

January 26, 2024

Alaska Department of Environmental Conservation
Solid Waste Program
555 Cordova Street
Anchorage, Alaska 99501

RESTORATION

SCIENCE & ENGINEERING

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Subject: Permit Renewal Application for the Palmer Reclamation Site (PRS) Inert Waste Landfill, Palmer, Alaska

On behalf of Alaska Demolition, Restoration Science & Engineering, LLC (RSE) is providing this information supporting Alaska Demolition's Inert Waste Permit Application for renewal of the Palmer Reclamation Site (PRS) located in Palmer, Alaska. This letter serves to satisfy the engineer review requirements of 18 AAC 60.210(c).

RSE reviewed applicable elements of the permit application provided by Alaska Demolition, and based on information provided by Alaska Demolition found to fulfill the permit application requirements.

RSE also prepared updated design calculations for the maximum inventory of wastes that will be disposed of over the usable life of the facility, including the maximum design capacity of the facility, expected usable life and remaining life of the facility. RSE reviewed calculations prepared by Shannon & Wilson for the 2019 permit application renewal, 2019-2023 compacted Construction & Demolition (C&D) Waste survey data and RSE measured the remaining available area using the 2023 survey drawing to prepare the 2024 permit application calculations. A summary of these calculations and the section of the ADEC Inert Waste Monofill Permit Application is provided below, along with the attached calculation spreadsheet and figure showing the available area that was measured and assumed to be available for ongoing C&D waste disposal from 2024 moving forward.

Maximum Inventory of Wastes (ADEC Inert Waste Monofill Permit Application Section 7.5.b)

Based on information provided by Alaska Demolition, the Drinking Water Well 500-foot setback line was in an incorrect location on previous permit application drawings. Denali North collected updated survey information of the existing neighboring drinking water wells located west of the PRS site, and the 500-foot well setback line has been updated on the 2024 permit application Figures 1-7.

RSE used the 2019 total surveyed volume of compacted C&D Waste and added the 2019 through 2023 C&D fill survey information to calculate the total volume of compacted C&D waste through 2023. RSE used the 2023 survey data to create a new Current Site Plan Figure 1 and used scale measurements to calculate the remaining on property available space for C&D waste disposal inside of the 75-foot property line buffer and outside of the 500-foot water well setback line. Based on this RSE determined there is an estimated 275,000 square feet of remaining usable space for the full 50-foot depth of fill placement.

The total compacted C&D waste through 2023 is 1,494,983 cubic yards. RSE used the 275,000 square foot of remaining usable space multiplied by 50-foot depth to determine that there is approximately **509,259 cubic yards of space remaining in the landfill** for C&D wastes including cover material. Adding the 509,259 cubic yards of remaining space to the total compacted C&D waste through 2023 of 1,494,983 cubic yards gives a **maximum design capacity of 2,004,242 cubic yards** of C&D waste including cover material.

Expected Usable Life Calculations (ADEC Inert Waste Monofill Permit Application Section 7.5.c)

Total Landfill Volume Available: 2,004,242 cubic yards

Remaining Landfill Space (Including Cover Material): 509,259 cubic yards

Annual Surveyed Volume of Compacted C&D Waste: 46,870 (2022) to 140,000 cyd (from 2019 Application)

Estimated Operational Design Life of Landfill: 16 to 25 years

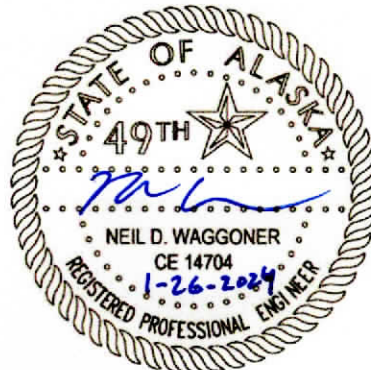
Estimated Remaining Operational Life of Landfill: 3.5 to 11 years

In accordance with 18 AAC 60.120(c), this letter and applicable permit application elements have been reviewed by a professional engineer in the State of Alaska. If you have questions or comments regarding the attached application please contact Neil Waggoner, PE at 907-602-8931 or nwaggoner@restorsci.com.

Respectfully submitted,
RESTORATION SCIENCE & ENGINEERING, LLC



Neil Waggoner, PE



- Attachments: (1) Alaska Demolition Palmer Reclamation Site Landfill Expected Usable Life Calculations
(2) Draft PRS Fig 1 with available remaining CD Disposal Area for Calculation

**Alaska Demolition Palmer Reclamation Site
Landfill Expected Usable Life Calculations
Restoration Science & Engineering, LLC**

Neil Waggoner, PE 1/25/2024

2019 Calculation Info (Shannon & Wilson, Inc.)

Landfill Volume available (including cover material) (V_{LF}):	1,890,000 cy
Annual design volume compacted C&D waste (V_{cd}):	80,000-120,000 cy
Total surveyed volume of compacted C&D waste (V_{cs}):	1,208,398 cy
Annual surveyed volume compacted C&D waste (V_{ca}):	60,000-140,000 cy

Estimated design operational life of landfill (V_{LF}/V_{cd}) = 16 to 24 years

Estimated remaining operational life of landfill ($(V_{LF}-V_{cs})/V_{ca}$) = 5 to 11 years

2024 Calculations (RSE)

Note 500' water well setback line has changed since 2019 calculations based on AK Demo provided survey showing actual surveyed location of wells nearby to the landfill

Calculation below uses the information provided in S&W 2019 calculations, as well as 2019-2023 survey information, and does not include the additional space from the changed well setback line location

Landfill Volume available (including cover material) (V_{LF}):	1,890,000 cy
Annual design volume compacted C&D waste (V_{cd}):	80,000-120,000 cy
Total surveyed volume of compacted C&D waste assume end 2018	1,208,398 cy
2019 C&D Fill survey volume	73145 cy
2020 C&D Fill survey volume	58371 cy
2021 C&D Fill survey volume	59369 cy
2022 C&D Fill survey volume	46869 cy
2023 C&D Fill survey volume	48831 cy
Total surveyed volume of compacted C&D waste through 2023 (V_{cs}):	1,494,983 cy
Annual surveyed volume compacted C&D waste (V_{ca}):	46870-140,000 cy

Estimated design operational life of landfill (V_{LF}/V_{cd}) = 16 to 24 years

Estimated remaining operational life of landfill ($(V_{LF}-V_{cs})/V_{ca}$) = 2.8 to 8.4 years 8.428108 2.82155 years (Calc used old well setback line, and does not use measurement of remaining space)

2024 Calculations Using Remaining Space Measurement Method

Using Current Site Map with August 14, 2023 Denali North Survey Showing fill to date and updated water well setback line.

Estimate 275,000 square feet of remaining available fill area with 50 feet available fill depth (Measurement box limits set at approximate halfway point of fill side slopes)

**13750000 ft³ Remaining landfill space
509259.3 cyds available remaining space for C&D waste includes cover material**

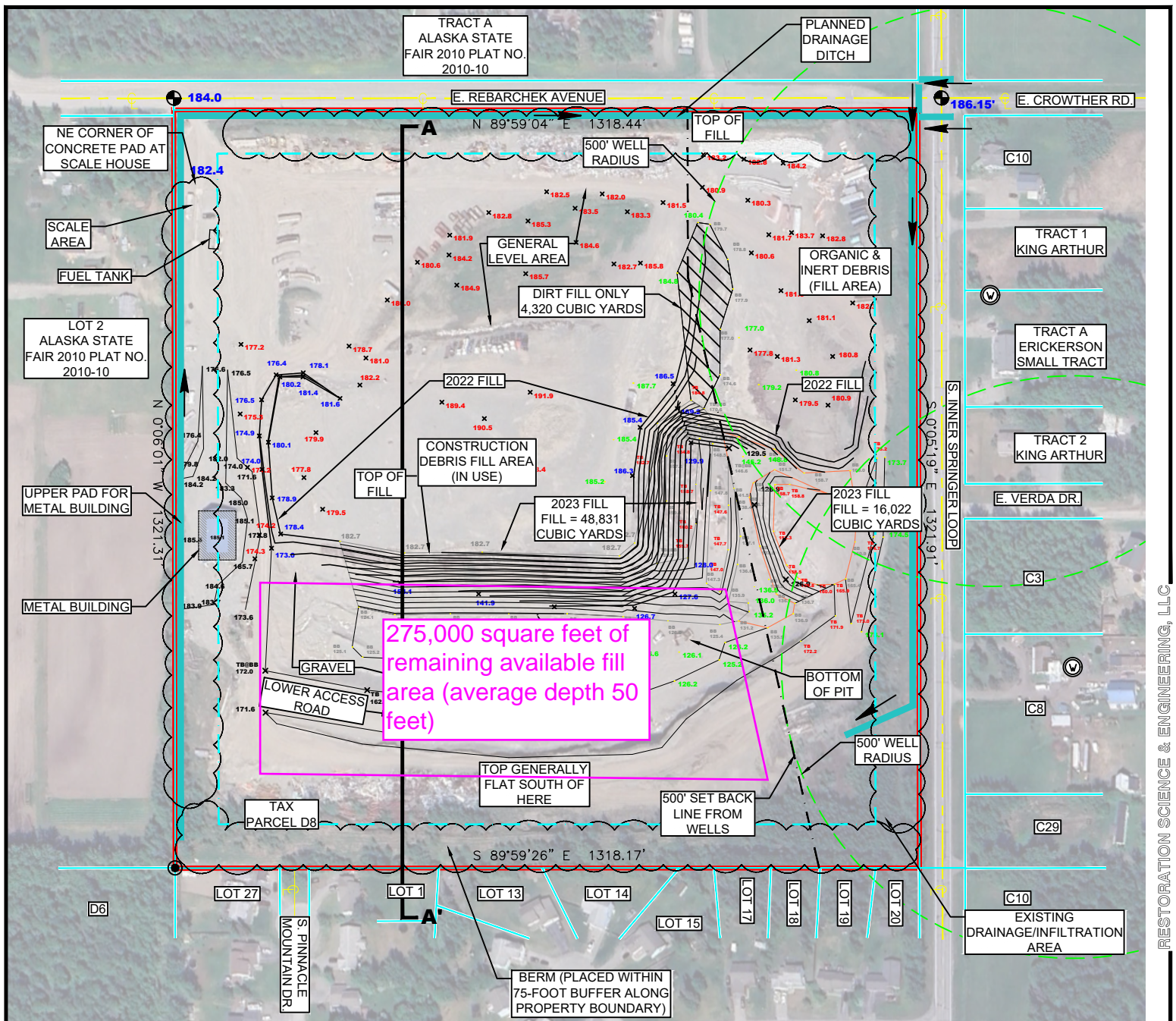
2019 C&D Fill survey volume	73145 cy
2020 C&D Fill survey volume	58371 cy
2021 C&D Fill survey volume	59369 cy
2022 C&D Fill survey volume	46869 cy
2023 C&D Fill survey volume	48831 cy
Annual surveyed volume compacted C&D waste (V_{ca}):	46870-140,000 cy

Estimated remaining operational life of landfill (Remaining Available space for C&D Waste)/ V_{ca} = 3.5 to 11 years 10.86559 3.637566 years

Estimated updated Total C&D Waste Design Volume with updated Water Well Setback = total surveyed volume compacted C&D Waste through 2023 + Available remaining space for C&D Waste

Estimated updated Total C&D Waste Design Volume with updated Water Well Setback = 1,494,983 + 509,259 = 2,004,242 cubic yards

Estimated updated Landfill Design Life = 2,004,242/annual design volume 80,000 to 120,000 cyds = 25.05 16.70

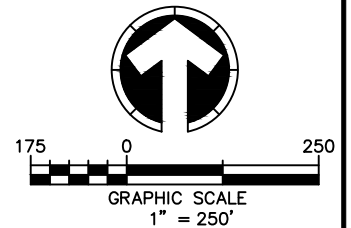


NOTES

1. SURVEY BASEMAP DATED AUGUST 14, 2023 PROVIDED BY DENALI NORTH.
2. OTHER SITE MAP DRAINAGE AND NOTES OBTAINED FROM SHANNON & WILSON SEPTEMBER 2018 FIGURE 1 SITE MAP.
3. THE NEAREST EARTHQUAKE FAULT IS THE BORDER RANGES FAULT, LOCATED ABOUT 7 MILES SOUTHEAST OF THE SITE AT ITS CLOSEST POINT.
4. REGIONAL GROUNDWATER FLOW IS TO THE SOUTH.
5. THE SITE IS NOT LOCATED ON A FLOODPLAIN.
6. THERE IS NOT PERMAFROST AT THE PROJECT LOCATION.
7. GROUNDWATER IS LOCATED ABOUT 26 FEET BELOW THE LOWEST POINT OF THE LANDFILL.
8. BASED ON USGS WATER LEVEL RECORDS FOR NEARBY WELL, THE HIGHEST ANTICIPATED.
9. GROUNDWATER LEVEL WILL BE ABOUT 18 FEET BELOW THE LOWEST POINT OF THE LANDFILL.
10. THERE IS NO KNOWN UNSTABLE GROUND AT THE FACILITY.
11. CONTOUR LINES FOR ELEVATION ARE FROM SURVEY PRIOR TO INITIAL CELL CONSTRUCTION.
12. WELL LOCATION ONLY FOUND ON TRACT A ERICKERSON SMALL AND TAX PARCEL C8.
13. WELL LOCATION SURVEY DONE MARCH 8TH/ 2023.
14. SEE FIGURE 4 FOR PROFILE A-A.

LEGEND

- APPROXIMATE PARCEL BOUNDARY
- ADJACENT LOTS
- EXISTING BUILDING
- SETBACK (BUFFER FROM PROPERTY BOUNDARY)
- POTENTIAL DRAINAGE DITCHES AND/OR RETENTION SWALES
- WATER DRAINAGE FLOW DIRECTION
- BERM
- SURVEYED DRINKING WATER WELL LOCATION



ALASKA DEMOLITION PALMER RECLAMATION SITE LANDFILL PERMIT RENEWAL		DRAFT
CURRENT SITE MAP		 RESTORATION Science & Engineering, LLC 911 West 8th Avenue, Suite 100 Anchorage, Alaska 99501 PH (907) 278-1023 FAX (907) 277-5718
PALMER, ALASKA		
JOB NO: 23-2784	DRAWN: SWS	FIGURE 1
DATE: 01.24.2024	CHECKED: NW	

RESTORATION SCIENCE & ENGINEERING, LLC