

The Power of Well-Organized Data: Using Power Apps, Automate, and BI to Structure Information for a Large- Scale Drinking Water Sampling Effort



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Barr Engineering Co.

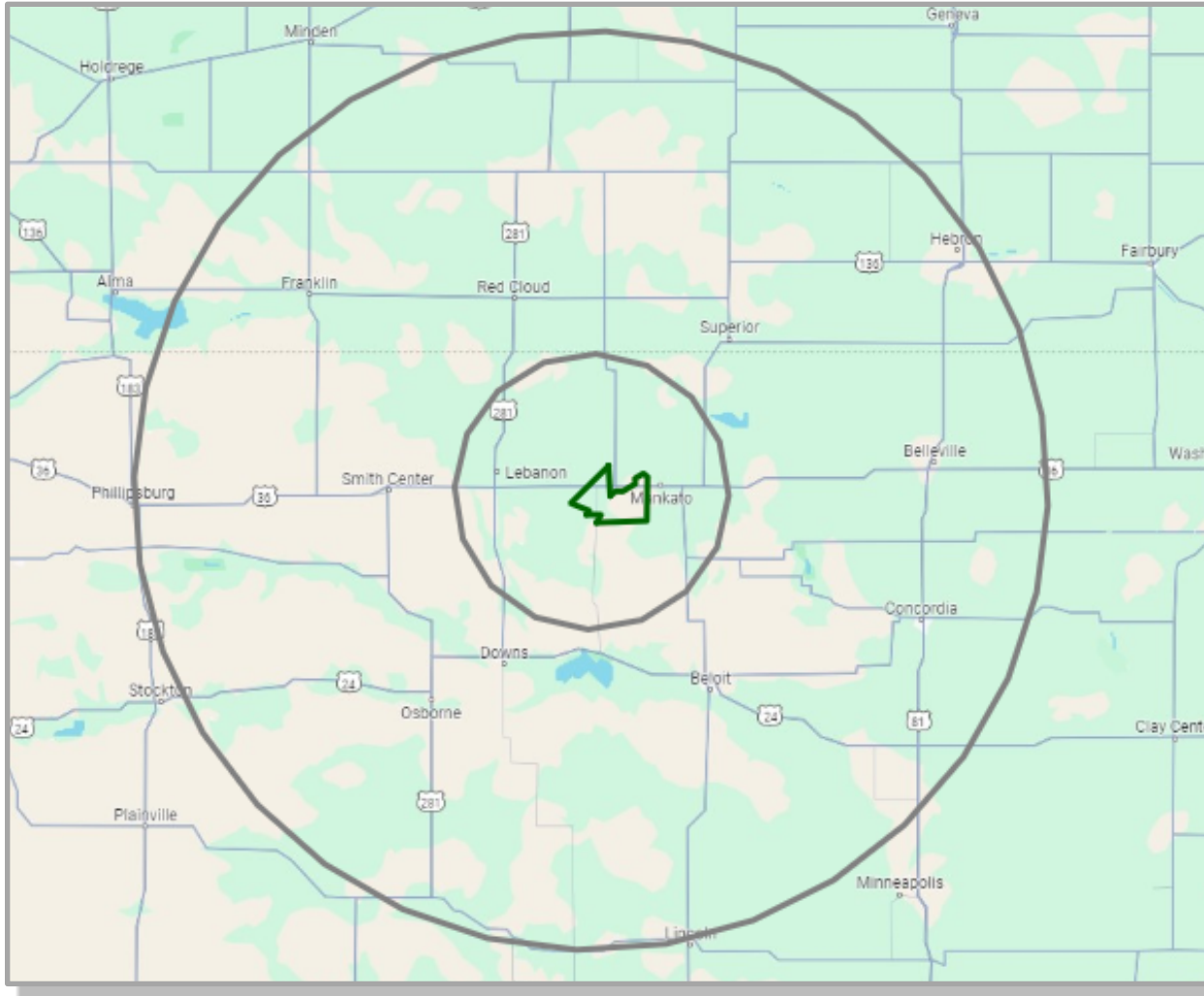
June 2024



The case study



Disclaimer: All visuals in this presentation are fictional



Emerging contaminant

Spanning several U.S. states

Based on distance from facility:

- Sampling
- Ongoing sampling
- Treatment systems

The case study



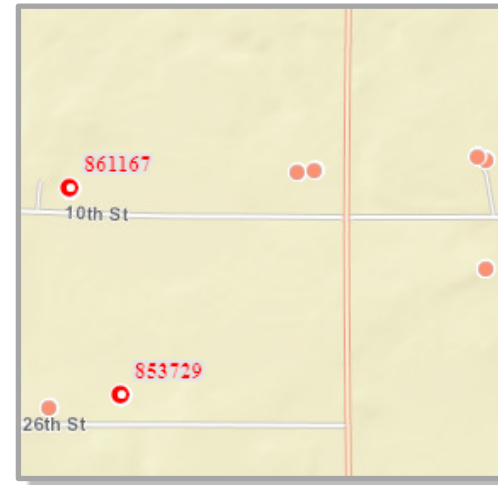
Aerial Imagery



Tax Records

name	address	lot	area	value	tax
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
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James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200
James H. and B. Co.	1000 N. 10th St.	1000	1.2	\$120,000	\$1,200

Well Logs



Field Reconnaissance



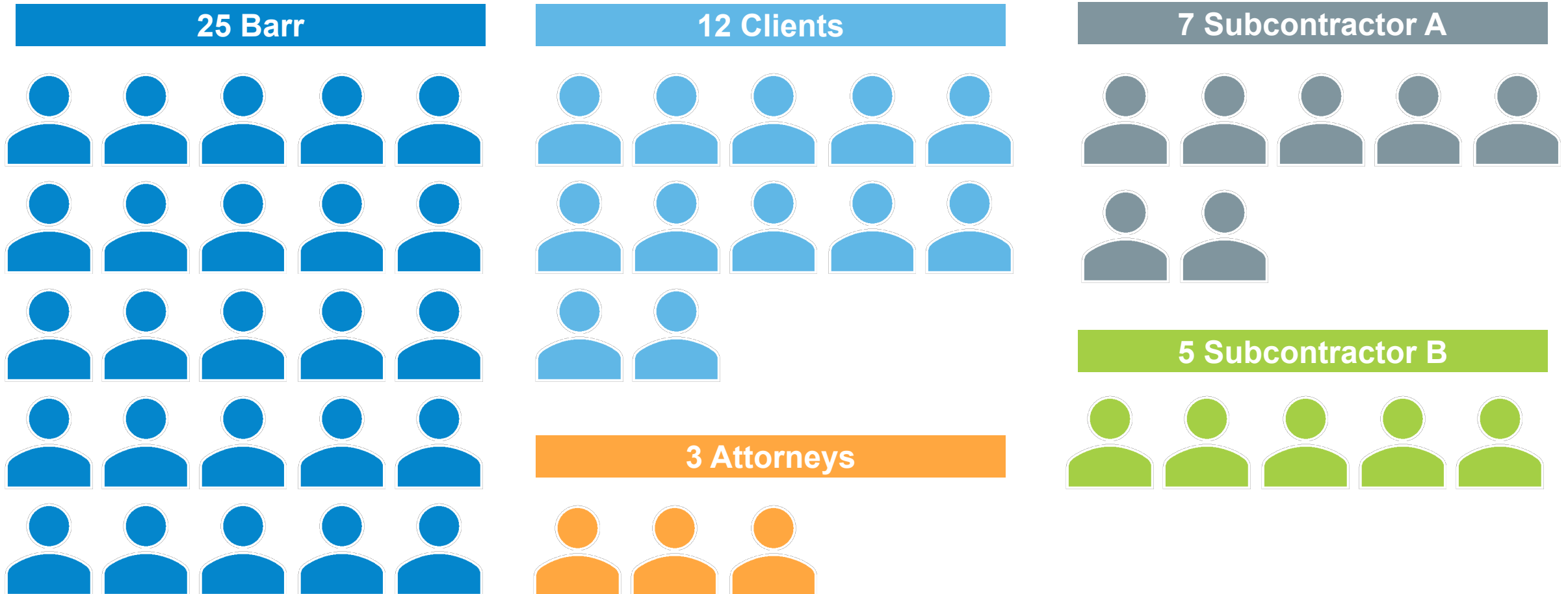
Identified:

500 private drinking water wells
30 public water systems (PWS)

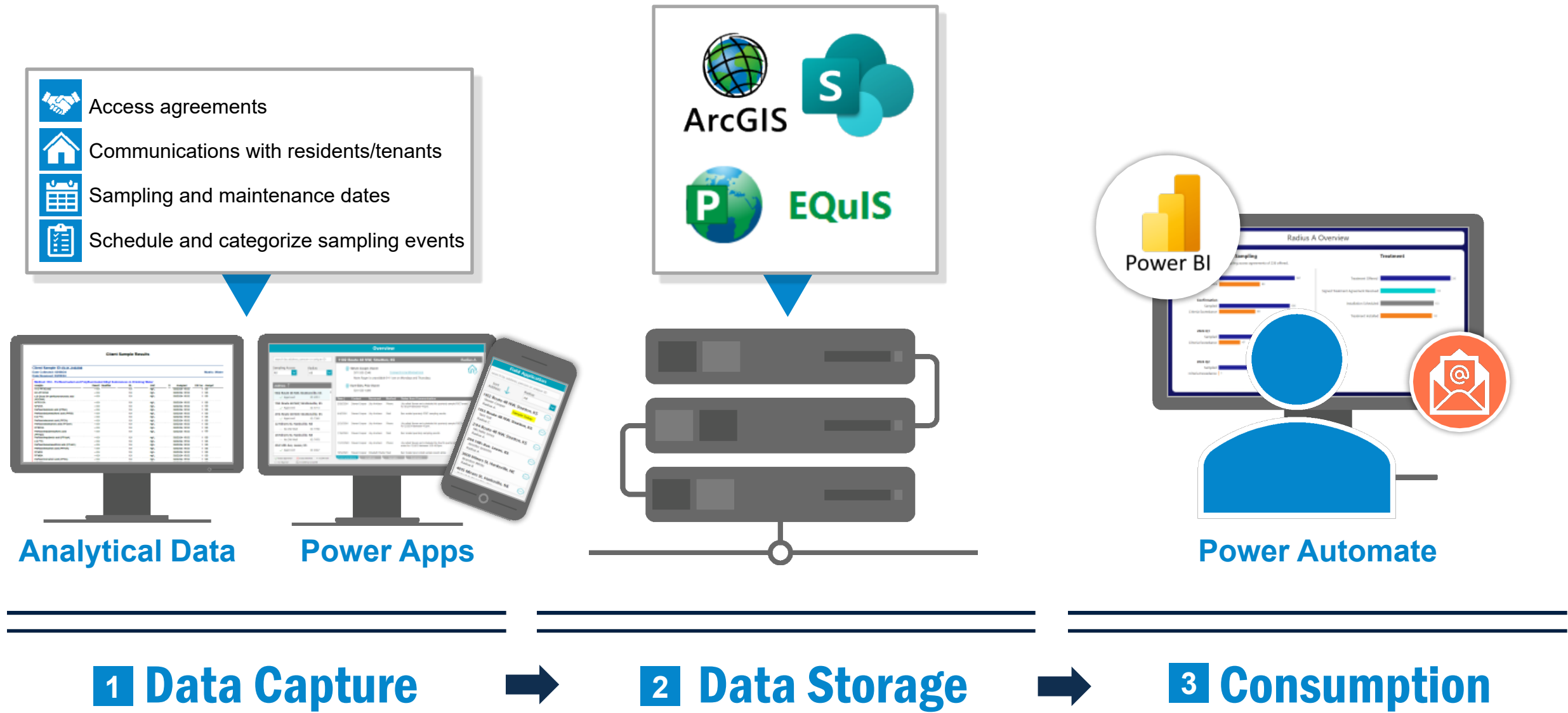
The Team



System allowed for **streamlined access for multiple users** and real-time status updates:



Note: All visuals are fictional



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1 Data Capture



2 Data Storage



3 Consumption

Collection: Power Apps - Desktop



Overview

search by address, person or unique ID

Sampling Access:

All

Radius:

All

Address ↑

1102 Route 48 NW, Strattonville, KS

✓ Approved ID: 2951

1153 Route 48 NW, Strattonville, KS

✓ Approved ID: 5713

2114 Route 48 NW, Strattonville, KS

✓ Approved ID: 7360

22 Miners St, Hanksville, NE

— No DW Well ID: 7788

28 Miners St, Hanksville, NE

— No DW Well ID: 7478

294 14th Ave, Lewes, KS

✓ Approved ID: 9367

✓ access approved

✗ access declined

— no DW well

○ no response

📄 3rd attempt complete

1102 Route 48 NW, Stratton, KS

Radius A

👤 Steven Cooper, Owner

501-555-2546

CoopersCorner@gmail.com

Note: Steven is unavailable 9-11 am on Mondays and Thursdays.

👤 Kurt Skies, Prior Owner

501-555-1499

Date ↓↑	Contact	Personnel	Method	Notes from Communication	
5/28/2024	Steven Cooper	Lily Arvidson	Phone	Lily called Steven and scheduled his quarterly sample POET event for 6/5/24 between 4-5pm.	✎
4/4/2024	Steven Cooper	Lily Arvidson	Mail	Barr mailed quarterly POET sampling results.	✎
2/23/2024	Steven Cooper	Lily Arvidson	Phone	Lily called Steven and scheduled his quarterly sample POET event for 2/29/24 between 4-5pm.	✎
1/18/2024	Steven Cooper	Lily Arvidson	Mail	Barr mailed quarterly sampling results.	✎
11/27/2023	Steven Cooper	Lily Arvidson	Phone	Lily called Steven and scheduled his fourth quarter sampling event for 12/4/23 between 3:30-4:30pm.	✎
10/5/2023	Steven Cooper	Elizabeth Maher	Mail	Barr mailed post-install sample results letter.	✎

Communications

Locations

Samples

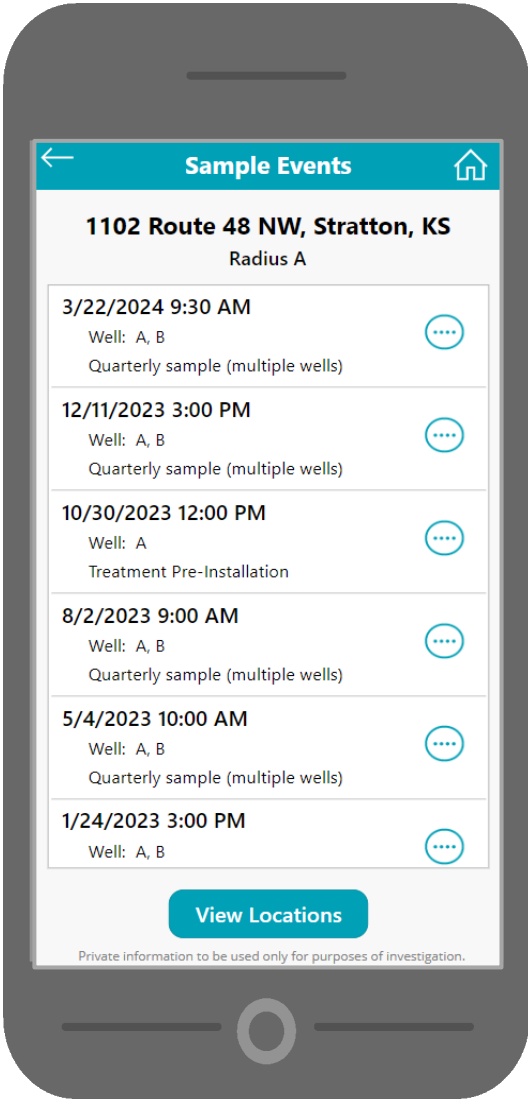
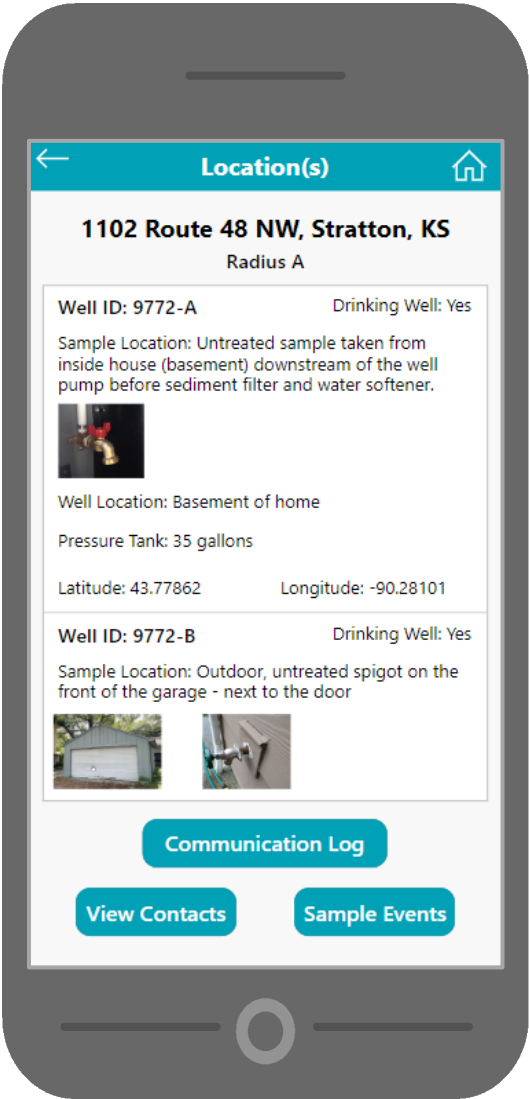
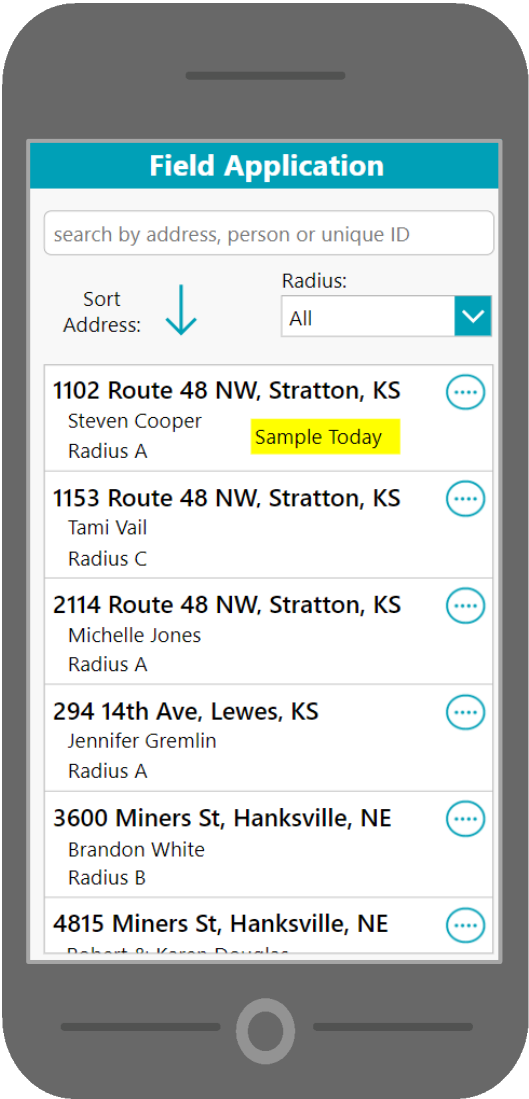
Treatment

Add Communication

Data entry

Data retrieval

Collection: Power Apps - Mobile



Analytical data in EQulS



- Barr has a strong analytical data management process with EQulS

Note: All visuals are fictional

Anonymized Laboratory Report

Client: Barr Engineering Company
Project/Site: Generic Projct

Job ID: 123-456789-1

General Chemistry (Continued)

Prep Batch: 12345 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280000-7	W118	Total/NA	Water	Distill/Ammonia	
310-280000-8	W132	Total/NA	Water	Distill/Ammonia	
310-280000-9	W127	Total/NA	Water	Distill/Ammonia	
310-280004-10	FB-1	Total/NA	Water	Distill/Ammonia	
MB 310-4209000-A	Method Blank	Total/NA	Water	Distill/Ammonia	
LCS 310-420000-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
310-280000-10 MS	FB-1	Total/NA	Water	Distill/Ammonia	
310-280000-10 MSD	FB-1	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 67890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280000-4	75	Total/NA	Water	350.1	
310-280000-6	W110	Total/NA	Water	350.1	
310-280000-7	W118	Total/NA	Water	350.1	
310-280000-8	W132	Total/NA	Water	350.1	
310-280000-9	W127	Total/NA	Water	350.1	
310-280000-10	FB-1	Total/NA	Water	350.1	
MB 310-420000/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-420000/2-A	Lab Control Sample	Total/NA	Water	350.1	
310-280000-10 MS	FB-1	Total/NA	Water	350.1	
310-280000-10 MSD	FB-1	Total/NA	Water	350.1	

Analysis Batch: 434343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280000-1	WCS	Total/NA	Water	SM 2320B	
310-280000-4	75	Total/NA	Water	SM 2320B	
310-280000-6	W110	Total/NA	Water	SM 2320B	
310-280000-7	W118	Total/NA	Water	SM 2320B	
310-280000-8	W132	Total/NA	Water	SM 2320B	
310-280000-9	W127	Total/NA	Water	SM 2320B	
310-280000-10	FB-1	Total/NA	Water	SM 2320B	
310-280000-11	M-1	Total/NA	Water	SM 2320B	
LCS 310-421000/2	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 310-421000/25	Lab Control Sample	Total/NA	Water	SM 2320B	
310-280000-8 DU	W132	Total/NA	Water	SM 2320B	
310-280000-F-5 DU	310-280004-F-5 DU	Total/NA	Water	SM 2320B	

Analysis Batch: 421111

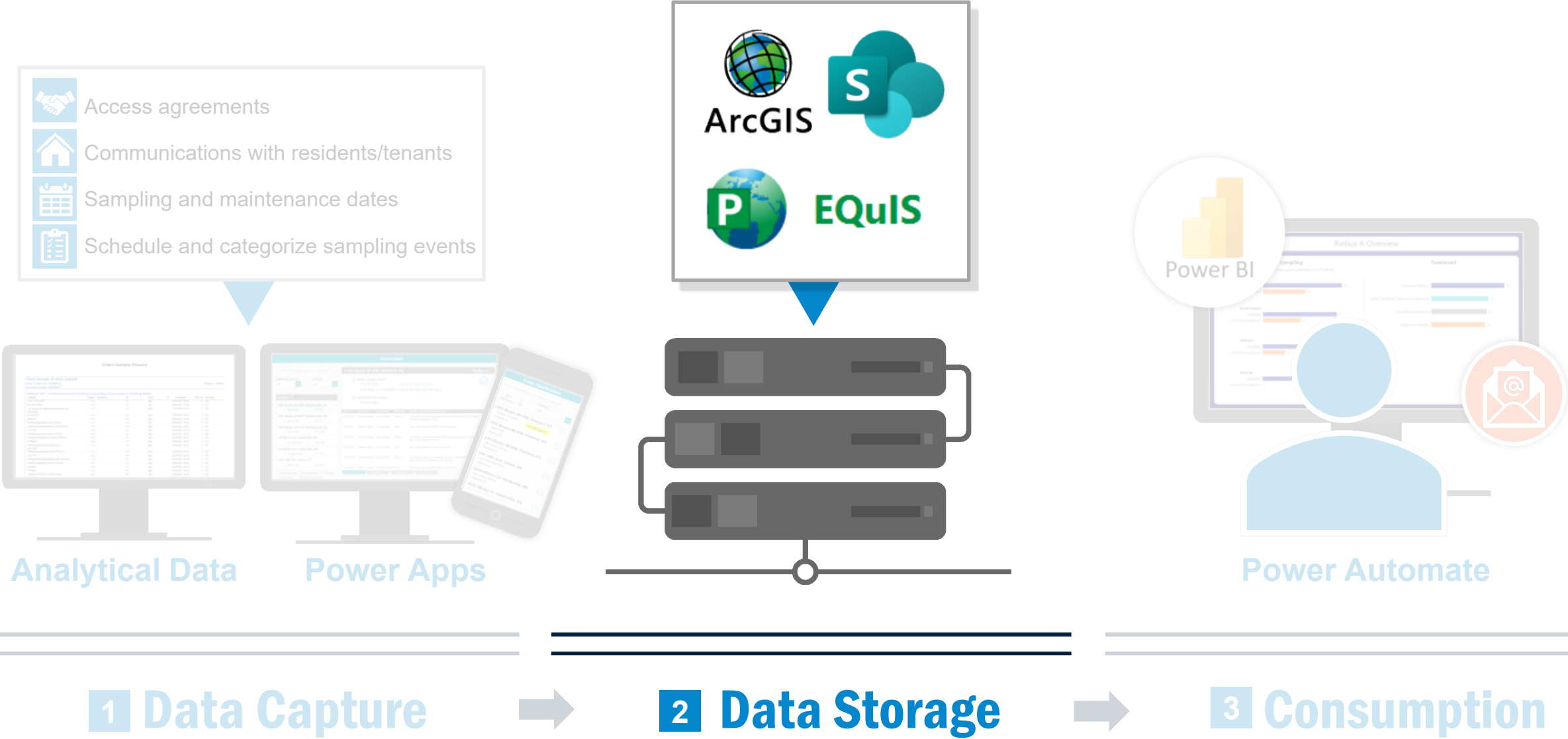
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280000-1	WCS	Total/NA	Water	350.1	
310-280000-3	LDS	Total/NA	Water	350.1	
310-280000-5	OU4	Total/NA	Water	350.1	
310-280000-11	M-1	Total/NA	Water	350.1	
MB 310-420000/1-A	Method Blank	Total/NA	Water	350.1	
LCS 310-420000/2-A	Lab Control Sample	Total/NA	Water	350.1	

Prep Batch: 24212

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-280000-2	LCS	Total/NA	Water	Distill/Ammonia	
MB 310-420000/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	
LCS 310-420000/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	

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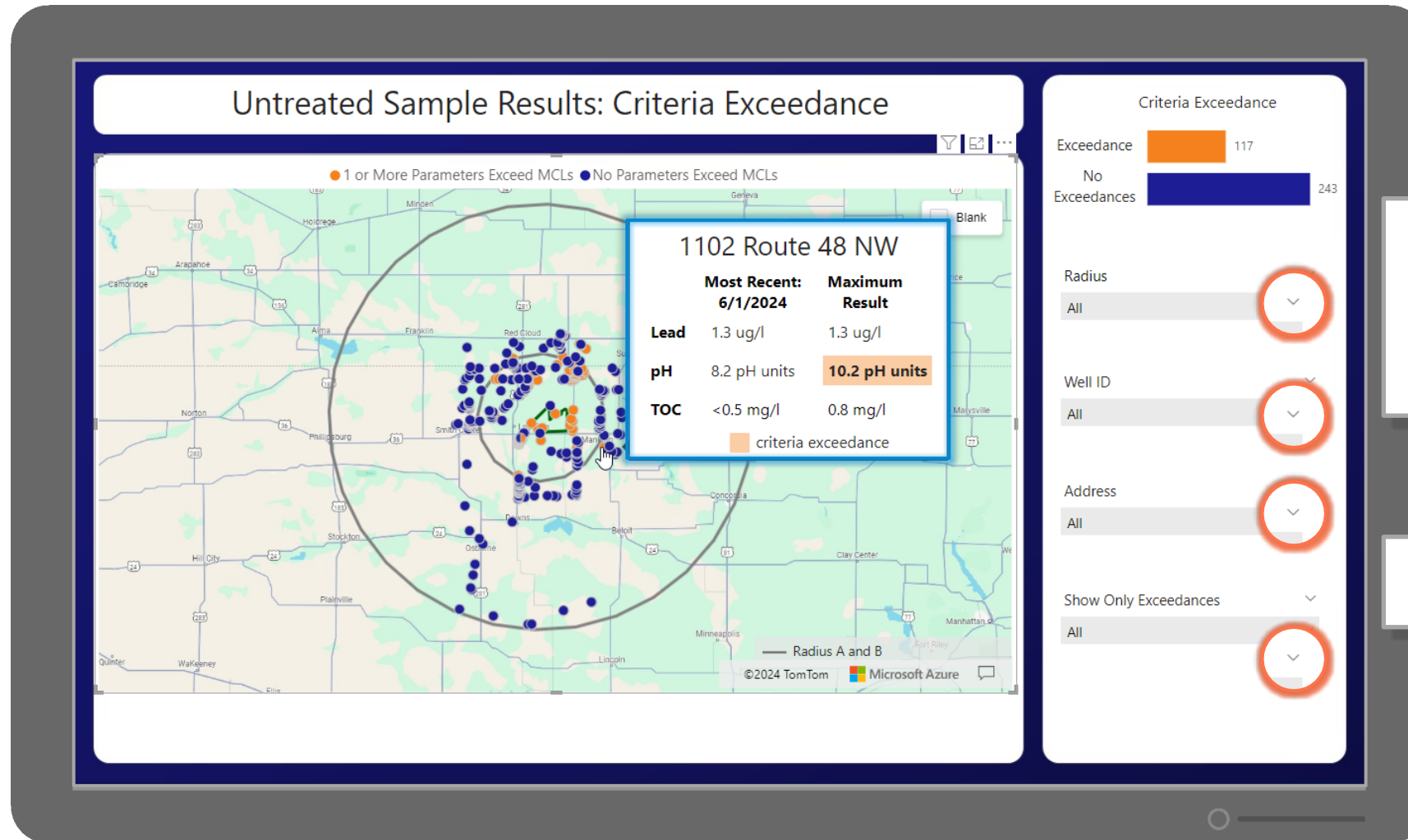


Power BI for reporting – Externally facing reports for team



Can see quick stats. No filtering or slicing – just data of major metrics of interest.

Power BI for reporting – Externally facing

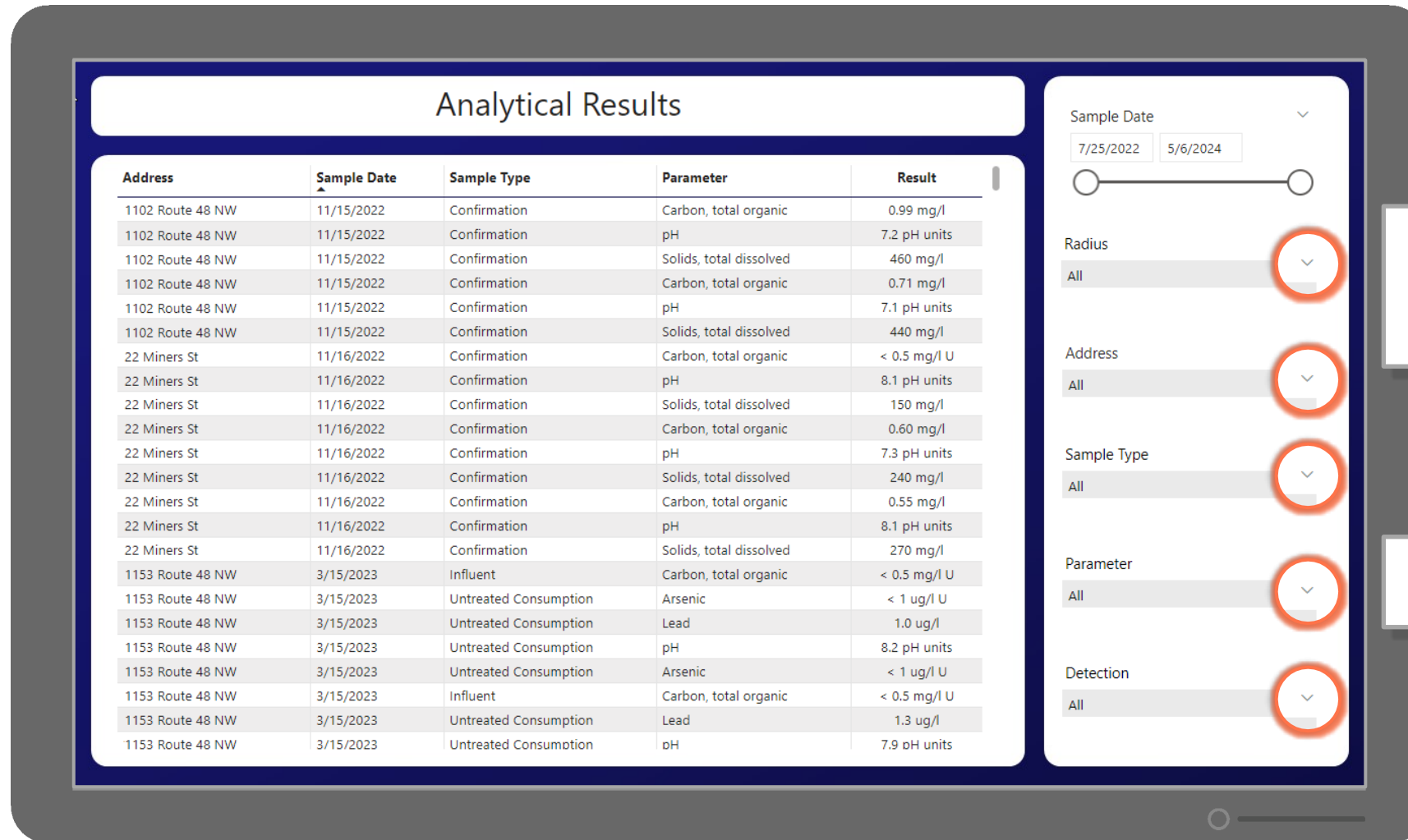


Can hover on markers to see results

Can filter

Power BI for reporting – Externally facing

|||||||



Can easily export to Excel



Can filter

Power BI for reporting – Internally facing



Schedule Sampling

Property Coordinator	Address	Initial Results Mailed	Last Communication	Last Communication Note
Christy Miller	1359 Route 48 NW	5/16/2024	5/16/2024	Barr mailed owner initial results letter.
Lily Arvidson	9700 Route 48 NW	12/21/2023	5/10/2024	Justin called Lily back and said that he will run the dates for the pre-install by his wife and get back to her. Lily said that there is a lot of sampling availability on Thursday, 5/15/24 if he is available then. Justin said that he is working nights right now and will speak to his wife and call Lily back.
Lily Arvidson	56 Nature Road	9/14/2023	5/9/2024	Lily tried calling Sandra but the operator said that the call could not be completed and hung up.
Christy Miller	78 Nature Road	1/11/2024	5/1/2024	Christy left Warren a voicemail about scheduling confirmation sampling.
Christy Miller	199 10th Avenue S	1/4/2024	5/1/2024	Christy left Thayne a voicemail about scheduling confirmation sampling.
Christy Miller	785 10th Avenue S	11/30/2023	5/1/2024	Christy left Mark a voicemail about scheduling confirmation sampling.
Christy Miller	1102 Route 48 NW	11/30/2023	5/1/2024	Christy left Theresa a voicemail about scheduling confirmation sampling.
Lily Arvidson	1103 Route 48 NW	9/7/2023	3/26/2024	Lily left Erik a voicemail requesting a call back to schedule his confirmation well sampling event. Lily provided her direct number.
Lily Arvidson	10 Nature Road	8/18/2023	3/26/2024	Lily left Martina a voicemail requesting a call back to schedule her confirmation sampling event of her private well. Lily provided her direct number for a call back.
Christy Miller	160 10th Avenue S	2/22/2024	2/22/2024	Barr mailed initial sample results letter.
Lily Arvidson	901 10th Avenue S	12/7/2023	2/6/2024	Lily emailed Jim the following: Hello Jim,

Sample

Radius

All

Address

All

Location ID

Search

- ☐ Select all
- ☐ 1175
- ☐ 1577
- ☐ 2345
- ☐ 2568
- ☐ 2763
- ☐ 3047
- ☐ 3312

Property Coordinator

Search

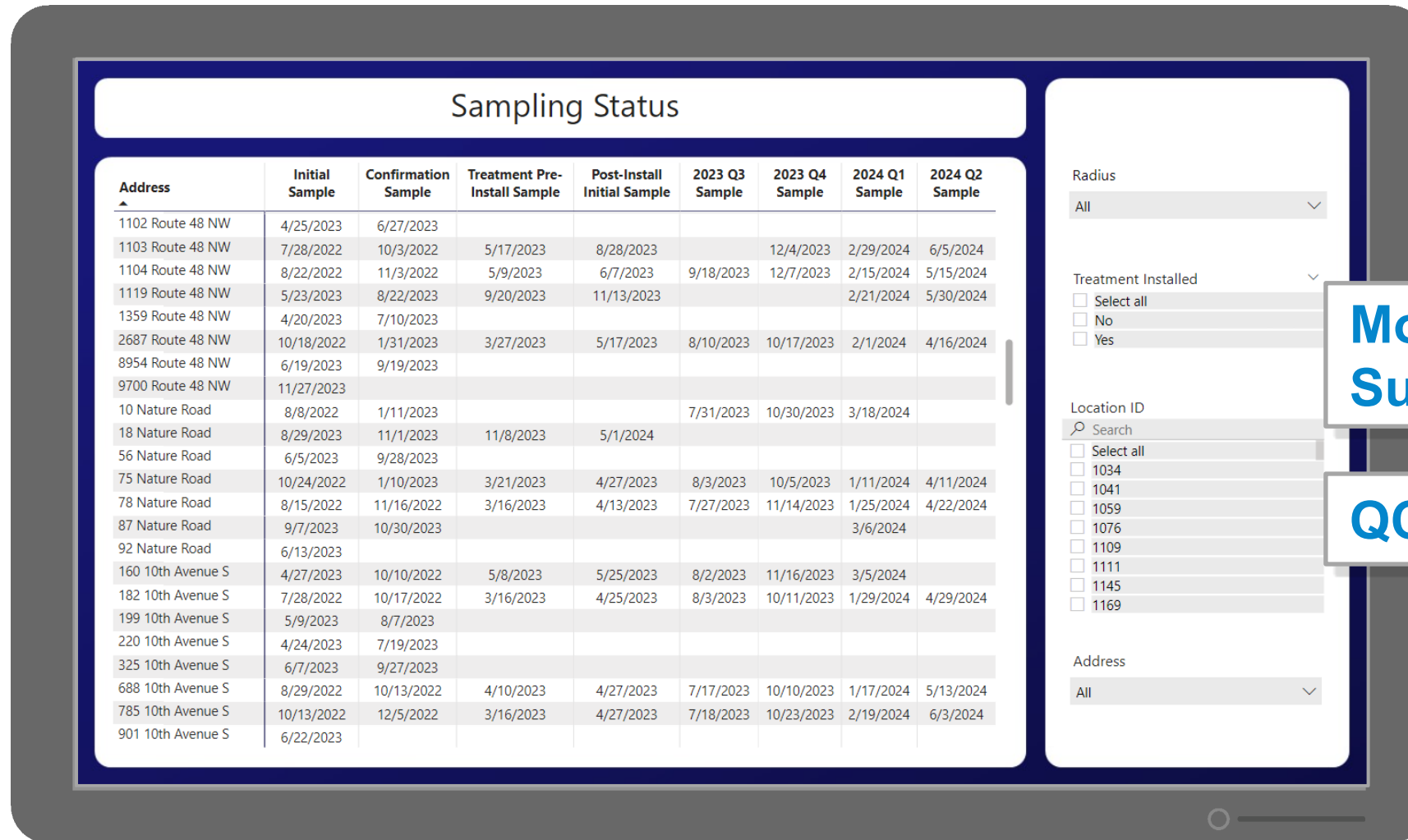
- ☐ Select all
- ☐ Christy Miller
- ☐ Lily Arvidson

Internally facing reports - Logistics

Reports for when properties should be scheduled

Reports for when results letters are ready

Power BI for reporting – Internally facing



Monthly Agency Submittals

QC Information

Alerts



All Emailed:

Communication Flag

Criteria Exceedance

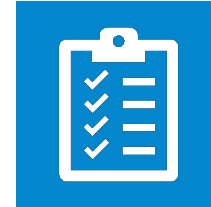
Analytical Method Detection

Scheduled Power BI Screens

Results: in under two years



18
agency reports



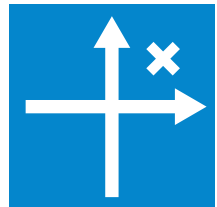
1,500
sampling events



135
treatment systems installed



3,400
communications



630
coordinates captured



290,000
analytical results

Results and lessons learned



- **Personalized communication** to over 500 well owners and operators
- **Real-time data** for 52 people across 5 entities
- **Improved cross-team communication**
- **Quick and efficient** analysis and reporting



Thank You



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