# Everything You Need to Know About Large Systems

2016 MassDEP/MHOA Seminar

# OUTLINE

- Definition of *Large System*
- Regulatory History
- Regulations
- Examples of Large Systems
- Case Studies
  - Large Systems
  - GW Permit required
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# Definition of *Large System*

# *Large System*

- Although used in Title 5, *large system* is not defined.
- Recall that the design flow is the aggregate design flow of the facility which may contain multiple properties or lots abutting and under the same ownership.
- Refers to a system with a design flow of 10,000 gpd or greater and less than 15,000 gpd.
- GW permit is required for any design flows of 15,000 gpd or greater (314 CMR 5.00).

# Regulatory History

Large Systems

# Regulatory History

- Title 5 is actually a subset of the *Ground Water Discharge Permit Program* regulations at 314 CMR 5.000
- 1978 Title 5 Code permitted flows of 15,000 gpd or less.
- DeFeo Wait & Associates Technical Evaluation Report discussed problems with larger system based on a literature search.
- 1995 Title 5 Code:
  - New construction threshold reduced to 10,000 gpd;
  - MassDEP identified as the approving authority for systems greater than 10,000 gpd and less than 15,000 gpd.

# Large System Regulations

# Large System Regulations

- MassDEP's role as the Approving Authority;
- Determination of design flows
- Inspectional requirements
- Failure criteria
- Requirement of groundwater discharge permit
- Expansion of large systems

# MassDEP as Approving Authority

- *Approving Authority* definition [310 CMR15.002];
- Coordination with Local Approving Authorities [310 CMR 15.003(2)];

# Determination of Design Flows

- Owner or operator is charged with determining the actual design flow [310 CMR 15.006(1)]
- Some further investigation may be needed:
  - A system serving a shopping center may have been designed for 8,000 gpd but did not take into account the 2 sit-down full service restaurants that went in. If an upgrade was being designed, a 12,435 gpd system would be required.
  - An existing system serves a seminary that is now only operating at only 25 % residence. The existing system was designed for 14,500 gpd.

# Inspectional Requirements

- Required to be inspected every five (5) years on a basin cycle [310 CMR 15.301(6)].
- Submitted to MassDEP as the approving authority within 30 days of the inspection.

Note: Submitting a copy to the local BOH is a good idea.

# Failure Criteria

- Standard failure criteria as listed in 310 CMR 15.303(1) plus
- Determination if the system poses a significant threat to public health, safety and the environment:
  - Within 400 feet of a surface water supply or within 200feet of a tributary of one
  - Within a nitrogen sensitive area
  - If either criteria is met, facility must come into compliance with the requirements of the Ground Water Discharge Permit Program [314 CMR 5.00]

# Examples of Large Systems

# Residential Thresholds

| | |
|---|---|
| • Hotel/motel | 91 – 136 bdrms |
| • Condominiums*/apartments | 91 – 136 bdrms |
| • Mobile Home Park (Family) | 34 – 49 units |
| • Mobile Home Park (Retirement) | 67 – 99 units |

* Only applies if there is at least one individual sewage disposal system serving units with a combined total design flow of 10,000 gallons per day or more. Please refer to Title 5, 310 CMR 15.301(3), for more information on the condominium inspection schedule.

# Commercial Thresholds

| | |
|---|---|
| • Commercial/Retail | 200,000 to 299,000 sf |
| • Office building | 134,000 to 199,000 sf |
| • Restaurant | 286 – 428 seats |
| • Restaurant, fast food | 500 – 749 seats |
| • Restaurant, thruway service area | 67 – 99 seats |

Please remember that for a shopping center or multi-use facility, all the applicable flows need to be totaled.

# Institutional Thresholds

- Hospital 50 – 75 beds
- Nursing Home/Rest Home 67 – 99 beds

But if you have a small hospital with doctors' and/or dentists' offices, you now need to add in those design flows:

- Doctor's Office 250 gpd/doctor
- Dentist's Office 200

# Elementary School Thresholds

Up to and including grade 6 and numbers are total of students, faculty and staff:

- No cafeteria, no gym, & no showers 2,000 – 2,900
- With or without gym, but no showers; & with cafeteria 1,250 – 1,874
- Cafeteria, gym and showers 1,000 – 1,499

# Secondary School & College Thresholds

From 7th grade through college and numbers are total of students, faculty and staff:

- No cafeteria, no gym, & no showers 1,000 – 1,499
- Cafeteria but no gym and no showers 667 – 999
- Cafeteria, gym and showers 500 – 749
- Boarding school or college 154 – 230

# Case Studies

# Facility #1Characteristics:

- Housing for the elderly;
- Not a condominium;
- 12 buildings with 8 units each plus a community building (Q = 14,440 gpd at 150 gpd/unit; Q = 10,560 gpd at 110 gpd/bedroom);
- Multiple systems;
- Public water supply well


218
58 FOUR MILE VILLAGE

# Facility #1 Solution

- Groundwater discharge permit using the nutrient loading approach
  - Calculation of nitrogen loading
  - Determination of groundwater monitoring
  - Title 5 systems (with and without I/As)
- One failing system (SAS closest to the PWS well) was immediately upgraded using an I/A
- Other systems have been upgraded as needed
- Permittee has recently proactively undertaken acquiring approval to upgrade 6 systems

# Facility #2 Characteristics:

- Hotel;
- No restaurant or bar;
- Continental breakfast is served with all food prep off-site, plates and utensils are disposable, no dishwasher;
- No Zone II or IWPA issues


740 ELM ST
Turnpike

# Facility #2 Solution

- Facility is permitted to remain a large system.
- I/A was installed a number of years ago – best option for upgrade under MFC.
- Facility is inspected on the 5-year basin cycle and the I/A is inspected and maintained on a monthly basis.
- Expansions have been discussed but owner has been informed that a groundwater discharge permit would be required.
- Status quo will continue for the time being.

Office buildings

Apartment complexes

Hotels/motels

Elderly housing complexes

Seminaries/monasteries/convents

# LARGE SYSTEMS

Shopping centers

Schools

Nursing/retirement homes

Office complexes

Detox hospitals

# Coordination Between Agencies

# Critical for a number of reasons

- Event of
  - Proposed expansion
  - Change of tenant/owner
- Proposed expansion of flow
  - > 15,000 gpd
  - May be in violation of prior MassDEP approval

# Communication is Key

- As a BOH, if you receive notice of a change (retail to restaurant, etc.), contact MassDEP Regional Contact
- MassDEP can sit down with BOH and the owner/operator to discuss issues
- This communication:
  - Results in a unified voice regarding potential expansion (of flow and/or facility); and
  - Runs parallel to MassDEP notification to BOHs of large system upgrades and the like.

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Thank you for your time
and attention today!