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FMC Corporation Middleport, New York

Corrective Measures Study (CMS) Work Plan

Tributary One and Flood Plain South of Pearson/Stone Roads Study Area

Draft July 2011

Corrective Measures Study Work Plan

Tributary One and Flood Plain South of Pearson/Stone Roads Study Area

FMC Corporation Middleport, New York

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#### Acronyms and Abbreviations

Agencies	NYSDEC and USEPA
AOC	Administrative Order on Consent
BEHI	Bank Erosion Hazard Index
CAMU	Corrective Action Management Unit
CAO	Corrective Action Objective
CFR	Code of Federal Regulations
СМА	Corrective Measure Alternative
CMS	Corrective Measures Study
COC	Constituent of Concern
DER	Division of Environmental Remediation
ERA	Ecological Risk Assessment
FEMA	Federal Emergency Management Agency
FMC	FMC Corporation
HEC-RAS	Hydrologic Engineering Centers - River Analysis System
HHRA	Human Health Risk Assessment
ICM	Interim Corrective Measure
IRIS	Integrated Risk Information System
MCIG	Middleport Community Input Group
mg/kg	milligrams per kilogram
NPDES	National Pollutant Discharge Elimination System
NYCRR	Compilation of the Rules and Regulations of the State of New York
NYSDEC	New York State Department of Environmental Conservation

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## Acronyms and Abbreviations (continued)

NYSDOH	New York State Department of Health
OSI	Off-Site Investigation
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Roy-Hart	Royalton-Hartland
SCO	Soil Cleanup Objective
SPDES	State Pollutant Discharge Elimination System
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WSI	Western Surface Impoundment
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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## 1. Introduction

FMC Corporation (FMC), the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency (USEPA) (NYSDEC and USEPA are referred to herein as "the Agencies") entered into an Administrative Order on Consent (AOC), Docket No. II RCRA-90-3008(h)-0209, effective July 2, 1991, under the corrective action provisions of the Resource Conservation and Recovery Act (RCRA) and under the New York Environmental Conservation Law with respect to releases of hazardous waste and hazardous constituents at the FMC pesticide formulating facility in Middleport, New York (Facility or Site). The AOC includes requirements to undertake a RCRA Facility Investigation (RFI) and, if determined to be necessary by the Agencies, a Corrective Measures Study (CMS). This document constitutes a work plan (CMS Work Plan) for the off-Site study area identified as Tributary One and Flood Plain South of Pearson/Stone Roads ("Tributary One South Study Area"; see Figure 1).

In 2005, FMC and the Agencies agreed that FMC should proceed to implement investigative, monitoring and remedial programs under the AOC using an operable unit or "study area" approach, consistent with Section VI.3.d. of the AOC, and further agreed to nine study areas. The Tributary One South Study Area is one of these nine areas, and is the subject of the FMC *RCRA Facility Investigation Report Volume V* – *Tributary One and Flood Plain South of Pearson/Stone Roads* (RFI Report Volume V).

The Agencies, in consultation with the New York State Department of Health (NYSDOH), communicated their final approval of RFI Report Volume V by letter dated May 13, 2010 and their determination that a CMS is required to address the presence of FMC-related constituents in soil and/or sediment on properties within the Tributary One South Study Area that are subject to the CMS, as identified in RFI Report Volume V. FMC submitted a schedule for the draft CMS Work Plan for the Tributary One South Study Area by letter dated October 1, 2010. As indicated in the letter, FMC proposed to submit the CMS Work Plan subsequent to the Agencies' written notice that the *Draft CMS Report for the Suspected Air Deposition Area and Culvert 105 Study Areas* was accepted for the purposes of public notice and comment. The Agencies' email to FMC dated May 13, 2011 communicated that acceptance.

The CMS Work Plan describes proposed CMS activities to address the presence of potentially FMC-related constituents (predominantly arsenic) in soil and sediment within the Tributary One South Study Area. The CMS will develop and evaluate potential corrective measure alternatives (CMAs) including a "no further action" CMA. The CMAs will be developed and evaluated in a CMS Report with respect to site-specific corrective action objectives (CAOs) and compared based on the following seven evaluation criteria: 1) community/property owner acceptance; 2) technical performance, reliability, implementability and safety; 3) environmental beneficial and adverse impacts; 4) potential post-remediation human health risks; 5) institutional effects, including consideration of federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation and timing of each CMA; 6) total estimated capital and long-term operation and maintenance costs of each CMA; and 7) consistency with green remediation practices.



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FMC will prepare a CMS Report to present the evaluation results and recommend a CMA. Prior to completion and submittal of the draft CMS Report there will be interim CMS submittals, as explained in this work plan.

### 1.1 Corrective Action Objectives

By letter dated March 26, 2009, the Agencies, in consultation with NYSDOH, issued final CAOs applicable to off-Site study areas pertaining to soil and sediment. The letter, which includes and describes the community input in the development of the CAOs, and the enclosed CAOs are provided in Appendix A. In the March 26, 2009 letter, the Agencies specifically noted the following:

"... [T]he Agencies' CAOs are "goals" to be strived for during the CMS process, and should <u>not</u> be considered as rigid "pass/fail" criteria. Failure of a proposed CMA [corrective measures alternative] to completely satisfy all CAOs, may not necessarily disqualify it from selection as the final CMA, or one of the final CMAs. Such selection must be based on a number of factors which will be thoroughly evaluated during the CMS process." (Emphasis in original)

The following discussions of proposed CMS tasks cite the CAOs and include explanations of how the CAOs tie into the proposed CMS activities.

#### 1.2 CMS Tasks

Proposed CMS tasks for the Tributary One South Study Area, described in Section 3, are as follows:

- CMS Task 1: Community Participation
- CMS Task 2: Fate and Transport Evaluation
- CMS Task 3: Ecological Risk Assessment
- CMS Task 4: Human Health Risk Assessment
- CMS Task 5: Identification, Development, and Evaluation of CMAs
- CMS Task 6: Justification and FMC's Recommendation of a CMA
- CMS Task 7: CMS Report

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## 2. CMS Study Area Description

RCRA Facility Investigation Report – Volume I – Background and Related Information (RFI Report Volume I; September 2009) presents detailed information on all the RFI study areas, and includes descriptions of current and historical operations at the Facility, current and historical land use in the area, previous and ongoing environmental investigations, monitoring programs and remedial activities, the regional setting, and the results of Middleport area soil background studies. Below is a discussion of the CMS Tributary One South Study Area (CMS Study Area) boundaries, and past and current releases which have (or may have) resulted in Site-related impacts to this study area.

#### 2.1 CMS Study Area

The CMS Study Area includes approximately 4.5 miles of stream banks (combined length of both sides of the stream) and all or portions of 62 properties located along Tributary One and its flood plain, as described in RFI Report Volume V. It extends from Francis Street to the bridge that spans Stone Road just north of the intersection of Pearson and Stone Roads. Figure 1 shows the CMS Study Area boundaries (approximately 46 acres), as well as the extent of the Tributary One 100-year flood plain as identified on Federal Emergency Management Agency [FEMA] flood insurance rate maps dated September 17, 2010. The extent of the CMS Study Area was delineated based on the soil and sediment arsenic data distribution (based on the data collected between 1993 and 2005 that are presented in RFI Report Volume V), surface topography, stream and surface water drainage hydrology and historical land use. The CMS Study Area boundaries include the properties/areas shaded green on Figure 1, and that were identified in RFI Report Volume V and the Agencies' May 13, 2010 letter to FMC. Appendix B presents the Agencies' December 2009 Fact Sheet on the draft RFI Report Volume V and the Agencies' May 13, 2010 letter to FMC.

There are portions of 16 properties included in the CMS Study Area that have no analytical data due to one of the following property-specific reasons: 1) sampling was not proposed as part of the RFI (ten properties); 2) no samples were collected due to lack of access permission (two properties); or 3) only a portion of the proposed sampling on a property was completed due to limited access permission (four properties). The areas with no analytical data are shown with black hatch lines on Figure 1. These areas were included in the CMS Study Area based on the soil/sediment arsenic data distribution nearby, surface topography, stream and surface water drainage hydrology and historical land use, as described in RFI Report Volume V. Additional sampling and analysis in these areas may be conducted during the CMS or Corrective Measures Implementation pursuant to a process to be approved by the Agencies. FMC will conduct such sampling and analysis upon receipt of written access permission from the respective property owners.

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#### 2.2 Tributary One

Tributary One of Jeddo Creek is fed by the Middleport Reservoir (within the Town of Royalton) south of the Village of Middleport and runs northerly from the reservoir approximately 6.75 miles through the Town of Royalton, the Village of Middleport, the Town of Hartland, and into the Town of Ridgeway until its confluence with Jeddo Creek. For the purposes of FMC's RCRA corrective action program, Tributary One and its flood plain located downstream of the former FMC Facility discharge at Francis Street was divided into two study areas: 1) Tributary One South of Pearson/Stone Roads (which is the subject of RFI Report Volume V and this CMS Work Plan); and 2) Tributary One North of Pearson Road and East of Stone Road (which will be the subject of RFI Report Volume VI, which has not been completed). The section of Tributary One south of Francis Street (immediately upstream of the former FMC Facility outfall) has been studied to characterize upstream or background sediment conditions in the stream.

In the early 1990s, the NYSDEC reclassified Tributary One from a Class D intermittent flow stream to a Class C surface water, which is defined as follows by the NYSDEC Water Quality Regulation (6NYCRR Part 701):

The best usage of Class C waters is fishing. These waters shall be suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary recreation, although other factors may limit the use for these purposes.

Within the CMS Study Area, the width of Tributary One ranges from approximately 5 to 30 feet and its average depth is between 0.5 and 1 foot. The banks of Tributary One are highly variable, ranging from less than 1 foot in height in low lying areas to more than 10 feet in highly modified areas within the Village of Middleport. Parts of the stream bank have riprap or other protective devices in some of the areas located south of Sherman Street through which the tributary flows. The bottom characteristics of Tributary One vary and range from almost 100% bedrock to sediments with a substantial fraction of fine-grained material.

RFI Report Volume V Figure 2.3 (provided in Appendix C of this CMS Work Plan) identifies historical land uses for areas along Tributary One south of Pearson/Stone Roads. Historical businesses located adjacent to Tributary One included a coal storage yard and lumberyard, the Loud-Wendell, Inc. plant (manufacturer of saw blades), flour and paper mills, stave mill, and boat dry docks. In addition, many former orchards and agricultural fields have been historically cultivated adjacent to Tributary One, especially north of the Erie Canal, and or drained into Tributary One. In the late 1800s and early 1900s, several mill ponds existed as part of the stream at the following locations:

- Between Church Street and the Erie Canal
- South of Sherman Road
- Between Sherman Road and Chase Road
- Between Chase Road and North Hartland Road



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• Northeast of Chase Road

Some forested/shrub areas along Tributary One north of the Erie Canal support wetland habitats and serve as a flood control/plain for Tributary One. The National Wetlands Inventory identifies four wetland areas (approximately 5 acres total) located along Tributary One South. These areas include the former Mill Ponds located between Sherman and Chase Roads, between Chase Road and North Hartland Road, and northeast of Chase Road; and an area along Pearson Road, downstream of the Village of Middleport Wastewater Treatment Plant (WWTP).

FMC's present State Pollutant Discharge Elimination System (SPDES)-permitted Outfall (Outfall 001) discharges into Tributary One, at a location north of the Francis Street bridge and south of the railway lines, via a 30-inch corrugated metal pipe that runs from Outfall 001 (at the Facility's northwest boundary), along South Street and into Tributary One. The Outfall 001 discharge consists of treated water from the Facility's on-site water treatment plant (WTP) (surface water runoff from the northern portion of the Facility and groundwater), and untreated surface water runoff from the southern portion of the Facility. Stormwater from a portion of the Northwest Conrail Area (also referred to as the "Phase 2 Interim Corrective Measure (ICM) Area of the North Railroad Property") and stormwater runoff from the back yards of several abutting residential properties, which were remediated by FMC in 2003 as part of an ICM, both drain to a catch basin situated in the Phase 2 ICM area. The catch basin is downstream of FMC's SPDES Outfall 001 and connects to the pipe that conveys water from the FMC Facility to Tributary One.

Stormwater from village and town streets, residential properties, commercial and business properties, and existing and former farm fields and orchards currently discharges into Tributary One South at various locations. The Village of Middleport WWTP also discharges to Tributary One near Pearson Road. North of the Erie Canal, flow in Tributary One is supplemented with water discharged from the Canal during the summer and fall seasons (when the canal is full). Current Middleport businesses located adjacent to Tributary One include an antique store, an appliance store, and a battery recycler. Currently, there are agricultural fields, and wooded and residential properties that are situated along and drain to Tributary One. In addition, a mobile home park is situated along Tributary One on the south side of Sherman Road. RFI Report Volume V, Figure 2.4 (provided in Appendix C of this CMS Work Plan) identifies the current zoning for areas along Tributary One South. Prior to 1977, FMC's discharge point to Tributary One was located beneath the Francis Street Bridge. FMC and other industries, as well as the Village of Middleport WWTP, have historically discharged stormwater or wastewater to Tributary One.

Between 1976 and 1978, FMC completed improvements for the handling of process wastewater and surface water at the Facility. The upgrades included construction of a surface water collection and retention system, including the Western Surface Impoundment (WSI), and an on-site WTP to collect and treat surface water runoff from the northern portion of the Facility; decommissioning (by plugging with grout) the Facility's buried sewer pipe (Outfall 001) and installation along South Street of a new 30-inch buried sewer pipe approximately 100 feet north of the former sewer pipe; and discharge of treated water through the new pipe

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to Tributary One pursuant to the terms and conditions of the Facility's National Pollutant Discharge Elimination System (NPDES) permit, which later became a SPDES permit. Other upgrades and remediation activities related to FMC's past discharges to Tributary One are described in Section 2.5 of RFI Report Volume V.

Currently, stormwater in the northern portion of the Facility (south of the mainline railroad track, with the exception of the western portion of the Northwest Conrail Area (the Phase 2 ICM area)) is directed into a series of grassy and/or asphalt-lined swales, or into collection sumps/drains and eventually collected in the WSI or the untreated water storage tanks. The collected stormwater is then treated at the Facility's WTP and discharged to Tributary One in accordance with the Facility's SPDES permit. Stormwater runoff from the western portion of the Northwest Conrail Area drains to the catch basin described above. Stormwater runoff from the eastern portion of the Northwest Conrail Area (the Phase 1 ICM area) drains to an asphalt-lined swale and is collected in the WSI.

The reconstructed north drainage ditch on the North Railroad Property receives stormwater runoff from the remediated Phase 1 ICM Area of the North Railroad Property, the properties (i.e., Falls Road Railroad tracks, the Roy-Hart Central School District property, Alfred Street, farm fields and commercial, industrial and residential properties) abutting the northern and eastern boundaries of the North Railroad Property, and a farm field that abuts FMC's eastern fence line, and discharges into the Village of Middleport's Culvert 105 storm sewer. A new inlet to Culvert 105 was constructed in 2007 as part of the 2007 Early Actions performed on a parcel (referred to as the "Wooded Parcel") within the North Commercial/Industrial Area north of the North Railroad Property. Culvert 105 discharges to Tributary One at a location approximately 1.5 miles downstream of the Facility's discharge pipe, near the Village WWTP.

#### 2.3 Constituents of Concern

As indicated in RFI Report Volume V and the Agencies' December 2009 Fact Sheet (copy provided in Appendix B), soil, stream banks, and stream bed sediment in the CMS Study Area were evaluated for constituents that were historically manufactured, formulated, handled, and/or used at the Facility. The data set includes over 2,300 soil and sediment samples collected from approximately 540 locations. While lead and some chlorinated pesticides were detected in some of these samples, arsenic was the constituent most frequently detected above background levels in soil and sediment. As a result, arsenic defines the extent of potential Site-related impacts to soil and sediment in the CMS Study Area.

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## 3. CMS Tasks

#### 3.1 Task 1: Community Participation

One of the Agencies' CAOs specifically addresses community participation:

"Inform and engage affected property owners and local residents in meaningful participation throughout the cleanup process, including the CMS, the corrective measures, design, and implementation phases."

FMC has developed a project-specific public participation program in accordance with USEPA's 1996 RCRA Public Participation Manual. Goals of FMC's community participation program are as follows:

- **Provide Information** Balanced and objective information will be provided to assist the community and stakeholders in understanding the project scope of work, the problems, and the process for addressing the problems, and the alternatives and the solutions to the problems. Information will be provided to the public and stakeholders by fact sheets, newsletters, web sites, open houses, availability sessions, and/or meetings.
- **Obtain Feedback** Community and stakeholder feedback on the project scope of work, the problems, the process for addressing the problems, the alternatives and solutions to the problems will be obtained. Comments and feedback will be obtained by maintaining open communications; holding public comment periods, public information sessions, and/or public meetings; conducting surveys; community-wide mailings with return/reply comment cards and/or web-site discussion forums.
- Provide Opportunities for Involvement Opportunities will be provided to the community and stakeholders for involvement during the implementation of the project and not just at the end of the project. Opportunities will be provided by holding meetings, workshops, information sessions and/or public meetings. Surveys or other forms of outreach may also be used to solicit information regarding activities conducted by residents within the study area.

Project-related documents will be/are available in FMC's document repository located at the Middleport Free Library and at the NYSDEC's Region 9 office in Buffalo, and also will be/are available on the following websites:

- FMC's CMS website: <u>www.middleportny.com</u>
- Middleport Community Input Group (MCIG) website: <u>www.middleport-future.com</u>



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In addition, FMC's Community Liaison located at 15 Main Street in Middleport is available to discuss the CMS activities and/or answer questions. Paper copies of major reports are/will be available at this location for review by the public. A contact list for any project related questions is presented in Table 1. Project-specific public participation activities will include (as needed) meetings, fact sheets, progress newsletters, public information sessions, open houses, and one-on-one conversations, as summarized in Table 2.

#### 3.1.1 Anticipated Future Land Use

The Agencies' CAOs state that "[r]easonably anticipated future land uses will be identified in consultation with the community." As discussed in FMC's Draft CMS Report for the Suspected Air Deposition and Culvert 105 Study Areas (May 2011), FMC prepared a Draft Reasonably Anticipated Future Land Usages Map for the CMS Suspected Air Deposition and Culvert 105 Study Areas and Other Environmental Areas South of Pearson/Stone Roads (submitted by letter dated November 6, 2009) for review by the Agencies and the community. The November 2009 Draft Reasonably Anticipated Future Land Usages Map included properties within FMC's environmental study areas south of Pearson/Stone Roads (i.e., Suspected Air Deposition Areas, Culvert 105 and Flood Zone, Tributary One and Flood Plain South of Pearson/Stone Roads, FMC Plant Site, Former FMC Research and Development Property). FMC distributed the November 2009 Draft Map to, and held information sessions with, the Agencies, affected property owners, community members, and local officials from the Village of Middleport and the Towns of Hartland and Royalton (including the Village of Middleport Mayor, Town of Royalton Supervisor, and planning and zoning officials) to provide information and/or solicit input from stakeholders on the November 2009 Draft Reasonably Anticipated Future Land Usages Map developed by FMC. Comments from the Agencies and the community and FMC's responses to those comments were presented in FMC's Draft CMS Report for the Suspected Air Deposition and Culvert 105 Study Areas (May 2011).

FMC will prepare and include in the CMS Report a revised reasonably anticipated future land usages map that focuses on the Tributary One South Study Area, taking into account the comments received from the Agencies and the community. This map will be used to support the human health and ecological risk assessments, the development and evaluation of CMAs and the recommendation/selection of the CMA(s) for the CMS Study Area. Wetland and flood plain areas not currently developed will be assumed to remain undeveloped.

#### 3.2 Task 2: Fate and Transport Evaluation

As stated in the Agencies' CAOs, one of the objectives of corrective measures is to:

"Eliminate, reduce or control the potential for migration of FMC-related contaminants in soil and/or sediment, while balancing adverse ecological impacts that may result from any such measures themselves."

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To support the development and evaluation of CMAs relative to this CAO, a fate and transport evaluation will be completed. The COCs tend to adsorb to organic carbon matter within finer grained sediment and soil. The distribution of the finer grained sediment/soil and associated COCs is affected by physical characteristics of the Study Area. The physical features of the CMS Study Area vary considerably upstream to downstream (see RFI Volume V). These variations affect the distribution and fate and transport of COCs, which in turn affects the identification, evaluation, and implementation of remedial technologies. Examples of the physical features with notable variations within the CMS Study Area include: stream channel width, depth, velocity, and slope; bank soil type/material composition, stability, and height; sediment deposition and scour areas; flood plain characteristics including former locations and size of mill ponds and locations and extent of current wetlands. A combination of field data collection, modeling and data evaluation will be performed in order to develop CMAs and to evaluate fate and transport associated with any CMAs. A brief discussion of fate and transport evaluation activities is provided below:

- a. Flood Plain Modeling and Evaluation any remedial activities that are within or that may affect the FEMA 100-year flood plain will be subject to certain federal, state and local regulations and guidance. The extent of the 100-year flood plain, as identified on FEMA flood insurance rate maps dated September 17, 2010, is shown on Figure 1. To identify and assess the potential impacts of potential remedial activities on the flood plain, the United States Army Corps of Engineers (USACE) Hydrologic Engineering Center's River Analysis System (HEC-RAS) will be used for modeling the flood plain. Use of the HEC-RAS model for flood plain studies is encouraged on the NYSDEC's Flood Plain Development and Floodway Guidance website (http://www.dec.ny.gov/lands/24281.html). Field data (examples identified below) will be required to support and validate the HEC-RAS model for use in the development of the conceptual site model and the CMAs.
- b. Characterization of Geomorphology field identify, survey, and assess those geomorphic features of the CMS Study Area that affect sediment and COC distribution and movement, including sediment deposits, eroding channels, braided channels, culvert elevations/dimensions, and potential surface runoff areas (rills).
- c. Sediment/Streambed Bathymetry Data supplement previous sediment and bank profile data for use in the HEC-RAS model, noting potential conditions affecting deposition/scour, and noting changes in slope, channel shape or sediment distribution.
- d. Stream Bank Stability Evaluation identify potential bank erosion areas (using the Bank Erosion Hazard Index [BEHI] or other methods), obtain additional stream flow measurements, supplement observations regarding existing engineering bank controls (located south of the Erie Canal), and obtain physical characteristic data of soil/sediment (e.g., particle size distribution, Atterberg Limits, bank soil shear strength, etc.) to support the HEC-RAS model and the development and evaluation of CMAs.

The proposed field data collection activities to support the fate and transport evaluation (and the ecological risk assessment, see Section 3.3) will be detailed in a scope of work that will be submitted to the Agencies



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under separate cover for review and comment by the Agencies and the community in accordance with the schedule included in Section 5.

The fate and transport evaluation results, combined with the potential exposure pathways and receptors to be identified for the human health and ecological risk assessments, will be represented in the conceptual site model to be developed for the CMS Study Area, as described in the following section.

#### 3.2.1 Preliminary and Final Conceptual Site Models

A conceptual site model is a representation of the physical, chemical, and biological processes that determine the potential for exposure to soil/sediment COCs by receptors. The conceptual site model identifies the process and interactions that typically control the fate and transport of constituents of concern. As presented in the USEPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (December 2005):

"[f]or sediment sites, perhaps even more so than for other types of sites, the [conceptual site model] CSM can be an important element for evaluating risk and risk reduction approaches...Essential elements of a CSM generally include information about contaminant sources, transport pathways, exposure pathways, and receptors."

A preliminary conceptual site model based on existing data will be developed and evaluated as part of the development of the fate and transport and the human health and ecological risk assessments scopes of work (described in the following sections). The final conceptual site model will be presented to the Agencies in the CMS Report.

#### 3.3 Task 3: Ecological Risk Assessment

The Agencies' CAOs state that one of the goals of the corrective measures is to:

"... protect human health and the environment relative to FMC-related contamination."

An ecological risk assessment and a human health risk assessment (discussed in Section 3.4) will be used to develop CMAs and to evaluate the risk reduction achievable by different CMAs. As identified in Section 3.1.1, reasonably anticipated future land usages will be presented in the CMS Report and used to support the ecological and human health risk assessments.

Screening-level risk evaluations conducted initially as part of the RFI for Tributary One South will be supplemented, as needed, by additional site-specific data regarding the nature and magnitude of site-specific risks. For properties in the CMS Study Area, the degree to which different CMAs can reduce risks will be evaluated by considering background conditions, including historic uses and activities, and the overall net environmental benefit and/or impact for the remedy. Other criteria by which to evaluate CMAs,

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including technical considerations, institutional considerations, and community acceptance, are discussed in detail in Section 3.5.4.

As noted above, the Agencies' CAOs include protection of the environment relative to FMC-related constituents. The CAOs also include the following which address ecological impacts:

"Eliminate, reduce or control existing or potential adverse ecological impacts due to elevated concentrations of FMC-related contaminants in soil and/or sediments, while balancing the adverse ecological impacts that may result from the remediation activities themselves."

"Eliminate, reduce or control the potential for migration of FMC-related contaminants in soil and/or sediments, while balancing the adverse ecological impacts that may result from any such measures themselves."

To date, two ecological evaluations have been conducted relative to the Tributary One South Study Area. A screening-level ecological risk assessment (ERA) was presented in RFI Report Volume V and an ecological assessment was conducted by ICF Kaiser Engineers as part of the Off-Site Investigation (OSI) in 1992-1993. The screening-level ERA in RFI Report Volume V consisted of a simplistic comparison of COC concentrations in sediments, soil, and surface water to default ecological benchmarks, and identified exceedances of some screening criteria. Though these types of comparisons are useful for identifying the potential for risks, they have less utility for risk management decisions. This is largely because the screening criteria or benchmarks are generic and conservative predictors of potential toxicity and do not reflect site-specific conditions or impacts. As noted in RFI Report Volume V and applicable NYSDEC guidance, if screening criteria are exceeded, then "a site-specific evaluation procedure must be employed to quantify the level of risk, establish remediation goals, and to determine the appropriate risk management actions."

Site-specific data on toxicity and the biological community information provide more integrated and realistic measures of exposures and ecological effects, and therefore can provide a refined understanding of the degree to which site-related constituents are causing an impact in the natural community. The ecological assessment conducted in 1992-93 (which was performed in accordance with NYSDEC-approved work plans) provided a variety of site-specific data, including habitat and stream surveys, benthic macroinvertebrate community survey, and toxicity testing. Based on the results of the sediment chemistry, macroinvertebrate community survey, and sediment bioassays, FMC's OSI Report concluded that the benthic aquatic community of Tributary One was not significantly impacted by constituents in the sediments upstream of the Village of Middleport WWTP. As noted in RFI Report Volume V, these data were collected nearly two decades ago and may not represent current conditions.

The data collected to-date supports a screening-level evaluation, but is less useful for identifying and distinguishing among remedies. A key element of the community assessment portion of the ERA will be the comparison to reference site conditions. Although chemistry data from reference or background soils (and to

#### Draft – July 2011 CMS Work Plan Tributary One and Flood Plain South of Pearson/Stone Roads Study Area

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a more limited extent, sediments) are available to support the human health risk assessment (HHRA), the ERA will also require the collection of biological data (e.g., species diversity) for comparison to site conditions.

Accordingly, the CMS will include the collection of site-specific and reference area data to better assess the existence and magnitude of ecological impacts in the Tributary One South Study Area. The ecological risk assessment will follow the relevant components from Section 3.10 (Fish and Wildlife Resources Impact Analysis) of NYSDEC's *Technical Guidance for Site Investigation and Remediation* (DER-10, May 2010), as well as applicable federal guidance for the development and conduct of ecological risk assessments.

The details of the ecological assessment methodology (and the fate and transport evaluation) will be presented in a scope of work (see Section 4) under separate cover for review and comment by the Agencies and the community. The scope of work will include the following tasks:

- Identification of fish, benthic invertebrates, and wildlife resources within one-half mile of the CMS Study Area based on review of NYSDEC records and other sources, as well as field reconnaissance/survey;
- Development of a vegetation community cover-type map, including federal and state wetlands, and ecological communities within one-half mile of the CMS Study Area;
- Identification of an appropriate reference area to support the community assessment, consistent with agency guidance documents (e.g., USEPA 1994, USEPA 2002, NYSDEC 2010);
- Identification of constituents of ecological concern;
- Development of a site-specific conceptual site model that integrates potential fate and transport processes, exposure pathways, and ecological receptors relevant to the CMS Study Area;
- Identification of additional sampling needs to further characterize soil/sediment and/or assess acute and chronic effects; and
- Development of approaches to discern actual or potential adverse environmental impacts.

#### 3.4 Task 4: Human Health Risk Assessment

The human health risk assessment (HHRA) will be used for two purposes: to develop CMAs and to evaluate the risk reduction achievable by different CMAs on the basis of human health risks. Additional criteria that will be considered in the evaluation of CMAs are discussed in Section 3.5.4. The HHRA will also contribute to the conceptual site model by identifying potential human receptors and the potential exposure routes by which they could contact soils and sediments in the Study Area. The HHRA methodology will be detailed in

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a separate scope of work (see Section 4) under separate cover for review and comment by the Agencies and the community.

The HHRA of the Suspected Air Deposition and Culvert 105 Study Areas utilized regional and site-specific data to produce a risk assessment that reflects the exposures to soil and indoor dust for people residing in Middleport. Results of a biomonitoring study conducted among Middleport residents (Tsuji et al. 2005) contributed to the development of the Air Deposition Area conceptual site model. Site-specific soil data and house dust data reported for a city in the vicinity of Middleport provided the basis for determining exposure point concentrations. The community was surveyed regarding the nature and frequency of contact with soils in residential yards. This information, together with data from a regional office of the National Weather Service and EPA guidance, informed the selection of values for exposure frequency and duration. A site-specific study (Roberts et al. 2002) was used to identify values for the relative bioavailability of arsenic ingested in a soil matrix compared with the dosing regimen used in the toxicity study on which the cancer slope factor is based. Another site-specific study (Lowney et al. 2007) informed the evaluation of the soil dermal contact pathway. The inclusion of these regional and site-specific data contributed to a risk assessment relative to the Suspected Air Deposition and Culvert 105 Study Areas that met the CAOs and supported the evaluation of the CMAs identified in the CMS for those areas.

The HHRA of the Tributary One South Study Area will benefit from the same information resources and the insights learned from the previous HHRA. This understanding of fate and transport in the Study Area will inform the development of the human exposure pathways portion of the conceptual site model. The information used for the previous HHRA will be evaluated to determine its applicability to the Tributary One South Study Area. Based on the results of the previous HHRA, it is expected that exposure frequency will be an important parameter affecting the outcome of the HHRA for the Tributary One South Study Area. Community input will be solicited regarding how property owners within the Study Area use their properties and how local residents may come into contact with soils and sediments in the Study Area. Data and information from these various sources will be combined to produce a risk assessment that reflects the exposures to COCs in affected soil and sediment for people residing in, working in, or visiting the Tributary One South Study Area.

#### 3.5 Task 5: Identification, Development, and Evaluation of CMAs

#### 3.5.1 Overview

This task includes identification of viable technologies appropriate to the CMS Study Area land use types and physical characteristics (soil, stream banks, or stream bed sediment). The screened technologies will be used to develop CMAs. The CMAs will combine technologies and will take into account the difference in conditions within the various portions of the Study Area.



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3.5.2 Technologies Identification and Screening

As required by the AOC, FMC performed a preliminary evaluation of corrective measures technologies and identified potentially applicable technologies in 1991, prior to starting the RFI. The results of that evaluation are presented in a report entitled "Pre-Investigation Evaluation of Corrective Measures Technologies" (dated August 1991). Based on review of that report, the conclusions of the RFI (summarized herein in Section 2), and information presented in the May 2011 Draft CMS Report for the Suspected Air Deposition and Culvert 105 Study Areas, the following technologies have been identified for further screening and/or evaluation:

No Further Action involves no further remedial activities.

<u>Monitored Natural Recovery</u> uses known, ongoing, and naturally occurring processes to achieve protection of human health and the environment over time.

**Institutional Controls (non residential properties only)** are used to prevent or reduce the potential for human exposure to soil/sediment. Institutional controls include the use of deed restrictions (requires property owner consent), private property agreements/easements (requires property owner consent but not the participation of government authority), and/or environmental easements (requires property owner consent and participation of NYSDEC).

<u>Engineering Controls</u> involves the use of physical controls that may be used (for example) to limit contact (e.g., fence) or support remediation (e.g., measures to improve drainage).

**Bank Stabilization** includes engineered means to stabilize the bank and mitigate bank erosion and channel widening.

**<u>Capping</u>** involves placement of an engineered covering or cap material to physically isolate soil/sediment and prevent the transport of and/or exposure to COCs.

<u>Soil Tilling/Blending</u> involves the tilling or blending of soil to reduce the COC concentrations in soil and to recycle land/soil. Soil tilling/blending is an in-situ technology and is considered by FMC as a "green" technology per USEPA's and NYSDEC's green remediation concepts and strategies because it conserves two resources (soil/fill from off-Site borrow pits and space within off-Site commercial landfills).

**Removal and On-Site (CAMU) Disposal** includes the physical removal of soil/sediment containing COCs that exceed the selected cleanup goal and placement of that soil/sediment in a Corrective Action Management Unit (CAMU) at the FMC Facility. A CAMU is a defined as "an area within a facility that is used only for managing remediation wastes and for implementing corrective action or cleanup at the facility" (6NYCRR 370.2(b)(37) and 40 CFR 260.10). CAMUs and engineered on-Site consolidation areas have been selected by USEPA as part of a remedial or corrective action at numerous other sites across the country as well as by NYSDEC at sites in New York.



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**Removal and Off-Site Disposal/Reuse** includes the physical removal of soil/sediment containing COCs that exceed the selected cleanup goal and disposal of that soil/sediment in a permitted commercial off-Site landfill. Two off-Site disposal options will be evaluated: disposal at a permitted commercial landfill and beneficial reuse as cover material at a permitted commercial landfill. Two potential options for transporting the soil/sediment to the off-Site commercial landfill will also be evaluated: truck transportation and rail car transportation.

Table 3 presents these preliminary screened technologies and their potential applicability to soils, stream banks and stream bed sediment within the Study Area.

3.5.3 Corrective Measure Alternatives

CMAs will be identified and developed in the CMS Report using the above listed technologies. General types of CMAs to be developed in the CMS Report are preliminarily identified below. The specifics of each CMA (e.g., precise technology(ies) to be used and specific properties or portions of properties for which remediation is proposed) will be determined in the CMS, in accordance with the CAOs and AOC.

- No further action
- Remediation of soil/sediment arsenic concentrations for residential properties above a 20 mg/kg arsenic reference concentration, on both a point by point basis and an averaging basis
- Remediation based upon CMA that is selected by Agencies for the Suspected Air Deposition and Culvert 105 Study Areas
- One or more risk management CMAs developed on the basis of protection of human health and the environment

#### 3.5.4 CMA Evaluation Framework

The CMAs will be evaluated by FMC based on the ability to meet the project-specific CAOs issued by the Agencies using the evaluation criteria listed in Section 1. The factors considered for each of these evaluation criteria are described in the subsections below.

<u>Community/Property Owner Acceptance</u> - CMAs are to be evaluated based on the degree to which they are acceptable to the community and affected property owners. The community and affected property owners have previously requested that opportunities be provided for early involvement and input in FMC's RCRA environmental programs. Community participation is an ongoing process. Community members and affected property owners and other stakeholders will be provided opportunities to discuss and comment on the CMS and associated documents. Community acceptance will be evaluated throughout the CMS process



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and community concerns will be considered as the CMS process continues through selection and implementation of the corrective measures. Section 3.1 describes the community participation process.

**Technical** - The technical criterion involves evaluation of each CMA based on performance, reliability, implementability, and safety.

- The performance of the CMA is a function of its effectiveness and its useful life. Effectiveness is the ability of the CMA to reduce unacceptable risks (based on site-specific risk assessments). The useful life is the length of time over which the effectiveness can be maintained.
- Reliability is assessed based on the degree to which the technologies employed in the CMA have been
  demonstrated to be effective under site conditions and uncontrollable changes over time. Reliability also
  considers the frequency and complexity of any operation and maintenance which may be required to
  maintain effectiveness of the CMA.
- Implementability includes the relative ease of installation or construction (constructability) and the time required to achieve a given level of response (including the time required for implementation and the time it takes to actually obtain beneficial results). It also considers external factors which may affect implementation including the need for special permits, agreements, equipment and disposal availability.
- The safety evaluation examines potential safety risks to workers and community members during and after implementation of the CMA.

**Environmental** - The environmental criterion requires each CMA to be evaluated with respect to: 1) short-term adverse environmental impacts during construction; and 2) short-term and long-term beneficial and adverse impacts of the CMA on the environment, particularly in any environmentally sensitive areas.

<u>Human Health</u> - The human health criterion requires each CMA to be evaluated on the extent to which short- and long-term exposures to contaminants of concern are mitigated. The assessment includes an examination of how each CMA protects human health during corrective action implementation.

**Institutional** - The institutional criterion considers the effects of federal, state and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation and timing of each CMA.

<u>Green Remediation Practices</u> - The green remediation practices criterion requires each CMA to be evaluated for consistency with USEPA's and NYSDEC's Green Remediation concepts and strategies which consider the environmental consequences of remedial actions, including energy requirements, air emissions, material consumption, resource consumption, and waste generation.



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<u>Cost</u> - The cost criterion requires each CMA to be evaluated with respect to the capital, engineering, and any long-term costs (e.g., inspection, monitoring, and maintenance) associated with each CMA. The capital costs consist of two components: 1) direct cost expenditures for construction equipment, labor and materials to perform the remedial construction; and 2) indirect cost expenditures for engineering, financial, and other services that are not part of the actual construction but required to implement the corrective measure.

#### 3.6 Task 6: Justification and FMC's Recommendation of a CMA

In accordance with the AOC, the results of the evaluation of CMAs described in Section 3.5.4 will be used by FMC to justify and recommend the CMA or CMAs most appropriate for remediation of FMC-related constituents in soil and/or sediment on properties/areas within the CMS Study Area. Each CMA will be evaluated against the CAOs. Tradeoffs among community acceptance, health risks, environmental effects, and other pertinent factors will be highlighted. The Agencies will select the final CMA or CMAs for the CMS Study Area based on the CMS.

#### 3.7 Task 7: CMS Report

A Draft CMS Report presenting the results of all CMS Tasks, including FMC's recommended CMA or CMAs will be prepared by FMC for review and comment by the Agencies, NYSDOH, and the public/community. The Draft CMS Report will be subject to formal public comment and review prior to finalization.

## 4. Deliverables

As described in the prior sections, the following deliverables will be prepared by FMC for review and comment by the Agencies, NYSDOH, and the public/community.

- 1. Fate and Transport Evaluation Scope of Work and Ecological Risk Assessment Scope of Work
- 2. Human Health Risk Assessment Scope of Work
- 3. Draft CMS Report

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## 5. Project Schedule

The proposed project schedule for performance of the CMS is as follows:

Item	Anticipated Duration/ Target Dates
Agencies Approve CMS Work Plan	September 2011
Task 1: Community Participation	2011 - 2013
Tasks 2 and 3: FMC Submits Fate and Transport Scope of Work and Ecological Risk Assessment Scope of Work	October 2011
Task 4: FMC Submits Human Health Risk Assessment Scope of Work	November 2011
Tasks 2 to 4: FMC Performs Additional Field Work	Late 2011 through 2012
Tasks 5 to 7: FMC Submits Draft CMS Report	Mid-2013

A full sampling season is critical for the ecological community assessment to support the ERA. Therefore, this field work will be accomplished in the spring and summer of 2012. Some preliminary reconnaissance work may also be performed in the late summer and early fall of 2011 to assist in the preparation of the fate and transport and risk assessment scopes of work.

The project schedule is subject to revision during implementation of the project as appropriate.

#### Draft – July 2011 CMS Work Plan Tributary One and Flood Plain South of Pearson/Stone Roads Study Area

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## 6. References

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ARCADIS. 2010b. Corrective Measures Study Soil Tilling/Blending Pilot Study Report (March).

ARCADIS. 2010c. RCRA Facility Investigation Report – Volume V – Tributary One and Flood Plain South of Pearson/Stone Roads (June).

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USEPA. 2005. Contaminated Sediment Remediation Guidance for Hazardous Waste Sites. EPA-540-R-05-012. December.

USEPA. 2008. Green Remediation: Incorporating Sustainable Environmental Practices into Remediation of Contaminated Sites. EPA 542-R-08-002. April.

USEPA. 2009. Principles for Greener Clean-up. August.

USEPA. 2010. Clean & Green Policy – see http://www.epa.gov/region2/superfund/green\_remediation/policy.html

USEPA. 2010. Green Remediation Best Management Practices: Clean Fuel and Emission Technologies for Site Cleanup. EPA 542-F-10-008. August.

USEPA, NYSDEC and FMC Corporation. 1991. Administrative Order on Consent [Docket No. II RCRA-90-3008(h)-0209] entered into by FMC, NYSDEC and USEPA, effective July 2, 1991.

Tables

#### TABLE 1 PROJECT CONTACT LIST DRAFT – JULY 2011 CMS WORK PLAN TRIBUTARY ONE AND FLOOD PLAIN SOUTH OF PEARSON/STONE ROADS STUDY AREA FMC CORPORATION – MIDDLEPORT, NEW YORK

Organization	Contact	Phone Number	
FMC Corporation –	Andy Twarowski –	716 725 6214	
Middleport Facility	Plant Manager	710-730-0314	
	Robert Wojcik –	716 725 6201	
	Environmental Manager	710-735-0301	
FMC Neighborhood House	Alyssa Cruikshank –	716 725 0760	
(15 Main Street)	FMC Community Liaison	710-735-9709	
NYSDEC – Buffalo Office	Michael Hinton –	716-851-7220	
	Environmental Engineer		
NYSDEC – Albany Office	Matt Mortefolio –	518-402-9814	
	Environmental Engineer		
NYSDOH – Troy Office	Nathan Freeman –	518-402-7860	
	Public Health Specialist		
USEPA Region II –	Michael Infurna –	212-637-4177	
New York City Office	Project Coordinator		

#### TABLE 2 PROJECT-SPECIFIC PUBLIC PARTICIPATION ACTIVITIES DRAFT – JULY 2011 CMS WORK PLAN TRIBUTARY ONE AND FLOOD PLAIN SOUTH OF PEARSON/STONE ROADS STUDY AREA FMC CORPORATION – MIDDLEPORT, NEW YORK

Approximate Timing	Proposed Activities
Completion of CMS Work Plan	Notify local officials, FMC's Community Advisory Panel, the Middleport
	Community Input Group (MCIG), and CMS Study Area property owners
	after receipt of Agencies' approval of the CMS Work Plan
	Place CMS Work Plan in document repositories
	Meet with the MCIG to review the proposed CMS activities and/or hold
	information session(s)/workshop(s) on the work plan activities
During CMS implementation, after submittal of CMS	Provide updates (e.g., newsletters, fact sheets, visits to property owners,
documents, and after issuance of the Draft CMS	revised schedules) to project-specific stakeholders
Report, with FMC's recommendation of the CMA(s),	
for public review and comment	Place copies of project documents and Draft CMS Report in the
	document repositories and post on the aforementioned project websites
	Meet with project-specific stakeholders to review CMS activities and/or
	solicit comments/input and/or otherwise provide opportunities (e.g., public
	meetings, information sessions) for the project-specific stakeholders to
	discuss and comment on project documents and/or the Draft CMS Report
	Document public and project-specific stakeholders' comments and
	responses to comments

#### TABLE 3 PRELIMINARY LIST OF SCREENED TECHNOLOGIES DRAFT – JULY 2011 CMS WORK PLAN TRIBUTARY ONE AND FLOOD PLAIN SOUTH OF PEARSON/STONE ROADS STUDY AREA FMC CORPORATION – MIDDLEPORT, NEW YORK

Technology	Soil	Stream Banks	Stream Bed Sediment
No Action	✓	~	$\checkmark$
Monitored Natural Recovery			$\checkmark$
Institutional Controls	✓	✓	✓
Engineering Controls	✓	✓	$\checkmark$
Bank Stabilization		✓	
Capping	✓		✓
Tilling/Blending	✓		
Removal and On-Site (CAMU) Disposal	✓	✓	✓
Removal and Off-Site Disposal/Reuse	✓	✓	$\checkmark$

## Note:

1. Technologies are discussed in Section 3.5.2.

Figure



# Appendix A

Agencies' Corrective Action Objectives for Off-Site Soil and Sediment Corrective Measures Studies

# New York State Department of Environmental Conservation Division of Solid and Hazardous Materials Bureau of Hazardous Waste and Radiation Management, 9<sup>th</sup> Floor

625 Broadway, Albany, New York 12233-7258 **Phone:** (518) 402-8594 • **Fax:** (518) 402-9024 **Website:** <u>www.dec.ny.gov</u>

# Alexander B. Grannis Commissioner

### **CERTIFIED MAIL - RETURN RECEIPT REQUESTED**

March 26, 2009

Mr. Brian McGinnis FMC Corporation, Remediation Department 1735 Market Street Philadelphia, Pennsylvania 19103

Dear Mr. McGinnis:

Re: FMC Corporation, Middleport, NY EPA ID No. NYD002126845 AOC Docket No. II-RCRA-90-3008(h)-0209 Corrective Action Objectives (CAOs) for the Off-site Soil & Sediment Corrective Measure Studies (CMSs)

By letter dated August 1, 2008, the United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC), hereafter referred to as "the Agencies", in consultation with the New York State Department of Health (NYSDOH), provided FMC with a draft set of Corrective Action Objectives (CAOs) for a Corrective Measures Study (CMS) specific to Air Deposition Area 1. This draft set of CAOs was sent to FMC to initiate a consultation between FMC and the Agencies as required by Task VIII.B in Attachment II of the above referenced AOC. In response, FMC proposed an expanded draft set of CAOs intended for application to all off-site soil & sediment areas where a CMS would be required, not just Air Deposition Area 1. These expanded draft CAOs were discussed at a November 7, 2008 meeting between the Agencies and FMC. After this meeting, FMC and the Agencies exchanged a number of revised drafts of these CAOs, from which the Agencies developed a single draft version. By letters dated December 30, 2008 and January 6, 2009, the Agencies provided certain community stakeholder groups with this draft version of the CAOs for their review and comment. These groups included the Middleport Community Input Group (MCIG), the Village of Middleport Mayor and Trustees, the Town of Royalton Supervisor and Board members, the Town of Hartland Supervisor and Board members, and the Royalton-Hartland School Board President, Board members and Superintendent. In response to the Agencies' solicitation, the MCIG provided comments and a January 12, 2009 revised version of the draft CAOs to the Agencies by E-mail dated January 25, 2009. After review of the MCIG's revised draft CAOs, the Agencies provided this January 12 version to FMC by Email dated January 27, 2009. The Agencies also provided this version to the other community stakeholder groups mentioned above by E-mail dated January 29, 2009, and invited them to provide comments. FMC, in turn, provided some suggested revisions to the January 12 version of the draft CAOs to both the Agencies and the MCIG, which were discussed during the February 10, 2009 and March 9, 2009 MCIG meetings. As a result of these discussions, the MCIG provided the Agencies with revisions of their January 12 version of the Draft CAOs by E-mail dated March 12, 2009. Also, by E-mail dated February 26, 2009, the Agencies notified the

above community stakeholder groups that we were preparing to finalize the CAOs and once again invited them to provide comments. In response, the Village of Middleport and the Town of Royalton provided the Agencies with comments which the Agencies have considered in the development of the CAOs. A more comprehensive chronology of events associated with the consultation and public input process summarized above, is presented in this letter's Enclosure No. 1.

In consideration of the input received from FMC and the community stakeholder groups, the Agencies have developed a final set of CAOs which are presented in this letter's Enclosure No. 2. This final set of CAOs reflects substantial contributions from both FMC and local stakeholder groups. The Agencies appreciate the collaborative effort put forth by FMC and the community during the development of these CAOs, and consider that having objectives which are generally agreed upon by all involved parties (i.e., Agencies, Community Groups and FMC) provides for a positive first step in the CMS process.

It is the Agencies' determination that the CAOs in Enclosure No.2, shall be the Agencies' final CAOs for the soil and sediment CMSs that will or may be conducted for the following off-site areas, as delineated by the outcome of the RFI:

- Air Deposition Area 1;
- Air Deposition Area 2 (if necessary);
- Culvert 105 and associated flood zone;
- Tributary One and associated flood zone;
- · Jeddo Creek (downstream of Tributary One) and associated flood zone; and
- Johnson Creek (downstream of Jeddo Creek) and associated flood zone.

The Agencies' CAOs shall be used to guide our review of CMS Work Plans and Reports so as to insure that each CMS is as consistent as possible with these objectives. Each Corrective Measures Alternative (CMA) presented in a CMS will be evaluated by the Agencies on the basis of these CAOs and an appraisal made as to the degree to which each CMA satisfies the stated objectives. Also, the Agencies' CAOs will be used as guidance to help us select the final CMA, or CMAs, for each off-site area, in concert with FMC and community input.

It is important to note that the Agencies' CAOs are "goals" to be strived for during the CMS process, and should <u>not</u> be considered as rigid "pass/fail" criteria. Failure of a proposed CMA to completely satisfy all CAOs, may not necessarily disqualify it from selection as the final CMA, or one of the final CMAs. Such selection must be based on a number of factors which will be thoroughly evaluated during the CMS process. Furthermore, the Agencies are not necessarily opposed to modifying the CAOs in the future should circumstances change and sufficient justification is provided in support of such proposed modifications. However, if such proposals entail significant modification of the Agencies' CAOs, we would likely again conduct a consultation and public review process prior to adopting modified CAOs, so that all involved parties are able to provide input on the proposed modifications.

If you have questions concerning this letter or its enclosure, you may contact either Mr. Matt Mortefolio (NYSDEC) at (518) 402-8594 or Mr. Michael Infurna (USEPA) at (212) 637-4177.

Sincerely, Matt Mother, P.E.

Matt Mortefolio, P.E. NYSDEC Project Coordinator Bureau of Solid Waste & Corrective Action

Nott Mother For MIT.

Michael Infurna USEPA Project Coordinator Environmental Planning and Protection Division

#### Enclosures

cc: w/enc. - J. Maedl, Mayor, Village of Middleport

D. Seaman, Seaman, Jones, Hogan & Brooks (Village of Middleport)

R. Lang, Supervisor, Town of Royalton

W. Annable, Supervisor, Town of Hartford

P. Riegle, President, Royalton-Hartland Central School Board

P. Bona, Superintendent, Royalton-Hartland Central School District

W. Arnold, Chairperson, MCIG

D. Watts, New Jersey Institute (MCIG)

ecc: w/enc.- M. Hinton, DEC Region 9, Buffalo T. Girard, DOH, Troy

# ENCLOSURE NO. 1 Chronology Of FMC Corrective Action Objectives Development Process

1. August 1, 2008: (Letter) -	[Agencies to FMC] - Provides Draft CAOs to FMC for Air Deposition Area 1 CMS, and invites them to consult with the Agencies on the development of final CAOs.
2. August 25, 2008 (Letter) -	[FMC to Agencies] - FMC accepts Agencies offer to consult on the development of final CAOs and will provide tentative meeting dates.
3. October 16, 2008 (E-mail) -	[Agencies to FMC] - Requests FMC to provide meeting dates for CAO consultation.
4. October 31, 2008 (E-mail) -	[FMC to Agencies] - Provides FMC revised Draft CAOs for meeting discussions.
5. November 7, 2008 (Meeting) -	[Agencies/FMC Meeting] - Consultation meeting to discuss Draft CAOs. FMC and the Agencies agree to expand applicability of CAOs to all off-site areas subject to a CMS.
6. November 14, 2008 (E-mail) -	[FMC to Agencies] - Provides Agencies a revised version of the Draft CAOs for discussion purposes.
7. December 1, 2008 (E-mail) -	[Agencies to FMC] - Provides FMC another revised version of the Draft CAOs for discussion purposes.
8. December 12, 2008 (E-mail) -	[FMC to Agencies] - Provides Agencies another revised version of the Draft CAOs for discussion purposes.
9. December 30, 2008 (Letter) -	[Agencies to MCIG] - Agencies provide MCIG with revised Draft CAOs and invite MCIG to comment on them.
10. January 6, 2009 (Letters) -	[Agencies to Village, School & Towns] - Agencies provide Village of Middleport, Royalton-Hartland School, Town of Royalton and Town of Hartland with revised Draft CAOs and invite them to provide comments.
11. January 25, 2009 (E-mail) -	[MCIG to Agencies] - MCIG provides Agencies with comments on the Draft CAOs and January 12, 2009 MCIG revised version of the Draft CAOs.
12. January 27, 2009 (E-mail) -	[Agencies to FMC] - Agencies provide FMC with January 12, 2009 MCIG revised version of the Draft CAOs.
13. January 29, 2009 (E-mails) -	[Agencies to Village, School & Towns] - Agencies provide Village of Middleport, Royalton-Hartland School, Town of Royalton and Town of

Hartland with January 12, 2009 MCIG revised version of the Draft CAOs and again invite them to provide comments.

14. February 3, 2009 (E-mail) - [FMC to MCIG] - FMC expresses some concerns over the January 12, 2009 MCIG revised version of the Draft CAOs and requests to discuss these concerns with the MCIG.

15. February 3, 2009 (E-mail) - [Agencies to MCIG] - Agencies inform MCIG that we have no problems with the January 12, 2009 MCIG revised version of the Draft CAOs.

16. February 10, 2009 (Meeting) - [MCIG Meeting] - FMC, Agencies and MCIG discuss FMC proposed revisions to January 12, 2009 MCIG revised version of the Draft CAOs.

17. February 20, 2009 (E-mail) - [MCIG to Agencies] - MCIG informs Agencies that they do not have any revisions to their January 12, 2009 revised version of the Draft CAOs at this time.

 February 26, 2009 (E-mail) - [FMC to MCIG] - FMC provides MCIG with new suggested revisions to the January 12, 2009 MCIG revised version of the Draft CAOs for discussion purposes.

 19. February 26, 2009 (E-mails) - [Agencies to Village, School & Towns] - Agencies inform Village of Middleport, Royalton-Hartland School, Town of Royalton and Town of Hartland that we are nearing finalization of the Draft CAOs and again invite them to provide comments.

20. March 3, 2009 (E-mail) - [Agencies to MCIG] - Agencies inform MCIG that we have no problems with the January 12, 2009 MCIG revised version of the Draft CAOs or FMC's suggested revisions to them, and requests MCIG's opinion of FMC's proposed revisions.

21. March 3, 2009 (E-mail) - [MCIG to Agencies] - MCIG indicates that they will discuss FMC's proposed revisions to their January 12, 2009 revised version of the Draft CAOs at the March 9, 2009 MCIG meeting.

22. March 7, 2009 (E-mail) - [Town of Royalton to Agencies] - Town of Royalton provides comments in support of the January 12, 2009 MCIG revised version of the Draft CAOs.

23. March 9, 2009 (Meeting) - [MCIG Meeting] - FMC, Agencies and MCIG discuss FMC newly proposed revisions to January 12, 2009 MCIG revised version of the Draft CAOs.

24. March 12, 2009 (E-mail) - [MCIG to Agencies] - MCIG provides Agencies with some revisions of the MCIG revised version of the Draft CAOs that were discussed with FMC.

25. March 16, 2009 (E-mail) - [Village of Middleport to Agencies] - Village of Middleport provides the Agencies with their comments on the Draft CAOs (Hard Copy dated March 24, 2009).

# **ENCLOSURE NO. 2**

# Final FMC Corrective Action Objectives

#### AGENCIES' FINAL CORRECTIVE ACTION OBJECTIVES

FMC Corporation, Middleport, New York Facility Applicable to the off-Site study areas pertaining to soil and sediment (i.e., excluding the FMC plant site and the FMC-owned N. RR Property) March 26, 2009

- To protect human health and the environment relative to FMC-related contamination, in accordance with, and/or in consideration of, applicable, or relevant and appropriate laws, rules and guidance, using site-specific data and information, supported by multiple lines of evidence, including site-specific risk assessment, and based on current and reasonably anticipated future land use(s). Reasonably anticipated future land uses will be identified in consultation with the community.
  - A. Achieve unrestricted use (i.e., without the need for institutional or engineering controls) of current and reasonably anticipated future residential properties within these study areas.
  - B. Reduce and manage potential human health risks associated with FMC-related contaminants in soil and sediment, keeping in mind that risk is a function of contaminant concentration and routes, likelihood of exposure, and other factors, such that:
    - Excess human health carcinogenic risks are reduced such that the lifetime excess cancer risks fall within the range appropriate for residential communities (i.e., 10<sup>-4</sup> to 10<sup>-6</sup>);
    - Human health non-carcinogenic risks are reduced such that non-cancer risks do not exceed the level appropriate for residential communities (i.e., Hazard Index  $\leq$  1.0); and
    - The "point of departure", or starting point for corrective action risk-management decisions pertaining to arsenic in soil, is the site-specific residential background considering site-specific histories of use for current and reasonably anticipated future residential properties within these study areas.
  - C. With agreement by the property owner, and based on current and reasonably anticipated future non-residential use of a property, a combination of institutional and/or engineering control methods may be acceptable as corrective measures as long as they are determined to render adequate, long-term protection of human health and the environment.
  - D. Eliminate, reduce or control existing or potential adverse ecological impacts due to elevated concentrations of FMC-related contaminants in soil and/or sediments, while balancing adverse ecological impacts that may result from the remediation activities themselves.
  - E. Eliminate, reduce or control the potential for migration of FMC-related contaminants in soil and/or sediment, while balancing adverse ecological impacts that may result from any such measures themselves.
- 2. Minimize disturbance and disruption of the community so that the character of the neighborhoods can be maintained.

- 3. Inform and engage affected property owners and local residents in meaningful participation throughout the cleanup process, including the CMS, and corrective measures, design and implementation phases.
- 4. Consistent with the above objective, use best management practices of USEPA's Green Remediation concepts (i.e., clean diesel technology, waste minimization, resource conservation, reduction of greenhouse gas and other air emissions (e.g., by using alternative energy sources and/or fuel-efficient technology, minimizing truck trips, etc.), ecological and soil preservation) to reduce the demands placed on the environment ("footprint"). In keeping with the Green Remediation strategies site cleanup and reuse can mutually support one another by leveraging infrastructure needs, sharing data, minimizing demolition and earth-moving activities, re-using structures and demolition material, and combining other activities that support timely and cost-effective cleanup and reuse. Early consideration of green remediation opportunities offers the greatest flexibility and likelihood for related practices to be incorporated throughout a project life.

## Appendix B

Agencies' December 2009 Fact Sheet for FMC Middleport, NY Facility Environmental Investigation Report – Tributary One & Flood Zone Surface Water, Soil & Sediment

Agencies' May 13, 2010 Letter to FMC Communicating Final Approval of RFI Report Volume V and Requiring a CMS







# FMC - MIDDLEPORT, NEW YORK FACILITY ENVIRONMENTAL INVESTIGATION REPORT TRIBUTARY ONE & FLOOD ZONE SURFACE WATER, SOIL & SEDIMENT

GOVERNMENTAL AGENCIES' FACT SHEET DECEMBER 2009

## **Introduction:**

The United States Environmental Protection Agency (USEPA), the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) would like to provide you with the findings of FMC environmental investigations. This fact sheet is intended to provide a summary of environmental information contained in an FMC Draft Report on the results of surface water, soil and sediment sampling within a portion of the natural stream known as Tributary One and along its flood zone. This fact sheet also describes how the public can review and provide comments on this report.

## **Background:**

Past pesticide production operations at the FMC Middleport facility have resulted in releases of chemicals which have impacted surface water, soil and sediment in off-site areas. These chemical releases occurred as a result of air emissions and discharges from production processes, as well as surface water run-off from on-site waste disposal areas. In 1991, FMC signed an Administrative Order on Consent (AOC) with the USEPA and NYSDEC under the Resource Conservation and Recovery Act (RCRA) to perform a comprehensive environmental investigation of past chemical releases from the site. This AOC requires FMC to conduct a RCRA Facility Investigation (RFI) to determine the nature of the chemicals released and the extent of their impact on surface water, soil and sediment. FMC has now completed the RFI pertaining to surface water, soil and sediment chemical contamination along a portion of surface water, soil and sediment sampling and chemical analyses along the Tributary One flood zone from Francis Street in Middleport, north to Pearson and Stone Roads. Additional details on the findings and contents of Draft RFI Report Volume V are summarized below.

## Draft RFI Report Volume V – Tributary One (south of Pearson & Stone Roads):

Draft RFI Report Volume V provides information on the nature and extent of FMC related chemical contamination of surface water and sediment within Tributary One and in soil on offsite properties along the Tributary One flood zone, south of Pearson & Stone Roads. The contamination is considered to have been caused by the outflow of past FMC Plant pesticide production waste through a former culvert pipe which discharged to Tributary One near Francis Street. As indicated in Volume V, over 2300 soil & sediment samples were collected for analysis from just over 540 locations along Tributary One south of Pearson & Stone Roads. These samples were analyzed for chemical constituents associated with past discharges from the FMC facility. Results indicate detections of arsenic, lead and chlorinated pesticides in some of these soil / sediment samples. Arsenic was found to be the predominant chemical constituent in soil and sediment, both in terms of its magnitude (concentrations) and in the number of locations where elevated concentrations were identified. As a result, arsenic was selected as the chemical constituent to be used to define the extent of FMC related soil / sediment contamination.

Since arsenic is a naturally occurring element and may also originate from man-made activities other than those related to the FMC facility, FMC conducted a soil sampling program in 2003 to estimate regional arsenic concentrations in soil not affected by FMC facility releases. Approximately 100 soil samples were collected from properties with a variety of land usage histories in the Gasport, New York area, and analyzed for arsenic. Based on the results of these analyses, the aforementioned governmental agencies selected an arsenic concentration of 20 parts per million (ppm) to conservatively represent the upper bound of the non-FMC related arsenic concentrations in soil / sediment. This arsenic background concentration of 20 ppm was used along Tributary One south of Pearson & Stone Roads, in conjunction with flood zone topography, to help determine the extent of FMC related contaminants in soil and sediment on impacted properties/areas which will require evaluation in an FMC Corrective Measures Study (CMS). The attached **FMC Figure 9.1** approximately depicts the properties/areas along Tributary One south of Pearson & Stone Roads which will be included in the FMC CMS.

In addition, Volume V contains a comparison of some soil data from ecologically sensitive areas along the Tributary One flood zone to NYSDEC criteria for the protection of ecological resources, as listed in Subpart 375, Table 375-6.8(b) of the State regulations. Sediment data from within the tributary and along its banks downstream of FMC's former Francis Street discharge is compared in Volume V to criteria for protection of freshwater aquatic environments presented in NYSDEC Technical Guidance for Screening of Contaminated Sediments, as well as to site-specific background sediment data from upstream samples. These comparisons help evaluate potential impacts from FMC related chemical contaminants on local wildlife in ecological areas and aquatic life within the stream. Soil and sediment data from a number of sample locations along the tributary indicate exceedences of these criteria for arsenic, lead and some chlorinated pesticides.

Also, surface water within the tributary was sampled at 5 locations downstream of Francis Street with results presented in Volume V showing chemical concentrations mainly consistent with upstream sampling results and meeting NYSDEC Class C Surface Water Quality Standards. However, contaminants in soil and sediment remain susceptible to migration via surface water flow along the tributary.

## **<u>Public Involvement</u>**:

The aforementioned governmental agencies have reviewed FMC's Draft RFI Report Volume V, and have made a **preliminary** determination that FMC has adequately completed RFI environmental investigations regarding surface water, soil and sediment contamination along the Tributary One flood zone south of Pearson and Stone Roads, and as such we intend to approve this portion of FMC's RFI Report. However, before we take final action, the governmental agencies would like to provide the public with an opportunity to review and comment on this RFI Report volume. Details on how to review and comment on these documents is presented below:

## **Document Availability:**

FMC Draft RFI Report Volume V is available for public review through the NYSDEC web site at <u>http://www.dec.ny.gov/chemical/54220.html</u> or more directly through the Middleport Community Involvement Group's (MCIG's) web site at <u>www.middleport-future.com/rfi</u>. Also, hard copies of Volume V and other FMC environmental documents, are available for public review at the FMC Document Repository located at:

Middleport Village Library 9 Vernon Street Middleport, New York

## **<u>Public Input Opportunities</u>:**

The governmental agencies will be holding public sessions on FMC Draft RFI Report Volume V at:

Place:	<u>Middleport Fire Hall</u>
	28 Main Street, Middleport, New York
Date:	Wednesday, January 13, 2010
	(Alternate Bad Weather Date: January 20, 2010)
Times:	2:00 pm to 4:00 pm and 6:30 pm to 8:30 pm

The afternoon session will be informal, where members of the public can ask questions of staff from the governmental agencies and/or of FMC personnel and its consultants, on a one-on-one basis regarding the content of the Draft RFI Report Volume V or other FMC environmental matters. The evening session will begin with brief presentations by FMC and the governmental agencies and then will be opened to members of the public to make verbal comments on the record. Afterwards, agencies' staff will remain available for a specific period of time to informally respond to questions from the public. Also, written comments can be provided to the governmental agencies during both the afternoon and evening sessions.

In addition to these sessions, the governmental agencies will be accepting written comments from the public during a minimum 45 day period which begins on <u>December</u> <u>30, 2009 and runs through February 15, 2010</u>. Written comments should be submitted to:

Mr. Matt Mortefolio, P.E. NYSDEC Project Manager 625 Broadway Albany, New York 12233-7258

## Next Steps:

Upon completion of the written comment period (after February 15, 2010), the governmental agencies will review all written comments as well as those recorded during the public session. Based on our review of these comments, we will either approve, disapprove or require FMC to modify RFI Report Volume V. The governmental agencies will also prepare a Responsiveness Summary which will provide our responses to the public's comments. This Responsiveness Summary will be made available to the public through the previously mentioned web sites, and a hard copy will be placed in the above mentioned FMC Document Repository. Those providing comments and a mailing address to the governmental agencies, will receive written notification of our final determination on FMC RFI Report Volume V, and of the availability of the Responsiveness Summary.

For those properties/areas along the Tributary One flood zone south of Pearson and Stone Roads that are determined by the RFI to have soil / sediment impacted by past FMC releases, FMC will be required to conduct a CMS to determine what, if any, corrective measures will be necessary to rectify soil / sediment contamination. This CMS process will be conducted in a manner to allow substantial public involvement prior to any final decisions by the governmental agencies regarding corrective measures.

#### **Governmental Agency Contacts:**

If you have any questions on topics in this Fact Sheet, you may call the Agency contacts listed below:

 Michael Infurna, USEPA
 (212) 637-4177

 Matt Mortefolio, NYSDEC
 (518) 402-8594

 Michael Hinton, NYSDEC
 (716) 851-7220

 Nathan Freeman, NYSDOH
 1 (800) 458-1158, Ext. 2-7860

## New York State Department of Environmental Conservation Division of Solid & Hazardous Materials

Bureau of Hazardous Waste & Radiation Management 625 Broadway, 9<sup>th</sup> Floor, Albany, New York 12233-7258 Phone: (518) 402-8594 • Fax: (518) 402-9024 Website: www.dec.ny.gov



Alexander B. Grannis Commissioner

## CERTIFIED MAIL - RETURN RECEIPT REQUESTED

May 13, 2010

Mr. Brian McGinnis FMC Corporation, Remediation Department 1735 Market Street Philadelphia, Pennsylvania 19103

Dear Mr. McGinnis:

Re:

FMC Corporation, Middleport, NY EPA ID No. NYD002126845 AOC Docket No. II-RCRA-90-3008(h)-0209 FMC's Draft RCRA Facility Investigation (RFI) Report Volume V – Tributary One and Flood Plan South of Pearson/Stone Roads

The United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC), hereafter referred to as "the Agencies", in consultation with the New York State Department of Health (NYSDOH), have completed our review of the above referenced Volume V of FMC's Draft RFI Report (Volume V submitted by FMC letter dated December 9, 2009). As FMC is aware, this volume contains analytical results from off-site sampling and other information used to define the extent of FMC-related soil and sediment contamination within the Tributary One flood zone south of Pearson/Stone Roads. The Agencies, and NYSDOH, have also completed review of the public comments on this FMC Draft RFI Report volume that were received during the December 30, 2009 through February 15, 2010 comment period. As a result of these comments, the Agencies have prepared a written Responsiveness Summary which provides the Agencies' and NYSDOH's response to written comments from the public received during the comment period. It should be noted that although a January 13, 2010 public meeting was held to solicit verbal comments from the public and a transcript was made of this event, no member of the public came forward with comments. Be advised that the Agencies and NYSDOH intend to make this Responsiveness Summary available to the public by placing a hard copy in the FMC document repository (i.e., Middleport Public Library) and by providing an electronic version to the Middleport Community Input Group (MCIG) for posting on their web site at their discretion. A copy of this Responsiveness Summary is enclosed.

Based on our review of the referenced Draft RFI Report Volume V and careful consideration of the public comments which we received, the Agencies have determined that RFI Report Volume V is generally acceptable for approval. Therefore, the Agencies are hereby granting <u>final</u> approval of RFI Report Volume V, in accordance with Item 1.b in Section VI of the above referenced AOC.

The Agencies would like to make clear that this approval of RFI Report Volume V does <u>not</u> represent any agreement on the part of the Agencies that RFI activities beyond the limits of the areas depicted in RFI Report Volumes II, IV & V and with respect to groundwater in all areas, are complete at this time. As FMC is



aware, these other areas and groundwater are undergoing RFI's on separate tracks and will be addressed in future volumes of FMC's RFI Report. Also, this approval in no way diminishes or restricts the Agencies' right under Section VII of the above referenced AOC to require that FMC conduct additional investigative work in the future, within or beyond the study areas defined in RFI Report Volume V, if determined necessary to protect human health and/or the environment.

Based on our review of the data and other information contained in FMC RFI Report Volume V, the Agencies have hereby determined in accordance with Item 2 in Section VI of the above referenced AOC, that a Corrective Measures Study (CMS) is necessary to address FMC related soil and/or sediment contamination on the properties/areas indicated below, and that FMC must perform such a CMS in accordance with the requirements in Attachment II of the above referenced AOC.

- The properties/areas shaded in green on Figures 9.1 through 9.6 and with respect to the sediment/soils located within the sections of Tributary One running through these green shaded properties/areas.

As a result of the above determination, the Agencies have hereby established a schedule for FMC to submit a CMS Work Plan for the above properties/areas by the FMC proposed date of October 15, 2010, as stipulated by Item 2 in Section VI of the above referenced AOC. The Agencies will establish a schedule for submission of the CMS Report and Tasks in accordance with Item 2 in Section VI of the above referenced AOC in conjunction with our approval of the FMC CMS Work Plan.

If you have questions concerning this letter, you may contact either Mr. Matt Mortefolio (NYSDEC) at (518) 402-8594 or Mr. Michael Infurna (USEPA) at (212) 637-4177.

Sincerely, Mathin PE,

Matt Mortefolio, P.E. NYSDEC Project Coordinator Bureau of Solid Waste & Corrective Action

*For MIT.* Michael Infurna USEPA Project Coordinator Environmental Planning and Protection Division

Enclosure

cc: w/enc. - D. Watts, MCIG Technical Advisor W. Arnold, MCIG Chairperson D. Seaman, Seaman, Jones, Hogan & Brooks

ecc: w/enc. -

M. Hinton, NYSDEC Region 9 Buffalo N. Freeman, NYSDOH

# Appendix C

Figures from RFI Report Volume V

- Figure 2.3 Historical Land Uses and Mill Ponds
- Figure 2.4 Current Zoning





