STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY
State Water Quality Division – Wastewater Program

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M E M O R A N D U M

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TO: Health District Environmental Health Directors
Health District Land Based Program Supervisors
DEQ Regional Office Administrators
DEQ Regional Office Engineering Managers
DEQ Wastewater Program Staff – State Office
DEQ Technical Services – State Office

FROM: Tyler R. Fortunati, R.E.H.S., On-Site Wastewater Coordinator

SUBJECT: Large Soil Absorption System – Ground Water Constituent Monitoring

All large soil absorption systems (LSAS) located in areas influenced by shallow ground water are required to have their operation and maintenance entity or licensed wastewater system operator perform semi-annual ground water monitoring per IDAPA 58.01.03.013.06.d. Ground water monitoring requirements are initiated if seasonal or normal high ground water is within 15 feet of the ground surface for consistency with IDAPA 58.01.03.013.06.c. This memorandum provides direction on:

- Determining ground water levels at a proposed LSAS installation site
- Constituent determination
- Monitoring well construction
- Monitoring and reporting requirements
- Permit specifications

Ground Water Level Determination

The ground water level must be determined for each proposed LSAS site. This determination occurs through the site evaluation performed by the permitting health district during the permit application period. To ensure an accurate ground water determination is made, all test holes excavated for soil evaluation purposes in conjunction with an LSAS permit application must extend to a depth of 15 feet, unless soil conditions prevent reaching this depth. Test holes may be monitored for ground water during the appropriate time period when the shallowest ground water is expected to occur (e.g., seasonal runoff or irrigation) using temporary piezometers.

During the test hole evaluation the health district shall evaluate the soil profile for the presence of saturation or visible ground water and the presence of soil features (e.g., mottling) that indicate a historic presence of ground water at the site. If ground water is present or soil profile properties indicate that it is present at some point during the year, then seasonal ground water monitoring

must be required for all new systems as described in the Ground Water Level section of the Technical Guidance Manual for Individual and Subsurface Sewage Disposal (TGM) prior to system design and permit issuance. Historical records and mottling may not be substituted for actual ground water monitoring for any new LSAS when ground water is present or suspected to be present. If monitoring shows that ground water is present within 15 feet of the ground surface at the proposed LSAS site then ground water constituent monitoring is required to be performed semi-annually.

Constituent Monitoring Determination

Semi-annual ground water monitoring shall be performed and evaluated to ensure that the beneficial uses of Idaho's ground water are preserved. Monitoring terminology shall conform to the definitions of the Department of Environmental Quality's (DEQ) Ground Water Quality Rule (IDAPA 58.01.11). Constituents that are required to be monitored shall be required to meet limits that are protective of the ground water quality standards described in IDAPA 58.01.11.200. Constituent compliance limits will be determined dependent upon the monitoring well location in relation to the LSAS at the downgradient property lines. At a minimum the following constituents shall be monitored for all LSASs when semi-annual ground water monitoring is necessary:

- Nitrate (as N)
  - Degradation up to 1 mg/L above the background level at the property line is allowable unless this exceeds the ground water quality standard of 10 mg/L
- Total Coliform (if present then additional analysis for fecal coliform or E. coli must be conducted)
  - Fecal coliform and E. coli must be less than 1 viable colony or colony forming unit/100 ml
- Field Parameters Including:
  - Temperature
  - pH
  - Specific Conductivity
  - Ground water elevation

Constituents, in addition to those listed above, that are required to be monitored semi-annually shall be determined on a case-by-case basis by DEQ's regional office engineering and ground water program staff responsible for the plan and specification review and nutrient-pathogen evaluation for the LSAS. Input from DEQ's state office Water Quality Division may be used for constituent determination if necessary. Additional constituents may be required based on site specific concerns, wastewater characteristics, natural and site background constituent levels, aquifer categorization under the site, and ground water-surface water interconnection. Constituent permit standards shall be set on a case-by-case basis in compliance with the narrative ground water quality standards (IDAPA 58.01.11.200.02) and natural background level (IDAPA 58.01.11.200.03) requirements. Permit conditions shall not allow the owner of the LSAS to degrade ground water up to the ground water quality standard, thus permit limits shall ensure impacts for the system discharge do not raise background levels up to or above the ground water

quality standard.

Monitoring Well Construction

Shallow monitoring wells used for ground water quality monitoring in conjunction with an LSAS permit shall be designed by a professional engineer or professional geologist licensed in the State of Idaho. The design of the monitoring well should meet the minimum requirements described in Permanent Monitoring Wells section of the TGM and DEQ's Guide to Ground Water Sampling and Monitoring. Monitoring wells shall extend to a maximum depth of 18 feet, be at least 2 feet above ground level, and have a minimum well screen height of 2 feet. Monitoring wells shall not be deeper than 18 feet or a drilling permit is required from the Idaho Department of Water Resources.

The number and placement of the monitoring wells shall be determined by DEQ's regional office engineering and ground water program staff. Input from DEQ's state office Water Quality Division may be used in addition to the regional office. Placement of monitoring wells should be located near the property line that has been determined to be the ground water impact compliance boundary through the nutrient-pathogen evaluation performed for the system. To obtain background levels of ground water monitoring constituents at least one monitoring well should be located up-gradient from the LSAS drainfield installation location.

Monitoring and Reporting

A ground water sampling plan shall be developed for the LSAS by a professional engineer or professional geologist licensed in Idaho and shall be included in the operation and maintenance manual required for the system. Ground water sampling plans shall be consistent with DEQ's most current version of the Ground Water and Soils Quality Assurance Project Plan Development Manual. The sampling plan shall include:

- The requirement that sampling for constituents occur every six months.
- Describe the manner and method of how each well will be purged and sampled.
- Provide the laboratories that are capable of providing sample analysis.
- Provide the analysis methods that are acceptable for each constituent.
- An outline of procedures for additional sampling and notification of DEQ if constituent exceedances occur.

Sampling plans shall be approved by DEQ as part of the system's operation and maintenance plan required by IDAPA 58.01.03.013.07. Analysis of ground water samples obtained through the semi-annual ground water monitoring requirements shall meet the sample preservation and analytical procedures required by IDAPA 58.01.11.200.01.c and 58.01.03.013.06.e.

Analytical results of each sample including a completed chain of custody form shall be included in the annual LSAS report required by IDAPA 58.01.03.013.06.f. The semi-annual sample results included in the annual report must be obtained within the report's applicable calendar year. The results of the semi-annual sampling shall be reviewed by the district health department receiving the annual report. If the district health department finds that any of the monitored constituents exceed their specified permit standard the district health department shall refer the sample results

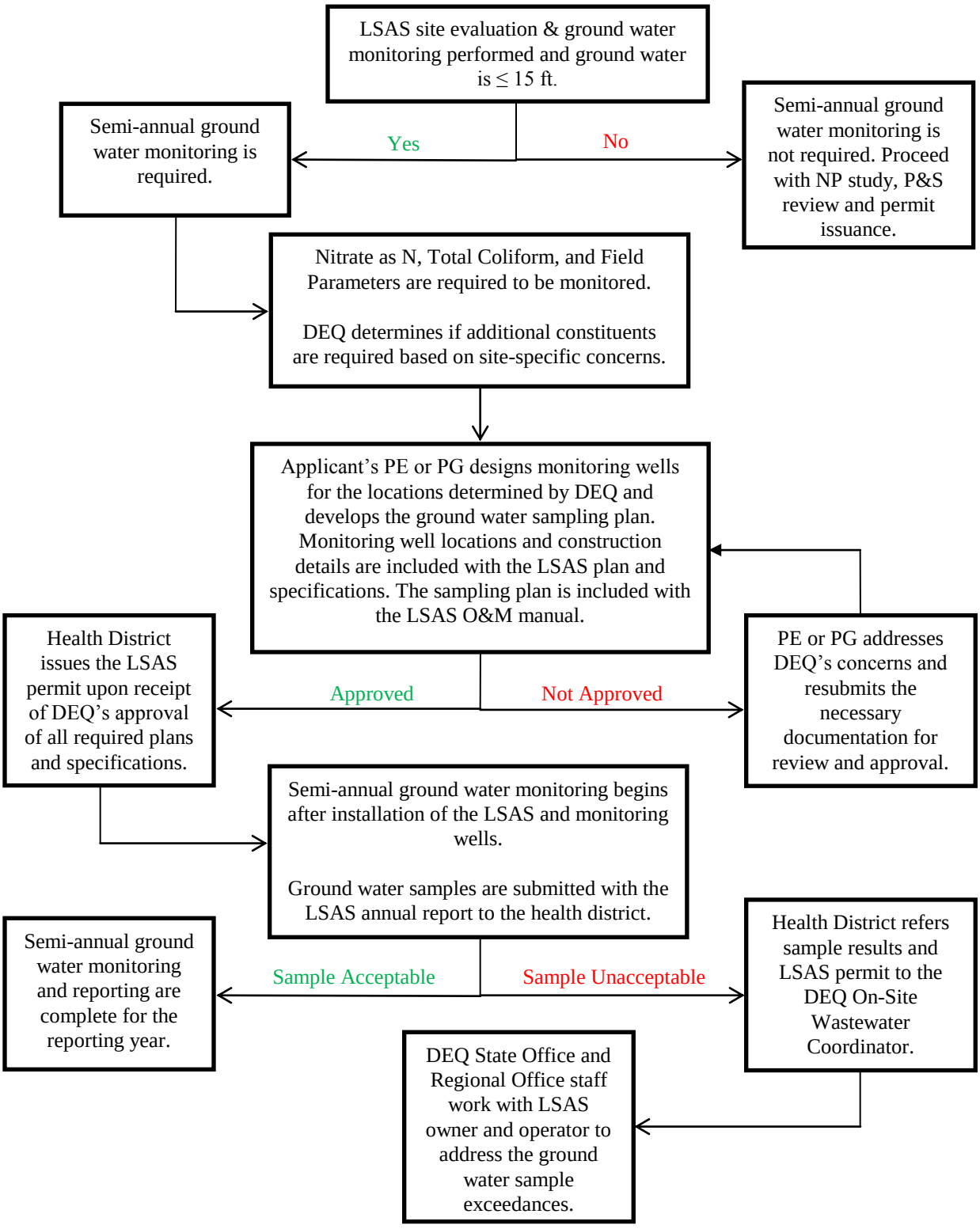
to the DEQ State Office Wastewater Program and provide copies of the analytical results documenting the constituent exceedances along with a copy of the associated LSAS permit. DEQ State Office Wastewater and Ground Water program staff and Regional Office staff will determine how to handle exceedances on a case-by-case basis.

Permit Requirements

Semi-annual ground water monitoring requirements shall be applied to all new, repair/replacement, or expansion permits issued for an LSAS where seasonal or normal high ground water is within 15 feet of the ground surface. All new and expansion LSAS permits shall not be issued until the ground water sampling plan and monitoring well construction plans are completed and submitted as part of the permit application along with other applicable plans and specifications (for plan and specification requirements see the Large Soil Absorption System Memorandum dated April 4, 2014 and the Engineering Design Review for Subsurface Sewage Disposal Systems Memorandum dated April 1, 2015). All repair/replacement LSAS permits may be issued upon acceptance of the systems plan and specifications but the permit inspections shall not be approved (finalized) until the ground water sampling plan is approved and monitoring well construction is complete.

All LSASs that are required to perform semi-annual ground water monitoring shall include the following statement on the installation permit issued by the health district:

Annual operation, maintenance, and monitoring meeting the requirements of IDAPA 58.01.03.013.06-.07 is required to be performed by a licensed wastewater operator and shall be reported to the district no later than January 31 of each year for the previous 12 month period. Semi-annual ground water monitoring is required for [insert each constituent and the allowable degradation limit(s)] and shall be done in conformance with the sampling plan included in the operation and maintenance manual submitted as part of this permit application.


LSAS site evaluation & ground water monitoring performed and ground water is ≤ 15 ft.
Yes
No
Semi-annual ground water monitoring is required.
Semi-annual ground water monitoring is not required. Proceed with NP study, P&S review and permit issuance.
Nitrate as N, Total Coliform, and Field Parameters are required to be monitored.
DEQ determines if additional constituents are required based on site-specific concerns.
Applicant's PE or PG designs monitoring wells for the locations determined by DEQ and develops the ground water sampling plan. Monitoring well locations and construction details are included with the LSAS plan and specifications. The sampling plan is included with the LSAS O&M manual.
Approved
Not Approved
Health District issues the LSAS permit upon receipt of DEQ's approval of all required plans and specifications.
PE or PG addresses DEQ's concerns and resubmits the necessary documentation for review and approval.
Semi-annual ground water monitoring begins after installation of the LSAS and monitoring wells.
Ground water samples are submitted with the LSAS annual report to the health district.
Sample Acceptable
Sample Unacceptable
Semi-annual ground water monitoring and reporting are complete for the reporting year.
Health District refers sample results and LSAS permit to the DEQ On-Site Wastewater Coordinator.
DEQ State Office and Regional Office staff work with LSAS owner and operator to address the ground water sample exceedances.