

# Mine Operation and Reclamation Plan

**Copper Flat Mine Project**

**Sierra County, New Mexico**

**July 18, 2012**

**Submitted To:** New Mexico Mining and Minerals Division  
Energy, Minerals and Natural Resources Department  
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WCO Sur-rebuttal  
Exhibit # 1

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aids. Residual reagent concentrations in the tailings and reclaim water streams, as well as the concentrate, are expected to be present at low concentrations. The details of reagent management used as part of the copper/molybdenum concentrating process are included in Section 3.15.3.7.

Hazardous materials and substances that may be transported, stored and used at the Copper Flat mine in quantities less than the Threshold Planning Quantity designated by *Superfund Amendments and Reauthorization Act* Title III for emergency planning are described in the Plan of Operations (NMCC 2011). Management of these and other hazardous materials would be in compliance with all applicable federal, state and local requirements, including the inventorying and reporting requirements of Title III of the *Comprehensive Environmental Response, Compensation and Liability Act*.

All petroleum products and reagents used would be stored in above-ground tanks within secondary containment as required by federal, state and local requirements and regulations. A preliminary Spill Prevention Control and Countermeasures (SPCC) plan has been developed and is included in NMCC (2012). The SPCC Plan will be maintained for the mine and mill site and provide contingencies to mitigate potential impacts from emergency or accidental releases of petroleum substances. Hydraulic oils, lubricants, antifreeze and other such liquids will all be stored in relatively small quantities, insufficient to cause any impact should they somehow be accidentally released. With the exception of the storage and use of diesel fuel and/or gasoline, all other materials and supplies used onsite will be in small quantities. All other potentially toxic materials will be stored in secured facilities and would be disposed in compliance with state and federal requirements. NMCC does not intend to dispose of any hazardous materials on-site.

#### 3.15.3.5 Pit [602.D (15) (c) (vi)]

The development of pit and mining is described in Section 3.15.1 above. Maps demonstrating the progression of pit development are provided in Appendix C.

#### 3.15.3.6 Tailings Storage Facility [602.D (15) (c) (vii)]

An existing TSF at Copper Flat was constructed by Quintana Minerals to serve their 1982 mining operation. The storage facility received 1.2 million tons of material and was essentially reclaimed in 1986. The TSF remains in place and is located southeast of the former plant site. NMCC proposes to construct a new lined TSF over the area used by previous operations for tailings storage. Tailings would be transported from the mill via slurry pipeline and deposited in the new TSF. Ancillary facilities associated with the TSF would include a tailings slurry delivery system, a tailings solution reclaim and recycling system (barge pump system) and an underdrain seepage return system.

Approximately 100 million tons of tailings are expected to be stored over the life of the Project. Tailings deposition would be approximately 25,000 tpd. During progressive settlement, water would be pumped from the TSF and returned to the process circuit. The total expected water recovery by

reclaim systems would be a nominal 70 percent. Water reporting to the TSF would be recovered from the pool of water that would form in the storage facility and be returned to the mill process water system for reuse. Precipitation would also contribute to the volume of water in the storage facility. The height of the embankment is designed to contain the normal operating volume of water completely within the storage facility, plus the amount of stormwater runoff from 75 percent of the probable maximum precipitation (PMP).

The size and location of the storage facility pool would vary during the life of the Project. The size of the pool would be affected by pre-deposition grading in the storage facility, the amount of tailings deposited, precipitation, evaporation rates, seepage rates into the designed embankment seepage collection system, infiltration into underlying soils and water recycling rates. The location of the pool would migrate within the storage facility as tailings beaches form. Tailings deposition would be managed to force the pool away from the embankment toward the upstream reaches of the storage facility. The TSF would be fenced to restrict access.

**3.15.3.7 Mill and Concentrator Facilities [602.D (15) (c) (viii)]**

For the most part, the plant facilities including the mill and concentrator would be constructed at the site of the original Quintana Minerals plant site. The crushing and concentrating plant complex would include buildings such as administrative offices, a truck shop, an electrical substation and a gatehouse. Some of the buildings will be prefabricated structures. Appropriate sanitary facilities would be provided for men and women. Table 7 provides the primary plant site structures and facilities and their approximate dimension and construction type.

**Table 7: Expected Dimensions and Construction of Mine Facilities**

Facility	Length (ft)	Width (ft)	Height (ft)	Diameter (ft)	Slab (ft)	Construction Type
Primary Crusher	90	30	103	–	0.83	Metal roof, metal siding
Electric Substation	94	68		--	1.00	slab only
Concentrator Building – Grinding Area	192	145	32	--	1.00	Metal roof, metal siding
Concentrator Building – Flotation Area	22	26	44	–	0.66	Metal roof, metal siding
Concentrator Building – Maintenance Office	13	12	14	–	0.50	Metal roof, metal siding
Concentrator Building - Reagent Area	100	52	24	--	0.83	Metal roof, block walls
Concentrate Thickeners (2)	–	--	--	50	--	Tank walls - metal
Assay & Metallurgical Laboratory	180	40	16	–	0.50	Metal roof, metal siding
Gate/Change House	120	60	14	–	0.50	Metal roof, metal siding
Truck Repair Warehouse	340	90		--	1.00	Metal roof, metal siding

#### **4.3.6 Impoundments [603.C (6)]**

Impoundments would be designed, constructed and maintained to minimize adverse impacts to the hydrological balance and adjoining properties and to assure the safety of the public. All sediment collection and stormwater ponds would be decommissioned and reclaimed during mine closure.

##### **4.3.6.1 Tailings Storage Facility Design Criteria [603.C (6) (a)]**

The TSF would be designed and would be constructed and maintained to minimize adverse impacts to the hydrologic balance and adjoining property and to assure the safety of the public. Water reporting to the TSF would be recovered from the pool of water that would form in the storage facility and be returned to the mill process water system for reuse. Precipitation would also contribute to the volume of water in the storage facility. The height of the embankment is designed so that the storage facility completely contains both the normal operating volume of water and the amount of stormwater runoff from 75 percent of the PMP. The U.S. Department of Commerce (1988) estimates the 72-hour PMP depth is approximately 26 in in the vicinity of the project area. The TSF was designed in accordance with the design and dam-safety guidelines and regulations of the NMOSE Dam Safety Bureau (NMOSE, 2010).

##### **4.3.6.2 Reclamation of Tailings Storage Facility [603.C (6) (b)]**

At closure, the TSF will be reclaimed and graded to achieve positive drainage. Details regarding the reclamation of the TSF are provided in Section 3.15.7.1.4.

#### **4.3.7 Mass Movement Minimization [603.C (7)]**

All slopes, embankments and the stockpiles would be designed, constructed and maintained to prevent the potential for mass movement both during operations and following closure. Details of the WRDF and TSF designs are presented in Appendix D.

#### **4.3.8 Riparian and Wetland Areas [603.C (8)]**

The Copper Flat mine area is primarily a terrestrial habitat with limited riparian and wetland habitats (see Section 3.13.3). The primary riparian areas are associated with the Grayback Arroyo and the established diversion. There are no plans alter Grayback Arroyo or the diversion during mining or reclamation activities. NMCC does not anticipate any significant changes to the existing surface water flow conditions with operations and would endeavor to maintain the existing hydrologic conditions that appear to support the riparian areas. All riparian areas will be managed appropriately according to state and federal requirements.

#### **4.3.9 Roads [603.C (9)]**

For the most part, existing haul roads would be utilized to haul material to the crusher, stockpiles and WRDF. Some minor realignment of these roads may be necessary and road widths would vary. Roads would be constructed and maintained to control erosion.

**MINING SEQUENCE MAPS**

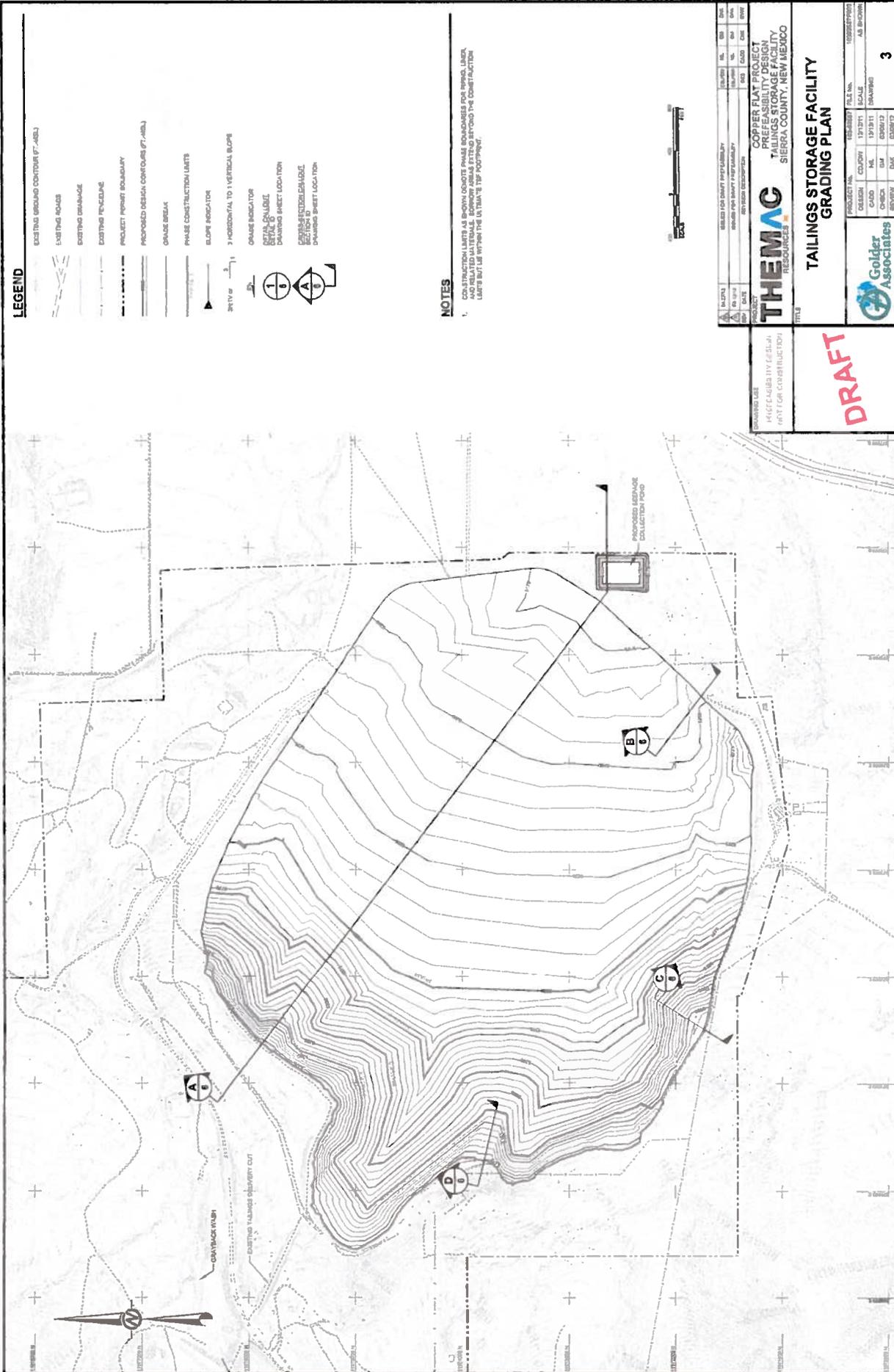
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**PRELIMINARY TAILINGS FACILITY DESIGN DRAWINGS**

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**LEGEND**

- EXISTING GROUND CONTOUR (FT./M.S.L.)
- EXISTING ROADS
- EXISTING DRAINAGE
- EXISTING FENCELINE
- PROJECT POINT BOUNDARY
- PROPOSED DESIGN CONTOURS (FT./M.S.L.)
- GRADE BREAK
- PHASE CONSTRUCTION LIMITS
- SLOPE INDICATOR
- 3-HORIZONTAL TO 1 VERTICAL SLOPE
- GRADE INDICATOR
- SECTION CHAINAGE
- CHAINAGE SHEET LOCATION
- CROSS-SECTION CHAINAGE
- SECTION ID
- DIVISION SHEET LOCATION

**NOTES**

1. CONSTRUCTION LIMITS AS SHOWN INDICATE PHASE BOUNDARIES FOR DESIGN, LAND, AND RELATED UTILITIES. BOUNDARY MARKS FIT TO BEYOND THE CONSTRUCTION LIMITS BUT ARE WITHIN THE LIMITS OF THE FOOTPRINT.



PROJECT NO.	171911	SCALE	AS SHOWN
DESIGN	171911	DATE	11/19/11
CHECK	DM	DATE	03/09/12
REVIEW	DM	DATE	03/09/12
DATE	11/19/11	PROJECT	COPPER FLAT PROJECT
DATE	11/19/11	PROJECT	PREFEASIBILITY DESIGN
DATE	11/19/11	PROJECT	TAILINGS STORAGE FACILITY
DATE	11/19/11	PROJECT	SIERRA COUNTY, NEW MEXICO

**THEMAC**  
RESOURCES

**TAILINGS STORAGE FACILITY  
GRADING PLAN**

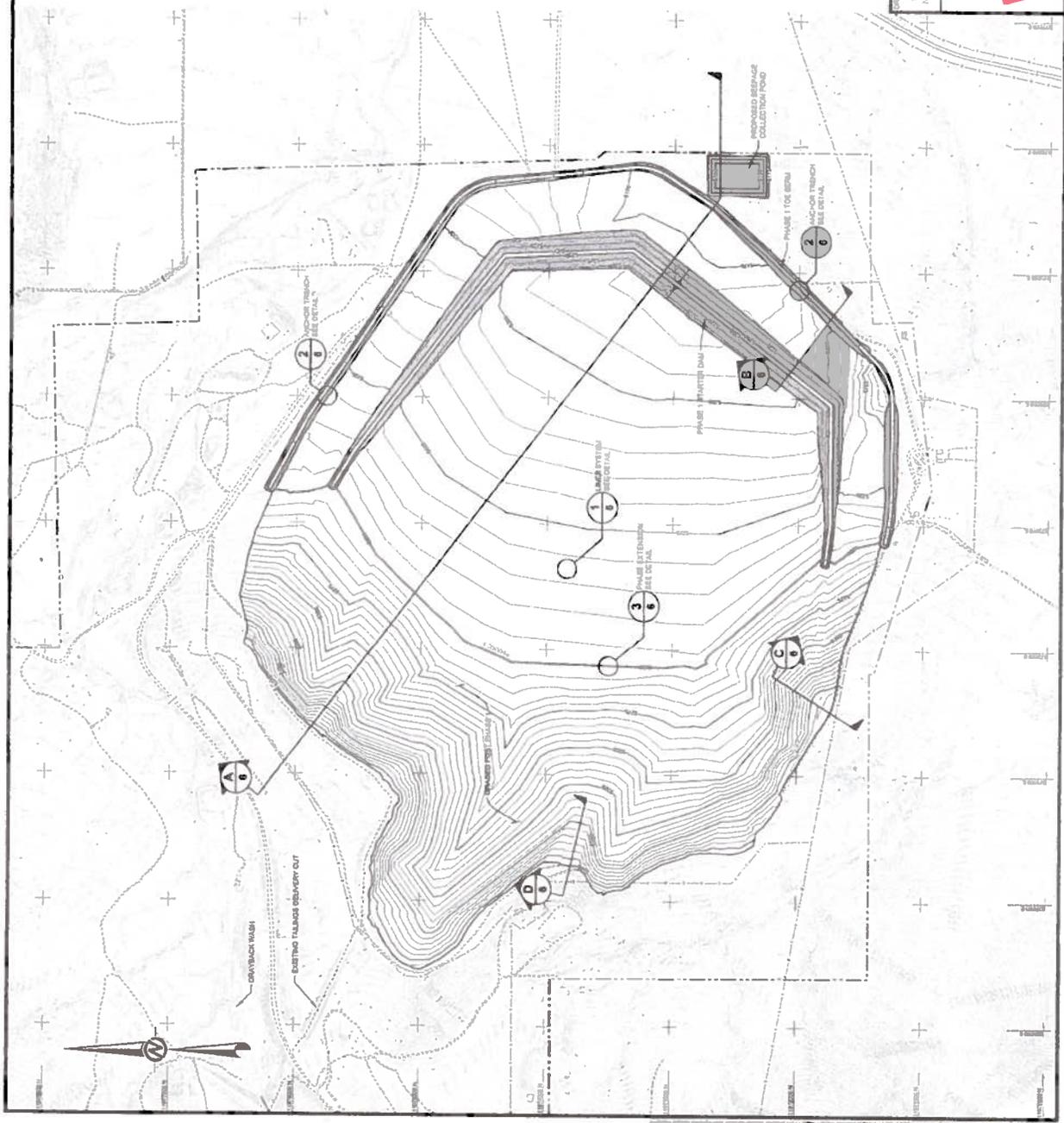
**Golden Associates**

**DRAFT**

3

**LEGEND**

- EXISTING GROUND CONTOUR (PT. 1/4")
- SUBSTRAD ROADS
- POSTROAD DRAINAGE
- EXISTING FENCELINE
- PROJECT PERMIT BOUNDARY
- IMPROVED DESIGN CONTOUR (PT. 1/4")
- GRADE BREAK
- PHASE CONSTRUCTION LIMITS
- SLOPE INDICATOR
- 3-HORIZONTAL TO 1 VERTICAL SLOPE
- 3:1 HORIZONTAL TO 1 VERTICAL SLOPE
- GRADE INDICATOR
- SEWER CHASE
- PHASE 1 TRENCH
- DRAINAGE SHEET LOCATION
- CONSTRUCTION CALLOUT
- PHASE 1 TRENCH LOCATION
- DRAINAGE SHEET LOCATION



PROJECT	COPPER FLAT PROJECT	DATE	04/08/2011
PROJECT	TAILINGS STORAGE FACILITY	DATE	04/08/2011
PROJECT	PHASE 1 CONSTRUCTION	DATE	04/08/2011
PROJECT	PHASE 1 CONSTRUCTION	DATE	04/08/2011

**THEMAC**  
RESOURCES

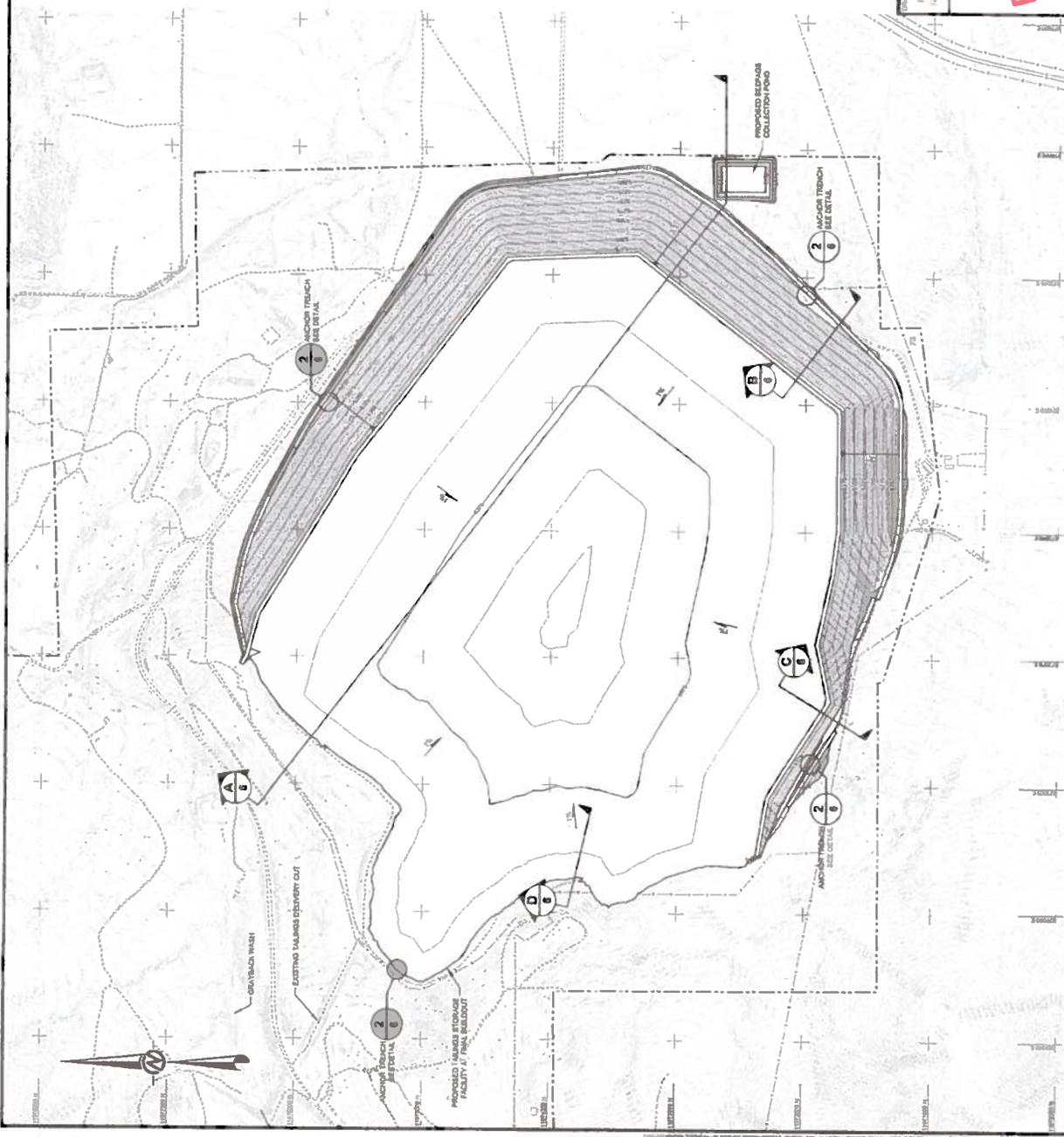
**TAILINGS STORAGE FACILITY PHASE 1 PLAN**

**DRAFT**

PROJECT NO.	102-02222	FILE NO.	102-02222-01
DESIGN	02/11/11	REVISION	04/08/11
CHECK	04/08/11	DATE	04/08/11
DATE	04/08/11	DATE	04/08/11

4

**Golden Associates**



**LEGEND**

- EXISTING GROUND CONTOUR (FT/MSL)
- EXISTING ROAD
- EXISTING DRAINAGE
- EXISTING FENCELINE
- PROJECT PERMIT BOUNDARY
- PROPOSED GROUND CONTOUR (FT/MSL)
- GRADE BREAK
- SLOPE INDICATOR
- 3 HORIZONTAL TO 1 VERTICAL SLOPE
- GRADE INDICATOR
- DETAILED CALLOUT
- DRAWING SHEET LOCATION
- CONSTRUCTION CALLOUT
- DRAWING SHEET LOCATION

DATE	DESCRIPTION	BY	CHK
12/11/11	ISSUED FOR PERMIT	...	...
01/12/12	ISSUED FOR DRAFT	...	...
02/13/12	ISSUED FOR DRAFT	...	...

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**PROJECT:** TAILINGS STORAGE FACILITY AT FINAL BUILDOUT  
**CLIENT:** GOLDER ASSOCIATES

**DRAFT**

PROJECT NO.	11-0001	FILE NO.	11-0001-05
DESIGN	13/13/11	SCALE	AS SHOWN
CAD	01/12/11	DRAWING	5
CHECK	02/13/12		
DATE	02/13/12		

