

TS POWER PLANT CCR LANDFILL – 2021 INSPECTION

Prepared for:

Nevada Gold Energy, LLC
914 Dunphy Ranch Road
Battle Mountain, Nevada 89820

Prepared by:



NewFields Mining Design & Technical Services
225 Silver Street, Suite 100
Elko, Nevada 89801

NewFields Project 475.0221.009
October 18, 2021

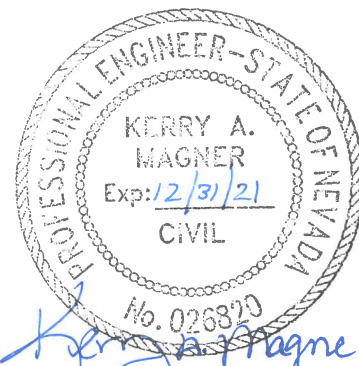




TABLE OF CONTENTS

1. INTRODUCTION	1
2. PROJECT DESCRIPTION	1
2.1. Site Inspection	2
3. KEY OBSERVATIONS MADE DURING INSPECTION	3
3.1. General Condition of the Landfill Perimeter	3
3.2. General Condition of the CCR	3
3.3. Collection Pond	4
3.4. Stormwater Controls	4
4. SUMMARY	4

LIST OF FIGURES

Figure 1	Vicinity Map
Figure 2	Site Plan

LIST OF APPENDICES

APPENDIX A

Inspection Tables

APPENDIX B

Selected Photographs



1. INTRODUCTION

This report presents the results of the September 2021 Inspection of the Coal Combustion Residue (CCR) Landfill at the TS Power Plant (TSPP), which is owned and operated by Nevada Gold Energy, LLC. The project site is located approximately three (3) miles north of the Interstate 80 Dunphy exit in Eureka County, Nevada as shown in Figure 1.

This report is intended to meet the 2015 Coal Combustion Residual Rule 40CFR Part 257.84(b) requiring an annual inspection by a qualified professional engineer for existing CCR landfills.

2. PROJECT DESCRIPTION

The TSPP is a 242 MW coal-fired power plant commissioned in 2008 and is one of the newest and reportedly most advanced coal fired power plants in the United States. Sub-bituminous coal from the Powder River Basin in Wyoming is the primary fuel at the facility. The coal contains approximately 5.4 percent ash. At full load, the plant burns approximately 110 tons/hour (tph) of coal and generates about 5.9 tph of ash.

The TSPP facilities are located within Sections 11 and 14, Township 33N and Range 48E and includes a CCR landfill located approximately 0.5 miles northeast of the power plant. The CCR landfill is a fully geomembrane-lined facility (80-mil HDPE) with a total designed footprint of approximately 36 acres and a maximum CCR design height of 60 feet. During the operational life of the power plant, the CCR landfill will be constructed incrementally as six adjoining six-acre cells plus two storage ponds to contain run-off from the design storm event falling on the landfill. The individual cells are to be developed in stages as needed to provide storage capacity for the planned life of the power plant facility. Each cell is hydraulically independent. The design storage is based on a maximum CCR height of 60 feet. In addition to ash, the CCR landfill was designed and permitted to contain cooling tower side stream softening filter press sludge. A 2017 modification to the Class III Landfill Permit issued by the Nevada Division of Environmental Protection allows for the disposal of two additional waste streams: site-generated construction and demolition (C&D) debris and spent baghouse bags.

Currently, two cells (Cell 1 and Cell 2) and one pond (Pond 1) have been constructed. Cell 1, the southwestern cell of the landfill, was part of original plant construction and is not currently being used for deposition. Cell 2, an identical six-acre cell immediately north of Cell 1, was constructed in 2013 and is currently the only cell accepting the designated waste streams.

Based on facility deposition information, during 2021 disposal consisted of 3,809 tons of ash, 275 tons of press sludge and baghouse bags, and 25 tons of construction debris all placed in Cell 2. Cell 1 has material placed over the full cell area to a height of approximately 35 to 40 feet. Vehicle



access to Cell 1 is currently restricted and material placement is occurring only in Cell 2 in approximately 15-foot lifts expanding to the north. Currently, Cell 2 has approximately 95% of the cell area covered with the first lift of disposed material and perimeter berms. Materials are being placed in Cell 2 beginning adjacent to the previously placed Cell 1 material and working northward.

Stormwater control consists of internal collection of precipitation falling on the landfill facility (contact water or run-off) and the diversion of external non-contact water (run-on). To provide internal storm water collection and drainage, the base of CCR landfill was graded to drain from the northwest to southeast at a slope of 1.4 percent. Internal drainage reports to the collection pond located at the down gradient end of the facility. The individual landfill Cell 1 and Cell 2 are separated by a 3-foot high and 12-foot wide (base width) internal divider berm constructed with a 2:1 (horizontal to vertical) slope. Perimeter containment is provided by 20-foot wide (base width) by 5-foot high perimeter berms with 2:1 fill slopes within natural soils.

The landfill cells are fully lined with a single layer of an 80-mil HDPE geomembrane liner placed over a prepared subgrade. The lining system extends to the external containment berms. A drainage blanket with an integral network of underdrain piping overlies the geomembrane and serves as the storm water runoff and leachate collection system. The drainage blanket consists of a 2-foot thick layer of free draining gravel. The internal underdrain piping consists of perforated 4-inch and 8-inch diameter corrugated polyethylene pipe (CPEP) placed on 30-foot centers within the drainage blanket material. A collection channel is located along the eastern down gradient edge of the individual cells to collect storm water runoff and leachate. The channel discharges to the storm water pond(s) located at the southern margin of the landfill.

Two storm water collection ponds have been designed down gradient and adjacent to Cell 1 and Cell 4. The western pond, Pond 1, has been constructed and serves Cell 1 and Cell 2 and the future Cell 3. The southeastern Pond 2 is to be constructed in the future, and will serve Cells 4, 5 and 6 once they are constructed and placed into operation. Pond 1 is lined with an 80-mil HDPE geomembrane overlying a geosynthetic clay liner (GCL).

The landfill facilities are separated from run-on from the natural up gradient watersheds by the perimeter berms surrounding the facility and the storm water diversion system. The diversion channels have been designed to safely pass the peak flow from a 100-year, 24-hour storm event.

2.1. Site Inspection

The Inspection of the CCR Landfill was conducted on September 7, 2021. The work items for the inspection involved the following elements:



- A site visit and inspection of the facility was performed by Kerry Magner, Ph.D., P.E. of NewFields.
- The results of the inspection of the facility were briefly discussed with Nevada Gold Energy site personnel.
- Photographs were taken of typical and key features noted during the inspection.
- Inspection tables were completed to document the inspection.
- This summary report was prepared.

Appendix A includes the tables completed for the November 2021 inspection. Selected photographs taken during the site inspection are presented in **Appendix B** of this report. **Figure 1** provides a vicinity map and **Figure 2** presents a general site plan of the CCR landfill showing the location of relevant features of the facility.

3. KEY OBSERVATIONS MADE DURING INSPECTION

3.1. General Condition of the Landfill Perimeter

The entire perimeter of the facility was toured as part of the inspection and appeared to be in good to excellent condition. Photographs 4 through 17 are illustrative of typical conditions along the facility perimeter. The perimeter containment berms were observed to be well constructed and the where the HDPE liner is exposed the liner appears to be in excellent condition. During the 2019 inspection and again during the 2020, damage to the perimeter berm liner system was noted at two locations. In 2021 these locations have been repaired, photographs 19 and 20 detail the repairs. General housekeeping practices around and within the facility were good and the facility appeared to be well maintained.

No signs of leachate flow, seepage, global slope instability, or significant deformation were observed within the facility during the site inspection.

3.2. General Condition of the CCR

The materials placed within the landfill are predominantly contained within Cell 1 to a height of 35 to 40 feet above the drainage layer. Vehicle access to Cell 1 is currently restricted and material placement is occurring in Cell 2 in approximately 15-foot lifts expanding to the north. Approximately 95-percent of Cell 2 has been covered in a single lift. Materials have been placed with approximate angle of repose slopes. Some isolated areas with minor raveling or sloughing of overly wet materials were reported in the 2017 and 2018 inspections. No signs of recent or additional significant raveling or sloughing was observed. Photographs 6, 7, 10, 14, 16 and 17 show typical conditions of the materials contained within the landfill. No signs of seepage, global



slope instability, or significant deformation were observed within the facility during the site inspection.

3.3. Collection Pond

As shown in Photographs 1, 2 and 3, the collection pond had a water level approximately 8 feet below the inlet spillway, with minimal water in the collection pond. Minor sediment and vegetation were observed along the east embankment of the collection pond. No leachate flow from the landfill to the pond was observed at the time of the inspection. The HDPE geomembrane was in good condition and no damage or defects were noted. The perimeter fencing and signage is maintained and in good condition.

3.4. Stormwater Controls

Stormwater is routed around the perimeter of the facility by diversion channels and/or the perimeter berms that surround the landfill. Typical diversions are shown in Photographs 4, 5, 8, 9, 11, 12, 15, and 16. An access ramp over the perimeter berm is located near the southwest corner of Cell 1 (Photograph 15). A secondary access into Cell 2 has been planned and partially constructed. A geomembrane wear sheet has been installed over the perimeter berm liner at the location of the planned secondary access. The secondary access includes a culvert to facilitate stormwater management. This culvert is yet to be installed. Stormwater controls were observed to be consistent with the intent of the design and no significant issues were noted as part of the inspection.

4. SUMMARY

The following conclusions are formed based on the site inspection performed in September 2021 by NewFields.

The facility appears to be functioning as the design intended and appears to be well maintained. No signs of seepage, leachate, global instability or major deformation were observed. No significant engineering or operational issues were observed or identified as part of this inspection.

Ongoing and routine programs at the landfill include the following:

- Continue weekly site monitoring and inspection of the facility to monitor the crest, downstream slopes and exposed liner for signs of damage, instability, slumping, erosion, seepage or other abnormal conditions (ongoing by TSPP personnel).
- To prevent overfilling, excessive sloughing and to facilitate grading for closure, we recommend placement successive lifts such that the toe of the new lift is set back from the



existing crest of the slope, such that an overall 3:1 exterior slope angle is achieved. Any sloughing that occurs onto the perimeter berm should be removed and the slope regraded such that drainage around the toe of the stacked materials is maintained.

- To expand facilitate access and improve utilization, the secondary access into Cell 2 should be completed. This requires the installation of a stormwater culvert under the access and securing of the wear sheet over the existing liner. Until the access is complete, the wear sheet should be properly secured by fusing welding to the primary liner to prevent any liner damage.
- Continuing documentation of the monitoring activities, including visual inspections of the facility (ongoing by TSPP personnel).
- Periodically check drainage channels and culverts for blockage and sediment to confirm functionality (ongoing by TSPP personnel).

If you have any questions or require additional information, please contact the undersigned.

Sincerely,

NewFields Mining Design & Technical Services

Reviewed by:

Kerry A. Magner, Ph.D., P.E.
Senior Geotechnical Engineer III

Kevin Lutes, P.E.
Principal, Partner

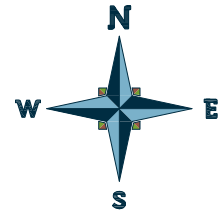
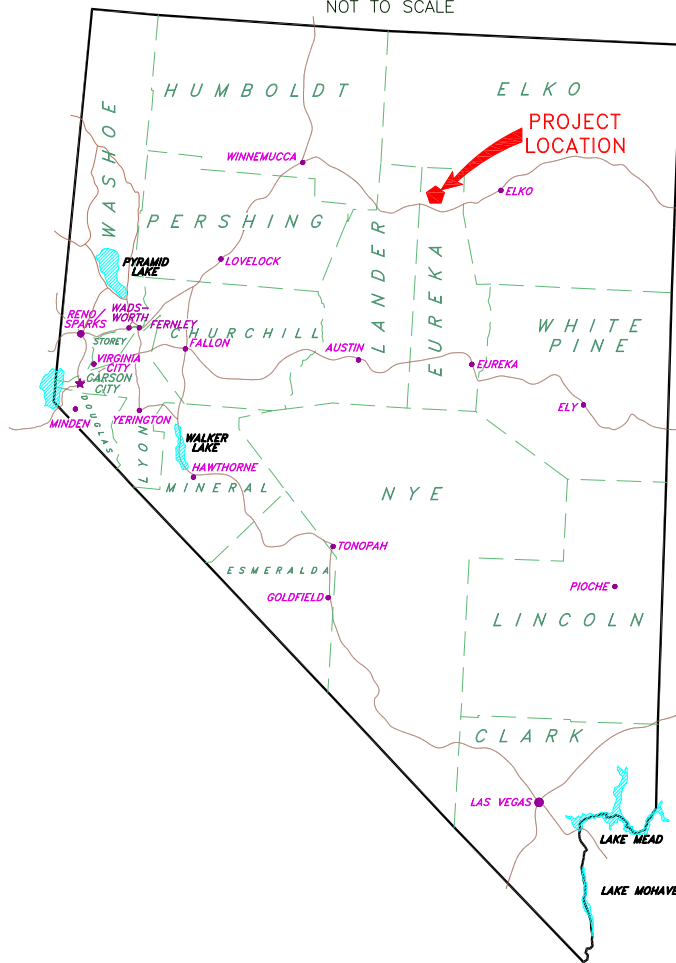
KM/KL/km

Addressee: (2) + electronic via e-mail

FIGURES

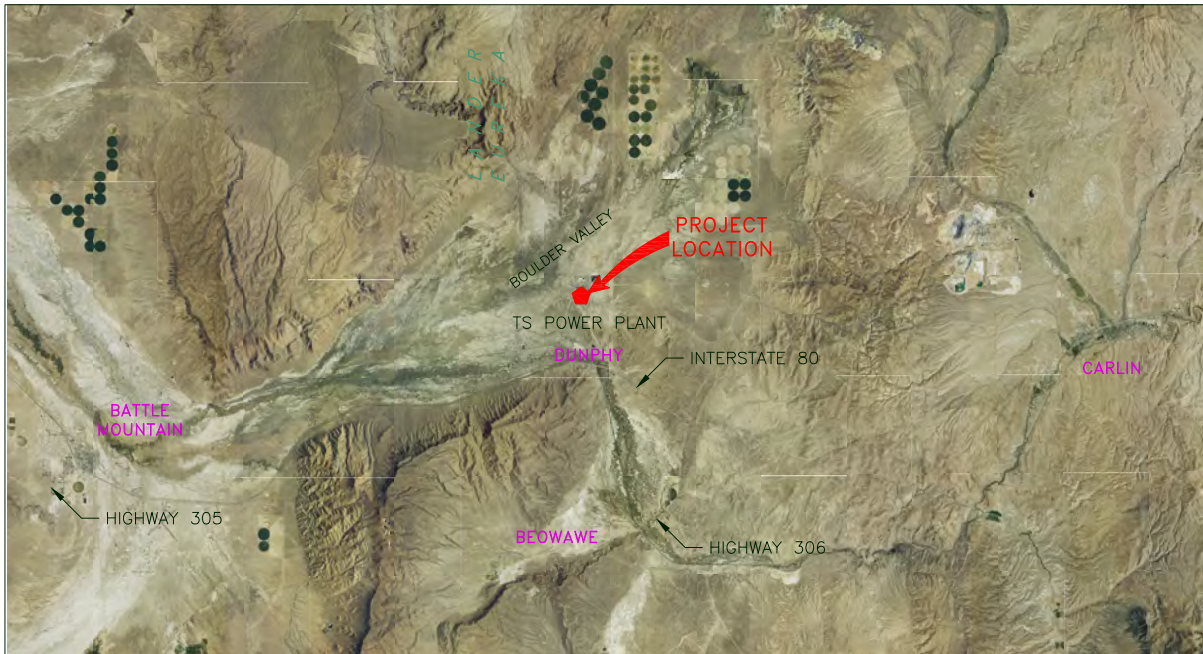
LOCATION MAP

NOT TO SCALE



VICINITY MAP

NOT TO SCALE



NOTE:
PHOTO DATE: AUGUST 2013.
SOURCE: NAIP



PROJECT NUMBER	LOCATION
475.0221	EUREKA COUNTY, NEVADA
DOCUMENT FILENAME	
TSP-221-1DK-0004_0 - VICINITY MAP.DWG	

AREA	CLIENT
TS POWER PLANT	NEVADA GOLD MINES
PROJECT	
2021 INSPECTION CCR LANDFILL	
FIGURE TITLE	
VICINITY MAP	




FIGURE NUMBER	REVISION
1	0



REFERENCE:

IMAGE PRODUCED BY UAS DIGITAL MODEL WITH A FLIGHT DATE OF JUNE 30, 2020. IT IS NOT CERTIFIED SURVEY DATA OVERSEEN OR SIGNED BY A REGISTERED PROFESSIONAL LAND SURVEYOR. USER ACKNOWLEDGES NEWFIELDS IS NOT LIABLE FOR MISUSE. APPROPRIATE USE SHOULD BE DISCUSSED WITH NEWFIELDS.

		AREA TS POWER PLANT	CLIENT NEVADA GOLD MINES
		PROJECT 2021 INSPECTION CCR LANDFILL	
PROJECT NUMBER 475.0221.008	LOCATION EUREKA COUNTY, NEVADA	FIGURE TITLE GENERAL SITE PLAN	
DOCUMENT FILENAME TSPP-221-1DK-0003_0.DWG		FIGURE NUMBER 2	REVISION 0



APPENDIX A

Inspection Tables

TABLE A.1
Background Information
2021 CCR Landfill Inspection
TS Power Plant, Eureka County, Nevada

Inspected by:	Kerry A. Magner, Ph.D., P.E.
Approved and reviewed by:	Kevin Lutes, P.E.
Inspection Date:	September 7, 2021
Weather conditions:	70°, Overcast (Smoky)
Purpose of facility:	Storage of CCR and cooling tower side stream softening filter press sludge.
Date of last Facility Inspection by the EOR:	N/A
Date of last Facility Inspection Report:	November 2020
Initial construction date:	Cell 1 - 2008 and Cell 2 - 2013
Original facility engineered by:	AMEC (2005)
Type of facility:	Non-impounding landfill. Fully geomembrane lined with 80-mil HDPE. External stormwater/leachate collection pond lined with 80-mil HDPE over GCL.
Watershed:	The up-gradient watershed is collected and routed to the east and west via stormwater diversion channels.
Monitoring:	Four groundwater monitoring wells in the area surrounding the landfill. Three down gradient and one up gradient as shown on Figure 2.
Design/as-built data available:	Yes. On-site.
Volume of solids stored:	Approximately 270,00 cubic yards of solids (266,000 cubic yards, NewFields Aerial Survey Completed Aug 2020).
CCR production rate:	5.9 tons per hour of ash.
Special 'as-built' features:	None
US features inspected/reviewed:	Yes
Perimeter walk-over conducted:	Yes
Discharge facilities inspected:	N/A
Surveillance program available:	Yes
Storage ponds/other facilities inspected:	Stormwater/Leachate Collection Pond (Pond 1) down gradient of Cell 1-2 facility.
New developments DS of facility:	None
General condition of facility:	Overall, facility is in good condition. No signs of leachate, seepage, instability, or distress. Minor liner issues that require attention
Next Inspection required:	Annually

TABLE A.2
Inspection of Facility
2021 CCR Landfill Inspection
TS Power Plant, Eureka County, Nevada

OBSERVED FEATURES	YES	NO	PHOTO NOS.	COMMENTS / NOTES
1.0 Facility Perimeter				
1.1 Evidence of Erosion		X	4,6,7,14, and 16	No erosion along the perimeter of the landfill berms was noted.
1.2 Evidence of Movement		X	See 1.1	
1.3 Evidence of Sloughing		X	See 1.1	Not in the constructed perimeter berms.
1.4 Evidence of Cracking		X	See 1.1	
1.5 Vegetation	X	X	1,3,4,6,7,8,9,10,11,12, 13,14,15,16 and 17	Minor vegetation on the liner cover material and in pond
1.6 Other Unusual Conditions		X		
1.7 Evidence of Repairs		X		
2.0 Landfill Materials				
2.1 Lateral Movement	X	X	4,6 and 16	Some minor sloughing noted in 2017-2020 inspections; No change in 2021 inspections.
2.2 Evidence of Settlement		X		
2.3 Evidence of Cracking		X		
2.4 Erosion		X	See 2.1	Localized.
2.5 Other Unusual Conditions		X		
2.6 Evidence of Repairs		X		
2.7 Miscellaneous		X		
3.0 General				
3.1 Solution Pond(s)	X		1, 2 and 3	External Stormwater/Leachate Collection Pond. Composite lined with 80-mil HDPE over GCL.
3.2 Embedded/buried structures		X		
3.3 Accessible by Truck	X		15	Landfill access ramp. Secondary Access wear sheet needs additional securing. Secondary Access needs stormwater pipe installed
3.4 Public Access - Pond		X	See 3.1	Area signed and fenced.
3.5 Liner Conditions	X		19 and 20	Repairs completed during summer 2021.
3.6 Other Unusual Conditions		X		



Photo 1. Collection Pond 1 - View Northeast



Photo 2. Collection Pond 1 Gate



Photo 3. Collection Pond 1 - View Southwest



Photo 4. South Perimeter Berm, Southeast Corner, Cell 1 - View West



Photo 5. East Perimeter Berm, Southeast Corner, Cell 1 - View North



Photo 6. Panoramic Southeast Corner of CCR, Cell 1 - View Northwest



Photo 7. Left to Right Cell 1 - Cell 2 Transition. View West



Photo 8. East Perimeter Berm, Northeast Corner, Cell 1 and 2 - View South



Photo 9. North Perimeter Berm, Northeast Corner, Cell 2 - View West



Photo 10. Panoramic Northeast Corner of CCR, Cell 2 - View Southwest



Photo 11. North Perimeter Berm, Northwest Corner, Cell 2 - View East



Photo 12. West Perimeter Berm, Northwest Corner Cell 2 - View South



Photo 13. Panoramic Northwest Corner of CCR, Cell 2 - View Southeast



Photo 14. Left to Right Cell 2 – Cell 1 Transition - View East



Photo 15. West Perimeter Berm and Access Point, Southwest Corner, Cell 1 - View North



Photo 16. South Perimeter Berm, Southeast Corner, Cell 1 - View East



Photo 17. Panoramic Southwest Corner of CCR Cell 1 - View Northeast



Photo 18. Cell 2 First Lift Deposition - View South to Cell 1



Photo 19. Liner Repair – Cell 1 South Berm Crest



Photo 20. Liner Repair – Cell 1 South Bern Downstream Toe