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& DUNHAM

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March 12, 2010

Mr. Keith Rogers, Project Manager
North Carolina Department of Environment and Natural Resources
Division of Waste Management - Superfund Section
Inactive Hazardous Sites Branch
401 Oberlin Road, Suite 150
Raleigh, North Carolina 27605

Reference: Supplemental Remedial Investigation Plan
Umicore Facility Area
Umicore USA Inc. - Maxton Facility
Maxton, Scotland County, North Carolina
NONCD0002833

Dear Mr. Rogers:

On behalf of Umicore USA Inc. **(**Umicore), Duncklee & Dunham, P.C. (Duncklee & Dunham) has prepared this Supplemental Remedial Investigation Plan (SRIP) for the above referenced site. This work plan compliments the recently submitted Remedial Investigation Plan (RIP) prepared for the Laurinburg-Maxton Airport Commission (LMAC) Area. Please refer to the LMAC Area RIP for information on the site location, ownership, industrial usage, site assessment methodology, or other information (*Remedial Investigation Plan, Umicore USA Inc., LMAC Area, 17180 Airport Road, Maxton, Scotland County, North Carolina, NONCD0002833*, prepared by Duncklee & Dunham, February 3, 2010).

1 Introduction

Umicore is in the process of razing several cobalt product production buildings (see Figure 1). This area, which is the primary focus of this SRIP, will be discussed in further detail in a subsequent Umicore Facility RIP as Area of Concern #1 (AOC1). However, due to time constraints and as an interim measure, this SRIP is designed to allow the collection of soil assessment, attenuation, and treatability data from AOC1 in accordance with the rules and guidelines required by the North Carolina Department of Environment and Natural Resources, Division of Waste Management, Inactive Hazardous Sites Branch (IHSB) – Registered Environmental Consultant Program.

These results will be used to support a remedial alternatives evaluation (RAE). The attenuation study will focus on the ability of the soil to adsorb and retard contamination migration with respect to certain target compounds in the shallow sand, the silty clay semi-confining unit, and the underlying intermediate sand. The treatability studies will focus on shallow soil from both the LMAC Area and the on-site cobalt production area (the Plant Area).

In preparing this SRIP, Duncklee & Dunham reviewed the operational history, previously collected soil and ground water data, and conducted interviews with Umicore personnel. Based on these evaluations, cobalt and other inorganics have likely been released from cobalt processing, waste and recycled water treatment operations, and from aboveground tank storage areas within AOC1.

2 Investigation Scope and Procedures

To determine if environmental impact has occurred beneath the foundation and visually confirm the impact upon removal of AOC1 structures, foundations, sumps, and tanks, etc., a sampling and analysis plan (SAP) has been prepared to focus on soil assessment, attenuation, and treatability studies. Sample locations and depths are subject to field adjustment based upon visual observations of soil conditions during demolition.

2.1 Soil Sampling

Table 1 summarizes the SAP for AOC1 including the soil sample locations, depths, collection methods, laboratory analyses, and sampling rational. In general, the locations were selected based on expectations that soil impact is distributed throughout the area as well as concentrated in the main production, treatment and storage areas (see Figure 1). Therefore, a combination of a grid and focused sampling techniques will be utilized to evaluate the total and leachable concentrations of constituents of concern (COCs) in soil from which a site-specific soil to ground water protection value (SSL) can be developed. The attenuation evaluation will focus on collection of shallow and deeper soil samples from the LMAC Area (see location DMW-1 on Figure 4 of the LMAC Area RIP) and also from the Plant Area shallow soils.

Data quality control and quality assurance (QA/QC), sample collection, laboratory analytes and methods used will follow those outlined in the LMAC Area RIP previously referenced. The specific QA/QC requirements for soil sampling beneath AOC1 are summarized on Table 2. Additionally, as part of the evaluation, geotechnical and geochemical samples will be collected to evaluate soil physical parameters and support the evaluations.

2.2 Attenuation and Treatability Studies

2.2.1 Objectives and Approach

The objectives of the soil attenuation testing are to evaluate the ability of the soil to retard the migration of cobalt through the matrix. The following three soil layers will be evaluated: 1) shallow unconfined sand unit, 2) the underlying silty clay semi-confining unit, and 3) the intermediate depth sand beneath the silty clay. The attenuation values for cobalt to be calculated for each soil layer include the distribution coefficient (K_d) and retardation factor (R_f).

The attenuation evaluation will focus on samples from: 1) the shallow zone on the LMAC and Plant Areas, and 2) the deeper soils from the LMAC Area. Shallow soil samples with a cobalt target range of 30 to 300 mg/kg (see Appendix A) will be selected these areas. To meet these criteria, locations will be selected based on cobalt sample results collected during the implementation of the LMAC Area RIP and

those collected in the cobalt production area of AOC1. In this evaluation, soils containing cobalt above 300 mg/kg will be omitted from further evaluation because these soils will most likely be excavated and disposed of off-site as a remedy.

If shallow soil from the LMAC Area attenuates the cobalt or other COCs, then no treatability testing will be performed for this area (see Appendix A). If attenuation is not achieved, then soil from this area will be subject to treatability testing. Both attenuation and treatability testing will be performed of shallow Plant Area soil.

The objective of the treatability testing is to evaluate the effectiveness of products that can be used to fixate or immobilize cobalt and other inorganics, including:

- The evaluation of additives to soil to fixate cobalt and inorganic COCs,
- The determination of physical-chemical properties of each potential chemical additive, and
- Develop an estimate of the dosage rate of each tested chemical.

The treatability testing will involve two phases. The first phase will test selected treatment products to determine their effectiveness in soil with cobalt containing approximately 100 to 300 mg/kg. The product found to be most effective per unit cost will be selected. In the second phase of treatability testing, the selected product will be evaluated in more detail to better define the volume of product needed to treat soil to different concentrations and be protective of the soil to ground water value. This will include an evaluation of how effective the remedial product is with time. The treatability testing will also be performed to demonstrate the ability of chemical additives to fixate cobalt and other COCs, estimate reaction byproducts and metals mobilization, and help refine design parameters for the final soil remedy.

2.2.2 Attenuation Testing Procedure

As shown in the flowchart in Appendix A, the attenuation capacity in soil from both areas will be evaluated by determining the K_d, which represents the partitioning between the liquids (leachate) and solids (soil). The K_d allows the calculation of the retardation of the contaminants in the soil (i.e., Retardation factor (R_f)). The K_d will be determined using laboratory batch testing after EPA (EPA, 1999, *Understanding Variation in Partition Coefficient, K_d, Values*: EPA 402-R-004A, B, C).

A known mass (M) of < two millimeter size soil will be placed in a beaker and a known volume (V) of solution (i.e., simulated rainwater for the shallow soil and ground water for the deeper soil) with a known cobalt concentration (C_o) is added to the beaker. The soil and solution are stirred in the beaker for several days to ensure that sorption equilibrium has occurred. Then the liquid solution is removed and analyzed for the cobalt concentration (C_i). The K_d is calculated by the following equation:

$$K_d = \frac{V(C_o - C_i)}{M(C_i)}$$

To derive the R_f, a K_d value will be derived using the formula below, where ρ_b is the dry soil bulk density and n is the water filled porosity:

$$R_f = K_d(\rho_b/n) + 1$$

To obtain K_d values, the solution will be spiked at three concentrations, one lower, one equal to, and one higher than the highest ground water concentration. The three concentrations will give three points on the K_d plot. This will be repeated for each soil, i.e. shallow sand, clay, and intermediate sand. The contaminated ground water will have the same naturally occurring chemical characteristics in addition to cobalt. A control test will be evaluated at each of the three concentrations to determine if cobalt and any of the COCs are adsorbed to the beaker surface. In addition to inorganic analytical testing, soil samples will also be tested for physical parameters (see Table 2).

2.2.3 Treatability Test Procedure

2.2.3.1 Phase 1

The Phase 1 treatability samples will be selected from shallow soil in the LMAC and Plant Areas based on the sample results falling within the cobalt target range of approximately 100 to 300 mg/kg. If the shallow LMAC soil fully attenuates the cobalt and other COCs, then treatability testing in this area may be omitted. Shallow soil from the Plant Area will be subject to treatability testing regardless of the attenuation study findings because significant groundwater impacts have been documented in this area.

The treatability study soil will be evaluated with several commercial fixation or stabilization products to determine which is best suited immobilize cobalt and other COCs and to determine a fixation dose rate when compared to the upper target range value of 300 mg/kg. During the Phase I treatability study, a potential list of reaction products and concentrations will be evaluated. If the product can fix the cobalt and other COCs and has acceptable reaction product levels, then a cost evaluation will be performed based on the estimated tonnage to remediate and the dosage required. The product that demonstrates the most effective cleanup cost will be chosen for the Phase 2 treatability testing.

2.2.3.2 Phase 2

Either a column or batch test will be used to evaluate the product selected. The product selected for evaluation will undergo four tests. One test will include no product additives as a control and the others will be mixed with the product at different dosages. For each test, a simulated rainwater solution will be sampled prior to sample saturation and analyzed after nine intervals. The water samples will be analyzed for cobalt and the COC list, total dissolved solids, pH, oxidation-reduction potential (ORP) and electrical conductivity (EC) by EPA Methods or Standard Methods as outlined in the SAP (see Tables 1 and 2).

2.2.4 Evaluation

The analytical results from the tests will be plotted for each dose and compared to North Carolina and EPA regulatory standards for ground water to determine if the chemical dose mixed in the soil is effective at fixing the cobalt and other COC list parameters. The control data will be extrapolated to estimate a time that rainwater leaching through the soil would meet regulatory standards for ground water.

Currently, Duncklee & Dunham recommends fixation products from recognized environmental remediation suppliers such as Adventus America, GeoChem Remediation, and others be evaluated. . Furthermore, products such as agricultural lime that may be helpful for pH control will also be considered prior to the implementation of the treatability study.

Once the appropriate technology is selected, a pilot study will be used to extrapolate the laboratory testing results to field scale remediation design criteria. The pilot study takes the laboratory testing results and monitors: 1) distribution and transport of chemicals, 2) contaminant rebound, if any, and 3) refines the study monitoring plan using trial and error modifications that are later to be extrapolated to the full scale system design. The field pilot study program will be summarized and scope detailing the objectives in a separate RIP.

3 Certification

The SRIP certification pages required by the REC program are included in Appendix B.

If there are any questions or you require any additional information, please do not hesitate to contact Mr. James Bennett, P.G., R.S.M. at jbennett@dunckleedunham.com or at (919) 858-9898, or Mr. Richard Laird at dick.laird@am.umicore.com or at (919) 874-7156.

Sincerely,

DUNCKLEE & DUNHAM, P.C.

Jay Bennett, P.G., R.S.M.
Senior Project Manager/Hydrogeologist

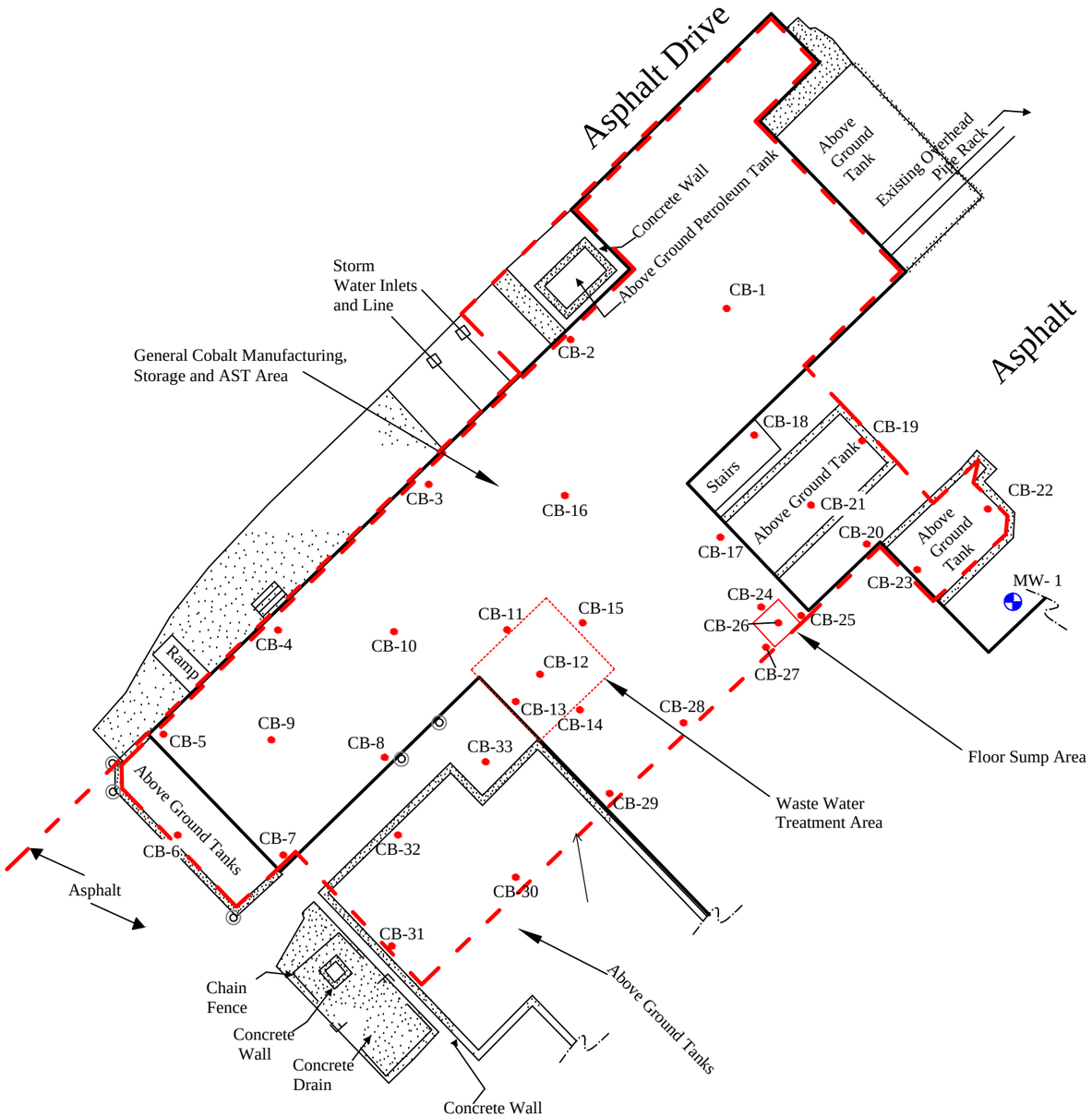
David L. Duncklee, P.G., R.S.M
Principal/Senior Hydrogeologist

Attachments: Figure 1
Tables 1 and 2
Appendix A – Attenuation and Treatability Study Flow Chart
Appendix B - Certification

cc: Mr. Dick Laird – Umicore USA
Ms Ravila Gupta – Umicore USA

P:\Umicore - 200917\7 Work Plans (g)\7.4 Addendums\SRIP AOC1\Text and tables\Supplemental RIP-10017.doc

FIGURE



0' 30' 60'

Graphic Scale
1" = 30'

Legend

CB-21	Soil Sample and Boring Location
	Approximate Area Where Concrete Slab to be Removed
MW- 1	Existing Monitoring Well

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Soil Sample Location Plan-Cobalt Building Production Areas
Umicore Facility
Maxton, North Carolina

Drawn By: lae	Checked By: jab	Date: 1-11-2010
Scale: 1" =30'	Revision No.:	Project Number: 200917
	Layers:	Filename: P:\Umicore - 200917\0 Field and Technical Documentation\8.8 CAD and GIS Maps

References:

Figure

1

TABLES

Table 1. Sampling and Analysis Plan, Cobalt Chloride Production Area (AOC 1), Umicore Facility, Maxton, North Carolina

Task Group Item	Area or Sub-Task	Sample Location	Sample ID	QA/QC	Sample Parameters	Media Code	Depths (each location)	Collection Method	Sampling Rational
A. Soil Assessment Proposed Demolition Area AOC 1	Waste Water Treatment Area	CB-12	CB-12a, CB-12b	CB-12b D	PPM, Inorg.List, SPLP of COC List	S,SS	0 to 6"and 36"	H,HS,HA,GP	Sample soil to comply with REC requirements, identify and finalize COC list, and identify soil beneath demolished structures that my require remediation.
		CB-11, CB-13, CB-14, and CB-15	CB-11a, CB-11b; CB-13a, CB-13b; CB-14a, CB-14b; and CB-15a, CB-15b	- - -	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
	Floor Sump Area	CB-26	CB-26a, CB-26b	CB-26b D	PPM, Inorg.List, SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-24, CB-25, CB-27	CB-24a, CB-24b; CB-25a, CB-25b; CB-27a, CB-27b	CB-24b D,	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
	General Cobalt Manufacturing, Storage, and AST Areas	CB-1	CB-1a, CB-1b	CB-1a EB	PPM, Inorg.List, SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-2, CB-3	CB-2a, CB-2b; CB-3a, CB-3b	- - -	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-4, CB-5	CB-4a, CB-4b; CB-5a, CB-5b	CB-4a D	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-6, CB-7	CB-6a, CB-6b; CB-7a, CB-7b	- - -	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-8, CB-9, CB-10, CB-29	CB-8a, CB-8b; CB-9a, CB-9b, CB-10a, CB-10b; CB-29a, CB-29b	CB-29b TB	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-16, CB-17, CB-28	CB-16a, CB-16b; CB-17a, CB-17b, CB-28a, CB-28b	- - -	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
	Above Ground Tank Areas	CB-21	CB-21a, CB-21b	- - -	PPM, Inorg.List, SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-18, CB-19, CB-20	CB-18a, CB-18b, CB-19a, CB-19b, CB-20a, CB-20b	CB-19bD	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-22, CB-23	CB-22a, CB-22b; CB-23a, CB-23b	CB-22aD	Total and SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-30	CB-30a, CB-30b	CB-30aEB	PPM, Inorg.List, SPLP of COC List	S,SS	0 to 6" and 36"	H,HS,HA,GP	
		CB-31, CB-32, CB-33	CB-31a, CB-31b, CB-32a,CB-32b,CB-33a, CB-33b	CB-33bD	Total and SPLP of COC List	SS	Varies	BHB	
B. Samples for Attenuation and Treatability Studies	General Cobalt Manufacturing, Waste Water and Floor Sump Area	Varies	AOC1-Bulk1	- - -	COC List and PPM	SS	1 to 3 ft bls	HS	Collect four shallow soil samples (two on the LMAC and two on the Umicore Plant Area based on cobalt concentrations. Select sample based on target clean-up values between 30 and 300 mg/kg).
		Varies	AOC1- Bulk2	- - -	COC List and PPM	SS	1 to 3 ft bls	HS	
	LMAC Area	Varies	LMAC-Bulk1	- - -	COC List and PPM	SS	1 to 3 ft bls	HS	
		Varies	LMAC- Bulk2	- - -	COC List and PPM	SS	1 to 3 ft bls	HS	
	LMAC Area	DMW-1b	DMW-1C, DMW-1D	- - -	COC List and PPM	SS	14' and 20'	GP	Collect two deep soil samples from boring on the LMAC Area (i.e., shallow clay unit and intermediate sand unit) from a clean zone boring to support attenuation testing.
	LMAC Area	DMW-1s	DMW1s(0310)		Cobalt and COC List and major Cations and Anions	GW	6-12	GP,LFS,MP	Collect ground water sample from upper aquifer to use for Kd and Rf evaluation.
	LMAC Area	DMW-1b	DMW-1bCNA, DMW-1bDNA	- - -	Cobalt and COC List to determine Kd and Rf.	W	NA	Grab	Determine the attenuation potential of cobalt in deeper soil sample from boring at LMAC Area (i.e. from DMW-1b soil boring) to calculate and determine the vertical Kd and Rf. Use LMAC Area shallow ground water from DMW-1s.
	AOC1	Varies	AOC1-NA, LMAC-NA	- - -	Cobalt and COC List to determine Kd and Rf.	W	NA	Grab	Determine attenuation potential of two shallow samples (i.e., one from each area) to determine the Kd and Rf. Samples must be between the 30 and 300 mg/kg target clean-up values for cobalt. Use simulated rainwater water.
	AOC1 and LMAC Areas	Varies	Phase 1-TS-Will vary based on the laboratory.	- - -	Cobalt and COC List	W	NA	Grab	Determine effectiveness of soil fixing products to treat soil up to 300 mg/kg.
		Varies	Phase 2-TS. Will vary based on the laboratory.	- - -	Batch test or column test via ASTM D4874-95.Cobalt and COC list, TDS,pH, ORP and EC.	W	Up to 9 water batches or 1, 2, 4, and 8 Pore Volumes	Grab	Determine effectiveness of selected soil fixing product to treat soil at deferent levels up to 300 mg/kg.
C. SP/pH and Geotechnical Parameters	Evaluate Soil Physical Parameters	CB-7 and CB-29	CB-7a, CB-7b and CB-29a, CB-29b	- - -	SP/pH and Geotechnical Parameters	S,SS	0 to 6" and 36"	H,HS,HA,GP	Provide soil physical data for evaluating and planning the remediation options for soil clean up.

Notes:

PPM = Priority Pollutant Metals List by SW-846 Methods 6010, 7471 (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Mn, Ni, Se, Ag, Th, Zn)
Inorg.. List = Includes cobalt, sodium, potassium, manganese, chloride, nitrate, and sulfate via EPA method 6000 series and 300 series.
COC List - Contaminants of concern that include cobalt and others to be determined with initial sampling from constituents tested above.
SPLP - synthetic precipitation leaching procedure (SPLP) via EPA method 1312. Note: only 30% of SPLP samples to be run based on the totals results and the others will be put on hold.
Major Cations and Anions - include calcium,magnesium, sodium, potassium (cations via EPA Method 300 series) and alkalinity (carbonate and bi-carbonate series), sulfate,nitrate, iron and chloride (anions by EPA Method 300 series)
SP/pH = Soil Parameters and pH (N.C. Dept. of Agriculture protocols) includes iron,manganese,cationic exchange capacity,sulfer, and magnesium.
GT = Geotechnical Parameters - include soil permeability, porosity, moisture content, grain size, total organic carbon, bulk density and fractional organic carbon.
Bulk = Bulk soil sample (i.e. 5 gallon bucket) collected at specified areas for bench scale testing.
NA = Not applicable.
Kd and Rf - Soil distribution coefficient and retardation factor for cobalt and other COC list as applicable are based on EPA documentation listed in EPA 402-R-004A,B,C (EPA, 19
Batch Study- indicates specified volumes of sol and water to be used by treatability testing laborato
ASTM D4874- American Society of Testing Methods for Column studies for Method # D487

QA/QC Sample Summary - selected at 10% of the matrix per analyte. Sample to be selected in the field at location specified.

TB = Trip Blank D = Field Duplicate EB = Equipment Blank
QA/QC = Quality assurance/quality control sample. Place a D, TB or EB after sample ID once sample is collected to fulfill QA/QC requirements.

Other Notes/Abbreviations

COC = Contaminants of Concern S = surface soil sample (6"' bls) SS = sub-surface soil sample (36" or as specified) Varies = indicates sample collected from sidewall an bottom of excavation, exact depth unknown. G = Grab sample from select zone W = Leachate water sample
GP = Geoprobe® HA = Hand auger HS = Hand scoop ft bls = Feet below land surface H = Soil homogenized in field BHB = Backhoe bucket as grab sample W = Water sample from bench study MP = Well screen mid-point LFS = Low-flow sampling
All soil samples to be collected as grab and prepared as indicated.

Table 2. Summary of Analytes and QA/QC Evaluation, Cobalt Chloride Production Area (AOC 1), Umicore Facility, Maxton, North Carolina

Task Group Item	Area or Sub-Task	# of Samples	Medium	PP Metals	Inorg.List	SPLP* of COC List	COC List	Major Cations and Anions	Soil Condition Parameters and pH	Attenuation Parameters	Geotech Parameters	Treatability Testing
A. Soil Assessment Proposed Demolition Area AOC 1	Waste Water Treatment Area	5	S	1	1	5	5					
		5	SS	1	1	5	5					
	Floor Sump Area	4	S	1	1	4	4					
		4	SS	1	1	4	4					
	General Cobalt Manufacturing, Storage, and AST Areas	14	S	1	1	14	14					
		14	SS	1	1	14	14					
	Above Ground Tank Areas	10	S	2	2	10	10					
		10	SS	2	2	10	10					
B. Samples for Attenuation and Treatability Studies	Central Cobalt Processing and, Effluent Holding Tank Area	2	S	2			2					Yes
	LMAC Area	2	S	2			2					Yes
		2	SS	2			2					Yes
	Attenuation Samples	1	GW				1	1				
		2	W				2			Yes		
		2	W				2			Yes		
	Treatability Study Samples (Phase 1)	4	W				4					Yes
	Treatability Study Samples (Phase 2)***	36	W				36					Yes
C. SP/pH and Geotechnical Parameters	Evaluate Soil Physical Parameters	2	S						2		2	
		2	SS						2		2	
Subtotal		**121**	**---**	**16**	**10**	**66**	**117**	**1**	**4**	**NA**	**4**	**NA**
QA/QC Sample Evaluation												
Trip Blanks			Soil									
Duplicates			Soil	1	1	7**	7**					
Equipment Blanks			Soil	1	1	2**	2**					
IDW	To be determined		Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA
Subtotal		**141**	**---**	**2**	**2**	**9**	**9**	**NA**	**NA**	**NA**	**NA**	**NA**
GRAND TOTAL		**141**	**---**	**18**	**12**	**75**	**126**	**NA**	**NA**	**NA**	**NA**	**NA**

Notes:

1) Field Parameters to include: temperature, pH, specific conductance, dissolved oxygen, turbidity, redox and Fe+2.
3) PP Metals = Priority Pollutant Metals (Sb, As, Be Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Th, Zn)
4) QA/QC samples based on DENR REC protocols of 1 per 20 field samples per matrix and analysis that includes field duplicates, which are 10%. Trip blanks are excluded for this SAP due to matrix selection and not required.
5) COC List - Contaminants of concern that include cobalt and others to be determined with initial sampling from A5-D1 location. These may include any of the constituents tested above.
6) Soil Parameters and pH (U.S. Dept. of Agriculture) include cation exchange capacity, pH, phosphate, potash, sulfur, nitrogen, mineral soil class among others.
7) Geotech Parameters include soil perm., porosity, moisture content, grain size, organic content, bulk density and fractional organic content.
8) Attenuation parameters include the distribution coefficient and retardation factor for specific compounds. Reference methods in EPA document EPA 402-R-004A,B,C (EPA, 1999)
9) Major Cations and Anions - include calcium,magnesium, sodium, potassium (cations via EPA Method 300 series) and alkalinity (carbonate and bi-carbonate series), sulfate,nitrate and chloride (anions by EPA Method 300 series)

COC = Contaminants of Concern

IDW- Investigative derived waste soil cuttings or water generated during the assessment process and number of samples and analytes required will be determined.

NA = Not applicable.

* - Indicates that up to 20 SPLP samples will be selected once the total cobalt evaluation is performed and determined to be between 30 to 300 mg/kg total cobalt.

** = Sample QA/QC only for the investigative samples and not the treatability samples.

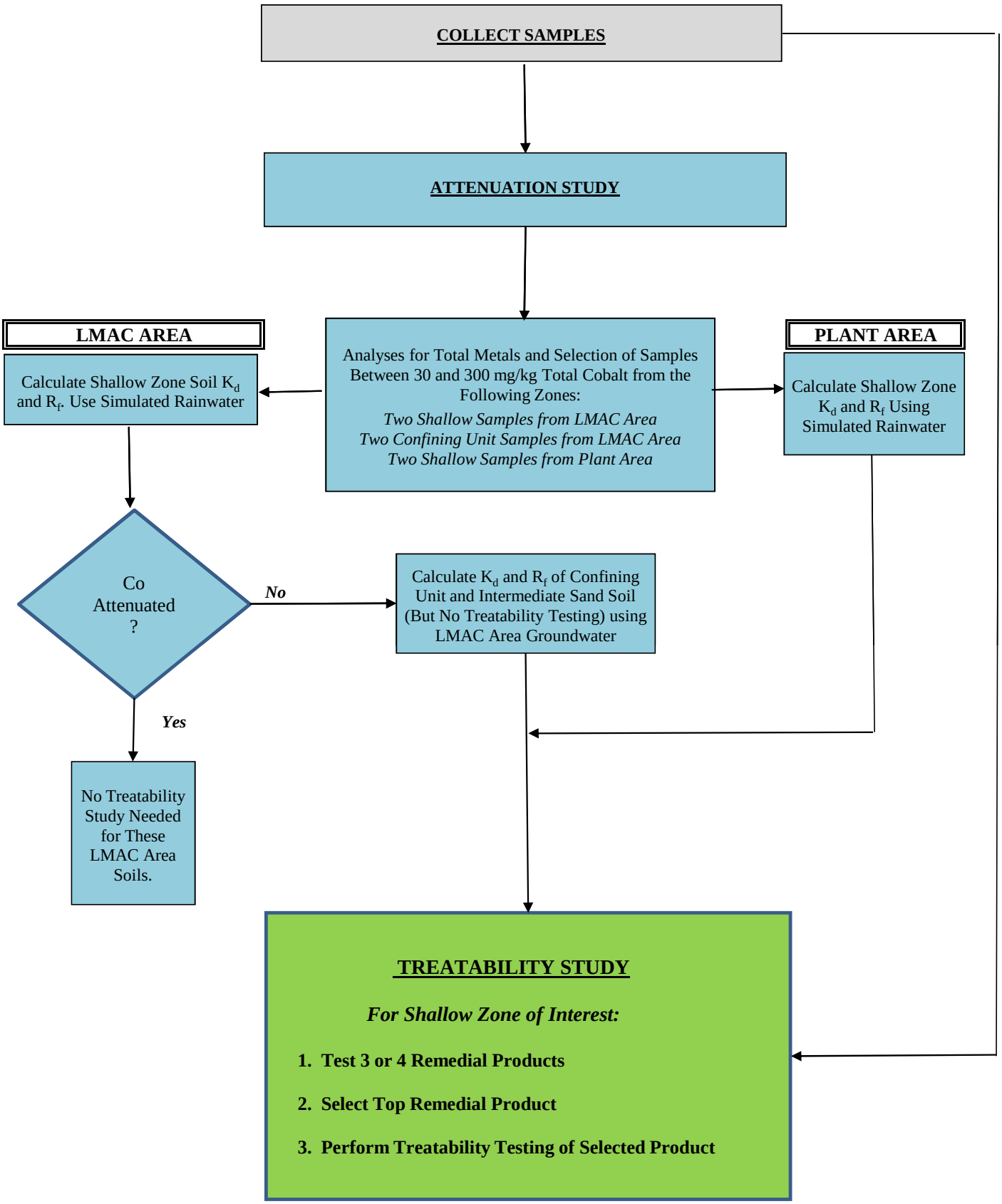
*** = Sample numbers may vary depending on the outcome of the test.

S = surface soil sample (six-inches below surface) SS = subsurface soil at 18-inches and 36-inches below land surface . W = water sample GW = ground water sample

TBD = To be determined based on the number of remediation chemicals to test and the dosage rates.

Appendix A

Umicore Attenuation and Treatability Study Flow Chart
Maxton, North Carolina
March 4, 2010



Appendix B

North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch

REMEDIATING PARTY CERTIFICATION STATEMENT (.0306(b)(2)):

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Richard C. Laird
(Name of Remediating Party Official)

* RCL * 3/12/10
(Signature of Remediating Party Official) Date

** NOTE: The RSM certifies all documents LAST. Failure to do so is a violation of 15A NCAC 13C .0306(b)(2) of the REC Rules and subject to possible enforcement action against the REC and/or RSM.*

NORTH CAROLINA (Enter State)

WAKE **COUNTY**

I, PAMELA S. ELLIOTT, a Notary Public of said County and State, do hereby certify that RICHARD C. LAIRD did personally appear and sign before me this day, produced proper identification in the form of PERSONALLY KNOWN, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 12th day of MARCH, 2010.

Pamela S Elliott
Notary Public (signature) (OFFICIAL SEAL)

My commission expires: Pamela S. Elliott
Notary Public
Wake County
North Carolina
My Commission Expires 8/15/2014

Form G - I

North Carolina Division of Waste Management DWM Educating today for a cleaner tomorrow wastenotnc.org

North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch

REGISTERED SITE MANAGER CERTIFICATION STATEMENT (.0306(b)(1)):

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

James A. Bennett, P.G., R.S.M.
(Name of Registered Site Managerl)

* James A. Bennett * 3-15-2010
(Signature of Registered Site Manager) Date

** NOTE: The RSM certifies all documents LAST. Failure to do so is a violation of 15A NCAC 13C .0306(b)(2) of the REC Rules and subject to possible enforcement action against the REC and/or RSM.*

North Carolina (Enter State)

Johnston **COUNTY**

I, Emily H. Sauls, a Notary Public of said County and State, do hereby certify that James A. Bennett did personally appear and sign before me this day, produced proper identification in the form of personal knowledge was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 15th day of March, 2010.

Emily H. Sauls
Notary Public (signature)

Emily H Sauls
Notary Public
Johnston County, NC
My Commission Expires July 10, 2012
(OFFICIAL SEAL)

My commission expires: July 10, 2012.

North Carolina Division of Waste Management
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