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REMEDIAL SAMPLING AND ANALYSES AT
CHEMICAL SPILL SITES 1 and 2 FOR
STEWART WARNER CORPORATION/
BASSICK-SACK DIVISION
WINSTON-SALEM, NORTH CAROLINA
JANUARY 28, 1988 - FEBRUARY 22, 1988

Prepared for:

Stewart Warner Corporation/
Bassick-Sack Division
Winston-Salem, North Carolina

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CERCLA

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1.0 INTRODUCTION

The information contained in this report consists of the remedial sampling activities provided by Research & Analytical Laboratories, Inc. (RAL) for Stewart-Warner Corporation (Bassick-Sack Division) at two (2) chemical spill sites located at their Winston-Salem, North Carolina facility. The remedial sampling activities, covering a period from 28 January 1988 through 22 February 1988, are in accordance with the Remedial Proposal outlined in Section 4.0 of the Comprehensive Site Report For The Assessment of Chemical Contamination at Spill Sites 1 and 2 - Bassick-Sack Division, Winston-Salem, North Carolina (July 1987). In reviewing the analytical data contained in this report it is important to note the following information:

- 1) GSX Services, Inc. provided clean-up and disposal of contaminated soils within Chemical Spill Sites 1 and 2. Information pertaining to clean-up and disposal strategies as well as quantities removed etc., should be on record with GSX Services, Inc.
- 2) The law firm of Womble Carlyle Sandridge and Rice coordinated the transfer of post excavation analytical test results to the North Carolina Solid and Hazardous Waste Management Branch.
- 3) The North Carolina Solid and Hazardous Waste Management Branch approved the back filling at Chemical Spill Sites 1 and 2 after post excavation and sampling had been completed and reviewed. Uncontaminated soil used for backfill was taken from Vulcan Materials East Forsyth Quarry.
- 4) A representative from the North Carolina Solid and Hazardous Waste Management Branch was present at Chemical Spill Sites 1 and 2 during post excavation and sampling. No concerns or objections with respect to post excavation, sampling strategies, etc. were communicated or evidenced by this official state representative to RAL personnel.

The following sections of this report include materials, methods, and results of all remedial sampling activities at Chemical Spill Sites 1 and 2.

2.0 MATERIALS AND METHODS

The information contained in this section is based upon the Comprehensive Sampling/Analysis Plan to Determine the Extent of Chemical Contamination at Spill Site(s) Located at Bassick-Sack Division, Winston-Salem, North Carolina prepared by RAL in June 1987. Post excavation sampling analyses for selected parameters were used to verify upon acceptance by regulatory agency the minimum contaminated soil removal requirements at Spill Sites 1 and 2. This also represents the vertical movement of contaminants. The horizontal movement of contaminants was determined by chemical analysis from vertical soil samples collected in Quadrant 26 or 50 feet North of Quadrant 2, Section A on 11 September 1987. The results of this analysis include the following:

<u>Parameter</u>	<u>Depth Interval(inches)</u>			
	<u>0-3</u>	<u>3-6</u>	<u>6-9</u>	<u>9-12</u>
Extractable Zinc(mg/l)	3.4	0.97	0.59	0.42
Extractable Copper(mg/l)	0.13	0.12	0.02	0.02
Extractable Nickel(mg/l)	0.29	0.17	0.03	0.11
Extractable Chromium(mg/l)	<0.02	<0.02	<0.02	<0.02
Extractable Lead(mg/l)	<0.05	<0.05	<0.05	<0.05
Extractable Cyanide(mg/l)	1.9	0.18	0.17	0.18
pH(Std. Units)	6.2	6.0	6.0	6.0
Total Solids(%)	89	99	94	92

The post excavation sampling/analysis procedures included the following chronology of events:

<u>Date</u>	<u>Time</u>	<u>Event</u>
1/22/88	1000-1200 hrs	Pre-excavation meeting
1/23/88	0800-1200 hrs	Quadrant Marker Replacement
1/24/88	1500-1700 hrs	Quadrant Marker Replacement
1/28/88	0900-1000 hrs	Quadrant 1A Sample Collection
1/28/88	1000-1100 hrs	Quadrant 1B Sample Collection
1/28/88	1100-1200 hrs	Quadrant 1C Sample Collection
1/28/88	1200-1300 hrs	Quadrant 1D Sample Collection
1/29/88	1400-1500 hrs	Quadrant 1E Sample Collection
2/2/88	1500-1600 hrs	Quadrant 3A Sample Collection
2/9/88	1600-1700 hrs	Quadrant 3B Sample Collection
2/11/88	1700-1800 hrs	Backfill Sample Collection
2/22/88	1000-1100 hrs	Quadrant 3B Resample Collection

Random soil composite samples were collected from each spill site section with a stainless steel trowel and soil was transferred to a four (4) gallon container. Composite soil samples from each container were thoroughly mixed and sample aliquot split with regulatory agency representative (ie: Mr. Steve Phibbs - 919/761-2390). Chain of Custody records are identified in Appendix A. The RCRA chemical analyses performed in triplicate on these sectional composite samples include the following parameters:

- 1) Zinc (Extractable)
- 2) Copper (Extractable)
- 3) Nickel (Extractable)
- 4) Chromium (Extractable)
- 5) Lead (Extractable)
- 6) Cyanide (Extractable)

The results of these analyses performed in triplicate were reported to representatives of Stewart Warner Corporation and their attorneys. The attorneys for Stewart Warner Corporation coordinated the analyses reporting with the North Carolina Hazardous Waste Compliance Unit so that backfilling could commence upon agency approval.

3.0 RESULTS

The results of the remedial sampling are described in Tables I-IV. Each composite sample collected was analyzed for selected parameters in triplicate using the RCRA or EP Toxicity Leachate procedure. Quadrant 3, Section B (Chemical Spill Site 1) was resampled after additional excavation had been completed as shown in Table IV. A significant reduction in contaminant concentration was identified for all chemical constituents analyzed.

TABLE I - Remedial Sampling for Selected Parameters at Chemical Spill Site 1
Bassick-Sack, Winston-Salem, North Carolina (February 2-9, 1988)

Source	Zinc (mg/l)	Copper (mg/l)	Nickel (mg/l)	Chromium (mg/l)	Lead (mg/l)	Cyanide (mg/l)
3A ₁	35.7	3.7	0.833	0.016	<0.110	0.068
3A ₂	41.3	2.43	0.722	0.016	<0.110	0.164
3A ₃	40.8	4.26	0.806	0.016	<0.110	0.055
AVG.	39.3	3.46	0.787	0.016	<0.110	0.091
3B ₁	1.73	0.85	0.65	<0.017	<0.110	0.936
3B ₂	9.40	1.4	1.60	<0.017	<0.110	0.936
3B ₃	8.60	1.2	1.30	<0.017	<0.110	0.816
AVG.	6.58	1.15	1.18	<0.017	<0.110	0.896
2A ₁	10.9	0.19	0.240	<0.017	<0.110	<0.005
2A ₂	15.2	0.93	0.320	<0.017	<0.110	<0.005
2A ₃	15.6	0.73	0.320	<0.017	<0.110	<0.005
AVG.	13.9	0.62	0.293	<0.017	<0.110	<0.005
2B ₁	15.7	0.13	0.240	<0.017	<0.110	<0.005
2B ₂	53.2	2.1	0.470	<0.017	<0.110	<0.005
2B ₃	59.6	2.96	0.440	<0.017	<0.110	<0.005
AVG.	42.83	1.73	0.383	<0.017	<0.110	
2C ₁	62.9	2.9	0.320	<0.017	<0.110	<0.005
2C ₂	78.3	7.5	0.410	<0.017	<0.110	<0.005
2C ₃	149	14.7	0.590	<0.017	<0.110	<0.005
AVG.	96.73	8.37	0.44	<0.017	<0.110	<0.005
2D ₁	34.9	0.73	0.440	<0.017	<0.110	<0.005
2D ₂	80.0	7.1	0.650	<0.017	<0.110	<0.005
2D ₃	78.3	6.9	0.650	<0.017	<0.110	<0.005
AVG	64.4	4.91	0.58	<0.017	<0.110	<0.005
2E ₁	18.4	0.96	2.0	<0.017	<0.110	<0.005
2E ₂	33.6	5.0	2.0	<0.017	<0.110	<0.005
2E ₃	40.0	7.1	3.1	<0.017	<0.110	<0.005
AVG.	30.67	4.35	2.37	<0.017	<0.110	<0.005

TABLE II - Remedial Sampling for Selected Parameters at Chemical Spill Site 2
Bassick-Sack, Winston-Salem, North Carolina (January 28, 1988)

Source	Zinc (mg/l)	Copper (mg/l)	Nickel (mg/l)	Chromium (mg/l)	Lead (mg/l)	Cyanide (mg/l)
1A ₁	5.2	0.982	0.556	<0.017	<0.110	<0.005
1A ₂	8.4	0.91	1.08	<0.017	<0.110	<0.005
1A ₃	8.63	0.37	1.03	<0.017	<0.110	<0.005
AVG.	7.41	0.754	0.889	<0.017	<0.110	<0.005
1B ₁	57.8	4.6	2.67	<0.017	<0.110	<0.005
1B ₂	38.7	2.0	1.58	<0.017	<0.110	<0.005
1B ₃	22.0	0.65	1.19	<0.017	<0.110	<0.005
AVG.	39.5	2.42	1.81	<0.017	<0.110	<0.005
1C ₁	29.8	1.86	1.89	<0.017	<0.110	<0.005
1C ₂	15.2	0.65	1.0	<0.017	<0.110	<0.005
1C ₃	10.0	0.44	0.47	<0.017	<0.110	<0.005
AVG.	18.3	0.983	1.12	<0.017	<0.110	<0.005
1D ₁	20.8	3.12	2.05	<0.017	0.110	<0.005
1D ₂	21.2	3.08	1.97	<0.017	0.110	<0.005
1D ₃	15.6	1.57	1.27	<0.017	0.110	<0.005
AVG.	19.2	2.59	1.76	<0.017	0.110	<0.005
1E ₁	9.3	0.89	0.64	0.017	<0.110	<0.005
1E ₂	3.83	0.16	0.33	<0.017	<0.110	<0.005
1E ₃	4.45	0.13	0.44	<0.017	<0.110	<0.005
AVG.	5.86	0.393	0.47	<0.017	<0.110	<0.005

TABLE III - RCRA Analyses of Backfill Soil for Selected Parameters for Chemical Spill Sites I and II at Bassick-Sack, Winston-Salem, North Carolina (February 11, 1988)

<u>Parameter</u>	<u>Concentration</u> <u>(mg/l)</u>
Zinc	0.124
Copper	0.019
Nickel	0.029
Chromium	<0.017
Cyanide	<0.125

TABLE IV - Remedial Sampling for Extractable Cyanide at Chemical Spill Site 1, Quadrant 3, Section B, Bassick-Sack, Winston-Salem, North Carolina (February 22, 1988)

<u>Source</u>	<u>Cyanide(mg/l)</u>
3B ₁	0.16
3B ₂	0.18
3B ₃	0.17

4.0 DISCUSSION

The information contained in this report has been used by representatives for Stewart Warner Corporation to seek approval from the North Carolina Solid and Hazardous Waste Management Branch to commence with the back-filling of Chemical Spill Site's 1 and 2. Total compliance with remedial clean-up activities and backfill operations as approved by regulatory agency for Chemical Spill sites 1 and 2 is expected by April 8, 1988