ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES (ABCA)

200 BLUE STAR HIGHWAY REDEVELOPMENT LOCATED AT 200 BLUE STAR HIGHWAY DOUGLAS, ALLEGAN COUNTY, MICHIGAN 49406

FY21 EPA BROWNFIELD CLEANUP GRANTS

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Prepared for

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1.0 INTRODUCTION AND BACKGROUND

This Analysis of Brownfields Cleanup Alternatives (ABCA) Report is a preliminary evaluation to document brownfield cleanup planning related to prospective site redevelopment of the 200 Blue Star Redevelopment project located at 200 Blue Star Highway, Douglas, Michigan, referred to herein as "subject property" or the "site", see Figure 1. This ABCA has been prepared for the City of the Village of Douglas ("the City") pursuant to the requirement specified in the U.S. Environmental Protection Agency (EPA) FY21 Guidelines for Brownfield Cleanup Grants (RFA No.: EPA-OLEM-OBLR-20-07).

For the purpose of this evaluation, the subject property is eligible for a Cleanup Grant. This project will assist the City ("the applicant") to conduct cleanup activities on the subject property that will allow the City to position the property for redevelopment. Cleanup activities will contribute to reducing threats posed by the hazardous substances present onsite and are a necessary first step that will allow the City to leverage additional brownfield redevelopment incentives at the state and local levels.

1.1: Subject property Location and Description

The subject property is located at 200 Blue Star Highway, Douglas, Michigan and consists of a single parcel containing a total of approximately 7.18 acres and is located approximately 500 feet north of the Blue Star Highway and Chase Road intersection in Douglas, Michigan. The subject property is developed with a 150,300 square foot, one-story industrial building and two utility buildings that have been occupied by various manufacturing companies since the 1940s. The building is currently vacant.

Subject Property Location/Address	200 Blue Star Highway, Douglas, Michigan
Number of Parcels and Acreage	One parcel containing 7.18 acres
Number of Building(s)	150,300 square foot, one-story building with two utility buildings
Current Property Use	Industrial
Current Zoning	C-2: General Commercial

The subject property location is depicted on Figure 1, Site Location Map. A diagram of the subject property and adjoining properties is included as Figure 2, Generalized Diagram of the Subject Property and Surrounding Area.

1.2: Subject property History and Previous Use(s)

The subject property was initially developed by 1938 with the construction of two small structures in the southwestern portion of the property and a small fallow orchard present in the western portion of the property. Between 1938 and 1955, two industrial buildings were constructed in the eastern and western portions of the property. The buildings were demolished between 1955 and 1963 when the current building was constructed. The two small structures in the southern portion of the property were demolished between 1968 and 1975. An addition was constructed to the southern portion of the current building between 1975 and 1968. The subject building was occupied by various light industrial occupants from initial construction to 2014 and has been

vacant since that time. The most recent occupant and owner of the property is Haworth Inc. (formerly Haworth Manufacturing), who used the building for plating, buffing, zinc die casting, metal forming, stamping, phosphatizing and painting metal parts since approximately 1976. Other prior occupants included Chase Manufacturing.

1.3: Previous Assessment Findings

The following is a list of previous environmental investigations performed on the property;

Name of Report	Date of Report	Prepared by
Phase II ESA	8/2015	Environmental Resources Management Michigan, Inc. (ERM)
Phase II ESA	10/9/2015	ERM
Remedial Alternatives Evaluation (RAE)	5/11/2018	GHD Services Inc. (GHD)
Polychlorinated Biphenyl (PCB) Cleanup Plan and Application for Risk-Based Cleanup and Disposal Approval (Cleanup Plan)	8/3/2018	GHD
Groundwater Sampling Results and Summary	3/13/2019	GHD
Phase I ESA	3/18/2019	PM Environmental (PM)
Baseline Environmental Assessment	5/2/2018	PM

Phase II ESA – 10/9/15 (ERM)
A Phase II Environmental Site Assessment (ESA) was completed for the subject property by ERM dated October 9, 2015. The Phase II ESA was conducted to assess the following Recognized Environmental Conditions (RECs) that were identified in a prior Phase I ESA completed by ERM in August 2015:

- Volatile Organic Compounds (VOCs) contamination documented beneath the subject building and subsequent Michigan Department of Environment Great Lakes and Energy (EGLE) sub-slab and indoor air sampling, which identified concentrations of volatile organic compounds (VOCs) above the [then] current EGLE Nonresidential Recommended Interim Action Screening Levels (RIASLs) for vapor intrusion:

- Three 6,000-gallon underground storage tanks (USTs) located southwest of the building, two 500-gallon USTs located east and west of the building, three concrete waste treatment tanks beneath the concrete slab in the eastern portion of the building, and a 17,500-gallon fuel oil UST that was once located on leased land across Ferry Street, to the west of the subject property, which were all reported to have been removed, but no soil sampling documentation was available;

- The structural integrity of floor drains and trench drains in the subject property building;

- Former die casting operations conducted between the 1950s and 1971.

Subsurface investigation activities were conducted in the former die cast pit area (east room) of the subject property building, which is not currently used for warehousing. No other former operational areas of the subject property building, or exterior locations were included in the Phase II ESA other than a former vent pipe area located east of the subject property building's east

exterior wall. Investigation activities included the advancement of 10 soil borings and the collection of soil samples for analysis of polychlorinated biphenyls (PCBs). Groundwater was not encountered in any of the soil borings advanced during ERM's August 2015 site investigation.

Soil analytical results identified concentrations of PCBs above 1.0 part per million (ppm) at three of the boring locations, however, the horizontal and vertical extent of PCB impacts were not defined within the Toxic Substances Control Act (TSCA) subpart D cleanup standards for unrestricted land use.

In addition, ERM collected six 24-hour indoor air samples at representative locations in the building for laboratory analysis of VOCs. No concentrations of VOCs were identified in any of the indoor air samples collected from the subject property building above laboratory method detection limits (MDLs).

ERM also traced a vent pipe along the eastern wall of the subject property building, which was suspected of being associated with a former fuel oil UST. No USTs were identified, and no sampling was completed. The other UST basins identified as RECs were not assessed.

Remedial Alternative Evaluation – 5/11/18 (GHD)
A Remedial Alternatives Evaluation (RAE) for the subject property was completed by GHD dated May 11, 2018. GHD reviewed previous reports that documented the nature and extent of trichloroethene (TCE) and PCB impacts at the subject property to evaluate remedial alternatives for the risks associated with the VOC groundwater plume and PCBs in soil for the vapor intrusion and direct contact pathways, respectively.

The RAE documented that ERM completed additional site investigations in December 2015, August, November, and December 2016, and January 2017 to attempt to delineate the horizontal and vertical extent of PCB impacts at the subject property. The soil analytical results identified concentrations of PCBs above 100.0 ppm at several locations ranging from 1 to 15.5 ft bgs. The horizontal extent of impacts was delineated within the TSCA subpart D cleanup standard for Low-Occupancy areas of 100 ppm.

ERM also collected concrete samples from the surface and lower layers of the concrete slab in the east room (warehouse). Concentrations of PCBs greater than 1.0 ppm were identified in all of the deeper intervals at concentrations ranging from 3.4 ppm to 5,600 ppm. The locations of the highest concentrations of PCBs were identified around the north and east pits, where concentrations exceeded 100 ppm. In addition, 10 surface concrete samples from the west room in the northwestern portion of the building were collected, none of which contained PCB concentrations exceeding 10 ppm, which is appropriate for high-occupancy use.

PCB Cleanup and Application for Risk-Based Cleanup and Disposal Approval – 8/3/18 (GHD)
In June 2018, GHD conducted an additional site investigation to vertically delineate the extent of PCB impacts greater than 1 ppm and 100 ppm, respectively, and/or confirm soil boring refusal depths encountered by ERM during previous site investigations in the central portion of the east room between 12.0 and 15.0 feet bgs to evaluate 27 identified data gaps. GHD concluded that the drilling work confirmed refusal at 21 of the 27 data gaps between 12.0 and 15.0 feet bgs. At the remaining six soil boring locations, soil samples were collected at depths to 19.0 to 20.0 feet bgs, none of which identified concentrations of PCBs above laboratory MDLs. Based on these results, GHD assumed vertical delineation in the east room at approximately 18.0 to 20.0 feet bgs. Additional vertical delineation would be required to fully define the vertical extent of PCB impacts to within the TSCA subpart D cleanup standards below refusal depths.

The results of GHD's investigation are included in a PCB Cleanup Plan (Cleanup Plan), dated August 3, 2018. GHD's Cleanup Plan contains a Draft PCB Cleanup Plan that was completed by ERM in 2017. Included within the plan is documentation of additional sampling that was conducted by ERM to evaluate PCBs impacts to groundwater and soil gas. Sampling included the installation of four temporary monitoring wells to a depth of approximately 40 feet bgs downgradient to the north of the east room for collection of groundwater samples. No concentrations of PCBs were identified above laboratory MDLs. Three soil gas samples collected in the east room identified no concentrations of PCBs above laboratory MDLs.

Concrete floor sampling was also conducted in the east and west rooms. PCB concentrations in concrete above 100 ppm were not identified in the west room. In the north central portion of the east room, PCB concentrations exceeding 100 ppm were detected and fully delineated. Along the east and north walls, PCB concentrations were greater than 1 ppm but less than 5 ppm. All other delineation samples collected from the east room were below 1 ppm or below laboratory detection limits.

Based on these results, GHD presented the following recommended approach in the Cleanup Plan, which envisioned Low-Occupancy uses of the subject property, as defined under TSCA:

- PCBs ≤ 100 ppm – leave in place and cap with an epoxy seal;
- PCBs > 100 ppm from 0.0 to 5.0 feet bgs – excavate to 5.0 feet bgs and dispose of offsite;
- PCBs > 100 ppm greater than 5.0 feet bgs – leave in place and cap with an epoxy seal; and
- PCBs > 1 ppm – cap with an epoxy seal all areas that exceed 1 ppm.

Additional recommended activities included:

- Collection of confirmation soil samples in the planned PCB excavation area following TSCA verification of soil remediation guidance.
- No PCB removal activities of soil or concrete to be completed in the west room; and
- Recording deed restrictions for the subject property consistent TSCA requirements.

<u>Groundwater Sampling Results and Summary - 3/13/2019 (GHD)</u>
Groundwater monitoring results dated 2019 document similar concentrations as previously identified. Sampling results indicate that the chlorinated VOCs present in groundwater have not mobilized the PCBs present in the impacted soils to groundwater.

1.4: Project Goals

The existing building has been subject to several years of decline and deterioration, prompting the City to acquire the property. The City's intent is to better position the property for redevelopment by addressing the PCB contamination known to exist at the site and demolish a portion of the building required to address the PCB contamination. The City will retain ownership of the property and oversee the cleanup activities until the property can be sold to a developer and redeveloped.

The City intends to engage in PCB cleanup activities to achieve Risk-Based High-Occupancy TSCA cleanup standards. The magnitude of these costs along with additional costs necessary to implement due care response activities exceeds the capabilities of available brownfield tax

increment financing, as well as other state cleanup programs that are experiencing significant funding reductions due to the COVID-19 pandemic. Cleanup of PCB contamination to the Risk-Based High-Occupancy TSCA standard will eliminate a significant cleanup cost, which would make state brownfield tax increment financing feasible to implement the necessary due care response activities available for redeveloping property.

The initial conceptual site development plan that was prepared by the City includes the redevelopment of the property into a commercial mixed use development that includes, restaurants, entertainment, and live-work space as the first phase of a larger two-phased development.

The project goals for this ABCA are to identify, evaluate, and select an appropriate cleanup plan to address the soil, groundwater, and soil gas impacts identified at the subject property. Based on the preliminary redevelopment concept, the goal of the ABCA also relate to activities likely required to achieve compliance with the Risk-Based High-Occupancy TSCA cleanup standards with the implementation of cleanup activities, as it pertains to documented soil, groundwater, and soil gas impacts at the subject property.

2.0 APPLICABLE REGULATIONS AND CLEANUP STANDARDS

2.1: Law and Regulations Applicable to the Cleanup

Laws and regulations that are applicable to this cleanup include the Federal Toxic Substances Control Act (15 U.S.C. chapter 53, subchapter 1, sections 2601-2629) and Brownfields Revitalization Act (Pub. L. 107-118, 115 stat. 2356), the Federal Davis-Bacon Act (Ch. 411, 46 Stat. 1494) and Michigan Parts 111, 115, and 201. Federal, state, and local laws regarding procurement of contractors to conduct the cleanup will be followed. As described herein, all cleanup will be in accordance with the State of Michigan regulations and Federal TSCA regulations. All applicable permits and documentation (i.e. One-Call, Project Notification Forms, Asbestos Removal, Building Demolition Permit, etc.) will be obtained prior to the work commencing, and all work will be conducted in accordance with the conditions for approval. Pertinent laws and regulations applicable to the contaminant of concern for this ABCA are detailed in the following subsections.

2.1.1: Cleanup Standards for Major Contaminants

Documented soil, groundwater, and soil gas impacts were identified at the subject property and compared to TSCA subpart D cleanup standards. These standards are described as follows:

Standard	No Action	Appropriate Cap w/Deed Restriction	Removal Required
High-Occupancy Area (≥335 hours/year)	≤1 ppm	>1 to ≤10 ppm	>10 ppm
Low-Occupancy Area (<335 hours/year)	≤25 ppm w/ deed restriction	>25 to ≤100 ppm	>100 ppm

ppm = parts per million

Cleanup activities will be undertaken in a manner compliant with TSCA subpart D cleanup standards, federal Occupational Safety and Health Administration (OSHA), and/or Michigan Occupational Safety and Health Administration (MIOSHA), as applicable.

The regulations also require work practice standards designed to eliminate or minimize the release of contaminated soil during the cleanup process. The objective of the contamination cleanup or mitigation is to reduce or eliminate the potential risk of exposure to site occupants and to workers and the public during remediation at the subject property.

The regulations for Asbestos Abatement require work practice standards designed to minimize and control the release of asbestos fibers during building demolition, waste packaging, transportation and disposal. The objective of the asbestos cleanup is to reduce or eliminate the potential risk of airborne asbestos fibers to workers and the public both prior to and during renovation of the building.

In order to be considered effective, the remedial alternative selected for the subject property needs to minimize the potential for human exposure to contaminated soil and ACM.

2.2: Cleanup Oversight Responsibility

An environmental professional will oversee cleanup remediation activities and will include reporting to EPA upon completion.

3.0 POTENTIAL CLEANUP ALTERNATIVES

The sections below provide an outline of the conceptual alternatives to achieve TSCA subpart D compliance in relation to identified contamination on the subject property. It is assumed that demolition of the building will be necessary to access the target cleanup areas. Therefore, ACM abatement will be required regardless of the Alternative chosen to cleanup objectives and is assumed to be included with each scope as an additional necessary step. The chosen Alternative will have a choice from each of these sections and the final scope will also include ACM abatement.

Multiple potential alternatives have been selected for further evaluation and comparison:

- Alternative #1: No Action
  - No action
- Alternative #2:
  - Comprehensive Cleanup to Achieve Compliance with Michigan's Part 201 Cleanup Criteria, and federal Self-Implementing High-Occupancy TSCA (no surface cap). Specifically, the Michigan Part 201 Residential Generic Cleanup Criteria and federal TSCA Self-Implementing High-Occupancy Standards will be utilized.
- Alternative #3:
  - Cleanup of Contaminated Areas to Achieve Compliance with TSCA Risk-Based High-Occupancy Standards.

Each alternative was evaluated for applicability to the subject property and its feasibility and are further discussed in the following sections.

3.1: Alternative #1: "No Action"

The "no action" cleanup alternative is included in the evaluation as a standard to compare other remedial action in order to compare and contrast any significant reduction in subject property risk,

as necessary. For the "no action" alternative, no action to abate or remediate the issues identified at the subject property would take place and the contaminants would remain in the building and in the ground. This alternative does not include a means to mitigate or eliminate potential exposure both during and following redevelopment and does not meet the objectives of the project.

3.1.1: Effectiveness

This alternative is not effective in controlling the release of contaminants or achieving project goals. Contamination will remain in the ground and potentially cause issues related to the development activities including soil management. ACM identified within the building; therefore, any potential renovation activities would release friable asbestos and thereby expose the workers and potentially the public in the area to hazardous material as the asbestos become airborne and uncontained.

3.1.2: Implementability

The 'No Action' alternative is simple to implement since no activities will be conducted.

3.1.3: Cost

No direct costs associated with this alternative; however, potential environmental and financial liabilities would not be addressed and may result in additional management costs during development.

3.2: Alternatives to "No Action"

The following Tables have lined up Alternatives 2 and 3 for an easier comparison of Effectiveness, Implementability and Cost. The Cost of ACM Abatement will be an estimated additional $60,000 to the chosen alternative below.

Alternatives to "No Action" CONCEPTUAL CLEANUP OPTIONS

Alternative 2: Comprehensive Cleanup to Achieve Compliance with Michigan's Part 201 of Michigan's Natural Resources and Environmental Protection Act (NREPA) (P.A. 451 of 1994), as amended.					
	Advantages	**Conceptual Budgetary Costs**	**Effectiveness Feasibility**	**Anticipated Cleanup Standard**	**Timeframe**
Comprehensive Cleanup of PCB/VOCs, and Metals above Part 201 Residential and Nonresidential Cleanup Criteria and, Volatilization to Indoor Air Pathway (VIAP) Screening Levels, and TSCA High-Occupancy Criteria. Removal of Contaminated Materials	**Advantages** • Removal of all contamination from the site that represents a potential unacceptable exposure risk to occupants. • Facilitates unrestricted use of the property. • Potential exposure risks via the groundwater ingestion pathway controlled using a Restrictive Covenant **Disadvantages** • A groundwater contaminant plume originating from the site already extends greater than 1,600 feet offsite to the north/northwest such that cleanup of all contamination on the site will not address the offsite plume area. • Not cost feasible when compared to other alternatives. • Additional evaluation and delineation studies needed to completely delineate the vertical and horizontal extent of contamination relative to current EGLE VIAP Screening Levels or Volatilization to Indoor Air Criteria (VIAC) issued by EGLE • Additional feasibility and pilot testing required to implement cleanup. • The contaminant types onsite require different cleanup technologies such that a combination of extensive excavation coupled with remediation system operation, possible in-situ groundwater treatment, and long-term groundwater monitoring would be required • Cleanup activities would require years to achieve.	Greater than $1,000,000	Effectively removes occupant contaminant exposure conditions	Part 201: Drinking Water, Ground-Water Surface Water Interface, Direct Contact, and Volatilization to Indoor Air Inhalation Cleanup Criteria	Five to ten years (or greater)

Alternative 2: Comprehensive Cleanup to Achieve Compliance with Michigan's Part 201 of Michigan's Natural Resources and Environmental Protection Act (NREPA) (P.A. 451 of 1994), as amended.					
	Advantages	**Conceptual Budgetary Costs**	**Effectiveness Feasibility**	**Anticipated Cleanup Standard**	**Timeframe**
Cleanup of PCBs to Achieve Risk-Based TSCA high-Occupancy Subpart D Cleanup Standards Utilization of Traditional Brownfield TIF to address Due Care Compliance (i.e. vapor mitigation, institutional controls, etc.)	**Advantages** • Cost feasible • Risk Based Approach allows source removal while implementing targeted engineering and institutional controls to facilitate reuse and redevelopment consistent with a high-occupancy land use as defined under TSCA. • Allows EPA input to Risk-Based TSCA Cleanup Workplan/Approach that is submitted to EPA prior to implementation; • Allows leveraging of state brownfield TIF programs for non-PCB impacts; • Reduces waste generation compared to Alternative 2 or a more conservative Self-Implementing standard under TSCA. • Moderate property disruption relative to other options. • Timeframe for cleanup activities significantly reduced compared to Alternative 2. • Maximizes redevelopment/reuse potential relative to PCB impacts including those consistent with both High and Low-Occupancy uses and mixed Residential/Commercial land uses; • Redevelopment features, like building pads, parking lots and driveways can be adopted or implemented to meet risk-based cleanup requirements and/or controls. **Disadvantages** • Only addresses TSCA subpart D cleanup standards. Additional institutional controls likely needed. • Surface barriers, vapor intrusion controls, or institutional controls may still be needed, which will require operation and maintenance. • Annual inspections and documentation may be required to demonstrate compliance with Due Care obligations and the institutional and engineering controls required for Risk-Based TSCA Closure;	±$400,000 to $600,000 PCBs are Removed to Meet Risk-Based High-Occupancy Standards, and Engineering/ Institutional Controls Implemented	Effective, achieves compliance with Risk-Based TSCA subpart D High-Occupancy cleanup standards.	TSCA Subpart D Cleanup Standards (Risk-Based High-Occupancy)	6-12 months

4.0 RECOMMENDED CLEANUP ALTERNATIVE

Given the cost feasibility involving cleanup of the PCB contamination on the property, the recommended cleanup option is Alternative 3: Cleanup of PCB Contaminated Areas to Achieve Compliance with Risk-Based High-Occupancy TSCA Subpart D Cleanup Standards.

While still a viable option for remediation, the costs associated with Alternative 2 is not economical as the total remediation costs are estimated to be greater than the property's value. In addition, a comprehensive cleanup of the property would not address the existing offsite groundwater contaminant plume which has migrated greater than 1,600-feet to the north/northwest. Cleanup of the PCB contaminations to TSCA Risk-Based High-Occupancy Standards would effectively split the cost of EPA Brownfield Cleanup funding, which would allow the leveraging of state brownfield TIF incentives to redevelop the site. Neither program would provide enough funding to fully address the cleanup of the PCB contamination and address due care response activities on their own.

Prior to any demolition required to access the target cleanup areas, ACM is required to be abated by a State of Michigan licensed asbestos abatement contractor along with appropriate disposal and oversight.

Following the implementation of cleanup activities, The City intends to submit a Risk-Based TSCA Closure Report to EPA documenting compliance with TSCA subpart D. It is understood that the Closure Report will need to include requirements for post-closure actions including inspections and operation and maintenance activities, as applicable.

5.0 REFERENCES

The following previous site investigations, some of which are available from public sources.

Name of Report	Date of Report	Prepared by
Phase II ESA	10/9/2015	Environmental Resources Management Michigan, Inc. (ERM)
Remedial Alternatives Evaluation (RAE)	5/11/2018	GHD Services Inc. (GHD)
PCB Cleanup Plan and Application for Risk-Based Cleanup and Disposal Approval (Cleanup Plan)	8/3/2018	GHD
Groundwater Sampling Results and Summary	3/13/2019	GHD

In addition, the following published sources were utilized during completion of this ABCA:

- TSCA Part 761 "Polychlorinated Biphenyls Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions", Subpart D "Storage and Disposal";
- "Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels," Revised December 2013 and in accordance with Section 20120a(1);
- EGLE Operational Memorandum No. 4 "Site Characterization and Remediation Verification – Attachment 10, Peer Review Draft Groundwater Not in an Aquifer," February 2007;

- EGLE Operational Memorandum No. 2 “Sampling and Analysis,” October 22, 2004, Revised July 5, 2007;
- EGLE Guidance Document for the Vapor Intrusion Pathway, May 2013;
- Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, ASTM, ASTM Designation E 1527-13, Published November 2013.