AECOM

Site Investigation Report: Delineation of Nature and Extent of Affected Environmental Media

Site:
Former McDoel Rail Switchyard
Grimes Lane
Bloomington, Indiana 47404

Prepared for and Submitted to:
Department of Parks and Recreation
City of Bloomington
Bloomington, Indiana

Prepared by:
AECOM
5010 Stone Mill Road
Bloomington, IN 47408

July 2009

AECOM Project No. 107087

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Author: Stacey Moore

Title: Project Geologist

Date: 7/26/2009

Reviewer: Jeffrey Bryan

Title: Project Mgr./Sr. Hydrogeologist

Date: 7/26/2009

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1.0 INTRODUCTION

This report has been prepared by AECOM on behalf of the City of Bloomington Parks and Recreation Department to document findings on the nature and extent of environmentally affected media occurring at the project Site. This report describes the field activities performed by AECOM at the former McDoel Rail Switchyard delineation project during May 2009, in conformance with a work plan prepared by AECOM in May 2009. Soil samples were collected at locations across the entire Site and at multiple depths. Samples were analyzed for constituents of interest pursuant to previous and anticipated future land uses. Investigative data are compared to various risk-based closure levels as presented in the Risk-Integrated System of Closure Policy (RISC) (IDEM, 2001 w/updates). The purpose of this investigation is to close previously identified data gaps and assist stakeholders with development of strategies for future land use(s) and environmental remediation.

1.1 Project Identification

The Site is identified as the former McDoel Rail Switchyard Site, and has been assigned Site Number 4010029 in the Brownfields Program as administered by the Indiana Finance Authority (IFA). The Site is centrally located in the city of Bloomington, Monroe County, Indiana. The Site encompasses approximately 36 acres located south of West Grimes Lane, between Walnut Street and Madison Street in Bloomington. There is no phone number for the Site. The Site location is shown on Figure 1, included within Appendix B.

The current Site contact information is as follows.

Mr. Dave Williams
Director of Operations & Development
City of Bloomington, Parks and Recreation
PO Box 848
Bloomington IN 47402
Telephone: (812) 349-3706

1.2 Overview of Current Contamination Conditions

A map of depicting current Site features is provided as Figure 2, included within Appendix B. Prior to this investigation, limited Site characterization was known from Environmental Site Assessments (ESAs) completed previously on the Site and the adjacent rail corridor. Sample locations associated with these legacy assessments are included in Figure 2.

Data collected by others during the ESAs confirm the presence of Total Petroleum Hydrocarbons (TPH), selected polynuclear aromatic hydrocarbons (PAHs) and selected metals in soil at certain locations on the Site. This supplemental Site investigation expanded on the previous assessments through the collection of analytical data across the entire Site in order to better understand the geographic distribution, specific constituent identification and concentrations across the Site.

The Site currently is unused and is largely razed of above ground structures and infrastructure. Currently, no formal land use restrictions are in place.

2.0 SITE BACKGROUND

2.1 Site History

A complete description of the history of Site use as well as previous environmental investigations is found in the documents included in Appendix G. A generalized summary is provided herein.

The Site was used as a railroad switchyard facility from about 1847 to 2004, when all rail service through the Site was terminated. Specific details of spills and/or releases at this Site during operation of the switchyard are not known; however, fuels and lubricants for locomotives were stored and dispensed, and maintenance activities were performed on Site. There is no known use or storage of hazardous materials or hazardous waste. Site cover is predominantly gravel and/or cinder aggregate, with grass and sparse woody vegetation cover. Clear Creek flows along the eastern margin of the Site. Heavier vegetation is present around the creek channel. The Site largely is surrounded by light commercial and residential land uses.

2.2 Geographic Information

The Site location shown on the Bloomington USGS 7.5' topographic quadrangle map is included on Figure 1, and the layout of current Site features is shown in Figure 2 (Appendix B). The Site is located in Monroe County, Perry Township, T8N, R1W, SW1/4 Sec. 4 and W1/2 Sec. 9. The Site is bounded on the north by West Grimes Lane, on the west and south by the vacated rail corridor, and on the east by Clear Creek and/or adjacent private properties (typically commercial in use). The approximate UTM coordinates at the entrance to Site on Grimes Lane are 540125E, 4333881N. Land use around the Site is developed commercial and/or residential properties.

The Site lies in the Mitchell Plain physiographic Province of the Southern Hills and Lowlands region. The Site is nearly level and is almost entirely covered with gravel or cinder aggregate material. Surface water from the Site either flows overland to Clear Creek or is directed to storm drains discharging to Clear Creek, located along the eastern margin of the Site and flowing southward past the Site. Much of the Site lies in the floodplain of Clear Creek as indicated in Figure 2 (Appendix B).

2.3 Geologic Information

Site geologic and hydrogeologic settings are fully described in the documents cited in Section 5.0, and are not rigorously described herein. A summary of the information presented in previous reports and published literature as cited within follows.

Site soil is mapped by the US Department of Agriculture as Udorthent loam. This soil is defined as deep, nearly level to moderately sloping well drained to somewhat poorly drained soil in disturbed areas of uplands and flood plains (USDA 2009). The Site is underlain by Terra Rossa clay to a depth of approximately 10 feet. A soil map of the Site is provided in the Wetland Delineation Report found in Appendix D. This unconsolidated stratum is underlain by Middle Mississippian aged limestone bedrock of the Sanders Group, comprised primarily of skeletal limestone. The bedrock surface dips to the southeast.

Hydrogeologically, the unconsolidated soil material is not used locally as a water resource. The bedrock is recognized as a carbonate bedrock aquifer within the East Fork White River Basin, 350 -550 feet thick. Wells completed in this unit are reported to yield 1 to 50 gpm.

Well records as found in the public repository maintained by the IDNR Division of Water are provided in Appendix F. No high-capacity wells are known to be located within two miles of the facility. Twenty-eight low capacity water wells are known to be located within the same sections as the Site, or one of the sections surrounding the Site (see Figure 1). Locally, drinking water is provided by municipal service from a remote surface water source. All of the water wells of record proximal to the Site are completed in the bedrock aquifer, at depths ranging from 30 to 225 feet. Those for which records indicate the installation was made for "home" (e.g., presumably used as a drinking water source) typical date to the period prior to 1970, suggesting that these were installed prior to access to the current municipal water supply. These wells may reasonably be assumed out of service as drinking water sources.

2.4 Ecologic Information

Information regarding the ecology of the Site was not included in previous Site assessments. A desktop review of the National Wetland Inventory was performed and indicated a Palustrine forested wetland located near the southeastern boundary of the Site. A wetland delineation was performed during this investigation with field activities including Site reconnaissance, vegetative assessment, soil assessment, and hydrologic determination. A full report detailing findings is included as Appendix D. Communication was initiated with the Indiana Department of Natural Resources (IDNR) and the United States Fish and Wildlife Service (USFWS) in an effort to identify any threatened, rare, or endangered specie. IDNR reports no such species are recorded within one-half mile of the Site. As of this printing date results from the USFWS are still forthcoming.

2.5 Evaluation of Susceptible Areas

No susceptible areas were known from previous Site data. Whereas local drinking water is supplied from a surface water source through municipal system treatment and distribution system, it is assumed that the Site is not in a wellhead protection area. The Site is bordered by Clear Creek to the east and is within the floodway of Clear Creek. In certain instances, Clear Creek exists within the Site boundaries. The proximity to and involvement of the Creek appears to have encouraged habitat for local terrestrial species. These conditions suggest a potential for occurrence of susceptible areas as defined in the RISC Policy. Additional data were collected during this investigation to further evaluate potentially susceptible areas (see Appendix D).

2.6 Evaluation of Chemicals of Concern

The Constituents of Interest (COI) for the purposes of this report are polynuclear aromatic hydrocarbons (PAHs), selected metals, total petroleum hydrocarbons – extended range organics (TPH-ERO) and Volatile Organic Compounds (VOCs). These constituents are identified as COI based on data presented in the legacy ESA reports for the Site and/or based on previous Site uses. There is no known use or storage of hazardous materials. There are no active processes at the Site related to the previous operations.

2.7 Evaluation of Contaminant Transport Mechanisms

Contaminant transport and exposure pathways were evaluated preliminarily during development of a document titled "Preliminary Conceptual Site Model and Environmental Data Gap Analysis" prepared by AECOM in January 2009. This document is included in Appendix G.

Surface water runoff from the Site is expected to be directed primarily toward Clear Creek. The local ground water flow direction is not accurately known, but may be inferred to be east/southeast toward Clear Creek. Potential transport of COI to ground water may occur through leaching of COI from affected soil to ground water and by direct contact between COI-affected saturated soil and ground water.

Predominant transport mechanisms that may facilitate transport of COI include particle erosion from the Site surface and, in the event of invasive subsurface construction activities, limited transport of fugitive particulate matter. The lack of volatile organic chemical detections as noted in the Data Gap report (AECOM 2009a) and corroborated through this investigation suggest that transport of chemicals via vapor movement is negligible.

2.8 Evaluation of Human Exposure Pathways

The main entrance to the Site is secured against unrestricted entry. Otherwise, the Site currently is accessible to pedestrian and limited vehicular traffic, although such access is neither invited nor encouraged. Limited evidence of Site use by trespassers has been noted during recent inspections. Immediately recognizable potential exposure pathways for COI to humans appear to be limited to direct contact with surface soil affected by COI.

During Site development, invasive subsurface activities might result in contact with subsurface soils during construction or maintenance excavations. Once Site development is complete, contact with COI is expected to occur only via incidental contact with surface soils.

2.9 Evaluation of Ecological Exposure Pathways

Clear Creek is an urban water way which presumably receives pollutants from many facilities throughout the city. Regardless, the aquatic habitat of Clear Creek was evaluated as an exposure point for aquatic species while determining the status of the Site as a susceptible area. As noted above, the terrestrial setting in the proximity of Clear Creek appears to provide habitat for a variety of birds and ground dwelling animals. The extent to which the terrestrial ecosystem is a susceptible area as defined under RISC which may result in a complete ecological exposure pathway is discussed in the Wetland and Stream Channel Investigation included in Appendix D.

2.10 Supporting Documentation

Previous environmental documents addressing the Site are enclosed in Appendix G. Similar documents have been prepared for the adjacent rail corridor by others and are available under separate cover. A preliminary Conceptual Site Model (CSM) was developed for reference and used during implementation of this investigation (see Appendix G).

2.11 Maps and Figures

Maps and figures are presented in Appendix B of this Plan.

3.0 INVESTIGATION RESULTS

3.1 Sample Collection

Soil samples were collected at sixty locations distributed across the Site as shown in Figure 2. Sampling locations were selected as described in the Supplemental Investigation Work Plan (AECOM, 2009a). Sampling locations were established in the field using a hand-held GPS receiving unit with sub-meter accuracy. These sampling locations were chosen to adequately delineate the extent of the contaminant concentrations on the entire property for the purposes of environmental site characterization. Typically, a truck mounted direct-push implement (*Geoprobe*®) was used to collect surface and subsurface soil samples. Subsurface samples were collected by advancing the sampling tool to the bottom of the unconsolidated zone which ranged across the Site from 6 to 16 feet below ground surface (ft-bgs). At two locations samples were collected by hand auger owing to field conditions inaccessible to the mechanized unit.

At sixteen of the sixty selected locations, each of which was proximal to locations where legacy data indicated COI present in the subsurface, a surface soil sample was collected during this investigation. Surface samples were collected from the top six inches of soil. Where gravel or asphalt was encountered at the surface, the zero datum for the sample interval was located directly beneath the overlying gravel or asphalt.

Surface and subsurface samples were collected at the remaining 44 locations. Forty five locations were selected to be sampled for surface and subsurface anomalies/COIs. One location was deemed unsafe for collection by hand auger. Lack of collection at this locality does not jeopardize Site delineation nor does it present a data gap in the work plan.

Soil cores were examined by a qualified Geologist and described on a detailed soil boring log using the USDA soil classification system in general conformance with ASTM Methods D 2488 and D 5434. Each two foot soil interval of soil core was screened for organic vapors using a Flame Ionizing Detector (FID). FID measurements can be found on the boring logs included in Appendix E. Samples for off-site laboratory analysis were collected at depth intervals selected based on elevated FID readings or visual and olfactory anomalies. Where no such anomalies occurred the sampling interval was selected from the 2-4 ft. range unless noted otherwise on the boring logs.

3.2 Geologic Observations

In general, silt and clay deposits comprise the majority of subsurface material. During this investigation, a surface layer of crushed gravel and/or cinder aggregate material, ranging from 0.5 to 6 feet thick, was noted overlying natural soil or fill material at most locations.

Bedrock was encountered between 6.5 ft-bgs (in the northern portion of the Site) and 12 ft-bgs in the central portion of the Site. Bedrock was identified as slightly weathered skeletal limestone. At locations east of Clear Creek, bedrock was encountered at a depth of 12 to 13 ft-bgs. Numerous buried limestone blocks were encountered during drilling activities indicating probable fill zones. Bedrock topography is shown in cross sections A-A' through E-E' (Figures 3 and 4, Appendix B).

Visual anomalies and/or elevated FID readings noted during completion of the soil borings are summarized below. Boring logs are included in Appendix E.

Location	Elevated FID / depth (ft)	Olfactory Anomaly	Visual Anomaly
9-001	20.1 ppm / 5 ft-bgs		
9-003	21.9 ppm / 9 ft-bgs	slight hydrocarbon-like odor	black staining
9-005	Max 126.2 ppm / 2.5 ft-bgs		
9-011			black organic matter
9-016	20.8 ppm / 6 ft-bgs		
9-020	Max 49.4 ppm / 4.5 ft-bgs		black staining
9-021	Max 24.5 ppm / 7 ft-bgs		
9-022	Max 132.4 ppm / 9.5 ft-bgs	slight hydrocarbon-like odor	heavy black staining at 8.5 ft-bgs
9-023	19.3 ppm / 6 ft-bgs		black streaking
9-025	27.8 ppm / 8.5 ft-bgs		
9-026	25.1 ppm / 9 ft-bgs	hydrocarbon-like odor	
9-027			black staining
9-029	Max 22.3 ppm / 5 ft-bgs		black stains and nodules
9-038		strong hydrocarbon-like odor	
9-042	22.8 ppm / 2.5 ft-bgs		black streaking
9-052	15.5 ppm / 6.5 ft-bgs	slight - moderate hydrocarbon-like odor	
9-054	Max 114.9 ppm / 6.5 ft-bgs		
9-060		slight hydrocarbon odor	
9-063	Max 36.2 ppm / 9 ft-bgs		tar-like material
9-064	Max 33.7 ppm / 9 ft-bgs	slight – very strong hydrocarbon odor	tar-like material, oily sheen on water

Generalized geologic cross sections are included as Figure 3 and Figure 4. The locations of cross section lines are shown on Figure 2.

Cross sections A-A', D-D', and E-E' bisect the length of the Site from north to south. Cross sections B-B' and C-C' bisect the width of the Site from generally west to east. Cross section A-

A' shows a range of fill material stretching from 1.5 ft thick on the northern end to 5 ft-bgs towards the southern end.

Cross section B-B' runs southwest to northeast through the upper mid section of the property and bisects Clear Creek.

Cross section C-C' shows Site lithology from the western boundary to the western edge of Clear Creek through the lower mid section of the property. The ground surface slopes slightly towards the east. Bedrock topography also generally slopes to the east.

Cross section D-D' shows lithology running north to south in the mid section of the property. Cross section D-D' bisects cross section C-C' at point 9-041. Bedrock slopes gently to the south. Fill materials range widely in depth as portrayed in this cross section.

Cross section E-E' shows fill materials generally following the bedrock topography. This cross section represents the lithology occurring in the southern portion of the Site from north to south lengthwise.

3.3 Hydrologic Observations

Ground water was encountered sporadically between four and eight ft-bgs at several points throughout the Site. No continuous water bearing stratum was identified. This is most likely representative of heavy rains prior to drilling, local infiltration and surface water runoff. Ground water was not sampled or investigated as part of this investigation. The local aquifer is documented to reside within the limestone bedrock unit, at least 30 feet below ground surface.

Clear creek runs parallel to the eastern property edge. Smaller tributaries drain into Clear Creek midway through the Site and at the southern end of the area investigated

3.4 Analytical Results

Analytical results are provided by Pace Analytical Labs, located in Indianapolis, IN. Samples were analyzed for the COI described in Section 2.6. Results are compared to RISC Industrial, Recreational, and Residential default closure levels. An action level report summarizing all values exceeding closure levels is provided in Table 1. In the following sections, comparisons are made separately for surface soil and subsurface soil.

3.4.1 Surface Sample Results

Surface soil samples were collected at 60 locations from the 0-0.5 ft. interval. Where gravel or asphalt was encountered the zero datum for the sample interval was established at the contact between the overlying gravel or asphalt and soil beneath. All surface soil samples were analyzed for TPH-ERO, PAHs, and selected metals. Metals analysis includes arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury. A summary of metals analysis results is shown in Table 3, Appendix A. Laboratory analytical results are provided in Appendix C.

Metals are prevalent in the surficial soils throughout the Site as seen on Figures 8 – 13. Lead concentrations exceed the Residential Default Closure Level (ResDCL) at locations across the Site (Figure 8). Lead concentrations exceed the Recreational DCL (RecDCL) at seven locations. The Industrial Default Closure Level (IDCL) was exceeded in seventeen of the sampled locations (Figure 9).

Arsenic is reported at concentrations exceeding the IDCL, RecDCL, and the ResDCL at locations across the Site (Figures 11 and 12).

Surface soil across the site contains detectable concentraations of PAHs. The three most commonly detected COI were benzo(a)pyrene, dibenz(a,h)anthracene, and benzo(a)anthracene. Surface PAH detections are summarized in Table 2 within Appendix A. The sampling locations at which the concentration of one or more of the PAH constituents exceeds a default closure level are shown in Figures 5, 6, and 7. As demonstrated in these figures, PAH concentrations exceeding closure levels are common in surface soil across the Site.

Previous investigations completed by others included analysis for TPH-Gasoline Range Organics (GRO), Diesel-Range Organics (DRO) and Extended Range Organics (ERO). The current RISC Policy evaluates TPH through the use of GRO data for low-range petroleum constituents (e.g., gasoline) and TPH-ERO for mid-to-high range petroleum constituents (e.g., diesel and oils). The legacy site TPH data and current TPH-ERO data are shown on Figures 14 and 15 of Appendix B. Analytical results from this investigation for TPH-ERO are presented in Table 4. Legacy TPH data results are summarized in Table 5, Appendix A.

Surface soil samples contain TPH exceeding the ResDCL at nearly all sample locations. Concentrations exceeding the IDCL are common across the central and southern sections of the Site. No ResDCL is established for TPH.

3.4.2 Subsurface Sample Results

Subsurface soil samples were collected from 44 locations ranging in depth from 2 to 10 feet below ground surface. Sample intervals were selected in conformance with the method established in the Work Plan (AECOM 2009b). In cases where the 2 to 4 foot range contained crushed stone or loose cinders the next available sample interval was chosen that contained representative environmental media (i.e., clay or silt).

Subsurface soil samples were analyzed for VOCs, PAHs, and selected metals. Metals analysis consisted of arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury. A summary of subsurface metal results is shown in Table 7, Appendix A.

Metals were encountered in the subsurface soil at concentrations exceeding default closure levels. Lead was found to exceed the ResDCL at four locations in the central portion of the Site (Figure 8). Lead concentrations did not exceed the IDCL or RecDCL (Figures 9 and 10). Arsenic is pervasive in subsurface soil at concentrations exceeding both the ResDCL and the IDCL. Six locations near the eastern Site boundary exceeded the RecDCL for subsurface soils (Figure 13).

Analytical results for VOCs are summarized in Table 8 (Appendix A). Lab analytical reports are provided in Appendix C. Two VOCs were detected: naphthalene and n-hexane. All reported concentrations are less than the IDCL, RecDCL and ResDCL.

PAHs were detected in the subsurface soil as summarized in Table 6 of Appendix A. The three most commonly detected hydrocarbons were benzo(a)pyrene, dibenz(a,h)anthracene, and benzo(a)anthracene. PAH concentrations exceeding closure levels are rare in subsurface soil. Concentrations exceeding the ResDCL were reported at five locations; exceeding the RecDCL at four locations; and exceeding the IDCL at two locations as shown in Figures 5, 7, and 6, respectively.

Legacy TPH data from the subsurface shows exceedances primarily concentrated in the mid section of the Site. It should be noted that subsurface TPH testing performed by others was limited in scope and does not reflect the extent of subsurface contamination for the entire Site. TPH concentrations exceed the IDCL and ResDCL in subsurface soils (see Figures 14 and 15). There is no ResDCL established for TPH.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Results of the investigation presented in this report provide constituent-specific delineation of affected soil across the entire Site. These data identify the specific compounds present in both surface and subsurface soil, as well as the concentration of each compound in each sample. With the incorporation of these data into the complete collection of data that exists for the Site, comprehensive delineation of the nature and extent of affected soil is completed on Site.

Comparison of the data presented herein to applicable default closure levels facilitates refined and updated evaluations of exposure pathways, receptors, extant risks and remaining data gaps (if any) presented by existing Site conditions. Thorough evaluation of the revised CSM supports preliminary considerations of potentially applicable/feasible remediation alternatives, and may be used to support cost-benefit analyses of potentially feasible remedial options.

4.1 Nature and extent of affected media

Sitewide data indicate surficial soils contain numerous COI within the area characterized. Petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), and metals are pervasive within the top six inches of soil.

4.2 Summary of Potential Risks Associated with Site

Potential risks are indicated by surface soil concentrations of TPH, PAHs and metals at locations across the site, and by subsurface soil concentrations of TPH, metals and PAHs at selected locations. Surface soil conditions represent potential risks via oral, dermal and inhalation exposure routes to receptors contacting this medium. Subsurface soil conditions represent risks via similar exposure pathways; however, these pathways are complete only in the advent of invasive subsurface activities (e.g., construction/utility work).

4.3 Preliminary Remediation Alternatives

Preliminary identification and evaluation of potentially feasible remediation alternatives are provided in the following sections.

4.3.1 No Further Action

No further action affords no mitigation of the potential risks indicated, in which case redevelopment of the site as contemplated by the City of Bloomington would be inappropriate. This alternative is inappropriate/infeasible if stakeholders are committed to Site redevelopment, and is incongruent with current IDEM ‘expectation of cleanup’ paradigm.

4.3.2 Institutional Controls

This alternative involves the development, implementation and maintenance of land use restrictions, institutional, engineering and/or adminstrative controls to minimze the risks identified. No direct remediation is indicated. This alternative is inappropriate if utilized as the exclusive remedy because the controls indicated by the existing Site conditions are incongruent

with the conceptual redevelopment goals and objectives. Further, this alternative is incongruent with current IDEM 'expectation of cleanup' paradigm.

4.3.3 In Situ Treatment

This alternative involves the direct application of equipment and/or reagents to affected media. As applied to the Site conditions identified herein, this alternative yields relatively lengthy implementation time and high cost owing to the large area and various types of COI indicated. This alternative requires operation and maintenace of remediation system which may impede or delay redevelopment activities. This alternative may be effective if non-default strategies and/or future land use designs support implementation of this treatment across smaller, specific/localized portions of the Site.

4.3.4 Removal

This alternative involves excavation of affected material, with off-Site treatment/disposal and backfill with appropriate clean fill. This remedy is an effective "final remedy" and is congruent with RISC Policy and with IDEM 'expectation of cleanup' paradigm. Implementation may be aggravated by floodway, wetlands and related ecological concerns. If applied unilaterally across the site, costs may be prohibitive. If combined with implementation of an aggressive nondefault closure demonstration, unilateral Site-wide application of removal/backfill likely is not warranted; instead this alternative can be applied strategically to selected local areas where Site conditions or future land use design demand, while other areas of the Site are addressed using non-default and non-invasive strategies.

4.3.5 Non-default Closure Strategy

This alternative involves the use of appropriate site data to identify areas where remediation is not necessary, areas where exposure to relatively low concentrations of COI may be controlled through application of practical institutional controls (i.e., no invasive remediation needed), and to minimize the area(s) subject to more costly or complex invasive remediation. Examples of elements of a non-default closure strategy include (but are not limited to) the following.

- Collect, analyze, evaluate samples for Site-specific background (metals)
- Evaluate Site-specific exposure duration/frequency, land use variables, etc.
- Calculate Site-specific nondefault closure levels (each/all COI)
- Compare Site data to nondefault closure levels and qualitative criteria
- Focus additional controls and/or remediation on those areas where non-default closure demonstration fails

This alternative is congruent w/RISC Policy, and may be expected to reduce the area/depth of material that would be subject to more aggressive controls or remediation methods. This alternative will facilitate design of future land use (i.e., the layout of future land uses can be designed around areas that pass/fail the nondefault closure criteria). This alternative is not anticipated to be an exclusive remedy (i.e., this alternative would be used in conjuction with other remedies applied in locations where non-default closure demonstration fails).

5.0 REFERENCES

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About AECOM
AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental and energy. With more than 40,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments.

AECOM
5010 Stone Mill Road
Bloomington, Indiana 47408
T 812.336.0972
F 812.336.3991
www.aecom.com