

GERAGHTY & MILLER, INC.

1041

NAVAL ASSESSMENT AND CONTROL
OF INSTALLATION POLLUTANTS
REVIEW WORKSHOP

NAS-JACKSONVILLE

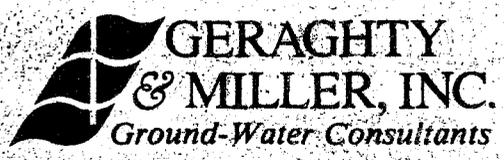
VERIFICATION STUDY
CHARACTERIZATION STUDY

April 29, 1986

GERAGHTY & MILLER, INC.
Ground-Water Consultants
14310 N. Dale Mabry Highway, Suite 200
Tampa, Florida 33688-11732

042-2

Certification Study
meeting WAS Held
29 Apr. 1986



Landmark Office Center
14310 North Dale Mabry Highway
Suite 200
Post Office Box 271173
Tampa, Florida 33688

BES/EPA/FDER NACIP WORKSHOP
 NAS JACKSONVILLE FLORIDA
 29 APRIL 1986

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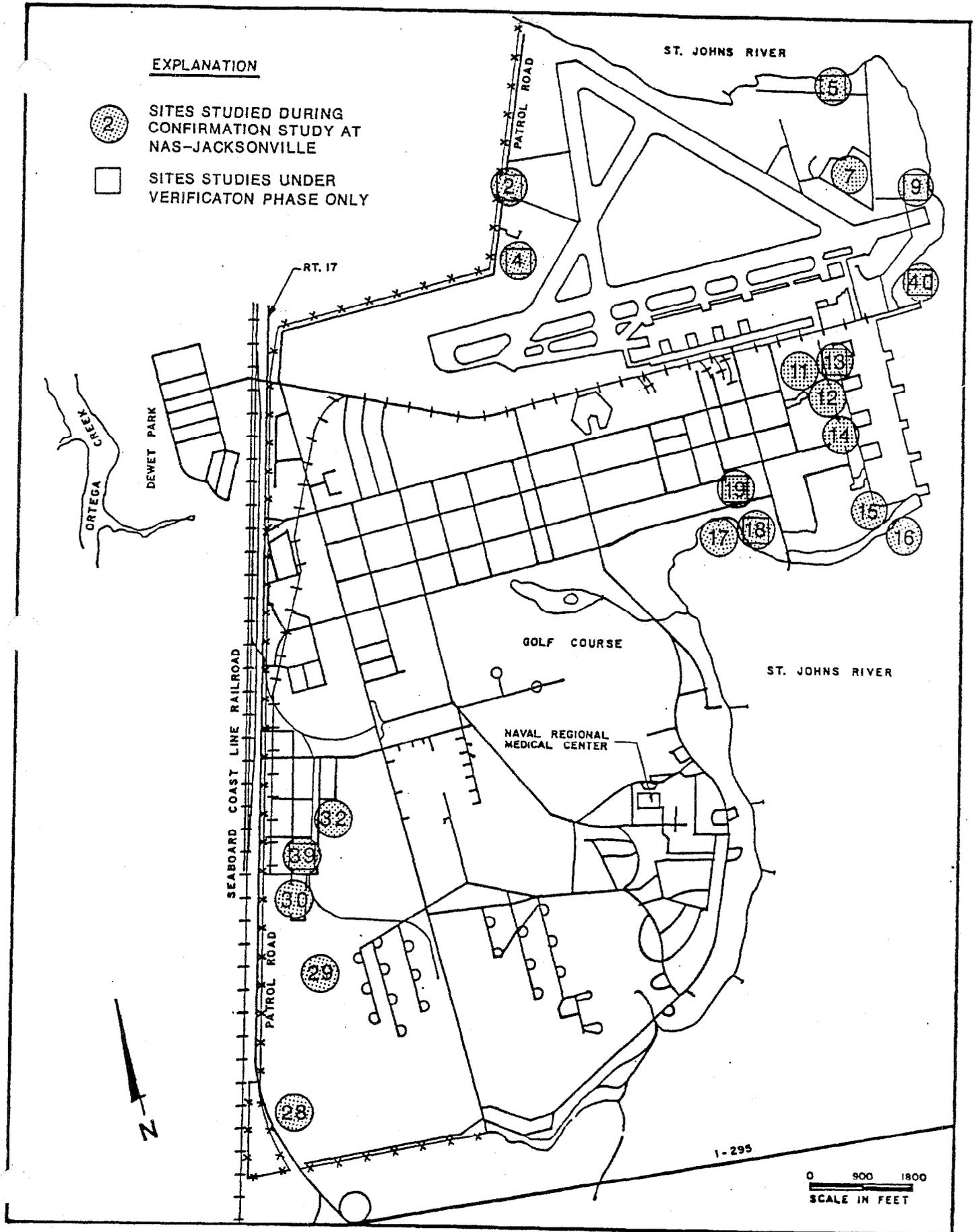
NAS-JACKSONVILLE

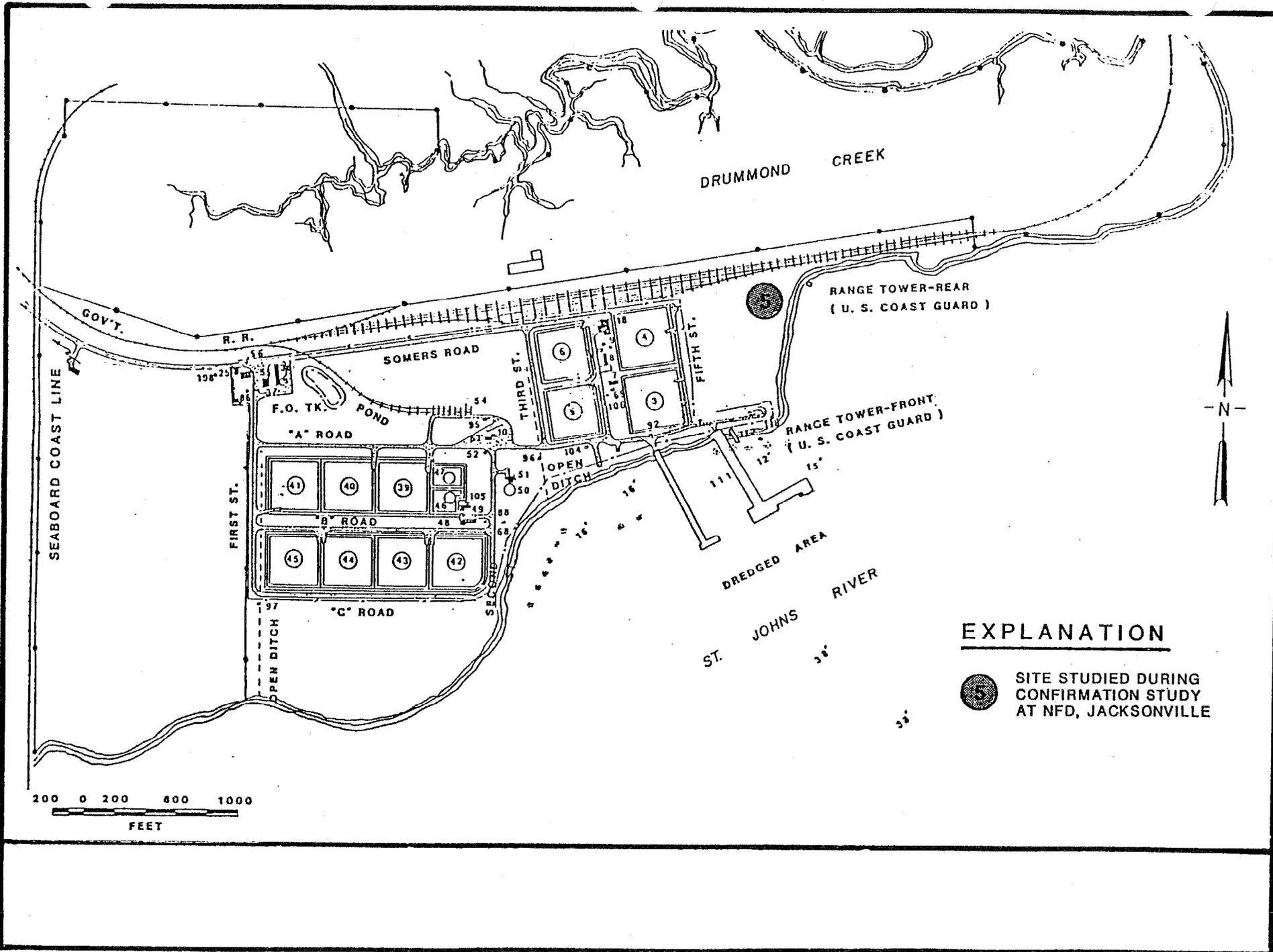
VERIFICATION STUDY
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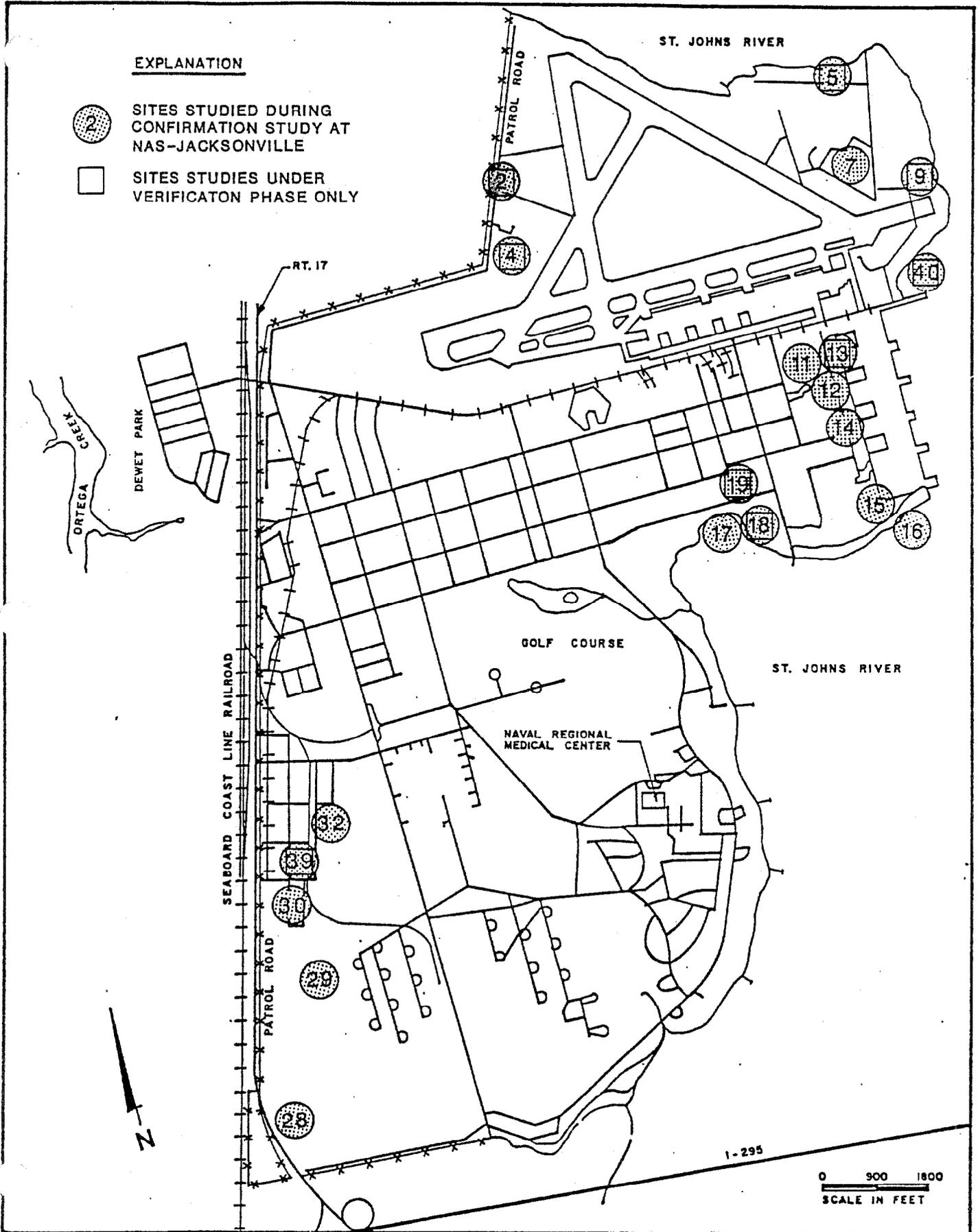
EXPLANATION

● 5 SITE STUDIED DURING CONFIRMATION STUDY AT NFD, JACKSONVILLE

TABLE 5. CURRENT STATUS ALL SITES IDENTIFIED AT THE NAS AND NFD

SITE NO.	IDENTIFIED BY	VERIFICATION RECOMMENDED BY	CHARACTERIZATION RECOMMENDED BY	REMEDIAL ACTION RECOMMENDED BY	CURRENT STATUS
<u>NAS</u>					
1	IAS ^{1/}	- ^{2/}	-	-	-
2	IAS	FDER ^{3/}	-	-	-
3	IAS	-	-	-	-
4	IAS	IAS	-	-	-
5	IAS	NAS-JAX	-	-	-
6	IAS	-	-	-	-
7	IAS	NAS-JAX	NAS-JAX	Characterization	RA Design ^{4/}
8	IAS	-	-	-	-
9	IAS	IAS	-	-	-
10	IAS	-	-	-	-
11	IAS	IAS	Verification	Characterization	RA Design
12	IAS	IAS	Verification	Characterization	RA Design
13	IAS	FDER	-	-	-
14	IAS	IAS	Verification	Characterization	RA Design
15	IAS	IAS	Verification	Characterization	RA Design
16	IAS	IAS	Verification	Characterization	RA Design
17	IAS	IAS	-	-	Closure Plan submitted
18	IAS	FDER	-	-	-
19	IAS	IAS	-	-	Tanks to be properly abandoned by the Navy
20	IAS	-	-	-	-
21	IAS	-	-	-	-
22	IAS	-	-	-	-
23	IAS	-	-	-	-
24	IAS	-	-	-	-
25	IAS	-	-	-	-
26	NAS-JAX	Prior to NACIP	-	NAS-JAX	Remedial action underway
27	IAS	-	-	-	-
28	IAS	NAS-JAX	Verification	Characterization	-
29	IAS	IAS	Verification	-	-
30	IAS	IAS	Verification	Characterization	Sediment removal
31	IAS	-	-	-	-
32	IAS	FDER	Verification	-	-
33	IAS	-	-	-	-
34	IAS	-	-	-	-
35	IAS	-	-	-	-
36	IAS	-	-	-	-
37	IAS	-	-	-	-
38	IAS	-	-	-	-
39	NAS-JAX	NAS-JAX	-	-	-
40	NAS-JAX	NAS-JAX	-	-	-
<u>NFD</u>					
1	IAS	-	-	-	-
2	IAS	-	-	-	-
3	IAS	-	-	-	-
4	IAS	-	-	-	-
5	IAS	IAS	Verification	-	-

1/ IAS = Initial Assessment Study Team
 2/ - = Not recommended or no further investigation
 3/ FDER = Florida Department of Environmental Regulation
 4/ RA Design = Remedial Action Design



SITE NO. 2 - FIRE-FIGHTING AREA

Site Description

The site is used for fire-fighting training by igniting junk vehicles with small quantities of jet fuel, JP-5, or waste oil.

Verification Study

Work Performed:

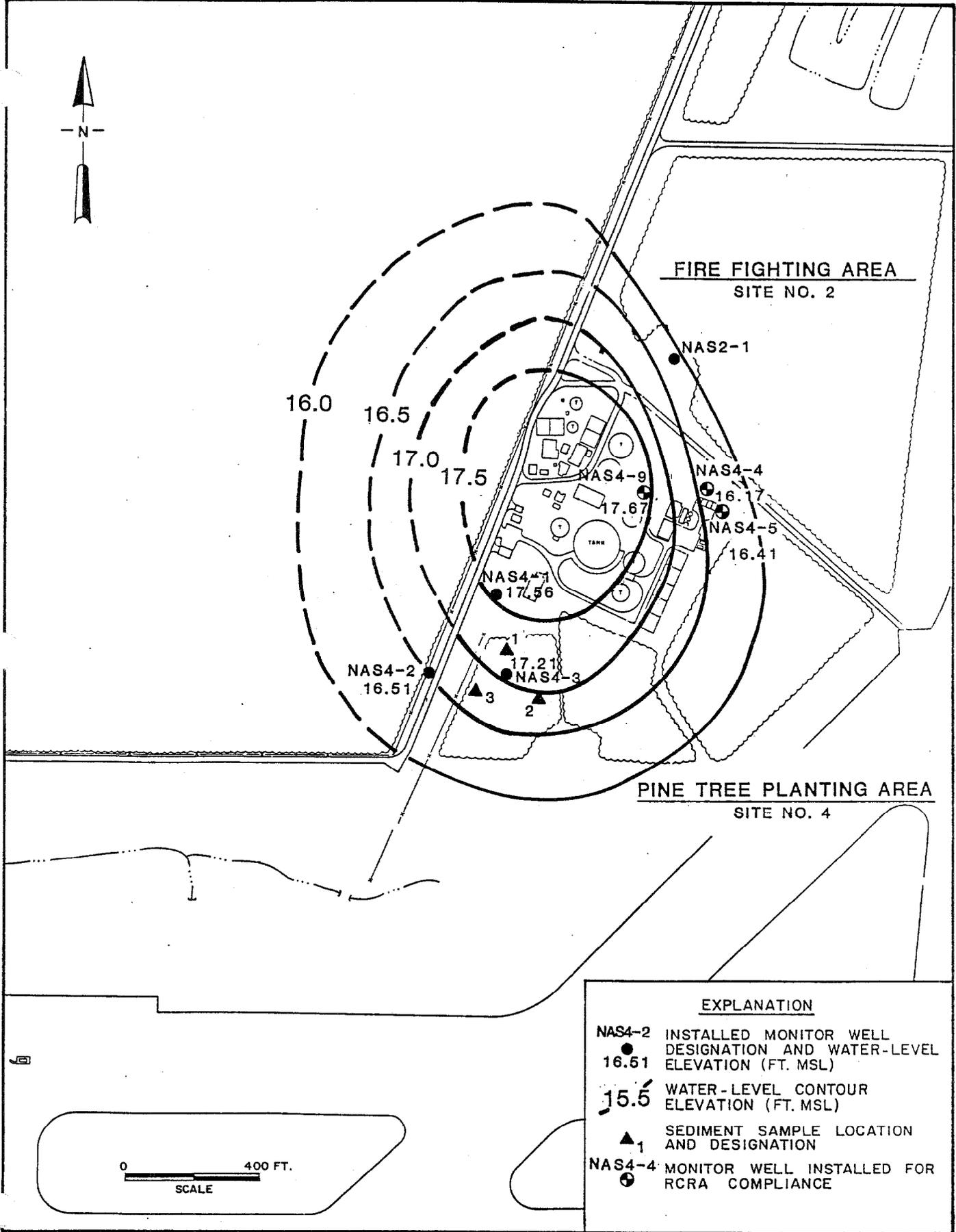
- o Installed one monitor well (NAS2-1)
- o Analyzed ground-water sample for VOCs (volatile organic compounds), PCBs (polychlorinated biphenyls) and pesticides.

Findings:

- o No VOCs, pesticides or PCBs detected in shallow ground-water.
- o Shallow ground-water flow direction is to the north-northeast based on water-level measurements in nearby wells.

Recommendations:

- o No further investigation.



EXPLANATION

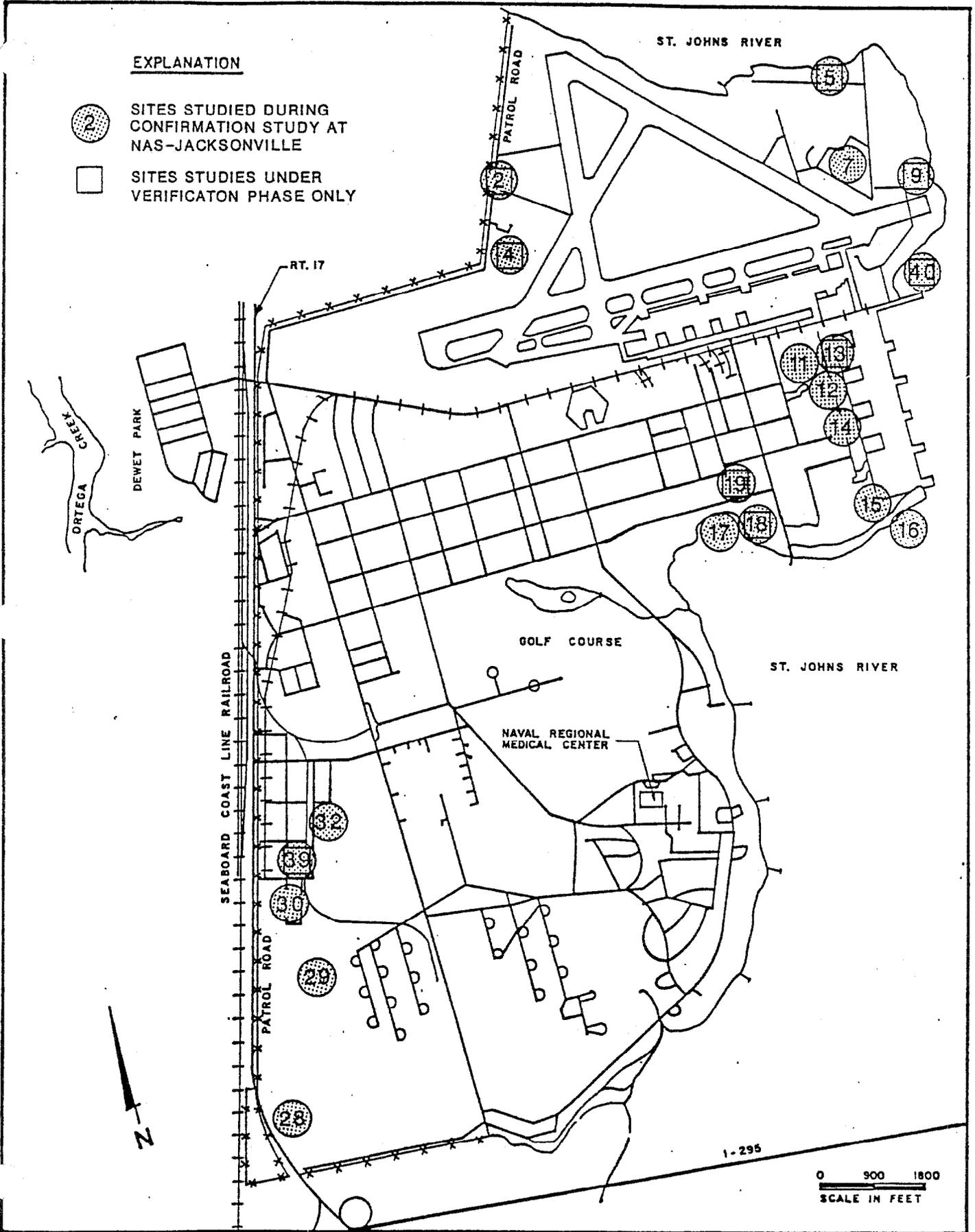
- NAS4-2 INSTALLED MONITOR WELL
● 16.51 DESIGNATION AND WATER-LEVEL
ELEVATION (FT. MSL)
- 15.5 WATER-LEVEL CONTOUR
ELEVATION (FT. MSL)
- ▲ 1 SEDIMENT SAMPLE LOCATION
AND DESIGNATION
- NAS4-4 MONITOR WELL INSTALLED FOR
● RCRA COMPLIANCE

SITE 2. VERIFICATION STUDY

Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

<u>Compound</u>	<u>NAS-2-1</u>
<u>VOLATILES, ug/l</u>	-
<u>PESTICIDES AND PCBS, ug/l</u>	-
<u>FIELD PARAMETERS</u>	
pH	5.93
Specific Conductance (umhos/cm)	NA
Temperature (°C)	18

- = none detected
NA = not analyzed



SITE NO. 4 - PINE TREE PLANTING AREA

Site Description

This site was used until 1975 for disposal of paint shavings, sewage sludge, asbestos, oil and other petroleum products.

Verification Study

Work Performed:

- o Installed three (3) monitor wells (NAS4-1, NAS4-2, NAS4-3.)
- o Analyzed ground-water samples for VOCs, TOC (total organic carbon), cyanide, and metals.
- o Collected water-level measurements from installed wells.
- o Analyzed three (3) soil samples for EP (Extraction Procedure) toxicity for metals.

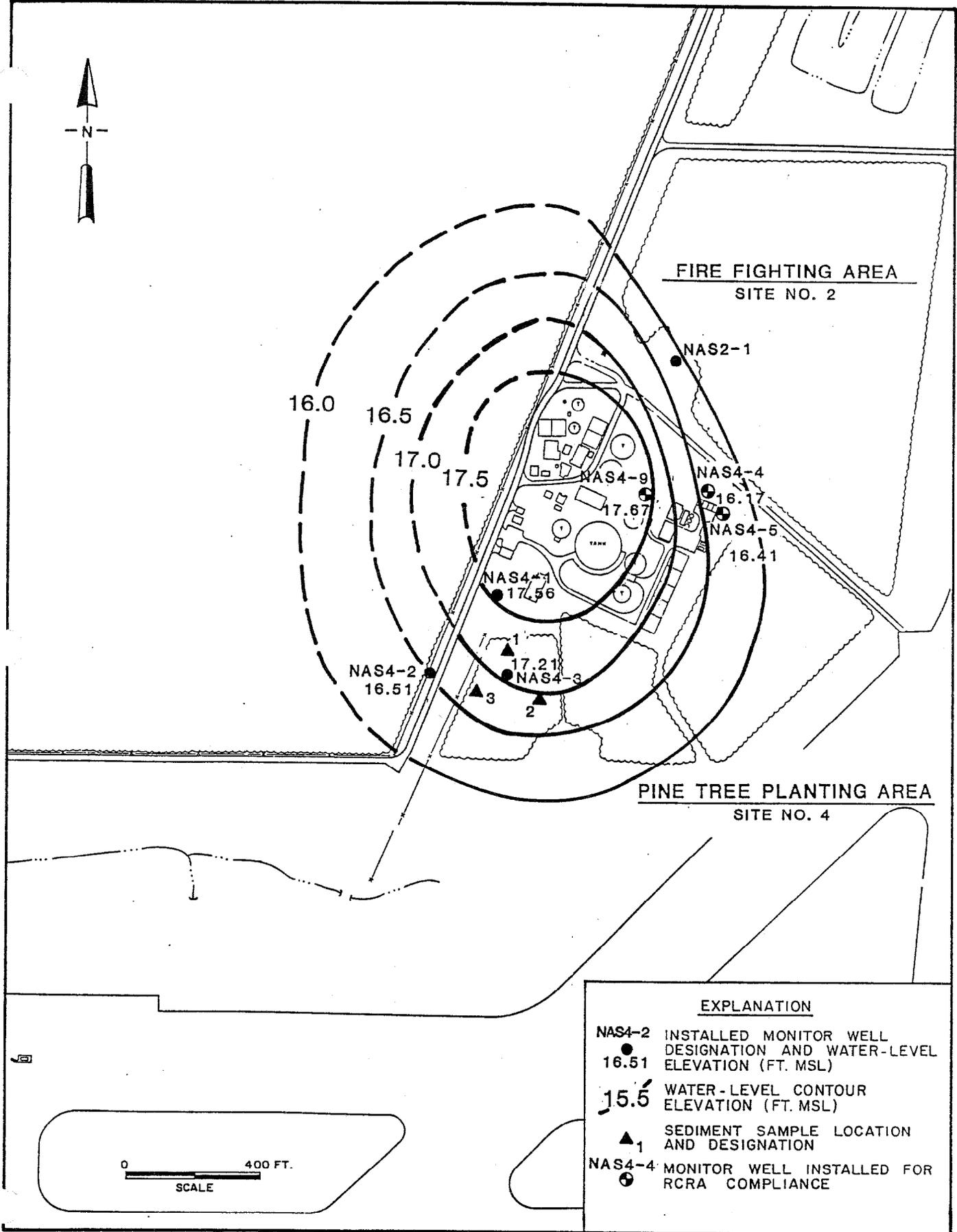
Findings:

- o Ground-water primarily contained low levels of VOCs with TCE (trichloroethene) primary constituent (4-1, 15 ppb; 4-2, 45 ppb; 4-3, 0.7 ppb). Metal and cyanide constituents were all below laboratory detection limit.
- o Soil analysis indicates non-hazardous waste.
- o Shallow ground-water flow to the north and northeast.

Recommendations:

- o No further investigation.

Continued (under risk assessment)



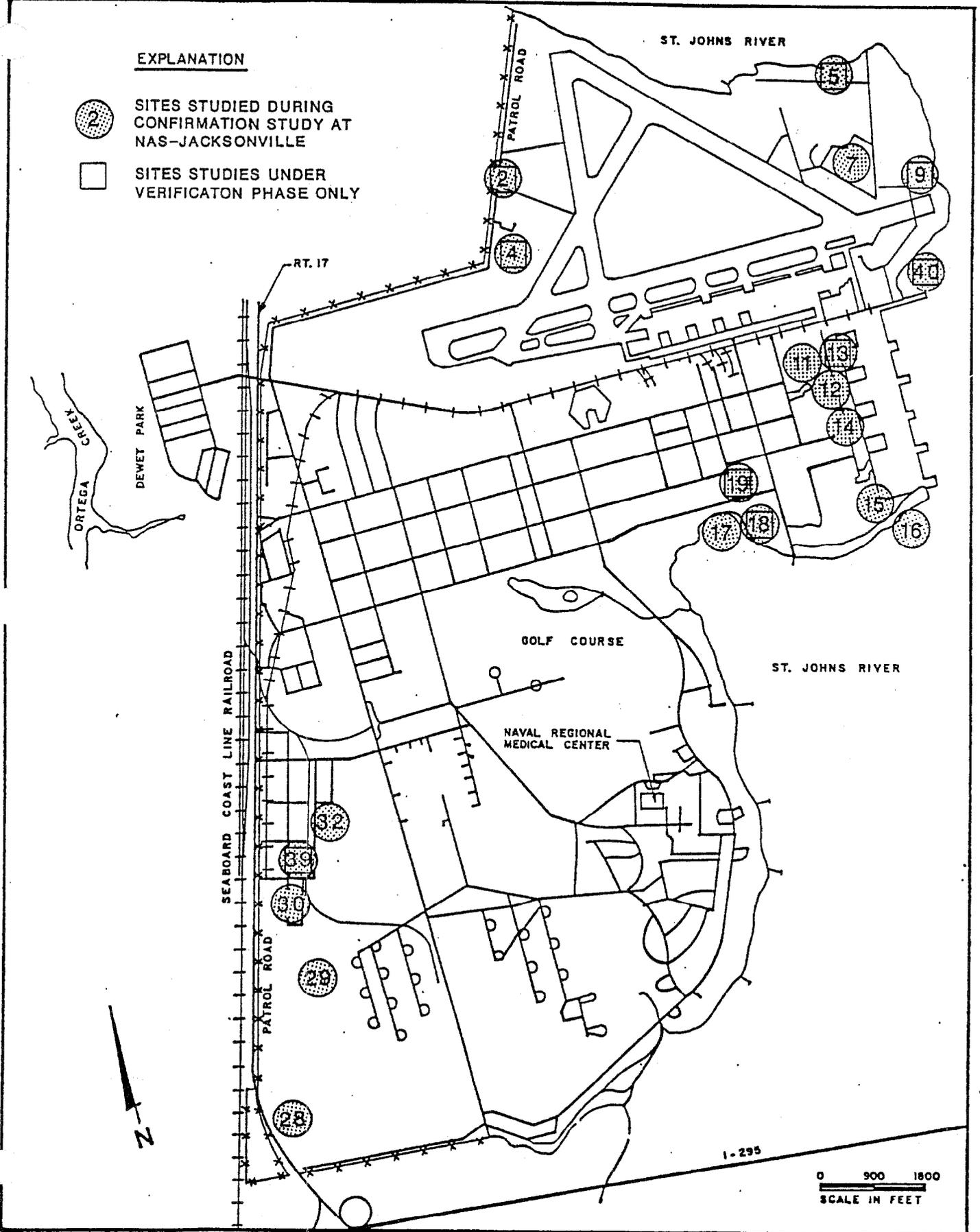
SITE 4. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS-4-1	NAS-4-2	NAS-4-3
<u>VOLATILES, ug/l</u>			
Trans-1,2 - dichloroethene	-	9.1	-
Trichloroethene	15	45.0	0.7
Tetrachloroethene	-	1.1	-
<u>TOTAL VOLATILES</u>	<u>15</u>	<u>55.2</u>	<u>0.7</u>
<u>TOTAL ORGANIC CARBON, MG/L</u>	1.0	3.7	1.0
<u>CYANIDE, mg/l</u>	-	-	-
<u>METALS, mg/l</u>	-	-	-
<u>FIELD PARAMETERS</u>			
pH	5.23	6.07	5.52
Specific Conductance (umhos/cm)	75	310	110
Temperature (°C)	26	26	24

Results of Chemical Analysis of Soil Samples

Compound	NAS-4-1	NAS-4-2	NAS-4-3
<u>EP TOXICITY, mg/l</u>			
Barium	0.1	0.1	0.3
Cadmium	-	0.009	0.036
Chromium	-	0.02	0.02
Mercury	-	0.0016	-
Silver	-	0.01	-

- = none detected



SITE NO. 5 - SHORELINE FILL

Site Description

Reportedly, this site was used during 1945 and 1946 for disposal of paint shavings, paint remover solvents and radioactive paint. The area was later covered with concrete rubble.

Verification Study

Work Performed:

- o Installed one monitor well (NAS 5-1).
- o Analyzed ground-water sample for Gross Alpha, Gross Beta, Radium 226 and 228, VOCs and metals.

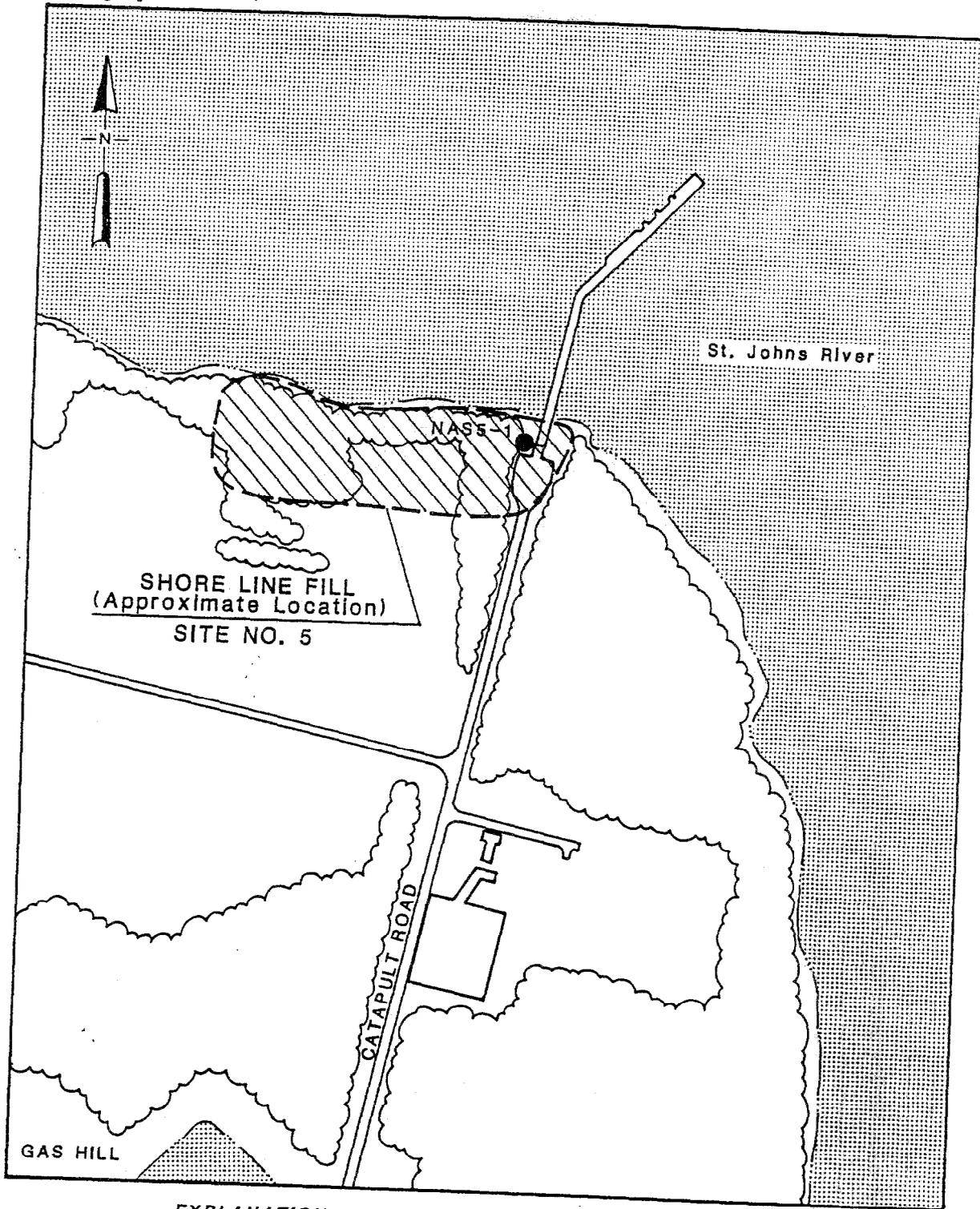
Findings:

- o Gross Alpha (< 2.3 pCi/l) and Gross Beta (14 + 3.1 pCi/l) were below levels to initiate further analysis.
- o Combined concentration of Radium 226 and 228 were below FDER primary drinking-water maximum contaminant levels (MCLs).
- o VOCs were all below laboratory detection limit.
- o Metals were all below MCL.

Recommendations:

- o No further investigation.

Mr Crane agrees to drop 4-29-84



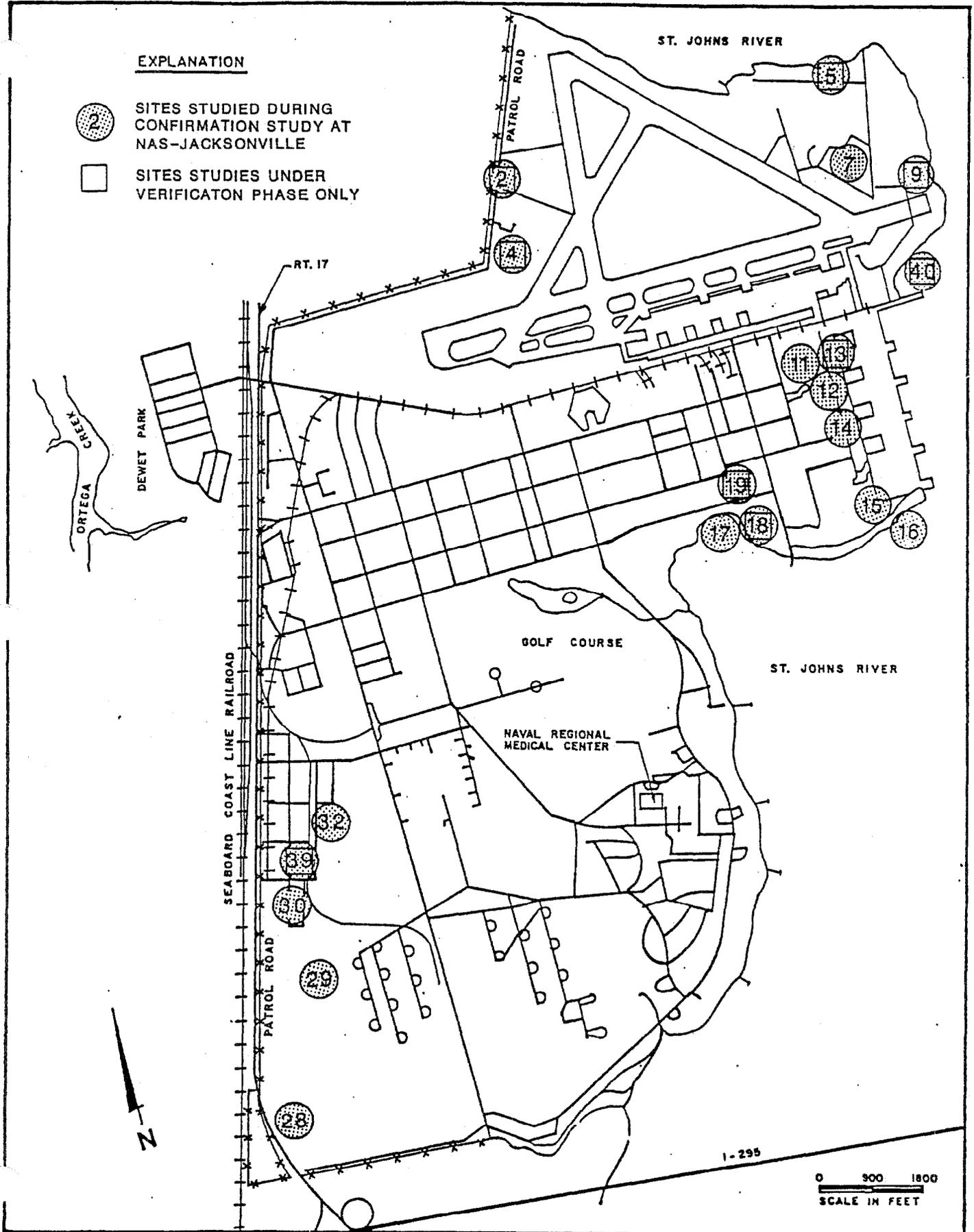
EXPLANATION
NAS5-1 ● MONITOR WELL
AND DESIGNATION

0 300 FT

SITE 5. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS-5-1
<u>RADIOACTIVE ANALYSIS, pCi/l</u>	
Gross alpha	<2.3
Gross beta	14 + 3.1
Radium 226	0.7 + 0.1
Radium 228	<0.8
<u>VOLATILES, ug/l</u>	
	-
<u>METALS, mg/l</u>	
Barium	0.28
<u>FIELD PARAMETERS</u>	
pH	7.49
Specific Conductance (umhos/cm)	600
Temperature (°C)	22

- = none detected



SITE NO. 7 - GAS HILL

Site Description

This site is currently used as a fuel storage facility for NAS-JAX and NAS-Cecil Field, storing both jet fuel (JP-5) and aviation gasoline (AVGAS-130).

Characterization Study

Work Performed:

- o Installed 27 exploratory soil borings around facility.
- o Constructed 2 piezometers to determine depth of water and presence or absence of free floating hydrocarbons.

Findings:

- o Hydrocarbon odors were present in soil above the water table at two areas around Gas Hill.
- o Free floating hydrocarbons were detected in one piezometer on the north side of Gas Hill.

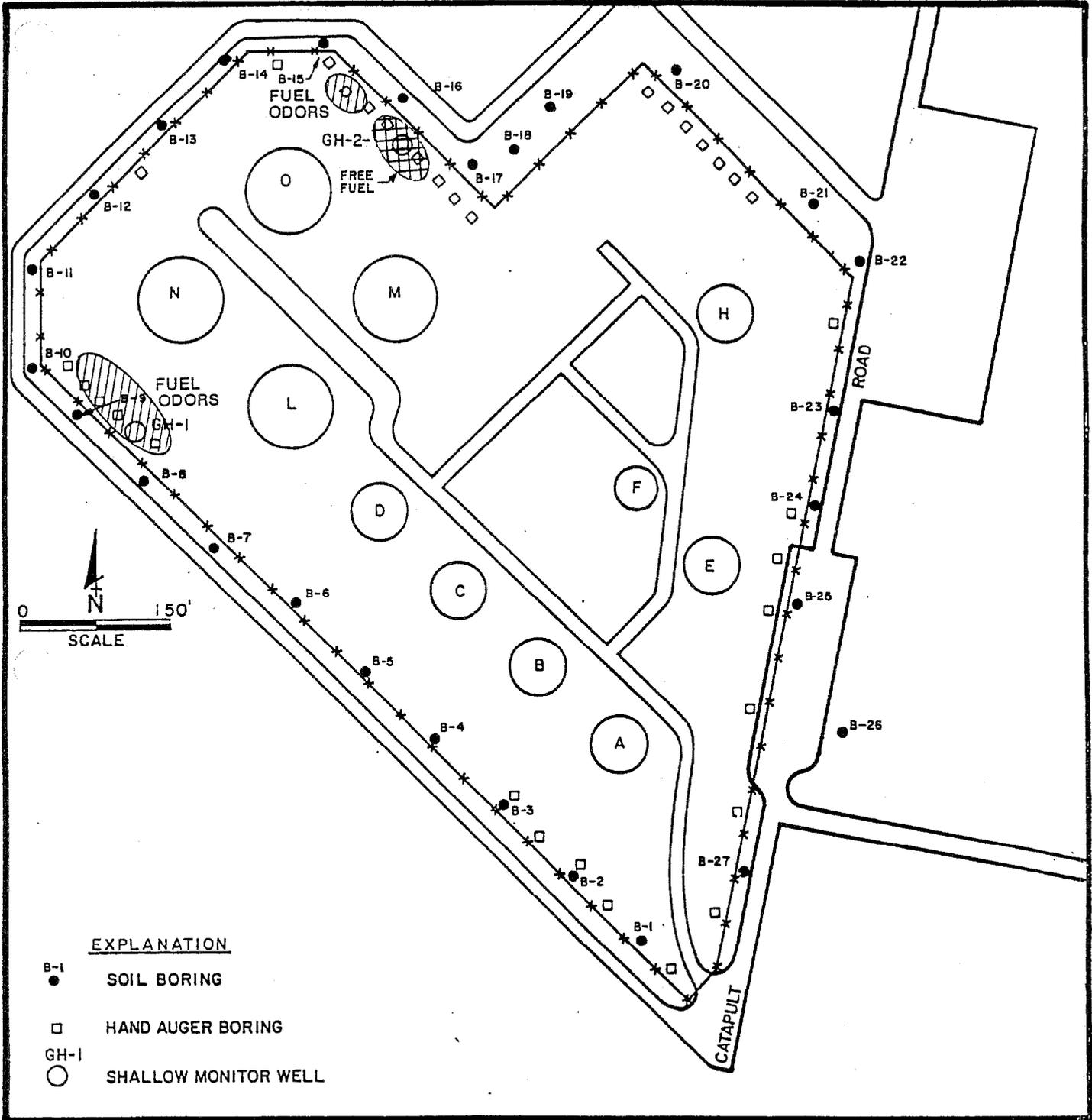
Recommendations:

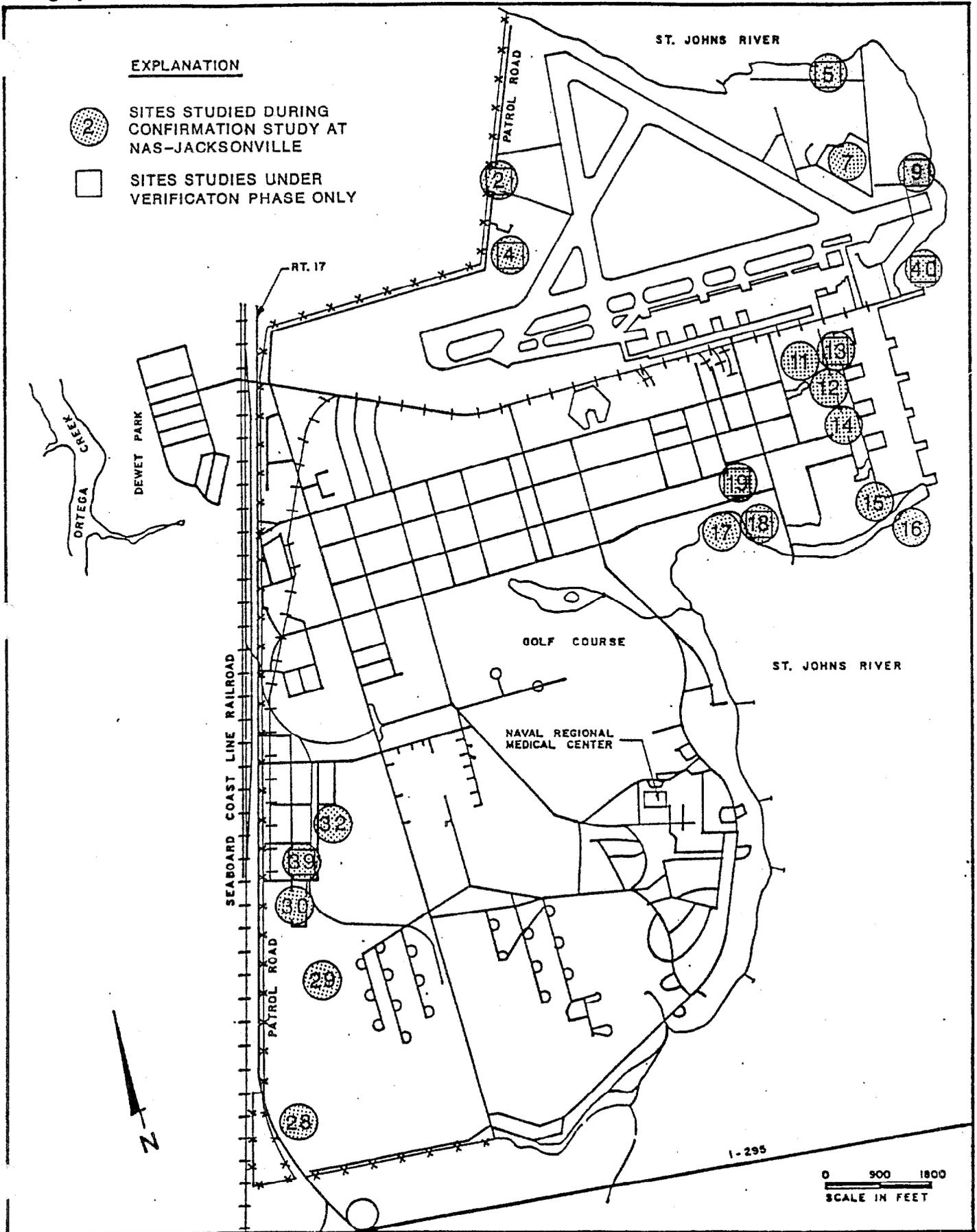
- o Installation of large diameter recovery well equipped with two pump recovery system.
- o Soil removed during construction of well to remain on site.
- o Ground-water discharged from well to be spray irrigated on site to increase soil flushing action.

601, ~~602~~, 610 state wants + city wants

Risk assessment . 4-29-84

most down gradient well requires 601





SITE NO. 9 - OLD DISPOSAL AREA

Site Description

This site was used as a disposal area for general refuse, construction debris, and a few 55-gallon drums during 1977 and 1978.

Verification Study

Work Performed:

- o Installed one monitor well (NAS 9-1).
- o Analyzed ground-water sample for VOCs, TOC, cyanide and metals.
- o Collected three soil samples (consisting of 3-4 sub-samples in an area) for EP Toxicity Testing of metals.

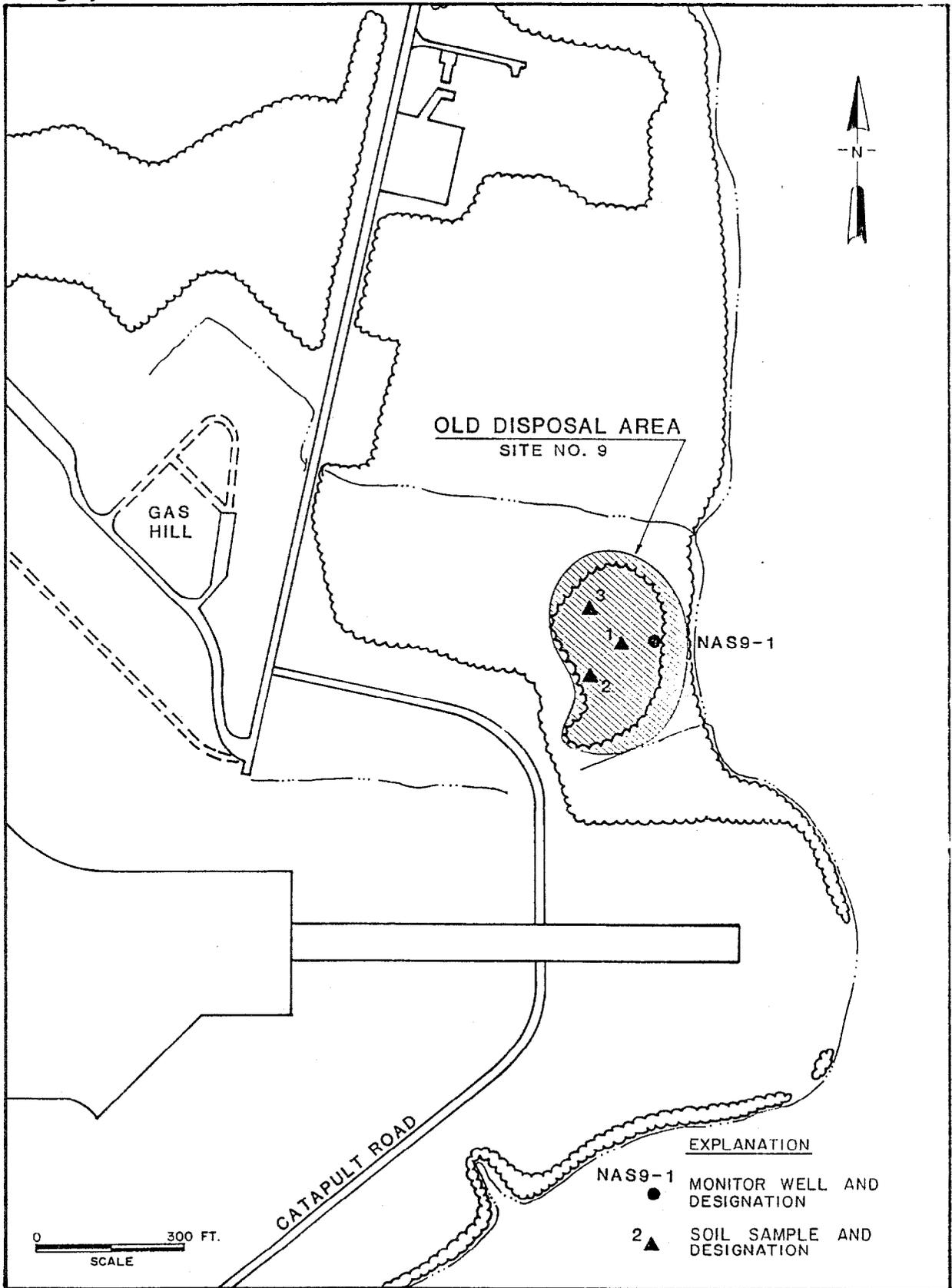
Findings:

- o Low concentrations of VOCs (total at 23.4 ppb) detection in ground-water.
- o Metals all below laboratory detection units.
- o TOC found at 17 ppm.
- o Specific conductance of sample measured in field appears to be influenced by brackish water of the St. Johns River.
- o Soil analyses indicates non-hazardous wastes.

Recommendations:

- o No further investigation.

Risk assessment



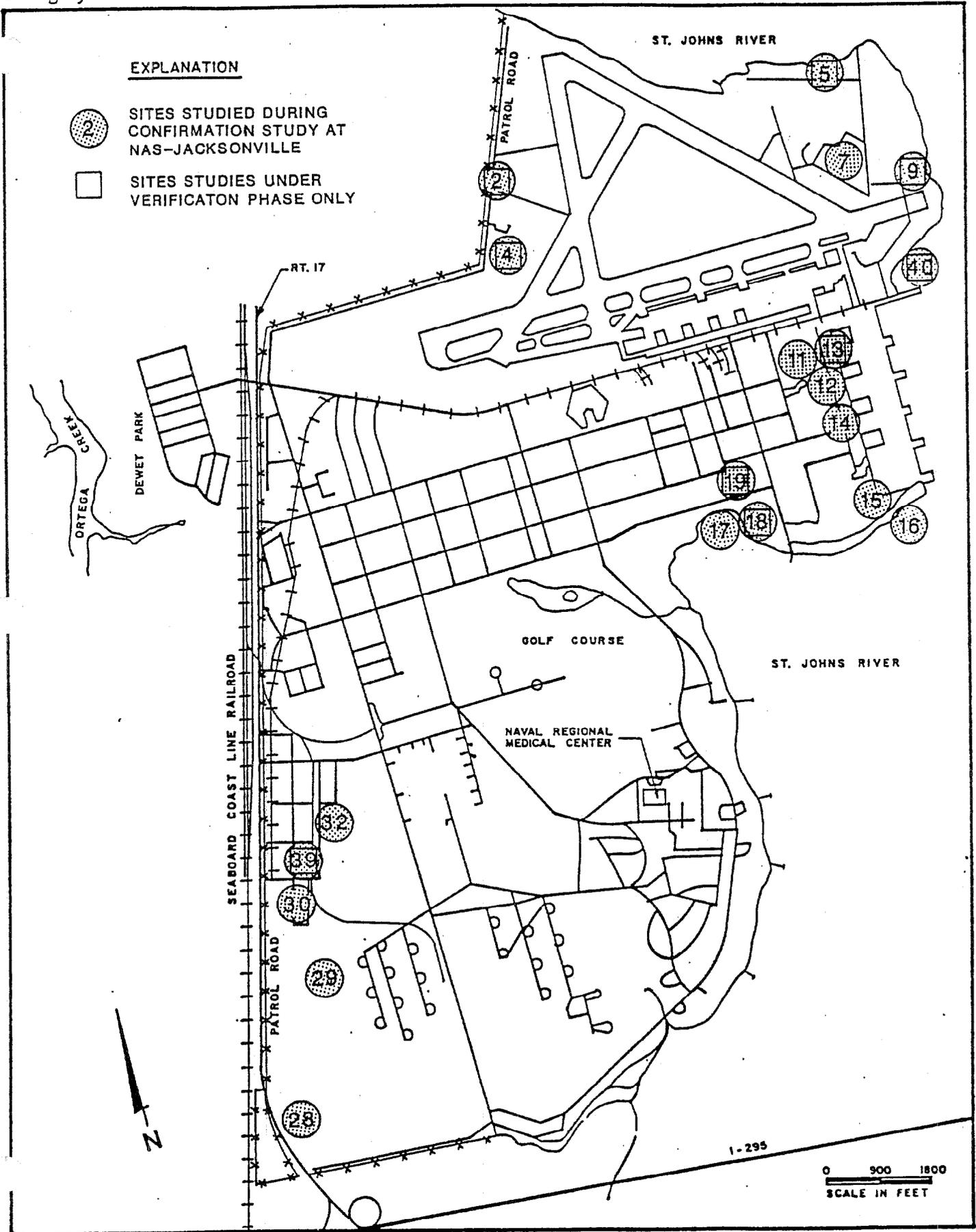
SITE 9. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS-9-1
<u>VOLATILES, ug/l</u>	
Methylene chloride	1.2
Trans-1,2-dichloroethene	21
Trichloroethene	1.2
<u>TOTAL VOLATILES</u>	<u>23.4</u>
<u>TOTAL ORGANIC CARBON, mg/l</u>	17
<u>CYANIDE, mg/l</u>	-
<u>METALS, mg/l</u>	-
<u>FIELD PARAMETERS</u>	
pH	6.90
Specific Conductance (umhos/cm)	1400
Temperature (°C)	24

Results of Chemical Analyses of Soil Samples

Compound	NAS-9-1	NAS-9-2	NAS-9-3
<u>EP TOXICITY, mg/l</u>			
Arsenic	-	-	0.002
Barium	0.2	0.2	-
Cadmium	0.028	0.17	0.071
Chromium	0.01	-	0.02

- = none detected



EXPLANATION



SITES STUDIED DURING CONFIRMATION STUDY AT NAS-JACKSONVILLE



SITES STUDIES UNDER VERIFICATON PHASE ONLY

SITE NO. 13 - RADIUM PAINT WASTE DISPOSAL AREA

Site Description

This site was used for the disposal of paint waste from aircraft instrument dial painting operations from World War II into the 1950's.

Verification Study

Work Performed:

- o Installed one monitor well (NAS13-1).
- o Analyzed two ground-water samples; the first for gross alpha, the second for gross alpha, gross beta, radium 226 and 228 and VOCs.

Findings:

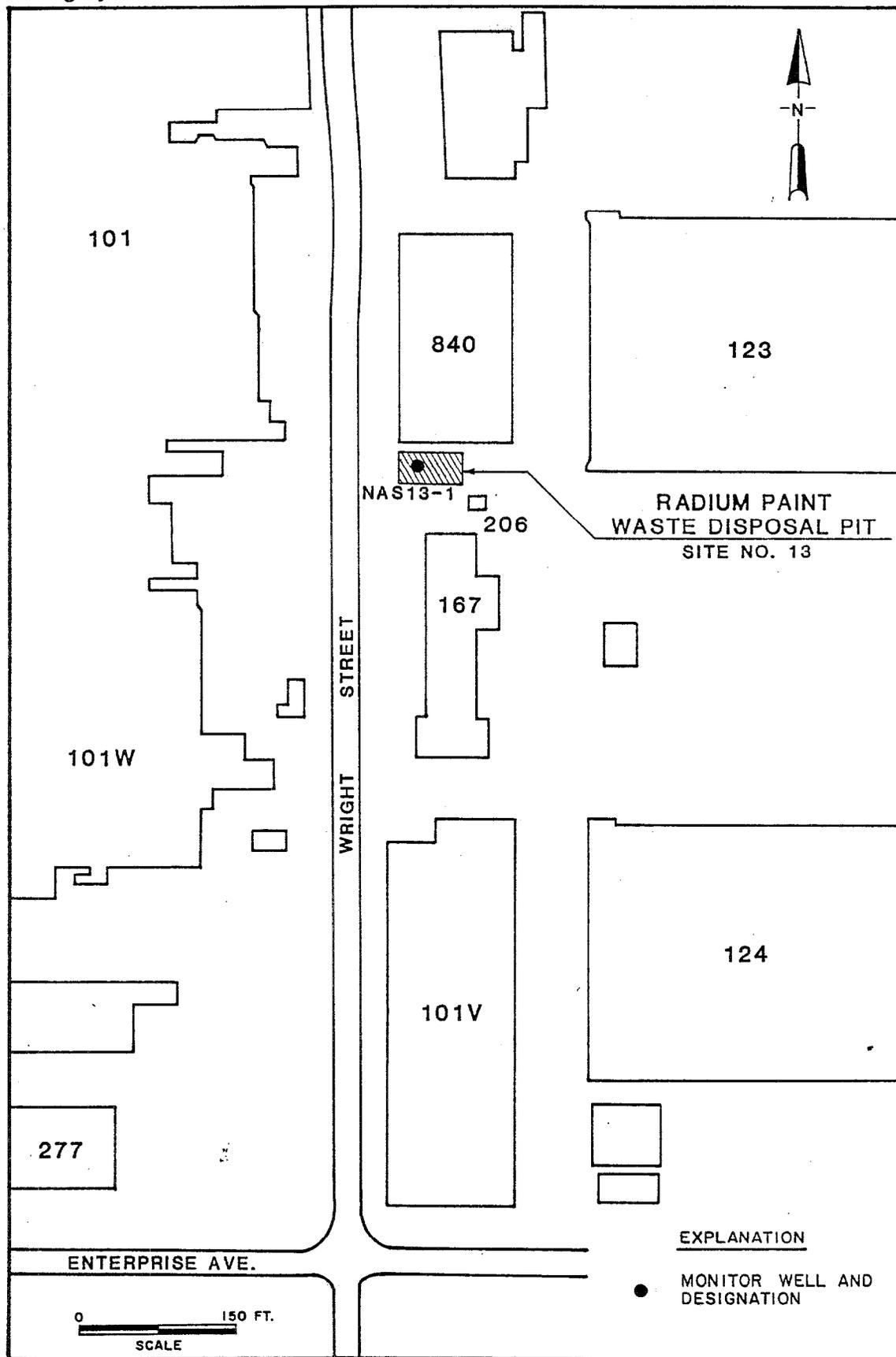
- o First sample showed high concentration of gross alpha ($54 \pm$ pCi/l).
- o Second sample, which was filtered in laboratory, had a concentration of gross alpha (6 ± 3 pCi/l) and gross beta (4 ± 2 pCi/l). Radium 226 at (6 ± 2 pCi/l) and radium 228 below laboratory detection limits (<1 pCi/l).
- o VOCs were all below laboratory detection limit.

Recommendations:

- o No further investigation.

~~Mr. Crane FOR Teller~~

Drop IT

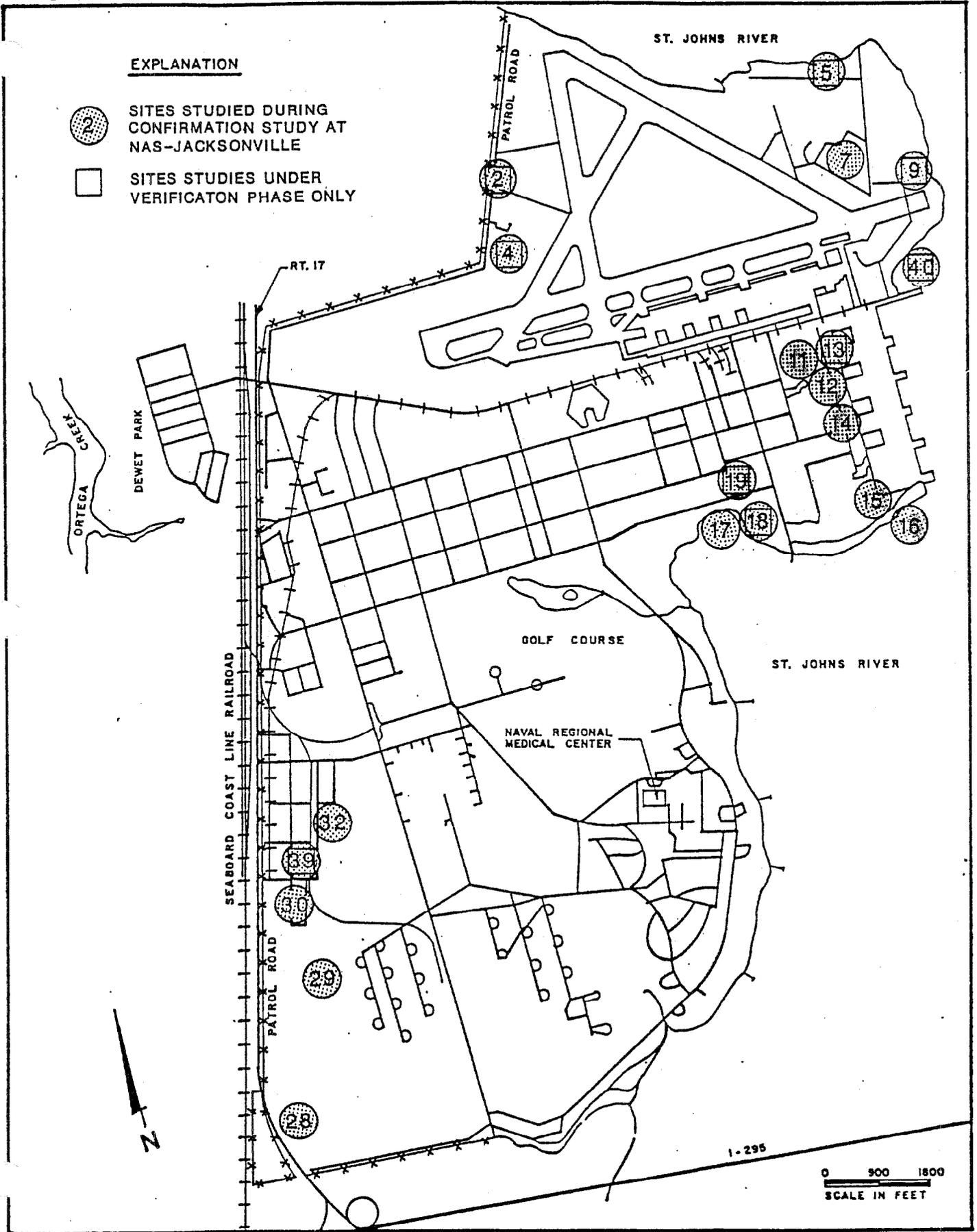


SITE 13. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS-13-1
<u>SAMPLE NO. 1</u>	
<u>RADIOACTIVE ANALYSIS, pCi/l</u>	
Gross alpha	54 ± 7

<u>SAMPLE NO. 2</u>	
<u>RADIOACTIVE ANALYSIS, pCi/l</u>	
Gross alpha	6 ± 3
Gross beta	4 ± 2
Radium 226	6 ± 2
Radium 228	<1
<u>VOLATILES, ug/l</u>	-
<u>FIELD PARAMETERS</u>	
pH	6.18
Specific Conductance (umhos/cm)	NA
Temperature (°C)	25

- = none detected	
NA = not analyzed	



SITE NOS. 11, 12, 14, 15, 16. NARF AREA

Site Description

Site No. 11 (Hanger Building 101): This site consists of the main hanger section of Building 101 where disposal of a total of 2000 gallons of solvents into industrial sewer lines may have been disposed of over a 40-year period.

Site No. 12 (Old Test Cell Building): The old test cell was used for storage of various chemicals in 55-gallon drums, some of which reportedly developed leaks.

Site No. 14 (Battery Shop): The battery shop contains a seepage pit where approximately 100 gallons of waste acids from lead-acid batteries were disposed of annually.

Site No. 15 (Solvent and Paint Sludge Disposal Area): This site was used as a disposal area for an estimated 2000 gallons annually of solvents and paint sludges.

Site No. 16 (Storm Sewer Discharge): The storm sewer that drains the NARF area has repeatedly contained JP-5 and other hydrocarbons at the outfall in the St. Johns River. Various other chemicals were reportedly disposed of in the storm sewer system over the years.

Verification Study

Work Performed:

- o Installed seven monitor wells (NARF-1, NARF-2, NARF-3, NARF-4, NARF-5, NARF-6, NARF-B-1).
- o Analyzed ground water for VOCs, TOC, cyanides, and metals.
- o Collected three soil samples at Site No. 15 and analyzed for EP Toxicity of metals.
- o Measured water-levels in wells.

Findings:

- o Shallow ground-water at site has primarily been affected by VOCs. Four compounds comprised nearly 80% of all the VOC detections (TCE, Trans-1,2-DCE, 1,1-DCE, and 1,1,1 TCA).
- o Relatively high levels of VOCs were found primarily in two areas; near Site No. 15 and east of Hanger Building 101.

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- o TOC concentrations ranged from <1 mg/l (NARF-2) to 9.5 mg/l (NARF-6).
- o Metal concentrations all below laboratory detection limits.
- o Cyanide ranged from below lab detection limits to 0.071 mg/l.
- o Soil analysis indicated non-hazardous wastes.
- o Shallow ground-water flow appears to be impeded by the presence of the sea wall along the St. Johns River. Flow direction is predominantly eastward although slight variations occur near the north and south ends of the sea wall.

Characterization Study

Work Performed:

- o Installed ten shallow monitor wells (NARF9-18) and two deep monitor well (NARFD-1 AND NARFD-2) in each of the two areas that previously exhibited high VOC concentrations in the ground-water.
- o Collected ground-water samples from twelve (12) new wells and six (6) wells installed previously.
- o Analyzed ground-water samples for only VOCs (14 wells) and complete EPA priority pollutant scan (4 wells).
- o Measured water-levels in wells.
- o Performed laboratory permeability tests on sediments encountered during drilling deep wells.

Findings:

- o Lithologic logs from deep wells show that a low permeability confining zone (approximately 21 feet thick) is present at well D-1 but not at D-2.
- o Nearly all water-quality samples were found to contain VOCs in concentrations ranging from trace levels to several tens of ug/l (micrograms per liter). High levels of VOCs were found at NARF B-1 (Site No. 15).
- o In the four wells (B-1, D-1, D-2 and 6) which were tested for other priority pollutants, only one compound, 2,4 dimethyl phenol (5.1 ug/l) was detected (NARFB-1) above laboratory detection limits. The metal concentrations were all below laboratory detection limits.

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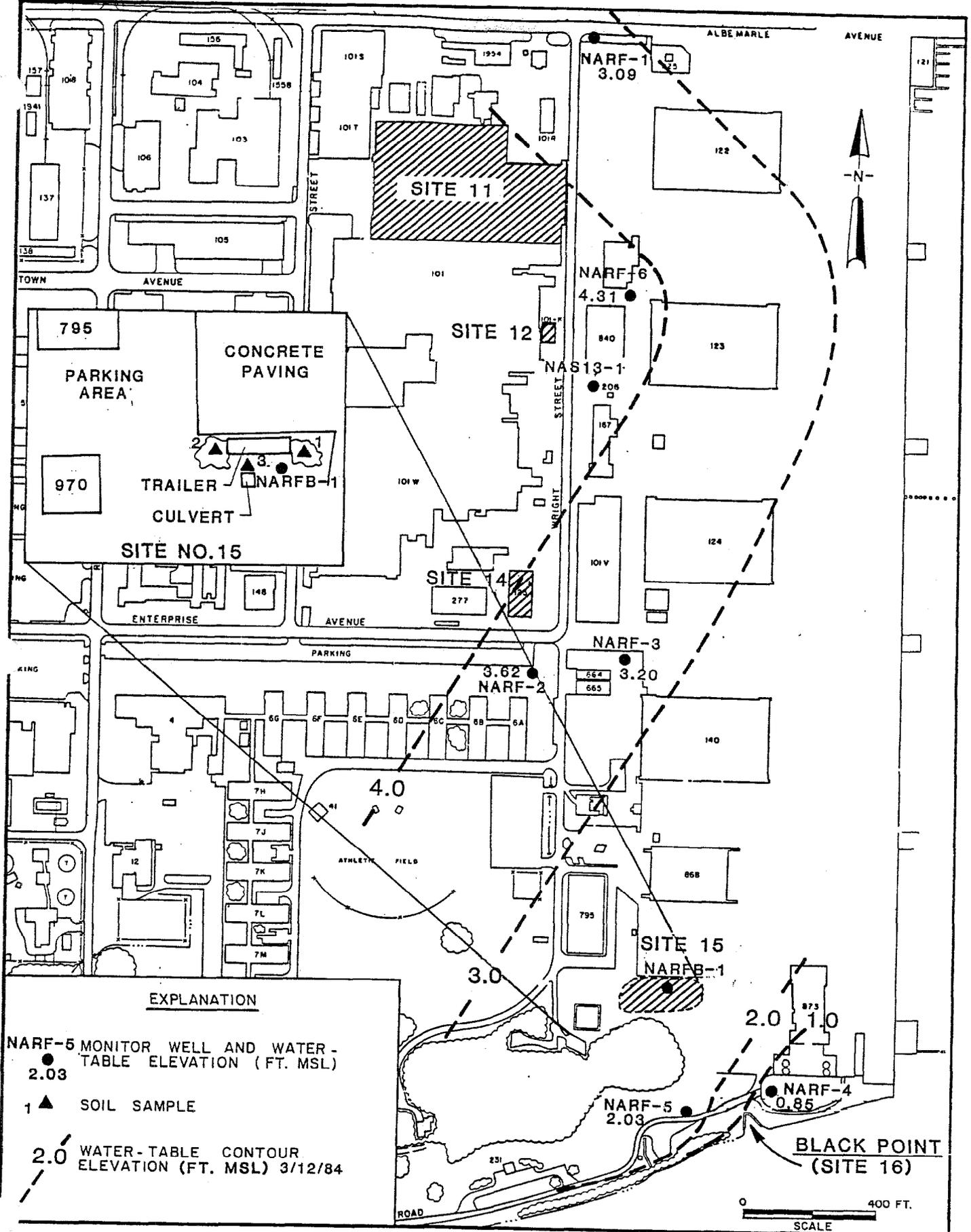
- o Shallow ground-water flow direction is primarily to the east and appears to be influenced by sea wall.
- o Water-level elevations show that there is an upward hydraulic gradient in the northern portion of the NARF and a very slight downward gradient in the southern portion. Vertical permeabilities in the sediments at D-1 were 1.23×10^{-6} cm/sec (centimeter per second) at 32-34 ft and 3.08×10^{-8} at 70-72 ft below land surface. A permeability of the clayey material below the screen at D-2 was 1.37×10^{-6} at 62-64 ft.

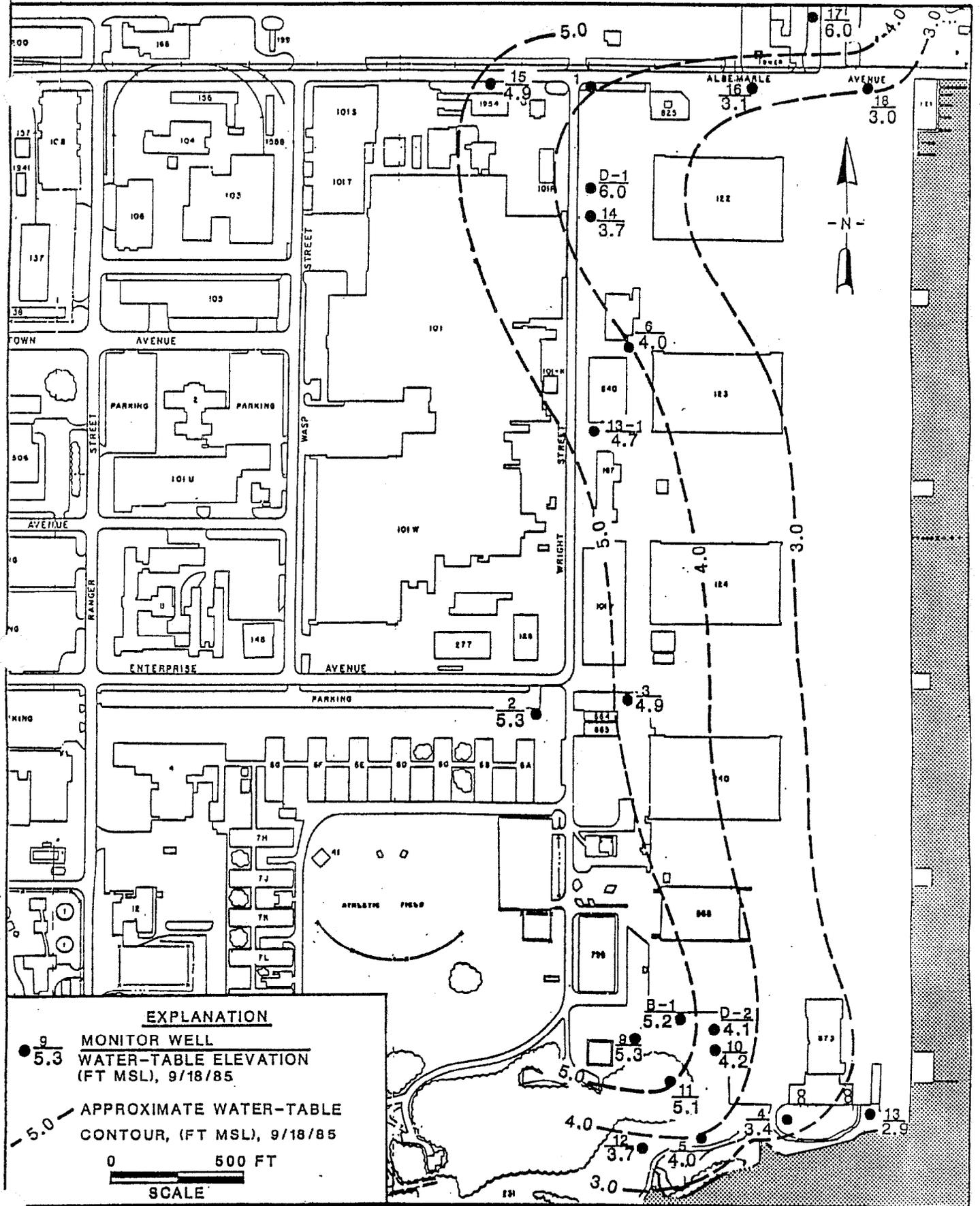
Recommendations:

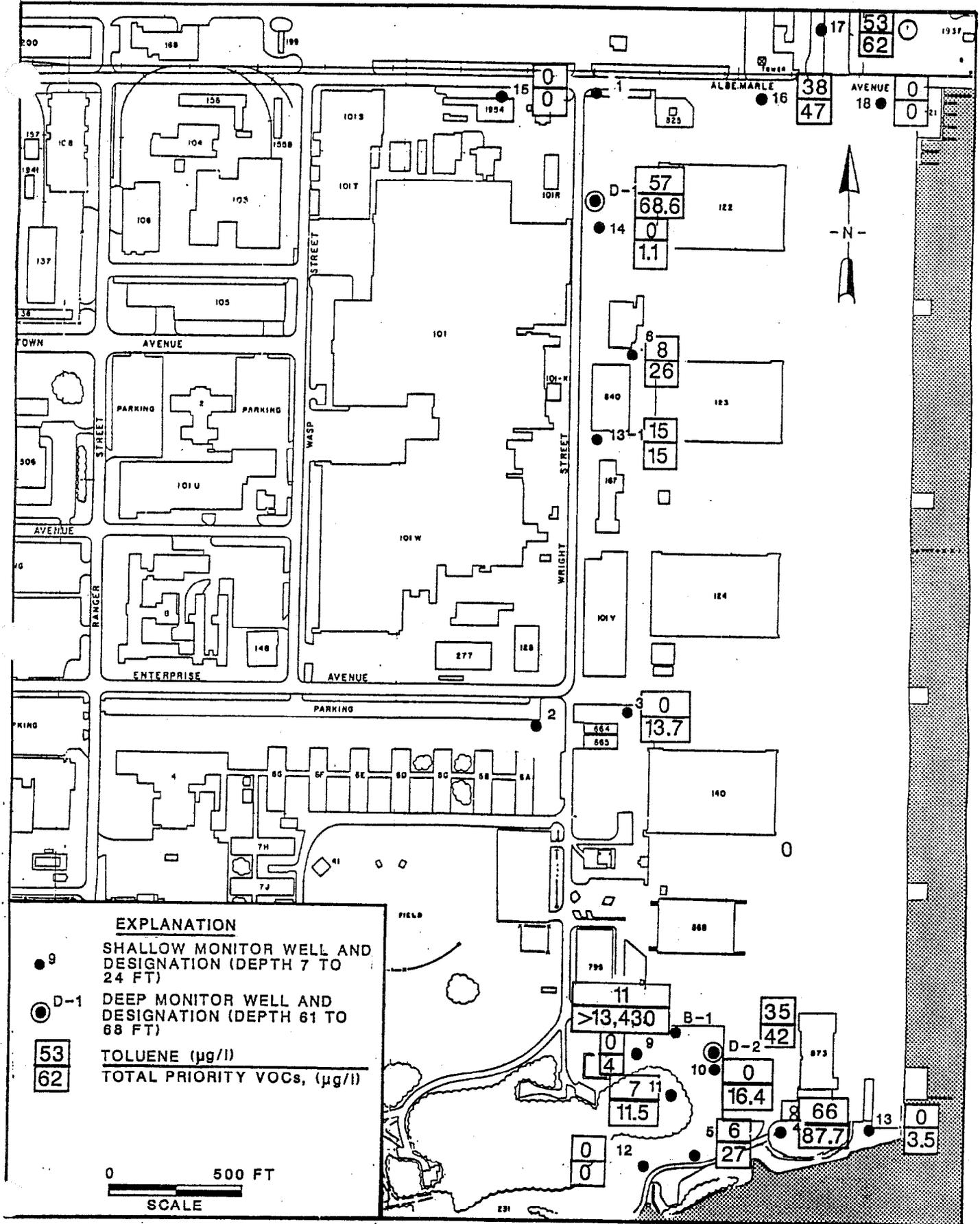
- o All NARF wells in which contaminants have been detected should be resampled for VOCs. Wells include B-1, D-1, D-2, 2,4,5,6,9,10,11,13,13-1,14,16,17.
- o Either repair or abandon NARF-1 due to vehicular damage to the well.
- o Sample water-supply wells in the vicinity for VOCs.
- o Install large-diameter interceptor well at Site No. 15. Conduct a pumping test to determine hydraulic characteristics of aquifer. Analyze water-quality samples from test to determine disposal alternatives for recovered water.

Crane
Mr ~~Clark~~ *Crane* thinks risk assessed on North end is OK. South end D1 needs corrective action.

Mr Crane would like to test specific conductance.
Place NARF as a whole under risk assessment.







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SITE 11, 12, 14, 15, 16. VERIFICATION STUDY

Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NARF-1	NARF-2	NARF-3	NARF-4	NARF-5	NARF-6	NARF-B1
<u>VOLATILES, ug/l</u>							
Vinyl chloride	-	-	-	270	-	-	-
Methylene chloride	0.6	-	1.8	-	-	-	-
1,1-dichloroethene	0.3	-	0.2	12	-	16	53,500
Trans-1,2-dichloroethene	0.4	-	2.2	1470	7.6	190	8,000
1,1,1-trichloroethane	0.7	-	0.5	6.2	-	22	25,500
Trichloroethene	23	3.9	6.1	170	4.9	6.0	155,300
Tetrachloroethene	-	-	-	1.8	-	-	480
Chloroform	-	-	-	-	-	5.5	-
<u>TOTAL VOLATILES</u>	<u>25.0</u>	<u>3.9</u>	<u>10.8</u>	<u>1930</u>	<u>12.5</u>	<u>239.5</u>	<u>242,780</u>
<u>TOTAL ORGANIC CARBON, mg/l</u>	3.9	<1.0	3.3	6.6	3.2	9.5	-
<u>CYANIDE, mg/l</u>	0.007	0.010	0.071	<0.005	<0.005	<0.005	<0.005
<u>METALS, mg/l</u>	-	-	-	-	-	-	-
<u>FIELD PARAMETERS</u>							
pH	11.88	5.51	6.07	6.81	6.17	6.35	5.73
Specific Conductance (umhos/cm)	2010	70	360	610	550	400	610
Temperature (°C)	29	28	31	26	27	30	28

Results of Chemical Analyses of Soil Samples

Compound	NAS 15-1	NAS 15-2	NAS 15-3
<u>EP TOXICITY, mg/l</u>			
Barium	0.1	0.3	0.3
Cadmium	0.15	0.041	-
Lead	1.66	-	-
Chromium	-	0.02	-

- = none detected

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SITE NOS. 11, 12, 13, 14, 15, 16. CHARACTERIZATION STUDY

Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NARF D-1	NARF D-2	NARF B1	NARF-3	NARF-4	NARF-5
<u>VOLATILES, ug/l</u>						
Toulene	57	35	11	-	66	6
1,1,1-Trichloroethane	3	2	>6500	-	4	-
Carbon Tetrachloride	2	2	2	-	2	2
Bromo dichloromethane	6.6	-	4	-	7	-
Trichloroethane	-	3	>6680	-	3	19
1,1,2-trichloroethane	-	-	170	13.7	-	-
cis-1,3-dichloropropane	-	-	-	6	-	-
Ethyl benzene	-	-	4	-	-	-
1,2 dichloroethane	-	-	-	-	5.7	-
<u>TOTAL VOLATILES</u>	<u>68.6</u>	<u>42</u>	<u>13337</u>	<u>19.7</u>	<u>87.7</u>	<u>27</u>
<u>BASE NEUTRAL</u>						
<u>EXTRACTABLES, ug/l</u>	-	-	-	-	-	-
<u>ACID EXTRACTABLES, ug/l</u>						
,4 - dimethyl phenol	-	-	5.1	-	-	-
<u>PESTICIDES/PCBS, ug/l</u>						
-	-	-	-	-	-	-
<u>METALS, mg/l</u>						
Barium	0.10	0.07	0.18	-	-	-
Zinc	0.04	0.02	0.03	-	-	-
<u>FIELD PARAMETERS</u>						
pH	7.51	8.55	6.41	6.68	7.21	6.91
Specific Conductance (umhos/cm)	320	240	360	160	225	210
Temperature (°C)	23	22	22	25	20	21

- = none detected

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SITE NOS. 11, 12, 13, 14, 15, 16. CHARACTERIZATION STUDY (Cont'd)

Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NARF-6	NARF-9	NARF-10	NARF-11	NARF-12	NARF-13
<u>VOLATILES, ug/l</u>						
Toluene	8	-	-	7	-	-
1,1,1-trichloroethane	16	-	-	-	-	-
Carbon tetrachloride	2	-	-	-	-	-
Chloroform	-	2	-	2	-	-
Bromodichloromethane	-	2	-	2.5	-	-
1,1 - dichloroethene	-	-	1.3	-	-	-
1,2-dichloroethane	-	-	5.5	-	-	-
Trichloroethene	-	-	9.6	-	-	-
Trans-1,2-dichloroethene	-	-	-	-	-	3.5
<u>TOTAL VOLATILES</u>	<u>26</u>	<u>4</u>	<u>16.4</u>	<u>11.5</u>	<u>0</u>	<u>3.5</u>
<u>BASE NEUTRAL</u>						
<u>EXTRACTABLES, ug/l</u>	-	-	-	-	-	-
<u>ACID EXTRACTABLES, ug/l</u>	-	-	-	-	-	-
<u>PESTICIDES/PCBS, ug/l</u>	-	-	-	-	-	-
<u>METALS, mg/l</u>						
Barium	0.10	-	-	-	-	-
Zinc	0.02	-	-	-	-	-
<u>FIELD PARAMETERS</u>						
pH	6.69	6.86	6.49	7.12	6.95	6.91
Specific Conductance (umhos/cm)	200	320	255	200	275	340
Temperature (°C)	24	21	21	20	20	22

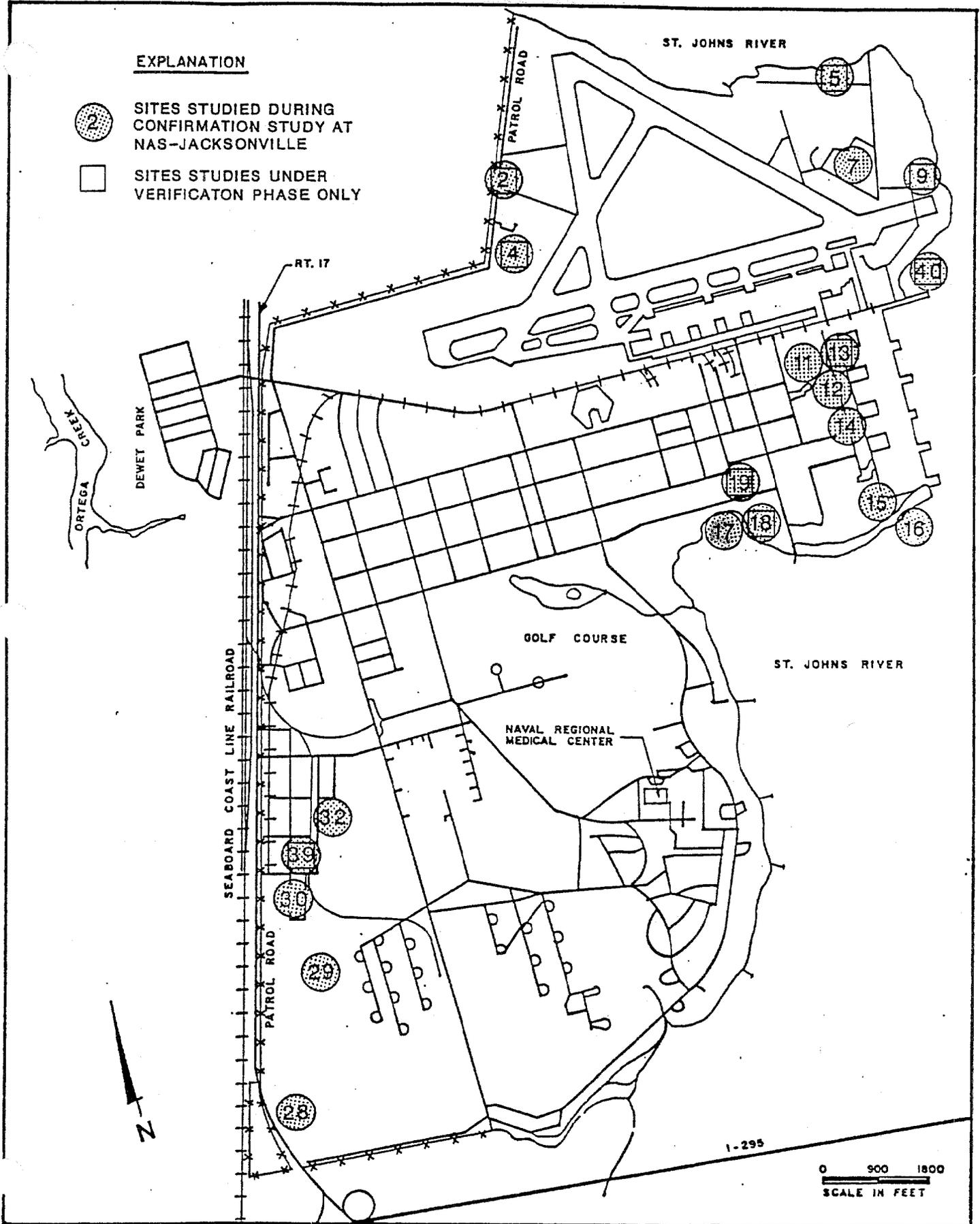
- = none detected

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SITE NOS. 11, 12, 13, 14, 15, 16. CHARACTERIZATION STUDY (Cont'd)Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NARF13-1	NARF-14	NARF-15	NARF-16	NARF-17	NARF-18
<u>VOLATILES, ug/l</u>						
Toluene	15	-	-	38	53	-
1,1-dichloroethane	-	1.1	-	-	-	-
1,1,1-trichloroethane	-	-	-	3	3	-
Bromodichloromethene	-	-	-	6	6	-
<u>TOTAL VOLATILES</u>	<u>15</u>	<u>1.1</u>	<u>0</u>	<u>47</u>	<u>62</u>	<u>0</u>
<u>FIELD PARAMETERS</u>						
pH	6.71	7.42	6.85	7.45	7.30	6.87
Specific Conductance (umhos/cm)	240	580	600	490	300	370
Temperature (°C)	24	23	21	23	22	24

- = none detected



SITE NO. 17. GLASS BEAD WASTE PILE

Site Description

Abrasive material (glass beads) used for removal of paint from aircraft was deposited along the shoreline of Mulberry Cove. This material contains fragments of the protective coatings and metal and occasionally exhibits the characteristic of EP Toxicity for cadmium.

Verification Study

Work Performed:

- o Three (3) sediment samples were collected and analyzed for EP Toxicity for nine metals.

Findings:

- o Laboratory results indicate non-hazardous waste.
- o Report was prepared in April 1984, entitled "Closure Plan for Spent Glass Bead Waste Pile."
- o Report recommended collecting 24 additional sediment samples for analysis of both EP Toxicity and total metals.

Characterization Study

Work Performed:

- o Twenty-four (24) sediment samples were collected.
- o Analyzed sediments for EP Toxicity of eight metals (4 samples - 1.1.1B, 1.2B, 2.3.1B, 3.2.1B) and total metals (destructive analyses for six metals).

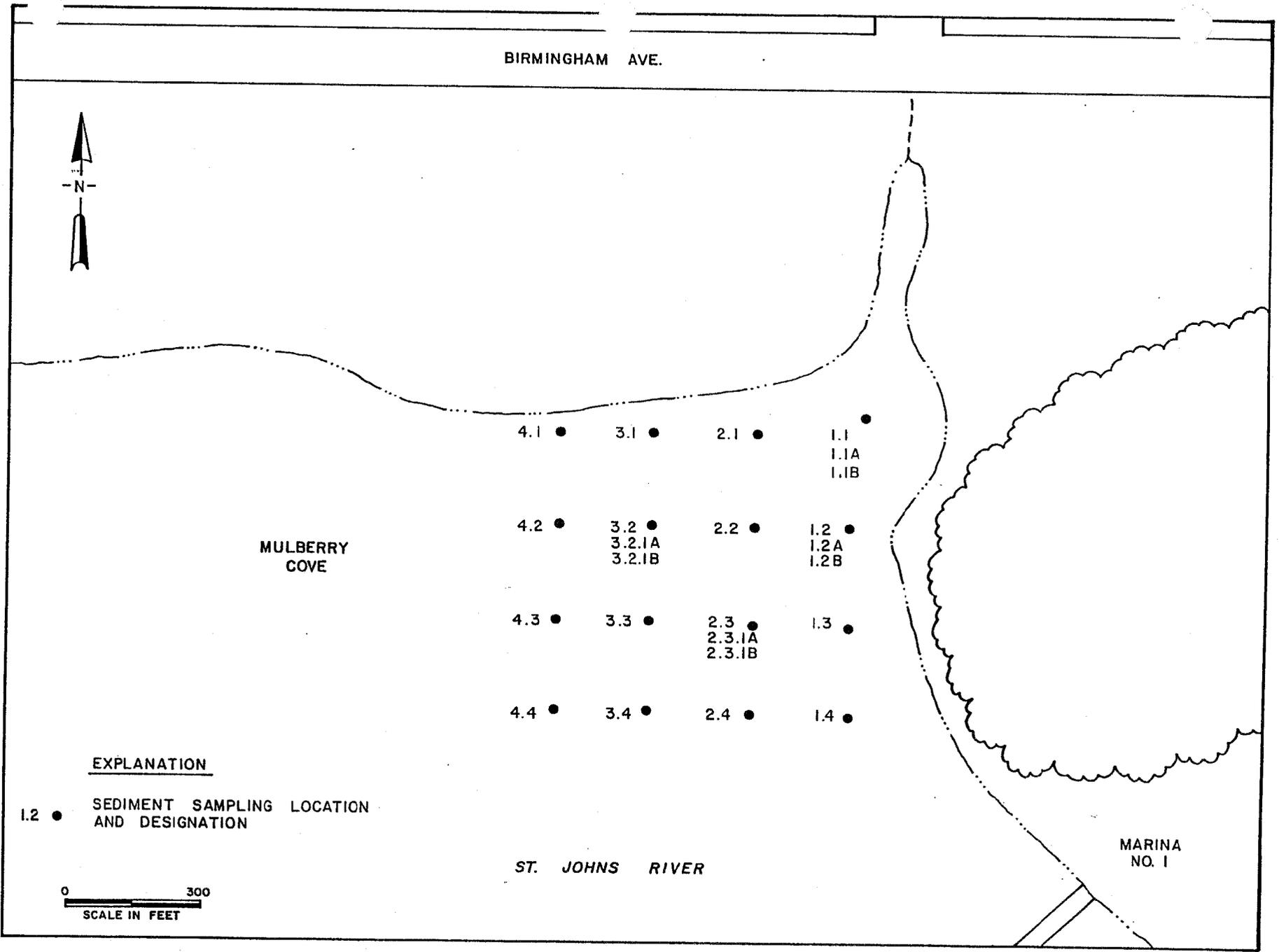
Findings:

- o Laboratory results indicate non-hazardous waste for EP Toxicity.
- o Bottom sediments contain elevated levels of selected metals when compared to background sample.
- o Exact boundary of waste pile is not easily identified but a permanent record stating that the abrasive material had been deposited in this area will be retained in Navy cadastral records.

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- o Report entitled "Closure of Spent Glass Bead Waste Pile submitted in February, 1985." It does not appear that these sediments can be removed from the cove without degrading the present cove environment. Therefore, no further action is recommended.

wayne mathis says drop it EPA.



SITE 17. VERIFICATION STUDY

Results of Chemical Analyses of Sediment Samples

Compound	NAS 17-1	NAS 17-2	NAS 17-3
<u>EP TOXICITY, mg/l</u>			
Arsenic	0.001	-	-
Barium	0.1	-	0.3
Cadmium	0.007	0.005	0.030
Chromium	0.02	-	-
Nickel	-	-	0.06

348/10

SITE 17. CHARACTERIZATION STUDY

Results of Chemical Analyses of Sediment Samples

Compound	1.1	1.1A	1.1.1B	1.2	1.2A	1.2B	1.3	1.4	2.1	2.2	2.3	2.3.1A	2.3.1B
<u>METALS, mg/kg</u>													
Cadmium	1.2	-		6.3	-		5.4	3	10	9.8	3.5	3	
Chromium	25	16		11	5		13	22	15	10	16	31	
Copper	12	320		24	2		21	72	36	10	24	31	
Lead	160	570		96	5		84	65	150	65	64	94	
Mercury	-	0.2		-	-		-	-	0.1	-	-	0.1	
Zinc	80	50		60	4		50	90	120	60	50	100	

EP TOXICITY, mg/l

Arsenic			0.004			0.002							0.004
Chromium			0.01			-							-

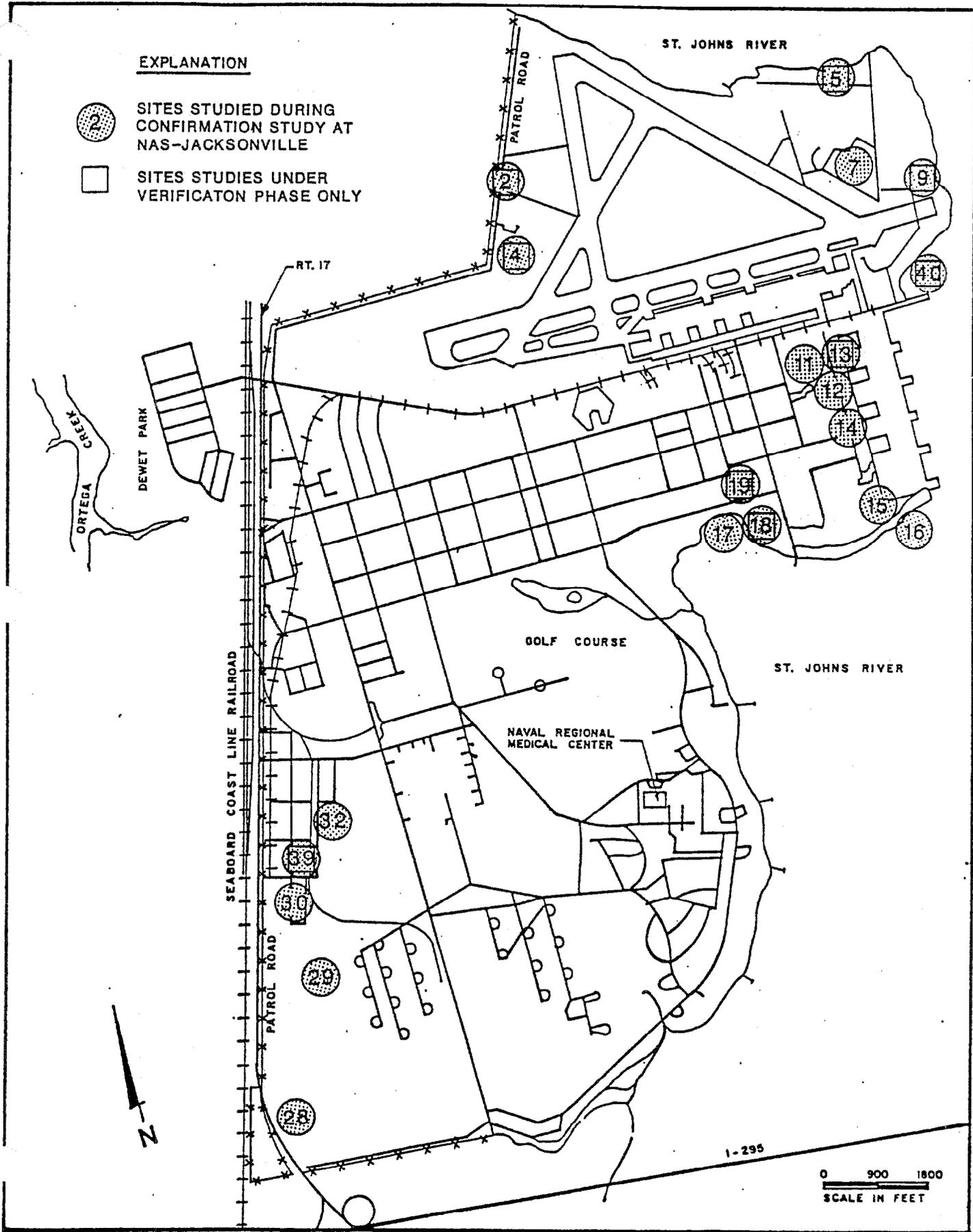
Compound	2.4	3.1	3.2	3.2.1A	3.2.1B	3.3	3.4	4.1	4.2	4.3	4.4
<u>METALS, mg/kg</u>											
Cadmium	0.5	7	2	-		5.9	1.6	20	35	-	-
Chromium	8	29	29	16		33	21	49	50	14	12
Copper	7	85	80	9		93	25	30	76	11	7
Lead	4	380	160	-		250	37	280	350	9	-
Mercury	-	0.1	0.2	-		-	-	-	-	-	-
Zinc	20	180	130	10		160	50	80	200	20	8

EP TOXICITY, mg/l

Arsenic						0.004					
Chromium						-					

- = None Detected

348/11



SITE NO. 18. RADIOACTIVE WASTE FILL AREA

Site Description

This site was used as a disposal area for approximately 1500 cubic feet of radium paint wastes and soil which was excavated from Site No. 13 in late 1950's. The area was originally near the water-level but was built up by this fill material.

Verification Study

Work Performed:

- o Installed one monitor well (NAS18-1).
- o Analyzed ground-water sample for gross alpha.

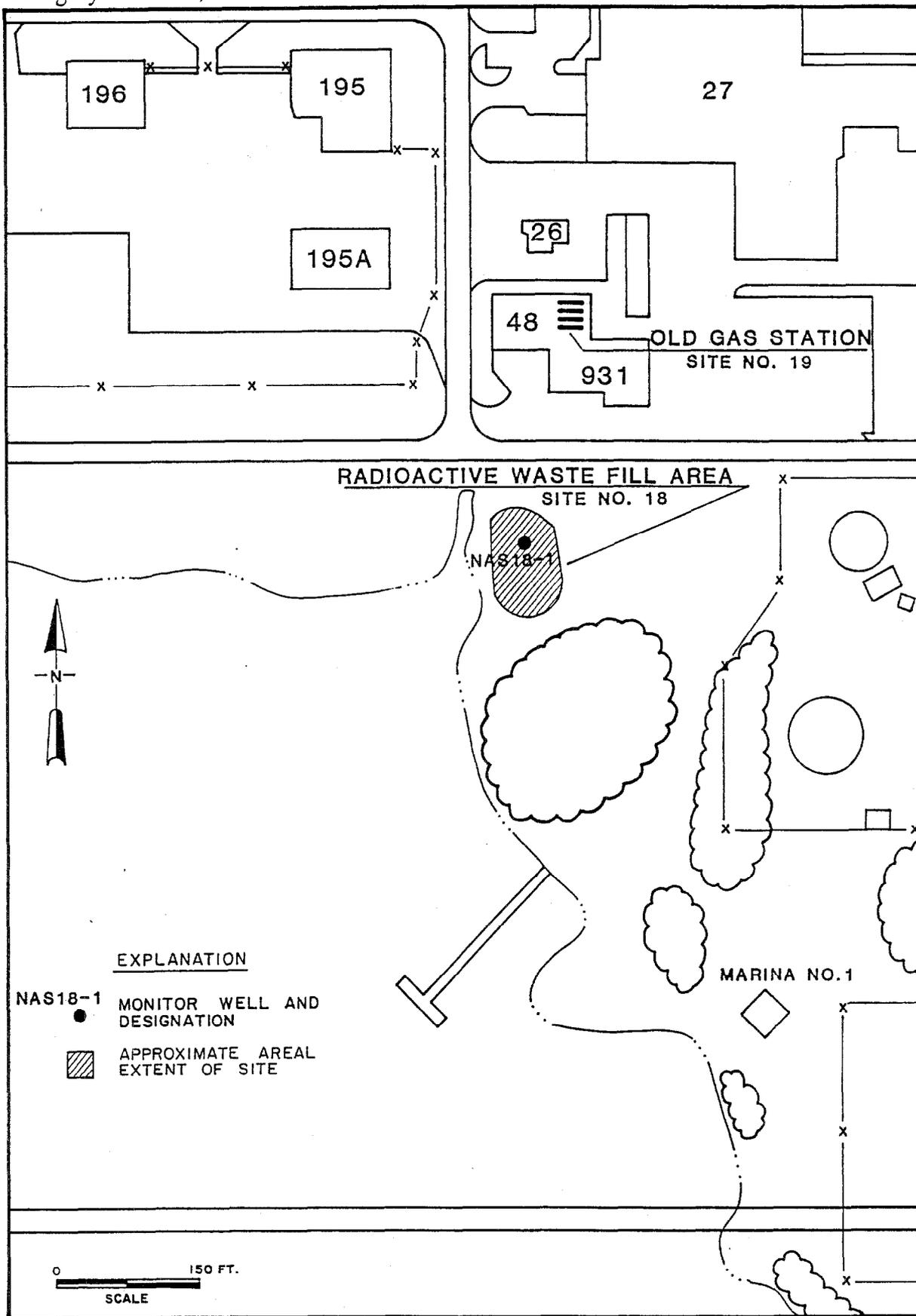
Findings:

- o Laboratory results show very low concentration of gross alpha (0 ± 3 pCi/l).

Recommendation:

- o No further investigation.

Drop it & Call DER



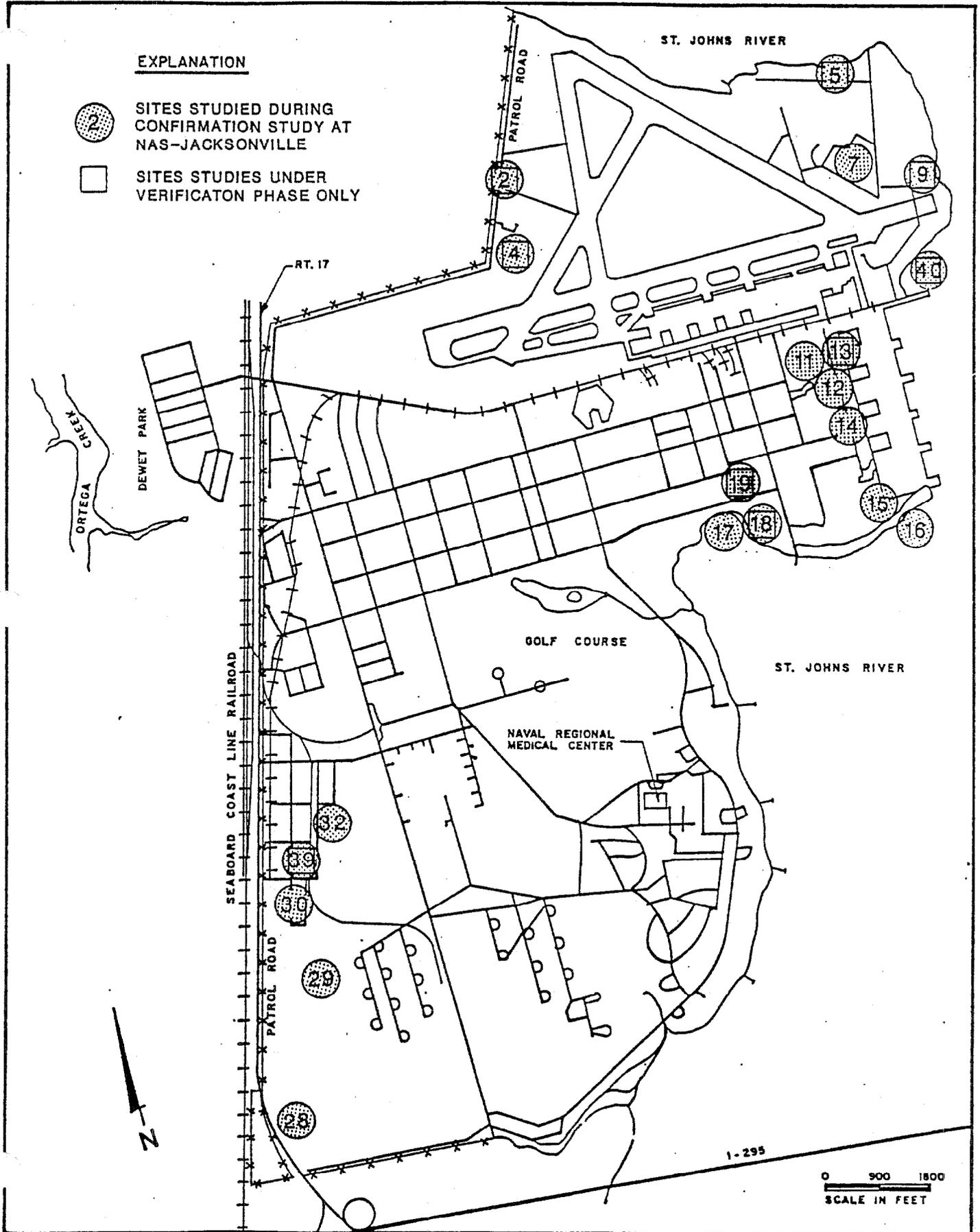
SITE 18. VERIFICATION STUDY

Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS 18-1
<u>RADIOACTIVE ANALYSIS, pCi/l</u>	
Gross alpha	0 ± 3
<u>FIELD PARAMETERS</u>	
pH	6.75
Specific Conductance (umhos/cm)	NA
Temperature (°C)	19

- = none detected

NA = not analyzed



SITE NO. 19. OLD GAS STATION

Site Description

The old gasoline service station (Building 48) contains four underground storage tanks which were abandoned by the Base Fire Department by filling with water. No hydrocarbons were observed discharging from the tank at the time of abandonment. The station is currently being used as a garden center.

Verification Study

Work Performed:

- o Site visit was made to locate tanks.

Findings:

- o Four 10,000 gallon tanks were located under plant stands.

Recommendations:

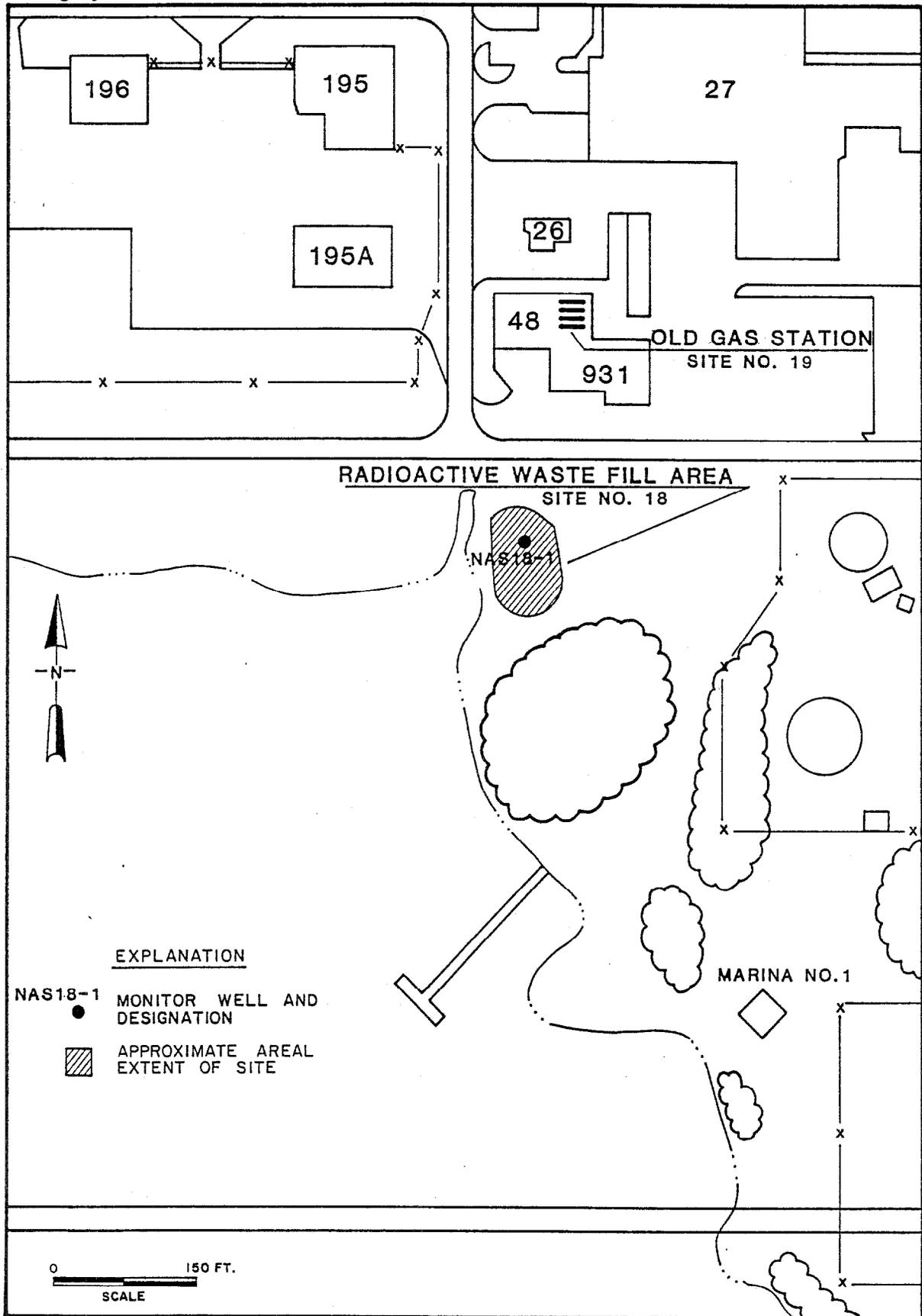
- o Abandon tanks by pumping water out of tanks to domestic waste water treatment plant and filling tanks with inert material such as sand.

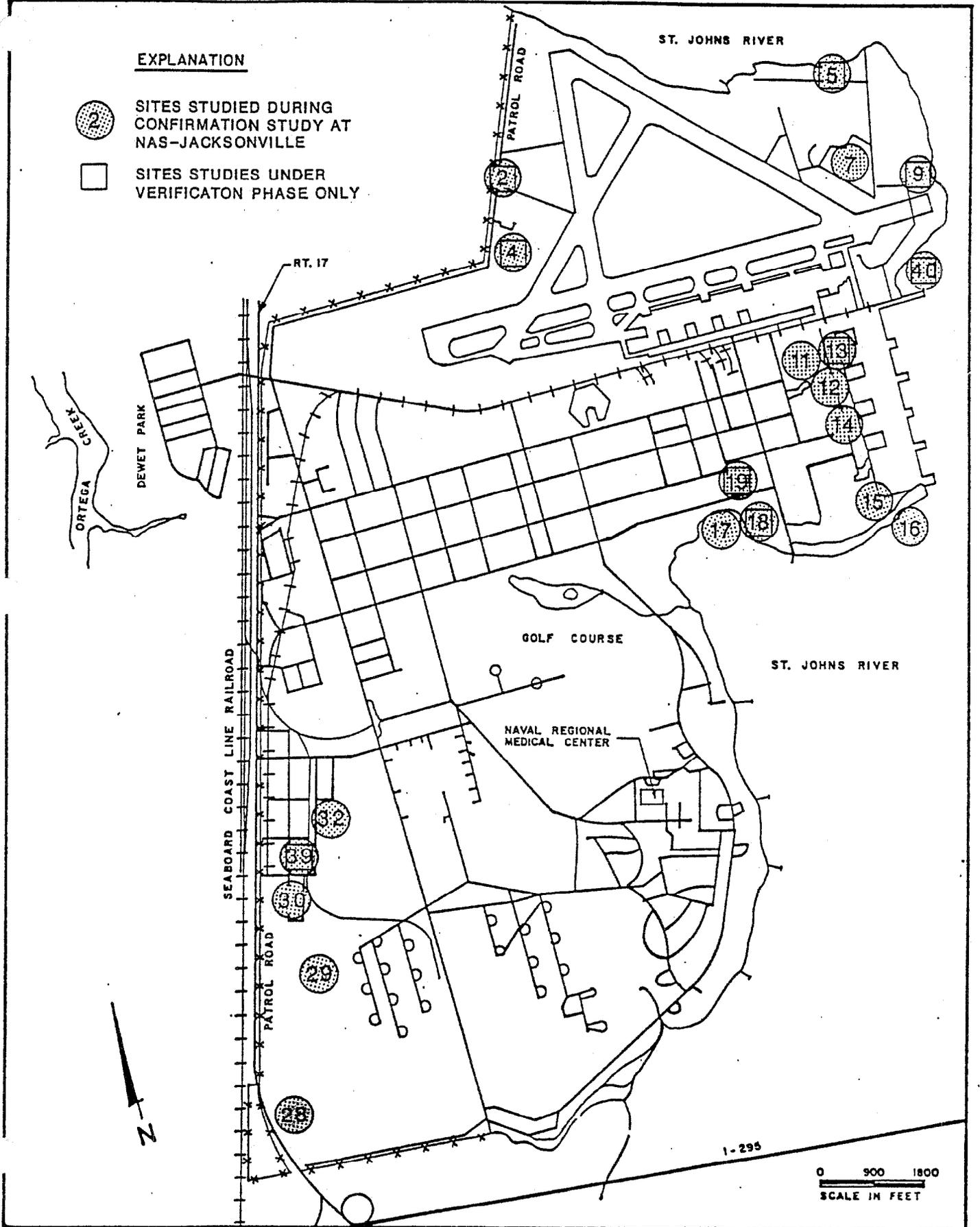
① Cathy wants a 601 + 602 completed from well # WAS 18.1

② Wayne doubts if they would be of value.

③ James agrees with Wayne

④ Mr Crane and Mr Fitzgibbon say to handle under ^{FAC} 17-61





SITE NO. 28. FIRE PIT

Site Description

This site formerly was used as a fire-fighting training area in which waste oils, possibly containing PCBs, were placed in a pit and incinerated.

Verification Study

Work Performed:

- o Installed one monitor well (NAS 28-1).
- o Analyzed ground-water sample for VOCs and PCBs.
- o Collected one soil sample which was composited from three locations.
- o Analyzed soil sample for PCBs.

Findings:

- o Ground-water sample was free of all VOCs and PCB with exception of very low concentration of TCE (4 ppb).
- o Soil sample contained concentration of PCBs in excess of recommended criteria (Chapter 17-34.02 (K), FAC) used to classify material as a hazardous waste.
- o Additional soil sampling was recommended to determine location of contaminated soils.

Characterization Study

Work Performed:

- o Soil samples were collected at fifteen locations from two depths 0-1 ft and 1-2 ft.
- o Analyzed samples for PCBs.

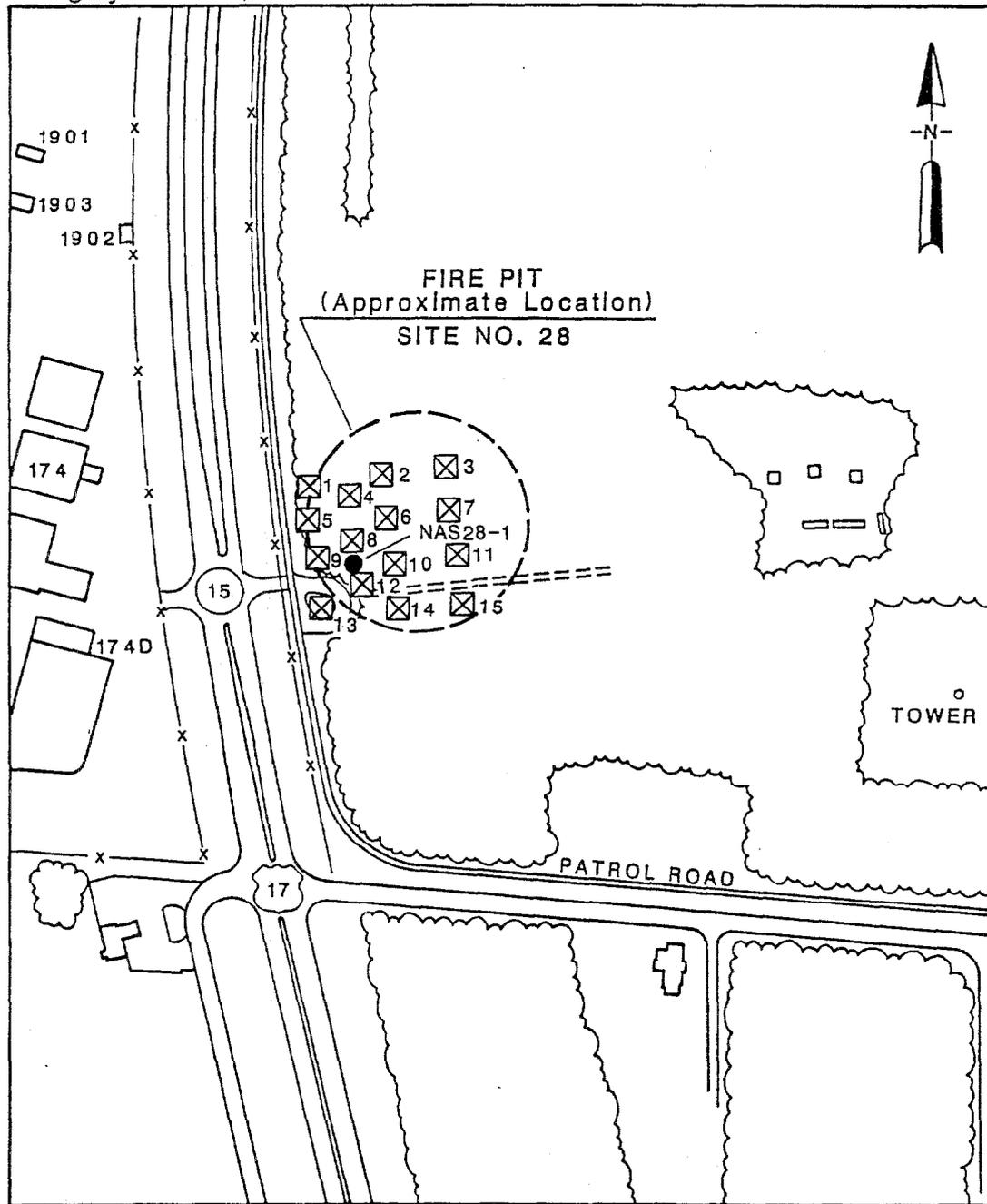
Findings:

- o Laboratory analyses shows that the PCB concentrations in all of the samples were less than 2 ppm; considerably lower than the hazardous waste criteria of 50 ppm.

Recommendations:

- o No further investigation is recommended.

Mr. Crane agrees to drop it 11-29-84



EXPLANATION

- NAS28-1 ● MONITOR WELL AND DESIGNATION
- ☒1 SOIL SAMPLES DURING CHARACTERIZATION STUDY

SITE 28. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

<u>Compound</u>	<u>NAS 28-1</u>
<u>VOLATILES, ug/l</u>	
Trichloroethene	4
<u>PCBs, mg/l</u>	<1.0
<u>FIELD PARAMETERS</u>	
pH	6.68
Specific Conductance (umhos/cm)	260
Temperature (°C)	20

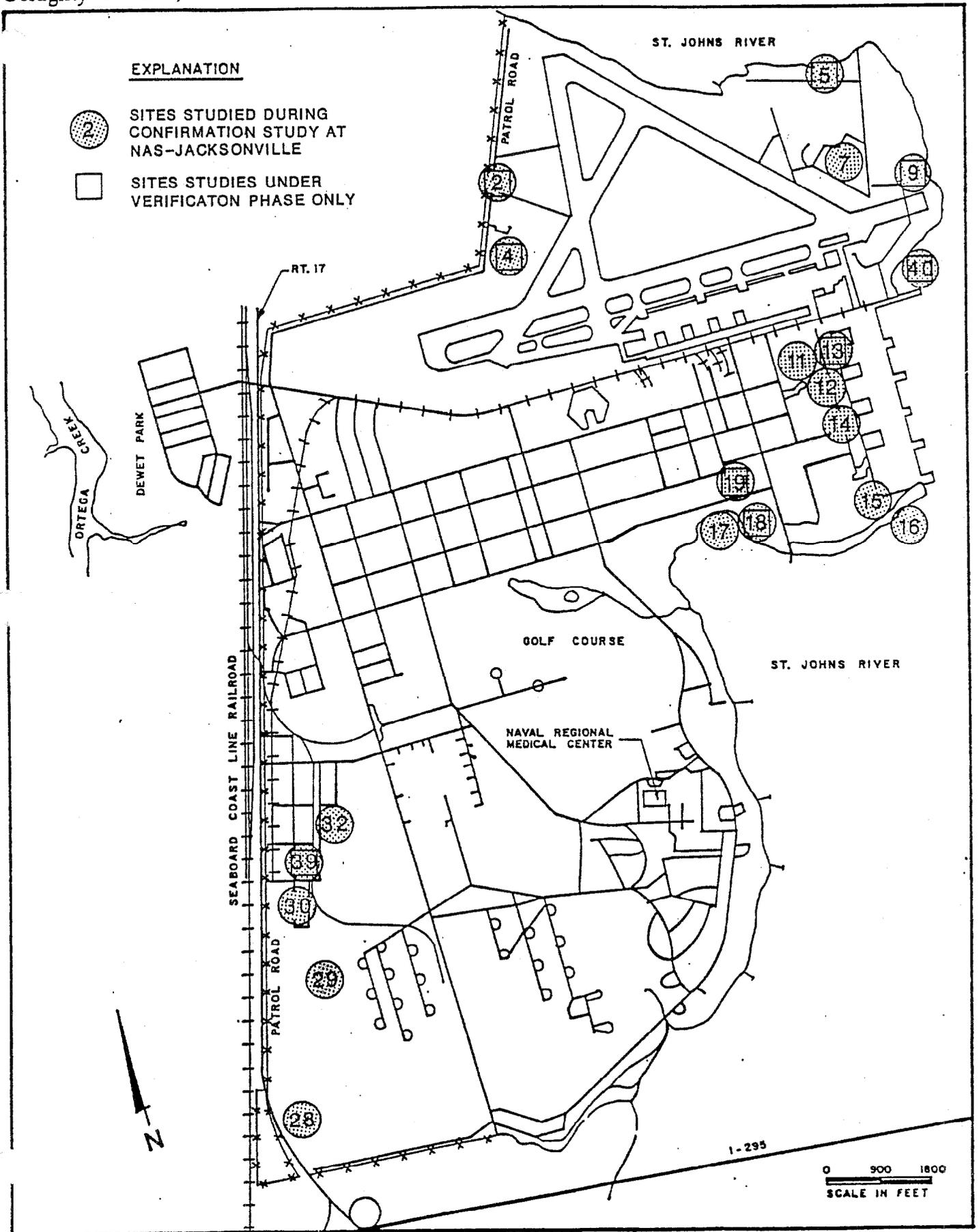
Results of Chemical Analyses of Soil Samples

<u>Compound</u>	<u>NAS 28-1</u>
<u>PCBs, mg/l</u>	103

SITE 28. CHARACTERIZATION STUDY

Results of Chemical Analyses of Sediment Samples

Sample No.	PCBs in mg/l
#3 (1-2 ft)	1.2
#8 (0-1 ft)	0.5
#9 (0-1 ft)	0.7
#12 (0-1 ft)	0.2
#15 (0-1 ft)	1.7
#15 (1-2 ft)	0.5



SITE NO. 29. ORGANIC DISPOSAL AREA

Site Description

The organic disposal area is used for disposal of organic debris such as wood and grass clippings. Additional items including crushed drums, construction debris, abrasive material piles, scrap metal, and PVC cases were present during a site visit by the IAS team.

Verification Study

Work Performed:

- o Installed two monitor wells (NAS29-1 and NAS29-2).
- o Analyzed ground-water samples for VOCs, TOC, cyanide and selected metals.
- o Collected three soil samples consisting of 3-4 sub-samples in an area.
- o Analyzed soil samples for EP Toxicity of metals.

Findings:

- o Shallow ground-water contained very low levels of VOCs (1 ug/l in NAS29-1 and 3.4 ug/l in NAS29-2).
- o TOC concentrations ranged from 2.8 ug/l (NAS 29-2) to 20.5 ug/l (NAS 29-1).
- o Metal concentrations were all below MCLs.
- o Soil sample from only one location revealed that this soil would constitute a hazardous waste.
- o Recommended further soil analysis in the affected area to delineate extent of hazardous waste.

Characterization Study

Work Performed:

- o Collected nine soil samples for analysis of cadmium by the EP Toxicity method.

Findings:

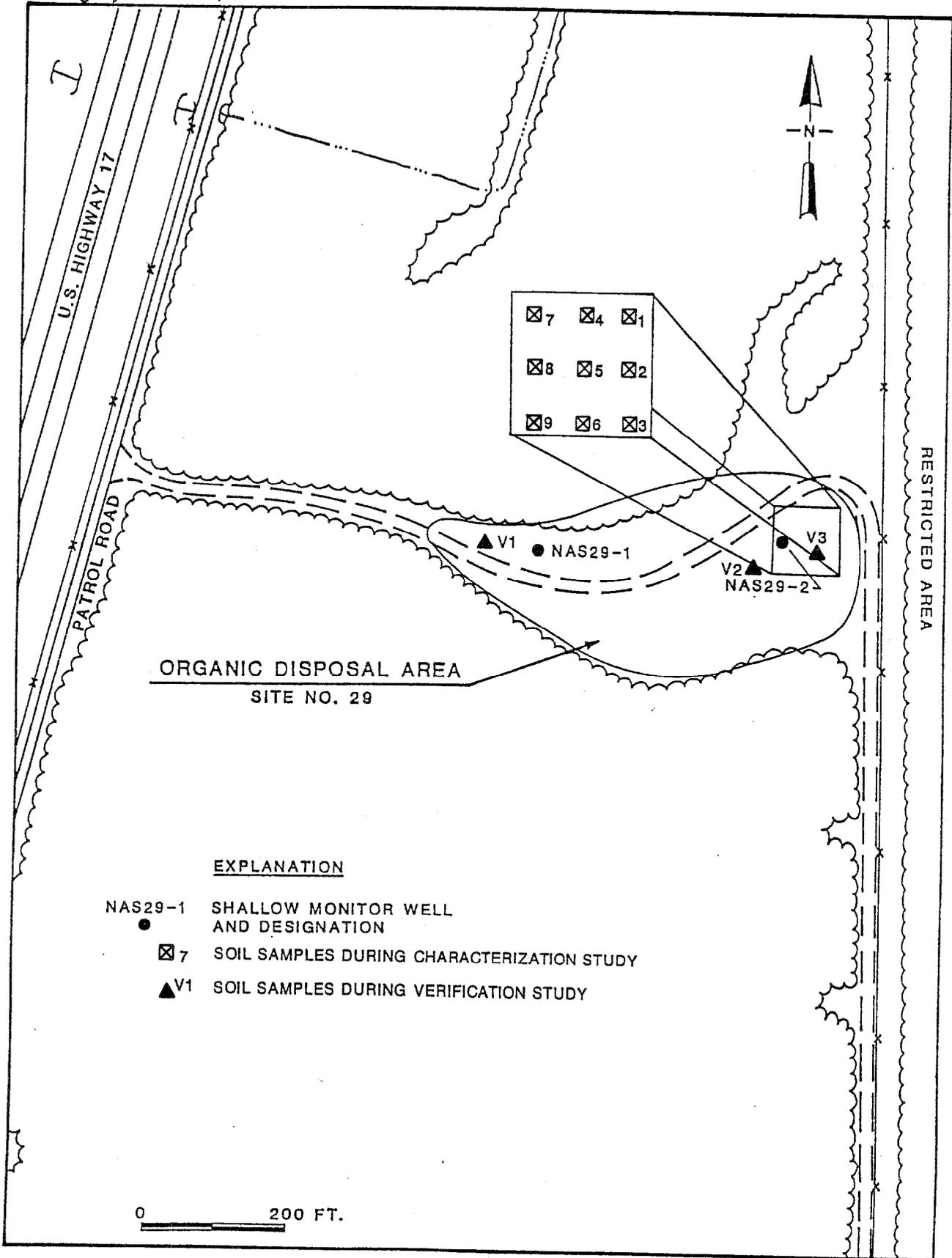
- o None of the soil samples exceeded the EP Toxicity level of 1 mg/l for cadmium; therefore, the soil is not considered a hazardous waste.

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Recommendation:

- o No further investigation.

Drop it.



ORGANIC DISPOSAL AREA
SITE NO. 29

EXPLANATION

- NAS29-1 ● SHALLOW MONITOR WELL AND DESIGNATION
- ☒ 7 SOIL SAMPLES DURING CHARACTERIZATION STUDY
- ▲ V1 SOIL SAMPLES DURING VERIFICATION STUDY

0 200 FT.

SITE 29. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS-29-1	NAS-29-2
<u>VOLATILES, ug/l</u>		
Chloromethane	-	3.4
Trans-1,2 - dichloroethene	0.6	-
1,1,1-trichloroethane	0.4	-
<u>TOTAL VOLATILES</u>	<u>1.0</u>	<u>3.4</u>
<u>TOTAL ORGANIC CARBON, mg/l</u>	20.5	2.8
<u>CYANIDE, mg/l</u>	<0.010	<0.010
<u>SELECTED METALS, mg/l</u>		
Copper	0.022	-
Zinc	0.066	0.016
<u>FIELD PARAMETERS</u>		
pH	6.38	6.28
Specific Conductance (umhos/cm)	NA	NA
Temperature (°C)	26	19

Results of Chemical Analyses of Soil Samples

Compound	NAS-29-1	NAS-29-2	NAS-29-3
<u>EP TOXICITY, mg/l</u>			
Arsenic	-	0.009	0
Barium	-	0.2	0.1
Cadmium	0.084	0.016	2.62
Chromium	0.04	-	-
Silver	0.02	-	-
Nickel	0.10	-	-

- = none detected
NA = not analyzed

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SITE NO. 29. CHARACTERIZATION STUDY

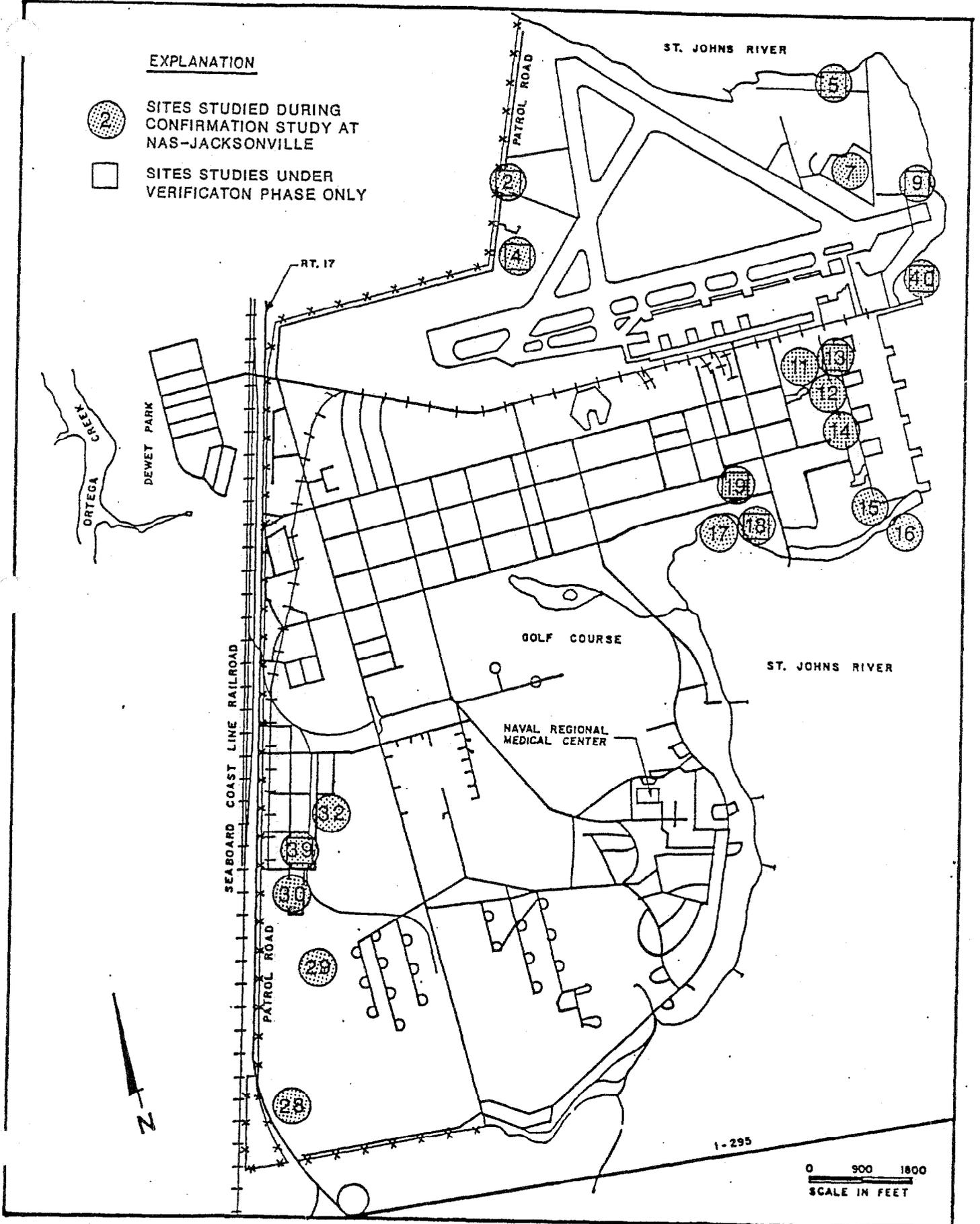
Results of Chemical Analyses of Soil Samples,
Existing Wells

Compound	#1	#2	#3	#4	#5	#6	#7	#8	#9
----------	----	----	----	----	----	----	----	----	----

EP TOXICITY, ug/l

Cadmium	-	-	-	-	-	-	-	-	-
---------	---	---	---	---	---	---	---	---	---

- = none detected



SITE NO. 30. OLD DRUM LOT

Site Description

The old drum lot was used for storage of drums containing raw products from 1955 to 1967. Reportedly, drums containing hazardous materials corroded and leaked their contents to the ground. Soil samples previously analyzed for PCBs in this area did not reveal any contamination.

Verification Study

Work Performed:

- o Installed three monitor wells (NAS30-1, NAS30-2, NAS30-3).
- o Analyzed ground-water samples for EPA priority pollutants.
- o Measured water levels in installed wells.
- o Collected six samples consisting of 3 sub-samples in an area for EP Toxicity analysis of metals.

Findings:

- o Laboratory analysis shows that the shallow ground water at the site contained only trace levels of two VOCs (TCE and Trans-1,2-DCE at one well (NAS30-2) and one base neutral compound (bis (2-chloroethyl) ether).
- o All metal and cyanide concentrations were below MCLs.
- o Shallow ground-water flow is to the east - southeast or toward a small drainage ditch.
- o Soil analysis shows levels of cadmium in three soil samples exhibit the characteristic of a hazardous waste.
- o Hazardous waste contractor was retained to remove contaminated soil.
- o Recommended follow-up study to be conducted in area after soil removal.

Characterization Study

Work Performed:

- o Installed two new monitor wells (NAS30-4 and NAS30-5).

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- o Analyzed three ground-water samples (two new wells and NAS30-1) for VOCs and metals.
- o Water-level measurements collected in all wells.
- o Collected six soil samples in excavated area for EP Toxicity analysis of cadmium and lead.

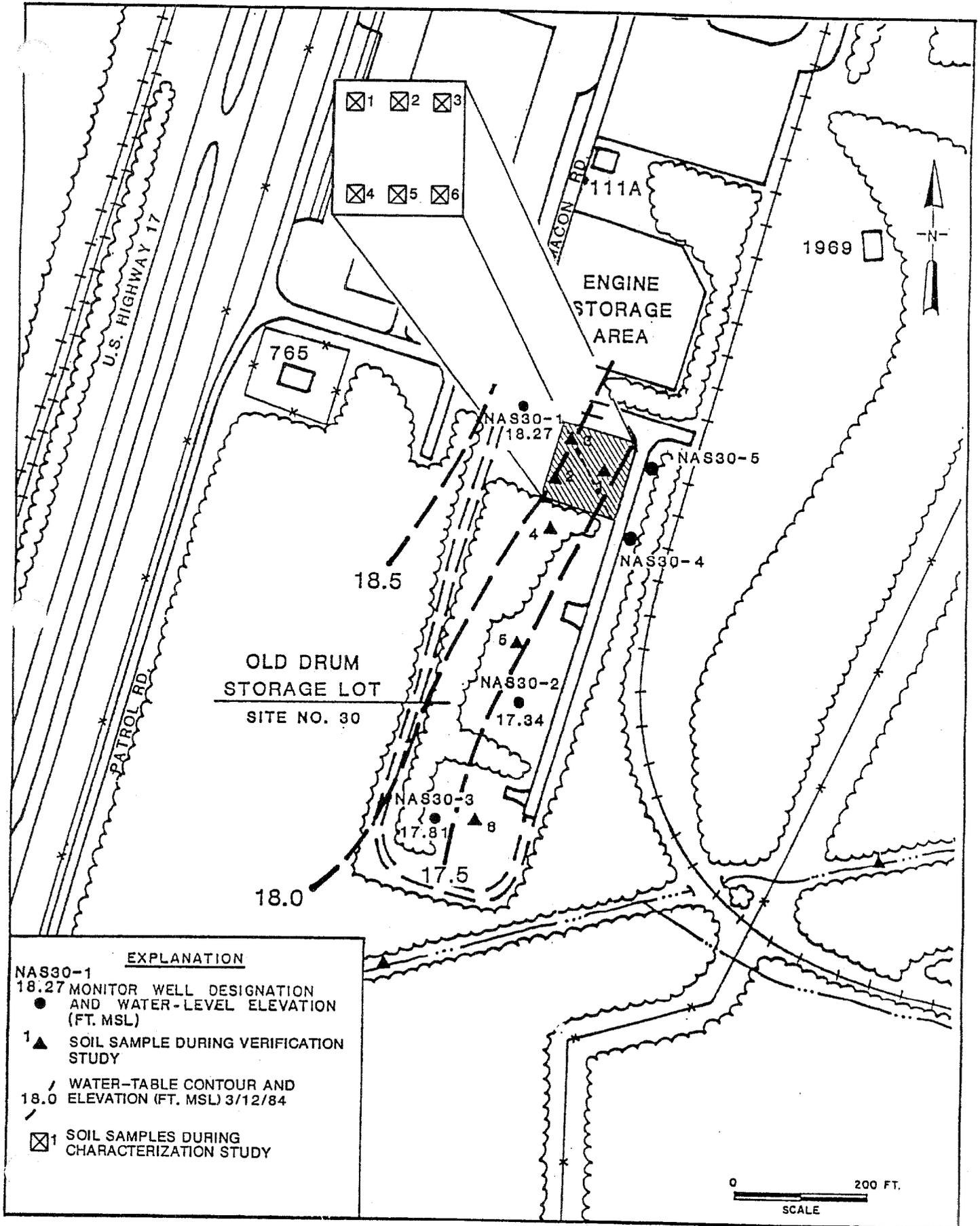
Findings:

- o VOCs, chiefly toluene (11 ug/l) and TCE (7 ug/l) detected only in NAS30-5.
- o Metal concentrations all below MCLs.
- o Analyses indicates that two of six soil samples (Nos. 3 and 4) exceeding EP Toxicity limit of cadmium for exhibiting the characteristic of a hazardous waste.

Recommendations:

- o Soils in area surrounding samples Nos. 3 and 4 should be removed and disposed of in an approved landfill.
- o Soil samples should be collected and analyzed for EP Toxicity (cadmium), during soil excavation, to assure contaminated soils are removed.

Risk Assessment.



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SITE 30. VERIFICATION STUDY

Results of Chemical Analyses of Ground-Water Samples

Compound	NAS-30-1	NAS-30-2	NAS 30-3
<u>VOLATILES, ug/l</u>			
Trans-1,2 - dichloroethylene	-	TR	-
Trichloroethylene	-	TR	-
<u>TOTAL VOLATILES</u>	<u>0</u>	<u>TR</u>	<u>0</u>
<u>ACID EXTRACTABLES, ug/l</u>			
	-	-	-
<u>BASE/NEUTRAL EXTRACTABLES, ug/l</u>			
bis (2-chloroethyl) ether	-	54	-
<u>PESTICIDES/PCBs, ug/l</u>			
	-	-	-
<u>METALS, mg/l</u>			
Copper	-		0.023
Zinc	0.030		-
<u>CYANIDE, mg/l</u>			
	-	-	-
<u>FIELD PARAMETERS</u>			
pH	5.37	6.13	6.10
Specific Conductance (umhos/cm)	145	420	290
Temperature (°C)	25	27	27

Results of Chemical Analysis of Soil Samples

Compound	NAS 30-1	NAS 30-2	NAS 30-3	NAS 30-4	NAS 30-5	NAS 30-6
<u>EP TOXICITY, mg/l</u>						
Barium	0.2	-	-	-	-	-
Cadmium	3.53	2.67	3.50	0.087	0.015	0.040
Chromium	0.23	0.01	-	0.06	-	0.03
Mercury	0.0005	-	-	-	-	-
Lead	-	2.55	-	-	-	0.11
Nickel	-	1.22	0.55	0.14	0.09	0.14
Arsenic	-	-	-	0.089	0.037	0.008
Silver	-	-	-	0.02	0.02	0.02

- = none detected
 TR = trace (<10 ppb)

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SITE NO. 30. CHARACTERIZATION STUDY

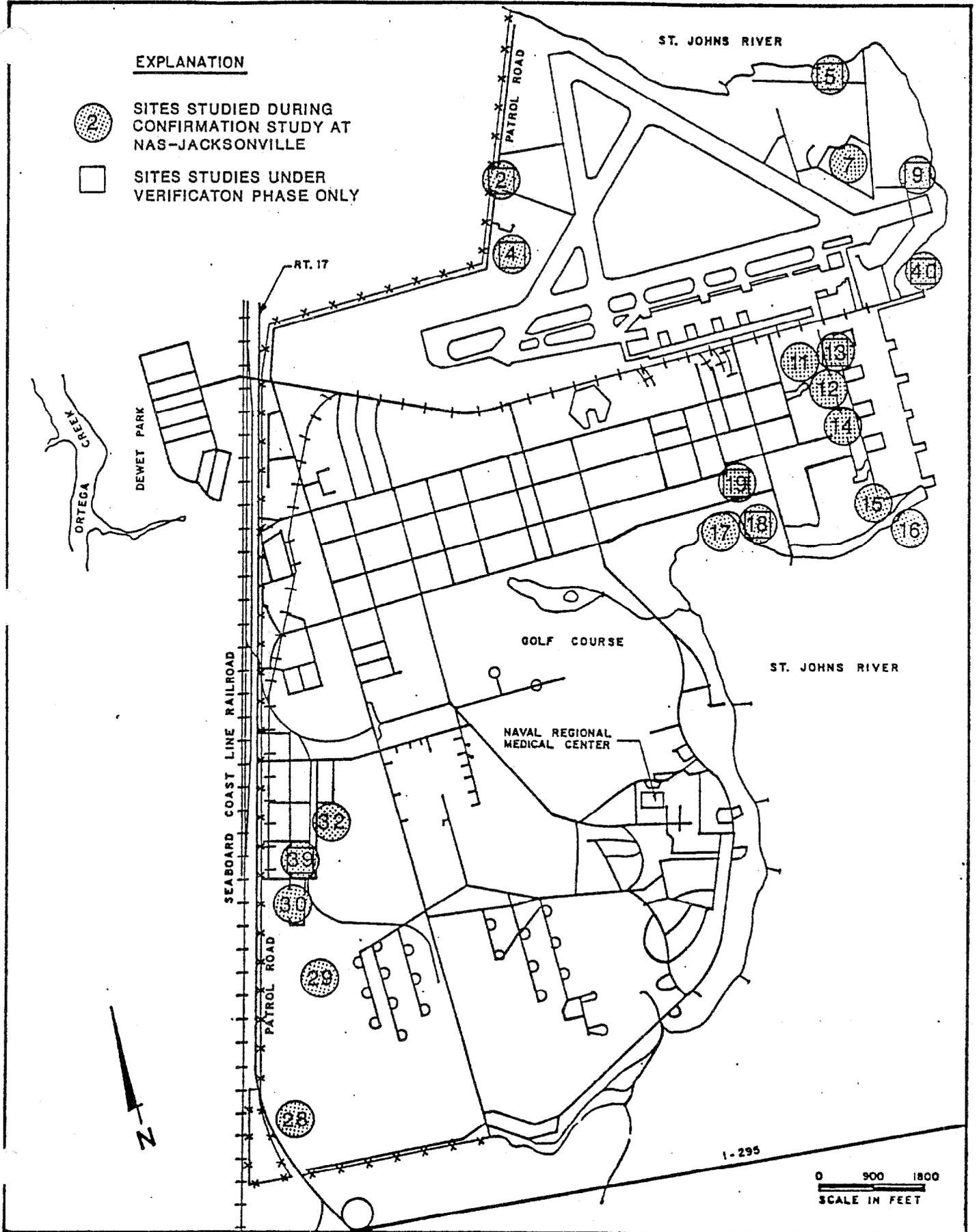
Results of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NAS 30-1	NAS 30-4	NAS 30-5
<u>VOLATILES, ug/l</u>			
Toluene	-	-	11
Chloroform	-	-	2.5
1,1,1-trichloroethane	-	-	2.5
Carbon tetrachloride	-	-	2
Bromodichloromethene	-	-	4
Trichloroethene	-	-	7
<u>TOTAL VOLATILES</u>	<u>0</u>	<u>0</u>	<u>29</u>
<u>METALS, Mg/l</u>			
Barium	0.14	0.15	0.25
<u>FIELD PARAMETERS</u>			
pH	5.04	6.38	7.66
Specific Conductance (umhos/cm)	100	340	260
Temperature (°C)	20	20	21

Results of Chemical Analyses of Soil Samples

Compound	#1	#2	#3	#4	#5	#6
<u>EP TOXICITY, MG/L</u>						
Cadmium	0.58	0.39	1.04	1.18	0.53	-
Lead	0.20	0.19	1.51	0.20	0.13	0.11

- = none detected



SITE NO. 32. BASE LANDFILL

Site Description

The base landfill was used during the 1960's, for disposing of soil, refuse and construction debris and junk vehicles. A portion of the site is presently used for the collection (in dumpsters) of large household refuse such as appliances.

Verification Study

Work Performed:

- o Installed one monitor well (NAS32-1).
- o Analyzed ground water sample for VOCs and TOC.

Findings:

- o Laboratory analysis shows only one VOC detected (methylene chloride) at low concentration (2.6 ug/l).
- o High concentration of TOC (60 mg/l) was measured.
- o Recommended ground-water to be analyzed for acid and base/neutral extractable compounds, pesticides, and PCBs.

Characterization Study

Work Performed:

- o Collected water-quality sample from installed well.

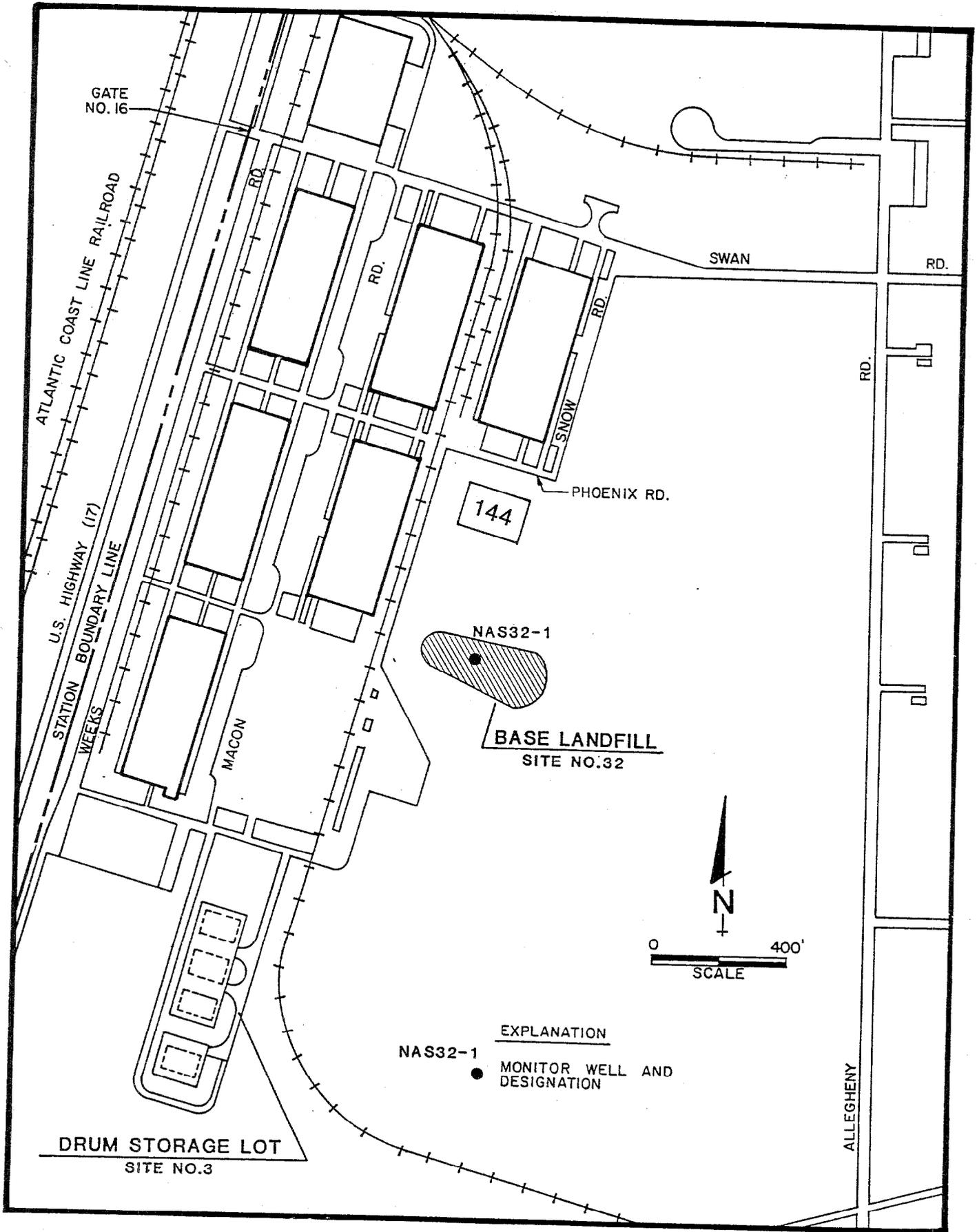
Findings:

- o Laboratory analysis indicates all compounds below laboratory detection limits.

Recommendations:

- o No further investigation.

Dwight



SITE 32. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

<u>Compound</u>	<u>NAS-32-1</u>
<u>VOLATILES, ug/l</u>	
Methylene chloride	2.6
<u>TOTAL ORGANIC CARBON, mg/l</u>	60
<u>FIELD PARAMETERS</u>	
pH	6.71
Specific Conductance (umhos/cm)	NA
Temperature (°C)	16.5

- = none detected
NA = not analyzed

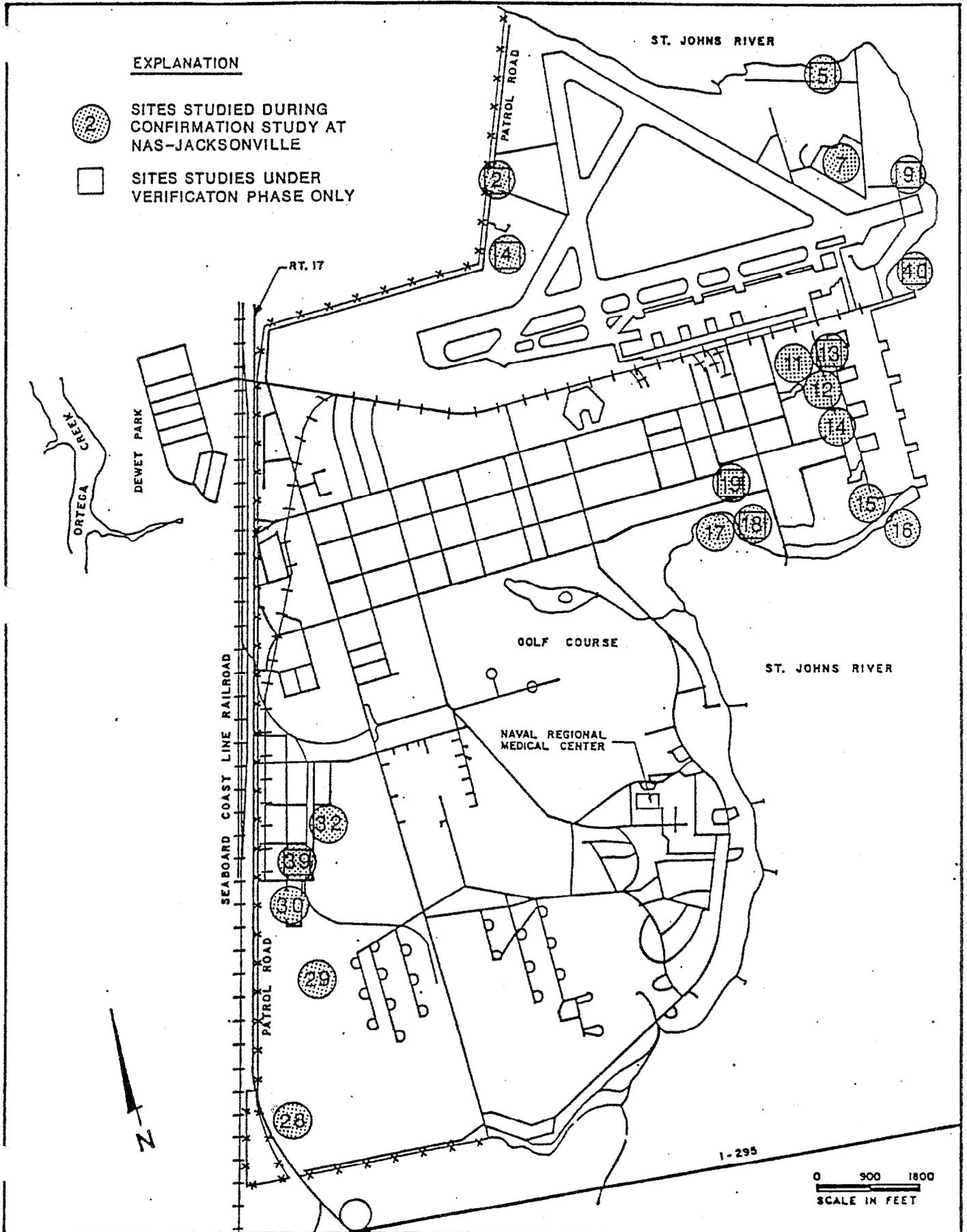
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SITE NO. 32. CHARACTERIZATION STUDY

Results of Chemical Analyses of Ground-Water Sample,
Existing Well

<u>Compound</u>	<u>NAS 32-1</u>
<u>BASE NEUTRAL EXTRACTABLES</u> , ug/l	-
<u>ACID EXTRACTABLES</u> , ug/l	-
<u>FIELD PARAMETERS</u>	
pH	6.47
Specific Conductance (umhos/cm)	570
Temperature (°C)	21

- = none detected



SITE NO. 39. TRANSFORMER BURIAL AREA

Site Description

Reportedly, items of electrical gear consisting of old and new transformers were buried in this area during 1943 and 1945.

Verification Study

Work Performed:

- o Drilled twenty-seven (27) soil borings in area which was located by former Navy employee as being burial ground.

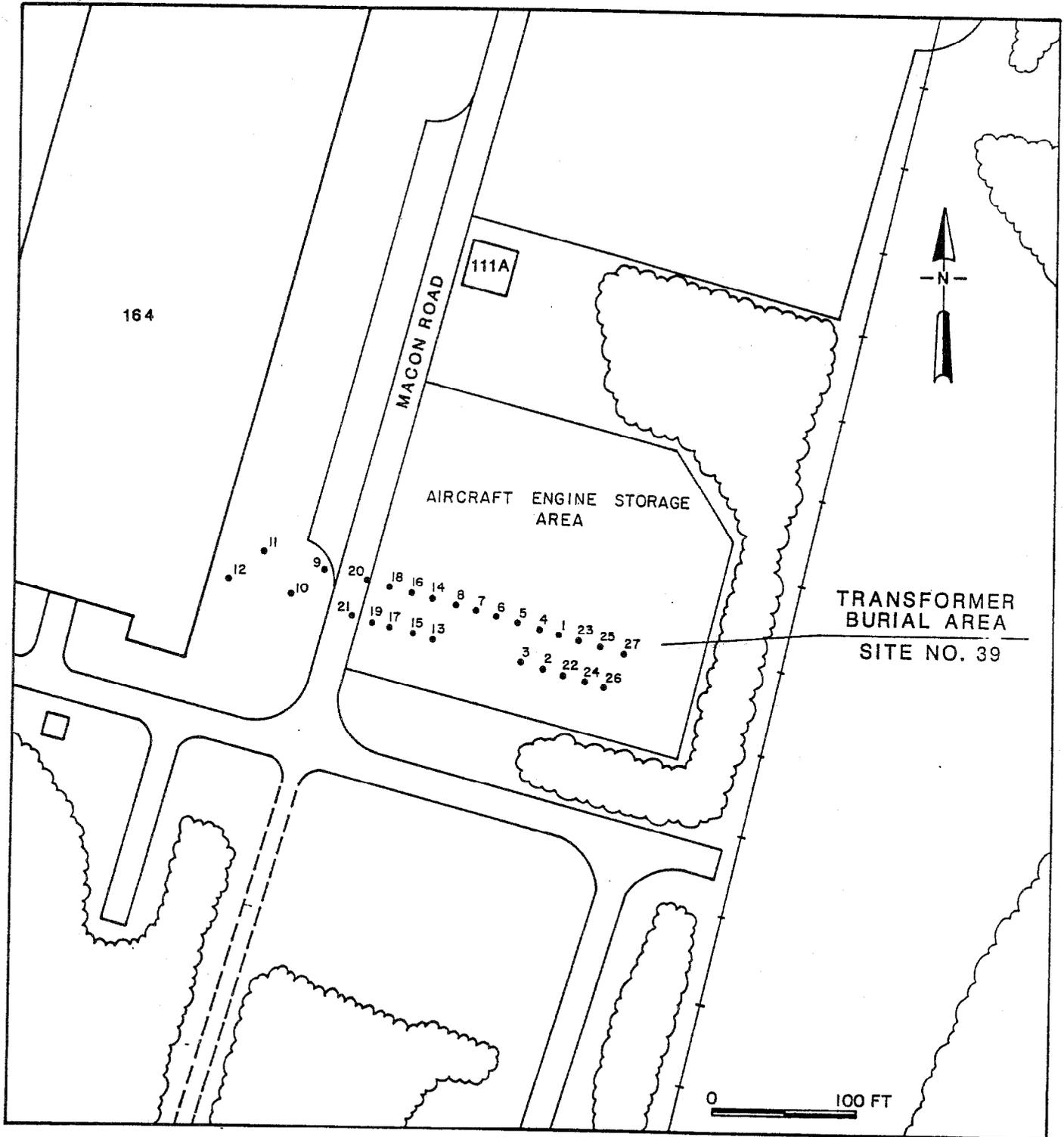
Findings:

- o No evidence of buried material.

Recommendations:

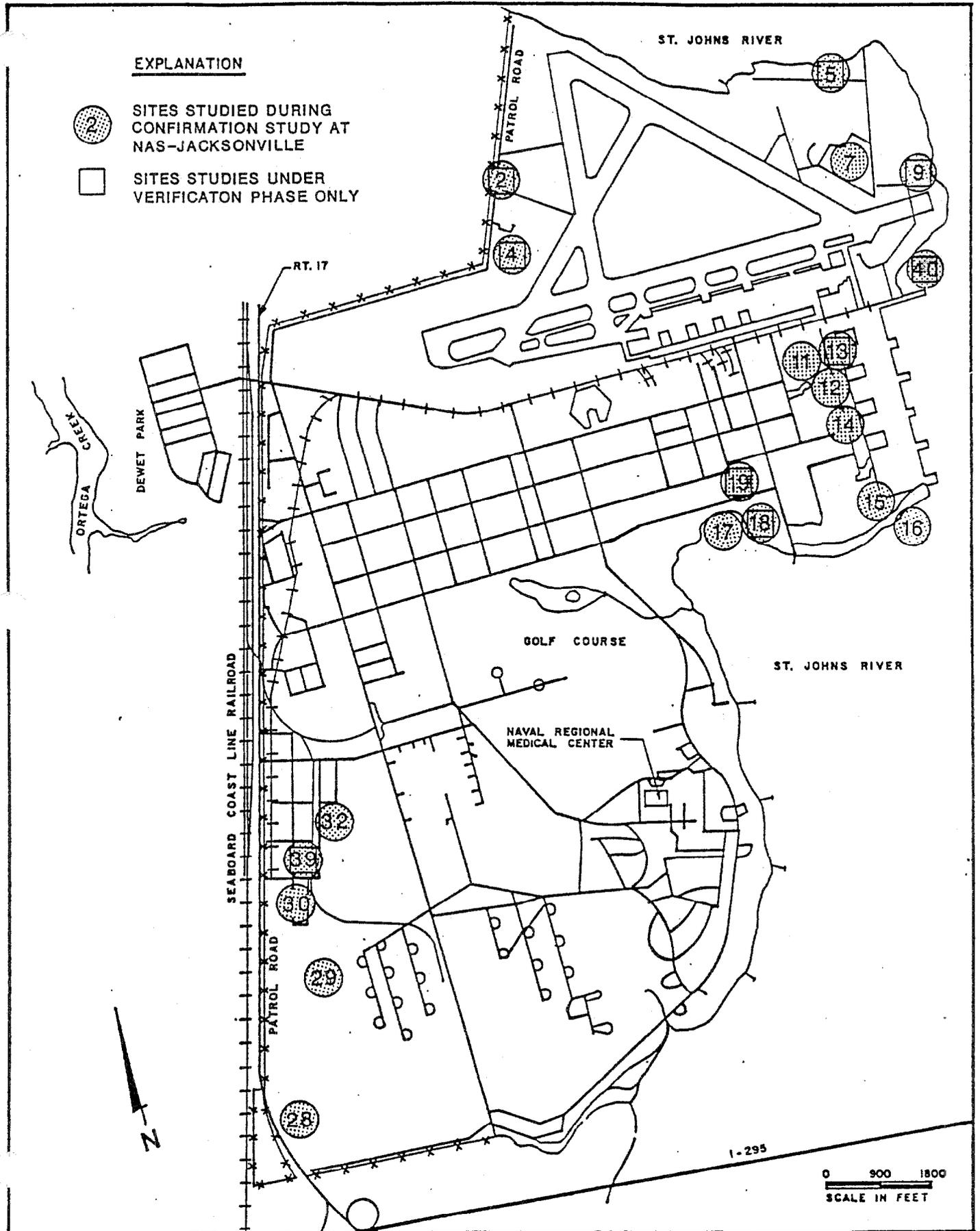
- o No further investigation.

Dray



EXPLANATION

- 6 • BORING LOCATION AND NUMBER



EXPLANATION

-  SITES STUDIED DURING CONFIRMATION STUDY AT NAS-JACKSONVILLE
-  SITES STUDIES UNDER VERIFICATON PHASE ONLY

SITE NO. 40. INDUSTRIAL WASTEWATER DISCHARGE

Site Description

Prior to 1972, a wastewater treatment plant was located south of the east end of runway. Effluent from this trickling filter plant was discharged to the St. Johns River which was thought to have resulted in a build-up of sediments in the cove.

Verification Study

Work Performed:

- o Sediment samples which consisted of sediments from the cove bottom to a depth of 2 ft were collected at four locations.
- o Analyzed sediments for EP Toxicity of metals.

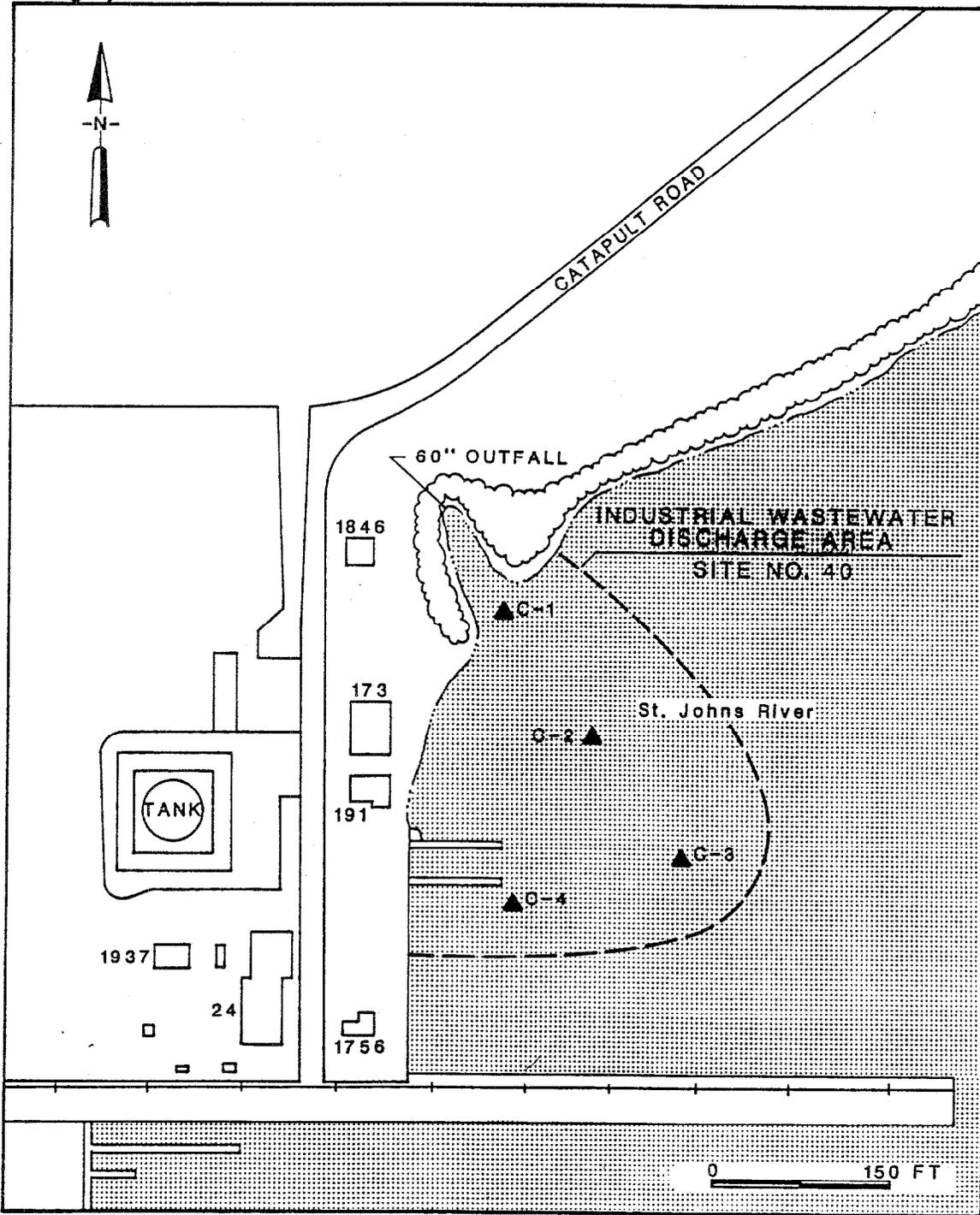
Findings:

- o Analytical results were all below laboratory detection limits; not characteristic of a hazardous waste.

Recommendations:

- o No further investigation.

Drop it.



EXPLANATION

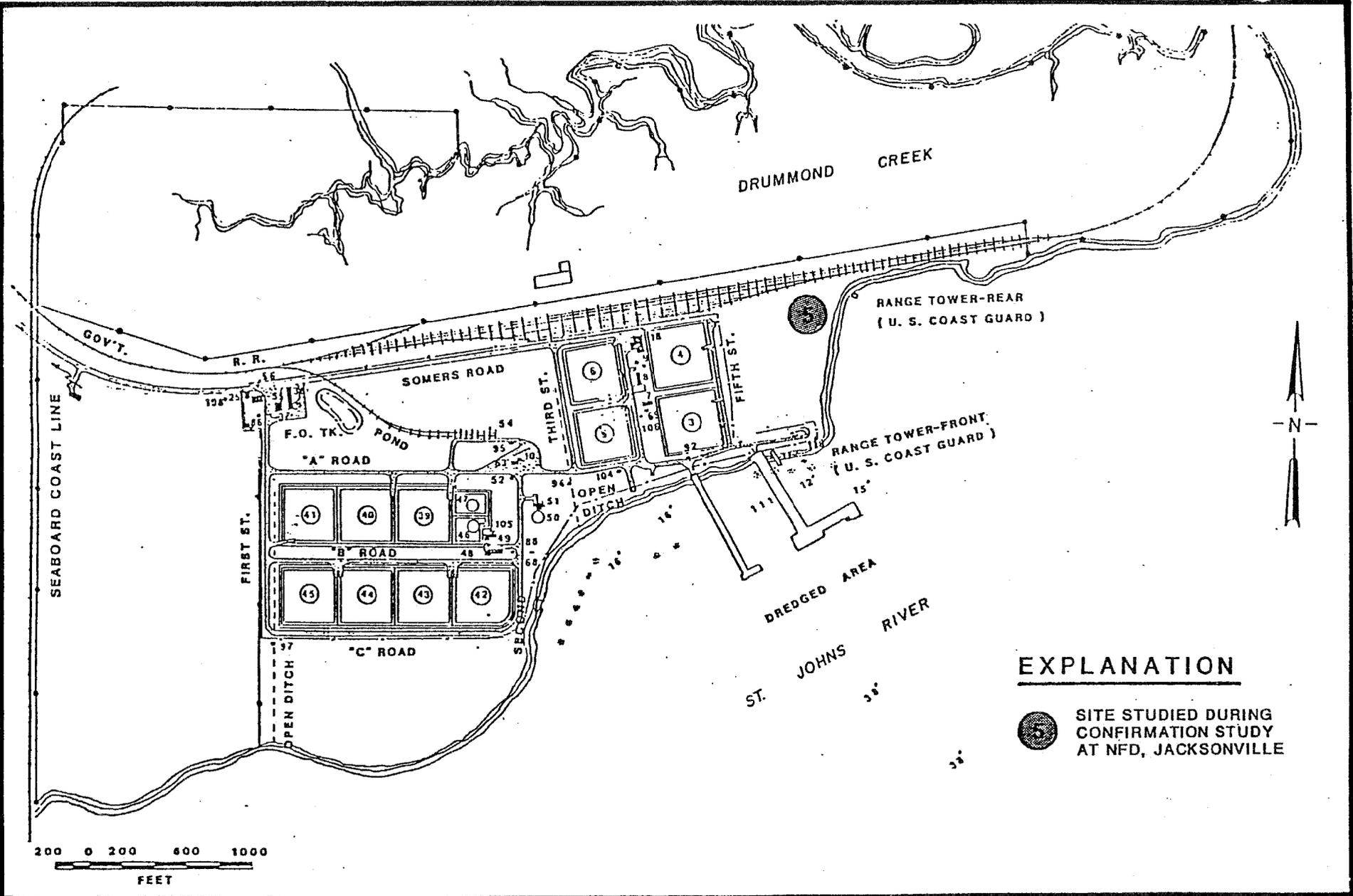
- C-2**
- ▲** SEDIMENT SAMPLING LOCATION AND DESIGNATION

SITE 40. VERIFICATION STUDY

Results of Chemical Analyses of Sediment Samples

<u>Compound</u>	<u>NAS C-1</u>	<u>NAS C-2</u>	<u>NAS C-3</u>	<u>NAS C-4</u>
<u>EP TOXICITY, mg/l</u>	-	-	-	-

- = none detected



EXPLANATION


 SITE STUDIED DURING
 CONFIRMATION STUDY
 AT NFD, JACKSONVILLE

SITE NO. 5. NFD: OIL POND AND LAND SPREADING AREA

Site Description

Through 1967, approximately 3000 barrels of fuel oil from an aircraft carrier were disposed in this area along with trash and wood. The pond was filled with soil in 1965 and graded and regraded again in 1971.

Verification Study

Work Performed:

- o Drilled thirty-two (32) soil borings.
- o Analyzed two (2) soil samples for EP Toxicity for metals.
- o Installed two (2) monitor wells (NFD-1 and NFD-2).
- o Analyzed ground-water samples for VOCs, cyanide, and metals.

Findings:

- o Areal extent of oil pond was determined from the soil borings.
- o Analytical results of soil samples indicate non-hazardous waste.
- o Water-quality results shows two VOCs at trace levels (only NFD-1) and metals below laboratory detection limits in both wells.
- o Recommended two additional wells and collecting ground-water samples from these wells and NFD-2.

Characterization Study

Work Performed:

- o Installed two new monitor wells (NFD-3 and NFD-4).
- o Analyzed ground-water samples from these wells and NFD-2 for dissolved aromatic hydrocarbons and petroleum hydrocarbon scan.
- o Measured water levels in wells.

Findings:

- o Aromatic hydrocarbons were all below laboratory detection limits.

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- o Petroleum hydrocarbons detected at 1 mg/l in NFD-2 and NFD-3.
- o Water levels measured indicate shallow ground-water flow to the east and south or toward the St. Johns River.

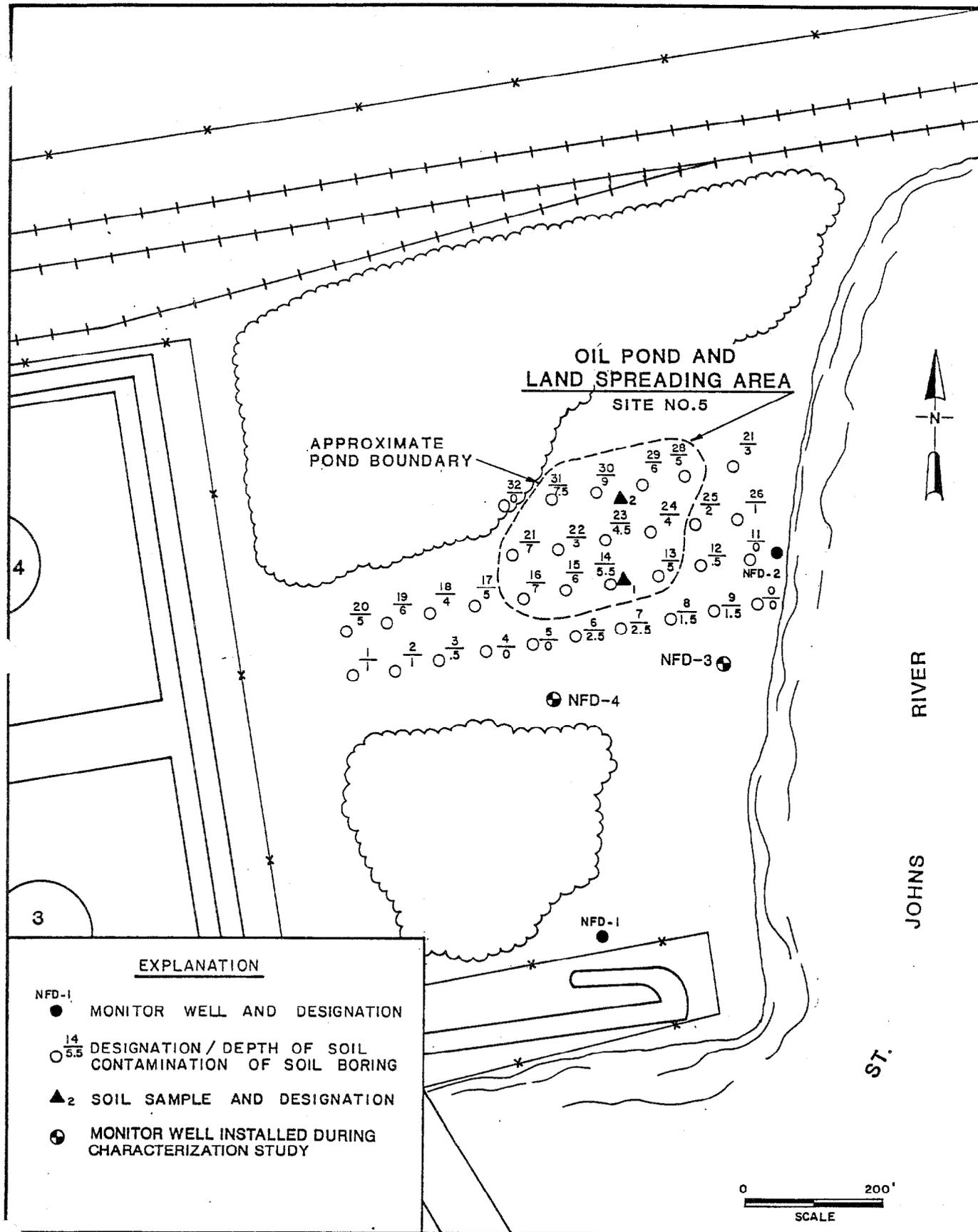
Recommendations:

- o No further investigation.

Don Bayley has no problem with this
and Mr. Crane agrees, but would like
a Ph on well #2 4-29-84

EPA 610

NFD 5 risk assessment depends on final
results.



SITE 5. VERIFICATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

Compound	NFD-1	NFD-2
<u>VOLATILES, ug/l</u>		
1,1,1-trichloroethane	0.7	-
Trichloroethene	0.3	-
<u>TOTAL VOLATILES</u>	<u>1.0</u>	<u>0</u>
<u>CYANIDE, mg/l</u>	<0.005	-
<u>METALS, mg/l</u>	-	-
<u>FIELD PARAMETERS</u>		
pH	7.61	5.60
Specific Conductance (umhos/cm)	430	110
Temperature (°C)	28	28

Results of Chemical Analyses of Soil Samples

Compound	NFD 5-1	NFD 5-2
<u>EP TOXICITY, mg/l</u>		
Barium	0.2	-

- = none detected

SITE 5. CHARACTERIZATION STUDYResults of Chemical Analyses of Ground-Water Samples,
Existing Wells

<u>Compound</u>	<u>NFD-2</u>	<u>NFD-3</u>	<u>NFD-4</u>
<u>AROMATIC HYDROCARBONS, ug/l</u>	-	-	-
<u>HYDROCARBONS, mg/l</u>	1	1	<1
<u>PETROLEUM</u>			
<u>FIELD PARAMETERS</u>			
pH	7.41	6.54	6.46
Specific Conductance (umhos/cm)	75	125	160
Temperature (°C)	21	21	21

- = none detected