October 16, 2018
File No. 25218118.00

Mr. Jason Lowery
Wisconsin Department of Natural Resources
101 S. Webster Street
Madison, WI 53707

Subject: Monitoring Well Redevelopment Documentation
Town of Watertown, Jefferson County
BRRTS No. 02-28-000945
WDNR Contract No. 37000-0000008175

Dear Mr. Lowery:

SCS Engineers (SCS) is providing this summary of monitoring well redevelopment work performed for the Keck Farm project. The monitoring wells were redeveloped consistent with the approved August 2018 Quality Assurance Plan (QAP). The work was performed in September 2018.

Monitoring well redevelopment documentation is provided in **Attachment A** and summarized in **Table 1**. About half of the wells produced clear water. Most others purged dry and would not produce clear water. **Table 1** shows proposed sampling methods based on purge rates observed during redevelopment. SCS proposes that 17 of the wells be sampled using low-flow methods, and the remaining 3 wells be sampled by standard purge methods (bailer or pump).

The redevelopment proceeded as planned with the exception of monitoring well MW-11D, which appears to have kink or other feature near the bottom of the well that caused the submersible development pump to become stuck in the well. Several attempts have been made to remove the pump. As discussed by phone on October 1, 2018, SCS plans to remove the pump tubing from the well and leave the stainless steel pump in place near the bottom of the well. The well should still function properly and the stuck pump should not influence the sampling results.

Please contact Robert Langdon at (608) 216-7329 if you have any questions regarding the monitoring well redevelopment work or proposed sampling methods.

Sincerely,

Robert Langdon
Senior Project Manager
SCS Engineers

Michael J. Prattke
Division Leader
SCS Engineers

REL/AJR/MP

Encl. Table 1 – Monitoring Well Redevelopment Summary
Attachment A – Monitoring Well Redevelopment Forms

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Table 1

Monitoring Well Redevelopment Summary

Table 1 - Well Redevelopment Summary
Keck Farm Property, Watertown, WI/SCS Engineers Projet No. 25218118.00

Well	Well Redevelopment Completion Date	Depth to Water Prior to Purge (feet)	Total Depth* (feet)	Casing Volume (gallons)	Well Volume (gallons)	Total Volume Purged (gallons)	Casing Volumes Purged	Well Volumes Purged	Total Depth* (feet)	Well Purged Dry?	Well Purged Dry 3 Times or More?	Sustained Yield > 100 ml/min	Water Clear at Conclusion of Purging?	Initial Turbidity Reading (NTU)	Final Turbidity Reading (NTU)	Proposed Sampling Method	Notes
MW01C	9/6/2018	45.59	112.2	10.75	20.55	110	10	5	112.2	N	N	Y	Y	600.7	3.36	1	
MW03	9/6/2018	16.64	42.1	3.79	9.50	16	4	2	42.1	Y	Y	Y	N	57.63	39.92	1	Purged dry 4 times
MW04	9/6/2018	27.27	67.5	5.88	11.60	30	5	3	67.5	Y	Y	Y	N	95.60	96.40	1	Water level recovers at about 3 feet/min after purging dry. Purged dry 5 times.
MW05	9/5/2018	27.82	62.1	4.79	10.51	15	3	1	62.1	Y	Y	Y	Y	35.27	22.41	1	Water level recovers at about 6 inches/minute after purging dry.
MW06	9/4/2018	37.54	65.4	4.01	9.72	60	15	6	65.4	Y	N	M	N	47.54	333.6	1	High initial turbidity. Well purges dry after 5 well volumes.
MW07	9/6-11/2018	37.50	57.7	3.13	8.85	32	10	4	57.7	Y	Y	N	N	315.8	88.61	2	Purged dry with bailer 3 times.
MW08	9/6-11/2018	58.42	72.2	2.01	7.73	24	12	3	72.2	Y	Y	N	N	344.6	216.0	2	Purged dry with bailer 3 times.
MW09	9/6-11/2018	37.50	89.7	4.27	9.98	24	6	2	89.7	Y	Y	N	N	> 1000	111.2	2	Purged dry with bailer 3 times.
MW11D	9/4/2018	44.18	140.4	15.90	20.39	60	4	3	140.4	Y	Y	Y	N	23.27	37.38	1	Water level recovers at about 1 foot/min after purging dry. Purged dry 4 times.
MW19C	9/5/2018	36.72	108.4	11.52	14.15	60	5	4	108.4	Y	N	Y	N	30.62	29.63	1	Purged dry after 4 well volumes and an increased pumping rate of approximately 3.5 gpm.
MW20C	9/4/2018	45.15	114.9	11.33	13.96	45	4	3	114.9	Y	Y	Y	N	20.65	57.75	1	Water level recovers at about 1 foot/min after purging dry. Purged dry 4 times.
MW26C	9/6/2018	25.82	124.2	16.25	18.89	130	8	7	124.2	N	N	Y	Y	73.38	2.05	1	
MW28D	9/4/2018	45.97	195.5	24.96	27.61	170	7	6	195.5	N	N	Y	Y	25.78	14.01	1	
MW35D	9/7/2018	36.22	153.3	21.01	25.51	120	6	5	153.3	N	N	Y	Y	9.16	4.77	1	
MW36D	9/7/2018	35.27	47.2	17.66	22.16	86	5	4	47.2	N	N	Y	Y	541.3	1.94	1	
MW40D	9/6/2018	38.61	139.6	16.60	21.10	100	6	5	139.6	N	N	Y	Y	15.32	1.88	1	
MW43D	9/6/2018	23.92	158.8	22.40	26.91	150	7	6	158.8	N	N	Y	Y	81.16	15.21	1	
MW44D	9/7/2018	39.17	145.8	17.56	22.06	123	7	6	145.8	N	N	Y	Y	10.07	2.45	1	
MW45D	9/4/2018	35.30	137.7	16.83	21.32	101	6	5	137.7	N	N	Y	Y	832.8	1.85	1	
MW46D	9/10/2018	10.72	128.9	19.46	23.96	100	5	4	128.9	N	N	Y	Y	88.38	2.84	1	

Abbreviations:
N = No
Y = Yes
M = Maybe

Notes:
* - Total Depth measured during well inspection in July 2018
1- Low-flow sampling
2-Purge with bailer or pump and sample

I:\25218118.00\Deliverables\Monitoring Well Redvelopment Summary\[Keck Farm Well ReDevelopment Summary Table 20180912.xls]

Attachment A

Monitoring Well Redevelopment Forms

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-1C
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well ID Number**
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 55 min.

4. Depth of well (from top of well casisng) 112.2 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 21.2 gal.

7. Volume of water removed from well 110.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 45.59 ft.	46.88 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018
Time	c. 09:15 ☒ a.m. ☐ p.m.	10:10 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
	(Describe) 600 NTU	(Describe) 3.36 NTU
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-1C

Purge date: 9/6/18 Total time purged (hrs/min): 55

Total depth before redevelopment: 112.2 Total depth after redevelopment: 112.2

Calculated well purge volume (gal): 1x: 10.75 4x: 43 10x: 110

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 45.59 / 600.7 NTU

1) 46.73	/ 67.3 NTU	6) 46.85	/ 2.60
2) 46.79	/ 10.50	7) 46.85	/ 3.45
3) 46.80	/ 8.68	8) 46.85	/ 3.69
4) 46.83	/ 6.38	9) 46.85	/ 4.08
5) 46.86	/ 4.73	10) 46.88	/ 3.36

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): ~~10~~ 110

Estimated sustainable yield: 9500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start at 0915, cloudy upon pump start
pump rate → 5 gal/2min

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-3

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well 90 min.

4. Depth of well (from top of well casisng) 42.1 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 10.1 gal.

7. Volume of water removed from well 16.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 16.64 ft.	15.15 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018 (m m d d y y y y)
Time	c. 08:00 ☒ a.m. ☐ p.m.	09:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	57.63 NTU	39.92 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-3

Purge date: 9/6/18 Total time purged (hrs/min): 1:30

Total depth before redevelopment: 42.10 Total depth after redevelopment: 42.10

Calculated well purge volume (gal): 1x: 3.79 4x: 15.16 10x: 37.9

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 16.64 / 57.63 dusty @ 4gals

1)	14.86	/ 59.9 dusty @ 4gals	6)
2)	15.21	/ 38.14 dusty @ 4gals	7)
3)	15.15	39.92 dusty @ 4gals	8)
4)			9)
5)			10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 16

Estimated sustainable yield: 100 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Has well wizard pump rods and line Fixed

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-4

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well 50 min.

4. Depth of well (from top of well casisng) 67.5 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 12.6 gal.

7. Volume of water removed from well 30.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 27.27 ft.	66.00 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018
Time	c. 09:33 ☒ a.m. ☐ p.m.	10:23 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	95.60 NTU	96.40 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-4

Purge date: 9/6/18 Total time purged (hrs/min): 50

Total depth before redevelopment: 67.5 Total depth after redevelopment: 67.5

Calculated well purge volume (gal): 1x: 5.88 4x: 23.52 10x: 58.8

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 27.27 / 95,60

1) Pumped Dry / 40.93	6) /
2) Pumped Dry / 23.95	7)
3) Pumped Dry / 107.6	8)
4) Pumped Dry / 108.3	9)
5) pumped Dry / 96.4	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 30

Estimated sustainable yield: 1500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start at 0933, cloudy upon appearance
pump rate → ≈5 gal / 2 min
Recovery rate → ≈3 ft / min
done @ 1022
pumped ≈ 30 gal

State of Wisconsin
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MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-5

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 62.1 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 11.6 gal.

7. Volume of water removed from well 15.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 27.82 ft.	61.05 ft.
Date	b. 09/05/2018 (m m d d y y y y)	09/05/2018 (m m d d y y y y)
Time	c. 08:05 ☒ a.m. ☐ p.m.	09:05 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	35.27 NTU	22.41 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers.com

17. Additional comments on development:
Well recovers at approximately 6 inches per Minute.

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-5

Purge date: 9/5/18 Total time purged (hrs/min): 60

Total depth before redevelopment: 62.1 Total depth after redevelopment: 62.1

Calculated well purge volume (gal): 1x: 4.79 4x: 19.16 10x: 47.9

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 27.82/ 35.27

1) Pumped Dry/ 31.63	6)
2) pumped dry / 19.72	7)
3) Pumped dry/ 22.41	8)
4) 61.05 /	9)
5) /	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 15

Estimated sustainable yield: 300 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: ~5 gal / 2 min
clear while pumping
Recover 6 inches / min.

State of Wisconsin
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MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-6

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 65.4 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 10.5 gal.

7. Volume of water removed from well 60.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 37.54 ft.	38.00 ft.
Date	b. 09/04/2018 (m m d d y y y y)	09/04/2018
Time	c. 13:02 ☐ a.m. ☒ p.m.	14:02 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	47.54 NTU	333.60 NTU
		Fine sand in discharge

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:
Well went Dry after 5 well volumes when pumping at 2.5 gallons/min

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-6

Purge date: 9/4/18 Total time purged (hrs/min): 60

Total depth before redevelopment: 65.40 Total depth after redevelopment: 65.40

Calculated well purge volume (gal): 1x: 4.01 4x: 16.04 10x: 40.1

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 37.54 / 47.54 NTU

1) 46.65	/ 49.27 NTU	6) 38	673.72 NTU
2)	/ OL	7)	211.89 NTU
3)	/ OL	8)	154.20 NTU
4)	/ OL	9)	333.60 NTU
5) 63.00	/ OL	10)	

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 60

Estimated sustainable yield: 100 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: start 12:02 1402 9/4/18
water fine start in discharge
dry after 5 well volumes
Turbidity too high for meter to read (OL)

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-7

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well _____ min.

4. Depth of well (from top of well casisng) 57.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 9.2 gal.

7. Volume of water removed from well 32.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 37.50 ft.	35.72 ft.
Date	b. 09/04/2018 (m m d d y y y y)	09/11/2018
Time	c. 09:30 ☒ a.m. ☐ p.m.	10:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 315.8 NTU	Clear ☐ 20 Turbid ☒ 25 (Describe) 88.6 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles. Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:
Bailed Dry 3 times

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-7

Purge date: 9/6/18 Total time purged (hrs/min): _____

Total depth before redevelopment: 57.7 Total depth after redevelopment: 57.7

Calculated well purge volume (gal): 1x: 3.4 4x: 13.6 10x: 34.0

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

37.5

1) dry @ 8gals / 315.8	6)
2) 35.95 1000 dry @ 12gal / 133.5	7)
3)	8)
4)	9)
5)	10)

9/10

Flow during redevelopment: _____(ml/min).

Total volume purged (gallons): 32

Estimated sustainable yield: _____(ml/min). Sustainable yield > 100 ml/min: **Y N**

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time: 9/6/18 0930	Turbidity: **None Low (High)** 315.8	DTW: 37.50	Vol. Removed (gal): 8 gal
Date/time: 9/10/18 1000	Turbidity: **None Low (High)** 133.5	DTW: 35.95	Vol. Removed (gal): 12 gals
Date/time: 9/11/18 1030	Turbidity: **None Low (High)** 88.6	DTW: 35.72	Vol. Removed (gal): 12 gal

Notes: purged w/ Bailer

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-8

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well _____ min.

4. Depth of well (from top of well casisng) 72.2 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 8.1 gal.

7. Volume of water removed from well 24.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 58.42 ft.	57.72 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/11/2018 (m m d d y y y y)
Time	c. 09:00 ☒ a.m. ☐ p.m.	11:00 ☒ a.m. ☐ p.m.
12. Sediment in bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 344.60 NTU	Clear ☐ 20 Turbid ☒ 25 (Describe) 216.0 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-8

Purge date:_____ Total time purged (hrs/min):_____

Total depth before redevelopment: 72.2 Total depth after redevelopment: 72.2

Calculated well purge volume (gal): 1x: 2.34 4x: 9.36 10x: 23.4

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 58.42 / 344.6

1) 57.77 / 242.8	6)
2)	7)
3)	8)
4)	9)
5)	10)

Flow during redevelopment:_____(ml/min).

Total volume purged (gallons): 24

Estimated sustainable yield:_____(ml/min). Sustainable yield > 100 ml/min: **Y N**

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time: 9/6/18 0900	Turbidity: **None Low (High)** 344.6	DTW: 58.42	Vol. Removed (gal): 8 gal
Date/time: 9/10/18 1050	Turbidity: **None Low High** 242.8	DTW: 57.77	Vol. Removed (gal): 8 gals
Date/time: 9/11/18 1100	Turbidity: **None Low High** 216.0	DTW: 57.72	Vol. Removed (gal): 8 gals

Notes: Dry @ 8 gal, Muddy water

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-9

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well ____ min.

4. Depth of well (from top of well casisng) 89.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 10.2 gal.

7. Volume of water removed from well 24.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis perfomned on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 63.37 ft.	62.45 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/11/2018 (m m d d y y y y)
Time	c. 01:00 ☐ a.m. ☒ p.m.	12:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	too high for meter to Read	112.2 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-9

Purge date: 9/6/18 Total time purged (hrs/min): _____

Total depth before redevelopment: 89.7 Total depth after redevelopment: 89.7

Calculated well purge volume (gal): 1x: 4.27 4x: 17.08 10x: 42.7

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 63.37 /

1) 62.42 / 375.2	6)
2)	7)
3)	8)
4)	9)
5)	10)

Flow during redevelopment: _____(ml/min).

Total volume purged (gallons): 24

Estimated sustainable yield: _____(ml/min). Sustainable yield > 100 ml/min: **Y N**

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time: 9/6/18 1400	Turbidity: **None Low (High)** Too high to Read	DTW: 63.37	Vol. Removed (gal): 8 gals
Date/time: 9/10/18 1145	Turbidity: **None Low (High)** 375.2	DTW: 62.42	Vol. Removed (gal): 8 gals
Date/time: 9/11/18 1200	Turbidity: **None Low (High)** 171.2	DTW: 62.45	Vol. Removed (gal): 8 gals

Notes: unable to Redevelop, pump does not reach water
Well is kinked @ 30ft down
- used Bailer to Redevelop

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-11D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 140.4 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 20.9 gal.

7. Volume of water removed from well 60.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	44.18 ft.	140.40 ft.
Date b. (mm/dd/yyyy)	09/04/2018	09/04/2018
Time c.	01:07 ☐ a.m. ☒ p.m.	02:07 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	23.75 NTU	37.28 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:
Purged dry four times

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-11D

Purge date: 9/4/18 Total time purged (hrs/min): 60

Total depth before redevelopment: 140.4 Total depth after redevelopment: 140.4

Calculated well purge volume (gal): 1x: 15.9 4x: 63.6 10x: 159.0

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 44.18 / 23.27 NTU

1) Pumped Dry	/	6)	/
2) Pumped Dry	/	7)	/
3) Pumped Dry	/	8)	/
4) Pumped Dry	/ 37.38	9)	/
5)	/	10)	/

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 60

Estimated sustainable yield: 600 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Begin @ 1307
No Sediment after agitation (clear)
Dry @ ≈ 15 gallons Recovery ≈ 1ft/min
Dry again after 15 gallons
Pumps Dry but after more than 1 volume
Pumped a total of 4 well volumes

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-19C

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 108.4 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 14.9 gal.

7. Volume of water removed from well 60.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 36.72 ft.	105.36 ft.
Date	b. 09/05/2018 (m m d d y y y y)	09/05/2018 (m m d d y y y y)
Time	c. 10:50 ☒ a.m. ☐ p.m.	11:20 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☐ 20 Turbid ☒ 25
(Describe)	30.62 NTU	29.63 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-19C

Purge date: 9/5/18 Total time purged (hrs/min): 30

Total depth before redevelopment: ~~108.4~~ Total depth after redevelopment: 108.4

Calculated well purge volume (gal): 1x: 11.52 4x: 46.08 10x: 115.2

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 36.72 / 30.62

1) 95.84 / 49.71	6)
2) 97.26 / 33,16	7)
3) 101.90 / 29.65	8)
4) 105.36 / 30.35	9)
5) pumped Dry / 29.63	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 60

Estimated sustainable yield: 5000 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: 5 gal/2 min start @ 1050
pumped Dry @ 1120
Clear while pumping
increased pumping rate after 4 well volumes
increased to 7 gal/2 min → then went dry

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-20C

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐ [illegible]

3. Time spent developing well 90 min.

4. Depth of well (from top of well casisng) 115.0 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 14.6 gal.

7. Volume of water removed from well 45.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 45.15 ft.	115.0 ft.
Date	b. 09/04/2018 (m m d d y y y y)	09/04/2018 (m m d d y y y y)
Time	c. 12:35 ☐ a.m. ☒ p.m.	02:05 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 20.65 NTU	Clear ☐ 20 Turbid ☒ 25 (Describe) 57.75 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Pumped Dry 5 times

Recovers at approximately 6 inches a minute

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-20C

Purge date: 9/4/18 Total time purged (hrs/min): 1:30

Total depth before redevelopment: 115.0 Total depth after redevelopment: 115.0

Calculated well purge volume (gal): 1x: 11.33 4x: 45.32 10x: 113.3

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 45.15 / 20.65

1) Pumped Dry	/	6)	/
2) Pumped Dry	/	7)	/
3) Pumped Dry	/	8)	/
4) Pumped Dry	/ 57.75	9)	/
5)	/	10)	/

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 45

Estimated sustainable yield: 650 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start @ 1235

Dry @ ~~11~~ ≈11 gallons, dark appearance (black color), pumped again, went dry again

Pumped Dry 5 times

recovered ± 6 inches in ~~about~~ 30 seconds

Pumped Dry 4 times (4 well volumes)

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson	MW-26C

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well ___52 min.

4. Depth of well (from top of well casisng) 124.2 ft.

5. Inside diameter of well __2.00 in.

6. Volume of water in filter pack and well casing __19.5 gal.

7. Volume of water removed from well 130.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 25.82 ft.	27.85 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018
Time	c. 12:05 ☐ a.m. ☒ p.m.	12:57 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
(Describe)	73.38 NTU	2.05 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-26C

Purge date: 9/6/18 Total time purged (hrs/min): 0:52

Total depth before redevelopment: 124.2 Total depth after redevelopment: 124.2

Calculated well purge volume (gal): 1x: 16.25 4x: 65 10x: 162.5

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 25.82 / 73.38 NTU

1) 27.60 / 87.06	6) 27.84 / 5.01
2) 27.30 / 31.16	7) 27.84 / 3.63
3) 27.83 / 12.30	8) 27.85 / 2.05
4) 27.84 / 12.28	9)
5) 27.84 / 12.74	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 130

Estimated sustainable yield: 9000 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Pumping Rate ≈ 2.5 gal / 1 Min
Black just after starting, Cleared up after 1 volume
Started @ 1205

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-280

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28		

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 100 min.

4. Depth of well (from top of well casisng) 195.5 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 28.2 gal.

7. Volume of water removed from well 170.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 45.97 ft.	124.70 ft.
Date	b. 09/04/2018 (m m d d y y y y)	09/04/2018 (m m d d y y y y)
Time	c. 10:20 ☒ a.m. ☐ p.m.	12:00 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 25.78 NTU	Clear ☐ 20 Turbid ☒ 25 (Describe) 14.01 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact/Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-28D

Purge date: 9/4/18 Total time purged (hrs/min): 1:40

Total depth before redevelopment: 195.5 Total depth after redevelopment: 195.5

Calculated well purge volume (gal): 1x: 24.96 4x: 99.84 10x: 249.6

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 45.97 25.78 NTU

1) 128.29 ~~45.97~~	/	18.95 NTU	6) 125.20	/	14.01
2) 126.22	/	29.42 NTU	7)	/	
3) 125.70	/	14.90 NTU	8)	/	
4) 125.20	/	12.54 NTU	9)	/	
5) 124.70	/	10.31 NTU	10)	/	

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 170 gallons

Estimated sustainable yield: 9000 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: 5 gal / 2 min
Started at 1020
dark liquid at first, cleared up 10 min after.
No sediment, water level stabilized at 2.5 gal / min
done @ 1200

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-35D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 50 min.

4. Depth of well (from top of well casisng) 153.3 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 24.5 gal.

7. Volume of water removed from well 130.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 36.22 ft.	44.27 ft.
Date	b. 09/07/2018 (m m d d y y y y)	09/07/2018
Time	c. 10:20 ☒ a.m. ☐ p.m.	11:10 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
(Describe)	9.16 NTU	4.77 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-350

Purge date: 9/7/18 Total time purged (hrs/min): 50

Total depth before redevelopment: 153.3 Total depth after redevelopment: 153.3

Calculated well purge volume (gal): 1x: 21.01 4x: 84.04 10x: 210.1

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 36.22 / 9.16 NTU

1) 44.01	/ 70.96	6) 44.27	/ 4.77
2) 45.17	/ 31.70	7)	/
3) 43.44	/ 6.29	8)	/
4) 44.10	/ 3.41	9)	/
5) 44.32	/ 2.21	10)	/

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 130

Estimated sustainable yield: 9500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: 5 gal / 2 min
Start @ 1020

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-36D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well ___45 min.

4. Depth of well (from top of well casisng) 142.6 ft.

5. Inside diameter of well __2.00 in.

6. Volume of water in filter pack and well casing __22.9 gal.

7. Volume of water removed from well __90.0 gal.

8. Volume of water added (if any) ___0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	35.27 ft.	37.32 ft.
Date b.	09/07/2018 (m m d d y y y y)	09/07/2018 (m m d d y y y y)
Time c.	12:40 ☒ a.m. ☐ p.m.	01:25 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 541.3 NTU	Clear ☒ 20 Turbid ☐ 25 (Describe) 1.94 NTU
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-36D

Purge date: 9/7/18 Total time purged (hrs/min): 45

Total depth before redevelopment: 142.6 Total depth after redevelopment: 142.6

Calculated well purge volume (gal): 1x: 17.66 4x: 70.64 10x: 176.6

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 35.27 / 541.3

1) 36.10	/ 100.8	6)	
2) 37.25	/ 7.53	7)	
3) 37.32	/ 3.79	8)	
4) 37.35	/ 3.12	9)	
5) 37.32	/ 1.94	10)	

Flow during redevelopment: 7500 (ml/min).

Total volume purged (gallons): 90

Estimated sustainable yield: 7500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start at 1240
Muddy at Start
2 gal/min

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-40D
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well ID Number**
	28	_____ / _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☒	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well: 40 min.

4. Depth of well (from top of well casisng): 139.6 ft.

5. Inside diameter of well: 2.00 in.

6. Volume of water in filter pack and well casing: 21.8 gal.

7. Volume of water removed from well: 100.0 gal.

8. Volume of water added (if any): 0.0 gal.

9. Source of water added: _____

10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 38.61 ft.	41.33 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018
Time	c. 02:00 ☐ a.m. ☒ p.m.	02:40 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 15.32 NTU	Clear ☒ 20 Turbid ☐ 25 (Describe) 1.88 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids: _____.__ mg/l | _____.__ mg/l

15. COD: _____.__ mg/l | _____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charles Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-40D

Purge date: 9/6/18 Total time purged (hrs/min): 0:40

Total depth before redevelopment: 139.55 Total depth after redevelopment: 139.55

Calculated well purge volume (gal): 1x: 16.6 4x: 66.4 10x: 166

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 38.61 / 15.32

1) 41.25 / 16.84	6) 41.33 / 1.88
2) 41.55 / ~~[illegible]~~ 34.64	7) / ~~[illegible]~~
3) 41.31 / 7.53	8)
4) 41.34 / 2.46	9)
5) 41,35 / 1.26	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 100

Estimated sustainable yield: 9500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start at 1400 flow rate: 5 gal/2 min
Clear water at start, some muddy water after 2 volumes

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-43D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐ [illegible]

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 158.8 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 27.6 gal.

7. Volume of water removed from well 150.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 23.92 ft.	27.73 ft.
Date	b. 09/06/2018 (m m d d y y y y)	09/06/2018 (m m d d y y y y)
Time	c. 04:05 ☐ a.m. ☒ p.m.	05:05 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 81.16 NTU	Clear ☐ 20 Turbid ☒ 25 (Describe) 15.21 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact/Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-43D

Purge date: 9/6/18 Total time purged (hrs/min): 60

Total depth before redevelopment: 158.8 Total depth after redevelopment: 158.8

Calculated well purge volume (gal): 1x: 22.4 4x: 89.6 10x: 224.0

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 23.92 / 81.16 NTU

1) 27.65	/ 357.1 NTU	6) 27.71	/ 17.32 NTU
2) 27.70	/ 60.48 NTU	7) 27.73	/ 15.21 NTU
3) 27.71	/ 30.72 NTU	8)	/
4) 27.69	/ 29.04 NTU	9)	/
5) 27.73	/ 20.84 NTU	10)	/

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 150

Estimated sustainable yield: 9000 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start @ 1605
dark turbid water at start
Flowrate -> 5 gal / 2 min

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-44D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 50 min.

4. Depth of well (from top of well casisng) 145.8 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 227 gal.

7. Volume of water removed from well 125.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 39.17 ft.	41.32 ft.
Date	b. 09/07/2018 (m m d d y y y y)	09/07/2018 (m m d d y y y y)
Time	c. 12:00 ☐ a.m. ☒ p.m.	12:50 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
(Describe)	10.07 NTU	2.45 NTU
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-44D

Purge date: 9/7/18 Total time purged (hrs/min): 50

Total depth before redevelopment: 145.8 Total depth after redevelopment: 145.8

Calculated well purge volume (gal): 1x: 17.56 4x: 70.24 10x: 175.6

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 39.17 / 10.07

1) 41.22	/ 12.63	6) 41.31	/ 5.13
2) 41.29	/ 20.20	7) 41.32	/ 2.45
3) 41.31	/ 18.62	8)	
4) 41.33	/ 11.29	9)	
5) 41.35	/ 9.73	10)	

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 125

Estimated sustainable yield: 9500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start @ 1200
2.5 gal / Min
Black at Start

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-45D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 50 min.

4. Depth of well (from top of well casisng) 137.7 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 22.0 gal.

7. Volume of water removed from well 100.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	35.30 ft.	36.91 ft.
Date b. (m m d d y y y y)	09/04/2018	09/04/2018
Time c.	11:15 ☒ a.m. ☐ p.m.	12:05 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 832.8 NTU	Clear ☒ 20 Turbid ☐ 25 (Describe) 1.85 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-45D

Purge date: 9/4/18 Total time purged (hrs/min): 50

Total depth before redevelopment: ~~137.7~~ 137.7 Total depth after redevelopment: 137.7

Calculated well purge volume (gal): 1x: 16.83 4x: 67.32 10x: 168.3

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 35.30 / 832.8

1) 35.83	/ ~~32.31~~ 100.2	6) 36.91	/ 1.85
2) 36.51	/ 12.56	7)	/
3) 36.98	/ 3.31	8)	/
4) 36.94	/ 1.97	9)	/
5) 36.89	/ 2.17	10)	/

Flow during redevelopment: 7500 (ml/min).

Total volume purged (gallons): 100

Estimated sustainable yield: 7500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start @ 11.15
Cloudy at first
2 gal/min → pump rate

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Keck Farm	Jefferson County	MW-46D

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	28	_____	___

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☒ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 40 min.

4. Depth of well (from top of well casisng) 128.9 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 24.7 gal.

7. Volume of water removed from well 100.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	10.72 ft.	12.34 ft.
Date b.	09/10/2018 (m m d d y y y y)	09/10/2018 (m m d d y y y y)
Time c.	10:00 ☒ a.m. ☐ p.m.	10:40 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) 88.38 NTU	Clear ☒ 20 Turbid ☐ 25 (Describe) 2.84 NTU

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Charlie Last Name: Bills
Firm: SCS Engineers

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jerome Last Name: Keck
Facility/Firm: Keck Farm
Street: P.O. Box 232
City/State/Zip: Clyman, WI 53016

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Charles A Bills
Print Name: Charles A Bills
Firm: SCS Engineers

NOTE: See instructions for more information including a list of county codes and well type codes.

Well Re-development Form – Keck Farm; Page 2

All wells -

Well Name: MW-46D

Purge date: 9/10/18 Total time purged (hrs/min): 40

Total depth before redevelopment: 128.9 Total depth after redevelopment: 128.9

Calculated well purge volume (gal): 1x: 19.46 4x: 77.84 10x: 194.6

For wells that do not purge dry -

Depth to water and turbidity (NTU) measurements during purging/redevelopment (per well volume):

0) 10.72 / 88.38

1) 12.24 / 28.27	6)
2) 12.26 / 5.64	7)
3) 12.29 / 3.37	8)
4) 12.30 / 3.30	9)
5) 12.34 / 2.84	10)

Flow during redevelopment: 9500 (ml/min).

Total volume purged (gallons): 100

Estimated sustainable yield: 9500 (ml/min). Sustainable yield > 100 ml/min: (Y) N

For wells that purge dry – document 3 purge events a minimum of 24 hours apart

Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):
Date/time:	Turbidity: **None Low High**	DTW:	Vol. Removed (gal):

Notes: Start @ 1000
Clear at start
Pump rate → 2.5 gal/min