

**CORRECTIVE MEASURES STUDY
SUSPECTED AIR DEPOSITION AND
CULVERT 105 STUDY AREAS**

FMC Corporation, Middleport, NY



June 14, 2011 Public Meeting

**Draft Corrective Measures Study (CMS) Report
Suspected Air Deposition and
Culvert 105 Study Areas**

Dated: May 2011 Draft

Prepared by : FMC Corporation



Outline of Today's Discussion

- Corrective Measures Study (CMS) Overview
- Description of Study Areas
- Description of Corrective Measures Alternatives (CMAs)
- Evaluation Criteria
- Comparison of the CMAs
- FMC's CMA Recommendation



Overview

Corrective Measures Study (CMS)

- CMS Purpose
- May 2011 Draft CMS Report
- Public Comments Requested
- Agencies to select final Corrective Measures Alternatives



SUSPECTED AIR DEPOSITION CMS AREA

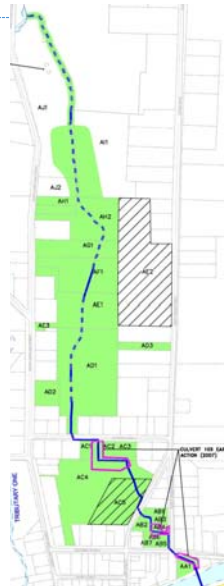
- = Culvert 105 buried pipe
- = Areas remediated by FMC
- = Areas included in CMS
- = Properties with "no further action" letter
- = Properties not sampled but included in CMS

← 1/4 mile →



CULVERT 105 CMS AREA

- - - = Culvert 105 open ditch
- = Culvert 105 buried pipe
- = Areas remediated by FMC
- = Areas included in CMS
- = Properties with "no further action" letter
- = Properties not sampled but included in CMS
- = Property AE2



Description of Corrective Measures Alternatives (CMAs)

CMA	Post-Remediation Soil Arsenic Goals	
	Property Use	Average / Maximum
1	No Further Action	
2	--	-- / 20 ppm
3	Residential Public, Institutional Agricultural, Commercial, Industrial, Railroad, Utility	20 ppm / 40 ppm 30 ppm / 60 ppm 40 ppm / 80 ppm
4	--	30 ppm / 60 ppm
5	--	40 ppm / 80 ppm
6A/6B	Residential, Public, Institutional Agricultural, Commercial Industrial, Railroad, Utility	20 ppm / 35 ppm 30 ppm / 50 ppm 40 ppm / 80 ppm
7A/7B	Residential, Public, Institutional Agricultural, Commercial Industrial, Railroad, Utility	20 ppm / 30 ppm 30 ppm / 50 ppm 40 ppm / 80 ppm
8	--	20 ppm / 30 ppm

Description of Corrective Measures Alternatives (CMAs)

CMA	Non-ICM Area of Roy-Hart School Property
1	No Further Action
2	Remedial Goal: 20 ppm (max)
3	Institutional Controls
4	No Further Action
5	No Further Action
6A	Institutional Controls
6B	Remedial Goal: 20 ppm (ave) / 35 ppm (max)
7A	Institutional Controls
7B	Remedial Goal: 20 ppm (ave) / 30 ppm (max)
8	Remedial Goal: 20 ppm (ave) / 30 ppm (max)

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Corrective Measures Alternatives Common Elements

- No further action previously remediated properties
- Pre-design and design activities
- Soil excavation with some soil tilling/blending
- CMAs 3, 6A/B and 7A/B include institutional controls on non-residential properties
- Tree preservation, if possible

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Corrective Measures Alternatives Common Elements

- CMAs 2-7 include institutional controls for unremediated sections of Culvert 105 buried pipe
 - CMA 8 – no institutional controls along Culvert 105 buried pipe
- Property restoration
- Disposal of soil and debris at
 - Commercial Landfill
 - or
 - FMC Plant in a Corrective Action Management Unit (CAMU) with a total height of 28 feet

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PROPOSED CAMU LOCATION



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Description of Corrective Measures Alternatives (CMAs)

CMA	No. of Properties	Volume of Soil	Culvert 105 Pipe to be Replaced	Construction Duration
1	0	0	0	0
2	181	228,000 cy	1,325 feet	10 years
3	152	69,000 cy	1,185 feet	5 years
4	86	38,000 cy	900 feet	3 years
5	48	28,000 cy	900 feet	2 years
6A	157	85,000 cy	1,185 feet	6 years
6B	158	98,000 cy	1,185 feet	6 years
7A	164	101,000 cy	1,185 feet	7 years
7B	165	119,000 cy	1,185 feet	7 years
8	179	162,000 cy	3,025 feet	8 years

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Description of Corrective Measures Alternatives (CMAs)

CMA	No. of Properties	No. of Properties Requiring Institutional Controls	Remediated Properties Average Arsenic	Total Estimated Cost	
				CAMU	Commercial Landfill
1	0	0	NA	\$0.4 M	
2	181	11	7 ppm	\$58.0 M	\$68.7 M
3	152	25	16 ppm	\$23.6 M	\$27.4 M
4	86	14	21 ppm	\$13.3 M	\$15.3 M
5	48	14	22 ppm	\$9.8 M	\$11.3 M
6A	157	22	14 ppm	\$26.7 M	\$31.3 M
6B	158	21	14 ppm	\$29.9 M	\$35.2 M
7A	164	22	12 ppm	\$30.2 M	\$35.7 M
7B	165	21	12 ppm	\$34.5 M	\$40.9 M
8	179	0	11 ppm	\$42.9 M	\$50.9 M

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CMA Evaluation Criteria

- Community/Property Owner Acceptance
- Technical (effectiveness, performance, reliability, implementability and safety)
- Environmental (short- and long-term)
- Human Health (short- and long-term)
- Institutional
- Cost
- Green Remediation Practices



Comparison of Corrective Measures Alternatives (CMAs)

Evaluation Criteria	Alternatives										
	1	2	3	4	5	6A	6B	7A	7B	8	
Community/Property Owner Acceptance	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Technical	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Public and Worker Safety	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Environmental	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Human Health	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Institutional	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Green Remediation Practices	CAMU	☺	☺	☺	☺	☺	☺	☺	☺	☺	
	Landfill	☺	☺	☺	☺	☺	☺	☺	☺	☺	
Total Estimated Cost	CAMU	\$0.4 M	\$58.0 M	\$23.6 M	\$13.3 M	\$9.8 M	\$26.7 M	\$29.9 M	\$30.2 M	\$34.5 M	\$42.9 M
	Landfill		\$68.7 M	\$27.4 M	\$15.3 M	\$11.3 M	\$31.3 M	\$35.2 M	\$35.7 M	\$40.9 M	\$50.9 M

☺ = favorable ☺ = moderate ☺ = not favorable



FMC Recommends CMA 3

- Soil removal, with soil tilling/mixing
- Post-remediation soil arsenic cleanup goals
 - Residential (20 ppm Ave/40 ppm Max)
 - Public/Institutional (30 ppm Ave/60 ppm Max)
 - Agricultural, Commercial, Industrial, Railroad, Utility (40 ppm Ave/80 ppm Max)
- Roy-Hart School property: no further soil remediation
- Institutional Controls



FMC Recommends CMA 3

- No further action for remediated properties
- Soil/Debris disposal in a CAMU at the Plant
- Pre-design and design activities
- Tree preservation, if possible
- Property restoration

