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Lucky Friday Mine Mullan, Idaho

Mine Tailings Impoundment Structure (MTIS) No. 4

Topics of Presentation:

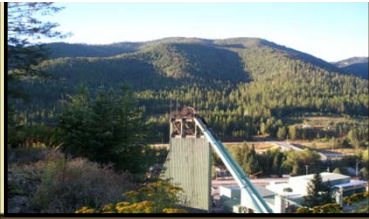
Considerations & Criteria Incorporated Into The Design

- Impoundment Geometry
- Geotechnical Concerns (Downstream Construction Method and Slope stability)
- Capacity (Stage-Storage Curve)
- Environmental Protections (Liner Materials and Groundwater Monitoring, Stormwater Runoff and Return Water Management)

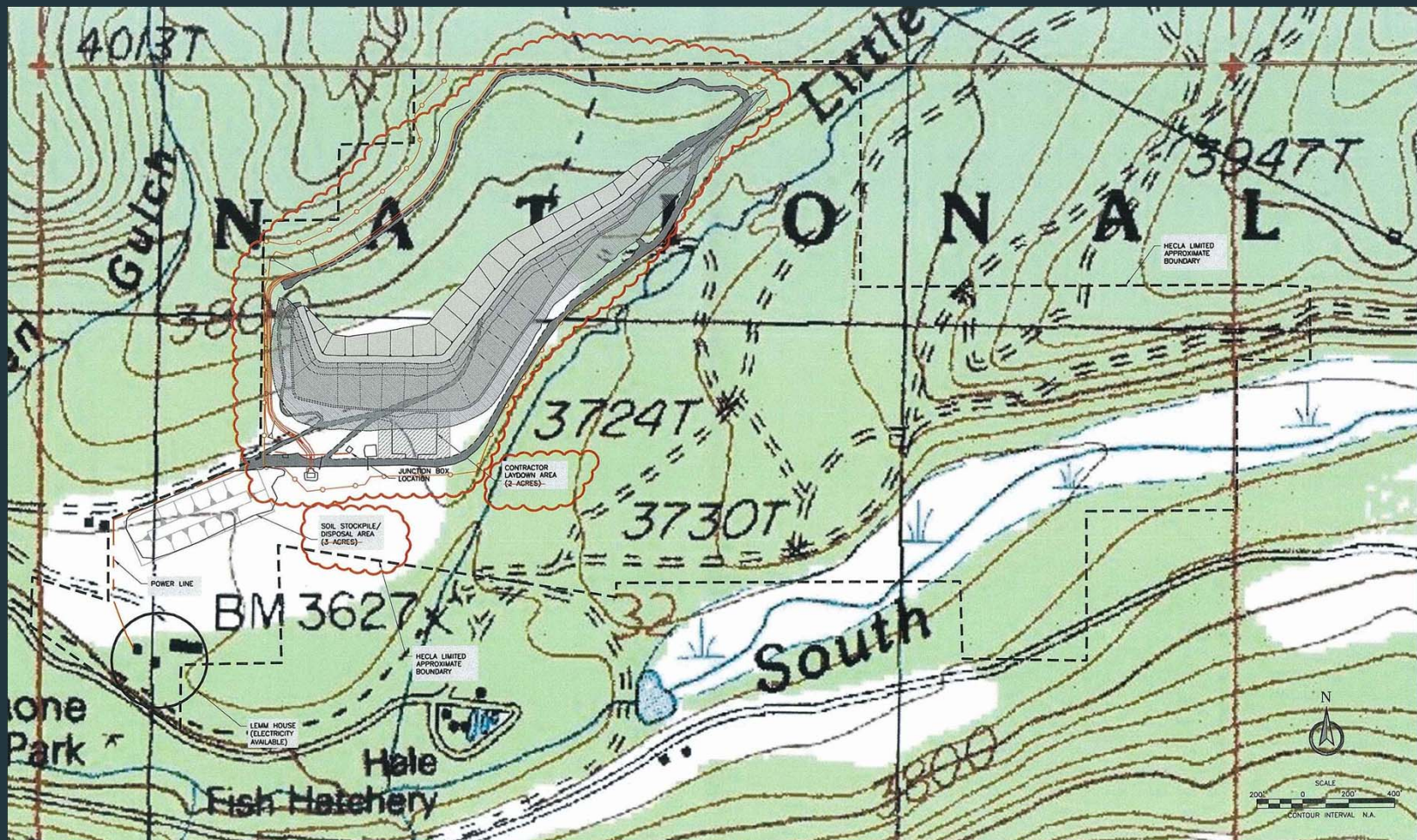
Photos From Construction and Commissioning the Impoundment

Pool Water Management Strategies: Design verses Operational Needs -

Dichotomy of perspectives..



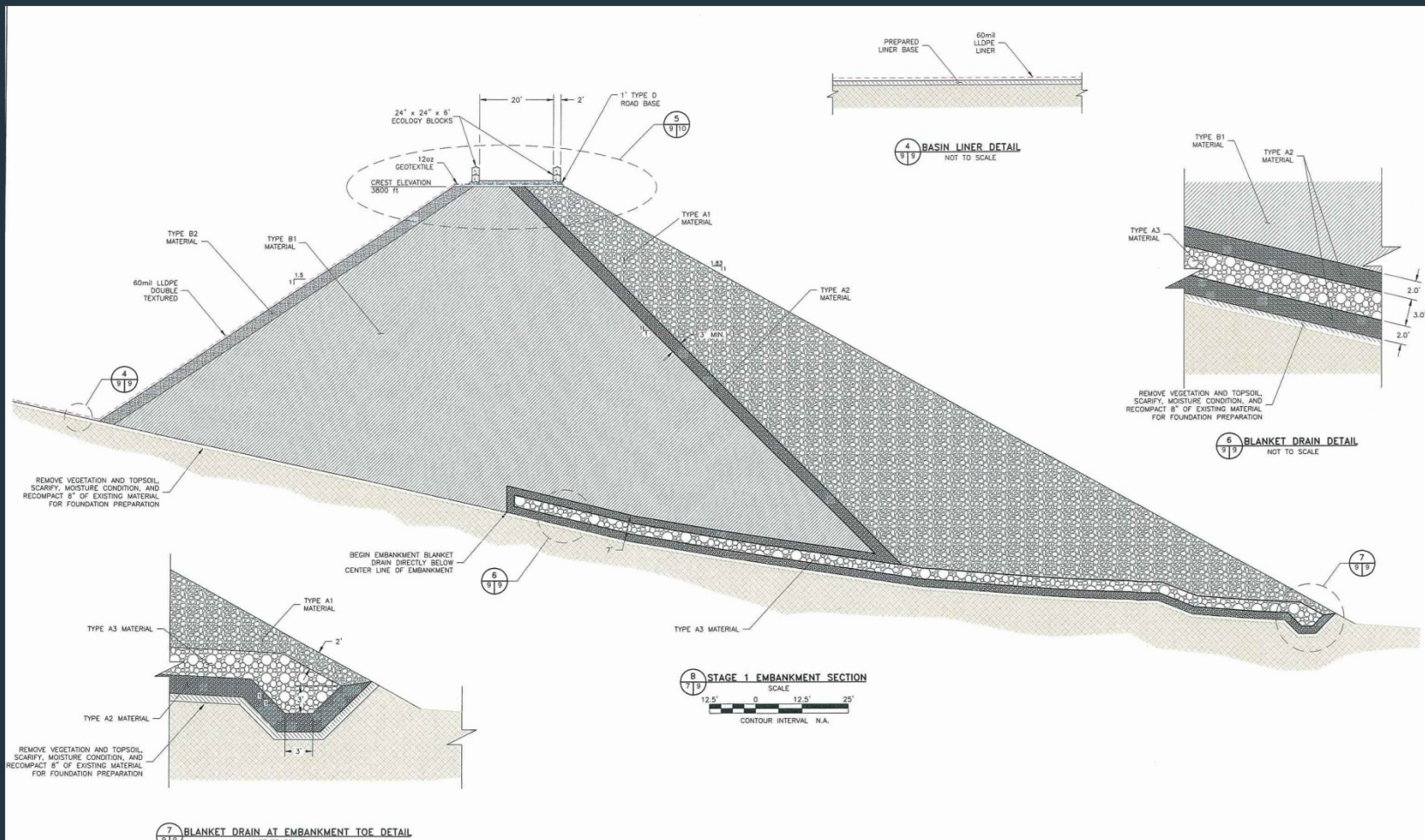
Lucky Friday MTIS No. 4 No. 4 Impoundment Geometry





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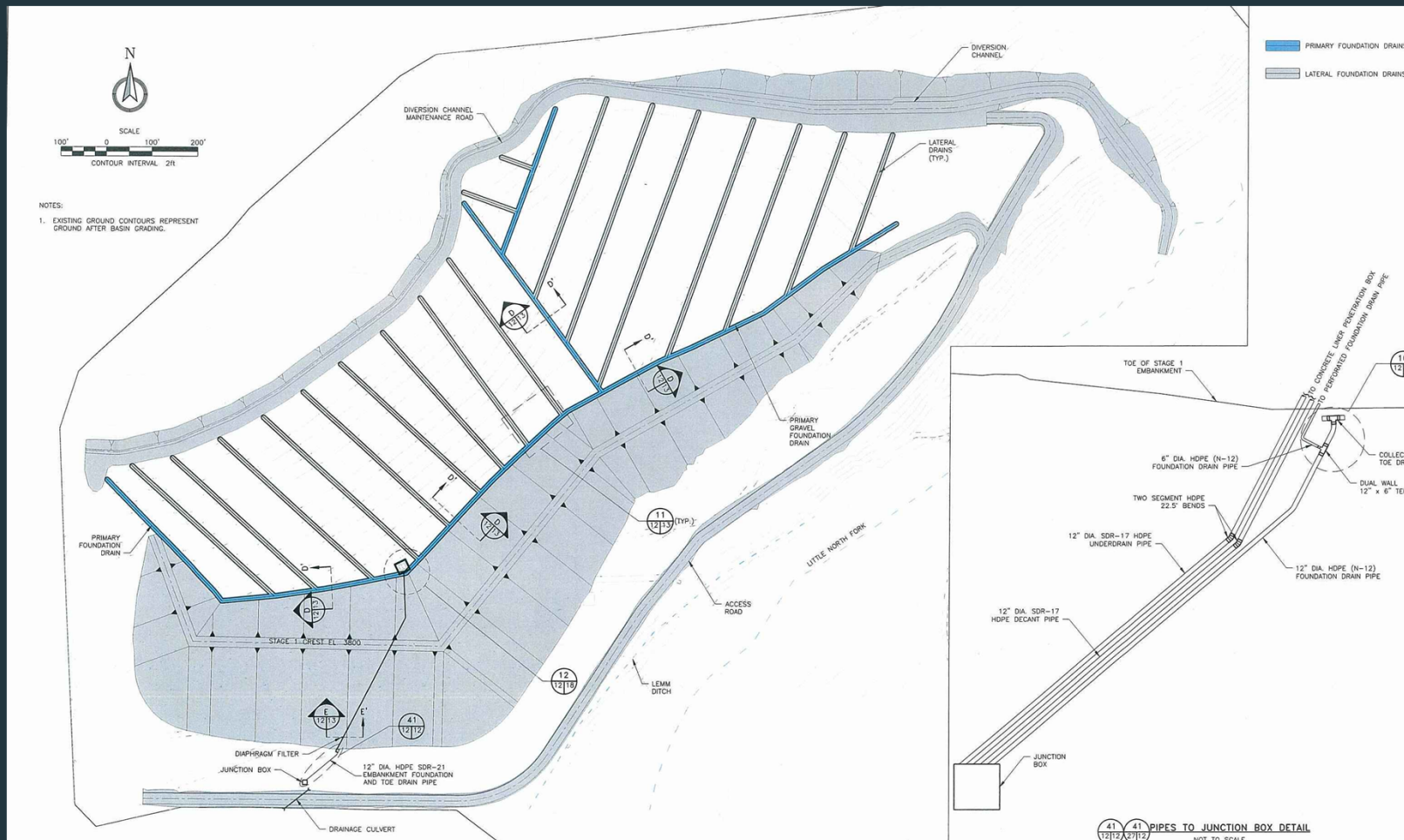
No. 4 Impoundment Geometry





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No. 4 Impoundment Geometry

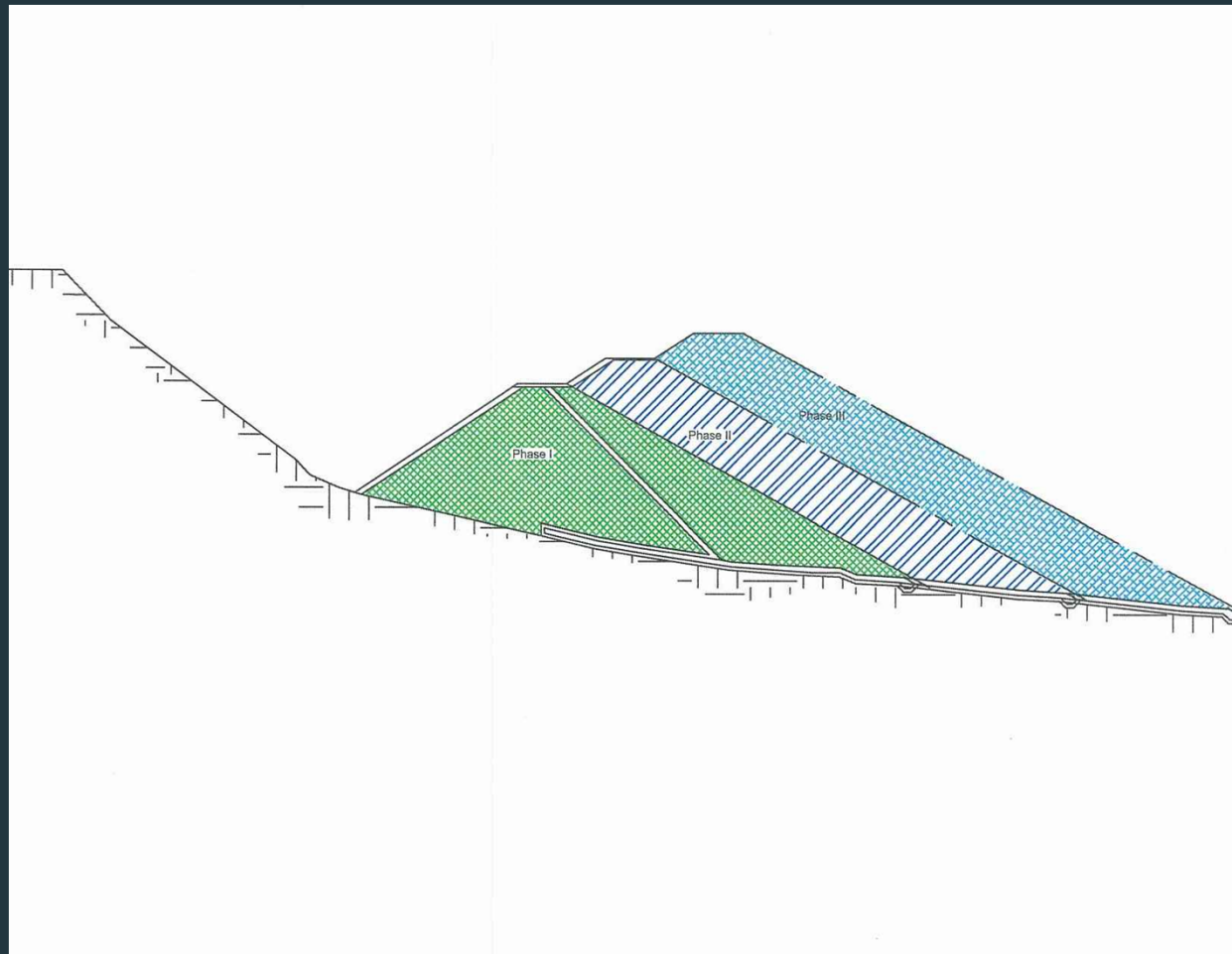




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No. 4 Impoundment Geometry





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Design Considerations and Criteria

Capacity

Stage-Storage Relationship

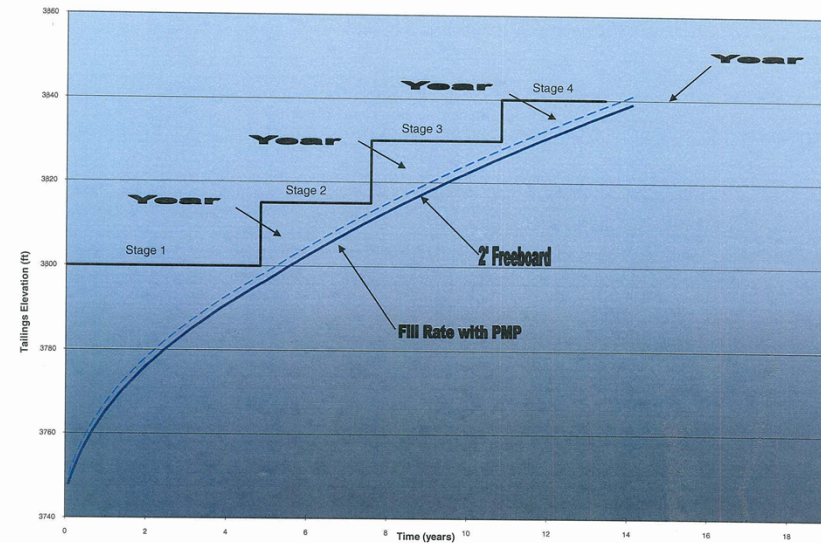
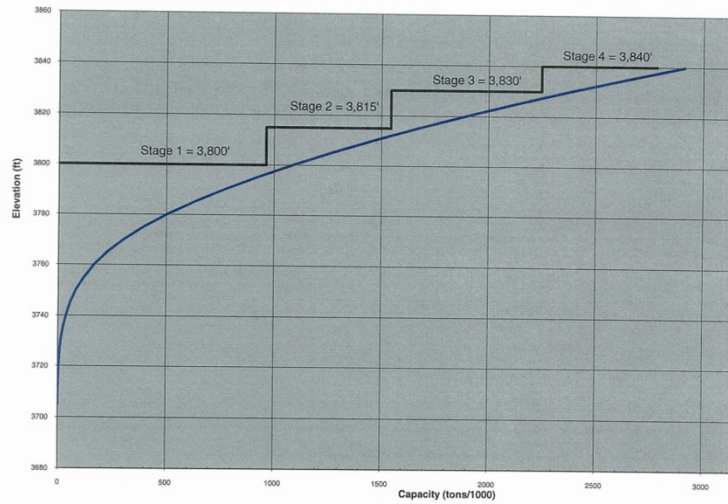
- Tailings Capacity
- Water Balance



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Stage-Storage Relationship

Capacity vs. Elevation





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Design Considerations and Criteria

Capacity - Water Balance

Tailings pumped to the impoundment in a slurry of variable solids content. +

Precipitation falling directly in the footprint of the impoundment. +

Evaporation to atmosphere. –

Decanted water or underdrain water removal . –

- Some water is unavailable for removal because of capillary pressures and surface tension within the pore spaces of the fine grained material.

If the results of the Stage-Storage Relationship, cost benefit analysis and water balance



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Design Considerations and Criteria

Capacity - Conclusion

- Evaluate Stage-Storage Relationship
- Perform Cost Benefit Analysis based on projected life of Impoundment.
- Create a Water Balance model and determine if impoundment will have deficit of water or surplus.
- If surplus, refine cost Benefit Analysis to include budgetary cost of treatment facility to allow discharge into the environment.

If the results of the se evaluations are acceptable, the design advances to creation of Construction documents and subsequent construction of the facility.



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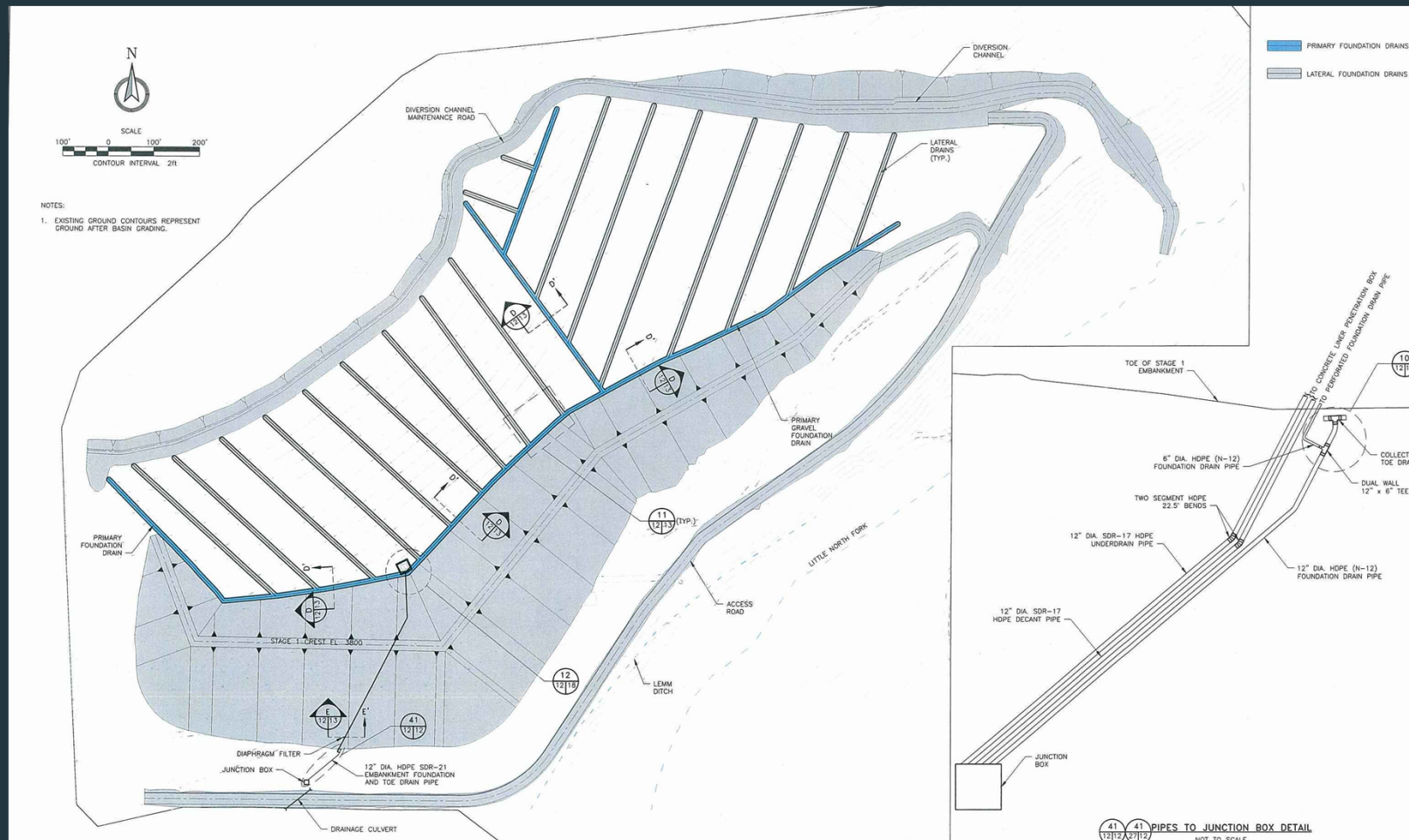
Design Considerations and Criteria

Environmental Protections

- Liner Materials
- Leak Monitoring Program
- Groundwater Monitoring, and
- Stormwater Runoff .



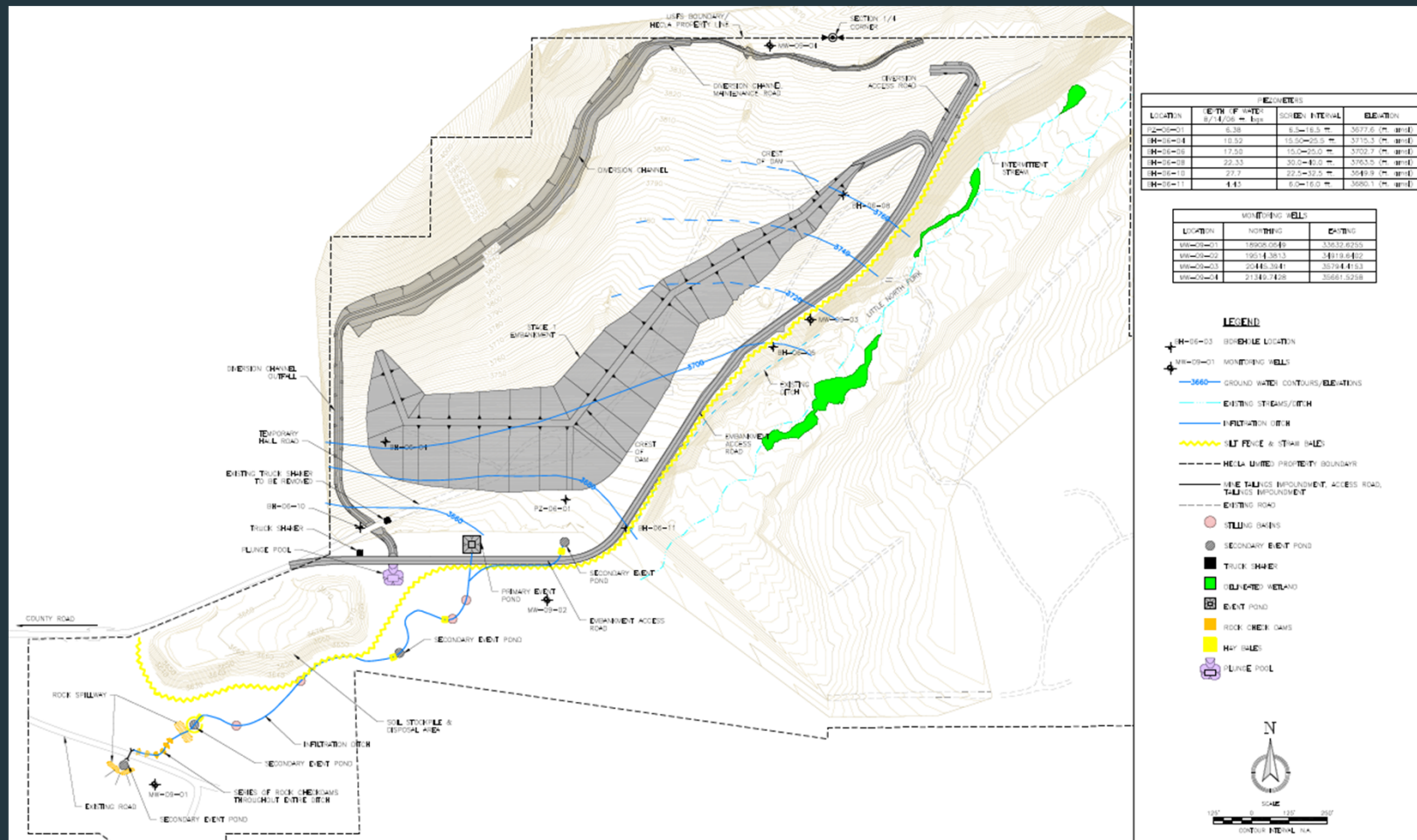
Lucky Friday MTIS No. 4 No. 4 Impoundment Env. Protections

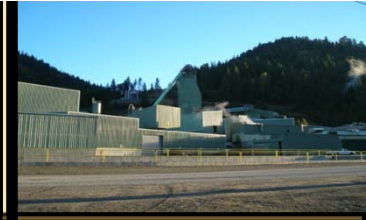




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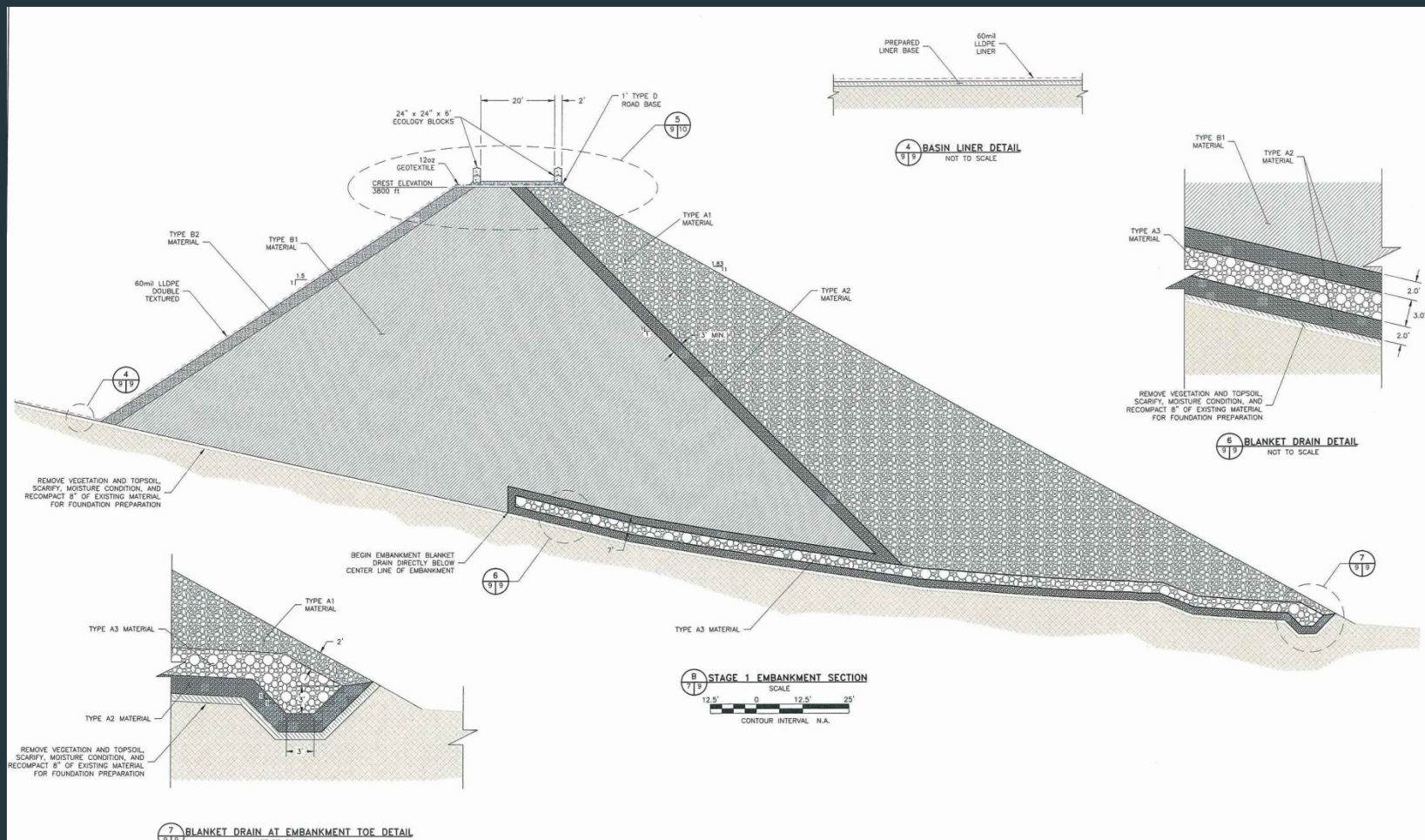
Lucky Friday MTIS No. 4 No. 4 Impoundment Env. Protections

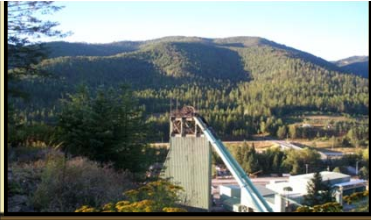




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No. 4 Impoundment Env. Protections





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Stockpile the Soil





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A Good Foundation





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Raising Embankment





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Lining Begins 2009





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Chasing Down The Subgrade Crew





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Into Everyone's Life A little Rain Must Fall





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2010 Crews Hit The Ground Running

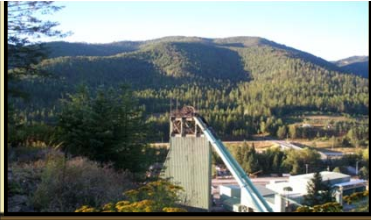




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Drainpipe Goes In





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Completed Sept. / Commissioned Oct.

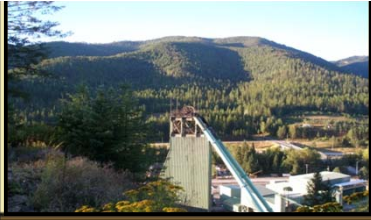




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Winter 2010-2011





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Questions???

THANK YOU