Lewicki & Associates
ENGINEERING | GEOLOGY | ENVIRONMENTAL

April 5, 2025

Colorado Division of Reclamation, Mining, and Safety
1313 Sherman St, Rm 215
Denver, CO 80203

RE: Kattenburg Pit, M-2004-017
Technical Revision – Updates to Mining and Reclamation Plans

United Companies is providing the attached technical revision to revise the mining and reclamation plans at the Kattenburg Pit. Exhibit C Maps, Exhibit D, Exhibit E, Exhibit G, and Exhibit L have been revised to incorporate groundwater exposure into the permit. An applicable Substitute Water Supply Plan is incorporated via reference.

Regards,

Ben Langenfeld, P.E.
Lewicki & Associates, PLLC
(720) 842-5321, ex. 1
benl@lewicki.biz

Attachments

Exhibit C –

- Map C-1A Current Conditions
- Map C-2 Mining Plan
- Map C-3 Cross Sections

Exhibit D – Mining Plan

Exhibit E – Reclamation Plan

Exhibit F –

- Map F-1 Reclamation Plan

Exhibit G – Water Information

Exhibit L – Reclamation Costs

LEGEND

BOUNDARIES
- DRMS Permit Boundary
- Incorporated city or equivalent

BUILDINGS AND RELATED STRUCTURES
- Building
- Fence

LAND SURVEYS
Public Land Survey System
- Range or Township line
- Range or Township labels — R1E T2N
- Section line
- Section numbers — 1-36

Property boundary

Mining claim

ROADS AND RELATED FEATURES
- Highway
- Light duty road, paved
- Light duty road, gravel

RIVERS, LAKES, SHORELINES, AND CANALS
- Perennial stream/ditch
- Perennial river
- Intermittent stream/ditch
- Perennial lake/pond
- Intermittent lake/pond
- Wells — PERMIT
- Drainage direction

VEGETATION
- Agricultural Fields
- Wetlands (Delineated 2013)
- Soils (NRCS) — Soil ID

TRANSMISSION LINES AND PIPELINES
- Power transmission line; pole; tower
- Telephone/data line, buried

BASELINE CONTOURS
- Index — Approximate of indefinite
- Intermediate — Approximate of indefinite
- Supplementary

Drainage Basin Labels

Basin — 1 — 46.2 | 0.2 — Area / Composite Runoff Coefficient

1 — Basin Destination

W88169-F

1
39.3 | 0.2

1

8250'
8225'
8200'
8175'
8150'
8125'
8275'
8300'

C-1A Current Conditions

Kattenberg Pit

DRMS Permit Number: M-2004-017 — **United Companies**

Mine Entry Location:	Latitude: 40.0863	Longitude: -105.9047
State: CO	County: Grand	Nearest Town: Granby
Section: 33	Township: 2N	Range: 76W PM: 6th
Major Watershed:	Colorado River	

Map Scale: 1": 300'

0 — 300 — 600

Map Georeferencing Information: **Datum: NAD83** **Projection: CO NORTH**

Survey Source: Drone	**Drawn by:** BEL	Date: 02/20/25
Imagery Source: Google	**Checked by:** BEL	Date: 02/20/25
Survey Date: 10/2022	**Approved by:** BEL	Date: 02/20/25
Imagery Date: 2019		

File Name: Kattenberg 250310

3375 West Powers Circle
Littleton, CO USA 80123
(303)-346-5196
info@lewicki.biz

LEGEND

BOUNDARIES
- DRMS Permit Boundary
- Incorporated city or equivalent

BUILDINGS AND RELATED STRUCTURES
- Building
- Fence

LAND SURVEYS
- Public Land Survey System
  - Range or Township line
    - Range or Township labels: R1E T2N
  - Section line
    - Section numbers: 1-36
- Property boundary
- Mining claim

ROADS AND RELATED FEATURES
- Highway
- Light duty road, paved
- Light duty road, gravel

RIVERS, LAKES, SHORELINES, AND CANALS
- Perennial stream/ditch
- Perennial river
- Intermittent stream/ditch
- Perennial lake/pond
- Intermittent lake/pond
- Well (PERMIT)
- Drainage direction
- Wetlands

MINING FEATURES
- Mining Facilities
- Berm/windrow
- Disturbed Area

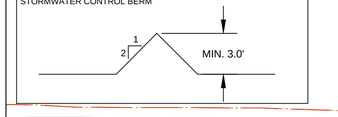
TRANSMISSION LINES AND PIPELINES
- Power transmission line; pole; tower
- Telephone/data line, buried

BASELINE CONTOURS
- Index: 5280'
- Intermediate: 5281'

POST-MINING CONTOURS
- Index: 5280'
- Intermediate: 5281'

DRAINAGE DATA
- Basin: 1 — 32.3 (Area (acres)) | 0.6 (Composite Runoff Coefficient)
- Basin Destination: 1
- Drainage Direction
- Drainage Basin

DETAIL 1
STORMWATER CONTROL BERM



C-2 Mining Plan

Kattenberg Pit

DRMS Permit Number: M-2004-017 — **United Companies**

Mine Entry Location:	Latitude: 40.0863	Longitude: -105.9047
State: CO	County: Grand	Nearest Town: Granby
Section: 33	Township: 2N	Range: 76W PM: 6th
Major Watershed:	Colorado River	

Map Scale: 1": 200

0 — 200 — 400

N

Map Georeferencing Information: **Datum:** NAD83 **Projection:** CO NORTH

Survey Source: Drone
Imagery Source: Google
Survey Date: 10/2022
Imagery Date: 2019

Drawn by: BEL — Date: 02/20/25
Checked by: BEL — Date: 02/20/25
Approved by: BEL — Date: 02/20/25

File Name: Kattenberg 250310

3375 West Powers Circle
Littleton, CO USA 80123
(303)-346-5196
info@lewicki.biz

LEGEND

BOUNDARIES
- DRMS Permit Boundary
- Incorporated city or equivalent

BUILDINGS AND RELATED STRUCTURES
- Building
- Fence

ROADS AND RELATED FEATURES
- Highway
- Light duty road, paved
- Light duty road, gravel

RIVERS, LAKES, SHORELINES, AND CANALS
- Perennial stream/ditch
- Perennial river
- Intermittent stream/ditch
- Perennial lake/pond
- Intermittent lake/pond
- Drainage direction

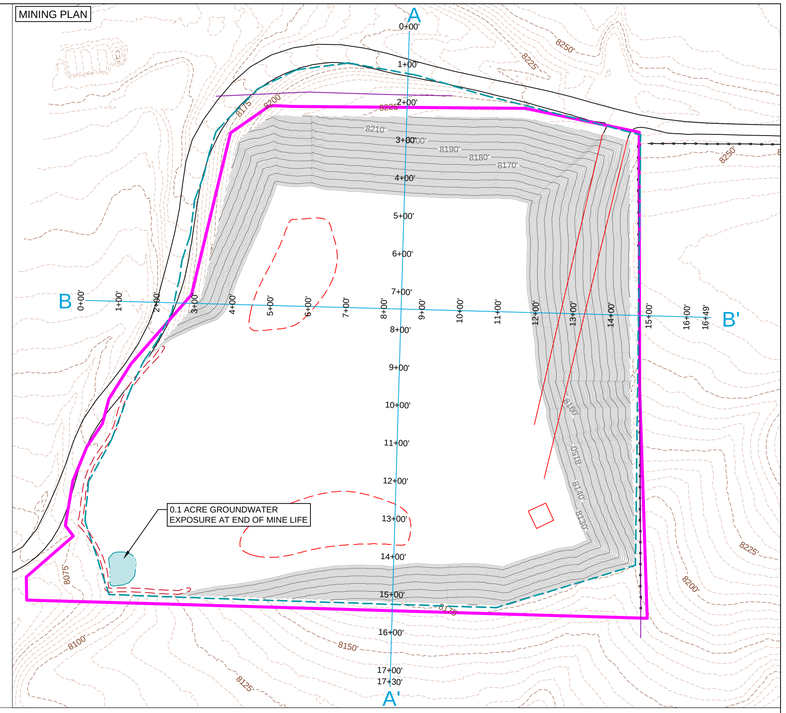
MINING FEATURES
- Mining Facilities
- Disturbed Area

TRANSMISSION LINES AND PIPELINES
- Power transmission line; pole; tower
- Telephone/data line, above ground

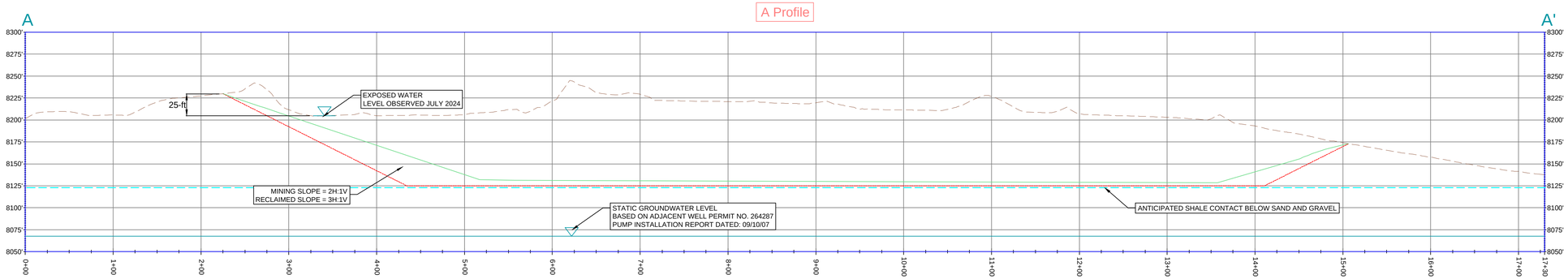
BASELINE CONTOURS
- Index
  - Approximate of indefinite
- Intermediate
  - Approximate of indefinite
- Supplementary

POST-MINING CONTOURS
- Index
- Intermediate
- Baseline Topography
- Mining Topography
- Reclaimed Topography

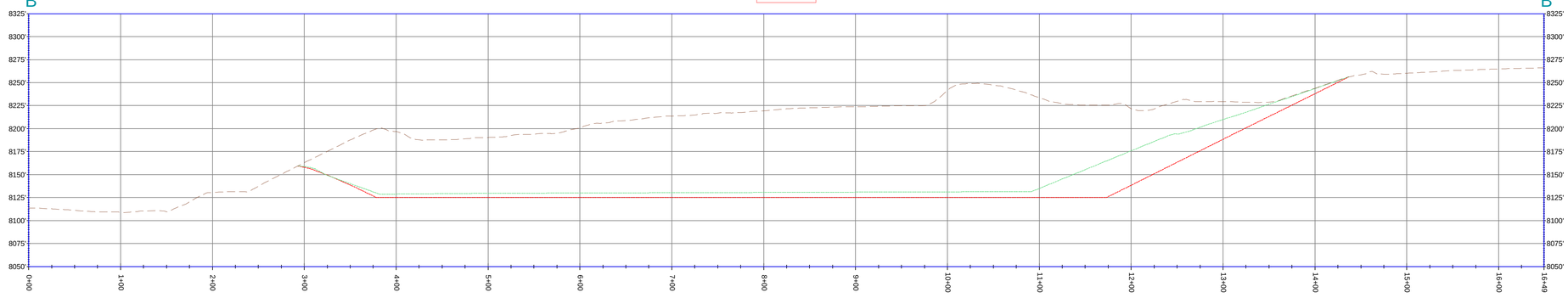
MINING PLAN



A Profile



B Profile



C-3 Cross Sections

Kattenberg Pit

DRMS Permit Number: M-2004-017 — **United Companies**

Mine Entry Location:	Latitude: 40.0863	Longitude: -105.9047
State: CO	County: Grand	Nearest Town: Granby
Section: 33	Township: 2N	Range: 76W PM: 6th
Major Watershed:	Colorado River	

Map Scale: 1": 70

0 — 70 — 140

N

Map Georeferencing Information:	**Datum: NAD83**	**Projection: CO NORTH**
Survey Source: Drone	**Drawn by:** BEL	Date: 02/20/25
Imagery Source: Google	**Checked by:** BEL	Date: 02/20/25
Survey Date: 10/2022	**Approved by:** BEL	Date: 02/20/25
Imagery Date: 2019		

File Name: Kattenberg 250310

3375 West Powers Circle
Littleton, CO USA 80123
(303)-346-5196
info@lewicki.biz

EXHIBIT D MINING PLAN

1. General Mining Plan

The mining operation is located in Grand County approximately 1.25 miles east of Granby, Colorado on 38.65 acres north of the Fraser River and east of County Road 60. The property boundary has been surveyed and the permit area will be surveyed prior to any site disturbance.

1.1. Mining Method

Mining will be conducted using excavators, trucks, and bulldozers. Crushing and screening may take place on the site. Mining is proceeding principally vertically, working downward into the deposit. Full mining extents are shown on Map C-2. Map C-3 shows cross sections of the site.

1.2. Equipment List and Usage

Mining operations utilize:

- Two to three front-end loaders for material handling
- Motor graders for road maintenance
- Bulldozers for stripping and grading
- Tractor trailers and tandem-axle end dumps
- Articulated haul trucks for material movement
- Water trucks for dust control
- Portable screening plants (wet and dry)
- Portable conveyors and crushers

1.3. Slope Specifications

All mining faces will maintain specific slope requirements throughout operations. During active mining, working faces may be maintained at 0.5H:1V. Interim slopes within the mining area may be maintained at 2H:1V, but at no more than 750-feet of length and no more than 20-ft of height. The final reclaimed slopes will be graded to a maximum gradient of 3H:1V to ensure long-term stability.

2. Description of the Deposit

The site contains a Pleistocene age, Slocum alluvial terrace deposit that averages 100+ feet deep across the property. The deposit consists of approximately 80% rock to 20% sand composition with intermixed large boulders. The material is overlain by soil ranging from 0-8

inches, averaging 6 inches, with underlying clayey, sandy, loamy overburden of 24-60 inches depth. The deposit consists of colluvium and glacial till lying on top of Pierre Shale bedrock. The underlying shale beds strike at N87°W and dip 8° NE in the vicinity of the pit. Bedrock outcrops in the southwest corner of the property, where a spring occurs, at an approximate elevation of 8110 feet. Depths of gravel have been confirmed to an elevation of 8125 in the west-central part of the deposit and can be easily inferred to depths greater than the proposed ultimate pit depth.

3. Description of the Size of the Area to be Worked at Any One Time

The operation encompasses a total area of 38.65 acres, with 33.39 acres designated for active mining and 5.26 acres reserved for undisturbed setback areas. The maximum disturbed area at any time will be 33.39 acres.

3.1. Mining Sequence

Mining will begin in the central part of the property near the old mine where a plant site will be established. Mining will then advance outward at an elevation intended to create a 20-foot face. The mining will progress into the hillside at this level until the exterior slope area is reached. Once the deposit has been mined at this starting elevation, mining will progress downward in 20-foot increments.

4. Description of Water Management Procedures

4.1. Surface Water Controls

Stormwater management includes maintaining pit-ward attitude on all slopes and installing isolation ditches around the pit perimeter as shown on Map C-2. Sediment control basins are established on site, with comprehensive erosion control measures implemented for all disturbed areas.

Drainage patterns maintain natural flows where possible while implementing specific controls around stockpiles and operational areas. The groundwater exposure will be used as a stormwater pond for water management, with regular monitoring and maintenance of all water control structures.

4.2. Groundwater Management

Mining operations will expose approximately 0.1 acres of groundwater. This exposure is permitted under Stormwater Water Discharge Permit (SWSP) WDID 1407801. All groundwater management activities will be conducted in accordance with this permit's requirements and conditions. A gravel well permit will be maintained for the operation throughout its life. The groundwater exposure will always exist at the low point of the operation. Once mining has

reached full depth, this exposure is expected to be at the southwest corner of the pit, at the lowest elevation of the operation.

4.3. Water Quality Procedures

Each pit serves as a sediment pond for operations. All interior pit slopes will be maintained with a pit-ward attitude so that there will be no drainage off the affected land. No water will be discharged from the pit without a National Pollutant Discharge Elimination System (NPDES) Permit that will address any discharges associated with the mining operation or Stormwater as required by law.

5. Mining Timetable

The total permit duration is planned for 10-15 years, of which 13 years will be mining. This is based on an average annual production of 250,000 tons per year. Market forces will determine the actual production level and thus this timetable is an estimate.

Table D-1 Mining Timetable

Stage	Description	Mining Time	
1	Establish access roads and facilities shown on Map C-2. Begin topsoil and overburden removal. Initiate mining.	4	Years
2	Advance mining down and southward while conducting concurrent reclamation. Processing and sales of materials from the site.	8	Years
3	Complete mining and finalize slopes for reclamation.	2	Years
Total		**14**	**Years**

The mining schedule is planned to minimize disturbance by reclaiming areas as additional mining is undertaken. Note: If large contracts are awarded to the site, production could increase to the permit maximum, thereby curtailing the life of the pit. On the other hand, if contracts are less than anticipated, the life of the pit could be extended. This table is based on a reasonable projection of average production rates.

6. Description of the Method of Handling Materials

Topsoil and overburden will be handled onsite. Both will be stripped, placed, and stockpiled as needed. Any topsoil or overburden stockpile that is to be in place longer than 180 days will be vegetated to prevent wind erosion.

6.1. Topsoil Management

Mining extraction begins with stripping and stockpiling topsoil separately from other materials. Materials are stored in designated areas shown on Map C-2 for future reclamation. Stockpiles planned for storage longer than one year receive temporary seeding for protection. An average

4-inches of topsoil will be stripped. The stripped topsoil will be placed directly on regraded slopes for reclamation as frequently as possible. An estimated 32,000 CY of topsoil will be stripped and replaced as part of mining and reclamation.

6.2. Overburden Handling

Overburden is removed using scrapers and dozers, maintaining separate stockpiles from topsoil. The material is stored for use in concurrent and final reclamation activities. Roughly 24-60 inches of overburden will be stripped during mining. The exact thickness will vary by location. Overburden will be placed in mined out areas for reclamation grading as frequently as possible. An estimated 160,00 CY of overburden will be stripped and backfilled as part of mining and reclamation.

6.3. Hazardous Materials Management

The only hazardous materials stored onsite during operations will be fuel and equipment oils. All fuel tanks will have secondary containment. Some are double walled, others will be located within bermed or lined areas that have over 110% of the volume of the largest stored tank. If fuel is stored on the site a small containment berm will be placed around the fueling facility to keep any spills contained. The size of the berm will be engineered to contain the amount of fuel stored in the area. There will be adequate sand to absorb spills and any contaminated material will be disposed of properly. The site will maintain Spill Prevention, Control, and Countermeasure plan (SPCC Plan) for fuel and oil storage. Fuel storage location(s) are identified on Map C-2.

No acid or toxic forming materials will be mined our processed as part of the operation.

7. Water Information, Rights and Augmentation

All water rights issues such as availability of water for this operation, consumption rates, dust control, etc. is presented in Exhibit G - Water Information.

8. Description of Wildlife Protection Measures

The site is used by various wildlife species. Measures to protect wildlife include limiting disturbance areas to the minimum necessary and concurrent reclamation of mined areas. The Division of Wildlife letter in Exhibit H was prepared at our request to identify potential wildlife issues. Our planning takes this into account and the report does not raise issues regarding endangered or threatened species.

EXHIBIT E RECLAMATION PLAN

1. General Reclamation Plan

The reclamation plan encompasses the following areas as shown on Map F-1 and outlined in Table E-1.

The slopes will be shaped to the setback distances and will be ready for soiling and planting as mining reaches the outer limits. Along the property line the setback will be 25 feet; on the ROW the setback will be 15 feet. Slopes will be mined to final configuration at the setbacks.

Table E-1 Reclaimed Areas

Post Mine Land Use	Area (acres)
Dry rangeland	33.39
Undisturbed	5.3
Total Permit	**38.65**

2. Description of Topsoil Management

Topsoil salvage operations maintain soil structure throughout the handling process. Storage specifications limit stockpile heights to 15 feet with side slopes maintained at 3H:1V or flatter to ensure stability. Sufficient quantities of soil will be available to reclaim the disturbed lands to their present condition. The soils salvaged and replaced will represent what is there now.

Prior to topsoil replacement, the subsurface is ripped or scarified to ensure proper bonding between materials. Topsoil is replaced to an average depth of 7 inches across reclaimed areas as shown on Map F-1, with careful attention to avoiding compaction during placement. The topsoil stockpiles will be located on the pit floor to reduce the haul distances when reclamation starts.

All final reclamation slopes will be 3H:1V or shallower.

An internal road will be left in place for the property owner to access and use the site following mining. The currently existing access to the property will be left in place for the landowners use as well.

3. Reclamation Timetable

The time for reclamation is shown below. Exhibit L: Reclamation Costs describes the worst-case bond scenario.

Table E-2 Reclamation Timetable

Stage	Description	Mining Time	
1	Establish access roads and facilities shown on Map C-2. Begin topsoil and overburden removal. Initiate mining.	4	Years
2	Advance mining down and southward while conducting concurrent reclamation. Processing and sales of materials from the site.	8	Years
3	Complete mining and finalize slopes for reclamation.	2	Years
4	Revegetation monitoring	2	Years
Total		**16**	**Years**

4. Revegetation Plan

For all revegetated areas the soil will be disced to loosen the soil. Seed will be drilled in all areas if practicable. In the event that drill seeding is not practicable, broadcast seeding will be conducted instead. Broadcast seeding will be conducted at twice the seeding rate of drill seeding. Certified weed free mulch will be crimped into the surface at a rate 2000 pounds per acre. Fertilizer may be added as determined by a soil test at the time of seeding, but fertilizer is not required by default. Furrows will be left in the tilled topsoil to provide moisture concentration and shade areas in order to promote better conditions for successful vegetation establishment. Seeding will take place the fall after which a slope has been retopsoiled. Slopes will be regraded, backfilled, and retopsoiled as soon as they are able to be reclaimed.

4.1. Dryland Seed Mix

Species	Pounds of pure live seed per acre
Smooth Brome	13.0
Pubescent Wheatgrass	12.0
Slender Wheatgrass	4.4
Total	**29.4**

The seeding rates listed above are drilling rates.

5. Post-Reclamation Site Drainage

Map F-1 shows arrows indicating the approximate direction of post-reclamation drainage throughout the pit. The final reclamation will be graded so that drainage water will go in a similar path to the original path. The daylighting of the pit to the southwest will ensure that all runoff continues the pre-mine northeast-to-southwest flow pattern.

6. Weed Control

Measures will be employed for the control of any noxious weed species. The objective of this weed management plan is to control undesirable plants on the Kasttenburg Pit 1 property. Plants identified through the Colorado Noxious Weed Act (C.R.S. 35-5.5) and the Grand County Noxious Weed List as undesirable and designated for management within the county will be removed. These plants identified as noxious weeds will be managed by control measures. A Weed Control Plan will be utilized as follows:

1) Each April, a weed survey will be taken of the permit area.

2) If any patches or plants have been identified, they will be sprayed by backpack sprayer or 4-wheeler using chemicals approved for use by the weed control staff of Grand County.

3) After reclamation, weed surveys and spraying will continue until the perennial cover and production of the site have met DRMS requirements and bond release has been obtained.

The Division and Granf County staff will be consulted regarding any weed infestation areas and any control measures prior to their initiation. The plan does not contemplate total weed removal on the property. Past experience has shown that some initial weed cover in the first year following the retopsoiling is beneficial to the reclamation effort in rangeland site. Weeds tend to

provide shade for new grasses, are a means of holding snow on the seedbed longer and protecting it from wind and water erosion until the planted species have taken hold.

During all phases of the mining operation the permit area will be monitored closely every year, through which the operator may determine if any additional weeds have grown. If any new species of weeds are found, Grand County and the Division will be consulted in order to formulate the best plan for the new infestation.

7. Revegetation Success Criteria

7.1. Dry Rangeland Areas

These areas will be deemed adequate when the dryland vegetation has been established in order to control erosion and noxious weeds are not present in any significant amounts and all of the conditions of Rule 3.1.10 have been met.

8. Monitoring Reclamation Success

Monitoring the reclamation on an ongoing basis will allow minor revisions to ensure successful reclamation. The operator plans to use the local NRCS office to assist in determining the ability of the reclaimed land to control erosion. If minor changes or modifications are needed to the seeding and reclamation plan, revision plans will be submitted to the Division as required. It is hoped that the Division will provide assistance in evaluating the success of the ongoing reclamation process. All areas disturbed and reclaimed and any other important items regarding the reclamation will be submitted in the annual reports to the Division

LEGEND

BOUNDARIES
- DRMS Permit Boundary
- Incorporated city or equivalent

BUILDINGS AND RELATED STRUCTURES
- Building
- Fence

LAND SURVEYS
- Public Land Survey System
- Range or Township line
- Range or Township labels — R1E T2N
- Section line
- Section numbers — 1-36
- Property boundary
- Mining claim

ROADS AND RELATED FEATURES
- Highway
- Light duty road, paved
- Light duty road, gravel

RIVERS, LAKES, SHORELINES, AND CANALS
- Perennial stream/ditch
- Perennial river
- Intermittent stream/ditch
- Perennial lake/pond
- Intermittent lake/pond
- Well — PERMIT
- Drainage direction
- Wetlands

MINING FEATURES
- Mining Facilities
- Berm/windrow
- Disturbed Area

TRANSMISSION LINES AND PIPELINES
- Power transmission line; pole; tower
- Telephone/data line, buried

BASELINE CONTOURS
- Index — 5280'
- Intermediate — 5281'

POST-MINING CONTOURS
- Index — 5280'
- Intermediate — 5281'

DRAINAGE DATA
- Basin: 1 — Area (acres): 32.3 — Composite Runoff Coefficient: 0.6
- Basin Destination: 1
- Drainage Direction
- Drainage Basin

W88169-F

1 — 39.3 | 0.6

SITE ACCESS

3H:1V SLOPES

DRY RANGELAND

1

RECLAIMED GROUND DAYLIGHTS TO THE SOUTHWEST

8250' 8225' 8200' 8175' 8230' 8220' 8210' 8190' 8180' 8170' 8160' 8150' 8140' 8275' 8300' 8125' 8100' 8075' 8050' 5128'

F-1 Reclamation Plan

Kattenberg Pit

DRMS Permit Number: M-2004-017 — **United Companies**

Mine Entry Location:	Latitude: 40.0863	Longitude: -105.9047
State: CO	County: Grand	Nearest Town: Granby
Section: 33	Township: 2N	Range: 76W PM: 6th
Major Watershed:	Colorado River	

Map Scale: 1": 200

0 — 200 — 400

N

Map Georeferencing Information:	**Datum: NAD83**	**Projection: CO NORTH**
Survey Source: Drone	**Drawn by:** BEL	Date: 02/20/25
Imagery Source: Google	**Checked by:** BEL	Date: 02/20/25
Survey Date: 10/2022	**Approved by:** BEL	Date: 02/20/25
Imagery Date: 2019		

File Name: Kattenberg 250310

3375 West Powers Circle
Littleton, CO USA 80123
(303)-346-5196
info@lewicki.biz

EXHIBIT G WATER INFORMATION

1. General

The Kattenburg Pit's lies north of the Fraser River by roughly 0.5 miles. It is located on a dryland terrace that lacks any surface water features. It is outside of the FEMA mapped floodplain in this area. Groundwater is located at a variety of depths below the ground. Well records in the area show groundwater depths of 1-feet deep, 57-feet deep, and 180-feet deep.

2. Water Quality Protection

The primary concerns surrounding water quality protection at the Kattenburg Pit are the potential impacts to the surface and groundwater from sediment, hydraulic fluids, and diesel fuel. Sediment will be controlled through the use of stormwater retention within the disturbance area through the life of the mine. The site will be graded in a manner that maintains all surficial flows within the disturbed area, in turn containing all sediment and unwanted discharges from leaving the site. Stormwater berms will be constructed at the edge of mining to prevent sediment discharges in the Fraser River. Hydraulic fluids and diesel fuels will be contained within vehicles that follow best practices of maintenance; these practices include regular inspections of vehicles, hydraulic lines, and any other potential spill sources. Diesel fuel or other oils will not be stored on-site.

Any surface water discharges from the site will be sampled in accordance with the NPDES discharge permit. All discharge will be via the approved Outfall, the proposed location of which is shown on Map C-3.

Table G-1. Surface Water Discharge Monitoring Requirements in NPDES Discharge Permit

Parameter	Monitoring Frequency	Sample Type
Flow	Instantaneous, Monthly	In-situ
pH	2x/month	Grab
Total Suspended Solids	2x/month	Grab
Oil and Grease Visual	2x/month	Visual
Oil and Grease	Contingent on visibility of oil and grease	Grab
Total Flow	Instantaneous, Monthly	Calculated
Selenium, Potentially Dissolved	2x/month	Grab
Total Dissolved Solids	Quarterly	Grab

Note: these are the anticipated analytes based on operator experience at similar sites. CDPHE may issue different sampling requirements with the permit.

3. Floodplain

The site has not been mapped for flood potential by the Federal Emergency Management Agency. Based on upstream data, the areas surrounding the drainage are likely within the 100-year floodplain of the Fraser River, but not within the floodway.

4. Wetlands

The National Wetlands Inventory aerial-based mapping indicates the presence of wetlands within the permit area. These wetlands are mostly in the existing drainage and will not be disturbed, aside from wetlands crossings for access. A USACE Wetlands Permit will be obtained prior to any wetlands disturbances. Exhibit C and F maps show the NWI mapped wetlands.

5. Aquifers

The Fraser River aquifer is the only identified aquifer located at the site. It has an approximate depth of 10 feet in the upland areas of the site. It is approximately 35 feet below the surface of the terraces further from the creek.

6. Surface Water

The mining operation will impact surface water in the area through the stormwater runoff that enters the site. Map G-1 shows the drainage patterns and how they are affected throughout the life of the mine. The maps include information on the drainage basins currently, during mining, and post reclamation. The primary concern for surface water protection at the site is preventing the discharge of sediment, oil, and/or hydraulic fluids from the operation areas. Oils and hydraulic fluids are stored on site following the standard best management practices. These practices include the use of secondary containment at fluid storage and transfer points, spill kits, and employee training regarding safe handling practices. Sediment is trapped onsite using controls and best management practices by directing and controlling surface water runoff that enters the disturbed areas. More information on sediment and surface water control is provided below.

6.1. Surface Water Handling

In the pre-mine condition the site drained naturally to the southwest towards the Fraser River. During mining, runoff will be collected along the stormwater control berm in the southwest end of the site and routed to the groundwater exposure for infiltration. Upon reclamation, the site will drain to the southwest and to the Fraser again.

6.2. Disturbed Area Runoff

During all stages of mining, there is enough water storage capacity to contain the 5-year and 100-year 24-hour storm events and prevent erosion from surface water discharge. The expected rainfall from these events at the Kattenburg Pit is provided in Table G-2 below.

The peak runoff was generated from these values for the various drainage basins during all stages of mining. Pre-mine, mining, and reclamation conditions are delineated on maps C-1, C-2, F-1. The discharge volumes from these storm events are calculated in Appendix G-1 at the end of this exhibit. Table G-3 summarizes the runoff volumes and storage volumes for each drainage. All drainage calculations were made using the Rational Method identified in the Mile High Flood Control District.

Table G-2. Drainage Calculations

Drainage Basin 1					
Site Condition	Area (ac)	Runoff Coefficient	100-Yr 24-Hr Runoff (ac-ft)	Peak Flow Rate (cfs)*	Detention Capacity (ac-ft)***
Base	39.33	0.2	0.436	45.25	0
Mine		0.6	4.403	23.68	66.8
Reclamation		0.25	0.436	9.87	0

* The discharge flow rate is calculated from the peak discharge of the 100-Yr 24-Hr storm event using the Rational Method.

**Discharge flow rate is variable and controlled during mining as all discharges are pumped from the pit
***Detention Capacity calculated in CAD as the surface volume available between the pit floor and the top of the stormwater control berm.

7. Groundwater

Groundwater has been encountered in the pit at a depth of 25-feet below the original ground level. The 1-foot deep groundwater is found in well 7599-F, which is located near the airport to the west. This well has a collar elevation at least 100-ft below the Kattenburg Pit. The 57-foot deep groundwater value is located in well 22403, which is northwest of the pit. This well is a domestic supply well installed in 1964 and may not be an accurate representation of the gravel aquifer passing through the area. The other nearest well, 264287, has a water level of 180-feet. However, Well 264287 is installed in the shale below the local sand and gravel deposit and is thus not an accurate representation of groundwater in the sand and gravel that is being mined.

7.1. Groundwater – Mining

Given the groundwater information from the nearby wells, the encountering of groundwater in the pit, and how the gravel deposit being mined daylights at the southwest end of the property, it is theorized that groundwater encountered in the pit will drop as mining continues. The lack of groundwater consistently found in the sand and gravel of surrounding wells at the same elevation as the deposit being mined indicates that the water found in the pit is likely to be infiltrated surface water that has not yet flowed out of the deposit daylight to the southwest. However, since this is only a theory, the permittee has secured a gravel well permit to cover 0.1 acre of groundwater exposure at the mine.

7.2. Groundwater – Reclamation

Upon reclamation, when the reclaimed mine floor daylights to the southwest, all surface water will flow offsite in the same manner as the pre-mine condition. Any groundwater exposure that remains at that point will be backfilled, but no exposure is anticipated.

8. Water Related Permits

The permittee will maintain all necessary water related permits. This will include a stormwater discharge permit with CDPHE Water Quality Control Division and a gravel well permit with the Colo. Div. of Water Resources.

9. Water Consumption and Source

Water usage is from a combination of groundwater evaporation, aggregate production, and dust suppression. The total is estimated at 1.92 acre-ft of water a year.

All water is sourced from approved vendors and sources that meet regulatory requirements.

Appendix G-1 Hydrology Calculations

Pre-mine drainage basins and conditions are shown on Map C-1A. Mining drainage basins are shown on Map C-2. Reclaimed drainage patterns are shown on Map F-1.

Runoff conditions are calculated in three conditions: pre-mine, mining, and reclaimed. This is to show the baseline runoff condition of the site, how mine disturbance will change that, and what the post-mine runoff conditions will be.

All stormwater designs are based on the 100-YR 24-HR storm event for this area of Colorado. Runoff modelling is conducted for both operating and reclaimed conditions. Calculations of runoff, both in terms of volume and flow, are according to the Rational Method.

The Rational Method is a widely used technique in hydrology for estimating peak discharge from small drainage basins during storm events. It is based on the premise that peak discharge is proportional to rainfall intensity, catchment area, and a runoff coefficient that accounts for land use and soil type. The method uses the formula Q = CiA, where Q is the peak discharge (cubic feet per second or cubic meters per second), C is the runoff coefficient, i is the rainfall intensity (inches per hour or millimeters per hour), and A is the catchment area (acres or hectares). This method is particularly useful for catchments where the time of concentration is relatively short.

The maps summarize the drainage basins (A). Runoff coefficients are based on land conditions (C). NOAA data for rainfall intensity (i) is used. Runoff coefficients are typical values from ASCE[1] tables included in the hydrology software as well as the Urban Storm Drainage Citeria Manual. The coefficients are based on the soil type and either unimproved ground (0.13-0.25) or light industrial ground (0.5-0.55) for the vegetated and disturbed conditions of the site respectively.

Assumptions: The following assumptions are made for the surface hydrology model.

1. NOAA rainfall intensities that are publicly available are accurate.
2. The computed maximum rate of runoff to the design point is a function of the average rainfall rate during the time of concentration to that point.
3. The hydrologic losses in the catchment are homogeneous and uniform.
4. The runoff coefficients represent the average soil antecedent moisture condition, imperviousness, and type of soil.

[1] American Society of Civil Engineers

5. The depth of rainfall used is one that occurs from the start of the storm to at least the time of concentration, and the design rainfall depth during that time period is converted to the average rainfall intensity for that period.
6. The maximum runoff rate occurs when the entire area is contributing flow.

Hydraflow Table of Contents

Kattenburg.gpw

10 - Year

100 - Year

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	Rational	14.44	1	135	2.685	------	------	------	Mining
2	Rational	6.016	1	135	1.119	------	------	------	Reclaimed
3	Rational	27.59	1	7	0.266	------	------	------	Baseline

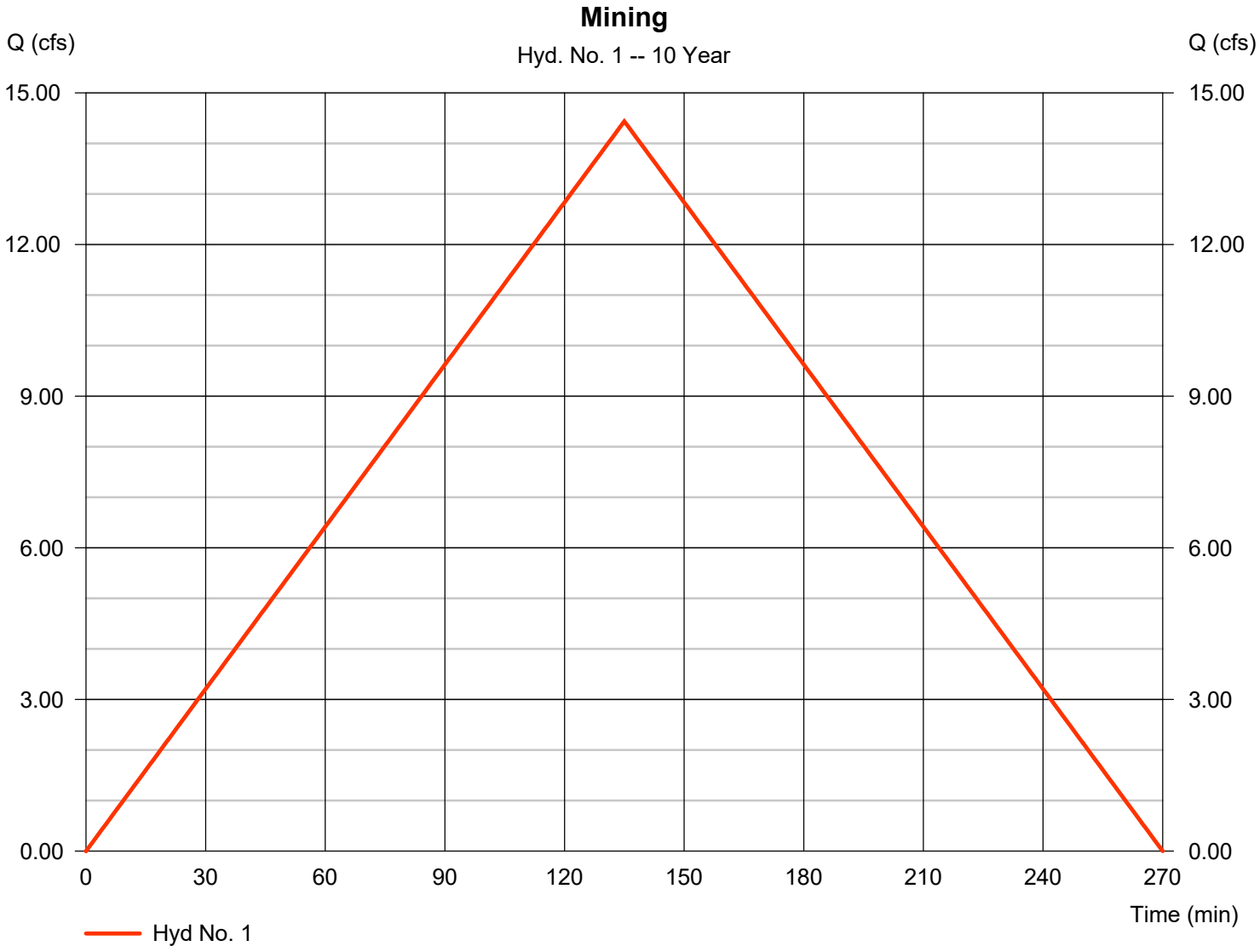
Hydrograph Report

Hyd. No. 1

Mining

Hydrograph type	=	Rational	Peak discharge	=	14.44 cfs
Storm frequency	=	10 yrs	Time to peak	=	135 min
Time interval	=	1 min	Hyd. volume	=	2.685 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.6*
Intensity	=	0.612 in/hr	Tc by TR55	=	135.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.60)] / 39.330



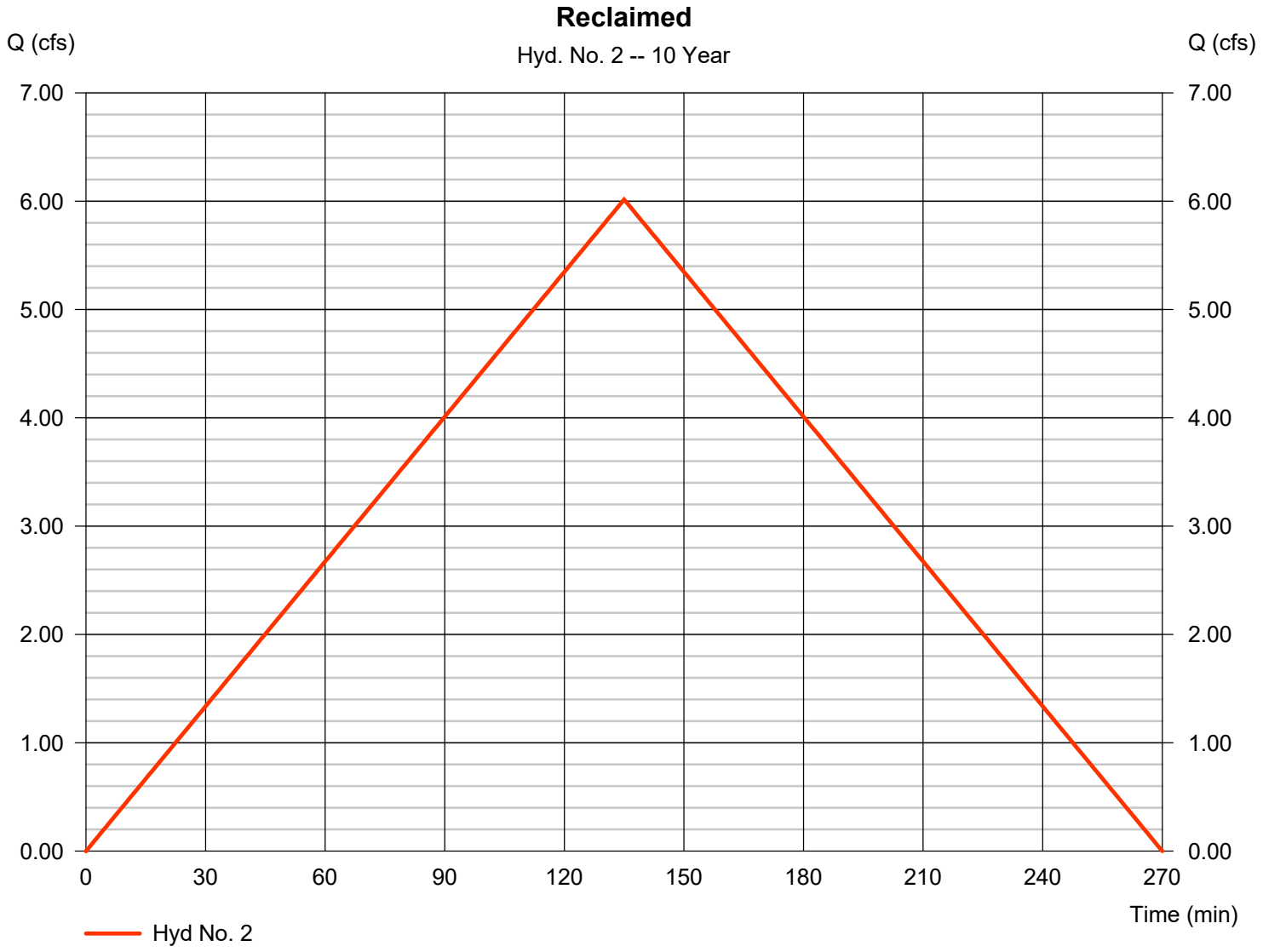
Hydrograph Report

Hyd. No. 2

Reclaimed

Hydrograph type	=	Rational	Peak discharge	=	6.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	135 min
Time interval	=	1 min	Hyd. volume	=	1.119 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.25*
Intensity	=	0.612 in/hr	Tc by TR55	=	135.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.25)] / 39.330



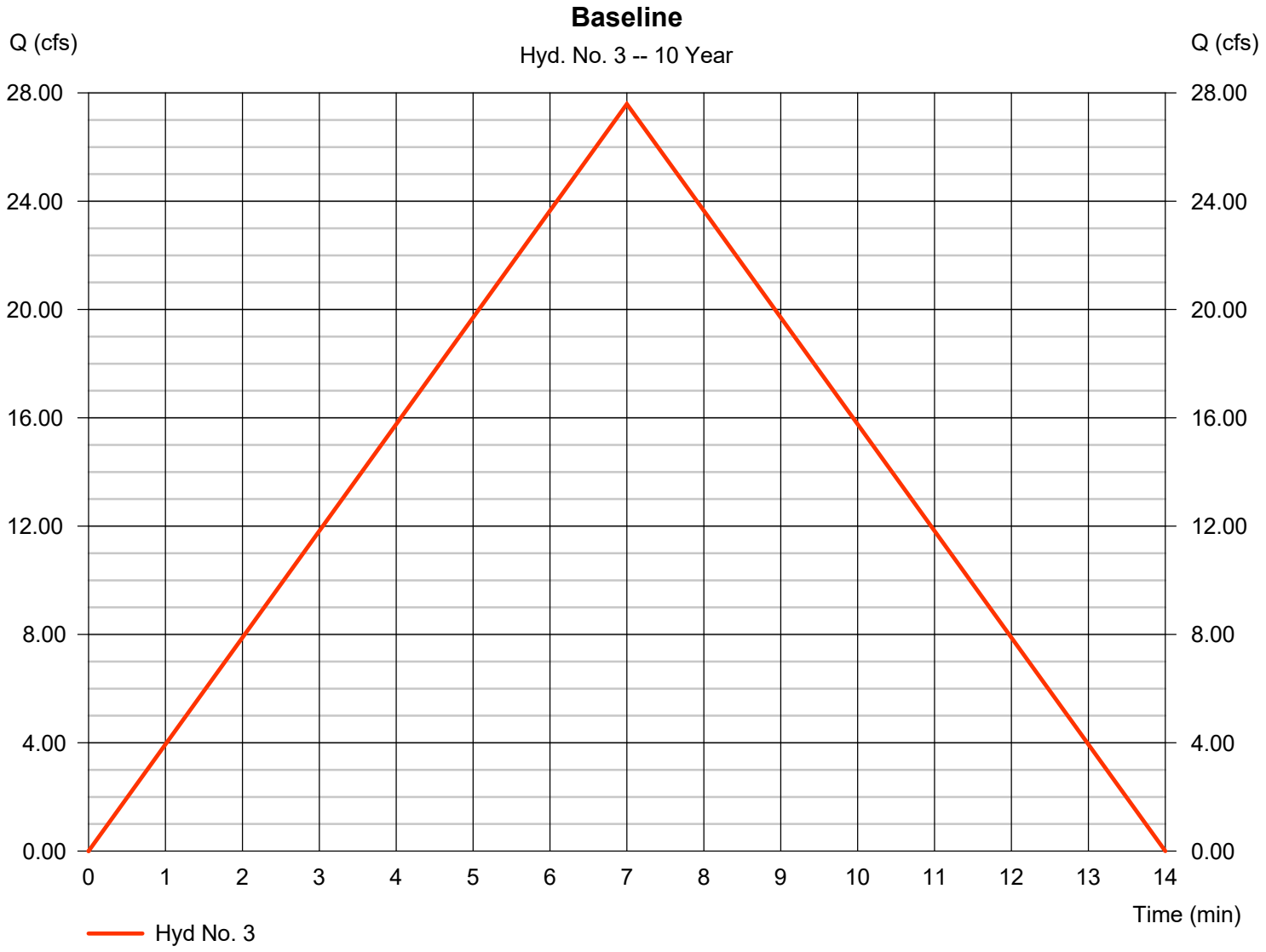
Hydrograph Report

Hyd. No. 3

Baseline

Hydrograph type	=	Rational	Peak discharge	=	27.59 cfs
Storm frequency	=	10 yrs	Time to peak	=	7 min
Time interval	=	1 min	Hyd. volume	=	0.266 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.2*
Intensity	=	3.507 in/hr	Tc by TR55	=	7.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.20)] / 39.330



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	Rational	23.68	1	135	4.403	------	------	------	Mining
2	Rational	9.867	1	135	1.835	------	------	------	Reclaimed
3	Rational	45.25	1	7	0.436	------	------	------	Baseline

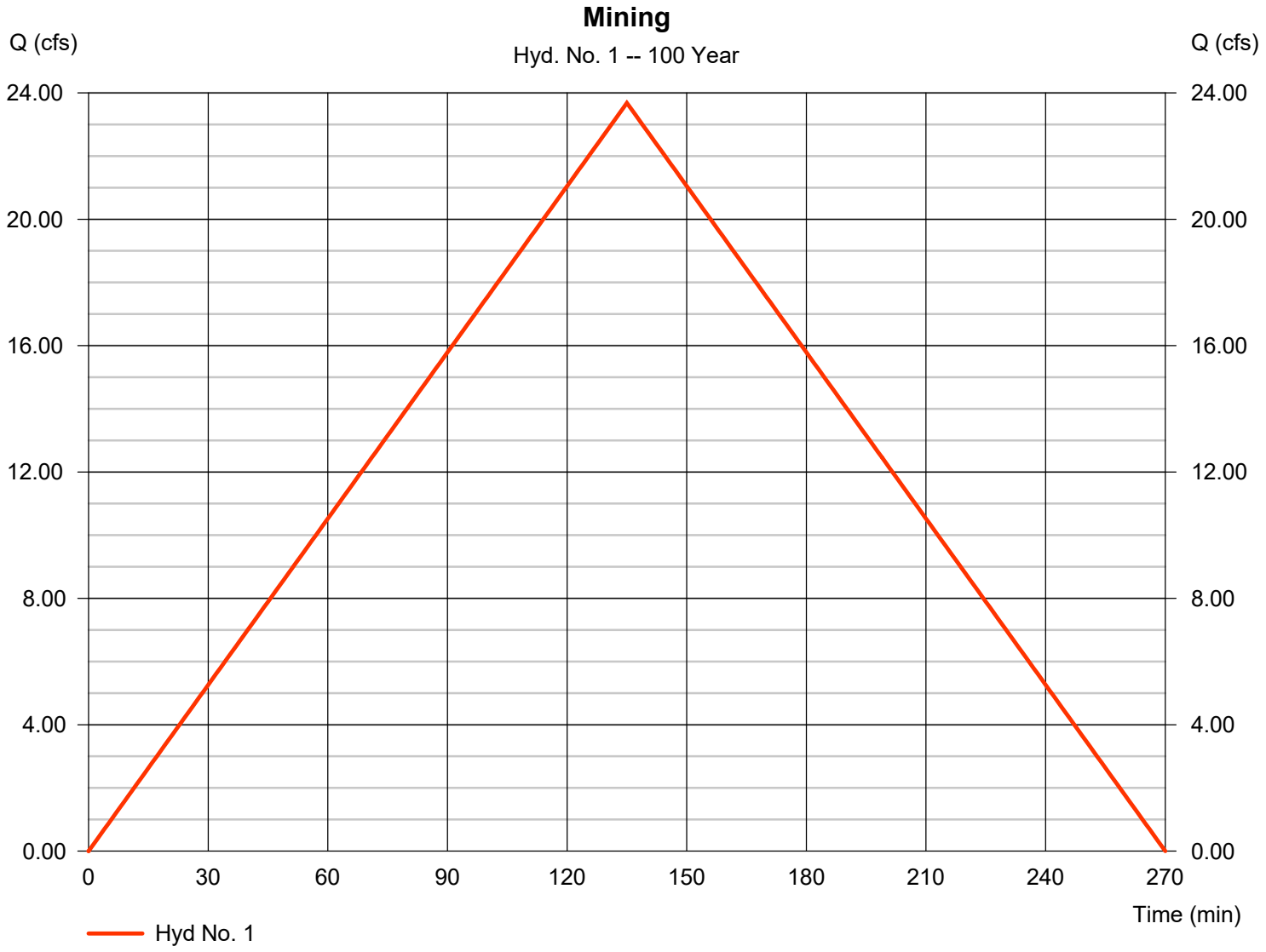
Hydrograph Report

Hyd. No. 1

Mining

Hydrograph type	=	Rational	Peak discharge	=	23.68 cfs
Storm frequency	=	100 yrs	Time to peak	=	135 min
Time interval	=	1 min	Hyd. volume	=	4.403 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.6*
Intensity	=	1.003 in/hr	Tc by TR55	=	135.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.60)] / 39.330



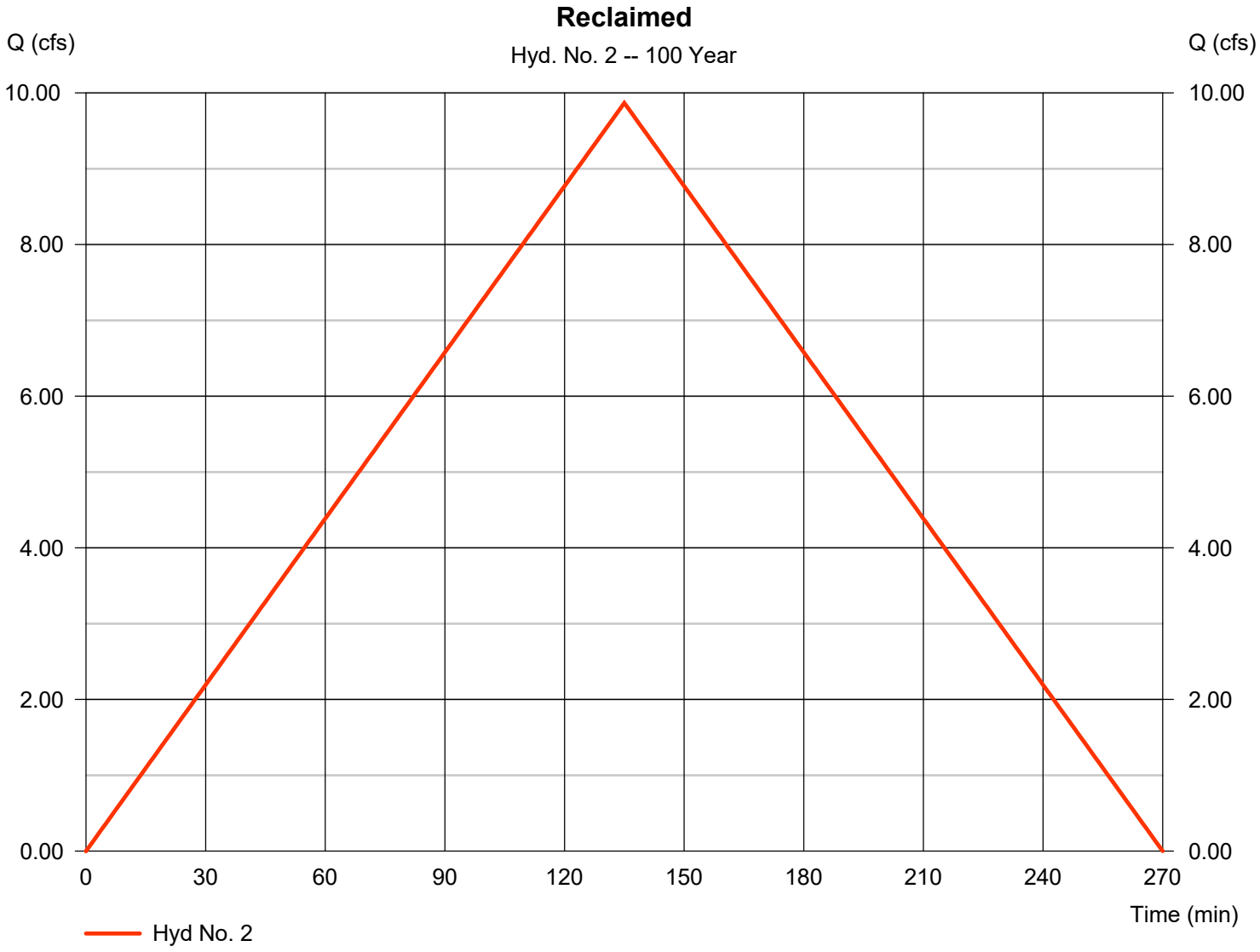
Hydrograph Report

Hyd. No. 2

Reclaimed

Hydrograph type	=	Rational	Peak discharge	=	9.867 cfs
Storm frequency	=	100 yrs	Time to peak	=	135 min
Time interval	=	1 min	Hyd. volume	=	1.835 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.25*
Intensity	=	1.003 in/hr	Tc by TR55	=	135.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.25)] / 39.330



Hydrograph Report

Hyd. No. 3

Baseline

Hydrograph type	=	Rational	Peak discharge	=	45.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	7 min
Time interval	=	1 min	Hyd. volume	=	0.436 acft
Drainage area	=	39.330 ac	Runoff coeff.	=	0.2*
Intensity	=	5.752 in/hr	Tc by TR55	=	7.00 min
IDF Curve	=	Granby CO.IDF	Asc/Rec limb fact	=	1/1

* Composite (Area/C) = [(39.330 x 0.20)] / 39.330

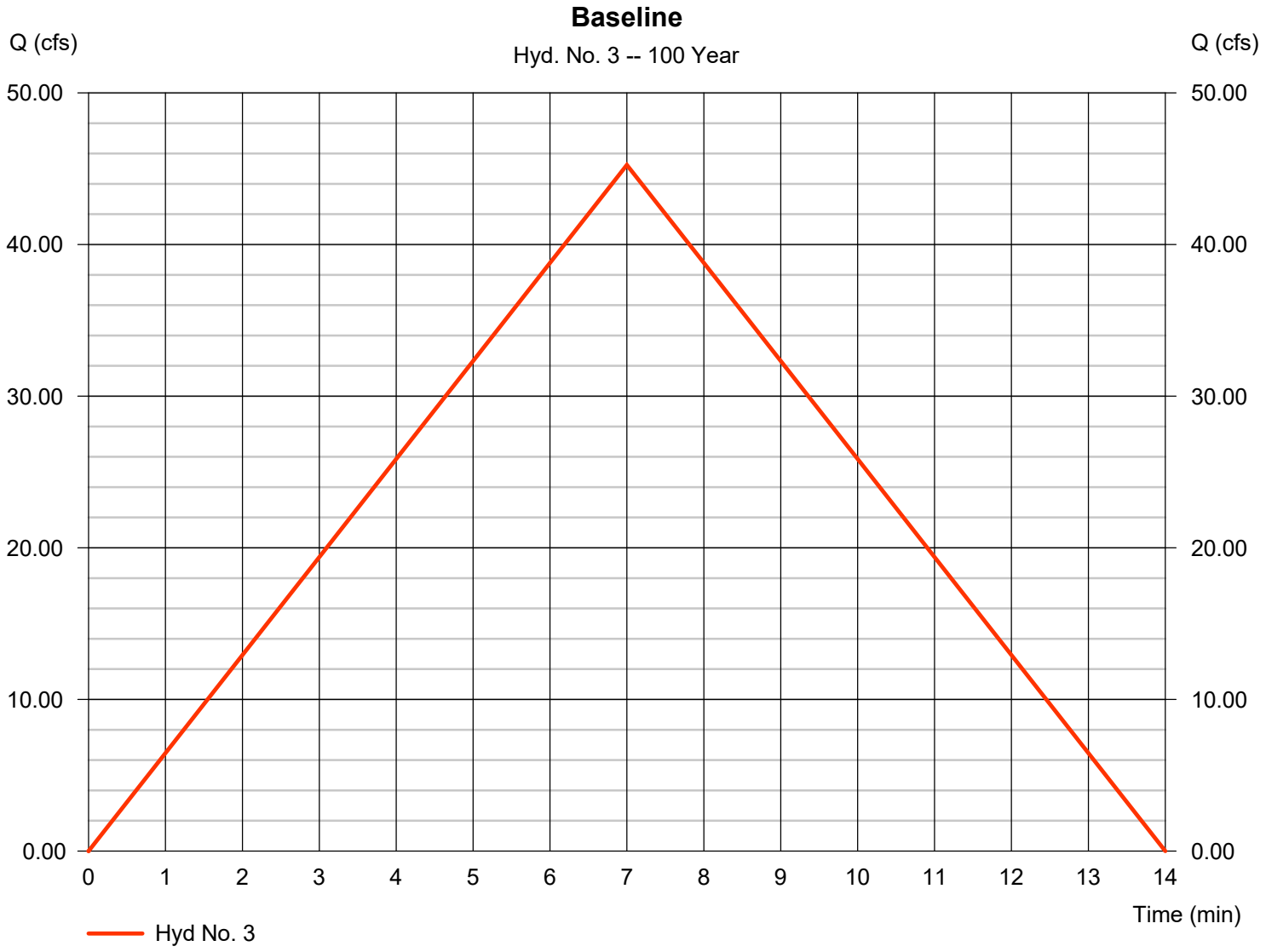


EXHIBIT L WORST CASE RECLAMATION SCENARIO

The worst case reclamation scenario for the Kattenburg Pit is at the end of mining, when the full length of interim will need backfilling, grading, and revegetation. The steps of reclamation at this point are outline below:

Final reclamation

- Highwall backfilling = 2H:1V to 3H:1V slope for 750-ft by 20-ft tall slope (Total = 22,222 CY).
- Topsoiling of all disturbed areas outside of lakes to a depth of 7 inches = 33.9 acres.
- Discing of topsoil to a depth of 7-inches over all topsoiled areas.
- Drill seeding with dryland seed mix in all other seed areas. Assuming a 25% seed failure rate, applied by increasing the seeding area to 125% of the topsoiled area.
- Facility removal (office trailer, truck scale, etc.)
- Mulching and crimping of mulch over seeding dryland areas.
- Two-years of weed control management.

Table L-1 Reclamation Task and Cost Estimate

Description	Material Quantity	Unit	Unit Cost	Cost
Highwall backfilling from mining to final condition.	22,222	CY	$1.50	$33,333
Facilities removal.	1	Unit	$15700	$15,700
Topsoiling to 7 inches deep the maximum disturbance area of 33.9 acres.	31903	CY	$1.50	$47,855
Discing of topsoil to a depth of 7 inches over 33.9 acres.	33.9	acres	$105	$3,560
Seeding of 33.9-acre dryland area. (25% reseed rate = 9.8 acres)	42.4	acres	$400	$16,960
Mulching and crimping of mulch over 33.9-acre dryland area.	33.9	acres	$850	$28,815
Weed control management for two years on 33.9 acres	33.9	acres	$220	$7,458
Subtotal				$153,681

Description	Material Quantity	Unit	Unit Cost	Cost
DRMS cost (28%)				$43,031
Total Bond Amount				$**196,712**