

**From:** Coleman, Matthew <Matthew.Coleman@arcadis.com>  
**Sent:** Tuesday, June 9, 2020 9:33 AM  
**To:** Neste, David E - DNR  
**Cc:** Jeffrey Howard Danko; Rick Dewey Bethel; Scott D Wahl; Bedard, Michael  
**Subject:** Land-applied Biosolids Information Updates  
**Attachments:** 2020.04.20 Land-Applied Biosolids Preliminary Drinking Water Well Sample Results\_v2.pdf; 2020.04.20 Land-Applied Biosolids Drinking Water Well Parcel and Owner Information.pdf; 2020.04.22 Land-Applied Biosolids Drinking Water Well Locations\_Road-DRAFT.pdf

Dave,

Jeff asked me to send some documents your way. Attached is the latest results table, decoder table, and map from the initial 98 wells sampled as part of the land-applied biosolids investigation.

He also asked that I provide a little more input on the Meyers property results package that was updated yesterday. The Meyers home is new construction, built in 2018. The background aerial imagery we used for figures was taken prior to the home's construction, so the image originally included with their results package showed their neighbor's house as it was the only home in the vicinity of their well. We updated the figure with a new aerial that included their actual home and re-sent the package after calling the homeowner and explaining the update they were going to receive.

Thanks,  
Matt

**Matthew Coleman** | techCOMM | [matthew.coleman@arcadis.com](mailto:matthew.coleman@arcadis.com)  
**Arcadis** | Arcadis of New York, Inc.  
One Lincoln Center | 110 West Fayette St | Suite 300  
Syracuse NY | 13202 | USA  
T. +1 315 671 9641

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LAND-APPLIED BIOSOLIDS - PRIVATE DRINKING WATER WELL SAMPLING RESULTS - MARINETTE AND OCONTO COUNTIES, WISCONSIN - APRIL 20, 2020

NOTE: PRELIMINARY DATA IS PRESENTED BELOW. DATA VALIDATION ON RESULTS IS PENDING.

Location	Sample Date	PFOA	PFOS	PFBS	PFHpA	PFHxS	PFNA	PFDA	PFDoA	PFHxA	PFTeA	PFTrIA	PFUnA	NEtFOSAA	NMeFOSAA	PFBA	PFPeA	PFHxDA	PFODA	PFPeS	PFHpS	PFNS	PFDS	PFDoS	FOSA	NEtFOSA	NMeFOSA	NMeFOSE	NEtFOSE	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	DONA	GenX	F-53B Major	F-53B Minor
BWS-049	3/10/2020	1.4 J	< 1.8	2.7 JN	5.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	8.3	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	5.4	9.2	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	2.9	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8	
BWS-049 DUP	3/10/2020	1.3 J	< 1.8	2.5 JN	5.2	< 1.8 UB	< 1.8	< 1.8	< 1.8	8.3	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	5.5	9.2	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	
BWS-050	3/10/2020	< 1.8	< 1.8	0.34 J	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	2.7	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	2.6	5.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8		
BWS-051	3/10/2020	21	< 1.8	3.7	77	< 1.8 UB	< 1.8	< 1.8	< 1.8	240	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	84	220	< 1.8	< 1.8	0.87 J	< 1.8	< 1.8	< 1.8	< 1.8	5.4	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	
BWS-052	3/10/2020	< 1.9	< 1.9	3.4	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	0.57 J	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	1.4 J	0.86 J	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	2.9	< 1.9	< 1.9	< 3.8	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 3.8	< 1.9	< 1.9	
BWS-053	3/10/2020	5.0	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	0.96 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	0.50 J	1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-054	3/10/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	0.55 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	0.42 J	1.3 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8		
BWS-055	3/10/2020	0.87 J	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	8.4	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-056	3/10/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.9 UB	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8		
BWS-057	3/10/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	2.0	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-058	3/10/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-059	3/10/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-060	3/11/2020	1.1 J	< 1.8	0.86 J	0.24 J	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	0.65 J	0.66 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	7.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-060 DUP	3/11/2020	1.1 J	< 1.8	0.88 J	0.29 J	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	1.4 J	< 1.8	< 1.8	< 1.8	0.61 J	0.65 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	4.4	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8		
BWS-061	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	2.0	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-062	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-063	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-064	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	9.5	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-065	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	3.6	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-066	3/13/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	0.36 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-067	3/11/2020	1.1 J	1.1 J	2.1	0.22 J	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	2.1	0.66 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	6.5	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-068	3/11/2020	< 1.9	< 1.9	0.26 J	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	5.1	< 1.9	< 1.9	< 3.8	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 3.8	< 1.9	< 1.9		
BWS-069	3/11/2020	14	4.0	0.78 J	4.1	< 1.8 UB	0.27 J	< 1.8	< 1.8	3.0	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	4.1	2.5	< 1.8	< 1.8	0.29 J	< 1.8	< 1.8	< 1.8	4.5	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-070	3/11/2020	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8 UB	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-071A	3/12/2020	< 1.8	< 1.8	0.86 J	0.25 J	< 1.8 UB	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	4.1	0.59 J	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	5.2	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.6	< 1.8	< 1.8		
BWS-071B	3/12/2020	< 1.7	< 1.7	0.48 J	< 1.7	< 1.7 UB	< 1.7	< 1.7	< 1.7	< 1.7	0.35 J	< 1.7	< 1.7	< 1.7	< 1.7	5.4	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	5.1	< 1.7	< 1.7	< 3.4	0.75 J	< 1.7	< 1.7	< 1.7	< 1.7	< 1.7	< 3.4	< 1.7	< 1.7	
BWS-072	3/12/2020	140	2.0 JN	1.5 J	140	28	1.1 J	< 1.8	< 1.8	160	0.30 J	< 1.8	< 1.8	< 1.8	< 1.8	46	140	< 1.8	< 1.8	1.0 J	< 1.8	< 1.8	< 1.8	5.2	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.5	< 1.8	< 1.8		
BWS-073	3/12/2020	< 1.9	1.2 J	< 1.9	< 1.9	< 1.9 UB	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 2.8 UB	< 1.9	< 1.9	< 3.7	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 3.7	< 1.9	< 1.9		
BWS-074	3/12/2020	11	5.9	4.6	8.5	2.1	2.7	< 1.8	< 1.8	13	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	12	17	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	6.6	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8	< 1.8	< 1.8	< 1.8	< 3.7	< 1.8	< 1.8		
BWS-074 DUP	3/12/2020	11	5.9	4.6	8.0	2.1	2.4	< 1.9	< 1.9	13	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	12	17	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	< 1.9	6.1	< 1.9	< 1.9	< 3.7	< 1.9	< 1.9	< 1.9	< 1.9						

**Notes:**

**Detections are boldfaced**

**Detections of combined PFOA and PFOS ≥ 20 ng/L are boldfaced**

Units are in ng/L (nanogram per liter)

< = Compound not detected at reporting detection limit

D = Dilution required for sample analysis

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

JN = The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.

U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit

UB = Compound considered non-detect at the listed value due to associated blank contamination

UJ = The compound was not detected above the reported sample method detection limit; however, the reported limit is approximate and may or may not represent the actual method detection limit

DUP = Duplicate sample result

PFOA = Perfluorooctanoic acid (C8)

PFOS = Perfluorooctanesulfonic acid (C8)

PFBS = Perfluorobutanesulfonic acid (C4)

PFHpA = Perfluoroheptanoic acid (C7)

PFHxS = Perfluorohexanesulfonic acid (C6)

PFNA = Perfluorononanoic acid (C9)

PFDA = Perfluorodecanoic acid (C10)

PFDaA = Perfluorododecanoic acid (C12)

PFHxA = Perfluorohexanoic acid (C6)

PFTeA = Perfluorotetradecanoic acid (C14)

PFTriA = Perfluorotridecanoic acid (C13)

PFUnA = Perfluoroundecanoic acid (C11)

NEtFOSAA = N-ethylperfluorooctanesulfonamidoacetic acid (C12)

NMeFOSAA = N-methylperfluorooctanesulfonamidoacetic acid (C11)

PFBA = Perfluorobutanoic acid (C4)

PFPeA = Perfluoropentanoic acid (C5)

PFHxDA = Perfluoro-n-hexadecanoic acid (C16)

PFODA = Perfluoro-n-octadecanoic acid (C18)

PFPeS = Perfluoropentanesulfonic acid (C5)

PFHpS = Perfluoroheptanesulfonic acid (C7)

PFNS = Perfluoronanesulfonic acid (C9)

PFDS = Perfluorodecanesulfonic acid (C10)

PFDoS = Perfluorododecanesulfonic acid (C12)

FOSA = Perfluorooctanesulfonamide (C8)

NEtFOSA = N-ethylperfluorooctanesulfonamide (C10)

NMeFOSA = N-methylperfluorooctanesulfonamide (C9)

NMeFOSE = N-methylperfluorooctanesulfonamidoethanol (C11)

NEtFOSE = N-ethylperfluorooctanesulfonamidoethanol (C12)

4:2 FTS = 4:2 fluorotelomer sulfonate (C6)

6:2 FTS = 6:2 fluorotelomer sulfonate (C8)

8:2 FTS = 8:2 fluorotelomer sulfonate (C10)

10:2 FTS = 10:2 fluorotelomer sulfonate (C12)

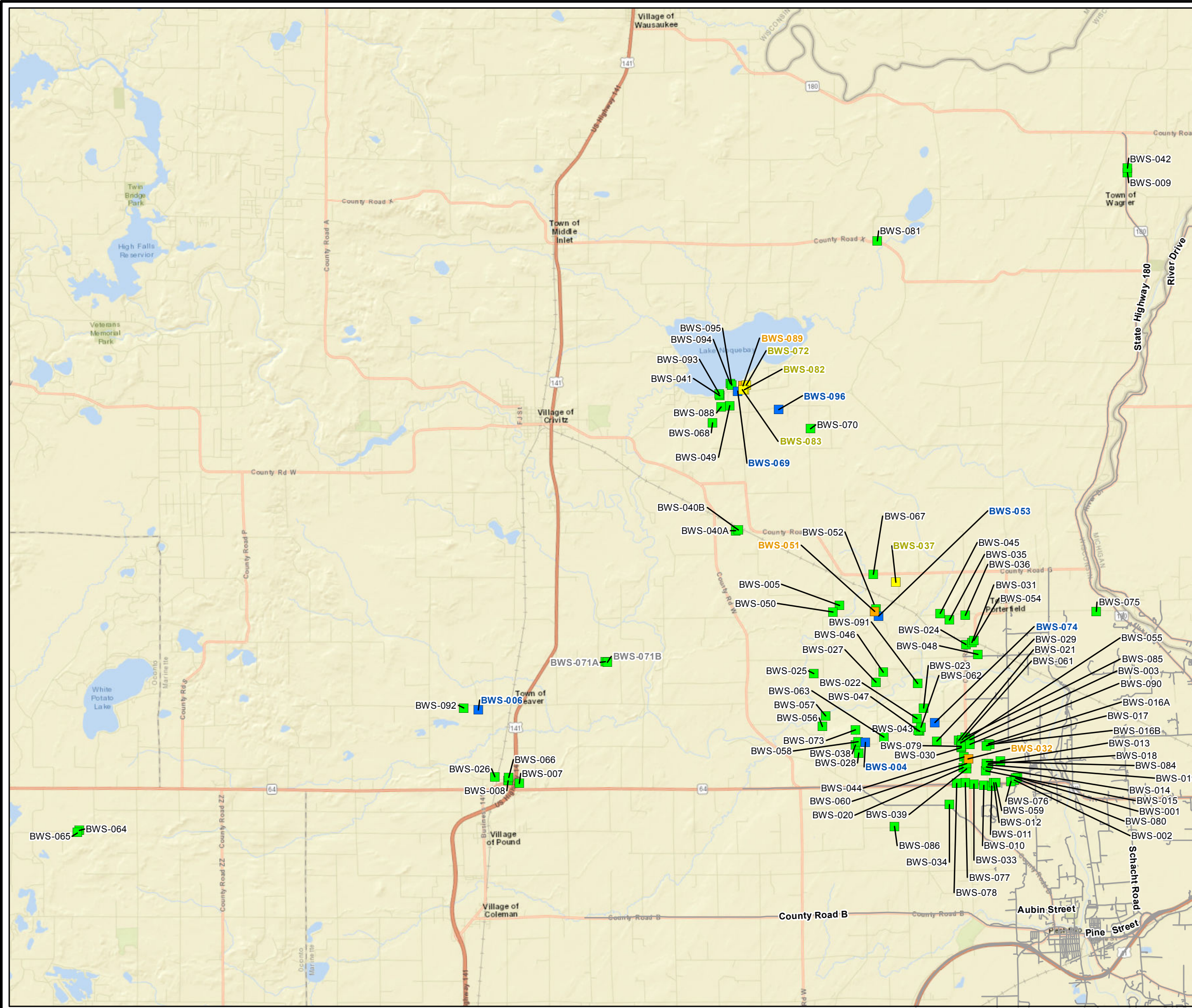
DONA = 4,8-Dioxa-3H-perfluorononanoic acid (C7)

GenX = Hexafluoropropylene oxide dimer acid (C6)

F-53B Major = 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (C8)

F-53B Minor = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (C10)





**LEGEND:**

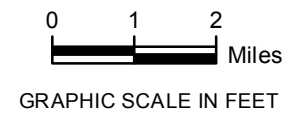
**Drinking Water Results**

- PFOA and/or PFOS below reporting limit (RL)
- PFOA and/or PFOS detection – RL < 20 ppt
- PFOA and/or PFOS detection – 20 – 70 ppt
- PFOA and/or PFOS detection above HAL

**Notes:**

ppt = parts per trillion  
 HAL = Health Advisory Level  
 PFOA = Perfluorooctanoic acid  
 PFOS = Perfluorooctanesulfonic acid  
 BWS-001 = Well sample identification  
 Well locations are approximate  
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**4/22/2020  
 DRAFT**



LAND-APPLIED BIOSOLIDS IN  
 MARINETTE AND OCONTO COUNTIES

**LAND-APPLIED BIOSOLIDS  
 DRINKING WATER WELL LOCATIONS**

