FINAL CLOSURE REPORT
SOLID WASTE LAND FILL
FORMER CE-CAST FACILITY
MUSE, PA

Prepared for:

ABB INC.
2000 DAY HILL ROAD
WINDSOR, CONNECTICUT

Prepared by:

MACTEC Engineering and Consulting, Inc.
800 North Bell Avenue, Suite 200
Pittsburgh, PA 15106

July 24, 2009

Project: 3410080603

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1.0 INTRODUCTION

MACTEC Engineering and Consulting, Inc. (MACTEC) has prepared this Final Closure Report (Report) on behalf of ABB Inc. (ABB) in accordance with the approved Landfill Closure Plan Revision 2 (MACTEC, September 2008) and solid waste rules specifically 25 PA Code 287.117. The activities described in this Report relate to the closure of the approximate 1.5 acre industrial solid waste landfill located within the 87 acre former CE-Cast facility (Site) in Muse, Washington County, Pennsylvania. The Pennsylvania Department of Environmental Protection (PADEP) approved the September 2008 Closure Plan via their letter dated September 11, 2008 (Appendix A). The Site location is shown on Figure 1 and the Site plan is shown on Figure 2.

The landfill was constructed pursuant to a May 12, 1980 Consent Order and Agreement (COA) with the PADEP, as well as PADEP Industrial Solid Waste Disposal Permit issued in May 5, 1980 (permit #300782). Copies of those documents are included in Appendix B. The landfill was constructed, and capped between the fall of 1980 and spring of 1981. All of the waste in the landfill cell came from the Site.

ABB has conducted the landfill closure activities described herein voluntarily. The objectives of the closure activities were to remove the landfill (cap, contents, and liner) and dispose of impacted material properly off-Site to minimize potential long term environmental liability. A secondary objective was to maximize the potential opportunity to demonstrate attainment with the Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2) non-residential standards for soil and groundwater at some time in the future.

During preparation and review of the Closure Plan, PADEP indicated that ABB's successful execution of the work, and subsequent PADEP approval of this Final Closure Report, will supersede the existing COA from 1980.

ABB has coordinated closely with PADEP during the planning and completion of the closure activities, as well as during the various landfill characterization activities conducted over the past seven years. In addition, PADEP has been provided with copies of semi-annual Site wide

groundwater monitoring reports since the mid-1990s. While there is currently no on-going regulatory enforcement action at either the state or federal levels, PADEP provided the United Sates Environmental Protection Agency (USEPA) Region III a copy of the Closure Plan for review prior to implementation. This was necessary since the Site, when active, was considered a large quantity generator of hazardous waste and USEPA completed a Resource Conservation Recovery Act (RCRA) Environmental Indicators Audit of the Site in 2003. While documentation relating to the RCRA closure of the manufacturing facility was identified in the files reviewed by MACTEC; no RCRA closure plan documentation has been identified that relates to the landfill. Because of the historical USEPA involvement with the Site, the PADEP notified USEPA of the landfill closure activities described in the Closure Plan. However, the PADEP Solid Waste Program is the lead agency in approving this Closure Plan.

2.0 LANDFILL BACKGROUND

The design for the landfill was included as an appendix to the COA and is included here as Appendix B. PADEP issued a Solid Waste Permit, Number 300782 on May 5, 1980 for disposal of industrial waste within the landfill according to the design (Appendix B). No "as built" documentation regarding actual landfill construction was identified or reviewed by MACTEC in the preparation of the Closure Plan.

The landfill was constructed, filled with waste, and capped between September 1980 and early 1981. According to available documentation, the waste reportedly consisted of soils, sludge, and discarded drums contaminated with Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs) that were excavated from the banks of the unnamed tributary, the barrel removal area, the black water pond area, and the staging area within the Main Plant Area (Figure 2). The engineer's certification to the PADEP regarding the landfill was issued in May 1981 (Appendix B).

In 1988, repairs were made to the berm forming the southern perimeter of the landfill and the cap was upgraded by installing an impermeable synthetic membrane made of high density polyethylene (HDPE) over the pre-existing clay cap and then covering the HDPE liner with top soil. No "as-built" drawings are available; however, according to the permitted design and the description of the 1988 repairs, the landfill was understood to be constructed according to the following sequence (from ground surface):

- 2 feet of top soil (added in 1988);
- HDPE Synthetic membrane (added in 1988);
- 2.0 feet of compacted clay from on-Site borrow area (original cap);
- 5 feet of waste;
- 0.5 feet of sand (to protect liner);
- 20-mil Polyvinyl Chloride (PVC) synthetic liner;
- 0.5 feet of sand (referred to hereafter as "bedding sand"); and
- 4-inch diameter perforated under-drain piping within the bedding sand. The under-drain discharge is to the ground surface down slope of the landfill as shown on Figure 2.

In addition, two wells, referred to as LF-1 and LF-2, were constructed within the landfill (Figure 2). According to design information, Well LF-2 was installed at the time of landfill construction (1980-1981) and LF-1 was installed in 1988. These wells were presumably installed to facilitate the collection of water from within the landfill to allow for dewatering.

2.1 LANDFILL CHARACTERIZATION ACTIVITIES

The following activities were completed between 2001 and 2008 to assess the integrity and size of the landfill along with the physical and chemical characteristics of the contents:

1) Semi-annual sampling of landfill wells LF-1 and LF-2 and surrounding groundwater monitoring well network (2001 through 2008): Samples have been analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCBs) and metals. Many of the constituents identified in the landfill water are not present in surrounding groundwater and those that are detected in both are typically found in much higher concentrations in the landfill water.

2) Routine landfill dewatering (2001 through 2008): Landfill water was collected approximately quarterly and was disposed of off-Site as non-hazardous liquid at Castle Environmental, New Castle, Pennsylvania. Following collection, water levels in the wells were observed to return to approximate pre-pumping levels within approximately 72 hours.

3) Under-drain cleaning and video (2002): Accessible portions of the under-drain appeared to be intact. No discharges were observed since routine observations began in 2001.

4) Geophysical survey (2004): Several areas of the landfill within the landfill that likely contained metal debris (e.g. drums or scrap metal) were identified, as was the depth to bedrock.

5) Test pits (2007): Seven test pits were completed within the landfill and waste samples were collected. Landfill water was not encountered in any of the pits and the waste materials were sampled and were found not to be characteristically hazardous. No drums were encountered.

In general, the results of those activities indicated that:

1) The integrity of the landfill liner had not been compromised. It is currently believed that the presence of water within the landfill was likely due to storm water infiltration in the immediate vicinity of the two landfill wells.

2) There were two types of waste – "brown waste" and "black waste". The brown

waste occurred immediately beneath the clay cap and consisted of brown, primarily silty, soil and did not exhibit organic solvent like odors. The black waste occurred beneath the brown waste layer and consisted of clayey soil, black ash-like material, coal fragments/refuse and debris such as broken glass and pieces of metal. The black waste did exhibit strong organic solvent-like odors. Analytical data indicated that the waste would be considered Pennsylvania residual waste if excavated. However, elevated concentrations of lead and VOCs observed in some of the black waste samples indicated the potential for some of that material to be considered hazardous if excavated.

3) The volume of the landfill was larger than presented in the design documents as described below:

2.2 WASTE VOLUME ESTIMATES

The elevation of the base of the landfill was estimated using the 1980 design information, geophysical survey data, test pit elevation data along with the bottom elevation of wells LF-1 and LF-2 and bedrock surface elevations in surrounding monitoring wells. Based on the information reviewed, MACTEC estimated the volume of cap materials (top soil, HDPE and clay cap) to be 8,000 cubic yards (CY.) and the volume of waste to be approximately 12,000 CY (approximately 18,000 tons). Of the waste, it was estimated that 14,250 tons would be disposed of as non-hazardous (i.e., residual) waste and 3,750 tons would require disposal as hazardous waste. It was expected that some waste would require disposal as hazardous due to the test pit analytical data, which indicated that elevated concentrations of lead could be present that might cause some material to exceed hazardous waste limits.

In addition to the solid waste, it was assumed that approximately 50,000 gallons of water would require collection from the landfill during closure activities and off-Site disposal as non-hazardous liquid. Finally, although no drums were observed in the test pits, it was estimated that approximately 15 drums would be encountered and require over packing and off-Site disposal as hazardous waste.

With this information, MACTEC prepared the June 2008 Closure Plan and the Erosion and Sediment Control Plan which are summarized below.

2.3 SUMMARY OF THE 2008 CLOSURE PLAN AND EROSION AND SEDIMENT CONTROL PLAN

MACTEC submitted the Closure Plan to PADEP initially in June 2008. Following incorporation of comments from PADEP, MACTEC submitted the final Closure Plan revisions to PADEP via a September 8, 2008 letter. PADEP approved the revised Closure Plan via their September 11, 2008 letter to MACTEC (Appendix A). During PADEP review of the closure plan, they determined that no additional permits (e.g., temporary construction water discharge permit) were necessary other than an approved Erosion and Sediment Control Plan.

In June 2008, MACTEC submitted the Erosion and Sediment Control Plan – Former CE-Cast Facility (E&SCP) to the Washington County Conservation District (WCCD) for review and approval. WCCD approved the E&SCP via their August 25, 2008 letter to ABB, Inc. (Appendix A

2.3.1 Closure Plan Summary

The remedial alternatives evaluation presented in the Closure Plan indicated that excavation and off-Site disposal was the most effective manner to remove the landfill materials and achieve the remediation objective. The objective of the closure activities stated in the approved Closure Plan was to remove the landfill waste, and the liner/under-drain system and dispose of the material appropriately off-Site as either residual or hazardous solid waste, depending on waste characteristics as determined by the US EPA Toxicity Characteristic Leaching Procedure (TCLP). Excavation of the soils beneath the liner would continue, if necessary, based on confirmation sample results, until attainment of an Act 2 Standard could be demonstrated or it was determined that continued excavation would not be feasible.

The tasks associated with closure were described in detail and in general included the following:

1) Site preparation: Establish stock pile areas and erosion and sediment control (E&SCP) measures.

2) Landfill Dewatering: Collect water from LF-1 and LF-2 prior to and during closure activities and dispose of off-Site as non-hazardous liquid. Storm water that could potentially contact waste would also be collected and disposed of off-Site.

3) Excavation: Excavate and stockpile cap material for subsequent reuse as backfill. Excavate, stockpile, and sample waste material, bedding sand, and the under-drain system for subsequent off-Site disposal as either non-hazardous or hazardous waste based on analytical data.

4) Confirmation Sampling and Analyses: Collect confirmation soil samples from beneath the landfill and, based on the analytical results, determine if additional excavation was warranted or if the results would allow future attainment of an Act 2 standard.

5) Final Grade: Establish a final grade using stockpiled clay cap material and the soil in the berm that formed the southern boundary of the landfill. The final grade would be established simply to allow future storm water run off and have a maximum slope of 33% and a minimum slope of 1%.

6) Reseed the area: Distribute the stockpiled top soil cap material across the area and plant with a suitable seed mix as described in the E&SCP.

The key aspects of the Closure Plan are described below.

The landfill was divided into 4 quadrants referred to as areas A, B, C and D as shown on Figure 3 with each quadrant being approximately 100 feet by 150 feet. Work was to begin in quadrant A (the most "uphill" area in the northwest corner) and progress through quadrant D (the most "downhill" portion in the southeastern corner). This progression was recommended to minimize the potential for landfill water, which was known to be present in wells LF-1 and LF-2 in the southern portion of the landfill, to "re-contaminate" clean fill, and allow for the collection of storm water that inadvertently contacted the waste.

Cap material was to be stockpiled in an area east of the landfill and waste was to be stockpiled in an area west of the landfill. Brown waste characterization sampling was to be conducted at a frequency of one sample per approximately 1,000 CY and black waste at a frequency of approximately one sample per approximately 500 CY (due to the increased potential that the black waste could exhibit hazardous characteristics). The waste characterization samples would be composites and analyzed by a Pennsylvania Certified Laboratory for the following:

- Target Compound List (TCL) VOCs by US EPA Method SW-846 8260B:
- TCL SVOCs plus 1,4-dioxane by US EPA Method SW-846 8270C:
- Target Analyte List (TAL) Metals by SW-6010B (plus mercury using SW 846 7471A);
- TCLP VOCs, SVOCs and metals;
- PCBs using US EPA Method 846 8;082
- Ignitability by US EPA Method 846 Section 7;
- Total Cyanide by US EPA Method SW 846 9012A;
- Total Sulfides by US EPA Method SW 846 9030B/9034;
- pH by US EPA Method SW 846 9045C; and
- Total Residue as percent by US EPA Method SM20 2540G

Upon receipt of the analytical data, the data would be provided to the disposal facility for disposal approval.

Confirmatory samples were to be collected at a frequency of 12 samples for every quadrant, with at least three of the 12 samples taken from the side walls. The grab confirmatory samples would be collected through the bottom liner (prior to its removal) so that the liner would not be removed prematurely if elevated concentrations were detected in the samples. The samples were collected from the first 12 to 18 inches below the liner and analyzed for the same parameters as the waste characterization samples, except the TCLP analyses would not be completed nor would ignitability. The confirmatory data would be compared with the Act 2 non-residential subsurface soil Medium Specific Concentrations (MSCs) (direct contact and soil to groundwater) and a determination would then be made regarding the need for further excavation.

Once acceptable confirmatory results were obtained, the liner would be removed along with the sand bedding and underdrain and the area was to be backfilled with the stock piled clay cap material in such a manner as to direct storm water away from waste in remaining areas.

Excavation and backfill activities were to proceed in a manner that reduced the potential for storm water to contact the waste. Therefore, close attention was to be given to weather forecasts when planning and executing specific work tasks in the field.

Once the waste had been removed, the final grade would be established by placing two feet of the cap material over the entire landfill area. A thickness of two feet was selected to enable comparison of the confirmatory sample data with the Act 2 "subsurface" non residential MSCs. In addition, the top approximately 3 to 4 feet of the berm which formed the southern boundary of the landfill was to be used as backfill. The area would then be seeded and fertilized according to the Closure Plan Requirements.

2.3.2 E&SCP Summary

In addition to the Closure Plan, a project specific E&SCP was submitted to the WCCD for review and approval (Appendix A). It was determined that a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharges during construction activities was not necessary since the activities would not disturb more than 5 acres and not result in a point source discharge of storm water to surface waters of the Commonwealth. Furthermore, runoff from the area to the existing retention basin in the southern portion of the Site (Figure 2) will not increase following closure.

The E&SCP measures generally included the use of super silt fence along the perimeter of the disturbed area along with and hay bales and poly sheeting around the waste stock pile area. In addition, rock mats were to be placed at the vehicle exit to remove soil from truck tires.

2.3.3 Community Relations

During preparation of the Closure Plan, MACTEC met with officials from Cecil Township to describe the approach, solicit input and develop a plan for addressing potential citizen concerns. The township was provided a copy of the Closure Plan. A Construction Permit was obtained from Cecil Township for the closure activities (Appendix A).

3.0 2008 – 2009 CLOSURE ACTIVITIES

The PADEP approved the Final Closure Plan via their September 11, 2008 letter and the E&SCP was approved on August 25, 2008 (Appendix A). A summary of the project chronology is included on Table 1 and a more detailed description of the project chronology and photographs are provided in Appendix C.

ABB's selected remediation contractor, EAP, Inc. of Atlasburg, Pennsylvania, mobilized to the Site on September 16, 2008, to begin Site preparation activities. The Site layout with pre-existing conditions is shown on Figure 3. The final elevations of the base of the excavation are shown on Figure 4 and cross sections are shown on Figure 5. The final grade as built is shown on Figure 6.

Between October 6, 2008 and May 30, 2009, EAP excavated and stockpiled 8,029 CY of top soil and clean cap material for later use as backfill. A total of 24,493 CY of waste (44,686 tons) of waste was excavated and properly disposed of off-Site during that period. Waste disposal information is summarized on Table 2. During that period a total of 160,518 gallons of landfill water (approximately 15,000 gallons) and stormwater (approximately 145,518 gallons) that had potentially contacted the waste was collected and disposed of off-Site as non-hazardous liquid. Final backfill, grading and Site restoration activities were completed by June 10, 2009.

A total of 71 waste characterization samples were collected using the methods described in the Closure Plan. That data, summarized on Table 3A, Table 3B and Table 3C, was used to obtain disposal approval from the appropriate facility. A total of 48 confirmatory soil samples were collected from below the landfill liner as prescribed in the Closure Plan. That data is summarized on Table 4. In addition, 6 confirmatory soil samples were collected from beneath the waste stock pile area at the completion of the project (Table 5). All of the confirmatory data meets the PADEP Act 2 non-residential surface soil MSC's.

Work proceeded in accordance with the approved Closure Plan with the following exceptions which were communicated to and approved by PADEP and WCCD at the time:

1) The cap stockpile area was moved from east of the landfill to the south west of the landfill to satisfy a request of Mr. Jack Rossman, who operates an oil well near the landfill.

2) The "bedding sand" beneath the liner was left in place (the PVC underdrain was removed). This was done since all the confirmatory data meets the non-residential surface soil Act 2 MSCs.

3) The final grading plan (May 19, 2009) was revised to show that the landfill berm along the southern side would remain essentially intact. This was necessary since black coal and coal fines were observed outside of the landfill, within the berm during excavation of Quadrants C and D. PADEP and WCCD approved the revision, with the stipulation that ABB submit a plan to PADEP by September 1, 2009 to characterize the material.

4) Placing less than 2ft of clean soil over the former bottom of the landfill since the confirmatory data meets the non-residential surface soil MSC.

Based on the activities completed, the landfill has been closed in accordance with the Closure Plan thereby warranting the termination of the 1980 COA. Closure activities are described further in the following sections.

3.1 SITE PREPARATION AND STOCKPILE AREAS

Between September 16 and October 3, 2008, EAP mobilized to the Site:

- Heavy equipment including 2 hydraulic excavators (Volvo EC 330B); 1 articulated dump truck (Komatsu HM300 – a.k.a. "rock hauler"); 1 bulldozer (John Deere 650J); 1 front end loader (Volvo L70E); and 1 skid steer loader.

- 2- 20,000 portable "baker tanks"

- 1 construction trailer--MACTEC secured Allegheny Power to drop 220 volt power service to the trailer.

In addition, during this period, EAP

- Installed erosion and sedimentation controls and constructed the clean top soil stockpile area and waste stock pile area in accordance with the approved E&SC Plan (Figure 3). The total disturbed area for the project was 3.89 acres. A total of 1,207 ft of super silt fence was installed.

- Constructed approximately 908 feet of gravel haul roads and trimmed trees along the existing asphalt road and entrance to the Site from Muse Bishop Road.

The general Site layout prior to closure is shown on Figure 3. The approved Closure Plan directed that the clean soil stockpile area be located east of the landfill. However, prior to construction of the stockpile in that area, Mr. Jack Rossman informed EAP that he had recently installed an underground pipeline that extends from his oil well adjacent to the landfill, north to a collection tank. He expressed concern that heavy truck traffic would damage the pipe. Therefore, MACTEC obtained approval from ABB, PADEP, and the WCCD (Appendix A) and relocated the clean soil stock pile area to a location south west of the landfill (Figure 3).

3.2 CAP EXCAVATION AND STOCKPILE

A total of 8,029 CY of cap material was excavated and stockpiled for future use as backfill. From the ground surface, the cap was comprised of 2 feet of top soil followed by a geotextile filter fabric and 10 mil HDPE membrane. Below the HDPE was approximately two to three feet of brown clay cap material. This is consistent with what was presented in the Closure Plan. Cross sections through the cap and waste are shown on Figure 5.

Cap excavation proceeded from Quadrant A to Quadrant B to Quadrant D to Quadrant C. The top soil was placed in the clean soil stockpile area. The geotextile and HDPE membrane was placed in the waste stockpile area and disposed of off-Site as residual waste. The clay cap material was staged either on top of the cap in another quadrant which had yet to be excavated or within a quadrant where all waste had been removed and acceptable confirmatory data had been received. No clean cap material ever contacted waste material. Care was taken to ensure that the bottom 6 to 10 inches of the clay cap which overlaid the waste was left in place and was then excavated as waste.

3.2.1 Southern Berm Findings

During the excavation of the southern most portions of the cap and waste in Quadrants C and D in March, 2009, it was observed that coal and coal fines were present in the berm that formed the outside southern boundary of the landfill (Figure 3). In light of this unexpected finding, ABB

instructed MACTEC to complete 5 test pits into the berm to visually characterize the material. MACTEC completed the test pits between March 13 and 16, 2009 and reported the findings to ABB and PADEP. The material appears to exist in a uniform layer ranging in thickness of 1 to 4 feet thick, approximately 1 to 3 feet below the ground surface and rests on top of a geotextile filter fabric. Representative photographs of the material are included in Appendix C.

The material does not contain soil or other debris, nor does it exhibit any odors like the black waste within the landfill. However, it was determined that this finding precluded the use of the berm material for use as backfill in establishing the final grade. MACTEC prepared and submitted the revised final grading plan to PADEP and WCCD on May 19, 2009, which was subsequently approved by PADEP on June 15, 2009 (Appendix A). In that submittal, ABB committed to provide PADEP with a plan by September 1, 2009 to further characterize the berm material.

3.3 SOLID WASTE EXCAVATION, SAMPLING AND DISPOSAL

A total of 24,493 CY (44,686 tons) of waste was excavated from the landfill and appropriately disposed of off-Site. Of this, 11,368 tons was "brown" waste and 33,318 tons was "black" waste. Table 2 presents a summary of the 43 piles of waste generated, along with their tonnage, date hauled from the Site and the location of the disposal facility. Shipping and disposal documentation is included in Appendix D. Excavation proceeded in the same order as the cap removal described above. The base of the excavation is illustrated on Figure 4 and cross sections are shown on Figure 5.

As indicated in the Closure Plan, the waste fell into two general categories - brown waste and black waste. The brown waste appeared to be soil and consisted primarily of silt sized material with some clay, sand and gravel. The brown waste did not exhibit chemical odors. The brown waste occurred immediately below the cap and was between approximately one to four feet thick and overlaid black waste throughout the landfill.

The black waste consisted of gray to black clay, moist coal ash like material, some coal fragments/refuse and debris. The debris consisted of broken glass bottles, pieces of metal and plastic. In general, the black waste exhibited strong organic solvent like odors.

The brown waste and black waste were stockpiled separately due to their different physical and chemical characteristics. As described in the Closure Plan, the brown waste was stockpiled in approximately 1,000 CY piles and the black waste was stockpiled in approximately 500 CY piles. Samples were collected from each pile as described in Section 3.3.1.

Waste from each quadrant was excavated approximately 6 inches to 8 inches above the PVC liner to ensure that the heavy equipment did not prematurely compromise the integrity of the liner. The landfill design documents indicated that 6 inches of sand was placed on top of the PVC liner. In fact, approximately 6 inches of brown silty clay had been placed on top of the liner.

The confirmatory samples were collected from below the liner in accordance with the Closure Plan. Confirmatory sampling methods and analytical data are described in Section 3.4. Once MACTEC received acceptable confirmatory data, the remaining waste, PVC liner and PVC under drain pipe were removed and staged in the waste stockpile area for off-Site disposal. The under drainpipe was located immediately below the liner and constructed of 4 inch pipe wrapped in filter fabric. Approximately 400 feet of this drain system was located in a brown silty sand material which was referred to as the "bedding sand" in the Closure Plan.

In light of the fact that the confirmatory data met the non-residential surface soil MSCs, as well as the residential soil MSC with very few exceptions, MACTEC obtained approval from PADEP to leave the bedding sand layer (Appendix A).

The total volume and weight of waste excavated was approximately twice that anticipated in the Closure Plan. The reason for the discrepancy in volume was that the landfill was up to approximately 5 feet deeper in some areas and approximately 1/3 acre larger than anticipated using the indirect methods employed to develop the original volume estimate (i.e., review of the

design documents, geophysical survey data and extrapolation of elevation data from wells LF-1 and LF-2 with depth to bedrock in surrounding monitoring wells). In addition, the density of the waste was considerably higher (average 1.7 to 1.8 tons/CY) than the 1.5 tons/CY used in the initial waste estimate.

3.3.1 Solid Waste Characterization Sampling and Analyses

As prescribed in the Closure Plan, waste characterization samples were collected at a frequency of approximately one per 1,000 CY of brown waste and one per 500 CY of black waste. A total of 71 waste characterization samples were collected and the data is summarized on Table 3A (VOC, metals and PCB data), Table 3B (SVOC data) and Table 3C (TCLP Data). Appendix D, contains a Compact Disk (CD) off all the final analytical data reports for the waste characterization sampling.

The waste characterization samples were composite samples collected during the creation of each material stockpile. Stockpiles were sequentially numbered in the field as generated for tracking. A gallon size Ziploc bag was used to hold portions of the soil as it was being excavated and placed in the stockpiles. This soil was then mixed together and placed in sample containers provided by the laboratory. A separate grab sample was collected for TCLP and TCL VOC analyses. The VOC sample was chosen from screening during excavation using a Photoionization Detector (PID) to identify the "worst case" soil during the formation of each stockpile.

The samples were submitted to TestAmerica Analytical Laboratories in Pittsburgh, PA via hand delivery and were analyzed for the parameters identified in Section 2.3.1. MACTEC requested expedited 3-day turn around for sample analyses. Typically, the turn around time for receipt of final data was between 3 and 5 days.

Based on the initial results, additional sampling was performed to either verify the original result or in an effort to minimize the volume of material that had to be disposed of as hazardous waste. The piles for which additional sampling was completed were piles W3, W6, W9, W16, W25, W38 and W39 (Table 2). The additional sample data are also summarized on Tables 3A, 3B and

3C. Pile W34 contained greater that 50 mg/kg total PCBs. That pile was not resampled as ABB made the determination to dispose of it entirely as Toxic Substance Control Act (TSCA) residual waste.

All of the data associated with a particular pile or portion of a pile (i.e., the "original" and "resample" data) was provided to the respective disposal facilities when seeking disposal approval so that the facility could make a fully informed determination for waste acceptance. The primary issue necessitating "resampling" was the detection of TCLP lead exceeding the hazardous characteristic standard of 5 mg/l. However, Pile W6 was resampled due to the concentration sulfide and pile W-25 due to the detected concentration of TCLP trichloroethene found in the original pile samples.

3.3.2 Solid Waste Disposal

During September and October, 2008, prior to mobilizing to the Site, EAP's subcontracted waste broker, American Waste, Inc., provided the data from the 2007 test pit activities to Waste Management, Inc.'s Arden Landfill in Washington, Pennsylvania. The data was also provided to the PADEP Solid Waste Management Program which is responsible for approving waste disposal in Pennsylvania. Based upon the data, it was determined that the waste could likely be disposed of at the Arden landfill as residual waste, however, a pile by pile determination would be made based upon the specific waste characterization results as described above and in the Closure Plan. In addition, American Waste identified EQ, Inc. in Wayne, Michigan as the likely disposal facility if concentrations of lead indicated that the material was a hazardous waste.

A total of 44,686 tons of waste were disposed. Of that, 41,330 tons were non-hazardous, and 3,356 tons required disposal as either hazardous, special or TSCA waste. Waste Disposal Documentation is included on the CD in Appendix D.

Table 2 identifies each waste pile and where it was disposed. Note that while most of the non-hazardous waste was disposed of at the Arden landfill, some of it went to Apex, Inc. and American Landfill, both of which are in Ohio. The reason for this is that as data was generated and submitted to PADEP for disposal at Arden, PADEP determined that piles with TCLP lead

concentrations exceeding 2.5 mg/L would require additional sampling. Therefore, instead of resampling those piles, alternate disposal locations were identified.

The following summarizes the disposal facilities and types of waste disposed of:

- Waste Management – Arden, Washington, Pennsylvania: Residual Waste Alternate Daily Cover (ADC) – 9,268.63 tons. Based on the waste characterization data, the PADEP determined that this material could be utilized by the facility as daily cover.

- Waste Management – Arden, Washington, Pennsylvania: Residual Waste Direct Disposal – 20,989.32 tons. Non hazardous material with TCLP lead concentrations less than 2.5 mg/l were typically disposed at this facility.

- Apex, Amsterdam, Ohio: Residual Waste Direct Disposal 8,181.70 tons. Non hazardous waste with TCLP lead concentrations between 2.5 mg/l and approximately 4.2 mg/l were disposed at this facility.

- American Waste, Waynesburg, Ohio: Residual Waste Direct Disposal – 2,890.33 tons. Non hazardous waste with TCLP lead concentrations between approximately 4.2 mg/l and 4.9 mg/l were disposed at this facility.

- EQ, Bellville, Michigan 3,216.49 tons. Waste that contained TCLP hazardous concentrations of lead or TCE or contained PCB concentrations greater than 50 mg/kg were disposed at this facility. In addition, soil that was non-hazardous but that contained PCB concentrations exceeding 50 mg/kg were disposed of at this facility.

- Horizon, Grandes-Piles, Quebec, Canada; 139.53 tons. Hazardous waste for lead that contained underlying hazardous constituents (UHCs) that could not be treated to meet applicable land disposal restrictions (LDRs) at EQ.

As MACTEC received final waste characterization data from the laboratory, it would be reviewed for completeness and forwarded to EAP and American Waste. American Waste would then forward the data to the facility that could most likely accept the material – typically this would be the Arden facility unless a TCLP lead concentration or PCB concentration was too high to likely be accepted by PADEP for disposal at Arden.

In cases where the waste did not meet the Arden facility's acceptance requirement, MACTEC would contact PADEP and request permission to segregate the subject pile into quadrants and collect a composite sample from each quadrant (a grab sample was collected for VOC analyses) – these are referred to as "resamples". Based on the "resample" data, MACTEC, EAP and

American Waste would make a determination as to where each waste quadrant would likely be accepted. All of the data (the original sample data along with the resample data) was then provided to the disposal facility and PADEP (when applicable) for use in making an acceptance determination.

3.4 LIQUID WASTE COLLECTION AND DISPOSAL

A total of 160,518 gallons of landfill water (approximately 15,000 gallons) and storm water (approximately 145,518 gallons) were collected and disposed of off-Site as non-hazardous liquid. The water was collected into two 20,000 gallon "Baker Tanks" using either a vacuum truck or pump. To be conservative, waste approvals were sought using the data collected from wells LF-1 and LF-2 prior to closure. Based on that data, the water was accepted by and disposed of at Castle Environmental, of New Castle, Pennsylvania and Petromax, Inc. in Carnegie, Pennsylvania. Liquid waste disposal documentation is included in Appendix D. No water was discharged on Site.

3.5 CONFIRMATORY SAMPLING AND RESULTS

A total of 48 confirmatory samples were collected by MACTEC following the removal of the waste in a quadrant to within 12 inches to 18 inches from below the bottom liner. In addition, 6 confirmatory samples were collected from immediately below the waste stock pile area liner after the waste had been removed at the completion of the project. The confirmatory data is summarized on Tables 4 and 5. Appendix E includes a CD with the final confirmatory data reports.

To collect the sample from below the landfill liner, a hole was dug through the waste to expose the bottom liner, then the liner was cut through using a knife. A sample was collected beneath the liner, using care not to allow any of the waste soil to fall into the hole, and placed in the laboratory supplied jars. After the sample was collected, the liner was put back in place and clay was placed over the hole to maintain a barrier until the last of the waste and liner was removed.

The remaining soil and bottom liner would then stay in place until the laboratory analysis confirmed that the soil beneath the liner was clean. Then the bottom liner and left over soil was removed and stockpiled for disposal. Care was taken to remove all waste material without removing all of the sand beneath the liner. The PVC drain which was located in the sand was also removed during the excavation of the liner and disposed of off-site.

The stockpile area confirmatory samples were collected using a hand trowel and placing the soil into appropriate laboratory provided containers. This sampling was completed after all the waste had been removed from the particular area of the stockpile area.

As shown on Tables 4 and 5 all of the results meet the non-residential surface soil MSCs.

3.6 FINAL GRADING AND SITE RESTORATION

The final Site grade (as builts) shown on Figure 6 was established in accordance with the approved May 19, 2009 revised final grading plan. In light of the fact that the berm material could not be used for backfill, there was insufficient clean cap material to establish 2 feet of cover over the entire landfill area. MACTEC requested approval from PADEP to allow less than 2 feet of cover since all the confirmatory data meets the non-residential surface soil MSCs. PADEP and WCCD met MACTEC at the Site on June 4, 2009 to inspect site conditions and discuss the viability of placing less than 2 ft of cover over the former bottom of the landfill. PADEP concurred with the plan verbally at that time and further signified their approval via their June 15, 2009 correspondence (Appendix A).

The clay cap material was placed in approximately 6 inch lifts and compacted with a sheeps foot roller. Once the grade was established, the stockpiled cap topsoil was placed (approximately 6 inches thick) over the clay. The area was then reseeded using the following:

- 500 lbs of grass seed
- 1000 lb fertilizer
- 800 bales of straw with a mulcher

Seeding was completed on June 10, 2009 and as of July 23, 2009, grass has been established and no unacceptable erosional features have been observed. EAP will make quarterly inspections through November 2009, at which time the silt fence will be removed.

3.7 REGULATORY OVERSIGHT AND COMMUNITY RELATIONS

During the course of the project, various PADEP and WCCD personnel visited the Site for inspections or meetings. These included:

- Mr. Dale Burns, PADEP Soil Scientist. Mr. Burns would inspect each pile for which the Alternate Daily Cover disposal option was being sought. He also attended meetings at the Site on 10/31/08 and 4/22/09 and 6/4/09 to discuss the overall project.
- Mr. Robert Popichak, PADEP Soil Waste Management Program. Mr. Popichak visited the Site on 10/31/08, 3/18/09, 4/22/09 and 6/4/09.
- Mr. Shawn Staley, PADEP visited the Site on 9/30/08, 10/8/08, 10/15/08, 11/6/08, 12/9/08, 1/22/09, 3/24/09 and 6/4/09.
- Mr. Matt Golden, WCCD visited the Site on 9/24/08 and 6/4/09.

Copies of inspection reports are included in Appendix A.

During the course of the closure, no significant odors were reported outside of the work zone. Cecil Township fielded some limited questions from citizens regarding the duration of the project and concern over "contamination". The concerned citizens did not contact MACTEC.

4.0 CONCLUSIONS

The closure of the landfill was completed in substantive accordance with the approved Closure Plan. Deviations have been noted in this Report, as described herein, and were approved by PADEP at the time they were encountered. Based on the information contained herein, the 1980 COA between PADEP and ABB should be terminated.

5.0 REFERENCE

MACTEC Engineering and Consulting, Inc. June 2008. *Erosion and Sediment Control Plan, Closure Plan- Solid Waste Landfill, Former CE-Cast Facility; Muse Pennsylvania.* Prepared for ABB

MACTEC Engineering and Consulting, Inc. June 2008. *Closure Plan- Solid Waste Landfill, Former CE-Cast Facility; Muse Pennsylvania.* Prepared for ABB

MACTEC Engineering and Consulting, Inc. September 2008. *Closure Plan- Solid Waste Landfill, Former CE-Cast Facility; Muse Pennsylvania. Revision 1* Former CE-Cast Facility; Muse Pennsylvania. Prepared for ABB

MACTEC Engineering and Consulting, Inc. September 2008. *Closure Plan- Solid Waste Landfill, Former CE-Cast Facility; Muse Pennsylvania. Revision 2*, Former CE-Cast Facility; Muse Pennsylvania. Prepared for ABB

MACTEC Engineering and Consulting, Inc. Oct 2007. Landfill Characterization Work Plan, Former CE-Cast Facility; Muse Pennsylvania,. Prepared for ABB

TABLES

Table 2
2008 - 2009 Waste Pile Summary
Former CE Cast Facility, Muse, PA
Final Closure Report

Quadrant	Period piles Generated	Pile #	Type of waste	Actual Dispoal Facility	Actual Total Tons	Date Hauled	Issue or Comments
			Quad A HDPE Cap	Arden	121.43		(Roll off Box)
A	10/7 - 11/1/08	1	Brown ADC	Arden	1155.14	10/29-11/3/08	
		2	Brown DD				Barrier for Staging Area shipped with pile 42 & 43
		3	***Black DD***	***Arden***	***295.6***	***12/5-12/6/08***	TCLP Lead. Resample approved to Arden
		4	Black DD	Apex	548.35	11/4-11/5/08	
		5	Black DD	Arden	469.03	10/29/2008	
		6	***Black DD***	***Arden***	***338.78***	***11/11-11/12/08***	800 mg/kg sulfate. Resample approved to Arden
				Apex	314.03		
		7	Black DD	Waynesburg	411.72	11/7-11/10/08	
		8	Black DD	Apex	371.92	11/5-11/6/08	
		9	***Black Haz Pb***	***EQ***	***506.84***	***12/11-12/15/08***	TCLP Lead
		9B	***Black HazPb LDR***	***Horizon Env***	***139.53***	***2/9-2/10/09***	TCLP lead. Bis 2 ethylhexyl phthalate exceeds LDR.
		10	Black DD	Arden	710.76	11/11/2008	
		11	Not generated				
B	11/8 - 12/8/08	12	Brown ADC	Arden	1599.42	11/17-11/18/08	
		13	Brown ADC	Arden	1352.64	11/20-11/21/08	
		14	Black DD	Arden	889.16	11/26-12/1/08	
		15	Black DD	Arden	944.55	12/2-12/4/08	
		16	***Black DD***	***Arden***	***1179.37***	***1/7-1/12/09***	TCLP Lead. Resample approved to Arden
		17	Black DD	Arden	906.48	12/11-12/19/08	
		18	Black DD	Arden	1303.18	12/19-12/24/08	
		19	Black DD	Arden	869.17	12/26-12/19/08	
D	12/31-2/20/09	20	Brown ADC	Arden	2011.46	1/14-1/19/09	
		21	Brown ADC	Arden	1094.21	1/19-1/20/09	
		22	Brown ADC	Arden	2055.76	1/21-1/22/09	
		23	Brown DD	Arden	1678.85	1/22-1/26/09	
		24	Black DD	Arden	1151.03	1/27-1/29/09	
		25	***Black HazVOC***	***EQ***	***951.82***	***3/30-4/6/09***	TCLP TCE. Resample - approved to EQ in 10 load batches
		26	Black DD	Waynesburg	74.68	2/4-2/6/09	
			Black DD	Apex	1087.55	2/4-2/6/09	
		27	Black DD	Apex	1097.73	2/6-2/11/09	
		28	Black DD	Waynesburg	1274.51	2/11-2/20/09	
C	1/26 - 5/11/09	29	Brown DD	Arden	752.72	2/20-3/17/09	
		30	Black DD	Apex	1154.69	2/25-3/3/09	
		31	Black DD	Apex	1220.08	3/3-3/4/09	
		32	Black DD	Waynesburg	1129.42	3/6-3/11/09	
		33	Black DD	Apex	1265.13	3/4-3/6/09	
		34	***Black PCB***	***EQ***	***971***	***4/14-4/21/09***	Total PCB >50mg/kg
		35	Black DD	Arden	968.88	3/17-3/19/09	
		36	Brown DD	Arden	1346.21	3/20-3/25/09	
		37	Black DD	Apex	1122.22	3/19-3/26/09	
		38	***Black DD***	***Arden***	***936.33***	***4/17-421/09***	TCLP Lead. Resample approved to Arden
		39	***Black Haz***	***EQ***	***786.83***	***5/4-5/11/09***	TCLP Lead. Resample approved to EQ in 10 load batches.
C&D Liner	4/15-4/24/09	40	Black DD	Arden	985.21	5/1-5/4/09	
		41	Black DD	Arden	1873.62	5/4-5/8/09	
		42	Black DD	Arden	1873.62	5/8-5/14/09	
Stockpile	5/14-5/30/09	43	Black DD	Arden	1394.97	5/29-5/30/09	
				Total Tons	**44685.63**		

Note:
1) Bold Italicized print indicates a pile that required non-routine management and handling.
2) "ADC" indicates alternate daily cover; "DD" indicates direct disposal as residual waste; "Haz" indicates hazardous waste.

Prepared By: ESW
Checked By: JAS

Table 5

2008-2009 Stock Pile Confirmatory

Final Landfill Closure Report
ABB, Inc. - Muse, PA
MACTEC Project # 3410080603

Parameter	NR Direct Contact	NR Soil to GW	RCRA TCLP STD	Units	MA-CW-01-050809	MA-CW-02-050809	MA-WC-03-051509	MA-WC-03-051509 DUP	MA-WC-04-051509	MA-WC-05-051509	MA-WC-06-051509
Sample Date											
VOC											
1,1,1-Trichloroethane	10000000	20000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,1,2,2-Tetrachloroethane	33000	30		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,1,2-Trichloro-1,2,2-trifluoroethane	190000000	53000000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,1,2-Trichloroethane	120000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,1-Dichloroethane	1200000	11000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,1-Dichloroethene	38000	700		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,2,4-Trichlorobenzene	10000000	27000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,2-Dibromo-3-chloropropane	12000	20		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,2-Dibromoethane	8600	5		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,2-Dichlorobenzene	10000000	60000		ug/kg	5.2 U	5.1 J	3.9 J		6.9	9.1	97
1,2-Dichloroethane	73000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,2-Dichloropropane	180000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,3-Dichlorobenzene	10000000	61000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
1,4-Dichlorobenzene	**3300000**	10000		ug/kg	5.2 U	5.3 U	1.7 J		1.1 J	1.1 J	8.5
1,4-Dioxane	**210000**	2400		ug/kg	1000 U	1100 U	1300 U		1300 U	1000 U	1100 U
2-Butanone	10000000	580000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
2-Hexanone	*500*	*100000*		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
4-Methyl-2-pentanone	4900000	41000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	10
Acetone	10000000	1000000		ug/kg	21 U	25	25 U		26 U	21 U	23 U
Benzene	240000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Bromodichloromethane	51000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Bromoform	1700000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Bromomethane	300000	1000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Carbon disulfide	10000000	410000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Carbon tetrachloride	120000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Chlorobenzene	10000000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Chloroethane	10000000	90000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Chloroform	19000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Chloromethane	1000000	300		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U

Table 5

2008-2009 Stock Pile Confirmatory

Final Landfill Closure Report
ABB, Inc. - Muse, PA
MACTEC Project # 3410080603

Parameter	NR Direct Contact	NR Soil to GW	RCRA TCLP STD.	Units	MA-CW-01-050809	MA-CW-02-050809	MA-WC-03-051509	MA-WC-03-051509 DUP	MA-WC-04-051509	MA-WC-05-051509	MA-WC-06-051509
cis-1,2-Dichloroethene	2100000	7000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
cis-1,3-Dichloropropene	1000000	1000000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Cyclohexane	0.5	100		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Dibromochloromethane	70000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Dichlorodifluoromethane	10000000	100000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Ethylbenzene	10000000	70000		ug/kg	5.2 U	2.3 J	1.7 J		2.6 J	6.2	13
Isopropylbenzene	10000000	1600000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	1.4 J
Methyl acetate	10000000	10000000		ug/kg	5.2 U	5.5	6.3 U		6.5 U	5.2 U	5.7 U
Methyl tert-butyl ether	3700000	2000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Methylcyclohexane	1000000	1000000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	1.3 J	5.7 U
Methylene chloride	4000000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Styrene	10000000	24000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Tetrachloroethene	3300000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	1.4 J	2.3 J
Toluene	10000000	100000		ug/kg	5.2 U	2.6 J	4.8 J		6.5 U	13	25
trans-1,2-Dichloroethene	4300000	10000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
trans-1,3-Dichloropropene	1000000	1000000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Trichloroethene	1100000	500		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Trichlorofluoromethane	10000000	200000		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Vinyl chloride	220000	200		ug/kg	5.2 U	5.3 U	6.3 U		6.5 U	5.2 U	5.7 U
Xylenes (total)	10000000	1000000		ug/kg	16 U	22	13 J		21	48	360
SVOC											
1,1'-Biphenyl	140000000	2200000		ug/kg	410 U	72 J	29 J		27 J	390 U	83 J
1,2,4-Trichlorobenzene	10000000	27000		ug/kg							
1,4-Dichlorobenzene	190000000	10000		ug/kg							
1,4-Dioxane	240000	2400		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
2,2'-oxybis(1-Chloropropane)	190000	30000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
2,4,5-Trichlorophenol	190000000	6100000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
2,4,6-Trichlorophenol	190000000	8900		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
2,4-Dichlorophenol	190000000	2000		ug/kg	83 U	82 U	84 U		85 U	79 U	22 J
2,4-Dimethylphenol	10000000	200000		ug/kg	110 J	140 J	83 J		420 U	390 U	290 J
2,4-Dinitrophenol	190000000	4100		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U

Table 5

2008-2009 Stock Pile Confirmatory

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ABB, Inc. - Muse, PA
MACTEC Project # 3410080603

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2,4-Dinitrotoluene	190000000	840		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
2,6-Dinitrotoluene	190000000	10000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
2-Chloronaphthalene	190000000	18000000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
2-Chlorophenol	1100000	4400		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
2-Methylnaphthalene	10000000	8000000		ug/kg	170	430	130		38 J	64 J	580
2-Methylphenol	10000000	510000		ug/kg	120 J	260 J	160 J		24 J	20 J	410
2-Nitroaniline	190000000	580		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
2-Nitrophenol	190000000	82000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
3,3'-Dichlorobenzidine	190000000	32000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
3-Nitroaniline	190000000	580		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
4,6-Dinitro-2-methylphenol	*100000*	*500*		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
4-Bromophenyl phenyl ether	*100000*	*500*		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
4-Chloro-3-methylphenol	190000000	110000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
4-Chloroaniline	190000000	52000		ug/kg	410 U	400 U	130 J		420 U	390 U	370 U
4-Chlorophenyl phenyl ether	*100000*	*500*		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
4-Methylphenol	140000000	51000		ug/kg	130 J	220 J	190 J		71 J	28 J	370
4-Nitroaniline	190000000	580		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
4-Nitrophenol	190000000	6000		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
Acenaphthene	190000000	4700000		ug/kg	83 U	36 J	84 U		85 U	79 U	50 J
Acenaphthylene	190000000	6900000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Acetophenone	10000000	1000000		ug/kg	410 U	400 U	420 U		420 U	54 J	660
Anthracene	190000000	350000		ug/kg	42 J	120	29 J		85 U	79 U	180
Aroclor 1016	10000000	200000	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U
Aroclor 1221	10000000	2500	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U
Aroclor 1232	10000000	2000	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U
Aroclor 1242	10000000	62000	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U
Aroclor 1248	10000000	67000	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U

Table 5

2008-2009 Stock Pile Confirmatory

Final Landfill Closure Report
ABB, Inc. - Muse, PA
MACTEC Project # 3410080603

Parameter	NR Direct Contact	NR Soil to GW	RCRA TCLP STD.	Units	MA-CW-01-050809	MA-CW-02-050809	MA-WC-03-051509	MA-WC-03-051509 DUP	MA-WC-04-051509	MA-WC-05-051509	MA-WC-06-051509
Aroclor 1254	4400	280000	50*	ug/kg	300	750	390		180	120	520
Aroclor 1260	190000000	1900000	50*	ug/kg	21 U	20 U	21 U		21 U	20 U	19 U
Atrazine	190000000	300		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Benzaldehyde	1000000	1000000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Benzo(a)anthracene	190000000	320000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Benzo(a)pyrene	190000000	46000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Benzo(b)fluoranthene	190000000	170000		ug/kg	83 U	82 U	84 U		85 U	18 J	76 U
Benzo(ghi)perylene	190000000	180000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Benzo(k)fluoranthene	190000000	610000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
bis(2-Chloroethoxy)methane	*100000*	*500*		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
bis(2-Chloroethyl) ether	5700	55		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
bis(2-Ethylhexyl) phthalate	5700000	130000		ug/kg	2500	6900	1900		450	560	23000 E
Butyl benzyl phthalate	10000000	10000000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Caprolactam	1000000	1000000		ug/kg	2100 U	2100 U	2100 U		2200 U	2000 U	1900 U
Carbazole	190000000	83000		ug/kg	83 U	82 U	84 U		85 U	79 U	27 J
Chrysene	190000000	230000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Dibenz(a,h)anthracene	190000000	160000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Dibenzofuran	*100000*	*500*		ug/kg	57 J	180 J	64 J		26 J	36 J	130 J
Diethyl phthalate	10000000	500000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Dimethyl phthalate	*100000*	*500*		ug/kg	410 U	400 U	420 U		420 U	390 U	50 J
Di-n-butyl phthalate	100000000	4100000		ug/kg	100 J	220 J	45 J		420 U	390 U	350 J
Di-n-octyl phthalate	100000000	10000000		ug/kg	960	2900	870		130 J	200 J	5300
Fluoranthene	110000000	3200000		ug/kg	21 J	41 J	27 J		14 J	21 J	54 J
Fluorene	110000000	3800000		ug/kg	40 J	120	84 U		85 U	79 U	80
Hexachlorobenzene	190000000	960		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Hexachlorobutadiene	10000000	1200		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Hexachlorocyclopentadiene	10000000	91000		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Hexachloroethane	190000000	560		ug/kg	410 U	400 U	420 U		420 U	390 U	370 U
Indeno(1,2,3-cd)pyrene	190000000	28000000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
Isophorone	10000000	10000		ug/kg	1900	3300	980		1300	1500	4000
Naphthalene	56000000	25000		ug/kg	540	1200	390		62 J	110	1800
Nitrobenzene	10000000	5100		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
N-Nitrosodi-n-propylamine	10000000	37		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U
N-Nitrosodiphenylamine	190000000	83000		ug/kg	83 U	82 U	84 U		85 U	79 U	76 U

Table 5

2008-2009 Stock Pile Confirmatory

Final Landfill Closure Report
ABB, Inc. - Muse, PA
MACTEC Project # 3410080603

Parameter	NR Direct Contact	NR Soil to GW	RCRA TCLP STD.	Units	MA-CW-01-050809	MA-CW-02-050809	MA-WC-03-051509	MA-WC-03-051509 DUP	MA-WC-04-051509	MA-WC-05-051509	MA-WC-06-051509
Pentachlorophenol	660000	5000		ug/kg	410 U	1400	130 J		420 U	390 U	160 J
Phenanthrene	190000000	10000000		ug/kg	210	550	210		56 J	85	630
Phenol	190000000	400000		ug/kg	88	270	84 U		42 J	79 U	450
Pyrene	84000000	2200000		ug/kg	83 U	36 J	84 U		85 U	79 U	41 J
Metals											
Aluminum	190000	na		mg/kg	12100 J	10100 J	10700 J		10700 J	10900 J	11600 J
Antimony	1100	27		mg/kg	0.9 B	0.55 B	1.5		3.1	1.1 B	3.7
Arsenic	53	150		mg/kg	7.1	6.9	5.9		8.4	8.9	9.3
Barium	190000	8200		mg/kg	110	86.6	147		97.6	121	123
Beryllium	5600	320		mg/kg	1.2	1	1.1 J		0.82 J	1.1 J	0.97 J
Cadmium	210	38		mg/kg	0.62 U	0.61 U	0.63 U		0.63 U	0.6 U	2.5
Calcium	na	na		mg/kg	3880	2620	13800 J		2570 J	6730 J	7090 J
Chromium	190000	190000		mg/kg	20	17.9	17.1		15.6	17.4	23.5
Cobalt	56000	200		mg/kg	14	13.5	17.9		11.3	14.3	12.7
Copper	100000	36000		mg/kg	29.4	25.4	30.6		17.9	25.6	25.6
Cyanide, Total	56000	200		mg/kg	0.14 B	0.61 U	0.15 B		0.63 U	0.53 B	0.28 B
Iron	190000	500000		mg/kg	32300	32000	29900		23900	24300	23900
Lead	1000	450		mg/kg	33.3	35.1	39.5		32.4	38.3	85.7
Magnesium	na	na		mg/kg	2880	2750	2660		1940	2730	2080
Manganese	190000	na		mg/kg	551	575	523		729	808	833
Mercury	840	10		mg/kg	0.15	0.03 B	0.073		0.048	0.056	0.073
Nickel	56000	650		mg/kg	27.7	24.7	31.6		17	27.9	20.7
Potassium				mg/kg	1530	1210	1780		1180	1700	1170
Selenium	14000	26		mg/kg	0.62 U	0.61 U	0.63 U		0.63 U	0.6 U	2.2
Silver	14000	84		mg/kg	0.15 B	0.1 B	0.086 B		0.089 B	0.14 B	0.14 B
Sodium	na	na		mg/kg	76.4 B	52.4 B	135 B		634 U	23.9 B	566 U
Thallium	200	14		mg/kg	0.28 B	0.39 B	1.3 U		1.3 U	1.2 U	1.1 U
Total Sulfide	100	0.5		mg/kg	37 U	36.5 U	37.8 U		38 U	35.8 U	18.1 B
Vanadium	20000	72000		mg/kg	22.6	20.6	19.1		22.5	18.8	22.6
Zinc	190000	12000		mg/kg	94.4 J	95 J	101 J		107 J	80.5 J	87.6 J

Notes:

VOC results - J indicates an estimated result below the Reporting Ilmit, B indicates the associated method blank contains the target analyte at a reportable level.

Metals results - B indicates an estimated result below the Reporting Ilmit, J indicates the associated method blank contains the target analyte at a reportable level.

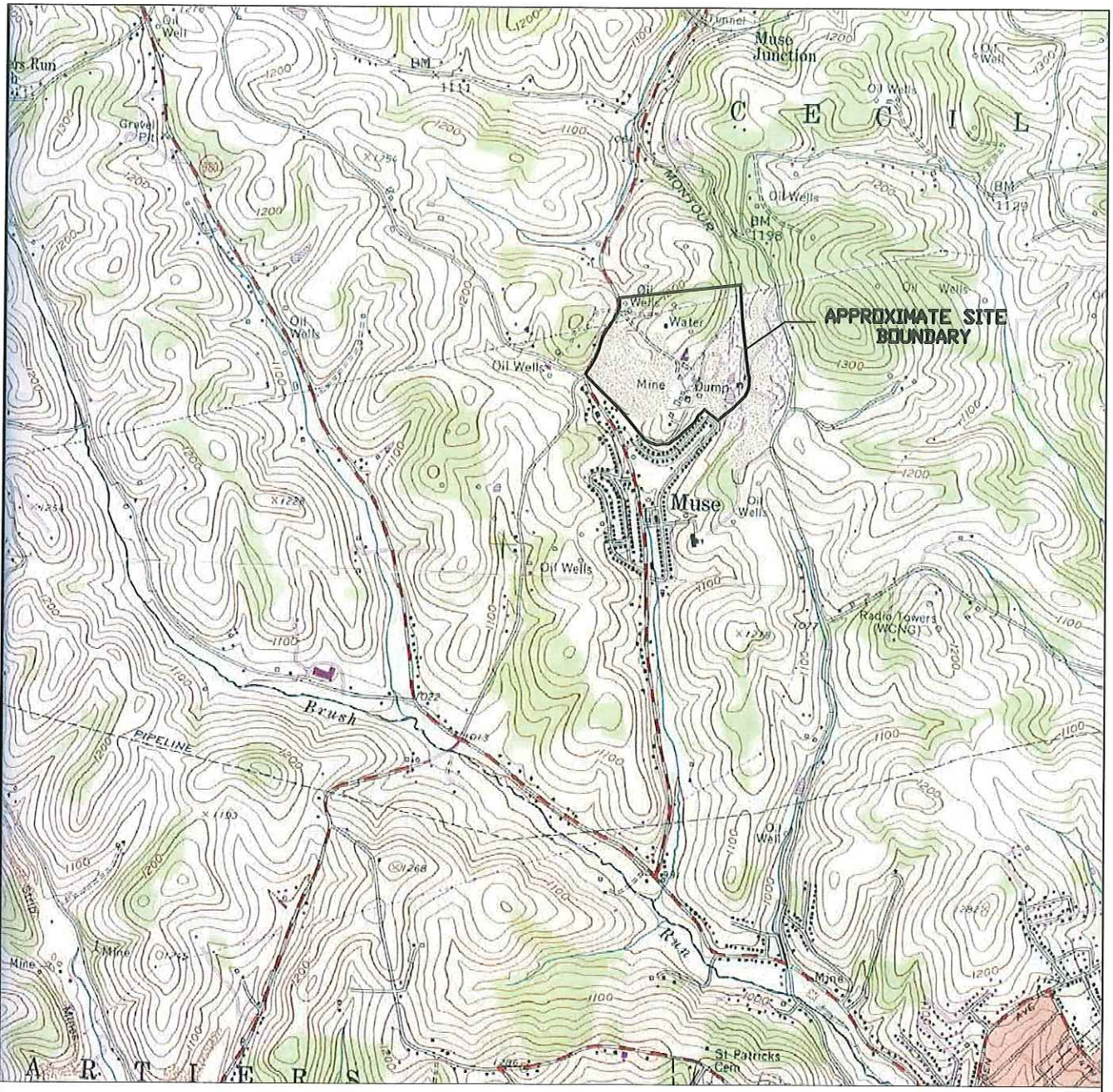
U indicates the analyte was undetected.

Sample Identification - MACTEC,ABB - Confirmatory,Quad ID - Pile Number - Date Collected

Yellow indicates the sample result exceeds the standard

Prepared By: CEH
Checked By: JAS

FIGURES



SCALE 1:24000

1 0.5 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0.5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

CANONSBURG QUADRANGLE

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MACTEC
Engineering & Consulting Inc.
700 North Bell Avenue Suite 200
Pittsburgh, PA 15106

SITE LOCATION MAP
FINAL CLOSURE REPORT
FORMER CE CAST FACILITY
MUSE, WASHINGTON COUNTY, PENNSYLVANIA

FIGURE 1

DRAWN	PROJECT NUMBER	DRAWING NUMBER	DRAWN BY	APPROVED BY	DATE	REVISED DATE
PIT	3410080603		NEL	JAS	4-28-2008	-