

ROCKY MOUNTAIN ARSENAL

Land Use Control Monitoring Report for Fiscal Year 2015

**Revision 0
December 16, 2015**

**U.S. Department of the Army
Shell Oil Company**

Prepared by:



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ACRONYMS AND ABBREVIATIONS

Army	United States Department of the Army
CCP	Comprehensive Conservation Plan
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
CSRG	Containment System Remediation Goal
DIMP	Diisopropylmethyl Phosphonate
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ES&H	Environmental Safety and Health
FFA	Federal Facility Agreement
FY	Fiscal Year
ICS	Integrated Cover System
Klein Property	Klein Water Treatment Facility
LTMP	Long-Term Monitoring Plan for Groundwater and Surface Water
LUCP	Land Use Control Plan
MDEH	Material Documented as an Explosive Hazard
NE	northeast
NPL	National Priorities List
NWR	National Wildlife Refuge
O&M	Operations and Maintenance
OU	Operable Unit
PELS	Previously Excavated Lake Sediments
PUD	Planned Unit Development
RCRA	Resource Conservation and Recovery Act
Refuge	Rocky Mountain Arsenal National Wildlife Refuge
Refuge Act	Rocky Mountain Arsenal National Wildlife Refuge Act
RI/FS	Remedial Investigation/Feasibility Study
RMA	Rocky Mountain Arsenal
ROD	Record of Decision
RVO	Remediation Venture Office
SACWSD	South Adams County Water and Sanitation District
SEO	Office of the State Engineer
SOP	Standard Operating Procedure
SSA	Southern Study Area
TCHD	Tri-County Health Department
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
VOC(s)	Volatile Organic Compound(s)

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1.0 INTRODUCTION

As part of the long-term remedy at the Rocky Mountain Arsenal (RMA), land use controls, both institutional and engineering controls, are utilized to ensure protectiveness. Pursuant to an amendment to the RMA On-Post Record of Decision (ROD), the land use controls are monitored annually to ensure they remain effective and are protective of human health and the environment (TtEC 2005).

Section 2 of this report summarizes relevant RMA background, Section 3 presents changes made to land use controls during the monitoring period, Sections 4 and 5 describe the applicable land use controls, and Section 6 discusses engineering controls. Section 7 discusses the monitoring and evaluation of the controls including follow up on any corrective actions from prior years. Section 8 describes required notifications. Section 9 presents corrective actions indicated by the monitoring and evaluation and Section 10 provides conclusions.

This evaluation covers the period for Fiscal Year 2015 (FY15), October 1, 2014 through September 30, 2015.

2.0 RMA BACKGROUND

The United States Department of the Army (Army) established RMA in 1942 to produce chemical warfare agents and incendiary munitions used in World War II. Following the war and through the early 1980s, the Army continued to use these facilities. Beginning in 1946, some RMA facilities were leased to private companies to manufacture industrial and agricultural chemicals. Shell Oil Company, the principal lessee, manufactured primarily pesticides at RMA from 1952 to 1982. Common industrial and waste disposal practices during those years resulted in significant levels of contamination. The principal contaminants include organochlorine pesticides, heavy metals, agent-degradation products and manufacturing by-products, and chlorinated and aromatic solvents.

The RMA was divided into the On-Post Operable Unit (OU) and Off-Post OU. On-Post sites that posed potential immediate risks to human health and the environment were addressed through Interim Response Actions. A Remedial Investigation/Feasibility Study (RI/FS) was conducted for the On-Post OU leading to the actions required by the On-Post ROD (FWENC 1996), as amended (TtEC 2005).

Contaminated groundwater migrated north and northwest of RMA prior to construction of the groundwater pump and treat systems. This necessitated creation of the Off-Post OU followed by preparation of an RI/FS and the Off-Post ROD (HLA 1995).

Current and future land use for the On-Post OU is restricted by provisions in the Federal Facility Agreement (FFA) (EPA 1989) and the On-Post ROD. Surrounded by development, the On-Post OU provides a refuge for an abundant diversity of flora and

fauna. For this reason the site was designated as a future National Wildlife Refuge (NWR) in the Rocky Mountain Arsenal National Wildlife Refuge Act (Refuge Act) of 1992 (Public Law 1992). The FFA and the On-Post ROD restrict future land use and prohibit certain activities such as agriculture, use of on-post groundwater as a drinking source, and consumption of fish and game taken at RMA.

As components of the On-Post OU remedy were completed, jurisdiction was administratively transferred to the United States Fish and Wildlife Service (USFWS) or other parties after the United States Environmental Protection Agency (EPA) certified that all required response actions had been completed and the areas were deleted from the National Priorities List (NPL). These transfers are depicted on Figure 2.0-1. The other parties that received property transfers include Commerce City, South Adams County Water and Sanitation District (SACWSD) and units of local government. Commerce City purchased acreage at the southwest corner and west side of RMA now known as the "Prairie Gateway." SACWSD received the property upon which the Klein Water Treatment Facility (Klein Property) is located. The Colorado Department of Transportation, Commerce City, and the City and County of Denver received 100-foot wide strips of property for public road construction, hereinafter referred to as "100-Foot Highway Setbacks." The Colorado Department of Transportation received a setback to the northwest boundary along Colorado Highway 2, Commerce City received a setback to the north boundary of RMA along 96th Avenue, and the City and County of Denver received a setback to the south boundary of RMA along 56th Avenue. In 2007, the USFWS acquired approximately 148 acres of the Prairie Gateway for incorporation into the refuge. In return, approximately 28 acres of land in Section 33 and approximately 14 acres in the northeast (NE) corner of Section 20 (Section 20 NE Parcel) were deeded to Commerce City.

The portions of the On-Post OU transferred to other parties (Commerce City, City and County of Denver, SACWSD, and Colorado Department of Transportation) are subject to land use restrictions prohibiting residential or industrial use, use of water as a source of potable water, hunting and fishing for consumptive use, and agricultural use. Current and future land use of the Off-Post OU surface area has not been restricted, although groundwater use has been restricted in the Off-Post ROD.

The Rocky Mountain Arsenal National Wildlife Refuge (Refuge) was officially established on April 21, 2004. To date, approximately 94 percent of RMA has been deleted from the NPL, and most of that property has been transferred to the USFWS. Groundwater has also been deleted in the eastern and southern perimeter areas of the RMA. However, groundwater underlying the central and northwestern portions of the site has not met remediation goals and remains on the NPL. The property transferred to the USFWS remains subject to land use controls as described in Section 4.

3.0 CHANGES TO LAND USE CONTROLS

A final Land Use Control Plan (LUCP) was completed in FY14 (Navarro 2013). The final LUCP identifies all land use control requirements in accordance with the RODs for both the On-Post and Off-Post OUs and provides the requirements for land use control maintenance, monitoring, and reporting for long-term operations.

During FY15, discussions related to potential changes to land use controls continued. Specifically, there are efforts underway to evaluate the continued need for the game consumption restriction and agriculture restriction. In addition, evaluation of site conditions is underway to determine whether overnight occupational stays require continued use of the approval process included in the LUCP. Although these efforts could result in changes to the land use controls and LUCP, no changes were made during FY15 and all requirements in the LUCP remain effective until such changes are approved and documented in accordance with the LUCP and ROD. Evaluation of the controls for FY15 is provided in Section 7.

4.0 ON-POST OPERABLE UNIT LAND USE CONTROLS

For the remainder of this report, the combination of USFWS NWR property and property retained by the Army is referred to as the "RMA." As such, the On-Post OU is comprised of the RMA, Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel.

Because the land use controls for the On-Post and Off-Post OUs differ, they are discussed separately. Discussion for land use controls for the Off-Post OU is provided in Section 5.0. The discussion of On-Post OU controls is further divided into primary controls and other controls.

The primary land use controls applicable to the On-Post OU (RMA, Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel) originate in one or more of the following three sources:

- *Rocky Mountain Arsenal Federal Facility Agreement* (EPA 1989)
- *Rocky Mountain Arsenal National Wildlife Refuge Act of 1992* (Public Law 1992)
- *Record of Decision for the On-Post Operable Unit* (FWENC 1996)

The source of the other land use controls at RMA is the LUCP (Navarro 2013). Land use controls for the Off-Post OU, discussed in Section 5.0, are identified in the Record of Decision for the Off-Post OU (HLA 1995). The control, the source, and the applicability of the primary on-post land use controls and other on-post land use controls are presented below in Table 4.0-1 and Table 4.0-2, respectively.

**Table 4.0-1
Source and Applicability of the Primary On-Post OU Land Use Controls**

Control	Source	Applicability
Prohibit residential development	FFA, On-Post ROD ¹	On-Post OU ²
Prohibit use of property for residential purposes	Refuge Act	Prairie Gateway and 100-Foot Highway Setbacks
Prohibit use of groundwater or surface water as a source of potable water	FFA, Refuge Act ³ , On-Post ROD	On-Post OU ²
Perform risk evaluation prior to non-potable use of groundwater	On-Post ROD	RMA ⁴
Prohibit consumption of fish and game taken at RMA	FFA, On-Post ROD	On-Post OU ²
Prohibit hunting and fishing, except for non-consumptive use	Refuge Act	Prairie Gateway and 100-Foot Highway Setbacks
Prohibit non-remedy agricultural activities such as raising of livestock, crops or vegetables	FFA, Refuge Act ³ , On-Post ROD	On-Post OU ²
Preserve and manage wildlife habitats to protect endangered species, migratory birds, and bald eagles	FFA	RMA ⁴
Prohibit major non-remedy alteration of the geophysical characteristics of the RMA if such alteration may likely have an adverse impact on the natural drainage of the Arsenal for floodplain management, recharge of groundwater, operation and maintenance of Response Action Structures, or protection of wildlife habitat(s).	FFA	RMA ⁴
Prohibit use of property for industrial purposes	Refuge Act	Prairie Gateway and 100-Foot Highway Setbacks
Provide access related to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response actions (including groundwater remedy structures and monitoring wells)	FFA, Refuge Act ³	On-Post OU ²

¹In addition, the National Wildlife Refuge System Administration Act of 1966 (Public Law 1966) precludes residential development on refuge lands.

²On-Post OU consists of RMA, Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel.

³Refuge Act applies only to the Prairie Gateway and 100-Foot Highway Setbacks.

⁴RMA consists of Army-retained property and RMA NWR.



**Table 4.0-2
Source and Applicability of Other On-Post OU Land Use Controls**

Control	Source	Applicability
Prevent excavation of the Previously Excavated Lake Sediments (PELS) Site (Southern Study Area [SSA] Site SSA-3b)	LUCP	PELS Site
Protection of groundwater remedial action structures	LUCP	RMA
Lake level maintenance to support aquatic ecosystems	On-Post ROD	Lower Derby Lake, Lake Ladora and Lake Mary
Restriction for overnight occupational use	LUCP	RMA
Prohibition on construction and/or use of basements at RMA	1993 Army and USFWS Letters (Spinks 1993, Walker 1993)	RMA
Access controls	LUCP, RVO Policy PM-A-101 (RVO 2012)	RMA
Activities management	LUCP, RVO SOP ES&H.210 (RVO 2007)	RMA
Access restrictions to ensure integrity of covers; prohibit activities that might damage or impair proper function of covers, including but not limited to, excavation, drilling, tilling, grading or construction.	On-Post ROD, LUCP	RMA caps and covers

4.1 RMA Land Use Controls

The primary and other land use controls applicable to the RMA are presented above in Tables 4.0-1 and 4.0-2. These controls are applicable to property transferred from Army to the USFWS for refuge use and to the properties retained by the Army for operations and maintenance (O&M) of caps and covers and groundwater treatment systems. Table 4.1-1 presents the means by which the controls are implemented.

**Table 4.1-1
Implementation of RMA Land Use Controls**

Control	Implementation
Prohibit residential development	FFA, On-Post ROD, LUCP
Overnight occupational use	LUCP. If USFWS anticipates activities by short-term workers they will submit a description of the activities to the RMA Committee for review and approval of overnight use (RMA Committee 2013). Emergency use of the RMA NWR bunkhouses is authorized without prior approval; however, notification to RMA Committee must be made within 72 hours of use.
Prohibit agricultural activities	FFA, On-Post ROD, LUCP

Table 4.1-1 (Continued)
Implementation of RMA Land Use Controls

Control	Implementation
Prohibit use of groundwater or surface water as a source of potable water	FFA, On-Post ROD, LUCP
Perform risk evaluation prior to non-potable use of groundwater	On-Post ROD
Prohibit consumption of fish and game taken at RMA	FFA, On-Post ROD, LUCP
Preserve and manage wildlife habitats	FFA, On-Post ROD, LUCP
Prohibit major non-remedy alteration of RMA geophysical characteristics	FFA, On-Post ROD, LUCP
Prevent excavation of the PELS Site	The PELS site (site SSA-3b) is located in Section 12 and contains contaminated sediment that was dredged from Upper and Lower Derby Lakes. Contaminated sediments remain at depths of greater than three feet. Excavation of the PELS site will be prevented using signs and worker training as required by the LUCP.
Protection of groundwater remedial action structures	Inspection requirements and the process to be used when damaged system components are identified are presented in the <i>Long-Term Monitoring Plan for Groundwater and Surface Water (LTMP)</i> (TtEC&URS 2010). Damaged system components and corrective actions performed will be documented in the Annual Summary Reports for Groundwater and Surface Water.
Lake level maintenance to support aquatic ecosystems	The On-Post ROD requires that water levels in Lower Derby Lake, Lake Ladora and Lake Mary be maintained to support aquatic ecosystems (FWENC 1996).
Prohibition on use of basements at RMA	Prior to building or using basements at RMA, the Army or USFWS must prepare a feasibility study that addresses the impacts of the use of basements on human health and the environment and documents that the impacts from such use are minimal (Spinks 1993, Walker 1993).
Access Controls	At RMA, access controls described in the LUCP and RVO Policy PM-A-101 are used to support the primary land use controls discussed above. These federally-enforceable controls limit RMA access to those with legitimate purpose. In addition, access control to the RMA NWR is maintained by the USFWS and is controlled by regulations governing the National Wildlife Refuge System (50 CFR Parts 25-29). One of the most significant aspects of these regulations is the fact that "No person shall trespass, including but not limited to entering, occupying, using, or being upon, any national wildlife refuge, except as specifically authorized in this Subchapter C or in other applicable Federal regulations" (50 CFR §25.21(a)). Access to areas of the RMA NWR that are not opened to the public is controlled using signs, regulations, and periodic monitoring by USFWS Law Enforcement. The multiple layers of engineering controls include a perimeter fence, gate security, restrictions on visitor access, and remedy-specific systems. Site worker training is required before entry into closed areas of RMA.



**Table 4.1-1 (Concluded)
Implementation of RMA Land Use Controls**

Control	Implementation
Activities Management	Activity management at RMA includes site-specific and project-specific training to provide information relevant to site restrictions and hazards. Intrusive soil activity permits and utility locates are required before performing intrusive activities on site (RVO 2007). In addition, signs are maintained as required by existing regulations, plans and procedures to provide visitors and workers with safety information and to advise them of entry into long-term remediation O&M areas.
Access restrictions to ensure integrity of covers; prohibit activities that might damage or impair proper function of covers, including but not limited to, excavation, drilling, tilling, grading or construction.	Access restrictions are maintained through engineering controls, which are monitored pursuant to the RCRA [Resource Conservation and Recovery Act]-Equivalent, 2-, and 3-Foot Covers Long-Term Care Plan (TtEC 2011a), Hazardous Waste Landfill Post-Closure Plan (TtEC 2011b), Enhanced Hazardous Waste Landfill Post-Closure Plan (TtEC 2010) and Basin F Post-Closure Plan (TtEC 2011c). Prohibited activities require notification and a Non-Routine Action Plan or Corrective Measures Plan prior to performing these activities.
Provide access related to CERCLA response actions	The Refuge Act provides for Army access to Refuge property after transfer of jurisdiction for any CERCLA response actions.

4.2 Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel

The primary land use controls applicable to the Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel are shown above in Table 4.0-1. Implementation of these land use controls is presented in Table 4.2-1. These primary land use controls were included as deed restrictions when the property was transferred from the Army to other parties. The property transferred to Commerce City (not including the highway setback along 96th Avenue and Section 20 NE Parcel) is now called the Prairie Gateway Planned Unit Development (PUD) (Commerce City 2005). The PUD zoning process assigns excluded uses, uses by right, conditional uses and temporary uses to each parcel. For the Prairie Gateway, the PUD was originally approved by the Commerce City Council on June 6, 2005 and Amendment #1 was approved on April 7, 2008. The PUD excludes residential, agriculture and industrial uses throughout the PUD. The PUD also provides other excluded uses, most notably child care centers.



**Table 4.2-1
 Implementation of Prairie Gateway, Klein Property,
 100-Foot Highway Setbacks and Section 20 NE Parcel Land Use Controls**

Control	Implementation
Prohibit use of property for residential purposes or prohibit residential development	For Prairie Gateway, implemented using deed restrictions and through the Commerce City PUD zoning process (Commerce City 2005, as amended). For the Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, implemented using deed restrictions.
Prohibit use of property for industrial purposes	For Prairie Gateway, implemented using deed restrictions and through the Commerce City PUD zoning process (Commerce City 2005, as amended). For the 100-Foot Highway Setbacks, implemented using deed restrictions. Not applicable for the Klein Property. Although not required for the Section 20 NE Parcel, this restriction was included in the deed for that property.
Prohibit agricultural activities	For Prairie Gateway, implemented using deed restrictions and through the Commerce City PUD zoning process (Commerce City 2005, as amended). For Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, implemented using deed restrictions.
Prohibit use of groundwater or surface water as a source of potable water	As a condition of service, all rights to groundwater beneath the Prairie Gateway PUD were transferred and are now owned and controlled by SACWSD. For the Klein Property, the 100-Foot Highway Setbacks, and Section 20 NE Parcel, the controls are implemented using deed restrictions.
Prohibit hunting and fishing or prohibit consumption of fish and game	For Prairie Gateway, implemented through the Commerce City Code of Ordinances, Chapter 12, Article VI, Section 12-6006, which prohibits discharges of firearms or other weapons (e.g., bow and arrow) within Commerce City. For the Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, controls are implemented using deed restrictions.
Provide access related to CERCLA response actions	For the Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, the deed includes a covenant providing access for response actions or corrective actions.

5.0 OFF-POST OPERABLE UNIT LAND USE CONTROLS

Two land use controls are identified in the Record of Decision for the Off-Post OU (HLA 1995). In addition, the LUCP provides greater detail on land use controls for the Off-Post OU.

5.1 Shell Property Deed Restrictions

The Off-Post ROD requires a deed restriction that prohibits drilling new alluvial wells and use of deeper groundwater underlying the Shell Property for potable purposes until such groundwater no longer contains contamination in exceedance of groundwater Containment System Remediation Goals (CSRGs) established in the ROD (HLA 1995). The deed restriction is defined in the *Declaration of Covenants among Shell, the United States, and the State of Colorado* dated February 2, 1996 (Shell 1996). The covenants were recorded by the Adams County Clerk and Recorder on June 11, 1996. These covenants “run with, and burden the land ... and are enforceable by the United States, through the Army and EPA [U. S. Environmental Protection Agency], and by the State.”



In September 2009, EPA completed a Ready for Reuse Determination for most of the Shell Property documenting that the property is ready for use for any purpose allowed under local land use and zoning laws (EPA 2009). The property remains subject to the restrictions specified in the Off-Post ROD. In September 2010, all the off-post surface media, including the Shell Property, was deleted from the NPL.

In addition, as part of the State of Colorado Natural Resource Damages settlement, 100 acres of the Shell Property was deeded to Commerce City for open space and for use as a stormwater retention area. A conservation easement has been placed on the property as part of the agreement, and the easement is held by Adams County. The conservation easement preserves the property's conservation values in perpetuity and opens the area for limited recreational use.

5.2 State Engineer's Office Well Permit Notification

The On-Post and Off-Post RODs require the Army to provide the Colorado Office of the State Engineer (SEO) a map where monitoring identifies groundwater that exceeds CSRGs. The ROD also states that the SEO will then include a distinctive notice on each well permit application, related correspondence and any resulting well permit and drilling permit, where the groundwater could potentially exceed CSRGs. Discussion with the SEO resulted in agreement for the SEO to provide the required notification only on each approved well permit. This program is known as the Off-Post Well Notification Program.

In 2011, the Off-Post Well Notification Program was modified to include both the potential CSRG exceedance area and the historic area of contamination (PMRMA 2011). The historic area of contamination is defined as the area of diisopropylmethyl phosphonate (DIMP) contamination based on the 0.392 parts per billion detection limit identified in the Off-Post ROD. The two notification areas are shown on Figure 2.0-1. These notification areas will be used until groundwater is deleted from the NPL, unless there is agreement to change the notification area.

6.0 RMA ENGINEERING CONTROLS

Engineering controls are used at RMA to enhance or complement both select remedies and the overall remedy.

6.1 Sanitary Sewers

As part of the remedy for sanitary sewers at RMA, the On-Post ROD required concrete plugging of the void space within abandoned sanitary sewer manholes and placement of aboveground warning signs every 1,000 feet along remaining abandoned sanitary sewer lines to indicate their location underground. The warning sign requirement was achieved by including an engraved brass plate on each plugged manhole and at additional locations where manholes were more than 1,000 feet apart (RVO 1998; TtEC 2008, 2011d). Monitoring and maintenance of the markers is required once every five

years. In addition, the Army or USFWS will conduct utility locates to identify abandoned sewer locations prior to intrusive activities, and will notify the Regulatory Agencies 14 days in advance of any excavation of the abandoned sanitary sewer line.

6.2 Groundwater Remedy Structures

As noted in the LUCP, protection of the groundwater remedial action structures including the treatment facilities, extraction/recharge systems, slurry walls, monitoring wells, and related infrastructure (e.g., electrical systems, instrumentation, access vaults) is part of the O&M of those systems. Inspection requirements and the process to be used when damaged system components are identified are presented in the *Long-Term Monitoring Plan for Groundwater and Surface Water (LTMP)* (TtEC&URS 2010). Damaged system components and corrective actions performed are documented in the Annual Summary Reports for Groundwater and Surface Water. For this reason, the groundwater remedy structures engineering controls/O&M activities are not evaluated as part of this effort.

During development of the LUCP, a concern was identified related to potential public access to groundwater monitoring wells in the RMA NWR public use area. To minimize the potential for exposure to groundwater or damage to these wells, the Army identified wells within close proximity to hiking trails that should be locked and placed locks on them. Inspection of these well locks is included in the land use control reporting.

6.3 Caps and Covers

One purpose of the caps and covers at RMA is to prevent exposure to the wastes contained within. In addition, the ROD requires access restrictions as part of long-term O&M. For caps and covers, engineering controls that include fences, signs and obelisks with plaques were installed during cap and cover construction and are monitored pursuant to the O&M plans. The O&M plans for the caps and covers areas include:

- *RCRA-Equivalent, 2-, and 3-Foot Covers Long-Term Care Plan, Revision 2* (TtEC 2011a)
- *Basin F Post-Closure Plan, Revision 0* (TtEC 2011c)
- *Hazardous Waste Landfill Post-Closure Plan, Revision 3* (TtEC 2011b)
- *Enhanced Hazardous Waste Landfill Post-Closure Plan, Revision 0* (TtEC 2010).

Caps and covers have been monitored and evaluated in accordance with requirements provided in these plans. The monitoring results, as well as any corrective actions are reported and tracked in annual reports for the RCRA caps (Navarro 2015a), Integrated Cover System (ICS) cover (Navarro 2015b), and Basin F cover (Navarro 2015c). No additional monitoring was performed under this effort.

7.0 MONITORING AND EVALUATION

Monitoring and evaluation of land use controls was conducted to ensure that land use control objectives are being met and that protectiveness is adequately maintained. The approach to monitoring was dependent on the type of land use or engineering control and involved either site inspection, documentation review, or inquiries of responsible officials.

7.1 Status of Corrective Actions from 2014 Monitoring Report

There were no corrective actions indicated as a result of the monitoring and evaluation performed in 2014; however, two follow up actions from previous monitoring years were identified. The issues and corrective actions identified along with the status of each issue are presented in Table 7.1-1.

**Table 7.1-1
Status of Previous Corrective Actions**

2014 Issue	Corrective Action	Status/Comments
USFWS removed four of the signs encompassing the PELS site excavation restriction area prior to prescribed burn activities.	Replacement of the signs will be coordinated with trail planning to ensure that the signs and trail are properly located.	One sign was installed at the visible access point to the area, but the original four signs have not been replaced. No additional meetings have been held to discuss sign placement or coordination with potential trail alignment.
There are some land uses identified in the Prairie Gateway PUD and Amendment #1 to the PUD that may be in conflict with the residential use restriction.	Follow up and continued coordination with the Commerce City Planning Department to ensure that the next revision to the Prairie Gateway PUD is modified as necessary to maintain the appropriate restrictions related to residential uses.	The Army continues to coordinate with the Commerce City Planning Department to clarify use language on the next amendment to the PUD. Follow up is necessary to ensure that the next revision to the PUD will resolve this issue. Additional detail is provided in Section 7.2.2.1.
Amendment #1 to the Prairie Gateway PUD includes, as a "use-by-right," public gardening for Parcels 3 and 4 of Parcel D located in Section 33 (surrounding the Adams City High School). This issue was first identified in 2009. A letter requesting clarification of the issue was submitted to the Deputy City Manager in September 2010.	Follow up and continued coordination with the Commerce City Planning Department to ensure that the next revision to the Prairie Gateway PUD resolves the issue of the public gardening use-by-right included in Amendment #1 to the PUD.	Although the Army has not received a response to the September 2010 letter, the Commerce City Planning Department has stated that this issue will be corrected at the next revision to the Prairie Gateway PUD. Follow up is necessary to ensure that the next revision to the PUD will resolve this issue. Additional detail is provided in Section 7.2.2.2.

7.2 On-Post Operable Unit Land Use Controls

As described above, a variety of mechanisms are used to implement the primary land use controls on the RMA, Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel.

7.2.1 RMA

The land use controls applicable to the RMA were monitored using inquiries of Army and USFWS personnel and site inspections. The Refuge is currently managed by the USFWS pursuant to the Refuge Act, the *National Wildlife Refuge System Administration Act of 1966* (Public Law 1966) and its implementing regulations. During FY15, the USFWS drafted a Comprehensive Conservation Plan (CCP), which provides the management plan for the RMA National Wildlife Refuge (USFWS 2015a). This plan will replace the *Rocky Mountain Arsenal National Wildlife Refuge Comprehensive Management Plan* (USFWS 1996) and is expected to be completed in calendar year 2016. An Environmental Impact Statement (EIS) for the CCP was also completed in FY15, and a Record of Decision for the EIS was signed on October 5, 2015 (USFWS 2015b).

No changes have occurred that might compromise the integrity and efficacy of remedy systems or allow otherwise prohibited activities to occur. The evaluation is presented below in Table 7.2.1-1.

**Table 7.2.1-1
 Evaluation of RMA Land Use Controls**

Control	Evaluation
Prohibit residential development	No residential development has occurred.
Overnight occupational use	During FY15, there were six overnight occupational uses approved for the bunkhouses in accordance with the process described in the LUCP. No unapproved use occurred. Overnight uses were associated with law enforcement activities, construction assistance, visitor services, and bison round up activities. In addition, a request was completed and approved for Army Explosive Ordnance Disposal personnel to set up camp in Section 35 during clearance activities.
Prohibit use of groundwater or surface water as a source of potable water	Groundwater and surface water have not been used as potable water.
Prohibit agricultural activities	No agricultural activities have occurred.



Table 7.2.1-1 (Continued)
Evaluation of RMA Land Use Controls

Control	Evaluation
Prohibit consumption of fish and game taken on the RMA	<p>Taking of fish and game at RMA is prohibited and consumption has not occurred.</p> <p>In January 2014, the USFWS transferred 5 bison to other refuge units. Because of the consumption restriction, the USFWS took measures to ensure that the bison would not be consumed, including language restricting against consumption in the transfer paperwork for these bison. Although not currently required by the LUCP, the USFWS contacted the receiving refuge units to verify that the transferred bison remained at the receiving unit. All transferred bison were accounted for including one bison that had died since the time it was transferred. The dead bison remained on the refuge and was allowed to be consumed by natural predators.</p>
Preserve and manage wildlife habitats	The USFWS continues to manage wildlife habitat on RMA.
Prohibit major non-remedy alteration of RMA geophysical characteristics	<p>No major non-remedy alterations of RMA geophysical characteristics have occurred due to site activity. Heavy rains in September 2013 caused the failure of the Havana Pond dam spillway, resulting in flooding across the western portion of RMA. Additional monitoring was conducted during FY14 and FY15 to evaluate whether the flood event and the loss of Havana Pond as a groundwater recharge source resulted in changes to the contaminant plume flow in the western portion of RMA. No negative impacts have been identified and no corrective action is necessary. Reconstruction of the Havana Pond spillway was completed in FY15.</p>
Prohibition on use of basements on RMA	<p>There are two basements on site with occasional use for facility operations and maintenance, one at Building 112, Communications, and one at Building 371, Lake Ladora Pump House. Evaluation of groundwater in the vicinity of these buildings indicates that the vapor intrusion pathway is not a pathway of concern due to no volatile organic compound (VOCs) or very low VOC levels in groundwater (TtEC 2011e). Therefore, continued use of these basements is acceptable.</p> <p>Based upon inquiries of Army and USFWS personnel, no other basements are in use at RMA and none were constructed.</p>
Perform risk evaluation prior to new non-potable use of groundwater	There were no new non-potable uses of groundwater developed during FY15.
Aboveground markers indicating the location of abandoned sanitary sewers	Inspection of the sanitary sewer markers is required once every five years. The last inspection was completed in FY14.
Lake level maintenance to support aquatic ecosystems	Based upon inquiries of USFWS personnel, through FY15, the water levels in Lower Derby Lake, Lake Ladora and Lake Mary continue to support an aquatic ecosystem in accordance with the On-Post ROD.

Table 7.2.1-1 (Concluded)
Evaluation of RMA Land Use Controls

Control	Evaluation
Prevent excavation of the PELS site (site SSA-3b)	<p>The PELS site was inspected for presence of signs and evidence of disturbance. No disturbance of the area was noted.</p> <p>During 2015, unusually high water levels and a clogged culvert at the north end of the site made access to the wildlife viewing blind on the west side of the site difficult. To restore access to the blind, the USFWS excavated soil and sediment from the clogged culvert and ditch. The excavation area is shown on Figure 7.2.1-1. Because the area requiring excavation fell within the restriction area, a data review was completed to determine soil Contaminant of Concern (COC) concentrations in the area of the excavation. Historic samples in the ditch did not have COC concentrations exceeding ROD Human Health Soil Exceedance Criteria. The Regulatory Agencies were notified of the need for excavation and the work was completed in June 2015.</p> <p>During 2014, the USFWS removed four of the signs encompassing the excavation restriction area prior to prescribed burn activities. Although the original four signs have not been replaced, one additional sign was installed at the visible access point to the area. Figure 7.2.1-1 indicates the locations of the existing and missing signs.</p> <p>Long-term plans for USFWS include construction of a walking/bike trail along the road north of the restriction area. Replacement of the signs will be coordinated with trail planning to ensure that the signs and trail are properly located.</p>
Access restrictions to ensure integrity of caps/covers; prohibit activities that might damage or impair the proper function of the covers	<p>Engineering controls were maintained on the caps and covers to provide access restrictions. There were no activities that resulted in damage to the caps/covers.</p> <p>Monitoring was completed as required under the relevant plans and the results were provided in annual monitoring reports (Navarro 2015a, 2015b, 2015c).</p>
Protection of groundwater remedial action structures	<p>Monitoring of treatment systems was completed as required by the LTMP. Two well locks in the public use area were identified as missing. The locks were immediately replaced.</p>
Access controls preventing exposure and maintaining remedy integrity	<p>Inquiries were made to Army and USFWS personnel charged with enforcement. In FY15 there were no trespass incidents that threatened the integrity or effectiveness of the remedy, or created any potential for exposure.</p> <p>Overall, project-specific access controls continue to provide adequate control to limit access to remediation areas to required or authorized personnel only.</p>
Activities Management	<p>Intrusive activities require completion of Intrusive Activity Permit prior to excavation. Project-specific training continues to provide coordination for activity management.</p> <p>In addition, signs were maintained to provide visitors and workers with safety information and to advise them of entry into long-term remediation facilities or waste containment areas.</p>
Provide access related to CERCLA response actions	<p>Based upon inquiries of Army and USFWS personnel, there are no access issues associated with performance of required response actions.</p>



7.2.2 Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel

The land use controls noted in Section 4.2 are applicable to the property transferred from Army to Commerce City or other state or local government agencies. Where appropriate, deed restrictions were used to implement the requirements. Evaluation of the Prairie Gateway, Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel land use controls are presented below in Table 7.2.2-1.

**Table 7.2.2-1
Evaluation of Prairie Gateway, Klein Property,
100-Foot Highway Setbacks, and Section 20 NE Parcel Land Use Controls**

Control	Evaluation
Prohibit use of property for residential purposes or prohibit residential development	<p>For the Prairie Gateway the deed restrictions are in place, and the PUD prohibition on residential use is being enforced (Commerce City 2005, as amended). However, the Prairie Gateway PUD and Amendment #1 to the PUD include potential uses, such as group homes and bed & breakfasts that may be in conflict with the residential restriction. See Section 7.2.2.1 for additional discussion. Follow up is identified as a corrective action in Section 9.0 to ensure that the next revision to the Prairie Gateway PUD incorporates changes to preserve this restriction.</p> <p>For the Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, the deed restrictions are in place and no residential use has occurred.</p>
Prohibit use of property for industrial purposes	<p>For Prairie Gateway the deed restrictions are in place, and the PUD prohibition on industrial use is being enforced (Commerce City 2005, as amended). For the 100-Foot Highway Setbacks and Section 20 NE Parcel the deed restrictions are in place and industrial use has not occurred. This restriction does not apply to the Klein Property.</p>
Prohibit agricultural activities	<p>For the Prairie Gateway, deed restrictions are in place; however, the PUD includes a use-by-right for public gardening. See Section 7.2.2.2 for additional discussion. Follow up is identified as a corrective action in Section 9.0 to ensure that the next revision to the Prairie Gateway PUD incorporates changes to preserve this restriction.</p> <p>For Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, the deed restrictions are in place and no agricultural activities have occurred.</p>
Prohibit use of groundwater or surface water as a source of potable water	<p>With the exception of three Army wells, as a condition of service, all rights to groundwater beneath the Prairie Gateway PUD were transferred and are now owned and controlled by SACWSD. The three Army wells are used exclusively for non-potable refuge and remedy purposes on RMA. A risk assessment was completed supporting use of these wells for remedial actions and refuge management (FWENC 1998).</p> <p>Because permanent surface water features are absent on the Prairie Gateway, consumption is not a concern.</p> <p>For the Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, the deed restrictions are in place and the properties continue to be managed for water treatment and road way use.</p>



**Table 7.2.2-1 (Concluded)
Evaluation of Prairie Gateway, Klein Property,
100-Foot Highway Setbacks, and Section 20 NE Parcel Land Use Controls**

Control	Evaluation
Prohibit hunting and fishing or prohibit consumption of fish and game	For the Prairie Gateway the deed restriction is in place and is enforced using the Commerce City Code of Ordinances, Chapter 12, Article VI, Section 12-6006, which prohibits discharges of firearms or other weapons (e.g., slingshot, bow and arrow) within Commerce City. Fishing and consumption of fish is not a concern because permanent surface water features are absent on the Prairie Gateway. No known hunting activity has occurred. For the Klein Property, 100-Foot Highway Setbacks, and Section 20 NE Parcel, the deed restrictions are in place and the properties continue to be managed for water treatment or roadway use. No known hunting or fishing activity has occurred.
Provide access related to CERCLA response actions	The CERCLA covenants providing access for response actions or corrective actions are in place in the deeds. Access was required and maintained for groundwater monitoring activities.

7.2.2.1 Residential Use in the Prairie Gateway Planned Unit Development

The PUD prohibition on residential use is being enforced (Commerce City 2005, as amended). However, the Prairie Gateway PUD and Amendment #1 to the PUD include potential uses that appear inconsistent with the residential restriction. These uses include bed & breakfasts, hotels, motels, public confinement facilities, halfway houses, correctional institutions, and group homes. A corrective action was identified in the FY12 monitoring report to include discussion with the Regulatory Agencies regarding land uses identified in the Prairie Gateway PUD and determine if changes to the PUD are warranted.

A meeting was held with the Regulatory Agencies on March 19, 2013 to discuss potential issues with land uses identified in the PUD. Although no resolution was reached on specific uses that would be in conflict with the residential use restriction, the Army committed to communicate these concerns to Commerce City. Subsequent to this meeting, Commerce City received a determination from Colorado Department of Public Health and Environment (CDPHE) that development of hotels does not constitute residential use for purposes of the land use restrictions on the property (CDPHE 2013). The remaining uses identified in the PUD were not addressed.

The Army continues to meet regularly with the Commerce City Planning Department to maintain open communications regarding land use control issues. Planning Department personnel have consistently confirmed their awareness of the residential use exclusion for the Prairie Gateway, have confirmed that these uses would not be approved while the residential restriction was in force, and stated that this issue will be corrected at the next revision to the Prairie Gateway PUD. The Army will continue to coordinate with the Planning Department to clarify use language in the next amendment to the PUD.



Follow up to ensure that the next revision to the PUD will resolve this issue is included as a Corrective Action in Section 9.

7.2.2.2 Agricultural Activity in the Prairie Gateway Planned Unit Development

As noted in Table 4.2-1, the prohibitions on residential, agricultural and industrial use contained in the deed restrictions are implemented through the Prairie Gateway PUD zoning process (Commerce City 2005, as amended). Monitoring in FY09 identified a potential issue with land use in the PUD. Amendment #1 includes, as a use-by-right, "*(p)ublic gardening and similar cultivation of land, nursery, and supplementary to the primary public use*" for Sub-Parcels 3 and 4 of Parcel D as shown on Figure 7.2.2.1-1. Parcel D is the northern-most parcel extending from 80th Avenue and Colorado Highway 2 southward, to 72nd Avenue. Sub-parcel 4 begins at 72nd Avenue, surrounds the Adam City High School and extends northward to Quebec Parkway. Sub-parcel 3 is triangular in shape and is located west of Parcel 4, on the west side of the Quebec Parkway.

The FY09 monitoring report included a corrective action to request clarification from the Commerce City Planning Department for the additional use-by-right in Amendment #1 to the PUD. A letter requesting clarification of the issue was submitted to the Deputy City Manager in September 2010 (Army 2010). Although the Army has not received a formal response to the September 2010 letter, the Commerce City Planning Department has stated that this issue will be corrected in the next revision to the Prairie Gateway PUD. The Army continues to meet regularly with the Commerce City Planning Department to discuss issues related to the Prairie Gateway, and potential changes to the PUD are discussed at these meetings. Follow up to ensure that the next revision to the PUD resolves this issue is included as a Corrective Action in Section 9.

7.3 Off-Post Operable Unit Land Use Controls

7.3.1 Shell Property Deed Restrictions

The deed restriction prohibiting drilling new alluvial wells and use of deeper groundwater underlying the Shell Property for potable purposes was recorded in June 1996 and remains in place. As of the close of FY15, no alluvial wells have been constructed and use of the deeper groundwater has not occurred.

7.3.2 State Engineer's Office Well Permit Notification

The Tri-County Health Department (TCHD) reviewed well permits issued by the SEO for new wells within the notification areas. The TCHD implements these reviews under the existing Memorandum of Agreement and in accordance with the process outlined in the 2005 Five-Year Review Report (Army 2007). There were five well permits approved for new wells during FY15 and the required notification language was present on all of the issued permits.

7.4 RMA Engineering Controls

7.4.1 Groundwater Remedy Structures

As noted in Section 6.2, certain wells within the RMA NWR public use area require well locks to minimize the potential for exposure to groundwater or damage to these wells. Each well was inspected to verify that locks were in place and that there had been no disturbance of the wells. Two well locks in the public use area were identified as missing. The locks were immediately replaced. There was no evidence of tampering with any of the wells.

Other groundwater remedy structures are monitored pursuant to the LTMP and have not been evaluated as part of this effort. The monitoring results, as well as any corrective actions, are reported and tracked in the *Annual Summary Report for Groundwater and Surface Water FY14* (Navarro 2015d).

7.4.2 Caps and Covers

As noted in Section 6.3, fences, signs, and obelisks with plaques were installed during cap and cover construction and are being monitored in accordance with the applicable O&M plans. The monitoring results, as well as any corrective actions, are reported and tracked in the annual reports (Navarro 2015a, 2015b, 2015c) and are therefore not evaluated separately as part of this report. There were no issues identified that indicate damage to the cap/cover controls or potential for exposure to contained wastes.

7.4.3 Sanitary Sewers

Based on the durability of the brass markers and the infrequency of intrusive work, field inspection of the sanitary sewer markers is required on a five-year cycle. The most recent inspection was completed in FY14; therefore, no inspection was conducted during this monitoring period.

The land use control requirements for the abandoned sanitary sewers include a notification requirement prior to excavation or disturbance of the sewer. During FY14, a segment of sewer in Section 35 was identified for replacement. This work, which was completed in October 2014, required excavation of a small portion of sewer to facilitate tie in to the existing line. Notification of this work was provided to the Regulatory Agencies at the September 25, 2014 RMA Committee meeting.

8.0 NOTIFICATIONS

The LUCP and ROD Amendment include notification obligations for violations of land use controls, changes to the LUCP, or certain activities with specific notification requirements. Notification activities during FY15 are presented below in Table 8.0-1. The source for each notification requirement is also noted.

**Table 8.0-1
FY15 Notifications**

Notification Requirement	Notes
Violation of a land use control that results in a release of hazardous materials or actual exposure of personnel to hazardous materials (LUCP)	No land use control violation resulted in a release of hazardous material or actual exposure of personnel to hazardous materials, so no notification and reporting was required.
Violation of a land use control that compromises remedy integrity (LUCP)	No land use control violation resulted in compromise to remedy integrity, so no notification and reporting was required.
Activity inconsistent with land use control requirements or objectives (ROD Amendment, LUCP)	No activities inconsistent with land use control requirements or objectives were identified.
Actions that may interfere with land use controls (ROD Amendment, LUCP)	No activities were identified that would interfere with land use controls, so no notification was required.
Emergency overnight stay on site (LUCP)	There were no emergency stays during FY15, so no notification was required.
Excavation of the PELS site (LUCP)	A portion of the ditch at the north central part of the site was excavated to restore water flow through the existing culvert. The Regulatory Agencies were notified on May 29, 2015.
Excavation of abandoned sanitary sewer line (LUCP)	Replacement of a small section of the sanitary sewer was completed in fall of 2014. Notification was provided to the Regulatory Agencies at the September 25, 2014 RMA Committee meeting.
Dredging in Lower Derby Lake (LUCP)	No dredging occurred so no notification was required.
Changes to the LUCP or proposed land use changes inconsistent with land use control objectives of the selected remedy (ROD Amendment, LUCP)	There were no changes to land use inconsistent with land use control objectives of the selected remedy.
Activity that might damage or impair the proper function of the caps/covers (LUCP)	Notifications were made in accordance with the post-closure plans or Long-Term Care Plan.
Discovery of unexploded ordnance (UXO) or repeated discovery of Material Documented as an Explosive Hazard (MDEH) within same area (LUCP)	There was no discovery of UXO or MDEH so no notification was required. During soil sampling activities in October 2014, munitions debris was encountered in Section 32. Although no UXO or MDEH was discovered, the Regulatory Agencies were notified on November 4, 2014 of the debris discovery. Subsequent debris removal actions in June 2015 did not reveal any UXO or MDEH.
Changes to the LUCP (LUCP, ROD Amendment)	There were no changes made to the LUCP in FY15.



9.0 CORRECTIVE ACTIONS

There were no corrective actions identified based on the monitoring and evaluation performed. However, three previously identified corrective actions require follow up evaluation to ensure that they are properly implemented:

- Follow up and coordination with USFWS to evaluate potential changes to sign placement or installation of signs in current required configuration.
- Follow up and continued coordination with the Commerce City Planning Department to ensure that the next revision to the Prairie Gateway PUD is modified as necessary to maintain the appropriate restrictions related to residential uses. Additional detail is provided in Section 7.2.2.1.
- Follow up and continued coordination with the Commerce City Planning Department to ensure that the next revision to the Prairie Gateway PUD resolves the issue of the public gardening use-by-right included in Amendment #1 to the PUD. Additional detail is provided in Section 7.2.2.2.

10.0 CONCLUSION

The land use controls required by the FFA, Refuge Act, On-Post ROD, Off-Post ROD, and LUCP remain effective and continue to be protective of human health and the environment. There is no indication this status is in jeopardy.

11.0 REFERENCES

Army (U.S. Department of the Army)

- 2010 (Sept. 22) *Letter to Tom Acre, Commerce City Deputy City Manager, requesting clarification of the public gardening use-by-right included in Amendment #1 to the Prairie Gateway PUD Zone Document.*
- 2007 (Nov.) *Final 2005 Five-Year Review Report for Rocky Mountain Arsenal. Revision 0.*

CDPHE (Colorado Department of Public Health and Environment)

- 2013 (Mar. 28) *Letter to James Hayes, Commerce City Deputy City Manager, regarding concurrence on hotel development of the former Western Tier Parcel of the Rocky Mountain Arsenal.*

Commerce City (Commerce City, Colorado)

- 2005 (June 6) *Prairie Gateway PUD Zone Document.*
- 2015 (Oct. 30) *Commerce City Code of Ordinances, Chapter 12, Article VI, Section 12-6006, Prohibited Use of Weapons.*

EPA (U.S. Environmental Protection Agency)

- 2009 (Sept. 3) *Ready for Reuse Determination for a Portion of the Shell Property Within the Offpost Operable Unit of the Rocky Mountain Arsenal National Priorities List Site.*
- 1989 (Feb. 17) *Federal Facility Agreement for the Rocky Mountain Arsenal. Pursuant to CERCLA Section 120, Docket No. CERCLA VIII-89-13.*

FWENC (Foster Wheeler Environmental Corporation)

- 1998 (June) *Risk Assessment for Section 4 Water Supply Wells Rocky Mountain Arsenal.*
- 1996 (June) *Record of Decision for the On-Post Operable Unit, Rocky Mountain Arsenal, Commerce City, Colorado, Prepared for the Program Manager for Rocky Mountain Arsenal.*

HLA (Harding Lawson Associates)

- 1995 (Dec.) *Rocky Mountain Arsenal Off-post Operable Unit Final Record of Decision, Rocky Mountain Arsenal, Commerce City, Colorado. Prepared for the Program Manager for Rocky Mountain Arsenal.*

Navarro (Navarro Research and Engineering, Inc.)

- 2015a (June 23) *Annual Covers Report for Resource Conservation and Recovery Act Caps 2015. Revision 0.*
- 2015b (Nov. 25) *Annual Covers Report for Integrated Cover System 2015. Revision 0.*
- 2015c (Nov. 25) *Annual Covers Report for Basin F 2015. Revision 0.*
- 2015d (Sept. 28) *Annual Summary Report for Groundwater and Surface Water, FY14, Revision 0.*
- 2013 (Oct. 10) *Land Use Control Plan. Revision 0.*

PMRMA (Program Manager Rocky Mountain Arsenal)

- 2011 (Mar. 31) *Decision Document Off-Post Groundwater Notification Area.*
- 1998 (Nov. 18) *Basin A Dispute Resolution Agreement.*

Public Law

- 1992 (Oct.) *Rocky Mountain Arsenal National Wildlife Refuge Act of 1992. Public Law 102-402.*
- 1966 (Oct.) *National Wildlife Refuge System Administration Act of 1966. Public Law 89-669.*

RMA Committee

- 2013 (Aug.) *Decision Document DD-29 Short-Term Use of Bunkhouses.*

RVO (Remediation Venture Office for Rocky Mountain Arsenal)

- 2012 (May 2) *Rocky Mountain Arsenal Access Policy PM-A-101.*
- 2007 (Apr. 10) *Intrusive Soil Activity RVO SOP: ES&H.210. Revision 4.*
- 1998 (Aug. 3) *Sanitary and Chemical Sewer Plugging Project Construction Completion Report.*

Shell Oil Company

- 1996 (Feb.) *Declaration of Covenants. Final Deed Restrictions on the Shell Property North of RMA.*

Spinks, John L. Jr. (Deputy Regional Director, U.S. Fish and Wildlife Service)

- 1993 (Feb. 3) *Letter to Jack McGraw, Acting Regional Administrator Of EPA Region VIII, Regarding the Construction of Buildings with Basements at RMA.*



TtEC (Tetra Tech EC Inc.)

- 2011a (Sept. 29) *RCRA-Equivalent, 2-, and 3-Foot Covers Long-Term Care Plan.* Revision 2.
- 2011b (Mar. 16) *Hazardous Waste Landfill Post-Closure Plan.* Revision 3.
- 2011c (Oct. 6) *Basin F Post-Closure Plan.* Revision 0.
- 2011d (June 3) *Miscellaneous RMA Structure Demolition and Removal Project – Phase IV and SQI Extension Sanitary Sewer Manhole Plugging Construction Completion Report.* Revision 0.
- 2011e (Sept. 23) *2010 Five-Year Review Report for Rocky Mountain Arsenal.* Revision 0.
- 2010 (May 20) *Enhanced Hazardous Waste Landfill Post-Closure Plan.* Revision 0.
- 2008 (Dec. 10) *Sanitary Sewer Manhole Plugging Project – Phase II Final Construction Completion Report.* Revision 0.
- 2005 (Oct. 20) *Amendment to the Record of Decision for the On-Post Operable Unit, Rocky Mountain Arsenal Federal Facility Site, Section 36 Lime Basins Remediation, Basin F Principal Threat Soil Remediation.*

TtEC and URS Corporation

- 2010 (Mar. 3) *Long-Term Monitoring Plan for Groundwater and Surface Water.*

USFWS (U.S. Fish and Wildlife Service)

- 2015a (Aug.) *Final Environmental Impact Statement Rocky Mountain Arsenal National Wildlife Refuge.*
- 2015b (Oct. 5) *Record of Decision for the Final Environmental Impact Statement Rocky Mountain Arsenal National Wildlife Refuge.*
- 1996 (Mar.) *Rocky Mountain Arsenal National Wildlife Refuge Comprehensive Management Plan.*

Walker, D. Lewis (Deputy Assistant Secretary of the Army, Environment, Safety and Occupational Health)

- 1993 (Feb. 3) *Letter to Jack McGraw, Acting Regional Administrator of EPA Region VIII, Regarding the Construction of Buildings with Basements at RMA.*

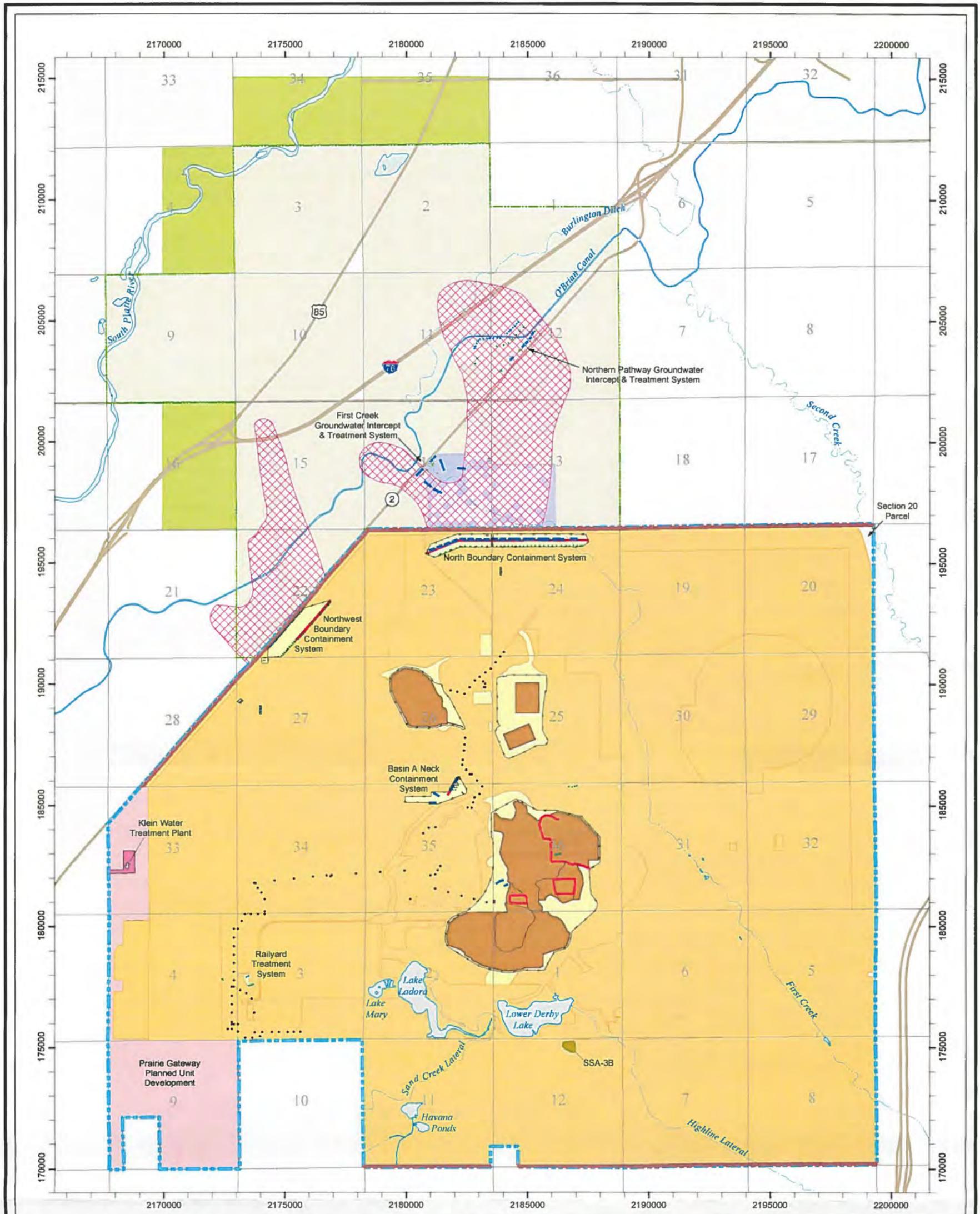


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FIGURES

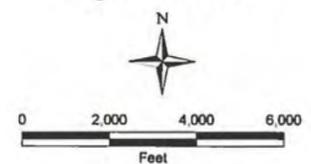
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RMA Detail

Figure 2.0-1

- | | | |
|------------------------------------------|--------------------------------------------|----------------------------------------------|
| RMA On-Post Operable Unit | Potential CSG Exceedance Notification Area | Intermittent Streams |
| Off-Post Operable Unit | Historical Contamination Notification Area | Ditches, Canals |
| U.S. Army | Shell Property | Slurry Walls |
| RMA National Wildlife Refuge | Caps and Covers | Recharge Trenches |
| Prairie Gateway Planned Unit Development | Army Maintained Area | Dewatering Trenches |
| Transfer for Roads | Township & Range Lines | Recharge Wells |
| SSA-3B Buried Sediments | Section Lines | Dewatering Wells |
| Lakes and Ponds | | Plugged Sanitary Sewers Manholes and Markers |



NAD27-NGVD29 Datum, US Survey Feet, Colorado North Zone
Sources: U.S. Army, RMA GIS, PMC/OMC, Shell/URS Corp.

Rocky Mountain Arsenal GIS

Note: Monitoring wells not shown for clarity. Location of monitoring wells is provided in the Long-Term Monitoring Plan for Groundwater and Surface Water (RVO 2010a)

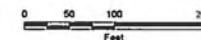
Rocky Mountain Arsenal SSA-3b Excavation Restriction Area

Legend

-  Site SSA-3b Boundary
-  Remedy Excavation Area
-  FY15 Excavation Area
-  Culverts, Siphons, Sluices, and Weirs
-  Ditches and Spillways
-  Paved Roads
-  Samples Exceeding Acute HHE Criteria
-  Area Closed Signs
-  Sign Added at Access Point

Sign Locations			
Sign_id	STP_X	STP_Y	FY14 Status
S-1	2186457.3	175224.5	Removed
S-2	2186707.2	175244.5	Removed
S-3	2186907.5	175266.3	Removed
S-4	2186964.8	175120.5	Removed
S-5	2186975.6	174972.9	
S-6	2186975.4	174854.4	
S-7	2186946.3	174794.1	
S-8	2186890.4	174745.2	
S-9	2186716.9	174807.7	
S-10	2186620.2	174855.2	
S-11	2186469.3	174906.3	
S-12	2186409.3	175042.3	

Acute Human Health Exceedance Samples Remaining at Site SSA-3b		
Site_id	Depth (ft)	Acute HI
1212010004	4.5	4.0
1212010008	4.5	8.1
2012010013	9.5	1.1
2012010018	4.5	4.4
2012010020	4.5	1.3
BR120007	6.0	11.9
SSA-3B-01	2.6	5.4
SSA-3B-02	3.5	10.0
SSA-3B-03	2.8	5.9
SSA-3B-05	10.7	21.0
SSA-3B-06	8.5	10.0
SSA-3B-11	5.4	10.4
SSA-3B-12	6.0	1.1
SSA-3B-13	2.1	7.8
SSA-3B-14	1.5	2.6
SSA-3B-16	3.0	1.1
SSA-3B-17	7.0	3.6
SSA-3B-18	3.2	4.8
SSA-3B-19	7.7	5.8



NAD27-NGVD29 Datum, US Survey Feet,
Colorado North Zone

Sources: U.S. Army, RMA GIS,
PMC, OMC, Shell/URS Corp.

Figure 7.2.1-1

12/2/2015 RMIT5

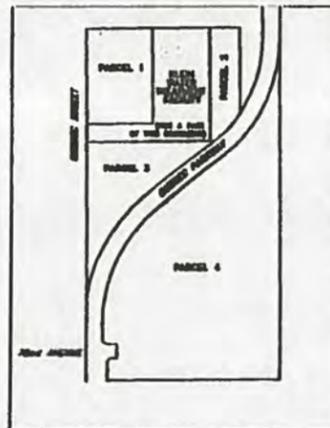
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PRAIRIE GATEWAY PUD ZONE DOCUMENT AMENDMENT #1

SHEET 4 OF 4

PARCELS OF LAND LOCATED IN THE SOUTHWEST ONE-QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 67 WEST
AND THE NORTHWEST ONE-QUARTER OF SECTION 4, TOWNSHIP 3 SOUTH, RANGE 67 WEST
OF THE 6TH PRINCIPAL MERIDIAN, CITY OF COMMERCE CITY, COUNTY OF ADAMS, STATE OF COLORADO

LAND USE AREA MAP



LAND USE SCHEDULE FOR PARCELS 1 AND 2
(CONTINUED)

Excluded Uses:
Residential
Industrial uses as defined in Commerce City Zoning Ordinance classifications of I-0, I-1, I-2, and I-3, as adopted or amended.
Manufacturing
Storage or warehousing
Contractor Shops
Agriculture
Outdoor kennels or catteries
Cemeteries and mortuaries
Sexually oriented business as defined by City of Commerce City code
Group home
Child care center
Visitor Center including staff offices, hospitality facilities and associated parking
Public and private golf courses and related uses
Public welfare institutions and social services
Public welfare offices
Oil & gas wells
Permanent Outdoor Sale or Rental of motor vehicles, campers, boats, motorized equipment and accessories for such vehicles
Christmas tree lots permits not to exceed thirty (30) days
Flea markets, indoor and outdoor
Lumber and building supply yards
Sales from moveable structure, vacant lot or parking lot
Recyclable materials collection facilities
Machinery sales, including truck trailers and heavy equipment
Automotive and motorcycle sales, repair service parts and dealers with exterior lots
Public stadiums, arenas, and auditoriums

Temporary Uses:
Temporary office
Temporary signage
Temporary construction trailer(s) incidental and necessary for the sale and/or construction of new construction by the permittee (Each permit shall be valid for a period of not more than six (6) calendar months and may be renewed for six (6) consecutive month periods at the same location)
Temporary outside storage yards for contractors, provided that no permit shall be granted for such use unless adequate provisions are made for concealing such storage by concealing-type fences or walls for adjacent properties in such a manner as to assure the protection of the general health, safety and welfare of the public.

Conditional Use:
Public health facilities
Public schools
Private schools
Churches and religious institutions
Public and private colleges, universities vocational and trade schools
Public and private commercial and non-commercial outdoor recreation (at the discretion of the CPDS Director, the proposed use may be required to obtain a CUP if it is determined the proposed use is not compatible with surrounding proposed or existing use.)
Public utility substations
Public transportation terminals
Liquor stores including drive-thru's
Full service car wash (at the discretion of the CPDS Director, the proposed use may be required to obtain a CUP if it is determined the proposed use is not compatible with surrounding proposed or existing use.)
Motels
Car pool lots/park and ride

LAND USE SCHEDULE FOR PARCELS 3 AND 4

Uses by right:
Public administrative offices and service buildings.
Public parks and public recreation centers.
Private parks.
Public utility offices.
Public outdoor recreational facilities.
Public gardening and similar cultivation of land, nursery, and supplementary to the primary public use.
Public parking lots.
Cemeteries and crematories, or mausoleums when incidental or supplemental to primary cemetery use.
Libraries.
Public welfare institutions and social service organizations.
Public and private schools, colleges, universities, vocational and trade schools.
Public and private golf courses.
The above-mentioned uses by right are by way of example and not by way of limitation.

Exclusions:
Enterprises of general commercial nature.
Private lodges and clubs.
Private gardening and cultivation of land.
Residential uses.
Private industrial uses unless otherwise provided for as a use by permit in this zone district.
Above ground storage of flammable and combustible liquids.
Commercial or private radio and television broadcasting stations.
Race tracks.
Adult entertainment uses.
The above-listed exclusions are by way of example and not by way of limitation.

Uses by permit:
Public transportation terminals.
Fire stations and ambulance services.
Sanitation and wastewater treatment facilities.
Water treatment facility.
Public confinement facilities, reformatories, correctional institutions and facilities, halfway houses, and treatment facilities of institution side.
Public utilities and garages and shop facilities, including substations.
Public stadiums, arenas, and auditoriums.
Hospitals.
Churches, synagogues, and other religious institutions.
Public airports and heliports.
Public or governmental communication centers, radio or television broadcasting stations, and private land mobile radio services (i.e., public radio services, special emergency radio services, etc.).
Group homes.
Any use determined to be appropriate by the city council after application of the conditional use criteria.

LAND USE SCHEDULE FOR PARCELS 1 AND 2

Use by Right:
Medical and dental offices/clinic
Animal hospitals (excluding outdoor kenneling)
Art or craft studio
Libraries
Museums
Public parks and public recreation centers/facilities
Private parks and private open space
Public and private commercial and non-commercial outdoor recreation (at the Discretion of the CPDS Director, the proposed use may be required to obtain a CUP if it is determined the proposed use is not compatible with surrounding proposed or existing use.)
Alliatic fields, including athletic camp, academies
Public utility offices
Public administration offices and service buildings
Fire stations and ambulance services
Retail Shops
Sporting Goods
Restaurants
Eating and drinking establishments, Excluding drive-in type
Eating and drinking establishments, including drive-in type
Eating and drinking establishments, including drive-in type, along Quebec St. And 56 th Ave.
Digital and photo imaging
Supermarkets
Personal Care services excluding tattoo and piercing
Full service car wash (at the discretion of the CPDS Director, the proposed use may be required to obtain a CUP if it is determined the proposed use is not compatible with surrounding proposed or existing use.)
Gasoline service stations, including car wash and small convenience store except in Mixed Use parcels the gasoline pumps shall be set back a minimum of fifteen (15) feet from property lines and not be enclosed in a structure.
Home improvement, lumber yard as accessory
Sidewalk sales, carnival or bazaar permits not to exceed thirty (30) days
Farmers markets
Nurseries (with limited storage of animal by-products, fertilizer, fungicides, herbicides and insecticides as necessary for retail and wholesale purposes and for arboriculture uses on premises)
Community sales center/welcome center incidental and necessary for the sale of new construction (permanent)
Automotive and motorcycle sales, repair service parts and dealers with interior showrooms only
Bed & breakfast
Hotels (rooms with an interior entrance) as a primary use and motels (rooms with an exterior entrance) exterior as an accessory structure, primary use is defined

Figure 7.2.2.1-1

CITY OF COMMERCE CITY 7867 EAST 60TH AVENUE COMMERCE CITY, CO 80022	
Project: PRAIRIE GATEWAY	
Title: PUD ZONE DOCUMENT AMENDMENT #1	
Date Modified: 8-7-07	
Drawn By: GFS	Sheet 4 of 4
Checked By: JAX	

