SITE SPECIFIC ADVISORY BOARD OF THE ROCKY MOUNTAIN ARSENAL, INC.
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Re: Public Comments Submitted by the Site Specific Advisory Board (SSAB) of the Rocky Mountain Arsenal (RMA) Regarding the RMA 2020 Five-Year Review Report (FYRR)

1. Background:
Site Specific Advisory Board of the Rocky Mountain Arsenal, Inc.

In 1994, citizens concerned with the "clean-up" of the Rocky Mountain Arsenal presented a 300-signature-petition to Colorado Governor Roy Romer, requesting that a citizen advisory group be established based on *the Report of the Federal Facilities Environmental Restoration Dialogue Committee* (FFERDC). In response to that petition, the ***Site Specific Advisory Board of the Rocky Mountain Arsenal*** was formed in early 1994 by the State of Colorado and EPA Region VIII, as the first Site Specific Advisory Board (SSAB) established at a Department of Defense (DOD) "clean-up" site.

The ***Site Specific Advisory Board of the Rocky Mountain Arsenal*** has met regularly since its inception. Its meetings are open to the public and its programs often include presentations from, and discussions with, the Army, Shell Oil Company, EPA, the State of Colorado, the US Fish and Wildlife Service, and Tri-County Health. The ***Site Specific Advisory Board of the Rocky Mountain Arsenal*** incorporated in December 2000 as a not-for-profit corporation. Regular attendees also serve, or have served, on other RMA-related or RMA-interested boards including, but not limited to, the Restoration Advisory Board (RAB), the Citizen Advisory Board (CAB), the Medical Monitoring Advisory Group (MMAG), the Sierra Club RMA subcommittee, the National Caucus of RAB Community members, Montebello community groups, the Northern Coalition, and the City Council of Commerce City.

The Rocky Mountain Arsenal is one of the largest and most expensive "clean-up" projects to date in the United States. At the completion of "clean-up", land was transferred to the Rocky Mountain Arsenal National Wildlife Refuge, which is intended to attract national and international visitors. As such, the RMA affects citizens and communities bordering RMA, as well as those of the Denver-metropolitan area, the State of Colorado, the United States and potentially the entire planet. It is for this reason the ***Site Specific Advisory Board of the RMA*** seeks and encourages the involvement of all citizens and interested persons. The Site Specific Advisory Board of the Rocky Mountain Arsenal, Inc. received a Technical Advisory Grant from the U. S. Environmental Protection Agency (EPA) in 2001. Without this grant, meaningful and substantive public participation would be difficult, if not impossible. We thank the EPA for their continued support of meaningful public participation.

The members of the RMA SSAB have remained involved in the oversight of the "Clean-up" of the Rocky Mountain Arsenal for as many as 35 years. This is an amazing commitment from community members that is often overlooked, and even dismissed, by the many involved in the long-term Operations and Maintenance at RMA.

Why are we so committed to this citizen oversight process at RMA? The Polluters chose a cap-and-cover remedy (rather than removal or treatment of the thousands of tons of contamination at RMA). ***The RMA hasn't been "cleaned-up" as advertised: it has been "covered-up".*** The integrity of a cap-and-cover system is completely reliant on diligent, timely, pro-active, and effective long-term Operations and Maintenance at RMA. We believe that only the public and the regulators can ensure the integrity of this remedy and we bring tremendous historical knowledge and memory to this process, as well as a deep and abiding commitment.

We remember that the "clean-up" at RMA was designed to be minimally protective. By this we mean that the remedy is designed to protect the public to a level of 10 (-4). It means that after the RMA "clean-up" is complete, exposure to the contamination left at RMA will provide additional cancer risk to one in ten thousand people (this is in addition to the current cancer rates in the United States: one-in-two men will have cancer and one-in-three women will have cancer during their lifetimes). This is the minimum level of "clean-up" allowed by law and, at the time this remedy was selected, the standard level of "clean-up" was 10 (-6) or a one-in-one-million increase in the cancer risk.

The SSAB objected to a minimal "clean-up" at RMA, and has tried to be diligent in its oversight of the RMA "clean-up" precisely because a minimum "clean-up' will only remain protective of human health and the environment if the assumptions underlying the remedies are valid, if the "clean-up" is designed and performed at the highest possible level, and if long-term operations and monitoring are effective. If every step taken at RMA is as minimalized and compromised as the choice of the RMA remedy was, the community surrounding and visiting the RMA will be harmed and the State of Colorado will pay a huge price to try to correct the problems.

The Five Year Review process was designed to provide regular and continuing review of a remedy, both in terms of current project operations and, most importantly, in review of the ongoing effectiveness of the operations and maintenance of remedy projects that have been

finished, in order to insure protection of public health and the environment. Such a review is of highest importance at a site like the RMA where thousands of tons of highly contaminated soils have been left in place in the ground and the contaminated groundwater will need to be treated for hundreds of years into the future. (The Natural Resource Damages Assessment Plan concludes that Shell Oil released an estimated 150,112 tons of contaminants into Colorado's environment. The Army is alleged to be responsible for another 26,405 tons. Some of the contaminated soils were placed in the Enhanced Hazardous Waste Landfill and /or the Hazardous Waste Landfill, and remaining contaminated soils were left in place with mere soil caps and covers.)

We call this a "cap-and-cover" remedy because the Polluters chose to leave soil contamination in place rather than treat or remove the contaminates even though there is also groundwater treatment, which is necessitated in perpetuity due to the fact that contaminated soils were left in place.

The Polluters made a promise to the public – that they would maintain the quality and integrity of the caps-and-covers "the containment system" and provide timely and high quality review of the effectiveness of their 'containment' remedy – when they fought for (and sued for) a remedy that would leave thousands of tons of contaminated waste at the RMA rather than to actually clean up, or remove, the contamination. They must be held accountable for this minimalized remedy. If they had chosen to remove and/or treat the contamination they wouldn't have such a difficult and important job of safe-guarding the public and the environment from this extremely contaminated site.

General Comments

1. **General Comment 1** – The SSAB is disappointed in the Army's lack of community involvement relating to its review of this document. The FYR process does not follow the EPA 2001 Five Year Guidance (EPA 2001). This guidance was used by the Army throughout the FYR 2020, but the 2020 FYR fails to acknowledge many of the policies in Appendix A *Community Involvement*. Examples include:

    a. The Army should have notified the SSAB about the most appropriate methods for notifying and involving the community in the five-year process;

    b. The Army should have worked with the SSAB during the initial planning stages of the five-year review to determine the appropriate level of community involvement;

    c. During the review, the Army should have provided the SSAB information on where to find written documentation about the review (the SSAB insists this should have included access to all reference material identified in Section 12 of the FYR 2020);

    d. The SSAB should have been involved in decisions regarding community involvement and appropriate activities.

e. We hereby formally request at least one, 3-hour public meeting regarding the 2025 Five-Year Review, where community members can ask questions and discuss their concerns. Sending us to the Army's presentation to the Commerce City Council meeting is not adequate since public participation is not allowed.

f. The 2020 FYR included more than 1,000 pages of report and data, and covers the activities and data collection of a five-year period of time. While we appreciate the extension of the public comment period this year by an additional two weeks, given the length of the Five-Year Review (including hundreds of supporting and reference documentation) and importance of the RMA Five-Year Review, **the public should be allowed an extensive period of time to provide comment, but not less than 90 days – as we requested in our public comments to the 2005-2010 Five-Year Review and the 2015 Five-Year Review.**

g. Please provide all of the tables, reference materials, and supporting documents to the future Five-Year Reviews by placing them on the Army website or on a storage site such as Dropbox. These could be made available before the Five-Year Review is released to the public for comment.

2. **General Comment 2**: The "Protectiveness Statements" in Section 10 of the 2020 FYR attempt to thwart regulatory agencies and the public by creating an illusion or false impression that the current state of the On-Post and Off-Post Operable Units (OUs) are effective and in compliance with the two Records of Decision (RODs), the Federal Facilities Agreement, EPA guidance, and CERCLA. If a reader were to limit their RMA 2020 FYR review strictly to Section 10, one would conclude that the remedy is safe, sound, and protective at RMA. However, if the reader were to read the entire 2020 FYR (approximately 600 pages), one would be alarmed at numerous new remedial problems, along with bewilderment as to why issues identified in prior RMA Five-Year Reviews remain unresolved.

   Section 10 of the 2020 FYR states, "The remedy for the On-Post OU currently protects human health and the environment because remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risks." Eliminating unacceptable risks from exposure pathways are not from remedial activities, but from institutional controls (ICs) defined prior to remediation and in effect today. If there were no Institutional Controls incorporated into the current remedy at RMA, risks from exposure to contamination from the current remedy would be dangerously high to human health both On-Post and Off-Post. The remedy chosen at RMA was a cap-and-cover system, where the most contaminated soils were contained in two hazardous waste landfills, and the remainder of the thousands of tons of contaminated soils were left in place and covered by less contaminated soil. Consolidating and covering contaminated

soils On-Post is beneficial to human health exposure, but the overall remedy is not responsible for eliminating exposures.

In addition, the SSAB disagrees with the Army's conclusion that the current remedy protects human health and the environment. Addressing exposure pathways does nothing to protect the environment, particularly groundwater. Throughout the 2020 FYR, the claim of protectiveness is concealed behind "human health protectiveness" (claiming that humans are not exposed to the on-going contamination at RMA) , while knowingly allowing toxic RMA contamination to be released into groundwater both On-Post and Off-Post. The Army relies on boundary groundwater treatment systems to conclude that the failure of the On-Post treatment system is acceptable since groundwater contamination will be treated at the North Boundary Containment System (NBCS) and/or North West Boundary Containment System (NWBCS). However, these systems continue to degrade the environment via, 1) ineffective treatment, 2) inability to capture groundwater plumes, and 3) allowing RMA groundwater to be discharged into off-post without treatment. On-Post treatment systems have been ineffective in capturing and treating groundwater and most, if not all, are allowing discharges that exceed Colorado Basic Standards for Groundwater (CBSGs) and continue to degrade the environment.

EPA guidance regarding the contents of Five-Year Reviews (FYR) states, "all issues that currently prevent the response action from being protective or may do so in the future should be documented as FYR issues in the FYRR. Such issues are to be documented along with follow-up actions needed to ensure the proper management of the remedy." Throughout the 2020 FYR, the Army instead punts many protective and corrective actions and instead relies on additional groundwater monitoring and/or installation of new groundwater monitoring wells to remediate failures. This results in continued damage to the environment while monitoring data is collected and evaluated, at times taking years.

EPA guidance also states, "...the FYR should identify early indicators of potential remedy failures." Instead of providing what would be considered "early indicators", the 2020 FYR identifies early indicators of potential remedy as "Recommendations and Follow-Up Actions" and states the recommendations "may improve remedy operations, management of O&M or completeness of the site file, but do not affect current and/or future protectiveness." By calling "early indicators" of remedy failure "Recommendations and Follow-Up Actions", it implies that the goal is to improve a well-functioning remedy instead of admitting that there are remedial breaches. Clearly this is not the intent of EPA guidance.

The SSAB has identified remedial actions that either currently "prevent the response action from being protective or may do so in the future" and/or are "early indicators of potential remedy failure." Our review concluded:

a. NWBS and NWBCS are currently not protective of human health and the environment. RMA contaminants such as dieldrin, NDMA 1,4 dioxane, and PAFS are bypassing systems and/or are not being treated. This concern was included in the SSAB's 2015 comments;

b. Basin F Wastepile and Principal Threat area are currently not protective of the environment. RMA contamination above Contaminant System Remediation Goals (CSRGs) has been detected in downgradient monitoring wells and in the confined flow system beneath the Former Basin F area. In addition, the vegetative cover continues to not be adequate. This concern was included in the SSAB's 2015 comments;

c. The Hazardous Waste Landfill (HWL)and Enhanced Hazardous Waste Landfill (FLF) show indications of potential remedy failure. Additional groundwater investigations are ongoing to identify contamination downgradient of the landfills. In addition, the Army has identified RMA contaminants in both the HWL and ELF's leak detection system (LDS).? This concern was included in the SSAB's 2015 comments;

d. Basin A has indicators of potential remedy failure. Contaminated groundwater is increasing from the former source area. Additional groundwater monitoring is necessary to determine environmental protectiveness;

e. Off-Post groundwater and treatment systems currently are not protective of human health and the environment. There is a gap in Off-Post extraction wells, exceedances of RMA contaminants downgradient of treatment systems, and DIMP has been detected above standards in a private well;

f. The Biomonitoring Program identifies early indicators of potential remedy failures as it is completely ineffective in determining health effects on RMA wildlife. The current testing protocol addresses only soil contamination and not the actual effects on wildlife. This concern was included in the SSAB's 2015 comments;

g. The Biomonitoring Program was abandoned in 2013 and a new Biomonitoring program has been delayed because the Army has cut funding to the EPA, which has interfered with the ability of EPA to provide oversight and concurrence. This is an insidious ploy to minimize the efficacy and protectiveness of this "cover-up" remedy; Until EPA concurs with the current Bio Monitoring Plan, the

protectiveness of the RMA remedy cannot be considered protective.

h. Land Use Controls, which are an essential part of the cap-and-cover remedy, have indicators of potential remedy failure. USFWS is attempting to allow RMA bison to be transported Off-Post and consumed. Commerce City is evaluating residual/commercial land uses on property previously part of RMA and integrated into RMA ICs. The Army appears to have little or no control over the Land Use Controls;

i. On-Post groundwater treatment systems such as the Basin A Neck and Bedrock Ridge are not protective of the environment. Both systems are currently discharging RMA contamination above CSRGs. This concern was included in the SSAB's 2015 comments;

j. Previous On-Post source areas such as the South Plants, Lime Basins, and Sand Creek Lateral are not protective of the environment. Contaminant plumes above CBSGs are migrating from these former source areas;

k. Emerging contaminants such as 1,4 dioxane, NDPA, and PAFs have been detected On-Post. No treatment of 1,4 dioxane and PAFs exists at the boundary systems and On-Post and Off-Post treatment systems. The NDMA concern was included in the SSAB's 2015 comments. The milestone for investigating NDMA and its potential remedy failure was August 31, 2017. The 1,4 dioxane concern was included in the SSAB's 2015 comments, with a milestone for investigating this potential remedy failure on June 30, 2017.
and,

l. Surface water is not protective of the environment and possibly individual wildlife species. Additional toxicological studies are needed as elevated RMA contaminants have been detected in the North Plants and Basin E pond. This concern was included in the SSAB's 2015 comments.

The current RMA remedy is <u>not</u> protective of human health and the environment. Numerous statements and conclusions in the 2020 FYR are indefensible or misleading. A majority of current remedial failures identified in the 2020 FYR were previously identified by the SSAB and regulatory agencies in past Five-Year Reviews. Therefore, the current remedial problems are likely to remain through the 2025 FYR, while more excuses for remedial breaches are promoted as "protectiveness". Aggressive correction actions are required to reduce continued damage to the environment and to maintain the

integrity of a cap-and-cover system that is completely reliant on diligent, timely, pro-active, and effective long-term Operations and Maintenance at RMA.

3. **General Comment 3:** FYRR, The issue of d fracking and its impact at RMA is of high concern in all of the communities surrounding RMA. WE are concerned about the potential impact of fracking on the contamination remaining at RMA and/or the impact on the geological formations that are relied on to contain contamination. Fracking could result in RMA contamination migrating into deeper aquafers and could actually influence the migration of contaminate plumes On-Post. This issue has still not been adequately addressed (other than an unsubstantiated denial) and was not even addressed in the 2020 FYRR.

4. **General Comment 4:** The 2015 FYRR stated, "...prior to remedy completion the RVO has committed to provide the USFWS with military munitions awareness training. This training is intended to heighten USFWS personnel awareness of military munitions-related hazards and to inform the USFWS of the Army notification process, if potential military munitions are encountered by Refuge employees/patrons after remedy completion. The Army-provided awareness training is not intended to grant the USFWS or its representative authorization to perform any action on potential military munitions, but to ensure notification and response by trained Army representatives."

    a. What is the status of this military munitions awareness training?

    b. There is nothing on the Rocky Mountain Arsenal Wildlife Refuge website regarding the possible of existence of munitions at the refuge or on RMA, there are no warnings, and no emergency plans. This was not addressed in the 2020 FYRR.

5. **General Comment 5:** The 2015 FYRR stated, "As components of the remedy have been completed and the land deleted from the NPL, administrative jurisdiction has been transferred to the USFWS or other parties purchasing the land, except for the property and facilities continuing to be used for response actions (e.g., landfills and groundwater treatment systems)."

    a. The FYRR should describe exactly what is entailed in USFWS's "administrative jurisdiction".

    b. In addition, the FYRR needs to explain what is meant by "other parties purchasing the land."

c. All communications related to efforts to transfer land, as well as land transfers, should be included in the FYRR. The FFA prohibits other non-federal government parties from purchasing RMA property. This issue was not addressed in the 2020 FYRR.

6. **General Comment 6:** The SSAB opposes any and all modifications to the reduction of RMA Land Use Controls (LUCs) because the entire CERCLA process, including the remedial investigation (RI), risk assessment (RA), feasibility study (FS) and Record of Decision (ROD) were developed and implemented based on the numerous – and clearly stated - restricted land uses. (Although more restrictions, such as the public will never be allowed access to any current or former RMA land, would be acceptable.) The review and development of comments from regulatory agencies and the public on hundreds of CERCLA documents were based on these land use restrictions and the resulting CERCLA process.

   Unfortunately, the SSAB has witnessed these critical LUCs being challenged through inane interpretations of what each of the LUCs allegedly restrict. It is the position of the SSAB that any attempt to modify RMA's LUCs will require a reassessment of the entire CERCLA process at RMA, starting with the RI and continuing through the ROD. This reassessment will include additional soil and water sampling as necessary to investigate all medium and contamination on RMA impacted by any change in LUCs. A modified and updated risk assessment will be needed to better define exposure scenarios not included in the original assessment, and the feasibility study must include additional remedial alternatives that were not evaluated. Finally, the ROD would need to be re-published with active public participation. The Cap and Cover remedy implemented at RMA was specifically designed based on the land use controls. The SSAB is bewildered as to why the Army would ever consider re-opening a billion-dollar remedy merely to remove LUCs and will make every attempt to stop modifications of LUCs from proceeding.

7. **General Comment 7:** As we noted in our comments on the 2015 FYR, the Army had already begun the process of reducing their financial contributions to the EPA for regulatory oversight and staffs had been significantly reduced over the prior three years. The failure to provide funding to the EPA, and related funding disputes, have continued during the past five years. These actions by the Army constitute an insidious attempt to minimize the "clean-up" of RMA by avoiding accountability for effective long-term Operations and Maintenance of this barely adequate cap-and-cover remedy, and to avoid enforcement of the Land Use Controls that are an essential lynchpin of the "protectiveness" of this "cover-up" remedy. This past ten years, the Army and other parties have engaged in processes to eliminate or minimize Land Use Controls

This is coupled with the Army's denial that the State of Colorado has jurisdiction over this remedy which has necessitated the State having to file suit in order to enforce RCRA and State regulations and standards. This remedy was agreed to by the EPA and State of Colorado with the understanding that the regulators would continue to have the ability to oversee and regulate the protectiveness and quality of this remedy. We consider the Army's actions in regard to withholding and/or decreasing funding of regulators, and the denial of Colorado's jurisdictional oversight role at RMA, coupled with the choice of a remedy that would necessitate vigilant oversight in perpetuity, to be indications of their contempt for the RMA remedy and the people of the State of Colorado.

8. **General Comment 8:** The SSAB agrees with 2020 FYR comments provided by EPA and the Colorado Department of Public and Environment regarding short and long-term protectiveness and incorporate them by reference. The SSAB provides its concerns with the "remedial activities completed" and provides following:

   On-Post Operable Unit

   The SSAB specific comments presented below dispute the Army's claim that the "The remedy for the On-Post Operable Unit (OU) currently protects human health and the environment because remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risk." The SSAB has identified numerous violations and deficiencies in ROD requirements, Army compliance and performance requirements, and concerns with how these remedial activities protect human health and the environment. Section 10.0 Protectiveness Statements merely identify human health risks to exposure of RMA contaminants, but precludes how the On-Post OU protects the environment, as required by the ROD, CERCLA and EPA guidance. The On-Post OU may be protective of human health due to Institutional Controls, but not Army remediation projects.

   As identified below, many of the internal treatment systems are discharging RMA contaminants greater than CBRGs. These include, but are not limited to Basin A Neck and Bedrock Ridge. In addition, several capped and/or covered hazardous waste sites have unanswered exceedances in downgradient performance wells, most importantly Basin F and the hazardous waste/principle threat landfills. For the first time in 25 years the Army has detected contaminants in the confined flow aquifer, indicating possible additional damage to the environment from the former Basin F. The discovery of emerging contaminants On-Post during this FYR poses new challenges in the protection of the environment (and human health Off-Post). Finally, the Biota Monitoring Program (BMP) has not been approved by EPA, and therefore no conclusions can be drawn as to whether the surface soils that remain on RMA are protective of wildlife. In addition, as provided in our comments, the current approach to the BMP has many deficiencies including the use of composite sampling to characterize soil contamination in large areas

and eliminating critical pathways that may have additive effects to the conclusions of surface soil exposure.

Off-Post Operable Unit

The 2020 FYR, Section 10 states, "The remedy for the Off-Post OU currently protects human health and the environment because remedial activities to date have adequately addressed all exposure pathways that could result in unacceptable risks in these areas." Again, as required by the Off-Post ROD, CERCLA, and EPA guidance, the remedy for the Off-Post of RMA definitively does not protect the environment. Again, the Army relies on current land use restrictions Off-Post (limited consumption and irrigation of groundwater) and Institutional Controls as a basis for its protectiveness conclusion. If consumption of groundwater was available off-post, the risk to human health would be extreme as numerous RMA contaminants remain throughout the RMA Off-Post Operable Unit. The Army fails to acknowledge that dieldrin is migrating around the Northwest Boundary System (NWBCS), although possibly not consumed by the public, is causing damage to the environment

The NBCS continues to discharge untreated 1,4 dioxane and nitrosodimethlyamine (NDMA) to the off-post, causing irreparable damage to the environment. In addition, there are exceedances of NDMA downgradient of the Off-Post Groundwater Intercept and Treatment System, allowing continued damage to the environment.

Specific Comments

Section 3

9. **Page 11, Section 3.5**
   The 2020 FYR states, "Contamination was detected on-post in soil, ditches, stream and lakebed sediments, sewers, groundwater, surface water, biota, structures, and to a much lesser extent, air"

SSAB comment:

This statement should be modified as air contamination had significant impacts on-post including fugitive dust and odors, especially with the Basin F excavation. Air contamination from the on-post caused health issues to neighboring communities off-post.

10. **Page 19, Summary of On-Post regulatory Comments reference 2**
    The Table states, Munitions screening prior to excavation encountered ..." "All munitions encountered were detonated off-post."

SSAB comment: All munitions encountered were detonated on-post.

Section 4

11. **Page 27, Table 4.1.1 – Summary of Agency Notifications and Operational Change Notice**

SSAB comment:

The corrective action/change regarding an increasing concentration of dieldrin downgradient of the NWBCS (dated 12/3/2014) identifies an on-going evaluation to eliminate off-post migration of dieldrin.

SSAB comments:

a. As this issue was identified in 2014, please explain why this evaluation has not yet been completed.
b. What date will the evaluation be concluded and concurred to by regulatory agencies?
c. What is the amount of dieldrin that has migrated off-post due to the inability of the NWBCS to capture this cancer-causing contamination?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

12. **Page 27, Table 4.1.1**
The 2020 FYR corrective action/change regarding the increase of contamination downgradient of the BAN's (dated 4/2/2015) states "contaminants in the downgradient wells decreased." (emphasis added)

SSAB comment:

The 2020 FYR should include whether the concentrations of 1,2 dichloroethane, CPMSO2, dieldrin, and dithiane achieved CRSGs.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

13. **Page 28, Table 4.1.1**
The corrective action/change regarding the possible loss of plume-edge capture at the NWBCS (dated 3/16/2016) and states "increasing sampling frequency of well 27010" and ..."if the trend to not cause dieldrin concentrations to decrease subsequent actions will be considered."

SSAB Comment:

As this issue has been on-going for five years, the Table should provide an up-date on dieldrin concentrations in this well and whether the corrective actions were successful.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

14. **Page 28, Table 4.1.1**

The 2020 FYR corrective action/change regarding concentrations of dieldrin above the PQL in performance wells downgradient of the NWBCS in FY16 states that an evaluation is ongoing.

SSAB comment:

As this issue has been on-going for five years, the Table should provide an up-date on dieldrin concentrations in these wells and whether the corrective actions were successful.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

15. **Page 30, Table 4.1.1**

The 2020 FYR corrective action regarding NDMA concentrations exceeding the current PQL (dated 5/15/2017) and states "Because the NWBCS is not capable of treating groundwater for NDMA, no operational changes have been made. Quarterly monitoring will continue to evaluate frequency of detections exceeding the PQL."

SSAB comments:

a. The corrective action/change is unclear. Why does the corrective action rely on 2014 influent concentrations?
b. The Table should better explain the statement "...the reason for the effluent detection above the current PQL was not apparent." (emphasis added)
c. Finally, the Table should include the concentrations of NDMA from the quarterly monitoring since the first quarter of FY18, particularly NDMA exceedances of the PQL.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

16. **Page 30, Table 4.1.1**

The 2020 FYR corrective action regarding NDMA exceedances in the NBCS states "Two additional ultra-violet lamps were placed in service during the first quarter FY18."

SSAB comment: The Table should state whether the addition of two UV lamps will be permanent and whether exceedances on NDMA's PQL in the NBCS have been resolved.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

17. **Page 34, Table 4.1.1**

The 2020 FYR correction action regarding the presence of NDPA above the CBSG in all treatment plant effluents merely includes adding NDPA to the LTMP and monitoring NDPA in plant influent, effluent, and water quality performance wells and adding the chemical to "select water quality tracking wells and off-post CSRG exceedance network wells."

SSAB comments:

a. Adding NDPA to the LTMP is not a corrective action.

b. The Table should describe:
   i. the source of NDPA contamination;
   ii. the number and locations of treatment plants with NDPA exceedances; and
   iii. how the corrective action will reduce NDPA concentration below CBSGs.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

18. **Page 35, Table 4.1.1**

The 2020 FYR table states "Downgradient monitoring at the NBCS has shown concentrations of some contaminants above the CSRG. Evaluations of system effectiveness were indictive of residual contamination present before construction and slow migration of contaminants through fine grained sediments."

SSAB comment:

The Table should identify these contaminants, the basis of determining they were residual contamination, and whether detections continue above CSRGs.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

19. **Page 43, Section 4.1.1.1**

In regards to treating 1,4 dioxane at the NBCS, the 2020 FYR states "The FS recommended treatment using advanced oxidation at the NBCS; however, treatability studies are required to determine the most appropriate specific advanced oxidation potential system."

SSAB comments:

a. The 2020 FYR should identify when the treatability studies and implementation of treatment for 1,4 dioxane will be coordinated with design and construction.

b. It should also estimate the period of time during which 1,4 dioxane has migrated off-post.

c. Is 1,4 dioxane currently being treated by the NBCS.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

20. **Page 48, Section 4.1.1.1**

Regarding groundwater treatment in the Off-Post, the 2020 FYR states, "Modifications were made to the NPS (Northern Pathway System) were made in 2006 due to residential and commercial development in the area. "Extraction and recharge wells in the development area were abandoned However, due to funding issues, the modification was not fully completed by the landowner, leaving a gap in the extraction."

SSAB comments – The 2020 FYR identifies a "gap" in the extraction system in the Off-Post groundwater intercept and treatment system.

a. The 2020 FYR should provide a timeframe of when additional extraction wells will be installed.
b. The 2020 FYR should provide what impacts the gap has on contamination on off-post groundwater.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

21. **Page 50, Table 4.1-7 - Off-Post Groundwater Intercept and Treatment System (OGTIS) CSRG Analytes**

SSAB comments: The Table does not include NDMA as an OGITS CSRG analyte.

a. This chemical should be part of the OGITS CSRG analyses.
b. The Table also identifies the inclusion of NDPA in 2020.
c. What is the source of NDPA and what is the extent of the off-site plume?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

22. **Page 56, Section 4.2 Ecological Protection**

The 2020 FYR states, "Ensure that biota are not exposed to COCs in surface water, due to migration from soil and sediments at concentrations capable of causing acute or chronic toxicity via direct exposure or bioaccumulation"

SSAB comment –

a. The 2020 FYR should expand "ecological protection" to include biota's consumption of contaminated wildlife and plant life. Previous biota sampling identified acute concentrations of RMA contaminants in lower tropic level biota.

Due to bioaccumulation, consumption of these can result in toxic effects on upper tropic biota.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

23. **Page 57, Section 4.2.1 Shell Disposal Trenches RCRA-Equivalent Cover Interim Operations and Maintenance**

SSAB comment –

a. The 2020 FYR should provide a timeframe when the Operational and Functional (O&F) determination will be made, i.e., when will there be enough performance data and percolation exceedance measures to make the O&F determination?
b. Were the percolation exceedance measures of 2019 and 2020 effective?
c. In addition, the 2020 FYR should describe requirements of the mandatory compliance period.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

24. **Page 63, Section 4.3.1.1 Site-Wide Biota Monitoring**

The 2020 FYR states, "Although the starling evaluation was completed as planned, the kestrel portion of the BMP could not be completed as outlined in the BMP due to lack of nest box occupancy. As a result, sampling requirements for program completion were revised to focus on soil sampling rather than collection of kestrel samples."

SSAB comments :

a. The conclusions of the starling study portion of the BMP should be included in the report.

b. The Army should have considered similar RMA biota to the kestrel in evaluating the effects of RMA soil contamination on biota that reside on the site.

c. The locations of soil sampling are not referenced in the report and should be included.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

25. **Page 64, Section 4.3.1.2 – Land Use Controls**

The 2020 FYR states, "Areas of RMA where property and management authority have been transferred_ to the USFWS are governed by the *National Wildlife Refuge System* regulations... "These regulations close all areas of RMA included in the National

Wildlife Refuge System to the public unless these areas are opened by regulation, individual permit, or public notice."

SSAB comments:

a. The 2020 FYR should describe what is entailed for the public to access closed areas of the refuge, i.e., what specific regulations, individual permits, and/or public notices are acceptable. The 2020 FYR should include:

i. Where are these requirements published specifically for RMA,
ii. Are they published by signage at the RMA Wildlife Refuge lakes and other areas where people engage in fishing and other contact with wildlife?
    a. If not, why not?
iii. To date, have these requirements been met by the public and what areas were opened and for what purpose?
iv. How often do the USFWS law enforcement monitor the public participation at the RMA Wildlife Refuge?
v. What areas of the refuge are designated for public use?
vi. How does the Army monitor LUCs at the RMA Wildlife Refuge and/or control and enforce LUCs?

b. This Section also states, "Project specific health and safety training <u>continued</u> (emphasis added) to be conducted...."

SSAB comment: Does this training continue to be part of land use controls? Who is trained and how often?

c. This Section also 2020 FYR states, "The USFWS provides information at the Visitor Center to help visitors understand which areas of RMA are accessible."

SSAB comments:

i. Have these members of the public been issued access via the requirements identified above?

ii. Have there been instances where violations of LUCs or activities inconsistent with LUCs occurred?

1. What were these activities and when?
2. How were these violations corrected?
3. Are activities, violations, and enforcement actions reported to the Army, EPA, and CDPHE?
    a. If not, how are LUCs enforced and the public protected?

iii. The 2020 FYR identifies a "formal process" initiated by USFWS to remove and/or modify the game consumption restriction with respect to bison on RMA. What is this formal process? It should include public comment.

iv. Why were the bison introduced to RMA, knowing it would eventually require removal of bison from the RMA Wildlife Refuge?

v. Is there a Memorandum of Understanding or other legal document evidencing the agreement between the Army and USFWS regarding the enforcement of LUCs and other regulations necessary to maintain the integrity of the remedy and to protect human health and the environment? Please provide a copy of the document(s) and include this issue in the future Five-Year Reviews.

vi. The 2020 FYR states, "when appropriate and consistent with the Department of Interior Bison Conservation Initiative 2020 animals may be transferred to other Department of Interior lands." Does the initiative allow such transfers when it violates federal requirements such as the LUCs identified in the FFA, the On-Post ROD, and the legislation that established the Rocky Mountain arsenal Wildlife Refuge?

vii. Does the initiative include "other conservation partners, including tribes, states, or other intertribal organizations" as these may not be "other Department of Interior lands"?

viii. There is no reference to the "Tissue Contaminant Study" which will evaluate risks associated with human consumption of RMA bison.

1. What is the expected date of the draft study and how will it be published for public comment?
2. This should include the EPA-approved risk assessment identified in this report.

ix. The 2020 FYR states, "If risks are determined to be acceptable, the ROD and LUCP may (emphasis added) be modified. Such changes to the RMA's LUCs will require a ROD modification at a minimum, with public comment included.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

Section 5

26. **Section 5.2 - Status of Recommendation and Follow-up Actions from 2015 FYR**
The 2020 FYR states, "unresolved concerns from EPA, CDPHE or TCHD identified in the 2015 FYR were addressed as part of ongoing consultation with the regulatory agencies with operational adjustments as appropriate."

SSAB comment:

a. What were these concerns?
b. Were these concerns identified in regulatory comments?
c. The SSAB should have equal opportunity to discuss its FY 2015 comments and unresolved concerns with the Army (see Background and General Comment 1 above).

27. **Section 5.2**
The 2020 FYR states, "Two issues from the 2015 FYRR dealt with emerging contaminants." "Groundwater monitoring during the FYR period confirmed the presence of NDPA above the CBSG upgradient of the NBCS, NWBCS, FCS and NPS."

SSAB comment:

a. The 2020 FYR should identify the source(s) location and history of NDPA use on RMA.

b. Including NDPA in the long-term performance and water quality tracking does not resolve NDMA from protecting human health and the environment. What corrective actions are planned to eliminate NDPA groundwater above CBSGs?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

28. **Section 5.2**
The 2020 FYR states a feasibility study was performed regarding remedial actions for 1,4-dioxane.

SSAB comment:

The 2020 FYR does not include a reference or the results of the study. This should be included in the 2020 FYR.

29. **Section 5.2**
The 2020 FYR states, In addition, per- and polyfluoroalkyl substances (PAFS) were

identified as emerging contaminants during this FYR period." The results of the investigation indicated detected detectable levels of POFA and PFOS in RMA groundwater, although only a location near the South Plants spill area was above the EPA health advisory level. Treatment plant and off-Post data indicated that RMA is not a significant source of PAF contamination in groundwater."

SSAB comment:

a. What is meant by "significant source of PAF contamination," if it exceeds EPA health advisory levels On-Post? The 2020 FYR should describe the risk, the concentrations found throughout RMA, and explain how the conclusion was reached that RMA is not a significant source.

b. Was the chemical not investigated and identified during the analyses of NDPA?

c. The SSAB was unable to identify the Department of Defense guidance referenced, it should be included in the report.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

30. **Section 5.2** The 2020 FYR provides only one location near the South Plants spill area with PAFS above the EPA health advisory level.

SSAB comment:

a. The 2020 FYR should include maps showing the South Plants spill area, as there were many concentrations detected. Were there adjacent locations sampled? These results should be included in the 2020 FYR.

b. Which select wells will be monitored for PAFS? How were these locations selected?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

31. Table 5.2.1 Status of Follow-up Actions to Address 2015 Issues

SSAB comment: The 2020 FYR should include a map of and schedules of the long-term monitoring network for dieldrin.

32. Table 5.2.1

SSAB comment:

The Table describes the 2017 NDAA provisions for Commerce City to modify or remove the restriction that prohibits the use of the PUD property for residential and industrial use.

It states Commerce City can modify or remove the restriction if a determination is made that the property will be protective of human health and the environment for the proposed use.

a. Will Commerce City make the required determination or will the land use be limited to compliance with current LUCs?

b. One visual inspection in 2018 was listed as the method of enforcement of LUCs; it should not be the basis to conclude that the PUD land use is consistent with the existing land use controls or objectives.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

33. Table 5.2.1

SSAB comment:

Well 359D exceeds the DIMP CBSG. As the exceedance was identified two years ago, why is the projected date regarding the evaluation of the new well and potential alternate solutions to be finalized in 2022?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

34. Table 5.2.1

SSAB comment:

NDPA was detected above CBSG in RMA groundwater. The 2020 FYR should provide the sources of NDPA on RMA.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

35. Table 5.2.1

For the BMP, the Table states, "Results indicated no concentrations of dieldrin above the screening criteria indicating that the remedy effectively eliminated significant exposure pathways in the area sampled."

SSAB comments:

a. What was the screening level and how was it determined?
b. Where was the area sampled?
c. Were the soil samples composited?
d. The 2020 FYR should include the sampling methodology, the sample locations, and soil sample results.

Section 6

36. Section 6 .2 - Community involvement and Public Notices

SSAB comment: See General comment #1

37. **Section 6.3.1.1 Northwest Boundary Contaminant System**
The 2020 FYR states, "Effluent concentrations for all contaminants were below their respective CSRGs except dieldrin in FY15..." Dieldrin was also detected in FY18. The review also states detections of NDMA were detected above their PQLs in the second quarters of FY17 and isodrin above its CSRG in FY19."

SSAB comment:

a. The 2020 FYRR also states "In FY2015, several analytes in addition to dieldrin were detected..." The 2020 FYRR should identify these contaminants and the reason they were detected. Why do none of these additional analytes or contaminants exist in the 2020 FYR?

b. The 2020 FYRR discusses an evaluation to determine where there is a potential for flow around the northern terminus of the Northeast Extension slurry wall requiring additional extraction in the area. The 2020 FYR should describe the initial exploratory investigation, the results, and conclusions. When will the evaluation be complete?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

38. **Section 6.3.1.2 North Boundary Containment System**
The 2020 FYR states, "Effluent concentrations for all contaminants were below their respective CSRGs except for NDMA."

SSAB comments:

a. Why does this section omit all data regarding 1,4 dioxane? The compound is not included in Table 6.3-4 Five-Year Summary of CSRG Analyte Sampling from NBCS Downgradient Performance Wells. In several Sections of the 2020 FYR 1,4 dioxane is described as a substantial failure of the NBCS and Off-Post of RMA. This Section should be modified to provide a complete description of the ineffectiveness of the NBCS to adequately capture all contaminants migrating into the system.

b. The 2020 FYRR is confusing as to the PQL for NDMA. At times the PQL is 0.009 ug/L while Table 7.2-1 identifies the 2020 CBSG for NDMA as 0.00069 ug/L. The 2020

FYRR should better explain the differing values.

c. Is the range of years for chloride and sulfate to achieve CBSGs 2026-2031? The 2020 FYRR needs correction.

d. Why does the 2020 FYR use "five-year concentrations of effluent contaminant discharge" to determine treatment effectiveness for fluoride?

e. The 2020 FYR describes "primary performance criteria" and "secondary performance criteria" in evaluating NBCS system optimization. The 2020 FYRR should describe what is meant by both criteria.

f. The 2020 FYR consistently relies on the Mann-Kendall test for evaluating contaminant trends. It does not, however, explain what the test is, what data it relies on, and how/why the test is used.

g. The 2020 FYR identifies placement of alternate wells north of the NBCS to provide "continuity in system performance monitoring" This modification was due to concerns related to monitoring continuity and lack of complete information regarding water quality downgradient of the system and the mechanisms causing contaminant concentrations to be above the CSRG. Where are locations of the five alternate wells along with the locations of existing wells being replaced. How does incorporating new wells north of the NBCS alleviate contaminant discharges that are not protective of the environment?

h. Figure 6.3-13 states that NDMA detections in downgradient performance wells were identified as "Laboratory contamination resulting in methodblank detections."
    i. As these appear to be critical data points, where there duplicate samples?
    ii. Were the wells resampled?
    iii. How were these results considered in NDMA contamination in the performance wells?

i. Table 6.3-4 provides sample concentrations for numerous RMA groundwater contaminants, however, seven contaminants were identified as N/A. Assuming this is not applicable, the 2020 FYRR should explain why they are labeled N/A and whether additional sampling will be performed in these contaminants. Why wasn't 1,4 dioxane included in these analyses?

j. The 2020 FYR should describe in detail why the Army believes "downgradient detections <u>are most likely</u> (emphasis added) caused by residual contamination and not representative of system effectiveness." Terms like "most likely" regarding

downgradient detections of dieldrin are not definitive, and additional monitoring and evaluations are necessary to confirm this conclusion.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

39. Section 6.3.1.4 Basin A Neck System

SSAB comment:

a. The 2020 FYRR indicated a "compliance requirement" for the system's reverse hydraulic gradient. Are there compliance requirements for each groundwater system, both internal and at the boundaries? These need to be included in each section of the 2020 FYR.

b. The 2020 FYRR also indicates a "performance requirement." Is this similar to the compliance requirement provided above? As with the compliance requirement, all performance requirements should be included in each section of the 2020 FYR.

c. The 2020 FYR states that during the five-year reporting period for the BANS, only 1,2 DCLE, CPMSO2, dieldrin and PPDDT occurred in downgradient performance at concentrations exceeding CSRGS/PQLs. The Section includes no discussion as to why these exceedances exist and what corrective actions will be implemented to rectify this remedy failure. Does this failure violate the compliance or performance requirements?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

40. Section 6.3.1.5 Bedrock Ridge Extraction System - The 2020 FYR describes numerous RMA contaminants detected in downgradient performance wells identifying plume capture and remedy failure at the Bedrock Ridge Extraction System.

SSAB comments:

a. As commented above, do these exceedances violate compliance and/or performance requirements?
b. These contaminant exceedances date back to the 2015 FYR: why does it take the Army greater than five years to evaluate data, improve monitoring of the downgradient performance wells, and ultimately optimize plume capture?
c. What is the estimated date to complete a corrective action on this system?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

41. Section 6.3.1.6 Off-Post Groundwater Intercept and Treatment System

SSAB comments:

a. This Section includes the need to demonstrate "compliance with remediation goals." Are these similar to compliance and/or performance requirements? Where are the remediation goals for the system identified in the 2020 FYR?

    i. There are exceedances of NDMA identified in both FY16 and FY17.

    ii. The review should describe what is meant as "The effluent met the four-quarter moving average throughout the five-year period..." Is the four-quarter moving average used as a remediation goal?

    iii. As the NBCS does not treat NDMA, what corrective actions are planned to alleviate NDMA exceedances of CSRGs?

b. What is meant by the "mass removal criterion" and how was the "performance goal" of removing 75% of the contaminant developed?

c. Table 6.3-13 identifies dieldrin exceedances downgradient of the system. The 2020 FYR states "It is expected that the dieldrin levels within the FCS (First Creek System) will generally continue (emphasis added) to decrease over time." The 2020 FYR should provide data that supports this conclusion.

d. The 2020 FYR states, "It is unlikely that the dieldrin detected downgradient is caused by bypass of the system, but rather dieldrin in soil was mobilized in groundwater due to fluctuating water levels in the vicinity of First Creek." Do the assumptions provided fully support this conclusion?

e. It is evident from this section that the inability of the NBCS to treat NDMA and NDPA (and 1,4 dioxane) has resulted in groundwater plumes Off-Post exceeding CSRGs, and therefore, the remedy does not protect the environment. Is it the Army's intention to allow continued environmental degradation of groundwater by these compounds, or will the NBCS be optimized to capture and discharge all RMA contaminants below CSRGs?

f. There is a significant plume of dieldrin approaching, within, and downgradient of the Off-Post groundwater "gap." The 2020 FYR indicates a system modification to capture groundwater flowing through the gap.

    i. When is this modification expected to be completed?

ii. How much dieldrin will have passed through the gap and at what concentrations?
iii. How far Off-Post is it estimated this dieldrin plume will migrate?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

42. Section 6.3.3.1 Water Level Tracking

The 2020 FYR states, "Overall, based on a year-to-year water level comparison for 2015 through 2019, groundwater flow directions and associated migration of contaminant plumes have not changed significantly."

SSAB comment:

a. The 2020 FYR should include plume maps from these years identifying changes in flow directions and migration of RMA contaminants.

b. Do these changes require modifications to On-Post and/or Off-Post monitoring well locations?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

43. Table 6.3-16 - Water Quality Tracking Wells and Analyses Demonstrating Increasing Statistical Trends

SSAB comment:

a. There are numerous increases in dieldrin and/or chloroform downgradient of South Plants source, Basin F source, and the Sand Creek Lateral source migrating towards the NWBCS. Why are these compounds increasing with the current remedy in place?

b. In addition, there are increases in chloride migrating towards the NBCS along with arsenic and trichloroethylene groundwater concentrations increasing downgradient of Basin A and migrating towards the Basin A Neck. The 2020 FYR should explain definitively why are these compounds continue to increase in groundwater with the current remedy in place?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

44. **Table 6.3-17 – Summary of FY19 Water Quality Tracking Data for Emerging Contaminants**

The 2020 FYR identifies 1,4 dioxane and NDPA exist in high concentrations from the South Plants, Lime Basins, Basin F, and Basin A.

SSAB comment:

a. Has the Army identified the sources of these RMA contaminants?

b. What is the rate of groundwater migration for these compounds i.e, when will they reach the RMA boundaries?

c. Why is there no groundwater data regarding the NBCS and these compounds?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

45. **Section 6.3.3.3 Confined Flow System Monitoring**

SSAB Comment:

Dieldrin detections in the confined flow system beneath Basin F were identified for the first time in 2017 and again in FY2019. Have these wells been sampled yearly since 1994 and 2002?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

46. **Section 6.3.3.4 Off-Post Exceedance Monitoring**

The 2020 FYR states, "Exceedance monitoring is also conducted in support of the institutional control component of the off-post remedy. The purpose of the institutional control is to restrict the use of contaminated groundwater – in particular by restricting the installation of new wells – within identified plume areas."

SSAB comments:

a. The exceedance monitoring should not be limited to human health consumption of contaminated groundwater, but to protect the environment as required by the RODs and CERCLA.

b. The 2020 FYR should describe how exceedance monitoring is designed to ensure the environment is not continually damaged by RMA contaminants discharged into Off-Post groundwater.

c. The list of RMA Off-Post groundwater contaminants identified on the two pages of Table 6.3-21 is extensive.

d. The 2020 FYR should clearly describe the reasons for the considerable amount of contaminated groundwater that remains Off-Post of RMA, i.e., is this a boundary treatment system(s) failure?

e. Will all these contaminants be treated by Off-Post systems?

f. What is the corrective action to remove arsenic, carbon tetrachloride, dieldrin, 1,4 dioxane, and NDPA, which appear downgradient, or possibly not captured by the Off-Post treatment systems?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

47. Section 6.3.3.5 Private Well Network

SSAB comment:

The 2020 FYR does not identify a corrective action regarding the DIMP exceedance in the Off-Post private well. What is the Army's proposed future action to resolve this, and possibly other neighboring private wells contaminated with DIMP above the CBSG?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

48. Section 6.3.3.6 Hazardous Waste Landfill Post Closure Groundwater Monitoring

SSAB comments:

a. The 2020 FYR should describe how the upper prediction limit (UPL) is derived and its relevance to concentration exceedances.

b. The 2020 FYR should describe what additional investigations are proposed to conclude that elevated dieldrin in well 25194 "is likely sources of pre-existing soil contamination in the vicinity of the HWL."

c. The 2020 FYR should include the locations of subsurface dieldrin sampling collected during the program.

d. Was dieldrin detected in previous groundwater sampling events or during the soil RI?

e. What is CUSUM an abbreviation for?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

49. Section 6.3.3.8 Basin F Post-Closure Groundwater Monitoring

SSAB comments:

a. The 2020 FYR should better describe the date, location, and length of time the breach in the Basin F liner. How was the breach repaired?

b. The 2020 FYR indirectly concludes that arsenic and chloroform are leaking from the Basin F Wastepile liner as identified in increases in wells 26015 and 26017, which are the only wells monitoring groundwater downgradient of the site.

   i. The current groundwater monitoring program is insufficient to characterize contaminants migrating from the Wastepile and should be modified to better characterize the extent of the remedy failure.
   ii. What were the sampling results of well 26016 located between wells 26015 and 26017?

c. Table 6.3.25 identifies the increase of chloroform in wells 26015 and 26017 as "likely caused by higher water levels mobilizing residual chloroform."

   i. What data was used as a basis of this conclusion?

   ii. What soils samples during the remedial investigation were taken beneath the Basin F Wastepile prior to construction of the liner?

   iii. The 2020 FYSR concludes "Groundwater quality downgradient of the Basin F WP area has potentially been affected in the vicinity of wells 26015 and 26017." This indicates remedy failure at the Basin F Wastepile; what corrective actions are in place, or being considered, to alleviate the continued migration of contamination from the wastepile?

d. The 2020 FYR states for the Basin F Principal Threat area, "Several indicator compounds – including chloroform, DIMP, sulfate, and tetrachloroethylene – appear to be increasing in more than one downgradient well. The exceedances likely (emphasis added) are caused by residual contamination and are consistent with pre-existing contamination that was present before the Basin F Post-closure period."

i. What additional RMA contaminants were identified in addition to these four?

ii. What data was used as a basis of this conclusion?

iii. The 2020 FYR concludes that the downgradient groundwater quality has potentially been affected in all four Basin F Principle Threat monitoring wells. This indicates remedy failure at the Basin F PT area; what corrective actions are in place, or being considered, to alleviate the continued migration of contamination from the Basin F PT area?

iv. Do groundwater level data confirm that the contamination is from "rising water levels and mobilization of pre-existing residual contamination from the Former Basin F"?

v. Later in this Section the 2020 FYR it states, "Groundwater elevations have generally decreased in all downgradient and upgradient wells since 2015." The 2020 FYR should explain this discrepancy.

e. The 2020 FYR states "...there are no chemical-specific standards that apply to Basin F groundwater since the RMA remedy addresses contaminated groundwater downgradient at the NBCS and NWBCS, where it is extracted and treated."

i. The Army must explain if this is the intention/direction of the overall remedy on RMA.

ii. If so, why were Basin F, and all other internal hazardous waste source areas within RMA, capped and/or covered?

iii. Why are there internal treatment systems if RMA contaminated groundwater is and will be addressed at the NBCS and NWBCS?

iv. Why is the Army monitoring internal groundwater?

v. The statement above, which is a repeated assertion that the Amy doesn't need to address failures in On-Post remedies since the contaminants will be picked up by the boundary groundwater treatment systems, violates the FFA, the On-Post ROD, regulations, and defies reason.

f. The 2020 FYR acknowledges that contaminants increasing downgradient of the Former Basin F are not limited to chloroform, DIMP, sulfate, and tetrachloroethylene. In addition to these RMA contaminants, arsenic, chloride, copper, DCPD, and NDMA are also increasing.

g. The 2020 FYR states,"...it appears that the PT groundwater flow path is having a greater impact on water quality downgradient of the former Basin F compared to the WP flow path."

   i. Does this statement consider that the monitoring wells for the WP are half (2) the number as the PT area (4)?

   ii. It is evident that all groundwater monitoring wells, from both WP and PT areas, are showing increases in RMA groundwater contamination. What corrective actions beside additional groundwater monitoring are proposed to alleviate this remedy failure?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

50. Section 6.3.3.9 Emerging Contaminants

SSAB comments:

a. The 2020 FYR provides the Army's definition of emerging contaminants; it should also provide EPA's definition.

   i. Does the Army consider 1,4 dioxane an "emerging contaminant"? The Army has been monitoring the compound on RMA since 2011; it is no longer an emerging contaminant.

b. The 2020 FYR should provide a reference to the 2016 Army guidance regarding PFOA/PFOS.

c. The 2020 FYR should include a plume map, instead of monitoring results, for NDPA.

d. The 2020 FYR should include a plume map, instead of monitoring results, for PFAS.

   i. The 2020 FYR identifies one location where PFAS was above the EPA health advisory.

ii. Figure 6.3-73 identifies four locations in the South Plants where PAFS exceeded the health advisory.
iii. The 2020 FYR states, "All of the wells were located in the vicinity of the South Plants source area associated with documented use." However, Figure 6.3-73 identifies PFAS detections upgradient of South Plants, and downgradient of Basin A, north and east of the Army Complex Trenches, west of Basin F, Off-Post, and in Sections 27 and 33.
iv. As these are individual well results, additional groundwater monitoring is necessary to better define PFAS on and off RMA.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future.".

51. Section 6.3.4 Surface Water Monitoring

SSAB comment:

Was the contamination detected in surface water evaluated to determine impacts on biota other, than aquatic, as part of the BMP? Exposures to biota from surface water would include dermal absorption and ingestion. While likely not a primary route of exposure, these pathways should be included in the BMP and overall protectiveness of RMA wildlife.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

52. Section 6.3.5 – Site-Wide Biota Monitoring

The 2020 FYR states, "Although the majority of the dieldrin concentrations in the eggs collected were below detection, there was insufficient data to evaluate the decision rule described in the BMP for all nest box decisions. Dieldrin residues above the No Observable Adverse Effect Concentration (NOAEC) were detected once in each of seven different kestrel nest boxes during the four seasons that the kestrel nest boxes were monitored."

SSAB comments:

a. The 2020 FYR should include the percentage of total eggs sampled that contained dieldrin above the NOAEC and the locations and concentrations of the eggs.

b. The 2020 FYR states, "The Army conducted a series of meetings with Regulatory Agencies to determine requirements for completion of the program." The 2020 FYR also states, "... sampling requirements for program completion were revised to focus on soil sampling rather than collection of kestrel samples."

i. How were soil sample results compared to actual kestrel eggs that were analyzed? This evaluation is critical as soil samples are a single pathway whereas kestrel egg sampling would include other pathways such as inhalation of contaminated dust, ingestion of contaminated biota, and consumption of contaminated surface water.

c. Were all soil samples collected within the entire range of the kestrels?

d. Were the sample locations from areas undisturbed by the remediation?

e. Why weren't other RMA biota similar to kestrel eggs considered as a contingent sampling collection? This could include the Rock Dove, pheasant, quail and/or mallards which historically had acute concentrations of dieldrin that resulted in mortality.

f. Why weren't substrates other than eggs considered including kestrel brains or liver?

g. The 2020 FYR states, "The Army completed the Data Summary Report for tissue sampling in November 2016 (Navarro 2016c) and prepared a sampling and analysis plan for the soil sampling event. An incremental sample methodology was selected to provide an estimate of mean surface soil concentrations across the entire sample area." Why incremental sampling ?

h. Without the ability to review the above referenced report, what tissue sampling is the 2020 FYR referring to?

i. Did the USF&WS prepare the sampling and analysis plan? If not, did it review and concur?

j. The 2020 FYR should include a detailed description of the "incremental sample methodology" used to evaluate dieldrin concentrations.

    i. Does incremental sampling imply composite sampling?
    ii. What were the greatest concentrations of dieldrin identified in the soil sampling program?
    iii. Where were the locations?
    iv. How did the incremental sampling adjust its findings due to the potential of substantial dilution of contamination concentrations due to combining numerous samples into one?

k. What is meant by "The nest boxes that required additional investigation..."?

l. Figure 6.3.78 does not identify the "59 soil sample decision units." The figure needs to be revised to include these decision units.

m. The 2020 FYR should include a discussion why decision unit 35NW, located in a highly contaminated area of RMA, was identified as "No Additional Monitoring Needed."

n. Was there consideration to include other RMA contaminants to the revised BMP? These should include contaminants such as DDT, DDE, and/or endrin.

o. The 2020 FYR should include how the selected screening criteria of 110 ug/g was calculated.

p. The 2020 FYR should identify where decision units are located.

q. The 2020 FYR should identify which agencies and/or regulators determined the results to be acceptable.

r. The 2020 FYR should explain why the Data Summary Report is still awaiting EPA review three years after completion.

The 2015 FYRR stated that there is a ROD requirement "Ensure that biota are not exposed to COCs in surface water, due to migration from soil or sediment, at concentrations capable of causing acute or chronic toxicity via direct exposure or bioaccumulation." In addition, the 2015 FYRR stated, "Although the ROD requirement will continue to be evaluated as part of annual land use control monitoring, the ecosystem has no bearing on remedy effectiveness and will not be evaluated in future five-year reviews."

i. The SSAB disagrees that this evaluation be terminated. Ensuring that all biota are not exposed to CoC's capable of causing acute or chronic toxicity via direct exposure or bioaccumulation has a definitive bearing on remedy effectiveness.

ii. This is particularly important since there appears to be meager enforcement of the "catch and release" fishing program at the RMA Wildlife Refuge. This issue was not addressed in the 2020 FYR. Monitoring of aquatic biota needs to be evaluated in this and future FYRRs.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

53. **Section 6.3.6 – Hazardous Waste Landfill Monitoring**

The 2020 FYR states, "The integrity of the HWL Cap will be maintained by the U.S. Army for the duration of the post-closure period."

SSAB comments:

a. The 2020 FYR should make it clear that the post-closure groundwater monitoring and maintenance of the HWL will be the responsibility of the U.S Army in perpetuity.

b. The 2020 FYR discusses issues with adequate vegetation on the HWL cover. As required by regulation, vegetation is required to reduce erosion. The 2020 FYR failed to provide the current status of vegetation on the cap's cover, especially as erosion continues to be an issue with cap integrity.

c. The 2020 FYR identifies the LS/LF Building and shipments of LCS/LDS wastewater being shipped off site for treatment and disposal.

   i. The 2020 FYR should identify the locations of the treatment/disposal facility.
   ii. What are the transportation routes for these shipments?
   iii. Are these "wastewaters" being regulated as hazardous wastes?

d. The 2020 FYR states, "the HWL LCS liner system appear (emphasis added) to be intact." The 2020 FYR also states "Typically, the detections are attributed to contaminants in the LCS clay liner material rather than indications of leaks in the liner system."
   i. The 2020 FYR should include what analytes (and concentrations) were detected in the clay liner prior to installation.
   ii. It should make definitive conclusions why contaminants were detected in the LDS.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

54. Section 6.3.6.2 Enhanced Hazardous Waste Landfill Monitoring

SSAB comment:

a. Many of the vegetation and erosion concerns on the ELF are similar to the HWL (see SSAB comments above).

b. Table 6.3-37 should identify the locations of the sumps beneath the ELF. Including the statement that "detections are attributed to contaminants in the LCS clay liner material rather than indications of leaks in the liner system."

i.

c. The 2020 FYR should provide the locations of lysimeters 04 and 014. It should include the "recommended path forward" for the excess percolation in these lysimeters.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

55. **Section 6.3.6.4 – Basin F RCRA-Equivalent Cover Monitoring**

The 2020 FYR provides three conditions which are not being met: percolation, cover thickness, and vegetation. It states that each of these conditions has been resolved. These conclusions are based on additional measurements provided after these conditions were identified.

SSAB comments:

a. The 2020 FYR should provide a list of the improvements that were done to make these conditions acceptable to regulatory agencies, including the dates of completion.

b. The 2020 FYR should identify how the burrowing owls and black-footed ferrets were "eliminated" and the dates of such eliminations.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

Section 7

56. **Section 7.1.1. - On Post Soil Remedies Under Construction**

The 2020 FYR states routine percolation monitoring, vegetation assessments, and cover maintenance activities are "expected to be protective and performance standards will likely be met."

SSAB comments:

a. It appears these ongoing projects may not be protective and/or capable of meeting performance standards. When and how will the results of these critical requirements be published for public comment?

b. Does CDPHE have overall RCRA regulatory authority at RMA, including when the O&M period moves into Operational and Functional (O&F)?

c. Approximately when will the draft CCR – Part 2 be available for public review?

i. What performance data will be included in this report?
ii. Why has it been a year for EPA to support the O&F determination?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

57. **Section 7.1.1.2 – Shell Disposal Trenches RCRA Equivalent Cover Interim Operations and Maintenance**
The 2020 FYR states, "Once enough performance data are collected and corrective measures performed on the cover is validated…"

SSAB comments:

a. What corrective measures are ongoing at the Shell Trenches?

b. Approximately when will the draft CCR – Part 2 for the Shell Trenches be available for public review?

58. **Section 7.1.2.1 – Shell Disposal Trenches Slurry Walls**
The 2020 FYR states, "The report concluded that Bore 3453 may not be an appropriate location to evaluate groundwater/disposal trench interaction as it is uncertain that disposal trenches extended to the area of Bore 3453."

SSAB comments:

a. It's unclear why there's uncertainty as to locations of Shell's trenches.
b. Was the RI insufficient to define all trench locations?
c. Does it remain questionable where additional, unidentified Shell trenches extend?
d. Did the Army's investigation of the SW portion look for the boundaries of other Shell Trench boundaries?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

59. **Section 7.1.2.3 – Bedrock Ridge Extraction System**
The 2020 FYR states, "Analytes 1,2 DCLE and trichloroethylene in downgradient performance well 36566 show increasing concentration trends."

SSAB comments:

a. The remedy at the Bedrock Ridge Extraction System cannot be considered "protective" when the report clearly identifies CRSG exceedances of RMA wastes in a downgradient performance well.

b. The definition of protectiveness includes the environment, not just human health. Why does 2020 FYR omit the evaluation of the protectiveness of the environment?

c. Depending on capture of contamination at the NBCS should not be the goal of a protective remedy. It calls into question why there are any on-post treatment systems if capture of contamination and "protectiveness" are reliant upon extraction and treatment at the RMA's boundary.

d. When will there be a corrective action that is available for public comment on how the Army plans to remedy this violation of the On-Post ROD?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

60. **Section 7.1.2.5 – Section 36 Lime Basins Slurry/Barrier Wall**

The 2020 FYR states, "The Lime Basins dewatering system is functioning as intended..." Then states, "...the inward gradient goal will not be achieved by this date the date (sic) for meeting the inward gradient performance goal cannot be reliably projected" However, a new goal of September 2024 was established to track progress towards meeting the goal."

SSAB comment:

The 2020 FYR identifies a problem with the Lime Basins dewatering system. Explain how the Army considers this to be "functioning as intended."

As per EPA Guidance this remedy is an "early indicator of remedy problems."

61. **Section 7.1.2.8 Basin A Neck System**

The 2020 FYR states, "The BANS met the 75 percent mass removal criterion throughout the FYR period."

SSAB comments:

a. Was the 75% mass removal criteria for the Basin A Neck System identified in the On-Post ROD?

b. The 2020 FYR states, "The BANS is operating as intended..." The 2020 FYR previously stated, "Concentrations of most analytes (except dieldrin, PPDDT, 12 DCLE and CPMSO2), are below CSGG/PQL in the downgradient performance wells."
   a. Were these exceedances intended in the in the On-Post ROD?
   b. What are the dimensions of these plumes?
   c. What corrective action will be implemented to resolve these exceedances?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

62. **Section 7.1.2.9 – Northwest Boundary Containment System:**
The 2020 FYR states, "...the NWBCS is functioning as intended..." It also states that effluent concentrations for all contaminants were below their respective CSRGs except dieldrin and NDMA. The Army then relied on the effluent meeting the "four-quarter moving averages." The 2020 FYR also states, "Although dieldrin was detected above the PQL in Original System and Northeast Extension downgradient performance wells, the performance criteria were met because the long-term trend is not increasing in downgradient performance wells." The 2020 FYR also states, "...dieldrin concentrations above the PQL in downgradient performance wells is an early indicator of potential remedy failure..." The 2020 FYR then states the exceedances "appear to be unrelated to system performance."

SSAB comments:

1. Does the Army consider the NWBCS to be functioning "as intended" with RMA contaminants exceeding CSRGs downgradient and off-post, and based on trends of dieldrin not increasing?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

63. **Section 7.1.5.1 Site-Wide Biomonitoring**
The 2020 FYR states, "although the starling evaluation was completed..."

SSAB comments:

a. The 2020 FYR should include a location map along with the results of the starling collection. This data needs to be included by the Army's BMP in defining RMA impacts on biota. How were the starling results used in defining soil sample locations?

b. The 2020 FYR states soil samples were conducted in the area where limited kestrel results indicated potential exposure. The 2020 FYR should provide the locations and concentrations of the limited kestrel results.

c. What toxicology studies were used to develop the "selected screening criteria of 110 ug/g" for sampled soil? Was this agreed to by all regulators? This information should be included in the 2020 FYR.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

64. Section 7.1.5.2 Site Wide Surface Water Monitoring

The 2020 FYR states that exposed surface soil from the Shell Plants cover and landfill caps did not impact biota at Lake Ladora and Borrow Area 5.

SSAB comments:

a. It was assumed that soils used for RMA covers and caps were clean fill material.
   i. What sampling has been performed to define contamination on Shell Plant's cover and caps?
   ii. Were contaminated soils used on all RMA caps and covers?

b. The 2020 FYR should explain the statement "Based on local topography, contaminants at this location (North Plants) do not have the potential to migrate to downstream receptors off-post and exceed the remediation goals in off-post surface water."
   i. FYR 2020 should describe why surface water in the North Plants that exceeds aquatic life standards remains on RMA.
   ii. Are these surface water concentrations harmful to other RMA biota through absorption and/or consumption?

c. The 2020 FYR should explain what is meant by off-post surface water being "consistent with the historical trend in arsenic within First Creek."
   i. When did this historical trend begin?
   ii. Did this historical trend first appear prior to RMA contamination migrating into First Creek?
   iii. What background data and analysis were used to reach the conclusion that arsenic in First Creek is naturally occurring?

d. The 2020 FYR states, "With the continuing removal of organic contamination from the groundwater in the area, concentrations of the suite of organic constituents in surface water at off-post station SW37001nare expected to decrease." What organic contaminants exist in off-post SW 37001?
   i. What data/calculations and analysis were used to conclude these organic constituents "are expected to decrease"?
   ii. Are they currently decreasing? If so, based on what data?
   iii. When are they estimated to completely dissipate?

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

65. **Section 7.1.5.3 Site-Wide Groundwater Monitoring**

The 2020 FYR describes increasing statistical trends of numerous groundwater contaminants at numerous RMA sites including Basin F and Basin A.

SSAB comments:

a. Why do each of these increases exist?

b. Why do you conclude that these increases do not represent changes in site conditions that affect remedy performance and/or remedy failure?

c. These increases could be due to remedy failure of Basin F and Basin A caps and/or covers. What have you done to determine if there is remedy failure of the caps and covers at Basin F, Basin A?

d. What contingencies and/or corrective actions are being considered if these increasing trends continue?

e. What groundwater modeling or other hydrogeologic considerations have been evaluated to better understand why dieldrin has been detected for the first time (or in 25 years) in the confined flow system (CFS) beneath basin F?

f. The 2020 FYR states the four wells "should" be evaluated to determine the source of CFS contamination.
    i. How long has the Army known or believed that the four wells should be evaluated?
    ii. Why haven't the four wells been evaluated at this point?
    iii. What is the estimated date for evaluation of these four wells?
    iv. What is the process, groundwater modeling, or other hydraulic considerations that will be used in this evaluation?
    v. This evaluation should be an Army priority since it may be due to remedy failure of the Basin F liner.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

66. **Section 7.1.5.4 Land Use Controls (LUCs)**

The 2020 FYE states, "...the LUCP incorporates controls for other specific areas, including additional ICs for the previously excavated lake sediments."

SSAB comments:

a. There is little or no discussion in the 2020 FYR regarding the excavated lake sediments.

i. Please describe the locations these sediments and concentrations of RMA contaminants in the sediments.
ii. Describe what actions will be done to remove the contaminates of protect human health and the environment from any threat by this contamination.

b. The 2020 FYR states that LUCs have effectively protected individuals from exposure to unacceptable levels of risk.
   i. Are these individuals members of the public, RMA contractors or both?
   ii. Do RMA contractors continue to receive hazardous waste training at the site?

c. Does the Department of Interior support USFWS's attempt to change RMA's LUCs regarding consumption of RMA bison?
   i. Are the USFWS and DOI prepared to re-open the On-Post ROD to make the LUC modification?
   ii. Will all aspects of the process of re-opening the ROD be opened to public comment?

d. The 2020 FYR should include the bison sampling program report.
   i. Was/is this report available for public comment?
   ii. What is the status to the reporting requirements and risk evaluation needs?
   iii. The SSAB requests public review and comment on all aspects of these critical issues regarding the proposed consumption of RMA bison and attempts to re-open the ROD.

e. The 2020 FYR is vague regarding Commerce City's proposal to violate and/or change LUCs.
   i. Why hasn't this issue been resolved since it was addressed in the 2015 RMA FYR?
   ii. Is Commerce City prepared to perform a risk assessment to justify and prove that a change to LUCs remains protective to human health and environment? This risk assessment must be available to public review and comment.

f. Why would a modification to the LUCP resolve a violation of the FFA and ROD regarding past transfers of land outside federal control? How was this violation resolved?

As per EPA Guidance this remedy is an "early indicator of remedy problems."

67. **Section 7.1.6.2** Secondary Basins Remediation Part 3, Basin C Supplemental Soil Excavation Project – The 2020 FYE states, "...the Basin C Supplemental Excavation Project has been completed."

SSAB comments:

a. The 2020 FYR cannot, as was done previously throughout the 2020 FYR, simply reference a Navarro document instead of describing actual details of an issue.

b. The 2020 FYR should describe in detail the investigation and remediation of Basin C soils.

68. **Section 7.1.7 Cost**

SSAB comment:

a. Has the Army estimated the overall cost, including the yearly costs, to maintain groundwater treatment systems, caps, covers, groundwater monitoring etc. in perpetuity?

69. **Section 7.2.1.1 Changes to Water Standards** The 2020 FYR provides that the 2020 CSRG for chloroform is 6.0 ug/L while the new or revised standard (CBSG) is 3.5 ug/L.

SSAB comment: Are the boundary systems meeting the chloroform ARAR of 3.5 ug/L?

70. **Section 7.2.1.3 PQLs , Certified Reporting Limits, and MRLs**
The 2020 FYR states that there was agreement with CDPHE in 2012 for an interim PQL for NDMA as twice the calculated PQL. In 2015 the PQL was replaced to 0.009 ug/L . The 2020 FYR states Reporting limits have not changed significantly during the review period while Table 7.2.1 identifies the 2020 NDMA CSRG as 0.00069 ug/L.

SSAB comment: What is the CSRG value for NDMA treatment at the boundary systems and at all internal treatment systems?

71. **Section 7.2.5 Changes in Exposure Assessment Variables; Vapor Intrusion**

SSAB comment: 1,4 dioxane, NDMA, and NDPA exist in both On-Post and Off-Post groundwater, they should be included in the risk screening evaluation in regards to vapor intrusion.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

72. Section 7.2.5 Changes in Exposure Assessment Variables; Emerging Contaminants

The 2020 FYR states a feasibility study and risk assessment were performed for 1,4 dioxane, but were limited to "potential off-post exposure pathways." The Army concluded that "remedial action for 1,4 dioxane in the off-post OU was not warranted."

SSAB comments:

a. The feasibility study should include groundwater treatment options for protection of the environment as required by CERCLA and the RMA RODs, and not merely risks to human health.

b. The On-Post treatment systems should also meet CBSG for NDPA, not merely the boundary systems and the OGITS.

c. The 2020 FYR states that Army and EPA guidance were used to determine whether PFOA/PFOS were present in RMA groundwater above the EPA health advisory level of 0.07 ug/L. There is no reference to either of these guidance documents and they should be included in the 2020 FYR.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

73. Section 7.4 Technical Assessment Summary

SSAB comment:

The Section contradicts itself, the remedy is not "generally functioning as intended." As stated throughout Section 7, groundwater contaminants continue to exceed state and/or federal standards with no clear corrective actions identified. These remedy failures have been identified for years with no resolution as to remediation of the violations of ARARs, the RODs, and CERCLA. The 2020 FYR states that emerging contaminants have been assessed and remediation goals and monitoring requirements have been incorporated where appropriate. The 2020 FYR does not include how remediation goals and monitoring requirements protect the environment, but instead merely human health. In conclusion, the current remedy is not protective in the short-term and long-term of human health and the environment.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

Section 8

74. Section 8 Issues

SSAB comment:

The Army references a portion of 2001 EPA to justify its determination of "Issues Identified and Effects on Current or Future Protectiveness" at RMA (Table 8.0.1). In the ten years since this guidance, numerous additional EPA guidance documents have been published to better characterize remedy protectiveness determinations.

It is evident in this Section that the Army misinterprets the 2001 guidance. The table merely identifies issues that currently prevent the response action from being protective; it fails to identify issues that may affect protectiveness in the future and/or early indicators of potential remedy failure.

Instead, the 2020 FYR inappropriately lists these future protectiveness issues in Section 9 "Recommendations and Follow-Up Actions" of the Review. Each of the SSAB's comments in Section 9 are in response to remedial issues should be included in Section 8 because they clearly meet the 2001 EPA FYR guidance as they relate to future issues of protectiveness and/or early indicators of potential remedy failure.

Section 9

75. Section 9 – Recommendations and Follow-Up Actions

SSAB comments:

a. Section 9.1 states the recommendations identified during the 2020 FYR "may improve remedy operations, management of O&M or completeness of the site file, but do not affect current and/or future protectiveness." These "recommendations" are instead follow-up actions to resolve issues that may affect protectiveness in the future and/or early indicators of potential remedy failure.

b. Without EPA concurrence, the Biota Monitoring Program (BMP) remains an issue that may affect protectiveness in the future. Without EPA concurrence, the BMP may reveal that remaining RMA surface soils adversely impact RMA biota now and in the future.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

c. The Bedrock Ridge Extraction System has identified three RMA organic contaminants downgradient of the system, an evident indication of potential remedy failure.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

d. Basin F groundwater monitoring has identified a minimum of four increasing RMA contaminants downgradient of the basin. This issue has resulted in the Army evaluating Basin F groundwater data, the Basin F monitoring network, and statistical data evaluation. It is evident these studies are being done due to indicators of potential remedy problems, not to improve remedy operations, manage the O&M and/or completeness of the site. The Army needs to acknowledge this is a remedy failure and initiate corrective actions to remedy the failed response action.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

e. The identification of dieldrin in the confined flow system below Basin F has become a possible remedy failure.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

f. Increasing chloride concentrations in Well 35083 (location unidentified) indicates potential remedy problems. The Army recommendation of further evaluation of chlorine in the vicinity would be evidence of a remedy protectiveness concern.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

g. The USFWS's desire to allow consumption of bison (or other animals from RMA, for that matter) is a clear violation of RMA's LUCs.

As per EPA Guidance, this remedy "currently prevents the response action from being protective or may do so in the future."

h. The 2020 FYR identifies many issues concerning inadequate community involvement. While this may not directly impact remedy protectiveness, the SSAB agrees that without meaningful public input on remedial issues on RMA, there will be significant delays on implementation of important remedy decisions, an early indicator of remedy problems. Any updates, improvements, and/or communications with the community must be in coordination with the public and the RMA SSAB.

As per EPA Guidance this remedy is an "early indicator of remedy problems."

Conclusion

It is important for everyone to remember that the "clean-up" at RMA is designed to be minimally protective. The remedy is designed to protect the public to a level of 10 (-4). This means that after the RMA "clean-up" is complete, exposure to the contamination left at RMA will provide additional cancer risk to one in ten thousand people (this is in addition to the current cancer rates in the United States: one-in-two men will have cancer and one-in-three women will have cancer during their lifetimes). This is the minimum level of "clean-up" allowed by law and, at the time this remedy was selected, the standard level of "clean-up" was 10 (-6) or a one-in-one-million increase in the cancer risk.

The SSAB objected to a minimal "clean-up" at RMA, and has tried to be diligent in its oversight of the RMA "clean-up" precisely because a minimum "clean-up' demands that the assumptions underlying the remedies are valid, that the "clean-up" is designed and performed at the highest possible level, and that long-term monitoring is effective and the long-term remedy is protective of human health and the environment. If every step taken at RMA is as minimalized and compromised as the choice of the RMA remedies, the community surrounding and visiting the RMA will be harmed and the State of Colorado will pay a huge price to try to correct the problems.

Given the fact that the public has had to accept the presence of thousands of tons of contaminated soil being left at the RMA, and that over one-square mile of contaminated land has become a sacrifice zone, and that there is no quantification or cataloguing of the remaining contamination in throughout RMA, , the institutional controls that are used and will be used to control contamination and protect the public must be absolute and fool-proof. That is nowhere near the case at RMA.

In our limited survey, we have been able to identify hundreds of land transfers in the Off-Post area that have NOT included the required notice of below-surface contamination emanating from the RMA. Deed restrictions are one of the only institutional controls used Off-Post and have been discussed many times with the public. The fact that there are no groundwater or CERCLA easements contained in thousands of sales documents shows that that the deed restrictions put in place by the Polluters are inadequate and not functioning as intended by the public.

All Off-Post contamination pathways have not been closed and the public has not been protected. We are aware of homeowner/developer struggles to acquire the so-called replacement water, provided in the ROD, at properties where existing wells continue to analyze "positive" for military contamination. In addition, we are aware of a landowner in the contaminated Off-Post area of RMA who was able to obtain a permit to drill a well, contrary to the "advertised" institutional controls required by the ROD.

This issue also raises the concerns about the inadequate number of sampling and monitoring wells, which are necessary to provide data to insure long-term protection. In order to protect the community and to ensure that there are no open pathways to the tons of contamination that have been left in place, the amount of information and data should be increasing over time, rather than

decreasing. For all these reasons, the public cannot consider the assurances of protectiveness as adequate, let alone fool-proof.

We look forward to seeing these comments and your responses incorporated into the Final RMA 2020 FYRR.

Respectfully submitted on behalf of the Rocky Mountain Arsenal Site Specific Advisory Board,

Sandra Jaquith

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RMA-SSAB Chairperson

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