**COUNTY OR MUNICIPALITY**

**APPROVAL FOR SURFACE MINING**

(Form SM-6)

<table>
<thead>
<tr>
<th>NAME OF COMPANY OR INDIVIDUAL APPLICANT(S)</th>
<th>TOTAL ACREAGE AND DEPTH OF PERMIT AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadman Materials Inc.</td>
<td>(Include all acreage to be disturbed by mining, setbacks, and buffers, and associated activities during the life of the mine.) (See SM-8A)</td>
</tr>
<tr>
<td></td>
<td>Total area permitted will be 471 acres</td>
</tr>
<tr>
<td></td>
<td>Maximum vertical depth below pre-mining topographic grade is 480 feet</td>
</tr>
<tr>
<td></td>
<td>Maximum depth of excavated mine floor is 100 feet relative to mean sea level</td>
</tr>
</tbody>
</table>

**MAILING ADDRESS**

PO Box 97038

Redmond, WA 98073-9738

**Telephone**

Proposed subsequent use of site upon completion of reclamation: Light Industrial and Forestry

<table>
<thead>
<tr>
<th>COUNTY</th>
<th>Snohomish</th>
</tr>
</thead>
<tbody>
<tr>
<td>No attachments will be accepted. Legal description of permit area:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1/4</th>
<th>1/4</th>
<th>Section</th>
<th>Township</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>SE</td>
<td>13</td>
<td>27N</td>
<td>6E</td>
</tr>
<tr>
<td>SE</td>
<td>24</td>
<td>27N</td>
<td>6E</td>
<td></td>
</tr>
<tr>
<td>W1/2</td>
<td>19</td>
<td>27N</td>
<td>7E</td>
<td></td>
</tr>
</tbody>
</table>

**TO BE COMPLETED BY THE APPROPRIATE COUNTY OR MUNICIPALITY:**

Please answer the following questions ‘yes’ or ‘no’:

1. Has the proposed surface mine been approved under local zoning and land-use regulations? 
   - Yes \[\square\] No \[\xmark\]

2. Is the proposed subsequent use of the land after reclamation consistent with the local land-use plan/designation? 
   - Yes \[\square\] No \[\xmark\]

When complete, return this form to the Department of Natural Resources.

<table>
<thead>
<tr>
<th>Name of planning director or administrative official (please print)</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gayle McCready</td>
<td>Snohomish County Ads</td>
</tr>
<tr>
<td>Signature</td>
<td>3600 Rockefeller</td>
</tr>
<tr>
<td>Title (please print)</td>
<td>M/S 604</td>
</tr>
<tr>
<td>Principal Planner</td>
<td>Everett, WA 98201</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Telephone</th>
<th>Date</th>
<th>FOR DEPARTMENT USE ONLY: DNR Reclamation Permit No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>425-262-2943</td>
<td>1/18/18</td>
<td></td>
</tr>
</tbody>
</table>
APPLICATION FOR
RECLAMATION PERMIT AND PLAN
(Form SM-8A)

Check appropriate box(es): ☑ new permit ☑ revision of existing permit ☑ transfer of permit ☑ expansion

NOTE: Do not attempt to complete this form until you have carefully read “Instructions for Form SM-8A”.

1. NAME OF APPLICANT/PERMIT HOLDER(S)
   Cadman, Inc.

2. MAILING ADDRESS
   PO Box 97038
   Redmond, WA 98073-9738

3. Telephone (206) 678-3131
   Email kurtt.siegfried@lehighhanson.com

4. NAME OF MINE
   High Rock Pit and Quarry

5. Street address and milepost of surface mine
   19221 High Rock Road. Monroe, WA 98272

6. Distance (miles) 2.5

7. Direction from South

8. Nearest community Monroe, WA

9. COUNTY Snohomish

   No attachments will be accepted. Legal Description of permit area:

<table>
<thead>
<tr>
<th>Section</th>
<th>Township</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>13</td>
<td>27N</td>
</tr>
<tr>
<td>NE</td>
<td>24</td>
<td>27N</td>
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<tr>
<td>W ½</td>
<td>19</td>
<td>27N</td>
</tr>
<tr>
<td>SE</td>
<td>18</td>
<td>27N</td>
</tr>
<tr>
<td>SW</td>
<td>18</td>
<td>27N</td>
</tr>
</tbody>
</table>

10. Do you or any person, partnership, or corporation associated with you now hold, or have you held, a surface mining operating or reclamation permit? ☑ yes ☑ no

If you answered yes to the above, please list: Complete list attached

11. Are all of these mines now in compliance with RCW 78.44, WAC 332-18, and conditions of the permits? ☑ yes ☑ no

Have you ever had a surface mining operating or reclamation permit revoked? ☑ yes ☑ no

Have you ever had a reclamation security forfeited? ☑ yes ☑ no

If you answered yes to either of the above, give permit number(s):

12. TOTAL ACREAGE OF PERMIT AREA APPLIED FOR:
   (Include all acreage to be permitted. See Form SM-6.) 471 acres

13. Total disturbed acreage (Include all acreage to be disturbed by mining and reclamation during the life of the mine.)
   Total area to be disturbed: 277 acres.
   Area to be disturbed in next 36 months: 50+ acres.

14. Maximum vertical depth (thickness) mined below pre-mining topographic grade will be 380 feet.

15. Lowest elevation of excavated mine will be 100 feet relative to mean sea level.
   Highest elevation of excavated mine will be 575 feet relative to mean sea level.

16. Type of proposed or existing mine: ☑ pit ☑ quarry

17. Material(s) to be mined: ☑ sand and gravel ☑ rock or stone
   ☑ clay ☑ metal ☑ limestone ☑ silica
   ☑ other ______

18. Deposit type: ☑ glacial ☑ river floodplain (alluvial)
   ☑ river channel deposits ☑ talus ☑ bedrock ☑ lode
   ☑ other ______

19. Expected start date of mining: N/A Active Operation

20. Estimated number of years:
   3.0 years quarry remaining,
   8.0 years S&G remaining

21. Total quantity to be mined over life of mine (estimated):
   +30MT ☑ tons or ☑ cu yds

22. Estimated annual production:
   1.0 M ☑ tons or ☑ cu yds

23. Subsequent land use: ☑ industrial ☑ commercial ☑ residential
   ☑ agricultural ☑ forestry ☑ wetlands and lakes
   ☑ other

24. Reclaimed elevation of floor of mine: Approx. 403 (S&G) Approx. 275’ (State Trust Quarry) Approx. 225’ (Expansion Quarry) relative to mean sea level
   Reclaimed elevation is shown on cross sections? ☑ yes ☑ no

25. SEPA Checklist required? ☑ yes ☑ no

26. Application fee for a new reclamation permit is herewith attached? ☑ yes ☑ no
# APPLICATION FOR RECLAMATION PERMIT AND PLAN

## 22. SEGMENTAL RECLAMATION

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit area has been divided into segments for mining and a mining schedule has been developed?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permission area has been divided into segments for reclamation and a reclamation schedule has been developed?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 23. SITE PREPARATION

### 23A. Saving Topsoil, Subsoil, and Overburden for Reclamation

<table>
<thead>
<tr>
<th>Question</th>
<th>Thickness of Topsoil</th>
<th>Thickness of Subsoil</th>
<th>Depth to bedrock</th>
<th>Total Volume of Topsoil</th>
<th>Total Volume of Subsoil</th>
<th>Storage Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness of topsoil is <strong>varies from 1.0 to 2.0 feet</strong></td>
<td>Varies 1.0 to 2.0 feet</td>
<td>Varies 10.0 to 20.0</td>
<td>Varies feet</td>
<td>Varies 360,000 cubic yards</td>
<td>Varies 3.0 Million cubic yards</td>
<td>Varies narrative</td>
</tr>
<tr>
<td>Total volume of topsoil is <strong>360,000 cubic yards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total volume of subsoil is <strong>3.0 Million cubic yards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume of stored topsoil/subsoil is <strong>see narrative</strong> cubic yards and will require <strong>see narrative</strong> acres for storage.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage areas are shown on maps and will be marked on the ground with permanent boundary markers?</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>Topsoil will be salvaged?</td>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topsoil and overburden will be moved to reclaim an adjacent depleted segment?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before materials are moved, vegetation will be cleared and drainage planned for soil storage areas?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil storage areas will be stabilized with vegetation to prevent erosion if materials will be stored for more than one season?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 23B. Permit and Disturbed Area Boundaries

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary of the permit area will be marked on the ground with permanent boundary markers?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>Explain boundary markers:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 23C. Setbacks Screens and Buffers

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are Screens required and are shown on maps?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>The reclamation setback for this site will be <strong>50.0 to 200.0 feet wide</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is a permanent, undisturbed buffer planned for this site?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setbacks and buffers are shown on maps and have been marked on the ground with permanent boundary markers?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If no, explain:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 23D. Buffers to Protect Streams and Flood Plains

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the site include a stream or flood plain?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>If yes, see “Additional Requirements for Mines in Flood Plains” in “Instructions for SM-8A”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If no, skip to 23E.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A stream buffer of at least 200 feet has been marked on the ground with permanent boundary markers?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>A buffer of at least 200 feet from the 100-year flood plain has been marked on the ground with permanent boundary markers?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>Portions of the site are within the 100 year floodplain. Mitigation has been covered under a wetland buffer restoration and enhancement plan. Permit #ZA 9206077</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copy of Shoreline Permit from local government or the Department of Ecology is attached?</td>
<td>☒</td>
<td>☐</td>
</tr>
<tr>
<td>Hydraulic Project Approval from the Department of Fish and Wildlife is attached?</td>
<td>☒</td>
<td>☐</td>
</tr>
</tbody>
</table>
**APPLICATION FOR RECLAMATION PERMIT AND PLAN**

### 23E. Conservation Buffers

Are there any conservation buffers?

- [x] yes  
- [ ] no

**If no, skip to 23F**

Conservation buffers will be established for the following purpose(s): (Check all that apply)

- [ ] unstable slopes  
- [ ] wildlife habitat  
- [x] water quality  
- [ ] other

Describe the nature and configuration of the conservation buffer(s): **Within sand and gravel phases there is a 10.0 foot vertical separation from the seasonal high water table. There is also a 100ft shoreline wetland buffer requirement.**

Conservation buffers are shown on maps and have been marked on the ground with permanent boundary markers?

- [x] yes  
- [ ] no

### 23F. Ground Water

High water table depth is **391.3** feet [x] relative to mean sea level, [ ] below original surface, or [ ] unknown. Well 93-4 on 4/3/97

Low water table depth is **285.7** feet [x] relative to mean sea level, [ ] below original surface, or [ ] unknown. Well 94-7 from 1-97 thru 11/28/17

Annual fluctuation of water table is from **366.5** feet on **11/98** to **373.3** feet on **4/2013, in well 94-1 typically**. Water levels are monitored monthly and reported annually according to the High Rock Monitoring Plan.

Are well logs attached?

- [ ] yes  
- [x] no

The shallowest aquifer is [ ] confined  
- [x] unconfined

The site will be mined: [ ] wet  
- [x] dry  
- [ ] both

Describe mining method: **Front end loaders in conjunction with haul trucks will feed the processing plant. The quarry side will employ drill and blast methods, the sand and gravel side will work active mine faces with front end loaders.**

The site is in a:

- [x] critical aquifer recharge area  
- [ ] sole source aquifer  
- [ ] public water supply watershed  
- [ ] wellhead protection area  
- [ ] special protection area  
- [ ] designated aquifer protection area

*If checked above, see “Additional Requirements for Mines in Hydrologically Sensitive Areas” in “Instructions for SM-8A”.*

Ground water study attached?

- [x] yes  
- [ ] no

**If no, explain:**

### 23G. Archeology

Are archeological/cultural resource sites present?

- [ ] yes  
- [x] no

If yes, describe how you will protect these resources:

### 24. MINING PRACTICES TO FACILITATE RECLAMATION

#### 24A. Soil Replacement

Topsoil and (or) subsoil will be restored?

- [x] yes  
- [ ] no

If “no”, explain:

Subsoil will be replaced to an approximate depth of **varies** feet on the pit floor and a depth of **varies** feet on slopes.

Topsoil will be replaced to an approximate depth of **2.0** feet on the pit floor and a depth of **<2.0** feet on slopes.

If topsoil is in short supply, it will be strategically placed in depressions and low areas in adequate thickness to conserve moisture and promote revegetation?

- [x] yes  
- [ ] no

If no, explain:

Topsoil will be moved when conditions are not overly wet or dry?

- [x] yes  
- [ ] no

If no, explain:

Topsoil will be restored to promote effective revegetation and to stabilize slopes and mine floor?

- [x] yes  
- [ ] no

If “no”, explain:

Topsoil will be replaced with equipment that will minimize compaction, or it will be plowed, disked, or ripped following placement?

- [x] yes  
- [ ] no

If no, explain:
Topsoil will be immediately stabilized with grasses and legumes to prevent loss by erosion, slumping, or crusting?  
If no, explain:  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Segmental topsoil removal and replacement is shown on maps?  
If no, explain:  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Topsoil will be imported?  
If yes, describe source. **Clean soil that is acceptable for use as topsoil may be imported and saved for reclamation to supplement existing topsoil.** Estimated volume is see narrative cubic yards.  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Synthetic topsoil made from compost, biosolids, or other amendments will be used and (or) made on site to supplement existing topsoil?  
If yes, explain: **Till is a component of the in-situ overburden and can be used to supplement topsoil.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Materials such as till, loess, and (or) silt are available on site that could be used to supplement topsoil for reclamation.  
If yes, explain:  
**Settling pond fines will be used to supplement topsoil.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

### 24B. Removal of Vegetation

Vegetation will be removed sequentially from areas to be mined to prevent unnecessary erosion?  
If no, explain:  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Small trees and other transplantable vegetation will be salvaged for use in revegetating other segments?  
If no, explain: **Small trees and other vegetation generally will not be saved, opportunities to salvage vegetation will be reviewed by site management on a case by case basis.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Wood and other organic debris will be:  
- recycled  
- removed from site  
- chipped  
- burned  
- buried  
- used to synthesize topsoil or mulch  
- other (explain)  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Solid waste disposal, burning, and land use permits are attached?  
If yes, give details.  
**Coarse wood may be saved for wetland buffer restoration.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Some coarse wood (logs, stumps) and other large debris will be salvaged for fish and wildlife habitats?  
If no, explain:  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

### 24C. Stormwater and Erosion control for Reclamation

Pit floor will slope at gentle angles toward highwall, sediment retention pond, or proper drainage?  
If no, explain: **See grading plans. Generally, the sand and gravel and quarry floors will slope towards sedimentation ponds and drainage features.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Revegetation, sheeting, and (or) matting will be used to protect areas susceptible to erosion?  
If no, explain: **Revegetation will be incorporated into areas susceptible to erosion.**  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Water control systems used during segmental reclamation will:  
- Divert clean water around pit?  
- Trap sediment-laden runoff before it enters a stream?  
- Be established to prevent erosion of setbacks and neighboring properties?  
- Be removed or reclaimed?  

If any answers are no, explain:  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>

Stormwater system design will be capable of carrying the peak flow of the 25-year, 24-hour precipitation event?  
*Data are available at the National Oceanic And Atmospheric Administration (NOAA)*  
If yes, are calculations attached?  
If yes, give details.  

<table>
<thead>
<tr>
<th>yes</th>
<th>no</th>
</tr>
</thead>
</table>
**APPLICATION FOR RECLAMATION PERMIT AND PLAN**

| Natural and other drainage channels will be kept free of equipment, wastes, stockpiles, and overburden? | ☑ yes ☐ no |
| 25. **RECLAMATION TOPOGRAPHY** |
| 25A. **Final Slopes** |
| Final slopes will be created using the cut-and-fill method? | ☑ yes ☐ no |
| Explain procedure to be used: **Fill will be placed on quarry benches for stabilization and to foster vegetation. See grading plan.** |
| Slopes will be created by mining to the final slope using the cut method? | ☐ yes ☑ no |
| Explain procedure to be used: **Final slopes within the sand and gravel phases will be created via the cut method. Some slopes within the quarry will be backfilled to final slope. See grading plans.** |
| Slopes will vary in steepness? | ☑ yes ☐ no |
| If no, explain: |
| Slopes will have a sinuous appearance in both profile and plan view? | ☑ yes ☐ no |
| If no, explain: |
| Large rectilinear (that is, right angle, or straight, planar) areas will be eliminated? | ☑ yes ☐ no |
| If no, explain: |
| Where reasonable, tracks of the final equipment pass will be preserved and oriented to trap moisture, soil, and seeds, and to inhibit erosion? | ☑ yes ☐ no |
| If no, explain: |
| 25B. **Slope Requirements for Pits and Overburden/Waste Rock Dumps (non-saleable products)** |
| *If the mine is a quarry or in hard rock, skip to Quarry section (25C).* |
| Slopes will vary between 2 and 3 feet horizontal to 1 foot vertical or flatter, except in limited areas where steeper slopes are necessary to create sinuous topography and control drainage? | ☑ yes ☐ no |
| If no, explain: |
| For pits, slopes will not exceed 2 feet horizontal to 1 foot vertical except as necessary to blend with adjacent natural slopes? | ☑ yes ☐ no |
| Give details: **Slopes will be kept at a maximum of 2:1** |
| Review “**Additional Requirements for Mines with Steep or Potentially Unstable Slopes**” in “Instructions for SM-8A”. |
| **Slope stability analysis required?** | ☑ yes ☐ no |
| If yes, attach analysis. No slope stability required for the sand & gravel mine. |
| 25C. **Slope Requirements for Quarries and Hardrock Metal Mines** |
| *If mine is a pit in unconsolidated materials covered by Section 25B, go to Section 25D* |
| Check the appropriate box(es) |
| ☐ Slopes will not exceed 2 feet horizontal to 1 foot vertical. |
| ☐ Slopes steeper than 1 foot horizontal to 1 foot vertical are an acceptable subsequent land use as confirmed on Form SM-6. |
| ☑ Hazardous slopes or cliffs are indigenous to the immediate area and already present a potential threat to human life. Photo and maps attached to document presence of cliffs. Cliff are indigenous to the area (Bronn Parcel) |
| ☐ Geologic or topographic characteristics of the site preclude slopes being reclaimed at a flatter angle and are an acceptable subsequent land use as confirmed on Form SM-6. |
| Review “**Additional Requirements for Mines with Steep or Potentially Unstable Slopes**” in “Instructions for SM-8A”. |
| **Slope stability analysis required?** | ☑ yes ☐ no |
| If yes, attach analysis. **See High Rock Quarry Phase 2 Stability Assessment, High Rock Quarry Reclamation Backfill Geotechnical Quality Assurance Plan and High Rock Quarry Slope Stabilization Monitoring Plan.** |
Measures will be taken to limit access to the top and bottom of hazardous slopes?  
☑️ yes ☐ no

Describe measures, or if no, explain: **Areas identified to have unstable slopes have been modified and stabilized with backfill materials from the site. Areas deemed unstable in the future will be closed off from access by placing berms around the perimeter.**

Selective blasting will be used to remove benches and walls and to create chutes, buttresses, spurs, scree slopes, and rough cliff faces that appear natural?  
☑️ yes ☐ no

Blasting plan attached?  
☐ yes ☒ no

If no, explain: **Production blasting will take benches to final configuration. See final mine grading figure.**

Reclamation blasting will be used to reduce the entire highwall to a scree or rubble slope less than 2 feet horizontal to 1 foot vertical?  
☐ yes ☐ no

Blasting plan is attached?  
☑️ yes ☐ no

If no, explain: **Production blasting will take benches to final configuration.**

Access to benches will be maintained for reclamation blasting?  
☑️ yes ☐ no

If no, explain:

Small portions of benches will be left to provide habitat for raptors and other cliff-dwelling birds?  
☑️ yes ☐ no

25D. Backfilling

The site will require backfilling?  
☑️ yes ☐ no

**If no, skip to 25E.**

Maximum depth of backfilling is 100.0 feet.

Backfill will be ☐ onsite materials ☑ imported materials ☐ both  
☐ yes ☒ no

Provide a written screening method that ensures importation of acceptable soil for reclamation.

Backfilling plan is attached?  
☐ yes ☒ no

If no, explain:

Backfill stockpiles are shown on maps and will be marked on the ground with markers?  
☑️ yes ☐ no

All grading/backfilling will be done with non-noxious, non-combustible, and relatively incompactible solids?  
☐ yes ☐ no

If no, explain:

Backfill will require compaction?  
☑️ yes ☐ no

If no, explain: **See attached High Rock Quarry Reclamation Backfill Geotechnical Quality Assurance Plan.**

Will you be backfilling to create slopes?  
☐ yes ☒ no

Is slope stability analysis attached?  
☑️ yes ☐ no

If no, explain. **See High Rock Slope Stabilization Monitoring Plan and High Rock Quarry Phase 2 Stability Assessment.**

25E. Mine Floors

Flat areas will be formed into gently rolling mounds?  
☑️ yes ☐ no

If yes, give details. If no, explain: **See attached narrative.**

Mine floor will be gently graded into sinuous drainage channels to preclude sheetwash erosion during intense precipitation?  
☑️ yes ☐ no

If yes, give details. If no, explain: **See attached narrative and grading plan.**

Mine floor and other compacted areas will be bulldozed, plowed, ripped, or blasted to foster revegetation?  
☑️ yes ☐ no

If yes, give details. If no, explain: **See attached narrative.**

25F. Lakes, Ponds, and Wetlands

Is water currently present in the area or will the mining penetrate the water table?  
☐ yes ☒ no

**If no, go to Section 25G.**
Reclaimed areas below the permanent low water table in soil, sand, gravel, and other unconsolidated material will have a slope no steeper than 1.5 feet horizontal to 1 foot vertical?  

If yes, give details. If no, explain:

If not already present, soils, silts, and clay-bearing material will be placed below water level to enhance revegetation?  

If yes, give details. If no, explain:

Some parts of pond and lake banks will be shaped so that a person can escape from the water?  

If yes, give details. If no, explain:

Armored spillways or other measures to prevent undesirable overflow or seepage will be provided to stabilize bodies of water and adjacent slopes?  

If yes, give details. If no, explain:

Wildlife habitat will be developed, incorporating such measures as:

- Sinuous and irregular shorelines?  
- Varied water depths?  
- Shallow areas less than 18 inches deep?  
- Islands and peninsulas?  

Give details:

Ponds or basins will:

- Be located in stable areas?  
- Have sufficient volume for expected runoff?  
- Have an emergency overflow spillway?  
- Spillways and outfalls will be protected (for example, rock armor) to prevent failure and erosion?  

If any answers are no, explain:

Proper measures will be taken to prevent seepage from water impoundments that could cause flooding outside the permitted area or adversely affect the stability of impoundment dams or adjacent slopes?  

If yes, give details. If no, explain:

Written approval from other agencies with jurisdiction to regulate impoundment of water is attached?  

If no, explain:

25G. Final Drainage Configuration

Drainages will be constructed on each reclaimed segment to control surface water, erosion, and siltation?  

Result in essentially natural conditions of volume, velocity, and turbidity?  

Clean runoff is directed to a safe outlet?  

If yes, give details. If no, explain:  See High Rock Stormwater Plan.

Are these shown on maps?  

26. SITE CLEANUP AND PREPARATION FOR REVEGETATION

26A. Dealing with Hazardous Materials

Hazardous materials are present at the mine site?  

If no, go to Section 26B

The final ground surface drains away from any hazardous natural materials?  

If yes, give details. If no, explain:

Plan for handling hazardous mineral wastes indigenous to the site is attached?  

If no, written approval from all appropriate solid waste regulatory agencies attached?
### 26B. Removal of Debris

All debris (garbage, ‘bone piles’, treated wood, old mining equipment, etc.) will be removed from the mine site?  

- [ ] yes  [ ] no

All sheds, scale houses, and other structures will be removed from the site?  

- [ ] yes  [ ] no

If either answer is yes, give details. If no, explain: **Mining equipment and structures will be removed from site upon final reclamation.**

### 27. Revegetation

The mine site is in:  

- [ ] eastern Washington  
- [x] western Washington

The average precipitation is **59.1** per year.

Revegetation will start during the first proper growing season (fall for grasses and legumes, fall or late winter for trees and shrubs) following restoration of mine segments?  

- [x] yes  [ ] no

If yes, give details. If no, explain: **See narrative.**

The site will not be revegetated because:  

- [ ] It is a rural area with a rainfall exceeding 30 inches annually and erosion will not be a problem (requires approval of DNR).  
- [ ] Revegetation is inappropriate for the approved subsequent use of this surface mine.

Explain:

### 27A. Recommended Pioneer Species

In the Sections below, check the species that will be planted at your mine site:

* indicates nitrogen-fixing species

#### Western Washington Dry Areas

- [ ] alfalfa*  
- [ ] cereal rye  
- [ ] creeping red fescue  
- [x] ground cover

- [ ] lupine*  
- [ ] perennial rye  
- [ ] red alder*  
- [ ] shrubs

- [ ] clover*  
- [ ] colonial bent grass

- [x] orchard grass  
- [ ] ponderosa pine

- [ ] shore pine

#### Western Washington Wet Areas

- [x] birdsfoot trefoil  
- [ ] cottonwood  
- [x] red alder*

- [ ] sedges  
- [ ] wetland grasses  
- [ ] creeping red fescue

- [ ] cedar  
- [ ] willow

#### Eastern Washington Dry Areas

- [ ] alder*  
- [ ] black locust  
- [ ] deciduous trees  
- [ ] diverse evergreens

- [ ] grasses  
- [ ] lodgepole pine  
- [ ] ponderosa pine  
- [ ] shrubs

- [ ] alfalfa*  
- [ ] clover

- [ ] juniper  
- [ ] lupine*

- [ ] deep-rooted ground cover

#### Eastern Washington Wet Areas

- [ ] alder*  
- [ ] serviceberry  
- [ ] other

- [ ] cottonwood  
- [ ] tubers

- [ ] poplar  
- [ ] willow

- [ ] sedges

Give planting details (stems/acre of trees and shrubs, see Forest Practices manual; lbs/acre of grass, legume, or forb mixture): **See narrative.**

Describe weed control plan:
### 27B. Planting Techniques

Revegetation at this site will require:

- Ripping and tilling? [x] yes [ ] no
- Blasting to create permeability? [ ] yes [x] no
- Mulching? [x] yes [ ] no
- Irrigation? [ ] yes [x] no
- Fertilization? [ ] yes [x] no
- Importation of clay- or humus-bearing soils? [ ] yes [x] no
- Other soil conditioners or amendments? [x] yes [ ] no

Give details:

### Trees and shrubs will be planted in topsoil or in subsoil amended with generous amounts of organic matter?

[ ] yes [x] no

If yes, give details. If no, explain:

### Mulch will be piled around the base of trees and shrubs?

[ ] yes [x] no

### High quality stock will be used?

[ ] yes [x] no

### Trees and shrubs will be planted while they are dormant?

[ ] yes [x] no

### Stock will be properly handled, kept cool and moist, and planted as soon as possible?

[ ] yes [x] no

### Seeds will be covered with topsoil or mulch no deeper than one-half inch?

[ ] yes [x] no

If any answers are no, explain:

### 28. FINAL CHECKLIST

#### All required maps are attached? *(See “Instructions for SM-8A” for detailed requirements.)*

[ ] yes [x] no

#### All required cross sections are attached? *(See “Instructions for SM-8A” for detailed requirements.)*

[ ] yes [x] no

#### Geologic map attached (if required)? *(See “Instructions for SM-8A” for detailed requirements.)*

[ ] yes [x] no

#### All documents submitted have the date, the name and address of the permit holder, and the application number?

[ ] yes [x] no

#### Have you completed the SM-6 and has it been signed by the local jurisdiction?

[ ] yes [x] no

#### Have you provided the SEPA checklist?

[ ] yes [x] no

#### Have you provided a copy of the SEPA determination (DNS, MDNS, or DS)?

[ ] yes [x] no

#### Have you attached photographs (as needed)?

[ ] yes [x] no

#### Are additional supplemental studies included?

[ ] yes [x] no

If yes, check the appropriate box(es) below:

- Archeological [ ]
- Geohydrologic [x]
- Backfill [ ]
- Slope stability [x]
- Topsoil [ ]
- Flood plain [ ]
- Conservational [ ]
- Vegetation [ ]
- Other [ ]

#### Other permits required? [ ] yes [ ] no

If yes, check the appropriate box(es) below:

- Shoreline Permit [x]
- Water Discharge Permit [ ]
- Solid Waste Permit [ ]
- Air Quality Permit [x]
- NPDS or General Discharge Permit [x]
- Hydraulic Project Approval [ ]
- Special or Conditional Use Permit [ ]
- Other [ ]
APPLICATION FOR RECLAMATION PERMIT AND PLAN

IDENTIFICATION OF LANDOWNER(S)

Identify names and addresses of all landowners. Provide written evidence of landowner approval of the extraction of minerals by surface mining methods and of the reclamation plan and/or provide the signature of all landowners below. If landownership has been severed between surface and mineral rights ownership, identify all affected mineral rights owner(s) and provide their approval. (Attach signed copies of this page if more than one.)

Print Name(s) Washington State Department of Natural Resources

Address(es): 919 N Township
Sedo-Woolley, WA 98284

APPLICANT ACKNOWLEDGMENT

By signing this application, the applicant acknowledges the following:

- **Application’s Information True.** The applicant verifies that all information on this application and reclamation plan is true.
- **Reclamation Plan Contents.** The applicant’s reclamation plan consists of this document (SM-8A), SM-6, associated maps, cross sections, reclamation narrative, and other attachments. The department’s approval of this application would reflect approval of the applicant’s reclamation plan.
- **Applicant/Permit Holder Must Comply.** If the department approves this application, the applicant shall be the permit holder and shall be responsible for compliance with Chapter 78.44 RCW, Chapter 332-18 WAC, the terms and conditions of the permit, and the approved reclamation plan and attachments. The permit holder shall comply with the permit and may not significantly deviate from the reclamation plan without prior written approval by the department for the proposed change. Revised permits or modified plans might be necessary following significant deviations.
- **Applicant/Permit Holder Consents to Inspection.** All permitted surface mines are subject to regular inspection. See RCW 78.44.161 and WAC 332-18-050. The applicant verifies that it has authority to consent to department inspections on behalf of itself and the landowner(s). Applicant authorizes the department to enter and inspect any property covered by this application during any day or time determined necessary by the department to ensure compliance with the Surface Mining Act, Surface Mining Rules, the Reclamation Permit, and the Reclamation Plan.

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<td>Dave Warner</td>
<td>Area Manager, Aggregates</td>
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| LANDOWNER(S) | |
|--------------| |
| As landowner, I [Dave Symmank](name) authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan. | |

Signature: [Signature]

Date signed: 4-3-2020

| FOR DEPARTMENTAL USE ONLY | |
|---------------------------| |
| Date accepted | Accepted by: | Title: | Reclamation Permit No. | |
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APPLICANT
Signature of surface mine permit applicant or applicant’s company representative

Name and Title of Company Representative
(Please print)
Dave Warner
Area Manager, Aggregates

Date signed 4/3/20

LANDOWNER(S)
As landowner, I [name] authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan.

Signature: [Signature]
Date signed: 4-3-2020

FOR DEPARTMENTAL USE ONLY
Date accepted
Accepted by:
Title:
Reclamation Permit No.

Form SM-8A Revised 7/2018
Page 10 of 10
Reclamation Permit/App No.
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Print Name(s): Marella Investments LLC

Address(es): 4124 NE 186th Street
Lake Forest Park, WA
98155

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APPLICANT

Signature of surface mine permit applicant or applicant's company representative

Landowner(s)

As landowner, I Gary Bromm & Bernie TeVelde (name) authorize the applicant to extract minerals from my land using surface mining methods and I approve this reclamation plan.

Signature: [Signature]

LANDOWNER(S)

Date signed: 1-11-19

FOR DEPARTMENTAL USE ONLY

Date accepted

Accepted by:

Title:

Reclamation Permit No.
APPLICATION FOR RECLAMATION PERMIT AND PLAN

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Print Name(s): Cadman, Inc.
Address(es): 7554 185th Ave NE
Redmond, WA 98073

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Cadman High Rock  
Narrative for Form SM-8A (updated from 2008)  
Reclamation Permit No. 70-011346  
Revision and Expansion March 2020

The purpose of this narrative is to supplement the Washington State Department of Natural Resources (DNR) Application for Reclamation Permit Form SM-8A for reclamation of the Cadman, Inc. High Rock quarry and gravel mine. DNR has issued a combined reclamation permit for the Cadman-owned portion of the site and for the portion of the site located on the State Trust parcel (Permit No. 70-011346). This permit application will include an expansion component for a 40-acre parcel north of the State Trust parcel and serve to address the importation of clean reclamation backfill as part of a landslide mitigation measure. This plan is intended to incorporate all the lands into one reclamation plan.

SITE DESCRIPTION
The site is located adjacent to SR 203 approximately two and a half miles south of the city of Monroe, Washington in Snohomish County. The existing property consists of two contiguous parcels; the 134-acre western portion is owned by Cadman, Inc., referred to as the “Cadman Parcel,” and the 269-acre eastern portion is owned by the Washington State DNR, referred to as the “State Trust Parcel.” This application will seek to add an additional 40-acre parcel, “Brons Parcel” north of the State Trust Parcel thus creating a total permit area of 441 acres.

Mining Operations
Mining of sand and gravel has occurred on the Cadman parcel since the 1920s. Snohomish County issued the original Conditional Use Permit (CUP) to a previous operator in 1974. That conditional use permit expired in 1984 after Cadman took over operation. Extraction of the alluvial and unconsolidated glacial deposits within this parcel has been completed. At present, operations on this parcel are limited to processing, transporting, and support services.

Rock quarrying on the north portion of the State Trust parcel began in 1974. This parcel is leased by Cadman, Inc. via a mining contract (Agreement No. 32-B61123) from DNR that expires on August 20th, 2029. The quarried materials consist of basalt and andesite bedrock outcrops. To facilitate quarrying in this area, sand and gravel has been extracted from the overburden materials overlying the bedrock outcrops. In 1999, Cadman applied to expand sand and gravel mining to the southern portion of the State Trust parcel. At present, rock-quarrying continues in the northern portion and sand and gravel extraction occurs within mining cells 3A-3C of the State Trust parcel and is transported to the Cadman parcel for processing.

Environmental Documentation
A Final Environmental Impact Statement (FEIS) was prepared on October 2, 1998 to evaluate the proposal to renew the expired CUP for the Cadman parcel, establish a CUP for mining operations on the State Trust Parcel, and obtain approval of a substantial shoreline development permit. On February 16, 1999, a Hearing Examiner Pro Tempore for Snohomish County approved a CUP for the entire site and the shoreline development permit. The CUP was issued on April 25, 2002. Additionally, on November 16th, 2017, a Decision of the Snohomish County Hearing Examiner approved an expansion of the existing rock quarry into 40 acres of zoned Mineral Conservation lands, Bronn parcel. The additional 40 acres is north of the State Trust parcel and will be contiguous to the existing quarry operations. Advancement into the expansion area is expected to begin in 2020.
**Geology and Groundwater**

The products being mined derive from both sedimentary and bedrock units. Volcanic bedrock is exposed in the quarry and in numerous outcrops in the expansion area and northern part of the State Trust parcel. The bedrock consists of andesite and basaltic andesite and slopes generally southwestward at an angle of approximately 20 degrees. The bedrock outcrops are overlain by glacial sediments that vary in depth from zero feet in the north to up to 500 feet in the south portion of the State Trust parcel. Sand and gravel extraction will occur in the upper portion of the glacial sediments in the State Trust parcel. These mined sediments consist primarily of recessional outwash sand and gravel. A till-like soil, interpreted to be an ice-contact deposit, also occurs on a large part of the mined southern portion of the State Trust parcel. This deposit is referred to as the “till cap.” The sedimentary units mined from the Cadman parcel consisted primarily of alluvium of the Snoqualmie and Skykomish Rivers.

The advance outwash sand and gravel in the State Trust parcel is underlain by transitional bed silt, at approximately 350 to 380 feet elevation, and advance outwash sand, at approximately 250 to 350 feet elevation. The transitional bed silt contact forms the High Rock Road Aquifer and results in numerous springs above the unit’s upper contact.

The existing High Rock mine and expansion area are located on the east side of the Snoqualmie Valley. The topography of the expansion area ranges from a gently sloping terrace in the northwestern side of the expansion area rising to steep cliffs on the southeastern side of the site. The change in slope is coincident with the inferred northwest-dipping top of the basalt bedrock surface. The cliffs trend in an approximate northeast direction; with cliff faces of up to 50 feet. The elevation of the expansion area ranges from about 200 to 225 feet amsl in the terrace area to over 500 feet amsl in the southeast corner of the expansion area.

Previous hydrogeologic investigations (Huckell/Weinman Associates, Inc. 1998 and Garland and Liszak 1995) have identified several aquifer units at the High Rock Quarry, the relevant aquifer units in the expansion area include:

- **High Rock Road Aquifer (HRRA):** A semi-confined aquifer that consists of unconsolidated glacial units, primarily an outwash sand and gravel terrace deposit located along the terrace upland on the east side of the Snoqualmie Valley. The HRRA is bounded to the east by bedrock and to the west by the Snoqualmie Valley. The HRRA continues to the north, northeast and is inferred to extend to the northeast of the expansion area.

- **Valley Alluvial Silt and Sand Aquifer:** An unconfined aquifer that consists of alluvial deposits from the Skykomish and Snoqualmie Rivers. These deposits thicken toward the center of the Snoqualmie Valley and pinch out on the western portions of the mine properties. Local sandy zones provide sufficient water for wells on the west side of SR 203.

- **Bedrock Aquifer:** consists of the Eocene basaltic and volcaniclastic rocks in the eastern portion of the High Rock Quarry and in the expansion area. Water occurs under confined conditions in joints and fractures in the bedrock.

Groundwater flow in the HRRA and Valley Alluvial Silt and Sand Aquifer in the area of the High Rock Quarry is to the west-northwest (Aspect 2012, 2013). In the area of the proposed quarry expansion, groundwater flow is inferred to be discharging to Foye Creek.
CURRENT CONDITIONS

Current hard rock mining is being conducted on benches of the south wall and within areas of the quarry floor. Hard rock extraction is scheduled to be completed in 2022 on the State Trust Parcel. Instability along the east slope of the quarry became a concern in late 2011. The headscarp of the slide area occurred on Bench 3 (elevation 460 ft amsl) and the toe of the slide occurred on Bench 7 (elevation 300 amsl) with a slide length of approximately 400 feet in the E-W direction. Sliding occurred over a N-S width of approximately 500 feet.

Cadman initiated construction of an earthen stabilization buttress in July 2013 and further stabilization of the slide area for reclamation is planned to be accomplished by the construction of a stabilization buttress using imported clean soils and assisted by positive drainage of the quarry.

A full analysis with technical recommendations can be found in the Phase 2 Stability Assessment dated May 3rd 2017 and initially submitted to DNR in mid-2017 [Golder Associates Inc. (Golder)]. More detailed recommendations and actions for long term slope stability and assurances can be found in the Reclamation Backfill Geotechnical Quality Assurance Plan (Golder, 2018) and Slope Stabilization Monitoring Plan (Golder, 2018) included with this plan.

Mining of the sand and gravel segments will essentially remain unchanged from the previously approved 2008 reclamation plan and are as follows:

- Mining will remove the till cap that currently governs wetland hydrology and protects the High Rock Road Aquifer. A detailed sand and gravel mining sequence of development, mining, and reclamation was prepared during the environmental impact analysis to describe the manner in which the till-cap will be replaced as a safeguard for infiltration into the local aquifer. See the groundwater section of this narrative for more detail on the existing, long-term monitoring to preserve the hydroperiod and recharge to the HRRA aquifer.

- The sand and gravel mine has been divided into 18 mining cells in 6 segments for development. As topsoil is removed from one segment it will replace topsoil in another segment that has been mined and backfilled with till. As till-cap material is encountered while mining sand and gravel from one segment, it will be transported and placed to reclaim slopes in another mined segment or temporarily stored for future reclamation within the sand and gravel mine. Placement of till within temporary storage locations will be managed by Cadman staff and constructed to prevent erosion. Additionally, site management will perform monthly inspections to ensure stormwater is directed to conveyance systems. Till previously placed near mining boundaries that show signs of instability will be modified during the dry season, modifications may include but are not limited to; decreasing slope angles to 3H:1V, lining channels with geo-fabric and or rip rap, constructing localized blanket drains to limit hydrostatic pressure, and/or inclusion of appropriate erosion control best management practices. Future advancement into the sand and gravel mining cells will create the footprint necessary for final placement of all temporary stockpiles. In the initial phases of development, topsoil removed from the first mining phases was used to construct a noise berm along the southern boundary of the State Trust parcel sand and gravel mine. Wash plant waste may be used throughout the project for reclamation material as available.
The Cadman Parcel has already been mined out. Therefore, many areas not currently being used for processing have already been reclaimed. Reclamation of existing processing areas will occur as equipment is removed and these areas are no longer necessary for processing.

**Reclamation Materials**

Cadman is negotiating with DNR regarding use of offsite, clean soils for long-term, slope stability and general reclamation enhancement of the quarry portion of the State Trust Parcel. Reclamation of the quarry portion of the site will be accomplished by using a combination of imported and native clean soils (Cadman Clean Soil Policy) to improve and further stabilize the previously constructed fill buttress. The High Rock Quarry and Reclamation Backfill Quality Assurance Plan and Specifications along with Cadman’s Clean Soil Policy detail the types and estimated quantities of materials expected to be imported for slope stabilization and reclamation.

Reclamation sequencing and materials used for reclamation in the sand and gravel segments will essentially remain unchanged from the previously approved 2008 reclamation plan.

Reclamation of the expansion property will consist of placing clean soils at a 2H:1V slope over final benches, enhancing revegetation with one to two feet of topsoil and topsoil replacement in areas regarded as the quarry floor.

**SITE PREPARATION**

*Saving Topsoil, Subsoil, and Overburden for Reclamation*

The topsoil overlying most of the rock quarry has already been cleared however not properly salvaged and stored for reclamation. Any remaining topsoil over the southern and western portions of the quarry will be managed and used in reclamation within the quarry as it is stripped to mine bedrock and the overlying sand and gravel deposits.

Cadman will continue to mine the sand and gravel deposit in 17-acre segments. This condition was adopted by the County and is incorporated into the land use conditions of the CUP. The Sand and Gravel operation has a detailed schedule for management of topsoil and overburden developed during the EIS process as described above. Topsoil management practices, to date, have not properly followed approved written protocols and volume shortfalls are likely to exist. A reassessment of topsoil budgets, shortfalls, topsoil management and past practices will occur with Surface Mining during a future inspection. This will include corrective actions Cadman will take to bolster topsoil deficits.

The topsoil overlying the rock quarry planned for the Bronn parcel will be managed and used for reclamation as mining progresses. Subsoil and overburden will be used as reclamation material in the expansion quarry.

Potential topsoil deficiencies will be addressed through on-site topsoil generation as approved by DNR Lands and DNR Surface Mining.

*Setbacks and Screens, Conservation Buffers*

A minimum 50-foot setback will be maintained between mining operations and the neighboring properties in the area of the quarry, the north and northeast boundaries to the State Trust parcel.
Per the required conditions of the CUP, a 200-foot undisturbed buffer has been established along the east and southern boundaries of the sand and gravel operations in the State Trust Parcel. A 100-foot sensitive areas buffer (wetlands) has been established adjacent to the sand and gravel operations in the State Trust Parcel. The CUP requires that when sand and gravel mining approaches the southern boundary with adjacent property owners, a 20-foot high earthen noise berm be constructed.

A minimum 10-foot vertical buffer will be maintained to separate sand and gravel mining activities and the seasonal high water table underlying the Sand and Gravel Operation in the State Land parcel.

For the expansion area, the 200-foot undisturbed buffer has been established along the west, north and northeast property boundaries to reflect the CUP conditions. On the majority of the east boundary of the expansion area, the adjoining parcels are owned by Cadman, there is no setback from these, Cadman-owned, parcels. There is an additional steep-slope setback on the northwest corner of the expansion area.

**Ground Water**
The andesitic basalt bedrock formation mined in the quarry operations contains water in joints and fractures which are locally water filled due to the enhanced recharge associated with mining activities. Away from the mine, in overlying volcanic rocks, weathered interfaces between volcanic ash flows have sufficient permeability to yield adequate water for domestic supplies. Vibrating wire piezometers and bedrock wells drilled in the quarry andesitic basalt formation had few, infrequent fractures (see Golder Phase 2 Stability Report, 2017). These fractures provide limited connectivity for water flow. Water perching in shallow fractures form seeps on the quarry high wall. Further details are provided in the Phase 2 Stability Report.

No groundwater was encountered in the exploration borings completed in the andesitic basalt on the expansion area property. Along the terrace in the vicinity of the Cadman stormwater ponds, groundwater occurs more than 10 feet below ground surface. Further details of borings completed for the design of the stormwater infiltration ponds are included in the Targeted Stormwater Investigation Report submitted to Snohomish County (and attached to this permit application). A summary of the expansion area hydrogeology completed by Golder during 2016 is also provided with the permit application.

Groundwater investigations conducted during environmental impact analysis identified the upgradient margin of a semi-confined, alluvial (water table) aquifer (High Rock Road Aquifer) underlying the proposed sand and gravel deposit. Groundwater analyses excerpted from the EIS were attached as Appendix C in the original reclamation permit submittal. The Drainage Report and Grading and Drainage Plans submitted and approved by Snohomish county were attached as Appendix D. The *High Rock Drainage Plan Hydroperiod Modeling* report prepared by Hart Crowser was attached as Appendix E.

The conditional use permit conditions set the maximum depth of the sand and gravel excavation at an elevation no lower than 403 feet MSL (NAVD29) to maintain a 10-foot vertical separation above the seasonal high groundwater table. Per the approved grading and drainage plans, prepared December 7, 2001, the maximum depth of the infiltration ponds is set at an elevation of 398 feet MSL. The Department of Ecology’s *2005 Stormwater Management Manual for Western Washington*, site suitability criteria number 5 (SSC-5), recommends that the base of all infiltration systems be a minimum of 5 feet above the seasonal high groundwater elevation. Land
use conditions also require that stormwater management (infiltration) mimic the existing hydroperiod of the adjacent wetlands.

The Water Resource Monitoring Plan, High Rock Mine Site, Cadman (Rock) Inc. dated September 11, 2000 was developed in accordance with Snohomish County’s Revised Decisions on Reconsideration (File No. ZA9206077 dated March 8, 1999) of the Final Environmental Impact Statement for the Conditional Use Permit for the High Rock Site. Groundwater levels in ten onsite monitoring wells, one onsite production well, and seven neighboring water supply wells are being monitored monthly and will continue throughout the duration of mining operations. An amendment to the Water Resource Monitoring Plan has been submitted with this permit application. The amendment adds additional monitoring locations (three onsite wells, one water supply well which is not in use, and one active water supply well) up and down gradient of the expansion area.

Through 2019, the highest groundwater level observed in the mine area was 391.33 feet in Monitoring Well 93-4. The current monitoring results indicate that the allowable maximum sand and gravel excavation depth of 403 feet MSL and the proposed infiltration facility elevation of 398 feet MSL should be sufficient to maintain the required vertical buffer to the seasonal high groundwater elevation as described above.

MINING PRACTICES TO FACILITATE RECLAMATION

**Soil Replacement**

Little or no topsoil remains within the footprint of the existing hard rock quarry. The topsoil removed from the expansion area will be managed and used for reclamation activities for the expansion quarry. Topsoil removal from, the Sand and Gravel Operation has been and will continue to be used to generate topsoil for quarry reclamation. Topsoil will be placed after slopes have been reclaimed.

Due to the need and interest in protecting the High Rock Road Aquifer, and the presence of a commercially low value till layer overlying greater than 40 percent of the sand and gravel within the State Trust Parcel, a highly detailed segmental mining sequence was developed. The purpose of these plans was to incorporate mining methods for reclamation, use live topsoil management, and reduce material handling to the greatest extent possible. The plan is designed so that as many as six cells (each segment contains three mining cells) are open and in process at one time. A discussion of sand and gravel mining sequence is provided below.

The first step in mining the sand and gravel is to remove the salable timber and large woody debris, which cannot be incorporated into the ‘live’ topsoil. The second step is to remove the live topsoil and contained organic debris. As soon as the sequencing plan is fully developed, this material would immediately be placed on a mining cell being reclaimed. The third step would be to remove the till layer and place that on a mined cell for reclaiming slopes. The fourth step is to mine the cell to a maximum depth of 403 feet msl. The fifth step is to replace the till onto the mined cell, utilizing material developed from step 3 of a future mining cell as described above. The final step is to replace the ‘live’ topsoil using material from step 2 of a future mining cell.

The sequence described above for the sand and gravel mine has been described in detail and presented in environmental impact analysis and incorporated into the Land Use Approval decision. Where possible and to the extent that sequencing allows, overburden and excess non-salable materials will be utilized to flatten the slopes of the rock quarry as shown on the plans.
Pond fines may be used to supplement on-site topsoil resources. Additionally, it may be necessary to import topsoil if on-site resources are depleted prior to the final stages of reclamation on the State Trust Parcel or Bronn Parcel.

**Erosion Control for Reclamation**

A Reclamation Stormwater Plan has been updated for the existing quarry, expansion area and the active sand and gravel segments (Golder, 2018). In the expansion area, the pre-settling pond and infiltration ponds will collect stormwater during and after reclamation. These features will provide substantial water storage and direct the water back to the aquifer system. On the existing quarry, blanket drains and positive-drainage grading are used to direct water from the stability buttress and observed seeps to the existing pond network.

Furthermore, the 2002 CUP conditions place specific performance requirements on stormwater management goals for the sand and gravel operations. Detailed Grading Plans have been prepared and were attached (Appendix D) in the original permit submittal to illustrate stormwater management facilities. The infiltration ponds are designed to match recharge under natural conditions. Therefore, the infiltration pond designs are preliminary until operations substantiate such performance goals. Performance of the stormwater facilities will be evaluated by monitoring water levels in adjacent wells for several years after construction. Pond configurations may be changed to adjust the infiltration performance and recharge conditions, if monitoring results indicate these modifications are necessary. After pond performance is verified, each pond will be allowed to mature into a permanent stormwater feature.

**RECLAMATION TOPOGRAPHY**

*Final Slopes*

General reclamation will utilize on-site waste material derived from the quarry, sand and gravel operations and wash plant silts.

Quarry mining will create 40-foot high by 60-foot wide benches, to an overall slope of 1.5H (horizontal):1V (vertical), prior to reclamation. Due to the limited availability of on-site material, the final reclaimed slopes in the quarry will vary from 1.5H:1V to 2H:1V. Further detail on reclamation of the quarry is provided in Section 25C below.

Reclaimed slopes within the sand and gravel mining operations of the State Trust parcel will be developed within each mining cell in accordance with the reclamation sequence plan. The maximum mining slope will be approximately 1H:1V and will be reclaimed to a final slope of 2H:1V to 3H:1V. The majority of reclamation fill (till) will occur within the eastern mining cells where the maximum mining cuts will occur.

*Slope Requirements for Quarries and Hardrock Mines (SM8A 25C)*

Reclamation blasting will not reduce the highwall to a scree slope of less than 2H:1V. The mine design creates an overall slope of 1.5H:1V prior to reclamation. The reclamation planning does not create a “high wall” but creates the slope as a series of benches 40 feet high and 60 feet wide. Where sufficient on-site backfill is available, the quarry benches will be completely backfilled to create slopes varying from 1.5H:1V to 2H:1V.

The area of the 2012 rock slope failure and fill buttress will further be enhanced through a clean soils import proposal. Cadman is requesting approval from the agency for the importation of approximately 4.5 million cubic yards of clean soil. The clean soil will only be accepted under
rigorous screening protocol (Cadman Clean soils policy) and placed in accordance with the High Rock Quarry Reclamation Backfill Geotechnical Quality Assurance Plan (Golder, 2018). Additionally, a fully developed slope stability monitoring plan has been developed as part of this reclamation plan. Final grading of slopes and construction techniques will be documented for compliance by a third-party consultant.

Standard hard rock slope reclamation methods are allowed within current law. RCW 78.44.131 (4)(b) provides that slopes in consolidated material shall “have no prescribed slope angle or height,” but should the slope be deemed “severely hazardous” and “not indigenous to the immediate area” then slopes shall not exceed 2H:1V.

**Quarry Backfilling (State Lands Quarry)**
See High Rock Quarry Reclamation Backfill Geotechnical Quality Assurance Plan (Golder, 2018) and High Rock Slope Stabilization Monitoring Plan (Golder, 2018).

**Sand & Gravel Mine and Expansion Quarry Backfilling**
Backfilling within the sand and gravel mine and expansion quarry will follow Cadman’s SOP for backfill compaction procedures and can be summarized as follows:

- Fill will be spread by bulldozer in lifts no more than two feet.
- Operator will utilize bulldozer to track compact lifts.
- Saturated material will be allowed to decant and dehydrate prior to final placement and compaction.
- When necessary fill areas will be seeded to discourage erosion.

**Mine Floors**
It is the applicant’s goal to restore the State Trust Parcel portion of the site to DNR Surface Mining standards. This is to be accomplished by preparation of the post-mining surface, utilization of organic debris, live topsoil management, development of synthetic riparian zones, an aggressive groundcover establishment with legumes and perennials and reforestation planting.

The post-mining surface of the sand and gravel pit will maintain a minimum 10-foot separation between the seasonal high-water level of the High Rock Road Aquifer and any mining activities. The post-mining surface will likely be mechanically compacted to a varying extent during the course of mining. For effective forest planting this surface will need to be loosened to provide porosity and permeability for good root development and drainage.

It is the intent of the operator to prepare this surface by ripping to the greatest extent possible using an appropriately sized piece of equipment, such as a bulldozer with rear ripping teeth. The surface will be intentionally left as rough as possible to promote trapping fine sediment and moisture. Large organic debris will be placed upon this rough surface prior to or with the placement of live topsoil removed from the next segment mined.

If possible, live topsoil and organic debris will be transported simultaneously to promote mixing. The wholesale replacement of topsoil and organic debris will provide for rapid reintroduction of native species, as well as introduction of organic matter necessary for plant nutrition and soil porosity. These activities, combined with groundcover seeding, should accomplish good soil stabilization and rapid revegetation.

If it is deemed necessary and/or the material are available, muck sands and fine silts from processing operations will be incorporated as soil amendments. Attention will be paid to
maintaining a rough irregular surface and not further compacting prepared areas during topsoil placement and, if necessary, re-ripping the surface prior to groundcover seeding. Post-mining surface and topsoil replacement will meet the requirements of DNR Surface Mining as administered through the reclamation permits and agreements.

It is anticipated that the post-mining, land-use zoning designation of the Cadman Parcel will be industrial use. Therefore, the applicant’s goal is to restore this portion of the site to a post-reclamation condition that is feasible for industrial use. This will be accomplished by removing mining equipment and structures and establishing vegetation over the post-mining surface. The surface will be ripped to the greatest extent possible and left as rough as possible to promote trapping fine sediment and moisture. Imported topsoils will be placed over the roughened surface and then planted with a rural seed mix to establish groundcover to control erosion.

**Final Drainage Configuration**
CUP conditions require stormwater to be contained within each sand and gravel mine segment and infiltrated in such a manner as to maintain the identified hydroperiod of the downgradient wetlands. Drainage Plans have been updated to reflect the expansion property and final topography with the most significant change coming with the addition of the 40-acre expansion parcel. See attached Reclamation Stormwater Plan (Golder, 2018)

**Synthetic Riparian Zones.** Stormwater management facilities will remain as permanent elements of the reclaimed site. Ponds will be modified, where feasible, to enhance riparian quality. Pond enhancements could include pond slope improvements for safety and variability in depth, creation of non-rectangular shape, and the introduction of large woody debris to enhance wildlife habitat, as necessary. The planting around riparian habitat will include a variety of indigenous hardwood species and possibly include cedar species.

**SITE CLEANUP AND PREPARATION FOR REVEGETATION**

**Removal of Debris**
All man-made features will be removed from the site upon completion of mining. Waste piles, rock debris and large woody debris not already incorporated into reclamation will either be incorporated into reclamation or be removed.

**REVEGETATION**
DNR informs us that the preclusion of nuisance or unwanted vegetation species (weed control) is a matter of timing of the soil preparation and planting of groundcover and trees. Critical to the successful establishment of groundcover is the introduction of groundcover seeds within no more than 3 days after soil preparation. Important to the success of these plans is that this work will be completed as near to the first rains of fall or spring. This is necessary to establish adequate groundcover for protection of seedlings in the late winter (February) and or during the dry summer months. Indications are that groundcover seeding needs to follow soil preparations as closely as possible to achieve the best results and minimize post reclamations plant management. Flat areas will be seeded at 40 to 60 pounds per acre, slopes at 100 to 120 pounds per acre.

**Groundcover Seeding Mixtures and Rates**
Seeding will be accomplished by broadcasting. The specific seeding method and mixture will be determined on a site-by-site basis at the time of reclamation. Experience tells us that seeding methods, rates and variety can vary due to the nature of the site and soils to be seeded. Therefore, final seed mixtures, rates of application, additional tree species and planting schemes will be
finalized at the time of reclamation of each segment. In those areas where live topsoil and organic debris are placed, it is anticipated that significant amounts of the existing vegetation will re-establish.

The intent of the final reclamation groundcover seed mixture design is to set a balance between erosion control, nitrogen-fixing species, and species compatible with climax species. Test plots may be utilized to determine the optimum planting scheme to re-establish forest ecology. This work will be conducted in conjunction with the DNR as reclamation over the site.

Currently the site operators utilize a commercially available mix referred to as DNR reclamation mix provided by Wolfkill Industries of Monroe. An example of this seed mixture for groundcover, as reported, is presented below.

<table>
<thead>
<tr>
<th>Species</th>
<th>Percent of Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraploid Perrenial Rye</td>
<td>40</td>
</tr>
<tr>
<td>Annual Rye</td>
<td>25</td>
</tr>
<tr>
<td>White Clover</td>
<td>17</td>
</tr>
<tr>
<td>Bird Foot Trefoil</td>
<td>17</td>
</tr>
</tbody>
</table>

**Conifer Planting**

To complete reforestation of reclaimed areas, softwoods, such as Douglas Fir, and hardwoods, such as Big Leaf Maple or Red Alder, may need to be introduced to accelerate establishment of climax species. Specific species may be selected for varying reclamation areas. An example would be that Douglas Fir may be introduced onto low gradient areas and Red Alder may be emphasized around pond reclamation. It is anticipated that Douglas Fir will be introduced last to newly reclaimed areas in late winter to early spring. The two year survival goal of the DNR is 300 stems per acre, which commonly requires an initial planting of 400 stems per acre.