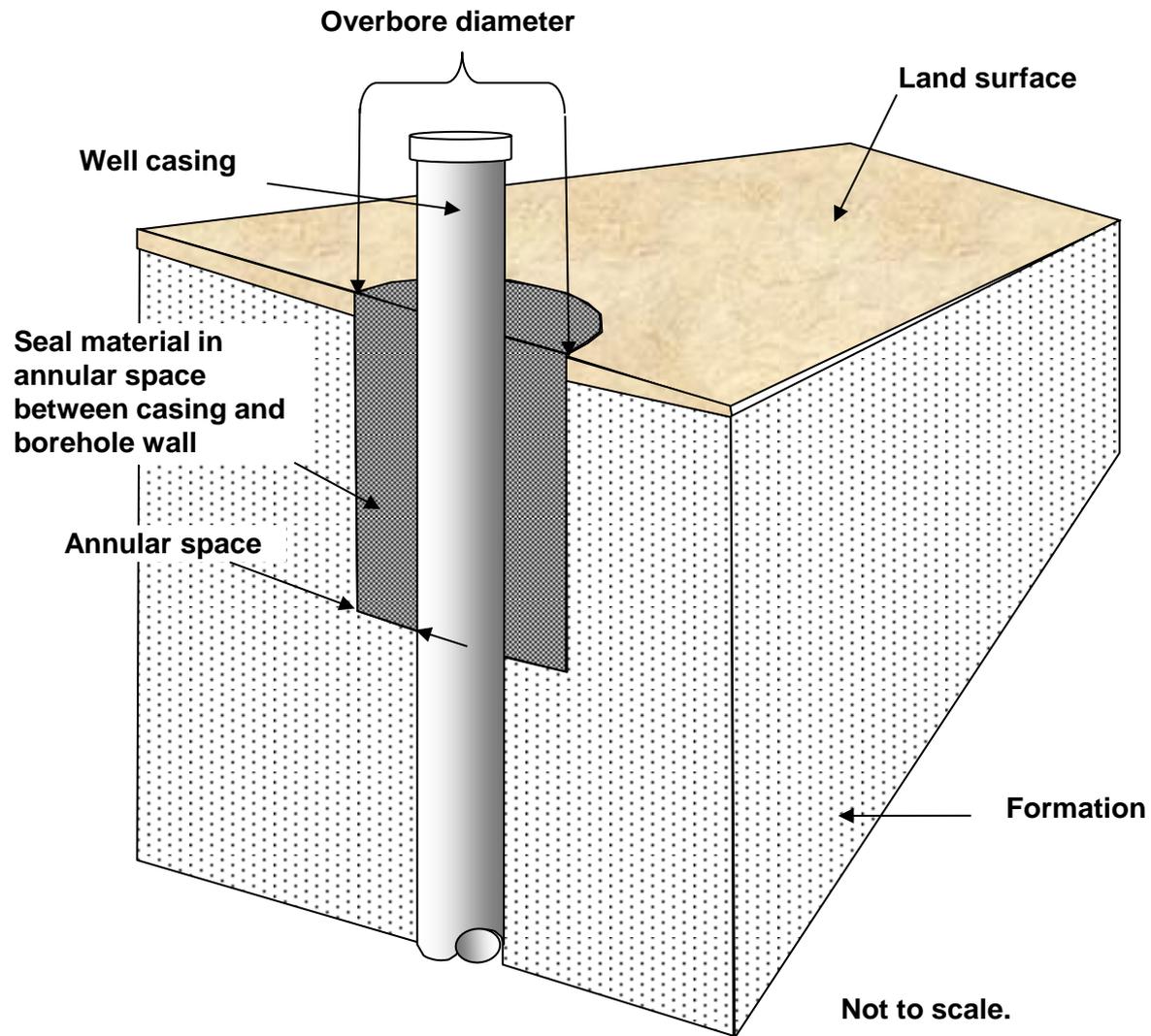


Idaho Department of Water Resources - Ground Water Protection Section

Thomas Neace, P.G.
Manager

Department Authority

- Department of Water Resources has regulatory authority over appropriation of water
- Department has a Ground Water Protection Program to implement and enforce the:
 - Well Construction Standards Rules - IDAPA 37.03.09
 - Underground Injection Control Program – IDAPA 37.03.03

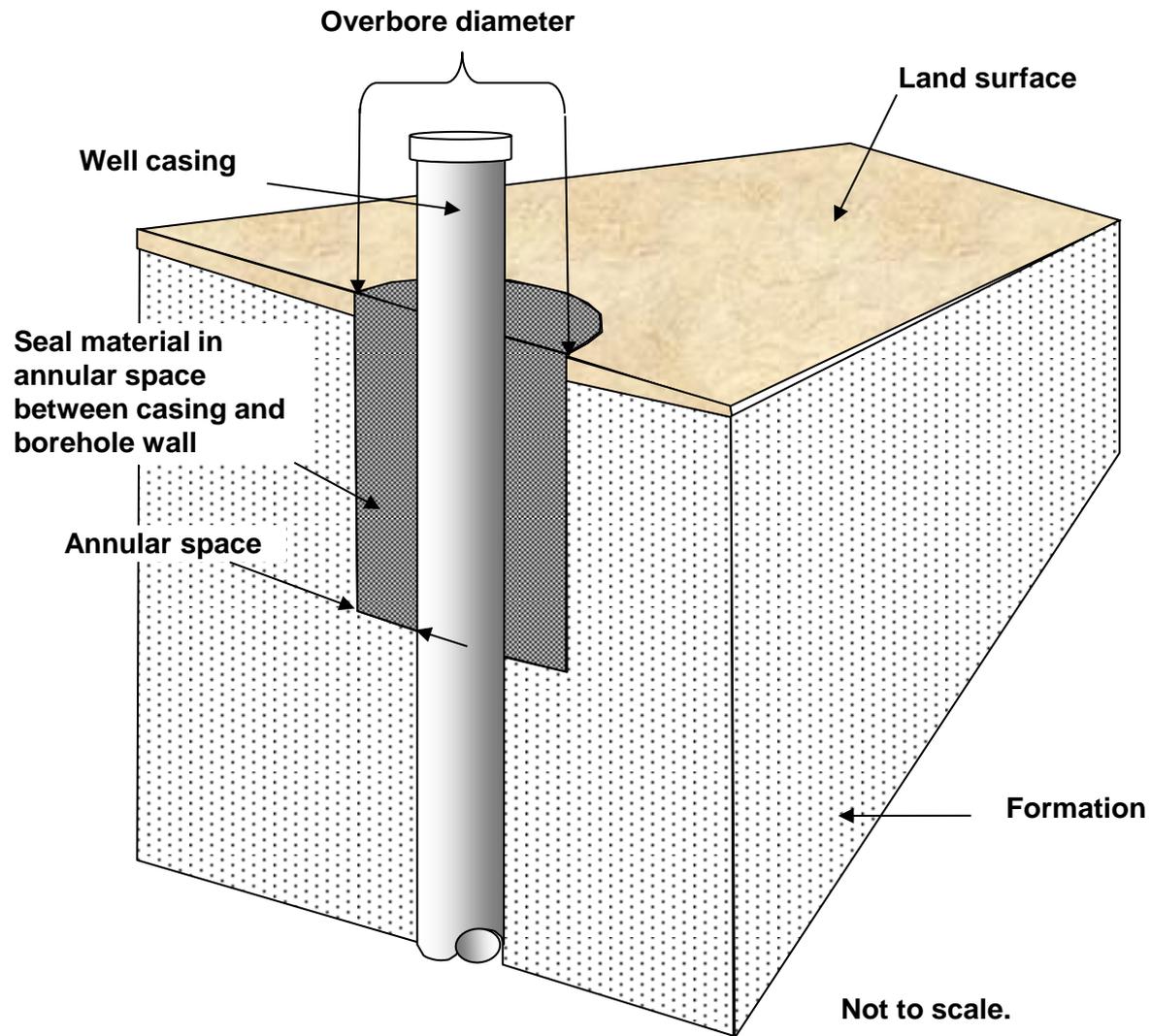


Well Construction Program

- Ensure well seals are properly placed to protect against waste or contamination
- Ensure the well meets setback distances potential from contaminant sources
- Administer “Areas of Drilling Concern” based on known ground water contamination.
- Assure that materials used to seal wells are approved seal materials
- Proper Decommissioning of unused or problem wells

Well Casing

- Steel or Thermoplastic
- Steel Casing is subject to corrosion especially if not properly sealed
 - Stray electricity
 - Corrosive soil/rock conditions
 - Corrosive water
- Thermoplastic casing not subject to corrosion





Well Seals

- All wells must have appropriate well seals to prevent movement of fluids in the annular space.
- Driller must provide the Department a minimum of 4 hours notification of seal placement prior to placing the seal

Well Seals

Minimum Surface Seal For most wells is 38 feet

Seals are required at greater depths if:

- The well is under artesian conditions
- To seal through confining layers separating aquifers of differing pressure, temperature of quality.
- Public Water System Wells require a 58 foot seal

Approved Seal Material

- Dry bentonite products – granular or chips
- Bentonite Grout
 - Below the water table only
- Cement Grout
- Hybrid mixtures of cement and bentonite if preapproved

Annular Space

- Sufficient annular space is necessary for emplacement of seal material
- Dry Bentonite Products = 2 inch annular space on all sides. 3 inch annular space required if the seal depth is greater than 200 feet.
- Bentonite grout and cement grout = 1 inch annular space on all sides of the casing

Poor seals allow for contamination of the aquifer



Set-Back Distances

- From Public Water System wells – 50 feet
- Other existing wells – 25 feet
- Septic Drain Field – 100 feet
- Septic Tank – 50 feet
- Drain Field with >2,500 gal per day – 300 feet
- Sewer Line Main, pressured – 100 feet
- Sewer Line Main, gravity – 50 feet
- Sewer Line secondary single building – 25 feet

Sealing Artesian Wells

- Artesian Water – water will rise in the well casing or drilled hole above the elevation where it was first encountered. The term includes wells that are flowing or not flowing at the surface.
- Well casing must extend from the surface to the lower most confining layer above the production zone and be sealed.

Sealing Artesian Wells

- If possible the well screen or production area should be limited to one water bearing zone and adequately sealed to prevent waste or contamination.
- Some mixing of water may be allowed to develop an adequate water well but is restricted to water zones of similar pressure, temperature and quality.



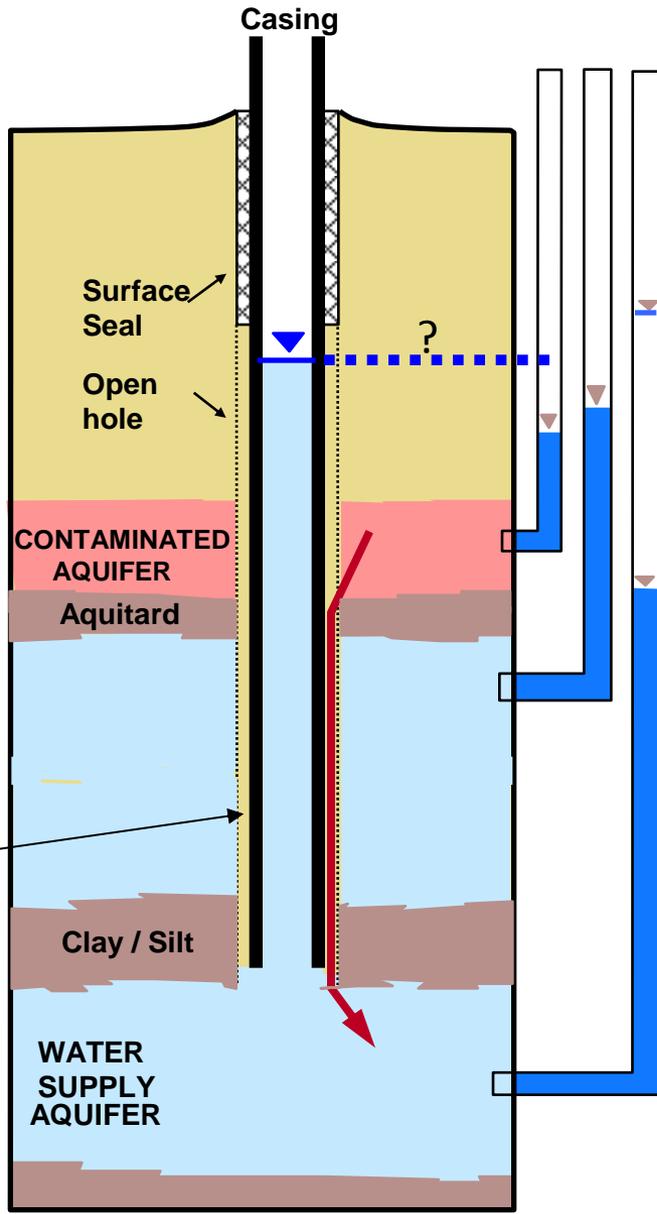
Artesian Waste: Lack of Proper Sealing



**Artesian
Water
Leaking
Upward
Along
Outside of
Casing**

An Inadequate Casing Seal is Probably the Single Biggest Problem in the Idaho Water Well Industry

No casing seal



Original hydrologic isolation is lost

Regardless of the static context, the inevitable result is cross-contamination due to pumping

Common Contaminants

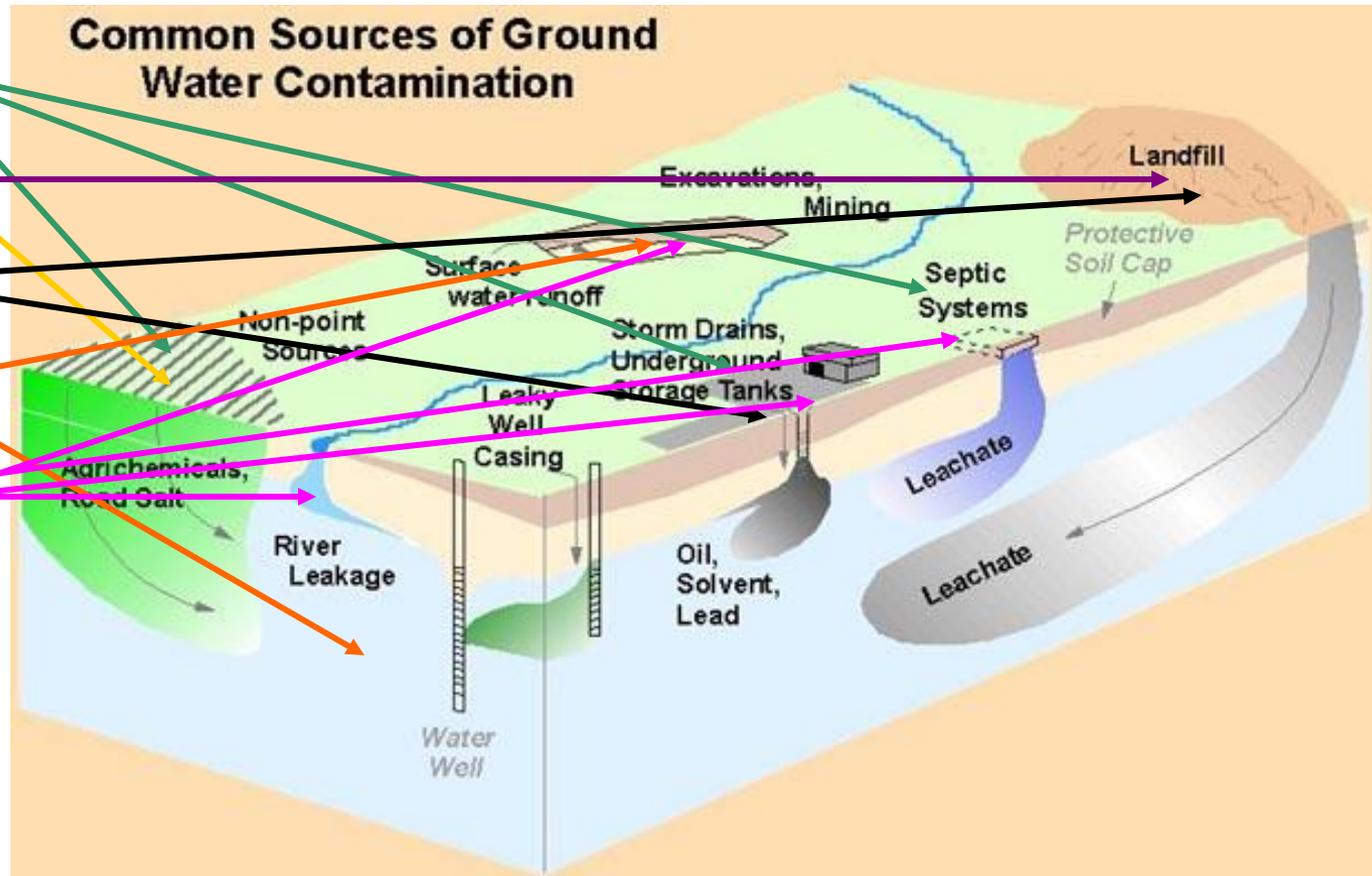
Nitrates

Pesticides

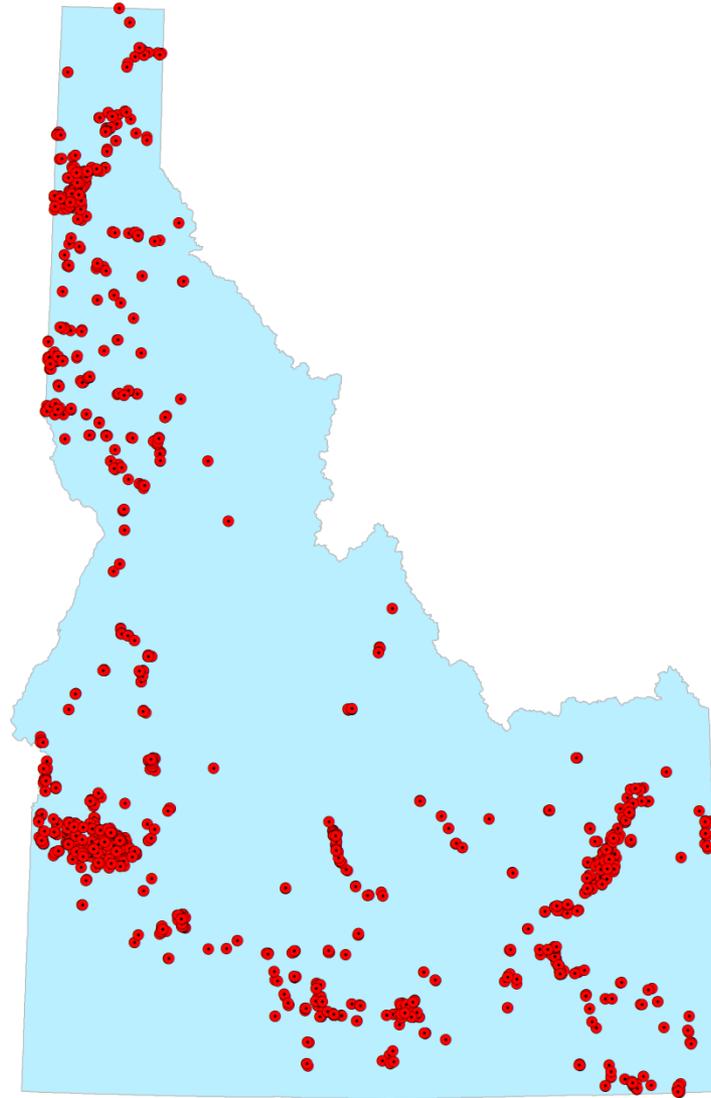
Petroleum

Arsenic

Biological

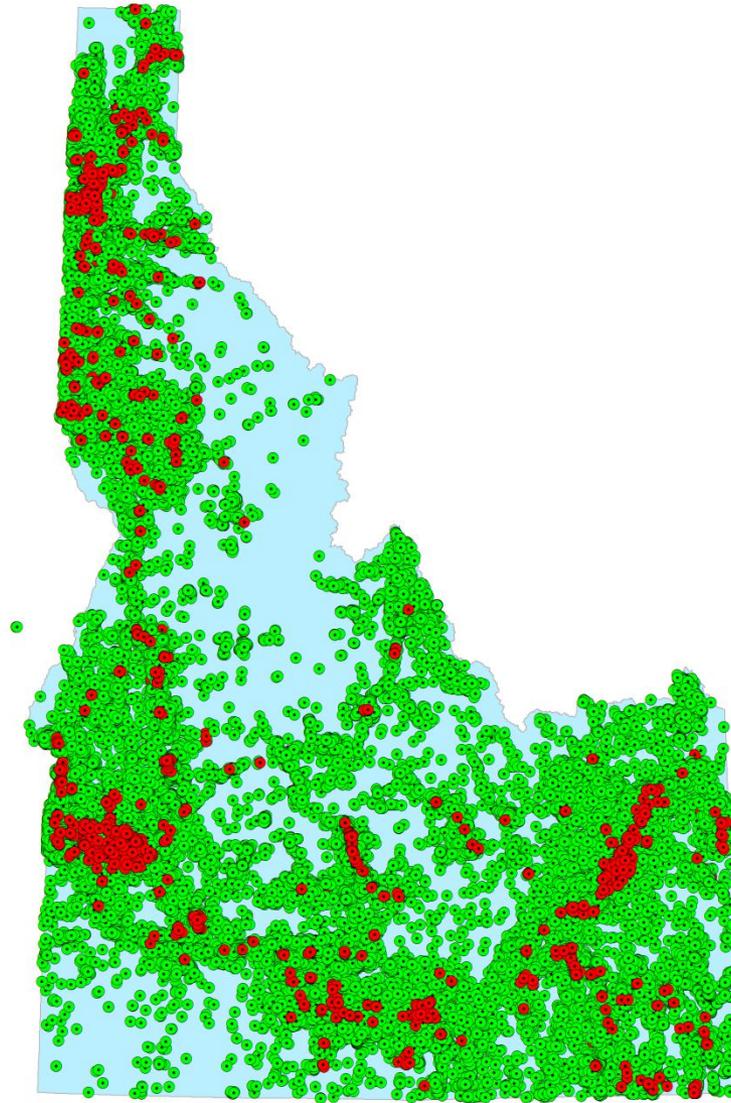


Community Water System Wells



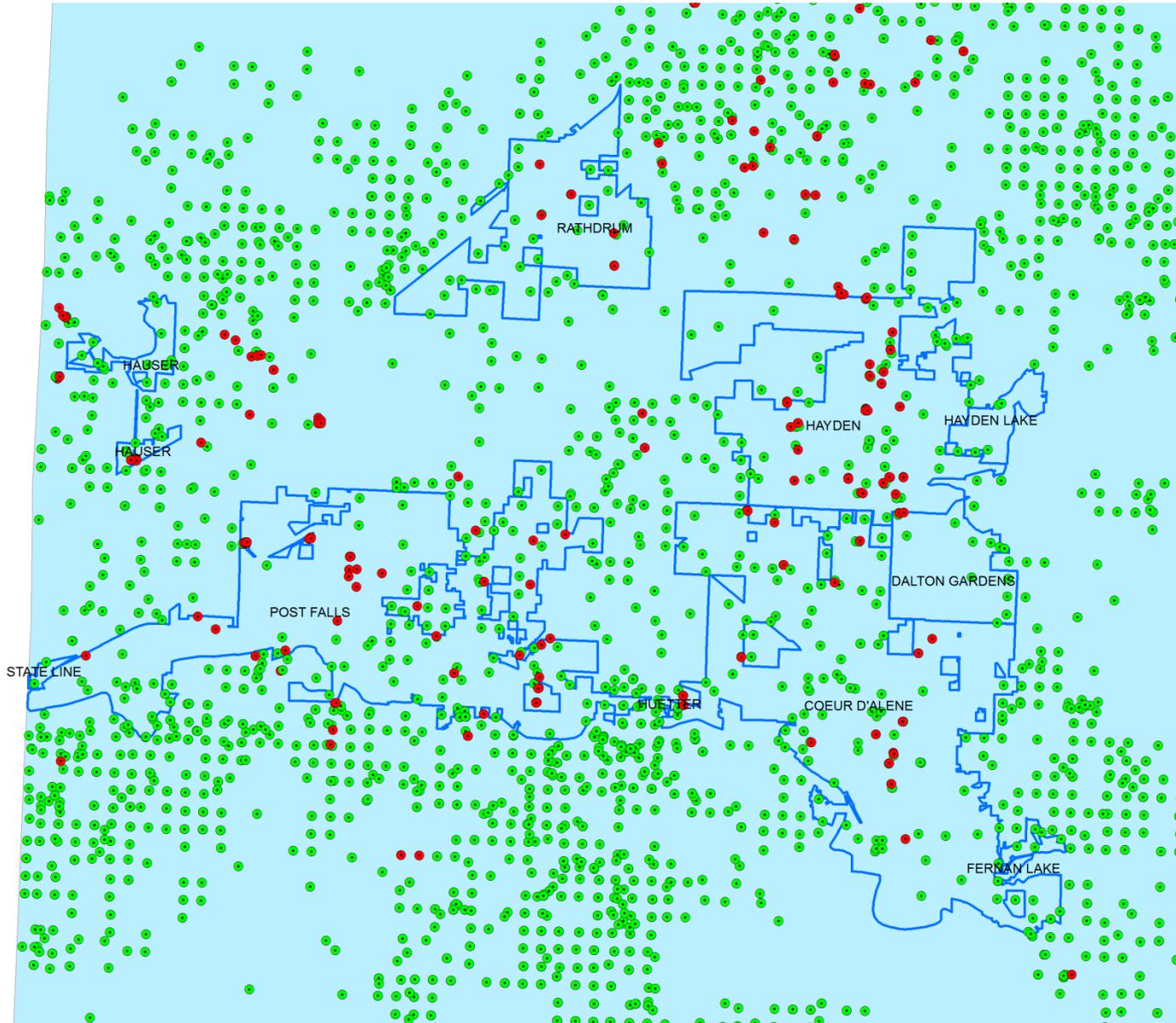
1,800 Groundwater
based CWS

All Water Wells

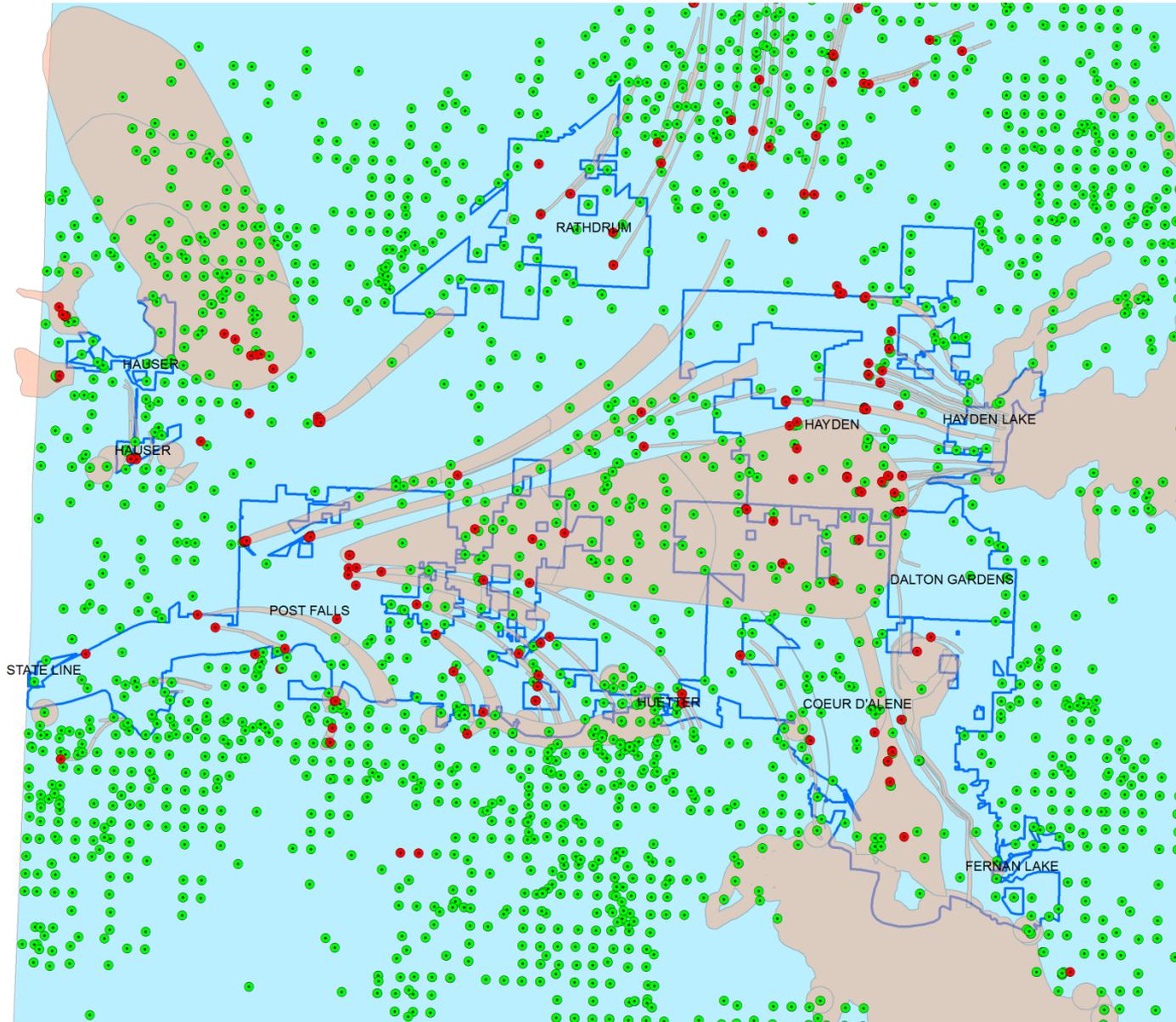


1% of the wells in
Idaho are CWS

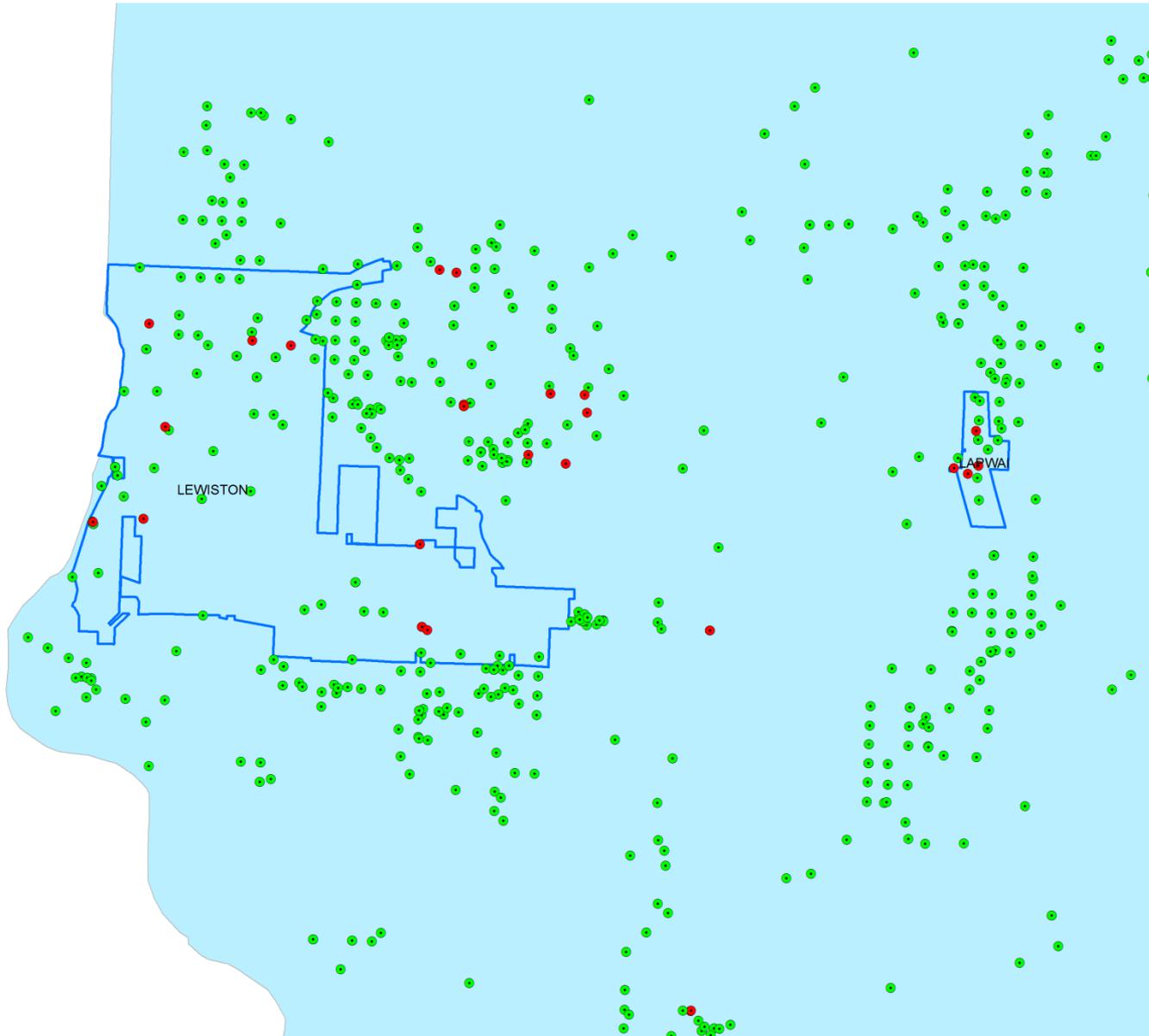
Coeur d'Alene



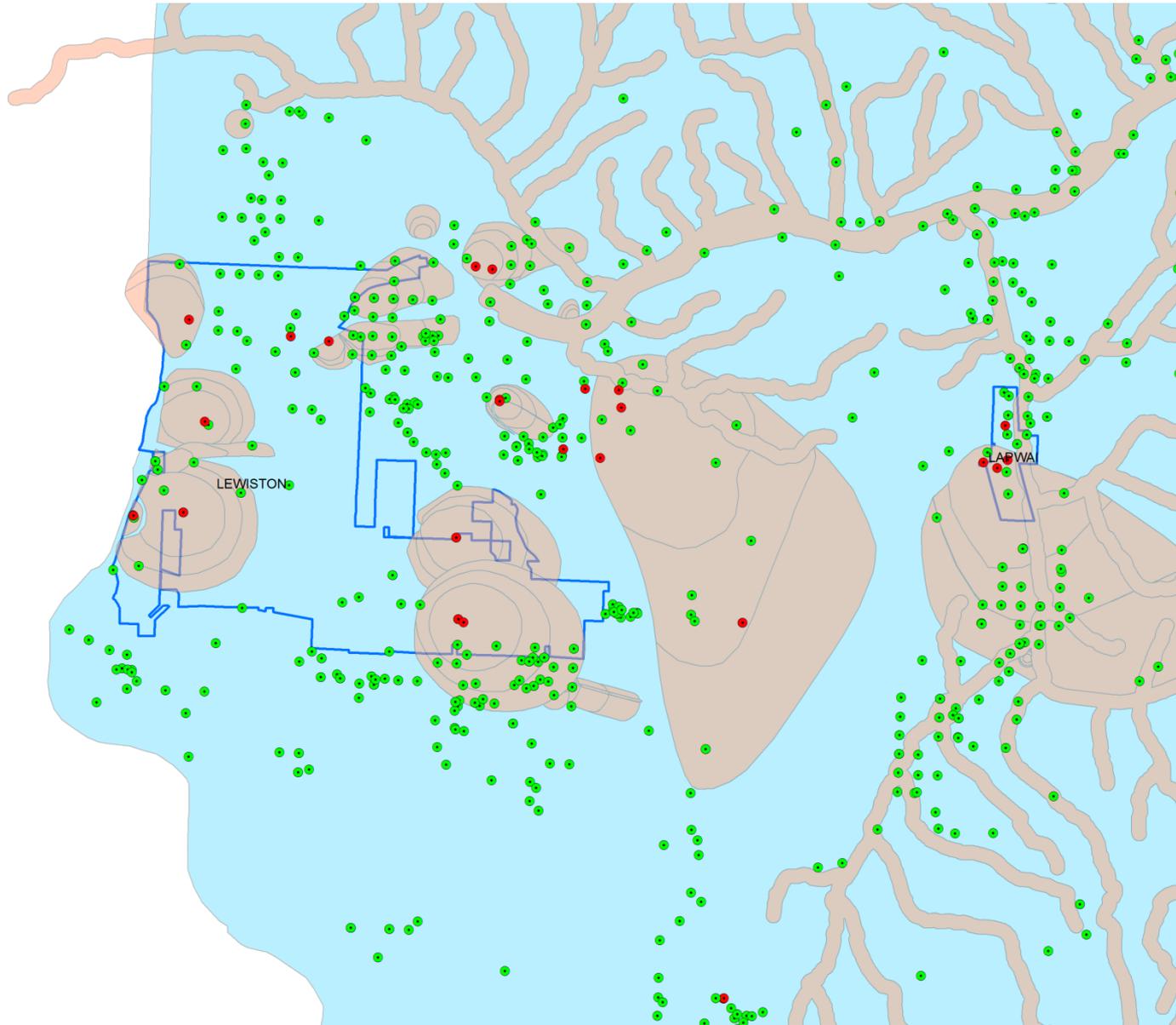
Coeur d'Alene



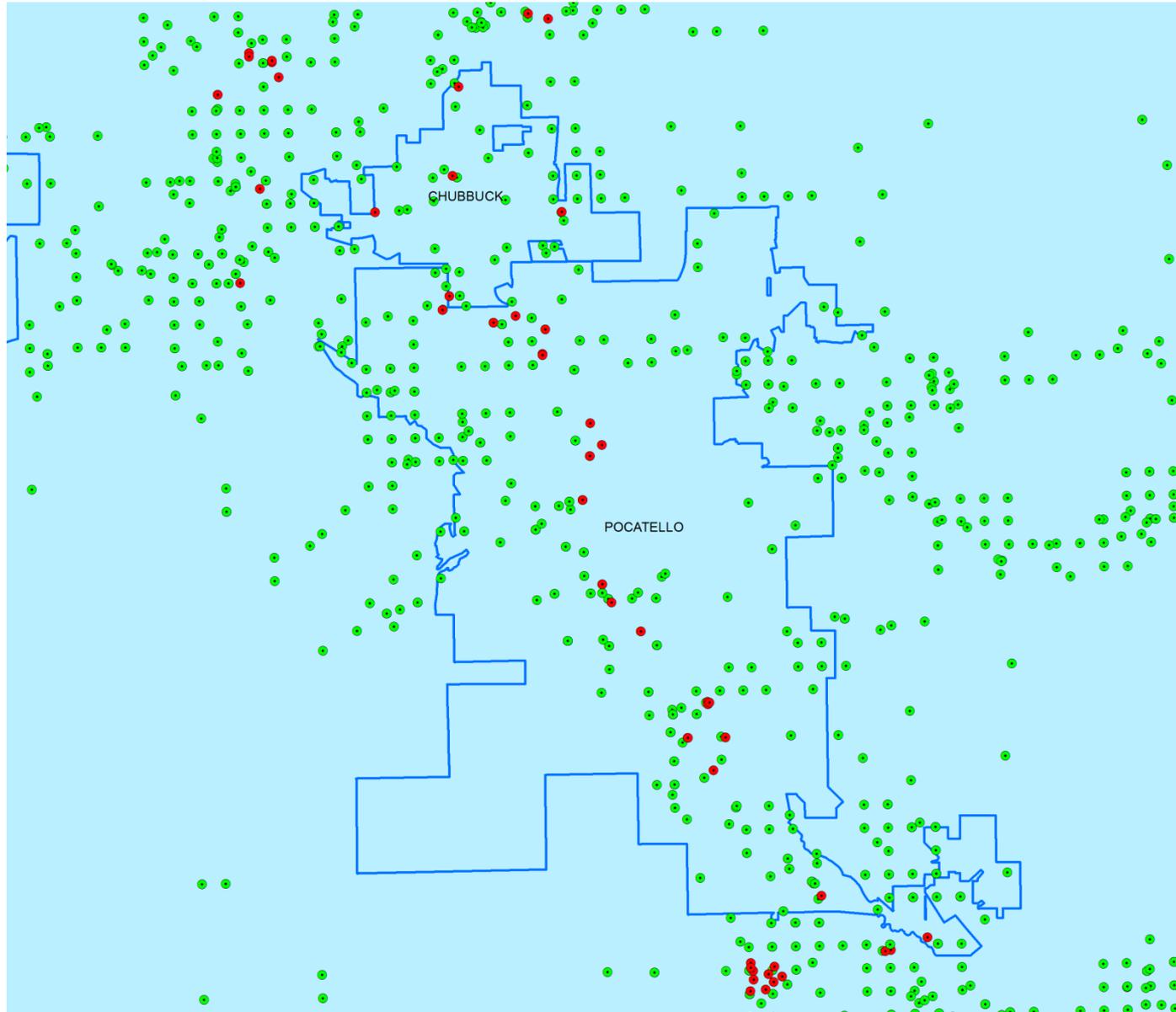
Lewiston



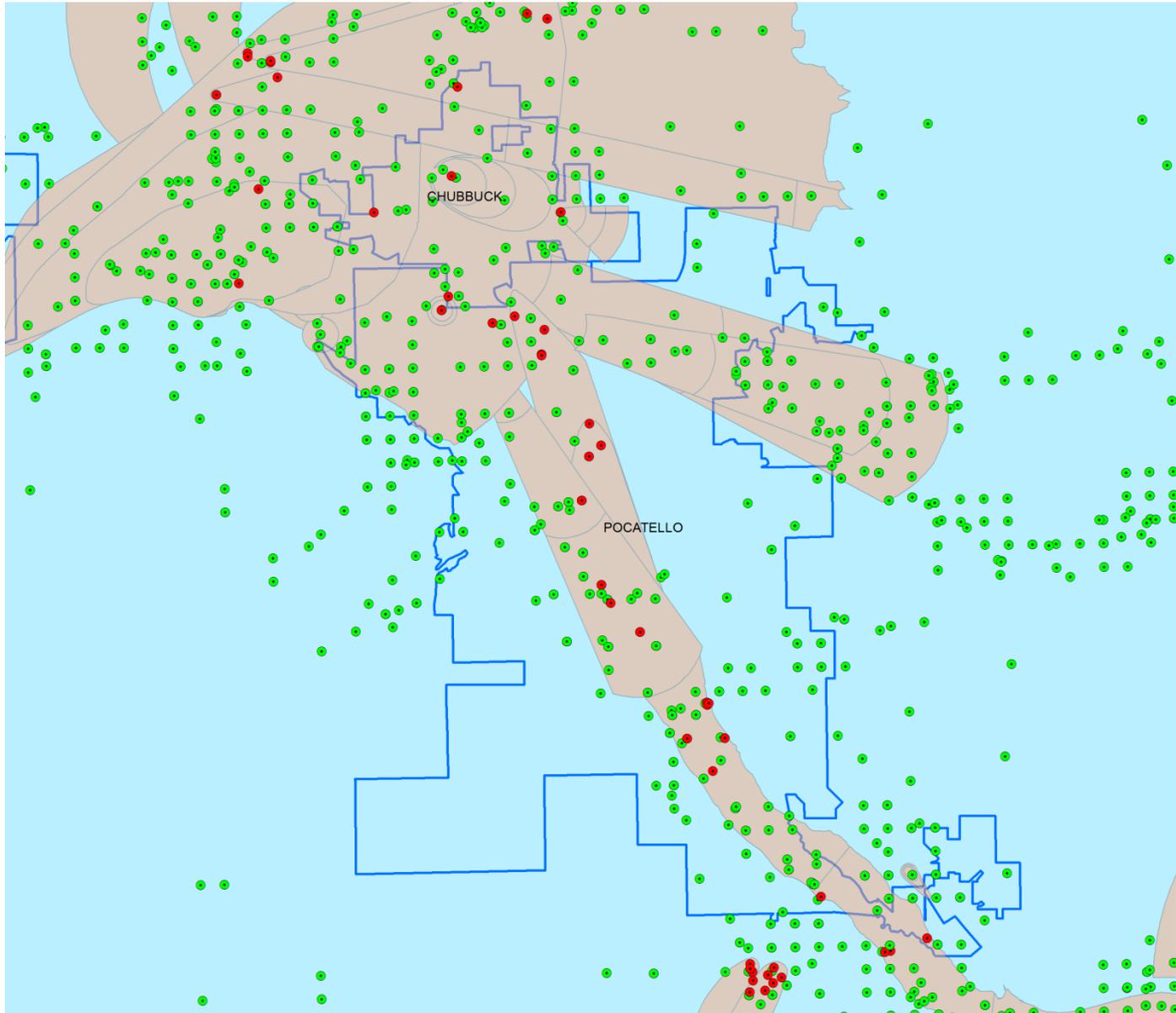
Lewiston



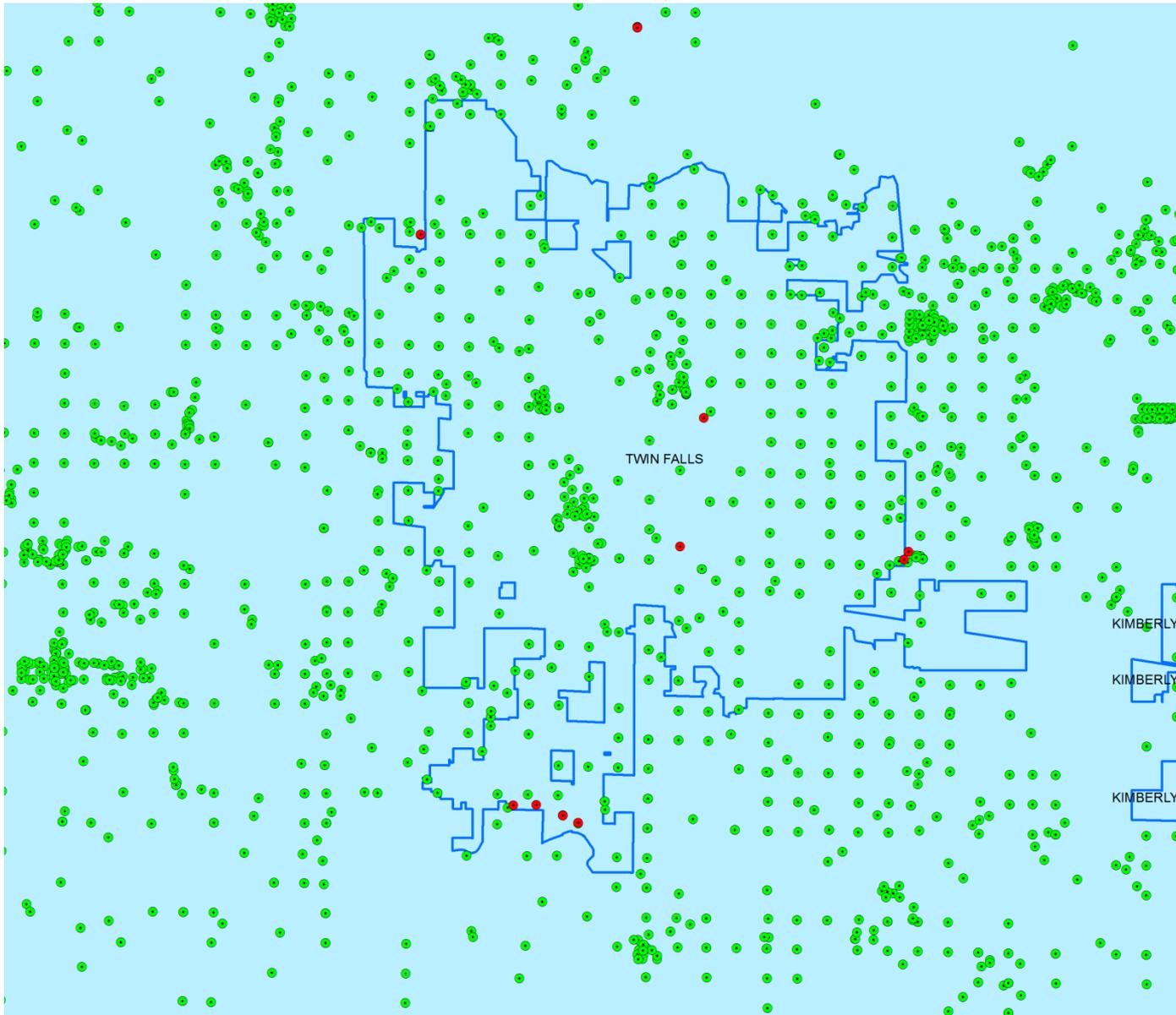
Pocatello



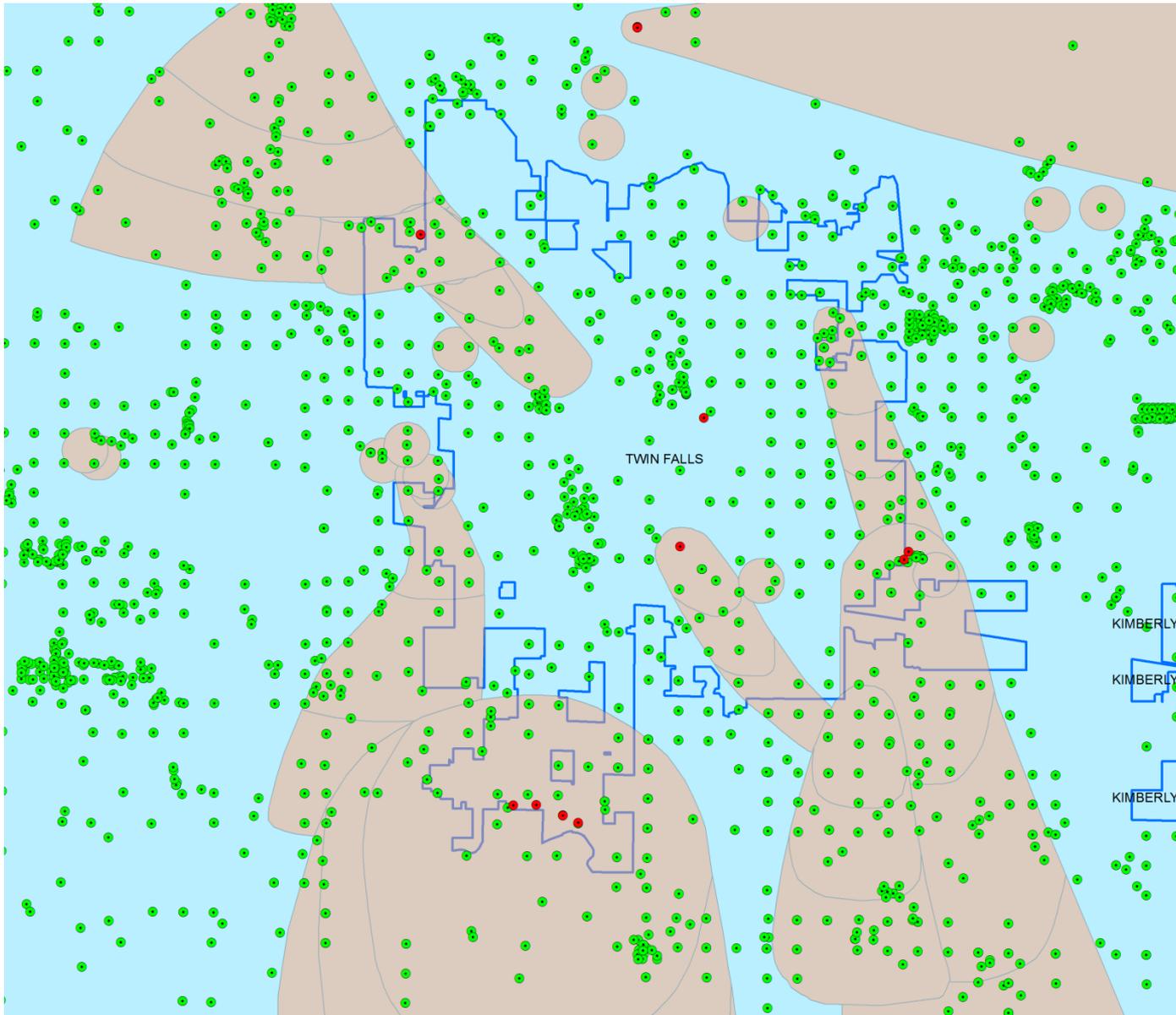
Pocatello



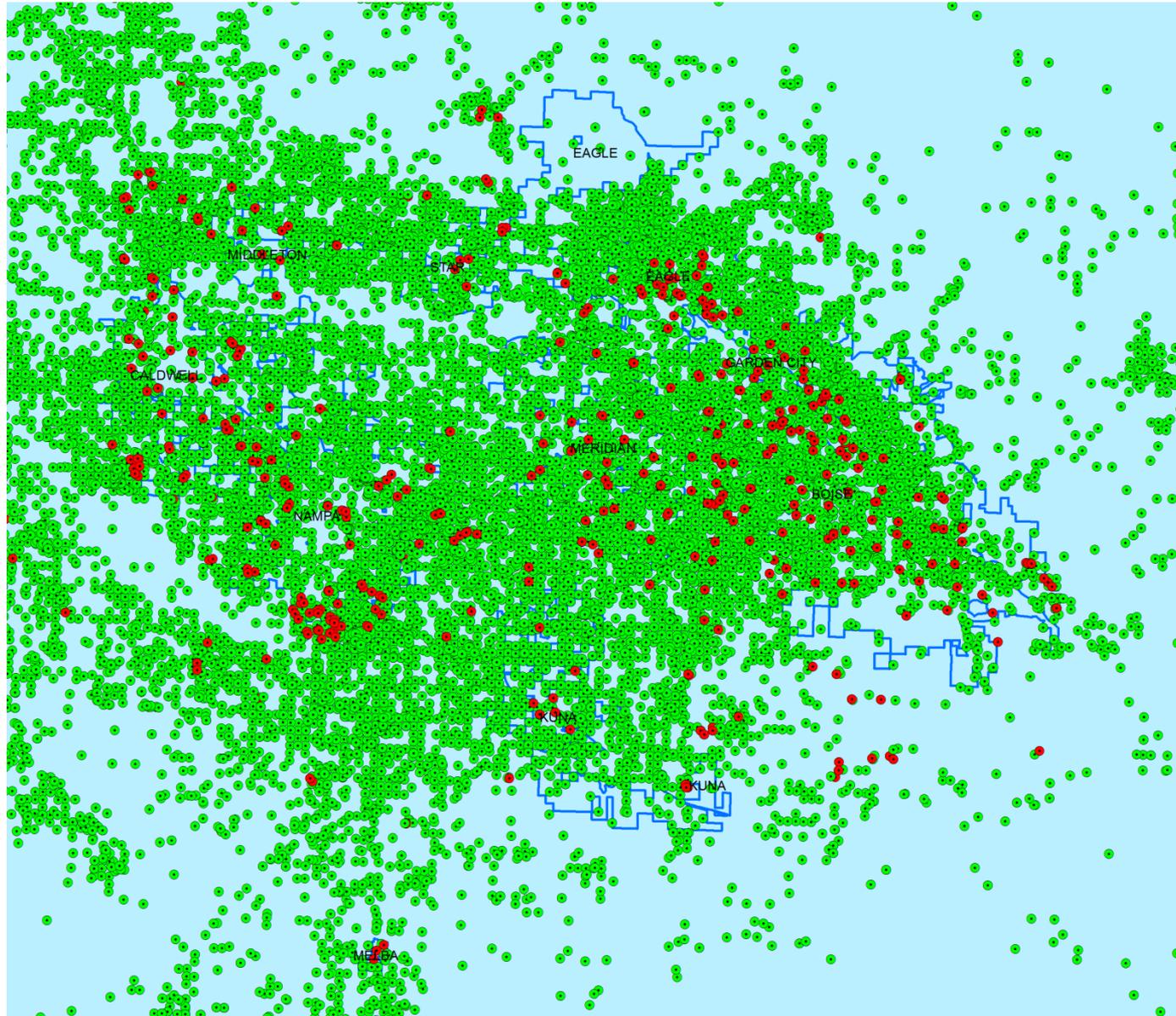
Twin Falls



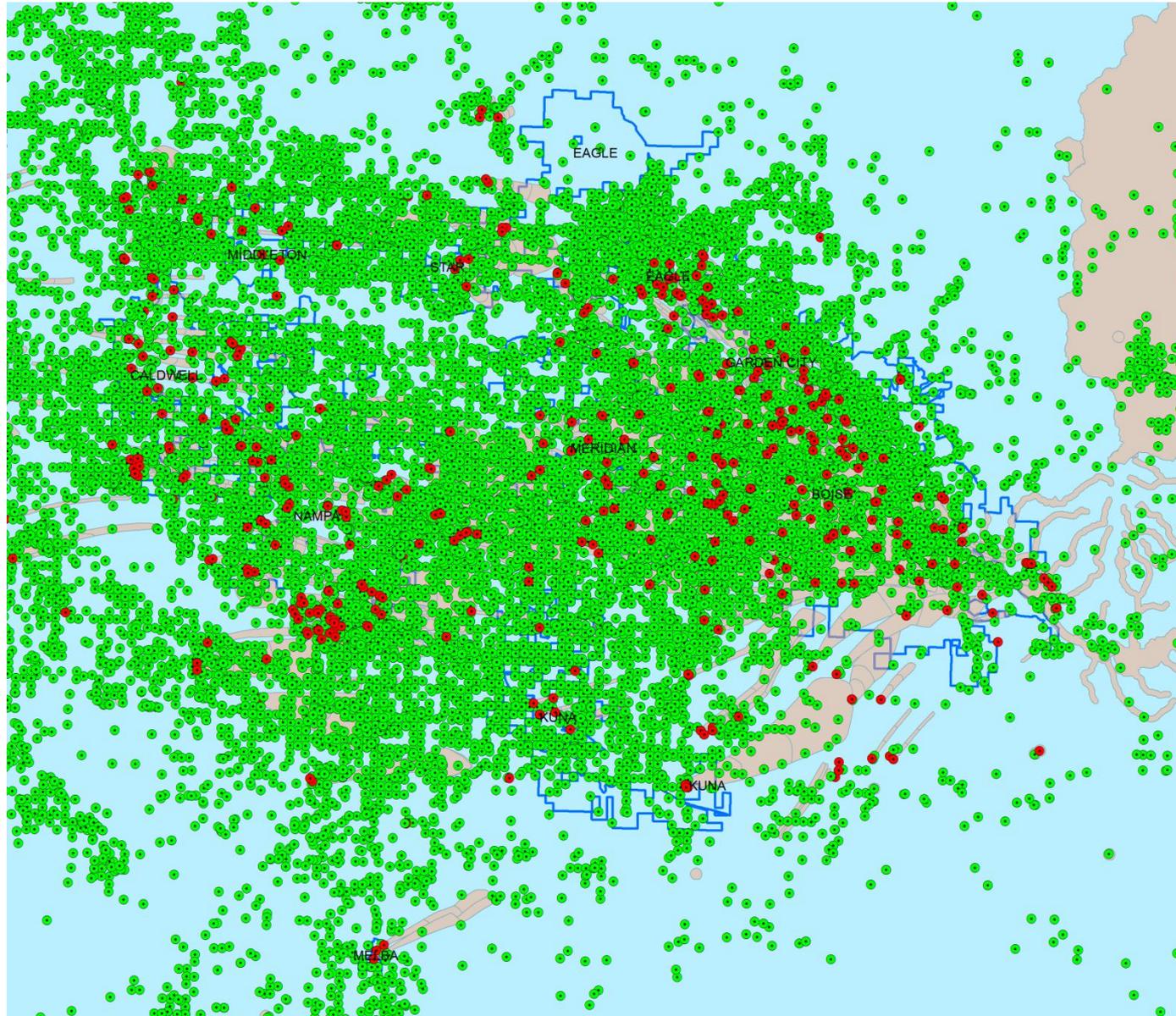
Twin Falls



Treasure Valley



Treasure Valley



Underground Injection Control Program

- Administer a permit process for injection wells
- Require the water injected to meet certain water quality standards
- Require proper decommissioning of problem injection wells
- Require that injection well meet well construction standards
- Prohibits industrial, radioactive or hazardous waste from being injected

Injection Wells and Permitting

- \leq 18-ft = **Shallow Injection Well**
 - Inventory Form
 - Valid for life of the well
 - \$75 fee

- $>$ 18-ft = **Deep Injection Well**
 - Application for Permit
 - Subject to a review to determine set-back requirements
 - Requires legal notice in newspaper
 - Recurring permit renewal cycle
 - \$100 fee

Water Quality Standards for Injectate

IDEQ IDAPA 58.01.11 “Ground Water Quality Rule”

Chemical

- MCL or background concentration

Radiological

- MCL

Biologic

- technically no standard via UIC rules, but...
- can not contaminate existing or proposed adjacent wells

Why Different Standards?

Chemical / Radiological

- takes longer to degrade
- filtration virtually non-existent
 - travel much greater distances

Biological

- Living organisms die
 - old age
 - not tolerant to environment
 - antagonistic bacteria
- Substrate acts as a natural filter to trap organisms

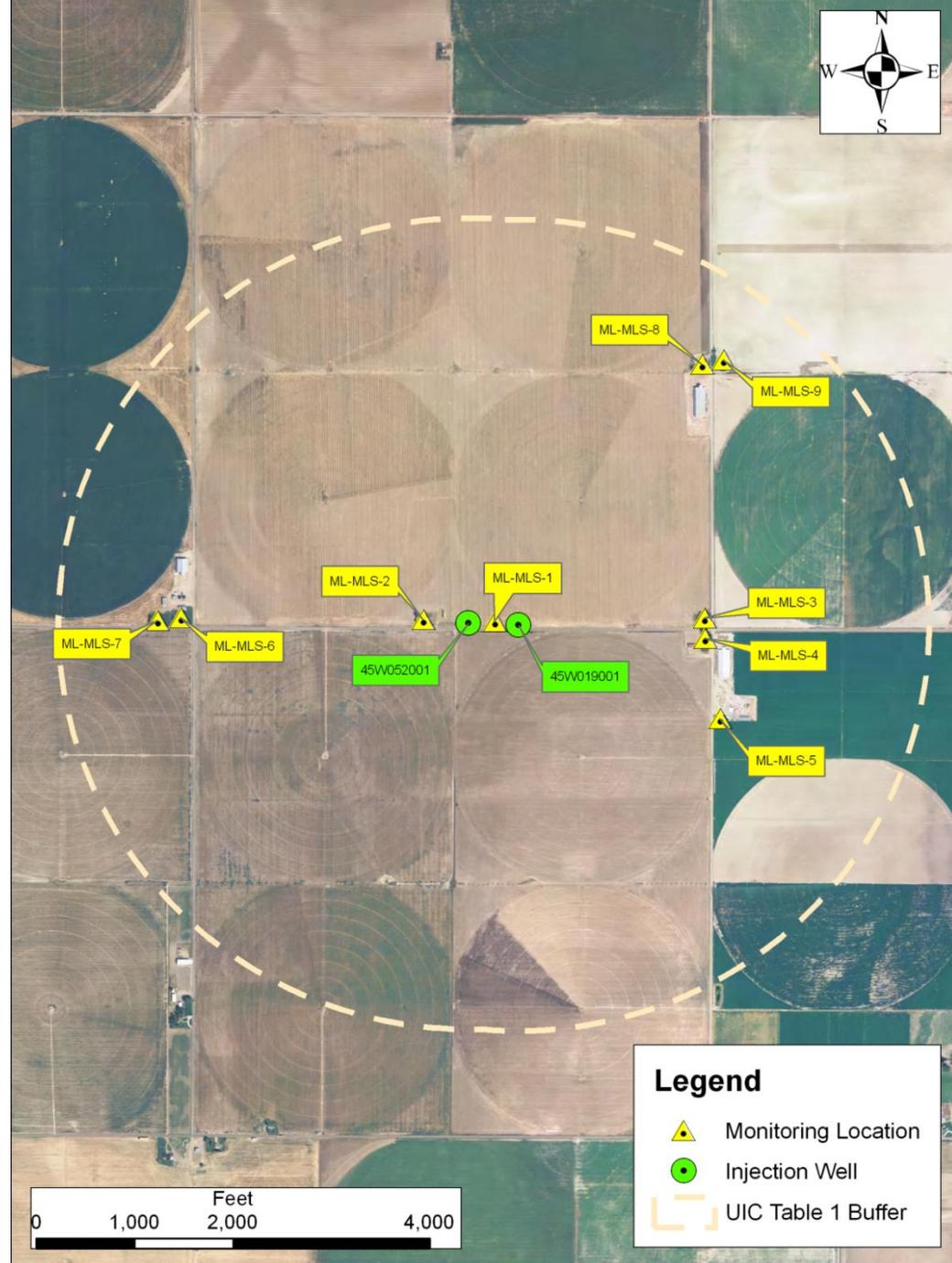
Point of Compliance

Chemical / Radiological

- injection well head

Bacteriological

- adjacent PODs for beneficial use

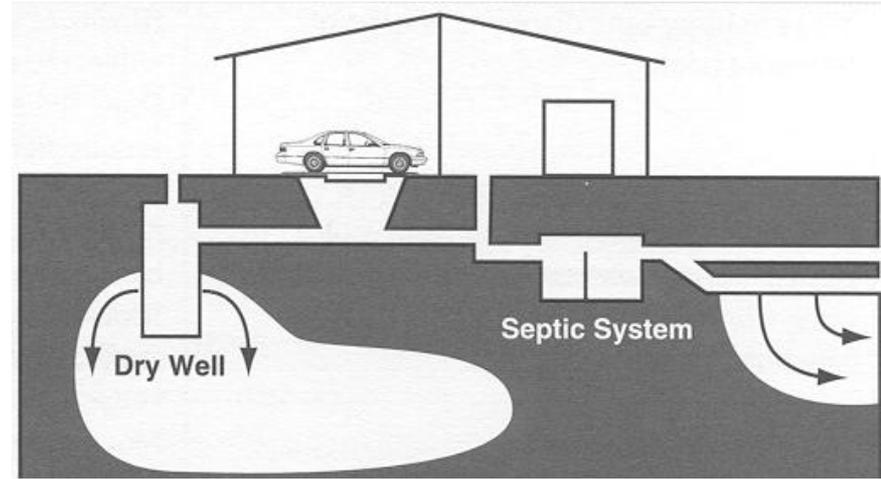


Motor Vehicle Waste Disposal Wells

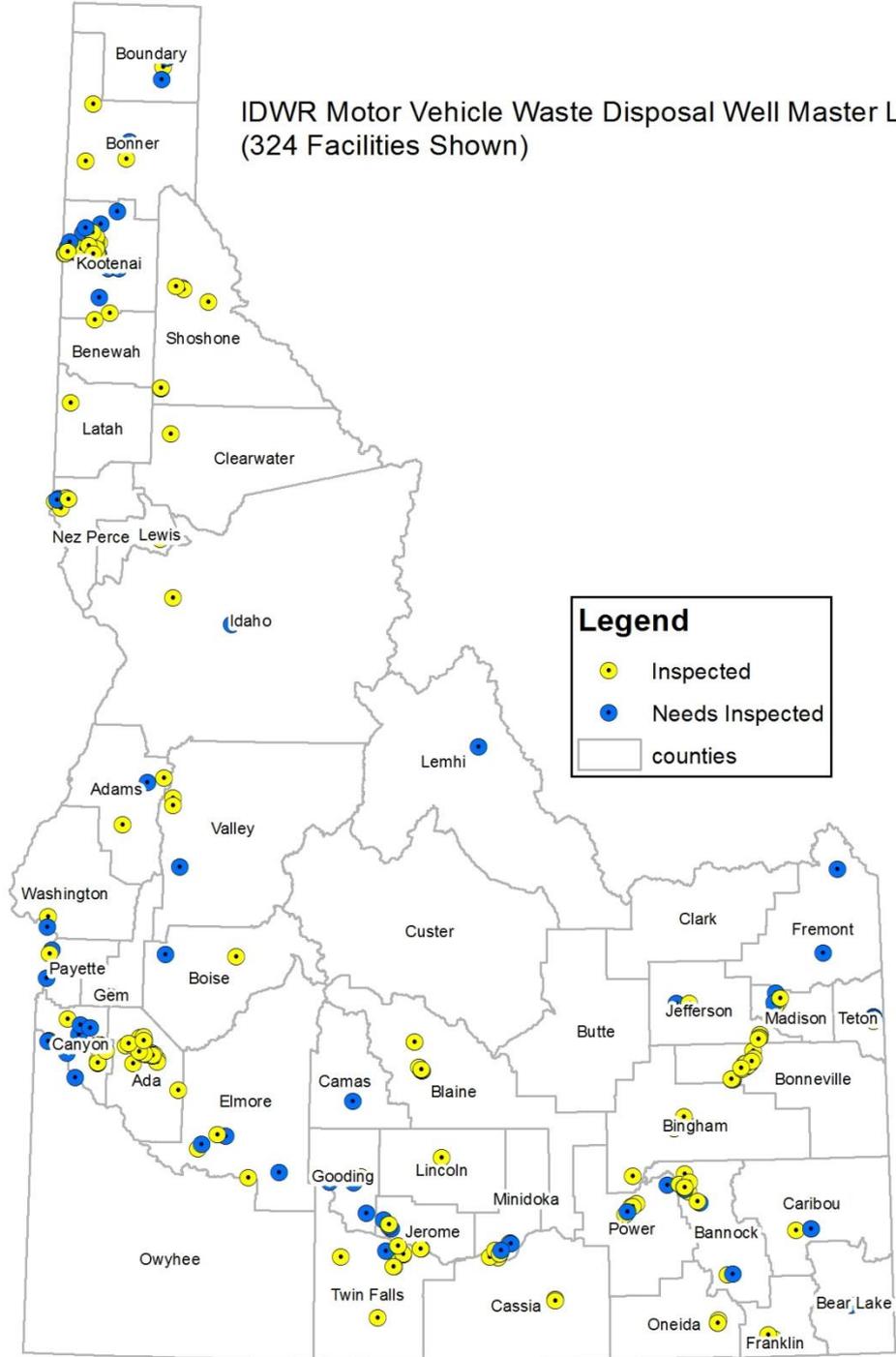
- Injection Wells used to dispose of waste fluids from motor vehicles of all types
- Use of MVWDW has been Illegal since 1999.
- Idaho has approximately 324 potential MVWDW's.
- The Department has confirmed 72 facilities as MVWDW's and are working with DEQ toward remediation and site closure.

Motor Vehicle Waste Disposal wells

- VOC's
- SVOC's
- Metals
- Hydrocarbons



IDWR Motor Vehicle Waste Disposal Well Master List (324 Facilities Shown)



IDWR/DEQ Injection Well Project

- DEQ provided funding to identify and inspect all high priority injections well in Ground Water CWS delineated areas plus a 1,000 foot buffer.
- High Priority Wells Include
 - Motor Vehicle Waste Disposal Wells
 - Deep Agricultural Injection Wells
 - Deep Storm Water Wells

IDWR/DEQ Injection Well Project

- List of all High Priority Injection Wells within the Source Water Delineations including GPS location and estimated time of travel to public water systems.
- GIS data include contact information, well status and operational history
- Inspections, notes, photos, sampling data and relevant file records.

Source Water Protection

- 1 Define the zone of contribution
- 2 **Contaminant source inventory**
- 3 Susceptibility analysis

Enhanced Contaminant Inventory

- Motor Vehicle Waste Disposal Wells
- Deep Injection Wells Associated with Agriculture
- Deep Storm Water Injection Wells
- Unused wells that are not properly Decommissioned.

Enforcement

- IDWR has the legal authority to enforce the statutes and rules for water well drilling, injection wells and driller licensing.
- Most enforcement is done through administrative actions with assistance from the Idaho Attorney General's Office
- Civil Enforcement in District Court is pursued if administrative action is not effective