DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name:	Action Manufacturing Company
Facility Address:	500 Bailey Crossroads, Atglen, PA 19310
Facility EPA ID #:	PAD096844311

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   X If yes - check here and continue with #2 below.

   ____ If no - re-evaluate existing data, or

   ____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Facility History

Action Manufacturing Company ("Action") is located in Atglen, West Fallowfield Township, Chester County, Pennsylvania. The property is 217 acres in size and contains 93 operations buildings including eight aboveground munition magazines. Action manufactures explosive and timing devices for the United States and foreign governments, as well as private contractors. The company produces a variety of detonators, leads, ignition elements and fuses. Explosive materials are processed on-site and incorporated into final military-grade products for packaging and shipping. Historically, explosive wastes generated by operations conducted at the facility were disposed of onsite by open burning in pits and detonation areas or by chemical/physical treatment methods.

Action purchased the facility in 1975 from Colt Industries. Between 1965 and 1975, Colt Industries constructed several buildings throughout the site and operated an explosives assembly facility, similar to the present operation. Prior to 1965, the property is believed to have been used for agricultural purposes. The land surrounding the facility is primarily agricultural with some residential properties.

The property can be separated into three areas based on topography and land use. The eastern portion of the site is the most developed and contains most of the company's manufacturing, storage and administrative offices. The southern portion of the property is largely undeveloped woods and farmlands. The western portion of the property consists largely of undeveloped fields and woodlands and contains several storage magazines as well as areas formerly used for disposal.

In March 1992, EPA issued a unilateral Order from Superfund requiring Action to undertake a removal action to identify, segregate, and dispose of various off-specification and surplus munitions, explosive manufacturing wastewaters, and materials such as rags, packing materials, and cleaning materials potentially contaminated with explosives. A November 1992 Preliminary Findings Report (PFR) identified the Detonation Fields, Burn Pits, Popping Kettle and Burn Cages as areas of concern (AOCs) at the site:

An August 1993 Response Action Plan (RAP) Report supported the position that no further remedial action or investigation was required under the CERCLA Order. Groundwater sampling indicated that 1,1,1-TCA, acetone, phthalates, HMX and RDX (explosive compounds) were present in the on-site production wells but these contaminants were not found in the twelve offsite wells and springs that were sampled. Soils from 13 AOCs were evaluated during the RAP. Hexachlorobenzene in a soil sample collected in the burn cage area and arsenic in a boring installed in the burn pit area were found to exceed the 10^{-6} target risk level (TRL) for residential exposure. The arsenic was also above the 10^{-4} TRL for commercial/industrial exposure. Several organic compounds, metals and explosive compounds were detected at concentrations below the screening criteria in surface water and seep samples.

After Action satisfied all requirements under the CERCLA 106 Order, EPA informed Action that future study or remediation of the site would occur pursuant to the RCRA Corrective Action program. A Pre-RCRA Facility Investigation was completed in January 1994 with the purpose of eliminating certain AOCs from any future RCRA Corrective Action at the site. Areas which were characterized as not requiring further corrective action were the Popping Kettle, the Sand Bed Burning Pad, the Low Ground Clearance trailer and the Satellite Accumulation Areas. EPA agreed that these areas do not require further evaluation or remediation.

On September 24, 1994, Action and EPA entered into a RCRA Facility Investigation (RFI)/Corrective Measures Study (CMS) Consent Order.

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			The explosive compound RDX and several VOCs (vinyl chloride, ethylbenzene, benzene, trichloroethylene (TCE), etc.) were detected in groundwater at levels above EPA's tap water risk based concentrations (RBCs) in wells located in the developed eastern portion of the site and former disposal areas in the western portion of the site. Elevated levels of nitrobenzene have been detected in wells along the eastern portion of the property. Dissolved arsenic, iron and manganese have been detected above the RBCs in the Burn Pit and Plant areas.
Air (indoors) [2]		X		TCE and other VOCs have been detected in groundwater samples collected in the developed eastern portion of the site near occupied operations buildings at concentrations above the RBC. However, no VOC contamination from the site is suspected of impacting any off-site properties.
Surface Soil (e.g., <2 ft)	X			Arsenic concentrations in surface soils in the vicinity of Burn Pit Boring BP-7, Geophysical Anomaly AA-4, and the Buildings 1 and 4 Infiltration Bed were found to be significantly higher than the levels found in background surface soil samples. The arsenic concentrations at the source areas were above both the residential and industrial soil direct contact RBCs.
Surface Water	X			RDX has been detected in surface water samples at concentrations above the tap water RBC. Several VOCs were detected in one surface water sample at concentrations above their respective RBCs.
Sediment	X			Aluminum, arsenic, chromium, iron and manganese were detected in sediment samples collected during the RAP and Phase I RFI at levels above the residential soil RBCs.
Subsurf. Soil (e.g., >2 ft)	X			Arsenic concentrations in subsurface soils in the vicinity of Burn Pit Boring BP-7, Geophysical Anomaly AA-4, and the Buildings 1 and 4 Infiltration Bed were found to be significantly higher than the levels found in background subsurface soil samples. The arsenic concentrations at the source areas were above both the residential and industrial soil RBCs.
Air (outdoors)		X		No evidence of a release of contaminants to air.

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Groundwater:
It should be noted that the RBC's selected by Action for noncarcinogens were based on a hazard index (HI) of 0.1 rather than 1.0. The health-based screening levels for noncarcinogens contained in the USEPA Region 3 RBC Table were divided by 10 to allow for the presence of multiple chemicals, while screening below an HI of 1.0. Unless stated otherwise, all references to RBCs below and in the following sections of this document are based on an HI of 0.1 for noncarcinogens.

Sixteen monitoring wells were installed for the Phase I RFI, completed in 1996. VOCs including 1,1-dichloroethene, 1,1-dichloroethane, trichloroethylene (TCE), toluene, acetone and 2-butanone were detected at concentrations above their respective RBCs at MW-1S (near Burn Pits). Low concentrations of chlorinated organics were detected in several of the wells in the Plant Area. TCE was found at concentrations above the RBC at a few of those wells. The explosive compound RDX was detected at significant levels in approximately half of the Phase I RFI monitoring wells and production wells. Another explosive compound, HMX was also detected in about half of the well samples, but below its associated RBC. These compounds were generally detected in wells downgradient of the Burn Pits and Plant Area operations. The only inorganic analytes which were found to exceed RBCs during the Phase I investigation were dissolved arsenic, manganese and iron in a few of the wells.

Eight monitoring wells (4 in the western portion of the site and 4 in the Plant/Production Area) were installed as part of the Phase II RFI in 1997. Seven of the eight Phase II wells and the 16 Phase I wells were sampled for the Phase II RFI. VOCs were again detected in MW-1S at concentrations above RBCs. A few VOCs at concentrations below the RBCs were found in the sample collected from MW-1D. Explosive compounds were detected in 11 of the 17 shallow wells and in two of the six deep wells.

In December 1999, monitoring well MW-18S (Central Detonation Field) and P-3 (Southwest Detonation Field) were installed. A site wide groundwater sampling event occurred during the first week of January 2000. Volatile organic compounds were found in groundwater samples collected in the vicinity of the central detonation field and burn pits at concentrations that exceeded EPA's RBCs for tap water. The highest levels of VOC contamination continued to be found at monitoring well MW-1S. TCE contamination was still apparent in the Plant area. RDX was found in 17 of the groundwater sampling locations and two seep sampling locations at concentrations above the RBC. Another explosive compound, nitrobenzene, was found in 10 wells above the RBC (Hazard Index of 0.1). Dissolved manganese and iron were found in several groundwater samples at concentrations above the RBCs.

In December 2001, monitoring wells MW-19S and MW-20S were installed to better define groundwater flow in the central western portion of the site. The new wells and four existing wells in the central western portion of the site were sampled for VOCs, RDX and select total and dissolved metals. VOCs were again detected at concentrations above the RBCs in the sample collected from MW-1S. No VOCs were detected in the samples collected from the two new monitoring wells or from well numbers MW-15S and P-3. The groundwater sample from MW-18 exhibited concentrations of 1,1-DCA and 1,1-DCE below their respective RBCs. RDX was found in each of the 6 groundwater samples, although it was above the RBC in only three of the samples (MW-1S, MW-18S and MW-19S). While total aluminum, arsenic, iron, lead and manganese were found in the wells at concentrations greater than the RBCs, only dissolved iron (MW-1S) and manganese (all 5 samples analyzed) were found at levels higher than the RBCs.

Surface and Subsurface Soil:

Soils from 13 AOCs were evaluated during the RAP. Hexachlorobenzene in a soil sample collected in the burn cage area and arsenic in a boring installed in the burn pit area were the only contaminants found to exceed the 10^{-6} target risk level (TRL) for residential exposure. The arsenic was also above the 10^{-4} TRL for commercial/industrial exposure.
A Pre-RCRA Facility Investigation was completed in January 1994 with the purpose of eliminating certain AOCs from any future RCRA Corrective Action at the site. Areas which were characterized as not requiring further corrective action were the Popping Kettle, the Sand Bed Burning Pad, the Low Ground Clearance trailer and the Satellite Accumulation Areas. EPA agreed that these areas do not require further evaluation or remediation. The Pre-RCRA Facility Investigation recommended additional study of the Burn Cages and Diesel/Gasoline Tank Containment Area.

Soil sampling was conducted at 15 individual AOCs as part of the Phase II RCRA Facility Investigation. Based on the results of this sampling effort, no further action was determined to be required at 9 of these AOCs including a waste oil storage area near Building 55, the Diesel/Gasoline Tank Containment Area, the 40 mm Test Range, the Shooting Range Backstops, the Building 17 Infiltration Bed, the Building 20 Infiltration Bed, Demolition Debris Area, Colt Explosives Test Pit, and the Former Colt Powder Mix House. Further investigation/action would be required at the remaining 6 AOCs including the area around Burn Pit Boring BP-7, Buildings 1 and 4 Infiltration Bed, Building 35, Geophysical Anomaly AA-4, the Maintenance Trailer, and the Burn Cages. A seventh AOC requiring additional investigation was the lead contamination impacting the soils around Building 18.

On June 23, 1999 EPA approved of Actions's May 1999 Soil Removal Plan which addressed soil contamination proximate to Building 35, the Maintenance Trailer, the Burn Cages and Building 18 at the Plant. On November 10, 1999 EPA approved of the soil removal interim measures at these four areas and stated that no additional soil remediation would be required at those areas.

In December 1999, arsenic delineation soil samples were collected from the Burn Pit area, Geophysical Anomaly area and Buildings 1 and 4 Septic System area. The arsenic delineation soil samples indicated that significant arsenic contamination was present in both the surface and subsurface soils at the three investigated areas compared to background levels and RBCs. Arsenic concentrations in the surface soils were found as high as 93.4 mg/kg and were found as high as 321 mg/kg in the subsurface soils.

Surface Water:

The site is traversed by three distinct surface water bodies. Knight Run Creek flows west along the southern property boundary. Little Knight Run Creek, a tributary to Knight Run Creek, crosses the southern portion of the property and flows from east to west. An unnamed tributary to Little Knight Run Creek runs through the central portion of the facility from north to south and contains a pond on its upper portion on the Action property.

Surface water samples were collected from three locations (Knight Run Creek, Little Knight Run Creek, and the Unnamed Tributary to Little Knight Run Creek) as part of the Response Action Plan. The only organic contaminant detected in the most upstream surface water sample (unnamed tributary) was 1,1,1-trichloroethane (2 J ug/l). The common laboratory contaminants acetone and diethylphthalate.were found in the two downstream samples at low laboratory qualified concentrations. 1,1,1-TCA was also detected at 2 J ug/l in the sample collected from Little Knight Run Creek. RDX and HMX were detected in the two downstream samples. The RDX concentrations were greater than the tap water RBC for that contaminant. The only inorganic constituents for which there is a standard detected in the three surface water samples were barium, manganese, and zinc. The highest concentrations of these inorganic constituents were all less than their corresponding RBC.

Surface water samples from Little Knight Run Creek and its tributaries were collected from six locations as part of the Phase I RFI. VOCs were found in SW-3 (1,1-DCA - 2 ug/l, 1,1,1-TCA - 2 ug/l, cis-1,2-DCE - 0.8 ug/l and laboratory qualified concentrations for a few other VOCs). Explosive compounds HMX and RDX were found at the single digit ppb level in three of the surface water samples. The RDX concentrations were above the tap water RBC. Arsenic (SW-1) and manganese (SW-1, SW-3, and SW-6) were also found at concentrations exceeding the tap water RBCs.

Sediment:

Sediment samples were collected from three locations (Knight Run Creek, Little Knight Run Creek, and the Unnamed Tributary to Little Knight Run Creek as part of the Response Action Plan. Additional sediment samples from two depths at the same sample location in a pond located along the Unnamed Tributarty to Little Knight Run Creek were collected as part of the Phase I RFI. The only organic compounds found in any of the sediment samples were common laboratory contaminants (methylene chloride, acetone, chloroform and bis(2-ethylhexyl)phthalate) which were all detected with laboratory qualifiers and are not attributable to historical site operations. The explosive compound RDX was detected in the subsurface sediment sample collected at the pond, but it was at a concentration below the residential soil RBC. Aluminum, arsenic, chromium, iron and manganese were found at concentrations in excess of their respective RBCs. The higher concentrations of the metals were generally found in the downstream samples.

Air (indoor)

There is no evidence to support that any VOC-contaminated groundwater has migrated off-site or has impacted the indoor air quality of nearby residences or other off-site structures. The highest concentrations of VOCs at the site have been found in groundwater samples collected from MW-1S, MW-2S and MW-18S, all of which are located in the western portion of the site at least several hundred feet from the nearest occupied building. Low concentrations of TCE, 1,1-dichloroethene, 1,1-dichloroethane, cis-1,2-dichloroethene, 1,1,1-trichloroethane and toluene have been detected in monitoring wells located near buildings in the developed eastern portion of the plant.

Comparing the observed concentrations of these VOCs to the 10^{-5} risk level target groundwater concentrations contained in Table 2b and Table 3b-GW of EPA's "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" indicates that only TCE may be a potential indoor air problem for workers at the site. The target groundwater concentration for TCE in the guidance tables is 5 ug/l, which corresponds to the maximum contaminant level (MCL) for the compound. Historically, TCE has been found to exceed the MCL at only one well (MW-10D) located about 150 feet south of the maintenance trailer. The TCE concentration in samples collected from this well has been as high as 17 ug/l.

Utilizing a very conservative groundwater to indoor air attenuation factor of 0.01, TCE at 17 ug/l in groundwater corresponds to an indoor TCE air concentration of 0.07 mg/m^3 or 0.013 ppm. The Occupational Safety and Health Administration (OSHA) has the lead role in addressing potential occupational exposures. OSHA's permissible exposure limit (PEL) for TCE is 100 ppm. The National Institute for Occupational Safety and Health (NIOSH) time weighted average (TWA) for TCE is 25 ppm. Since these regulatory levels are at least three orders of magnitude greater than an overly conservative estimate of the TCE concentration inside buildings at the facility, it is concluded that TCE does not pose a significant health risk to workers at the site.

Air (Outdoor)

A release of contaminants from source areas to the air above a risk-based level is not suspected. The concentrations of VOCs observed at the site do not warrant a concern for a release to the atmosphere.

Ref.: Response Action Plan Report, Action Manufacturing Company, prepared by ERM Inc., August

1993; Resource Conservation and Recovery Act Work Plan, Action Manufacturing Company, prepared by, ERM Inc., April 1995; Phase I RCRA Facility Investigation Report, Action Manufacturing Company Plant No. 5, prepared by Dames & Moore, February 1996; Phase II RCRA Facility Investigation Report, Action Manufacturing Plant No. 5, prepared by ERM Inc., Revised April 1999; Soil Removal Summary Report, Action Manufacturing Company, prepared by ERM, Inc., October 1999; Supplemental Phase II RFI soil and groundwater data tables, submitted by ERM, Inc., December 2000; Supplemental Phase II RFI Groundwater Investigative Activities, submitted by ERM, Inc., October 2002; Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, USEPA, November 2002.

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	Yes	No	No			No
~~Air (indoors)~~	___	___	___				
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Surface Water	No	No			No	No	No
Sediment	No	No			No	No	No
Soil (subsurface e.g., >2 ft)				No			No
~~Air (outdoors)~~	___	___	___	___	___		

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

X If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

See the following pages

Groundwater

As described in the rationale for Question No. 2 above, several VOCs, semi-VOCs, explosive compounds, and inorganic constituents were detected in at least one of the four groundwater sampling events that have occurred at the site since the Phase I RFI. Groundwater elevation contour maps, which show the direction of groundwater flow at the site, used in conjunction with historical groundwater analytical data provide no evidence that any of the VOC, semi-VOC or inorganic constituent contamination has migrated off-site.

There is some evidence that groundwater contaminated with RDX at concentrations below the tap water RBC may be migrating off-site to the west of the detonation fields. Well no. MW-20S is located along the western border of the site and was found to contain RDX at a concentration of 0.26 ug/l during the December 2001 sampling event. This well is located downgradient of the wells near the Burn Pits and Central Detonation Field where levels of RDX above the RBC were observed. RDX is not currently suspected of migrating off-site at a concentration that is harmful to human health. Explosive compounds were not detected in any of the off-site groundwater samples collected as part of the RAP from nine wells and three springs located within a quarter mile radius of the Action property.

The January 2000 groundwater sampling event indicated that nitrobenzene was present in ten wells above the RBC (HI = 0.1). Monitoring well MW-14D, installed during the Phase II RFI south of the Plant Area and across Little Knight Run Creek was found to contain nitrobenzene at 0.69 ug/l when sampled as part of the January 2000 site wide groundwater sampling event. This well is relatively close to the property's eastern border. The only other contaminant detected above the RBC in MW-14D was manganese, but its concentration was below the background concentration for that metal in groundwater and its presence is more attributable to the natural geology than to any site related activities. The low levels of VOC contamination seen in the Plant Area were not detected on the MW-14D side of the Little Knight Run Creek. Since nitrobenzene is the only site-attributable contaminant that is potentially migrating off-site from the Plant Area, it is appropriate to set the Hazard Index at 1.0 for this contaminant which corresponds to an RBC of 3.5 ug/l. Only one well (MW-10D) was found to contain nitrobenzene above this RBC. Since the concentration of nitrobenzene in MW-14D is almost one order of magnitude below the 3.5 ug/l RBC, it is unlikely that this contaminant is migrating off-site at a level that may be harmful to human health.

The groundwater pathway is complete for workers at the plant, since groundwater is used as process water in the plant and for sanitary purposes. Groundwater from the plant production wells is not used as a source of drinking water at the site. Historically, RDX and dissolved copper, iron, and manganese have been detected at concentrations greater than their corresponding RBCs in the plant production wells. The metals concentrations are more indicative of the natural geology in the area and are not attributable to site related activities. Lower than RBC concentrations of VOCs and other explosive compounds have been detected in samples collected from the production wells.

Surface and Subsurface Soil:

There is no evidence that supports that site-related activities resulted in the contamination of any off-site soils. The facility can only be accessed through a gate on Bailey's Crossroads and there is 24-hour security protection. The entire perimeter of the facility is bounded by a 6-foot chain link fence with barbed wire on top.

Soil contamination has been addressed at all but three AOCs at the site including the Geophysical Anomaly, Building Nos. 1 and 4 Infiltration Bed, and the area around Burn Pit Boring BP-7, which each were found to contain elevated levels of arsenic in both the surface and subsurface soils when compared

to the background samples collected per the Supplemental Phase II Investigation.

Action has agreed to minimize the opportunities for its employees to come into contact with the arsenic contaminated soil located in the three identified source areas. Action will also ensure that its employees and/or contractors will wear the proper personal protective equipment if excavation/construction or any other type of soil disturbance is to occur in any of these areas. Action also agrees that these areas will be addressed in the final remedy for the site or prior to the final remedy.

Surface Water

Aside from the common laboratory contaminants that are not attributable to any operational activities at Action, only RDX, 1,2-dichloropropane, 1,2-dichloroethene, iron and manganese were detected in surface water at concentrations above the Pennsylvania Ambient Water Quality Criteria (AWQC) for Human Health or EPA's tap water RBC if AWQC data for a particular constituent was not available. These constituents do not present unacceptable risk to human health due to the infrequency of contact with on-site surface water. The screening levels assume that 100% of one's drinking water is from surface water, which is overly conservative for this site. In addition, the only attributable contaminant that was detected at a level above the corresponding RBC in the furthest downstream surface water sample was RDX. As part of the Risk Assessment included in the Phase II RFI, it was demonstrated that the concentrations of RDX observed in the surface water did not pose an unacceptable health risk to the indigenous terrestrial wildlife or aquatic receptors.

Sediment

The only contaminants detected in sediment samples at concentrations above the RBCs for residential soils were aluminum, arsenic, chromium, iron and manganese. These constituents do not present an unacceptable risk to human health due to the infrequency with which contact to on-site sediment would occur. Additionally, comparing sediment contaminant levels to residential soil screening levels is overly conservative; however, there are no sediment screening criteria currently in use.

Ref.: Response Action Plan Report, Action Manufacturing Company, prepared by ERM Inc., August 1993; Resource Conservation and Recovery Act Work Plan, Action Manufacturing Company, prepared by, ERM Inc., April 1995; Phase I RCRA Facility Investigation Report, Action Manufacturing Company Plant No. 5, prepared by Dames & Moore, February 1996; Phase II RCRA Facility Investigation Report, Action Manufacturing Plant No. 5, prepared by ERM Inc., Revised April 1999; Soil Removal Summary Report, Action Manufacturing Company, prepared by ERM, Inc., October 1999; Supplemental Phase II RFI soil and groundwater data tables, submitted by ERM, Inc., December 2000; Supplemental Phase II RFI Groundwater Investigative Activities, submitted by ERM, Inc., October 2002

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_X_ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Groundwater

The only complete pathway identified at the site is the exposure of contaminated groundwater to site workers. Although the plant production wells have been shown to contain RDX and a few metals at concentrations above the RBCs, it is important to note that water from these wells is not used for drinking purposes. Because Action only uses onsite groundwater for sanitary and limited production use, the tap water RBCs are overly conservative since they are based on a direct ingestion pathway (residential exposure scenarios at the water tap). The dermal dose associated with coming into contact with contaminated groundwater from the production wells through normal activities such as hand washing or showering is significantly less than the dose that may adversely impact human health. Therefore, dermal exposure to contaminated on-site groundwater has been determined to be insignificant.

Ref: Response Action Plan Report, Action Manufacturing Company, prepared by ERM Inc., August 1993; Resource Conservation and Recovery Act Work Plan, Action Manufacturing Company, prepared by, ERM Inc., April 1995; Phase I RCRA Facility Investigation Report, Action Manufacturing Company Plant No. 5, prepared by Dames & Moore, February 1996; Phase II RCRA Facility Investigation Report, Action Manufacturing Plant No. 5, prepared by ERM Inc., Revised April 1999; Exposure Factors Handbook, U.S. EPA, August 1997; Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), U.S. EPA, December 1989.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and

experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Action Manufacturing Company facility, EPA ID # PAD 096 844 311 , located at 500 Bailey Crossroads, Atglen, PA 19310 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by	(signature)	/s/	Date 4/29/03
	(print)	Andrew Clibanoff	
	(title)	RCRA Project Manager	

Supervisor	(signature)	/s/	Date 4/29/03
	(print)	Paul Gotthold	
	(title)	Chief, PA operations Branch	
	(EPA Region or State)	EPA Region III	

Locations where References may be found:

EPA Region III
Waste and Chemicals Management Division
1650 Arch Street
Philadelphia, PA 19103-2029

Contact telephone and e-mail numbers:

(name)	Andrew Clibanoff
(phone #)	215-814-3391
(e-mail)	clibanoff.andrew@epa.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.