OKI GROUNDWATER COMMITTEE
March 4, 2009 - 10:00 A.M.
OKI Board Room
720 East Pete Rose Way (at the corner of Eggleston Avenue)*

AGENDA

1. **Welcome/Introductions**

2. **Announcements**

3. **OKI Staff Updates**

4. **Update on Local Groundwater Management Efforts**
   Scott Belcher, Chris Brausch, Dave Combs, Tim McLelland

5. **On-Site Wastewater Treatment Systems: Failure Rates and Patterns, How They're Regulated, and What's Next in Ohio**
   Rebecca Fugitt, Ohio Department of Health

6. **Other Business**

ADJOURNMENT

**** SEE the MAP and DIRECTIONS on the REVERSE HARD COPY (or in separate attachment to email)**

On-Site Wastewater Treatment Systems: Failure Rates and Patterns, How They're Regulated, What's Next in Ohio

Ohio Department of Health
Bureau of Environmental Health
Residential Water and Sewage Program

OKI
March 4, 2009

How many systems, how much sewage?

- **Over 1 million sewage systems in use in Ohio, with 17,000 new systems permitted each year**
- On average each person produces 120 gallons per day of sewage – equaling 360 gallons per day for the average home
- 1,000,000 homes X 360 gpd= 36,000,000 gallons per day of sewage generated from private systems
- Approximately 25-30 % are known to be failing

Typical constituents of sewage effluent

- Organic material – biochemical oxygen demand (BOD) – 100 to 450 mg/l
- Total suspended solids (TSS) – 450 to 1200 mg/l
- Ammonia – 10 to 40 mg/l
- Total Nitrogen – 15 to 60 mg/l
- Phosphorous – 5 to 30 mg/l
- Chlorides – 10 to 300 mg/l
- Total coliform – 10^8 to 10^{10}
- Fecal coliform – 10^3 to 10^6
- Viruses – 30 to 7000 PFU
- Pharmaceuticals and personal care products

Ohio – History of Sewage Law and Rules

- 1974 to 2007 – Original Administrative Code Chapter 3701-29
  - original rules with "cookbook" approach to system sizing with standardized designs
  - Local health district rules developed to deal with challenging soil conditions
- January – June, 2007 – Substantially revised OAC Chapter 3701-29
  - required site and soil evaluation, system design based on new standards and site conditions using Tyler Table
  - State rules with ability for local health districts to request more stringent rules
- July , 2007 to now –
  - 1977 state minimum rules
  - 88 sets of local health district rules

Operation and Failure Rates

- So….. An examination of operation and failure rates really reflects the success or failure of the 1977 rules and, to a certain extent, the more stringent local health district in place until 2007
- Obviously, many more stringent local health district rules were developed in response to local successes and failures

Ohio - 1977 Sewage Rules

- Original statewide minimum household sewage disposal rules adopted in 1974 with minor changes in 1977 – no changes since then.
- Allowed use of 4 technologies – septic tanks, leach lines, aerobic treatment units and sand filters. Systems were "cookbook" – cheap, easy and simple.
- The old rules and way of dealing with sewage was about DISPOSAL – "out of sight - out of mind"

Ohio– 1977 Sewage Rules

- Rules did not use best science to determine the capability of the soil to accept and treat wastewater resulting in many failing systems especially in certain soil types where seasonal water tables exist.
- There was very little evaluation of site and lot conditions
- Trench depth - minimum of 18 inches
- Trench width – minimum of 8 inches
- Trench max length – 150 ft.
- Sizing typically based on number of bedrooms

Ohio– 1977 Sewage Rules

- Soil absorption systems
  - Vertical separation distance of four feet to rock strata and water table
  - Requirement that leaching systems utilizing soil absorption not be installed where *texture, structure or permeability of the soil* is not suitable to provide internal drainage
  - Required leaching field absorption area requirements to be *adequate* to prevent water pollution or a nuisance
  - Use of curtain drains to attempt to lower shallow seasonal water and/or remove excess water in soils

Ohio - 1977 Sewage Rules

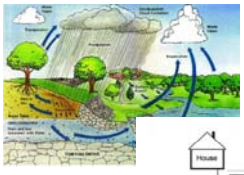
- Discharging systems were discouraged, but allowed under limited circumstances.
- Where soils were unable to disperse the wastewater, discharging systems were installed, many of which fail to meet current water quality standards.
- Any new technologies had to be approved under "experimental" concurrence through a state/local variance, a cumbersome process

The result - failing systems

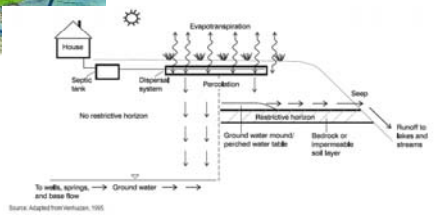
History – The Impacts and the Cost

- Our legacy of sewage management has led to contamination of surface and ground water
- Many areas under enforcement orders due
- The known risks to public health and the spread of disease – South Bass Island illness outbreak – over 1400 ill
- The cost to Ohio taxpayers –
- Since 1989, Ohio has spent nearly 1 billion dollars in low interest loans and grants to communities to run sewers to areas of failing septic systems

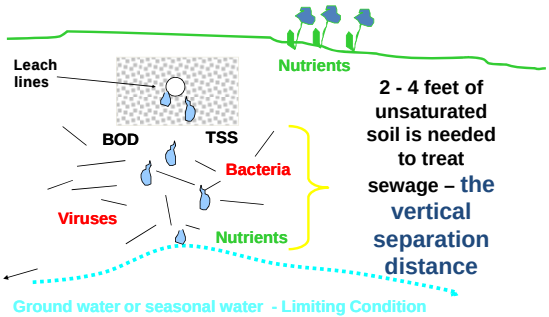
Fate of Wastewater from On-Site Systems



• We do not "dispose" of sewage – the sewage water (effluent) is "recycled" in the environment
• Proper treatment of sewage water in the soil is needed to prevent contamination and disease



Treatment of Sewage in Soil and Vertical Separation Distance



Operation and Failure Rate Report

- Requirement of Am. Sub. H.B. 119
- Report provided to Study Commission by June 1, 2008
  - A survey of boards of health in this state concerning household sewage treatment system operations and the failure rates of those systems

Sewage System Failu

Sewage system failure is typically defin

- 1) the inability of the system to accept wastewater at the rate it was designed for which prevents or limits the use of the plumbing fixtures;
- 2) when the wastewater discharge exceeds the absorptive capacity of the soil, resulting in ponding, seepage, or other discharge of contaminants to surface or ground water, or
- 3) when wastewater is discharged from a system causing contamination of surface and/or ground water.

Discharge to Surface/Ground Wa

- State water quality standards have been established for bathing beach waters, primary contact water, and secondary contact or public health nuisance, and establish limits for fecal coliform, E. coli, odor, and visual manifestations of sewage.
- The National Pollutant Discharge Elimination System (NPDES) General Permit for household systems sets effluent quality standards for physical and chemical parameters.
- While specific ground water quality standards are not set for Ohio, ground water quality is generally

Contact Standards

Bathing Waters		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method
E. coli	Geometric mean *E. coli* content (either MPN or MF), based on not less than five samples within a thirty-day period, shall not exceed 126 per 100 ml and *E. coli* content (either MPN or MF) shall not exceed 235 per 100 ml in more than ten per cent of the samples taken during any thirty-day period	For the three Lake Erie assessment units exceedance of the geometric mean bathing water criterion or an exceedance of the single sample maximum for more than 10% of the recreation season is considered impairment of the bathing water use.
Primary Contact		
Indicator	Criterion (Table 7-13, OAC 3745-1-07)	Assessment Method
Fecal coliform	Geometric mean fecal coliform content (either MPN or MF), based on not less than five samples within a thirty-day period, shall not exceed 1,000 per 100 ml and fecal coliform content (either MPN or MF) shall not exceed 2,000 per 100 ml in more than ten per cent of the samples taken during any thirty-day period	Statewide data on rivers and streams were not extensive enough to allow direct comparison of geometric mean to the water quality criterion of 1000; data pooled from all sources over period of record were used; thresholds used for impairment of primary contact use were 75th percentile compared to 1000 and 90th percentile compared to 2000.

Discharge Standards

Table A.1. FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS FOR DISCHARGES FROM HSTS DESIGNED IN ACCORDANCE WITH OAC 3701-29, DISCHARGING TO WATERS OTHER THAN LAKE ERIE.

During the period beginning on the effective date of this permit and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements.

EFFLUENT CHARACTERISTICS			DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS (3)	
Reporting Code	Units	Parameter	Concentration 30 Day	Daily	Meas. Frequency	Sample Type
00056	GPD	Flow Rate	-	-	1/year	24Hr Tot Flw
00530	mg/l	Total Suspended Solids	-	18	1/year	Grab
00610	mg/l	Nitrogen, Ammonia(NH_3) (summer)	-	2.0	1/year	Grab
		(winter)	-	4.5	1/year	Grab
80082	mg/l	$CBOD_5$	-	15	1/year	Grab
31616	#/100ml	Fecal Coliform (summer)	-	2000	1/year	Grab
00083	-	color, severity (1)	-	-	1/year	Estimate
01330	-	odor, severity (1)	-	-	1/year	Estimate
01335	-	turbidity, severity (1)	-	-	1/year	Estimate
00300	mg/l	Dissolved Oxygen	not less than 5.0 at any time		1/year	Grab
50060	mg/l	Chlorine,total residual (2)	not to exceed 0.038 at any time		1/year	Grab

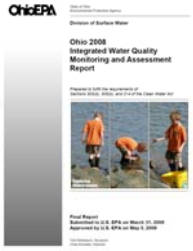
(1) See Part IV, paragraph E.
(2) See Part IV, paragraph F.
(3) Additional operational monitoring requirements shall comply with those listed in OAC 3701-29 for all system components, including service contracts as applicable.

Operation and Failure Rate Survey

- 2008 Integrated Water Quality Monitoring Report – Ohio EPA (Clean Water Act)
- Total Maximum Daily Load (TMDL) reports
- Ohio EPA enforcement data
- Areawide Planning Agency reports
- Local Health District Survey – focus on this information

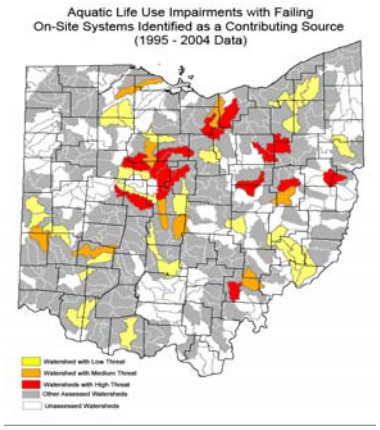
2008 Integrated Water Quality Monitoring Report – Ohio EPA (Clean Water Act)

- A review of the Clean Water Act, Section 303(d) report prepared by Ohio EPA shows that a total of 37 watersheds, and 116 streams and stream segments have been impacted by urban, unknown and other sources of pollution.
- Ohio EPA has identified that these source types are often related to failing on-



Total Maximum Daily Load Reports (TMDL)

- Thirty-seven final and draft Total Maximum Daily Load (TMDL) reports for specific watersheds were reviewed, with evaluation of 121 subwatershed units.
- Of the 121 subwatershed units reviewed, 102 or 84% reported a major source of impairment as bacteria, fecal coliform or pathogens.
- Of the 121 subwatershed units evaluated, 91 (76%) reported that home sewage systems were a suspected source of impairment.
- A total numbers of 15,428 failing systems were identified for twenty-three (23) subwatersheds.
- Surface water is the most frequently identified impact from failing systems in Ohio particularly in areas with large numbers of discharging sewage systems.



Ohio EPA Enforcement Actions

- From 1986 through 2007, Ohio EPA has identified 236 communities where failing systems have caused either public health nuisances or environmental degredation and administrative orders to correct have been iss

ODH/LHD Permit Data

- Sewage permit data reported to the ODH for permits issued in 2007 showed that 30% of the nearly 7,000 permits issued were obtained for system alteration or replacement.

Areawide Planning Agency Surveys

- Northern Ohio Areawide Coordinating Agency (NOACA) study of seven counties and over 700 systems found an on-site sewage system failure rate of 13 to 20% and that 20-33% of off-lot discharging system had poor water quality effluent with 32 to 63% not meeting water quality standards in the original 1977 sewage disposal system rules.
- In 2001, the Toledo Metropolitan Area Council of Governments (TMACOG)

Local Health District Survey

- Approximately 100 county and city health districts in Ohio have a sewage program
- 67 counties and 6 cities responded to the survey

Table 1. Distribution of survey responses by region.

Region/Response	Number responding/total counties in region	Percent responded
Northwest	20/24	83%
Northeast	13/15	87%
Southeast	13/23	56%
Southwest	14/16	87%
Central	8/10	82%

Survey Questionnaire

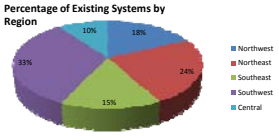
Requested information for areas in their jurisdiction on:

1) the number of systems and systems failures reported by county/area with identification of system type, total existing systems, currently failing systems and systems projected to fail within the next 5 years;
2) principal reasons for failure with identification of failure types observed and the relative percentage of failure type for that county/area; and
3) manifestation of the failure with a check of all

Local Health District Survey

Table 4. Summary of system data collected from the local health district surveys (73 health districts responding).

Region	Northwest	Northeast	Southeast	Southwest	Central	State Total
Existing Systems	98414 (18%)	126984 (24%)	81061 (15%)	174139 (33%)	51517 (10%)	532115
Failing Systems	32944 (26%)	27206 (22%)	32144 (26%)	19707 (16%)	12164 (10%)	124165 (23%)
Future Failing Systems (5 yrs)	8603 (13%)	17958 (27%)	6818 (10%)	18070 (27%)	15406 (23%)	66855 (13%)



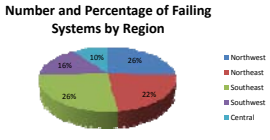


Table 5. Total number of reported existing, failing, and future failing system types by region

Region / System Type	Northwest			Northeast			Southeast			Southwest			Central		
	Existing Systems	Failing	Future Failing	Existing Systems	Failing	Future Failing	Existing Systems	Failing	Future Failing	Existing Systems	Failing	Future Failing	Existing Systems	Failing	Future Failing
Septic tank/leaching lines	46557	7307	3323	26983	2219	4023	53007	7473	1008	103261	8288	13070	20820	1184	6946
Septic tank/mound	211	4	23	744	1	1	23	2	0	990	31	69	76	2	2
Septic tank/sand filter	14705	4749	902	10908	1487	1145	12315	10790	223	9974	599	1940	7019	445	179
Septic tank/storm sewer	1599	1599	28	5908	5721	0	1477	1451	25	249	230	0	0	0	0
Septic tank to ditch/ surface water	3774	3418	341	219	165	46	1729	2	0	776	775	10	129	129	65
Septic tank to unknown	8783	4487	2432	6813	2442	3727	2636	1713	41	5836	958	196	3881	3839	1907
Aeration to leach field	996	298	129	3870	308	260	4429	431	316	2616	118	221	198	3	8
Aeration to mound	1443	82	37	2553	156	83	2209	26	103	176	1	1	151	0	0
Aeration to sand filter	191	60	2	3812	1974	963	3618	1972	277	2199	58	54	44	0	0
Aeration to ditch/ surface water	3439	1019	655	17556	6680	1560	6769	3721	341	12145	7172	220	2565	755	128
Aeration to storm sewer	1227	286	139	3595	971	424	3791	830	548	3875	2563	15	3656	3238	3209
Aeration to unknown	2909	2340	257	1092	422	163	909	106	57	1190	77	57	1456	1190	1265
Privy	19	6	2	191	3	0	213	53	5	143	23	2	417	24	13
Dry wells	1281	1281	0	428	32	200	4834	2338	866	6663	840	1354	629	208	26
Unknown	9093	5848	433	37666	4321	3448	2758	1238	108	8260	888	1961	8606	1334	40
Holding Tank	10	0	0	0	0	0	2	1	0	4	0	0	2012	51	10
Other	17	12	0	6560	1212	2318	2	0	0	9001	18	0	147	92	10
Total	99414	32944	9603	126994	27206	17958	81061	32144	6618	174139	19707	19070	51517	12164	15456

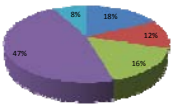
Local Health District Survey

Table 6. Total of all discharging and on-site systems by region (excludes privies, unknowns, holding tanks and others).

System Type	Northwest	Northeast	Southeast	Southwest	Central	State
Discharging	36787 (22%)	49703 (29%)	32704 (19%)	32251 (19%)	18760 (11%)	170225 (37%)
On site	51492 (10%)	32864 (12%)	45402 (16%)	132490 (46%)	21658 (8%)	283804 (63%)

Assuming a daily discharge of 360 gallons per day for a three bedroom home, then over 61 million gallons of effluent are discharging daily from discharging systems to streams and waterways!

Percentage of On-Site Sewage Systems by Region in Ohio



Percentage of Discharging Sewage Systems by Region in Ohio

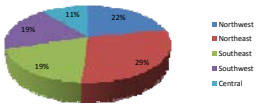
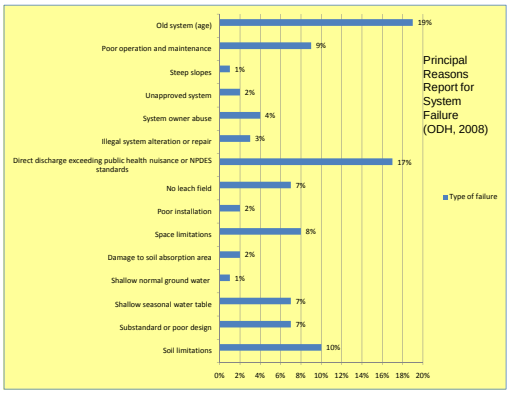
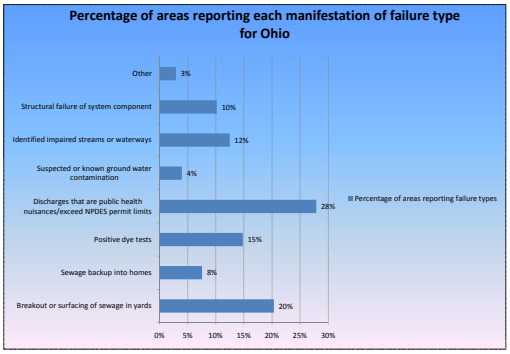


Table 7. Average of the percentage failure type reported and the number of records for each category reported.

Region / Principal Reasons for Failure	Northwest % failure (no. areas)	Northeast % failure (no. areas)	Southeast % failure (no. areas)	Southwest % failure (no. areas)	Central % failure (no. areas)
Soil limitations	47% (77)	42 % (55)	45% (43)	43% (86)	57% (62)
Substandard or poor design	61% (70)	46% (25)	45% (37)	40% (54)	65% (39)
Shallow seasonal water table	47% (37)	30% (42)	24% (12)	46% (76)	65% (57)
Shallow normal ground water	12% (6)	32% (17)	22% (6)	21% (2)	60% (14)
Damage to soil absorption area	21% (10)	15% (17)	3% (7)	6% (23)	15% (16)
Space limitations	54% (9)	53% (54)	63% (58)	55% (62)	92% (74)
Poor installation	24% (9)	19% (22)	22% (13)	16% (19)	15% (8)
No leach field	53% (111)	59% (37)	47% (29)	18% (15)	58% (27)
Direct discharge exceeding public health nuisance or NPDES standards	53% (132)	58% (113)	58% (49)	67% (189)	76% (72)
Illegal system alteration or repair	23% (25)	14% (20)	24% (9)	15% (23)	15% (11)
System owner abuse	25% (24)	11% (33)	34% (24)	44% (43)	20% (17)
Unapproved system	44% (18)	17% (12)	17% (9)	15% (14)	26% (11)
Steep slopes	67% (6)	17% (6)	38% (7)	10% (5)	43% (2)
Poor operation and maintenance	55% (64)	26% (59)	41% (40)	36% (72)	44% (61)
Old system (age)	56% (156)	76% (131)	58% (55)	56% (161)	84% (103)
Other	20% (4)	53% (3)	0	59% (3)	100% (1)





Operation and Failure Rate Report

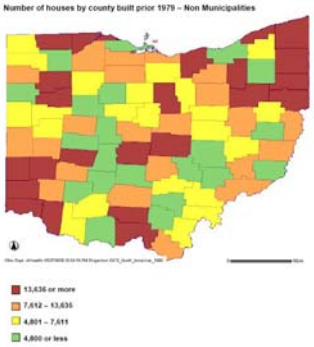
< Table 10 shows that from 2000 census data for census tracts outside of municipal boundaries - 68% of all houses in Ohio were constructed outside of municipal boundaries prior to 1977. Design life of typical system is 30-50 years.

< It is reasonable to assume that at least 27-30% of the systems for these houses may be failing based on system age (>30 years), alteration and replacement permit data, and published studies.

< This would equal a projected number of failing systems (based on age alone) at 313,033.

Table 10. House Age by Region of the State.

	Total	2000 - 1990	2000 - 1990 %	1989-1980	1989-1980 %	1979 and Before	1979 and Before %
Northwest	242546	42716	17.61	29217	12.05	170613	70.34
Northeast	466523	84730	18.16	53145	11.39	328650	70.45
Southeast	244136	49815	20.40	35056	14.36	159265	65.24
Southwest	413355	89791	20.85	60344	14.53	269220	64.82
Central	175118	39733	22.69	19689	11.24	115696	66.07
State Total	1543678	302785	19.61	197449	12.79	1043444	67.59



System Types Installed – July to November, 2007

Table 12. Type, number, and percentage by region of sewage treatment system installations reported between July 1, 2007 to November 30, 2007.

Region System Type/Description Code	Northwest Number (%)total reported)	Northeast Number (%)total reported)	Southeast Number (%)total reported)	Southwest Number (%)total reported)	Central Number (%)total reported)	State Number (%)total reported)
1. Septic tank to shallow leach lines	133 (30%)	74 (16%)	120 (27%)	83 (18%)	41 (9%)	451 (18%)
Pretreatment to shallow leach lines	2 (1%)	75 (44%)	52(30%)	5 (2%)	35(21%)	169 (7%)
Septic tank to 18-30" leach lines	106(10%)	298(28%)	224(21%)	249(23%)	189(18%)	1066 (42%)
Pretreatment to 18-30" leach lines	5 (4%)	34(27%)	44(35%)	19(15%)	22(18%)	124 (5%)
Septic tank to sand mound	32(14%)	97(39%)	13(6%)	67(29%)	32(14%)	231 (9%)
Pretreatment to sand mound	8(21%)	4(11%)	0	21(55%)	5(13%)	38 (1%)
Septic tank to drip distribution	0	16(36%)	0	6(13%)	23(51%)	45 (2%)
Pretreatment to drip distribution	1(4%)	10(48%)	0	3(15%)	7(33%)	21 (1%)
NPDES system	12(9%)	113(81%)	1(1%)	11(8%)	3(2%)	140 (6%)
Septic tank to low pressure pipe	0	0	0	0	0	0
Pretreatment to low pressure pipe	0	0	0	0	0	0
Other	24	82	77	42	16	360 (10%)

Table 11. Type, number, and percentage by region of sewage treatment system installations reported between July 1, 2007 to May 1, 2008**.*

Region SystemType/Description Code	Northwest Total reported (%)	Northeast Total reported) (%)	Southeast Total reported (%)	Southwest Total reported (%)	Central Total reported (%)	State Total reported (%)
Septic tank to shallow leach lines	258 (30)	170 (20)	198 (23)	139 (16)	81 (10)	846 (17%)
Pretreatment to shallow leach lines	4 (1)	130 (42)	100 (32)	11 (4)	64 (21)	309 (6%)
Septic tank to 18-30" leach lines	177 (9)	536 (28)	460 (24)	443 (23)	311 (16)	1927 (39%)
Pretreatment to 18-30" leach lines	7 (3)	69 (28)	111 (45)	22 (9)	39 (16)	248 (5%)
Septic tank to sand mound Pretreatment to sand mound	76 (13) 16 (24)	233 (40) 13 (20)	98 (17) 1 (2)	104 (18) 29 (44)	66 (11) 7 (11)	577 (12%) 66 (2%)
Septic tank to drip distribution	1 (1)	23 (34)	0 (0)	10 (15)	34 (50)	68 (2%)
Pretreatment to drip distribution	2 (5)	18 (45)	0 (0)	4 (10)	16 (40)	40 (1%)
NPDES system	32 (6)	410 (79)	11 (2)	57 (11)	11 (2)	521 (10%)
Septic tank to low pressure pipe	0	0	0	0	1	1 (<1%)
Pretreatment to low pressure pipe	1	4	0	0	1	6 (<1%)
Other	25 (6)	162 (41)	63 (16)	69 (17)	76 (19)	395 (8%)
Total	599 (12%)	1768 (35%)	1042 (21%)	888 (18%)	707 (14%)	5004

*Alterations not included for 796 records
**System type and description not reported for 112 sites

Percentage of Sewage System Types Installed (July, 2007 to May, 2008)

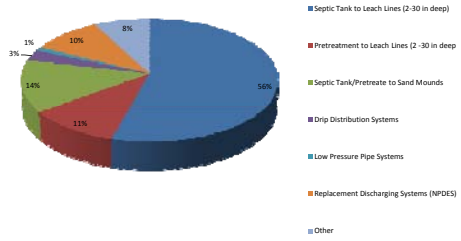


Table 12. Number and percentage by region of household sewage treatment systems versus small flow onsite sewage treatment systems, and the new, alteration or replacement systems installed from July 1, 2007 through May 1, 2008.

Region	Northwest	Northeast	Southeast	Southwest	Central	State
House-New	410 (11%)	1080 (28%)	1013 (26%)	712 (19%)	614 (16%)	3843 (65%)
House-Replacement	188 (15%)	673 (55%)	78 (6%)	199 (16%)	77 (6%)	1215 (21%)
House - Alteration	140 (16%)	232 (30%)	92 (12%)	177 (23%)	130 (17%)	771 (13%)
SFOSTS - new	8 (13%)	15 (25%)	11 (18%)	5 (8%)	21 (35%)	60 (1%)
SFOSTS - replacement	2 (17%)	7 (58%)	1 (1%)	1 (8%)	1 (8%)	12 (<1%)
SFOSTS - alteration	1 (9%)	6 (55%)	1 (9%)	2 (18%)	1 (9%)	11 (<1%)
Totals	750 (13%)	2021 (34%)	1196 (20%)	1096 (19%)	844 (14%)	5912

System Types Installed

Number and % of system types installed (July, 2007 - May, 2008)

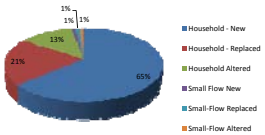


Table 13. Estimated sewage treatment system costs by type and region as reported from July 1, 2007 to May 1, 2008.*

Region SystemType/ Description Code	Northwest Average $	Northeast Average $	Southeast Average $	Southwest Average $	Central Average	State Average
Septic tank to shallow leach lines	8,292	10,500	4,687	7,500	9,044	8,004
Pretreatment to shallow leach lines	7,000	8,841	6,747	10,857	9,354	8,559
Septic tank to 18-30" leach lines	6,428	7,120	5,363	6,271	7,073	6,450
Pretreatment to 18-30" leach lines	8,278	7,570	6,379	9,928	8,905	8,212
Septic tank to sand mound	8,865	13,455	7,700	17,450	14,369	12,367
Pretreatment to sand mound	14,272	19,181	12,000	22,882	16,875	17,042
Septic tank to drip distribution	16,000	19,686	n/a	29,864	16,270	16,360
Pretreatment to drip distribution	18,000	21,568	n/a	29,697	20,156	22,355
NPDES system	7,971	10,166	7,250	16,516	10,289	10,438
Other	9,275	7,194	3,847	6,206	6,312	6,566
Septic tank to low pressure pipe	n/a	n/a	n/a	n/a	10,000	10,000
Pretreatment to low pressure pipe	12,000	10,625	n/a	n/a	12,500	11,708

*Cost data reported for 4333 sites.

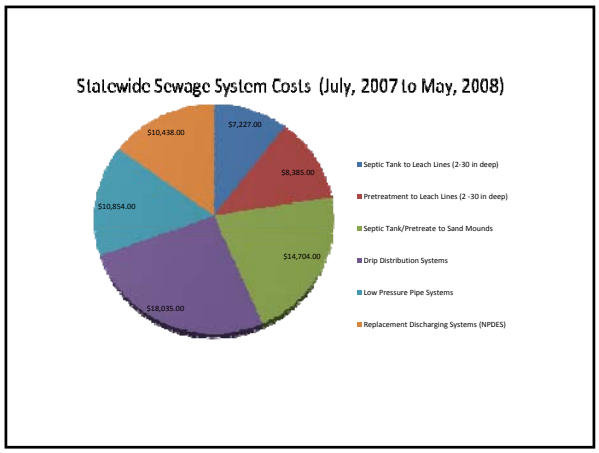


Table 14. Comparison of July to November, 2007 cost data with July 1, 2007 to May 1, 2008 cost data for each system type.

System Type	July 1 – November 30, 2007 State Average Cost Data	July 1, 2007 to May 1, 2008 State Average Cost Data
Septic tank to shallow leach lines	$7,555	$8,004
Pretreatment to shallow leach lines	$8,752	$8,559
Septic tank to 18-30" leach lines	$6,590	$6,450
Pretreatment to 18-30" leach lines	$8,117	$8,212
Septic tank to sand mound	$14, 154	$12,367
Pretreatment to sand mound	$19,051	$17,042
Septic tank to drip distribution	$19764	$16,360
Pretreatment to drip distribution	$19,711	$22,355
NPDES system	$11,612	$10,438
Other	$7,473+	$6,566
Septic tank to low pressure pipe	None reported	$10,000
Pretreatment to low pressure pipe	None reported	$11,708

Recommendations

- Implement the recommendations for sewage treatment system siting, design, and installation, operation and maintenance recommended in the ODH report to the Household Sewage and Small Flows Onsite Study Commission.
  - Proper siting, design and installation will help ensure systems that protect public health and the environment, and also protects the investment the property owner makes in the systems and reduces the need for public dollars to provide sewage treatment through public facilities.
  - ***System designs need to account for site and soil conditions, site limitations, reasonable expected***

Recommendations

- Recommend the use of a proactive and preventive approach to managing sewage treatment systems that combines public education, local health district involvement, local planning and management factors, and consideration of area risks to sensitive water environments or ecological resources.
- Improve coordination with and provide training to local watershed groups and other grass roots organizations (green and community initiatives) to help promote an understanding of the importance of proper sewage system operation and maintenance to the system owner, and the impact to a community when systems are not maintained.
- Encourage and facilitate solutions and activities that prompt system owners to take an active role in

Recommendations

- Continue the use of operation permits through local health districts with the provision of flexibility to establish local operation and maintenance management programs that recognize priority protection areas, high risk water or ecological resources, or existing unsanitary conditions due to a high incidence of system substandard performance or failure.
- Provide the necessary legal and enforcement tools for local health districts to ensure that service contracts for mechanical systems are maintained, and that routine inspection and maintenance occurs for all systems.
- Recommend the continued option for establishing household sewage treatment management districts to help provide proactive or responsive approaches to resolve sewage treatment problems in an area.
- Encourage and facilitate decentralized wastewater management of systems through public utilities such as county or regional water and sewer districts, local government, and private utilities

SEWAGE TREATMENT SYSTEMS

Information

ODH Web Site

www.odh.ohio.gov/odhPrograms/eh/sewage/sewage1.aspx

OR

Contact:

Bureau of Environmental Health
Residential Water and Sewage Program
(614) 466-1390
BEH@odh.ohio.gov

OKI GROUNDWATER COMMITTEE MEETING SUMMARY
Wednesday, March 4, 2009
OKI Board Room – 10:00 a.m.

Attendees:

Bruce Whitteberry, Chair, Greater Cincinnati Water Works
MaryLynn Lodor, Vice Chair, Butler County Water & Sewer Department
Scott Belcher, City of Middletown
Frank Bell, Village of Indian Hills
Chris Brausch, Warren County Water and Sewer Department
Dan Cloyd, Ohio EPA
Jim Collins, City of Hamilton
Peggy Collins, League of Women Voters
Barry Conway, City of Springboro
Dave Combs, City of Trenton
Dave Crouch, City of Fairfield
Frank Divo, Southwestern Ohio Water Company
Mike Ekberg, Miami Conservancy District
Jim Fox, Stantec
Rebecca Fugitt, Ohio Department of Health
Carl Gatton, Warren County Water and Sewer Department
William Gollnitz, Earthworks
Chris Griffith, Hamilton County General Health District
Doug Hunter, Leggette, Brashears & Graham, Inc.
Tammy Jett, Duke Energy
Ralph Johanson, GRW Engineers, Inc.
Robert Leichman, City of Trenton
Mike Lippert, City of Wyoming
Tim McLelland, Hamilton to New Baltimore Ground Water Consortium
Terry Morris, City of Springboro
Matt Newman, City of Milford
Krystal McNutt, Miami Conservancy District
Norma Pennock, Southwest Regional Water District
Greg Petredis, City of Hamilton
Bruce Pletsch, Miami Conservancy District
Allison Reed, Ohio EPA
Richard Renneker, Retired
Jim Stieritz, Duke Energy
John Thornsberry, Butler County Water and Sewer Department

OKI Staff

Jane Wittke, Gayle Foster, Sue Kawar and Bruce Koehler

Welcome / Introductions

Bruce Whitteberry called the meeting to order at 10:08 a.m. and those attending introduced themselves. Bruce announced the next meeting will either be on May 20th or June 3, 2009.

Announcements

MaryLynn Lodor announced that the City of Hamilton won the Taste of Water Contest, which drew over 100 submissions from across the U.S. The City of Hamilton received the distinction of having the best-tasting drinking water in the United States.

MaryLynn went over the deadline dates for the stimulus package (American Recovery and Reinvestment Act) funding. March 6, 2009 at 5:00 p.m. is the deadline to have "Expressions of Interest" submitted to the OhioRecovery.gov Website. All pre-applications must be submitted by 5:00 p.m. on March 13, 2009.

Jane Wittke reported that while only $276.5 million dollars is available in stimulus money for Ohio drinking water and wastewater projects, so far there have been over $4 billion in requests, of which over $680 million are for drinking water projects.

Jane also announced that in the future, contact hour certificates will be available for Groundwater Committee members to pick up at meetings of the Committee instead of being mailed out automatically. This is to cut down on cost and to move in the direction of paperless communications. Jane also asked committee members who have email addresses but have not yet provided them for the membership directory to put them on the sign-in sheet.

OKI Staff Updates

Bruce Koehler made a presentation on *A Resident's Guide to Protect the Upper Mill* Creek, which is an educational slide show developed for the Mill Creek Headwaters Project by Butler Soil & Water Conservation District. The show gives a brief history of the upper Mill Creek's worsening water quality and the future of its restoration. The upper Mill Creek watershed covers about 45 square miles in southeastern Butler and northern Hamilton Counties. Most of the watershed's 62,000 residents live in three Butler County townships - West Chester, Fairfield, and Liberty. Their populations have increased 476% in the last four decades, causing watershed urbanization.

Bruce also highlighted best management practices that protect or restore the upper Mill Creek. Today, a variety of people are working to enhance the value of the Mill Creek, its tributaries, and its watershed. They do their part by planting trees, cleaning up streams, labeling storm drains, creating rain gardens, restoring wetlands, educating others and taking eye-opening excursions with the Mill Creek Yacht Club. The Yacht club is a loose-knit group of people who paddle on the urban stream to raise public awareness and report conditions.

Jane Wittke announced that the St. Clair Township Planning Project successfully integrated source water protection in its comprehensive plan from the beginning. In January the St. Clair Township trustees enthusiastically endorsed the plan, and in February the Butler County Planning Commission adopted it. Jane thanked Mike Ekberg and the Miami Conservancy District (MCD) for funding and advocating for the project.

Local Groundwater Management Updates

Scott Belcher from Middletown explained that the Aeronca site northeast of the city's wellfield had created some contamination which is being addressed with bio-remediation. Test wells indicate that the injection of live organisms to assist in cleaning the site is working and it will be an ongoing process. Scott also reported that the city is in the process of cleaning two wells in their well field, which is proving to be less costly than previous cleaning, which used blasting with primer cord (RDX detonating cord) to break up sediment to bring the well back. The roof on the water treatment plant is in need of replacement and Middletown will submit a request for stimulus funds to replace it.

Chris Brausch from Warren County reported wrapping up the expansion of the south water treatment plant, located near the Little Miami River. The plant was renamed the Richard A. Renneker Water Treatment Plant, and the committee gave Dick Renneker a round of applause for his years of service. With 5 new wells at the Renneker WTP and 4 new wells in 2007 at the Franklin-Clearcreek WTP, the County now has a total of 17 wells with a capacity of 15 million gallons per day. In addition, with the assistance of Megan Marhelski of MACTEC, Carl Gatton and Barry Conway acquired a $15,000 MCD grant to provide a water educator for schools and contracted with Susan Giesler for this work.

Dave Combs from Trenton reported that they have refilled the ionic exchange units in their water softeners after three years of running them. As a result of a leak detection project, the City is rebuilding some hydrants and mains. The City's Wellhead Protection Program is almost complete, and when finished, they will offer local tours.

Tim McLelland from the Hamilton to New Baltimore Groundwater Consortium reported that the Consortium has completed 95% of the redelineation project. The consultant is putting together a new potential contaminant source database with a GIS interface. Tim noted the recent on-line release of a U.S. Geological Survey report on geophysical profiling methods on the Great Miami River to characterize subsurface riverbed conductivity. Tim announced that the Consortium and the Greater Cincinnati Water Works will set up displays at Sawyer Point for Hamilton County's Earth Day on April 22 and for Hamilton's Earth Day on April 24. The Clean Sweep of the Great Miami River is May 2. The Consortium has been awarded an MCD grant to help educate homeowners on the importance of sealing unused wells, and to provide some financial assistance to owners who do not have the resources.

Dan Cloyd reported that Ohio EPA will be changing the on-line version of monthly operating reports and will offer them on a new web-based site to make the process easier, probably by April.

On-Site Wastewater Treatment Systems: Failure Rates and Patterns, How They're Regulated, What's Next in Ohio

Rebecca Fugitt from the Ohio Department of Health (ODH) gave an overview of private on-site wastewater treatment systems in Ohio. There are over 1 million private on-site sewage systems in use in Ohio, with 17,000 new systems permitted each year. The average person produces 120 gallons per day of sewage, equating to 360 gallons per day for the average home. There are approximately 360 million gallons a day of sewage generated from private systems, with an approximate failure rate of 25-30%.

Rebecca explained that from 1974 to 2007, state rules for private on-site systems took a "cookbook" approach to system sizing with standardized designs, and some local health districts developed rules to deal with challenging soil conditions like those in much of southwest Ohio. In 2007 the state's rules were substantially revised to require site and soil evaluation and set new standards for system design and site conditions. Under pressure from northeast Ohio legislators, however, the legislature rescinded the 2007 rules and called for additional study of system failure rates and associated problems.

As a result, the 1977 minimum state rules remain in force at this point. Rebecca said that the 1977 state rules do not use the best science to determine the capability of soils to accept and treat wastewater. Consequently, many discharging systems have been installed which fail to meet current water quality standards. Rebecca also explained how the 1977 state rule does not allow for current technologies to be readily used. New technologies have to go through long and cumbersome approval procedures.

Systems approved under the 1977 rules that have subsequently failed have led to contamination of surface and ground water. Ohio EPA data indicates that three-quarters of watersheds reporting bacteria, fecal coliform or pathogens as major impairments also reported that on-site systems were a suspected source of the impairments. From 1986 to 2008, Ohio EPA also identified 236 communities where failing on-site systems have caused public health nuisances or environmental degradation. According to the Ohio Water Development Authority, since 1989 over a billion dollars have been spent in Ohio on low-interest loans and grants to extend sewer lines to replace failing on-site systems.

Rebecca made several recommendations to follow through on the ODH report to the study commission appointed by the legislature, including public education, local health district involvement, consideration of risks to sensitive water environments or ecological resources, and proper siting, design and installation of on-site systems. Click http://www.scribd.com/doc/15632394/OKI-ODH-Failure-Rate-Report-2009-Handouts?secret_password=2j9h4fqrtmcm3gyawiv to see her full presentation.

Other Business/Adjournment

The next meeting will be May 20 or June 3. If you have questions about accessing committee presentations on Scribd, please contact Gayle Foster at OKI (gfoster@oki.org). To collect electronic RSVPs for meetings, OKI will use the *Survey Monkey* application; please click on the link in the email to answer. The meeting was adjourned at 11:55 a.m.