

Source Water Protection Plan

Village of Cleves, Ohio
December 10, 2014

Dan Schaefer, P.E.
Principal Planner and Civil Engineer
Brandstetter Carroll Inc.
Cleves Water Engineer

Acquire Funding for a Source Water Protection Plan That Can Be Certified With the OEPA

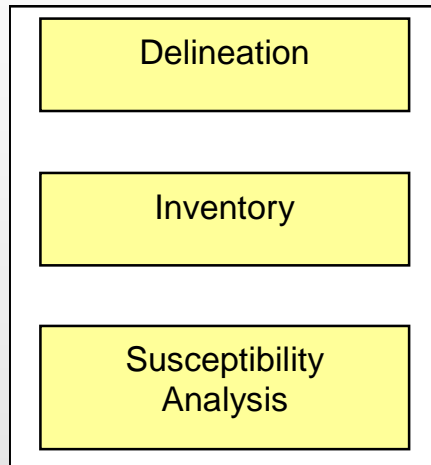
- Cleves BPA applied and obtained grant funding from the Miami Valley Conservancy District with the assistance of Brandstetter Carroll Inc. to develop a source water protection plan.
- A source water protection plan for its three ground water wells at 4545 Kilby Road in Whitewater Township, Hamilton County.
- The Village was approved for a \$45,500 in **grant** in October 2012 receiving half of this amount to date with Miami Conservancy District to develop a source water protection plan.
- Close coordination with the OEPA and the conservancy district will assist in getting a certified plan that improves opportunities for future grant and low interest loan dollars for water projects.

Review Existing Records and Form Team Relationships

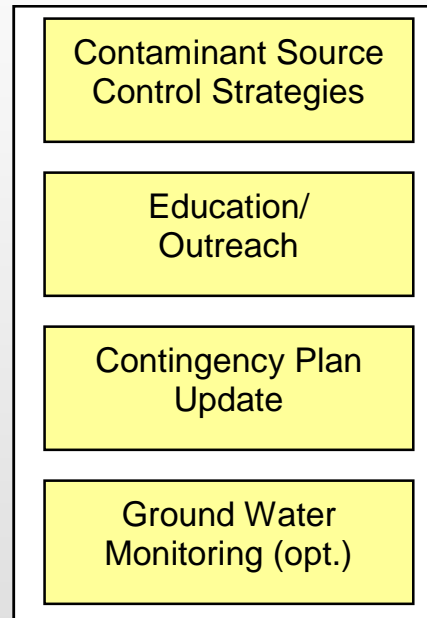
- Review Existing 2003 OEPA Source Water Assessment and Update with Current Data and Information
- Review Water System Records and Identify Risks
- Coordinate and Collaborate on Action Steps to be Taken on potential impacts to existing well field areas and WTP
- Meetings with MSD, GCWW, Whitewater Township, Miami Township – Issues and assets impacting ground water areas

The Process of Planning and Protecting Our Ground Water

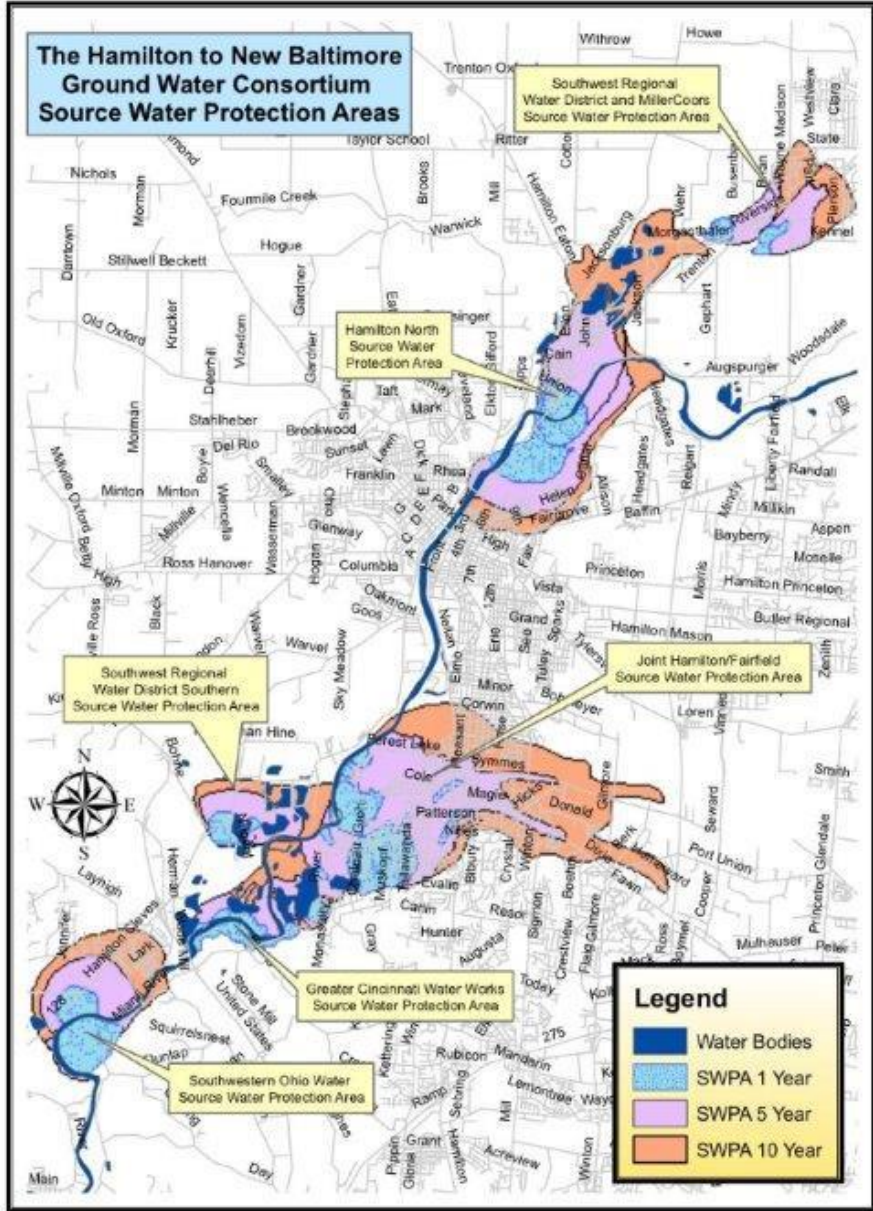
Assessment (Technical Information)



Protection Plan (developed by local team)



**Protected
source of
drinking
water**



Review Inventory Contaminant Sources Influencing Ground Water

- Cleves Buried Valley Aquifer using the OEPA box method causes the boundary walls to be a no flow boundary with a shale and limestone bedrock.
- Cleves well area appears confined to OEPA from 45-65 feet with a clay layer with extent unknown. Confined aquifer is more conservative and recommended by OEPA.
- Transmissivity Values were 471 to 1800 ft. per day which were conservatively measured at 300 to 1000 feet per day. A pump rate of 2.1 MGD divided equally with three wells with porosity of 20%.

Identify Type of Aquifer and Flow Impacts from Geology Analysis

- OEPA Re-delineates Cleves ground water model area in 2013 from 4545 Kilby Road between US 50, Lawrenceburg Road, Suspension Bridge Road and Kilby Road as a Confined Aquifer. (Based on Well Logs from Reynolds Feasibility Study)
- Ground Water Modeled Area as a consequence is somewhat larger, See attached map for new area.

Drinking Water Source Protection Area Village of Cleves, PWSID#OH3100512



Legend

- Active Wells
- Inner Management Zones
- Source Water Protection Areas

Protection Area Data

- Number of Wells = 3
- Total Well Pumping Rate = 2.1 MGD
- Porosity = 20%
- Aquifer Thickness = 40 feet
- Hydrogeologic Setting = Buried Valley



Ohio Environmental Protection Agency
Division of Drinking and Ground Water
March 6, 2013

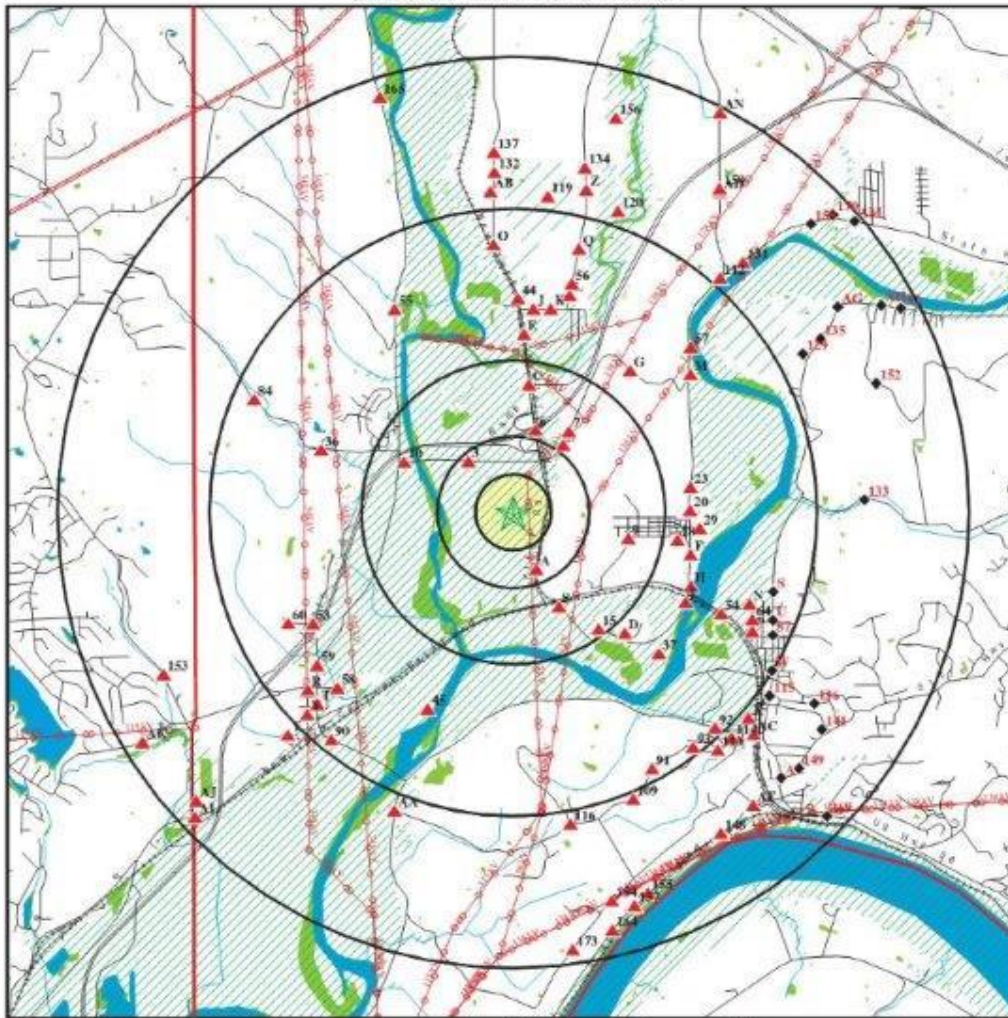
Identify and Develop Contaminant Source Listing – Basic Strategies

- Potential Contamination Inventory
 - Add Inventory to OEPA GIS for review
- General Analysis of the Big Picture
 - Perform EDR Analysis of all government databases
- Contamination Sites Review
 - Remedies to address any impacts on water supply
- Identify and List Properties with Potential Impacts on identified protection zones
 - Owners, Customers and Industries

Identify Contaminant Sites EDR Report

- Environmental Data Resources - EDR Radius Map and Report
 - Executive Summary of Findings
 - Checks all environmental sites and data
 - Provides overview map of potential sites
 - Provides Geo Check for Source Contamination Potential
 - Source Map and Findings Summary
 - Orphan Summary
 - Government Records Searched
 - OVERVIEW MAP
 - Pictures of Sites

OVERVIEW MAP - 3437198.1s



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- ▲ Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites

- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands



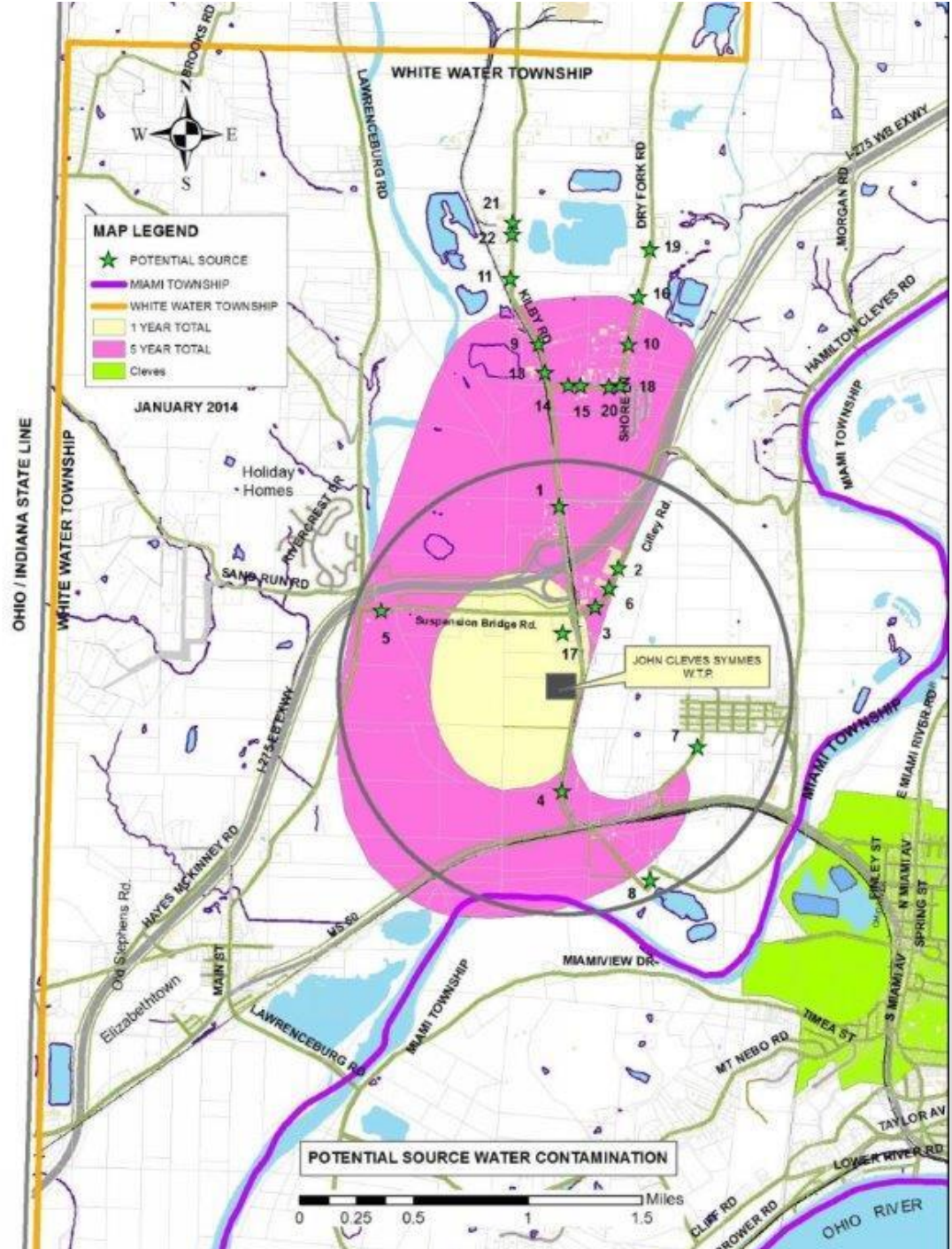
This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 4545 Kilby Road ADDRESS: 4545 Kilby Road Cleves OH 45002 LAT/LONG: 39.1782 / 84.7809	CLIENT: Brandstetter Carroll Inc. CONTACT: Daniel R. Schaefer, P.E. INQUIRY #: 3437198.1s DATE: October 19, 2012 4:11 pm
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Best Management Practices – Focus on Potential Contaminant Sources First

- Set Targets and Priorities – Most Affecting Aquifer
 - Determine Key Stressors – Environmental Issues
- Evaluate Each Situation as it currently stands
- Make recommendations to achieve good outcomes
 - Use Zoning and or OEPA Restrictions, Village Resolutions
 - Use local ordinances to safeguard health and water supply.
- Consider options for communities without zoning control
 - Community meetings to explain the reasons and need for protection
- Other Team Suggestions – Community Meetings, Blogging



FID	Shape	OBJECTID	PCSI_ID	Name	Type	inv_code	Source	Map_ID	UpdateNow
0	Point	1	110002112632	BRUEWER WOODWORK MFG CO	TRIS	R-10	US EPA Envirofacts	57	No
1	Point	2	19168	E-Town LF	Construction & Demolition Landfill	W-2	OEPA DSWM/DDAGW CD&D Landfill GIS Layer	52	No
2	Point	3	1PC00002-901	Harrison WWTP		R-7	OEPA NPDES GIS Layer	1	No
3	Point	4	1PR00106-1	Bruewer Woodwork Mfg Co		R-7	OEPA NPDES GIS Layer	2	No
4	Point	5	1PV00096-1	Riverview Crossing WWTP		R-7	OEPA NPDES GIS Layer	5	No
5	Point	6	1PV00096-801	Riverview Crossing WWTP		R-7	OEPA NPDES GIS Layer	3	No
6	Point	7	1PV00096-901	Riverview Crossing WWTP		R-7	OEPA NPDES GIS Layer	4	No
7	Point	8	1PY00001-1	Dry Fork MHP		R-7	OEPA NPDES GIS Layer	6	No
8	Point	9	3100002		Sludge Application Field	M-11	OEPA DSW Sludge Field GIS Layer	53	No
9	Point	13	ADD310051210	Valley Asphalt Corp.	Asphalt/cement/concrete plants	I-1	Field Inventory of SWAP area	19	No
10	Point	14	ADD310051211	Pond	Lagoon/Pond/Pit	Q-10	Field Inventory of SWAP area	17	No
11	Point	15	ADD310051212	Quarry	Gravel pits & Quarries	I-5	Field Inventory of SWAP area	14	No
12	Point	16	ADD310051213	Gas Line	Gas Lines	O-8	Field Inventory of SWAP area	16	No
13	Point	17	ADD310051214	Local Farm	Above Ground Storage Tanks	O-1	Field Inventory of SWAP area	12	No
14	Point	19	ADD31005123	Agriculture	Crops : corn,soybean,wheat	A-5	Field Inventory of SWAP area	8	No
15	Point	20	ADD31005124	Agriculture	Crops : corn,soybean,wheat	A-5	Field Inventory of SWAP area	7	No
16	Point	21	ADD31005125	Salt Storage	Salt storage areas	M-6	Field Inventory of SWAP area	9	No
17	Point	22	ADD31005126	Residential Wells	Wells: not in use	Q-23	Field Inventory of SWAP area	10	No
18	Point	23	ADD31005127	Residential Septic	Septic Systems (leachfield)	Q-15	Field Inventory of SWAP area	13	No
19	Point	24	ADD31005128	84 Lumber	Hardware/lumber/parts stores	C-17	Field Inventory of SWAP area	15	No
20	Point	25	ADD31005129	Quarry	Gravel pits & Quarries	I-5	Field Inventory of SWAP area	18	No
21	Point	26	ADD31006121	Dry Fork MHP	Wastewater treatment plant	M-10	Field Inventory of SWAP area	20	No
22	Point	27	ADD310061210	Pipeline	Chemical/petroleum pipelines	Q-4	Field Inventory of SWAP area	27	No
23	Point	28	ADD310061211	Ashcroft Sand and Gravel	Gravel pits & Quarries	I-5	Field Inventory of SWAP area	44	No
24	Point	29	ADD310061212	Residential Wells	Wells: not in use	Q-23	Field Inventory of SWAP area	47	No
25	Point	30	ADD310061213	Mapleleaf MHP	Underground Injection: Class 5	R-15	Field Inventory of SWAP area	22	No
26	Point	31	ADD310061214	Mapleleaf MHP	Underground Injection: Class 5	R-15	Field Inventory of SWAP area	21	No
27	Point	32	ADD310061215	Residential	Septic Systems (leachfield)	Q-15	Field Inventory of SWAP area	45	No
28	Point	33	ADD310061216	Used Car dealership	Car/boat/camper dealerships	C-5	Field Inventory of SWAP area	33	No
29	Point	34	ADD310061217	Junk Yard (Machinery, etc.)	Junk yards (scrap and auto)	C-20	Field Inventory of SWAP area	46	No
30	Point	35	ADD310061218	Cincinnati Test Systems	Research laboratories	C-30	Field Inventory of SWAP area	42	No
31	Point	36	ADD310061219	Agriculture	Crops : corn,soybean,wheat	A-5	Field Inventory of SWAP area	24	No
32	Point	37	ADD31006122	Dry Fork MHP	Above Ground Storage Tanks	O-1	Field Inventory of SWAP area	26	No
33	Point	38	ADD310061220	Ponding	Lagoon/Pond/Pit	Q-10	Field Inventory of SWAP area	49	No
34	Point	39	ADD310061221	Haring Co. Speciality Gases	Other Commercial Sources	C-33	Field Inventory of SWAP area	50	No
35	Point	40	ADD310061222	Ready Mix Plant	Wells: not in use	Q-23	Field Inventory of SWAP area	51	No
36	Point	42	ADD31006124	Dry Fork MHP	Storm Drains	O-18	Field Inventory of SWAP area	28	No
37	Point	43	ADD31006125	Mapleleaf Mobile Home Park	Underground Injection: Class 5	R-15	Field Inventory of SWAP area	30	No
38	Point	44	ADD31006126	Mapleleaf Mobile Home Park	Above Ground Storage Tanks	O-1	Field Inventory of SWAP area	34	No
39	Point	46	ADD31006128	Mapleleaf Mobile Home Park	Underground Injection: Class 5	R-15	Field Inventory of SWAP area	37	No
40	Point	47	ADD31006129	Weisvrod residence	Animal waste storage/disposal	A-3	Field Inventory of SWAP area	25	No
41	Point	48	ADD313831210	Private Wells	Wells: not in use	Q-23	Field Inventory of SWAP area	40	No
42	Point	49	ADD31383122	Cincinnati Test Systems	Other	O-24	Field Inventory of SWAP area	39	No
43	Point	50	ADD31383123	Cincinnati Test Systems	Septic Systems (leachfield)	O-15	Field Inventory of SWAP area	41	No
44	Point	51	ADD31383124	Alt Foundations	Other Commercial Sources	C-33	Field Inventory of SWAP area	35	No
45	Point	52	ADD31383125	Auto Sales	Auto repair shops/body shops	C-2	Field Inventory of SWAP area	32	No
46	Point	53	ADD31383126	Machinery/Junkyard	Junk yards (scrap and auto)	C-20	Field Inventory of SWAP area	43	No
47	Point	54	ADD31383127	Agriculture	Crops : corn,soybean,wheat	A-5	Field Inventory of SWAP area	29	No
48	Point	55	ADD31383128	Cincinnati Test Systems	Storm Drains	O-18	Field Inventory of SWAP area	31	No
49	Point	56	ADD31383129	Residential septic	Septic Systems (leachfield)	Q-15	Field Inventory of SWAP area	38	No
50	Point	57	ADD31384127	Agriculture	Crops : corn,soybean,wheat	A-5	Field Inventory of SWAP area	48	No

Source Controls and Collaboration

- Identify Specific Sources of Contamination with OEPA
- Determine Recommendations for Prohibitions and Restrictions
 - Physical Berms and Containment Systems to protect area
 - Conservation Easements Using Grant Dollars
 - Routine inspection, testing, maintenance and reporting
 - Acquire Village Volunteers to Assist with Village Water Staff
- Update contaminant sources yearly with highest susceptible sites being investigated more rigorously
- Memorandums of Understanding with Property Owners
- Keeping data up to date and inform the public
- Comply with OEPA Siting and Rules Requirements

Source Controls – Continued

Collaboration with OEPA and Miami Vally Conservancy District

- Coordinate with Villages, Townships affected by SWAP
 - Coordinate with Property Owners
 - Coordinate with Business Owners
- Potential Sources of Contamination and Control Strategies.
 - Identify Health and Safety Strategies that are practical and effective
- General Map of Zone Impacts to Water Supply
 - Update protection zone map regularly
 - Update the Susceptibility and SWAP Report
 - Report on a yearly basis on changes and impacts to water supply
- List of Groundwater Monitoring Protective Strategies

Siting Prohibitions of the OEPA



Drinking Source Water Protection Siting Prohibitions and Setbacks in Ohio Rules



Please refer to the cited rule for the specifics and exceptions to the restricted activities.

May 2011

FACILITY	REGULATED ACTIVITY	Sanitary Isolation Radius	Inner Management Zone (One-Year Time-of-Travel)	Drinking Water Source Protection Area (Five-Year Time-of-Travel)	
				Low and Moderate Susceptibility	High Susceptibility
Animal Feeding Operation Fact Sheet Regulated by ODA-LEPP OAC § 901.702-202	Siting of manure storage or treatment facilities	Not permitted	Not permitted (exemptions if the facility is also a PWS)	Permitted	Not permitted unless engineering and management controls are put in place
Wastewater Treatment Land Application System Fact Sheet Regulated by OEPA-DSW OAC § 3745-02-13	Land application of wastewater	Not permitted	Not permitted	Permitted	Not permitted unless engineering and management controls are put in place
	Siting of wastewater storage facilities.	Not permitted	Not permitted	Not permitted in community and non-transient, non-community protection areas unless engineering and management controls are put in place	
Sewage Sludge (Biosolids) Fact Sheet Regulated by OEPA-DSW OAC § 3745-40-07 thru 40-08	Staging, stockpiling, field storage, and land application of biosolids	Not permitted	Not permitted	Permitted	Not permitted if underlain by karst or fractured bedrock
Landfills Industrial Solid Waste Fact Sheet Regulated by OEPA-DSW OAC § 3745-29-07 Municipal Solid Waste Fact Sheet Regulated by OEPA-DSW OAC § 3745-27-07 Residual Waste Fact Sheet Regulated by OEPA-DSW OAC § 3745-30-06 Scrap Tires Fact Sheet Regulated by OEPA-DSW OAC § 3746-27-71	Siting of landfills and monofills	Not permitted	Not permitted (exemptions if the facility is also a PWS)	Not permitted (exemptions if the facility is also a PWS)	

Siting Prohibitions of the OEPA



Drinking Source Water Protection Cleanup Standards in Ohio Rules



May 2011

ACTIVITY	Drinking Water Source Protection Area (Five-Year Time-of-Travel)
<p>Leaking Underground Storage Tanks (LUSTs)</p> <p>Fact Sheet Regulated by the Bureau of Underground Storage Tank Regulations (BUSTR)</p>	<p>Cleanup standards are more stringent if the LUST is within 2,000 feet of a drinking water source protection area for a community or non-transient non-community public water system</p>
<p>Site Clean-up through the Voluntary Action Program (VAP)</p> <p>Fact Sheet Regulated by OEPA-VAP</p>	<p>Cleanup standards are more stringent if the VAP site is located within a drinking water source protection area.</p> <p>Urban Siting Designations for ground water are not allowed within a drinking water source protection area. Some exceptions apply to community public water systems.</p>

Education and Outreach

- Posters
- Bill Enclosures
- CCR Updates
- Employee and Customer Awareness
- Letters to Business Owners
- Brochures to Stores
- Signs in Public Places

Education and Outreach

- Signs, Activity books, posters, public education and brochures
- Get List of Volunteers including schools who want to protect
- Its critical to get community support with regular updates at Village meetings and use of website, blogging and brochures
- Education and Bulletins to update the Public
 - Website, Mailers with Bills, Articles Council Support, Stream Teams
 - Street Signs – River Road (2), Kilby Road (2), Suspension Bridge Road (2), Dry Fork Road (2), Cilley Road (2), Lawrenceburg Road (2)
 - Review Meetings with Potential Site Owners (24)
 - MCD Newsletters, The Good Deed, Annual Updates, Brochures, Briefings

Source Water Monitoring

- Groundwater monitoring by Cleves Water Works
 - At existing well field area
 - Establish early monitoring locations to develop base profile
- Establish base line parameters through monitoring with assistance from the OEPA
 - Determine the base line parameters and background contaminants
- Prepare and develop annual trends for protection
 - For changing chemistry and movement of any contaminants
 - Changing business climate
- OEPA recommended about Six Ground Water Monitoring Sites for the Cleves Well Fields.
 - Review with OEPA recommended locations along with contaminant listings

Contingency Plan – Update with Water Protection Plan

- Have Emergency Plans for any immediate action
 - Regular Updates of Contact Information
- Update contingency plan in lieu of water protection plan
 - Update plan at least every 3 years
- Determine appropriate responses to accidental spills
 - Protection of Well Field plan
- Inform Critical Village and Utility personnel of plan
 - provide training on actions needed
- **Submit Plan to OEPA for Certification and Final Approval – 2015**
 - Village periodic review of overall plan

Questions and Comments

Dan Schaefer, P.E.
Water System Planner
Brandstetter Carroll Inc.