**DEPARTMENT OF THE ARMY**
HEADQUARTERS, JOINT BASE LEIWIS-MCCHORD
1010 LIGGETT AVENUE, BOX 339500, MAIL STOP 1AA
JOINT BASE LEWIS - MCCHORD, WASHINGTON 98433-9500

REPLY TO
ATTENTION OF

September 21, 2015

Public Works

Mr. Brian Dixon
WA Department of Ecology
Central Regional Office
15 W Yakima Avenue, Suite 200
Yakima, Washington 98902-3452

Dear Mr. Dixon:

Enclosed for your review is one paper copy of the final RCRA Corrective Action Completion Report Yakima Training Center, Yakima, Washington. An electronic version of the report will also be e-mailed to you. All Ecology comments regarding the second draft of the Yakima Training Center RCRA Corrective Action Completion Report have been addressed in this report.

If you have any questions or need clarification, please contact myself at (253) 477-3742.

Sincerely,

William W. Myers
Installation Restoration Program Manager

CF: Mr. Greg Caron, WA Department of Ecology

# RCRA CORRECTIVE ACTION COMPLETION REPORT

YAKIMA TRAINING CENTER, WASHINGTON

September 2015
FINAL

PREPARED BY:

Installation Restoration Program
Directorate of Public Works
Joint Base Lewis-McChord

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC | Area of Concern |
| ASP | Ammunition Storage Point |
| AST | Aboveground Storage Tank |
| CCP | Compliance Cleanup Program |
| COPC(s) | Contaminant(s) of Potential Concern |
| DD | Decision Document |
| ECOLOGY | Washington Department of Ecology |
| GWM | Groundwater Monitoring |
| IRP | Installation Restoration Program |
| JBLM | Joint Base Lewis-McChord |
| LUC(s) | Land Use Control(s) |
| MATES | Mobilization and Training Equipment Site |
| MPRC | Multipurpose Range Complex |
| MTCA | Model Toxics Control Act |
| MW(s) | Monitoring Well(s) |
| NFA | No Further Action |
| OWS | Oil/Water Separator |
| POL | Petroleum, Oil, and Lubricant |
| RCRA | Resource Conservation and Recovery Act |
| REPORT | RCRA Corrective Action Completion Report |
| RFA | RCRA Facility Assessment |
| SI | Site Investigation |
| SWMU | Solid Waste Management Unit |
| TCE | Trichloroethylene |
| TPH | Total Petroleum Hydrocarbons |
| TVR | Tracked Vehicle Repair |
| UMTU | Unserviceable Munitions Treatment Unit |
| UST | Underground Storage Tank |
| WAC | Washington Administrative Code |
| YTC | Yakima Training Center |

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# RCRA CORRECTIVE ACTION
# COMPLETION REPORT
# YAKIMA TRAINING CENTER, WASHINGTON

## 1. Introduction

### 1.1 Purpose

This Resource Conservation and Recovery Act (RCRA) Corrective Action Completion Report (Report) documents the completion of RCRA corrective action recommendations at all solid waste management unit (SWMU) and area of concern (AOC) sites at Yakima Training Center (YTC) following the 1995 RCRA Facility Assessment (RFA).

### 1.2 Report Organization

This Report is intended to be a comprehensive summary of previously conducted evaluations, investigations, cleanup actions, and decisions resulting from the 1995 YTC RCRA corrective action recommendations. As such, the reader is referred to approximately 36 "terminal" documents included as appendices to this Report in which a site remedy decision or RCRA corrective action decision was made or implied. It should be noted that other critical reporting milestones following the 1995 RFA are also referenced in this Report, but not included as appendices if subsequent documentation documents the decision.

After this introductory section (Section 1), Sections 2 through 47 summarize for each SWMU/AOC in sequential order how the recommended RCRA corrective action was satisfied. A conclusion section and references section are in Section 48 and Section 49, respectively.

Locations of each SWMU and AOC are shown on the attached plate entitled "Final Remedies at YTC RCRA Corrective Action Sites."

### 1.3 Regulatory Context

YTC was an interim-status dangerous waste facility as a result of a RCRA permit application to operate an open burning and detonation unit known as the Unserviceable Munitions Treatment Unit (UMTU) at Range 14. Since YTC was an interim-status facility, the United States Environmental Protection Agency conducted a RFA at YTC in 1995. The RFA identified 77 SWMUs and 38 AOCs. The RFA recommended further RCRA corrective action for each SWMU/AOC with a documented release to the environment as well as all SWMU/AOCs where the authors deemed a potential release to the environment might have occurred. As a result, some form of RCRA corrective action was recommend for most of the YTC SWMU/AOCs. The RFA concluded that no further action (NFA) was necessary for the following 25 SWMU/AOCs, which will not be discussed further in this Report:

- Dip Tanks (SWMU 2)
- 810 Baghouse (SWMU 9)
- Former Building 810 Paint Booth (SWMU 10)
- Former Building 951 Paint Booth (SWMU 11)
- Former Army Reserve Stoddard Solvent Wash Tank (SWMU 15)

- Main Motor Pool Former Waste Battery Acid Container (SWMU 17)
- Mobilization and Training Equipment Site (MATES) Waste Oil Tank (SWMU 20)
- MATES Oil Filter Press (SWMU 21)
- National Guard Battery Room (SWMU 23)
- National Guard Underground Oil Tank (SWMU 24)
- Range Control Battery Room (SWMU 30)
- Building 319 Underground Storage Tank (UST) (SWMU 35)
- Building 319 UST (SWMU 36)
- Building 319 UST (SWMU 37)
- Building 323-1 UST (SWMU 38)
- Building 323-2 UST (SWMU 39)
- Building 323-3 UST (SWMU 40)
- Building 339 UST (SWMU 41)
- Building 845-2 UST (SWMU 42)
- Building 845-5 UST (SWMU 45)
- Building 845 UST (SWMU 46)
- Building 805/806 UST (SWMU 47)
- Building 951-4 UST (SWMU 48)
- Building 970-1 UST (SWMU 49)
- Building 970-2 UST (SWMU 50)

The interim-status UMTU was clean closed in 2003 (URS 2003). Thus, the RCRA corrective action requirements stemming from the 1995 RFA are the only remaining RCRA requirements associated with the YTC interim-status facility. Although the RCRA corrective action requirements for final-status facilities in Washington Administrative Code (WAC) 173-303-646 technically do not apply to the interim-status YTC facility (WAC 173-303-400 for interim-status facilities adopt the federal standards by reference with minimal modification), in practice Model Toxics Control Act (MTCA) regulations in Chapter 173-340 of the WAC have been used to address actual releases to the environment at YTC per WAC 173-303-646(3) and a 2001 potentially liable person letter (Dick 2001) from the Washington Department of Ecology (Ecology). Since a MTCA agreed order or consent decree has not been implemented for YTC, the regulation of the YTC MTCA sites is following a MTCA voluntary cleanup administrative approach, with consultation provided by Ecology's Hazardous Waste and Toxics Reduction Program.

This Report documents the completion of RCRA corrective action recommendations and/or MTCA cleanup requirements for all of the SWMUs/AOCs listed in the 1995 RFA, with the exception of ongoing long-term management requirements (i.e., maintenance of land use controls and groundwater monitoring) at the nine locations listed below. JBLM is requesting Ecology issue a Dangerous Waste Management Permit for Corrective Action (commonly referred to as a "Permit Lite") for the long-term management requirements at these nine locations:

- Former Pesticide Handling Area (SWMU 5)
- Former Ammunition Storage Point (ASP) Burn Pits (SWMU 27)
- Tracked Vehicle Repair (TVR)/Old MATES Site (includes SWMUs 43 and 44)
- 1969-1994 Landfill (SWMU 51)
- 1954-1968 Landfill/Burn Pits (SWMU 57)
- Former Fire Training Pit (SWMU 59)

- Building 218 Buried Munitions (AOC 7)
- Building 301 Former UST Site (AOC 14)
- Building 319 Former UST Site (AOCs 15 and 16)
- Building 323 Former UST Site (AOCs 17 and 18)
- Building 321 Former UST Site (AOCs 19 and 20)
- Building 845-1 Former UST Site (AOC 27)
- Centralized Fuel Facility

## 2. Satellite Accumulation/Other Temporary Storage Areas (SWMU 1)

This SWMU refers to various locations around YTC where small containers of waste are temporarily stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "For those accumulation areas where there is no containment to prevent hazardous wastes being released to soil if containers tipped or leaked, containment such as polypacks should be provided. Also the holes in the bottoms of the battery totes eliminate any spill containment. Also for those areas with multiple containers for the same waste, practices should be changed so that only one container per waste type is present in each area."

The RCRA recommendations have been addressed as documented in a February 2006 Memorandum (Koch 2006, **Appendix A**). Since the RCRA corrective action recommendation has been addressed, NFA is needed for this site.

## 3. 90 Day Accumulation Area (SWMU 3)

This SWMU referred to a 90 day accumulation area located west of Building 810, whose use was discontinued subsequent to the 1995 RFA. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Based on the quantities of wastes being moved in and out of this area, there is a potential that a container may be tipped or punctured while being handled. As the area currently exists this would result in a release to soil. Paving the area to provide additional containment for the area would eliminate this potential and also reduce the potential for having to remove soil."

As documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), there is no evidence of a release at the site while it was used as an accumulation area and the site is no longer used for accumulation or handling of hazardous waste. Since the RCRA corrective action recommendation is no longer necessary or appropriate, NFA is needed for this site.

## 4. Former Hazardous Waste Storage Area (SWMU 4)

This SWMU referred to a former storage area located west of Building 810. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "the area be investigated for soil contamination."

A site investigation (SI) was conducted to address the RCRA corrective action recommendation as documented in a March 2003 SI Report (Hart Crowser 2003a, **Appendix C**). The actual contaminants of potential concern (COPCs) detected in surface soil during the SI (e.g., dieldrin) were due to the immediately adjacent SWMU 5. As a result, the SWMU 5 site was expanded to incorporate SWMU 4. Thus, NFA is needed for SWMU 4 in and of itself.

## 5. Former Pesticide Handling Area (SWMU 5)

This SWMU refers to the former practices of storing pesticides at former Building 815 and mixing pesticides adjacent to former Building 815 between 1965 and 1990. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "the area be investigated for soil contamination."

A SI was conducted to address the RCRA corrective action recommendation as documented in a March 2003 SI Report (Hart Crowser 2003b). Additional investigation activities include evaluations of the potential leaching to groundwater (Bussey 2006a) and potential terrestrial ecological exposure pathways (Becker *et. al.* 2006). This body of investigation work demonstrated that the only potentially complete exposure pathway at the site (which includes SWMU 4 as described in the previous section) is the potential direct contact pathway. However, the potential direct contact pathway does not pose an unacceptable risk or hazard given the current and anticipated future land use. Nonetheless, NFA is not acceptable since MTCA regulations require land use controls (LUCs) at a minimum whenever contaminant concentrations in soil shallower than 15 feet exceed MTCA cleanup levels for unrestricted land use. Thus, the site remedy selected in a 2007 Decision Document (DD) is for JBLM Installation Restoration Program (IRP) to implement and maintain LUC mechanisms to prevent unmitigated future residential land use within the site boundary (Fort Lewis IRP 2007a, **Appendix D**). The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**)

## 6. Former Transformer Storage Area (SWMU 6)

This SWMU referred to a former storage area located west of Building 810. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "the area be investigated for soil contamination."

A SI was conducted to address the RCRA corrective action recommendation as documented in a March 2003 SI Report (Hart Crowser 2003c, **Appendix F**). NFA was recommended in the SI Report since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Since an actual release did not occur at the site, NFA is needed for this site.

## 7. Former Containers Next to Fence (SWMU 7)

This SWMU referred to an area west of Building 810 where numerous 55-gallon and smaller containers were observed, including one instance of a leaking container. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "the area be investigated for soil contamination."

A 1996 SI documented that all containers had been removed from the site (Smith and Whelan 1996, **Appendix G**). No contamination above MTCA screening levels were present. The fact that the 1996 SI did not sample for total petroleum hydrocarbons (TPH) was a preliminary concern since 20,000-gallon diesel tanks were temporarily stored at the site at one time. However, as documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), the tanks did not ever contain fuel while at YTC. NFA is recommended since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria.

## 8. Contaminated Soil North of Building 810 (SWMU 8)

This SWMU referred to a gravel covered area north of Building 810 where drums and drop boxes containing petroleum-contaminated soil was stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "appropriate containment be provided. This includes having all containers sealed and having an impermeable surface that is easily cleaned if materials are spilled."

A 2003 SI Report documented that all soil containers had been removed from the site prior to 2001 (Hart Crowser 2003d, **Appendix H**). More importantly, the 2003 SI Report demonstrated that there had not been a release to surface soil at the site. NFA was recommended in the SI Report since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Since an actual release did not occur at the site, NFA is needed for this site.

## 9. Medical and Dental Clinic Silver Recovery/X-Ray Solutions (SWMUs 12 through 14)

These SWMUs refers to a silver recovery machine at the medical clinic (SWMU 12), an x-ray developing machine at the dental clinic (SWMU 13), and a former x-ray developing machine at the dental clinic (SWMU 14). The 1995 RCRA corrective action recommendation (Brimmer 1995) for all three SWMUs was that "Yakima Training Center should review the analytical results when they are completed and handle the waste water accordingly."

A 1995 report (Ogden Professional Services 1995, **Appendix I**) documented that wastewater from the silver recovery machine at the medical clinic and x-ray developing machines at the dental clinic are being handled appropriately based on the analytical results, which indicated the wastewater is non-hazardous. Since the RCRA corrective action recommendation has been addressed, NFA is needed for SWMUs 12 through 14.

## 10. Marine Reserve POL Storage Building (SWMU 16)

This SWMU refers to a building located near Building 851 where hazardous waste and hazardous material are temporarily stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) was that "the floors be sealed, including seams, to prevent releases if materials are spilled."

Ecology's September 2001 meeting notes (Caron 2001, **Appendix J**) document a 12 September 2001 site visit, in which Ecology concluded that the existing floor seal and seams was adequate in the event of a spill. Since the RCRA corrective action recommendation is no longer necessary or appropriate, NFA is needed for this site.

## 11. MATES Battery Room (SWMU 18)

This SWMU referred to a drain in the MATES room where batteries and waste acid were temporarily stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "It should be determined where the drain in this room discharges. Depending on the determined location sampling and cleanup maybe warranted."

As documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), the drain was capped prior to 1996 and there has been no evidence of a release from this storage area. Since the RCRA corrective action recommendation is no longer necessary or appropriate, NFA is needed for this site.

## 12. MATES Hazardous Waste Storage Area (SWMU 19)

This SWMU refers to a 90 day accumulation area at MATES where hazardous waste is temporarily stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Since this area is a historic waste storage area and was used when the area had no containment and wastes have historically been stored outside the current containment, it is recommended that the area be evaluated for potential releases to soil."

Upon further inspection and evaluation following the 1995 RFA, it was determined that there is no evidence of a historical or current release from the storage area as documented in a January 2006 Memorandum (Fain 2006, **Appendix B**) and a February 2006 Memorandum (Wilson 2006, **Appendix K**). Since the RCRA corrective action recommendation is no longer necessary or appropriate, NFA is needed for this site.

## 13. Former PCS Stockpile Area (SWMU 22)

This SWMU referred to a former petroleum-contaminated soil stockpile area within the fenced area of Petroleum, Oil, and Lubricant (POL) 2 that operated in 1992 and 1993. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "This is an area with documented surface soil contamination resulting from both a large fuel spill and the former contaminated soil stockpile. Contamination may extend a significant distance below ground surface. This area needs to be characterized and if soil contamination is found, remediated."

SWMU 22 is co-located entirely within POL 2 (AOC 4). The SWMU 22/POL 2 site was investigated and completely remediated as described below under the AOC 4 section. Since the release from SWMU 22/POL 2 was remediated to MTCA standards for unrestricted land uses, NFA is needed for this site.

## 14. Old POL Yard (SWMU 25)

This SWMU referred to a former yard near the intersection of 5th Avenue and D Street where drums of waste antifreeze were stored and three 12,000-gallon fuel USTs were located. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Based on the area handling wastes and serving as a main fueling area, there is likely to have been surface and subsurface soil contamination. This area should be investigated to determine if there is soil contamination."

A site evaluation was conducted to address the RCRA corrective action recommendation as documented in a 1996 report (Smith and Whelan 1996, **Appendix G**). COPCs were not detected above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria, therefore, NFA is needed for this site.

## 15. Ammunition Storage Point (SWMU 26)

This SWMU referred to an approximately 40-foot by 50-foot area in the southwest corner of the Ammunition Storage Point (ASP) complex where stained soil was observed as a result of historic waste management practices. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "This area has documented soil contamination. The area should be cleaned up and any hazardous waste management practices, such as drums containing waste with holes that could contribute additional contamination should be modified."

A SI was conducted to determine the extent of soil contamination as documented in a 2001 SI Report (Shannon & Wilson 2001a). Based on the results of the 2001 SI Report, a soil removal action was taken as documented in a removal report (Bay West 2004**, Appendix BB**). Approximately 130 cubic yards of contaminated soil were removed from the site. Since COPC concentrations in confirmation soil samples were not detected at concentrations above MTCA cleanup levels for unrestricted land use and the terrestrial ecological pathway is not complete and significant, NFA is needed for the site as documented in a 2007 DD (Fort Lewis IRP 2007b, **Appendix L**).

## 16. Former Ammunition Storage Point Burn Pits (SWMU 27)

This SWMU refers to four unlined burn pits in the northeastern portion of the ASP complex that were used until 1985 for burning ammunition packing materials, including wood that was reportedly treated with pentachlorophenol. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Since this is a historic area where wood with pentachlorophenol was burned the soils should be tested to determine if pentachlorophenol or any by-products such as dioxin are still present."

A SI was conducted to address the RCRA corrective action recommendation as documented in a 2001 SI Report (Shannon & Wilson 2001b). Additional investigation and evaluation activities include a screening-level risk assessment (Bussey 2006b) and an evaluation of the potential terrestrial ecological exposure pathway (Becker *et. al.* 2006). This body of investigation work demonstrated that the only potentially complete exposure pathway at the site is the potential direct contact pathway. However, the potential direct contact pathway does not pose an unacceptable risk or hazard given the current and anticipated future land use. Nonetheless, NFA is not acceptable since MTCA regulations require LUCs at a minimum whenever contaminant concentrations in soil

shallower than 15 feet exceed MTCA cleanup levels for unrestricted land use. Thus, the site remedy selected in a 2007 DD is for JBLM IRP to implement and maintain LUC mechanisms to prevent unmitigated future residential land use and unplanned excavation within the site boundary (Fort Lewis IRP 2007c, **Appendix M**). The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 17. Wire Storage Areas (SMWUs 28 and 29)

SWMU 28 and SWMU 29 refer to the former and current areas, respectively, where scrap metal, wood, and 55-gallon drums associated with Range Control Forward activities were/are stored. The 1995 RCRA corrective action recommendation (Brimmer 1995) for SWMUs 28 and 29 was: "The wire storage areas have been used to store a wide variety of materials and should be evaluated to determine if any releases have occurred that would require cleanup. It is likely that there are some areas where surface soils have been impacted."

A SI was conducted to address the RCRA corrective action recommendation as documented in a 2004 SI Report (Calibre 2004, **Appendix N**). NFA was recommended in the 2004 SI Report for SWMU 28 since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Since an actual release did not occur at SWMU 28, NFA is needed for SWMU 28.

A limited soil removal action was taken at SWMU 29 in 2005 as documented in a 2006 SI Report (Bussey 2006a, **Appendix O**) since elevated COPC concentrations were detected in one SWMU 29 sample from the 2004 SI. Approximately 0.15 cubic yards of contaminated soil were removed from the site. NFA was recommended in the 2006 SI Report for SWMU 29 since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria in either the confirmation soil sample or other SWMU 29 samples collected subsequent to the soil removal. Since the limited release to surface soil at SWMU 29 has been addressed in accordance with MTCA regulations, NFA is needed for SWMU 29.

## 18. MPRC Drain Field and Collection Containers (SWMUs 31 through 33)

SWMU 31 and SWMU 32 referred to a septic system drain field and collection drum, respectively, that may have received waste/wash water from shops at the Multipurpose Range Complex (MPRC). SWMU 33 referred to a former aboveground storage tank (AST) at the MPRC that stored used oil to be recycled. The 1995 RCRA corrective action recommendation (Brimmer 1995) for SWMUs 31 through 33 was: "The MPRC area should be thoroughly investigated to determine waste handling practices. Drains from one shop area discharge to a buried drum and another shop is connected to a drain field. It needs to be determined if any releases to the environment, particularly soils, have occurred."

Upon further inspection and evaluation following the 1995 RFA, it was determined that there is no evidence of a historical or current release from SWMUs 31 through 33 as documented in a January 2006 Memorandum (Fain 2006, **Appendix B**). Furthermore, the SWMU 32 collection drum and SWMU 33 tank have been removed. Since the RCRA corrective action recommendation has been addressed, NFA is needed for SWMUs 31 through 33.

## 19. Waste Oil Tanks (SWMU 34)

This SWMU refers to portable ASTs used throughout YTC to store waste oil. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "There are portable waste oil tanks located throughout the facility. There is a potential that waste oil may be spilled as the tank contents are being transferred. These tanks should be located on a paved surface so that if any oil spills it can easily be cleaned up."

As documented in a February 2006 Memorandum (Koch 2006, **Appendix A**), all portable tanks have been replaced with new double-wall tanks and there is no evidence of a release from any of the old tanks. Since the new tanks provide the secondary containment sought in the RCRA corrective action recommendation, the RCRA corrective action recommendation is no longer necessary or appropriate and NFA is needed for this site.

## 20. TVR/Old MATES (includes SWMUs 43 and 44)

TVR/Old MATES refers to sites associated with a trichloroethylene (TCE) groundwater plume in the area roughly between Building 951 and Building 810. Although the 1995 RFA did recommend corrective action for SWMUs 43 and 44 (see below), the RFA did not specifically address the TCE detected in four monitoring wells (MWs) as documented in a 1993 SI Report (Ecology & Environment 1993). As a result, the TVR/Old MATES site was essentially created post-RFA. It appears the sources of TCE in groundwater are historical discharges of TCE at Old MATES and probably TVR. The site investigation chronology includes the 1991 removal of five waste oil USTs at TVR, 1993 removal of approximately 1000 cubic yards of soil associated with TVR waste oil USTs, 1993 SI Report (Ecology & Environment 1993), 1995 removal of waste oil UST at Old MATES, installation of eight additional MWs between 2004 and 2005, and groundwater monitoring (GWM) events conducted between January 2004 and present as summarized in annual GWM Reports. This body of investigation work demonstrated that the only potentially complete exposure pathways at the site are the potential direct contact and groundwater ingestion/inhalation pathways. However, the potential direct contact and groundwater ingestion/inhalation pathways do not pose an unacceptable risk or hazard given the current and anticipated future land use. Nonetheless, NFA is not acceptable since MTCA regulations require LUCs at a minimum whenever contaminant concentrations exceed MTCA cleanup levels for unrestricted land use. Thus, the site remedy selected in a 2007 DD is for JBLM IRP to conduct GWM events and to implement and maintain LUC mechanisms to 1) prevent the installation of on-post water supply wells within 1000 feet of the site boundary, and 2) address potential soil contamination as necessary in the event that Building 843 is deconstructed in the future (Fort Lewis IRP 2007d, **Appendix P**). The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

SWMUs 43 and 44 referred to former waste oil USTs 845-3 and 845-4 associated with TVR (Building 845). During the removal of USTs 845-3 and 845-4 in 1993, the excavations could not be cleaned closed because contamination was present under Building 843 and further excavation would have compromised the structural integrity of the building. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "When SWMUs 43 and 44 were removed contaminated soil remained. This soil should be removed." Since soil contamination may remain under Building 843, the selected remedy for TVR/Old MATES includes a provision to address potential remaining soil contamination as described above.

## 21. 1969 – 1994 Landfill (SWMU 51)

This SWMU refers to the most recent YTC landfill, which is located southeast of the Cantonment Area and was active between 1969 and 1994. The landfill primarily received municipal solid waste and construction debris. As a permitted municipal solid waste landfill, the landfill is subject to RCRA closure and post-closure requirements, including GWM at the exiting four MWs. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "The one groundwater monitoring well that has been sampled contained elevated metals concentrations. Additional investigation should be done to identify the source of these metals."

The RFA recommendation should not have been made as a corrective action issue since it is a post-closure issue. The technical issue raised in the RFA is being addressed as part of post-closure landfill requirements.

Since this permitted landfill is by far the largest YTC landfill in terms of operational scope and waste received, it is prudent to restrict future residential exposure to the landfill contents. As a result, the JBLM Compliance Cleanup Program (CCP) is using this Report to select a LUC presumptive remedy for the site. JBLM CCP will implement and maintain LUC mechanisms to prevent unmitigated future residential land use and unplanned excavation within the landfill boundary. The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 22. Soil Stockpile Area (SWMU 52)

This SWMU referred to former petroleum-contaminated soil stockpiles located near the 1969 – 1994 Landfill (SWMU 51) between 1993 and 1995. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "The soil stockpile area is being used to mix petroleum contaminated soil to reduce the TPH concentrations so the soil can be disposed in SWMU 51, the landfill. This practice should either be discontinued or all applicable monitoring should be performed and permits should be obtained."

As documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), the practice was immediately discontinued per the RCRA corrective action recommendation. In addition, there was no evidence of a release from the large petroleum-contaminated soil stockpile removed in January 1995 (E.P. Johnson Construction & Environmental 1995, **Appendix Q**). Since the recommended corrective action has been implemented and there is no evidence of a release, NFA is needed for this site.

## 23. Transfer Station (SWMU 53)

This SWMU refers to metal drop box located near the 1969 – 1994 Landfill (SWMU 51) that has been used to collect municipal solid waste since the 1969 – 1994 Landfill closed in 1994. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "As long as no hazardous materials are placed in the drop box current practices are acceptable. YTC needs to ensure all units including those that only use the facility on a temporary basis are aware of this. The lid, open at the time of the visual site inspection, should be closed during periods when waste is not actively being added."

Upon further inspection and evaluation following the 1995 RFA, it was determined that hazardous waste has not been placed in the drop box and procedures are in place to ensure hazardous waste is not placed in the drop box as documented in a January 2006 Memorandum (Fain 2006, **Appendix B**). Since the RCRA corrective action recommendation does not apply, NFA is needed for this site.

## 24. Pre-1954 Landfill (SWMU 54)

This SWMU refers to a 0.2-acre landfill that received municipal solid waste prior to 1954 in a location immediately south of the Cantonment Area. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "All former landfills throughout YTC need to be identified. These areas need to be evaluated to determine if they may pose any problems including releases to the environment."

The RCRA corrective action recommendation was satisfied with preliminary assessment activities in a 1996 Report (Smith and Whelan 1996) as well as additional preliminary assessment/SI work documented in a 2006 SI Report (Bussey 2006c). Since these assessment activities concluded that the site does not pose an unacceptable risk or hazard to human health or the environment, NFA is needed for the site as documented in a 2007 DD (Fort Lewis IRP 2007e, **Appendix R**).

## 25. Former Landfill Pits (SWMUs 55 and 56)

SWMUs 55 and 56 referred to relatively small landfill pits located near SWMU 57 and SWMU 51, respectively, that reportedly received municipal solid waste for a limited time in the 1968 to 1969 timeframe. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "All former landfills throughout YTC need to be identified. These areas need to be evaluated to determine if they may pose any problems including releases to the environment."

Upon further inspection and evaluation following the 1995 RFA, the former landfill pits could not be located as documented in a February 2006 Memorandum (Wilson 2006, **Appendix K**). Furthermore, as discussed in the memorandum, it is likely that the landfill pits either did not exist or were extremely limited in use. Since the RCRA corrective action recommendation has been addressed, NFA is needed for SWMU 55 and SWMU 56.

## 26. 1954 - 1968 Landfill/Burn Pits (SWMU 57)

This SWMU refers to a location immediately north of the Cantonment Area where municipal solid waste was apparently burned and disposed of in up to 7 unlined pits between 1954 and 1968. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "All former landfills throughout YTC need to be identified. These areas need to be evaluated to determine if they may pose any problems including releases to the environment."

The RCRA corrective action recommendation was satisfied via two SI Reports (Hart Crowser 2003e, Bussey 2006c). This body of investigation work demonstrated that the only potentially complete exposure pathway at the site is the potential direct contact pathway. However, the potential direct contact pathway does not pose an unacceptable risk or hazard given the current and anticipated future land use. Nonetheless, NFA is not acceptable since MTCA regulations require LUCs at a minimum whenever contaminant concentrations in soil shallower than 15 feet exceed MTCA cleanup levels for unrestricted land use. Thus, the site remedy selected in a 2007 DD is for JBLM IRP to implement and maintain LUC mechanisms to prevent unmitigated future residential land use and unplanned excavation within the landfill/burn pits boundary (Fort Lewis IRP 2007f, **Appendix S**). The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 27. Former Bivouac Landfill Pits (SWMU 58)

This SWMU referred to two former bivouac landfill pits located in Training Area 12 and Training Area 3A that were reportedly used from 1982 to 1983. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "All former landfills throughout YTC need to be identified. These areas need to be evaluated to determine if they may pose any problems including releases to the environment."

Upon further inspection and evaluation following the 1995 RFA, the former landfill pits could not be located as documented in a February 2006 Memorandum (Wilson 2006, **Appendix K**). Furthermore, as discussed in the memorandum, it is likely that the landfill pits either did not exist or were extremely limited in use. Since the RCRA corrective action recommendation has been addressed, NFA is needed for this site.

## 28. Former Fire Training Pit (SWMU 59)

This SWMU refers to a location formerly used for fire fighting practice, where common practice was to extinguish fires set by lighting petroleum fuel added to an unlined earthen pit. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "The fire training pit has documented soil contamination and product present in a nearby monitoring well that did not contain any ground water. This area needs to be remediated to remove the product and contaminated soil."

A SI was conducted to determine the extent of soil contamination as documented in a 2001 SI Report (Shannon & Wilson 2001c). Based on the results of the 2001 SI Report, a soil removal action was taken as documented in a removal report (Bay West 2004). Approximately 965 cubic yards of contaminated soil were removed from the site. Additional investigation activities include an evaluation of the potential terrestrial ecological exposure pathway (Becker *et. al.* 2006) and GWM events conducted between January 2004 to present and summarized in the latest annual

GWM Report. This body of investigation work demonstrated that the only potentially complete exposure pathway at the site is the potential groundwater ingestion/inhalation pathway. However, the potential groundwater ingestion/inhalation pathway does not pose an unacceptable risk or hazard given the current and anticipated future land use. Nonetheless, NFA is not acceptable since MTCA regulations require LUCs at a minimum whenever contaminant concentrations exceed MTCA cleanup levels for unrestricted land use. Thus, the site remedy selected in a 2007 DD is for JBLM IRP to conduct GWM events and to implement and maintain LUC mechanisms to prevent the installation of water supply wells within the site boundary (Fort Lewis IRP 2007g, **Appendix T**). The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 29. White Phosphorous Pit (SWMU 60)

This SWMU referred to an explosive ordnance disposal pit in the YTC operational range area that was suspected to contain white phosphorus. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "YTC is in the process of identifying what might be buried in this area. This investigation should continue. If unsafe or potentially environmentally harmful conditions are discovered, they should be appropriately remediated."

As documented in a 2007 completion report (Battelle 2007, **Appendix U**), the site was investigated (Vermeul *et. al.* 2005) and all munitions debris was removed from the site in three phases of work between 2004 and 2006. Approximately 81 tons of munitions debris was recovered, demilitarized, and removed from the site. Since there is no remaining munitions debris at the site, NFA is needed for this site. Furthermore, it should be noted that RCRA corrective action is no longer applicable at this site located within the YTC operational range area per the RCRA military munitions rule in WAC 173-303-578.

## 30. Range 14 UMTU Area (SWMU 61)

This SWMU referred to the UMTU interim-status dangerous waste unit that was the basis for the 1995 RFA. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "This area is operating under an old Part B permit. The permit should be updated to match current practices. When the area is closed monitoring should be conducted to ensure contaminants are removed."

The UMTU was clean closed as documented in the closure certification report (URS 2003, **Appendix V**). Since the RCRA corrective action recommendation has been addressed, NFA is needed for this site.

## 31. Main Vehicle Wash Rack (SWMU 62)

This SWMU refers to the active vehicle washrack in the northeastern portion of the Cantonment Area. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Soil contamination has been documented at this unit. Soils/sediments collected at this unit with elevated TPH concentrations are being transported to SWMU 52 to reduce the TPH concentrations. Waste handling practices should be modified to ensure that contaminated materials are properly handled and disposed. YTC needs to consider that there may be elevated metals concentrations associated

with the wash racks and test for these before wastes are disposed. Areas throughout YTC where these wastes have been disposed that have not been fully characterized, should be identified and tested to ensure there is no environmental impact. The practice of rinsing out drums should cease at the wash rack since this introduces the potential for a wide range of materials to be present in the water, oil, and sediments. The pesticide mixing area should be maintained such that no spilled material is present after mixing is completed."

As documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), all of the RCRA corrective action recommendations were implemented following the 1995 RFA. Since the corrective action recommendation has been addressed, NFA is needed for this site.

## 32. Oil/Water Separators (SWMUs 63 through 73)

SWMUs 63 through 73 refer to the following YTC oil/water separators (OWSs) as they existed at the time of the 1995 RFA:

- Building 319 OWS (SWMU 63), discharge to sanitary sewer
- Marine Reserve "tank rack" OWS (SWMU 64), discharge to drain field
- Army Reserve Shop OWS (SWMU 65), discharge to drain field
- Building 845 OWS (SWMU 66), discharge to surface drainage
- Building 845 OWS (SWMU 67), discharge to sanitary sewer
- Building 301 OWS (SWMU 68), discharge to surface drainage
- Building 951 OWS (SWMU 69), discharge to sanitary sewer
- Building 323 OWS (SWMU 70), discharge to sanitary sewer
- New National Guard Facility OWS (SWMU 71), discharge to sanitary sewer
- POL 1 OWS (SWMU 72), discharge to surface drainage
- POL 1 OWS (SWMU 73), discharge to surface drainage

The 1995 RCRA corrective action recommendation (Brimmer 1995) for the 11 OWSs was: "Oil/water separators connected to the sanitary sewer system should be operated to eliminate oil releases. Oil/water separators that are not connected to the sanitary sewer should be connected. The areas where they are currently discharging should be evaluated to determine if any releases are occurring or that have occurred."

This RCRA recommendation should not have been made since operation of these OWSs is a Clean Water Act compliance issue, not a RCRA compliance issue. OWSs are operated in accordance with a Clean Water Act National Priority Discharge Elimination System Permit. Furthermore, the operation of any OWS that discharges to surface drainage is in accordance with the current Storm Water Pollution Prevention Plan (Gray & Osborne 2000, **Appendix W**). As a result, NFA is needed for SWMUs 63 through 73 (at least from a RCRA perspective).

## 33. Sanitary Sewer System (SWMU 74)

This SWMU refers to the actual pipes of the sanitary sewer system that carry sewage to the wastewater treatment plant (SWMU 75). The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "For those areas where materials have historically been discharged, the integrity of the pipes should be evaluated to determine if there have been any releases to soil."

This RCRA recommendation should not have been made since operation of the sanitary sewer system is a Clean Water Act compliance issue, not a RCRA compliance issue. The sanitary sewer system is operated in accordance with a Clean Water Act National Priority Discharge Elimination System Permit. As a result, NFA is needed for this "SWMU" (at least from a RCRA perspective).

## 34. Wastewater Treatment Plant (SWMU 75)

This SWMU refers to the actual YTC wastewater treatment plant. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "YTC should ensure that no materials including oil that could adversely impact the Yakima River are released. The easiest way to do this is eliminate all sources of hazardous materials entering the plant."

This RCRA recommendation should not have been made since operation of the wastewater treatment plant is a Clean Water Act compliance issue, not a RCRA compliance issue. The wastewater treatment plant is operated in accordance with a Clean Water Act National Priority Discharge Elimination System Permit. As a result, NFA is needed for this "SWMU" (at least from a RCRA perspective).

## 35. Yakima Research Station Sewage Lagoons (SWMU 76)

This SWMU refers to the evaporative lagoons used for treating sewage at the Yakima Research Station. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "This area could not be thoroughly investigated during the inspection. YTC should ensure that only sewage is being discharged to this lagoon."

The National Security Administration operated the Yakima Research Station on property leased from the Department of Defense. Active use of the Yakima Research Station ceased in 2013. As documented in a 2014 completion report (USACE, 2014, **Appendix KK**), the site was investigated, all drains and lines from the facility were cleaned, and all sediments, liner and associated lagoon structures were removed in 2014. Since there is no remaining contamination at the site, NFA is appropriate for this unit.

## 36. Surface Water Drainage System (SWMU 77)

This SWMU essentially refers to all stormwater runoff at YTC based on "elevated" levels of metals in sediment samples documented in a 1993 SI Report (Ecology & Environment 1993). The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "There are documented releases to the surface water drainage system. All practices that result in these releases should cease and contaminated areas still contributing to these releases should be cleaned up and contained and or cleaned up. Kiddies Pond should not be stocked with fish and fishing should be restricted until the sediments are clean enough to ensure there are no adverse food chain effects."

The "documented releases" claim in the 1995 RFA was based on concentrations of metals (e.g., copper, lead, and/or zinc from military munitions) in three Cantonment Area sediment samples that were above the background concentrations of 10 sediment samples collected during the 1993 SI. The "documented releases" statement was not based on comparison with potential regulatory or risk-based screening criteria. The maximum copper, lead, and zinc concentrations from the 1993 SI

were 55 mg/kg, 28 mg/kg, and 340 mg/kg while the background concentrations ranged from 15 to 49 mg/kg, 3 to 34 mg/kg, and 40 to 85 mg/kg, respectively. The RFA recommendation for the Kiddies Pond was based solely on the detection of copper and lead at concentrations of 55 mg/kg and 16 mg/kg, respectively. A 1996 risk assessment document concluded that the metals concentrations in the Kiddies Pond do not pose a health hazard or risk (Washington State Department of Health 1996, **Appendix X**). Since Kiddies Pond (which had the highest copper and "elevated" lead concentrations and has the greatest potential exposure) is safe, then other drainages with lower metals concentrations and less potential exposure are also safe. Moreover, these metal detections should never have been considered "documented releases" for the following reasons: 1) the maximum detected concentrations are within or just slightly above the range of background concentrations measured during the 1993 SI Report, 2) there are no freshwater sediment quality standards in WAC 173-340-760 or WAC 173-204-340, 3) the maximum detected metals concentrations are well below marine sediment quality standards in WAC 173-204-320, and 4) surface water drainage is a Clean Water Act compliance issue, not a RCRA compliance issue. Stormwater discharges at YTC are in accordance with a Clean Water Act National Priority Discharge Elimination System Permit and the current Storm Water Pollution Prevention Plan (Gray & Osborne 2000, **Appendix W**). As a result, NFA is needed for this "SWMU" (at least from a RCRA perspective).

## 37. Former Vehicle Washracks (AOCs 1 through 3)

AOCs 1 through 3 referred to the three former Cantonment Area washracks known as the Former Central Vehicle Washrack, Former Main Motor Pool Washrack, and Former Building 812 Washrack, respectively. The 1995 RCRA corrective action recommendation (Brimmer 1995) for these three washracks was: "Soils in these areas should be sampled to determine if there are elevated levels of metals or hydrocarbons present from washing vehicles. If so, potential impacts on groundwater should be evaluated and the contamination should be cleaned up."

A SI was conducted to address the RCRA corrective action recommendation for AOC 1 and AOC 2 as documented in a 2006 SI Report (Bussey 2006a, **Appendix O**). Since no COPCs were detected during the SI at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria, NFA is needed for AOC 1 and AOC 2 as documented in the respective 2007 DDs (Fort Lewis IRP 2007h, **Appendix Y** and Fort Lewis IRP 2007i, **Appendix Z**).

A SI was conducted to address the RCRA corrective action recommendation for AOC 3 as documented in a 2003 SI Report (Hart Crowser 2003f). No COPCs were detected during the SI at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria, with the exception of an elevated lead concentration in a single soil sample. As a result, a soil removal action was taken at AOC 3 in 2006 as documented in an Interim Cleanup Action Report (Bussey 2006d). Approximately 8 cubic yards of contaminated soil were removed from the site. Since COPC concentrations in confirmation soil samples in combination with SI results are below the most stringent potential MTCA cleanup levels for unrestricted land use, NFA is needed for AOC 3 as documented in a 2007 DD (Fort Lewis IRP 2007j, **Appendix AA**).

## 38. POL Fuel Point (AOC 4)

This AOC referred to the former main fueling area in the Cantonment Area, which was divided by a road into sections called POL 1 and POL 2. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "This is the current fueling area that has had a number of large spills. There were also underground storage tanks at this location. Thorough characterization should be conducted and any remaining or newly discovered contamination should be cleaned up. The containment associated with the current tanks should be removed as planned."

The documented releases to soil (as opposed to AST spills captured in the secondary containment system at POL 1), visible soil staining, and USTs referenced in the 1995 RFA (Science Applications International Corporation 1995) for this AOC were at POL 2. A SI was conducted to determine the extent of soil contamination at POL 2 as documented in a 2001 SI Report (Shannon & Wilson 2001d). Based on the results of the 2001 SI Report, a soil removal action was taken at POL 2 as documented in a removal report (Bay West 2004, **Appendix BB**). Approximately 799 cubic yards of contaminated soil (i.e., all soil down to bedrock interface) were removed from POL 2. The potential leaching to groundwater pathway is not significant given the soil removal action, groundwater depth, and distance to potential receptors (Ecology & Environment 1993, Shannon & Wilson 2001d, Bussey 2007b). The potential terrestrial ecological pathway is not significant given the soil removal action, site size, and surrounding land use. As a result, NFA is needed for POL 2.

According to the 1995 RFA, it appears that all known spills at POL 1 were promptly cleaned up. The ASTs and associated equipment at POL 1 were removed as documented in a completion report (Cape Environmental 2004, **Appendix CC**). There was no evidence of a release under the liner and associated secondary containment system at POL 1. As a result, NFA is needed for POL 1.

## 39. Hazardous Materials Storage Area (AOC 5)

This AOC refers to a hazardous materials storage shed near Building 318. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "The hazardous materials storage area has had drums of waste stored outside the area and at one time had a product solvent tank located outside the shed. During a visual site inspection, YTC personnel stated that the tank had been taken out of use when it started leaking. The area surrounding the shed should be sampled to determine if any releases to soil have occurred."

A SI was conducted to address the RCRA corrective action recommendation as documented in a 2006 SI Report (Bussey 2006a, **Appendix O**). Since no COPCs were detected during the SI at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria, NFA is needed for AOC 5 as documented in the 2007 DD for the adjacent AOC 2 (Fort Lewis IRP 2007i, **Appendix Z**).

## 40. Dud Areas (AOC 6)

This AOC refers to active and former dud areas located in the YTC operational range area. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "The dud areas are likely to have areas with soil contamination from exploding ordnance. Areas that are most likely to be contaminated should be identified and sampled to determine if there is any remaining contamination. Current operations should be conducted so that any areas where significant soil contamination occurs are identified and can be remediated as needed."

A 1995 report (Ogden Professional Services 1995, **Appendix I**) documented that the dud areas are located in active training areas, now known by the term operational range area. RCRA corrective action recommendations do not apply within the YTC operational range area per the RCRA military munitions rule in WAC 173-303-578. As a result, NFA is needed for this site.

## 41. Building 218 Buried Munitions (AOC 7)

This AOC refers to the an area between Buildings 218 and 217 where discarded military munitions were discovered (and subsequently removed) on two occasions. This AOC is also known as the "Cantonment – Discarded Military Munitions Area (YTCR-001-R-01)" under the Military Munitions Response Program. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "Buried munitions have been discovered in the vicinity of Building 218 and there are possibly other areas where munitions have been buried located throughout the facility. As munitions are discovered their composition should be identified and characterized to determine if as they decompose they are likely to have hazardous constituents that would be released."

A geophysical investigation was conducted around Buildings 217 and 218 (Vermuel *et. al.* 2004, **Appendix DD**). No evidence of discarded military munitions was found in the uncovered portions of the site. However, since it is possible that discarded military munitions could exist under Building 218, it is prudent to institutionally remember this possibility. As a result, the JBLM CCP is using this Report to select a LUC remedy for the site. JBLM CCP will implement and maintain LUC mechanisms to address as necessary potential discarded military munitions under Building 218 if the building is deconstructed. The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 42. Cobra Range AST (AOC 8)

This AOC refers to a former 250-gallon heating oil tank at the Cobra Range. The 1995 RCRA corrective action recommendation (Brimmer 1995) was: "There was an old above-ground storage tank identified at the Cobra Range that is scheduled to be removed. It should be removed as scheduled and any other old tanks that are identified and possibly of questionable integrity should also be removed."

As documented in a January 2006 Memorandum (Fain 2006, **Appendix B**), the AST was removed as planned. There was no evidence of a release. Since the RCRA corrective action recommendation has been addressed, NFA is needed for this site.

## 43. USTs (AOCs 9 through 32)

AOCs 9 through 32 refer to 24 former USTs used to store petroleum products (heating oil, waste oil, gasoline) at various locations throughout the YTC Cantonment Area. The 1995 RCRA corrective action recommendation (Brimmer 1995) for the 24 USTs was: "AOCs 9 through 13 and 24 through 26 are all scheduled to be removed and should be removed as scheduled. For AOCs 14 through 23 and 27, contamination has been documented. Some of these tanks have been removed or filled with slurry with no documentation of the condition of the surrounding soils. For those tanks with documented contamination the contaminated soils should be removed. The other tanks should be further investigated to determine if there is any associated contaminated soils. AOCs 28 through 32 were all identified from 1954 blue prints. Indications are that at least part of these tanks no longer exist. YTC should follow up and determine the status of these tanks."

**AOCs 9-13:** As documented in a Building 223 tank removal report (TerraSolve 2002, **Appendix EE**), the five co-located AOC 9 through 13 USTs as well as approximately 830 tons of associated soil contamination were removed from the Building 223 site. Since COPC concentrations in confirmation soil samples were not detected at concentrations above MTCA cleanup levels for unrestricted land use and the potential terrestrial ecological pathway is not significant given the soil removal action, site size, and surrounding land use, NFA is needed for AOCs 9 through 13.

**AOC 14:** A 1996 report (Shannon & Wilson 1996, **Appendix FF**) documents the 1993 tank removal and 1996 investigation for a Building 301 heating oil tank. Although the AOC 14 UST was removed, the site was not clean closed and could not be excavated further without compromising the structural integrity of Building 301. Since it is possible that petroleum contamination in soil may not have naturally attenuated and may continue to remain adjacent to or under Building 301 in the future, it is prudent to institutionally remember the need to investigate and/or remediate potential site contamination in the future. As a result, the JBLM CCP is using this Report to select a LUC remedy for the site. JBLM CCP will implement and maintain LUC mechanisms to address as necessary potential contamination under Building 301 if the building is deconstructed. The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

**AOCs 15-20, 27:** The RCRA corrective action recommendation (Brimmer 1995) for the Building 319 USTs (AOCs 15 and 16), Building 323 USTs (AOCs 17 and 18), Building 321 USTs (AOCs 19 and 20), and Building 845-1 UST (AOC 27) is in error regarding documented contamination. In fact, upon closer inspection of the 1995 RFA itself (Science Applications International Corporation 1995), there is no mention of documented contamination at AOCs 15 through 20 and 27. In addition, UST information in JBLM CCP files (Berman 1998 and Poole 1992, **Appendix GG**) document that there was no evidence of a release from the former USTs at Buildings 319, 323, 321, and 845-1. In that there is a potential that contamination may remain on these sites, Land Use Controls will be utilized to warn those who may excavate in the vicinity of AOCs 15 through 20 and 27.

**AOC 21:** A 1996 remedial action report (United States Army Corps of Engineers 1996, **Appendix HH**) documents the 1994 tank removal and 1995 soil removal action for a Building 434 heating oil tank (AOC 21). Approximately 100 cubic yards of contaminated soil was removed from the site. Since COPC concentrations in confirmation soil samples were not detected at concentrations above MTCA cleanup levels for unrestricted land use and the potential terrestrial ecological pathway is not significant given the soil removal action, site size, and surrounding land use, NFA is needed for AOC 21.

**AOCs 22-23:** The RCRA corrective action recommendation (Brimmer 1995) for the Building 810 USTs (AOCs 22 and 23) is in error regarding documented contamination. In fact, upon closer inspection of the 1995 RFA itself (Science Applications International Corporation 1995), there is no mention of documented contamination at AOCs 22 and 23. In addition, a 1996 report (Smith and Whelan 1996, **Appendix G**) documents that there is no evidence of a release from the former USTs at Buildings 810. Since there is no evidence of a release associated with these USTs, NFA is needed for AOCs 22 and 23.

**AOCs 24-26:** As documented in a Building 833 tank removal report (Garry Struthers Associates 1998, **Appendix II**), the three co-located AOC 24 through 26 USTs as well as approximately 136 tons of associated soil contamination (i.e., all soil down to bedrock interface) was removed from the site. COPC concentrations in confirmation samples were not detected at concentrations above MTCA cleanup levels for unrestricted land use. The potential terrestrial ecological pathway is not significant given the soil removal action, site size, and surrounding land use. In that there is a potential that contamination may remain on these sites, Land Use Controls will be utilized to warn those who may excavate in the vicinity of AOCs 24 through 26.

**AOCs 28-32:** A 1996 report (Smith and Whelan 1996, **Appendix G**) documents that the two USTs associated with former Building 1470 (AOC 28 and 29) and three USTs or ASTs associated with former Building 2020 (AOCs 30 through 32) no longer exist and that there is no evidence of a release from these five USTs. Since the RCRA corrective action recommendation has been addressed, NFA is needed for AOCs 28 through 32.

## 44. Fueling Areas (AOCs 33 through 36)

AOC 33 refers to former bladder tanks used for storing JP-4 aviation fuel in the vicinity of Building 450. AOCs 34 through 36 refer to three downrange locations where 1000-gallon fuel bladders are typically placed during temporary fueling of troop vehicles. AOCs 34 through 36 are located north of the MPRC, west of the Central Impact Area, and near Interstate 82 Exit 11, respectively. The 1995 RCRA corrective action recommendation (Brimmer 1995) for AOCs 33 through 36 was: "These areas have been identified as areas where fueling has taken place. It is possible that fuel has been spilled in these areas and has impacted soil. There are likely to be other fueling areas that were not identified during the VSI that would warrant investigation. Soils in fueling areas should be evaluated to determine if there have been any releases."

A SI was conducted to address the RCRA corrective action recommendation for AOC 33 as documented in a 1996 SI Report (Wilson 1996, **Appendix JJ**). NFA was recommended in the 1996 SI Report since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Since an actual release did not occur at AOC 33, NFA is needed for AOCs 33.

A SI was conducted to address the RCRA corrective action recommendation for AOCs 34 and 35 as documented in a 2004 SI Report (Calibre 2004, **Appendix N**). NFA was recommended in the 2004 SI Report for AOCs 34 and 35 since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Since an actual release did not occur at either AOC 34 or AOC 35, NFA is needed for AOCs 34 and 35.

Upon further inspection and evaluation following the 1995 RFA, it was determined that there is no evidence of a historical or current release at AOC 36 as documented in a February 2006

Memorandum (Wilson 2006, **Appendix K**). Since the RCRA corrective action recommendation is no longer necessary or appropriate for AOC 36, NFA is needed for AOC 36.

## 45. Pistol Ranges (AOCs 37 and 38)

AOCs 37 and 38 refer to two pistol ranges located within the YTC operational range area. The 1995 RCRA corrective action recommendation (Brimmer 1995) for AOCs 37 and 38 was: "During the visual site inspection one pistol range was visited that has a large number of lead slugs scattered across the ground. The lead and associated contamination should be reduced. Any other ranges identified that may have similar problems should also have the concentration of lead reduced."

A 1995 report (Ogden Professional Services 1995, **Appendix I**) documented that the pistol ranges are located in active training areas, now known by the term operational range area. RCRA corrective action recommendations do not apply to these sites located within the YTC operational range area per the RCRA military munitions rule in WAC 173-303-578. As a result, NFA is needed for AOCs 37 and 38.

## 46. Former Small Arms Range (AOC 39)

This AOC refers to a former small arms range located in the Cantonment Area, in the vicinity of the Former Fire Training Pit (SWMU 59) and Main Vehicle Washrack (SWMU 62). This AOC designation was not included in the RFA, but was created following the discovery of this potential site circa 2003. This AOC is also known as "Range #1 (YTCR-002-R-01)" under the Military Munitions Response Program.

A SI was conducted to address the potential for a release at AOC 39 as documented in a 2004 SI Report (Calibre 2004, **Appendix N**). NFA was recommended in the 2004 SI Report for AOC 39 since no COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use or MTCA terrestrial ecological screening criteria. Therefore, NFA is needed for AOC 39.

## 47. Centralized Fuel Facility (AOC 40)

This unit is located at the installation's current fuel facility approximately three miles east of the cantonment area on Cold Creek Road, and south of the former Yakima Research Station. This unit was not included in the 1995 RFA because the Facility did not exist at that time. A significant gasoline release occurred at the fuel island in 2008.

A SI was conducted to address the release as documented in a 2009 closure report (PRI. 2009, **Appendix KK**). COPCs were detected at concentrations above MTCA cleanup levels for unrestricted land use in soil beneath the concrete fuel island. One monitoring well placed immediately north of the concrete pad identified no impacts. Due to the remaining soil contamination under the concrete island, it is prudent to institutionally remember the need to investigate and/or remediate contaminated soil in the future. JBLM CCP will implement and maintain LUC mechanisms to address contamination under the concrete when it is deconstructed. The specifics of how JBLM IRP has implemented and maintains the LUC remedy is described in the current YTC LUC Plan (JBLM, 2015, **Appendix E**).

## 48. Conclusions

This Report summarizes and documents the completion of RCRA corrective action recommendations and/or MTCA cleanup requirements for all of the SWMUs/AOCs listed in the 1995 RFA, with the exception of ongoing long-term management requirements at the nine locations listed below. As a result, NFA is needed for all but the nine following YTC RCRA corrective action locations:

- Former Pesticide Handling Area (SWMU 5)
- Former ASP Burn Pits (SWMU 27)
- TVR/Old MATES Site (includes SWMUs 43 and 44)
- 1969-1994 Landfill (SWMU 51)
- 1954-1968 Landfill/Burn Pits (SWMU 57)
- Former Fire Training Pit (SWMU 59)
- Building 218 Buried Munitions (AOC 7)
- Building 301 Former UST Site (AOC 14)
- Centralized Fuel Facility

Ongoing long-term management is required for these locations as explained in this Report. In summary, maintenance of implemented LUCs is required at all nine locations listed above within the LUC boundaries shown on the attached plate entitled "Final Remedies at YTC RCRA Corrective Action Sites." In addition, ongoing GWM is required at TVR/Old MATES and Former Fire Training Pit (SWMU 59). As a result, JBLM is requesting Ecology issue a Dangerous Waste Management Permit for Corrective Action for the ongoing long-term management requirements (i.e., LUC maintenance and GWM) at these nine locations.

## 49. References


Battelle 2007. SWMU 60 Site Clearance Report, June 2007. **Appendix U**.

Bay West 2004. Closure Report for Remedial Action at Various IRP Sites, January 2004. **Appendix BB**.

Becker *et. al.* 2006. Terrestrial Ecological Evaluations at Yakima Training Center Sites, April 2006.

Berman 1998. Email from Debby Berman to Rich Wilson with subject of "Status of Former YTC Tanks", 13 July 1998. **Appendix GG**.

Brimmer 1995. Letter from Lynn Brimmer to Jack Boller entitled "EPA Contract No. 68-W4-0005, RCRA Facility Assessment Preliminary Assessment Report for Yakima Training Center in Yakima, Washington", 28 July 1995.

Bussey 2006a. Site Investigation Report for Former Central Vehicle Washrack (AOC 1), Main Motor Pool (AOC 2/5), New Wire Storage Area (SWMU 29), Former Pesticide Handling Area (SWMU 5), and TVR/Old MATES, December 2006. **Appendix O**.

Bussey 2006b. Draft Screening-Level Risk Evaluation for ASP Burn Pits, June 2006.

Bussey 2006c. Draft Site Investigation Report for Pre-1954 Landfill (SWMU 54), 1954-1968 Landfill/Burn Pits (SWMU 57), and TVR/Old MATES, August 2006.

Bussey 2006d. Interim Cleanup Action Report for Former Building 812 Vehicle Washrack (AOC 3), December 2006.

Calibre 2004. Site Investigation Report for Old Wire Storage Area (SWMU 28), New Wire Storage Area (SWMU 29), MPRC Forward Refueling Area (AOC 34), Forward Refueling Area (AOC 35), and Former Small Arms Range (AOC 39), 8 July 2004. **Appendix N**.

Cape Environmental 2004. Completion Report for Military Fueling Facility Removal of Storage Tanks and Associated Equipment at Yakima Training Center, Washington, November 2004. **Appendix CC**.

Caron 2001. Meeting notes from 12 September 2001 YTC site visit, 13 September 2001. **Appendix J**.

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