.5	ug/g	
	STAGE_1	SO	TPH-U	53.9	ug/g	
	STAGE_1	SO	TSF MAX	9837	intens	
009B	STAGE_1	SO	Ba	450	ug/g	
	STAGE_1	SO	Pb	6	ug/g	
	STAGE_1	SO	TPH	152.4	ug/g	
	STAGE_1	SO	TPH-R	4.7	ug/g	
	STAGE_1	SO	TPH-U	147.7	ug/g	
	STAGE_1	SO	TSF MAX	86750	intens	
010B	STAGE_1	SO	TPH	20.7	ug/g	
	STAGE_1	SO	TPH-R	1.6	ug/g	
	STAGE_1	SO	TPH-U	19.1	ug/g	
	STAGE_1	SO	TSF MAX	241	intens	
011B	STAGE_1	SO	Ba	24	ug/g	
	STAGE_1	SO	TPH	2.5	ug/g	
	STAGE_1	SO	TPH-R	1.7	ug/g	
	STAGE_1	SO	TPH-U	.7	ug/g	
	STAGE_1	SO	TSF MAX	734	intens	
012B	STAGE_1	SO	TPH	2.8	ug/g	
	STAGE_1	SO	TPH-R	1.7	ug/g	
	STAGE_1	SO	TPH-U	1.2	ug/g	
	STAGE_1	SO	TSF MAX	151	intens	
013B	STAGE_1	SO	Ba	27	ug/g	
	STAGE_1	SO	TPH	5.7	ug/g	
	STAGE_1	SO	TPH-R	3.2	ug/g	
	STAGE_1	SO	TPH-U	2.5	ug/g	
	STAGE_1	SO	TSF MAX	149	intens	

Non-null results of all samples submitted for Site 42.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
038B	STAGE_1	SO	ACNP	50.8	ng/g	
	STAGE_1	SO	ACNPY	12.2	ng/g	
	STAGE_1	SO	ANTH	19.4	ng/g	
	STAGE_1	SO	BIPHENYL	28.3	ng/g	
	STAGE_1	SO	BZAA	.7	ng/g	
	STAGE_1	SO	BZAP	.2	ng/g	
	STAGE_1	SO	BZBF	.4	ng/g	J
	STAGE_1	SO	BZEP	.4	ng/g	J
	STAGE_1	SO	BZGHIP	.4	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	Ba	1680	ug/g	
	STAGE_1	SO	CHRYSENE	1.7	ng/g	
	STAGE_1	SO	CHRYSENE_C1	2.9	ng/g	
	STAGE_1	SO	CHRYSENE_C2	2.7	ng/g	
	STAGE_1	SO	Cr	8	ug/g	
	STAGE_1	SO	DBAHA	.1	ng/g	J
	STAGE_1	SO	DBF	27.3	ng/g	
	STAGE_1	SO	DBFC1	84	ng/g	
	STAGE_1	SO	DBFC2	72.9	ng/g	
	STAGE_1	SO	DBFC3	53.8	ng/g	
	STAGE_1	SO	DMNPH26	209.6	ng/g	
	STAGE_1	SO	FL	82.4	ng/g	
	STAGE_1	SO	FLA	8.4	ng/g	
	STAGE_1	SO	FLA_PYRC1	26.3	ng/g	
	STAGE_1	SO	FLC1	262.3	ng/g	
	STAGE_1	SO	FLC2	518.5	ng/g	
	STAGE_1	SO	FLC3	392.3	ng/g	
	STAGE_1	SO	INP123	.3	ng/g	J
	STAGE_1	SO	MTNPH1	17.5	ng/g	
	STAGE_1	SO	MTNPH2	22.2	ng/g	
	STAGE_1	SO	MTPHAN1	111	ng/g	
	STAGE_1	SO	NAPH	7.4	ng/g	
	STAGE_1	SO	NAPHC1	39.7	ng/g	
	STAGE_1	SO	NAPHC2	772.3	ng/g	
	STAGE_1	SO	NAPHC3	3616.9	ng/g	
	STAGE_1	SO	NAPHC4	2088	ng/g	
	STAGE_1	SO	PAHTOT	9570.2	ng/g	
	STAGE_1	SO	PERY	1.3	ng/g	
	STAGE_1	SO	PHAN	208	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	562.4	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	443.8	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	124.9	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	39.9	ng/g	
	STAGE_1	SO	PYR	17.2	ng/g	
	STAGE_1	SO	Pb	31	ug/g	
	STAGE_1	SO	TMNPH167	1214.5	ng/g	
	STAGE_1	SO	TPH	539.3	ug/g	
	STAGE_1	SO	TPH-R	157.6	ug/g	
	STAGE_1	SO	TPH-U	381.7	ug/g	
	STAGE_1	SO	TSF MAX	245300	intens	
039B	STAGE_1	SO	ACNP	1.3	ng/g	
	STAGE_1	SO	ACNPY	.6	ng/g	
	STAGE_1	SO	ANTH	.9	ng/g	
	STAGE_1	SO	BIPHENYL	1.3	ng/g	
	STAGE_1	SO	BZEP	.1	ng/g	J
	STAGE_1	SO	BZGHIP	.1	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	Ba	943	ug/g	
	STAGE_1	SO	CHRYSENE	.1	ng/g	
	STAGE_1	SO	Cr	15	ug/g	
	STAGE_1	SO	DBF	.2	ng/g	J
	STAGE_1	SO	DBFC1	.2	ng/g	J
	STAGE_1	SO	DBFC2	.1	ng/g	J
	STAGE_1	SO	DBFC3	.5	ng/g	J
	STAGE_1	SO	DMNPH26	.9	ng/g	
	STAGE_1	SO	FL	.4	ng/g	J
	STAGE_1	SO	FLA	.5	ng/g	J
	STAGE_1	SO	FLA_PYRC1	1.9	ng/g	J

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	FLC1	3.5	ng/g	
	STAGE_1	SO	FLC2	11	ng/g	
	STAGE_1	SO	FLC3	13.6	ng/g	
	STAGE_1	SO	MTNPH1	1	ng/g	J
	STAGE_1	SO	MTNPH2	1.9	ng/g	
	STAGE_1	SO	MTPHAN1	.8	ng/g	
	STAGE_1	SO	NAPH	2.1	ng/g	J
	STAGE_1	SO	NAPHC1	2.9	ng/g	
	STAGE_1	SO	NAPHC2	6.5	ng/g	
	STAGE_1	SO	NAPHC3	34.3	ng/g	
	STAGE_1	SO	NAPHC4	104	ng/g	
	STAGE_1	SO	PAHTOT	217.4	ng/g	
	STAGE_1	SO	PERY	.1	ng/g	J
	STAGE_1	SO	PHAN	.9	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	5.5	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	14.4	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	7.3	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	1.9	ng/g	
	STAGE_1	SO	PYR	.9	ng/g	J
	STAGE_1	SO	Pb	6	ug/g	
	STAGE_1	SO	TMNPH167	4.3	ng/g	
	STAGE_1	SO	TPH	111.6	ug/g	
	STAGE_1	SO	TPH-R	13.9	ug/g	
	STAGE_1	SO	TPH-U	97.7	ug/g	
	STAGE_1	SO	TSF MAX	23880	intens	
040B	STAGE_1	SO	Ba	26	ug/g	
	STAGE_1	SO	TPH	2.1	ug/g	
	STAGE_1	SO	TPH-R	.6	ug/g	
	STAGE_1	SO	TPH-U	1.5	ug/g	
	STAGE_1	SO	TSF MAX	222	intens	
041B	STAGE_1	SO	TPH	2.7	ug/g	
	STAGE_1	SO	TPH-R	.5	ug/g	
	STAGE_1	SO	TPH-U	2.2	ug/g	
	STAGE_1	SO	TSF MAX	330	intens	
SUN_8_WP1	STAGE_2	DC	TPH	.9	ug/g	
	STAGE_2	DC	TPH-R	.9	ug/g	
	STAGE_2	DC	TSF MAX	161	intens	
SUN_8_WP1_W	STAGE_2	WG	TPH	2.3261	mg/L	
	STAGE_2	WG	TPH-R	2.217	mg/L	
	STAGE_2	WG	TPH-U	.1091	mg/L	
	STAGE_2	WG	TSF MAX	141300	intens	
SUN_8_WP2	STAGE_2	DC	TPH	.8	ug/g	
	STAGE_2	DC	TPH-R	.8	ug/g	
	STAGE_2	DC	TSF MAX	178	intens	
SUN_8_WP2_W	STAGE_2	WG	TPH	.9267	mg/L	
	STAGE_2	WG	TPH-R	.891	mg/L	
	STAGE_2	WG	TPH-U	.0357	mg/L	
	STAGE_2	WG	TSF MAX	5110	intens	
SUN_8_WP3	STAGE_2	DC	TPH	3347.7	ug/g	
	STAGE_2	DC	TPH-R	1610	ug/g	
	STAGE_2	DC	TPH-U	1738	ug/g	
	STAGE_2	DC	TSF MAX	218000	intens	
SUN_8_WP3_W	STAGE_2	WG	TPH	.0203	mg/L	
	STAGE_2	WG	TPH-R	.009	mg/L	
	STAGE_2	WG	TPH-U	.0113	mg/L	
	STAGE_2	WG	TSF MAX	1933	intens	
Sun_8_WP1_F	STAGE_2	WG	SC	7860	mS/cm	
Sun_8_WP1_W	STAGE_2	WG	Cr	.9	mg/L	
	STAGE_2	WG	Cu	.16	mg/L	
	STAGE_2	WG	Hg	.003	mg/L	
	STAGE_2	WG	Ni	.11	mg/L	
	STAGE_2	WG	Pb	.61	mg/L	
	STAGE_2	WG	Zn	1.25	mg/L	
Sun_8_WP2_F	STAGE_2	WG	SC	4130	mS/cm	
Sun_8_WP2_W	STAGE_2	WG	Cr	.19	mg/L	
	STAGE_2	WG	Ni	.15	mg/L	
	STAGE_2	WG	Zn	.45	mg/L	
Sun_8_WP3_F	STAGE_2	WG	SC	1940	mS/cm	

Non-null results of all samples submitted for Site 44.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
Sun_8_WP3_S	STAGE_2	DC	ACNP	13.4	ng/g	
	STAGE_2	DC	ACNPY	3.3	ng/g	
	STAGE_2	DC	ANTH	5.9	ng/g	
	STAGE_2	DC	BIPHENYL	4.7	ng/g	
	STAGE_2	DC	BZAA	20.7	ng/g	
	STAGE_2	DC	BZAP	17.2	ng/g	
	STAGE_2	DC	BZBF	26	ng/g	
	STAGE_2	DC	BZEP	12.6	ng/g	
	STAGE_2	DC	BZGHIP	11.9	ng/g	
	STAGE_2	DC	BZKF	8.5	ng/g	
	STAGE_2	DC	CHRYSENE	19	ng/g	
	STAGE_2	DC	DBAHA	2.8	ng/g	
	STAGE_2	DC	DBF	1.8	ng/g	
	STAGE_2	DC	DBFC1	2	ng/g	
	STAGE_2	DC	DMNPH26	31.2	ng/g	
	STAGE_2	DC	FL	7.2	ng/g	
	STAGE_2	DC	FLA	36.8	ng/g	
	STAGE_2	DC	FLA_PYRC1	18.9	ng/g	
	STAGE_2	DC	FLC1	7.6	ng/g	
	STAGE_2	DC	FLC2	25.4	ng/g	
	STAGE_2	DC	FLC3	28.1	ng/g	
	STAGE_2	DC	INP123	12	ng/g	
	STAGE_2	DC	MTNPH1	9.7	ng/g	
	STAGE_2	DC	MTNPH2	10.2	ng/g	
	STAGE_2	DC	MTPHAN1	4.5	ng/g	
	STAGE_2	DC	NAPH	2.4	ng/g	
	STAGE_2	DC	NAPHC1	19.9	ng/g	
	STAGE_2	DC	NAPHC2	66.1	ng/g	
	STAGE_2	DC	NAPHC3	109.8	ng/g	
	STAGE_2	DC	NAPHC4	68.9	ng/g	
	STAGE_2	DC	PAHTOT	642.5	ng/g	
	STAGE_2	DC	PERY	5.6	ng/g	
	STAGE_2	DC	PHAN	25.2	ng/g	
	STAGE_2	DC	PHAN_ANTHC1	16.1	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	13.8	ng/g	
	STAGE_2	DC	PYR	29.1	ng/g	
	STAGE_2	DC	TMNPH167	31.7	ng/g	
Sun_8_WP3_W	STAGE_2	WG	ACNP	9.8	ng/L	
	STAGE_2	WG	ACNPY	1.2	ng/L	J
	STAGE_2	WG	ANTH	4.7	ng/L	J
	STAGE_2	WG	BIPHENYL	3.7	ng/L	J
	STAGE_2	WG	BZAA	7.8	ng/L	
	STAGE_2	WG	BZAP	11.9	ng/L	
	STAGE_2	WG	BZBF	15.8	ng/L	
	STAGE_2	WG	BZEP	9.1	ng/L	
	STAGE_2	WG	BZGHIP	10.2	ng/L	
	STAGE_2	WG	BZKF	3.5	ng/L	J
	STAGE_2	WG	CHRYSENE	11.2	ng/L	
	STAGE_2	WG	CHRYSENE_C1	13.6	ng/L	J
	STAGE_2	WG	CHRYSENE_C2	13	ng/L	J
	STAGE_2	WG	DBAHA	2.1	ng/L	J
	STAGE_2	WG	DBF	3.1	ng/L	
	STAGE_2	WG	DBFC1	5.5	ng/L	J
	STAGE_2	WG	DBFC2	18.2	ng/L	
	STAGE_2	WG	DBFC3	15.5	ng/L	
	STAGE_2	WG	DMNPH26	25.6	ng/L	
	STAGE_2	WG	FL	7.4	ng/L	
	STAGE_2	WG	FLA	22.3	ng/L	
	STAGE_2	WG	FLA_PYRC1	33.8	ng/L	
	STAGE_2	WG	FLC1	20.8	ng/L	
	STAGE_2	WG	FLC2	41.2	ng/L	
	STAGE_2	WG	FLC3	83.3	ng/L	
	STAGE_2	WG	INP123	8.2	ng/L	
	STAGE_2	WG	MTNPH1	39	ng/L	
	STAGE_2	WG	MTNPH2	69.3	ng/L	
	STAGE_2	WG	MTPHAN1	9.4	ng/L	J
	STAGE_2	WG	NAPH	76.3	ng/L	
	STAGE_2	WG	NAPHC1	108.3	ng/L	
	STAGE_2	WG	NAPHC2	52.5	ng/L	
	STAGE_2	WG	NAPHC3	73.5	ng/L	
	STAGE_2	WG	NAPHC4	38.2	ng/L	
	STAGE_2	WG	PAHTOT	943.5	ng/L	
	STAGE_2	WG	PERY	4.5	ng/L	J
	STAGE_2	WG	PHAN	31.1	ng/L	
	STAGE_2	WG	PHAN_ANTHC1	42	ng/L	
	STAGE_2	WG	PHAN_ANTHC2	39.4	ng/L	
	STAGE_2	WG	PHAN_ANTHC3	43.3	ng/L	
	STAGE_2	WG	PHAN_ANTHC4	32.2	ng/L	
	STAGE_2	WG	PYR	25.7	ng/L	
	STAGE_2	WG	TMNPH167	15.1	ng/L	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
048F	STAGE_1	SO	TPH	1.7	ug/g	
	STAGE_1	SO	TPH-R	1.1	ug/g	
	STAGE_1	SO	TPH-U	.6	ug/g	
	STAGE_1	SO	TSF MAX	178	intens	
048G	STAGE_1	SO	Ba	8	ug/g	
049D	STAGE_1	SO	Ba	263	ug/g	
	STAGE_1	SO	TPH	3.3	ug/g	
	STAGE_1	SO	TPH-R	1.2	ug/g	
	STAGE_1	SO	TPH-U	2.2	ug/g	
	STAGE_1	SO	TSF MAX	436	intens	
050A	STAGE_1	SO	TPH	16.7	ug/g	
	STAGE_1	SO	TPH-R	2.3	ug/g	
	STAGE_1	SO	TPH-U	14.4	ug/g	
	STAGE_1	SO	TSF MAX	2253	intens	
050B	STAGE_1	SO	Ba	210	ug/g	
	STAGE_1	SO	TPH	6.5	ug/g	
	STAGE_1	SO	TPH-R	4.4	ug/g	
	STAGE_1	SO	TPH-U	2.1	ug/g	
	STAGE_1	SO	TSF MAX	1890	intens	

Non-null results of all samples submitted for Site 49.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
077A	STAGE_1	SO	Ba	15	ug/g	
	STAGE_1	SO	TPH	2.8	ug/g	
	STAGE_1	SO	TPH-R	1.3	ug/g	
	STAGE_1	SO	TPH-U	1.5	ug/g	
	STAGE_1	SO	TSF MAX	301	intens	
078B	STAGE_1	SO	TPH	12.6	ug/g	
	STAGE_1	SO	TPH-R	1.1	ug/g	
	STAGE_1	SO	TPH-U	11.5	ug/g	
	STAGE_1	SO	TSF MAX	83	intens	

Non-null results of all samples submitted for Site 55.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
079B	STAGE_1	SO	Ba	1020	ug/g	
	STAGE_1	SO	Pb	20	ug/g	
	STAGE_1	SO	TPH	521	ug/g	
	STAGE_1	SO	TPH-R	10.2	ug/g	
	STAGE_1	SO	TPH-U	510.9	ug/g	
	STAGE_1	SO	TSF MAX	581000	intens	
080A	STAGE_1	SO	TPH	3.2	ug/g	
	STAGE_1	SO	TPH-R	.5	ug/g	
	STAGE_1	SO	TPH-U	2.7	ug/g	
	STAGE_1	SO	TSF MAX	105	intens	
081A	STAGE_1	SO	TPH	1.5	ug/g	
	STAGE_1	SO	TPH-R	.6	ug/g	
	STAGE_1	SO	TPH-U	.9	ug/g	
	STAGE_1	SO	TSF MAX	151	intens	
082A	STAGE_1	SO	ACNP	.9	ng/g	
	STAGE_1	SO	ACNPY	2.3	ng/g	
	STAGE_1	SO	ANTH	2.4	ng/g	
	STAGE_1	SO	BIPHENYL	1.3	ng/g	
	STAGE_1	SO	BZAA	.4	ng/g	
	STAGE_1	SO	BZAP	.6	ng/g	J
	STAGE_1	SO	BZBF	.6	ng/g	J
	STAGE_1	SO	BZEP	.6	ng/g	
	STAGE_1	SO	BZGHIP	1	ng/g	J
	STAGE_1	SO	BZKF	.4	ng/g	J
	STAGE_1	SO	Ba	18	ug/g	
	STAGE_1	SO	CHRYSENE	1	ng/g	
	STAGE_1	SO	DBAHA	.1	ng/g	J
	STAGE_1	SO	DBF	.4	ng/g	
	STAGE_1	SO	DMNPH26	.5	ng/g	J
	STAGE_1	SO	FL	.8	ng/g	
	STAGE_1	SO	FLA	4	ng/g	
	STAGE_1	SO	FLA_PYRC1	20.8	ng/g	
	STAGE_1	SO	INP123	.5	ng/g	
	STAGE_1	SO	MTNPH1	.7	ng/g	J
	STAGE_1	SO	MTNPH2	1.1	ng/g	J
	STAGE_1	SO	MTPHAN1	1.2	ng/g	
	STAGE_1	SO	NAPH	1	ng/g	J
	STAGE_1	SO	NAPHC1	1.8	ng/g	J
	STAGE_1	SO	PAHTOT	56.5	ng/g	
	STAGE_1	SO	PERY	1	ng/g	
	STAGE_1	SO	PHAN	3.6	ng/g	
	STAGE_1	SO	PYR	11.1	ng/g	
	STAGE_1	SO	TMNPH167	1.3	ng/g	
	STAGE_1	SO	TPH	239.4	ug/g	
	STAGE_1	SO	TPH-R	8.8	ug/g	
	STAGE_1	SO	TPH-U	230.6	ug/g	
	STAGE_1	SO	TSF MAX	342000	intens	
083	STAGE_1	SO	ACNP	.9	ng/g	
	STAGE_1	SO	ACNPY	1.8	ng/g	
	STAGE_1	SO	ANTH	1.6	ng/g	
	STAGE_1	SO	BIPHENYL	3.7	ng/g	
	STAGE_1	SO	BZAA	.8	ng/g	
	STAGE_1	SO	BZAP	.8	ng/g	
	STAGE_1	SO	BZBF	.4	ng/g	J
	STAGE_1	SO	BZEP	.4	ng/g	J
	STAGE_1	SO	BZGHIP	.3	ng/g	J
	STAGE_1	SO	BZKF	.8	ng/g	
	STAGE_1	SO	CHRYSENE	.6	ng/g	J
	STAGE_1	SO	DBAHA	.3	ng/g	J
	STAGE_1	SO	DBF	3.2	ng/g	
	STAGE_1	SO	DMNPH26	3.5	ng/g	
	STAGE_1	SO	FL	1.7	ng/g	
	STAGE_1	SO	FLA	.5	ng/g	J
	STAGE_1	SO	INP123	.5	ng/g	
	STAGE_1	SO	MTNPH1	9.9	ng/g	
	STAGE_1	SO	MTNPH2	14	ng/g	
	STAGE_1	SO	MTPHAN1	3.2	ng/g	
	STAGE_1	SO	NAPH	16.6	ng/g	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	NAPHC1	23.9	ng/g	
	STAGE_1	SO	NAPHC2	30.2	ng/g	
	STAGE_1	SO	NAPHC3	53.5	ng/g	
	STAGE_1	SO	PAHTOT	146.3	ng/g	
	STAGE_1	SO	PERY	3	ng/g	
	STAGE_1	SO	PHAN	.8	ng/g	J
	STAGE_1	SO	PYR	.5	ng/g	J
	STAGE_1	SO	TMNPH167	5.2	ng/g	
	STAGE_1	SO	TPH	6145.9	ug/g	
	STAGE_1	SO	TPH-R	104.9	ug/g	
	STAGE_1	SO	TPH-U	6041	ug/g	
	STAGE_1	SO	TSF MAX	3742500	intens	
084	STAGE_1	SO	TPH	5.9	ug/g	
	STAGE_1	SO	TPH-R	1.2	ug/g	
	STAGE_1	SO	TPH-U	4.8	ug/g	
	STAGE_1	SO	TSF MAX	176	intens	
SUN_II_WP1_S	STAGE_2	DC	ACNP	.2	ng/g	J
	STAGE_2	DC	ACNPY	.3	ng/g	
	STAGE_2	DC	ANTH	.2	ng/g	J
	STAGE_2	DC	BIPHENYL	1	ng/g	
	STAGE_2	DC	BZAA	.4	ng/g	
	STAGE_2	DC	BZAP	.5	ng/g	J
	STAGE_2	DC	BZBF	1	ng/g	J
	STAGE_2	DC	BZEP	.5	ng/g	J
	STAGE_2	DC	BZGHIP	.6	ng/g	J
	STAGE_2	DC	BZKF	.2	ng/g	J
	STAGE_2	DC	CHRYSENE	1	ng/g	
	STAGE_2	DC	DBAHA	.1	ng/g	J
	STAGE_2	DC	DBF	.1	ng/g	J
	STAGE_2	DC	DMNPH26	1	ng/g	
	STAGE_2	DC	FL	.1	ng/g	J
	STAGE_2	DC	FLA	1.1	ng/g	
	STAGE_2	DC	FLA_PYRC1	1.3	ng/g	J
	STAGE_2	DC	INP123	.5	ng/g	
	STAGE_2	DC	MTNPH1	2	ng/g	
	STAGE_2	DC	MTNPH2	3	ng/g	
	STAGE_2	DC	MTPHAN1	.1	ng/g	J
	STAGE_2	DC	NAPH	3.4	ng/g	
	STAGE_2	DC	NAPHC1	5	ng/g	
	STAGE_2	DC	NAPHC2	6.2	ng/g	
	STAGE_2	DC	NAPHC3	11.2	ng/g	
	STAGE_2	DC	NAPHC4	5.4	ng/g	
	STAGE_2	DC	PAHTOT	42.3	ng/g	
	STAGE_2	DC	PERY	.3	ng/g	J
	STAGE_2	DC	PHAN	.7	ng/g	J
	STAGE_2	DC	PYR	1	ng/g	J
	STAGE_2	DC	TMNPH167	.9	ng/g	
	STAGE_2	DC	TPH	53	ug/g	
	STAGE_2	DC	TPH-R	6	ug/g	
	STAGE_2	DC	TPH-U	47	ug/g	
	STAGE_2	DC	TSF MAX	13280	intens	
SUN_II_WP1_W	STAGE_2	WG	TPH	.2296	mg/L	
	STAGE_2	WG	TPH-R	.192	mg/L	
	STAGE_2	WG	TPH-U	.0376	mg/L	
	STAGE_2	WG	TSF MAX	2208	intens	
SUN_II_WP2_S	STAGE_2	DC	TPH	7.2	ug/g	
	STAGE_2	DC	TPH-R	2.2	ug/g	
	STAGE_2	DC	TPH-U	5	ug/g	
	STAGE_2	DC	TSF MAX	327	intens	
SUN_II_WP2_W	STAGE_2	WG	TPH	.1658	mg/L	
	STAGE_2	WG	TPH-R	.081	mg/L	
	STAGE_2	WG	TPH-U	.0848	mg/L	
	STAGE_2	WG	TSF MAX	574	intens	
SUN_II_WP4_S	STAGE_2	DC	TPH	48.9	ug/g	
	STAGE_2	DC	TPH-R	14.9	ug/g	
	STAGE_2	DC	TPH-U	34	ug/g	
	STAGE_2	DC	TSF MAX	5860	intens	
SUN_II_WP4_W	STAGE_2	WG	TPH	.1235	mg/L	

Non-null results of all samples submitted for Site 56.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	TPH-R	.079	mg/L	
	STAGE_2	WG	TPH-U	.0445	mg/L	
	STAGE_2	WG	TSF MAX	623	intens	
Sun_11_WP1_F	STAGE_2	WG	SC	3800	mS/cm	
Sun_11_WP2_F	STAGE_2	WG	SC	1990	mS/cm	
Sun_11_WP4_F	STAGE_2	WG	SC	1910	mS/cm	
Sun_11_WP4_W	STAGE_2	WG	ACNP	.5	ng/L	J
	STAGE_2	WG	ACNPY	.5	ng/L	J
	STAGE_2	WG	ANTH	2.7	ng/L	J
	STAGE_2	WG	BIPHENYL	.6	ng/L	J
	STAGE_2	WG	BZAA	1.9	ng/L	J
	STAGE_2	WG	BZAP	1.7	ng/L	J
	STAGE_2	WG	BZBF	3.1	ng/L	J
	STAGE_2	WG	BZEP	1.9	ng/L	J
	STAGE_2	WG	BZGHIP	2	ng/L	J
	STAGE_2	WG	BZKF	1.3	ng/L	J
	STAGE_2	WG	CHRYSENE	2.6	ng/L	J
	STAGE_2	WG	Cr	.05	mg/L	
	STAGE_2	WG	DBAHA	.7	ng/L	J
	STAGE_2	WG	DBF	.7	ng/L	J
	STAGE_2	WG	DMNPH26	1.6	ng/L	J
	STAGE_2	WG	FL	2.4	ng/L	J
	STAGE_2	WG	FLA	6.4	ng/L	J
	STAGE_2	WG	FLA_PYRC1	52.9	ng/L	
	STAGE_2	WG	FLC2	39.5	ng/L	
	STAGE_2	WG	FLC3	51.4	ng/L	
	STAGE_2	WG	INP123	2	ng/L	J
	STAGE_2	WG	MTNPH1	3.8	ng/L	J
	STAGE_2	WG	MTNPH2	4.4	ng/L	J
	STAGE_2	WG	MTPHAN1	1.4	ng/L	J
	STAGE_2	WG	NAPH	45.4	ng/L	
	STAGE_2	WG	NAPHC1	8.2	ng/L	J
	STAGE_2	WG	NAPHC2	20	ng/L	J
	STAGE_2	WG	NAPHC3	38.9	ng/L	
	STAGE_2	WG	NAPHC4	38.2	ng/L	
	STAGE_2	WG	PAHTOT	443.7	ng/L	
	STAGE_2	WG	PERY	.9	ng/L	J
	STAGE_2	WG	PHAN	6.1	ng/L	J
	STAGE_2	WG	PHAN_ANTHC1	11.2	ng/L	J
	STAGE_2	WG	PHAN_ANTHC2	14.4	ng/L	J
	STAGE_2	WG	PHAN_ANTHC3	34.1	ng/L	
	STAGE_2	WG	PHAN_ANTHC4	46.3	ng/L	
	STAGE_2	WG	PYR	5.4	ng/L	J
	STAGE_2	WG	TMNPH167	3.9	ng/L	J

Non-null results of all samples submitted for Site 56 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
014B	STAGE_1	SO	Ba	50	ug/g	
	STAGE_1	SO	TPH	4.5	ug/g	
	STAGE_1	SO	TPH-R	1.6	ug/g	
	STAGE_1	SO	TPH-U	2.9	ug/g	
	STAGE_1	SO	TSF MAX	384	intens	
015A	STAGE_1	SO	ACNP	.5	ng/g	J
	STAGE_1	SO	ACNPY	1	ng/g	
	STAGE_1	SO	ANTH	.8	ng/g	
	STAGE_1	SO	BIPHENYL	2	ng/g	
	STAGE_1	SO	BZAA	.4	ng/g	
	STAGE_1	SO	BZAP	.3	ng/g	J
	STAGE_1	SO	BZBF	.6	ng/g	J
	STAGE_1	SO	BZEP	.8	ng/g	
	STAGE_1	SO	BZGHIP	.7	ng/g	J
	STAGE_1	SO	BZKF	.1	ng/g	J
	STAGE_1	SO	Ba	3110	ug/g	
	STAGE_1	SO	CHRYSENE	1.7	ng/g	
	STAGE_1	SO	CHRYSENE_C1	3	ng/g	
	STAGE_1	SO	CHRYSENE_C2	3.6	ng/g	
	STAGE_1	SO	Cr	60	ug/g	
	STAGE_1	SO	DBAHA	.1	ng/g	J
	STAGE_1	SO	DBF	1.7	ng/g	
	STAGE_1	SO	DBFC1	6.9	ng/g	
	STAGE_1	SO	DBFC2	9.1	ng/g	
	STAGE_1	SO	DBFC3	13.3	ng/g	
	STAGE_1	SO	DMNPH26	6.1	ng/g	
	STAGE_1	SO	FL	1.6	ng/g	
	STAGE_1	SO	FLA	1.1	ng/g	
	STAGE_1	SO	FLA_PYRC1	5	ng/g	
	STAGE_1	SO	FLC1	5.2	ng/g	
	STAGE_1	SO	FLC2	14.2	ng/g	
	STAGE_1	SO	FLC3	18	ng/g	
	STAGE_1	SO	INP123	.2	ng/g	J
	STAGE_1	SO	MTNPH1	4	ng/g	
	STAGE_1	SO	MTNPH2	5.9	ng/g	
	STAGE_1	SO	MTPHAN1	3.7	ng/g	
	STAGE_1	SO	NAPH	3.6	ng/g	
	STAGE_1	SO	NAPHC1	9.8	ng/g	
	STAGE_1	SO	NAPHC2	17.7	ng/g	
	STAGE_1	SO	NAPHC3	60	ng/g	
	STAGE_1	SO	NAPHC4	74.6	ng/g	
	STAGE_1	SO	PAHTOT	320.3	ng/g	
	STAGE_1	SO	PERY	2.2	ng/g	
	STAGE_1	SO	PHAN	3.8	ng/g	
	STAGE_1	SO	PHAN_ANTHC1	11.8	ng/g	
	STAGE_1	SO	PHAN_ANTHC2	20.6	ng/g	
	STAGE_1	SO	PHAN_ANTHC3	15.1	ng/g	
	STAGE_1	SO	PHAN_ANTHC4	6.8	ng/g	
	STAGE_1	SO	PYR	2.3	ng/g	
	STAGE_1	SO	Pb	24	ug/g	
	STAGE_1	SO	TMNPH167	22	ng/g	
	STAGE_1	SO	TPH	434.1	ug/g	
	STAGE_1	SO	TPH-R	11.5	ug/g	
	STAGE_1	SO	TPH-U	422.6	ug/g	
	STAGE_1	SO	TSF MAX	394500	intens	
016	STAGE_1	SO	ACNP	.3	ng/g	J
	STAGE_1	SO	ACNPY	.6	ng/g	
	STAGE_1	SO	ANTH	.6	ng/g	
	STAGE_1	SO	BIPHENYL	2.4	ng/g	
	STAGE_1	SO	BZAA	.4	ng/g	
	STAGE_1	SO	BZAP	.5	ng/g	J
	STAGE_1	SO	BZBF	.8	ng/g	J
	STAGE_1	SO	BZEP	.9	ng/g	
	STAGE_1	SO	BZGHIP	.8	ng/g	J
	STAGE_1	SO	BZKF	.4	ng/g	J
	STAGE_1	SO	CHRYSENE	1	ng/g	
	STAGE_1	SO	DBAHA	.2	ng/g	J
	STAGE_1	SO	DBF	.1	ng/g	J

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_1	SO	DMNPH26	.8	ng/g	
	STAGE_1	SO	FL	.5	ng/g	J
	STAGE_1	SO	FLA	.9	ng/g	J
	STAGE_1	SO	FLA_PYRC1	3.3	ng/g	
	STAGE_1	SO	INP123	.5	ng/g	
	STAGE_1	SO	MTNPH1	2	ng/g	
	STAGE_1	SO	MTNPH2	3.8	ng/g	
	STAGE_1	SO	MTPHAN1	.3	ng/g	
	STAGE_1	SO	NAPH	5.4	ng/g	
	STAGE_1	SO	NAPHC1	5.8	ng/g	
	STAGE_1	SO	NAPHC2	6.9	ng/g	
	STAGE_1	SO	NAPHC3	7.5	ng/g	
	STAGE_1	SO	PAHTOT	42.8	ng/g	
	STAGE_1	SO	PERY	.4	ng/g	J
	STAGE_1	SO	PHAN	1.3	ng/g	
	STAGE_1	SO	PYR	1.5	ng/g	
	STAGE_1	SO	TMNPH167	.3	ng/g	J
	STAGE_1	SO	TPH	45	ug/g	
	STAGE_1	SO	TPH-R	2	ug/g	
	STAGE_1	SO	TPH-U	43	ug/g	
	STAGE_1	SO	TSF MAX	24250	intens	
017B	STAGE_1	SO	TPH	10.9	ug/g	
	STAGE_1	SO	TPH-R	3.8	ug/g	
	STAGE_1	SO	TPH-U	7.1	ug/g	
	STAGE_1	SO	TSF MAX	558	intens	
018C	STAGE_1	SO	TPH	4.3	ug/g	
	STAGE_1	SO	TPH-R	2	ug/g	
	STAGE_1	SO	TPH-U	2.3	ug/g	
	STAGE_1	SO	TSF MAX	110	intens	
019B	STAGE_1	SO	TPH	5	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	4.2	ug/g	
	STAGE_1	SO	TSF MAX	292	intens	
020A	STAGE_1	SO	TPH	16.9	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	16.1	ug/g	
	STAGE_1	SO	TSF MAX	2768	intens	
021B	STAGE_1	SO	TPH	30.1	ug/g	
	STAGE_1	SO	TPH-R	4.2	ug/g	
	STAGE_1	SO	TPH-U	25.9	ug/g	
	STAGE_1	SO	TSF MAX	436	intens	
UCAL_J_WP1_S	STAGE_2	DC	TPH	6.6	ug/g	
	STAGE_2	DC	TPH-R	3.6	ug/g	
	STAGE_2	DC	TPH-U	3	ug/g	
	STAGE_2	DC	TSF MAX	115	intens	
UCAL_J_WP1_W	STAGE_2	WG	TPH	.2922	mg/L	
	STAGE_2	WG	TPH-R	.267	mg/L	
	STAGE_2	WG	TPH-U	.0252	mg/L	
	STAGE_2	WG	TSF MAX	1346	intens	
UCAL_J_WP2_S	STAGE_2	DC	ACNP	.3	ng/g	J
	STAGE_2	DC	ACNPY	.6	ng/g	
	STAGE_2	DC	ANTH	.1	ng/g	J
	STAGE_2	DC	BIPHENYL	1.9	ng/g	
	STAGE_2	DC	BZAA	.1	ng/g	J
	STAGE_2	DC	BZAP	.1	ng/g	
	STAGE_2	DC	BZBF	.2	ng/g	J
	STAGE_2	DC	BZEP	.2	ng/g	J
	STAGE_2	DC	BZGHIP	.3	ng/g	J
	STAGE_2	DC	CHRYSENE	.2	ng/g	J
	STAGE_2	DC	DBF	.2	ng/g	J
	STAGE_2	DC	DBFC1	.5	ng/g	J
	STAGE_2	DC	DMNPH26	2.9	ng/g	
	STAGE_2	DC	FL	.7	ng/g	
	STAGE_2	DC	FLA	.4	ng/g	J
	STAGE_2	DC	FLC1	1.8	ng/g	
	STAGE_2	DC	FLC2	3.2	ng/g	
	STAGE_2	DC	FLC3	4.9	ng/g	
	STAGE_2	DC	INP123	.1	ng/g	J

Non-null results of all samples submitted for Site 57.

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	DC	MTNPH1	4	ng/g	
	STAGE_2	DC	MTNPH2	6.2	ng/g	
	STAGE_2	DC	MTPHAN1	.5	ng/g	
	STAGE_2	DC	NAPH	4	ng/g	
	STAGE_2	DC	NAPHC1	10.2	ng/g	
	STAGE_2	DC	NAPHC2	22.3	ng/g	
	STAGE_2	DC	NAPHC3	56.7	ng/g	
	STAGE_2	DC	NAPHC4	39.8	ng/g	
	STAGE_2	DC	PAHTOT	155.7	ng/g	
	STAGE_2	DC	PERY	.4	ng/g	J
	STAGE_2	DC	PHAN	.7	ng/g	J
	STAGE_2	DC	PHAN_ANTHC1	1.8	ng/g	
	STAGE_2	DC	PHAN_ANTHC2	2	ng/g	
	STAGE_2	DC	PHAN_ANTHC3	1.6	ng/g	
	STAGE_2	DC	PYR	.3	ng/g	J
	STAGE_2	DC	TMNPH167	4.6	ng/g	
	STAGE_2	DC	TPH	82	ug/g	
	STAGE_2	DC	TPH-R	14	ug/g	
	STAGE_2	DC	TPH-U	68	ug/g	
	STAGE_2	DC	TSF MAX	23380	intens	
UCAL_J_WP2_W	STAGE_2	WG	TPH	.1135	mg/L	
	STAGE_2	WG	TPH-R	.1	mg/L	
	STAGE_2	WG	TPH-U	.0135	mg/L	
	STAGE_2	WG	TSF MAX	2072	intens	
UCAL_J_WP3_S	STAGE_2	DC	TPH	25.4	ug/g	
	STAGE_2	DC	TPH-R	12.4	ug/g	
	STAGE_2	DC	TPH-U	13	ug/g	
	STAGE_2	DC	TSF MAX	74	intens	
UCAL_J_WP3_W	STAGE_2	WG	TPH	.0594	mg/L	
	STAGE_2	WG	TPH-R	.04	mg/L	
	STAGE_2	WG	TPH-U	.0194	mg/L	
	STAGE_2	WG	TSF MAX	240	intens	
UCal_J_WP1_F	STAGE_2	WG	SC	710	mS/cm	
UCal_J_WP1_W	STAGE_2	WG	ACNP	.7	ng/L	J
	STAGE_2	WG	ACNPY	.7	ng/L	J
	STAGE_2	WG	ANTH	2	ng/L	J
	STAGE_2	WG	BIPHENYL	2	ng/L	J
	STAGE_2	WG	BZAA	3.9	ng/L	J
	STAGE_2	WG	BZAP	5.1	ng/L	J
	STAGE_2	WG	BZBF	8	ng/L	J
	STAGE_2	WG	BZEP	4.6	ng/L	J
	STAGE_2	WG	BZGHIP	4.3	ng/L	J
	STAGE_2	WG	BZKF	3.4	ng/L	J
	STAGE_2	WG	CHRYSENE	6.4	ng/L	J
	STAGE_2	WG	CHRYSENE_C1	3.2	ng/L	J
	STAGE_2	WG	CHRYSENE_C2	6.6	ng/L	J
	STAGE_2	WG	Cr	.34	mg/L	
	STAGE_2	WG	DBAHA	1.4	ng/L	J
	STAGE_2	WG	DBF	1.5	ng/L	J
	STAGE_2	WG	DBFC1	5.4	ng/L	J
	STAGE_2	WG	DBFC2	13.3	ng/L	
	STAGE_2	WG	DBFC3	17.6	ng/L	
	STAGE_2	WG	DMNPH26	4.2	ng/L	J
	STAGE_2	WG	FL	3.2	ng/L	J
	STAGE_2	WG	FLA	11.6	ng/L	
	STAGE_2	WG	FLA_PYRC1	11.6	ng/L	J
	STAGE_2	WG	FLC2	12.6	ng/L	J
	STAGE_2	WG	FLC3	34.1	ng/L	
	STAGE_2	WG	INP123	4.4	ng/L	J
	STAGE_2	WG	MTNPH1	3.8	ng/L	J
	STAGE_2	WG	MTNPH2	5.8	ng/L	J
	STAGE_2	WG	MTPHAN1	2	ng/L	J
	STAGE_2	WG	NAPH	38.9	ng/L	
	STAGE_2	WG	NAPHC1	9.5	ng/L	J
	STAGE_2	WG	NAPHC2	29.4	ng/L	
	STAGE_2	WG	NAPHC3	34.7	ng/L	
	STAGE_2	WG	NAPHC4	30.5	ng/L	
	STAGE_2	WG	Ni	.07	mg/L	

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
	STAGE_2	WG	PAHTOT	395.9	ng/L	
	STAGE_2	WG	PERY	2.2	ng/L	J
	STAGE_2	WG	PHAN	10	ng/L	
	STAGE_2	WG	PHAN_ANTHC1	9.7	ng/L	J
	STAGE_2	WG	PHAN_ANTHC2	12.6	ng/L	J
	STAGE_2	WG	PHAN_ANTHC3	21.2	ng/L	J
	STAGE_2	WG	PHAN_ANTHC4	20.5	ng/L	J
	STAGE_2	WG	PYR	9.1	ng/L	
	STAGE_2	WG	TMNPH167	4.7	ng/L	J
	STAGE_2	WG	Zn	.11	mg/L	
UCal_J_WP2_F	STAGE_2	WG	SC	840	mS/cm	
UCal_J_WP3_F	STAGE_2	WG	SC	1060	mS/cm	
UCal_J_WP3_W	STAGE_2	WG	Zn	.34	mg/L	

Non-null results of all samples submitted for Site 57 (continued).

Sample Id	Phase	Matrix	Analyte	Value	Units	Qualifier
022C	STAGE_1	SO	TPH	6.3	ug/g	
	STAGE_1	SO	TPH-R	2.6	ug/g	
	STAGE_1	SO	TPH-U	3.6	ug/g	
	STAGE_1	SO	TSF MAX	186	intens	
023D	STAGE_1	SO	TPH	4.5	ug/g	
	STAGE_1	SO	TPH-R	.9	ug/g	
	STAGE_1	SO	TPH-U	3.6	ug/g	
	STAGE_1	SO	TSF MAX	400	intens	
025C	STAGE_1	SO	TPH	2.8	ug/g	
	STAGE_1	SO	TPH-R	.8	ug/g	
	STAGE_1	SO	TPH-U	2	ug/g	
	STAGE_1	SO	TSF MAX	70	intens	
026B	STAGE_1	SO	TPH	2.9	ug/g	
	STAGE_1	SO	TPH-R	1.9	ug/g	
	STAGE_1	SO	TPH-U	1	ug/g	
	STAGE_1	SO	TSF MAX	5870	intens	

Non-null results of all samples submitted for Site 58.

Appendix II
Site Information Database

Site Name :	**Sun Oil Dunn et al. 4-B**
Site Identification No. :	**1.00**
Dual Location Name :	Also referred to as Sun 4-B.
Site Location Lat : N :	**27 31' 12"**
Site Location Long : W :	**97 16' 21"**
Site Location TX Grid : X :	**2,397,876.70**
Site Location TX Grid : Y :	**675,569.80**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access appears to be possible by a private road that turns west off the main approach road to the park prior to the park entrance. Use of this road is restricted.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	According to park personnel, the surface location falls outside the park, and only the bottom hole location falls within the park boundary.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**03/06/62**
Completion Date :	**03/27/62**
Status :	Dry hole. Plugged and abandoned.
Date of P & A :	**03/28/62**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,000**
State Tract No. :	**Not determined**

Site Name :	**Colorado Henderson**
Site Identification No. :	**2.00**
Dual Location Name :	Possibly a La Gloria State site, shown on the Corpus Christi Geological Library map close to the plot for the given site coordinates in the Cumulative Impact report. No site by the name of Colorado Henderson appears near the plot.
Site Location Lat : N :	**27 31' 36"**
Site Location Long : W :	**97 17' 36"**
Site Location TX Grid : X :	**2,391,050.00**
Site Location TX Grid : Y :	**677,900.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Accessing this site would require a boat. This site is located on a spoil island in the Laguna Madre.
Pad Material :	**Dredge Spoil**
Site Area and Dimensions :	**Unknown**
Site Description :	The site is located on a spoil island within the park boundary. This site is excluded from the investigation due to the location.
Owner :	Not determined.
Operator :	Not determined.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Active in 1987.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Sun Oil Dunn etal 5-B**
Site Identification No. :	**3.00**
Dual Location Name :	Also referred to as Sun 5-B.
Site Location Lat : N :	**27 30' 39"**
Site Location Long : W :	**97 16' 46"**
Site Location TX Grid : X :	**2,396,230.36**
Site Location TX Grid : Y :	**671,057.68**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access appears to be possible by a private road that turns west off the main approach road to the park prior to the park entrance. Use of this road is restricted.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	According to park personnel, the surface location falls outside the park, and only the bottom hole location falls within the park boundary.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**12/08/63**
Completion Date :	**12/25/63**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**12/26/63**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,001**
State Tract No. :	**Not determined**

Site Name :	**Sun Dunn et al. No.1**
Site Identification No. :	**4.00**
Dual Location Name :	Also referred to as Sun No. 1. An additional Sun No. 1 exists in the Yarborough pass area. The Yarborough site is identified as Sun No. 1 (Yarborough).
Site Location Lat : N :	**27 28' 41"**
Site Location Long : W :	**97 16' 28"**
Site Location TX Grid : X :	**2,397,225.00**
Site Location TX Grid : Y :	**660,394.00**
Site Located in the Field :	
Site is Active :	**No**
Access :	This site can be accessed using the northern Malaquite beach access road.
Pad Material :	**Possibly Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	Some scattered oyster shell was located on the northern side of the access road just prior to the beach. This site appears to have been covered.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**05/26/54**
Completion Date :	**06/23/54**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**06/24/54**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,578**
State Tract No. :	**Not determined**

Site Name :	**Standard Oil of Texas State Tract 945 No. 7**
Site Identification No. :	**5.00**
Dual Location Name :	Also referred to as Standard Oil State No. 7. In the Cumulative Impact report this location is identified as belonging to Standard Oil state tract 949 well No's. 42 & 63. This site is misplaced. The true location for the ST 949-42 & 63 is further south at the location indicated in the report as the Standard Oil state track 949 No. 22 and state tract 951 No. 87. The ST 945-7 site is a new added site located where the Standard site ST 949 No's. 42 and 63 was possitioned in the Cummulative report. This site location should be swapped with the Standard Oil state tract 949 No. 22 and state track No. 87 site location.
Site Location Lat : N :	**27 28' 29"**
Site Location Long : W :	**97 16' 30"**
Site Location TX Grid : X :	**2,397,176.00**
Site Location TX Grid : Y :	**659,105.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	This site can be accessed using the beach access road leading to the northern end of Malaquite beach, and then south along the beach.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Shown to be located along the primary duneline.
Owner :	Uncertain. Cheveron Oil Company.
Operator :	Uncertain. Standard Oil of Texas.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Unknown.
Date of P & A :	**Unknown.**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,944**
State Tract No. :	**BH ST 945**

Site Name :	**Sun Oil Dunn Kerlin well No. 2**
Site Identification No. :	**6.00**
Dual Location Name :	This site is also known as Sunmark No. 2.
Site Location Lat : N :	**27 28' 24"**
Site Location Long : W :	**97 17' 50"**
Site Location TX Grid : X :	**2,389,964.69**
Site Location TX Grid : Y :	**658,505.08**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	This site can be accessed by the Bird Island Basin road. The site is then located to the north of the road at the bend, in heavily vegetated barrier flat terrain. Final access to the site needs to be by foot.
Pad Material :	**Caliche-removed**
Site Area and Dimensions :	**Unknown**
Site Description :	Some scattered debris and remnants of the caliche pad remain at the site location. The site is surrounded by efemeral ponds. Access is difficult. A surveying stake remains on the site, probably placed there by Frontier surveying comapany. Wetland vegetation. Two possible pit areas next to the site.
Owner :	Three owners: 1. Sunmark Exploration Company (a division of Sun Oil Company of Delaware) 2. Anadarko Production Company 3. Champlin Petroleum Company
Operator :	Sun Gas Company (a division of Sun Oil Company of Delaware)
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry hole. Plugged and abandoned.
Date of P & A :	**02/18/81**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**11,270-straight hole**
State Tract No. :	**Not determined**

Site Name :	Standard Oil Company of Texas Dunn-McCampbell No. 1
Site Identification No. :	7.00
Dual Location Name :	Also referred to as Standard Oil of Texas No. 1.
Site Location Lat : N :	27 27' 57"
Site Location Long : W :	97 18' 47"
Site Location TX Grid : X :	2,384,893.54
Site Location TX Grid : Y :	655,770.14
Site Located in the Field :	
Site is Active :	No
Access :	Access can be gained using the Bird Island Basin access road.
Pad Material :	**Possibly Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	Oyster shell was encountered at the end of the Bird Island Basin access road just north of Little Dagger hill. The road is composed of caliche. If this is the site location, it appears that a drainage ditch cuts through a portion of the southern side of the site. The access road and a roundabout may cover part of the site.
Owner :	Uncertain. Cheveron Oil Company.
Operator :	Uncertain. Standard Oil Company and Sun Oil Company ?.
Beginning Date :	**12/17/64**
Completion Date :	**01/13/65**
Status :	Dry hole. Plugged and abandoned.
Date of P & A :	**01/16/65**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,213-straight hole**
State Tract No. :	**Not determined**

Site Name :	**Standard Oil State Tract 949 No's. 42 and 63**
Site Identification No. :	**8.00**
Dual Location Name :	Also referred to as Standard of Texas State Tract 949 No. 42 & 63. The coordinates for this site in the Cumulative Impact report conflict with those for the ST 949-87 & ST 951-22. This site is shown located to the south on the Corpus Christi Geological Library map. In addition to this conflict, there also appears to be a conflict with the McMoran Exploration site coordinates.
Site Location Lat : N :	**27 27' 43"**
Site Location Long : W :	**97 16' 36"**
Site Location TX Grid : X :	**2,395,414.00**
Site Location TX Grid : Y :	**654,579.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	This site can be accessed using the northern Malaquite beach access road, and then south along the shoreline beach.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Two directional wells were drilled off the same site, both appear to be from the same surface location. Well 42 and well 63.
Owner :	Uncertain. Cheveron Oil Company.
Operator :	Uncertain. Standard Oil of Texas.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Well 42 is shown on the Corpus Christi Geological Library map as an abandoned Natural Gas well and well 63 is shown as an Oil well. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,000/8,793**
State Tract No. :	**BH ST 949**

Site Name :	**McMoran Exploration Company**
Site Identification No. :	**9.00**
Dual Location Name :	The Texas Grid Coordinate given in the Cumulative Impact report is similar to that for Standard Oil ST 949-22 & 63. A McMoran Exploration Company site is shown on the Corpus Christi Geological Library map located some distance to the west in the Laguna Madre.
Site Location Lat : N :	**27 27' 27"**
Site Location Long : W :	**97 16' 50"**
Site Location TX Grid : X :	**2,395,415.00**
Site Location TX Grid : Y :	**654,579.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	The plot of the coordinates for this site places it in the closed beach area near the Cheveron site. According to park personnel, this site is actually located in the Laguna Madre, just west of the Standard Oil of Texas well No. 1.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Unknown. In the Laguna Madre.
Owner :	Uncertain. McMoran Exploration Company.
Operator :	Uncertain. McMoran Exploration Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Plugged and abandoned.
Date of P & A :	**Unknown.**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,059**
State Tract No. :	**Not determined**

Site Name :	**Enserch Dunn-McCampbell No. 17**
Site Identification No. :	**10.00**
Dual Location Name :	Also kwnown as EP Operating Limited, Ensearch Dunn-McCampbell No. 17.
Site Location Lat : N :	**27 27' 49"**
Site Location Long : W :	**97 16' 56"**
Site Location TX Grid : X :	**3,038,788.45**
Site Location TX Grid : Y :	**669,753.96**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by Quail benchmark access road.
Pad Material :	**Caliche-removed**
Site Area and Dimensions :	**Unknown**
Site Description :	Reclaimed. Caliche pad removed and area was graded and revegetated.
Owner :	Lessee: LEMARCO, LTD. from Lessor: Dunn-McCampbell Royalty Interest, Inc.
Operator :	EP Operating Limited Partnership.
Beginning Date :	**11/15/94 ?**
Completion Date :	**Not determined**
Status :	Inactive. Area reclaimed and previously sampled.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,500-straight hole**
State Tract No. :	**Not determined**

Site Name :	Cheveron Oil of California, A. Jones et al. 30292 (l-WD)
Site Identification No. :	**11.00**
Dual Location Name :	Also known as the "Cheveron site".
Site Location Lat : N :	**27 27' 42"**
Site Location Long : W :	**97 17' 08"**
Site Location TX Grid : X :	**2,394,000.00**
Site Location TX Grid : Y :	**654,400.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access along park road that leading to the Quail benchmark. Located in the closed beach area behind the primary dunes.
Pad Material :	**Reclaimed Sand**
Site Area and Dimensions :	**Unknown**
Site Description :	The site is presently under mitigation. It appears that there once was a caliche/oystershell pad that has been removed. A large site. Debris scattered through the area (pipe and rusting metal). Stressed vegetation.
Owner :	Uncertain. Cheveron Oil Company.
Operator :	Uncertain.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Inactive. Presently undergoing remediation efforts.
Date of P & A :	**10/19/72 ?**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**N/A**
State Tract No. :	**N/A**

Site Name :	**Standard Oil of Texas State Tract 949 No. 87 and State Tract 951 No. 22**
Site Identification No. :	**12.00**
Dual Location Name :	Also referred to as Standard of Texas State Tract 949 No. 82 and State Tract 951 No. 22. A new location has been determined for this site. This site was inaccurately addressed in the Cumulative Impact report. The coordinates for this location were determined from the plotted location on the Corpus Christi Geological Library map.
Site Location Lat : N :	**27 27' 15"**
Site Location Long : W :	**97 17' 05"**
Site Location TX Grid : X :	**2,394,200.00**
Site Location TX Grid : Y :	**651,850.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Located in the closed beach area, or Malaquite beach. Access can be gained from the Quail bench mark access road.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Two directional wells were constructed from the same site. Well No. 87 into state tract 949 and well No. 42 into state tract 951. Both appear to use the same surface location.
Owner :	Uncertain. Cheveron Oil Company.
Operator :	Uncertain. Standard Oil of Texas.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Inactive.
Date of P & A :	**Unknown.**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,845/8,610**
State Tract No. :	**BH ST 949 & 951**

Site Name :	**Sun Oil State Tract 975 well No. 1**
Site Identification No. :	**13.00**
Dual Location Name :	Also known as Sun ST 975-1. No site by this name is listed on the Corpus Christi Geological Library map. A Sun State 1-A, first of three similarly named sites, is shown closely located to the plot of Sun ST 975-1.
Site Location Lat : N :	**27 22' 42"**
Site Location Long : W :	**97 19' 01"**
Site Location TX Grid : X :	**2,383,927.00**
Site Location TX Grid : Y :	**623,911.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access along the gulf shoreline. Located close to the old 4-wheel drive sign in the primary dunes.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Located in sun Tract F.
Owner :	Uncertain. Sun Oil Company.
Operator :	Uncertain. Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,324 ?**
State Tract No. :	**Not determined**

Site Name :	**Houston Pipeline Company**
Site Identification No. :	**14.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 22' 33"**
Site Location Long : W :	**97 20' 26"**
Site Location TX Grid : X :	**2,377,677.00**
Site Location TX Grid : Y :	**622,638.00**
Site Located in the Field :	
Site is Active :	**Yes**
Access :	Centrally located on the island. Access can be gained by a service road.
Pad Material :	**Disturbed Sand**
Site Area and Dimensions :	**Unknown**
Site Description :	A pipeline transfer station. Located in an area called the "Three Pigs" area. According to park personnel, this area experienced a spill incident in November 1995, and is not accessible to the investigating parties due to on-going mitigation.
Owner :	Uncertain, presumably the Houston Pipeline Company.
Operator :	Uncertain, presumably the Houston Pipeline Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Active. A spill in the area caused the exclusion of the site from the investigation.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**N/A**
State Tract No. :	**N/A**

Site Name :	Coral Petroleum and Development well No. 1
Site Identification No. :	**15.00**
Dual Location Name :	Also referred to as Coral No. 1
Site Location Lat : N :	**27 21' 47"**
Site Location Long : W :	**97 19' 31"**
Site Location TX Grid : X :	**2,381,250.00**
Site Location TX Grid : Y :	**618,350.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	This site is located behind the primary dunes. An access road once passed through the primary duneline. This road no longer connects to the beach. The road can be found beyond the duneline and continues to the site. The road does not appear to presently extend beyond the site. This road at one time did extend beyond the site.
Pad Material :	**Oyster Shell/Caliche**
Site Area and Dimensions :	**64 m SW end, 25 m NE end, 54 m**
Site Description :	The site has an irregular shaped pad, surrounded on the western and northern sides by surface water. The pad material is composed of an oyster shell and caliche mix. Two pipes extend from the ground on the north-western corner of the site. Cement and dried mud, along with other debris are scattered around the site. In the Coral proposal report, a reference is made to an abandoned mud pit off the northern side of the pad. Prior exploratoin history, several wells may have been constructed from the same pad.
Owner :	Uncertain. Coral Petroleum and Development and Sun Oil Dunn-McCampbell ?.
Operator :	Coral Petroleum and Development. Site was previously worked prior to Coral exploration.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Inactive. Plugged and abandoned.
Date of P & A :	**Unknown.**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**11,734**
State Tract No. :	**BH ST 976**

Site Name :	**Sun Oil well No. A-2**
Site Identification No. :	**16.00**
Dual Location Name :	On a Sun Oil map supplied by Mr. Paul Eubanks with the National park, this well shares the same location as well Sun Oil State Tract 976 well No. 1. A second Sun Oil State Tract 976 No. 1 on some map representations is indicated just to the south. Well 2-A appears to be a straight well and the ST 976-1 well appears to be a directional well with the same surface location. A second well is shown to have been drilled from the same site with a different surface location. This well is named Sun State 1-A (the second site shown with the same name).
Site Location Lat : N :	**27 21' 43"**
Site Location Long : W :	**97 19' 20"**
Site Location TX Grid : X :	**2,382,243.70**
Site Location TX Grid : Y :	**618,006.10**
Site Located in the Field :	
Site is Active :	**No**
Access :	Located in the duneline and accessed by foot from the shoreline beach.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	Small exposed pad area. Dunes are partially covering the site. A small concret pad may mark one of the well areas. As many as three wells may be associated with this site. Two have the same surface location (Sun A-2 and ST 976-1).
Owner :	Uncertain. Sun Oil Company.
Operator :	Uncertain. Sun Oil Company.
Beginning Date :	**08/25/54**
Completion Date :	**09/24/54**
Status :	Inactive. Dry Hole. Plugged and abandoned.
Date of P & A :	**09/27/54**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,427/9,373/9,238**
State Tract No. :	**BH ST 976, ST D**

Site Name :	**Sun Oil State Tract 976 well No. 1**
Site Identification No. :	**17.00**
Dual Location Name :	On some maps, a second well by the same name shares the same surface locacation as Sun Oil 2-A. On other representations, primarily maps produced by the Sun Oil Company, this well is shown with an indipendent surface location just to the south of the well 2-A site.
Site Location Lat : N :	**27 21' 42"**
Site Location Long : W :	**97 19' 18"**
Site Location TX Grid : X :	**2,382,382.00**
Site Location TX Grid : Y :	**617,717.00**
Site Located in the Field :	
Site is Active :	**No**
Access :	Access from the shoreline by foot.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	In this representation, this well shares a site with Sun Oil State Tract 976 well No. 2. The pad is covered in large part by drifting sand. Some unnatural depressions that could be attributed to exploration activities.
Owner :	Uncertain, presumably the Sun Oil Company Dunn-McCampbell.
Operator :	Uncertain, presumably the Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Inactive. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,373 ?**
State Tract No. :	**BH ST 976**

Site Name :	**Sun Oil State Tract 976 well No. 2**
Site Identification No. :	**18.00**
Dual Location Name :	The surface location plot for this well on the Corpus Christi Geological Library map, connects to a bottom hole location off-shore labeled as Sun Oil St Tr 975-976 G. Un. 30003(2). This may be a gas unit.
Site Location Lat : N :	**27 21' 42"**
Site Location Long : W :	**97 19' 23"**
Site Location TX Grid : X :	**2,381,937.00**
Site Location TX Grid : Y :	**617,717.00**
Site Located in the Field :	
Site is Active :	**No**
Access :	Access by foot from the gulf shoreline.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	This well may share the site with the Sun Oil State Tract 976 well No. 1. The pad is covered in large part by drifting sand. Some unnatural depressions that could be attributed to exploration activities were located in the area.
Owner :	Sun Oil Company Dunn-McCampbell
Operator :	Uncertain. Sun Oil Company.
Beginning Date :	**Not detremined**
Completion Date :	**Not determined**
Status :	Inactive Gas well. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**11,265 PB 10,680**
State Tract No. :	**BH ST 976**

Site Name :	**Sun Oil Dunn-McCampbell A-1 (water)**
Site Identification No. :	**19.00**
Dual Location Name :	Also known as Sun 1-A and American Exploration well No. A-1. This is the third well site shown plotted on the Corpus Christi Geological Library map with the same name. For the purpose of identification , this site will be known as the only Sun Oil Dunn-McCampbell A-1.
Site Location Lat : N :	**27 20' 53"**
Site Location Long : W :	**97 19' 37"**
Site Location TX Grid : X :	**2,380,817.50**
Site Location TX Grid : Y :	**612,922.80**
Site Located in the Field :	
Site is Active :	**No**
Access :	Located on the gulf shoreline. Access by foot.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Exploration well converted to a water extraction well. This well was marked with a surface wellhead for several years, and could be seen in front of the primary duneline. The well has been plugged and abandoned and all surface material has been removed.
Owner :	Uncertain. Sun Oil Company. Oryx Exploration Company then purchaced by American exploration company in 1989.
Operator :	Uncertain. Sun Oil Company. Oryx Exploration Company, American exploration.
Beginning Date :	**02/15/54**
Completion Date :	**06/12/54**
Status :	Dry hole, plugged back and converted to a water well on September the 2nd, 1954. Inactive. Plugged and abandoned.
Date of P & A :	**12/15/91 ?**
TRRC Identification # :	**018023**
Total Depth in feet :	**11,020 PB 9,490**
State Tract No. :	**?**

Site Name :	**Bright and Company Dunn-McCampbell well No. 1**
Site Identification No. :	**20.00**
Dual Location Name :	Also referred to as Bright and Company No. 1.
Site Location Lat : N :	**27 20' 35" ?**
Site Location Long : W :	**97 20' 56" ?**
Site Location TX Grid : X :	**2,373,543.85**
Site Location TX Grid : Y :	**610,861.85**
Site Located in the Field :	
Site is Active :	**No**
Access :	Access by the Amoco service access road and along an existing American Exploration road. This road was extended during the exploration event. The road has been removed. Ultimate access may need to be by foot.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Not visited. Instructed to exclude from the study.
Owner :	Uncertain. Bright and Company, and, or Dunn-McCampbell.
Operator :	Uncertain. Bright and Company, and, or Dunn-McCampbell.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Amoco Production No. 1**
Site Identification No. :	**21.00**
Dual Location Name :	Also referred to as Amoco No. 1, or Amoco Production GU-1. The bottom hole location is labeled as Pan American State Tract 980-S No. 1.
Site Location Lat : N :	**27 20' 01"**
Site Location Long : W :	**97 20' 04"**
Site Location TX Grid : X :	**2,378,540.16**
Site Location TX Grid : Y :	**607,549.00**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	Access from the shoreline to the northern service road into the American Exploration area of the island. This road no longer extends into the southern portion of the American Exploration area.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	Active site. There appears to be one well located on the site. This well is a directional well that has a bottom hole location in state tract 980.
Owner :	Uncertain, presumably Amoco.
Operator :	Uncertain, presumably Amoco.
Beginning Date :	**1967**
Completion Date :	**Not determined**
Status :	Active. Natural Gas production site. Excluded from the investigation.
Date of P & A :	**Active**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,976**
State Tract No. :	**BH ST 980**

Site Name :	**McMoran Exploration State Tract 985-S well No. 1**
Site Identification No. :	**22.00**
Dual Location Name :	Also referred to as McMoran ST 985-1.
Site Location Lat : N :	**27 19' 07"**
Site Location Long : W :	**97 20' 13"**
Site Location TX Grid : X :	**2,377,632.00**
Site Location TX Grid : Y :	**602,158.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access from the shoreline and then on foot over the primary dunes.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	One directional well that has a bottom hole location in state tract 985. Still not located in the field.
Owner :	Uncertain, presumably McMoran Exploration Company.
Operator :	Uncertain, presumably McMoran Exploration Company.
Beginning Date :	**06/17/75 ?**
Completion Date :	**07/17/75 ?**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**07/17/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,059**
State Tract No. :	**BH ST 985**

Site Name :	**Sun A-6**
Site Identification No. :	**23.00**
Dual Location Name :	A map produced by national park personnel shows a second abandoned A-6 site located off a road that extends west from the American Exploration well A-3. The area was investigated. The remenants of an oyster shell road extends to the back island. No pad areas were located.
Site Location Lat : N :	
Site Location Long : W :	
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	
Owner :	Unknown
Operator :	Unknown
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Gas Well.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Sun Oil Dunn-McCampbell A-6**
Site Identification No. :	**24.00**
Dual Location Name :	Also known as American Exploration well No. A-6 and Sun A-6. A second site location with the same name may exist. This site is apparently an abandond site located on an unused road that extends back island from the Sun A-3 and A-8 site.
Site Location Lat : N :	**27 18' 27"**
Site Location Long : W :	**97 21' 04"**
Site Location TX Grid : X :	**2,373,263.00**
Site Location TX Grid : Y :	**597,947.00**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	A road once led to the site. This road is associated with the road used to access the Amoco No. 1 site from the south. This road has been barricaded and may have been removed.
Pad Material :	**Oyster Shell/Caliche mix**
Site Area and Dimensions :	**Unknown**
Site Description :	Natural gas production site ?. Plugged back to 2298 feet in 1981. Since October of 1981 the well has been utilized as a salt water injection well for separated waters produced at the American Exploration 3-A (Sun Oil Dunn-McCampbell 3-A) site. Presently considered an active site. A wellhead and a Tank Battery may be located on the site.
Owner :	Previously owned by Sun Oil Company. Presently owned by American Exploration Company.
Operator :	American Exploration Company. Previously Sun Oil Company.
Beginning Date :	**12/06/68**
Completion Date :	**12/16/68**
Status :	Salt water injection well. Previously a natural Gas well plugged back on October 6, 1981 to a total depth of 2298 feet.
Date of P & A :	**Active**
TRRC Identification # :	**4226102091 ?**
Total Depth in feet :	**7,600 PB 2,298-straight hole**
State Tract No. :	**Not determined**

Site Name :	Sun A-5
Site Identification No. :	25.00
Dual Location Name :	A map produced by national park personnel shows a second abandoned A-5 site located off a road that extends west from the American Exploration well A-3. The area was investigated in the field. The remenants of a road extend back island but no pad areas were located.
Site Location Lat : N :	
Site Location Long : W :	
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	
Owner :	Unknown
Operator :	Unknown
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Gas Well.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Sun Dunn-McCampbell 2-CT**
Site Identification No. :	**26.00**
Dual Location Name :	Also referred to as Sun Oil Core Test No. 2 and Sun CT-2.
Site Location Lat : N :	**27 17' 56"**
Site Location Long : W :	**97 20' 34"**
Site Location TX Grid : X :	**2,376,250.00**
Site Location TX Grid : Y :	**595,550.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access from the shoreline and then on foot into the pimary dunes.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Two areas behind the duneline that appear to be unusually flat. No obvious evidence of a site. A plot on the coordinates places the site slightly in the Gulf. The plot shown on the Corpus Christi Geological Library map is a better representation, placing the site behind the primary dunes. Park personnel place the site closer to the Pelto site than the CC Geo map representation.
Owner :	Uncertain. Sun Oil Company
Operator :	Uncertain. Sun Oil Company
Beginning Date :	**06/29/59**
Completion Date :	**07/06/59**
Status :	Core Test. Plugged and abandoned.
Date of P & A :	**07/06/59**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**4,015**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil Dunn-McCampbell well No. A-3**
Site Identification No. :	**27.00**
Dual Location Name :	Also known as American Exploration well No. A-3 and Sun A-3.
Site Location Lat : N :	**27 17' 57"**
Site Location Long : W :	**97 21' 24"**
Site Location TX Grid : X :	**2,371,504.00**
Site Location TX Grid : Y :	**595,019.00**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	Access using the southern entrance to the American Exploration area.
Pad Material :	**Oyster Shell/Caliche mix**
Site Area and Dimensions :	**Unknown**
Site Description :	Natural Gas production site. Located on a production pad shared with American Exploration well No. 8-A. A wellhead and two compressors and separators are located on site. Produced brine water is discharged to Sun A-6 for disposal by injection.
Owner :	American Exploration Company. Purchaced from Sun Oil Company.
Operator :	Presently American Exploration Company. Previously Sun Oil Dunn-McCampbell.
Beginning Date :	**09/09/68**
Completion Date :	**10/21/68**
Status :	Natural Gas Production site. Active.
Date of P & A :	**Active**
TRRC Identification # :	**4226102090 ?**
Total Depth in feet :	**10,827**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil Dunn-McCampbell well No. A-8**
Site Identification No. :	**28.00**
Dual Location Name :	Also known as American Exploration well No. A-8. Shown on the Corpus Christi Geological Library map as Sun Exploration and Production Dunn-McCampbell 8-A. A second site by the same name may exist.
Site Location Lat : N :	**27 17' 57"**
Site Location Long : W :	**97 21' 24"**
Site Location TX Grid : X :	**2,371,504.00**
Site Location TX Grid : Y :	**594,914.00**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	Access by the American Exploration service road.
Pad Material :	**Clay/Oyster shell/Caliche**
Site Area and Dimensions :	**Unknown**
Site Description :	This well shares a production pad with the Sun Oil Dunn-McCampbell well 3-A. This well was directionally drilled from the 3-A well. A wellhead and two compressors and separators are located on the site. Another well by the same name and number is mentioned in a 1991 report as having been plugged and abandoned in 1972, with a subsequent mention of a shut in for possible future workover.
Owner :	American Exploration Company. Purchaced from Sun Oil Company.
Operator :	Presently American Exploration Company. Previously Sun Oil Dunn-McCampbell.
Beginning Date :	**03/15/85**
Completion Date :	**05/15/85**
Status :	Natural Gas Production site. Active.
Date of P & A :	**Active ?**
TRRC Identification # :	**4227331942 ?**
Total Depth in feet :	**11,593 ?**
State Tract No. :	**Straight hole**

Site Name :	**Pelto No. 1 State Tract 986**
Site Identification No. :	**29.00**
Dual Location Name :	Also known as Pelto No. 1.
Site Location Lat : N :	**27 17' 44"**
Site Location Long : W :	**97 20' 39"**
Site Location TX Grid : X :	**2,375,352.33**
Site Location TX Grid : Y :	**593,764.54**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	At the time that exploration was underway, an existing sand road extended to within 500 feet of the site. This road accessed the beach and connected to the American Exploration road at the Sun A-3 site. A board road was placed from the Pelto site to this road. Neither of these roads are present today. Access should be gained from the shoreline on foot.
Pad Material :	**Board Pad-removed**
Site Area and Dimensions :	**300 ft x 300 ft**
Site Description :	The site area consists of a vegetated flattened area behind the primary dune line. Some scattered debris and cement was located on the preliminary site visit. Some scattered oyster shell in the area. A single directional well with a bottom hole location in state tract 986.
Owner :	Pelto Oil Company and possibly Shell Oil Company.
Operator :	Pelto Oil Company.
Beginning Date :	**04/16/82**
Completion Date :	**06/18/82**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,340**
State Tract No. :	**BH ST 986**

Site Name :	**Sun Oil Dunn-McCampbell well No. A-7**
Site Identification No. :	**30.00**
Dual Location Name :	Also referred to as Sun Dunn-McCampbell 30181 (7-A) or Sun A-7.
Site Location Lat : N :	**27 17' 21"**
Site Location Long : W :	**97 21' 13"**
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	A road once accessed the site. This road is no longer used and is restricted by the park. Access using the American Exploration road, then follow the track of the old road out to the site on foot. The road and surrounding areas have been removed in places causing a wetland. Vehicular access is restricted.
Pad Material :	**Oyster Shell/Caliche mix**
Site Area and Dimensions :	**134 ft x 120 ft**
Site Description :	Pad consisting of an oyster shell caliche mix. A three inch pipe was located in the north west corner of the pad. The pipe was latter removed. An abandone cable is located in the northeastern corner. Area next to the cable a suspect pit. A large pile or mound of dry cement is located to the south of the site next to a suspect pit.
Owner :	Sun Oil Company. Uncertain if American Exploration purchased this site.
Operator :	Uncertain. Sun Oil Company
Beginning Date :	**06/23/71**
Completion Date :	**07/12/71**
Status :	Natural Gas. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**30181 ?**
Total Depth in feet :	**7,400 PB 7,361**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil Dunn-McCampbell well No. A-4**
Site Identification No. :	**31.00**
Dual Location Name :	Also known as Sun A-4 and American Exploration well No. A-4.
Site Location Lat : N :	**27 17' 12"**
Site Location Long : W :	**97 21' 52"**
Site Location TX Grid : X :	**2,368,819.00**
Site Location TX Grid : Y :	**590,473.00**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	Access by the American Exploration road. This road terminates at this site.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	In one report the site is considered an active natural gas production site. In another report the site is said to be shut in for possible future workover. Standing structes remain onsite.
Owner :	Presumably American Exploration. Previously Sun Oil Company.
Operator :	Presumably American Exploration. Previously Sun Oil Company.
Beginning Date :	**11/01/68**
Completion Date :	**11/13/68**
Status :	Active in 1987 as a Natural Gas production site.
Date of P & A :	**Active**
TRRC Identification # :	**4226102089 ?**
Total Depth in feet :	**7,620**
State Tract No. :	**Straight hole**

Site Name :	**Sun Dunn-McCampbell 3-CT**
Site Identification No. :	**32.00**
Dual Location Name :	Also referred to as Sun Oil Core Test No. 3 and Sun CT-3
Site Location Lat : N :	**27 17' 03"**
Site Location Long : W :	**97 21' 11"**
Site Location TX Grid : X :	**2,372,592.00**
Site Location TX Grid : Y :	**589,580.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access using the American Exploration road and then follow the abandoned road to Sun A-7. A road once extended to the south from the Sun A-7 site and then curved east. The site is shown situated just off to the east of the curve in the road. Some evidence of the road can be encountered. A depressed area leads to the general site location. Not an access road. A road once may have accessed the site from the primary duneline.
Pad Material :	**Oyster shell**
Site Area and Dimensions :	**Unknown**
Site Description :	A pond was located next to the site. Site covered by thick layer of vegetation and sand. Oyster shell found scattered throughout the area. Three or more inches of sand coveres the oyster shell. To the southwest of the pond a metal stake may mark the site. A oyster shell path extends towards this pole and end in the same area.
Owner :	Uncertain. Sun Oil Company
Operator :	Uncertain. Sun Oil Company
Beginning Date :	**07/29/61**
Completion Date :	**08/13/61**
Status :	Plugged and abandoned.
Date of P & A :	**08/13/61**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,300**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil Dunn-McCampbell 5-A**
Site Identification No. :	**33.00**
Dual Location Name :	Also referred to as Texaco, Incorporated well No. 1, Sun A-5 and Tana well's No's. 1 and 2.
Site Location Lat : N :	**27 16' 30"**
Site Location Long : W :	**97 22' 25"**
Site Location TX Grid : X :	**2,365,840.00**
Site Location TX Grid : Y :	**586,194.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access was once possible along an oyster shell road that extended south-west from the American exploration A-4 site over the mud flats. This road has been removed. Access by foot during low tide.
Pad Material :	**Oyster shell/Caliche mix**
Site Area and Dimensions :	**180 ft x 300 ft**
Site Description :	Three wells were drilled from the same exploration/production pad. Well 5-A was drilled by Sun Oil Company. Wells Tana 1 and 2 were drilled by Tana Oil and Gas company in 1989. Only one surface location is suspected at this site at the present time. Much of the pad matterial remains. The area has been contoured and leveled with the surrounding mud flats.
Owner :	Texaco, Incorporated purchased the site or well on January 1, 1990 from Tana Oil and Gas Company. Tana Oil and Gas purchased the site or well from Sun Oil Company ?. During the time that the Tana wells were constructed, Sun Exploration and Production Company is referenced as the owner and operator. Uncertain if Tana was ever in ownership of this site.
Operator :	Texaco, Incorporate. Prior to Texaco, the operator was Tana Oil and Gas Company and Sun Exploration and Production Company.
Beginning Date :	**11/24/68**
Completion Date :	**12/15/68**
Status :	Natural Gas. Plugged and abandoned. Site reclaimed, regraded and contoured.
Date of P & A :	**07/11/85**
TRRC Identification # :	**4226131101 ?**
Total Depth in feet :	**7,600/8,000**
State Tract No. :	**Both on island**

Site Name :	**Sun Dunn-McCampbell CT-1**
Site Identification No. :	**34.00**
Dual Location Name :	Also referred to as Sun Oil Core Test No. 1 and Sun CT-1.
Site Location Lat : N :	**27 15' 39"**
Site Location Long : W :	**97 21' 07"**
Site Location TX Grid : X :	**2,373,010.00**
Site Location TX Grid : Y :	**581,076.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access along the shoreline beach. The plots from the Cummulative Impact report, and those found on the Corpus Christi Geological Library map place the surface location for the site offshore.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Not located in the field. May be located offshore in the gulf.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**06/24/59**
Completion Date :	**06/27/59**
Status :	Core test. Dry Hole. Plugged and abandoned.
Date of P & A :	**06/29/59**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**4,030**
State Tract No. :	**BH ST 992/999**

Site Name :	**Samedan ST 1000, Samedan Oil et al. State (1)**
Site Identification No. :	**35.00**
Dual Location Name :	Also referred to as Samedan State Tract 1000.
Site Location Lat : N :	**27 14' 49"**
Site Location Long : W :	**97 21' 22"**
Site Location TX Grid : X :	**2,371,623.00**
Site Location TX Grid : Y :	**576,089.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access once was obtainable by an oyster shell road that extended through the duneline to the beach. This road is covered by drifting sand, or has been removed. Access is gained today by foot from the beach over the primary sand dunes.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**300 ft x 300 ft**
Site Description :	This is a large site covered by sand/vegetation. Oyster shell is scattered on the surface throughout the site. The oyster shell on the surface appears to have been carried up. The covered exploration pad is thin. Some of the pad material may have been removed prior to abandonment. Several suspect pit areas were discovered. Cement and dried mud found scattered on the surface throughout the site area.
Owner :	Uncertain, presumably Samedan.
Operator :	Uncertain, presumably Samedan.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,569**
State Tract No. :	**BH ST 1000**

Site Name :	**Samedan No. 1, Samedan Oil Dunn No. 1**
Site Identification No. :	**36.00**
Dual Location Name :	Also referred to as Samedan No. 1 Dunn.
Site Location Lat : N :	**27 14' 04"**
Site Location Long : W :	**97 21' 38"**
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access once was obtainable by an oyster shell road that extended through the duneline to the beach. This road is covered drifting sand, or has been removed. Access is gained today by foot from the beach over the primary sand dunes.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**280 ft x 300 ft**
Site Description :	This is a large site covered by sand/vegetation. Oyster shell is scattered on the surface throughout the site. The oyster shell on the surface appears to have been carried up. The covered exploration pad is thin. Some of the pad material could have been removed prior to abandonment. Cement and dried mud found scattered on the surface.
Owner :	Uncertain, could be Dunn-McCampbell and Samedan.
Operator :	Uncertain, Samedan.
Beginning Date :	**06/17/75**
Completion Date :	**07/13/75**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**07/17/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,980**
State Tract No. :	**Straight hole**

Site Name :	**Carrl Oil Dunn et al. No. 3**
Site Identification No. :	**37.00**
Dual Location Name :	Also referred to as Carrl Oil No. 3.
Site Location Lat : N :	**27 13' 05"**
Site Location Long : W :	**97 23' 14"**
Site Location TX Grid : X :	**2,361,500.00**
Site Location TX Grid : Y :	**565,600.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access using the Yarbourough Pass road, north along the access road after the Sun compound. This site is located beyond the Carl Oil No. 1 site on an ellevated exploration pad located on the wind tidal flats.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Not determined**
Site Description :	A small oyster shell pad. Some debris. The surounding mud flat is periodically under water.
Owner :	Uncertain, presumably Carl Oil.
Operator :	Uncertain, presumably Carl Oil.
Beginning Date :	**05/04/65**
Completion Date :	**05/14/65**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**05/15/65**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,690**
State Tract No. :	**Straight hole**

Site Name :	**Carrl Oil Dunn et al. No. 1**
Site Identification No. :	**38.00**
Dual Location Name :	Also referred to as Carrl Oil No. 1.
Site Location Lat : N :	**27 12' 58"**
Site Location Long : W :	**97 22' 53"**
Site Location TX Grid : X :	**2,363,522.89**
Site Location TX Grid : Y :	**564,793.13**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by Yarbourough Pass road, then right after the sun compound.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**100 ft x 180 ft**
Site Description :	A mix of oyster shell and vegetation. Scattered rusting metal debris. A metal fence post marks the site and possibly the surface location of the well. The road runs through the center of the site. The remnants of a second road connects to the access road and the site just to the north. This road is covered by dence vegetation. Cement and dry mud was found on the surface by the second road and within the site boundaries. A cable was found on the surface in the southern side of the site.
Owner :	Uncertain, presumably Carl Oil.
Operator :	Uncertain, presumably Carl Oil.
Beginning Date :	**09/16/64**
Completion Date :	**11/26/64**
Status :	Natural Gas well. Inactive. Plugged and abandoned.
Date of P & A :	**09/18/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,930**
State Tract No. :	**Straight hole**

Site Name :	**Carrl Oil Dunn et al. No. 4.**
Site Identification No. :	**39.00**
Dual Location Name :	Also referred to as Carrl Oil No. 4.
Site Location Lat : N :	**27 12' 54"**
Site Location Long : W :	**97 21' 59"**
Site Location TX Grid : X :	**2,368,684.00**
Site Location TX Grid : Y :	**564,488.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Accessed by foot from the Gulf shoreline. Located out on the vegetated flats beyond the primary dunes.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**130 ft x 180 ft**
Site Description :	The pad consists of an oyster shell and vegetation mix. Two ponds associated with the site.
Owner :	Uncertain, presumably Carl Oil.
Operator :	Uncertain, presumably Carl Oil.
Beginning Date :	**05/25/65**
Completion Date :	**07/14/65**
Status :	Dry hole. Plugged and abandoned.
Date of P & A :	**07/14/65**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**13,350**
State Tract No. :	**Straight hole**

Site Name :	**McCormick Oil and Gas State Tract 1009 well No. 1**
Site Identification No. :	**40.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**21 12' 36"**
Site Location Long : W :	**97 21' 56"**
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access from the Gulf shoreline. An oyster shell road appears behind the duneline. This road once probably cut through the duneline.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**160 ft x 205 ft**
Site Description :	An old site. Vegetated and covered in areas by dunes. Two large mounds of oyster shell, one at the end of the access road to the northeastern corner of the pad, and the other at the end of the road just prior to the duneline. Abandoned cable and drill pipes located on the surface behind the remenants of the pad.
Owner :	Unknown
Operator :	Unknown
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Natural Gas well. Abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,881**
State Tract No. :	**BH ST 1009**

Site Name :	**Carrl Oil Dunn et al. No. 2**
Site Identification No. :	**41.00**
Dual Location Name :	Also referred to as Carrl Oil No. 2.
Site Location Lat : N :	**27 12' 36"**
Site Location Long : W :	**97 23' 02"**
Site Location TX Grid : X :	**2,362,700.00**
Site Location TX Grid : Y :	**562,600.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by using the Yarbourough Pass road, north after the Sun Compound, and then west at the first intersection. The site is located at the end of this road.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**145 ft x 230 ft**
Site Description :	Oyster shell pad. Lightly vegetated. Surrounded by mud flats.
Owner :	Uncertain, presumably Carl Oil.
Operator :	Uncertain, presumably Carl Oil.
Beginning Date :	**04/13/65**
Completion Date :	**05/02/65**
Status :	Natural Gas well. Plugged and abandoned.
Date of P & A :	**10/02/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,125**
State Tract No. :	**Straight hole**

Site Name :	**Union Oil Company of California No. 1**
Site Identification No. :	**42.00**
Dual Location Name :	Also referred to as Union of California No. 1 and Union Oil Company of California SL 83801 well No. 1.
Site Location Lat : N :	**27 12' 25.4"**
Site Location Long : W :	**97 22' 16"**
Site Location TX Grid : X :	**2,366,849.85**
Site Location TX Grid : Y :	**561,676.35**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by Yarbourough Pass road. Located to the north just befor the Sun compound.
Pad Material :	**Board Pad-removed**
Site Area and Dimensions :	**300 ft x 400 ft**
Site Description :	Large site area consisting of sand and vegetation. Some piles of oyster shell located near the Yarborough Pass road. This shell does not extend into the site. Area is depressed and surface water covered the site on the initial site visit. Possible berm along the western and northern boundary. Surface location of the well is centrally located.
Owner :	Union Oil Company of California and Sun Oil Company.
Operator :	Union Oil Company of California.
Beginning Date :	**06/26/85**
Completion Date :	**Not determined**
Status :	Natural gas well. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**15,230 ?**
State Tract No. :	**BH ST 1009-S**

Site Name :	**Sun Oil Compound**
Site Identification No. :	**43.00**
Dual Location Name :	Also referred to as Sun Compound (Yarborough Pass).
Site Location Lat : N :	**27 12' 18"**
Site Location Long : W :	**97 22' 40"**
Site Location TX Grid : X :	**2,364,779.93**
Site Location TX Grid : Y :	**560,771.48**
Site Located in the Field :	**Yes**
Site is Active :	**Yes**
Access :	Access by Yarborough Pass road.
Pad Material :	**Disturbed Sand ?**
Site Area and Dimensions :	**Not determined**
Site Description :	Fenced perimeter. Wellhead and platform located onsite.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Unknown.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**N/A**
State Tract No. :	**N/A**

Site Name :	**Sun Oil well No. 8**
Site Identification No. :	**44.00**
Dual Location Name :	Also referred to as Sun No. 8. This site may have been purchased by American Exploration. If so, this site may be known as American Exploration No. 8. A second well may have been constructed from this same site. This well is identified as Sun No. 8-A. It appears to be a directional well with the same surface location as the Sun No. 8 well.
Site Location Lat : N :	**27 12' 11"**
Site Location Long : W :	**97 23' 02"**
Site Location TX Grid : X :	**2,362,753.00**
Site Location TX Grid : Y :	**560,008.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by Yarborough Pass road. Located on the left just beyond the Sun Oil Compound. Access restricted to vehicles by an earthern barricade.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**245 ft x 195 ft**
Site Description :	The entrance to the site is blocked by a earthen barricade. A portion of the site is covered by a fresh layer of oyster shell. The original surface is a mix of sand and shell with good vegetation cover. Cement and scrap metal were found scattered over the site. Two ponds/pit are located to the north-east of the pad area.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Sun No. 8 was a natural gas well. Sun No. 8-A was a dry hole. Both plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,103/8,372**
State Tract No. :	**Both on Island**

Site Name :	**Sun Oil well No. 1 (Yarborough Pass)**
Site Identification No. :	**45.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 12' 03"**
Site Location Long : W :	**97 22' 30"**
Site Location TX Grid : X :	**2,365,753.00**
Site Location TX Grid : Y :	**559,318.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Access either on foot from Yarborough Pass road, or from the backside of the island from the south.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	Not located in the field. A reference to this well was encountered stating the well was moved 20 feet to the north. The well may be located in the Sun Compound area or close to it.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**02/01/51**
Completion Date :	**03/23/51**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**03/25/51**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,002**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil well No. 9**
Site Identification No. :	**46.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 11' 47"**
Site Location Long : W :	**97 22' 58"**
Site Location TX Grid : X :	**2,363,159.00**
Site Location TX Grid : Y :	**557,663.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by foot during low tide.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Not determined**
Site Description :	Good vegetation cover. Oyster shell pad. Surrounded by mud flats. A man made spit once connected this site to the Sun No. 8 site. This access road has been removed.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,500**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil State Gulf No. 1 606 Ac.**
Site Identification No. :	**47.00**
Dual Location Name :	
Site Location Lat : N :	
Site Location Long : W :	
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	
Owner :	Unknown
Operator :	Unknown
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	
Date of P & A :	**Unknown**
TRRC Identification # :	**not derterminded**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Sun Oil Dunn-McCampbell well No. 6**
Site Identification No. :	**48.00**
Dual Location Name :	Also referred to as Sun Oil No. 6. A second well called Sun Oil State Gulf No. 1 606 Ac on one map (Sun Company map) and Sun State-Gulf No. 1 on another (CC G L map) may be associated with this site. This well appears to be a directional well with a bottom hole location extending into state tract 1018.
Site Location Lat : N :	**27 11' 05"**
Site Location Long : W :	**97 22' 11"**
Site Location TX Grid : X :	
Site Location TX Grid : Y :	
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access by vehicle along the gulf shoreline and then by foot. Located just beyond the primary dune line.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	The site is located in an area of the primary duneline where extensive washovers have occured. Two surface locations for two indipendent wells may be located on, or near this site. Small site. Overgrown. Sand drift covers most of the site. Two small oyster shell mounds on the site.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**12/03/55**
Completion Date :	**12/24/55**
Status :	Sun No. 6: Dry Hole, Plugged and abandoned. Sun State No. 1: Dry Hole, Plugged and abandoned.
Date of P & A :	**12/28/55**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,103/9,209**
State Tract No. :	**Both on Island**

Site Name :	**Sun Oil Dunn-McCampbell well No. 10**
Site Identification No. :	**49.00**
Dual Location Name :	Also referred to as Sun Oil No. 10.
Site Location Lat : N :	**27 10' 47"**
Site Location Long : W :	**97 22' 08"**
Site Location TX Grid : X :	**2,367,853.00**
Site Location TX Grid : Y :	**551,680.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Located along the gulf shoreline in the primary duneline.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**260 ft x 35 ft**
Site Description :	The site is located in an area of the primary duneline where extensive washovers have occured. The site has been altered by high tidal activity and only the remenants of the pad remain.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**10/29/68**
Completion Date :	**11/18/68**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**11/22/68**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,500**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil Dunn-McCampbell well No. 7**
Site Identification No. :	**50.00**
Dual Location Name :	Also referred to as Sun Oil No. 7.
Site Location Lat : N :	**27 10' 06"**
Site Location Long : W :	**97 22' 14"**
Site Location TX Grid : X :	**2,367,330.00**
Site Location TX Grid : Y :	**547,533.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Located along the gulf shoreline. Possibly located within the primary duneline.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**Unknown**
Site Description :	This site has not been located in the field. It is uncertain if this site can be located. The site is located in an area of the primary duneline where extensive washovers have occured.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**07/08/58**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**8,008**
State Tract No. :	**Straight hole**

Site Name :	Sun Oil well No. 2
Site Identification No. :	**51.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 10' 18"**
Site Location Long : W :	**97 23' 57"**
Site Location TX Grid : X :	**2,357,882.00**
Site Location TX Grid : Y :	**548,548.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Located on the tidal flats in the Laguna Madre. This site can be accessed by boat or possibly by foot during periods of low tide.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	This site has not been located. It is unlikely that this site will be located due to it's location in the Laguna Madre. The well was constructed using a barge. The barge accessed the location by dredging a channel.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**11/09/52**
Completion Date :	**12/10/52**
Status :	Oil Production well. Plugged and Abandoned.
Date of P & A :	**02/03/85**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**7,633**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil well No. 5**
Site Identification No. :	**52.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 09' 47"**
Site Location Long : W :	**97 23' 01"**
Site Location TX Grid : X :	**2,362,958.00**
Site Location TX Grid : Y :	**545,512.00**
Site Located in the Field :	
Site is Active :	**No**
Access :	Located on the back island. An oyster shell road passes through the shoreline primary dunes, and ultimately ends at this site.
Pad Material :	**Oyster Shell.**
Site Area and Dimensions :	**Unknown**
Site Description :	The area apears to be intermittently submerged by the Laguna Madre. Oyster shell is scattered throughout the general area. No definitive pad was located. A washover may have dispersed the pad material.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**01/21/54**
Completion Date :	**02/04/54**
Status :	Natural Gas or Dry Hole ?. Plugged and abandoned.
Date of P & A :	**04/12/85**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**7,631**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil well No. 3**
Site Identification No. :	**53.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 09' 07"**
Site Location Long : W :	**97 23' 37"**
Site Location TX Grid : X :	**2,359,843.00**
Site Location TX Grid : Y :	**541,575.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	Located on the tidal flats in the Laguna Madre. The site area can be accessed by boat or possibly by foot during periods of low tide.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	This site may have been located. The area was visited on 1/11/96. The tide was very low. Close to the GPS waypoint, metal debris was located at the end of a channel in the mud flat. This debris was not confirmed as the site location. It is unlikely that this site will be located. The well was constructed using a barge. A dredge was used to access the location.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**04/27/53**
Completion Date :	**05/10/53**
Status :	Oil Production well or natural gas ?. Plugged and Abandoned.
Date of P & A :	**06/07/74**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**7,340 PB 7,330**
State Tract No. :	**Straight hole**

Site Name :	**Sun Oil well No. 12**
Site Identification No. :	**54.00**
Dual Location Name :	No apparent conflict.
Site Location Lat : N :	**27 00' 41"**
Site Location Long : W :	**97 25' 24"**
Site Location TX Grid : X :	**2,350,577.00**
Site Location TX Grid : Y :	**490,368.00**
Site Located in the Field :	**No**
Site is Active :	**No**
Access :	This site needs to be accessed by boat. The coordinates for the site place it in the Laguna Madre near the park boundary.
Pad Material :	**Not determined**
Site Area and Dimensions :	**Unknown**
Site Description :	This site has not been located in the field. It is unlikely that this site will be located due to it's location in the Laguna Madre.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**05/22/81**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**Unknown**
State Tract No. :	**Not determined**

Site Name :	**Sun Oil State Gulf 30001 (I-E) State Tract 1048**
Site Identification No. :	**55.00**
Dual Location Name :	Also referred to as Sun ST 1048-1 and Sun Oil State Tract 1048 well No. 1
Site Location Lat : N :	**27 00' 11"**
Site Location Long : W :	**97 22' 47"**
Site Location TX Grid : X :	**2,364,738.00**
Site Location TX Grid : Y :	**487,375.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access from the Gulf shoreline along the beach. Located just inside the primary duneline. A maintained cut is present through the primary duneline.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**230 ft x 250 ft**
Site Description :	A small pad consisting of oyster shell. A road connects to this site. This road leads into the back island. A single surface location for a directional well.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**Unknown**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,650**
State Tract No. :	**BH ST 1048**

Site Name :	**Sun Oil Dunn-McCampbell No. 11**
Site Identification No. :	**56.00**
Dual Location Name :	Also referred to as Sun No. 11, Sun Oil well No. 11.
Site Location Lat : N :	**27 00' 06"**
Site Location Long : W :	**97 23' 16"**
Site Location TX Grid : X :	**2,362,268.00**
Site Location TX Grid : Y :	**486,876.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access along the shoreline and then though the maintained cut onto the Sun ST 1048-1 site. Continue along the oyster shell road towards the back island. This road passes through a low area that appears to cause prolonged surface emponding. The site is located on the northern side of the road, just beyond the depressed area, and befor the mud flats on the back of the island.
Pad Material :	**Possibly a board pad ?**
Site Area and Dimensions :	**165 ft x 295 ft**
Site Description :	The site area was visited numerous times. Due to several significant precipitation events, this area was inaccessible to vehicles. The site was found on 1/11/96. The pad material is either buried, or was removed. Tree bark is scattered throughout the site area. The site appears to be in a depression. Dry cement can be found in the eastern portion of the site along with a cable and pea gravel. It is unknown at the present time if the pad consisted of boards that were removed, or if the wood bark encountered on the site was introduced as mulch.
Owner :	Uncertain, presumably Sun Oil Company.
Operator :	Uncertain, presumably Sun Oil Company.
Beginning Date :	**12/01/77**
Completion Date :	**12/17/77**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**12/20/77**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**9,715**
State Tract No. :	**Straight hole**

Site Name :	**Union Oil of California W.V. Jones, et al. 30036 (1)**
Site Identification No. :	**57.00**
Dual Location Name :	Also referred to as Union of California/Jones etal.
Site Location Lat : N :	**26 52' 48"**
Site Location Long : W :	**97 22' 06"**
Site Location TX Grid : X :	**2,368,901.00**
Site Location TX Grid : Y :	**442,651.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access from the Gulf shoreline by vehicle. The site is located behind the primary duneline. The area needs to be accessed by foot. An oyster shell road runs south towards a blowout area located approximately one kilometer to the south.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**350 ft x 260 ft**
Site Description :	The site consists of a large oyster shell pad. A stake found on the site marks the possible well area. The area is densely vegetated. A pond is located on the northern edge of the site. A tower can be seen in the distance to the north.
Owner :	Uncertain, presumably Union Oil Company of California and Sun Oil Company.
Operator :	Uncertain, presumably Union Oil Company of California and Sun Oil Company.
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole, Plugged abandoned.
Date of P & A :	**06/08/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**13,514**
State Tract No. :	**Straight hole**

Site Name :	**McMoran Exploration, Jones 30130 (1)**
Site Identification No. :	**58.00**
Dual Location Name :	Also referred to as McMoran No. 1.
Site Location Lat : N :	**26 51' 23"**
Site Location Long : W :	**97 21' 52"**
Site Location TX Grid : X :	**2,370,100.00**
Site Location TX Grid : Y :	**434,100.00**
Site Located in the Field :	**Yes**
Site is Active :	**No**
Access :	Access from the Gulf shoreline. An oyster shell road appears behind the duneline. This road once probably cut through the duneline. The road leads to a large oyster shell pad.
Pad Material :	**Oyster Shell**
Site Area and Dimensions :	**310 ft x 160 ft**
Site Description :	This site has a large oyster shell pad. A channel runs along the northern boundary of the pad and connects to a surface water body in a deflation flat. Scattered debris was encountered throughout the site.
Owner :	Uncertain
Operator :	Uncertain
Beginning Date :	**Not determined**
Completion Date :	**Not determined**
Status :	Dry Hole. Plugged and abandoned.
Date of P & A :	**07/15/75**
TRRC Identification # :	**Not determined**
Total Depth in feet :	**10,206**
State Tract No. :	**Straight hole**