

May 7, 2026

Alexis Slade
Environmental Engineer
IDNR – Land Quality Bureau
6200 Park Avenue, Suite 200
Des Moines, Iowa 50321



**RE: CERTIFICATION #1 OF ADDITIONAL DRAINAGE LAYER
PHASE W-1 EXPANSION
PAGE COUNTY SLF - PERMIT NO. 73-SDP-01-75P
HLW PN 6047-26A.200**

Dear Ms Slade:

This Certification is being submitted to document the installation of additional drainage layer sand in the Phase W-1 Expansion at the Page County Sanitary Landfill. The Quality Control and Assurance (QC&A) Report for the Phase W-1 Expansion project was submitted to IDNR on August 9, 2024 (Doc #110676) and approved by IDNR in the Permit Revision dated August 20, 2024.

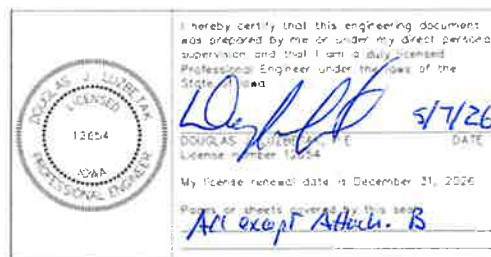
Drainage layer sand was installed on the base and the lower portion of the east sideslope of the Phase W-1 Expansion area during the initial project. The area that originally had drainage layer sand installed was shown on the Record Drawings in the QC&A Report (Doc #110676) and is included on the figure in Attachment A.

Additional drainage layer sand was installed on a portion of the east slope of the Phase W-1 Expansion area on May 4, 2026 and May 5, 2026. The area where the additional drainage layer sand was installed is hatched on the figure in Attachment A and labelled "EXTENT OF DRAINAGE LAYER PLACED 5/04/26-5/05/26".

Sand with a hydraulic conductivity exceeding the IDNR minimum drainage layer hydraulic conductivity of 1×10^{-2} cm/sec was used for the drainage layer. The sand also had less than 5% of material (by weight) passing the No. 200 sieve in accordance with IDNR regulations. Hydraulic conductivity and gradation testing results for the drainage layer sand are included in Attachment B.

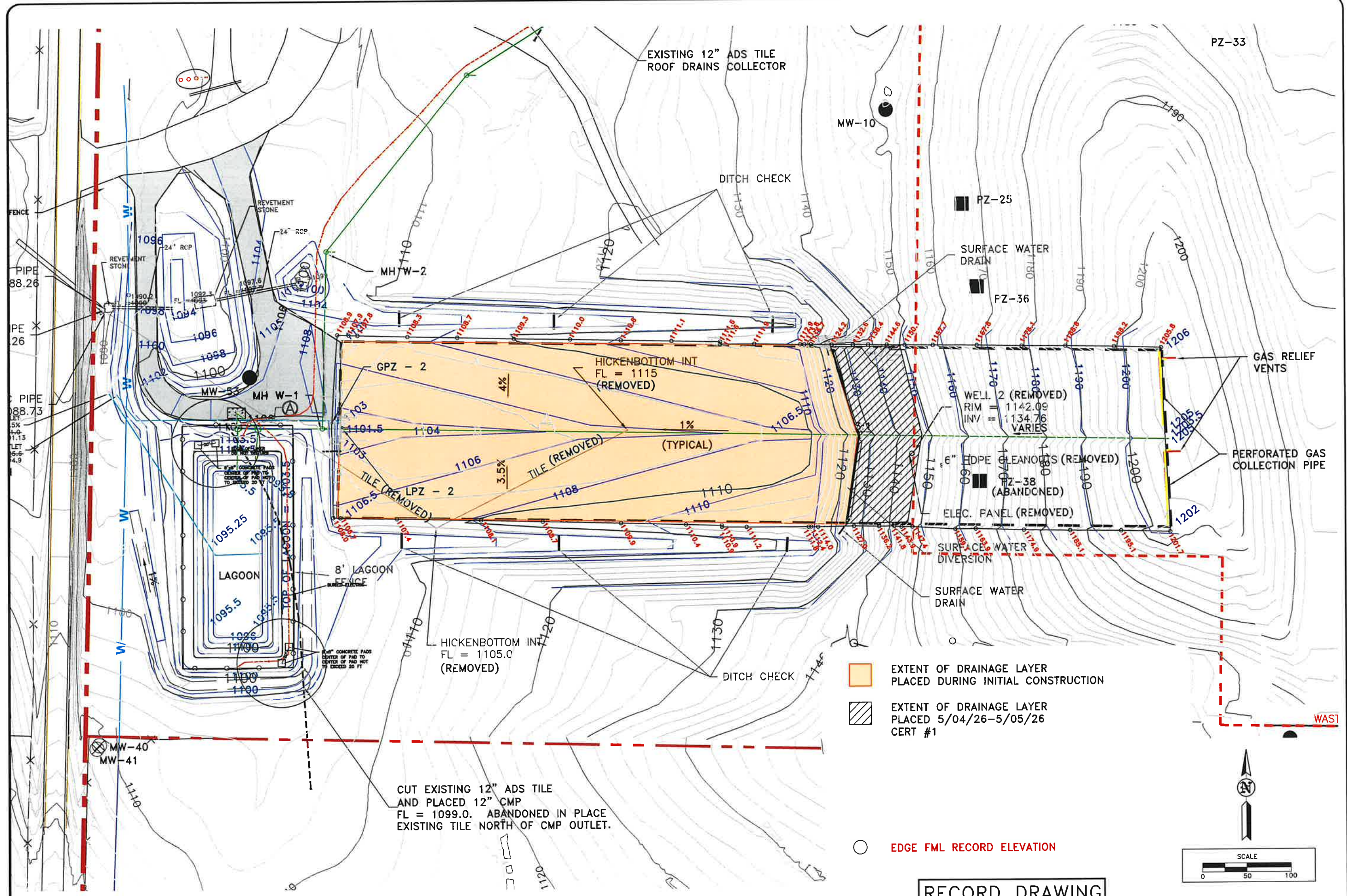
The installation of the additional drainage layer sand was performed with a low ground pressure dozer equipped with GPS control to protect the flexible membrane liner during sand placement. The thickness of the drainage layer sand was checked on May 6, 2026 by HLW personnel to confirm the 12 inch minimum depth required. Photos documenting the placement and measurement of the drainage layer sand are included in Attachment C.

Please contact me if you have any questions.



cc: Brian Ward, Manager, Page County SLF (electronic copy)

ATTACHMENT A



- EXTENT OF DRAINAGE LAYER PLACED DURING INITIAL CONSTRUCTION
- EXTENT OF DRAINAGE LAYER PLACED 5/04/26-5/05/26 CERT #1

RECORD DRAWING

FIGURE: 4 AD-1

REVISION	NO.	DATE
DRAWN	JGH	PROJECT NO. 6047-26A
		DATE 5/06/26

SITE PLAN
DRAINAGE LAYER CERTIFICATION #1
 PHASE W-1 EXPANSION
 PAGE COUNTY SANITARY LANDFILL
 PAGE COUNTY, IOWA

HLW Engineering Group
 204 West Broad Street, P.O. Box 314
 Story City, Iowa 50248
 Phone: (515) 733-4144
 FAX: (515) 733-4146



ATTACHMENT B

ALLENDER BUTZKE ENGINEERS INC.

3660 109TH STREET • URBANDALE, IOWA 50322 • PHONE 515-252-1885 • FAX 515-252-1888



April 17, 2026

HLW Engineering Group
P.O. Box 314
Story City, IA 50248
Attn: Glenn Hunter

RE: Laboratory Soil Analysis
Page County SLF
Shenandoah Fill Sand
PN 261224

Dear Mr. Hunter:

Enclosed is the result of one hydraulic conductivity test performed on a sand sample delivered to our office by HLW Engineering on April 7, 2026.

The hydraulic conductivity test was conducted on approximately 6 inches of sand material tamped and rodded into a 3-inch diameter permeameter. The test was conducted by passing water through the sample under a constant water head of about 1.5 feet. Results of the test are provided in Table A.


TABLE A

Sample/Description	Hydraulic Conductivity cm/sec
Shenandoah Fill Sand	4.2×10^{-2}

A sieve analyses (washed over a No. 200 sieve) was also conducted and the results are included with this letter.

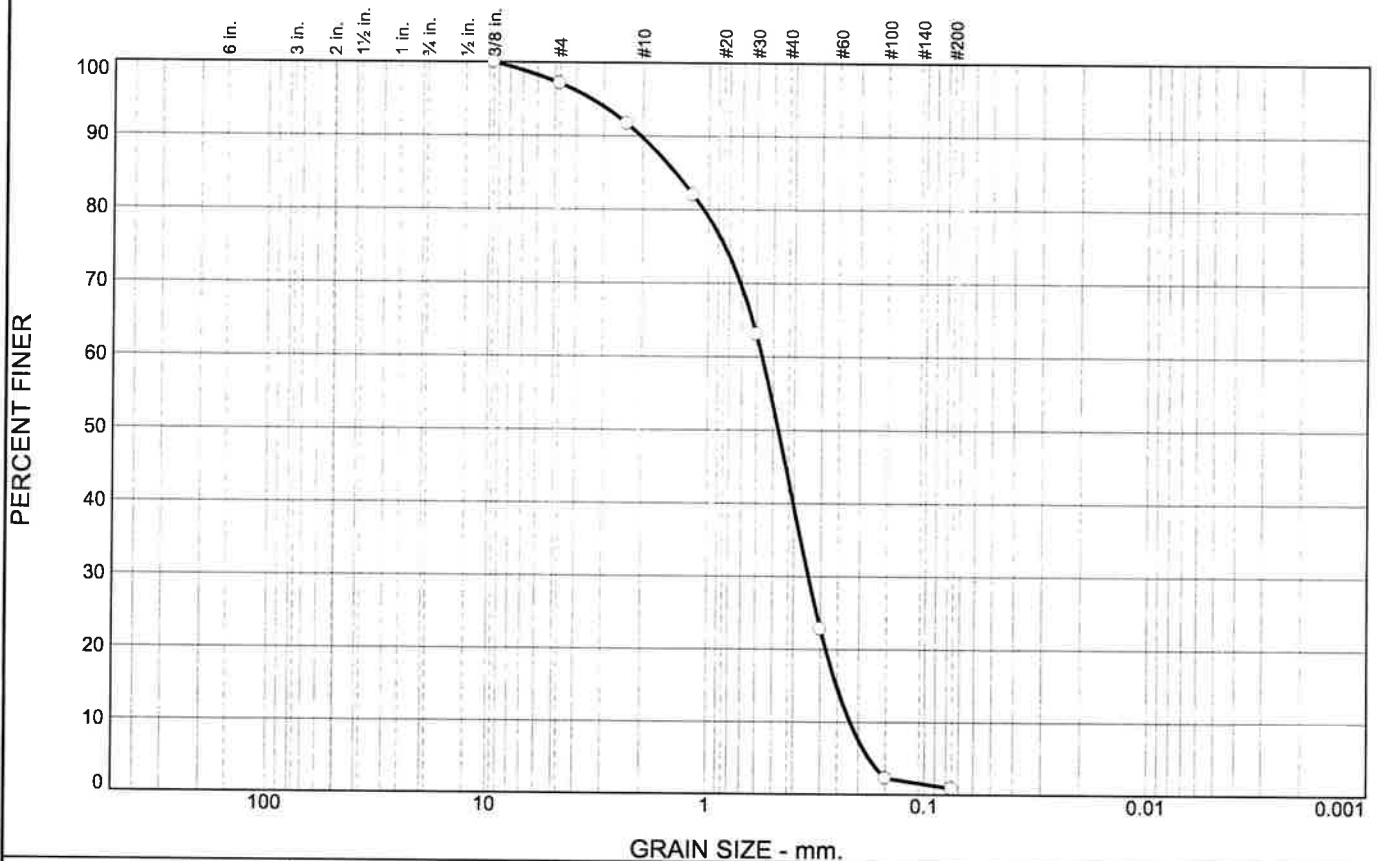
If there are any questions concerning these test results, please contact us at your convenience.

Respectfully submitted,
ALLENDER BUTZKE ENGINEERS INC.


Seth Hansen, P.E.
Project Engineer

1 Email Above

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	7.3	46.5	42.4	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	97.1		
#8	91.7		
#16	82.0		
#30	63.1		
#50	22.8		
#100	2.3		
#200	0.9		

Soil Description

Brown fine to medium sand, trace gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₉₀= 2.0409 D₈₅= 1.4222 D₆₀= 0.5642
 D₅₀= 0.4733 D₃₀= 0.3420 D₁₅= 0.2524
 D₁₀= 0.2186 C_u= 2.58 C_c= 0.95

Classification

USCS= SP AASHTO=

Remarks

* (no specification provided)

Location: Shenandoah Fill Sand
Sample Number: 1

Date:

ALLENDER
BUTZKE
ENGINEERS, INC.

Client: HLW Engineering Group
Project: Page County SLF Sand Perm
 Shenandoah Fill Sand

Project No: 261224

Figure GS-1

ATTACHMENT C



Photo 1: Drainage layer sand coverage area reviewed 05/06/26. Looking east.



Photo 2: Drainage layer sand coverage area reviewed 05/06/26. Looking south.



Photo 3: Drainage layer sand measurement 05/06/26.



Photo 4: Drainage layer sand measurement 05/06/26.



Photo 5: Drainage layer sand measurement 05/06/26.