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U.S. DEPARTMEN
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Hazardous Materials Response Branch
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Seattle, Washington 98115
August 23, 1991

mailed . 8/30/91 182
rec'd 9/2/91 8211
rev'd . 7/6/91 505

N00204.AR.000256
NAS PENSACOLA
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Ms. Suzanne Sanborn, Code 18211
Southern Division Naval Facilities Engineering Command
P.O. Box 10068
Charleston, South Carolina 29411-0068

Dear Ms. Sanborn:

Thank you for the opportunity to review and comment on the Contamination Assessment/ Remedial Activities Investigation, Interim Data Reports and Proposed Phase II Sampling for Sites 1, 2, 11, 12, 13, 14, 15, 24, 26, and 30 for the Naval Air Station Pensacola, Pensacola, FL.. Our comments are enclosed. If you have any questions regarding these comments, please call me at 206-526-6404 or John Lindsay or Waynon Johnson at 404-347-5231.

Sincerely,

Jay Field

Jay Field

cc: Ron Joyner, Naval Air Station Pensacola, Pensacola, FL

TO: Suzanne Sanborn, Code 18211
Southern Division Naval Facilities Engineering Command
P.O. Box 10068
Charleston, South Carolina 29411-0068

FROM: John Lindsay, NOAA Coastal Resource Coordinator
Waynon Johnson, NOAA Coastal Resource Coordinator

DATE: August 23,1991

SUBJECT: Naval Air Station (NAS) Pensacola, Pensacola, FL
Contamination Assessment/ Remedial Activities Investigation, Interim Data Reports for Sites 1, 2, 11, 12, 13, 14, 15, 24, 26, and 30.

General Comments

The Interim Data Reports are the results of the Phase I investigations for Sites 1, 2, 11, 12, 13, 14, 15, 24, 26, and 30. The purpose of Phase I was to identify contaminants of concern at the sites and to provide a basis for determining Phase II sampling locations. Not all compounds were analyzed for. Some metals, VOCs, total PAHs, total phenols, some pesticides, and total PCBs were analyzed for in surface water, sediment, soil and temporary wells. All TCL compounds were analyzed for in existing permanent wells. At all sites, Phase I sampling was as much or more extensive than the work plans had shown.

General problems with the Phase I sampling were the high detection limits for pesticides and PCBs, Limited numbers of contaminants measured in some samples, and sampling and analysis problems with the temporary wells. Mercury was not analyzed for in most Phase I samples, but was found in a permanent well at Site 15 at over 100 times the marine chronic ambient water quality criterion (AWQC) for the protection of aquatic organisms. Radionuclides were not analyzed for in Phase I, although the surface was scanned for radioactivity.

To identify substances that might pose a threat to resources of concern to NOAA, water samples were screened by comparing the measured contaminant concentration to the chronic marine AWQC. No criteria similar to the AWQC are available for soils or sediments. For screening purposes, the contaminant levels in sediments were compared to the Effects Range-Low (ER-L) values reported by Long and Morgan (1990).[1]

Detection limits for PCBs and pesticides were too high to determine effects on aquatic organisms. Detection limits for analysis of PCBs were: sediment and soil, 5 mg/kg; surface water and temporary monitoring wells, 10 µg/l, and permanent wells 0.50 - 1.0 µg/l. Pesticide detection limits were 5.0 µg/l for surface water and temporary well samples, 0.05 to 0.50 µg/l for samples from permanent wells, and 1.0 mg/kg for soil and sediment samples. Marine chronic AWQC for pesticides/PCBs are 0.0019 µg/l for Dieldrin, 0.001 µg/l for DDT, and 0.03 µg/l for PCBs. ER-L values are 0.050 mg/kg for PCBs, 0.003 mg/kg for total DDT, and 0.00002 mg/kg for Dieldrin. To collect information that can be used to determine the potential effects on aquatic organisms, detection limits should be at least as low as the AWQC and ER-L concentrations.

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[1] The ER-L value is the concentration equivalent to that reported at the lower 10 percentile of the available screened sediment toxicity data. As such, it represents the low end of the range of concentrations at which effects were observed in the studies compiled by the authors. Although freshwater studies were included, predominantly marine and estuarine toxicity studies were used for generating ER-L values.

A few existing permanent monitoring wells were sampled at sites 1, 11, and 15 which provided a comparison with results from the temporary monitoring wells. Contaminant concentrations found in the temporary wells were were much higher (10 to 100 times or more) than concentrations found in the permanent wells. The problem apparently resulted from turbid water in the temporary wells, which was not filtered, and acid preservative dissolving the suspended sediment. Because of this, results from the temporary monitoring wells were considered unreliable, and the extent of groundwater contamination at some sites consequently will be determined by Phase II sampling.

In general, little consideration was given to characterizing surface water pathways because the sandy, permeable soil present at the site was considered to limit run-off. However, some some surface run-off is likely from most sites during major storm events and should be evaluated.

Sites of Highest Concern to NOAA

Site 1 Sanitary Landfill

Ponds and wetland habitats in the vicinity of Bayou Grande that support NOAA resources have been impacted by leachate contamination from the landfill. Elevated contaminant concenrrations were found in soil and shallow groundwater at the site. Cohcentrations of contaminants found in surface water samples were low, but elevated concentrations were found in sediment from the ponds adjacent to Bayou Grande, some of which discharge to Bayou Grande and support NOAA resources. Concentrations of contaminants in samples of sediments from Bayou Grande were below the ER-Ls.

Discolored water and a surface sheen were observed in area ponds, some wetlands, an intermittent stream, and a spring/leachate seep. Red/orange discoloration'was also observed on vegetation, sediments, and turtle shells along the Bayou Grande shore.

Elevated radiation (4 to 11 µR/h) was found in a portion of the landfill area. Background radiation for NAS Pensacola is 2 to 3 µR/h.

The depth to the water table was found to vary from 5.5 m bls to less than 0.3 m bls near Bayou Grande. A downward vertical hydraulic gradient from the surficial zone to the main producing zone of the sand and gravel aquifer below the site is suspected.

Slightly elevated concentrations of zinc were found in both surface water and sediment (Table 1). Lead, cadmium, and PAHs were also found above ER-L values in the pond sediment. Elevated concentrations of trace elements, VOCs, PAHs, and phenols were found in soils and groundwater on the site (Table 2).

Planned Phase II sampling will provide some additional data to characterize surface water, soil, shallow groundwater, and sediment contamination at and nearby the site. Sediment samples are also needed to determine the extent of contamination of wetland areas to the west and southwest of the site.. No sampling is currently planned for Phase II at these locations and sampling stations should be added for Phase II. Sampling of the deeper aquifer layers should be performed in Phase III.

Compound	Water	AWQC µg/l	Sediment mg/kg	ER-L
arsenic	ND		6.7	33
cadmium	ND		11	5
chromium	34	50	21	80
copper	ND		6.4	70
lead	ND		92	35
zinc	100	86	140	120
Organic Compounds				
TRPH[1]	ND		230	N/A
total PAH	ND		6.1	4.0
chlorobenzene	26	N/A	ND	N/A
total phenols	ND		9.6	N/A

[1]Total Recoverable Petroleum Hydrocarbons
N/A: Not Available
ND: Not Detected

Table 2. Maximum concentrations in surface soils and shallow groundwater at Site 1.

Compound	Soil mg/kg	Groundwater Temporary µg/l	Groundwater Permanent µg/l	AWQC µg/l
Trace Elements				
arsenic	ND	310	60	36
cadmium	18	120	22	9.3
chromium	6.7	1,000	176	50
copper	4.8	500	99	29
iron	NA	148,000	1,000+	
lead	24	1,400	42.5	5.6
nickel	ND	280	100	83
zinc	14	700	350	86
Organic Compounds				
TRPH	330,000	7.800	,400	N/A
chlorobenzene	ND	NA	160	129*
total xylenes	39.0	18	2	N/A
total PAH	26.0	250	NA	10**
total phenols	2,500	320	NA	N/A
Other				
Gross Alpha (pCi/l)	NA	NA	9+3	15***

NA: Not analyzed
\+ Freshwater chronic AWQC
* Lowest observed effect level (LOEL)
** Florida groundwater cleanup standard
*** Florida drinking water standard.

Site 2. Waterfront Sediments

Nearshore sediments at 24 locations around wastewater and stormwater outfalls were sampled in Phase I. Metals, TRPHs, VOCs, and PAHs were found in sediment (Table 3). Elevated metals and PAH concentrations were located along the eastern portion of the southern waterfront area where untreated indusmal waste had formerly discharged Elevated TRPH concentrations were widespread.

Table 3. Maximum sediment concentrations (mg/kg) at Sire 2.

Compound	Sediment	ER-L
Trace Elements		
cadmium	4.9	5
chromium	110	80
copper	54	70
lead	190	35
zinc	140	120
Organic Compounds		
TRPH	440	-
toluene	2.4	
total xylenes	2.1	-
total PAH	17	4.0

Twelve additional nearshore locations are to be sampled in Phase II. Three samples will be taken from each station. At three of the stations near the former indusmal waste outfall, one deeper sample will be taken from 4 to 12 inches depth. Sixteen offshore stations will also be sampled. The samples should be analyzed for PCBs and pesticides at detection limits that are appropriate for ecological evaluations (i.e., less than ER-L values).

Site 11. North Chevalier Disposal Area

Contamination from burning, landfilling and disposal of indusmal wastes was found throughout the site. The site is adjacent to Bayou Grande. Groundwater from the site was found to flow northeast, east and southeast to Bayou Grande. Sediment sampling showed high contaminant concentrations from the site (Table 4). Elevated concentrations of arsenic, chromium and zinc were found in both surface water and sediment samples from Bayou Grande. High metals concentrations were found in 2 of 4 sediment samples. Elevated concentrations of TRPH and PAH were also found in sediment. A benthic core sample from the marsh area adjacent to Bayou Grande found no biota and garbage. Areas and spots of elevated surface radiation readings were observed including one reading of concern at 40 µR/h.

Chromium, zinc, lead, and TRPHs were detected in most soil samples (Table 5). PAHs were detected in 2/3 of the samples. Copper, cadmium and phenols were found in about 1/2 the soil samples. PCBs were found in one boring.

Groundwater contamination was found throughout the site. Some contamination by organic compounds was suspected to be from off-site sources:

Table 4. Maximum surface water and sediment concentrations in Bayou Grande near Site 11.

Compound	Water µg/l	AWQC Marine Chronic	Sediment mg/kg	ER-L
Trace Elements				
arsenic	120	36	11	33
cadmium	ND		45	5
chromium	52	50	1.800	80
copper	ND		47	70
lead	ND		550	35
silver	ND		2.3	1.0
zinc	110	86	130	120
Organic Compounds				
TRPH	ND		32,000	N/A
total PAH	ND		33	4.0
total phenols	ND		9.6	N/A

Table 5. Maximum contaminant levels in surface soils and shallow groundwater at Site 11.

Compound	Soil	Groundwater Temporary µg/l	Groundwater Permanent µg/l	Marine Chronic AWQC
Trace Elements				
arsenic	14	610	60	36
cadmium	64	800	22	9.3
chromium	620	2,600	176	50
copper	28,000	6.700	99	2.9
lead	1,700	22,000	42.5	5.6
nickel	110	370	100	8.3
silver	NA	180	ND	2.3(acute)
zinc	1,300	22,000	350	86
Organic Compounds				
TRPH	43,000	560,000	NA	N/A
total xylenes	1.6	35	89	N/A
total PAH	280	150	NA	10**
total phenols	150	520	NA	N/A
PCBs	< 5.0	< 10		0.03

** Florida groundwater cleanup standard

Proposed Phase II soil and groundwater sampling is more extensive than originally planned. About 128 soil samples and 46 groundwater samples will be taken. Some soil samples will be analyzed for only compounds found in those areas in Phase I. Soil samples in the area of the high radioactivity reading will be analyzed for radium 226, radium 228, gross beta and gamma. Thirty-six permanent monitoring wells will be installed, including 32 as well clusters of 3 wells (shallow, intermediate and deep) with existing wells.

Soil, groundwater, and sediment samples should be analyzed for radionuclides. Detection limits for pesticides and PCBs should be below AWQC and ER-L values.

Sediment samples in addition to the planned Phase II samples (to be included in Site 30 sampling) should be collected to delineate the extent of the high contaminant concentrations found in Bayou Grande and to determine the extent of contamination in the wetland areas adjacent to Bayou Grande.

Site 30, Buildings 649 and 755

Former plating operations at these buildings is considered to be the source of most contamination found at the site, although some contamination may result from off-site sources. Groundwater plumes of 1,1,1-trichloroethane and other VOCs, PAHs and phenols were found. A marsh area immediately below the buildings drains to a small creek that flows to a drainage ditch with paved sides and sandy bottom; the ditch discharges to Bayou Grande near Site 11. Blue crab were observed in the northern pomon of the ditch. Thirteen pipes and culverts were found during the site reconnaisance that appeared to be outfalls to the marsh, creek, and ditch. Not all of the outfalls could be identified as to the source. An oily sheen was observed on surface water in the ditch, creek, and drainage from Chevalier Field.

The water table was found at depths from 7.6 m to 1 m bls. Groundwater discharges to the ditch and creek.

The high surface water and sediment contamination concentrations found in Bayou Grande are considered to result from Site 11 because of the distribution of contaminants, although Site 30 also contributes to Bayou Grande contamination.

The highest surface water and sediment concentrations (other than found in Bayou Grande) (Table 6) were found in the marsh and creek area. Chromium, zinc, lead, cadmium, and copper wen present in most sediment samples.

High PAH and phenol concentrations were found in soil south of the Buildings (Table 7). No permanent monitoring wells were available at Site 30. The maximum metals concentrations in groundwater wen found downgradient of Building 649. Maximum PAH concentrations were found downgradient of buildings 692 and 649-B.

Proposed Phase II sampling includes additional surface water and sediment samples. Sediment samples are planned from two depth intervals. Sediment samples in addition to those planned in Bayou Grande, should be collected to determine the extent of the high metals concentrations found at two sampling locations in Bayou Grande near Site 11. PCBs and pesticides should be analyzed for using detection limits less than the AWQC and ER-L values.

Site 12, Scrap Bins

The facilities at the site include a salvage yard with a compactor, a chemical storage shed, and storage bins which had been located at various portions of the site. The facilities are likely sources of contamination found at the site and Site 12 may contribute to contamination found downgradient at Site 11.

Elevated surface radiation readings were found at Building 3821, up to 35 µR/h. A boring was abandoned there because of radiation levels to 300 µR/h.

Compound	Water	AWQC µg/l	Sediment mg/kg	ER-L mg/kg
Trace Elements				
cadmium	ND		19	5
chromium	ND		120	80
copper	130	2.9	93	70
lead	ND		180	35
silver	ND		1.6	1.0
zinc	280	86	130	120
Organic Compounds				
TRPH	ND		720	N/A
total PAH	ND		5.4	4.0
total phenols	ND		6.6	N/A
trichloroethene	16	2,000'	ND	
Dieldrin/4,4-DDE	ND		< 1.0	0.00002
PCBs	ND		< 5.0	0.050

* LOEL

Table 7. Maximum contaminants in surface soils and shallow groundwater from temporary wells on Sire 30.

Compound	Soil	Groundwater µg/l	Marine Chronic AWQC
Trace Elements			
cadmium	1.1	360	9.3
chromium	71	8,300	50
copper	2.8	74	2.9
nickel	ND	2,200	8.3
zinc	12	290	86
Organic Compounds			
TRPH	170	1,100	N/A
1,1-dichloroethane	1.1	< 500	N/A
total PAH	64	110	10**
total phenols	200	320	N/A

** Florida groundwater cleanup standard

All trace elements measured, PAH, and PCBs showed elevated concentrations in sediment samples from the storm drains (Table 8). Elevated metals contamination was found in soils throughout the site (Table 9). High concentrations of contamination appeared to be in localized spots.

Water table depth is about 4 to 5 m bls. The direction of shallow groundwater flow is to the east and northeast towards Site 11 and Bayou Grande. No permanent monitoring wells were available at Site 12. Seven permanent shallow monitoring wells are planned for Phase II. In addition to TCL compounds, the groundwater should be analyzed for radionuclides. Detection limits used for Phase II analysis for PCBs and pesticides should be at or lower than AWQC and ER-L values. Some soil samples will be analyzed for radionuclides.

Additional sediment samples will be collected from 3 stormwater drains in Phase II. The sediment samples should also be analyzed for radionuclides.

Table 8. Maximum sediment concentrations (mg/kg) from 2 sediment samples collected from storm drains in the southern portion of Site 12.

Compound	Stormdrain Sediment	ER-L
cadmium	7.9	5
chromium	150	80
copper	340	70
lead	110	35
nickel	220	30
zinc	390	120
TRPH	220	
total PAH	19.0	4.0
total PCBs	120	0.050

Table 9. Maximum contaminant levels in surface soils and shallow groundwater from temporary wells on Site 12.

Compound	Soil	Groundwater µg/l	Marine Chronic AWQC
Trace Elements			
arsenic	39	ND	
cadmium	12	89	9.3
chromium	23	470	50
copper	65	160	2.9
lead	24	130	
nickel	9.4	41	8.3
zinc	44	820	86
Organic Compounds			
TRPH	110	ND	N/A
total PAH	8.9	ND	10**
total phenols	25	< 100	N/A
PCBs	< 5.0	< 10	0.03

** Florida groundwater cleanup standard

Site 15. Pesticide Rinsate Disposal Area

Site 15 is mostly unpaved except for a small asphalt pad and includes 3 buildings. Arsenic was found in high concentrations in both soil and groundwater (Table 10). The site is near Bayou Grande.

Shallow groundwater flows to the northwest towards Bayou Grande. Some groundwater could possibly reach the Golf Course Pond, which discharges to Bayou Grande. Depth to the water table is about 3.6 m.

Arsenic was detected in 5 soil borings and was found in 4 wells in the direction of groundwater flow from those brings (Table 10). Zinc and chromium wen detected in most soil samples at low concentrations. TRPH were found in soil throughout the site:

It appears from the topo map that this site is near a drainage pathway to Golf Course Pond, which discharges to Bayou Grande. Surface water drainage was not discussed.

Phase II sampling will include the installation and sampling of 7 permanent shallow monitoring wells. Soil samples will be collected from 8 additional borings at various depths for a total of 41 samples. Nineteen samples will be analyzed for full TCL compounds. Fifteen samples from 2 borings will be analyzed for VOCs only.

Lower detection limits should be used for pesticides in Phase II sampling analysis. Because mercury was not analyzed for in soils previously, all samples should be analyzed for metals to determine the source of the high mercury concentration found in the permanent monitoring well.

The possible surface water pathway should be investigated if not previously considered.

Site 24. DDT Mixing Area

The site is mostly unpaved with one building used for pesticide storage and rinsate disposal. DDT was formerly mixed with fuel oil at the site in the 1950's and early 60's. The site is located in the center of the peninsula and therefore is of less concern than the sites adjacent to surface water. Lead found in soil and groundwater is the contaminant of concern at the site. The source of the lead contamination is uncertain, but was suspected to be from the occasional use of aviation fuel for mixing with DDT instead of diesel fuel.

A groundwater ridge was found below the site, with groundwater flow away from the site to the southwest, northwest, and northeast. The overall area flow direction may be towards the north-northwest and Bayou Grande, but has not been confirmed. Permanent monitoring wells were not available at Site 24.

Lead, TRPHs, PAHs, and the carbamate pesticide fluometuron were found in soil (Table 11). Metals, tetrachloroethene, and the carbamate pesticide methomyl were found in groundwater. The tetrachloroethene is suspected to be From an off-site source. DDT was not detected at the site in soil or groundwater at detection limits of 1.0 mg/kg and 5 µg/l respectively.

Because of the widespread metals contamination found at the site, all Phase II soil samples should be analyzed for TCL metals to determine the extent of metals contamination. Some samples are only planned to be analyzed for lead BNAs, pesticides, etc.

Seven permanent shallow monitoring wells will be installed for Phase II and will be sampled and analyzed for TCL compounds. These wells may not determine all contaminant sources and groundwater flow direction, but will provide reliable data on shallow groundwater contamination. Detection limits for pesticides should be at or below AWQC values. Possible surface drainage pathways from the site also should be investigated during Phase 11.

Table 10. Maximum contaminant levels in surface soils and shallow groundwater at Site 15.

Compound	Soil	Groundwater		Marine
		Temporary	Permanent	Chronic
	mg/kg	µg/l	µg/l	AWQC
Trace Elements				
arsenic	670	8,000	226	36
cadmium	1.0	38	ND	9.3
chromium	20	400	56	50
copper		190	23	2.9
iron	NA	NA	30.300	1,000*
lead	12	300	18.5	5.6
nickel		110	ND	8.3
mercury	NA	NA	3.4	0.025
zinc	55	22,000	94	86
Organic Compounds				
TRPH	180	ND	NA	N/A
trans-1,2-dichloroethene		ND	89	N/A
total PAH		ND	NA	10**
4,4-DDT	< 1.0	ND	NA	0.001
Dieldrin/4,4-DDE	< 1.0	< 5		0.00002

* Freshwater chronic AWQC
** Florida groundwater cleanup standard

Lower Concern Sites

Site 13. Magazine Point Rubble Disposal Area

The site is a narrow strip of land along Pensacola Bay where building rubble and construction materials were disposed. Site 13 habitat types are nearshore estuarine, beach, coastal dune, and open slash pine woodland Other sites located in the vicinity are the Indusmal Waste Treatment Plant (IWTP) sites to the west and Site 14-Dredge Spoil Fill Area to the south.

Several surface radiation readings were recorded above background, including a mass of metal ship parts which had a reading of 100 µR/h. Floor tiles from the rubble were found to contain 5 to 20 % asbestos materials.

Depth to the water table ranges from 3 m bls to about 1 m bls. Groundwater appears to flow east from the site to Pensacola Bay. Permanent monitoring wells were not available at Site 13.

Table 11. Maximum contaminant levels in surface soils and shallow groundwater from temporary wells on Site 24.

Compound	Soil	Groundwater, µg/l	Marine Chronic AWQC
Trace Elements			
cadmium	11	310	9.3
chromium	33	820	50
copper	180	860	2.9
lead	2,900	2,600	5.6
nickel	14	1,100	8.3
zinc	360	52,000	86
Organic Compounds			
TRPH	160	1,400	N/A
tetrachloroethene	ND	17	450*
total PAH	1.6	< 100	10**
Fluometuron	20	ND	N/A
methomyl	ND	< 100	N/A

* LOEL
** Florida groundwater cleanup standard

Table 12. Maximum contaminant levels in surface soils and shallow groundwater from temporary wells on Site 13.

Compound	Soil	Groundwater, µg/l	Marine Chronic AWQC
Trace Elements			
cadmium	1.6	5.6	9.3
chromium	12	57	50
copper	6.1	170	2.9
lead	12	53	5.6
zinc	16	510	86
Organic Compounds			
TRPH	2,800	ND	N/A
total PAH	28	110	10**
total phenols	58	ND	N/A

** Florida groundwater cleanup standard

Elevated concentrations of metals, TRPHs, PAHs, and phenols were found at the site in the vicinity of the IWTP and adjacent to Pensacola Bay (Table 12). It is suspected that the IWTP and Chevalier Field runways may contribute more to contamination at the site than the rubble disposed then. Contamination of the area is of concern because of the proximity to Pensacola Bay.

Only 2 permanent monitoring wells are planned for Phase II in the north and south areas of the site. It is planned that the investigation of the IWTP sites will delineate groundwater contamination connected with that area.

An additional 24 soil samples are planned for Phase II, as well as a geophysical survey to locate metal objects.

Radionuclides should be analyzed for in Phase II soil and groundwater samples. Sediment samples should be collected from Pensacola Bay in the vicinity of the elevated contaminant concentrations found in soil and groundwater.

Site 14. Dredge Spoil Fill Area

Contaminated sediment from Pensacola Bay were placed at the Site in the late 1970's when the Bay was dredged to create an aircraft carrier turning basin and port. Chevalier Field, west of the site, is suspected to be the source of some of the contamination found.

The dredge spoil area is divided into two bermed settling basins with drainage structures that provide drainage to Pensacola Bay. A brackish pond/emergent wetland is located north of the fill area. Another wetland south of the spoil area has been drained and planted with pine and a drainage channel connected to the Bay has blue crab and small fish. Drainage from Chevalier Field discharges to the pond areas.

The maximum TRPH and PAH concentrations were found in sediment near a drainage pathway from Chevalier Field (Table 13). Metals were highest in a sample from fine sediment in Pensacola Bay. Metal concentrations found were below ER-L values. The maximum phenol concentrations were found near a drainage structure from the basins.

Permanent monitoring wells were not available at Site 14. The direction of shallow groundwater flow appears to be towards the Bay with some tidal influence. Elevated metals concentrations were found in temporary wells near both Chevalier Field and the dredge spoil area (Table 14). High TRPH concentrations were found in borings adjacent to Chevalier Field PAH and phenols were found in soils within the settling basins.

Sediment, soil, and groundwater contamination are present, but probably not at high concentrations. The site is of concern because of its location on Pensacola Bay. Structures to control fuel spills from Chevalier Field and oil/water separators should be constructed here.

Phase II sediment and soil samples are proposed to confirm and delineate the extent of contamination. Five permanent shallow monitoring wells will be installed and samples analyzed for TCL compounds.

Site 26. Supply Department Outside Storage

The site is an open shed on a concrete pad used for chemical storage. The site is located in the center of the Peninsula.

The water table was found about 5 m bls. Shallow groundwater flow direction at the site was east-southeast (towards Pensacola Bay). Permanent monitoring wells were not available at Site 26. The highest metals concentrations found in groundwater were from the former chemical storage building area (Table 15). The source of the 1,1,1-trichloroethane found in groundwater has not been determined. TRPHs were found in most soil samples.

Three permanent shallow monitoring wells are planned far Phase II and samples will be analyzed for T U compounds. The permanent wells planned will determine the extent of groundwater contamination in the vicinity of the chemical storage shed, but wells are not planned for the southern portion of the site where some contamination was found. Since

the groundwater flows easterly, the well planned on the south side of the shed should be on the east side of the shed.

Soil samples will be collected from 10 borings. A few samples below the water table will be analyzed for metals only to determine if metals found in the temporary wells are in water or soil.

Table 13. Maximum sediment concentrations (mg/kg) found in the Bay and wetland areas at Site 14.

Compound	Sediment	ER-L
chromium	31	80
copper	10	70
lead	6.6	35
nickel	13	30
zinc	45	120
TRPH	2,500	N/A
total PAH	4.7	4.0
total phenols	4.3	N/A

Table 14. Maximum contaminant levels in surface soils and shallow groundwater from temporary wells on Site 14.

Compound	Soil	Groundwater, µg/l	Marine Chronic AWQC
Trace Elements			
cadmium	2.4	13	9.3
chromium	17	130	50
copper	4.3	170	2.9
lead	10	53	5.6
nickel	ND	56	8.3
zinc	33	200	86
Organic Compounds			
TRPH	1,800	ND	NIA
trans-1,2-dichloroethene	2.1		N/A
1.1,1-trichloroethane	3.3		NIA
total PAH	2.8	< 100	10**
total phenols	20	< 100	N/A

** Florida groundwater cleanup standard

Site Summary

Site 1-Sanitary Landfill

Elevated contaminant concentrations were found in soil and shallow groundwater at the site. Elevated concentrations of metals, TRPHs, PAHs, and phenols were found in sediment from the ponds adjacent to Bayou Grande, some of which discharge to Bayou Grande and support NOAA resources.

Compound	Soil	Groundwater, µg/l	Marine Chronic AWQC
Trace Elements			
cadmium	1.4	13	9.3
chromium	18	130	50
copper	3.4	170	2.9
nickel	7.3	56	8.3
zinc	17	200	86
Organic Compounds			
TRPH	220	ND	N/A
1,1,1-trichloroethane	ND	25	N/A
total PAH	4.4	ND	10**

Sediment samples are needed to determine the extent of contamination of wetland areas to the west and southwest of the site.and are not currently planned for Phase II.

Site 2. Waterfront Sediments

Metals, TRPHs, VOCs, and PAHs were found in nearshore sediments. Elevated metals and PAH concentrations were located along the eastern portion of the southern waterfront area where untreated industrial waste had formerly discharged. Elevated TRPH concentrations were widespread.

Planned Phase II samples should be analyzed for PCBs and pesticides at detection limits that will show effects on aquatic life.

Site 11. North Chevalier Disposal Area

Contamination from burning, landfilling and disposal of industrial wastes was found in soil and groundwater throughout the site. The site is adjacent to Bayou Grande and sediment sampling there found high contaminant concentrations from the site.

Phase II soil, groundwater, and sediment samples should be analyzed for radionuclides. Detection limits for pesticides and PCBs should be below AWQC and ER-L values.

Sediment samples in addition to the planned Phase II samples (to be included in Site 30 sampling) should be collected to delineate the extent of the high contaminant concentrations found in Bayou Grande and to determine the extent of contamination in the wetland areas adjacent to Bayou Grande.

Site 30. Buildings 649 and 755

Former plating operations at these buildings is considered to be the source of most contamination found at the site, although some contamination may result from off-site sources. Elevated contaminant concentrations were found in soil and groundwater at the site. Sediment and surface water near the site are contaminated with metals, TRPHs,

PAHs, and phenols. Undetermined concentrations of pesticides and PCBs were also found in sediment near the site.

Additional Phase II sediment samples should be collected to determine the extent of the high metals concentrations found at two sampling locations in Bayou Grande near Site 11. For all Phase II samples, PCBs and pesticides should be analyzed for using detection limits less than the AWQC and ER-L values.

Site 12, Scrap Bins

The facilities at the site which include a salvage yard with a compactor, a chemical storage shed, and storage bins are likely sources of contamination found at the site. Elevated surface radiation readihgs were found and a boring was abandoned because of radiation levels to 300 µR/h. High concentrations of metals, PAHs, and PCBs were found in sediment samples from a storm drain at the site. Elevated contaminant concentrations were also found in soil and groundwater.

Phase II groundwater and sediment samples should be analyzed for radionuclides. Lower detection limits should be used for PCB and pesticide sampling analysis in Phase II.

Site 15, Pesticide Rinsate Disposal Area

Arsenic was found in high concentrations in both soil and groundwater at'the site, which is located near Bayou Grande. A high concentration of mercury was found in an existing permanent well at the site.

Lower detection limits should be used for pesticides in Phase II sampling analysis. Because mercury was not analyzed for in soils previously, all samples should be analyzed for metals to determine the source of the high mercury concentration found in the permanent monitoring well.

Possible surface water pathways should be investigated.

Site 24, DDT Mixing Area

The site is located in the center of the peninsula and therefore is of less concern than the sites adjacent to surface water. Lead found in soil and groundwater throughout the site is the contaminant of concern. The source of the lead contamination is uncertain, but was suspected to be from the occasional use of aviation fuel for mixing with DDT instead of diesel fuel.

All Phase II soil samples should be analyzed for T U metals. Lower detection limits for pesticides should be used. Possible surface drainage pathways from the site should be investigated during Phase II.

Site 13, Magazine Point Rubble Disposal Area

The site is a narrow strip of land along Pensacola Bay where building rubble and construction materials were disposed. Several surface radiation readings were recorded above background, including a mass of metal ship parts which had a reading of 100 µR/h. Floor tiles from the rubble were found to contain 5 to 20 % asbestos materials.

Elevated concentrations of metals, TRPHs, PAHs, and phenols were found at the site in the vicinity of the IWTP and adjacent to Pensacola Bay. It is suspected that the IWTP and

Chevalier Field runways may contribute more to contamination at the site than the rubble disposed there. Contamination of the area is of concern because of the proximity to Pensacola Bay.

Radionuclides should be analyzed for in Phase II soil and groundwater samples. Sediment samples should be collected from Pensacola Bay in the vicinity of the elevated contaminant concentrations found in soil and groundwater.

Site 14. Dredge Spoil Fill Area

Contaminated sediments from Pensacola Bay were placed at the Site in the late 1970's when the Bay was dredged to create an aircraft carrier turning basin and port Chevalier Field, west of the site, is suspected to be the source of some of the contamination found. Wetland areas which receive drainage from Chevalier Field are located north and south of the dredge spoil fill area.

Sediment, soil, and groundwater contamination are present, but probably not at high concentrations. The site is of concern because of its location on Pensacola Bay. Structures to control fuel spills from Chevalier Field and oil/water separators should be constructed here.

Site 26. Supply Department Outside Storage

The site is an open shed on a concrete pad used for chemical storage, located in the center of the Peninsula. Slightly elevated contaminant concenrrations were found in soil and groundwater. The source of 1,1,1-trichloroethane found in groundwater has not been determined. TRPHs were found in most soil samples.

References

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