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155012

DATE: 25 January 1999

TO: Alan Humphrey, U.S. EPA/ERTC Work Assignment Manager

THROUGH: Edward F. Gilardi, Program Manager *Mark Huster*

FROM: *for* Scott Grossman, Task Leader *Paul A. [Signature]*

SUBJECT: 16th STREET QUARRY DRUM ASSESSMENT AND RECOVERY, WORK ASSIGNMENT 3-320
- TRIP REPORT

BACKGROUND

The objective of this project is to provide support to the United States Environmental Protection Agency/Environmental Response Team Center (U.S. EPA/ERTC) and Region III U.S. EPA in conducting a Remotely Operated Vehicle (ROV) and diver search and recovery of drums which have allegedly been illegally dumped in the quarry.

The 16th Street quarry is located in an industrial/urban area in downtown Wilmington, New Castle Co., Delaware (Figure 1). The property is bordered to the northeast by 16th Street, to the southeast by North Church Street, to the southwest by 14th Street, and to the northwest by North Pine Street. The quarry is primarily surrounded by a woods with the Wilmington Boys Club building and parking area located to the northeast of the quarry. The Brandywine River is located about 500 feet to the southwest of the site. The Diamond State Salvage Superfund site is located adjacent to the site between 14th Street and the Brandywine River. The quarry is located on property owned by the Wilmington Boys Club and is enclosed by a chain-link fence.

Prior to being abandoned due to flooding, Brandywine granite had been extracted from the quarry. The quarry is currently filled with water to depths of approximately 50 feet with a surface area of approximately 3 acres. The banks of the quarry are primarily steep although more gradual drop-offs exist in several areas. The quarry contains numerous debris including, wood, trees, rubbish (e.g., washing machines, wood palettes, cars, oil heaters, shopping carts). A large area in the southwest portion of the quarry (approximately from near ERT-8 to the southwest corner of the pump house) is covered soda bottle caps.

In 1985, divers on a training dive identified approximately forty 55-gallon drums in the quarry, but no further action was taken at the time. In 1994, the drums were again located by local city divers and a removal was attempted. During the removal, a 55-gallon drum ruptured and the divers reported a burning sensation on their skin. Labels on some of the drums listed the contents as vinyl acetate and methyl ether. The drums have reportedly been in the quarry for approximately 30 years. Samples taken in 1994 indicated that the recovered drums contained elevated levels of volatiles and metals.

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The U.S. EPA/ERTC had been requested by the Region III U.S. EPA to perform a search of the quarry to confirm the presence and condition of the drums. An ROV was used to conduct the initial search. Approximately 12 to 18 drum-like objects were observed during the ROV search, but due to algal growth on the drums and limitations on visibility, a precise estimate of the actual number of drums or their condition could not be determined. An attempt was made to obtain coordinates for all the locations drums were observed with the ROV. Upon locating a target, the ROV was brought to the surface and anchor attached to a buoy was dropped at the location the ROV surfaced. This method only provided an approximate drum location since the ROV tended to drift while as it surfaced. Sediment and water samples were collected from locations near the drums to determine if elevated levels of contaminants were present in either of these media. Water quality measurements were made at several locations in the quarry and at multiple depths. Low concentrations of PAHs and metals were detected in the water and sediment samples (Roy F. Weston, Inc. 1998). The buoy positions were surveyed using a global positioning system (GPS). Water depth data was collected in conjunction with GPS positions to produce a bathymetric map of the quarry.

REAC was tasked by the U.S. EPA/ERTC to use U.S. EPA-certified contaminated water divers to locate, assess, and video-document the drums in the quarry. An attempt was made in December 1997 to locate the drums using divers. Due to extremely limited visibility, the drum search of the entire quarry could not be performed in a safe and efficient manner, so it was postponed until visibility improved. During this site visit, two drums were located and marked with buoys (ERT-1 and ERT-2) (Roy F. Weston, Inc 1998).

The ERTC dive team returned to the quarry in the June 1998 to perform the drum assessment. The visibility in the quarry improved dramatically, approximately 15 feet near the surface compared to 2 feet in December 1997. Once the drums were located and marked with buoys, REAC would provide assistance contracting and overseeing a drum removal performed by a subcontracted commercial dive operation (Roy F. Weston, Inc 1998). All work on the project was performed in conjunction with U.S. EPA Region III personnel, Environmental Removal Contract (ERCs), and Region III Superfund Assessment and Technical Assistance (SATA) personnel.

OBSERVATIONS AND ACTIVITIES

On Tuesday, 16 June 1998, ERTC and REAC personnel arrived on the site and began setting up dive equipment. The objective of the dives were to locate (mark with buoys and obtain GPS positions), video document, and assess the condition of the drums submerged in the quarry. Diver searches were performed by following depth contours, parallel to the shoreline for distances of 100 to 400 feet, depending on the visibility, bottom characteristics and amount of debris in the search area. Upon completing a transect and if conditions allowed, the divers would descend approximately 10 to 15 feet, and reverse direction following the new depth contour back to the starting area. This would continue until the diver reached a depth of approximately 40 to 45 feet, at which point visibility was reduced to 0 to 2 feet and efficient visual searches could no longer be performed. In these areas of poor visibility, only those areas down gradient of drum "hot spots" were searched.

Upon encountering a drum, the diver requested the surface support team to lower a line with a concrete anchor block attached. The diver directed the surface personnel to move the block towards the diver waiting near the drum. Once the diver was able to reach the block, it was positioned as close to the drum as feasible. A labeled buoy was then tied to the line and the search was continued. Only intact drums that could potentially contain material were marked; no open top or degraded drums were marked. Drums that had small holes (6 inches or less) or were partially buried and could not be completely assessed were considered to potentially contain material and were marked. Bottom descriptions and drum conditions were transmitted to the surface by the diver and were transcribed in a field log book (Appendix A).

All dive activities were performed by U.S. EPA-certified, line tended single divers or two man buddy teams equipped with contaminated water dive gear (Viking PRO® dry suit, AGA MKII® positive pressure face mask), and diver-to-surface wireless communication gear (Aquacom® SSB-2001 single sideband acoustic telephone). All diving tasks were conducted in accordance with the guidelines, procedures, and regulations of the U.S. EPA Dive Safety Board, the Occupational Safety and Health Administration (OSHA), the United States Coast Guard (USCG) and the site Dive and

Health and Safety Plans (HASP). Records of all dive activities were maintained in dive operation log books. While underwater, the diver maintained communication with the dive tender or the dive supervisor. At the conclusion of the dive, the diver was brought to the staging area and decontaminated according to the HASP. All gear was either decontaminated or disposed of following each set of dives.

On Tuesday, 16 June 1998, dive operations were conducted in the cove located in the south-eastern portion of the quarry (Figure 2). A total of two dives (#1 and #2) were performed by Scott Grossman. During these dives, four intact 55-gallon drums (ERT-4 through ERT-7) and one approximately 300-gallon storage tank (ERT-3) were located and marked with buoys (Table 1 and Figure 2). Large amounts of trash and debris along with many open drums were observed in this section of the quarry.

On Wednesday, 17 June 1998, dive search operations in the quarry continued. Two dives (#3 and #4) were made by Dave Mickunas and Brian Holderness in the morning. During these dives an area between the pump house and 200 feet northwest of the pump house was searched to a depth of approximately 45 feet. During these two dives a single 55-gallon drum (ERT-8) was located and marked (Table 1 and Figure 2).

In the afternoon two dives (#5 and #6) were made by Alan Humphrey and Steve Blaze. The area searched covered from where the divers left off in the morning (approximately 200 feet northwest of the pump house) to the west end of the rock outcrop on the north side of the quarry. No intact drums were located on the first dive (#5), but three open-top drums were observed. The amount of debris observed in the quarry continued to increase as the dive team headed in a northern direction. On the second dive (#6) four intact drums [ERT-9 and ERT-10 (this buoy marked a pile containing three drums)] were located and marked. Numerous degraded and open top drums were observed in this area (Table 1 and Figure 2).

On Thursday, 18 June 1998, Scott Grossman and Brian Holderness each made two dives (#7 and #8). During the first dive (#7), the area searched extended from the rock outcrop on the east edge of the cove in a northwest direction to the eastern edge of the rock outcrop on the northern end of the quarry. This search area covered almost the entire eastern half of the quarry. This area was searched rapidly because no targets were observed in this area during the ROV search and generally bank was too steep to trap drums or other debris. Most of the searching was performed by swimming along the base of the slope. In this entire area only one intact drum was located [ERT-11 (Table 1 and Figure 2)]. The second dive (#8) started where Alan Humphrey and Steve Blaze finished searching on the previous day. This was near the west end of the rock outcrop on the north side of the quarry heading in a eastern and then southeastern direction to the northwestern limits of the search area on the first dive of the day. Four intact drums (ERT-12 through ERT-15) were located and marked (Table 1 and Figure 2). This area contained several additional open top drums and numerous debris and junk. The drums located in this area were resting on a moderately steep slope (approximately 35 to 55 degrees) and ranged from almost completely exposed to 80 percent buried.

The second two dives (#9 and #10) of the day were made by Alan Humphrey and Steve Blaze. The area searched during their first dive (#9) was from the western edge of the rock outcrop on the northern shoreline of the quarry (near ERT-9 and ERT-10) south for a distance of about 150 feet. Due to the numerous drums located nearby, this area, although previously searched, was rechecked. One additional drum (ERT-16) was found and marked in this area. For their second dive (#10), Alan Humphrey and Steve Blaze spent additional time searching for drums in the cove. During this search a previously located drum (ERT-6) was remarked as ERT-17 and one additional drum (ERT-18) was located (Table 1 and Figure 2). This drum (ERT-18) was almost completely buried in sediments with only a small portion of the top of the drum being visible. Outside of the cove, as the divers were heading towards the staging area, an additional drum (ERT-19) was found (Table 1 and Figure 2).

On Friday, 19 June 1998, Scott Grossman and Brian Holderness performed two dives (#11 and #12) to video document the marked drums. The divers were directed to from one drum location to the next by surface personnel. Each drum was video documented using a Sony® TR-910 Hi-8mm camera in a Light n' Motion Industries StringRay underwater video housing. The first dive (#11) was made in the northern portion of the quarry and the second dive (#12) was made in the cove area in the southern portion of the quarry. After the video documentation was completed, a Trimble

Pathfinder Pro XRS™ GPS was used to collect real-time differentially corrected surface positions for each marker buoy. This method produced positions with sub-meter accuracy. This data was also used to produce a drum location map of the quarry (Figure 2).

On Monday, 5 October 1998, Dryden Divers Inc., subcontracted by ERCs to remove the submerged drums from the quarry, arrived on site. ERTC and REAC were present on the site to provide oversight and assure that all diving activities were conducted in accordance with the guidelines, procedures, and regulations of the U.S. EPA Dive Safety Board, the Occupational Safety and Health Administration (OSHA), the United States Coast Guard (USCG) and the site Dive and Health and Safety Plans (HASP). Dryden Divers utilized experienced commercial divers equipped with contaminated water dive gear to perform the drum removal. All dive activities were performed by single line-tended divers utilizing surface supplied air, positive pressure dive helmets, vulcanized rubber dry suits, diver-to-surface communication gear, and sealed dry gloves. All personnel on site were also OSHA 40-hour Health and Safety certified. Records of all dive activities were maintained by Dryden Divers (Appendix A). While underwater, the diver maintained communication with the dive tender or the dive supervisor. Upon loss of communication the dive to be terminated. At the conclusion of the dive, the diver was brought to the staging area and decontaminated according to the HASP. All gear was either decontaminated or disposed of following each set of dives. If any visible signs of contamination were present on any dive gear at the conclusion of the dive, wipe samples were to be collected and analyzed.

- To remove the drums from the quarry, the Dryden diver descended to the drum. An overpack (80 or 100 gallon), depending on the size and condition of the drum, was lowered to the diver. The drum was then placed in the overpack and the overpack was sealed underwater. The overpack was then placed on a sling and brought to the surface using a winch. Once on the surface, the drum was placed on the deck of the work vessel and transported to the shore where it was off-loaded from the vessel using a backhoe. At this point the drums were transferred to ERCs custody, and were staged in a secure location to be sampled at a later date.

On Monday, three dives (D1, D2, D3) with a total bottom time of 220 minutes were completed by Dryden Divers. These dives focused on the cove area located on the southeastern corner of the quarry. On the first dive (D1), two drums were recovered and numerous other drums with open tops or in very poor condition were observed. The first drum recovered was ERT-4. This drum was a 55-gallon drum with a one inch hole in the lid of the drum. The second drum, ERT-1, was an 80-gallon ribbed drum with a recessed and riveted lid. This drum was located in very shallow water (4 feet) and caught by reeds which prevented it from rolling down the grade into deeper water. This drum was taken directly from the quarry using the backhoe from shore.

On the second dive (D2) of the day, a 300-gallon tank (ERT-3) was removed from the quarry. This tank was too large to fit in an overpack and contained numerous small holes that were not observed underwater since they were obscured by algal growth and sediments. Upon bringing the tank to the shore, all of the tank's contents, which appeared to be quarry water, drained from the tank.

On the third dive (D3) of the day, the area surrounding ERT-6/17 was searched. A radial search centered at the marker buoy was used in an attempt to find the missing drums. One of the drums at this location may have been found during the first dive (D1), but was not recovered because it was in very poor condition and did not appear to contain any material other than quarry water. The second drum at this location, which was previously described as being mostly buried, still could not be found. The search was terminated after approximately 35 minutes due to diver bottom time limits.

On Tuesday, 6 October 1998, drum recovery operations continued and three dives (D4, D5, and D6) with a total bottom time of 260 minutes were conducted. Dive operations started at location ERT-5. The drum at this location was approximately 20-gallons in size and contained numerous large holes in the top and bottom. The drum did not appear to contain any material other than quarry water, so it was not recovered. The diver then traveled to location ERT-6/17 and continued searching for the missing drum at this location. After another 40 minutes of searching, the drum still could not be found and the search in this area was again terminated. After the search, the diver was moved to location ERT-11. At this location a 55-gallon drum was located, overpacked, and recovered.

For the second dive (D5) of the day, the area surrounding ERT-8 was searched. After a lengthy search a 55-gallon drum was located, overpacked, and recovered. This drum appeared to be completely intact and was noted by the diver as being extremely heavy. On the third dive (D6) of the day, two additional drums were recovered, a 55-gallon drum (ERT-16) and a 80-gallon ribbed drum (ERT-9A). The 80-gallon ribbed drum was too large to be placed in an overpack. The 80-gallon drum had numerous small holes and lost most of its contents by the time it was transferred to the shore. The drum appeared to contain no other material other than quarry water. An oily sheen and a couple of oily rags were observed on the surface of the quarry while these drums were being recovered.

On Wednesday, 7 October 1998, drum recovery operations continued and two dives (D7, D8) with a total bottom time of 211 minutes were conducted. On the first dive (D7) of the day, a total of four drums were located and recovered (ERT-9B, ERT-10A, ERT-10B, and ERT-10C). The first drum recovered (ERT-9B) was a 55-gallon drum that appeared to be completely intact, without holes or other damage. The next two drums (ERT-10A and ERT-10B), were both 55-gallon drums each containing moderate sized holes (6 to 10 inches). Since the diver could not determine if the drums contained any content other than quarry water, they were both recovered. A yellow grease-like material was observed on the lid of the overpack of ERT-10A after it was brought to the surface. The final drum recovered during the first dive was an 80-gallon ribbed drum. Like the other 80-gallon ribbed drums, this drum could not be overpacked and lost most of its contents (appeared to be quarry water) during recovery. An oily sheen was observed on the surface of the quarry in the recovery area while all four drums were being overpacked and brought to the surface. It appeared that the oil was coming from the disturbed sediments rather than the drums themselves. All four drums were transported to the shoreline and removed from the work vessel with a backhoe.

On the second dive (D8) of the day, one 55-gallon drum (ERT-15) and one 80-gallon ribbed drum (ERT-13) were recovered. Like the other 80-gallon ribbed drums, it contained numerous small holes and was too large to be overpacked. Most of its contents (which appeared to be quarry water) were lost during recovery. An additional 20-gallon drum (ERT-13/14) was found by Dryden Divers between locations ERT-13 and ERT-14. This drum was estimated to be about 1.5 feet in diameter and 2 feet long and it had a small 1 by 4 inch hole in the lid. This drum was mostly buried in the sediment and could not easily be recovered, so it was marked with a buoy and recovered the following day. The 55-gallon drum at ERT-14 was also mostly buried and would also be recovered the following day.

On Thursday, 8 October 1998, drum recovery operations continued and two dives (D9 and D10) with a total bottom time of 170 minutes were conducted. On the first dive (D9) of the day, a 55-gallon drum (ERT-14) and 20-gallon drum (ERT-13/14) were dug out of the sediments, placed in overpacks, and brought to the surface. An oil sheen was observed on the surface during the recovery of these two drums. The area around ERT-12 was searched, using a radial search on a 40-foot line, but a drum was not found. Visibility at this location was very poor (less than 2 feet). The only drum-like object observed in the area was a partially buried 5-gallon bucket. At the conclusion of the dive, the recovered drums were transported to the shore and offloaded to the staging area.

During the second dive (D10) of the day, one 55-gallon drum (ERT-7) was located, overpacked, and recovered. This drum appeared to be in good condition and no holes or other damage to the drum was observed by the diver. After the drum was placed on the work vessel, the diver was transported back to ERT-6/17 to continue to search for this missing drum. After another 45 minutes of researching this area, the diver was brought back to the surface and moved to location ERT-19. After a few minutes of searching, the 55-gallon drum was located and marked with a buoy. Due to the limits of the diver's bottom time, the dive was terminated and the drum was to be recovered the following day.

On Friday, 9 October 1998, drum recovery operations were completed after one dive (D11) with a total bottom time of 76 minutes. During this dive, ERT-19, a 55-gallon drum which was located the previous day, was placed in an overpack and brought to the surface. The last remaining drum, ERT-2, was searched for and located. This was a 55-gallon drum and appeared to be in good condition. The drum was placed in an overpack and brought to the surface. The two drums were brought to the shore and offloaded from the work vessel. Drum recovery operations were completed and Dryden Divers decontaminated all dive equipment and demobilized from the site.

During the week, a total eleven dives with a total of 937 minutes of bottom time were conducted by Dryden Divers to locate, overpack, and recover twelve 55-gallon drums, four 80-gallon ribbed drums, and one 300-gallon tank. Two drums (ERT-6A/17 and ERT-12) that were found by ERTC in June 1998 during dive search operations could not be located by Dryden Divers. Three drums (ERT-5, ERT-6B, ERT-18) found by ERTC were not recovered because they were in poor condition and did not appear to contain any material other than quarry water. One additional drum (ERT-13/14) was located and recovered by Dryden Divers. All dive operations were performed in a safe and efficient manner without incident. These drums were transferred to ERCs custody and will be sampled at a latter date.

FUTURE ACTIVITIES

Drums will be secured, sampled, and disposed of by ERCs. No additional work for ERTC is anticipated at the site.

REFERENCES

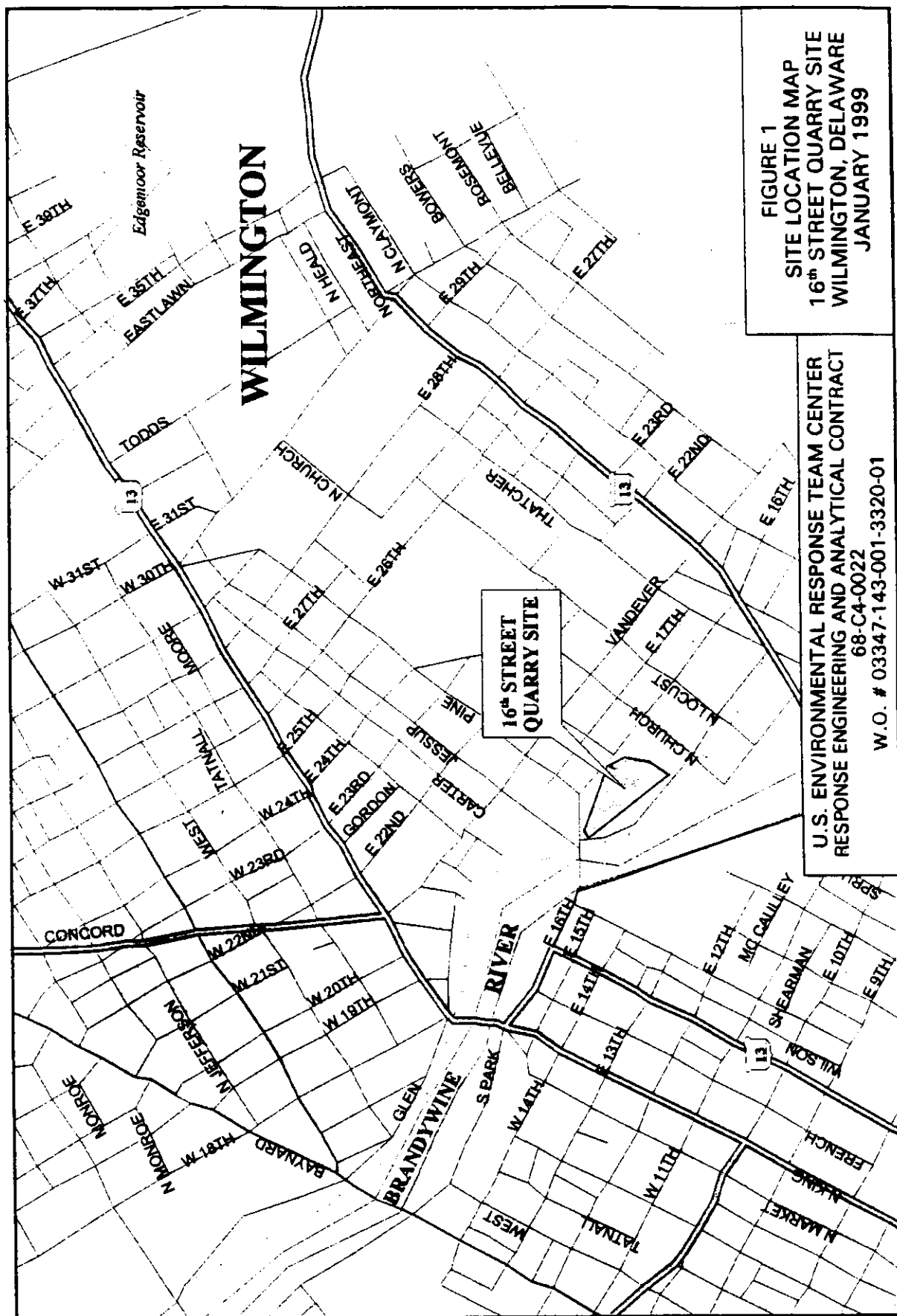
Roy F. Weston, Inc. 1998. "Quality Assurance Work Plan, 16th Street Quarry." Prepared for U.S. Environmental Protection Agency/Environmental Response Team Center under Contract 68-C4-0022. Work Assignment No. 2-230. Edison, NJ.

Roy F. Weston, Inc. 1998. "Trip Report, 16th Street Quarry." Prepared for U.S. Environmental Protection Agency/Environmental Response Team Center under Contract 68-C4-0022. Work Assignment No. 2-230. Edison, NJ.

Table 1
Summary of Drums Located and Recovered
16th Street Quarry Site
Wilmington, DE
January 1999

ERT Drum Number	Approximate Size (gallons)	Approximate Depth (feet)	Recovery Date	Overpack (Yes/No)
ERT-1	80	6	5-Oct-1998	No
ERT-2	55	40	9-Oct-1998	Yes
ERT-3	300	20	5-Oct-1998	No
ERT-4	55	15	5-Oct-1998	Yes
ERT-5	20	20	Not Recovered	NA
ERT-6A	55	25	Not Located	NA
ERT-6B	55	25	Not Recovered	NA
ERT-7	55	42	8-Oct-1998	Yes
ERT-8	55	20	6-Oct-1998	Yes
ERT-9A	80	20	6-Oct-1998	No
ERT-9B	55	20	7-Oct-1998	Yes
ERT-10A	55	25	7-Oct-1998	Yes
ERT-10B	55	25	7-Oct-1998	Yes
ERT-10C	80	25	7-Oct-1998	No
ERT-11	55	16	6-Oct-1998	Yes
ERT-12	55	40	Not Located	NA
ERT-13	80	18	7-Oct-1998	No
ERT-14	55	20	8-Oct-1998	Yes
ERT-13/14	20	20	8-Oct-1998	Yes
ERT-15	55	15	7-Oct-1998	Yes
ERT-16	55	35	6-Oct-1998	Yes
ERT-17	55	25	Not Recovered	NA
ERT-18	55	10	Not Recovered	NA
ERT-19	55	15	9-Oct-1998	Yes

NA denotes Not Applicable.



AR100245

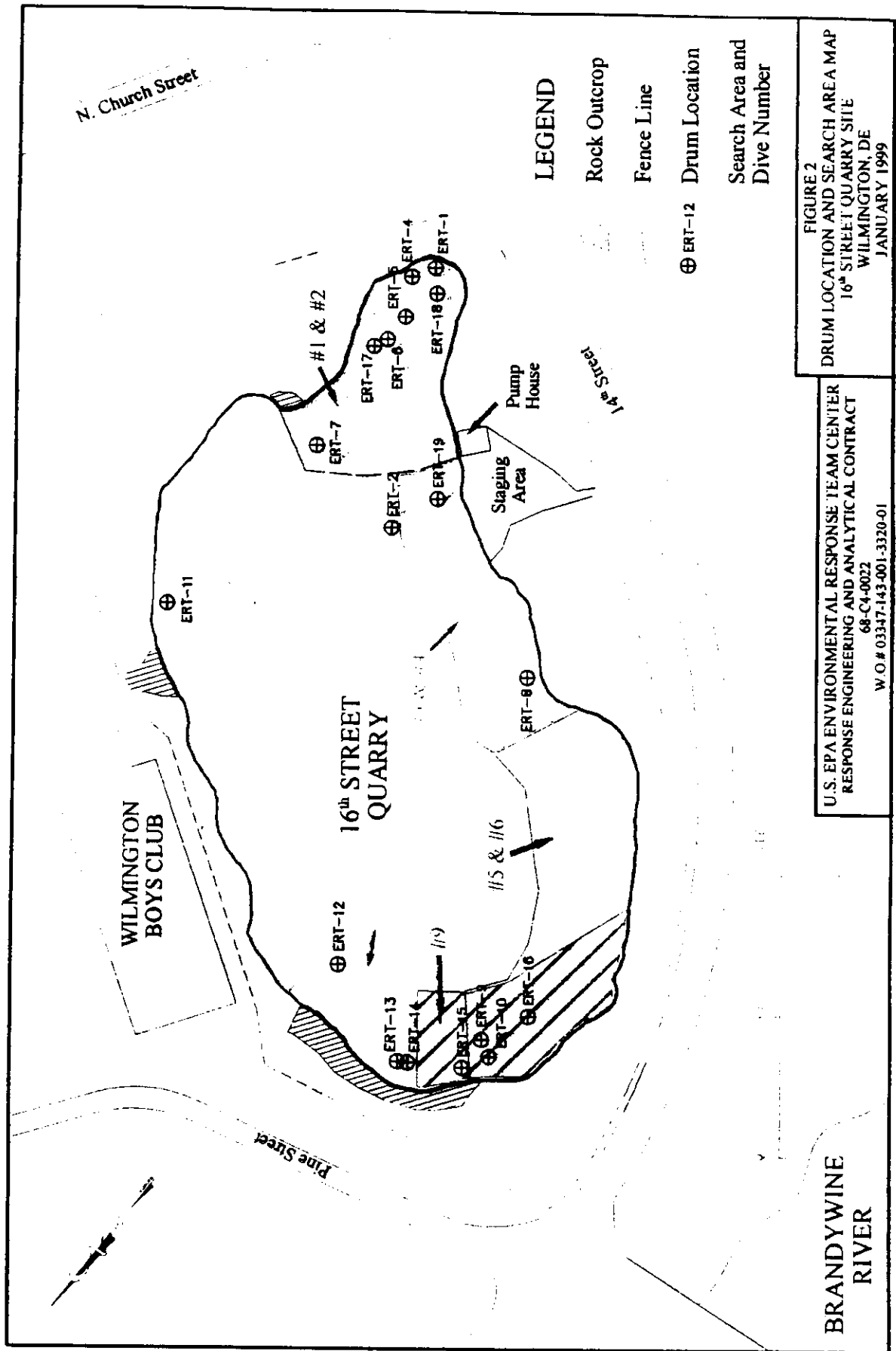


FIGURE 2
 DRUM LOCATION AND SEARCH AREA MAP
 16th STREET QUARRY SITE
 WILMINGTON, DE
 JANUARY 1999

U.S. EPA ENVIRONMENTAL RESPONSE TEAM CENTER
 RESPONSE ENGINEERING AND ANALYTICAL CONTRACT
 68-C4-0022
 W.O.# 03347-143-001-3320-01

BRANDYWINE
 RIVER

APPENDIX A
Dive Logs and Field Log Book Notes
16th Street Quarry Site
Wilmington, DE
January 1999

6/11/92

logged to beam #1 at 16,500

(11) 2658 (noq north inlet)

vegetation looks

(12) 2258 NO SONAR TARGET

(13) 2101

(14) SONAR map rejected

(302) 656 - 1079 EPA
(302) 656 - 1073 SARA
105500 6.16.98
Notes: Diver entering water

- open up drum about 20% from powerhouse

- drill depth on a ledge

- 2-300 gpm tank - may be intact. about 20 feet from bank diagonally from powerhouse to the right. appeared a buoy - EBT-3.

- three open top drums in the southwest corner.

- EBT-4 drum found in South east corner - very light

- found fishing lure along east end of the South east corner.

- open top drum/maybe gas pipes can along the southern of corner towards the east bank.

- Near Boy Club

1113: 20 ft from shoreline - very deep
34 ft base of wall
& rocky w/ general debris
Tank pressure - 20 ft

Scott - 1200 psi
Brian - 1200 psi

50 ft base of slope

1117 Open top labelled purple drum

Size - not marked
- metal debris, steel ribbon
metal grates, shopping
carts

- Barber's Grill propane tank
Tank pressure 23 minutes

Scott 1000 psi
Brian 800 psi

1120 Drum found No. 74 shore
- sealed drum at 16 ft
- Bury deployed - ERT-11
on rock slide - unstable terrain

1124 open top drum in poor condition
(ltd in bank near rock fall
on surface of North shore)

1135 Scott surfaced
Divers at shore becoming
sinks

End Tank pressure -
Scott - 400 psi
Brian - 200 psi
- Tanks changed out

1150 Both divers 2900 PSI
on shoreline

1200 Entry time near pink
bush NW corner
Base of wall forty feet
3/4 buried potholes

1210 ERT-12 Broyed
1215 Brian - 1800 psi
Scott = 22 ft
40 ft base of slope

1218 Brian - 1300 psi
Scott 1000 psi
20 ft
divided blocks, also of debris
(North shore) chains
(Broyed up rock in pile, loose)

- 20 gallon drum found middle
of pond in SE corner.
Eh 7-5

- very corroded drum
near that a almost bury drum
and a couple open tops.
Eh 7-6 by east bank
of SE corner

1730 diver up.
Total of 6 open top drums found.
depth 8.7 feet at deepest point

1805 Gage back out.

- No drums at EH-1

Eh 7-7 drum found center of
quarry across from the edge
of the power house electrical
pole. 4.2 feet down.

1840 diver up.

Wednesday 6.17.98

1100 divers entering water
- starting on the upside of the slope
by the pump house.

Monday 1103 down bottom corner.

- lost bottom directions

- found an open and a drum on shore by
1105 divers surfaced. ^{500 yds away}

1155 divers entering water

Swimming out to pump house
then heading in a NW direction slope
the 15-20 ft marker.

- found water 10000 slope W slope

- found drum 60% buried water 5 ft
hole. 100 yards intact bottom buried

Eh 7-8. W slope by swimming of reeds.
down marker 3 ft of drum in up slope
of drum.

1220 divers surfaced.

1155 Divers in.
 starting on the NW side.
 30 ft. deep making 10 ft.
 - found an open top drum cover
 near the west end.
 - thick grey sediment
 - and open top drum at
 20 ft. at western end.
 - lot of debris.
 - 5 ft open top
 1120 Divers up.

1150 Divers in.
 - found open top drum along west
 shoreline at about 100 ft.
 - 2nd open top drum. buried in beach.
 - lot of debris mostly wood.
 - another open top drum
 open top drum - full of bottle caps.
 - lot of 100 ft cylinder along
 western shoreline
 - found sealed drum on NW shoreline
 - apparently a head of buck
 - found open top drum on NW shoreline
 1110 at base of Red rock wall N shoreline
 approaching benches
 40 ft base of wall bulk of
 10 ft is an slope

- another drum full of sed. material working
 towards northern shoreline.
 - found closed drum about 100 ft. S.
 lots of drums most open top. about 100 ft.
 200 ft. S.
 - 3 more drums by the beginning of
 the 100 ft. wall on the N shoreline.
 1100 7-10
 - 6 drums well by trees / pink flowers
 830 Divers surfaced.

Thursday 18 June 1998

1105 NE corner - general
 debris 26 + 32 feet

- car?
 Turn Pressure -
 5000 - 2000 psi 26 + 30 ft
 Brian - 1900 psi

1110 at base of Red rock wall N shoreline
 approaching benches
 40 ft base of wall bulk of
 10 ft is an slope

1223 Brian 1200
 Scott 1000
 Not of boulders
 1225 Drum found recessed lid
 intact, lid recessed
 2 inches from top - 18 feet
 NW corner - Buoy ERT-13
 near pink Skuro 70%
 1230 2nd Drum - buried but
 intact - Buoy ERT-14
 Brian 750 psi
 Scott 700 psi
 1232 Drum found 70% buried
 standard steel drum - 15 ft
 Buoy ERT-15
 * ERT-09 3-4 drums in
 this vicinity
 1235 Divers up
 1245 Divers submerged in NW
 corner of quarry
 1610 Steve 1800 psi
 Alan 2000 psi
 1614 ERT-16 sealed drum

Not right on drum but near it
 2nd Drum open side buoy
 Steve 700 psi
 Alan 1200 PSI
 1428 Drum w. 1/4 open side
 buoy (west shore)
 1430 Steve up
 1432 Alan up with whiskey bottle
 1200 Divers submerged for second
 dive
 1710 ERT-17 found in cave area
 - old drum, old buoy line
 PSI Steve
 1750 PSI Alan
 - one open top drum
 - another open top
 drum
 1720 Partially submerged drum
 at 10 feet in cave
 ERT-18 - 99% buried
 Steve - 1250 psi
 Alan - 1250 psi
 1728 Open top drum on South shore
 just outside cave

1730 Steve 700 psi
 Alan 750 psi
 1735 Divers on surface - Steve
 1738 Drum found near Smith
 shore launch area
 ERT-19

Friday 19 June 1998
 1007 Divers submerged with
 underwater video camera
 - began air 11 minutes
 1015 - Diver doing drum inspection
 of buoyed drum
 1020 - On air 24 minutes
 Brian 1400 psi
 Scott 1700 psi
 1032 Scott 1200 psi
 Brian 750 psi
 1037 Divers up
 1110 Divers on air
 1115 Divers submerged
 1130 Brian 1300 psi
 Scott 1900 psi
 in SE Cove area
 1150 End of Dive

DIVE LOGS FROM DRYDEN DIVERS.

11

ROB TAYLOR 10/5/98

0917 L.S. (i.e. hat on)

1130 LB

31' = max. d

1139 = P.S. (i.e. hat off)

1142 B.T. (hat on - hat off)

Table ~~40/150~~ ¹²⁰/₂₂

35/160 group K

moved to next buoy -

Found smashed, open drum
w/wires in it - abandon.

Pulled buoy. wrong drum.

moved to next buoy - open drum,
nothing in it. Pulled buoy. X

X = were intended to be pulled
but decided to be abandoned,
per Scott G. 10/8/98

1st Drum: open end,
abandon per Alon H.

2nd drum - old trash can -
abandon.

3rd drum - "Qtr size" hole
in Lid - keep upright per A.
bung in side, is in place.

(Large overpack left sheer on
surface)

1010 AM - set drum on
beach using excavator.

4th drum - had bands around
will try to pick w/ excavator
1045 - picked up drum.

5th drum - open top, abandon.
searched area, found no more
drums, retrieved buoy.

X 6th drum - (near beach @ excavator)
rotted mostly away - abandon
Retrieve buoy from that area.
searched around area of 1st drum

X found drum 25% rotted - abandon
pulled buoy.

X moved to next buoy - drum is
75% rotted away - abandon.
← Search that area. Pull 1st drum.

AR100254

Loe Ericsson 10/5/98

1300 L.S. (hat on)

1416 L.S.

LB

18' max.d

28' max.d.

1352 R.S. (hat off)

1442 RS (hat off)

52 B.T.

:26 B.T. + :25 RNT = :51 TBT

20/75 table - group C

30/60 group D.

to retrieve large tank - too big for overpack - tott to beach for excavator
(2 x length + 2 x dia. of 55 gal. drum) (~300 gal tank)

1350 - retrieved tank, pulled diver up to ch. for leaks in
Decon. diver. suit

1420 - Found bucket @ next buoy - abandon per Scott G.

searched that area, found nothing, pulled up the buoy.

AR100255

10/6/98

Depth 23' 30'

= 29'

= 35' Table

= 37'

Diver on 210' Table
Max: 800

LS 0839

Depth

Mark Mason - 120

(1) Found Barrel in cave next to body (Scrape Barrel per Scott's Decision)
Fst + 5th Hole, 1st Finger size Holes Barrel detected

(2) Searching for 2nd Drum of the day = using 20 search line did not find

3rd Drum Found = Retrieved in outpack

RS 1006 = 107

Group

40/200 Des I

~~Mark Mason~~ MARK MASON - DIVER

0839 LS

0840 Found Barrel did not retrieve per Scott's Decision

0900

0900-0940 Searched for 2nd Drum of Dive

0945 Searched & Retrieved 3rd Drum

1006 RS

AR100256

10/6/98

Koy

1st in

LS 1100

Depth 17'

~~31'~~

~~31'~~

~~31'~~

46'

50 Table
:100

1/2 Time
used in
Circle Search

Search for 1st Drum - Jagged upon Drum ^{→ not retrieved} Found / Retrieved Barrel put in overpack
BT expired

RS 1223

BT:83

50/90 K

-S 1100

1101 Searched for first Drum

1150 Found Drum & Retrieved in overpack

1222

1223 RS

AR100257

10/6/98

Rob Taylor

1350 L.S. (hat on)

(1423) LB 1455

1500 R.S. - (hat off)

36 max d.

:70 B.T.

40/70 group G

1355 1st drum - open @ end - empty - abandon per ALH.

2nd " - sealed, no holes

1400 overpack on bottom

1415 " sealed & secured.

Diver sweeping bottom to look for any other drums. No

1429 overpack on deck. Shown on water. retrieved buoy^S

1435 - moved to next location - Diver on bottom.

1439 - 3rd drum - stuck in mud - open end - abandon per.

1440 - Found ~~tank~~ - ϕ of drum, length? - stuck in mud.

Found 4th drum - uphill of tank - top is rotted out.

1445 - rigging to tank to try & pull out.

1455 - Lifting tank. - tank @ surface, secure to float stage

1500 - Diver decon'd

1506 - heading for beach to offload drum & tank.

1515 - both offloaded.

break down dive station.

interview w/ EPA camera crew

1557 - /o.o.o.o. - 4.1

ARI00258

10/7/98 Lou Ericsson

2825 L.S. (hat on)
L.B.

max d. ~~18~~ 27 32'

0954 R.S. (hat off)

: 89 B.T.

40/100 table/school/group I

0700-0740 safety meeting

0740-0805 - Loading overpacks & diving equipt. to float stage.
7815 anchored @ Buoy #10 - should be (3) intact drums.

0827 - found drum #1 - too large for overpack - appears intact
found drum #2 - open end, empty } don't count
found drum #3 - open end, empty } per S.G. -
found drum #4 - hole size of football } retrieve
" " #5 - hole size of softball)

keep looking per S.G.

@ Buoy #9 found 2 more on hill. - Found #6 - intact - has 2" ribs use b
" #7 - no top - mud. o

0840 noted sheen on water. - overpack on bottom

0900 - overpack secured to float stage -

move back to #10 buoy, look for more drums.

0907 - lowering yellow offpack to "softball"

0920 - secure on deck - lowering yellow offpack for "Football"

0940 - secure on deck - lowering sling to "too large tank"

0950 - tank secured to float stage Retrieved buoy #9 - 10

1005 - offloading drums @ beach (4)

1021 - coffee break & equipt repair (for glove)

AR100259

Mark Mason 14. 198

1110 L.S. (Hat on)

1308 L.B.

max d 21

1312 R.S. (Hat off)

1122 BT.

30/45 table/sched/group H

1105 on site @ buoy #15 - Should be one drum here per H.H.

1114 - diver on bottom, sweeping area to look for drums.

Found other debris - car chassis, barb. grill, etc

Found another drum @ 15' downhill of buoy - top open end - appears to be abandoned per

" " " " - open, empty - abandoned - Found drum @ buoy weight - 70% buried - "frisbee" hole in one noted oil sheen breaking water surface.

1130 offpack on bottom.

~~1138~~ 1142 - offpack secured on deck - moving to buoy #14 - should be one

1148 - on bottom - found drum @ buoy wt., 80% buried - has open

(15' rad.) searching area - Found drum w/ ribs @ buoy #13

noted sheen coming up on water surface.

Found ~~one~~ other drums w/ ribs' radius betw. 13 & 14 buoys - 90% buried.

Digging out by hand, barrel @ #14.

H.H. says not on list attempt to retrieve moved Buoy #14 to 8' from '80%

1212 using lifting rig to dislodge barrel.

1301 - cannot get sling around this drum,

silt keeps caving in. Move to Buoy #13 w/ ribs.

1308 - drum secured to float stage - taking it back to beach,

1330 offloaded (2) drums

1340 - breaking down dive station.

Loading overpacks for tomorrow.

1355 - interview w/ TV people.

~~1420~~ 1410 leaving site

AR100260

~~battery's for tomorrow need~~
~~so far just pump for~~
"TSP cleaner PF
Viking gloves. sh
#10 gloves. and

Oct 8

LOW. ERICSSON.

0700 Set up Tet pump on Float stage.
Set up Dive stations

0800 > Safety meeting x Work plan.
0830

0900 ON Dive site Diver in Water working on Barrel 14 a

0920 Overpack to Ray on Bottom.

0930 lid x ~~Ratchet~~ Ratchet x lid to diver.

0935 Barrel Overpack on deck (14 a)

0945 located 2nd Barrel 90% Buoyed on Side 1"x4" Hole Barrel 2' x 18 D.
This Barrel is considered Barrel 14 b.

0955 Overpack to Diver.

10:00 Barrel on deck 14 b (Mark found this extra Barrel on Oct 7)

10:05 Dive to ERT 12 Found 5 Gallon Bucket at Buoy weight
Told to search area for 15 minutes (No luck)

10:25 Diver on surface washing down

10:30 heading to crane to Unload x Switch Divers

11:00 Unloaded Barrels Taking Lunch

11:30 lunch over.

12:00 ON 2nd Diver at site # 7 Buoy located Drum.

12:30 Barrel in Overpack x ON Deck.

13:15 Searched area for 2nd Drum (No luck.) 45 minutes searching. 6-

13:30 Moved to site # 19 searched x located Drum¹⁹ put Buoy on

13:40 Diver on surface Washing Down.

14:00 Unloading Drum # 7 on Bench

14:30 Break down Dive station (Raining) Hilar, AR100261

Bottom T
50' / 100'

Bottom
50' / 90'

~~10/9/98~~ 10/9/98 Diver - Lou Ericsson

0700 - ~~0750~~ pre-DIVE meeting/ set up for dive.

0750 - 0815 Stand By for u/v DIVER Scott.

0820 LOU S

0820 ~~0820~~ RB

Depth - 16'

0823 sent Down OVER PACK FOR Drum #19

0833 OVER PACK ON DECK. Drum #19

0835 SEARCH AT 27' To Right ~~27'~~

0840 found DRUM (Buried) ABANDONED. Big Hole

0842 ABANDONED DRUM. DRUM open on one end.

0843 Search to Left @ 30'

0845 ALL STOP. DROP 5' AND SEARCH to Right @ 33'

0849 ALL STOP @ 36' more Left

0852 found DRUM @ 41' down intact. DRUM #2
move float station to diver. "0" u/s.

0856 get float station in position to send overpack.

0858 sent overpack

0859 Diver Retrieved overpack

0901 Diver Retrieved Lid + WRECK

0910 DRUM #1 on DECK. DRUM #2

0915 ~~0915~~ Video Drum Lifting procedure

0930 CANCEL Video

0931 Diver R/S

0931 - 0935 Decon Diver

0936 - Remove Hat from Diver TOTAL BT 276

1000 - Reach Beach.

1000 - 1015 BREAK

ARI00262