

### **3.4.6 Recommended Cleanup Action**

The recommended cleanup alternative for the new OB/OD Area is frost depth (up to 14 ins. bgs) clearance with implementation of ICs. This alternative is determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The total area to be cleared is 16.33 acres, which encompasses the estimated extent of the area. Step-out procedures will be implemented as described in the Final RI/FS.

A Soil and Groundwater Sampling Program will be implemented for OB/OD areas to address potential explosives residues from historic OB/OD activities. The sampling will be conducted per site specific Work Plans that focus on the potential for groundwater impacts related to the OB/OD operations/material explosive residuals will be prepared as a separate document. The Sampling Program will be conducted in a phased approach based upon the results of the Recommended Cleanup Action, field observations, and analytical sample results. Potential excavation and restoration would be conducted in the OB/OD Area pending residual explosive contamination evaluation sample results.

**Insert cost Table 3.6**



### **3.5 Newly Discovered 37mm Artillery/Stokes Mortar Target Area in the CVF**

#### **3.5.1 Description**

The newly identified 37mm and Stokes Mortar Target Area is located east of the newly discovered Stokes Mortar Target Area and was identified during investigation of the CVF. The area has several subsurface anomalies co-located with MEC discovered on the surface, which are indicative of additional potential MEC or MD. The area was also previously posted with an “Impact Area” warning sign that had not been identified pre-transfer of the property and which was only discovered during the brush clearance as part of the CVF Interim Action. The area is divided between valley floor and a hillside with a steep gradient. It is bordered along the eastern side by forest. The total acreage of the 37mm and Stokes Mortar Target Area is 27.64 acres, see **Figure 1.3**.

#### **3.5.2 Characterization**

Historical records do not identify this area as a potential target area. While range fans for artillery firing do overlay this area, there was not an identified target. Recent MEC and MD findings in the 37mm and Stokes Mortar Target Area include (**Figure 1.3**):

- 133 MEC items and 251 MD findings that included 3 in. Stokes mortars, 2.36 in. rockets (fired, some fuzed and some unfuzed), smoke grenades, HE type munitions, M744 Mortar sub caliber, and 37mm projectiles (fired, fuzed).

#### **3.5.3 Proposed Reuse**

In the original Reuse Plan, the 37mm and Stokes Mortar Target Area overlapped a proposed Tent and Yurt Camping Area. (see **Figure 1.5**). The 37mm and Stokes Mortar Target Area is considered a High-Intensity Reuse Area.

#### **3.5.4 Risks Presented Under Proposed Reuse Scenario**

##### **3.5.4.1 Hazard Severity Ranking**

Residual UXO poses the greatest explosive safety threat to the public as these items are fuzed and armed but failed to function properly. The hazard severity ranking for a Target Area is the most severe of all site types. While implementing the Central Valley Floor and Roads and Trails Interim Actions, it was observed that almost all of the items identified have been determined to be training rounds. While these rounds would have a significantly lower explosive risk, the overall explosive risk ranking is maintained at the conservative levels established in the Final RI/FS. This newly discovered target area would be ranked similarly as the other target areas, which are 1 on a scale of 1-7, with 1 representing the highest explosive risk.

### 3.5.4.2 Accessibility Rating and Reuse Intensity

The 37mm and Stokes Mortar Target Area overlies a proposed Tent and Yurt Camping Area and will be highly accessible and involve various intrusive activities.

### 3.5.4.3 Explosive Hazard Ranking

The explosive hazards exposure assessment for target areas Rank A on a scale of A-E, with A representing the greatest exposure risk. The 37mm and Stokes Mortar Target Area is ranked as A due to its high explosive safety ranking and high-intensity proposed reuse and accessibility. The explosive hazards exposure characteristics associated with the 37mm and Stokes Mortar Target Area are summarized in **Table 3.7**.

**TABLE 3.7**  
**SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE CHARACTERISTICS FOR THE**  
**NEWLY DISCOVERED 37MM AND STOKES MORTAR TARGET AREA**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse	
Newly Discovered 37mm and Stokes Mortar Target Area	1	Accessible	Medium	Surface and Subsurface Recreation	A

## 3.5.5 Detailed Evaluations of Alternatives

### 3.5.5.1 Scoring against MTCA Criteria

The 37mm and Stokes Mortar Target Area has been determined to pose the greatest explosive hazards exposure because of its site type and the potential for receptor interaction. It received an explosive hazards exposure ranking of A. Several remedial alternatives have been evaluated and the most feasible permanent alternative was selected for the 37mm and Stokes Mortar Target Area to reduce the explosive hazard exposure. Screening of the potential remedial technologies against the minimum threshold requirements is presented in the Final RI/FS and is not duplicated herein. A range of cleanup action alternatives were evaluated, and are presented herein, using the cost analysis in MTCA (see **Table 3.8**).

### **3.5.5.2 Cost Estimates**

The cost estimates for each of the alternatives considered for the 37mm and Stokes Mortar Target Area are shown in **Table 3.8**. The preferred alternative cost is \$1,848,000.

### **3.5.6 Recommended Cleanup Action**

The recommended cleanup alternative for the newly discovered 37mm and Stokes Mortar Target Area is frost depth (up to 14 ins. bgs) clearance with, implementation of ICs (see **Figure 1.3**). This alternative is determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The total area to be cleared in the 37mm and Stokes Mortar Target Area is 27.64 acres, which encompasses the estimated extent of the area. Step-out procedures will be implemented as described in the Final RI/FS.

**Insert SCORING Table 3.8**

### **3.6 Newly Discovered 2.36 in. Rocket Target Area near the Former Sewage Lagoons**

#### **3.6.1 Description**

The newly discovered 2.36 in. Rocket Target Area near the Former Sewage Lagoons (2.36 in. Rocket –SL) is located east of the former sewage lagoon ponds in the northern part of the CVF. Based upon the density and type of findings discovered during MEC clearance conducted as part of the CVF Interim Action, the area is considered to be a newly discovered target area. MEC and MD findings included numerous 2.36 in. rockets. Additional MEC may also be located in the wetland east of the cleared area. The wetland area requires brush clearance to determine the eastward lateral extent of MEC. The area is level with CVF and is covered heavily with brush (vine maple) and numerous deadfall trees. The total acreage to be investigated is 5.08 acres.

#### **3.6.2 Characterization**

During historical investigations conducted in 1997 only one 2.36 in. rocket, no other MEC was found in the area now known as the 2.36 in. Rocket –SL. More recent pre-transfer investigations also found no MEC and MD in this area. However, during the CVF clearance action, MEC and MD findings were identified in the 2.36 in. Rocket –SL and include:

- 30 MEC items and 22 MD findings including 2.36 in. rockets (all fired and fuzed), and a smoke grenade).

#### **3.6.3 Proposed Reuse**

The 2.36 in. Rocket –SL is in the Medium Intensity Reuse Area within the CVF.

#### **3.6.4 Risks Presented Under Proposed Reuse Scenario**

##### **3.6.4.1 Hazard Severity Ranking**

The MEC and MD findings described above for the 2.36 in. Rocket –SL suggests this is a newly discovered target area. The munition release mechanism resulting in the presence of MEC in the vicinity of a target area is from deployed munitions that failed to function properly. Residual MEC poses the greatest explosive safety threat to the public as these items are fuzed and armed but failed to function properly. While implementing the CVF and R & T Interim Actions, it was observed that almost all of the items identified have been determined to be training rounds. While these rounds would have a significantly lower explosive risk, the overall explosive risk ranking is maintained at the conservative levels established in the Final RI/FS. The hazard severity ranking for a target area is the most severe of all site types. The explosive safety relative risk ranking for target areas is 1 on a scale of 1 – 7, with 1 representing the highest explosive risk.

**3.6.4.2 Accessibility Rating and Reuse Intensity**

The 2.36 in. Rocket –SL is located in the Medium Intensity Reuse area of the CVF. The area is considered accessible due to its proximity to a road.

**3.6.4.3 Explosive Hazard Ranking**

The explosive hazards exposure assessment ranking for this target area was assigned Rank B on a scale of A – E, with A representing the greatest exposure risk. This ranking is due to the high relative explosive safety risk of target areas; its locations in a medium intensity reuse area and accessibility. The explosive hazards exposure characteristics associated with the 2.36 in. Rocket –SL are summarized in **Table 3.9**.

**TABLE 3.9  
 SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE CHARACTERISTICS FOR NEWLY  
 DISCOVERED 2.36 IN. ROCKET TARGET AREA NEAR THE FORMER SEWAGE  
 LAGOONS**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse	
Newly Discovered 2.36 in. Rocket –SL	1	Accessible	Medium	Surficial	B

**3.6.5 Detailed Evaluations of Alternatives**

**3.6.5.1 Scoring against MTCA Criteria**

The 2.36 in. Rocket –SL has been determined to pose the second greatest explosive hazards exposure because of the site type and the potential for receptor interaction. It received an explosive hazards exposure ranking of B. Several remedial alternatives have been evaluated and the most feasible permanent alternative was selected for this area to reduce the explosive hazard exposure. Screening of the potential remedial technologies against the minimum threshold requirements is presented in the Final RI/FS and is not duplicated herein... A range of cleanup action alternatives were evaluated, and are presented herein, (see **Table 3.10**).

**3.6.5.2 Cost Estimates**

The cost estimates for each of the alternatives considered for the 2.36 in. Rocket –SL are shown in **Table 3.10**. The preferred alternative cost is \$573,850.

### **3.6.6 Recommended Cleanup Action**

The recommended cleanup alternative for the 2.36 in. Rocket Target Area is frost depth (up to 14 ins. bgs) clearance with implementation of ICs. This alternative is determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The total area to be cleared is 5.08 acres which encompasses the estimated extent of the target area. Step-out procedures will be implemented as described in the Final RI/FS.

**Insert Table 3.10**



## **3.7 Newly Discovered Rifle Grenade Target Area**

### **3.7.1 Description**

A number of M-9 Rifle Grenades (fired, fuzed), several 2.36 in. rockets and a number of MD items have been recovered from an area east of the former Field Small Arms Ranges 1 and 2 near or in Grid N-17 (see **Figure 1.3**). Based upon the density and type of MEC and MD findings, the area is considered a newly discovered target area. The newly discovered Rifle Grenade Target Area is approximately 3 acres in extent.

### **3.7.2 Characterization**

During the CVF MEC surface clearance Interim Action, MEC and MD were identified in the Rifle Grenade Target Area and include:

- 14 MEC items consisting of M-9 rifle grenades (fired, fuzed), 2.36 in. rockets (fired, fuzed) and numerous MD findings including debris from M-11 rifle grenades and practice rifle grenades.

### **3.7.3 Proposed Reuse**

The Rifle Grenade Target Area is located in an area proposed for future use as an equestrian center and is nearby to a road and planned future RV camping area.

## **3.7.4 Risks Presented Under Proposed Reuse Scenario**

### **3.7.4.1 Hazard Severity Ranking**

The MEC and MD findings described above for the Rifle Grenade Target Area suggest this is a newly discovered Target Area. The munition release mechanism resulting in the presence of MEC in the vicinity of a target area is from deployed munitions that failed to function properly. Residual MEC poses the greatest explosive safety threat to the public as these items are fuzed and armed but failed to function properly. The hazard severity ranking for a Target Area is the most severe of all site types. The explosive safety relative risk ranking for Target Areas is 1 on a scale of 1 – 7, with 1 representing the highest explosive risk

### **3.7.4.2 Accessibility Rating and Reuse Intensity**

The Rifle Grenade Target Area is located in the High Intensity Reuse area and will be considered very accessible, due to its' planned future use as an equestrian center and its proximity to a road and planned future RV camping area.

### **3.7.4.3 Explosive Hazard Ranking**

The explosive hazards exposure assessment ranking for this target area was assigned Rank A on a scale of A – E, with A representing the greatest exposure risk. This ranking is due to the high relative explosive safety risk of target areas,

its location in a planned high-intensity reuse area. The explosive hazards exposure characteristics associated with the Rifle Grenade Target Area are summarized in **Table 3.11**

**TABLE 3.11  
 SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE CHARACTERISTICS FOR NEWLY  
 DISCOVERED RIFLE GRENADE TARGET AREA**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse	
Newly Discovered Rifle Grenade Target Area	1	Accessible	High	Surface and Subsurface Recreation	A

**3.7.5 Detailed Evaluations of Alternatives**

**3.7.5.1 Scoring against MTCA Criteria**

The Rifle Grenade Target Area been determined to pose the highest explosive hazards exposure because of the MEC type and the potential for receptor interaction during the planned future reuse for this area. It has been assigned an explosive hazards exposure ranking of A. Several remedial alternatives have been evaluated and the most feasible permanent alternative was selected for this area to reduce the explosive hazard exposure, using the analysis approach required in MTCA (see **Table 3.12**).

**3.7.5.2 Cost Estimates**

The cost estimates for each of the alternatives considered for the Rifle Grenade Target Area are shown in **Table 3.12**. The preferred alternative cost is \$344,300.

**3.7.6 Recommended Cleanup Action**

The recommended cleanup alternative for the Rifle Grenade Target Area is frost depth (up to 14 ins. bgs) clearance with implementation of ICs. Should any structures be required, additional subsurface clearance will be required prior to any excavation. This alternative is determined to be the most feasible permanent solution for this area and would achieve the RAU 3 remediation standard. The total area to be cleared approximately 3.0 acres which encompasses the estimated extent of the target area. Step-out procedures will be implemented as described in the Final RI/FS.

**Insert Table 3.12**

## **4.0 REGIONAL PARK WESTERN SLOPES AREA**

The Training Areas (Nos. 1, 2, 3, 4, 5, 11, 12 and a portion of 13) west of the CVF have been grouped together into the Regional Park Western Slopes Area and is discussed in **Section 4.2**). This larger area includes the Training Areas 4, 5, and 12 where Transect Investigations were conducted as part of the Interim Measures (see **Section 4.1** below).

### **4.1 Training Areas 4, 5, and 12 Transects**

#### **4.1.1 Characterization, Description, and Proposed Reuse**

The Training Areas 4, 5, and 12 historical training operations use consisted of non-live fire exercises such as squad tactics training with and without the use of night vision gear, hand-to-hand combat, practice training for the assault/defense of various types of positions and convoys, and bayonet and obstacle course training. Pyrotechnics and blank ammunition were typically employed to add to the realism of these training activities. Reviews of the historical documents concerning CBMR have not revealed evidence of target areas being present in the Training Areas 4, 5, and 12. The characterization, description, and proposed reuse are unchanged from the Final RI/FS, included as the Limited Access Medium Intensity Reuse Areas subsections.

#### **4.1.2 Hazard Severity Ranking**

The Training Areas 4, 5, and 12 (**Figures 1.4 and 1.5**) consist of those areas within the proposed Regional Park that are located between specific designated reuse areas, and do not have the accessibility characteristics of gentle slope and low vegetation characteristics. The Training Areas 4, 5, and 12 comprise approximately 210 acres, and have a low explosive safety hazard and low likelihood of occurrence with an explosive relative risk ranking of 6.

#### **4.1.3 Accessibility Rating and Reuse Intensity**

The Training Areas 4, 5, and 12 differs from the CVF in the number of people and the types of activities likely to occur in these areas. Very few people are expected to enter the Training Areas 4, 5, and 12, as most people would be expected to use the accessible Roads and Trails, and these areas have significant vegetative cover and or moderate-steep terrain characteristics. The anticipated activities within this area are limited to walking.

#### **4.1.4 Explosive Hazard Ranking**

The explosive hazards exposure assessment ranking for Training Areas 4, 5, and 12 is Rank E based on the small number of potential receptors in the Training Areas 4, 5, and 12. The explosive hazards exposure characteristics associated with Training Areas 4, 5, and 12 are summarized in **Table 4.1**.

**TABLE 4.1  
 SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE CHARACTERISTICS  
 FOR TRANSECT INVESTIGATIONS THROUGH TRAINING AREAS 4, 5, AND 12**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse	
Training Areas 4, 5, and 12	6	Limited Access, with ICs	Medium	Surficial / Short-cuts	E

## 4.2 Regional Park Western Slopes Area

### 4.2.1 Description

Camp Bonneville contained a wide variety of troop training areas. Training Areas 1, 2, 3, 4, 5, 11, 12 and a portion of 13 have been grouped together as the Western Slopes area; previously described as the Limited Access Medium Intensity Reuse area in the RAU 3 RI/FS (RAU 3 CAP, **Appendix A**). Usage of the Western Slopes area was listed by the U. S. Army as limited to non-live fire exercises such as troop movement, hand-to-hand combat, practice assaults/defense bayonet and obstacle courses. The Western Slopes Area is shown in **Figure 1.4** and covers roughly 600 acres along the western portion of the CBMR and is part of the regional park. Pyrotechnics and blank ammunition were typically employed to evaluate the reactionary responses of troops and convoys to an ambush and to train in tactics. Military munitions containing high explosives were not used for reactionary training.

### 4.2.2 Hazard Severity Ranking

The Western Slopes Area was primarily used for troop training and the historical documentation on the CBMR suggests a low probability of encountering MEC. However, during transect investigations conducted in Training Areas 4, 5 and 12, two 3 in. Stokes mortars (fired, unfuzed) were recovered from the northeastern corner of Training Area 12. There is also a possibility that pyrotechnic devices (i.e. flares, smoke grenades) may be present as a result of abandonment, mishandling, or loss while troops were training in this area. Any residual non-deployed pyrotechnics that may be present are potentially flammable, and may contain a small, low explosive charge that may cause bodily injury. However, large portions of the pyrotechnics were constructed with fiberboard containers and are therefore extremely susceptible to exposure to the elements and resultant weathering. Over time, the photoflash powder has likely been exposed to moisture and deteriorated.

#### **4.2.3 Accessibility and Reuse Intensity**

The Western Slopes are classified as Limited Access Medium Intensity Reuse areas in the future Regional Park and have limited future reuse intensity of due to terrain, vegetation and are outside the CVF in the regional park.

#### **4.2.4 Explosive Hazard Ranking**

During the implementation of the Interim Actions far more MEC (over 650 items) and 1600 MD items have been recovered from the CMBR site than was ever anticipated. The large disparity between BCRRT's actual findings and the site conditions anticipated from review of historical site documentation has cast significant doubt on the reliability of the historical documentation. As a result of this concern and the numbers of MEC and MD findings in the CVF, the WDOE has determined that additional clearance of the Western Slopes is warranted.

#### **4.2.5 Recommended Cleanup Action**

The WDOE has determined (letter dated March 18, 2009) that MEC surface clearance, assess limitations based on steep slopes and Institutional Controls are the preferred permanent solution for the Western Slopes Area (**Figure 14**). Of the 609 acres in the Western Slopes Area, over 425 acres will be MEC surface cleared through the cleanup actions detailed in this CAP.

## **5.0 NORTHERN CENTRAL IMPACT TARGET AREA EXPANSION**

### **5.1 Description**

The Northern Central Impact Target Area Expansion consists of approximately 107 acres, located north of the current CITA boundary, and extends approximately 500 - 1,000 feet north of Lower DNR road. MD debris findings (including 105 and 155mm projectile fragments) along the Lower DNR Road buffer zones clearance area (20 feet on both sides of road) indicate the strong potential for targets existing north of the current CITA boundary (see **Figure 1.2**) in a roughly 107 acre area.

### **5.2 Characterization**

Recent MEC and MD findings in this area include:

- 32 MD findings of various sizes of projectile fragments, which can be attributed to 105mm and 155mm projectiles (27 along Lower DNR Road and 5 along the northern CITA Boundary Road).

While the CITA boundaries were established and fenced to include firing targets and a safety buffer zone, the MD findings indicate the potential for new additional targets to be located in the area north of the currently established CITA beyond the Lower DNR Road, some 1000 ft to the north of the CITA.

### **5.3 Proposed Reuse**

Because this area is becoming a portion of the CITA, no reuse is planned for this restricted access area.

### **5.4 Hazard Severity Ranking**

The presence of the extensive MD findings suggests the potential of a target area. The munition release mechanism resulting in the presence of MEC in the vicinity of potential target area would be from deployed munitions that failed to function properly (UXO). Residual UXO poses the greatest explosive safety threat to the public as these items could be fuzed and armed but failed to function. The hazard severity ranking for a target area would be the most severe of all site types. Should a target be found in this area, its explosive safety relative risk ranking would be 1 on a scale of 1 – 7, with 1 representing the highest explosive risk.

### **5.5 Accessibility Rating and Reuse Intensity**

The overall accessibility of the Northern CITA Expansion is considered extremely limited as the entire area will be fenced and signed. The vast majority of the Northern CITA Expansion is either limited or inaccessible due to very steep terrain. It is designated as no-reuse to very low reuse intensity since it will be isolated by fencing and signage and located within the WMA. There are no overlying proposed future use sites or facilities planned in this area. People are not expected to venture into the area because of the fencing, signage, written documents and steep terrain; therefore the number of potential human receptors is considered negligible.

## 5.6 Explosive Hazard Ranking

The high likelihood of an MEC source combined with the very limited number of potential receptors in the area, results in an explosive hazards exposure assessment ranking of Rank B on a scale of A – E with A representing the greatest exposure risk, for each potential target located in AAOC-1. The explosive hazards exposure characteristics associated with AAOC-1 is summarized in **Table 6.2**.

**TABLE 5.1  
 SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE CHARACTERISTICS  
 FOR NORTHERN CITA EXPANSION**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse <sup>1</sup>	
Northern CITA Expansion	1	Limited to Regional Park Personnel	None	NA / Restricted Access Area	B

<sup>(1)</sup> The level of subsurface intrusion or depth of activity is designated as not applicable (NA) for those sites located in the CITA.

## 5.7 Recommended Cleanup Actions

The recommended cleanup alternative for the Northern CITA Expansion consists of securing the area with fencing, no public access, and implementation of ICs. This fencing will extend from the northern CITA Interim Action fencing and enclose the entire 107 acre area. The cost to implement the recommended alternative for the Northern CITA Expansion is \$200,000 (see **Table 5.2**).

The nature of the munitions found and the potential for targets being located north of the current CITA boundary, WDOE has determined that fencing and signage will provide the most permanent solution. An alternative hiking, biking and equestrian trail is being planned for the area north of the Lower DNR which will be outside the new CITA fence line.



**INSERT TABLE 5.2**

## **6.0 MEC SURFACE CLEARANCE OF DEMOLITION AREA 1/LANDFILL 4 KICK-OUT AREA**

### **6.1 Description**

Historical Army investigations of the Demolition Area 1/Landfill 4 (DA1/LF4) included a 10 acre surface clearance, and a 4 acre subsurface clearance. However, due to the recent MEC and MD findings within the previously cleared area, the area requiring surface clearance has now been expanded from a 500' x 500' to a 1200' x 1200' area: encompassing 103.82 acres (see **Figure 1.4**).

### **6.2 Characterization**

The recent investigations completed to date include:

- Anomaly avoidance, brush clearance, and MEC surface clearance of the roads traversing north and south and east of the DA1/LF4 area (approximately 2 acres);
- Anomaly avoidance of DA1/LF4 area (approximately 4 acres).

Recent MEC and MD findings in DA1/LF4 included:

- 16 MEC findings, including: 2.36 in. rockets (unfuzed) and 2.75 in. rockets (fuzed and HE), 20 mm rocket (fired, fuzed), CS and smoke grenades (some live), anti-tank practice land mines (spotting charge), HE warheads; fuzes and flares, and 3 in. Stokes mortars (fired, unfuzed);
- 130 MD findings of various munitions.

### **6.3 Proposed Reuse**

DA1/LF4 Kick-Out Area represents an expansion of the area delineating the Demolition Area 1/LF4 (expanding from 500' x 500' to 1200' x 1200'). The proposed reuse of this area is the same as the proposed reuse of the previously identified area (500' x 500'): that is, DA1/LF4 Kick-Out Area will be included within the WMA with the same restrictions, controls, and cleanup actions.

### **6.4 Hazard Severity Ranking**

At an OB/OD area, the unsuccessful demilitarization of a UXO item poses the greatest explosive safety threat to the public. The hazard severity ranking for an OB/OD Area is the second most severe of all demolition area site types (marginal/critical explosive safety hazard). The explosive safety relative risk ranking for DA1/LF4 Kick-Out Area is 2 on a scale of 1 – 7, with 1 representing the highest explosive risk.

### **6.5 Accessibility Rating and Reuse Intensity**

DA1/LF4 Kick-Out Area is accessible by roads and trails however; it is located outside the boundary of the proposed regional park and within the WMA and is therefore low reuse intensity.

## 6.6 Explosive Hazard Ranking

DA1/LF4 Kick-Out Area is Ranked B, on a scale of A – E, with A representing the greatest exposure risk. There are expected to be fewer potential receptors as it is located in the proposed WMA, which is a low reuse intensity area. The explosive hazards exposure characteristics associated with DA1/LF4 is summarized in **Table 6.1**.

**TABLE 6.1**  
**SUMMARY OF EXPLOSIVE HAZARDS EXPOSURE**  
**CHARACTERISTICS FOR MEC SURFACE CLEARANCE OF**  
**DEMOLITION AREA 1/LANDFILL 4 KICK-OUT AREA**

Site	MEC Source	Receptor Interaction			Explosive Hazards Exposure Rank
	Explosive Relative Risk Ranking	Accessibility	Future Land Reuse	Depth of Activity / Reuse <sup>1</sup>	
DA1/LF4 Kick-Out Area	2	Accessible	Low	Surface/WMA	B

## 6.7 Recommended Cleanup Action

The WDOE’s recommended cleanup action for the expanded DA1/LF4 Kick-Out Area is MEC surface clearance with ICs. This alternative is determined to be the most feasible permanent solution for this area and would achieve the RAU 3 cleanup standard. The approximate area to be surface cleared is shown in **Figure 1.4** and is 103.82 acres in size. The total cost to implement this alternative is \$2,730,000 (see **Table 6.2**).

**INSERT TABLE 6.2**

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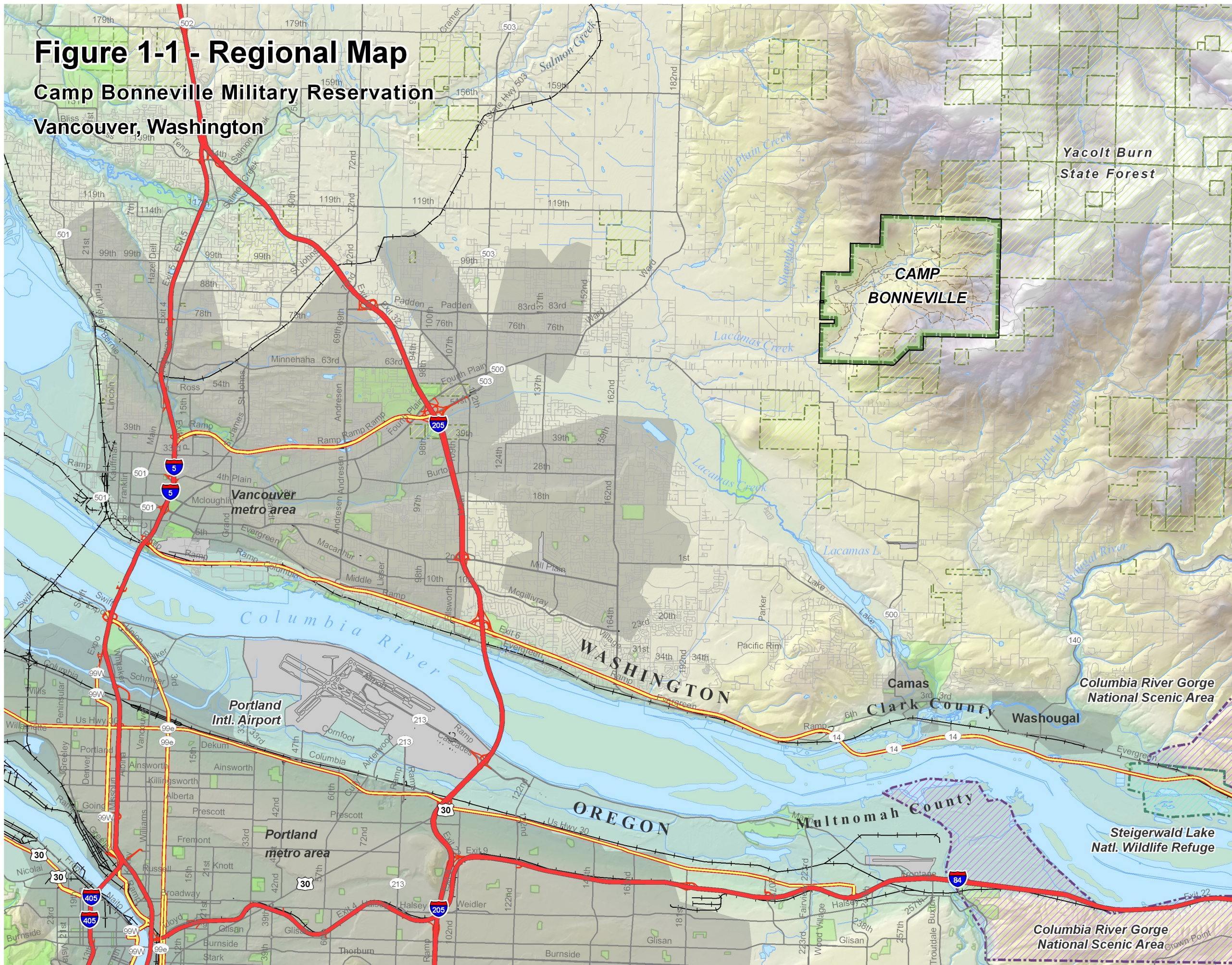
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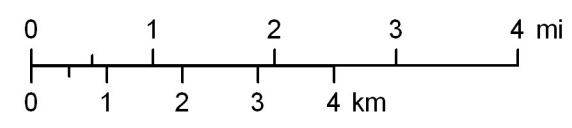


# Figure 1-1 - Regional Map

Camp Bonneville Military Reservation  
Vancouver, Washington



**BONNEVILLE  
CONSERVATION,  
RESTORATION &  
RENEWAL  
TEAM, LLC**

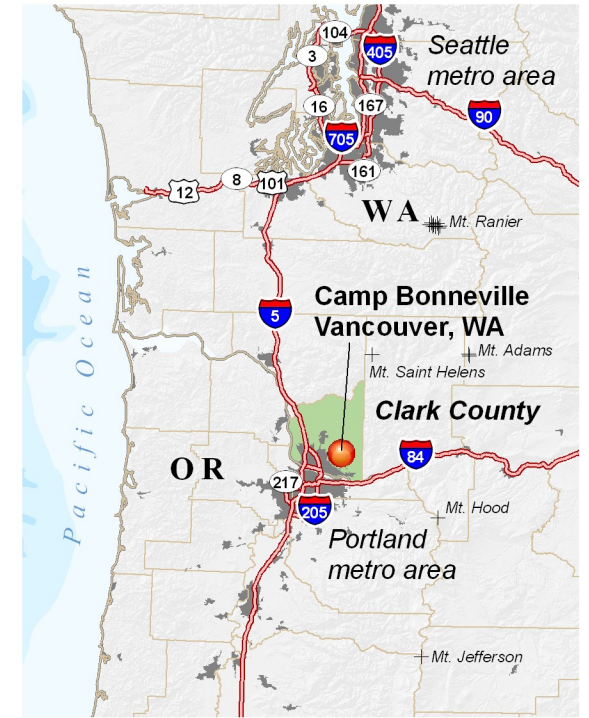
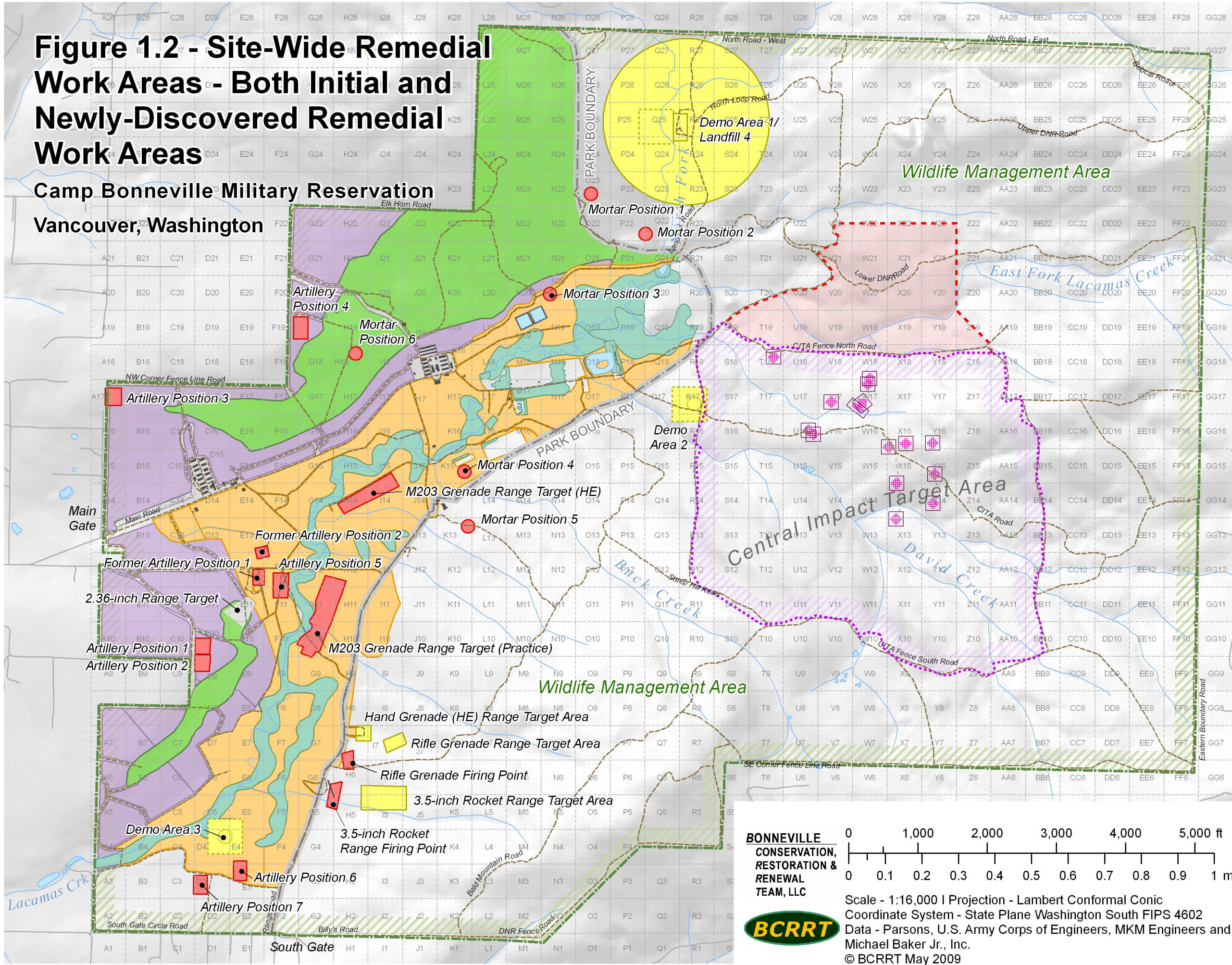



Scale - 1:100,000; 1 in equals 5.6 mi  
Projection - Lambert Conformal Conic  
Coordinate System - State Plane Washington  
South FIPS 4602  
Data - Parsons & U.S. Army Corps of  
Engineers  
© BCRRT May 2009



# Figure 1.2 - Site-Wide Remedial Work Areas - Both Initial and Newly-Discovered Remedial Work Areas

Camp Bonneville Military Reservation  
Vancouver, Washington



- Recommended Clearance Depths**
- Site grid (with grid # shown)
  - CITA (Central Impact Target Area / Central Impact Area)
  - CITA targets
  - Northern CITA expansion (fence)
  - Western Slopes - Surface clearance (areas less than 25% slope)
  - Western Slopes - Site-wide IC's (areas greater than 25% slope)
  - Surface clearance
  - Firing points - Sub-surface (to 14-in)
- Central Valley Floor**
- Frost-depth clearance (to 14-in)
  - Frost-depth clearance (to 14-in) with wetland protocols
- Target areas and Open Burn / Open Demolition areas are identified by labels only.

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RESTORATION &  
RENEWAL  
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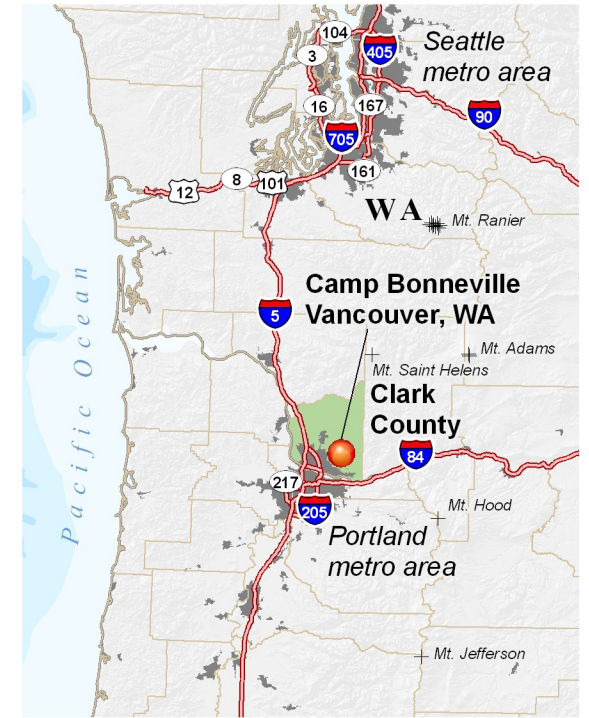
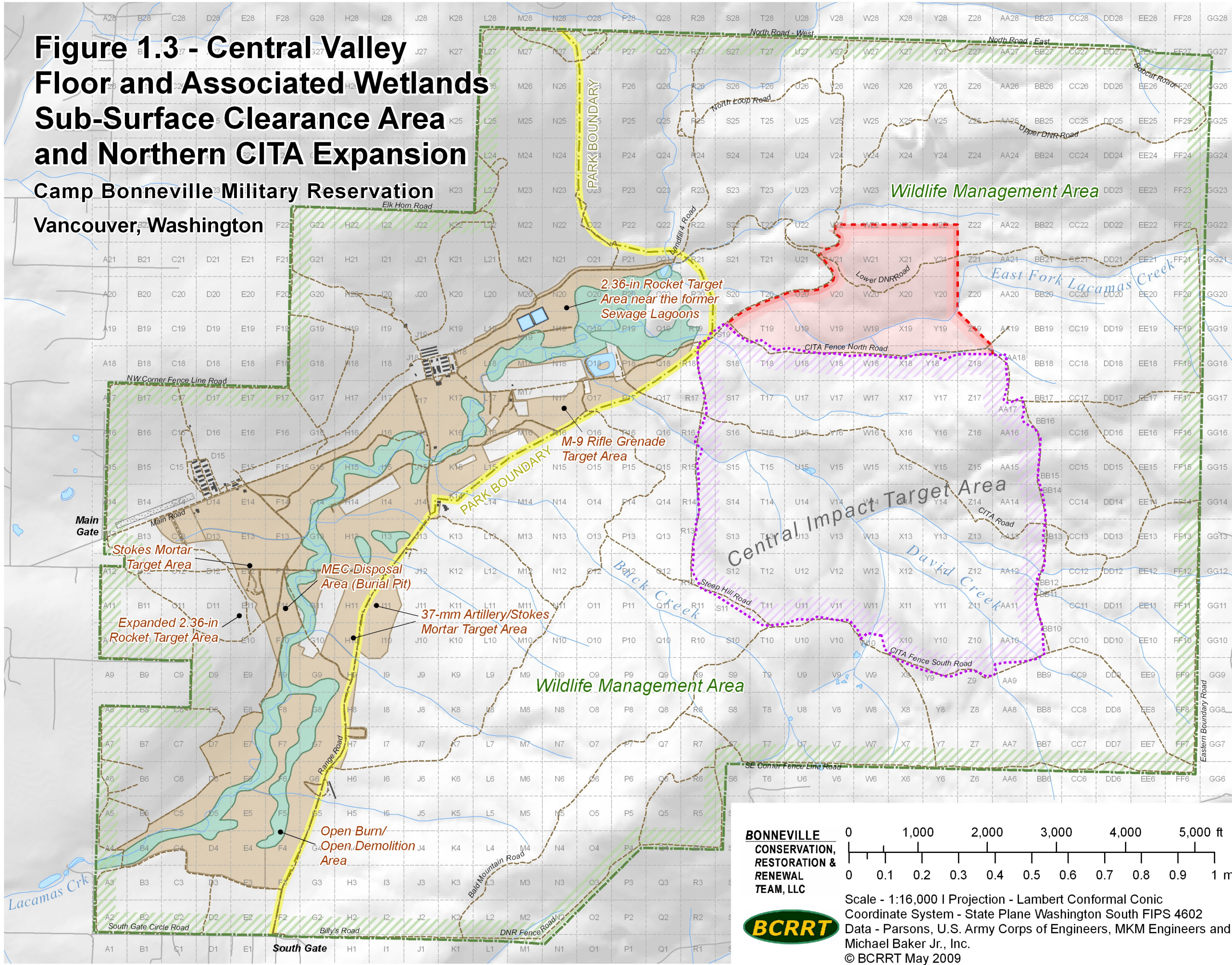
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Coordinate System - State Plane Washington South FIPS 4602  
Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and  
Michael Baker Jr., Inc.  
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# Figure 1.3 - Central Valley Floor and Associated Wetlands Sub-Surface Clearance Area and Northern CITA Expansion

Camp Bonneville Military Reservation  
Vancouver, Washington



**LEGEND**

**Additional Cleanup Areas**

- Northern CITA expansion (fence)
- Wetlands in CVF - Surface and Frost-depth clearance (to 14-in)
- Central Valley Floor - Both High Intensity and Accessible Medium Intensity reuse areas - Frost-depth clearance (to 14-in)
- Central Impact Target Area (CITA)
- Western Slopes - Surface clearance (areas less than 25% slope)
- Western Slopes - Site-wide IC's (areas greater than 25% slope)

**BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC**

**BCRRT**

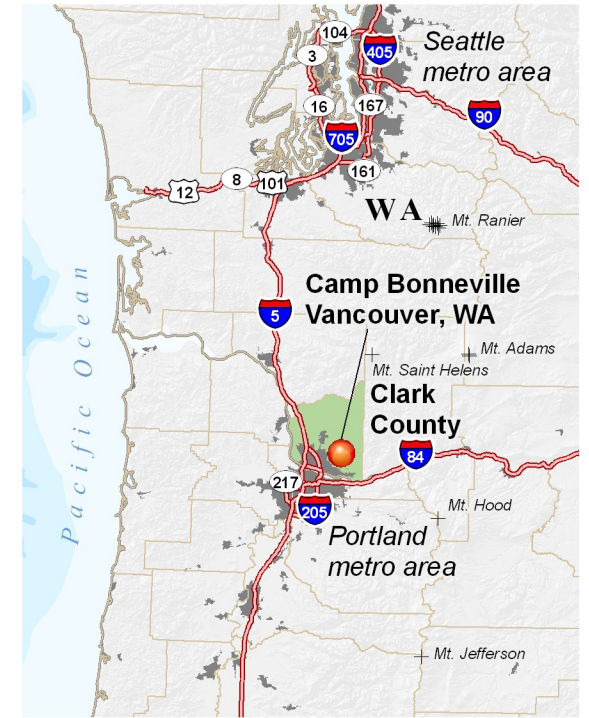
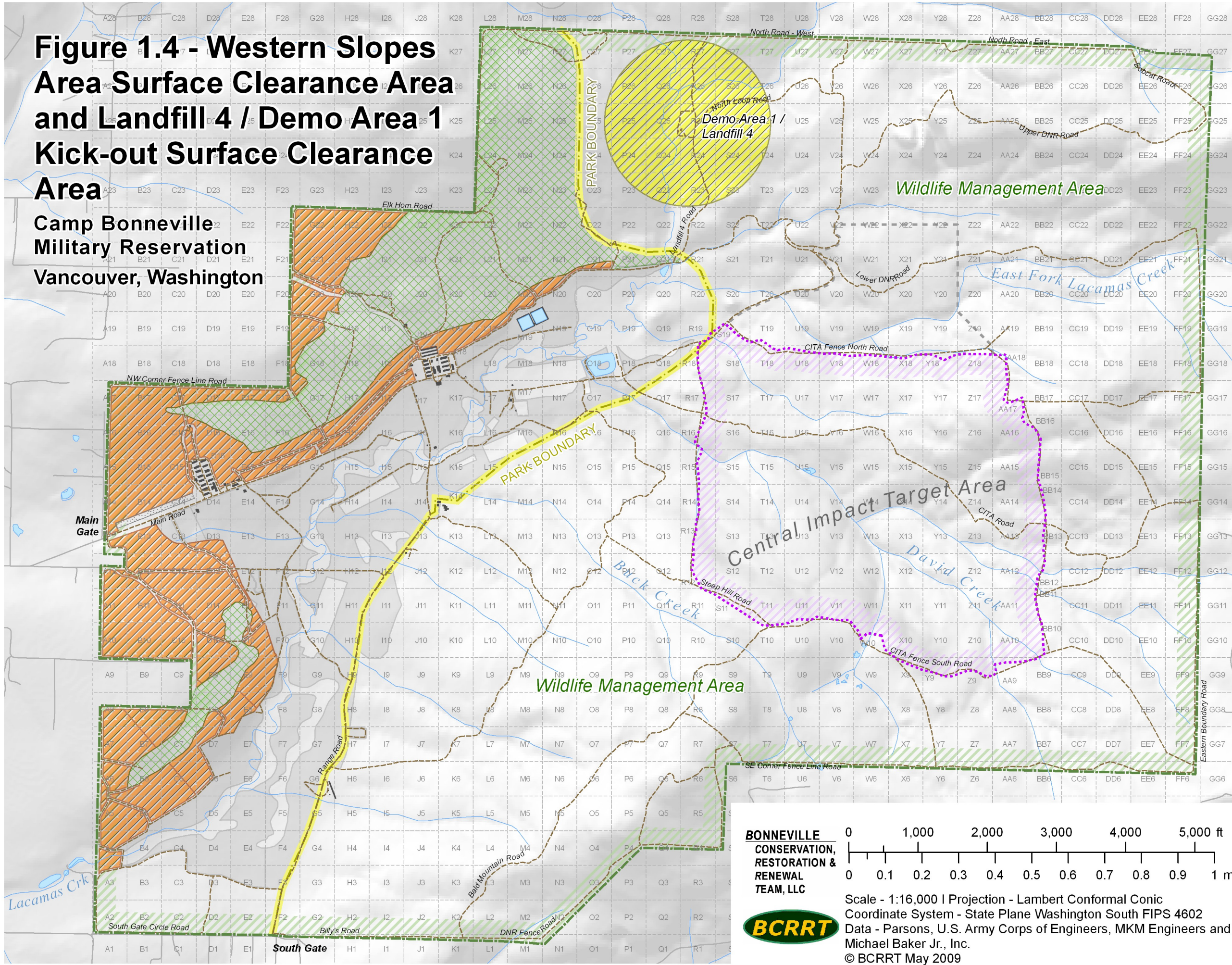
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Scale - 1:16,000 | Projection - Lambert Conformal Conic  
Coordinate System - State Plane Washington South FIPS 4602  
Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and Michael Baker Jr., Inc.  
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# Figure 1.4 - Western Slopes Area Surface Clearance Area and Landfill 4 / Demo Area 1 Kick-out Surface Clearance Area

Camp Bonneville  
Military Reservation  
Vancouver, Washington



**LEGEND**

**Additional Cleanup Areas**

- Demo Area 1 / Landfill 4 (kick-out area is surface clearance)
- Western Slopes - Surface clearance (areas less than 25% slope)
- Western Slopes - Site-wide IC's (areas greater than 25% slope)
- Central Impact Target Area (CITA)
- Northern CITA expansion (fence)
- Central Valley Floor - Frost-depth clearance (to 14-in)

**BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC**

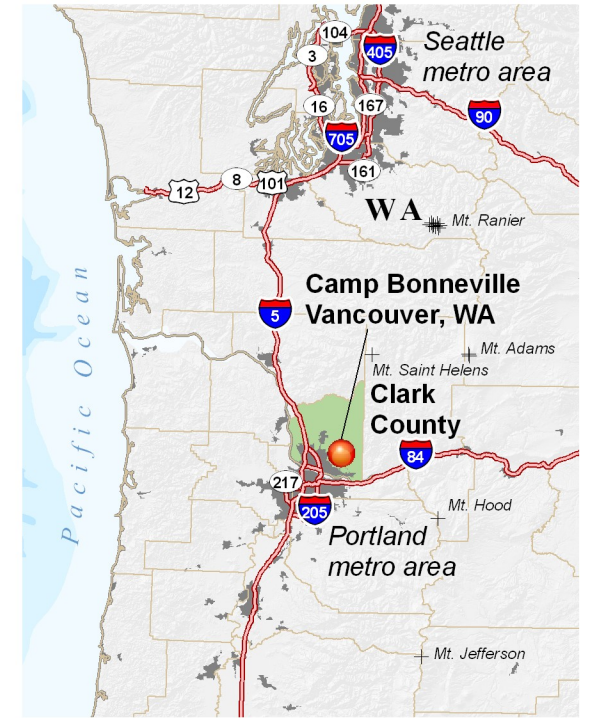
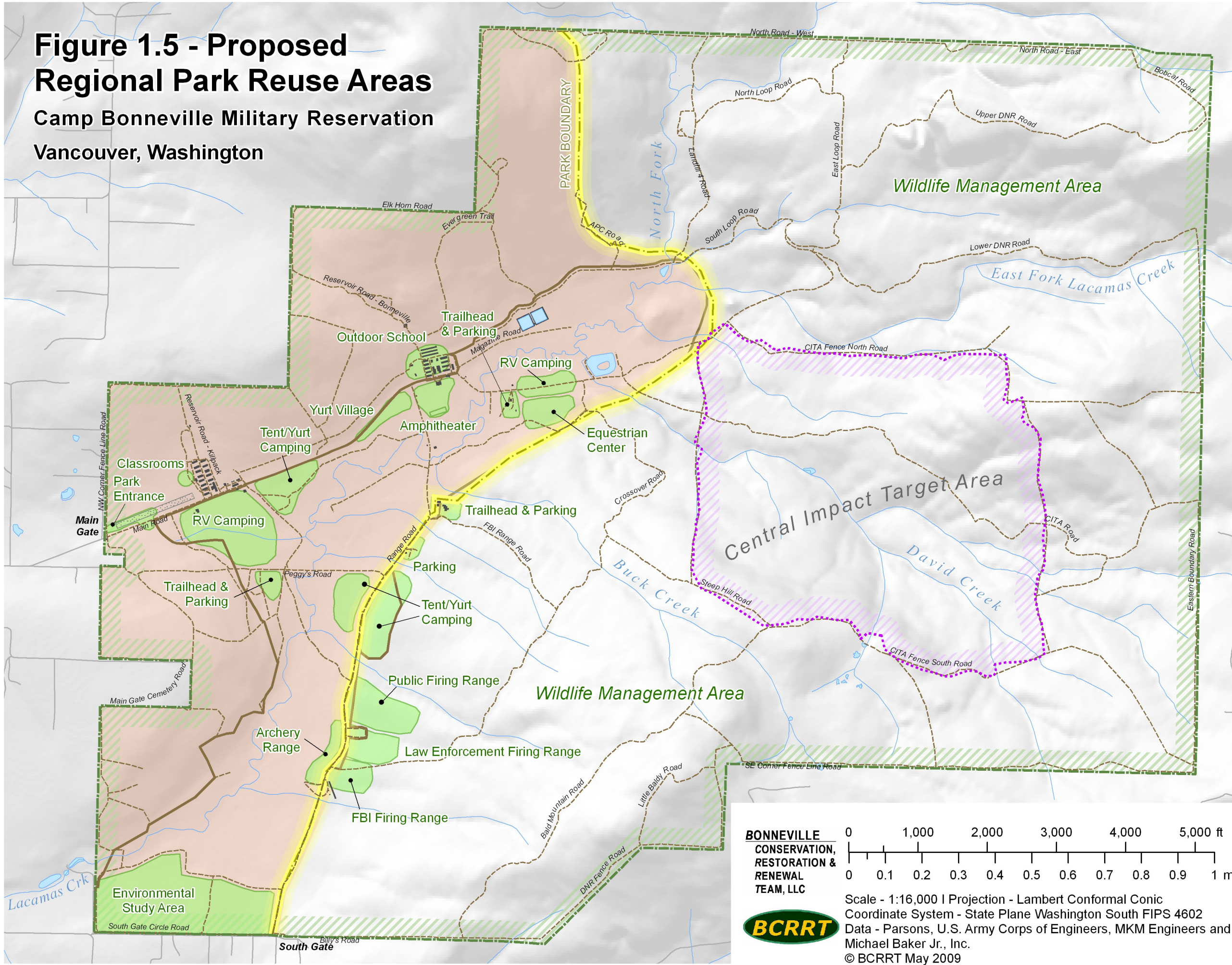
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Scale - 1:16,000 | Projection - Lambert Conformal Conic  
Coordinate System - State Plane Washington South FIPS 4602  
Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and Michael Baker Jr., Inc.  
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**Figure 1.5 - Proposed Regional Park Reuse Areas**  
**Camp Bonneville Military Reservation**  
**Vancouver, Washington**



**LEGEND**

- Park / Wildlife Management Area boundary
- Central Valley Floor (CVF)
- CITA (Central Impact Target Area)
- Proposed reuse areas (High-intensity reuse areas)
- Regional Park

\* While the locations/needs for the Tent/Yurt Camping, Public Firing Range, Archery Range, FBI Firing Range, and Trail Head Parking areas are being evaluated, they would be located within the Regional Park. The Logging Camp is not shown and if developed would be outside of the Regional Park.

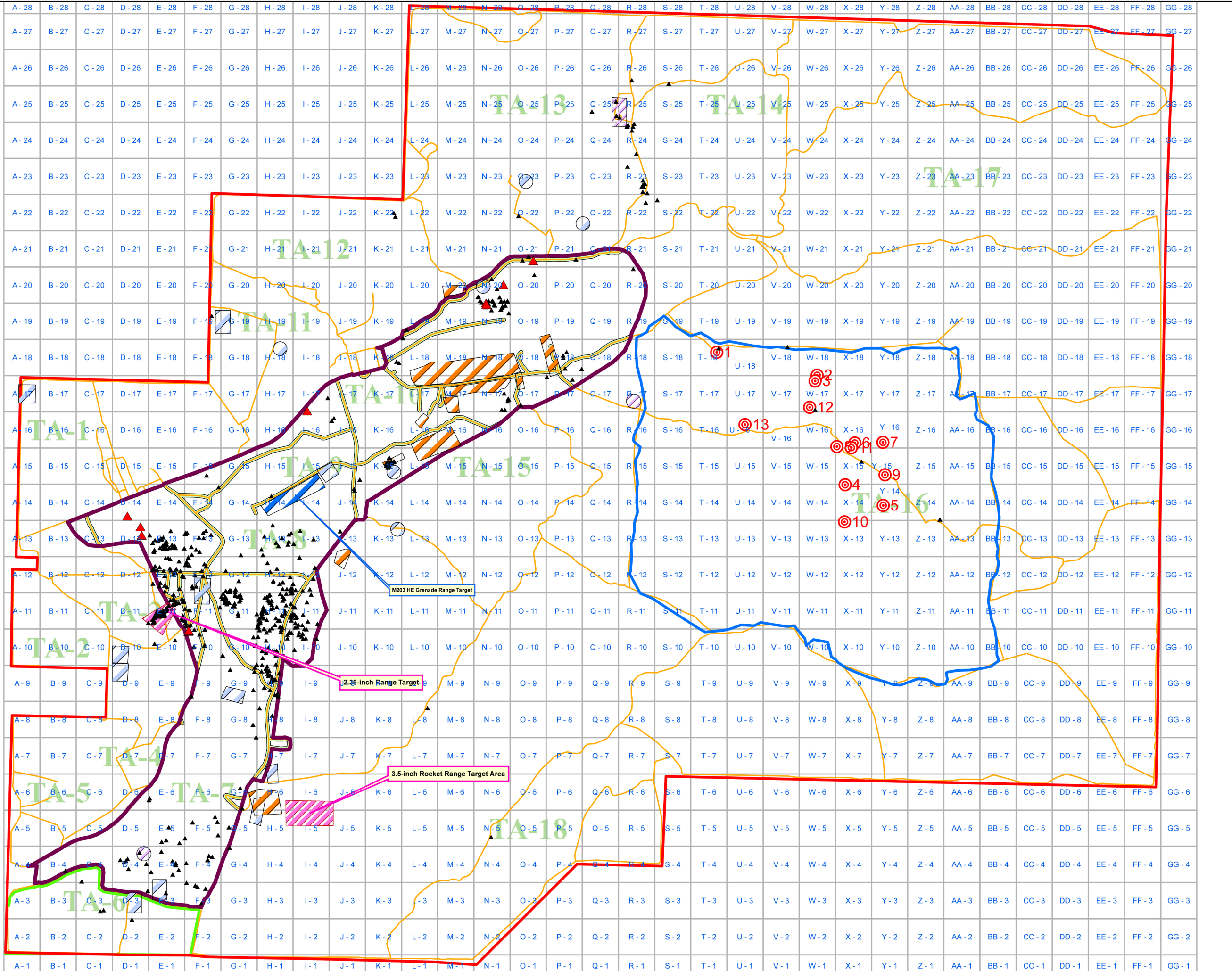
**BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC**

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 Coordinate System - State Plane Washington South FIPS 4602  
 Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and Michael Baker Jr., Inc.  
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### Legend

- Camp Bonneville Perimeter
- Roads and Trails with buffer zones
- Central Impact Target Area
- Central Valley Floor
- Environmental Study Area
- Demo Areas
- Firing Ranges
- Target Area
- M203 Grenade Range
- Artillery Motar Positions
- Military Target Points
- MEC Findings
- MEC Findings (February 2009)
- Recon Points
- 500 ft Grids

Figure 1.6 - Interim Actions MEC Findings

N

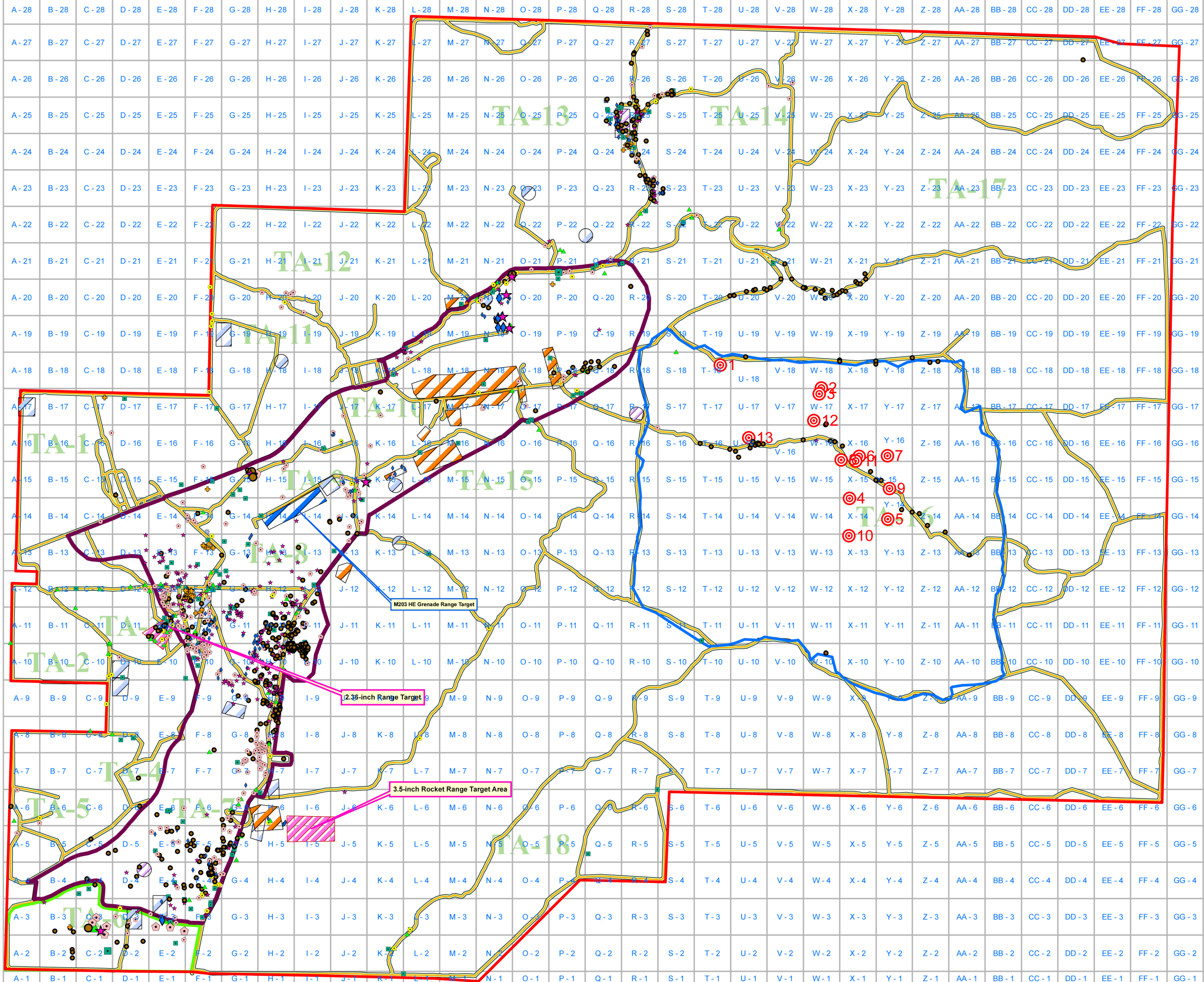
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**MKM** MKM Engineers, Inc. 4153 Bluebonnet Drive Stafford, TX 77477 **PIKA** INTERNATIONAL, INC.

MEC Findings (through February 2009)

Drawn On: 03/05/2009 Drawn By: QX Reviewed By: KA





**Legend**

- Camp Bonneville Perimeter
- Roads and Trails with buffer zones
- Central Impact Target Area
- Central Valley Floor
- Environmental Study Area
- Demo Areas
- Firing Ranges
- Target Area
- M203 Grenade Range
- Artillery Motar Positions
- ⊙ Military Target Points
- ▲ Recon Points
- 500 ft Grids

**Munition Debris Categories**

- ▲ Small Arms
- Frag
- ★ Projectiles
- ✕ Landmines
- ◆ Rockets
- ⊙ Grenades
- Flares
- Fuze Spoons
- ⊙ Miscellaneous

**Figure 1.7 - Interim Actions MD Findings**

N

**BCRRT**

0 305 610 1,220 1,830 2,440 Feet

MKM Engineers, Inc.  
4153 Bluebonnett Drive  
Stafford, TX 77477

MD Findings (through February 2009)

Drawn On: 03/05/2009 Drawn By: QX Reviewed By: KA

Table 3.10 Alternatives Analysis and Scoring - Newly Discovered 2.36 in. Rocket Target Area near the Former Sewage Lagoons

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	6
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$4,700	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	5
3) Institutional Controls with Fencing and Signage - No Public Access	4	No source reduction	10	No adverse impact to ecological systems	4	Moderate reliability - remaining potential for receptor contact with any remaining MEC	7	\$35,700	3	Receptor awareness and access restrictions but fundamental risk remains	9	No short term risk to MEC technicians and fence installers	3	Limited acceptability to regulatory agencies, Clark County, or public	3	Anticipate high level of public concern due to remaining risk	43	4
4) Surface MEC Clearance of entire area with subsurface clearance to frost depth (14") around identified targets, step-out procedures applied as appropriate, and institutional controls with fencing and signs	7	Near total source reduction - nearly all MEC found in frost zone	5	Brush clearance required over entire area, limited excavation	8	High reliability - little potential for frost heave to remaining MEC to surface barring intrusive activities	5	\$425,800	5	Long term risk is nearly eliminated	6	No short term risk to community; some MEC technicians with longer exposure than Alt. 4	8	Can be implemented with personnel and equipment already on site	6	Anticipate little public concern due to remaining risk but some concern due to ecological impacts	50	2
5) Subsurface MEC Clearance to frost depth (14") of entire area, step-out procedures applied as appropriate, and institutional controls with fencing and signs	10	Near total source reduction - nearly all MEC found in frost zone	3	Brush clearance required over entire area, extensive excavation	10	High reliability - no potential for frost heave to remaining MEC to surface barring intrusive activities	4	\$573,850	8	Long term risk is nearly eliminated	5	No short term risk to community; some MEC technicians with longer exposure than Alt. 5	7	Can be implemented with personnel and equipment already on site	8	Anticipate little public concern due to remaining risk, limited concern due to ecological impacts	55	1
6) Subsurface MEC clearance to 48 inches of entire area with stepouts at the perimeter as appropriate	10	Total source reduction - all MEC of this type found top 24" - little real improvement over Alt. 6	0	Brush clearance required over entire area, extensive excavation	10	High reliability - no potential for frost heave to remaining MEC to surface barring intrusive activities	3	\$680,900	10	Long term risk is eliminated	3	No short term risk to community; some MEC technicians with longer exposure than Alt. 6	6	Requires use of heavy equipment not currently on site	6	Anticipate little public concern due to remaining risk but significant concern due to ecological impacts	48	3

Preferred and recommended alternative

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.



Table 3.12 Alternatives Analysis and Scoring - Newly Discovered Rifle Grenade Target Area

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	6
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$2,900	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	5
3) Institutional Controls with Fencing and Signage - No Public Access	4	No source reduction	10	No adverse impact to ecological systems	4	Moderate reliability - remaining potential for receptor contact with any remaining MEC	7	\$21,500	3	Receptor awareness and access restrictions but fundamental risk remains	9	No short term risk to MEC technicians and fence installers	3	Limited acceptability to regulatory agencies, Clark County, or public	3	Anticipate high level of public concern due to remaining risk	43	4
4) Surface MEC Clearance of entire area with subsurface clearance to frost depth (14") around identified targets, step-out procedures applied as appropriate, and institutional controls with fencing and signs	7	Near total source reduction - nearly all MEC found in frost zone	5	Brush clearance required over entire area, limited excavation	8	High reliability - little potential for frost heave to remaining MEC to surface barring intrusive activities	5	\$255,500	5	Long term risk is nearly eliminated	6	No short term risk to community; some MEC technicians with longer exposure than Alt. 4	8	Can be implemented with personnel and equipment already on site	6	Anticipate little public concern due to remaining risk but some concern due to ecological impacts	50	2
5) Subsurface MEC Clearance to frost depth (14") of entire area, step-out procedures applied as appropriate, and institutional controls with fencing and signs	10	Near total source reduction - nearly all MEC found in frost zone	3	Brush clearance required over entire area, extensive excavation	10	High reliability - no potential for frost heave to remaining MEC to surface barring intrusive activities	4	\$344,300	8	Long term risk is nearly eliminated	5	No short term risk to community; some MEC technicians with longer exposure than Alt. 5	7	Can be implemented with personnel and equipment already on site	8	Anticipate little public concern due to remaining risk, limited concern due to ecological impacts	55	1
6) Subsurface MEC clearance to 48 inches of entire area with stepouts at the perimeter as appropriate	10	Total source reduction - all MEC of this type found top 24" - little real improvement over Alt. 6	0	Brush clearance required over entire area, extensive excavation	10	High reliability - no potential for frost heave to remaining MEC to surface barring intrusive activities	3	\$414,550	10	Long term risk is eliminated	3	No short term risk to community; some MEC technicians with longer exposure than Alt. 6	6	Requires use of heavy equipment not currently on site	6	Anticipate little public concern due to remaining risk but significant concern due to ecological impacts	48	3

Preferred and recommended alternative

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

**Table 3.2 Alternatives Analysis and Scoring - Newly Discovered Stokes Mortar Target Area in Central Valley Floor**

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	7
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$20,500	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	6
3) Additional Surface MEC Clearance with step-out procedures applied as appropriate	4	Significant source reduction - most MEC of this type near surface	6	Brush clearance required	5	Some reliability - potential for frost heave to remaining bring MEC to surface	6	\$558,625	5	Long term risk is reduced but not eliminated	7	No short term risk to community, some short term risk to MEC technicians	7	Can be implemented with personnel and equipment already on site	6	Anticipate limited public concern due to remaining risk	46	4
4) Subsurface MEC Clearance to 24" around targets with step-out procedures applied as appropriate <b>Standard Target Area Treatment</b>	7	Near total source reduction - nearly all MEC found in frost zone	6	Brush clearance required with limited excavation	6	High reliability - little potential for frost heave to remaining bring MEC to surface barring intrusive activities	6	\$637,375	7	Long term risk is nearly eliminated	6	No short term risk to community, some short term risk to MEC technicians	8	Can be implemented with personnel and equipment already on site	8	Anticipate little public concern due to remaining risk but some concern due to ecological impacts	54	2
5) Subsurface MEC Clearance to 14" throughout with step-out procedures applied as appropriate	10	Near total source reduction - nearly all MEC found top 14" - some improvement over Alt. 5 due to greater coverage area	0	Total brush clearance required	10	High reliability - little potential for frost heave to remaining bring MEC to surface barring intrusive activities	5	\$861,000	9	Long term risk is essentially eliminated	5	No short term risk to community, some short term risk to MEC technicians	8	Can be implemented with personnel and equipment already on site	10	Anticipate public acceptance due to complete coverage of subsurface MEC clearance	57	1
6) Subsurface MEC Clearance to 24" around targets with step-out procedures applied as appropriate <b>Improved Target Area Treatment</b>	8	Near total source reduction - nearly all MEC found top 14" - little improvement over Alt. 5	3	Brush clearance required with more extensive excavation than Alt. 4	7	High reliability - no potential for frost heave to remaining bring MEC to surface barring intrusive activities	6	\$721,875	7	Long term risk is nearly eliminated	5	No short term risk to community, some short term risk to MEC technicians	7	Can be implemented with personnel and equipment already on site	6	Anticipate little public concern due to remaining risk but increased concern due to ecological impacts	49	3
7) Subsurface MEC Clearance to 48" around targets with step-out procedures applied as appropriate <b>Maximum Target Area Treatment</b>	8	Total source reduction - all MEC of this type found top 14" - little improvement over Alt. 6	3	Brush clearance required with more extensive excavation than Alt. 4	8	High reliability - no potential for frost heave to remaining bring MEC to surface barring intrusive activities	4	\$879,375	7	Long term risk is eliminated	4	No short term risk to community, some short term risk to MEC technicians	5	Requires use of heavy equipment not currently on site	5	Anticipate little public concern due to remaining risk but significant concern due to ecological impacts	44	5

**Preferred and recommended alternative**

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

**Table 3.4 Alternatives Analysis and Scoring - Newly Discovered MED Disposal Area (Burial Pit) in Central Valley Floor**

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	7
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$500	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	6
3) Institutional Controls and Groundwater Monitoring Program	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - potential receptor contact with any remaining MEC	6	\$150,500	4	Receptor awareness remains - GW is addressed	9	No short term risk to community or MEC technicians - very limited risk to drillers & samplers	4	Moderate acceptability to regulatory agencies, Clark County and public	4	Anticipate significant public concern due to remaining risk	39	5
4) Institutional and Engineering Controls - installation of a cap in the form of an asphalt paved parking area with low density polyvinyl liner as barrier to upward migration of MEC, MD, COPCs	8	No source reduction, but high level of public protection if engineering controls are adequately maintained	5	Ecological impact offset by enhancement of park facilities	7	High reliability for MEC protection assuming adequate maintenance of engineering controls	7	\$50,500	7	Receptor isolation from MEC & MD if engineering controls are adequately maintained	9	No short term risk to community or MEC technicians - very limited risk to pavers	6	Fair acceptability to regulatory agencies & Clark County - can be implemented with readily available personnel & equipment	6	Moderate level of public concern	55	4
5) Institutional and Engineering Controls with Groundwater Monitoring Program - installation of a cap in the form of an asphalt paved parking area with low density polyvinyl liner as barrier to upward migration of MEC, MD, and COPCs	8	No source reduction, but high level of public protection if engineering controls are adequately maintained	5	Ecological impact offset by enhancement of park facilities	7	High reliability for MEC protection assuming adequate maintenance of engineering controls	6	\$200,500	8	Receptor isolation from MEC & MD if engineering controls are adequately maintained - GW is addressed	9	No short term risk to community or MEC technicians - very limited risk to pavers, drillers, & samplers	8	Fair acceptability to regulatory agencies, Clark County and public - can be implemented with readily available personnel & equipment	7	Moderate level of public concern - somewhat less than Alt.4	58	3
6) Source Removal - excavation to remove MEC and MD source materials	10	Very high level of source removal	5	Localized ecological damage to surface vegetation and root zones	10	High reliability for MEC protection	7	\$42,000	8	MEC & MD removal	5	Limited short term risk to community; some risk to excavation workers	7	Acceptable to regulatory agencies & County	9	Low level of public concern	61	2
7) Source Removal and Groundwater Monitoring Program - excavation to remove MEC and MD source materials	10	Very high level of source removal	7	Localized ecological damage to surface vegetation and root zones	10	High reliability for MEC protection	5	\$342,000	10	MEC & MD removal + GW monitoring	5	Limited short term risk to community; some risk to excavation workers	8	Acceptable to regulatory agencies & County	10	Eliminates nearly all public concern issues	65	1

Preferred and recommended alternative

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

Notes: (1) All final cleanup action alternatives assume surface MEC clearance will have been completed previously as part of characterization of AAOC-5 and the rest of the Central Valley Floor.  
 (2) All cleanup action alternatives that include any intrusive activities include appropriate MEC avoidance construction support.

**Table 3.6 Alternatives Analysis and Scoring - Newly Discovered Open Burn/Open Demolition Area in the Central Valley Floor**

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	7
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$8,165	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	6
3) Institutional Controls and Groundwater Monitoring Program	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	7	\$158,165	4	Receptor awareness but fundamental risk remains - GW is addressed	9	No short term risk to community or MEC technicians - very limited risk to drillers & samplers	4	Moderate acceptability to regulatory agencies, Clark County and public	4	Anticipate significant public concern due to remaining risk	40	5
4) Institutional and Engineering Controls - installation of a cap in the form of an asphalt paved parking area with low density polyvinyl liner as barrier to upward migration of MEC, MD, and COPCs	8	No source reduction, but high level of public protection if engineering controls are adequately maintained	5	Ecological impact offset by enhancement of park facilities	7	High reliability for MEC protection assuming adequate maintenance of engineering controls	7	\$824,665	7	Receptor isolation from MEC & MD if engineering controls are adequately maintained	9	No short term risk to community or MEC technicians - very limited risk to pavers	6	Fair acceptability to regulatory agencies & Clark County - can be implemented with readily available personnel & equipment	6	Moderate level of public concern	55	4
5) Institutional and Engineering Controls with Groundwater Monitoring Program - installation of a cap in the form of an asphalt paved parking area with low density polyvinyl liner as barrier to upward migration of MEC, MD, and COPCs	8	No source reduction, but high level of public protection if engineering controls are adequately maintained	5	Ecological impact offset by enhancement of park facilities	7	High reliability for MEC protection assuming adequate maintenance of engineering controls	6	\$974,665	8	Receptor isolation from MEC & MD if engineering controls are adequately maintained - GW is addressed	9	No short term risk to community or MEC technicians - very limited risk to pavers, drillers, & samplers	8	Fair acceptability to regulatory agencies, Clark County and public - can be implemented with readily available personnel & equipment	7	Moderate level of public concern - somewhat less than Alt 4	58	3
6) Source Removal - excavation to remove MEC and MD source materials	10	Very high level of source removal	5	Localized ecological damage to surface vegetation and root zones	10	High reliability for MEC protection	4	\$600,128	9	MEC & MD removal	5	Limited short term risk to community; some risk to excavation workers	7	Acceptable to regulatory agencies & County	9	Low level of public concern	59	2
7) Source Removal and Groundwater Monitoring Program - excavation to remove MEC and MD source materials	10	Very high level of source removal	6	Localized ecological damage to surface vegetation and root zones	10	High reliability for MEC protection	3	\$900,128	10	MEC & MD removal + GW monitoring	5	Limited short term risk to community; some risk to excavation workers	10	Acceptable to regulatory agencies & County	10	Eliminates nearly all public concern issues	64	1

Preferred and recommended alternative

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

Notes: (1) All final cleanup action alternatives assume surface MEC clearance will have been completed previously as part of characterization of AAOC-5 and the rest of the CVF.  
 (2) All cleanup action alternatives that include any intrusive activities include appropriate MEC avoidance construction support.

**Table 3.8 Alternatives Analysis and Scoring - Newly Discovered 37mm Artillery/Stokes Mortar Target Area in the Central Valley Floor**

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies, Clark County, or public	0	Anticipate high level of public concern due to remaining risk	32	7
2) Institutional Controls Only	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$44,000	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies, Clark County, or public	2	Anticipate high level of public concern due to remaining risk	37	6
3) Additional Surface MEC Clearance with step-out procedures applied as appropriate	4	Significant source reduction - most MEC of this type near surface	6	Brush clearance required	5	Some reliability - little potential for frost heave to remaining bring MEC to surface	6	\$1,199,000	5	Long term risk is reduced but not eliminated	7	No short term risk to community, some short term risk to MEC technicians	7	Can be implemented with personnel and equipment already on site	6	Anticipate limited public concern due to remaining risk	46	4
4) Subsurface MEC Clearance to 24" around targets with step-out procedures applied as appropriate <b>Standard Target Area Treatment</b>	7	Near total source reduction - nearly all MEC found in frost zone	6	Brush clearance required with limited excavation	6	High reliability - little potential for frost heave to remaining bring MEC to surface barring intrusive activities	6	\$1,356,500	7	Long term risk is nearly eliminated	6	No short term risk to community, some short term risk to MEC technicians	8	Can be implemented with personnel and equipment already on site	8	Anticipate little public concern due to remaining risk but some concern due to ecological impacts	54	2
5) Subsurface MEC Clearance to 14" throughout with step-out procedures applied as appropriate	10	Near total source reduction - nearly all MEC found top 14" - some improvement over Alt. 5 due to greater coverage area	0	Total brush clearance required	10	High reliability - little potential for frost heave to remaining bring MEC to surface barring intrusive activities	5	\$1,848,000	9	Long term risk is essentially eliminated	5	No short term risk to community, some short term risk to MEC technicians	8	Can be implemented with personnel and equipment already on site	10	Anticipate public acceptance due to complete coverage of subsurface MEC clearance	57	1
6) Subsurface MEC Clearance to 24" around targets with step-out procedures applied as appropriate <b>Improved Target Area Treatment</b>	8	Near total source reduction - nearly all MEC found top 14" - little improvement over Alt. 5	3	Brush clearance required with more extensive excavation than Alt. 4	7	High reliability - no potential for frost heave to remaining bring MEC to surface barring intrusive activities	6	\$1,522,500	7	Long term risk is nearly eliminated	5	No short term risk to community, some short term risk to MEC technicians	7	Can be implemented with personnel and equipment already on site	6	Anticipate little public concern due to remaining risk but increased concern due to ecological impacts	49	3
7) Subsurface MEC Clearance to 48" around targets with step-out procedures applied as appropriate <b>Maximum Target Area Treatment</b>	8	Total source reduction - all MEC of this type found top 14" - little improvement over Alt. 6	3	Brush clearance required with more extensive excavation than Alt. 4	8	High reliability - no potential for frost heave to remaining bring MEC to surface barring intrusive activities	4	\$1,837,500	7	Long term risk is eliminated	4	No short term risk to community, some short term risk to MEC technicians	5	Requires use of heavy equipment not currently on site	5	Anticipate little public concern due to remaining risk but significant concern due to ecological impacts	44	5

**Preferred and recommended alternative**

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

Table 5.2 Alternatives Analysis and Scoring - Northern CITA Area Expansion

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
3) Institutional and Engineering Controls - fence w/o public road or trail access	0	No source reduction	9	Limited adverse impact to ecological systems due to additional fence construction	5	Limited reliability - remaining potential for receptor contact with any remaining MEC - some benefit from additional fencing & signage	7	\$200,000	5	Receptor awareness but fundamental risk remains - somewhat better than Alt. 2	8	No short term risk to community; some risk to MEC technicians & fence builders	4	Limited acceptability (somewhat greater than Alt. 2) to regulatory agencies and Clark County	5	Anticipate high level of public concern due to remaining risk	43	1
4) Institutional and Engineering Controls - public access to Lower DNR Road and MEC-cleared buffer zones on both sides of Lower DNR Road with fences and no public access north or south of that corridor	3	Significant source reduction in areas most likely to be accessed by public	5	Some impact to ecology due to brush clearance and fence construction	6	Moderate reliability due to MEC removal in buffers along roads plus fences and signs	4	\$1,042,200	6	Additional MEC clearance coverage, fencing & signs, but some risk remains - significantly better than Alt. 3	5	No short term risk to community; some risk to MEC technicians & fence builders	5	Moderate acceptability to regulatory agencies and Clark County	6	Anticipate significant level of public concern due to remaining risk	40	2
5) Anomaly avoidance, brush clearance, and surface MEC clearance north of Lower DNR Road; fence with no public access south of the cleared buffer zone south of Lower DNR Road	5	Major source reduction in areas most likely to be accessed by public	2	Major ecological impact due to extensive brush removal in Wildlife Management Area	8	Medium reliability due to MEC removal north of Lower DNR Road and in buffer and road plus fences and signs	2	\$2,175,560	7	Moderate risk remains outside areas of MEC surface clearance	3	Significant risk to MEC personnel due to terrain and access issues	7	Regulatory agencies and Clark County balancing of risk and ecological issues	6	Trade-off in risk reduction versus ecological impact	40	3
6) Anomaly avoidance, brush clearance, and surface MEC clearance north and south of Lower DNR Road with public access throughout area	8	Nearly complete source removal	1	Nearly total ecological destruction of 200 A of Wildlife Management Area	9	High reliability due to major source removal	1	\$5,524,560	9	Limited risk remains outside areas of MEC surface clearance	1	High risk to MEC personnel due to terrain and access issues	5	Regulatory agencies and Clark County balancing of risk and ecological issues	5	Trade-off in risk reduction versus ecological impact	39	
7) Anomaly avoidance, brush clearance, and surface MEC clearance to frost depth (14") north and south of Lower DNR Road with public access throughout area	10	Complete source removal	0	Total ecological destruction of 200 A of Wildlife Management Area	10	Very high reliability due to total source removal	0	\$8,978,400	10	No remaining risk	0	High risk to MEC personnel due to terrain and access issues	3	Regulatory agencies and Clark County balancing of risk and ecological issues	4	Trade-off in risk reduction versus ecological impact	37	5

Preferred and recommended alternative

Alternative 1 and 2 did not meet MTCA Threshold Criteria and were not carried into detailed evaluation and scoring process.

Notes:

- 1) Alternatives 3 and 4 include anomaly avoidance, brush removal and surface MEC clearance of transects north and south of Lower DNR Road to define the northern limit of AAOC-1, subject to worker safety issues related to adverse terrain.
- 2) Alternative 5 includes anomaly avoidance, brush removal, and surface removal MEC clearance of transect south of Lower DNR Road to further define issues in this area subject to worker safety issues related to adverse terrain.
- 3) Under Alternatives 3 through 7, the **Standard Target Area Treatment** protocol will be applied to any discrete targets identified in this area.



Table 6.2 Alternatives Analysis and Scoring - MEC Surface Clearance of Demolition Area 1/Landfill 4

Alternative Description	MEC Protectiveness		Environmental Protectiveness		Permanence		Cost		Long-Term Effectiveness		Short-Term Effectiveness		Implementability		Public Concerns		Total Numerical Score	Ranking
	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments		
1) No Further Action	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	10	\$0	0	No long term risk reduction	10	No short term risk to community or MEC technicians	0	Not acceptable to regulatory agencies or Clark County	0	Anticipate high level of public concern due to remaining risk	32	7
2) Institutional Controls Only - No Public Access	0	No source reduction	10	No adverse impact to ecological systems	2	Limited reliability - remaining potential for receptor contact with any remaining MEC	9	\$52,000	2	Receptor awareness but fundamental risk remains	10	No short term risk to community or MEC technicians	1	Limited acceptability to regulatory agencies and Clark County	0	Anticipate high level of public concern due to remaining risk	34	6
3) Institutional and Engineering Controls - new fences w/o public road or trail access	0	No source reduction	9	Modest adverse impact to ecological systems due to fence construction	3	Moderate reliability - signs - some potential for receptor contact with remaining MEC	8	\$100,000	4	Receptor awareness and physical access restrictions but fundamental risk remains	10	No short term risk to community or MEC technicians	2	Limited acceptability to regulatory agencies and Clark County	3	Anticipate high level of public concern due to remaining risk	36	5
4) Additional Surface MEC Clearance with step-out procedures applied as appropriate	7	Significant source reduction - most MEC & MD are "kickout" from OB/OD ops. & therefore near surface	7	Brush clearance required	7	High reliability - nearly all MEC & MD near surface - very limited potential for frost heave to bring MEC to surface	5	\$2,730,000	7	Long term risk is significantly reduced	6	No short term risk to community, some MEC technicians (adverse terrain & heavy vegetation)	7	Can be implemented with personnel and equipment already on site	7	Anticipate very limited public concern due to remaining risk	53	1
5) Subsurface MEC Clearance to frost depth (14") with step-out procedures applied as appropriate	8	Very limited increase in source reduction over Alt. 4 - nearly all MEC found in frost zone	3	Brush clearance required with limited excavation	8	High reliability - little potential for frost heave to remaining MEC to surface barring intrusive activities	4	\$3,822,000	7	Long term risk is nearly eliminated	5	No short term risk to community - increased short term risk to MEC techs relative to Alt. 4 due to longer exposure and heavy equipment	7	Can be implemented with personnel and equipment already on site	8	Anticipate very limited public concern due to remaining risk	50	2
6) Subsurface MEC Clearance to 24 inches with step-out procedures applied as appropriate	8	No significant increase in source reduction over Alt. 5 - nearly all MEC found in frost zone	0	Total ecological destruction	8	High reliability, but little or no improvement over Alt. 5	2	\$4,641,000	9	Long term risk is essentially eliminated	3	No short term risk to community - increased short term risk to MEC techs relative to Alt. 5 due to longer exposure and more heavy equipment ops.	5	Requires use of additional excavating equipment not currently on site	10	Anticipate high degree of acceptance from general public	45	3
7) Subsurface MEC Clearance to 48 inches with step-out procedures applied as appropriate	8	No significant increase in source reduction over Alt. 5 - nearly all MEC found in frost zone	0	Total ecological destruction	8	High reliability, but little or no improvement over Alt. 5	0	\$5,187,000	9	Long term risk is eliminated	2	No short term risk to community - increased short term risk to MEC techs relative to Alt. 6 due to longer exposure and more heavy equipment ops.	5	Requires use of additional excavating equipment not currently on site	10	Anticipate high degree of acceptance from general public	42	4

Preferred and recommended alternative

Alternatives that do not meet MTCA Threshold Criteria and are carried into the detailed evaluation and scoring process for completeness only.

## **APPENDIX B**

### **INSTITUTIONAL CONTROL CONSIDERATIONS**



**DRAFT**

**APPENDIX B**  
**INSTITUTIONAL CONTROL ALTERNATIVES**

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## APPENDIX B INSTITUTIONAL CONTROL ALTERNATIVES

### B.1 INTRODUCTION

B.1.1 Institutional Controls (ICs) are measures undertaken to limit public exposure to hazardous materials. These preventive measures may be voluntary in nature or may be legally enforceable requirements. The ICs may consist of educational awareness programs, legal restrictions on land use, and physical access controls. The ICs recommended in this report are an important component of the overall risk management system for Camp Bonneville upon property transfer to Clark County. Clark County will have authority and responsibility for implementing and monitoring the ICs. The ICs proposed for application at Camp Bonneville were developed in response to Washington State Model Toxics Control Act requirements, listed in WAC 173-340-440. These ICs also address the concerns expressed in the public participation meetings and Camp Bonneville Reuse Planning process. These priority concerns were listed as follows:

- Public Safety
- Liability
- Property Values
- Land Use

B.1.2 The Camp Bonneville IC Plan addresses site-wide concerns as well as site-specific camp reuse plans. The proposed controls correspond to the site-wide and site-specific elements of the Camp Bonneville Reuse Plan (1998). The Reuse Plan includes an overall recreation focus with site-specific eco-preservation programs, active and passive recreation, education uses, stakeholder use of the park, maintenance and operations, and timber harvestings functions to generate income for economic development and self sufficiency of the park. This recommended program of institutional controls is designed to complement both specific engineering controls and ordnance removal actions. ICs are a key element of the overall risk management program to protect future visitors, contractors and employees at Camp Bonneville.

B.1.3 The importance of effective implementation of ICs is magnified by the population growth in Clark County. In the 2000 Census the population was 345,238, and it was ranked as the fastest growing county in the State of Washington. The County population in 2002, according to the Washington State Office of Financial Management, was 363,400. Clark County is expected to be the primary source of visitors to the future Camp Bonneville regional park. The adjacent Portland, Oregon area has a "metro" development plan that is guided by Urban Growth Boundaries. These Urban Growth



reflect the site as recreation and park land uses. Since the Camp will remain in government ownership internal, land uses will remain institutional. Of more concern is the surrounding land use. Any increase of land uses surrounding the future park to higher development intensities will result in increased access to the area. It is recommended that the restrictive covenants on the site be amended to the County comprehensive plan and to the regional plan in order to discourage an increase in land use density near the park. The surrounding area is currently used for agriculture and large lot residentially zoned property. This is consistent with the mostly forested nature of Camp Bonneville.

### **B.3.2 Financial Assurances**

The site-wide ICs includes a financial mechanism for funding of appropriate UXO-trained staff (UXO Tech 1) for an established period of time to ensure the transition to long-term effectiveness of engineered and ICs. The UXO-trained staff will provide maintenance for the park, continuity on maintenance of the ICs, and monitor effectiveness of the controls to the intent of the risk management program. Financial assurances will address changing conditions in the park, particularly in regards to increased visitation for a recommended 5-year period.

### **B.3.3 Education Outreach**

Camp Bonneville has an 85 year history that encompasses American Military Heritage from WW I, to the Cold War and through Desert Storm. The education outreach program recommends audio, visual, written, and classroom outreach programs, both regionally and on site. The site-wide history lesson for visitors at Camp Bonneville should include tours; preservation lessons, environmental education, courses on 1950s Cold War threats illustrated by the Soviet Village, training bunkers, and training strategies. To facilitate an understanding of the history and the risk program, the ICs recommend site-wide retention of "signage" naming or designating roads, areas, districts and training areas for their original purposes. The signage should be amended with current recreational purposes and locations. The education process will include an expanded website; new video prepared for public television, cable television and for visitors; a school outreach program; the interpretive and retreat educational centers; a historical museum and exhibit on the Camp Bonneville site; and written materials to correspond to the identification of ordnance, safety and heritage protocols.

### **B.3.4 Regional and Clark County Comprehensive Plan**

Covenants adopted by Clark County that restrict development on the former Camp Bonneville to a site plan for preservation, economic, recreational and educational uses will be amended to the Regional and Clark County Comprehensive Plans. This institutional control will assure that developers and property owners representing surrounding land uses, re-zonings and any new development in the fast growing area will be made aware officially of the history, safety plans, and associated issues related to development near Camp Bonneville.

## B.4 SITE-SPECIFIC ICs

### B.4.1 Access Control

B.4.1 The Camp Bonneville Reuse Plan includes key parcels of land that are designated for complete access restrictions. The recommendation for these restricted sites is to landscape gateways, signage, trails and roadway entrances with fencing and native prickly shrubbery that prevents easy access. All new construction site plans at Camp Bonneville will call for defensible space landscape measures on restricted areas. OE Source site types will be individually evaluated so that appropriate site-specific ICs can be customized for local applicability.

B.4.2 The proposed ICs at Camp Bonneville will utilize comprehensive access control and behavior modification through public education. However, it is also understood that public education may incite a reverse reaction from a small segment of the population that may view dangerous actions as an adventure. This possibility is accepted and it is understood that there will always be some portion of the populace who refuse to heed warnings or follow directions. Access controls are recommended for the Central Impact Area since this was the target site for most all of the ordnance activities. The strategy is to remove the human element from the chain of events that could lead to an accident. The controls recommended below summarize the proposed techniques for Camp Bonneville.

### B.4.2 Signage and Fencing

B.4.2.1 Present a comprehensive sign posting system that entry is prohibited, that activities within the property are restricted in some manner, or that although the area is accessible, there is a history of a certain type of ordnance. Present this signage with dual information: historic and current designations, i.e., Artillery Range Road amended with "Jogging Trail 8 and College Center," or Mortar Range Road amended with "Lacamas Creek Fishing." The use of this signage system is based upon the safety, and institutional education. The link between *not trespassing/care in usage of Camp Bonneville* and *explosive safety* should be reinforced.

B.4.2.2 Fencing is a desired element of the ICs; and a comprehensive landscape plan with a fencing system is recommended. A fencing system is recommended for Camp Bonneville, both as a landscape feature for beneficial economic purposes and also as an enforcement tool to deny access to the public to areas designated as off limit. Fencing and gates will reinforce the link between appropriate access points, not trespassing and explosive safety. Because of the urbanization of Clark County there is greater importance to enforce trespass strictures on the large site and more effectiveness if fencing is present.

B.4.2.3 Signs and fencing will be extremely effective ICs on this site. They are valid for use in reducing the risk of exposure to potential accidents involving ordnance through personal restraint and identification of risks. The posting of signs along the perimeter and within the interior of the property provides "on the spot" warnings of the potential hazards of physical contact with residual ordnance items.

B.4.2.4 Fencing and signage are presently used at the Entrance to Camp Bonneville and on the property lines adjacent to single family developments that are 5 miles from the Vancouver City Limits at the southwest corner of the site. The wildlife management area does not have access and entry restrictions and may be accessed randomly by hunters. Signs and fencing should be concentrated near private property owners mostly in the west and southwest areas.

B.4.2.5 The installation of fencing and signage to limit access is recommended. The implementation of the Reuse Plan will include development of a landscape plan. Prior to opening the regional park for public access, a fencing and signage system should be developed and implemented. A comprehensive fencing and signage plan is recommended and can be developed at nominal cost with advice of Clark County and City of Vancouver Department of Parks and Recreation. The fencing and signage should be consistent with City and/or County Park and Recreation design guidelines.

## **B.5 EDUCATION & AWARENESS PROGRAMS**

B.5.1 The Clark County Government will need to modify the behavior of the park visitors and general population through public education by utilizing County stakeholder agencies that have interest in using the site. In addition, the County should amend its comprehensive plan, land use and zoning maps to reflect the restrictive covenants on Camp Bonneville property.

B.5.2 Raising public education for the potential hazards that exist within the former Camp Bonneville should be facilitated with ICs as listed below.

- Notice – Notifications during timbering, utility and infrastructure construction, and permitting;
- General Printed Media - Including brochures and news articles;
- Visual and Audio Media - Including videotapes and announcements;
- Education Classes - Including ordnance identification, safety presentations to various audiences, and preparation of packages for administrators and public officials;
- Exhibits/displays;
- Internet Website; and
- Ad Hoc Committee.

B.5.3 Potential hazards must be considered in the design and use of any site improvements or activities. Notices should be placed on Camp Bonneville property to address visitation, maintenance, operations and construction. Clark County notifications should be sent through the permitting of utility connections, infrastructure construction, surveying, timbering, and related physical land disturbance tasks. Standard application forms and brochures that explain the procedures involved in the construction notification

and building permit approval processes should be updated to reflect training and circumstances dealing with ordnance at Camp Bonneville.

B.5.4 The cost for the initial brochures on Camp Bonneville ordnance identification, Maps and Reuse Plan information documents would cost approximately \$5,000. A master copy can be created electronically for reproduction purposes and revisions as needed, and included as a part of the existing City of Vancouver and Clark County building permit information packets.

## **B.6 LAND USE CONTROLS**

B.6.1 The inclusion of restrictive covenants and site plan requirements for Camp Bonneville in the update of the County and Regional Comprehensive Plan will discourage nearby development intensity on a voluntary basis. Restrictive covenants on the land uses of Camp Bonneville will be detailed in an official site plan and adopted by Clark County for enforcement and effectiveness of monitoring purpose. This approach will be effective because it focuses on traditional market and real estate pricing.

B.6.2 The standard permit application process of the City of Vancouver and Clark County should be amended to include information about the possibility of ordnance hazards, and specific Camp Bonneville site plan information and restrictive covenants. The cost of updating geographic information systems to include the planning and to create the capability of identifying these parcels could be provided by Clark County. The cost to document all properties and to input this information into the County system, and train County employees to call up and provide the information is estimated to be between approximately \$2,500 and \$3,000.

## **B.7 PRINTED MEDIA AWARENESS PROGRAM**

B.7.1 Ordnance education, acknowledgement of the risk involved, and reinforcement of the message are key in minimizing the hazards of ordnance. The avenue recommended to facilitate this education and understanding is through printed media in the form of brochures, fact sheets, newspaper articles, and other information packages. The opportunity to disseminate information through the printed media is readily available and can be easily facilitated because of the numerous media outlets in Metropolitan Portland. Through the use of printed media, property owners and residents from within the County and the region can be informed about the existence of ordnance hazards within the former Camp Bonneville.

B.7.2 Updated brochures and fact sheets describing the important history of the Camp, its new future as a large regional park, and explanation of ordnance hazards can be produced. Text and graphics can be used to describe how to identify ordnance, provide warnings to avoid physical contact in any way, provide instructions for dealing with ordnance if encountered, and how to report ordnance sightings. These printed materials could be produced by Clark County and should also include local sponsorship and ownership. They can be distributed as follows:



- Enclosed as flyer in local newspapers announcing the opening of the park
- Provided through schools to all students in the region
- Provided to stakeholders and community groups
- Provided as part of the City and County Park and Recreation Program

B.7.3 Newspaper articles and interviews provide another means of informing the public about the changeover from army use to County parkland. The articles can discuss the site as an environmental sanctuary as well as the potential presence of ordnance. News articles can continue to be supplied as press releases from Clark County. Interviews with Clark County representatives, local residents, and other institutions can be included. Continued regular coverage should result in more tourism, visitor use and better information and understanding of the actual existence of and hazards of ordnance. Interviews with people who actually were involved in training at the Camp would add interest to these articles.

B.7.4 County Commissioners and City of Vancouver elected officials should be provided with more detailed current information on the risk management plan, the RI/FS Report the ICs recommended and the extent of ordnance hazards. An information package, including maps defining primary areas of concern, would be valuable for the public officials. It can also include a brief history of the site, areas of greatest concern, types and potential danger of the ordnance discovered, and other relevant organizations' contact information.

B.7.5 Regular updates to local elected officials are effective means of public outreach. Local elected officials are in regular contact with constituents and the media and are the logical broker of information regarding the new park and the Reuse Plan. The Army could provide a fact sheet about BRAC that can be customized for Camp Bonneville. Press releases should be prepared by Clark County and presented to the local newspapers. When a new fact sheet is prepared to describe the findings and recommendations of the BRAC and the proposed plans for creation of the Regional Park as well as removal tasks and ICs.

B.7.6 The estimated cost to produce an original professional quality, multi-color one page fact sheet on an 8 ½ x 11 format suitable as a mailer or handout is approximately \$5,000.00. The fact sheet would be prepared to include primarily graphics with minimal text description to provide information about the presence of ordnance, plans for removal and ICs; plus information on the identification, handling, and reporting of ordnance. The cost to print and distribute the fact sheet will depend on the number of copies to be distributed. Assuming that 7,500 fact sheets are to be printed and mailed (at a cost of \$2.00 each), and 5,000 fact sheets are to be printed and distributed by local institutions (\$1.50 each). The total cost for design and preparation of the brochure (printing 12,500 copies and mailing 7,500 copies) will be \$27,500.00. Revision of the fact sheet is anticipated to be done only once. Fact sheets or brochures should be utilized together with abstracts of additional information on ordnance cleanup, mapping, and proposed removal

and ICs. The production cost for these information packages is already included in the production cost of the fact sheets above.

## **B.8 VISUAL AND AUDIO MEDIA AWARENESS PROGRAM**

B.8.1 Powerpoint presentations, audio and visual media (such as videos, segments on local television stations, and radio news and talk shows) should be prepared on an on going basis to inform and educate the public. Professional quality videos that contain similar information as described in the printed materials can be produced at a cost estimate of \$1,000 per minute. The videos can be produced privately by the City, by the County, or through cable television franchise agreements and could include interviews with local citizens, sponsorship, and ownership. Videotapes can be produced for use as part of the classroom education as discussed in a later section. Copies should also be provided to local libraries.

B.8.2 Public television station should provide excellent local access. Public Service Announcements should be requested on how to identify and deal with ordnance. Local contact information on ordnance handling and emergencies can be provided. It is suggested that the television programs include interviews with USACE personnel, local residents, and others who have knowledge of the history of the former Camp.

B.8.3 Local radio stations should be invited to participate in events, such as the grand opening of the regional park, and to provide public service announcements for school programs and programs of stakeholder groups that fit the demographics of the individual stations. Talk shows or news reports are both possible formats for the radio programs.

B.8.4 The provision of information using visual and radio media is an effective method of modifying behavior and educating the public. This is currently a technique used by the Army. Periodic updating of the videotapes is recommended to ensure the accuracy and timeliness of the information presented. Cable and radio stations would readily agree to assist in distribution of the information and provide free air time for public service announcements.

B.8.5 The estimated cost to produce a 5- to 7-minute videotape for distribution to the community is approximately \$5,000 to \$8,000. Assuming 100 copies of videotapes at \$5 each (including the cost of the videotape, dubbing, and postage) the cost would be approximately \$500. Add to the cost a 30 second public service announcements at \$1000 and the estimated total cost to implement a media program would be \$6,500 to \$9,500.

## **B.9 CLASSROOM EDUCATION PROGRAMS**

B.9.1 The Camp Bonneville Reuse Plan includes the provision for a college environmental education center. This center should be the location for classroom education programs. In addition, the video and brochures should be the core of a public schools outreach program targeted to Clark County Public Schools. The public needs to understand the nature of ordnance hazards and be able to properly identify and avoid

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ordnance if encountered. A properly educated public is more likely to make correct decisions related to the safe and proper precautions of found ordnance. Classroom education can be offered in two major categories:

- Ordnance Identification; and
- Ordnance Safety.

B.9.2 Because access to different parts of the site cannot be fully controlled, it is necessary to have public training in ordnance identification. The basic message should be to not touch anything that looks like ordnance, shrapnel, or any other unidentified material. Ordnance identification classes may be conducted through assistance from the County Public Schools Systems, all private schools, and universities. The City of Vancouver – Clark County Parks and Recreation Department should be the responsible agency.

B.9.3 The affected public should be educated about the potential dangers associated with ordnance and should understand the safety procedures to follow if they encounter any suspected ordnance item. Safety presentations should be made as a part of the ordnance identification classes. Providing education through the classroom is critical to modify children's behavior. Ordnance identification classes should be conducted on a regular basis and ordnance safety should be incorporated as a regular part of the classes held at Camp Bonneville. All visitors to the regional park should be given a brochure illustrating ordnance hazards.

B.9.4 Providing classroom education should be easily implementable. With team work between the City of Vancouver – Clark County Parks and Recreation and with the US Army providing the funding and the educational information package, local institutions would agree to participate and support the program. The USACE can provide experts to conduct ordnance identification and safety lectures. The ordnance expert presentations to local schools would be co-sponsored by the City, County or the school systems. The cost for travel and presentation materials (other than the videos) for an employee to make presentations and provide local training to local schools for one week is \$500.00.

### **B.10 EXHIBITS/DISPLAYS**

Placing historic Camp Bonneville exhibits/displays in museums or other areas where the public will be exposed to educational information is another method of generating and preserving general awareness and educating the public on the possible risk associated with the ordnance. An exhibit should be established at Camp Bonneville as part of the college center. The cost of producing, maintaining, and updating an exhibit will vary depending upon the scope. A replica of Camp Bonneville is recommended, complete with archival records and photos of the history of the site over the past 85 years. The Army could provide decommissioned examples of the weapons and ordnance used at Camp Bonneville.

## B.11 INTERNET WEBSITE PROGRAM

B.11.1 The expansion of the City of Vancouver – Clarke County web pages on the Internet should be used in educating the public about Camp Bonneville and the presence of ordnance on the site. The web page could be designed to include the history of the camp, a background on ordnance finds and cleanup, and ordnance identification and procedures for dealing with it. The web pages would be very effective in terms of presenting substantial and updated information about ordnance hazards on the site. Creation and maintenance of the website can be sponsored by Clark County. Information to be included in the website will come from the USACE studies and other sources.

B.11.2 Existing website masters or County staff may be able to design, create and maintain a Camp Bonneville website. However, the cost to design a new website varies from \$50.00 to \$150 per hour. Assuming that the design would require 100 hours at \$100.00 per hour (including review, revisions, and placing the site on the web), the total cost could be \$10,000.00. The website enhancements can be prepared internally or externally. Any site will provide links to other important government agencies relevant to ordnance handling and identification.

## B.12 AD HOC COMMITTEE AWARENESS PROGRAM

B.12.1 A new Clark County/City of Vancouver Parks and Recreation Committee should be enabled with a revised scope of service for community awareness. The original Committee was comprised of community leaders and a representative from the USACE and served as a mechanism for implementing ideas for the Reuse Plan. An ad hoc committee should serve as the primary proponent for public education of the ordnance issues. It will work to ensure the successful implementation of each of the recommended institutional control education programs. The committee will be responsible for analyzing the effectiveness of the different programs on an annual basis and recommending changes as necessary to bring the message to the largest sector of the public.

B.12.2 An ad hoc committee would be very effective in providing a proponent for public education. This group would provide a direct and flexible administration over information dissemination programs. With the committee's annual evaluation, more effective alternatives could be enhanced and less effective ones could be discontinued. This type of committee is most effective for ensuring the implementation of institutional control programs.

B.12.3 The City of Vancouver – Clarke County Parks and Recreation will oversee the formation of the ad hoc committee. Community leaders, veterans, and agency representatives will be contacted and invited to join. Joining and serving within the ad hoc committee will be by appointment and voluntary except for the Tech 1 recommended for staff to Camp Bonneville. This person will act as staff to the ad hoc committee. The members will not be paid for their time. To implement ad hoc committees as a mechanism for information dissemination will cost approximately \$2,000 for the first year and \$2,000 for each subsequent year. The costs would include retaining services of a

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stenographer to record meeting minutes, overhead administrative costs, and other miscellaneous expenses. To create an ad hoc committee, the City of Vancouver – Clark County Parks and Recreation, Clark County Commission and USACE must jointly meet and select community leaders to join the committee.

### **B.13 CONCLUSIONS**

The goal of the Institutional Controls Program is to assure the maximum safety to citizens. It is technically and financially impossible to provide 100% clean up of unexploded ordnance at Camp Bonneville due to the 85 year history of ordnance use. However, ICs will demonstrably reduce risks as a protective remedy. The City of Vancouver Clark County Parks and Recreation Department will need to establish an ICs monitoring or surveying system for user suggestions, for a quick understanding of changing conditions, to identify problems and to identify shifts in the age of visitors (their capacity to relate or understand the written and audio visual information). An annual report card on ICs should be issued to the County Commission for policy and procedure revisions in all aspects of the program (education, legal, physical restrictions). Ongoing monitoring, quantification of input, and updated policy and park planning will enable Clark County to protect its citizens while enjoying access to one of the largest new urban parks in America.

# Camp Bonneville Cultural and Historical Resources Protection Plan

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## I. INTRODUCTION

The United States War Department and its successor agency, the Department of Defense, has owned and operated the Camp Bonneville Military Reservation (Camp Bonneville) since 1909. Camp Bonneville was placed on the Base Realignment and Closure (BRAC) list and closed in 1995.

Camp Bonneville consists of three parcels, the “Early Transfer Parcel,” which was 3,020 acres that was owned by the Army, and the “DNR Parcels.” The DNR Parcels are two separate parcels, totaling approximately 820 acres, which are owned by the Washington Department of Natural Resources (WDNR) and were leased to the Army by WDNR. These two parcels are adjacent to the Early Transfer Parcel and respectively northeast and south of the Early Transfer Parcel.

In 1998, the United States Army (Army), the Washington State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation signed a Programmatic Agreement (PA; Appendix A) for the “Closure and Disposal of Camp Bonneville, Washington.” This PA satisfies the Army’s responsibility to take into account the effects of the undertaking on historic properties in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. The PA includes two attachments (D and E), stipulating that the Army identify and evaluate significant archaeological sites, objects, buildings, structures, landscapes and other cultural resources on lands at Camp Bonneville, Washington.

On October 4, 2006, the Army transferred the Early Transfer Parcel to Clark County, which then conveyed ownership to a non-profit entity, the Bonneville Conservation, Restoration, and Renewal Team LLC (BCRRT), for the purpose of meeting its cleanup obligations on Camp Bonneville under the Prospective Purchaser Consent Decree (Decree). During its ownership of the land, BCRRT intends to take actions to ensure the conservation of the natural resources on the property. The DNR Parcels continue to be owned by WDNR and leased to the Clark County.

To ensure that private ownership does not adversely affect the cultural resources on the property, the Decree, Paragraph 112 includes a requirement for a Cultural and Historical Resources Protection Plan. This Protection Plan is designed to fulfill the requirements of the Decree. The Decree requires that the BCRRT include the Protection Plan as part of any remedial investigation work plan, emergency action work plan, interim action work plan, cleanup action plan, or long-term operation and maintenance plan. The Protection Plan includes plans for identifying cultural and historical resources and for protecting identified cultural and historical resources. The Protection Plan will also comply with Federal and State regulations that address consideration and treatment of cultural resources.

Additionally, the BCRRT will include a Cultural and Historical Resources Protection Report as part of any emergency action report, interim action report, cleanup action report, or Unexploded Ordnance findings report. This report will include a description of each cultural resource found during the implementation of the plan. This description will include identification of the cultural resource and a description of the disposition of the cultural resource.

This Protection Plan also fulfills the requirements stipulated in the Preservation Covenant for Conveyance of Property that Includes Archeological Sites, in the Environmental Covenants,

Conditions, and Restrictions section of the Draft Finding of Suitability for Early Transfer (FOSET).

In their capacity as interim land owners, the BCRRT will act as agents of Clark County to ensure that the stipulations of the Programmatic Agreement are met. This Protection Plan is unique in that its purpose is to address the treatment of cultural resources that are in private ownership. Since the landowners intend to hold the property for the purposes of conservation, no actions are planned that would directly impact the cultural resources. The intent of the plan, therefore, is to focus on processes to ensure that activities associated with conservation do not impact the cultural resources.

## **II. GOALS AND OBJECTIVES**

This Protection Plan has several goals and objectives as outlined below:

- Comply with the requirements of the Decree and the Draft FOSET.
- Protect and preserve the cultural resources within the Camp Bonneville project area.
- Implement cultural resource preservation as a regular component of Camp Bonneville planning.
- Identify procedures to follow in the event that conservation actions have the potential to adversely affect cultural resources.
- Ensure that the identification of previously unidentified cultural resources at Camp Bonneville is comprehensive and consistent with state and federal regulations.

## **III. REGULATIONS**

This Protection Plan is designed to ensure compliance with the following State and Federal regulations and guidelines.

- Indian Graves and Records (RCW 27.44)
- Archaeological Sites and Resources (RCW 27.53)
- Human Remains (RCW 68.50)
- Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)
- Department of Archaeology and Historic Preservation's *State Standards for Cultural Resource Reporting* (July 2006)
- Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37).
- National Historic Preservation Act (NHPA; 16 USC 470 et seq.) and Section 106 (36 CFR 800).
- Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.).

## **IV. PROJECT AREA**

This section describes the location of the project area and the local environment.

## **1. Location**

Camp Bonneville Military Reservation is approximately 10 miles northeast of Vancouver, Clark County, Washington (Figure 1). It is in the westernmost foothills of the Northern Cascade Mountain Range section of the Cascade Sierra Mountains and lies along both banks of Lacamas Creek, a tributary of the Columbia River. It consists of approximately 3,840 acres.

## **2. Environment**

Camp Bonneville is at the base of the westernmost foothills of the Cascade Mountain Range. It is within the southernmost section of the Puget Trough Physiographic Province and the Northern Cascade Mountain section of the Cascade Sierra Mountains Physiographic Province. The western section is relatively flat, with some rolling hills, and contains the Lacamas Creek valley, while the eastern section contains the foothills. The elevation at Camp Bonneville ranges from approximately 1452 feet above mean sea level (amsl) at the summit of Little Baldy, to approximately 250 feet amsl in the southwestern corner of the camp.

Camp Bonneville is between the Cascade Mountains to the east and the Coast Range to the west. These two mountain ranges influence the local climate, which is otherwise a mild marine climate typical of the region. The Coast Range separates the area from feeling the full effect of winter storms from the Pacific Ocean, and the Cascade Mountains separates the area from the strong temperature contrasts between summer and winter that occur in eastern Washington. The summers in this area are warm and dry and the winters are mild and wet, with an average of approximately 6.1 inches of rain per month during the winter months.

The western section of Camp Bonneville consists of prairie habitat that extends into the foothills of the Cascade Mountains. The remainder of Camp Bonneville lies within the “westside western hemlock” vegetation zone, which occurs in forested upland areas (Sadler 2003).

## **V. KNOWN CULTURAL RESOURCES**

Numerous archaeological surveys have been conducted at Camp Bonneville since the late 1970s. More recently, in anticipation of the disposal of Camp Bonneville, the Army conducted a cultural resources assessment and survey in 1999. This survey was conducted on 741 acres of high probability areas that had not previously inventoried. The areas included in this survey were the Lacamas Creek valley, Munsell Hill and the Little Baldy (Bald Mountain)/Buck Creek vicinity in the eastern part of the base. The sites recorded at Camp Bonneville include two historic sites (45-CL-528 and 45-CL-529), one site with both prehistoric and historic components (45-CL-318), and 16 isolated finds. None of these sites were found to be eligible for the National Register of Historic Places (Draft FOSET 2005; Sadler 2003).

The Army completed a “Cultural Resource Survey of Selected Areas, Camp Bonneville, Clark County, Washington” in 2003 (Sadler 2003). This study summarized all previous cultural resource surveys on Camp Bonneville and conducted additional field surveys. The additional field surveys were initially targeted at 741 acres considered to be high probability areas for the presence of cultural resources as determined by consultation and specified by agreement. Three small areas totaling 7.5 acres were added to the study area when background research suggested cultural resources might be present in these areas. A total of 392 acres was subjected to

systematic pedestrian survey or shovel-testing. The remaining 356.5 acres were not physically surveyed because field inspection revealed environmental conditions that would likely preclude the existence of significant archaeological resources (extremely steep slopes and wetland areas; 324.5 acres), or because safety factors precluded survey (potential unexploded ordnance in the M203 HE Grenade Ranges; 32 acres).

Two historic-period sites (45-CL-528 and 45-CL-529); one site with both prehistoric and historic components (45-CL-318); and 16 isolated finds have been recorded on the Property (see Sadler 2003: Appendix B). The SHPO concurred with the Army's determination that none of the sites or isolated finds is eligible for the National Register of Historic Places in correspondence dated September 13, 2002 and June 17, 2003.

The Cultural Resource Survey (Sadler 2003) concluded that additional prehistoric archaeological sites may remain undiscovered even in previously surveyed areas, as well as in buried alluvial contexts in the Lacamas Creek valley, or in the M203 HE Grenade Ranges that were not available for survey due to the possibility of unexploded ordnance.

The Cultural Resource Survey (Sadler 2003) did not examine areas outside the Camp Bonneville boundary. A review of archaeological site records housed at the Washington Department of Archaeology and Historic Preservation indicates that at least one large prehistoric site with a diverse artifact assemblage is within one mile of the Camp Bonneville boundary. The existence of such a site in a similar upland environment and in close proximity to Camp Bonneville suggests an increased likelihood that significant cultural resources may remain undiscovered within the Camp Bonneville boundary.

In Cowlitz Indian Tribe Resolution No. 05-29, issued to the Office of the Secretary of the Army, the Cowlitz Tribal Council declared the presence of a series of historic and prehistoric Indian villages, burial grounds, and trails on or near Camp Bonneville, and declared site number 45-CL-318 and surrounding property as a sacred site; and further resolved that actions on the said sacred site are not endorsed to take place without government-to-government consultation with the Cowlitz Indian Tribe.

In 1997, the National Parks Service-Columbia Cascades Support Office (NPS-CCSO) entered into an agreement with the Department of the Army, Headquarters I Corps, and Fort Lewis for a National Register of Historic Places evaluation of buildings and landscapes at Camp Bonneville. The NPS-CCSO completed the evaluation and documentation in 1999. Based on this information, the Army concluded that the Camp Bonneville and Camp Killpack cantonment areas at Camp Bonneville are not eligible for listing in the National Register of Historic Places. The SHPO concurred with the Army's determination that Camp Bonneville and Camp Killpack are not eligible for listing in the National Register of Historic Places in correspondence dated April 14, 1999.

In the event that previously unidentified cultural resources are found to be present at Camp Bonneville, they will be recorded and treated in accordance with this Protection Plan.

## VI. IMPLEMENTATION PLAN

The following section outlines the procedure for protecting cultural resources at Camp Bonneville. These procedures are defined in the Preservation Covenant for Conveyance of Property that May Include Archaeological Sites (PA Attachment D) and Archaeological Monitoring and Inadvertent Discovery Plan for Remedial Actions Associated with the Removal of Munitions and Explosives of Concern (MEC) at Camp Bonneville, Washington (PA Attachment E). The protection procedures included in the Draft FOSET comply with those found in the Preservation plan. The process of compliance with PA Attachment D is show in the flow chart in Figure 2 and the Attachment E process is shown in Figure 3.

### 1. Definitions

For this Protection Plan, the following definitions are used:

#### **Archaeological Site:**

“Archaeological site means a geographic locality in Washington, including but not limited to, submerged and submersible lands and the bed of the sea within the state’s jurisdiction, that contains archaeological objects” (RCW 72.53.030).

#### **Archaeological Object:**

“Archaeological object means an object that comprises the physical evidence of an indigenous and subsequent culture including material remains of past human life including monuments, symbols, tools, facilities, and technological by-products” (RCW 27.53.030).

#### **On-Site Environmental Compliance Officer (ECO):**

BCRRT will ensure that an On-Site Environmental Compliance Officer is designated. The ECO is responsible to be on-site during all remediation activities. The ECO is responsible for communicating procedures for inadvertent discoveries and the treatment of human remains to all cleanup personnel, and implementing the notification procedures and site protection measures described herein in the event of an inadvertent discovery.

#### **Remediation Team:**

The Remediation Team consists of all those workers engaged in the implementation of the MEC cleanup alternatives described herein.

#### **Professional Archaeologist:**

Professional archaeologist means “a person who:

- (a) Has designed and executed an archaeological study as evidenced by a thesis or dissertation and been awarded an advanced degree such as an M.A., M.S., or Ph.D. in archaeology, anthropology, history or other germane discipline with a specialization in archaeology from an accredited institution of higher education; and
- (b) Has a minimum of one year of field experience with at least twenty-four weeks of field work under the supervision of a professional archaeologist, including no less than twelve weeks of survey or reconnaissance work and at least eight weeks of supervised laboratory experience. Twenty weeks of field work in a supervisory capacity must be documentable with a report on the field work produced by the individual” (WAC 25-48-020(4)).

**Working day vs Calendar day:**

Working days are Monday through Friday, Calendar days are all the days of the year.

**Low potential impacts:**

No ground disturbance, normal maintenance and repair of existing structures and facilities, lands that have been substantially disturbed to a depth of more than eight (8) inches, and areas that have been adequately surveyed in the past with no discovery of resources.

**Moderate potential impacts:**

Slight ground disturbance not otherwise characterized as having low or high impact potential.

**High potential impacts:**

Disturbance of more than twelve (12) inches below the ground surface and more than ten thousand (10,000) square feet of area.

**Consultation:**

Arrive at mutually-agreeable and appropriate measures that BCRRT will employ to mitigate any adverse effects associated with the proposed undertaking.

**2. Preservation Covenant for Conveyance of Property that May Include Archaeological Sites**

The Preservation Covenant protects archaeological sites that may be encountered during activities that are not associated with the removal munitions and explosives of concern (MEC). In compliance with the Preservation Covenant of the PA, the following procedures will be adhered to in order to maintain and preserve site 45-CL-318 and other as yet undiscovered archaeological sites.

- a. BCRRT shall notify the SHPO and the Cowlitz Indian Tribe in writing prior to undertaking any disturbance of the ground surface or any other action within 300 feet of the center of site 45-CL-318 that would affect its physical integrity. Such notice shall describe in reasonable detail the proposed undertaking and its expected effect on the physical integrity of 45-CL-318.
- b. For ground-disturbing activities other than remediation of munitions and explosives of concern (MEC) (MEC remediation-related impacts are addressed later), BCRRT shall prepare and submit to the SHPO and the Cowlitz Indian Tribe a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within areas mapped as “20-100% probability” in the BCRRT Archaeological Predictive Model Map and having slopes less than 5% (Figure 4). The assessment of project effects will describe the proposed undertaking in reasonable detail, discuss its expected effects upon recorded or unrecorded archaeological resources, and will conclude with recommendations concerning the need for additional archaeological survey or other actions to avoid or mitigate adverse effects to archaeological resources, taking into account previous cultural resource surveys at Camp Bonneville (see Sadler 2003) and other recorded archaeological sites in close proximity to the proposed project.



- c. BCRRT shall make every reasonable effort to prohibit any person from knowingly or inadvertently disturbing any archaeological object or archaeological site, as defined in RCW 27.53.030. In the event that any archaeological object or archaeological site is knowingly or inadvertently disturbed, BCRRT shall immediately stop the activity causing the disturbance and make a reasonable effort to protect the archaeological object or archaeological site from further disturbance. BCRRT shall provide written notification to the SHPO and the Cowlitz Indian Tribe within one (1) working day of the discovery. Within fifteen (15) calendar days of the discovery, BCRRT shall provide to the SHPO and the Cowlitz Indian Tribe a Draft Site Treatment and Restoration Plan to describe the actions BCRRT will take to mitigate the damage, restore the site of discovery, and provide for the treatment and disposition of any archaeological resources recovered.
- d. Within thirty (30) calendar days of the SHPO and Cowlitz Indian Tribe's receipt of notification provided by BCRRT pursuant to paragraphs above, the SHPO will respond to BCRRT in writing as follows:
  - 1. That BCRRT may proceed with the proposed undertaking without further consultation; or
  - 2. That BCRRT must initiate and complete consultation with the SHPO before it can proceed with the proposed undertaking.

If the SHPO and the Cowlitz Indian Tribe fail to respond to BCRRT's written notice within thirty (30) calendar days of the SHPO's receipt of the same, then BCRRT may proceed with the proposed undertaking without further consultation.

- e. If the response provided to BCRRT by the SHPO pursuant to paragraph d.2. of this covenant requires consultation with the SHPO and the Cowlitz Indian Tribe, then all parties will so consult in good faith to arrive at mutually-agreeable and appropriate measures that BCRRT will employ to mitigate any adverse effects associated with the proposed undertaking. Pursuant to this covenant, any mitigation measures to which the BCRRT and SHPO mutually agree shall be carried out solely at the expense of BCRRT.
- f. The SHPO and the Cowlitz Indian Tribe shall be permitted at all reasonable times to inspect the Camp Bonneville property in order to ascertain conditions and to fulfill its responsibilities hereunder.
- g. In the event that another Indian tribe should request consultation regarding activities described in paragraphs (a), (b), or (c) of this covenant, BCRRT shall consult with such tribes consistent with Washington state law and Clark County ordinances.

### **3. Archaeological Monitoring and Inadvertent Discovery Plan for Remedial Actions Associated with the Removal of Munitions and Explosives of Concern (MEC) at Camp Bonneville, Washington**

The following is a monitoring and inadvertent discovery plan intended to ensure the protection of archaeological objects, archaeological sites, and human remains during ground-disturbing remediation activities. The plan describes specific procedures to be followed in the event of the inadvertent discovery of archaeological objects, archaeological sites, or human remains. The plan has four components: Monitoring, Archaeological Awareness Training, Inadvertent Discovery Procedures, and Treatment of Human Remains.

#### **3.1. Monitoring**

The following monitoring protocol will be followed during all remediation actions that may result in ground-disturbing activity and the inadvertent discovery or disturbance of archaeological objects, archaeological sites, or human remains.

An Environmental Compliance Officer (ECO) will be on-site at Camp Bonneville during all remediation actions that may result in ground-disturbing activity and the inadvertent discovery or disturbance of archaeological objects, archaeological sites, or human remains, including but not limited to: sign and fence installation, land surveying, brush clearing, metal detection investigations, and excavation.

The procedures described in Section 6 “Human Remains” will be followed in the event of an inadvertent discovery of human remains. The procedures described in Section 7 “Inadvertent Discovery Procedures” will be followed in the event of an inadvertent discovery of any archaeological resource.

#### **3.2. Archaeological Awareness Training**

A Professional Archaeologist will conduct archaeological awareness training for the entire Remediation Team and the On-Site Environmental Compliance Officer prior to the commencement of any remediation action on Camp Bonneville. The training will familiarize cleanup personnel with the laws and regulations that protect archaeological objects, archaeological sites, and human remains; will aid cleanup personnel in the recognition of archaeological objects, archaeological sites, and human remains; will guide cleanup personnel in the procedures to be followed in the event of an inadvertent discovery; and will instruct cleanup personnel in the appropriate treatment of human remains.

The training will include:

- Relevant Federal and Washington State Law (Revised Code of Washington, RCW)
  - National Historic Preservation Act
  - Indian Graves and Records (RCW 27.44)
  - Archaeological Sites and Resources (RCW 27.53)
  - Human Remains (RCW 68.50)
  - Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)
  - Department of Archaeology and Historic Preservation’s *State Standards for Cultural Resource Reporting* (July 2006)
- Recognition of archaeological objects, archaeological sites and human remains



- Previously recorded archaeological sites and isolated finds at Camp Bonneville
- Inadvertent discovery procedures
- Treatment of human remains

### **3.3. Inadvertent Discovery Procedures**

If any member of the Remediation Team believes that any archaeological object or archaeological site has been discovered, that person will stop work in the vicinity of the discovery and notify the ECO. The ECO will investigate, and if the discovery is confirmed, the ECO will immediately stop all ground-disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the ECO and the Remediation Team, on behalf of the interests of Clark County, will: implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; take reasonable steps to ensure the confidentiality of the discovery site; and take reasonable steps to restrict access to the site of discovery.

The ECO will notify a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three (3) working days after notification. If the Professional Archaeologist determines that the discovery is of no archaeological interest (e.g., artifacts or faunal remains less than 50 years of age), then the ECO may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to ECO, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) calendar days to document the investigation, including photographs of the discovery site and items discovered, and his or her determination that the discovery is of no archeological interest.

In the event that the discovery is determined to be of archaeological interest, the Professional Archaeologist will notify ECO, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery is determined to be of archaeological interest. The notification will describe the nature of the archaeological objects or archaeological sites encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's opinion, either:

- (1) Sufficient information is available to determine that the archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or
- (2) Additional archaeological test investigations are necessary to determine if the archaeological resources are eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity continue to be halted.

In the first instance, the ECO may authorize ground-disturbing activity to recommence after thirty (30) days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, the ECO, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that The ECO will employ to

avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area. Consultation must result in a written plan of action in accordance with Washington state law between the Cowlitz Indian Tribe, the SHPO, and ECO. The ECO may elect to develop programmatic archaeological resource treatment plans in consultation with the SHPO and the Cowlitz Indian Tribe in advance of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources, the Professional Archaeologist will obtain a written permit for such activities in accordance with state law. Any mitigation measures to which the ECO, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of BCRRT. The ECO will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response is received within three (3) working days, the ECO may authorize ground-disturbing activity to recommence.

### **3.4. Human Remains**

Human remains will be treated with dignity and respect at all times.

If any member of the Remediation Team believes that any remains may have been discovered (whether believed to be human or non-human), that person will stop work in the vicinity of the discovery and notify the ECO. The ECO will investigate, and if the discovery is confirmed (whether believed to be human or non-human), the ECO will immediately stop all ground-disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the ECO and the Remediation Team, on behalf of the interests of Clark County, will: implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; take reasonable steps to ensure the confidentiality of the discovery site; and take reasonable steps to restrict access to the site of discovery.

The ECO will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three (3) working days after notification. If the Professional Archaeologist determines that the remains are demonstrably non-human, and there are no archaeological resources in association, then the ECO may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to the ECO, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) days to document the investigation, including photographs of the discovery site and the remains discovered. If non-human remains are determined to be in association with archaeological resources, then the procedures described in Inadvertent Discoveries, below, will be followed.

The Professional Archaeologist will notify the ECO immediately if archaeological excavations to expose the remains are necessary to aid in the determination. The ECO will notify the SHPO and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail) in advance of any such excavations. The SHPO and the Cowlitz Indian Tribe will be invited to observe the excavations. In the event that the Professional Archaeologist cannot determine whether the remains are human or non-human, the ECO will retain the services

of a physical anthropologist or other qualified individual to assist in an in-field determination. Remains will be exposed only to the extent necessary to determine whether the remains are human, their cultural affiliation, antiquity, the number of individuals represented, their age, sex, stature, and to identify any pathologies or trauma evident. Measurements, observations and photographs of human remains and associated artifacts may be recorded; however, under no circumstances will any destructive testing take place without the express written consent of the SHPO.

If it is determined that the remains are demonstrably non-human, and there are no archaeological resources in association, then the ECO may authorize ground-disturbing activity to recommence. In this event, the Professional Archaeologist will submit a letter report to the ECO, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) days to document the investigation, including photographs of the discovery site and the remains discovered.

If it is determined that the remains are non-human, but are in association with archaeological materials, then the procedures described in Inadvertent Discoveries will be followed.

If it is determined that the remains are human, the Professional Archaeologist will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe. Notification will be made by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the remains are determined to be human. The notification will describe the nature of the human remains encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's professional opinion concerning the likely cultural affiliation (whether Native American or non-Native American) based on the archaeological context, bioanthropological observations, and other relevant data. The notification will include the Professional Archaeologist's professional opinion, either:

- (1) Sufficient information is available to determine that the human remains are non-Native American and any associated archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or
- (2) Additional consultations are necessary to determine the custody, treatment and disposition of the Native American human remains; archaeological test investigations are necessary to determine if the associated archaeological resources are eligible for listing in the National Register of Historic Places; and recommending that ground-disturbing activity continue to be halted.

In the first instance, the ECO will consult with the Clark County Sheriff to determine the custody, treatment and disposition of the non-Native American human remains. If otherwise lawful, the ECO may authorize ground-disturbing activity to recommence after thirty (30) days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, the ECO, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that the ECO will employ to avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area, and to determine the custody, treatment and disposition of the Native American

human remains. Consultation must result in a written plan of action in accordance with Washington state law between the Cowlitz Indian Tribe, SHPO, and the ECO. The ECO may elect to develop programmatic plans for the treatment of archaeological resources and human remains in consultation with the SHPO and the Cowlitz Indian Tribe in advance of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources or human remains, the Professional Archaeologist will obtain a written permit for such activities in accordance with RCW 27.53 "Archaeological Sites and Resources." Any mitigation measures to which the ECO, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of BCRRT. The ECO will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response is received within three (3) working days, the ECO may authorize ground-disturbing activity to recommence.

### **3.5. Intrusive Activities**

The cleanup actions at the CBMR will include intrusive activities to various depths as part of Corrective Action Plan (CAP) implementation(s). An example of one such intrusive activity is the Remedial Action Unit (RAU) 3 Site-Wide Munitions of Explosive Concern (MEC) Cleanup.

Intrusive activities will consist of the following four steps:

1. An initial survey clearance to find and remove anomalies (anomaly avoidance) conducted for worker safety during subsequent clearance activities;
2. Brush removal to make the surface visible and accessible;
3. A second instrument aided surface clearance to confirm that surface MEC and MD items have been identified and removed;
4. Limited excavation with MEC identification support to find and remove MEC items from below the site surface to the specified depth.
5. If any member of the Remediation Team believes that any archaeological object or archaeological site has been discovered, that person will stop work in the vicinity of the discovery and notify the ECO. The ECO will investigate, and if the discovery is confirmed, the ECO will immediately stop all ground-disturbing activity within 100 feet of the discovery.

Monitoring by the ECO, Archaeological Awareness Training, Inadvertent Discovery Procedures, and Human Remains protocols will be implemented during any cleanup activities in accordance with **Sections 3.1 to 3.4**.

### **3.6. Excavation and Processing or Removal Activities**

The cleanup actions at the CBMR will include excavation and processing and/or removal of soil from the site. An example of one such activity is the RAU 2A lead contaminated soil removal at the former firing ranges where excavated soils are processed to remove bullets and bullet fragments and applicable off-site disposal.

In order to evaluate the processed soils/soils removed from the CBMR, for the presence of archaeological objects and human remains, the following procedures will be employed:

1. All soil materials requiring sifting will be processed using a vibrating multi-stage screening system. The mesh size interval on the screens will be varied with a larger spacing at the top and the smallest at the bottom level per the following:
  - Primary screen will have a spacing of 5-inches (to capture vegetation debris, large rocks etc);
  - Secondary level will have a spacing of 3-inches (to capture smaller rocks, brush debris etc); and
  - Tertiary level will have a spacing of 0.5-inches (to capture bullets and bullet fragments).
2. As soils are segregated by the screening system during the work day, the different size fraction materials will be isolated into "day piles" for temporary storage. It is thought that objects of archeological interest are more likely to be found in the Primary and Secondary screen day piles.
3. After the end of soil screening activities for each work day a Professional Archeologist (as defined by the Secretary of the Interior [see **Section 1**]), or an Archeologist working under the supervision of a Professional Archeologist, accompanied by a trained hazwaste/UX0 technician will be given access to the Primary and Secondary screen day piles. The Archeologist or Professional Archeologist will examine the materials in these day piles for the presence of objects of archeological interest.
4. Should the Archeologist or Professional Archeologist identify any potential objects of archeological interest, those objects will be photographed and removed from the day pile for further evaluation. Following evaluation of these objects by the Professional Archeologist and depending upon the results of that evaluation and the type of object identified (i.e. archaeological object or human remain) the reporting and notification procedures detailed in **Sections 3.3 and 3.4** will be followed.
5. When objects of archeological interest are identified in a day pile, the Archeologist or Professional Archeologist will notify the Construction Manager of this finding. The Construction Manager will determine the location from which the sifted soil was excavated. The Professional Archeologist will inspect that location for additional objects of archeological interest. No additional soil excavation will occur at this location until it has been cleared by the Professional Archeologist.
6. Once the day piles have been examined by the Archeologist or Professional Archeologist and determined to be clear of objects of archeological interest (or those objects have been removed) the day piles will be released for disposition as described in the applicable Operations Plan.
7. Depending upon the volume of the materials deposited into the Primary and Secondary screen day piles, the frequency of day pile inspections may be adjusted.

Monitoring by the ECO, Archaeological Awareness Training, Inadvertent Discovery Procedures, and Human Remains protocols will be implemented during any cleanup activities in accordance with **Sections 3.1 to 3.4**.



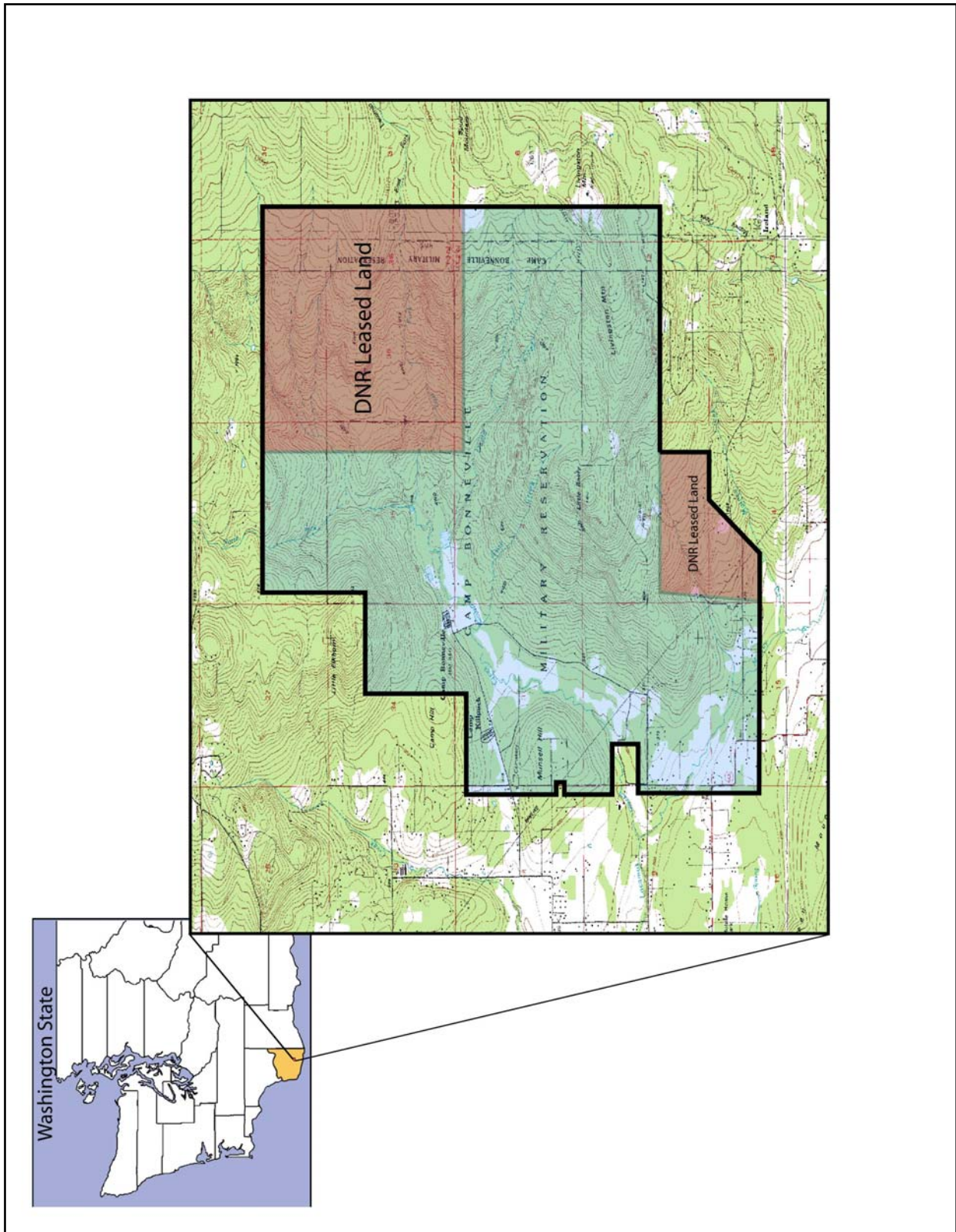


Figure 1. Location of Camp Bonneville, Clark County, WA

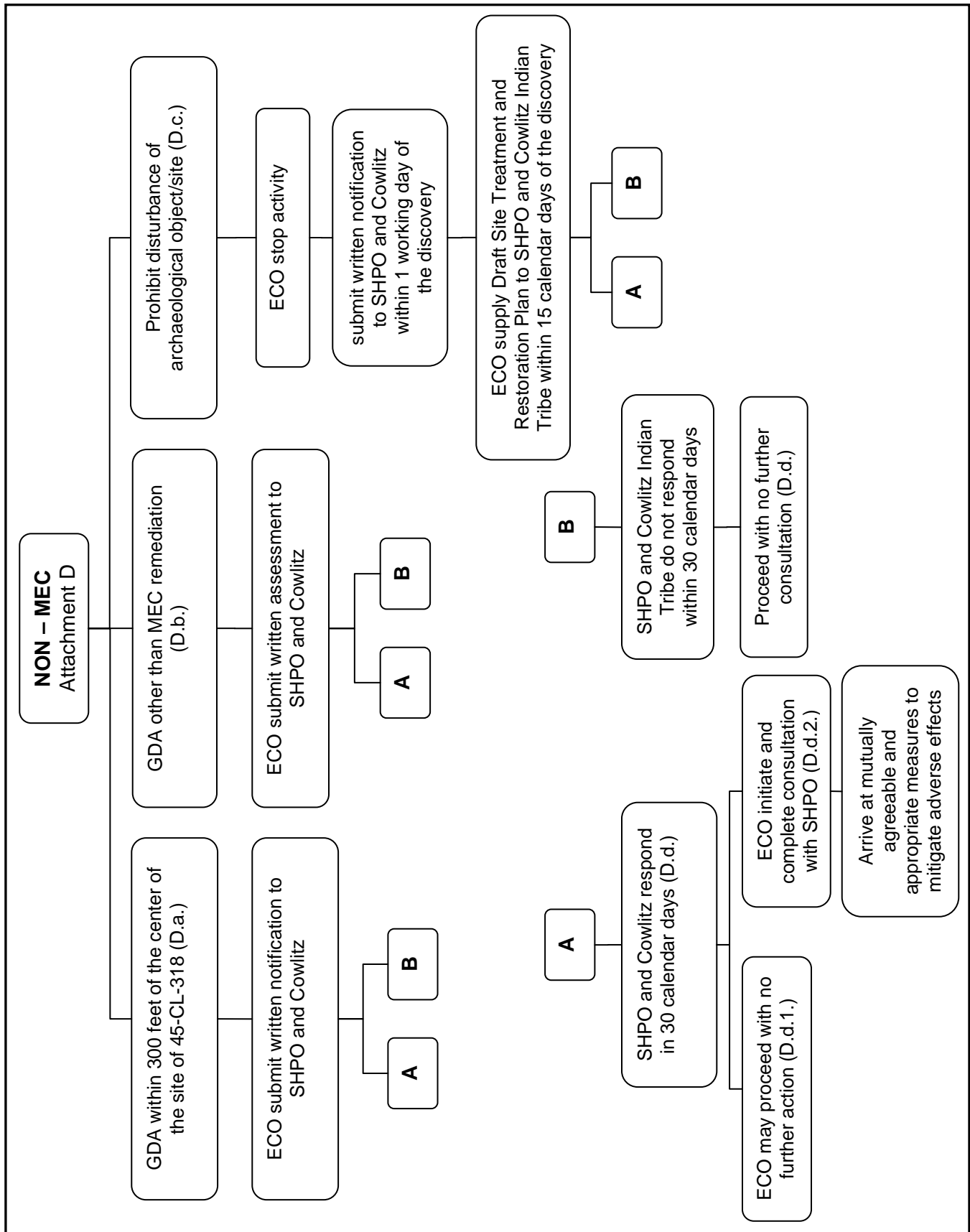


Figure 2. Flow Chart of PA Attachment D Compliance Process.



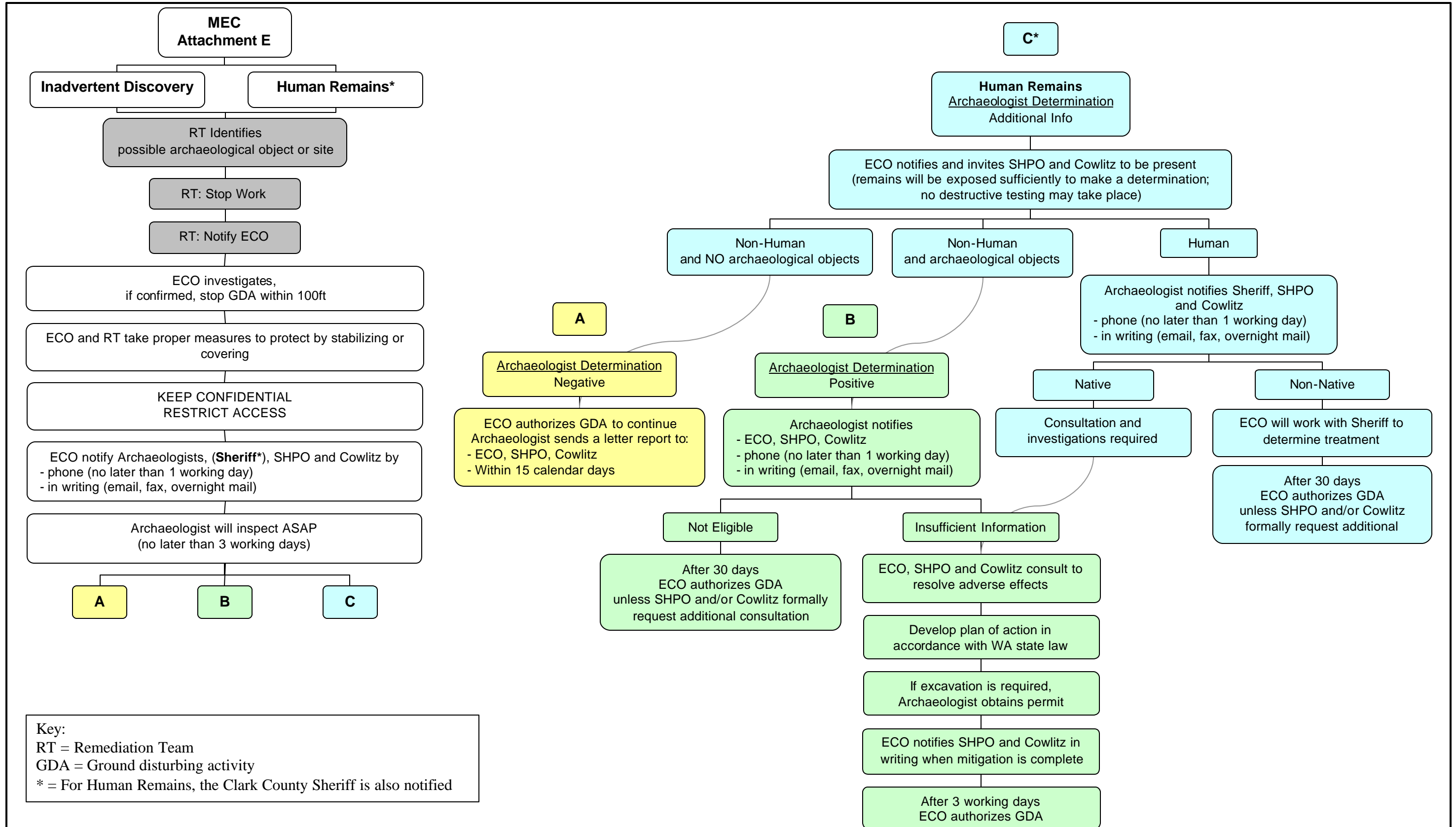


Figure 3. Flow Chart of PA Attachment E, Archaeological Monitoring and Inadvertent Discovery Plan for Remedial Actions Associated with the Removal of MEC, Compliance Process.

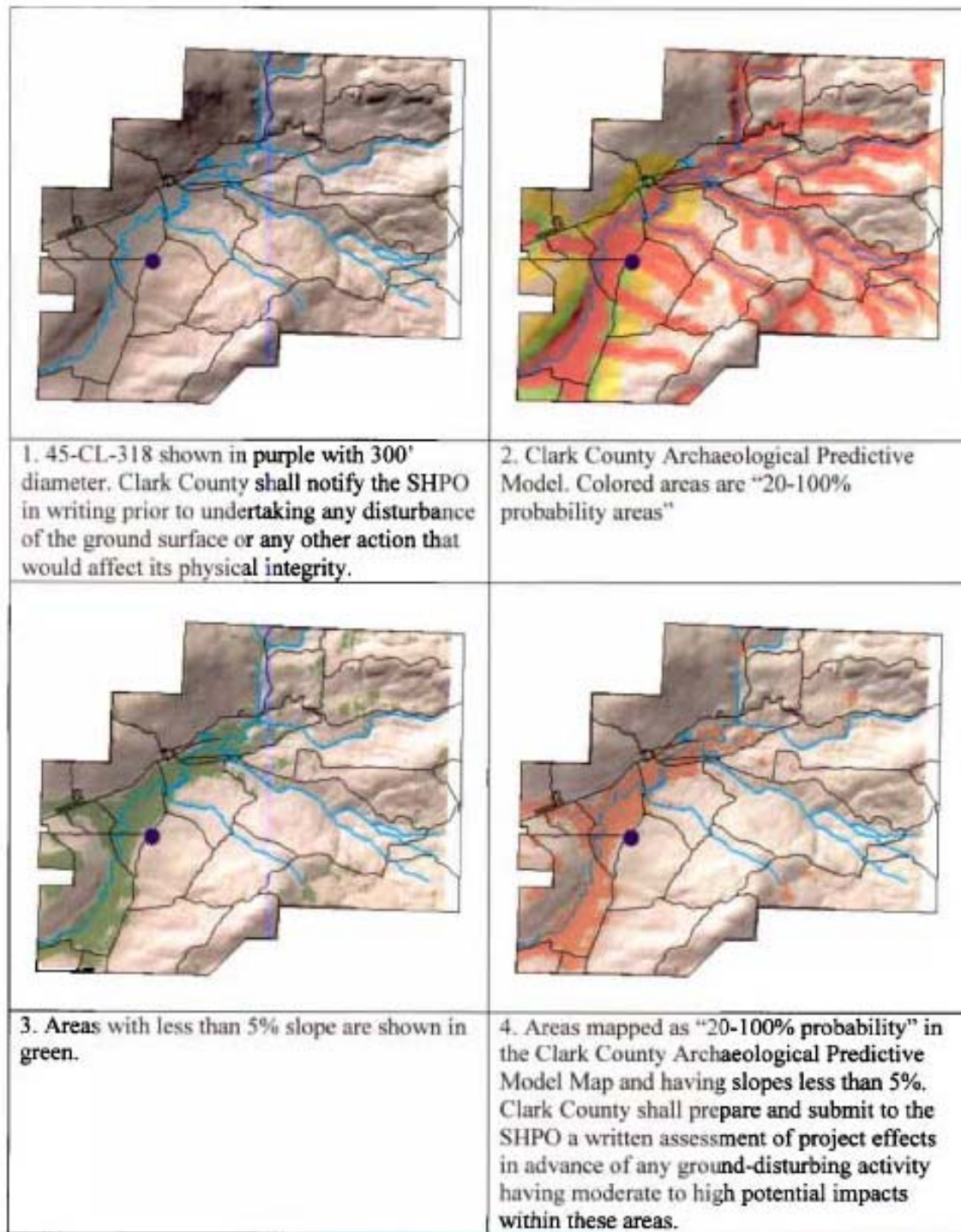


Figure 4. Demonstration of the probability areas for the identification of areas of concern for ground disturbing activity not associated with MEC

## REFERENCES CITED

Draft Finding of Suitability for Early Transfer (FOSET)  
2005 Camp Bonneville, Clark County, Washington.

Sadler, Dale L.  
2003 *Cultural Resources Survey of Selected Areas, Camp Bonneville, Clark County, Washington*. Fort Lewis, Washington.

## **APPENDIX A: PROGRAMMATIC AGREEMENT**

**Programmatic Agreement Among United States Army, Washington State Historic Preservation Officer, Advisory Council on Historic Preservation, Cowlitz Indian Tribe, and Clark County, Washington for the Closure and Disposal of Camp Bonneville, Washington**

AMENDMENT #1  
PROGRAMMATIC AGREEMENT  
AMONG  
UNITED STATES ARMY,  
WASHINGTON STATE HISTORIC PRESERVATION OFFICER,  
ADVISORY COUNCIL ON HISTORIC PRESERVATION,  
COWLITZ INDIAN TRIBE, and  
CLARK COUNTY, WASHINGTON  
For the  
Closure and Disposal of Camp Bonneville, Washington

WHEREAS the United States Army (Army), the Washington State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) entered into a Programmatic Agreement related to the closure and disposal of Camp Bonneville, Washington, in 1998; and

WHEREAS several conditions have changed and events have occurred since the Programmatic Agreement was executed by the Parties in 1998 that may necessitate amending certain provisions of the Programmatic Agreement; and

WHEREAS the federal regulations implementing Section 106 of the National Historic Preservation Act, 36 CFR Part 800 (Protection of Historic Properties), were revised effective 05 August 2004; and

WHEREAS in 2001 the Cowlitz Indian Tribe became a federally recognized Indian Tribe eligible for the special programs and services provided by the United States to Indians because of their status as Indians; and

WHEREAS the Cowlitz Indian Tribe is now entitled to have a consulting role in any continuing actions pursuant to the Section 106 process at Camp Bonneville; and

WHEREAS the Cowlitz Indian Tribe executed Cowlitz Indian Tribe Resolution 05-29, which declared Site 45-CL-318 and surrounding property is a sacred site to the Tribe, and notified the Army of the designation as a sacred site; and

WHEREAS the Cowlitz Indian Tribe participated as a consulting party in the development of this Amendment to the Programmatic Agreement and agreed to sign as an invited signatory; and

WHEREAS the Chinook Indian Tribe, the Confederated Tribes of the Grand Ronde Community of Oregon, and the Yakama Indian Nation were consulted in the development of the 1998 Programmatic Agreement and this Amendment and offered no comment; and

WHEREAS Clark County participated as a consulting party in the development of the 1998 Programmatic Agreement and had an opportunity to sign the Agreement but did not do so; and

WHEREAS Clark County participated as a consulting party in the development of this Amendment to the Programmatic Agreement and agreed to sign as an invited signatory; and

WHEREAS, pursuant to Article IX (A) and (B) of the Programmatic Agreement, the Army, the SHPO and the ACHP consulted and determined that certain provisions of the Programmatic Agreement should be revised;

NOW THEREFORE the Army, the SHPO, the ACHP, the Cowlitz Indian Tribe and Clark County (hereinafter “the Parties”) agree that the Programmatic Agreement should be amended as follows:

### **I. Identification and Evaluation**

Paragraphs I (C) and I (D) are added as follows:

C. The Army completed a “Cultural Resource Survey of Selected Areas, Camp Bonneville, Clark County, Washington” in May 2003 (Sadler 2003). This study summarized all previous cultural resource surveys on Camp Bonneville and conducted additional field surveys. The additional field surveys were initially targeted at 741 acres considered to be high probability areas for the presence of cultural resources as determined by consultation and specified by agreement. Three small areas totaling 7.5 acres were added to the study area when background research suggested cultural resources might be present in these areas. A total of 392 acres was subjected to systematic pedestrian survey or shovel-testing. The remaining 356.5 acres were not physically surveyed because field inspection revealed environmental conditions judged likely to preclude the existence of significant archaeological resources (steep slopes, 252 acres); or environmental conditions that precluded field survey (wetland areas, 72.5 acres); or because safety factors precluded survey actions (potential unexploded ordnance in the M203 HE Grenade Ranges, 32 acres).

Two historic-period sites (45-CL-528 and 45-CL-529); one site with both prehistoric and historic components (45-CL-318); and 16 isolated finds have been recorded on the Property (see Sadler 2003: Appendix B). The Washington State Historic Preservation Officer concurred with the Army’s determination that none of these sites or isolated finds is eligible for the National Register of Historic Places in correspondence dated September 13, 2002 and June 17, 2003.

The Cultural Resource Survey (Sadler 2003) concluded that additional prehistoric archaeological sites may remain undiscovered even in previously surveyed areas, as well as in buried alluvial contexts in the Lacamas Creek valley, or in the M203 HE Grenade Ranges that were not available for survey due to the possibility of

unexploded ordnance.

The Cultural Resource Survey (Sadler 2003) did not examine areas outside the Camp Bonneville boundary. A review of archaeological site records housed at the Washington Department of Archaeology and Historic Preservation indicates that at least one large prehistoric site with a diverse artifact assemblage is located within one mile of the Camp Bonneville boundary. The existence of such a site in a similar upland environment and in close proximity to Camp Bonneville suggests an increased likelihood that significant cultural resources may remain undiscovered within the Camp Bonneville boundary.

In Cowlitz Indian Tribe Resolution No. 05-29, issued to the Office of the Secretary of the Army, the Cowlitz Tribal Council declared the presence of a series of historic and prehistoric Indian villages, burial grounds, and trails on or near Camp Bonneville, and declared site number 45-CL-318 and surrounding property as a sacred site; and further resolved that actions on the said sacred site are not endorsed to take place without government-to-government consultation with the Cowlitz Indian Tribe.

- D. In 1997, the National Parks Service-Columbia Cascades Support Office (NPS-CCSO) entered into an agreement with the Department of the Army, Headquarters I Corps, and Fort Lewis for a National Register of Historic Places evaluation of buildings and landscapes at Camp Bonneville. The NPS-CCSO completed the evaluation and documentation in 1999. Based on this information, the Army concluded that the Camp Bonneville and Camp Killpack cantonment areas at Camp Bonneville are not eligible for listing in the National Register of Historic Places. The Washington State Historic Preservation Officer concurred with the Army's determination that Camp Bonneville and Camp Killpack are not eligible for listing in the National Register of Historic Places in correspondence dated April 14, 1999.

#### **IV. Disposal of Camp Bonneville Properties**

Paragraph IV (J) is added as follows:

##### **J. Conservation Conveyances to Local Redevelopment Authority (LRA)**

In disposing of real property that may contain historic properties to an LRA pursuant to the conservation conveyance authority provided in 10 U.S.C. § 2694a (Conveyance of surplus real property for natural resource conservation) appropriate preservation covenants (At Attachments C and D) will be incorporated into the transfer instruments. The Army will promptly notify the SHPO and ACHP in writing of such transfer of property. Property conveyed pursuant to 10 U.S.C. § 2694a requires that the property be used and maintained for the conservation of natural resources in perpetuity.

#### **V. Environmental Remediation**

Paragraph V (C) is added as follows:

- C. The Army will conduct and/or fund environmental remediation at Camp Bonneville, including removal of unexploded ordnance (UXO). The removal of UXO may require ground-disturbing activities that could expose archaeological resources. In order to preserve any archaeological resources found during remediation, an “Archeological Monitoring Plan for Remedial Actions associated with the Removal of Munitions and Explosives of Concern (MEC) at Camp Bonneville” (See Attachment E) will be attached to the transfer instruments and run with the land and will be binding upon the Army, the transferee, including the Clark County LRA, its successors and assigns and all subsequent transferees.

## **VII. Status Reports**

Article VII is amended by replacing the original text with the following:

Until such time as all Camp Bonneville properties have transferred from Army control in accordance with the terms of this agreement, the Army will, on or before January 1 of each year, provide an annual status report to all signatories to the Programmatic Agreement and its Amendments. The annual report shall summarize activities carried out under the terms of this PA during the preceding year and other such information on identification and resolution efforts and the projections for completion of the activities. The signatories to the Programmatic Agreement shall review this information to determine what, if any, revisions or amendments to the Agreement are necessary. If amendments are needed, the signatories to this agreement will consult, in accordance with Article IX of this Agreement, to make such revisions.

## **VIII. Dispute Resolution**

Article VIII is amended by replacing the original text with the following:

A. Should the SHPO, the ACHP, the Cowlitz Indian Tribe and/or Clark County object within thirty (30) days to any plans or other documents provided by the Army or others for review pursuant to this agreement, or to any actions proposed or initiated by the Army pursuant to this agreement, the Army shall notify the Parties and consult with the objecting party to resolve the objection. If the Army determines that the objection cannot be resolved, the Army shall forward all documentation relevant to the dispute to the ACHP. Within thirty (30) days after receipt of all pertinent documentation, the ACHP will either:

- (1) Provide the Army with recommendations, which the Army will take into account in reaching a final decision regarding the dispute; or
- (2) Notify the Army that it will comment pursuant to 36 C.F.R. 800.7(c), and proceed to comment.



Any ACHP comment will be taken into account by the Army in accordance with 36 C.F.R. 800.7(c)(4) with reference to the subject of the dispute.

B. Any recommendations or comment provided by the ACHP pursuant to Stipulation VIII.A above will pertain only to the subject of the dispute; the Army's responsibility to carry out all other actions under this agreement that are not the subjects of the dispute will remain unchanged.

C. At any time during implementation of the measures stipulated in this agreement by the Army, if an objection to any such measure or its manner of implementation is raised by interested persons, then the Army shall notify the Parties and consider the objection and consult, as appropriate, with the objecting party, the SHPO, the ACHP, the Cowlitz Indian Tribe and Clark County to attempt to resolve the objection.

## **IX. Amendments**

Article IX is amended by replacing the original text with the following:

A. The Army, the SHPO, the ACHP, the Cowlitz Indian Tribe and/or Clark County may request that this PA be revised, whereby the parties will consult to consider whether such revision is necessary.

B. This PA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

## **X. Termination of Agreement**

Article X is amended by replacing the original text with the following:

The Army, the SHPO, the ACHP, the Cowlitz Indian Tribe and/or Clark County may terminate this PA by providing thirty (30) days written notice to the other signatory parties. During the period after notification and prior to termination, the Army, the SHPO, the ACHP, the Cowlitz Indian Tribe and Clark County will consult to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the Army will comply with 36 C.F.R. 800.4 through 800.6 with regard to individual undertakings associated with the BRAC disposal action.

Execution and implementation of this Programmatic Agreement and all Amendments thereto evidences that the Army has afforded the ACHP a reasonable opportunity to comment on the closure and disposal of excess and surplus property at Camp Bonneville, and that the Army has taking into account the effects of the undertaking on historic properties. Execution and compliance with this Programmatic Agreement and all Amendments thereto fulfils the Army's Section 106 responsibilities regarding the closure and disposal of Camp Bonneville.

**XI. Expiration of the Programmatic Agreement**

Article XI is added to the Programmatic Agreement as follows:

This Programmatic Agreement and all Amendments thereto shall take effect on the date the Agreement and Amendments are signed by the last signatory and will remain in effect, unless terminated pursuant to Article X above, until such time as all Camp Bonneville properties are transferred from Army control and the transfer instruments are recorded in the Public Records of Clark County, Washington.

**DEPARTMENT OF THE ARMY**

By:  Date: 26 JUNE 2006

**WASHINGTON STATE HISTORIC PRESERVATION OFFICER**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**ADVISORY COUNCIL ON HISTORIC PRESERVATION**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**COWLITZ INDIAN TRIBE**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**CLARK COUNTY**

By: \_\_\_\_\_ Date: \_\_\_\_\_

## **Programmatic Agreement, Attachment D**

Attachment D of the Programmatic Agreement, “Standard Preservation Covenant for Conveyance of Property that Includes Archeological Sites,” is replaced with the following:

### **Attachment D: Preservation Covenant for Conveyance of Property that May Include Archaeological Sites.**

In consideration of the conveyance of the real property that includes site 45-CL-318 and may include other as yet undiscovered archaeological sites located on lands owned by the Department of Defense at the Camp Bonneville Military Reservation, Clark County, Washington, Clark County hereby covenants on behalf of itself, its heirs, successors, and assigns at all times to the Washington State Historic Preservation Office (SHPO) to maintain and preserve site 45-CL-318 and other as yet undiscovered archaeological sites in accordance with the provisions of the following paragraphs of this covenant.

- a. Clark County shall notify the SHPO and the Cowlitz Indian Tribe in writing prior to undertaking any disturbance of the ground surface or any other action within 300 feet of the center of site 45-CL-318 that would affect its physical integrity (center point is 134810 E, 1150207 N, NAD 1983 HARN State Plane Washington South FIPS 4602 Feet). Such notice shall describe in reasonable detail the proposed undertaking and its expected effect on the physical integrity of 45-CL-318.
- b. For ground-disturbing activities other than remediation of munitions and explosives of concern (MEC) (MEC remediation-related impacts are addressed in Attachment E), Clark County shall prepare and submit to the SHPO and the Cowlitz Indian Tribe a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within areas mapped as “20-100% probability” in the Clark County Archaeological Predictive Model Map and having slopes less than 5% (these areas are mapped in Attachment F; “moderate to high potential impacts” are defined in Clark County Ordinance 40.570.080 C.3.k). The assessment of project effects will describe the proposed undertaking in reasonable detail, discuss its expected effects upon recorded or unrecorded archaeological resources, and will conclude with recommendations concerning the need for additional archaeological survey or other actions to avoid or mitigate adverse effects to archaeological resources, taking into account previous cultural resource surveys at Camp Bonneville (see Sadler 2003) and other recorded archaeological sites in close proximity to the proposed project.
- c. Clark County shall make every reasonable effort to prohibit any person from knowingly or inadvertently disturbing any archaeological object or archaeological site, as defined in RCW 27.53.030. In the event that any archaeological object or archaeological site is knowingly or inadvertently disturbed, Clark County shall immediately stop the activity causing the disturbance and make a reasonable effort to protect the archaeological object or archaeological site from further disturbance. Clark County shall provide written notification to the SHPO and the Cowlitz

Indian Tribe within one (1) working day of the discovery. Within fifteen (15) calendar days of the discovery, Clark County shall provide to the SHPO and the Cowlitz Indian Tribe a Draft Site Treatment and Restoration Plan to describe the actions Clark County will take to mitigate the damage, restore the site of discovery, and provide for the treatment and disposition of any archaeological resources recovered.

- d. Within thirty (30) calendar days of the SHPO and Cowlitz Indian Tribe's receipt of notification provided by Clark County pursuant to paragraphs (a), (b), or (c) of this covenant, the SHPO will respond to Clark County in writing as follows:
  1. That Clark County may proceed with the proposed undertaking without further consultation; or
  2. That Clark County must initiate and complete consultation with the SHPO before it can proceed with the proposed undertaking.

If the SHPO and the Cowlitz Indian Tribe fail to respond to Clark County's written notice within thirty (30) calendar days of the SHPO's receipt of the same, then Clark County may proceed with the proposed undertaking without further consultation.

- e. If the response provided to Clark County by the SHPO pursuant to paragraph d.2. of this covenant requires consultation with the SHPO and the Cowlitz Indian Tribe, then all parties will so consult in good faith to arrive at mutually-agreeable and appropriate measures that Clark County will employ to mitigate any adverse effects associated with the proposed undertaking. Pursuant to this covenant, any mitigation measures to which Clark County and the SHPO mutually agree shall be carried out solely at the expense of Clark County.
- f. The SHPO and the Cowlitz Indian Tribe shall be permitted at all reasonable times to inspect the Camp Bonneville property in order to ascertain conditions and to fulfill its responsibilities hereunder.
- g. In the event that another Indian tribe should request consultation regarding activities described in paragraphs (a), (b), or (c) of this covenant, Clark County shall consult with such tribes consistent with Washington state law and Clark County ordinances.
- h. In the event of a knowing violation of this covenant, and in addition to any remedy now or hereafter provided by law, the SHPO may, following reasonable notice to Clark County, institute suit to enjoin said violation or to require the restoration of any archaeological site affected by such violation. The successful party shall be entitled to recover all costs or expenses incurred in connection with any such suit, including all court costs and attorney's fees.
- i. This covenant is binding on Clark County, its heirs, successors, and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by Clark County verbatim or by express reference in any deed or other legal instrument by which it divests itself of either the fee simple title or any other lesser estate in site 45-CL-318 or other property that may contain unrecorded archaeological sites or any part thereof.
- j. The failure of the SHPO to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

- k. The covenant shall be a binding servitude upon the real property that includes site 45-CL-318 and other potential archeological sites and shall be deemed to run with the land.

Execution of the transfer instrument shall constitute conclusive evidence that Clark County agrees to be bound by the foregoing conditions and restrictions and to perform the obligations herein set forth.

## **Programmatic Agreement, Attachment E**

Attachment E is added to the Programmatic Agreement as follows:

### **Archaeological Monitoring and Inadvertent Discovery Plan for Remedial Actions Associated with the Removal of Munitions and Explosives of Concern (MEC) at Camp Bonneville, Washington**

## **1 Introduction**

The Camp Bonneville Military Reservation (Camp Bonneville) comprises approximately 3,020 acres of land in Clark County, Washington. Camp Bonneville currently leases 820 acres of adjoining land from the Washington Department of Natural Resources (WDNR). The Department of Defense used Camp Bonneville for troop training from 1910 to 1995. Training included the use of small arms, assault weapons, field artillery and air defense artillery. The United States Congress approved the closure of Camp Bonneville under the 1995 Base Realignment and Closure (BRAC) Commission.

The Camp Bonneville property is proposed for transfer to Clark County via a conservation conveyance under the authority provided in 10 U.S.C. § 2694a (Conveyance of surplus real property for natural resource conservation). The WDNR leased land will be returned to WDNR. WDNR may retain the 820 acres for its own use or may transfer it to Clark County. Clark County will manage the Camp Bonneville property as a regional park to provide recreational opportunities for the local community and to support natural resource conservation.

The Department of the Army will conduct or fund remedial actions associated with the removal of munitions and explosives of concern (MEC) from Camp Bonneville. These remedial actions may involve ground-disturbing activities and have the potential to result in the inadvertent discovery of archaeological resources or human remains. This plan describes procedures that will be followed in the event of the inadvertent discovery of archaeological resources or human remains resulting from these remedial actions at Camp Bonneville, Washington, and the leased WDNR land.

## **2 Definitions**

**Archaeological Site:** “Archaeological site means a geographic locality in Washington, including but not limited to, submerged and submersible lands and the bed of the sea within the state’s jurisdiction, that contains archaeological objects” (RCW 72.53.030).

**Archaeological Object:** “Archaeological object means an object that comprises the physical evidence of an indigenous and subsequent culture including material remains of past human life including monuments, symbols, tools, facilities, and technological by-products” (RCW 27.53.030).

**On-Site Environmental Compliance Officer (ECO):** Clark County will ensure that an On-Site Environmental Compliance Officer is designated. The ECO is responsible to be on-site during all remediation activities. The ECO is responsible for communicating procedures for inadvertent discoveries and the treatment of human remains to all

cleanup personnel, and implementing the notification procedures and site protection measures described herein in the event of an inadvertent discovery.

Remediation Team: The Remediation Team consists of all those workers engaged in the implementation of the MEC cleanup alternatives described herein.

Professional Archaeologist: Professional archaeologist means “a person who:

(a) Has designed and executed an archaeological study as evidenced by a thesis or dissertation and been awarded an advanced degree such as an M.A., M.S., or Ph.D. in archaeology, anthropology, history or other germane discipline with a specialization in archaeology from an accredited institution of higher education; and

(b) Has a minimum of one year of field experience with at least twenty-four weeks of field work under the supervision of a professional archaeologist, including no less than twelve weeks of survey or reconnaissance work and at least eight weeks of supervised laboratory experience. Twenty weeks of field work in a supervisory capacity must be documentable with a report on the field work produced by the individual” (WAC 25-48-020(4)).

SHPO: Washington State Historic Preservation Officer.

### **3 Archaeological Monitoring and Inadvertent Discovery Plan**

The following describes an archaeological monitoring and inadvertent discovery plan intended to ensure the protection of archaeological objects, archaeological sites, and human remains during ground-disturbing remediation activities<sup>1</sup>. The plan describes specific procedures to be followed in the event of the inadvertent discovery of archaeological objects, archaeological sites, or human remains. The plan has four components: Monitoring; Archaeological Awareness Training; Inadvertent Discovery Procedures; and Treatment of Human Remains.

#### **3.1 Monitoring**

The following monitoring protocol will be followed during all remediation actions that may result in ground-disturbing activity and the inadvertent discovery or disturbance of archaeological objects, archaeological sites, or human remains.

An Environmental Compliance Officer (ECO) will be on-site at Camp Bonneville during all remediation actions that may result in ground-disturbing activity and the inadvertent discovery or disturbance of archaeological objects, archaeological sites, or human remains, including but not limited to: sign and fence installation, land surveying, brush clearing, metal detection investigations, and excavation.

The procedures described in Section 3.3 “Inadvertent Discovery Procedures” will be followed in the event of an inadvertent discovery of any archaeological resource. The

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<sup>1</sup> This plan is founded on the assumption that the Camp Bonneville property will transfer out of federal ownership prior to the implementation of the subject remedial actions. Hence, Washington state law will apply, rather than the provisions of the Archaeological Resources Protection Act (ARPA) and the Native American Graves Protection and Repatriation Act (NAGPRA).

procedures described in Section 3.4 “Treatment of Human Remains” will be followed in the event of an inadvertent discovery of human remains.

### **3.2 Archaeological Awareness Training**

A Professional Archaeologist will conduct archaeological awareness training for the entire Remediation Team and the On-Site Environmental Compliance Officer prior to the commencement of any remediation action on Camp Bonneville. The training will familiarize cleanup personnel with the laws and regulations that protect archaeological objects, archaeological sites, and human remains; will aid cleanup personnel in the recognition of archaeological objects, archaeological sites, and human remains; will guide cleanup personnel in the procedures to be followed in the event of an inadvertent discovery; and will instruct cleanup personnel in the appropriate treatment of human remains.

The training will include:

- Relevant Federal and Washington State Law (Revised Code of Washington, RCW)
  - National Historic Preservation Act
  - Indian Graves and Records (RCW 27.44)  
<http://apps.leg.wa.gov/rcw/default.aspx?cite=27.44>
  - Archaeological Sites and Resources (RCW 27.53)  
<http://apps.leg.wa.gov/rcw/default.aspx?cite=27.53>
  - Human Remains (RCW 68.50)  
<http://apps.leg.wa.gov/rcw/default.aspx?cite=68.50>
  - Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)  
<http://apps.leg.wa.gov/rcw/default.aspx?cite=68.60>
- Recognition of archaeological objects, archaeological sites and human remains
- Previously recorded archaeological sites and isolated finds at Camp Bonneville
- Inadvertent discovery procedures
- Treatment of human remains

### **3.3 Inadvertent Discovery Procedures**

If any member of the Remediation Team believes that any archaeological object or archaeological site has been discovered, that person will stop work in the vicinity of the discovery and notify the ECO. The ECO will investigate, and if the discovery is confirmed, the ECO will immediately stop all ground-disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the ECO and the Remediation Team, on behalf of the interests of Clark County, will: implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; take reasonable steps to ensure the confidentiality of the discovery site; and take reasonable steps to restrict access to the site of discovery.

The ECO will notify a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three (3) working days after notification. If the



Professional Archaeologist determines that the discovery is of no archaeological interest (e.g., artifacts or faunal remains less than 50 years of age), then the ECO may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to Clark County, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) calendar days to document the investigation, including photographs of the discovery site and items discovered, and his or her determination that the discovery is of no archeological interest.

In the event that the discovery is determined to be of archaeological interest, the Professional Archaeologist will notify Clark County, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery is determined to be of archaeological interest. The notification will describe the nature of the archaeological objects or archaeological sites encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's opinion, either:

(1) Sufficient information is available to determine that the archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or

(2) Additional archaeological test investigations are necessary to determine if the archaeological resources are eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity continue to be halted.

In the first instance, Clark County may authorize ground-disturbing activity to recommence after thirty (30) days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, Clark County, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that Clark County will employ to avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area. Consultation must result in a written plan of action in accordance with Washington state law (RCW 27.44 or RCW 27.53) between the Cowlitz Indian Tribe, the SHPO, and Clark County. Clark County may elect to develop programmatic archaeological resource treatment plans in consultation with the SHPO and the Cowlitz Indian Tribe in advance of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources, the Professional Archaeologist will obtain a written permit for such activities in accordance with RCW 27.53 "Archaeological Sites and Resources." Any mitigation measures to which Clark County, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of Clark County. Clark County will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response

is received within three (3) working days, Clark County may authorize ground-disturbing activity to recommence.

### **3.4 Treatment of Human Remains**

Human remains will be treated with dignity and respect at all times.

If any member of the Remediation Team believes that any remains may have been discovered (whether believed to be human or non-human), that person will stop work in the vicinity of the discovery and notify the ECO. The ECO will investigate, and if the discovery is confirmed (whether believed to be human or non-human), the ECO will immediately stop all ground-disturbing activity within 100 feet of the discovery. Until the procedures described in this plan have been fully implemented, the ECO and the Remediation Team, on behalf of the interests of Clark County, will: implement reasonable measures to protect the discovery site, including any appropriate stabilization or covering; take reasonable steps to ensure the confidentiality of the discovery site; and take reasonable steps to restrict access to the site of discovery.

The ECO will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the discovery. A Professional Archaeologist will inspect the discovery site as soon as possible, but no later than three (3) working days after notification. If the Professional Archaeologist determines that the remains are demonstrably non-human, and there are no archaeological resources in association, then the ECO may authorize ground-disturbing activity to recommence. The Professional Archaeologist will submit a letter report to Clark County, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) days to document the investigation, including photographs of the discovery site and the remains discovered. If non-human remains are determined to be in association with archaeological resources, then the procedures described in Section 3.3 will be followed.

The Professional Archaeologist will notify Clark County immediately if archaeological excavations to expose the remains are necessary to aid in the determination. Clark County will notify the SHPO and the Cowlitz Indian Tribe by telephone, followed by written confirmation (by email, fax or overnight mail) in advance of any such excavations. The SHPO and the Cowlitz Indian Tribe will be invited to observe the excavations. In the event that the Professional Archaeologist cannot determine whether the remains are human or non-human, Clark County will retain the services of a physical anthropologist or other qualified individual to assist in an in-field determination. Remains will be exposed only to the extent necessary to determine whether the remains are human, their cultural affiliation, antiquity, the number of individuals represented, their age, sex, stature, and to identify any pathologies or trauma evident. Measurements, observations and photographs of human remains and associated artifacts may be recorded; however, under no circumstances will any destructive testing take place without the express written consent of the SHPO (in accordance with RCW 27.44.020).

If it is determined that the remains are demonstrably non-human, and there are no archaeological resources in association, then the ECO may authorize ground-disturbing activity to recommence. In this event, the Professional Archaeologist will submit a letter report to Clark County, the SHPO, and the Cowlitz Indian Tribe within fifteen (15) days to document the investigation, including photographs of the discovery site and the remains discovered.

If it is determined that the remains are non-human, but are in association with archaeological materials, then the procedures described in Section 3.3 will be followed.

If it is determined that the remains are human, the Professional Archaeologist will notify the Clark County Sheriff's Office, a Professional Archaeologist, the SHPO, and the Cowlitz Indian Tribe. Notification will be made by telephone, followed by written confirmation (by email, fax or overnight mail). Notification will be made as soon as possible, but no later than one (1) working day after the remains are determined to be human. The notification will describe the nature of the human remains encountered and the circumstances of their inadvertent discovery. The notification will include the Professional Archaeologist's professional opinion concerning the likely cultural affiliation (whether Native American or non-Native American) based on the archaeological context, bioanthropological observations, and other relevant data. The notification will include the Professional Archaeologist's professional opinion, either:

(1) Sufficient information is available to determine that the human remains are non-Native American and any associated archaeological resources are not eligible for listing in the National Register of Historic Places, and recommending that ground-disturbing activity be permitted to recommence without further evaluation; or

(2) Additional consultations are necessary to determine the custody, treatment and disposition of the Native American human remains; archaeological test investigations are necessary to determine if the associated archaeological resources are eligible for listing in the National Register of Historic Places; and recommending that ground-disturbing activity continue to be halted.

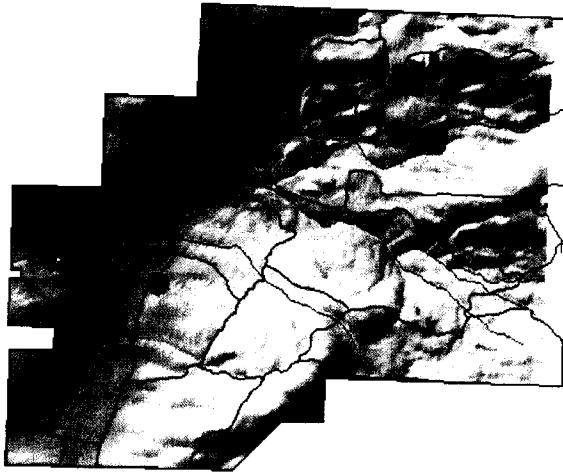
In the first instance, Clark County will consult with the Clark County Sheriff to determine the custody, treatment and disposition of the non-Native American human remains. If otherwise lawful, Clark County may authorize ground-disturbing activity to recommence after thirty (30) days, unless the SHPO and/or the Cowlitz Indian Tribe provide a written request for further consultation within that period. In the event of a written request for further consultation, the procedures applicable to the second instance will apply.

In the second instance, Clark County, the SHPO and the Cowlitz Indian Tribe will consult in good faith to arrive at mutually-agreeable and appropriate measures that Clark County will employ to avoid or mitigate any adverse effects associated with continued ground-disturbing activities in the affected area, and to determine the custody, treatment and disposition of the Native American human remains. Consultation must result in a written plan of action in accordance with Washington state law (RCW 27.44 or RCW 27.53) between the Cowlitz Indian Tribe, SHPO, and Clark County. Clark County may elect to develop programmatic plans for the treatment of archaeological resources and human remains in consultation with the SHPO and the Cowlitz Indian Tribe in advance

of any remedial actions to minimize work stoppages in the event of an inadvertent discovery.

If the mitigation measures entail the excavation and removal of archaeological resources or human remains, the Professional Archaeologist will obtain a written permit for such activities in accordance with RCW 27.53 "Archaeological Sites and Resources." Any mitigation measures to which Clark County, the SHPO and the Cowlitz Indian Tribe mutually agree shall be carried out solely at the expense of Clark County. Clark County will provide written notification (by email, fax or overnight mail) to the SHPO and the Cowlitz Indian Tribe when all mitigation measures have been completed. If no verbal or written response is received within three (3) working days, Clark County may authorize ground-disturbing activity to recommence.

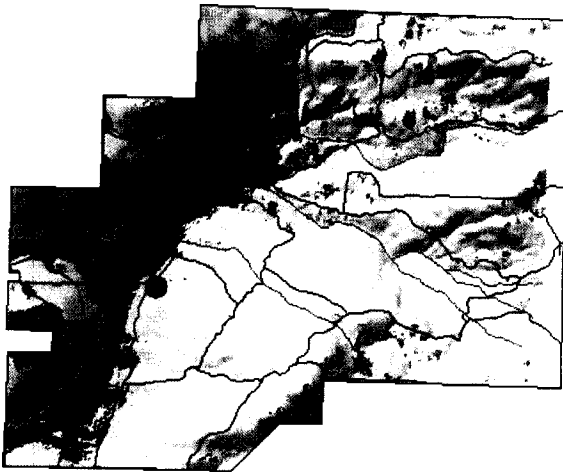
Attachment F



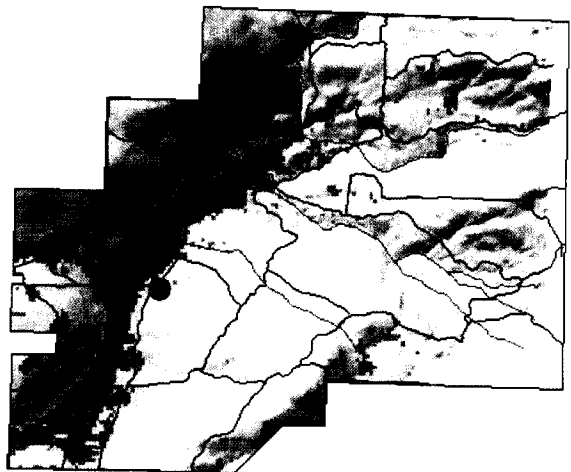
1. 45-CL-318 shown in purple with 300' diameter. Clark County shall notify the SHPO in writing prior to undertaking any disturbance of the ground surface or any other action that would affect its physical integrity.



2. Clark County Archaeological Predictive Model. Colored areas are "20-100% probability areas"



3. Areas with less than 5% slope are shown in green.



4. Areas mapped as "20-100% probability" in the Clark County Archaeological Predictive Model Map and having slopes less than 5%. Clark County shall prepare and submit to the SHPO a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within these areas.

**APPENDIX B: ARCHAEOLOGICAL AWARENESS TRAINING**

Presented By Lisa Folb, Nathan Reynolds, and Paul Solimano

## Camp Bonneville

Archaeology Awareness Training

## Introductions

Lisa Folb

Archaeologist with Michael Baker Jr., Inc.

Nathan Reynolds

Ecologist with the Cowlitz

Paul Solimano

Archaeologist – Applied Archaeological Research

## Awareness Training

- Relevant Laws
- Previously recorded sites and isolated finds
- Inadvertent discovery procedures
- Treatment of human remains
- Recognize objects, sites, & human remains

## Relevant Laws

- Indian Graves and Records (RCW 27.44)
- Archaeological Sites and Resources (RCW 27.53)
- Human Remains (RCW 68.50)
- Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)
- Department of Archaeology and Historic Preservation's *State Standards for Cultural Resource Reporting* (July 2006)
- Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37).
- National Historic Preservation Act (NHPA; 16 USC 470 et seq.) and Section 106 (36 CFR 800).
- Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.)

## Previously Recorded Cultural Resources

- 2 historic-period sites (45-CL-528 and 45-CL-529)
- 1 prehistoric and historic-period site (45-CL-318)
- 16 isolated finds

## Cultural Resources Survey was not 100%

- Sites may be present in these locations:
  - buried sites
  - alluvial contexts
  - floodplain/wetlands
  - higher elevations
  - areas with unexploded ordnance

## Agreement Documents

Programmatic Agreement (PA)  
and  
Finding of Suitability for Early Transfer  
(FOSET)

Cultural Resources Identification Procedure

## Agreement Documents Cont.

- Attachment D to the PA
  - Preservation Covenant  
(Included in the FOSET)
- Attachment E
  - Monitoring and Inadvertent Discovery Plan

## Definitions

- Archaeological Site – geographic locality that contains archaeological objects
- Archaeological Object – the physical evidence of an indigenous culture
- On-Site Environmental Compliance Officer (ECO) – on-site during all remediation activities
- Remediation Team – all workers engaged in the implementation of the MEC cleanup
- Professional Archaeologist – advanced degree in appropriate discipline and has fieldwork experience
- SHPO – State Historic Preservation Officer

## Definitions Cont.

- Calendar Days vs Working Days
- Low, moderate, high potential to impact
  - Low potential impacts: no ground disturbance, normal maintenance and repair of existing structures and facilities, lands that have been substantially disturbed to a depth of more than eight (8) inches, and areas that have been adequately surveyed in the past with no discovery of resources.
  - Moderate potential impacts: slight ground disturbance not otherwise characterized as having low or high impact potential.
  - High potential impacts: disturbance of more than twelve (12) inches below the ground surface and more than ten thousand (10,000) square feet of area.

## For Your Information

- SHPO and Cowlitz may visit Camp Bonneville at any reasonable time

## Preservation Covenant

Primary Concern:  
Protection of site 45-CL-318

300 feet of the center

ECO will notify the SHPO and Cowlitz Indian Tribe in writing

*Letter contents:*

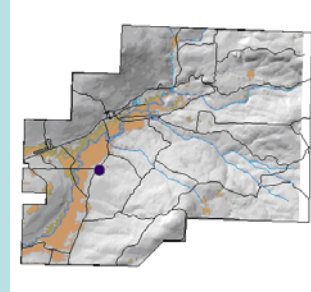
*describe the undertaking and the expected effect to the integrity of the site.*



### Other Concerns:

- Ground-disturbing Activities **not** associated with MEC remediation
- ECO will submit to the SHPO
  - a written assessment of effects for activities with a potential for **moderate** or **high** impacts within the areas that are in the intersection of
    - 20–100% probability and
    - Slope < 5%

### 20-100% Probability + < 5% slope



### Letter Contents

- *Assessment of project effects:*
  - 1. *Describe undertaking*
  - 2. *Discuss effects on recorded and unrecorded cultural resources*
  - 3. *Recommendations for*
    - A) *additional cultural resources survey or*
    - B) *other actions to avoid/mitigate adverse effects to cultural resources*

### Protection

- Prohibit known or inadvertent disturbance of cultural resources
- If there is a disturbance, stop activity, protect, notify SHPO

### SHPO Result

Respond in 30 Calendar days saying either:

- Proceed with no further consultation
- Initiate and complete consultation before proceeding

If no response in 30 days – Proceed

*Consultation = mutually-agreeable and appropriate measures to mitigate adverse effect*

### Attachment E

#### Monitoring and Inadvertent Discovery Plan

To be followed during all MEC activities

- Monitoring
- Awareness Training
- Inadvertent Discovery Procedures
- Human Remains

## Monitoring

ECO will be onsite during all remediation actions that result in ground-disturbing activity

- Sign and fence installation
- Land surveying
- Brush cleaning
- Metal detection investigations
- Excavation

## Inadvertent Discovery Plan

- Stop work
- Notify ECO

## ECO Responsibility

- If confirmed
  - Stop ground-disturbing activity within 100ft
  - Take appropriate measures to protect until procedures in plan are fully executed by
    - stabilization
    - covering
- KEEP CONFIDENTIAL
- RESTRICT ACCESS

## ECO Responsibility Cont.

1. Notify Archaeologist, SHPO, and Cowlitz
  - Telephone (no later than ONE WORKING day)
  - Written confirmation (emails, fax, overnight mail)
2. Archaeologist will inspect ASAP  
no later than THREE WORKING days

## Archaeologist Determination - Negative

Not an archaeological site:

- ECO authorizes activity to continue
- Archaeologist sends a letter report to
  - ECO, SHPO, Cowlitz, and Clark County
  - Within 15 CALENDAR days

*Letter: document finding and results, photos, determination*

## Archaeologist Determination - Positive

- Archaeologist notifies
  - ECO, SHPO, Cowlitz
    - Telephone (no later than ONE WORKING day)
    - Written confirmation (emails, fax, overnight mail)

Contents: nature of the finding, circumstances of discovery, and an opinion

- Not Eligible
- Insufficient Information

### **"Not Eligible"**

SHPO and Cowlitz must provide comments within 30 CALENDAR days

### **"Additional Information"**

- ECO, SHPO, and Cowlitz will Consult to agree on measures to avoid or mitigate the adverse effect
- May result in typical archaeological procedures

### **Treatment of Human Remains**

Human remains will be treated with dignity and respect at all times

### **Any Identification of Bone**

- Stop work
- Notify the ECO

### **ECO Responsibility**

- If confirmed
  - Stop ground-disturbing activity within 100ft
  - Take appropriate measures to protect until procedures in plan are fully executed by
    - stabilization
    - covering
- KEEP CONFIDENTIAL
- RESTRICT ACCESS

### **ECO Responsibility Cont.**

1. Notify Clark County Sheriff's Office, Archaeologist, SHPO, and Cowlitz
  - Telephone (no later than ONE WORKING day)
  - Written confirmation (emails, fax, overnight mail)
2. Archaeologist will inspect ASAP no later than THREE WORKING days

### Archaeologist Determination - Negative

Remains are non-human and no archaeological resources present:

- ECO authorizes activity to continue
- Archaeologist sends a letter report to
  - ECO, SHPO, Cowlitz, and Clark County
  - Within 15 CALENDAR days

*Letter: document finding and results, photos, determination*

### Archaeologist Determination – Additional Information

- SHPO and Cowlitz will be invited to be present
- Remains will be excavated sufficiently to make a determination
- If non-human, and no associated archaeological objects – activity may continue

### Archaeologist Determination – Positive

- If human – Archaeologist will notify the Sheriff, SHPO, and Cowlitz
- If non-Native – ECO will work with Sheriff to determine treatment
- If Native – ECO, SHPO, and Cowlitz with Consult

### Summary

- Stop Work
- Notify ECO
- Restrict Access
- Keep Confidential
- Treat Human Remains with Respect and Dignity

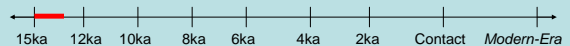
### Ecological and Cultural History of Southwest Washington State

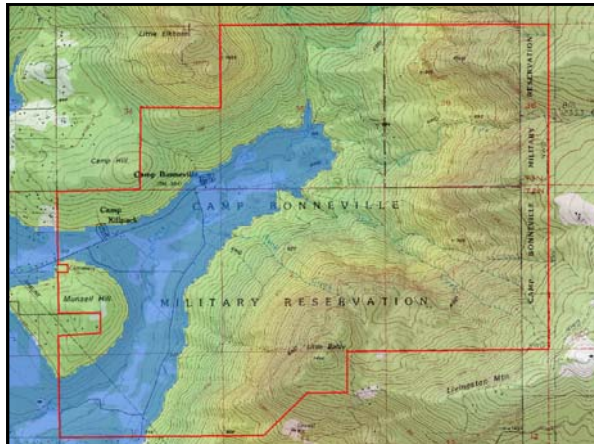


Nathan Reynolds  
Ecologist -- Cowlitz Indian Tribe

### 15,000-13,000 years ago:

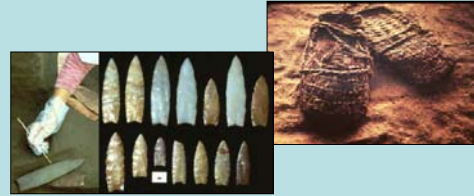
- Humans likely on the landscape of the Americas
- End of last Ice Age
- Missoula Floods





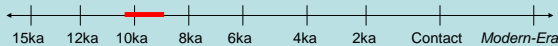
### 12,000-10,500 years ago:

- Humans elsewhere in PNW



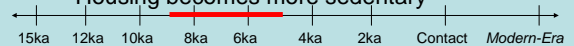
### 10,500-9,000 years ago:

- Climate equivalent to today
  - Conifer forest assemblage similar to today
  - Eco-zonation similar to today
- First known traces of humans in Clark County



### 9,000-4,500 years ago:

- Climate warmer than today
  - Mild moist winters, warm dry summers
  - Conifer forests receded, replaced by White oak/ Douglas-fir woodlands and savannahs, and prairie habitats
  - Change in tool technology
    - Smaller points
    - Enhanced food processing/storage
    - Enhanced harvesting efficiency
  - Housing becomes more sedentary



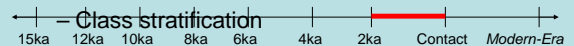
### 4,500-2,000 years ago:

- Climate cools, again equivalent to today
- Conifer forests advance
- Prairie areas persist due to anthropogenic burning practices
- Population densities increase



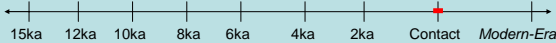
### 2,000 years ago to Contact:

- Climate stays stable
- Even higher population density
- Cultural Organization
  - Politically independent villages
  - No Hollywood chiefs
  - Strong intermarriage/Trade relations
  - Some landscape ownership/some shared areas



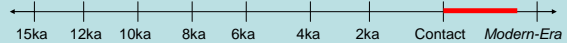
### Contact (~1800AD):

- Coastal/River Trade
- Lewis and Clark
  - Portland Basin Population ~15,500
  - Disease waves already evident
- Significant aspects of culture
  - Monumental architecture
  - Material culture
  - Trade Items/Trade Skills



### Post-Contact:

- Continued Disease (Malaria 1830-1835)
  - Fragmentation of Indian Culture, Dispersal
  - 1-2 % of pre-contact population survives
- Euro-American settlers arrive 1845
- Mostly empty landscape
  - Described as an “untamed wilderness”

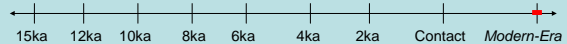


### Post-Contact (continued):

- No treaty, reservation or compensation for land
- Assimilation into White Culture
- Cessation of prairie burning
- Late 1800's
  - Recruitment and relocation of Indian individuals to the Yakima Reservation

### Modern Era:

- Cowlitz Tribal Organization formed 1912
  - Includes Salish/Sahaptin peoples
- In 1972, granted compensation for lands taken by USA – \$ not awarded.
- Cowlitz Indian Tribe
  - recognized in 2000
  - acknowledged in 2002



### Camp Bonneville Process From the Cowlitz Indian Tribe Perspective

- Applied to be LRA – not selected
- Promoted need for cultural resource survey
- Army conducted survey
  - much information incorrect, missed altogether
  - less than satisfactory field survey process
  - Army would not revisit CR survey document
- Assisted preparation of Inadvertent Discovery plan
  - Monitoring, monitoring, monitoring
  - Possible to revisit idea of new CR survey?

### Why should BCRRT care?

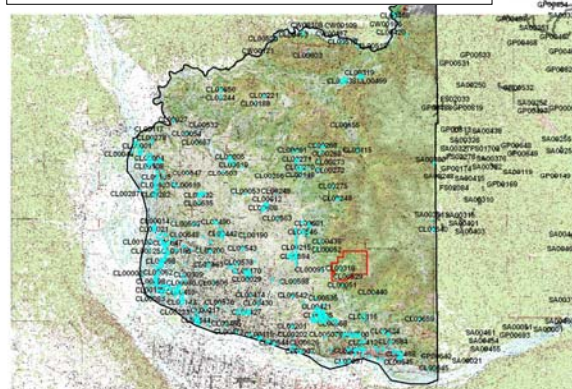
1. Oral histories:
  - Ralph Dreher, RAB Meeting, Aug 9<sup>th</sup> 2006
    - Artifacts: 11 bowls on the “Dubose”, arrowheads
    - Possible burials
    - Trails/trade routes through the site
  - Other neighbors concur



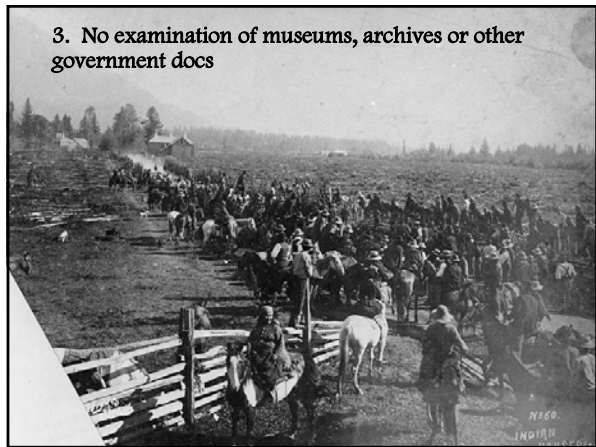
## 2: Other rich archaeological sites in close proximity

- 45-CL-95, recorded in 1972
- 0.8 miles from front gate of Camp B
- Artifacts included:
  - CCS flakes, projectile points, perforated sinker, flaked cobbles, blades, stone bowls, pestles, stone club, and 1- 12" artifact of unknown use.

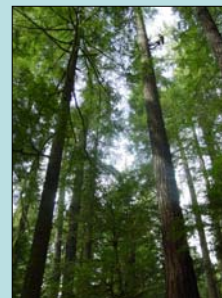
## 528 known sites in Clark County alone



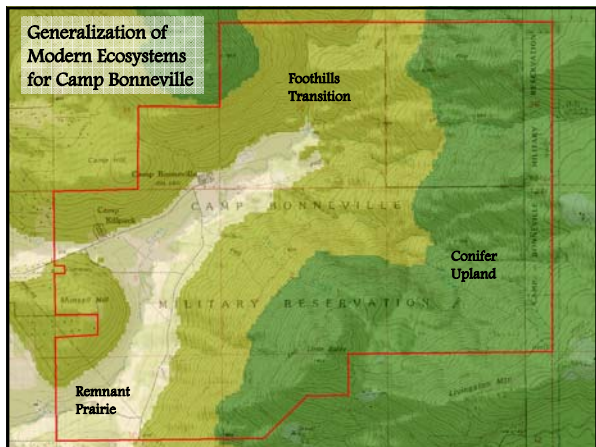
## 3. No examination of museums, archives or other government docs



## Overview of Camp Bonneville-Specific Ecology and Anthropology



## Generalization of Modern Ecosystems for Camp Bonneville



## Prairie Habitat

- Activities
  - Gathering roots
  - Gathering seeds
  - Processing plant foods
  - Hunting deer/elk
  - Hunting waterfowl
  - Tool repair
- Archaeology
  - Mortars/Pestles
  - Stone bowls
  - Oven features
  - CCS projectile points, lost and broken
  - CCS flakes/blanks
  - Bone

## Foothills Transition Habitat

- Activities
  - Cooking
  - Food processing
  - Hide preparation
  - Occupation/housing
  - Hunting/Butchering
  - Tool making/repair
- Archaeology
  - Fire-cracked rock
  - Mortars/Pestles/bowls grinding rocks
  - Scrapers
  - Cobble choppers
  - CCS flakes/blanks/lost points/broken points
  - Bone

## Conifer Upland Habitat

- Activities
  - Hunting
  - Butchering
  - Tool repair
- Archaeology
  - Cobble choppers
  - CCS flakes/blanks/lost points/broken points
  - Bone

## Disturbances that likely altered the archaeological signature

- Forest Fire 1902
- Grading and shaping of earth surface
  - Plowing/discing fields
  - Road building
  - Ordnance
  - Berms
- Surface collection of artifacts

## Questions?





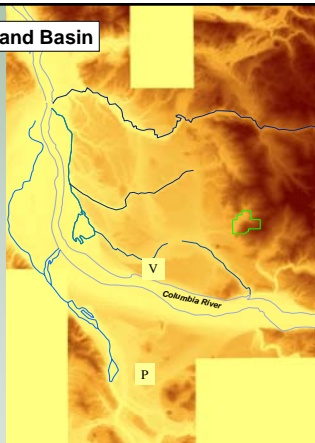
# Prehistoric Archaeology in the Portland Basin

Paul S. Solimano  
Applied Archaeological Research, Portland

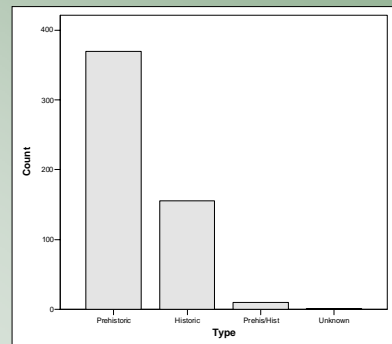
## Regional Prehistory

- What does the empirical archaeological record look like?
- What do we know about prehistory in the area?
- How does this information bear on Camp Bonneville?
- What types of sites and artifacts are likely to be found at Camp Bonneville?

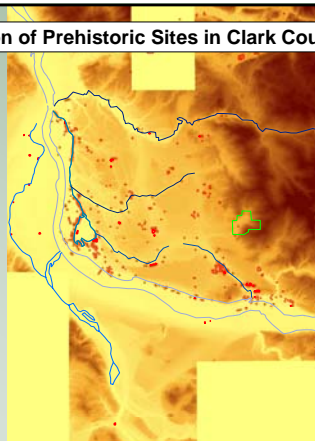
The Portland Basin



Sites by Period

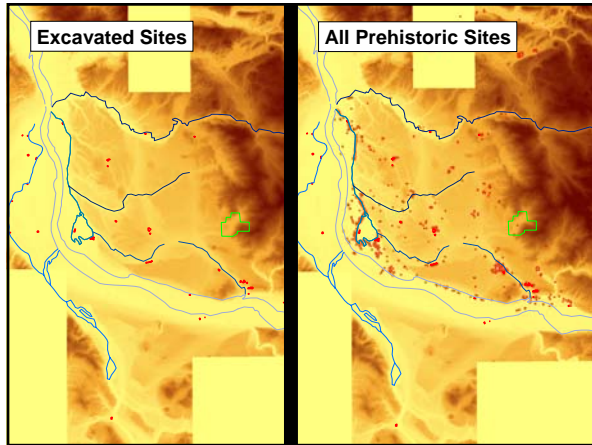
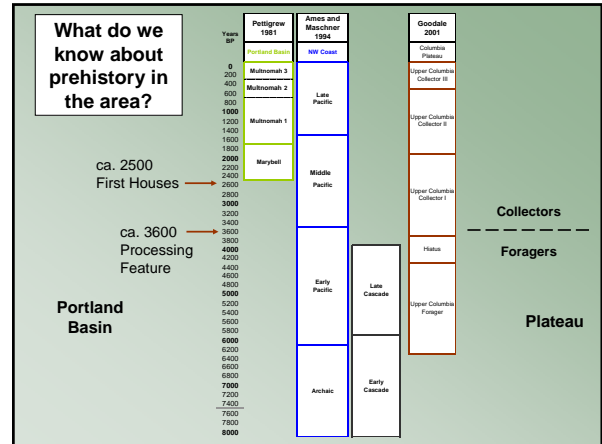
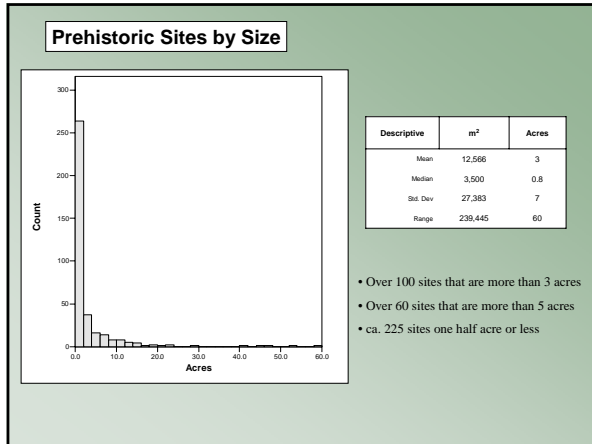


Distribution of Prehistoric Sites in Clark County



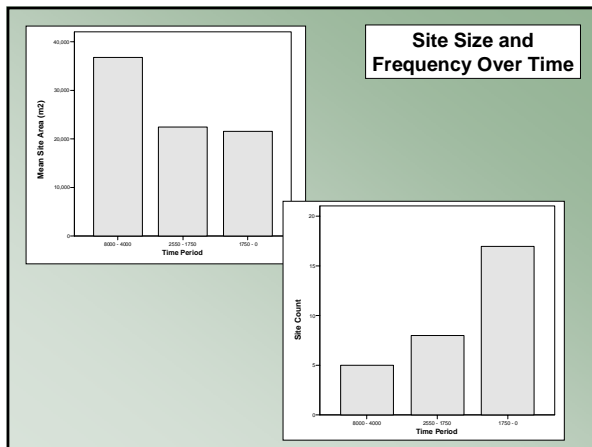
Detail of Prehistoric Site Distribution





### Artifact Classes

Artifact Class	Site No.	Classes	Assemblage Size
Projectile point	CL00632	5	13
Bifaces	CL00651	8	27
Flake Tools	CL00096	9	80
Unifaces	CL00428	12	552
Drill	Geertz	12	308
Gravers		5	5
Microblade	CL00412	19	394
Used Spalls	CL00527	10	29
Used Flakes	CL00055	11	374
Tabular Tools		3	3
Flaked Cobbles	CL00124	8	25
Cobble Choppers	CL00479	5	24
Perf Flaked Cobbs	CL00454	9	19
Flaked spalls	CL00500	10	165
Edge-battered Cobble	CL00500	5	91
Edge-ground Cobble	MU00009	11	1011
Hammerstones		6	6
Anvil	CL00427	9	81
Microblade Core	MU00057	8	101
Misc or UnID GS	CO00034	11	30
Abrader	CL00031	14	408
Shaft Abrader	CO00004	11	108
Adz	MU00001	15	511
Celt	CO00003	16	858
Adult Weights	MU00006	12	242
Mano	CO00007	8	238
Grinding Slabs	MU00028	5	21
Pestle/Maul	CL00004	8	88
Netweights	CL00004	5	7
Pecked stones	CL00006	15	172
Stone mortars/bowls	CO00005	11	546
Cores		14	14
Total	Total Sites	28	28



Time Period	N	Range	Mean
8000 - 4000	5	.66	-.17
6000 - 4000	3	3.14	1.00
2550 - 1750	6	2.76	-.54
1750 - 0	14	3.03	.08

Time Period	Descriptive	Richness	Evenness	Number of 100 year increments	Increase in Richness for each 100 year increment	Increase in Evenness for each 100 year increment	Number of Assemblages	Increase in Richness for each Assemblage	Increase in Evenness for each Assemblage
8000 - 4000	Net	10	1.72	40	0.25	0.043	5	0.2	0.34
	Range	11	3.26						
2550 - 1750	Net	9	1.66	8	1.2	0.21	8	1.2	0.21
	Range	13	3.77						
1750 - 700	Net	10	1.93	10.5	0.95	0.18	10	1	0.2
	Range	11	3.5						
700 - 0	Net	14	3	7	1.6	0.32	6	1.8	0.37
	Range	21	5.71						

Period		Interior	Columbia River Floodplain	
Pre 3000	Count	8	1	More sites in uplands
	Expected	4.4	4.6	
	Large	50	993	
	Small	971	38	
2550 - 1750	Count	6	2	
	Expected	3.9	4.1	
	Large	186	929	
	Small	911	206	
1750 - 700	Count	3	7	
	Expected	4.9	5.1	
	Large	898	254	
	Small	256	862	
700 - 0	Count	0	8	More sites in lowlands
	Expected	3.9	4.1	
	Large	1000	45	
	Small	14	982	

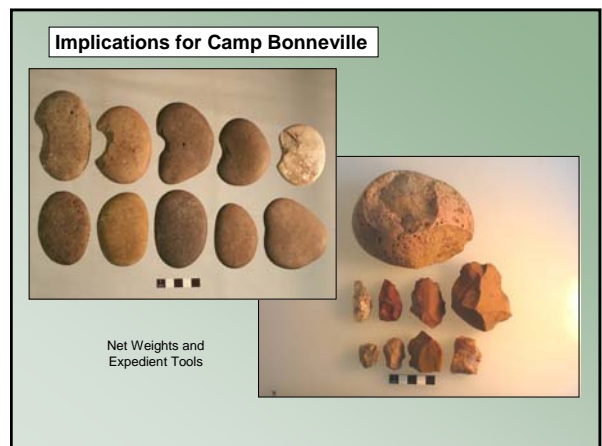
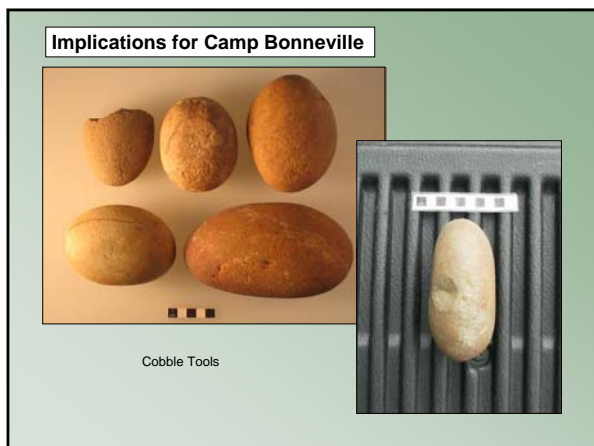
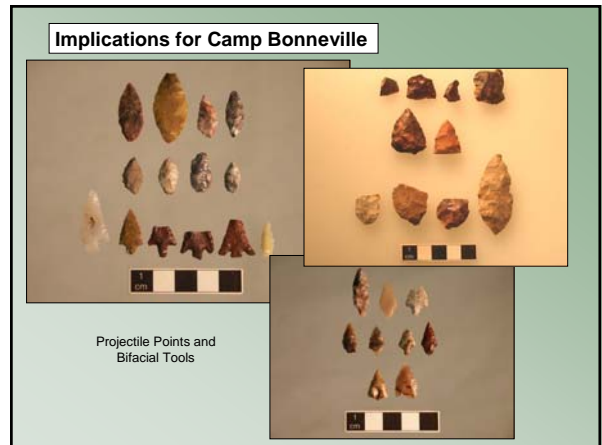
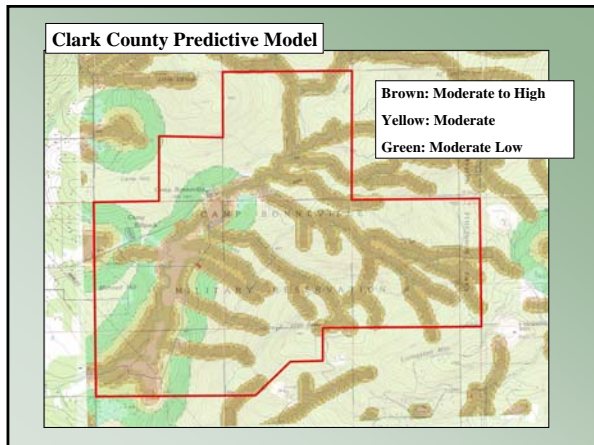
### What do we know about prehistory in the area?

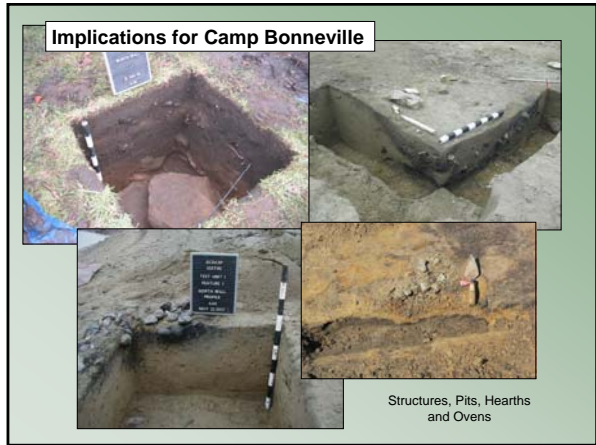
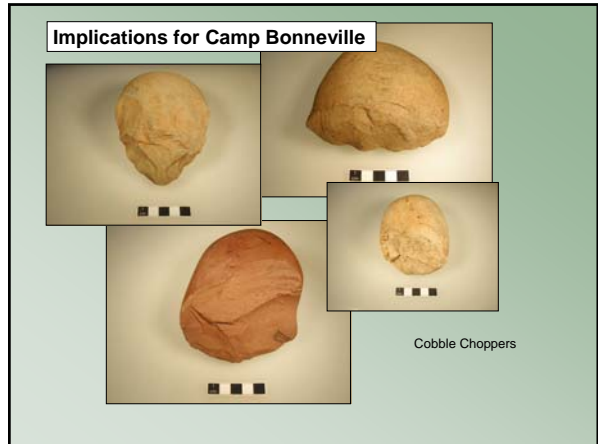
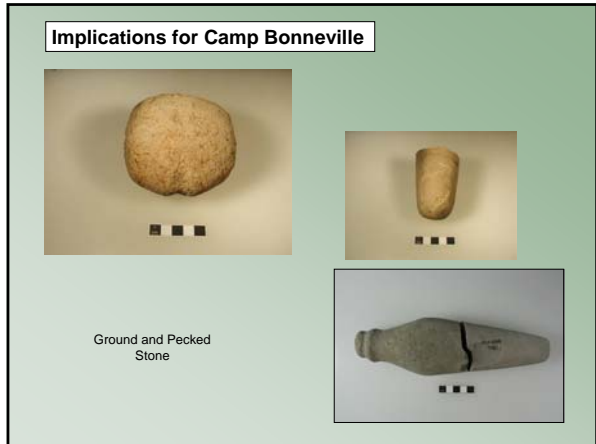
**Collectors**

- More Complex Settlement Patterns
- Substantial Houses
- Complex Resource Use
- Extensive Storage

**Foragers**

- Simpler Settlement Patterns
- No Houses
- Wide Diet Breadth
- Little Storage Technology





- Implications for Camp Bonneville**
- High likelihood for prehistoric sites.
  - Ground disturbance increases discovery probability.
  - Sites likely occur in a wider variety of environments than suggested by the Clark County Predicative Model.
  - Sites will date to nearly the entire Holocene, but post-ca. 700 bp sites may not be found.
  - A variety of functional sites may be expected (i.e. residential and task specific).

