

Republic Engineered Products, Inc. Corrective Measure Proposal

SWMU 3	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	CM5
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or ACC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of relense is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposite-pathways from surface soils to industrial and construction workers as necessary to ficialities reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the . RFI. Republic will modify their existing Safety Management System (SMS) documents and alto permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hearded associated with raw materials and final products at the Site, which are similar to the potential hearants associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacouplable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to facilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFL. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the heards associated with raw materiale and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated tisk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to enting, drinking, or smoking and, vearing appropriate personal protective equipment (FPE).	The CM will be utilized to eliminate potentially complete exposure pathways: therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment end/or disposal facilities.
Threshold Criteria					
Protection of Human Health and the Environment	No, the CM does not most this criteria	Yes, the CM meets this criteria for potential exposure to surface soils when combined with CM3.	Yes, the CM meets this criteria for potential exposure to subsurface soils when combined with CM2.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:	I		۰.	······	
Carcinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area ealculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Cercinogonic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-caroinogenic H1 below 1.0.	The CM diministes the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- earcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-earcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby siding to reduce the Target Area non- enreimogenic HI below 1.0.
Blood Lend Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe, As, M) contributing to the Target Area Risk Based Factors.	Sing aggregate may contain residual levels of various metals from the steel production process, The metals in the sing are immediate as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	Slag aggregate may contain residual levels of various motals from the steel production process. The metals in the slag are inuroble as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	Slug aggregate may contain residual levels of various motals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media,	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

SWMU 3			Corrective Measure Options		
	CM1	CM2	СМЗ	CM4	CM5
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Can	Surface Excavation
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Afternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will effectively reduce the calculated risk by reducing the exposure to surface soils.	The CM will effectively reduce the calculated risk by reducing the exposure to subsurface soils.	The CM will effectively reduce the calculated risk; except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation	Reliable with proper implementation, risk of failure associated with improper implementation	Unrealistic operation and maintenance requirements, the ongoing activity and heavy equipment traffic in the area would continuously damage the soil cap, exeavations required to extraot the sing for beneficial reuse will contribute to a bit it with of future.	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby roduce the toxicity, mobility and volume of the COPIs.
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term affectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the dovelopment and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk te construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan,
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor eliterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no purnits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve boneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals, no specialized technology requirements.
Cost	I				1
Cost of Implementation	\$0	\$0	20	\$1,170,000	\$12,163,000
Estimated Future Costs	\$0	\$0	\$0	\$222,000	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifieble administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fees; and the availability of backfill materials.
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM3;	Meets the threshold oriteria; Ramoves the source from the Site
Key Disadyantages					
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impneted materials; Difficult to implement and impossible to maintain; High cost to reward ratio.	Existing Site conditions would make the CM difficult to implement in some locations High cost
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation in combination with CM3; recommended.	Retained for further evaluation in combination with CM2; recommended.	Retained for further evaluation in combination with CM3; not recommended for this area due to ongoing slag processing in this area.	Dismissed, the slag material is considered a valuable commodily and is processed under OEPA regulations.

DOCUMENT

ARCHIVE

◄

EР

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

SWMU 9	Corrective Measure Options					
	CM1	CM2	СМЗ			
Target Area 2	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface			
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site normit requirements to	The CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to facilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to			
· · · · · · · · · · · · · · · · · · ·	This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the bazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs, including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, vearing appropriate personal protective equipment (PPE).			
Threshold Criteria		<u> </u>				
Protection of Human Health and the Environment	No, the CM does not meet this criterin	Yes, the CM meets this criteria for potential exposure to surface soils when combined with CM3.	Yes, the CM meets this criteria for potential exposure to subsurface soils when combined with CM2.			
Attainment of Media Cleanup Objectives:			1			
Carcinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below $1x10^{-4}$	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}			
Non-Carcinogenic Health Index (HI) below 1.0	Criterion is not applicable because the calculated index was below 1.0	Criterion is not applicable because the calculated index was below 1.0	Criterion is not applicable because the calculated index was below 1.0			
Blood Lead Level (BLL) below 10 µg/dL	The CM does not reduce the BLL. No evidence of a release to the environment was found during inspection of the SWMU. The BLL in excess of the Site screening criteria is associated with the SWMU's assigned Target Area (TA 2)	Not applicable to this SWMU; however in general, the CM alters the assumptions utilized in the risk assessment portion of the RFI to reduce the BLL for the Target Area below 10 μ g/dL.	Not applicable to this SWMU; however in general, the CM alters the assumptions utilized in the risk assessment portion of the RFI to reduce the BLL for the Target Area below 10 µg/dL.			
Source Control	The CM would not control the source of COPIs (i.e. Pb) contributing to the Target Area Risk Based Factors.	No evidence of a release to the environment was found during inspection of the SWMU; therefore Source Control is not applicable.	No evidence of a release to the environment was found during inspection of the SWMU; therefore Source Control is not applicable.			
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media	Criterion is not applicable because the CM would not involve removal of contaminated media	Criterion is not applicable because the CM would not involve removal of contaminated media			
1	1					

P:\2002\221-613 - Republic, Canton\Statement of Basis\Table 3 Corrective Measure Options Overview.xlsx

Page 4 of 70 Revision 1 May 2010

SWMU 9		Corrective Measure Options	
	CM1	CM2	CM3
Target Area 2	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface
Balancing Criteria			
ong Term Reliability and Effectiveness			
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will reduce the exposure to surface soils.	The CM will reduce the exposure to subsurface soils.
Reliability and Risk of Failure	Inclicative and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation
Projected Useful Life of the Alternative	None	Indefinițe	indefinite
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the potential COPIs.	The CM would not reduce the toxicity, mobility or volume of the potential COPIs.	The CM would not reduce the toxicity, mobility or volume of the potential COPIs.
Short term effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.
Implementability .	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.
Cost			
Cost of Implementation	\$0	\$0	1. \$0
Estimated Future Costs	\$0	\$0	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.
Key Advantages	There are no costs associated with the CM	Meets threshold criteria; Ease of implementation; Lower cost	Meets threshold criteria; Ease of implementation; Lower cost
· · · · · ·	i		
Key Disadvantages			
	Baseline risks to human health and environment is not acceptable;	Does not alter the mobility, toxicity, or volume of potentially impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume o potentially impacted material; Long term responsibility for administering program.
Status			
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended for use in combination with CM3; No evidence of a release to the environment was found during inspection of the SWMU; the CM is recommended as a general precaution as applicable to the target area.	Retained for further evaluation; recommended for use it combination with CM2; No evidence of a release to the cuvironment was found during inspection of the SWMU the CM is recommended as a general precaution as applicable to the target area.

P:\2002\221-613 - Republic, Canton\Statement of Basis\Table 3 Corrective Measure Options Overview.xlsx

SWMU 13			Corrective Measure Options	·	
	CM1	CM2	CM3	CM4	CM5
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWAU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWAUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further setion. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPJ detocted above sufface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industry invertiant and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be exponded to include information on the areas of the Site that have an unacceptable calculated risk due to eluvated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PDE).	CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to facilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SNS) documents and site permit requirements to include work practices and procedures to nitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the enclutated risk to an acceptable level. The use of a soil/sing cap would consist of leveling the impacted area and installing two feet of soil/sing backfill. Dependent upon the location and intended use of the erea, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria					
Protection of Haman Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this oriteria for potential exposure to soils when combined with CM3.	Yes, the CM meets this criteria for potential exposure to soils when combined with CM2.	Yes, the CM meets this criteria for potential exposure when combined with WPC.	Yes, the CM meets this oriteria
Attainment of Media Cleanup Objectives:	·		4	·	
Carvinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below Ix10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk wax below 1x10 ⁻⁴
Non-Carcinogenic Health Index (Hf) below 1.0	The CM does not aid in reducing the Target Area non-careinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- careinogenic HI below 1.0 under general operating conditions.	The risk assessment for subsurface soils for this Target Area resulted in an exceedance of the non-cercinogenic Hi; however, no COPI were detected in the subsurface above the screening criteria for this SWMU. The CM would not affect the risk calculation	The CM eliminates the potentially complete exposure pathways thereby reducing the non- carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non- carcinogenie III below 1.0.
Blood Lend Level below 10 µg/dL	Criterion is not applicable because the calculated Target Ares blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lend level was below 10 µg/dL.	Criterion is not applicable because the onloulated Target Area blood lead level was below 10 µg/dI.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	Thu CM would not control the source of COPIs (i.e. Fe, As, Mn) contributing to the Target Aron Risk Based Factors.	Slag aggregate may contain residual levels of various motals from the steel production process. The motals in the slag are immobile as demonstrated by TcLP analysis. CM will control exposure to and migration of the source matorials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as domenstrated by TCLP analysis. The will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various matals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source,
Compliance with Waste Management Stundards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaministed media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offaite disposal at an approved landfill would comply with waste management standards.

SWMU 13	· · ·		Corrective Measure Options		
	CM1	CM2	CM3	CM4	CM5
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Cap	Surface Excavation
Balancing Criteria					
Long Term Reliability and Effectiveness	·				
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will officially reduce the calculated risk due to exposure to surface soils.	The CM will reduce the exposure to subsurface soils.	The CM will official velocities the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxioity, mobility and volume of the COPIs.
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as proceduros are implemented with no potential threats associated with the short term implementation.	Short term affectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Heulth & Safety Plan.
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response, Requires no permits or offsile approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or ollisite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.
Cost					
Cost of Implementation	\$0	\$0	\$0	\$4,500	\$11,000
Estimated Future Costs	\$0	\$0	\$0	\$31,500	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost associated with removal of small section of an area comprised mostly of slag material.
Key Advantages					
· ·	There are no coast associated with the CM	Meets threshold criteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM3;	Meets the threshold criteria;
Key Disadvantages					l.
	Baseline risks to human health and onvironment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not after the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; Difficult to maintain cap.	Selective removal of sing surrounding a single boring will not result in the removal of the source (i.e. sing fill).
Status			I) 	
	Dismissed, does not safisfy threshold oriteria.	Retained for further evaluation in combination with CM3; The CM is recommended for this area.	Retained for further evaluation in combination with CM2; The CM is recommended as a general procaution applicable to the Target Area.	Retained for further evaluation in combination with CM3; The CM is uot recommended due to maintenance concerns.	Dismissed, selective material removal will not result in satisfying the threshold criteria and complete removal of the slag material is not a practical solution.

Republic Engineered Products, Inc. Corrective Measure Proposal

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

Page 7 of 70 Revision 1 May 2010

Target Area 10 Description A no furthe SWMU or implements This option About or implements This option About or implements Threshold Criteria Protection of Human Health and the Environment Protection of Human Health and the Environment No, the CM Attainment of Media Cleanup Objectives: Criterion is Area calcula	CM1	CM2	CN42	
Target Area 10 Description A no furthe SWMU or implementin This option ACS when protection environment This volid the source eliminated, threshold criteria Protection of Fluman Health and the Environment No, the CM Attainment of Media Cleanup Objectives: Criterion is Carcinogenic Risk below 1x10 ⁻⁴ Criterion is	No Enath on A office		UMB	CM4
Description A no furthe SWMU or implementin This option ArdCs whe protection environment This would the source eliminated, threshold Criteria interstoil or Protection of Human Health and the Environment No, the CM Attainment of Media Cleanup Objectives: Criterion is Carcinogenic Risk below 1x10 ⁻⁴ Criterion is	INU FUITHEF ACtion	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Threshold Criteria Protection of Human Health and the Environment No, the CM Attainment of Media Cleanup Objectives: Criterion is Area calcula	r action approach will maintain the AOC in its current state without ig methods to control exposures. would be utilized for SWMUs or re it has been demonstrated that of human health and the its attained without further action, apply to SWMUs and AOCs where of release is controlled or the calculated risk is below the iteria, and/or there were no COPI pove surface or subsurface soils vels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to isufilate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated hour the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Protection of Human Health and the Environment No, the CM Attainment of Media Cleanup Objectives: Carcinogenic Risk below 1x10 ⁻⁴ Criterion is Area calcula				
Attainment of Media Cleanup Objectives: Carcinogenic Risk below 1x10 ⁻⁴ Area calcula	does not meet this critoria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Carcinogenic Risk below 1x10 ⁻⁴ Criterion is Area calcula		[
	not applicable because the Target and risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Arca calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0 The CM do Area non-ca	es not aid in reducing the Target reinogenic HI below I.O.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL The CM do Arca blood	es not aid in reducing the Target lead level below 10 μg/dL.	The CM alters the assumptions utilized in the risk assessment portion of the RFI to aid in reducing the blood lead level for the Target.Area below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area blood lead level below 10 μ g/dL.
Source Control The CM w COPIs (i.e. 1 Target Area	vould not control the source of Fe, Mn, and Pb) contributing to the Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards Criterion is would not media.	not applicable because the CM involve removal of contaminated	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

U |

SWMU 14	Corrective Measure Options					
	CM1	CM2	СМЗ	CM4		
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Stag Can	Surface Excavation		
Balancing Criteria						
Long Term Reliability and Effectiveness						
Effectiveness of the Alternative	Ineffective, CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source		
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cup damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Altornative	None	Indefinite	Indefinite	Indefinito		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.		
Short Torm Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no pennits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permilis or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.		
Cost		I	J	harrow and		
Cost of Implementation	\$0	\$0	\$4,500	\$38,000		
Estimated Future Costs	\$0	\$0	\$31,500	\$0		
Cortainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment und/or disposal facility; disposal fees; and the availability of backfill materials.		
Key Advantages						
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC,	Meets the threshold criteria; Removes the source from the Site		
Key Disadvantages			L			
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;			
Status						
	Dismissed, does not satisfy throshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended due to maintenance concerns.	Recommended CM to be used in conjunction with WPC.		

SWMU 22	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 3	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to climinate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two fact of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
hreshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives		· · · · ·		
	Coloring in the second se	Charles the Berlin have a des Brend Ameri		Columna is and so that he have the Town
Carcinogenie Kisk below 1x10	Area calculated risk was below 1x10 ⁻⁴	calculated risk was below 1x10 ⁻⁴	Area calculated risk was below 1×10^{-4}	Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-careinogenie HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe and Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated modia.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Republic Engineered Products, Inc. Corrective Measure Proposal

SWMU 22		Corrective Meas	sure Options	
	CM1	CM2	СМЗ	CM4
Target Area 3	No Further Action	Work Place Controls Surface	Soil/Slag Can	Surface Excavation
Balancing Criteria				
Long Term Reliability and Effectiveness			nan di manangan pang manang kalang na manang salan sanang manang manang sana sanang sana sanan di sana di sana Na salah sanang sana di sana sana sana sana sana sana sana san	
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will offectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation	Unrealistic operation and maintenance requirements; the ongoing activity and heavy equipment traffic in the area would continuously damage the soil cap; storage and processing of mill scale will contribute to a high risk of failure.	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.
Implementabėlity	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.
Cost	I			
Cost of Implementation	\$0	\$0	\$74,000	\$3,946,000
Estimated Future Costs	\$0	\$0	\$43,000	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for somi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.
Key Advantages				
· .	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2;	Meets the threshold criteria; Removes the source from the Site
Key Disadvantages			1	1
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not after the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; Difficult to implement and impossible to maintain; High risk of failure	High cost
Status	•			
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area due to ongoing material processing in this area.	Dismissed, the ongoing material processing in the area requires the use of the slag subsurface.

SWMU 37		Corrective Measure Options	
	. CM1	См2	СМЗ
Target Area 7	No Further Action	Work Place Controls, Subsurface	Asphalt Cap
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SVMUs and AOCs where the source of release is controlled or climinated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils sereening levels.	CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to facilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently ducated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs, including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of an asphalt cap would consist of leveling the impacted area or excavating up to 2 feet of soil to accommodate the cap, whichever is required to meet adjacent site conditions. Following the leveling or excavation, a slag subbase would be placed and compacted. An asphalt course would be added consisting of a binder course and a wearing course. The thickness of the subbase, binder course, and wearing course will be designed to suit the use of the area. The minimum pavement section would consist of 12 inches of subbase, 2 inches of binder course, and 0.5 inch wearing course.
Threshold Criteria			
Protection of Human Health and the Environment	No, the CM does not meet this critoria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.
Attainment of Media Cleanup Objectives:			
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Targot Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM climinates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathway for industrial workers thereby aiding to reduce the Target Area non-carcinogenic HL below 1.0 under general operating conditions. The CM alone does not remove the complete exposure pathway for construction workers.
Blood Lead Level below 10 µg/dL	The CM does not aid in reducing the Target Area blood lead level below 10 µg/dL.	The CM alters the assumptions utilized in the risk assessment portion of the RFI to aid in reducing the blood lead level for the Target Area below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions. The CM alone does not remove the complete exposure pathway for construction workers.
Source Control	The CM would not control the source of COPIs (i.e. Fe and Pb) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.

SWMU 37	Corrective Measure Options					
	• CM1	CM2	СМЗ			
Target Area 7	No Further Action	Work Place Controls, Subsurface	Asphalt Cap			
Balancing Criteria						
Long Term Reliability and Effectiveness	[
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to subsurface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.			
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Risk of failure unlikely under general operating conditions.			
Projected Useful Life of the Alternative	None	Indefinite	Indefinite			
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity mobility	The CM would not reduce the toxicity mobility or volume	The CM would not reduce the taxicity or volume of			
	or volume of the COPIs.	of the COPIs.	COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.			
Short term effectiveness	Ineffective, there is no difference in the effectiveness of CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.			
Inplementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures alroady in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; to offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.			
Cost			· · ·			
Cost of Implementation	\$0	\$0	\$9,000			
Estimated Future Costs	\$0	\$0	\$40.000			
Certainty of Future Costs	There are no costs associated with CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 10% of the area.			
Key Advantages						
	No cost associated with the CM.	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold critoria when used in conjunction with WPC; Currently implemented.			
Key Disadvantages						
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;			
Status						
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for evaluation, the CM is recommended for use in combination with WPC; the area is currently covered by asphalt.			

SWMU 40	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 4	No Further Action	Work Place Controls, Surface	Asphalt Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils serrening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The clucation program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways, therefore reducing the calculated risk to an acceptable level. The use of an asphalt cap would consist of leveling the impacted area or excavating up to 2 feet of soil to accommodate the cap, whichever is required to meet adjacent site conditions. Following the leveling or excavation, a slag subbase would be placed and compacted. An asphalt course would be added consisting of a binder course and a wearing course. The thickness of the subbase, binder course, and wearing course will be designed to suit the use of the area. The minimum pavement section would consist of 12 inches of Subbase, 2 inches of binder course, and 0.5 inch wearing course.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria	lang an intra managang ang ang ang ang ang ang ang ang			
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for constniction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:		L		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}
Non-Carcinogenie Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- earcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe, and As,) detected above screening criteria	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated modia.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

SWMII 40	Corrective Measure Options				
50000 40	CM	Contective w	chra	CM4	
Taugat A was A		CM2	<u> </u>	CIVI4	
Balancing Criteria	No Further Action	work riace Controls, Surface	Aspnait Cap	Surface Excavation	
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	CM will effectively reduce the calculated risk due to exposure to surface soils to acceptable levels	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Risk of failure unlikely under general operating conditions.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indofinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Torm Effectiveness	Ineffective, there is no difference in the effectiveness of CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no petmits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost		A		L	
Cost of Implementation	\$0	\$0	\$9,500	\$35,000	
Estimated Future Costs	\$0	\$0	\$40,500	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 10% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fees, and the availability of backfill materials.	
Key Advantāges					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets (breshold critoria	Meets the threshold criteria; Removes the source from the Site	
Key Disadvantages	<u> </u>	1*		I	
	Baseline risks to human health and	Does not alter the mobility toxicity or volume of impacted	Does not reduce the toxicity or volume of impacted	Source removal does not prohibit/reduce potential	
	environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Long term responsibility for administering program	materials.	for recontamination due to continual general operations.	
Status				1	
	Dismissed, does not salisfy threshold criteria.	Retained for further evaluation but not recommended.	Retained for further evaluation. The CM is recommended; an asplialt cap will facilitate future material storage and processing.	Retained for further evaluation; however not recommended due to anticipated use of the area after the completion of the CM.	

SWMU 46	Corrective Measure Options				
	CM1	CM2	CM3		
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to clevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to facilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The culculang the importance of personal hygienc including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria					
Protection of Human Health and the Environment	No, CM does not meet this criteria	Yes, the CM nueets this criteria for potential exposure to soils when combined with CM3.	Yes, the CM meets this criteria for potential exposure to soils when combined with CM2.		
Attainment of Media Cleanup Objectives:		· · · · · · · · · · · · · · · · · · ·			
Carcinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Contro]	None of the samples assigned to this SWMU exceeded the screening level, therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level, therefore source control for this area is not applicable.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Critorion is not applicable because the CM would not involve removal of contaminated media.		

SWMU 46	Corrective Measure Options					
	CM1	CM2	СМЗ			
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface			
Balancing Criteria						
Long Term Reliability and Effectiveness	[
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0.	The CM will reduce the exposure to surface soils.	The CM will reduce the exposure to subsurface soils.			
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation			
Projected Useful Life of the Alternative	None	Indefinite	Indefinite			
Reduction in toxicity mobility and volume of waste	The CM would not reduce the toxicity mobility	The CM would not reduce the toxicity mobility or volume	The CM would not reduce the toxicity mobility or volume			
,,,	or volume of the COPIs.	of the COPIs.	of the COPIs.			
Short term effectiveness	Ineffective, there is no difference in the effectiveness of CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.			
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor altorations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.			
Cost		· · · · · · · · · · · · · · · · · · ·				
Cost of Implementation	\$0	\$0	\$0			
Estimated Future Costs		\$0	\$0			
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.			
Key Advantages						
	There are no costs associated with the CM	Meets threshold criteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold eriteria when used in conjunction with CM2; Ease of implementation; Lower cost			
Key Disadvantages		L	1			
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of potential source material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of potential source material; Long term responsibility for administering program			
Status						
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation in combination with CM3; The CM is recommended as a general precaution applicable to the Target Area.	Retained for further evaluation in combination with CM2; The CM is recommended as a general precaution applicable to the Target Area.			
	1					

DOCUMENT

EPA ARCHIVE

U

SWMU 48	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
Target Area 9	Work Place Controls, Surface	Soil/Slag Cap	Asphalt Cap	Surface Excavation	
Description	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hypiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of an asphalt cap would consist of leveling the impacted area or excavating up to 2 feet of soil to accommodate the cap, whichever is required to meet adjacent site conditions. Following the leveling or excavation, a slag subbase would be placed and compacted. An asphalt course would be added consisting of a binder course and averaing course, the thickness of the subbase, binder course, and wearing course will be designed to suit the use of the area. The minimum pavement section would consist of 12 inches of subbase, 2 inches of binder course, and 0.5 inch wearing course.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.	
Threshold Criteria					
Protection of Human Health and the Environment	Yes, the CM moets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this critoria	
Attainment of Media Cleanup Objectives:		· · · · · · · · · · · · · · · · · · ·	I		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	
Non-Carcinogenic Health Index (HI) below 1.0	The CM alters the assumptions utilized in the risk assessment portion of the RFI to reduce the non- carcinogenic HI below 1.0,	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.	
Blood Lead Level below 10 µg/dL	The CM does not aid in reducing the Target Area blood lead level below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thoreby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area blood lead level below 10 μ g/dL.	
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis, CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the polential to eliminate the source.	
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.	

SWMU 48	· · · · · · · · · · · · · · · · · · ·	Corrective Measu	ire Options	
	СМІ	CM2	СМЗ	CM4
Target Area 9	Work Place Controls, Surface	Soil/Slag Cap	Asphalt Cap	Surface Excavation
Balancing Criteria				
ong Term Reliability and Effectiveness		· · · · · · · · · · · · · · · · · · ·		<u></u>
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils to acceptable levels	The CM will effectively reduce the calculated risk to acceptable levels, except for the construction worker risk scenario.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source
Reliability and Risk of Failure	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Risk of failure unlikely under general operating conditions.	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the cavironment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.
Short Term Effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.
Implementability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations, no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements. Difficult access for construction equipment	Requires engineering and planning considerations, requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.
Cost			-	<u> </u>
Cost of Implementation	\$0	\$31,000	\$69,000	\$107,000
Estimated Future Costs	\$0	\$11,000	\$62,000	\$0
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 10% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.
Key Advantages				
· .	Meets throshold criteria ; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM1;	Meets threshold criteria when used in conjunction with CM1;	Meets the threshold criteria; Removes the source from the Site
Key Disadvantages				<u>1</u>
	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;	Does not reduce the toxicity or volume of impacted materials; Poor accessibility for hot roll asphalt equipment	Existing Site conditions would make the CM difficult to implement
Status	1			<u>1</u>
	Retained for further evaluation in combination with CM4; recommended.	Retained for further evaluation in combination with CM1; the CM is not recommended for this area.	Retained for further evaluation; however the CM is not recommended based on construction equipment accessibility concerns	Retained for further evaluation; however the CM is recommended for this area.

SWMU 49	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
Target Area 9	Work Place Controls, Surface	Soil/Slag Cap	Asphalt Cap	Surface Excavation	
Description	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to clevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/sing cap would consist of leveling the impacted area and installing two feet of soil/sing backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of an asphalt cap would consist of leveling the impacted area or excavating up to 2 feet of soil to accommodate the cap, whichever is required to meet adjacent site conditions. Following the leveling or excavation, a slag subbase would be placed and compacted. An asphalt course would be added consisting of a binder course and a wearing course. The thickness of the subbase, binder course, and wearing course will be designed to suit the use of the area. The minimum pavement section would consist of 12 inches of subbase, 2 inches of binder course, and 0,5 inch wearing course.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.	
Threshold Criteria					
Protection of Human Health and the Environment	Yes, the CM moets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this critoria	
Attainment of Media Cleanup Objectives:	· · · · · · · · · · · · · · · · · · ·	L	<u> </u>	1	
Carcinogonic Risk below 1x10 ⁻¹	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	
Non-Carcinogenic Health Index (HI) below 1.0	The CM alters the assumptions utilized in the risk assessment portion of the RFI to reduce the non- carcinogenie HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.	
Bood Lead Level below 10 µg/dL	The COPI for this SWMU is Fe. The CM has limited to no affect on reducing the BLL for the Target Area.	The COPI for this SWMU is Fe. The CM has limited to no affect on reducing the BLL for the Target Area.	The COPI for this SWMU is Fe. The CM has limited to no affect on reducing the BLL for the Target Area.	The COPI for this SWMU is Fe. The CM has limited to no affect on reducing the BLL for the Target Area.	
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis, CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.	
Compliance with Waste Management Standards	Critorion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media,	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.	

DOCUMENT EPA ARCHIVE

SWMU 49	Corrective Measure Options				
	CM1	CM2	CM3	CM4	
Target Area 9	Work Place Controls, Surface	Soil/Slag Can	Asphalt Can	Surface Excavation	
Balancing Criteria		Control only			
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Risk of failure unlikely under general operating conditions.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the taxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would not reduce the toxicity or volume of COPIs; however, CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Requires minor afterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations, no offsite treatment or disposal required, no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements. Difficult access for construction equipment	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost	· · · · · · · · · · · · · · · · · · ·		A	Autor	
Cost of implementation	\$0	\$5,000	\$7,500	\$16,000	
Estimated Future Costs	\$0	\$31,000	\$34,500	\$0	
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 10% of the area.	Cost may vary substantially based on type of and distance to an appropriate officite treatment and/or disposal facility, disposal fees; and the availability of backfill materials. Proposed cost is limited to an approximate 1000 sf area.	
Key Advantages					
	Meets threshold oritoria ; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM1;	Meets threshold criteria when used in conjunction with CM1;	Meets the threshold criteria; Removes the source from the Site	
Key Disadvantages					
	Does not after the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;	Does not reduce the toxicity or volume of impacted materials; Poor accessibility for asphalt construction equipment	Existing Site conditions would make the CM difficult to implement	
Status					
	Retained for further evaluation; the CM is recommended for this area.	Retained for further evaluation; however the CM is not recommended based on construction equipment accessibility concerns	Retained for further evaluation; however the CM is not recommended based on construction equipment accessibility concerns	Retained for further evaluation; however the CM is not recommended for this area.	
· ·					

SWMU 51	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AQC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AQCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AQCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils sereening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw matrials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal protective equipment (PPE).	CM will be utilized to climinate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measuro, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:		· · · · · · · · · · · · · · · · · · ·	I	<u> </u>
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby niding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dl.	The CM does not aid in reducing the Target Area blood lead level below 10 µg/dL.	The CM alters the assumptions utilized in the risk assessment portion of the RFI to aid in reducing the blood lead level for the Target Area below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lend level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area blood lead level below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe, Mn, and Pb) contributing to the Target Area Risk Based Factors.	Sing aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media,	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Page 22 of 70 Revision 1 May 2010

SWMU 51	Corrective Measure Options					
	CM1	CM2	СМЗ	CM4		
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Can	Surface Excavation		
Balancing Criteria				Surface Excertition		
Long Term Reliability and Effectiveness						
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source		
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs, however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.		
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsito approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.		
Cost			· · · · · · · · · · · · · · · · · · ·	1		
Cost of Implementation	\$0	\$0	\$4,500	\$38,000		
Estimated Future Costs	\$0	\$0	\$31,500	\$0		
Certainty of Future Costs	There are no costs associated with CM1	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fees; and the availability of backfill materials.		
Key Advantages						
	No cost associated with CM1;	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold criteria; Removes the source from the Site		
Key Disadvantages			L	•		
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;	-		
Status			•	•		
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; The CM is not recommended due to maintenance concerns.	Recommended CM to be used in conjunction with WPC.		

Republic Engineered Products, Inc. Corrective Measure Proposal

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

Page 23 of 70 Revision 1 May 2010

SWMU 52	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently cducated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygicne including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria Protection of Haman Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils	Yes, the CM meets this criteria for potential exposure but would require WPC for construction	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives: Carcinogenic Risk below 1x10 ⁴	Criterion is not applicable because the Target	Criterion is not applicable because the Target Area	Criterion is not applicable because the Target	Criterion is not applicable because the Target
	Area oalculated risk was below 1x10 ⁻⁴	calculated risk was below 1x10 ⁻⁴	Area calculated risk was below 1x10 ⁻⁴	Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	The risk assessment for this Target Area resulted in an exceedances of the BLL; however, none of the samples assigned to this SWMU exceeded the screening criteria. The CM has no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.
Source Control	The CM would not control the source of COPIs (i.e. Fe, Mn, and Pb) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process, The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the stag are immobile as demonstrated by TCLP analysis, CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

SWMU 52	Corrective Measure Optious					
	CM1	CM2	СМЗ	CM4		
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Balancing Criteria						
Long Term Reliability and Effectiveness				· ·		
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source.		
Kehability and Kisk of Fallure	inclicelive and unrehable	Reliable will proper implementation; risk of failure associated with improper implementation	Keitability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditious should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs,		
Short Term Effectivoness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.		
Cost	1,			<u> </u>		
Cost of Implementation	\$0	\$0	\$10,000	\$73,000		
Estimated Future Costs	\$0	\$0	\$33,000	\$0		
Certainty of Future Costs	There are no costs associated with CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fees, and the availability of backfill materials.		
Key Advantages						
	No cost associated with CM1;	Meets threshold criteria Ease of implementation; Lower cost	Moots threshold criteria.	Meets the threshold criteria; Removes the source from the Site		
Key Disadvantages						
	Baseline risks to humau health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;			
Status						
· ·	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; the CM is recommended for this area.	Retained for further evaluation; however the CM is not recommended for this area.	Retained for further evaluation; however the CM is not recommended for this area.		

- Page 25 of 70 Revision 1 May 2010

SWMU 53	Corrective Measure Options			
	CM1	CM2	CM3	CM4
Target Area 9	Work Place Controls, Surface	Soil/Slag Cap	Asphalt Cap	Surface Excavation
Description	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smolding and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two foct of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of an asphalt cap would consist of leveling the impacted area or excavating up to 2 feet of soil to accommodate the cap, whichever is required to meet adjacent site conditions. Following the leveling or excavation, a stag subbase would be placed and compacted. An asphalt course and avearing course. The thickness of the subbase, binder course, and wearing course will be designed to suit the use of the area. The minimum pavement section would consist of 12 inches of subbase, 2 inches of binder course, and 0.5 inch wearing course.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:			1	·
Carcinogenic Risk below 1x10 ^{*4}	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-earcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	The CM does not aid in reducing the Target Area blood lead level below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area blood lead level below 10 µg/dL.
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Cor

SWMU 53	Corrective Measure Ontions				
	CM1	CM2	CM3	CM4	
Target Area 9	Work Place Controls Surface	Soil/Slag Can	Asphalt Can	Surface Excavation	
Balancing Criteria				j Gurrace Excertation	
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Risk of failure unlikely under general operating conditions.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite	Indefinite	
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment,	The CM would not reduce the toxicity or volume of COPIs; however, he CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short term offectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be roduced through the development and implementation of an appropriate Health & Safety Plan.	
İmplement ability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost		<u>.</u>	<u>.</u>	3	
Cost of Implementation		\$45,000	\$69,000	\$2,502,000	
Estimated Future Costs	\$0	\$38,000	\$171,000	\$0	
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 10% of the area.	Cost may vary substantially based ou type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	Meets threshold criteria Ease of implementation; Liower cost	Meets threshold criteria when used in conjunction with WPC;	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold criteria; Removes the source from the Site	
Key Disadvantages	1	1	1	J	
	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials.	Does not reduce the toxicity or volume of impacted materials.	High costs.	
Status	1	I		1	
	Retained for further evaluation; recommended for use in combination with CM2 and CM3.	Retained for further evaluation; recommended for use in combination with CM1 and partial use of CM3.	Retained for further evaluation; recommended for partial use in combination with CMI and CM2.	Retained for further evaluation; however, the CM is not recommended for this area.	

Page 27 of 70 Revision 1 May 2010

SWMU 59	Corrective Measure Options				
	CM1	CM2	СМЗ		
Independent	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Description	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and sic permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal protective equipment (PPE).	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependent upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.		
Threshold Criteria					
Protection of Human Health and the Environment	Yes, the CM meets this criteria for potential exposure to soils,	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria		
Attainment of Media Cleanup Objectives:			^		
Carcinogenic Risk below 1x10**	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}		
Non-Carcinogenic Health Index (HI) below 1.0	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	The CM does not aid in reducing the Target Area blood lead level below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area blood lead level below 10 µg/dL.		
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.		

SWMU 59	Corrective Measure Options				
	CM1	CM2	CM3		
Independent	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source		
Reliability and Risk of Failure	Reliable with proper implementation, risk of failure associated with improper implementation	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite		
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.		
Short term effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
Implement ability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsile treatment or disposal; requires permits or approvals; no specialized technology requirements.		
Cost			J		
Cost of Implementation		\$6,000	\$22,000		
Estimated Future Costs	\$0	\$32,000	\$0		
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual insportion and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fees; and the availability of backfull materials.		
Key Advantages					
	Meets threshold critoria Ease of implomentation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold criteria; Removes the source from the Site; Continuation of previous Interim Measure.		
Key Disadvantages	I	L			
	Does not alter the mobility, texicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials.	Volume of material to be disposed will be dependent on confirmation sampling.		
Status	I	<u> </u>	<u> </u>		
	Retained for further evaluation; the CM is not recommended for the area.	Retained for further evaluation; the CM is not recommended for the area.	Retained for further evaluation; the CM is recommended for this area.		

SWMU 60	Corrective Measure Options				
	CM1	CM2	СМЗ		
Target Area 5	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Description	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an ubsolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.		
Threshold Criteria					
Protection of Human Health and the Environment	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria.		
Attainment of Media Cleanup Objectives:					
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻¹	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic Hi below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.		

SWMU 60	Corrective Measure Options				
	CM1	CM2	СМЗ		
Target Area 5	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Balancing Criteria					
ong Term Reliability and Effectiveness					
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source.		
Reliability and Risk of Failure	Refiable with proper implementation; risk of failure associated with improper implementation.	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of fuilure.		
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite		
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.		
Short term effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potentia exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
mplement ability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and plauning considerations requires offsite treatment or disposal; requires permits or approvals; no specialized technolog; requirements.		
Cost	J	<u> </u>	· · · · · · · · · · · · · · · · · · ·		
Cost of Implementation		\$7,500	\$47,000		
Estimated Future Costs	\$0 .	\$32,500	\$0		
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility, disposal fces; and the availability of backfill materials.		
Key Advantages					
	Moets threshold criteria; Ease of implementation; Lower cost.	Meets threshold criteria when used in conjunction with WPC.	Meets the threshold criteria; Removes the source from the Site.		
Key Disadvantages					
9	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program.	Does not reduce the toxicity or volume of impacted materials.	Relatively higher initial costs.		
Status	<u> </u>		1		
	Retained for further evaluation; the CM is recommended for the area.	Retained for further evaluation; the CM is not recommended for the area.	Retained for further evaluation; the CM is no recommended for this area.		

DOCUMENT ARCHIVE

ЕP

SWMU 61	Corrective Measure Options			
	CM1	CM2		
Target Area 5	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFL. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The ducation program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COP1s; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.		
Attainment of Media Cleanup Objectives:	I	· · · · · · · · · · · · · · · · · · ·		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion 18 not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Arca non- carcinogenic HI below 1.0.		
Blood Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	The CM would not control the source of COPIs (i.e. Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.		

SWMU 61	Corrective Measure Options			
Í	CM 1	CM2		
Target Area 5	No Further Action	Work Place Controls, Surface		
Balancing Criteria				
Long Term Reliability and Effectiveness				
Effectiveness of the Alternative .	Incffective, the CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.		
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation		
Projected Useful Life of the Alternative	None	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Wasto	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.		
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Implementability.	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response, Requires no permits or offsite approvals.		
Cost		L		
Cost of Implementation	\$0	\$0		
Estimated Future Costs	\$0	\$0		
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.		
Key Advantages				
	There are no costs associated with the CM.	Meets threshold criteria Ease of implementation; Lower cost		
Key Disadvantages				
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program		
Status				
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; the CM is recommended for this area.		

Page 33 of 70 Revision 1 May 2010

SWMU 64 Corrective Measure Options CM5 CM1 CM2 CM3 CM4 Target Area 1 No Further Action Work Place Controls, Surface Work Place Controls, Subsurface Soil/Slag Cap Surface Excavation Description A no further action approach will maintain the The CM will be utilized to control potentially complete The CM will be utilized to control potentially complete The CM will be utilized to eliminate potentially Soil excavation is an absolute corrective measure SWMU or AOC in its current state without where contaminated material is excervated and exposure nathways from surface soils to industrial and exposure nathways from subsurface soils to industrial and complete exposure pathways; therefore reducing implementing methods to control exposures. construction workers as necessary to facilitate reducing the construction workers as necessary to facilitate reducing the the calculated risk to an acceptable level. transported to permitted off-site treatment and/or calculated risk to an acceptable level under the risk to an acceptable level under the assumptions used for disposal facilities. This option would be utilized for SWMUs or assumptions used for the risk assessment portion of the the risk assessment portion of the RFI. The use of a soil/slag cap would consist of AOCs where it has been demonstrated that leveling the impacted area and installing two feet \mathbf{E} [21] protection of human health and the Republic will modify their existing Safety Management of soil/slag backfill. Dependent upon the location environment is attained without further action. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to and intended use of the area, the cap may be This would apply to SWMUs and AOCs where System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk covered with six inches of topsoil and vegetated. the source of release is controlled or include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the eliminated, the calculated risk is below the to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently threshold criteria, and/or there were no COPI exposure to surface soils. Employees are currently educated educated about the hazards associated with raw materials detected above surface or subsurface soils about the hazards associated with raw materials and final and final products at the Site, which are similar to the screening levels. products at the Site, which are similar to the potential potential hazards associated with impacted subsurface hazards associated with impacted surface soils. The soils. The education program will be expanded to include education program will be expanded to include information on the areas of the Site that have an information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective smoking and, wearing appropriate personal protective equipment (PPE). equipment (PPE). Threshold Criteria ntection of Human Health and the Environment No, the CM does not meet this criteria Yes, the CM meets this criteria for potential exposure to Yes, the CM meets this criteria for potential exposure to Yes, the CM meets this criteria for potential Yes, the CM meets this criteria surface soils when combined with CM3 subsurface soils when combined with CM2. exposure but would require WPC for construction activity Attainment of Media Cleanup Objectives: Criterion is not applicable because the Target Criterion is not applicable because the Target Area Criterion is not applicable because the Target Criterion is not applicable because the Target Carcinogenic Risk below 1x10 Criterion is not applicable because the Target Area Area calculated risk was below 1x10-6 calculated risk was below 1x10⁻⁴ calculated risk was below 1x 10-4 Area calculated risk was below 1x107 Area calculated risk was below 1x10⁻¹ The CM does not aid in reducing the Target Non-Caroinogenic Health Index (HI) below 1.0 The CM eliminates the potentially complete exposure The CM eliminates the potentially complete exposure The CM eliminates the potentially complete The CM removes the source material thereby Area non-carcinogenic HI below 1.0. pathways thereby aiding to reduce the Target Area nonaiding to reduce the Target Area nonpathways thereby aiding to reduce the Target Area nonexposure pathways thereby aiding to reduce the carcinogenic HI below 1.0 under general operating carcinogenic HI below 1.0 under general operating Target Area non-carcinogenic HI below 1.0 under careinogenic HI below 1.0. conditions conditions general operating conditions. Blood Lead Level below 10 ug/dL Criterion is not applicable because the Criterion is not applicable because the calculated Target Criterion is not applicable because the calculated Target Criterion is not applicable because the culculated Criterion is not applicable because the calculated calculated Target Area blood lead level was Area blood lead level was below 10 ug/dL. Area blood lead level was below 10 µg/dL. Target Area blood lead level was below 10 µg/dL. Target Area blood lead level was below 10 µg/dL. helow 10 µg/dl., Source Control The CM would not control the source of Slag aggregate may contain residual levels of Slag aggregate may contain residual lovels of various Slag apprecate may contain residual levels of various The CM has the potential to eliminate the source. COPIs file. Fe. As. Mn) contributing to the metals from the steel production process. The metals in the metals from the steel production process. The metals in the various metals from the steel production process. Target Area Risk Based Factors. slag are immobile as demonstrated by TCLP analysis. The slag are immobile as demonstrated by TCLP analysis. The The metals in the slag are immobile as CM will control exposure to, and migration of, the source demonstrated by TCLP analysis. The CM will CM will control exposure to, and migration of, the source materials. materials. control exposure to, and migration of, the source materials. Criterion is not applicable because the CM would Compliance with Waste Management Standards Criterion is not applicable because the CM Criterion is not applicable because the CM would not Criterion is not applicable because the CM would not Offsite disposal at an approved landfill would would not involve removal of contaminated involve removal of contaminated media. involve removal of contaminated media not involve removal of contaminated media. comply with waste management standards media

DOCUMENT

EPA ARCHIVE

SWMU 64	Corrective Measure Options				
	CMI	CM2	CM3	CM4	CM5
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Can	Surface Excavation
Balancing Criteria				country cup	
Long Term Reliability and Effectiveness			-		
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to befow acceptable levels,	The CM will effectively reduce the calculated risk by reducing the exposure to surface soils.	The CM will effectively reduce the calculated risk by reducing the exposure to subsurface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by romoving the source
Rollability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation	Unrealistic operation and maintenance requirements; the ongoing activity and heavy equipment traffic in the area would coultmooully damage the soil app; executations required to extract the stag for beneficial reuse will contribute to a high risk of failure	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.
Short Term Fifed iveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as protochires are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term affectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the dovelopment and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alumations to plans and procedures already in uso. Minimal time to implement and achieve beneficial response. Requires no permits or offsitu approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires parmits or approvals; no specialized technology requirements.
Cost					
Cost of Implementation	\$0	\$0	.\$0	\$47,000	\$495,000
Estimated Future Costs	\$0	\$0	\$0	\$39,000	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for seni annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill unaterials.
Key Advantages					
	There are no costs associated with the CM	Meets threshold oriteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM3;	Meets the threshold oriteria; Removes the source from the Site; Relatively higher initial costs.
Key Disadvantages					
	Baseline risks to human health and environment is not acceptable; No change in texicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of impacted naterial: Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; Difficult to implement and impossible to maintain; High cost to reward ratio.	Existing Site conditions would make the CM difficult to implement in some locations High cost
Status					
	Dismissed, does not satisfy threshold oriteria.	Retained for further evaluation in combination with CM3; recommended.	Retained for further evaluation in combination with CM2; recommended.	Retained for further evaluation in combination with CM3; not recommended for this area due to ongoing slag processing in this area.	Dismissed, the slag material is considered a valuable commodity and is processed under OEPA regulations.

SWMU 65		Corrective Measure Options	
	CM1	CM2	СМЗ
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as neccessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work proteices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necossary to icalitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with twimaterial subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).
Threshold Criteria			
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils when combined with CM3.	Yes, the CM meets this criteriu for potential exposure to subsurface soils when combined with CM2.
Attainment of Media Cleanup Objectives:		Lu	
Carcinogenic Risk below 1x10 ⁴	Criterion is not applicable because the calculated risk for the Target Area was below 1x10 ⁻⁴	Criterion is not applicable because the calculated risk for the Target Area was below 1×10^{-4}	Criterion is not applicable because the calculated risk for the Target Area was below 1×10^{-4}
Non-Carcinogenic Health Index (HI) below 1.0	No samples were collected associated with this area. The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	No samples were collected associated with this area. The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	No samples were collected associated with this area. The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic H1 below 1.0 under general operating conditions.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Contro]	No samples were collected associated with this SWMU.	No samples were collected associated with this SWMU.	No samples were collected associated with this SWMU.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.

SWMU 65	Corrective Measure Options				
	CMI	CM2	CM3		
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface		
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Allomative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will effectively reduce the Target Area calculated risk by reducing the exposure to surface soils.	The CM will effectively reduce the Target Area calculated risk by reducing the exposure to subsurface soils.		
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation		
Projected Useful Life of the Alternative	None	Indefinite	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility	The CM would not reduce the toxicity, mobility or volume	The CM would not reduce the toxicity, mobility or volume		
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	or volume of potential COPIs.	of potential COPIs.	of potential COPIs.		
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.		
(Cool					
Cort of Implementation	(to	•n			
Entimeter Contractor	¢0	4/3	φ0		
Estimated Folure Costs	30	30			
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantitable administrative ice associated with program revision and implementation.	Minimal non-quantitable administrative for associated with program revision and implementation.		
Key Advantages					
<u></u>	There are no costs associated with the CM	Meets threshold criteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2; Euse of implementation; Lower cost		
Key Disadvantages					
· · · · · · · · · · · · · · · · · · ·	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program		
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation in combination with CM3; The CM is recommended as a general precaution applicable to the Target Are a.	Retained for further evaluation in combination with CM2; The CM is recommended as a general precaution applicable to the Target Area.		

Republic Engineered Products, Inc. Corrective Measure Proposal

SWMU 66				
	CM1	CM2	СМЗ	CM4
Target Area 2	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Siag Cap	Surface Excavation
Description	The CM will be ntilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate roducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to clevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to faoilitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work proteices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the bazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to clevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two fect of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soit excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	Yes, the CM meets this criteria for potential exposure to surface soils when combined with CM2.	Yes, the CM meets this criteria for potential exposure to subsurface soils when combined with CM1.	Yes, the CM mosts this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:		I	I	I
. Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	Criterion is not applicable because the Target Arca calculated non-carcinogenic HI was below 1.0.	Criterion is not applicable because the Target Area calculated non-carcinogonic HI was below 1.0.	Criterion is not applicable because the Target Area calculated non-carcinogenic HI was below 1.0.	Criterion is not applicable because the Target Area calculated non-carcinogenic HI was below 1.0.
Blood Lead Level below 10 j1g/dL	The CM alters the assumptions utilized in the risk assessment portion of the RFI to aid in reducing the blood lead level for the Target Area below $10 \ \mu g/dL$.	The CM alters the assumptions utilized in the risk assessment portion of the RFI to nid in reducing the blood lead level for the Target Area below 10 µg/dL.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the blood lead level for the Target Area below 10 µg/dL under general operating conditions.	The CM removes the source material thereby: aiding to reduce the Target Area blood lead level below $10 \mu\text{g/dL}$.
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to, and migration of, the source materials.	The CM has the potential to eliminate the source,
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landful would comply with waste management standards.

DOCUMENT

EPA ARCHIVE

S

	CM1	CM2	CM3	CM4
Target Area 2	Work Place Controls, Surface	Work Place Controls, Subsurface	Soil/Slag Can	Surface Excavation
Balancing Criteria				
Long Term Reliability and Effectiveness				
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk by reducing the exposure to surface soils to an acceptable level.	The CM will effectively reduce the calculated risk by reducing the exposure to subsurface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the er removing the source
Reliability and Risk of Failure	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable failure.
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the cavironment.	The CM would remove the source thereby reduce the toxicity, mobil of the COPIs.
Short Term Effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would p exposure to construction worker construction workers can be reduc development and implementa appropriate Health & Safety Plan.
implementability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning requires offsite treatment or dis permits or approvals; no speciali requirements.
Cost		I	······································	
Cost of Implementation	\$0	\$0	\$10,000	\$20,000/\$48,000
Estimated Future Costs	\$0	\$0 .	\$33,000	\$0
Certainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Costs based on reduced foot pri costs may vary substantially bas options and results of confirmation
Key Advantages				
	Meets threshold criteria when used in conjunction with CM2; Ease of implementation; Lower cost	Moets threshold criteria when used in conjunction with CM1; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2;	Meets the threshold criteria; Removes the source from the Site;
Key Disadvantages				
	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; Difficult to implement and maintain functionality	Limited excavation does not add concerns.
Status	Retained for further evaluation in combination with CM2 and CM3; recommended.	Retained for further evaluation in combination with CMI and CM3; recommended.	Retained for further evaluation in combination with CM1 and CM2; Not recommended.	Retained for further evaluation recommended for the area.

DOCUMEN

ARCHIVE

SWMU 70	Corrective Measure Options			
	CM1	CM2		
Target Area 5	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial an construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumption used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the ris to industrial workers and construction workers due to the exposure to surface soils. Employees are current induced to about the hazards associated with raw materia and final products at the Site, which are similar to the potential hazards associated with impacted surface soil The education program will be expanded to include information on the areas of the Site that have a unacceptable calculated risk due to elevated levels co COPIs; including, the importance of personal hygicn including washing hands prior to eating, drinking, c smoking and, wearing appropriate personal protectiv equipment (PPE).		
Threshold Criteria	1	1		
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils.		
Attainment of Media Cleanup Objectives:		1		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Arc calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0,	The CM eliminates the potentially complete exposure pathways (hereby aiding to reduce the Target Area non carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Targe Area blood lead level was below 10 µg/dL.		
Source Control	None of the samples assigned to this SWMU exceeded the screening level, therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded fu screening level; therefore source control for this area is no applicable.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would no involve removal of contaminated media.		

DOCUMENT

ARCHIVE

⊲

EP

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

SWMU 70	Corrective Measure Options		
	CM1	CM2	
Target Area 5	No Further Action	Work Place Controls, Surface	
Balancing Criteria			
Long Term Reliability and Effectiveness			
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will aid to reduce the calculated risk by reducing the exposure to surface soils.	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	
Projected Useful Life of the Alternative	None	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of potential COPIs.	The CM would not reduce the toxicity, mobility or volume of potential COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	
0			
		1	
Cost of Implementation	\$0	\$0	
Estimated Future Costs	\$0	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	
Key Advantages			
	There are no costs associated with the CM	Meets threshold criteria; Ease of implementation; Lower cost	
Key Disadvantages			
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	
Status		1	
	Dismissed, docs not satisfy threshold criteria.	Retained for further evaluation; recommended.	

Page 41 of 70 Revision 1 May 2010

SWMU 75	Corrective Measure Options				
	СМ1	CM2	СМЗ		
Target Area 5	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Description	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	The CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.		
Threshold Criteria Protection of Human Health and the Environment	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria.		
Attainment of Media Cleanup Objectives:			<u> </u>		
Carcinogenic Risk below-1x10 ⁻¹	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic H1 below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below $10 \ \mu g/dL$.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demostrated by TCLP analysis. The CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated medja.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.		

Page 42 of 70 Revision 1 May 2010

SWMU 75	Corrective Measure Options				
	CM1	CM2	CM3		
Target Area 5	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation		
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk to removing the source.		
Reliability and Risk of Failure	Reliable with proper implementation; risk of failure associated with improper implementation.	Reliability of CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinite		
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Si thereby reduce the toxicity, mobility and volum of the COPIs.		
Short term effectiveness	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potenti exposure to construction workers. The risk construction workers can be reduced through th development and implementation of a appropriate Health & Safety Plan.		
Implement ability	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning consideration requires offsite treatment or disposal; requir permits or approvals; no specialized technolog requirements.		
Cost	· · · · · · · · · · · · · · · · · · ·		L		
Cost of Implementation		\$5,000	\$16,000		
Estimated Future Costs	\$0	\$31,000	\$0		
Cortainty of Future Costs	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of ar distance to an appropriate offsite treatment and/ disposal facility; disposal fees; and the availabili of backfill materials.		
Key Advantages					
	Meets threshold criteria; Ease of implementation; Lower cost.	Meets threshold criteria when used in conjunction with WPC; Majority of the cost associated with maintenance.	Meets the threshold criteria; Removes the source from the Site,		
Key Disadvantages	1		I		
	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program.	Does not reduce the toxicity or volume of impacted materials.			
Status			I		
	Retained for further evaluation; the CM is recommended for the area.	Retained for further evaluation; the CM is not recommended for the area.	Retained for further evaluation; the CM is a recommended for this area.		

Republic Engineered Products, Inc. Corrective Measure Proposal

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

Page 43 of 70 Revision 1 May 2010

SWMU 76b	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils sereening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RF1. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of porsonal hygiene including washing hands prior to caling, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two fect of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil exeavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:		<u> </u>		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Arca calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10"4
Non-Careinogenie Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM climinates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic H1 below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	The risk assessment for this Target Area resulted in an exceedances of the BLL; however, none of the samples assigned to this SWMU exceeded the screening criteria. The CM has no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.
Source Control	The CM would not control the source of COPIs (i.e. Fe, Mn, and Pb) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various motals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.
			•	

DOCUMENT

ARCHIVE

◄

EP

SWMU 76b	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
Target Area 10	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation	
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Ineffective, CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively roduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Roliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be naticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or upprovals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost		· · · · · · · · · · · · · · · · · · ·			
Cost of Implementation	\$0	\$0	\$4,500	\$11,000	
Estimated Future Costs	\$0	\$0	\$31,500	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of eap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold criteria; Removes the source from the Site	
Key Disadvantages				i Shadhamaa waxaa waxaa ahaa ahaa ahaa ahaa	
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;	Elimination of Iron as COPI unlikely with limited excavation and replacement with slag fill.	
Status					
· · · · · · · · · · · · · · · · · · ·	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area.	Retained for further evaluation; the CM is not recommended for this area.	

AOC 80	Corrective Measure Options			
	CM1	CM2		
Target Area 3	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold eriteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal lygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils.		
Attainment of Media Cleanup Objectives:				
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻¹	Criterion is not applicable because the Target Area calculated risk was below $1x10^{-4}$		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 $\mu g/dL$	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.		

.

AOC 80	Corrective Measure Options		
	CM1	CM2	
Target Area 3	No Further Action	Work Place Controls, Surface	
Balancing Criteria			
Long Term Reliability and Effectiveness			
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will aid to reduce the calculated risk by reducing the exposure to surface soils.	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	
Projected Useful Life of the Alternative	None	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of potential COPIs.	The CM would not reduce the toxicity, mobility or volume of potential COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	
Cost			
Cost of Implementation	\$0	\$0 .	
Estimated Future Costs	\$0	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	
Kev Advantages			
	There are no costs associated with the CM	Meets threshold criteria; Ease of implementation.	
Key Disadyantages			
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	
Status			
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; The CM is recommended as a general precaution applicable to the Target Area.	

AOC 87c	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 6	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, he importance of porsonal hygicne including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two foct of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-sile treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:	1	<u></u>	1	L
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Critorion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM climinates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis, CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

AOC 87c	Corrective Measure Options				
	CM1	CM2	CM3	CM4	
Target Area 6	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation	
Balancing Criteria					
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Ineffective, CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs, however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost				·	
Cost of Implementation	\$0	\$0	\$5,000	\$16,000	
Estimated Future Costs	\$0	\$0	\$31,000	\$0	
Cortainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the throshold critoria; Removes the source from the Site	
Key Disadvantages					
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials;		
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area.	Retained for further evaluation; the CM is not recommended for this area.	

AOC 90	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 3	No Further Action	Work Place Controls, Surface	Soil/Stag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold eriterin, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to include work practices and procedures to mitigate the risk to include work practices and enstruction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil escavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this oritoria	Yes, the CM meets this critoria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM moots this criteria
Attainment of Media Cleanup Objectives:	£		11	t
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below Ix10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-1}
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead lovel was below 10 µg/dL
Source Control	The CM would not control the source of COPIs (i.e. Fe and Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the stag are immobile as demonstrated by TCLP analysis, CM will control exposure to and nigration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Page 50 of 70 Revision 1 May 2010

DOCUMENT ARCHIVE ◄ Ш

AOC 90	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
Target Area 3	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation	
Balancing Criteria					
Long Term Reliability and Effectiveness		· ·			
Effectiveness of the Alternative	Ineffective, the CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation	Unrealistic operation and maintenance requirements; the ongoing activity and heavy equipment traffic in the area would continuously damage the soil cap; storage and processing of recycled steel will contribute to a high risk of failure.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost					
Cost of Implementation	\$0	\$0	\$303,000	\$3,080,000	
Estimated Future Costs	\$0	\$0	\$79,000	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 2.5% of the area.	Cost may vary substantially based on type of and disiance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2;	Meets the threshold criteria; Removes the source from the Site	
Key Disadyantages	1		1		
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the textisity or volume of impacted materials; Difficult to implement and impossible to maintain; High risk of failure	High cost	
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area due to ongoing material processing in this area.	Dismissed, the ongoing steel recycling in the area requires the use of the slag subsurface.	

AOC 95	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Independent	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold eriteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to climinate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measuro, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Ycs, the CM meets this criteria
Attainment of Media Cleanup Objectives:	······································		· · · · · · · · · · · · · · · · · · ·	
Carcinogenic Risk below 1x10 ⁴	Criterion is not applicable because the calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the calculated risk was below 1×10^{-4}	Critorion is not applicable because the calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the calculated risk was below 1×10^{-4}
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the non- carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the non-carcinogenic HI below 1.0 under general operating conditions.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby niding to reduce the non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis, CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as domonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Republic Engineered Products, Inc. Corrective Measure Proposal

AOC 95	Corrective Measure Options			
	CM1	CM2	CM3	CM4
Independent	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation
Balancing Criteria			Statut -	
Long Term Reliability and Effectiveness				
Effectiveness of the Alternative	Ineffective, the CM would not reduce the H1 to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Cap damage due to general operating conditions should be anticipated and can be addressed with general inspection and maintenance activity.	Removal of the source is reliable with no risk of failure.
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would prosont potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.
Cost				Lu
Cost of Implementation	\$0	\$0	\$4,500	\$11,000
Estimated Future Costs	\$0	\$0	\$31,500	\$0
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfull materials.
Key Advantages				
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	 Meets threshold criteria when used in conjunction with CM2; 	Meets the threshold criteria; Removes the source from the Site
Key Disadvantages			1	
	Baseline risks to human health and	Does not alter the mobility, toxicity, or volume of impacted	Does not reduce the toxicity or volume of	Not practical to remove the potential source (i.e.
	environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	material; Long term responsibility for administering program	impacted materials;	Siag Material).
Status				
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation; however the CM is not recommended for this area.	Retained for further evaluation; however the CM is not recommended for this area.

AOC 97	Corrective Measure Options				
	CM1	CM2	СМЗ		
Target Area 1	No Further Action	Work Place Controls, Surface	Work Place Controls, Subsurface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to control potentially complete exposure pathways from subsurface soils to industrial and construction workers as necessary to foalitate reducing the risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to subsurface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted subsurface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygicne including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria					
Protection of Human Health and the Environment	No, CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils when combined with CM3.	Yes, the CM meets this criteria for potential exposure to soils when combined with CM2.		
Attainment of Media Cleanup Objectives:					
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Careinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HJ below 1.0.	The CM climinates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	None of the samples assigned to this SWMU exceeded the sereening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.		
	i	I I I I I I I I I I I I I I I I I I I			

400.97	Corrective Measure Options				
AUC 37	CM		(342)		
Target Area 1	Civil No Eventhon Antion	UNIZ Wente Dinos Controls Surface	UM3		
Balancing Criteria	No Further Action	Work Flace Controls, Surface	work Place Controls, Subsurface		
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Inclifective, the CM would not reduce the HI to below 1.0.	The CM will reduce the exposure to surface soils.	The CM will reduce the exposure to subsurface soils.		
Reliability and Risk of Failuro	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliable with proper implementation; risk of failure associated with improper implementation		
Projected Useful Life of the Alternative	None	Indefinite	Indefinite		
Reduction in toxicity, mobility, and volume of waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity, mobility or volume of the COPIs.		
Short term effectiveness	Ineffective, there is no difference in the effectiveness of CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor altorations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.		
Cost					
Cost of Implementation	\$0	\$0	\$0		
Estimated Future Costs	\$0	\$0	\$0		
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Minimal non-quantifiable administrative fee associated with program revision and implementation.		
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria when used in conjunction with CM3; Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with CM2; Ease of implementation; Lower cost		
Key Disadvantages					
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of potential source material; Long term responsibility for administering program	Does not alter the mobility, toxicity, or volume of potential source material; Long term responsibility for administering program		
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation in combination with CM3; The CM is recommended as a general precaution applicable to the Target Area.	Retained for further evaluation in combination with CM2; The CM is recommended as a general precaution applicable to the Target Area.		

AOC 101	Corrective Measure Options			
	CM1	CM2		
Target Area 10	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necossary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with invacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs, including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils.		
Attainment of Media Cleanup Objectives:		I		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenie Health Index (HI) below 1.0	No samples were collected associated with this area. The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	No samples were collected associated with this area. The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.		
Blood Lead Level below 10 µg/dL	The risk assessment for this Target Area resulted in an exceedances of the BLL; however, none of the samples assigned to this SWMU exceeded the screening criteria. The CM has no affect on reducing the BLL for the Target Area.	The CM has limited to no affect on reducing the BLL for the Target Area.		
Source Control	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.		
Compliance with Wastø Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contuminated media.		

Corrective Measure Options			
CM1	CM2		
No Further Action	Work Place Controls, Surface		
Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will aid to reduce the calculated risk by reducing the exposure to surface soils.		
Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation		
None	Indefinite		
The CM would not reduce the toxicity, mobility	The CM would not reduce the toxicity, mobility or volume		
or volume of potential COPIs.	of potential COPIs.		
Inoffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.		
	I		
\$0	\$0		
\$0	\$0		
There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.		
There are no costs associated with the CM	Meets threshold criteria; Ease of implementation.		
<u> </u>			
Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program		
Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; The CM is recommended as a general precaution applicable to the Target Area.		
	Correct CM1 No Further Action Ineffective, The CM would not reduce the calculated risk to below acceptable levels. Ineffective and unreliable None The CM would not reduce the toxicity, mobility or volume of potential COPIs. Inoffective, there is no difference in the effectiveness of The CM over short and long term. Criterion is not applicable because there would be no implementation. S0 S0 S0 There are no costs associated with the CM There are no costs associated with the CM Baseline risks to human health and environment is not applicable, volume of impacted material. Dismissed, does not satisfy threshold criteria.		

SWMU 102	Corrective Measure Options			
	CM1	CM2	· CM3	CM4
Target Area 11	No Further Action	Work Place Controls, Surface	Soil/Slag Can	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold eriteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workors due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs: including, hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two fect of soil/slag backfill. Dependent upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria		1		1
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.	Yes, the CM meets this criteria
Attainment of Media Cleanup Objectives:	· · · · · · · · · · · · · · · · · · ·	<u> </u>	I	I
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1×10^{-4}	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (Hi) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM climinates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-careinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

SWMU 102	Corrective Measure Options				
	CM1	CM2	CM3	CM4	
Target Area 11	No Further Action	Work Place Controls, Surface	Soil/Slag Cap	Surface Excavation	
Balancing Criteria					
Long Term Reliability and Effectiveness				······	
Effectiveness of the Alternative	Institution institution in the second	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Reliability of the CM limited to muintaining cover thickness. Extreme cap damage due to use of area should be anticipated.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility or volume of the COPIs.	The CM would not reduce the toxicity; mobility or volume of the COPIs.	The CM would not reduce the toxicity or volume of COPIs, however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	The CM would remove the source from the Site thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term offectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost			1		
Cost of Implementation	\$0	\$0	\$6,000	\$11,000	
Estimated Future Costs	\$0	\$0	\$32,000	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs secount for semi nanual inspection and reporting with an annual replecement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of aud distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold critoria; Removes the source from the Site	
Key Disadvantages		1			
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; General operation results in excessive damage to CM.	Not practical to remove the potential source (i.e. Slag Material).	
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area.	Relained for further evaluation; the CM is not recommended for this area.	

SWMU 103	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 11	No Further Action	Work Place Controls, Surface	Soil/Slag Can	Surface Excavation
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and procedures to mitigate the risk to industrial workers and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to clevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or	CM will be utilized to eliminate potentially complete exposure pathways; therefore reducing the calculated risk to an acceptable level. The use of a soil/slag cap would consist of leveling the impacted area and installing two feet of soil/slag backfill. Dependant upon the location and intended use of the area, the cap may be covered with six inches of topsoil and vegetated.	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.
Threshold Criteria Protection of Human Health and the Environment	No, the CM does not meet this criteria	equipment (PPE). Yes, the CM meets this criteria for potential exposure to	Yes, the CM moots this criteria for potential	Yes, the CM meets this oriteria
		soils,	exposure but would require WPC for construction activity.	
Attainment of Media Cleanup Objectives:				
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target	Criterion is not applicable because the Target Area	Criterion is not applicable because the Target	Criterion is not applicable because the Target
	Area calculated risk was below 1x10 ⁴	calculated risk was below 1x10 ⁻⁴	Area calculated risk was below 1x10 ⁻⁴	Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0 under general operating conditions.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applieable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.
Source Control	The CM would not control the source of COPIs (i.e. Fe) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.

SWMU 103	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
Target Area 11	No Fuetbas Astien	Cint4	CM3		
Balancing Criteria		1 Work Trace Controls, Surface	Son/Siag Cap	Surface Excavation	
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Ineffective, CM would not reduce the Hi to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM effectively reduces the exposure risk by removing the source	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation	Reliability of the CM limited to maintaining cover thickness. Extreme cap damage due to use of area should be anticipated.	Removal of the source is reliable with no risk of failure.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility	The CM would not reduce the toxicity, mobility or volume	The CM would not reduce the toxicity or volume	The CM would remove the source from the Site	
	or volume of the COPIs.	of the COPIs.	of COPIs; however, the CM would reduce the mobility of media by reducing exposure of the impacted materials to the environment.	thereby reduce the toxicity, mobility and volume of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	Requires engineering and planning considerations, requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	
Cost			1		
Cost of Implementation	\$0	\$0	\$6,000	\$11,000	
Estimated Future Costs	\$0	\$0	\$32,000	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on the availability of cap material. Future costs account for semi annual inspection and reporting with an annual replacement/repair assumption equal to 5% of the area.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fees; and the availability of backfill materials.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Meets threshold criteria when used in conjunction with WPC;	Meets the threshold criteria; Removes the source from the Site	
Key Disadvantages		.		L	
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Does not reduce the toxicity or volume of impacted materials; General operation results in excessive damage to CM.	Not practical to remove the potential source (i.e. Slag Material).	
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation in combination with WPC; however the CM is not recommended for this area.	Retained for further evaluation; the CM is not recommended for this area.	

AOC 109	Corrective Measure Options			
	CM1	CM2		
Target Area 3	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils servening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RF1. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils.		
Attainment of Media Cleanup Objectives:		·		
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target	Criterion is not applicable because the Target Area		
	Area calculated risk was below 1x10 ⁻⁴	calculated risk was below 1x10 ⁻¹		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0 under general operating conditions.		
Blood Lend Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	The CM would not control the source of COPIs (i.e. Fe and Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.		

AOC 109	Corrective Measure Options			
	CM1	CM2		
Target Area 3	No Further Action	Work Place Controls. Surface		
Balancing Criteria				
Long Term Reliability and Effectiveness				
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will aid to reduce the Target Area calculated risk by reducing the exposure to surface soils.		
Reliability and Risk of Failure	ineffective and unreliable	Reliable with proper implementation, risk of failure associated with improper implementation		
Projected Useful Life of the Alternative	None	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility	The CM would not reduce the toxicity, mobility or volume		
	or volume of potential COPIs.	of potential COPIs.		
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.		
Cost				
Cost of Implementation	\$0	\$0		
Estimated Future Costs	\$0	\$0		
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.		
Key Advantages				
<pre>distribution control in the second se second second sec second second sec</pre>	There are no costs associated with the CM	Meets threshold criteria; Ease of implementation.		
Key Disadvantages				
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program		
Status				
	Dismissed, does not satisfy threshold criteria.	None of the samples collected in TA No. 3 were assigned to AOC 109; however, the CM is retained for further evaluation as a matter of consistency for the TA. Recommended.		

Page 63 of 70 Revision 1 May 2010

AOC 113	Corrective Measure Options			
	CM1	CM2	СМЗ	CM4
Target Area 3	No Further Action	Work Place Controls, Surface	Surface Excavation	Debris Removal
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils, Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to eating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).	Soil excavation is an absolute corrective measure, where contaminated material is excavated and transported to permitted off-site treatment and/or disposal facilities.	CM includes the removal, transportation and disposal of accumulated debris from the surface of the area of concern. The debris will be transferred to a permitted off-site treatment and/or disposal facility. The excavated area will be restored with a 1-foot thick layer of backfill.
Threshold Criteria		<u> </u>		
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to soils.	Yes, the CM meets this criteria	Yes, the CM meets this criteria for potential exposure but would require WPC for construction activity.
Attainment of Media Cleanup Objectives:		[[
Carcinogenic Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below $1x10^{-4}$	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.	The CM removes the source material thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.	The CM will aid in the reduction of the complete exposure pathway thereby aiding to reduce the Target Area non-carcinogenic HI below 1.0.
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Target Area blood lead level was below $10 \ \mu g/dL$.
Source Control	The CM would not control the source of COPIs (i.e. Fe and Mn) contributing to the Target Area Risk Based Factors.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.	The CM has the potential to eliminate the source.	Slag aggregate may contain residual levels of various metals from the steel production process. The metals in the slag are immobile as demonstrated by TCLP analysis. CM will control exposure to and migration of the source materials.
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Offsite disposal at an approved landfill would comply with waste management standards.	Offsite disposal at an approved landfill would comply with waste management standards.

AOC 113	Corrective Measure Options				
	CM1	CM2	CM3	CM4	
Target Area 3	No Further Action	Work Place Controls Surface	Surface Exception	Dobris Romaval	
Balancing Criteria		work race controls, burace			
Long Term Reliability and Effectiveness					
Effectiveness of the Alternative	Ineffective, CM would not reduce the HI to below 1.0	The CM will effectively reduce the calculated risk due to exposure to surface soils.	The CM effectively reduces the exposure risk by removing the source	The CM may reduce the calculated risk by removing accumulated debris from surface soils.	
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation	Removal of the source is reliable with no risk of failure.	Reliability of the CM limited to maintaining area free of accumulation.	
Projected Useful Life of the Alternative	None	Indefinite	Indefinite	Indefinite	
Reduction in Toxicity Mobility and Volume of Waste	The CM would not reduce the toxicity mobility	The CM would not reduce the toxicity mobility or volume	The CM would remove the source from the Site	The CM would not reduce the toxicity mobility or	
	or volume of the COPIs.	of the COPIs.	thereby reduce the toxicity, mobility and volume of the COPis.	volumo of the COPIs.	
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.	
implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Requires engineering and planning considerations, requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.	Requires engineering and planning considerations; no offsite treatment or disposal required; no permits or approvals required; no specialized technology requirements.	
Cost	· · · · · · · · · · · · · · · · · · ·	•		1	
Cost of Implementation	\$0	\$0	\$302,000	\$150,000	
Estimated Future Costs	\$0	\$0	\$0	\$0	
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal facility; disposal fccs; and the availability of backful materials.	Cost may vary substantially based on the accuracy of estimated material quantities and required disposal options. Future costs were not evaluated for this area.	
Key Advantages					
	There are no costs associated with the CM	Meets threshold criteria Ease of implementation; Lower cost	Moets the threshold criteria; Removes the source from the Site	Meets threshold criteria when used in conjunction with WPC; Removes material encroaching the EBNC.	
Key Disadvantages					
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program	Not practical to remove the potential source (i.e. Slag Material).	Not practical to remove the potential source (i.e. Slag Material).	
Status					
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; recommended.	Retained for further evaluation; the CM is not recommended for this area.	Retained for further evaluation; the CM is recommended to be used in combination with WPC.	

Page 65 of 70 Revision 1 May 2010

AOC 115	Corrective Measure Options			
	CM1	CM2		
Target Area 6	No Further Action	Work Place Controls, Surface		
Description	A no further action approach will maintain the SWMU or AOC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	The CM will be utilized to control potentially complete exposure pathways from surface soils to industrial and construction workers as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will modify their existing Safety Management System (SMS) documents and site permit requirements to include work practices and procedures to mitigate the risk to industrial workers and construction workers due to the exposure to surface soils. Employees are currently educated about the hazards associated with raw materials and final products at the Site, which are similar to the potential hazards associated with impacted surface soils. The education program will be expanded to include information on the areas of the Site that have an unacceptable calculated risk due to elevated levels of COPIs; including, the importance of personal hygiene including washing hands prior to cating, drinking, or smoking and, wearing appropriate personal protective equipment (PPE).		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM does not meet this criteria	Yes, the CM meets this criteria for potential exposure to surface soils,		
Attainment of Media Cleanup Objectives:				
Careinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not aid in reducing the Target Area non-carcinogenic HI below 1.0.	The CM eliminates the potentially complete exposure pathways thereby aiding to reduce the Target Area non- carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below $10 \ \mu g/dL$.	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.	None of the samples assigned to this SWMU exceeded the screening level; therefore source control for this area is not applicable.		
Compliance with Weste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.		

Republic Engineered Products, Inc.
 Corrective Measure Proposal

DOCUMENT

ARCHIVE

EPA

Table 3 (Former CMP Table 12) Corrective Measure Options Overview

Page 66 of 70 Revision 1 May 2010

AOC 115	Correcti	Corrective Measure Options		
	CM1	CM2		
Target Area 6	No Further Action	Work Place Controls, Surface		
Balancing Criteria				
Long Term Reliability and Effectiveness				
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM will aid to reduce the Target Area calculated risk by reducing the exposure to surface soils.		
Reliability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of fuilure associated with improper implementation		
Projected Useful Life of the Alternative	None	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility	The CM would not reduce the toxicity, mobility or volume		
	or volume of potential COPIs.	of potential COPIs.		
Short Term Effectiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term risks are reduced as procedures are implemented with no potential threats associated with the short term implementation.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.		
Cost	·			
Cost of Implementation	\$0	\$0		
Estimated Future Costs	\$0	\$0		
Certainty of Future Costs	There are no costs associated with the CM	Minimal non-quantifiable administrative fee associated with program revision and implementation.		
Key Advantages				
	There are no costs associated with the CM	Meets threshold criteria; Ease of implementation.		
Key Disadvantages				
	Baseline risks to human health and environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Does not alter the mobility, toxicity, or volume of impacted material; Long term responsibility for administering program		
Status				
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; The CM is recommended as a general precaution applicable to the Target Area.		

DOCUMENT

ARCHIVE

EPA

EBNC Overbank Sediments	Corrective Measure Options			
and Outfalls	CM1	CM2		
	No Further Action	Excavation		
Description	A no further action approach will maintain the EBNC in its current state without implementing methods to control exposures. This option would be utilized for SWMUs or AOCs where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply to SWMUs and AOCs where the source of release is controlled or eliminated, the calculated risk is below the thorshold criteria, and/or there were no COPI detected above surface or subsurface soils screening levels.	Excavation of soils and sediments is an absolute corrective measure, where contaminated material is exeavated and transported to permitted off-site treatment and/or disposal facilities. The excavation of sediments would include the first 500 feet behind the dam on the EBNC. Visual observation of the sodiments being dredged will be used to determine when the removal activities have reached the natural stream bed. In addition to the in-stream sediment removal activities, a targeted hot spot excavation around sample location OB-7 would be conducted. The proposed surface excavation is estimated to measure approximately 10 feet by 10 feet by 1 foot deep to address PAH-impacted overbank sediment deposits. Additionally, the orange staining near Outfall 011 will also be removed to the visible limits of staining.		
Threshold Criteria				
Protection of Human Health and the Environment	No, the CM meets the human health criterion but does not meet this ecological criterion.	Yes, the CM meets this oriteria		
Attainment of Media Cleanup Objectives:	I			
Carcinogenie Risk below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴	Criterion is not applicable because the Target Area calculated risk was below 1x10 ⁻⁴		
Non-Carcinogenic Health Index (HI) below 1.0	Criterion is not applicable because the Target Area non-carcinogenic HI below 1.0.	Criterion is not applicable because the Target Area non- carcinogenic HI below 1.0.		
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Target Area blood lead level was below $10 \ \mu g/dL$	Criterion is not applicable because the calculated Target Area blood lead level was below 10 µg/dL.		
Source Control	The CM would not control the source of COPIs contributing to the Ecological Risk Based Factors.	The CM has the potential to eliminate the source.		
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media,	Offsite disposal at an approved landfill would comply with waste management standards.		

DOCUMENT

ARCHIVE

EPA

EBNC Overbank Sediments	Corrective Measure Options			
and Outfalls	CM1	CM2		
	No Further Action	Excavation		
Balancing Criteria				
Long Term Reliability and Effectiveness		· · · · · · · · · · · · · · · · · · ·		
Effectiveness of the Alternative	Ineffective, The CM would not reduce the ecological calculated hazard quotient to below acceptable levels.	The CM effectively reduces the exposure risk by removing the source		
Reliability and Risk of Failure	Ineffective and unreliable	Removal of the source is reliable with no risk of failure.		
Projected Useful Life of the Alternative	None	Indefinite		
Reduction in Toxicity, Mobility, and Volume of Waste	The CM would not reduce the toxicity, mobility	The CM would remove the source from the Site thereby		
	or volume of potential COPIs.	reduce the toxicity, mobility and volume of the COPIs.		
Short Term Effoctiveness	Ineffective, there is no difference in the effectiveness of The CM over short and long term.	Short term effectiveness would present potential exposure to construction workers. The risk to construction workers can be reduced through the development and implementation of an appropriate Health & Safety Plan.		
Implementability	Criterion is not applicable because there would be no implementation.	Requires engineering and planning considerations; requires offsite treatment or disposal; requires permits or approvals; no specialized technology requirements.		
Cost				
Cost of Implementation	\$0	\$372,000		
Estimated Future Costs	\$0	\$0		
Certainty of Future Costs	There are no costs associated with the CM	Cost may vary substantially based on type of and distance to an appropriate offsite treatment and/or disposal faeility; disposal fces.		
Key Advantages				
	There are no costs associated with the CM	Meets the threshold criteria; Removes the source from the Site		
Key Disadvantages				
	Baseline risks to the environment is not acceptable; No change in toxicity, mobility, volume of impacted material.	Costly, Sediments can accumulate behind the dam over time.		
Status				
	Dismissed, does not satisfy threshold criteria.	Retained for further evaluation; the CM is recommended for this area.		

Page 69 of 70 Revision 1 May 2010

Groundwater	Corrective Measure Options				
	CM1	CM2	СМЗ	CM4	
	No Further Action	Monitoring Natural Attenuation	Workplace and Institutional Controls	Confirmatory Sampling	
Description	A no further action approach will maintain the Site in its current state without implementing methods to control exposures. This option would be utilized for areas where it has been demonstrated that protection of human health and the environment is attained without further action. This would apply when the source of release is controlled or eliminated, the calculated risk is below the threshold criteria, and/or there were no COPI detected above sereening levels.	Monitored natural attenuation (MNA) is a technique used to monitor or test the progress of natural attenuation processes that can degrade contaminants in soil and groundwater. It may be used with other remediation processes as a finisiting option or as the only remediation processes as a finisting option or as the only remediation processes if the rate of contaminant degradation is fast enough to protect human health and the environment. MNA will also ensure that groundwater with a calculated risk above acceptable levels is not migrating offsite.	Workplace controls (WPC) will be utilized to control potentially complete exposure pathways from groundwater to potential receptors as necessary to facilitate reducing the calculated risk to an acceptable level under the assumptions used for the risk assessment portion of the RFI. Republic will implement institutional controls such as property use restrictions thereby eliminating non-industrial exposure scenarios, as well as, groundwater use restrictions thereby eliminating potential ingestion and direct contact exposure pathways to industrial workers. An environmental covenant will be filed with Stark County Recorder's Office to document site activities and property restrictions.	Confirmatory sampling proposed as part of this CMP is intended to verify that the previous conclusions (i.e. sitewide groundwater is not impacting offsite groundwater, surface water or sediments) remain valid following implementation of the onsite corrective measures through additional groundwater sampling at select locations over a period of up to 5 years.	
Threshold Criteria					
Protection of Human Health and the Environment	No, the CM does not meet this criteria	The CM meets this criteria for potential exposure to Site groundwater when combined with CM3 - Workplace and Institutional Controls	The CM meets this criteria for potential exposure to Site groundwater	The CM meets this criteria for potential exposure to Site groundwater when combined with CM3 - Workplace and Institutional Controls	
Attainment of Media Cleanup Objectives:		I			
Carcinogenic Risk below 1x10 ⁻⁴	The CM does not aid in reducing the calculated Sitewide Groundwater Lifetime Incremental Cancer Risk (LICR) below 1x10-4	The CM does not aid in reducing the calculated LICR for groundwater below 1×10^{-4} initially.	The CM is intended to eliminate the potential complete exposure pathway thereby aiding to reduce the LICR under 1x10-4 for general operating conditions.	The CM is intended to verify that the previous conclusions (i.e. sitewide groundwater is not eausing offsite groundwater, surface water or scdiments to have a calculated LICR in excess of 1x10-4) remain valid following implementation of the onsite corrective measures.	
Non-Carcinogenic Health Index (HI) below 1.0	The CM does not nid in reducing the Sitewide Groundwater non-careinogenic HI below 1.0.	The CM does not aid in reducing the Sitewide Groundwater non-carcinogenic HI below 1.0.	The CM is intended to eliminate the potential complete exposure pathway thereby aiding to reduce the Sitewide Groundwater non- carcingorie. III below 1.0 under general operating conditions.	The CM is intended to verify that the previous conclusions (i.e. sitewide groundwater is not causing offsite groundwater, surface water or sediments to have a calculated non-carcinogenic H below 1.0) remain valid following implementation of the onsite corrective measures.	
Blood Lead Level below 10 µg/dL	Criterion is not applicable because the calculated Sitewide Groundwater blood lead level was below 10 $\mu g/dL_{\star}$	Criterion is not applicable because the calculated Sitewide Groundwater blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Sitewide Groundwater blood lead level was below 10 µg/dL.	Criterion is not applicable because the calculated Sitewide Groundwater blood lead level was below 10 µg/dL.	
Source Control	The CM would not control the source of COPIs contributing to the Sitewide Groundwater Risk Based Factors.	The CM would not control the source of COPIs contributing to the Sitewide Groundwater Risk Based Factors. The CM would rely on natural processes to eliminate the source over time	The CM would not control the source of COPIs contributing to the Sitewide Groundwater Risk Based Factors.	The CM would not control the source of COPIs contributing to the Sitewide Groundwater Risk Based Factors,	
Compliance with Waste Management Standards	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	Criterion is not applicable because the CM would not involve removal of contaminated media.	

Republic Engineered Products, Inc. Corrective Measure Proposal

Groundwater	Corrective Measure Options				
	<u>CM1</u>	CM2	СМЗ	CM4	
	No Further Action	Monitoring Natural Attenuation	Workplace and Institutional Controls	Confirmatory Sampling	
Balancing Criteria					
Long Term Reliability and Effectiveness	· · · · · · · · · · · · · · · · · · ·				
Effectiveness of the Alternative	Ineffective, The CM would not reduce the calculated risk to below acceptable levels.	The CM has the ability to meet the threshold criteria over time through natural attenuation of the source.	The CM will effectively reduce the calculated risk, except for the construction worker risk scenario.	The CM will provide information to effectively confirm that offsite groundwater, surface water, and sediment does not pose a potentially unacceptable calculated risks to human health or coological receptors following implementation of the onsite corrective measures.	
Refiability and Risk of Failure	Ineffective and unreliable	Reliable with proper implementation; risk of failure associated with improper implementation and lack of reductive natural conditions.	Reliability of CM limited to implementation and enforcement of controls.	Reliable as this CM allows direct measurement of groundwater quality at the property boundary and the selected monitoring well network.	
Projected Useful Life of the Alternative	Indefinite	Indefinite	Indefinito	Indefinite	
Reduction in toxicity, mobility, and volume of waste	The CM is not proactive towards the reduction of toxicity, mobility or volume of the COPIs.	The CM is not proactive towards the reduction of toxicity, mobility or volume of the COPIs.	The CM is not proactive towards the reduction of toxicity, mobility or volume of the COPIs.	The CM is not proactive towards the reduction of toxicity, mobility or volume of the COPIs.	
Short term effectiveness	Ineffective, there is no difference in the effectiveness of the CM over short and long term.	Ineffective as a short term treatment option.	Effective as a short term method for exposure control.	Effective as a short term method for calculating potential exposure.	
Implementability	Criterion is not applicable because there would be no implementation.	Implementation would involve designing and implementing a monitoring plan.	Requires minor alterations to plans and procedures already in use. Minimal time to implement and achieve beneficial response. Requires no permits or offsite approvals.	Implementation would involve designing and implementing a monitoring plan.	
Cost		I	· · · · · · · · · · · · · · · · · · ·		
Cost of Implementation	\$0	\$10,000	\$10,000	\$10,000	
Estimated Future Costs	\$0	\$2,200,000	\$0	\$142,000	
Certainty of Future Costs	There are no costs associated with the CM	Costs may vary depending on the number and type of parameters analyzed as well as the required frequency of sampling and reporting.	Minimal non-quantifiable administrative fee associated with program revision and implementation. Minor costs associated with establishing and memorializing the institutional controls.	Costs may vary depending on the results of the monitoring, number and type of parameters analyzed, and required frequency of sampling and reporting.	
Key Advantages					
	There are no costs associated with the CM	Ease of implementation; Ability to meet threshold criteria over time.	Meets the threshold requirements with the exception of source control; Effective in the near-term; Minimal fee to implement;	Ease of implementation; Ability to verify that offsite groundwater, surface water, and sediment continue to meet threshold criteria following implementation of the onsite corrective measures.	
Key Disadvantages	• • • • • • • • • • • • • • • • • • •	· / // ///////////////////////////////	• • • • • • • • • • • • • • • • • • • •	•	
	Baseline risks to human health and environment is not acceptable; No proactive change in toxicity, mobility, volume of impacted material.	Not able to meet the threshold requirements in the near-term; Ineffective in the near-term; Larger future monetary requirements; Not proactive in reducing the toxicity, mobility, or volume of source.	Not proactive in roducing the toxicity, mobility, or volume of source.	Not proactive in reducing the toxicity, mobility, or volume of source.	
Status	· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
	Dismissed, does not satisfy threshold criteria.	Dismissed, there is no need to perform MNA because sitewide groundwater is not causing offsite groundwater, surface water, and sediment to exceed the threshold criteria.	Retained for further evaluation; the CM is recommended for groundwater to be used in conjunction with CM4.	Retained for further evaluation; the CM is recommended for groundwater to be used in conjunction with CM3.	