Y-12 Groundwater Protection Program Monitoring Well Inspection and Maintenance Plan

Environmental Compliance Department
Environment, Safety, and Health Division
Y-12 National Security Complex
Oak Ridge, Tennessee 37831

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Y-12 Groundwater Protection Program
Monitoring Well Inspection and Maintenance Plan

September 2020

Prepared by the

Consolidated Nuclear Security, LLC
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for the
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Acronyms

B&W Y-12	Babcock & Wilcox Technical Services Y-12, L.L.C.
BCV	Bear Creek Valley
BWXT	BWXT Y-12 L.L.C.*
CERCLA	Comprehensive Environmental Response, Liability, and Compensation Act
CNS	Consolidated Nuclear Security, LLC
CY	calendar year
DOE	U.S. Department of Energy
FI&S	Y-12 Facilities, Infrastructure, and Services Organization
GIMS	Groundwater Information Management System
GWPP	Y-12 Groundwater Protection Program
JHA	Job Hazard Analysis
LCC	Low Clearance Cap
LMES	Lockheed Martin Energy Systems, Inc.
MMES	Martin Marietta Energy Systems, Inc.
MOP	GWPP Monitoring Optimization Plan
MP	Measurement Point
P	Primary Inspection item
P&A	plugging and abandonment
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
S	Secondary Inspection item
SS	stainless steel
TOC	top of well casing
TOWW	top of Well Wizard™
UCOR	URS|CH2M Oak Ridge
VALA	Verification and Loading Application
WI&M	Well Inspection and Maintenance
WMR/R	Well Maintenance Request/Report
WW	Well Wizard™ Bladder pump – dedicated
Y-12	Y-12 National Security Complex

*Note: In 2008, BWXT Y-12 underwent a name change to B&W Y-12.

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1.0 INTRODUCTION

This document is the sixth revision of the *Monitoring Well Inspection and Maintenance Plan* for groundwater monitoring wells installed at the U.S. Department of Energy (DOE) Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee (Appendix A, Fig. 1). This plan describes the systematic approach for:

- inspecting the physical condition of monitoring wells at Y-12,
- determining maintenance needs that extend the life of a well, and
- identifying those wells that no longer meet acceptable monitoring well design or well construction standards and require plugging and abandonment.

The inspection and maintenance of groundwater monitoring wells is one of the primary management strategies of the *Y-12 Groundwater Protection Program* (GWPP) *Management Plan*, that is, the "proactive stewardship of the extensive monitoring well network at Y-12" (Consolidated Nuclear Security, L.L.C. [CNS], 2018). Effective stewardship, and a program of routine inspections of the physical condition of each monitoring well, ensures that representative water-quality samples and hydrologic data are obtained from the well network and protects the subsurface environment. In accordance with the *Y-12 GWPP Monitoring Optimization Plan* (MOP) *for Groundwater Monitoring Wells at the Y-12 National Security Complex, Oak Ridge, Tennessee* (CNS, 2017), the status designation (active or inactive) for each well determines the scope and extent of well inspections and maintenance activities (see Section 3.0). This plan, in conjunction with the above document, formalizes the GWPP approach to focus available resources on monitoring wells which provide the most useful data, and for that reason the GWPP inspects and performs maintenance on the wells sampled by the GWPP.

This plan applies to groundwater monitoring wells installed at Y-12 and the related waste management facilities located within the three hydrogeologic regimes (Appendix A, Fig. 2):

(1) the Bear Creek Hydrogeologic Regime (Bear Creek Regime),
(2) the Upper East Fork Poplar Creek Hydrogeologic Regime (East Fork Regime), and
(3) the Chestnut Ridge Hydrogeologic Regime (Chestnut Ridge Regime).

The Bear Creek Regime encompasses the section of Bear Creek Valley (BCV) immediately west of Y-12. The East Fork Regime encompasses most of the Y-12 process, operations, and support facilities in BCV west of Scarboro Road. The Chestnut Ridge Regime is directly south of Y-12 and encompasses a section of Chestnut Ridge that is bounded to the west by a surface drainage feature (Dunaway Branch, located immediately west of Industrial Landfill II) and by Scarboro Road to the east. The GWPP maintains an extensive database of geographic and construction details and related information for the monitoring wells in each hydrogeologic regime in the *Updated Subsurface Database for Bear Creek Valley, Chestnut Ridge, and Parts of Bethel Valley on the U.S. DOE Oak Ridge Reservation* (CNS, 2019). A detailed description of the hydrogeologic framework at Y-12 can be found in the GWPP Management Plan (CNS, 2018).

2.0 BACKGROUND

2.1 1989 - 2002

A regular program of well inspection and maintenance (WI&M) was created by the GWPP after a 1989 DOE Tiger Team finding of non-compliance with U.S. Environmental Protection Agency guidance regarding well security and well access. After the finding, the following items were documented for the well network at that time: well security, well access, well identification, and maintenance needs. A program of routine surveillances (i.e., well inspections) was initiated as a corrective action to the finding.

These well inspections were intended as a means to survey and document (by means of paper checklists) the above items on an annual basis. Well Maintenance Requests/Reports (WMR/Rs) were generated from these surveillances and the maintenance work submitted to a Well Services Subcontractor or the Y-12 Facilities, Infrastructure, and Services (FI&S) Organization for repairs. All maintenance work performed was inspected and documented and approved upon successful completion.

The WI&M program was first outlined and formalized in *Monitoring Well Inspection and Maintenance Plan for the Department of Energy Y-12 Plant, Oak Ridge, Tennessee* (Martin Marietta Energy Systems, Inc. [MMES], 1991). This plan:

- outlined a program for routine inspection of the physical condition of each monitoring well,
- identified well components to be inspected,
- defined minimum acceptable standards for each component,
- established a well maintenance program, and
- established procedures for performing and documenting well inspections and maintenance performed.

Procedures G-001 and G-002 detailing the step-by-step process of well inspections and depth measurements, respectively, were first published with this plan. The 1991 plan required only that a Monitoring Well Inspection/Maintenance Summary be updated and reissued each year. The first revision of this plan (MMES, 1994) clarified the definition of active wells and updated the two procedures (G-001 and G-002). The second revision of this plan (Lockheed Martin Energy Systems, Inc. [LMES], 1996) created a new mechanism to track the status designation of a monitoring well. This second revision of the plan was prompted by the rapid growth of the monitoring well network during the mid-1990s and the changing regulatory requirements resulting in constant changes to the status designation of each well.

2.2 2003 - 2020

The GWPP has not had the resources of a fully capable Well Drilling Services Subcontractor since 2002. (From 2003-2007, the GWPP had a Services Subcontract with Elvado Environmental, LLC, to perform minor well maintenance.) As a result, most maintenance on the well network (especially down-hole maintenance) has been deferred. In addition, reduced GWPP budgets and limited FI&S labor resources have slowed maintenance activities. For these reasons, WMR/Rs are not always generated for each problem identified during inspections. Rather the WI&M Coordinator tracks and

prioritizes maintenance issues. Service Notifications for larger well maintenance jobs are conveyed to the FI&S organization, or GWPP personnel are tasked with performing smaller maintenance jobs such as replacing locks or installing secondary identification labels. When the work, which may involve a single well or group of wells requiring a related maintenance activity (e.g., weed eating of the well-site and/or well access road) has been completed and inspected, a WMR/R is prepared and finalized, and subsequently published in the next WI&M triennial report.

The third revision of the WI&M Plan (BWXT Y-12 LLC [BWXT], 2006a) incorporated the language and structure of the GWPP MOP to aid in determining the scope and extent of well inspections and maintenance activities (see Sections 3.1 and 3.2). That revision also removed the monitoring well construction summary, Procedures G-001 and G-002, and the personnel training certification forms (see discussion in Section 3.2 for all of the above). Procedures G-001 and G-002 were eventually combined and replaced by Procedure Y71-66-EC-214 *Monitoring Well Inspection and Depth Measurement* (currently CNS, 2020).

Beginning in 2009, well inspections were completed electronically. Specifically, the inspection checklists were completed using a laptop/tablet PC. The following are a list of the benefits of electronic media use for well inspections:

- Reduces time to perform a well inspection in the field,
- Reduces errors introduced through double entry,
- Improves recordkeeping and reporting, and
- Improves identification of maintenance requirements, prioritization, and planning.

The well inspection checklist is presented on the PC screen (see Fig.15 in Appendix C for a screenshot of the checklist). The PC is pre-loaded with well construction information and the appropriate spaces on the form are automatically populated as each new location is identified. Rather than manually entering a chronological well inspection number (as was the procedure using the paper well inspection checklists), inspection numbers are now automatically assigned as the data is verified following an upload to the Verification and Loading Application (VALA) database.

The inspector goes through the checklist answering questions based on his/her observation of the condition of the inspection items. If the response to a question identifies a maintenance need, the inspection application supplies the inspector with a comment box with a pre-loaded statement that is specific to the question just answered. The inspector can accept the response in the comment box, but also has the opportunity to elaborate on the specific details regarding the condition of the well or maintenance needs.

In addition, when performing a triennial inspection, where a tag of the well total depth is required, the percentage of monitoring interval possibly blocked by sediment is automatically calculated by the inspection application once the measured depth has been entered into the appropriate space on the electronic checklist. The electronic well inspection checklist does not have the shaded boxes that are used on the paper well inspection checklists to identify maintenance needs. Instead, the maintenance needs of a particular monitoring well, or all of the wells exhibiting the same maintenance need,

can be compiled from the VALA database after inspection information has been uploaded and verified. With the electronic media, the inspection is complete only when all information has been entered, including the inspector's initials.

Should the electronic equipment not be available, a backup hard copy form of the well inspection checklist can be obtained from the WI&M Coordinator. The hardcopy checklist has the same questions as the electronic version, but the appearance is different (see Fig.16 in Appendix C).

As of this publication, the most recent version of the Updated Subsurface Data Base (Y/TS-881/R7 [CNS, 2019]) includes a total of 1451 groundwater monitoring wells, boreholes, borings, and coreholes that have been installed or drilled at Y-12. These wells or borings were installed to meet various groundwater quality monitoring programs, research projects, remedial investigations, plume characterization and delineation studies, or other various hydrogeologic studies. Of those, 596 wells have been plugged and abandoned, have been destroyed, are not locatable, or are of unknown status. Of the remaining wells, a total of 549 have been assigned a status designation of either active (357) or inactive (192) status in accordance with the current MOP (CNS, 2017) and will be the focus of the WI&M program. For the remaining locations, the wells:

- are not in service and will be scheduled for plugging and abandonment in the future, or
- are temporary piezometers or other specialized groundwater monitoring devices that were previously installed for research purposes, hydrologic testing, pilot studies, or short term investigations.

In CY 2020, a Statement of Work is being prepared to bring a Well Services Subcontractor to Y-12 to perform, primarily, down-hole well maintenance (i.e., well redevelopment/rehabilitation).

3.0 TECHNICAL APPROACH

The technical approach of this plan involves:

- determining the status designation of the well (e.g., determines the inspection frequency—annual or triennial basis),
- establishing a program of routine inspections to assess the physical condition of each well,
- identifying maintenance needs from the well inspections,
- prioritizing maintenance work based upon well status, well component, and available resources,
- documenting and verifying all maintenance work that is performed, and
- identifying wells that no longer meet GWPP technical specifications, or are damaged beyond repair, and must be decommissioned.

A step-by-step flow diagram (Appendix A, Fig. 3) illustrates the GWPP Well Inspection and Maintenance Program in detail.

The objectives of the plan are to:

- describe the well status designation,
- establish the current business practices of the GWPP WI&M Program,
- describe the role and duties of the WI&M Coordinator,
- identify and describe the well components (inspection items),
- define the minimum acceptable standards for the condition of each well component,
- establish a maintenance program to correct or repair well components that do not meet these standards,
- describe how well inspection and maintenance activities are prioritized, managed, and documented, and
- describe the final publication of each inspection event and the maintenance activities performed during that time period (note: well inspection and maintenance activity reports are compiled after each triennial inspection, and include the results/activities of the triennial inspection event, as well as the previous two annual inspection events).

3.1 Well Status Designation

The GWPP Monitoring Optimization Plan (MOP), first issued in 2003, formalized the technical approach the GWPP took to focus available resources on monitoring wells at Y-12 that provide the most useful hydrologic and water-quality monitoring data (BWXT, 2003a). The MOP formalized the definition of “active” and “inactive” status, outlined the process for determining a well’s status designation, provided comprehensive lists of wells (approved by the GWPP Program Manager) that were granted either active or inactive status, and formalized how changes (additions, deletions, change in status designations) were documented (i.e., addenda).

The status designation (active or inactive) of a well determines the frequency of well inspection, the scope of the inspection, and the prioritization of maintenance. This WI&M plan formally adopts the status designation of each well assigned in the MOP and focuses resources on those well locations. This designation differs from past WI&M plans where all existing wells, boreholes, coreholes, and borings were included in the WI&M program.

The criteria for determining a well’s status designation are briefly summarized below. Active status is granted to:

- wells included in a regulatory program (Section 3.2),
- wells sampled specifically to address applicable groundwater monitoring requirements in DOE Orders 436.1 and 458.1,
- wells used to monitor groundwater surface elevations (referred to as hydrologic monitoring).

Changes to the status designation of a well are done with approval of the GWPP Program Manager and documented in an addendum to the MOP. Active status will also be granted to any newly installed well that meets GWPP’s design and construction standards, serves an ongoing regulatory program, and/or the programmatic needs of the GWPP. The status of the well may change if the well no longer meets any of the above criteria, the well has been damaged beyond repair, or at the discretion of the GWPP Program Manager (CNS, 2017).

Inactive status is granted to wells where:

- the well is not included in an active regulatory program,
- the well is not sampled specifically to address applicable groundwater monitoring requirements in DOE Orders 436.1 and 458.1,
- the design and construction details are unknown,
- the well components do not meet the technical standards of the GWPP or other requirements (e.g., all weather access),
- monitoring data are not available,
- the well monitors uncontaminated groundwater or provides redundant monitoring coverage with other wells (CNS, 2017).

The status of a well may change from inactive to active if (1) one of the above conditions changes and/or (2) at the discretion of the GWPP Program Manager. A well is removed from the active or inactive list if the well is damaged beyond repair and an official plugging and abandonment (P&A) request has been submitted.

There are two well inspection schedules for monitoring wells listed in the MOP: Annual and Triennial. Active wells are inspected annually for both primary (P) and secondary (S) inspection items (see discussion in Sections 3.2 and 3.3). Both the active and inactive wells are inspected on a triennial basis, and down-hole conditions are assessed at that time (by a well depth measurement). This differs from previous WI&M plans where the down-hole conditions were evaluated every year. In 2003, a review of the depth measurements revealed that there was little, if any, substantial change in the measured depths at each well observed over multiple years, unless sedimentation was an obvious problem (Section 3.3.3). Maintenance on wells is prioritized based on resources and need. Emphasis is placed on maintaining primary inspection items on all wells. Inactive wells are inspected for primary and secondary inspection items, but primary inspection items are given priority (Section 3.2).

3.2 Well Inspection and Maintenance Program

For each calendar year (CY) inspection event, the WI&M Coordinator compiles a list of wells from the MOP, includes/excludes wells added or removed from the MOP (addenda), and excludes all wells managed under “other programs” (active wells listed under “Regulatory Monitoring Programs” in the MOP). Currently, the Environmental Management Contractor to DOE, URS|CH2M Oak Ridge (UCOR), has the responsibility for performing regulatory monitoring for the: 1) Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA) Remedial Effectiveness and Records of Decision, 2) the four active Solid Waste Disposal Facility permits, and 3) the CERCLA Environmental Management and Waste Management Facility. In addition, UCOR has the responsibility for actively performing well maintenance on these wells.

The WI&M Coordinator continues to compile the list of wells from the MOP and will:

- remove any wells that have persistent, unsafe access problems, or are slated for P&A, but have not been removed from the MOP,
- compile well-specific information from the Subsurface Database (CNS, 2019) or past inspections for wells that have obstructions, dedicated pumps (that have to be pulled to get a depth measurement in wells with an inside diameter of 2.0 inches or less),

off-normal well-head configurations (pressure relief valves—no depth measurements), dedicated packers (no depth measurements), or flush-mount configurations, and

- communicate special instructions for known and/or posted well access requirements (off-road access, remote locations, construction areas, active landfill operations, radiological work permits, bar-gated and fenced areas, contact number for entry, and keys needed for access) to field personnel performing the well inspections.

The WI&M Coordinator groups the wells by geographic location and controlled access to Y-12 areas, and then provides field personnel with work packages assigned by group number. Each work package contains the list of wells to be inspected, the length of the screened or open interval of the well, the reference tag depth (see discussion in Section 3.3.4), special instructions (discussed above), and copies of well location maps. The program requirement is for all well inspections to be completed electronically, even if paper checklists are used in the field.

Field personnel are trained in accordance with procedure Y71-66-EC-214, *Monitoring Well Inspection and Depth Measurement* (CNS, 2020). Training is performed on an annual basis and qualifications are tracked and documented in Y-12 SAP business management database. The Environmental Sampling Services Coordinator is responsible for assuring that all field personnel are qualified and have been briefed on the hazards and controls associated with the task to be performed. Field personnel are required to review and approve the applicable Job Hazard Analysis (JHA) prior to starting any work. The WI&M Coordinator will schedule an annual kickoff meeting to discuss the inspection and maintenance work (and may include the sampling work that is to be conducted during that particular quarter).

Prior to performing well inspections, field personnel review work packages, all field information, and special instructions. Personnel gather appropriate equipment (weighted tape measures or taglines, bar gate keys, plastic sheeting, plastic bags, and decontamination supplies), obtain a vehicle (4-wheel drive, if required), and make arrangements for access (posted conditions or contact numbers). When performing well inspections, field personnel verify the physical condition of each well location (note any newly posted or access requirements), complete primary and secondary inspection items on the checklist (see Section 3.3), perform and record a depth measurement (if required), note whether dedicated monitoring equipment is present, note if the depth measurement was soft or hard, and note any other problems or anomalies. If the well inspection checklists are recorded on paper, the personnel performing the paper inspections are responsible for transferring this information to the appropriate electronic checklist, and then electronically uploading to the VALA database. The WI&M Coordinator, or designee, is then required to verify each checklist before it becomes a final record in the database. Field personnel report any abnormalities observed in the field and any items that require immediate attention to the WI&M Coordinator.

The WI&M Coordinator queries the VALA database for individual inspection items that require maintenance. Maintenance items are prioritized according to well status, primary or secondary inspection items, and available resources. For significant maintenance tasks (e.g., a flush-mount vault replacement or a concrete pad rebuild) a Service Notification is conveyed to FI&S. For ongoing minor tasks (such as weed eating or mowing around a well), requests for Infrastructure support will be made by phone calls,

E-mails, or personal visits rather than a Service Notification. For other minor tasks (such as replacing a lock or attaching an identification tag or label), GWPP personnel will personally perform the maintenance.

Beginning in CY 2020, a Well Services Subcontractor will also be available to perform monitoring well maintenance (especially down-hole maintenance work).

The WMR/R (see Appendix D) is the official record of GWPP maintenance activities, documenting the work requested, actual work performed, and noted exceptions. Each WMR/R is assigned a unique identifier: the first two digits designate the CY, followed by a unique three-digit number (typically assigned chronologically), and a P or an S (depending on whether the maintenance need is to a primary or secondary inspection item).

The service provider may perform a walk-down of the requested work, provide input, and a cost estimate based on the scope of work. The maintenance work is performed by the service provider in accordance with the scope of the technical specifications provided by the WI&M Coordinator. All maintenance work is inspected for completeness and any problems, comments, or deviations from the agreed upon scope of work is documented (where work cannot be completed as requested) on the WMR/R.

After the work is completed, the WMR/R is finalized (the work inspected and the WMR/R signed and approved) indicating the type of maintenance requested (P or S) and a detailed description of the maintenance work completed. The completed WMR/Rs will be compiled in the triennial WI&M Report.

If the condition of a primary inspection item is beyond practical remediation or if the well is damaged beyond repair, the WI&M Coordinator can initiate a P&A request (Appendix D) and submit it to the GWPP Program Manager for approval.

The P&A request documents:

- the reason for P&A (including comments/explanation for the P&A),
- the individual submitting the P&A request (including the date the request was submitted),
- licensed driller who performs the P&A (including the date the P&A was completed),
- all P&A documentation of the event (daily log sheets, diagrams, etc.).

Each P&A request is given a unique identifier: the first two digits designate the CY, followed by a unique three-digit number (typically assigned chronologically) and “P/A” (to identify it as a Plugging and Abandonment Request). The well is removed from the active or inactive well list in the MOP when the P&A has been performed and approved. The status of the well in GIMS is changed to “P&A,” and the date of the P&A is entered.

Well inspection checklists, along with completed WMR/Rs and P&A requests, are published in a triennial WI&M Report, as specified in Section 3.4.

3.3 Well Inspection Items (Well Components)

Active and inactive wells under the GWPP WI&M Program are inspected for both primary and secondary inspection items - each relating to a specific well component. Note: generalized schematic diagrams of monitoring well components are found in Appendix B. Primary (P) inspection items are those well components that ensure representative subsurface conditions for sampling and hydrologic monitoring purposes. These components include the condition of the well casing, well security, well identification, and the down-hole condition of the screened or open interval. Because the primary inspection items are crucial to the well's integrity and its ability to provide representative data, these inspection items are given a higher priority for maintenance. Secondary (S) inspection items are those components of a monitoring well that, if damaged or compromised, will not generally affect the collection of representative groundwater analytical samples or hydrologic information. These items include well access, concrete pad, and protective posts.

3.3.1 Well Casing (Primary Inspection Item)

Well casing diameter, material type, and construction have varied dramatically over the last 25 years of well installations at Y-12. Well casing type was often dependent upon the project/program requirements, the drilling subcontractor, the well's depth, and the original purpose of the installation (hydrogeologic study, corehole, piezometer, water table well, bedrock well, or regulatory compliance well). In general, two types of monitoring wells are installed at Y-12: wells completed with screened intervals and wells completed with open-hole monitoring intervals (open borehole below the cased section of the well).

Screened wells typically are used for monitoring groundwater in both unconsolidated and bedrock zones. Open-hole monitoring wells are used primarily for monitoring groundwater conditions in the competent bedrock interval. Most wells have a surface casing to hold the borehole open in the unconsolidated and weathered bedrock zones during construction and prevent cross-contamination between the various aquifers. A smaller diameter riser casing is installed to the monitoring interval. Other types of holes that exist at Y-12, constructed for the purpose of subsurface investigations (or sampling) include: coreholes, boreholes, drive-point wells, piezometers/temporary wells (typically 1-inch or less in diameter), and open borehole wells instrumented/installed with dedicated sampling devices (Section 3.3.2). The well configurations on these holes are similar to those described below.

For monitoring wells that have a screened interval, the well (riser) casing and screen are typically constructed of either stainless steel (SS) or polyvinyl chloride (PVC) material. Wells constructed of PVC require an outer protective casing which encases the inner riser casing stick-up, i.e., the casing that extends above the ground surface. However, older generation PVC wells or small diameter drive-points/piezometers usually do not have this protective casing. This can be an extension of surface casing (mentioned earlier) extending above ground surface, or an outer protective casing installed after the installation of the well (Appendix B, Fig. 4). The outer protective surface casing provides additional protection against vehicular damage (e.g., PVC riser casing is easily damaged), provides well security, and protects the PVC casing from degradation from direct sunlight. Wells constructed of SS normally do not require an outer protective

surface casing (Appendix B, Fig. 5), but it was sometimes installed for 2-inch SS wells to provide additional protection. Bedrock wells with open-hole intervals are constructed with steel well casings which are often extended above the ground surface, and serve as a protective casing (Appendix B, Fig. 7).

Riser casings and outer protective surface casings are inspected for signs of physical deterioration or damage, such as cracks, corrosion, breaks, dents, and bends that can affect the structural integrity of the well. Any well casing that has sustained damage should be noted on the well inspection checklist. Also, any exposed portion of the annular grout seal (see Appendix B, Figs. 4 and 5; not normally seen on most wells) should be inspected for signs of deterioration (e.g., loose casing), for cracks and breaks due to degradation, or from wells that have experienced damage. For wells where it is possible for water to collect between the outer protective surface casing and the well casing itself, a weep-hole must be installed in the outer protective casing to allow the water to drain and prevent freezing damage to the well casing (stick-up).

Wells with a flush-mount design are typically employed in high traffic areas of Y-12 (Appendix B, Fig. 6). The riser casing is cut off below the ground surface, and the uppermost portion of the well casing is housed below grade inside a vault manhole enclosure, or Christy® box, with a traffic cover that bolts securely to the flush-mount enclosure. In addition to standard inspection items, flush-mounted wells will be inspected for the following:

- the presence of an intact concrete apron (pad) around the manhole enclosure and whether the enclosure is installed slightly elevated above grade with the concrete apron sloping away from the well;
- the presence of a gasket seal for the traffic cover and its condition (does not allow water to enter the manhole enclosure);
- whether the traffic cover is securely bolted to the manhole enclosure;
- whether water collects inside the manhole enclosure; and
- the presence of a water-tight locking cap (sometimes called a “pipe plug”), the condition of the cap, and whether it makes a water-tight seal with the casing.

Casing maintenance may involve:

- replacing or extending the outer protective casing (or riser casing) portion that is above ground;
- adding outer protective casing around the riser casing;
- replacing/repairing the vault manhole enclosure/Christy® box for flush-mounted wells;
- adding grout in the annular space between the well casing and the outer protective casing; and
- repairing the annular grout near the ground surface (if the casing is loose).

3.3.2 Well Security (Primary Inspection Item)

To prevent unauthorized access, all monitoring wells at Y-12 are secured with stainless steel or brass locks. The type of well cap and locking configuration is based on the type and diameter of the riser casing, or the outer protective casing, and whether a dedicated bladder pump (Well Wizard™) or monitoring system (Westbay® Instrumentation or BarCad® unit) is installed in the well. Wells with stainless steel casings normally have a

stainless steel slip-on well cap that locks through aligned hasps welded to the cap and to the outside of the well casing (Appendix B, Fig. 8). PVC wells, with no outer protective casing, usually have a locking water-tight well cap (sometimes called “pipe plug”) with a slip-on PVC cap. For a PVC casing with an outer protective casing (typically 6 inches in diameter), an aluminum casing lid (some have a square carbon steel casing with welded hasp) slips on over a hasp or a post welded to the outside of the protective casing (Appendix B, Fig. 8). For steel casing wells (open-interval bedrock wells that are 4 inch, 7 inch, or 10 inch in diameter), an aluminum slip-on Royers™-type collar bolts to the top of the casing and the manufactured lid slips over the collar (Appendix B, Fig. 8). There is a machined hole in the lid and a corresponding hole on the collar to lock the lid. This design is typical of all wells with a steel protective casing (usually 7 inch or 10 inch in diameter). For flush mounted wells (Appendix B, Fig. 7), a lockable water tight cap is required, independent of casing type or diameter.

Wells installed with dedicated Well Wizard™ (WW) sample pumps have a different well cap and locking configuration (Appendix B, Figs. 9 and 10) than those previously listed. The WW cap contains the connection fittings to operate the bladder pump which is suspended by tubing below the cap. The different WW cap styles depend on the casing type, diameter, and the year the pumps were purchased and deployed. Most wells with dedicated WW pumps have a white PVC WW cap (Appendix B, Fig. 9). The base is actually a casing extension piece that slips on over the well casing or the outer protective casing. A plate that holds the tubing fittings, from which the pump is suspended, rests on a ledge inside the casing extension piece. A top cap is secured to the casing extension piece with a locking pin that slips through the extension piece, locking the cap in place. Wells with dedicated WW pumps purchased in recent years have a low clearance cap (LCC), which rests on top of the well casing with the pump and tubing suspended below. These LCCs fit underneath the existing well caps (described above) which use the existing well cap, hasps, and lock (Appendix B, Fig. 10).

The addition of these white PVC WW caps raise the reference measurement point from the top of the well casing (TOC) to the top of the WW (TOWW) cap (Section 3.3.3.). This change in measurement point (MP) must be noted when making a total depth measurement to assess down-hole conditions of the well. In most cases, the difference in height of going from a TOC MP to a TOWW MP has already been determined for the majority of the wells at Y-12.

Locks are inspected for corrosion and operation of the locking mechanism. All wells should have an assigned Y-series lock, each with a unique number (i.e., Y0668). Hasps are visually inspected for corrosion, damage, and the overall condition of the welds. Hasps or hinges found to be substantially corroded will be replaced. Locks that are corroded or difficult to operate will be replaced. No lubricants will be used to improve performance of the lock mechanism because these substances may detrimentally impact water quality samples collected from the well. If a well shows evidence of tampering (i.e., bolt-cut locks or broken hasps), the inspection personnel will notify the WI&M Coordinator for further action. Well caps are inspected for snugness to the casing, and should not be removable without removing the lock first. Inspect all WW caps and extension pieces for damage, cracks, or looseness. Wells with missing caps and locks should be reported to the WI&M Coordinator immediately.

3.3.3 Well Identification (Primary Inspection Item)

Correct well identification is crucial for tracking all subsequent sampling and monitoring data obtained from the well. All monitoring wells must be accurately identified. All monitoring wells are required to have a well tag—a stainless steel or aluminum plate (Appendix B, Fig. 11) engraved, stamped, or etched with the well identification number. The well identification tag is attached to the riser casing, or to the outer protective casing, using a stainless steel cable (1/16 inch in diameter) or an aluminum ring threaded through a stainless steel pipe band that tightens to the casing. The well identification tag should be inspected to ensure that the well number is legible and correct. Tags with illegible or incorrect well numbers will be replaced. Field personnel must verify that the well identification tag corresponds to maps provided in the latest revision of the Subsurface Database (CNS, 2019). Additional well identification may also be present that includes the well number engraved on the well cap, well number written on the well cap or casing, the well number stenciled (painted) on the casing, or an adhesive label (Appendix B, Fig. 12). Stenciling is the recommended secondary identification method, but the well identification tag is required for all wells.

3.3.4 Down-hole Condition of the Screened or Open Interval (Primary Inspection Item)

The down-hole condition of the screened or open interval can only be evaluated directly through the use of a down-hole video camera or the analysis of well performance information (e.g. hydraulic conductivity, pumping rates, specific yield, pumping duration), which is beyond the scope of this plan. For example, well screen deterioration caused by chemical or biological incrustation can result in substantial reduction in well yield (Driscoll, 1986). Depth measurement is the standard direct method of measuring any change in the down-hole physical condition of a well. By comparing these measurements to a reference depth (see discussion below) it can be determined if changes are occurring in the condition of the monitoring interval due to differences in the measured and reference depths. Significant differences (>20% of the screened or open interval) between the measured depth and the reference depth may indicate:

- field measurement errors (e.g., wrong well, recording errors, or incorrect measurement reference point used); errors in the weighted tape used to measure the depth (e.g., stretching, can't read tape increment); or MP changes due to casing length changes (e.g., construction), or
- accumulation of sediment or other debris (encrustation byproducts) in the bottom of the well, or
- obstructions in the well which would provide an inaccurate depth measurement possibly caused by: 1) structural failure of the well casing or screen, 2) cave-in of the borehole wall within the open interval of the well, 3) instrumentation stuck in the well, or 4) snagging of measurement device due to down-hole orientation of casing or screen joints and the degree of vertical deviation of the well.

Many wells at Y-12 exhibit accumulations of sediment, which may eventually fill/plug the screened or open interval if it is not removed by redevelopment. This sediment can affect the performance of the well and the quality of analytical samples obtained from the well. The accumulation of sediment in the bottom of a well accounts for the differences between the reference depth (see discussion below) and the measured depth. Depth

measurements are taken in accordance with Y-12 procedure Y71-66-EC-214, *Monitoring Well Inspection and Depth Measurement* (CNS, 2020).

All depth measurements are taken from a reference mark (designated official reference/corrected MP) located either at the top of the innermost casing (riser casing, not the outer protective casing) recorded as feet below TOC, or from the top of the white PVC WW extension piece, recorded as feet below TOWW. These are recorded to the nearest hundredth of a foot. The WW extension piece can extend the height of the riser casing (from 0.2 foot to 1.0 foot or more depending on cap design (see Appendix B; Fig. 9). The percentage of sediment accumulation in the screen or open interval of a well is calculated by subtracting the measured depth (made from the official measurement point at the top of the casing or WW) from the reference depth ("well reference depth" recorded on the paper checklist), dividing that difference by the length of the screened or open interval, and then multiplying 100. When completing the well inspection checklist electronically, the well inspection program in the inspection checklist application automatically calculates the percentage of the screen/open interval that is blocked by sediment.

In previous WI&M plans, the constructed depth was used as the reference depth ("well depth" on the checklist, see Appendix C). The constructed depth is a calculated value based on well construction details provided in the Subsurface Database (CNS, 2019). Because there have been unexplained differences between the original well construction data and what is observed in the field, problems arose when using these constructed depth values in the calculation to determine the amount of sediment accumulation in a well. Discrepancies included the measured depth being several feet deeper, or shallower, than the constructed depth over several measurements. However, there was no other indication of sediment accumulation, obstruction and/or equipment in the well or any other structural failure in the well.

These discrepancies were first noted in the 1991 *Well Inspection and Maintenance Plan* (MMES 1991) and in subsequent published annual well inspection and maintenance reports through CY 2002 (BWXT 2002, BWXT 2003b, BWXT 2004). A number of inspections revealed these discrepancies were substantial, and remained consistent over several inspection events. Starting with the CY 2003 well inspection event, an agreed upon reference depth was used. Referred to as the "reference tag depth," it was based on several past depth measurements (obtained in CYs 1994, 1997, and 2000). This reference tag depth was used in lieu of the constructed depth (BWXT, 2002). These reference tag depths (see Appendix E) will be utilized in all future well inspections and updated as necessary. As of this publication, Appendix E includes the reference tag depth for all wells that are inspected by the GWPP. Wells inspected by the GWPP include wells granted active or inactive status in the MOP (CNS, 2017), wells from which the GWPP obtains annual water level data, and wells that are sampled by the GWPP.

The WI&M Coordinator provides additional well-specific information to field personnel (Section 3.2) for wells that have obstructions or dedicated pumps in the well. For all 2-inch wells, dedicated sampling equipment will need to be removed prior to performing a depth measurement. During pump removal, groundwater from the sampling equipment will need to be contained as directed in the GWPP Waste Management Plan (found in the most recent edition of the GWPP Sampling and Analysis Plan). Field personnel are required to note any other abnormalities, different than the information

provided, or note any other reason that the measured depth differs significantly from the well depth. Field personnel are also required to indicate whether a depth measurement was hard or soft (an indicator of possible sediment buildup at the bottom of the well), and to report the amount of any mud observed on the weighted tape when it has been removed from the well.

Where the measured and reference tag depths differ substantially, the WI&M Coordinator must determine if:

- a field measurement error occurred,
- the measurement did not pass an obstruction or dedicated instrumentation,
- a new obstruction has occurred,
- sedimentation has occurred, or
- a structural failure has occurred.

3.3.5 Well Access (Secondary Inspection Item)

Well access road conditions range from paved (asphalt and/or concrete) to gravel and/or dirt/grass. Groundwater monitoring wells must be accessible in all weather conditions. Most well sites inside the fenced section of Y-12 are paved and easily accessible. Well access roads comprised of gravel, dirt, or grass, are common outside the fenced area of Y-12 and may or may not be maintained for use by another organization (security, power operations, landfill operations, etc.). These roads are more susceptible to damage with heavy use, heavy equipment (mowers), and continual exposure and erosion over time (washouts, ruts, gullies, and potholes). These roads require continual maintenance, ranging from mowing (roads become quickly overgrown presenting visibility limitations for the driver) to re-gravelling and re-grading.

Well access for all road types should be inspected to identify conditions that require maintenance (overgrown conditions, gullies, erosion of the road surface, or culvert damage) or preclude access to the wells (e.g., construction activities, impassible roads, newly posted conditions, or fallen trees). Access restrictions and requirements not already provided by WI&M Coordinator (Section 3.2) should be noted on the inspection checklist. Any new conditions or restrictions should be noted and communicated to the WI&M Coordinator. Maintenance involves mowing, bush hogging, weed-eating, and removal of obstacles blocking the access road (e.g., construction fencing, fallen trees, equipment, storage material, jersey barriers, and temporary buildings). Repairing and re-grading road surfaces will be done on an as-needed basis and dependent upon well status and available resources. Maintenance may also involve removing barriers that block access to wells.

3.3.6 Concrete Pad (Secondary Inspection Item)

Concrete pads are used to prevent infiltration of surface water (and subsequently surface contamination) through the annular space between the borehole and the casing. A surface pad (3 × 3 × 0.75 foot, minimum) of concrete is placed (Appendix B, Fig. 13) around the outermost casing. Concrete pads are present for most active monitoring wells, but wells installed prior to 1986 may or may not have a pad. The installation or repair of concrete pads at the wells will be evaluated on a case-by-case basis.

The top of the concrete pad should be a minimum of 3 inches above ground level and sloped away from the well to prevent water from ponding around the well casing or protective surface casing. Inspection of the concrete pad will include identifying any damage (cracks, breaks, deterioration), and determining whether the top of the concrete pad is properly sloped. Maintenance may include patching cracks, patching damaged or deteriorated areas of the pad, replacing the pad, stabilizing the existing pad, or placing additional concrete to ensure that the pad is properly sloped.

3.3.7 Protective Posts (Secondary Inspection Item)

Protective posts, guard posts, or bollards are required for all active monitoring wells, to protect the exposed riser casing stick-up (portion above ground surface) from collision damage (e.g., mowing equipment, vehicular traffic, heavy equipment). Up to four posts are typically installed around each monitoring well, with a minimum of 3 feet of the post below the ground surface (Appendix B, Fig. 14). Posts are generally located at the corners of the concrete pad, and painted high-traffic yellow (for visibility), or provided with an appropriately colored durable plastic sleeve. Placement of the posts should protect the well from all potential traffic approaches (normally 4 feet to 5 feet apart). The height of the posts (a minimum of 3 feet above ground surface) should protect the well from collision damage and allow work-over rigs and sampling vehicles access to the well. The posts should be inspected for physical damage or deterioration, paint degradation, and proper positioning. Maintenance will generally involve repainting or the installation of plastic bollard sleeves, but damaged posts must be replaced and additional posts may be installed if conditions warrant.

3.4 Recordkeeping and Reporting

The records generated by the Well Inspection and Maintenance Program include:

- well inspection checklists (annual and triennial),
- well maintenance requests/reports and supporting documentation (generated as needed),
- plugging and abandonment requests and supporting documentation (generated as needed), and
- Monitoring Well Inspection and Maintenance Reports.

Through CY 2002, well inspection and maintenance records had been published in annual Well Inspection and Maintenance Reports for the year in which they were generated. Since CY 2009, inspection records have been recorded electronically and uploaded directly into the VALA database. Following the CY 2003 well inspection event, publishing of the WI&M Report has been on a triennial basis and includes a well inspection/maintenance summary for each year's inspections, the checklists from the triennial well inspection event, and all well maintenance requests and P&A requests (and associated supporting documentation) that were issued and completed since the last WI&M report.

A record copy of this WI&M plan is kept on file by the GWPP and Y-12 Central Records. This plan will be reviewed periodically for obsolescence, and updated as needed to reflect current business practices of the WI&M program. The status designation of wells

(active and inactive), as specified in the MOP, is not static and any changes to this status will be documented in addenda to the MOP.

Training records of field personnel to Procedure Y71-66-EC-214, *Monitoring Well Inspection and Depth Measurement*, are maintained in Y-12 SAP business management database.

4.0 REFERENCES

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APPENDIX A: FIGURES

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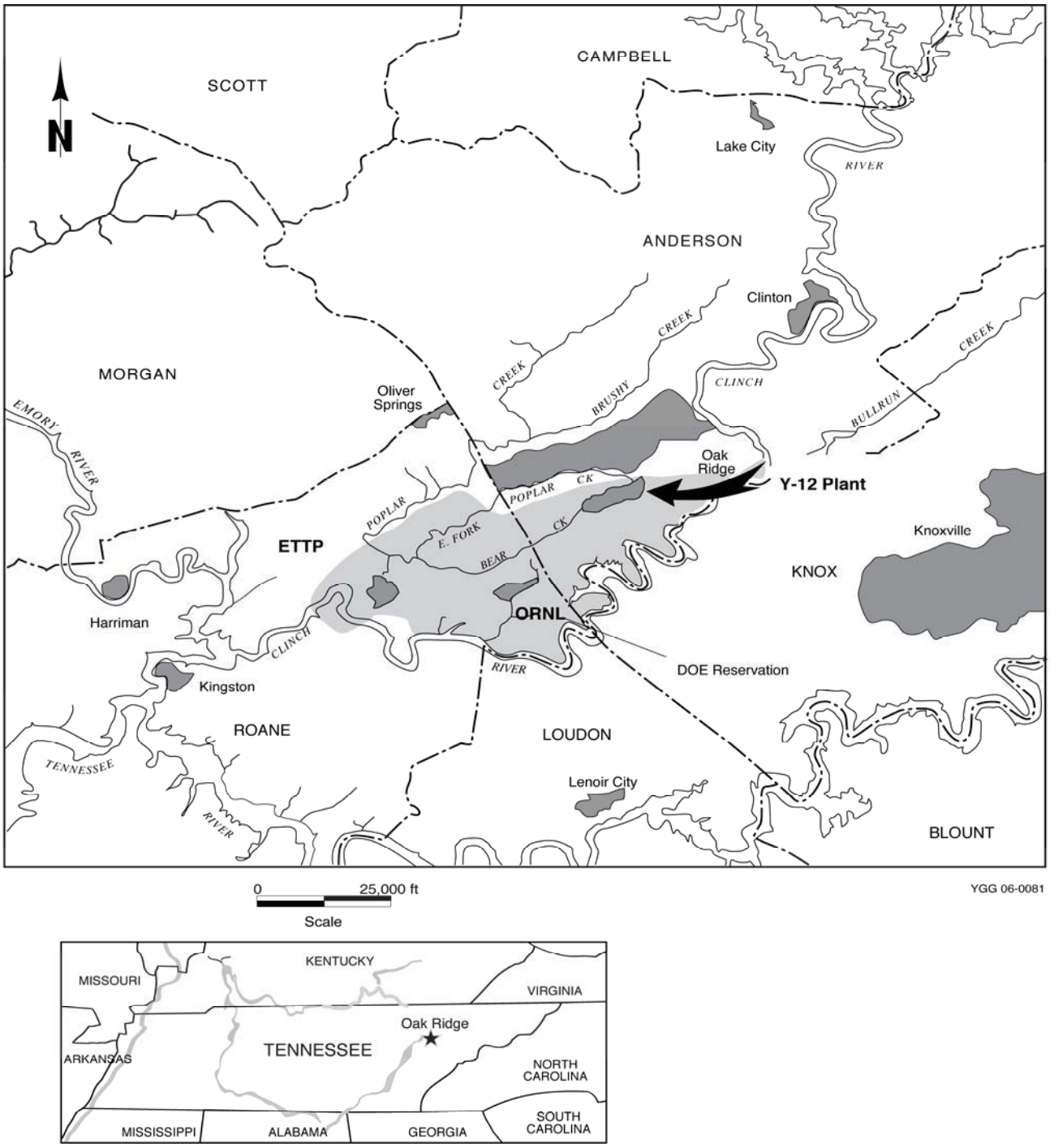

Fig. 1. Generalized location of the Y-12 National Security Complex.

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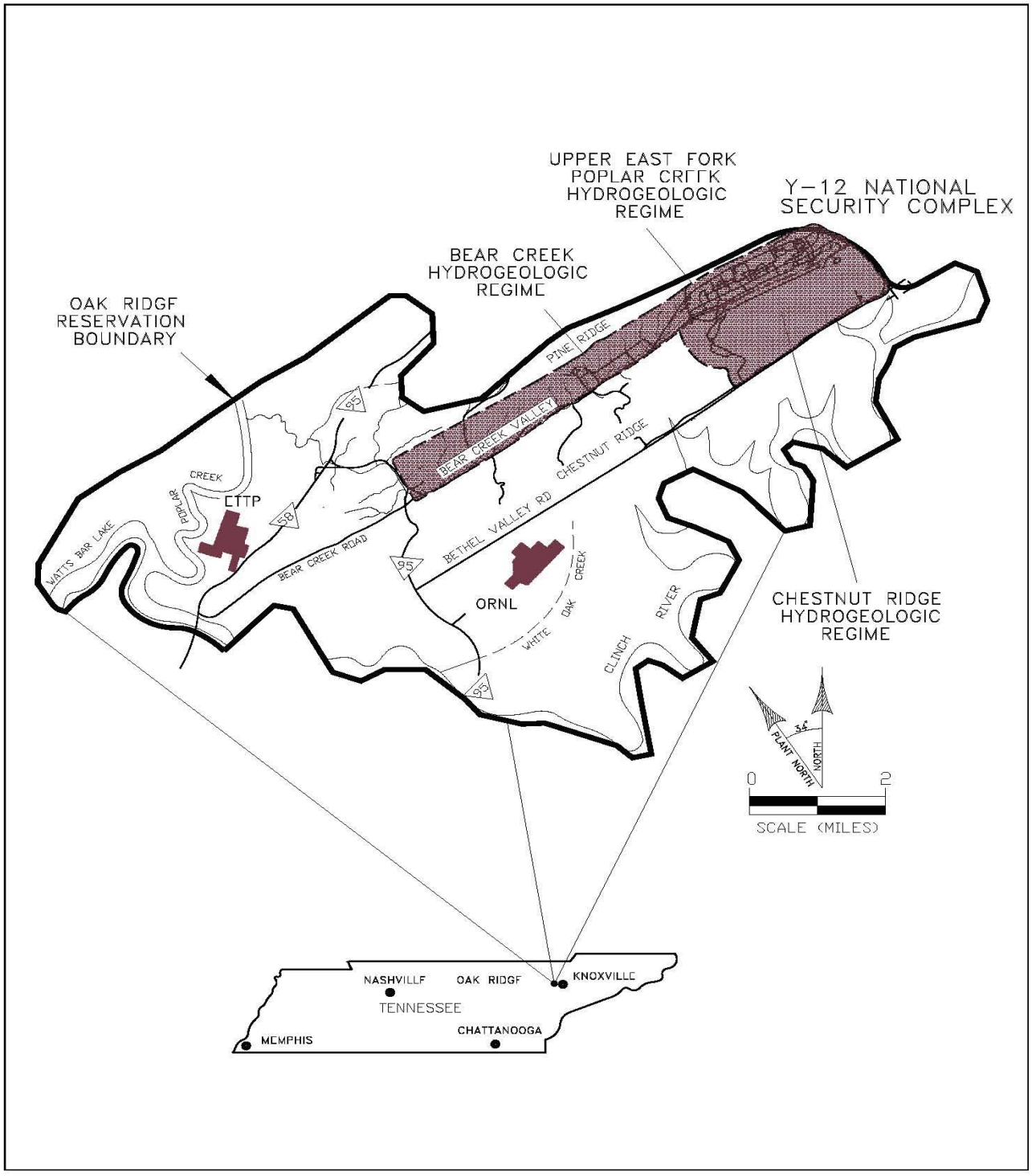

Fig. 2. Hydrogeologic regimes at the Y-12 National Security Complex.

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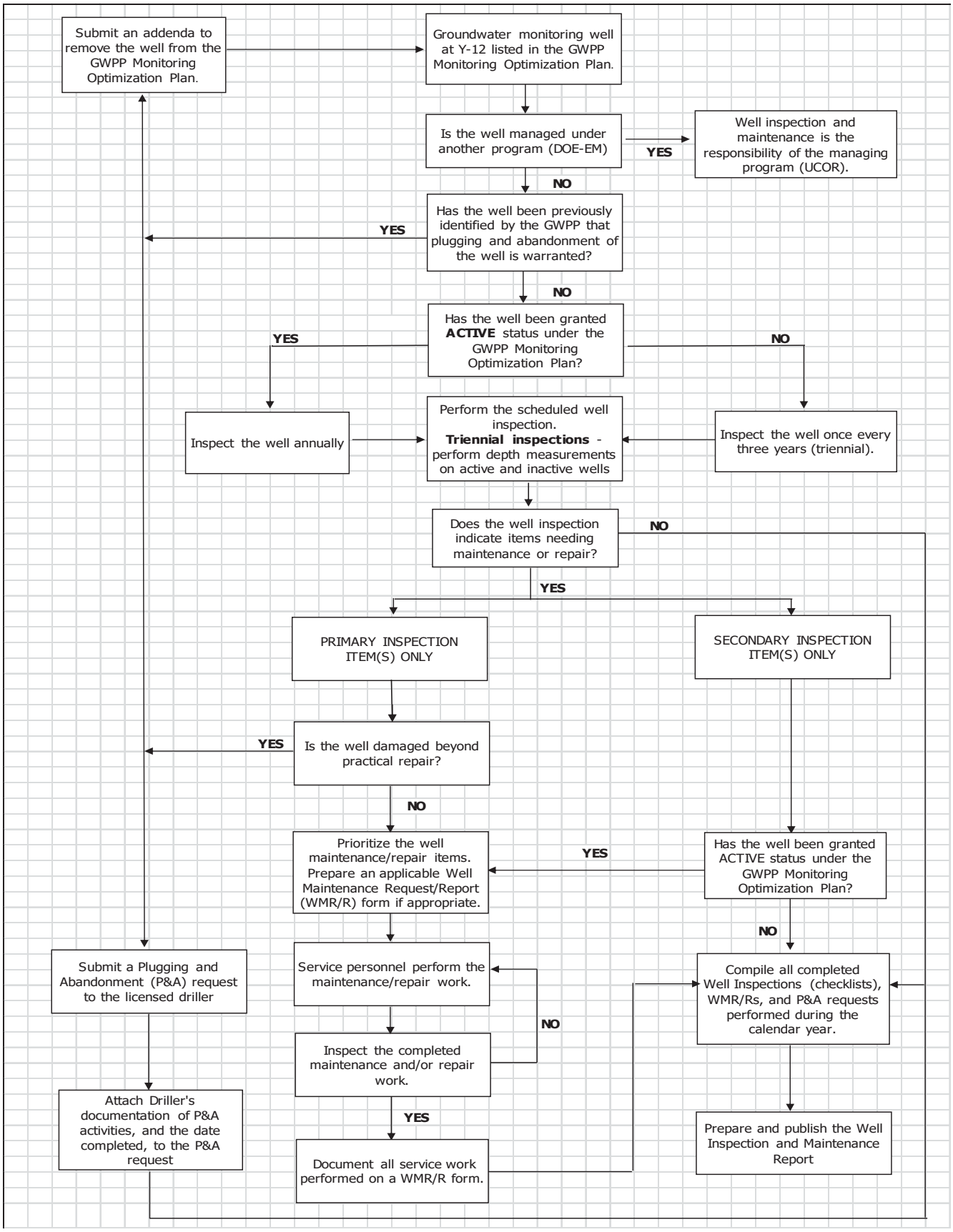

Fig.3. Y-12 GWPP Monitoring Well Inspection and Maintenance Program Decision Flowchart

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APPENDIX B: WELL COMPONENT SPECIFICATIONS

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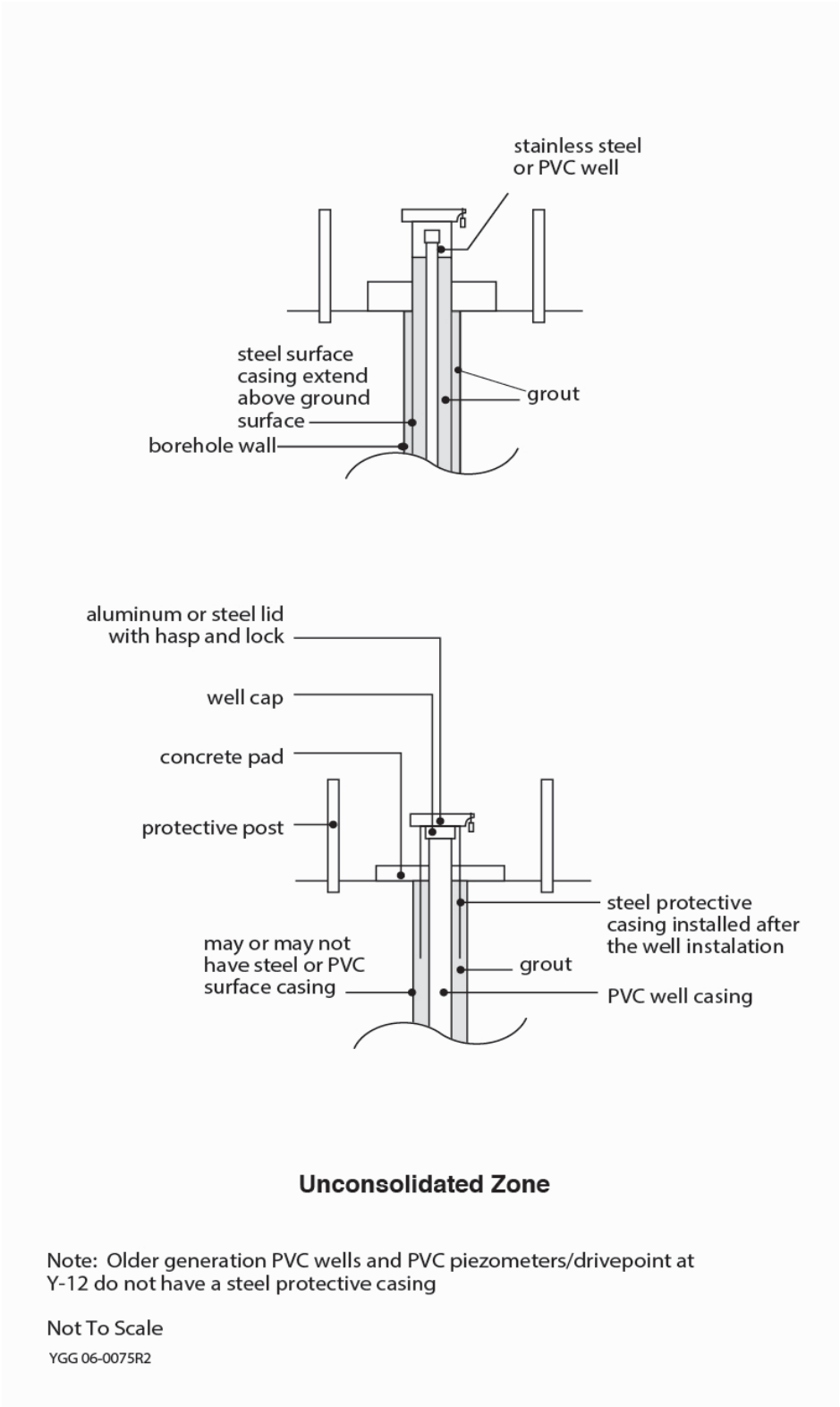

Fig. 4. Generalized schematic of outer protective surface casing for PVC and stainless steel wells in unconsolidated and bedrock zone.

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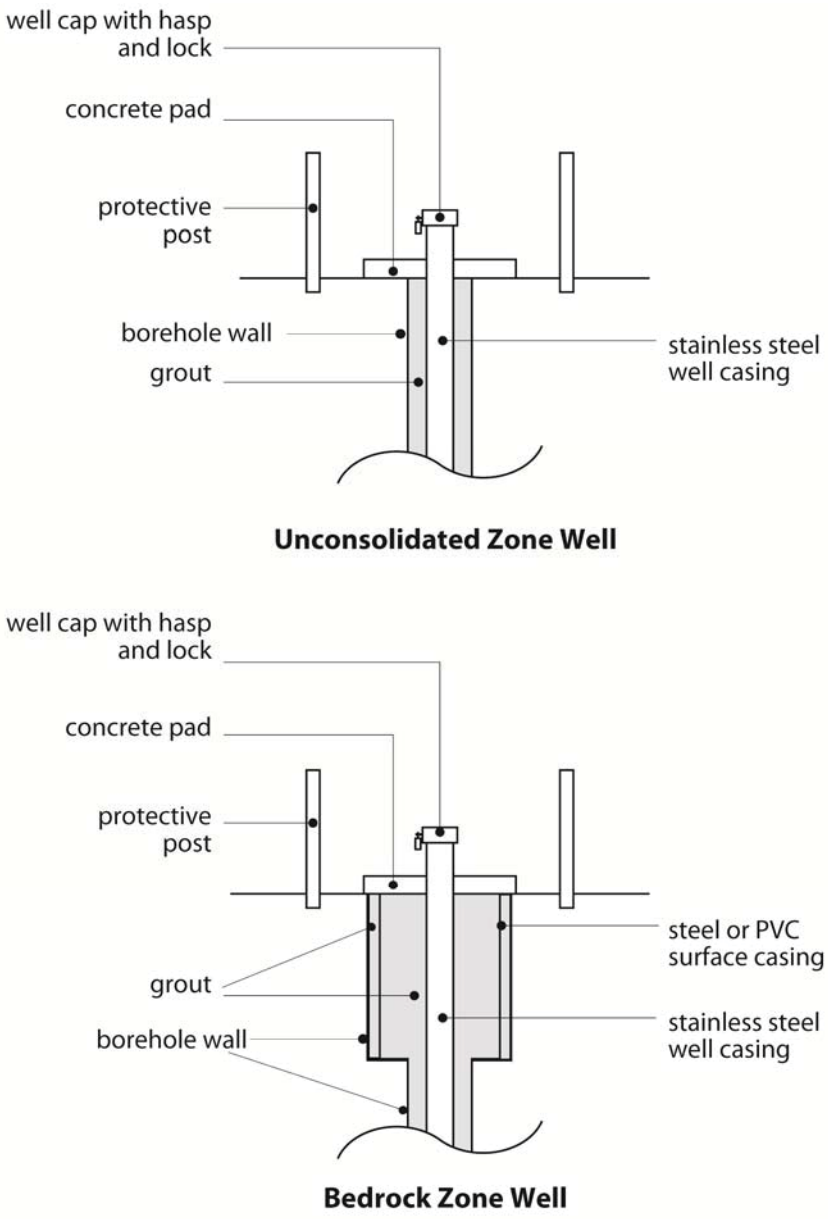

Fig. 5. Generalized schematic of stainless steel cased wells with screened intervals.

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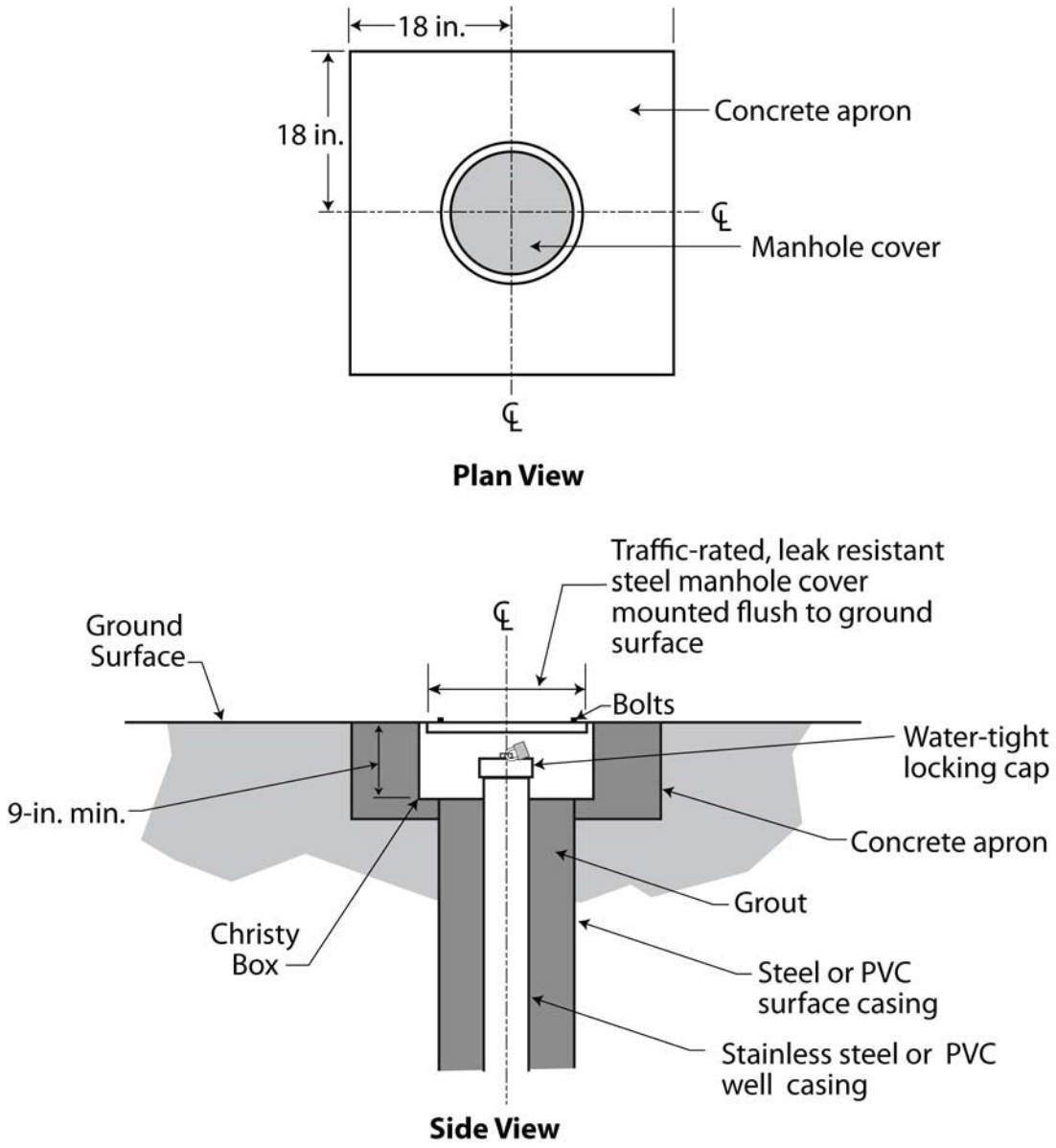

Fig. 6. Generalized schematic for wells completed with flush-mount vault (Christy® box).

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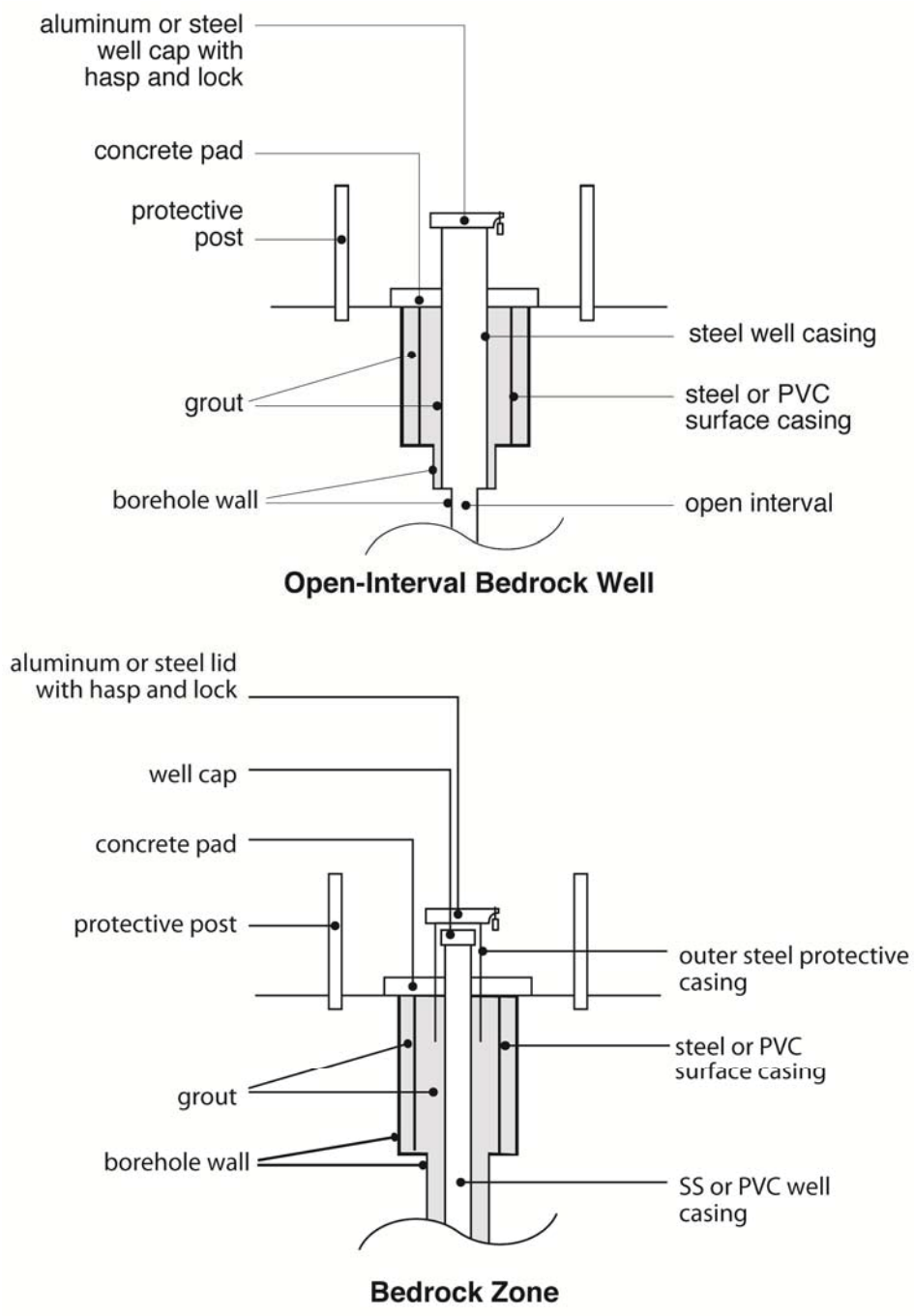

Fig. 7. Generalized schematic of steel cased wells with an open monitoring interval in bedrock.

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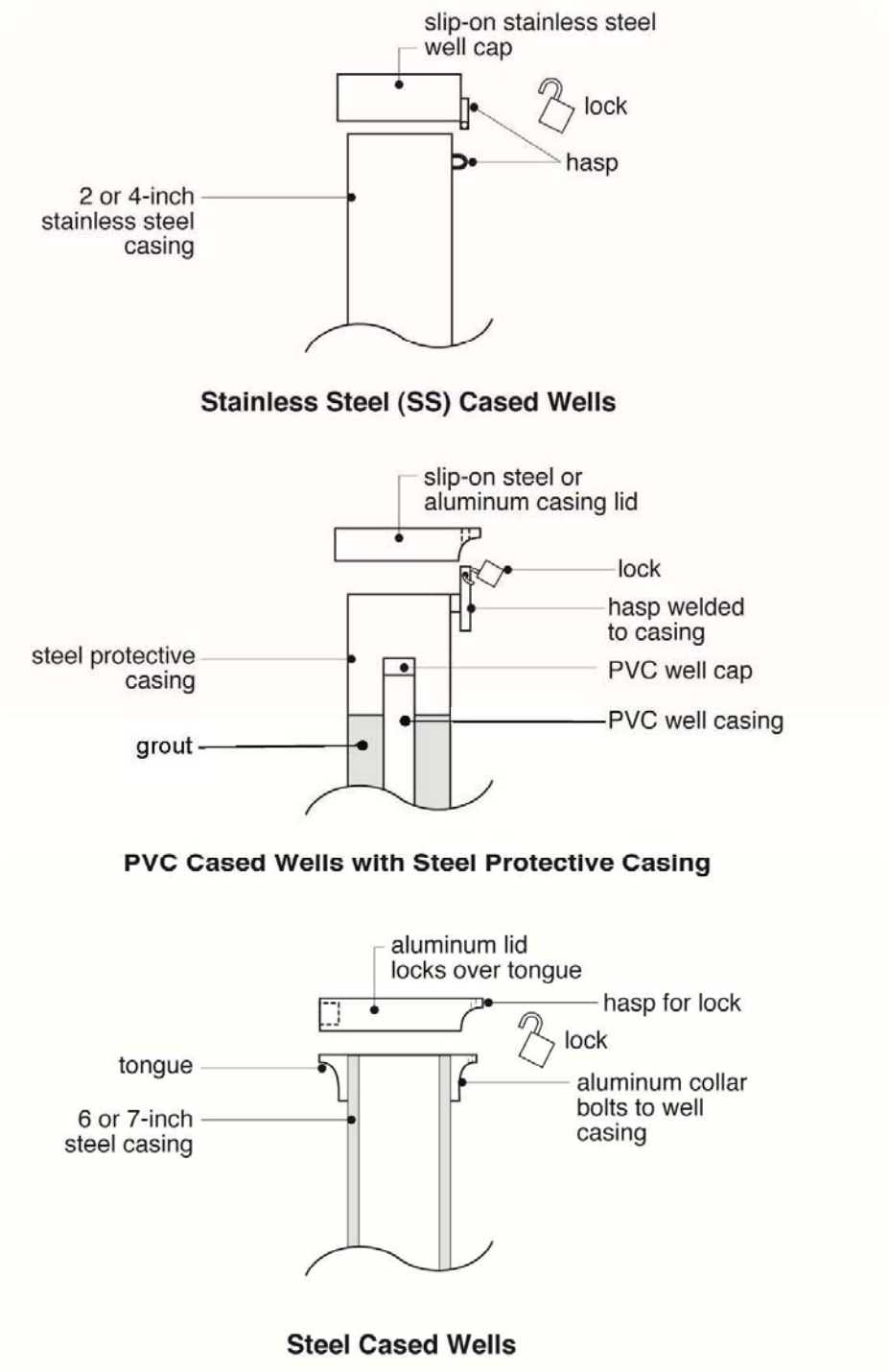

Fig. 8. Generalized schematics of typical well-head configurations with cap, hasp, and lock.

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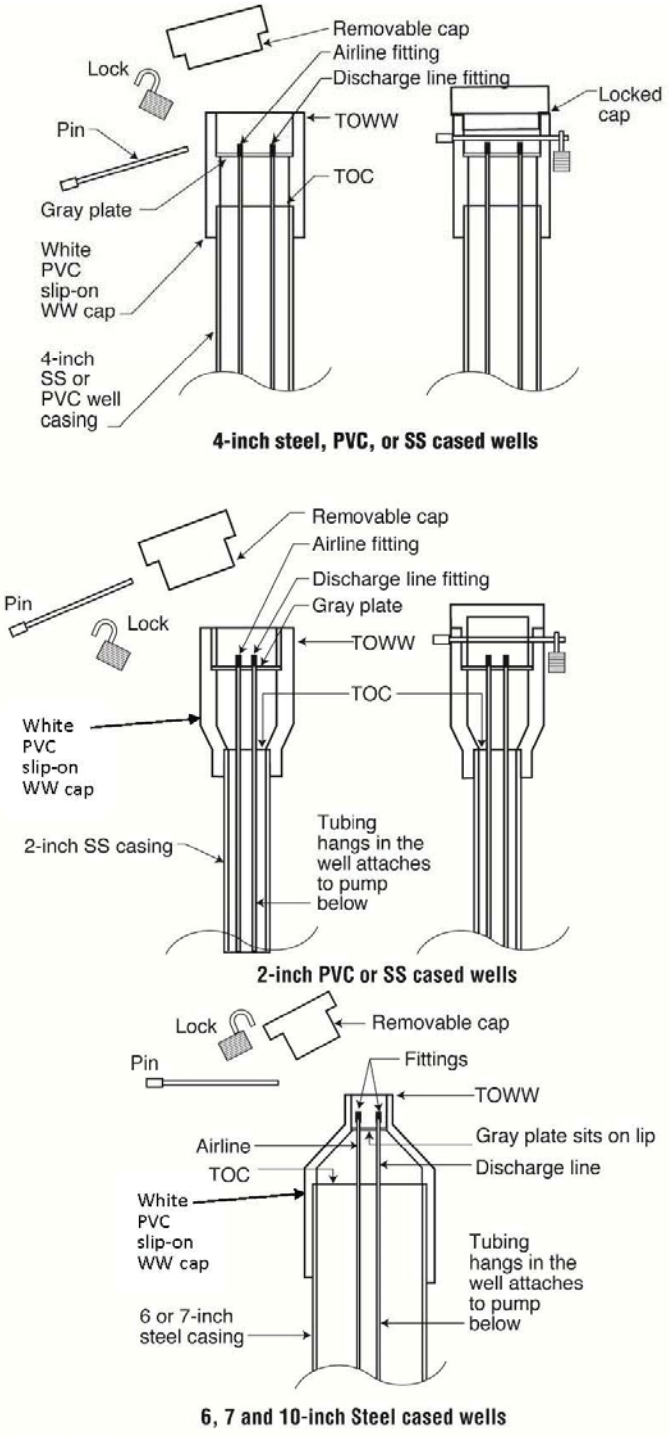

Fig. 9. Schematic of different configurations with Well Wizard™ dedicated equipment.

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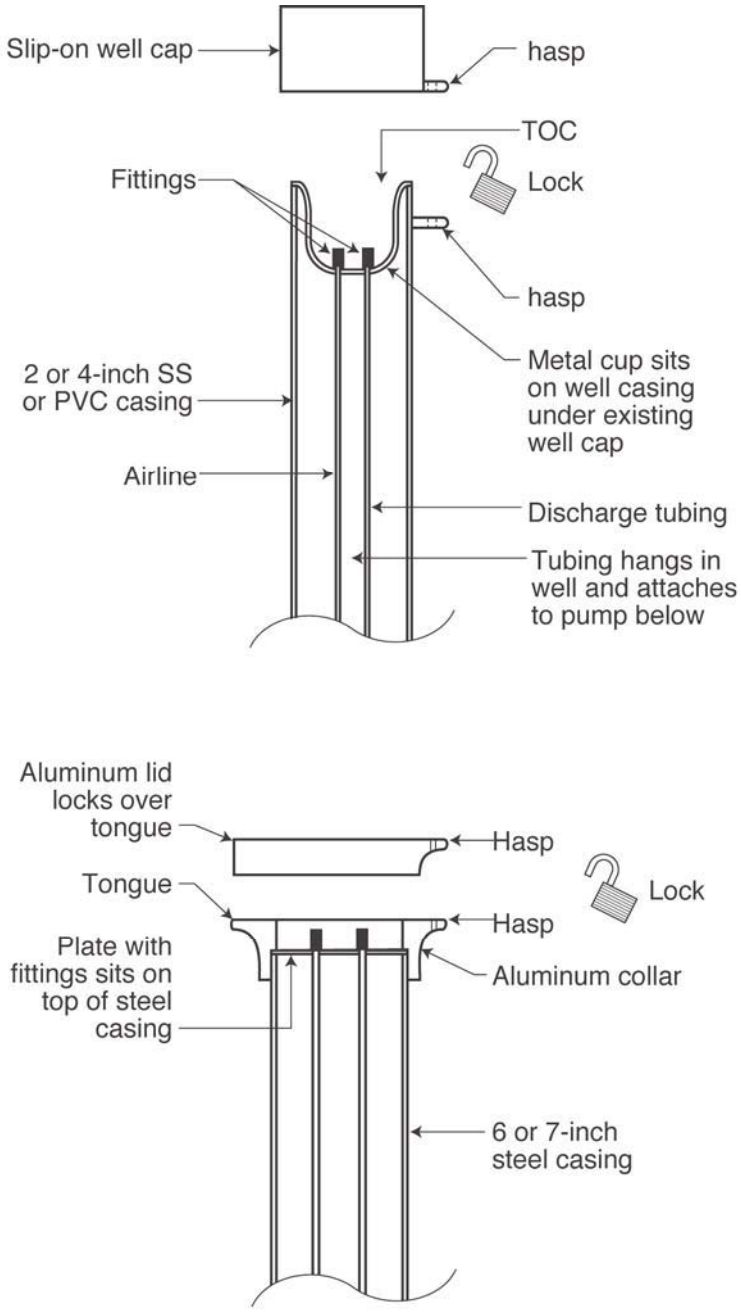

Fig. 10. Well Wizard™ with low clearance caps.

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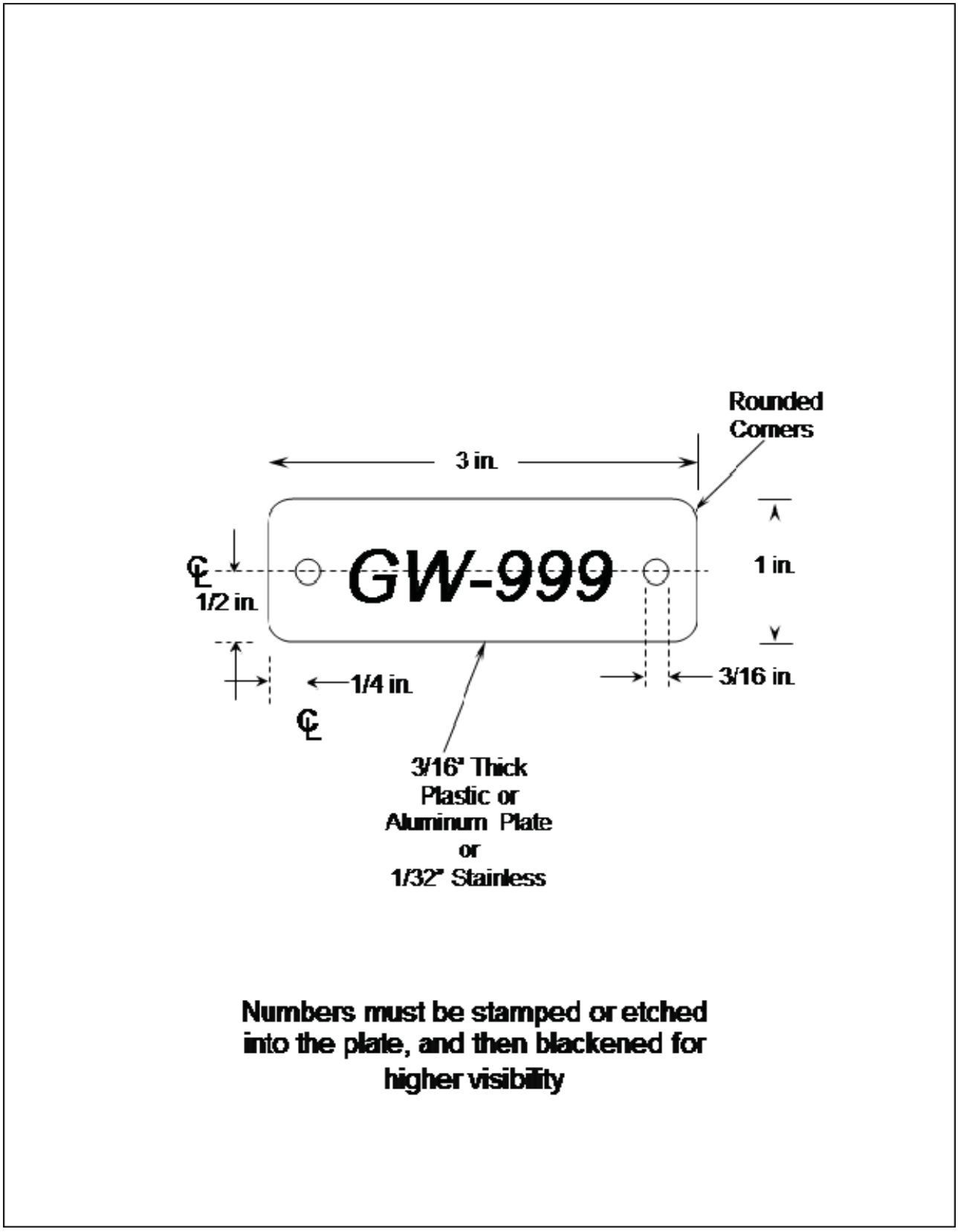

Fig. 11. Typical well identification tag.

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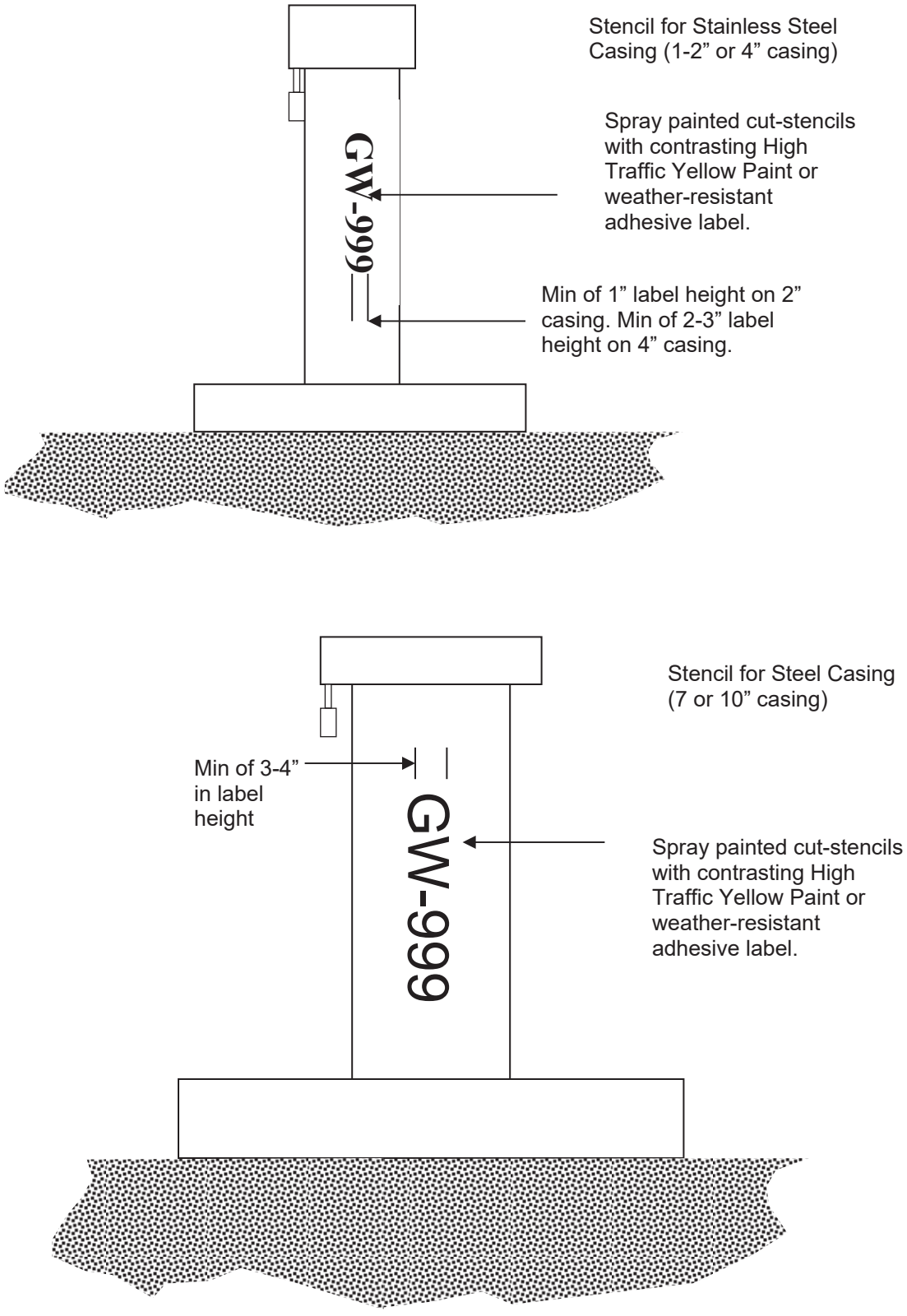

Fig. 12. Typical casing stencils.

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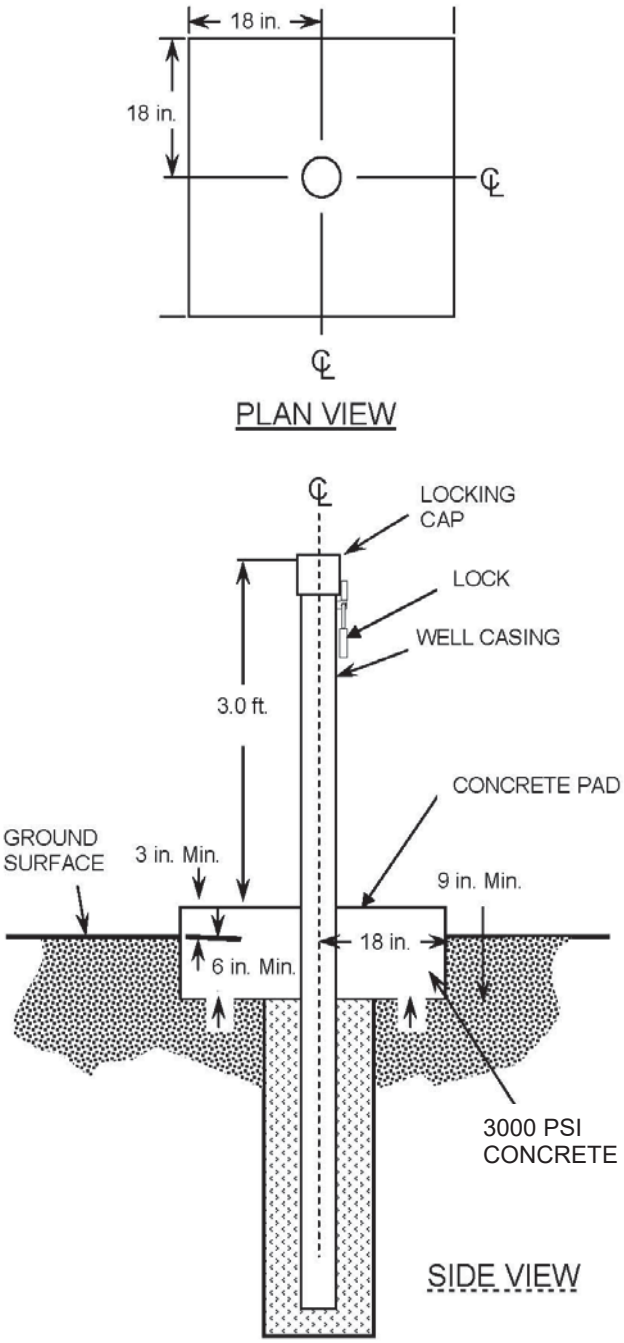

Fig. 13. Typical concrete pad.

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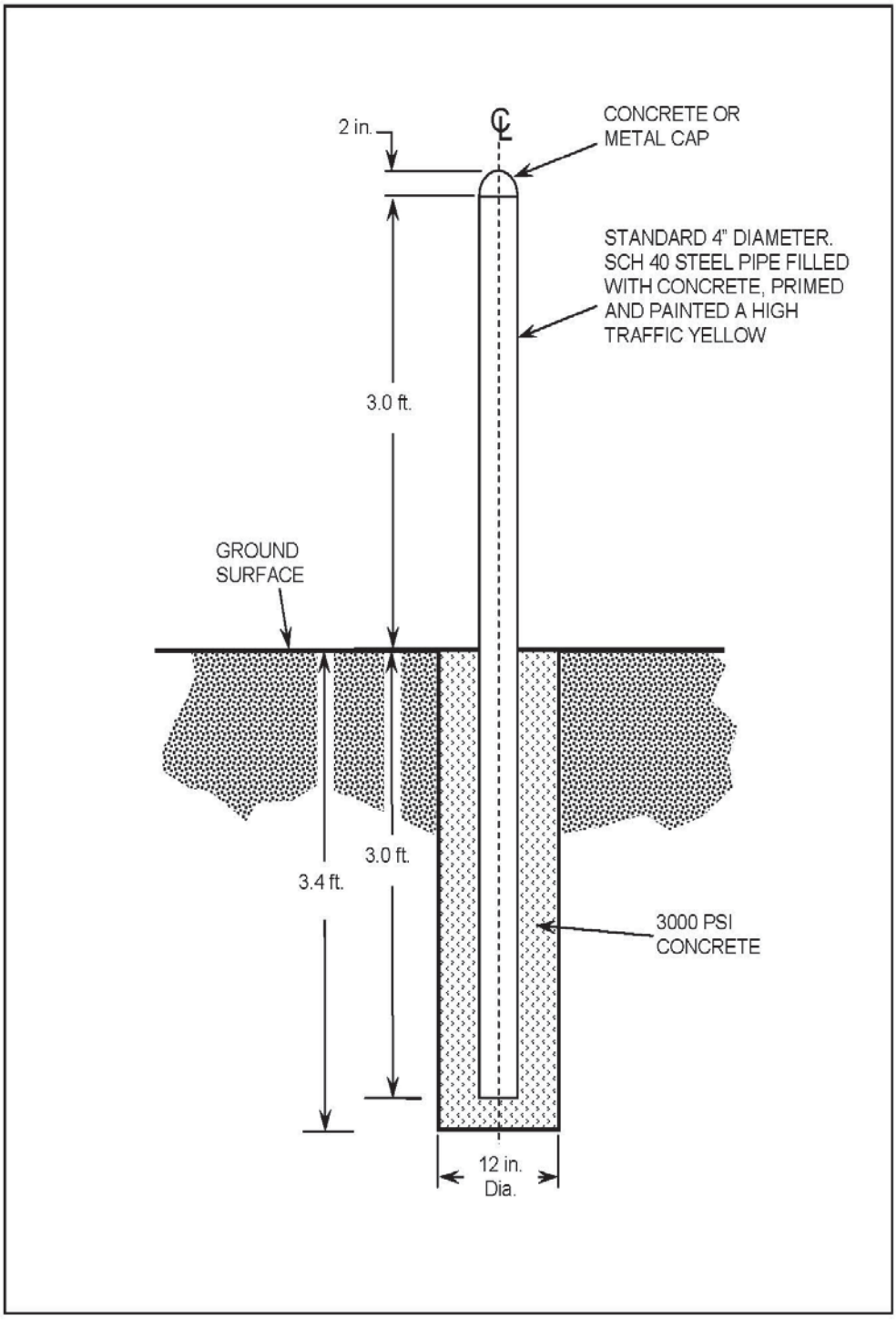

Fig. 14. Typical guard post.

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APPENDIX C: WELL INSPECTION CHECKLIST FORMS

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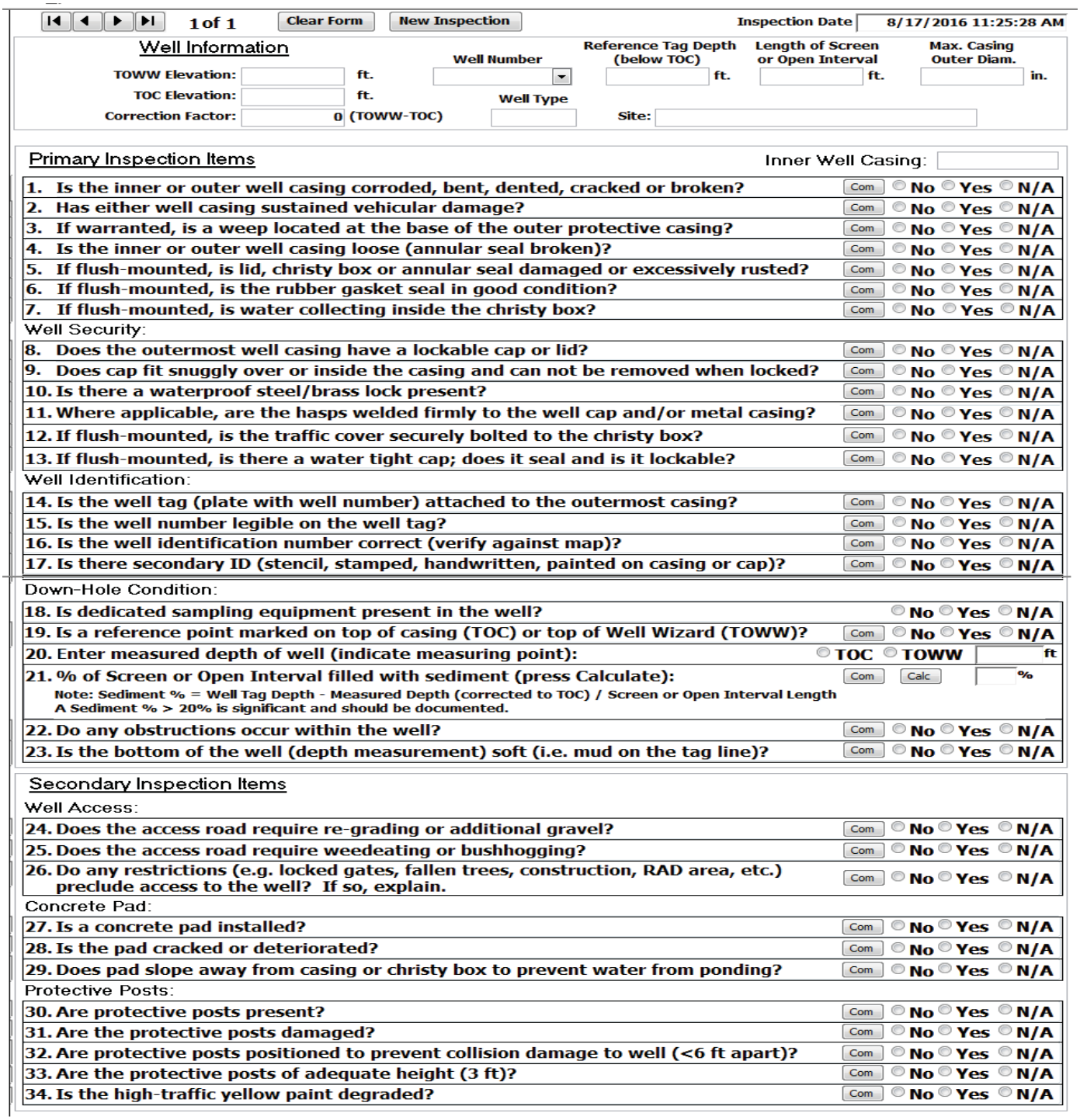

Fig. 15. Screenshot Capture of the Questions on the Electronic Well Inspection Form.

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Y-12 PLANT GROUNDWATER PROTECTION PROGRAM

WELL INSPECTION CHECKLIST Inspection Type: ANNUAL or TRIENNIAL (circle one)

Inspection Date: _____ Inspection Number: _____ Inspected by: _____

WELL INFORMATION Length of Screen or Open Interval (ft.): _____

Well Number: _____ Reference Tag Depth (ft.below TOC): _____

Site: _____ TOWW Elevation _____ TOC Elevation _____

PRIMARY INSPECTION ITEMS

INNER WELL CASING: Casing Type: _____ (e.g., Steel, SS, PVC)	**NO**	**YES**	**N/A**
1. Is the inner or outer well casing, corroded, bent, dented, cracked, or broken?	☐	■	☐
2. Has either well casing sustained vehicular damage?	☐	■	☐
3. If warranted, is a weep located at the base of the outer protective casing?	■	☐	☐
4. Is the inner or outer well casing loose (annular seal broken)?	☐	■	☐
5. If flush-mounted, is lid, christy box, or annular seal damaged or excessively rusted?	☐	■	☐
6. If flush-mounted, is the rubber gasket seal in good condition?	■	☐	☐
7. If flush-mounted, is water collecting inside the christy box?	☐	■	☐
WELL SECURITY:			
8. Does the outermost well casing have a lockable cap or lid?	■	☐	☐
9. Does the cap fit snuggly over or inside the casing and can not be removed when locked?	■	☐	☐
10. Is there a waterproof steel/brass lock present?	■	☐	☐
11. Where applicable, are the hasps welded firmly to well cap and/or metal casing?	■	☐	☐
12. If flush-mounted, is the traffic cover securely bolted to the christy box?	■	☐	☐
13. If flush-mounted, is there a water tight cap; does it seal and is it lockable?	■	☐	☐
WELL IDENTIFICATION:			
14. Is the well tag (plate with well number) attached to the outermost casing?	■	☐	☐
15. Is the well number legible on the well tag?	■	☐	☐
16. Is the well identification number correct (verify against map)?	■	☐	☐
17. Is there secondary ID (stencil, stamped, handwritten, painted on casing or cap)?	■	☐	☐
DOWN-HOLE CONDITION: ***(#20-23 not required for Annual Inspections)***			
18. Is dedicated sampling equipment present in the well?	☐	☐	☐
19. Is a reference point marked on the top of the casing (TOC) or top of Well Wizard cap (TOWW)?	■	☐	☐
20. Enter measured depth of well (circle measurement point): TOC or TOWW	_____ ft		
21. % of Screen or Open Interval filled with sediment:	_____ %		
Note: Sediment % = Well Tag Depth - Measured Depth (corrected to TOC)/ Screen of Open Interval Length. *A Sediment % > 20% is significant and should be documented.*			
22. Do any obstructions occur within the well?	☐	■	☐
23. Is the bottom of the well (depth measurement) soft (i.e. mud on the tag line)?	☐	■	☐

SECONDARY INSPECTION ITEMS

WELL ACCESS:	**NO**	**YES**	**N/A**
24. Does the access road require re-grading or additional gravel?	☐	■	☐
25. Does the access road require weedeating or bushhogging?	☐	■	☐
26. Do any restrictions (locked gates, fallen trees, construction, RAD area, etc.) preclude access to well?	☐	■	☐
CONCRETE PAD:			
27. Is a concrete pad installed?	■	☐	☐
28. Is the pad cracked or deteriorated?	☐	■	☐
29. Does the pad slope away from the casing or christy box to prevent water from ponding ?	■	☐	☐
PROTECTIVE POSTS:			
30. Are protective posts present?	■	☐	☐
31. Are the protective posts damaged?	☐	■	☐
32. Are the protective posts positioned to prevent collision damage to well (< 6ft apart)?	■	☐	☐
33. Are the protective posts of adequate height (3 ft)?	■	☐	☐
34. Is the high-traffic yellow paint degraded?	☐	■	☐

COMMENTS If used in hard copy form, please put comments in this section if any shaded boxes are checked.

Fig. 16. Well Inspection Checklist

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APPENDIX D:
WELL MAINTENANCE REQUEST/REPORT FORM
PLUGGING AND ABANDONMENT REQUEST FORM

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Y-12 GROUNDWATER PROTECTION PROGRAM

WELL MAINTENANCE REQUEST/REPORT (WMR/R)

WMR/R NUMBER: _____

*WELL INSPECTION NO.: _____

*WELL NUMBER:	LOCATION:
*WELL INSPECTION DATE:	*INSPECTED BY:

MAINTENANCE WORK REQUESTED :

- ☐ Build/Repair Concrete Pad
- ☐ Install/Paint Protective Posts
- ☐ Repair/Replace Hasp
- ☐ Remove/Replace Lock
- ☐ Well Re-development
- ☐ Repair/Replace Christy Box
- ☐ Replace gasket seals or bolts on Traffic Cover
- ☐ Replace Well Cap or Lid
- ☐ Extend or Repair Well Casing
- ☐ Install/Replace Well Identification Tag
- ☐ Well Access (weedeating, mowing, re-grading)
- ☐ Miscellaneous Labor (retrieval of items in well, weepholes, etc)
- ☐ Other (describe below)

DESCRIPTION OF WORK : _____

DATE REQUEST OR SERVICE NOTIFICATION SUBMITTED:

JHA# :

MAINTENANCE PERFORMED BY (name and badge #):

DATE WORK COMPLETED:	Service Notification :

COMMENTS ON MAINTENANCE WORK PERFORMED: _____

WORK INSPECTED BY:	DATE INSPECTED:

INSPECTION COMMENTS: _____

APPROVED BY: _____ DATE: _____

*Multiple entries may be appropriate

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Y-12 GROUNDWATER PROTECTION PROGRAM

PLUGGING AND ABANDONMENT (P&A) REQUEST

P&A REQUEST NUMBER: _____

WELL NUMBER:	SITE:
INSPECTION NUMBER:	INSPECTED BY:

REASON FOR PLUGGING AND ABANDONMENT:

- ☐ Well Casing Damage/Deterioration
- ☐ Annular Grout Deterioration
- ☐ Loss of Well Security
- ☐ Downhole Conditions
- ☐ Site Construction, Closure, or Operation

COMMENTS/EXPLANATION FOR P&A:

P&A REQUEST SUBMITTED BY:	DATE SUBMITTED:
CONTRACTOR PERFORMING P&A ACTIVITIES:	DATE COMPLETED:

P&A DOCUMENTATION ATTACHED ? YES ☐ NO ☐

APPROVED BY: _____ DATE: _____

(GWPP MANAGER OR DESIGNEE)

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APPENDIX E: INSPECTED WELLS

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Well Number	Location	Reference Tag Depth	Well Status/Function
1082	Oak Ridge Sludge Farm	55.00	Active/WL
1084	Oak Ridge Sludge Farm	148.60	Active/WL
1090	UNC Site	98.02	UCOR-Active/WL
54-2A	Y-12 Plant Site	26.15	Inactive
55-1A	Y-12 Grid Well B2	19.22	Active/WL
55-1B	Y-12 Plant Site	38.70	Inactive
55-1C	Y-12 Grid Well B2	76.60	Inactive
55-2A	Y-12 Plant Site	13.98	Active
55-2B	Y-12 Grid Well B3	27.69	Active
55-2C	Y-12 Grid Well B3	76.00	Active
55-3A	Y-12 Plant Site	14.25	Active/WL
55-3B	Y-12 Plant Site	37.98	Active
55-3C	Y-12 Plant Site	77.43	Active
55-6A	Y-12 Grid Well C2	12.77	Active/WL
56-1A	Y-12 Plant Site	18.95	Active/WL
56-1C	Y-12 Plant Site	73.45	Active
56-2A	Y-12 Grid Well C3	15.03	Active/WL
56-2B	Y-12 Grid Well C3	38.63	Active
56-2C	Y-12 Grid Well C3	77.03	Active
56-3A	Y-12 Plant Site	17.92	Active
56-3B	Y-12 Plant Site	30.85	Active
56-3C	Y-12 Plant Site	55.35	Active
56-4A	Y-12 Plant Site	12.60	Active
56-6A	Y-12 Plant Site	20.97	Active
56-7A	Y-12 Plant Site	21.13	Inactive
56-8A	Y-12 Plant Site	25.44	Active/WL
58-2A	Y-12 Plant Site	9.78	Inactive
59-1A	Building 9202	13.10	Inactive
59-1B	Building 9202	36.80	Inactive
59-1C	Building 9202	75.46	Inactive
60-1A	Y-12 Plant Site	23.10	Active/WL
60-1B	Y-12 Plant Site	29.10	Inactive
CH-143	Kerr Hollow Quarry	58.27	Inactive
CH-157	Chestnut Ridge Sediment Disposal Basin	538.73	Inactive
CH-185	Rogers Quarry	839.95	Inactive
CH-189	Rogers Quarry	764.43	Inactive
GW-001	Oil Landfarm WMA	27.56	Active/WL
GW-006	Oil Landfarm WMA	51.08	Active
GW-008	Oil Landfarm WMA	26.69	UCOR-Active/WL
GW-010	Oil Landfarm WMA	16.50	UCOR-Active/WL
GW-011	Oil Landfarm WMA	43.22	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-012	Oil Landfarm WMA	19.20	UCOR-Active/WL
GW-013	Oil Landfarm WMA	7.06	Inactive
GW-014	Bear Creek Burial Grounds WMA	14.50	UCOR-Active/SMPL/WL
GW-015	Bear Creek Burial Grounds WMA	11.69	Inactive
GW-016	Bear Creek Burial Grounds WMA	18.88	Active/WL
GW-017	Bear Creek Burial Grounds WMA	65.35	Inactive
GW-018	Bear Creek Burial Grounds WMA	21.71	Inactive
GW-040	Bear Creek Burial Grounds WMA	33.73	Inactive
GW-041	Bear Creek Burial Grounds WMA	42.48	Active/WL
GW-042	Bear Creek Burial Grounds WMA	32.31	Inactive
GW-045	Bear Creek Burial Grounds WMA	17.66	Inactive
GW-046	Bear Creek Burial Grounds WMA	23.85	UCOR-Active/WL
GW-047	Bear Creek Burial Grounds WMA	26.97	Active/WL
GW-052	Bear Creek Burial Grounds WMA	22.04	Active/WL
GW-053	Bear Creek Burial Grounds WMA	35.13	Active/WL
GW-054	Bear Creek Burial Grounds WMA	40.75	Inactive
GW-055	Bear Creek Burial Grounds WMA	22.89	Inactive
GW-056	Exit Pathway - Traverse A	59.21	Inactive
GW-057	Exit Pathway - Traverse A	25.17	Active/WL
GW-058	Bear Creek Burial Grounds WMA	48.90	Active
GW-059	Bear Creek Burial Grounds WMA	27.65	Active/WL
GW-061	Bear Creek Burial Grounds WMA	28.09	Inactive
GW-062	Oil Landfarm WMA	54.13	Inactive
GW-064	Oil Landfarm WMA	55.07	Inactive
GW-065	Oil Landfarm WMA	36.89	Active/WL
GW-066	Oil Landfarm WMA	59.24	Inactive
GW-067	Oil Landfarm WMA	NM	Inactive
GW-068	Bear Creek Burial Grounds WMA	86.10	Active
GW-069	Bear Creek Burial Grounds WMA	101.96	UCOR-Active/WL
GW-070	Bear Creek Burial Grounds WMA	142.13	Inactive
GW-071	Bear Creek Burial Grounds WMA	218.40	UCOR-Active
GW-072	Bear Creek Burial Grounds WMA	101.99	Inactive
GW-073	Oil Landfarm WMA	81.44	Inactive
GW-074	Oil Landfarm WMA	208.21	Inactive
GW-075	Oil Landfarm WMA	205.59	UCOR-Active
GW-077	Bear Creek Burial Grounds WMA	104.10	UCOR-Active
GW-078	Bear Creek Burial Grounds WMA	23.40	UCOR-Active/WL
GW-079	Bear Creek Burial Grounds WMA	67.70	UCOR-Active
GW-080	Bear Creek Burial Grounds WMA	33.00	UCOR-Active/WL
GW-081	Bear Creek Burial Grounds WMA	20.98	Inactive
GW-082	Bear Creek Burial Grounds WMA	38.45	UCOR-Active/SMPL/WL

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-083	Bear Creek Burial Grounds WMA	33.14	Inactive
GW-084	Oil Landfarm WMA	29.92	Active/WL
GW-085	Oil Landfarm WMA	62.34	Active
GW-086	Oil Landfarm WMA	33.01	Active/WL
GW-089	Bear Creek Burial Grounds WMA	27.97	Active
GW-090	Bear Creek Burial Grounds WMA	18.81	Active/WL
GW-091	Bear Creek Burial Grounds WMA	19.30	Active/WL
GW-094	Bear Creek Burial Grounds WMA	119.21	Inactive
GW-095	Bear Creek Burial Grounds WMA	157.03	Inactive
GW-096	Bear Creek Burial Grounds WMA	56.38	Inactive
GW-097	Oil Landfarm WMA	23.86	Active/WL
GW-097A	Oil Landfarm WMA	24.15	Inactive
GW-098	Oil Landfarm WMA	105.65	Active
GW-100	S-3 Site	17.87	Active/WL
GW-101	S-3 Site	19.18	UCOR-Active/SMPL/WL
GW-105	S-3 Site	19.40	Active/WL
GW-106	S-3 Site	74.10	Active
GW-107	S-3 Site	16.30	Active
GW-108	S-3 Site	58.30	UCOR-Active/WL
GW-109	S-3 Site	125.45	UCOR-Active/SMPL
GW-115	S-3 Site	54.49	Active/WL
GW-117	Bear Creek Burial Grounds WMA	533.06	Inactive
GW-118	Bear Creek Burial Grounds WMA	578.02	Inactive
GW-119	Bear Creek Burial Grounds WMA	512.99	Inactive
GW-120	Oil Landfarm WMA	184.19	Inactive
GW-121	Oil Landfarm WMA	607.68	Inactive
GW-122	S-3 Site	145.28	Active
GW-123	S-3 Site	574.79	Inactive
GW-124	S-3 Site	153.44	Inactive
GW-125	S-3 Site	553.68	Inactive
GW-126	Bear Creek Burial Grounds WMA	159.18	Inactive
GW-127	S-3 Site	26.52	UCOR-Active/SMPL/WL
GW-131	Scarboro Road	1099.4**	Active
GW-132	S-3 Site	762.42**	Inactive
GW-133	S-3 Site	602.26**	Inactive
GW-134	S-3 Site	845.13**	Active
GW-135	S-3 Site	1277.38**	Inactive
GW-141	Industrial Landfill IV	158.81	UCOR-Active/WL
GW-142	Kerr Hollow Quarry	298.20	Active/WL
GW-143	Kerr Hollow Quarry	252.7	UCOR-Active

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-144	Kerr Hollow Quarry	194.34	UCOR-Active/WL
GW-145	Kerr Hollow Quarry	113.49	UCOR-Active/WL
GW-146	Kerr Hollow Quarry	217.01	Inactive
GW-147	Kerr Hollow Quarry	72.82	Inactive
GW-148	New Hope Pond	13.93	Active/WL
GW-149	New Hope Pond	50.35	UCOR-Active
GW-150	New Hope Pond	14.75	Inactive
GW-151	New Hope Pond	99.63	UCOR-Active/WL
GW-152	New Hope Pond	20.76	UCOR-Active/WL
GW-153	New Hope Pond	60.84	UCOR-Active/SMPL
GW-154	New Hope Pond	13.55*	UCOR-Active/WL
GW-156	Chestnut Ridge Sediment Disposal Basin	157.65	UCOR-Active/WL
GW-158	Chestnut Ridge Sediment Disposal Basin	442.60	Inactive
GW-159	Chestnut Ridge Sediment Disposal Basin	155.87	UCOR-Active/WL
GW-160	Chestnut Ridge Borrow Area Waste Pile	230.52	Active/WL
GW-161	Chestnut Ridge Borrow Area Waste Pile	402.88	UCOR-Active
GW-162	Bear Creek Burial Grounds WMA	128.50	Inactive
GW-163	Bear Creek Burial Grounds WMA	27.13	Inactive
GW-164	Bear Creek Burial Grounds WMA	406.49	Inactive
GW-165	Chestnut Ridge/Deer Trap #10	309.37	Inactive
GW-166	Chestnut Ridge/Deer Trap #10	381.40	Inactive
GW-167	Scarboro Road	32.81	Active/WL
GW-168	Scarboro Road	138.13	UCOR-Active
GW-169	Union Valley - Exit Pathway	36.23	UCOR-Active/WL
GW-170	Union Valley - Exit Pathway	156.16	UCOR-Active
GW-171	Union Valley - Exit Pathway	32.64	UCOR-Active
GW-172	Union Valley - Exit Pathway	137.50	UCOR-Active
GW-173	Chestnut Ridge Security Pits	167.34	Active/WL
GW-174	Chestnut Ridge Security Pits	151.94	Active/WL
GW-175	Chestnut Ridge Security Pits	169.49	UCOR-Active/SMPL/WL
GW-176	Chestnut Ridge Security Pits	147.33	Active/WL
GW-177	Chestnut Ridge Security Pits	150.69	UCOR-Active/WL
GW-178	Chestnut Ridge Security Pits	134.68	Active/SMPL/WL
GW-179	Chestnut Ridge Security Pits	122.50	Active/SMPL/WL
GW-180	Chestnut Ridge Security Pits	146.08	Active/WL
GW-181	Chestnut Ridge Security Pits	169.45	Inactive
GW-183	Y-12 Fuel Station	33.30	Inactive
GW-184	Rogers Quarry	131.41	Active/WL

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-185	Rogers Quarry	470.88	Inactive
GW-186	Rogers Quarry	172.02	Active/WL
GW-187	Rogers Quarry	163.67	Inactive
GW-188	Rogers Quarry	73.15	Active/WL
GW-189	Rogers Quarry	206.56	Inactive
GW-190	Y-12 Plant Site	29.84	Active
GW-191	Beta-4 Security Pits	65.09	Inactive
GW-192	Beta-4 Security Pits	21.58	Active/WL
GW-193	Y-12 Plant Site	21.17	UCOR-Active/WL
GW-194	Beta-4 Security Pits	15.88	Inactive
GW-195	Beta-4 Security Pits	24.92	Active/WL
GW-196	Beta-4 Security Pits	28.67	Inactive
GW-197	Beta-4 Security Pits	19.67	Inactive
GW-198	Ravine Disposal Site	29.57	Inactive
GW-199	Y-12 Grid Well I1	25.92	Active/WL
GW-200	Ravine Disposal Site	59.96	Active/WL
GW-202	Ravine Disposal Site	22.59	Active/WL
GW-203	UNC Site	157.61	UCOR-Active/WL
GW-204	Y-12 Plant Site	20.23	Active/WL
GW-205	UNC Site	165.13	UCOR-Active/WL
GW-206	Exit Pathway Scarboro Road/Pine Ridge	17.12	Inactive
GW-207	Exit Pathway Scarboro Road/Pine Ridge	114.73	Inactive
GW-208	Exit Pathway Scarboro Road/Pine Ridge	416.62	Inactive
GW-217	Industrial Landfill IV	179.13	UCOR-Active/WL
GW-218	Uranium Oxide Vault	30.64	Inactive
GW-219	Uranium Oxide Vault	15.59	UCOR-Active/SMPL/WL
GW-220	New Hope Pond	49.00	Active
GW-221	UNC Site	159.34	UCOR-Active/WL
GW-222	New Hope Pond	28.55	Active
GW-223	New Hope Pond	93.57	UCOR-Active
GW-224	Rogers Quarry	126.99	Inactive
GW-225	Oil Landfarm WMA	203.30	Active
GW-226	Oil Landfarm WMA	58.47	Active/WL
GW-227	Oil Landfarm WMA	42.64	Active/WL
GW-228	Oil Landfarm WMA	93.45	Inactive
GW-229	Oil Landfarm WMA	51.45	Active/WL
GW-230	Union Valley - Exit Pathway	409.48	UCOR-Active
GW-231	Kerr Hollow Quarry	37.70	UCOR-Active/WL
GW-232	Union Valley - Exit Pathway	409.48	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-236	S-3 Site	21.14	Active/WL
GW-237	Bear Creek Burial Grounds WMA	17.26	Inactive
GW-239	Scarboro Road	436.17	Inactive
GW-240	New Hope Pond	32.55	Active
GW-241	Chestnut Ridge Sediment Disposal Basin	98.23	Active/WL
GW-242	Bear Creek Burial Grounds WMA	20.18	Active/WL
GW-243	S-3 Site	76.30	UCOR-Active
GW-244	S-3 Site	77.30	UCOR-Active
GW-245	S-3 Site	73.87	UCOR-Active/WL
GW-246	S-3 Site	76.50	UCOR-Active/SMPL
GW-247	S-3 Site	76.50	UCOR-Active
GW-248	Bear Creek Burial Grounds WMA	65.21	Inactive
GW-249	Bear Creek Burial Grounds WMA	37.85	Active/WL
GW-250	Bear Creek Burial Grounds WMA	64.83	Inactive
GW-251	S-2 Site	50.04	Active/WL
GW-252	S-2 Site	51.11	Inactive
GW-253	S-2 Site	51.51	UCOR-Active/WL
GW-255	S-2 Site	84.49	Active/WL
GW-257	Bear Creek Burial Grounds WMA	36.63	UCOR-Active/WL
GW-258	Bear Creek Burial Grounds WMA	52.86	Inactive
GW-259	Bear Creek Burial Grounds WMA	35.74	Active
GW-261	Y-12 Grid Well A1	26.82	Active/WL
GW-262	Y-12 Grid Well A1	72.19	Inactive
GW-263	Y-12 Grid Well A2	33.96	Active/WL
GW-264	Y-12 Grid Well A2	74.25	Inactive
GW-265	Y-12 Salvage Yard	25.68	Active
GW-268	Y-12 Salvage Yard	36.22	Active
GW-269	Y-12 Salvage Yard	33.50	Active
GW-270	Y-12 Salvage Yard	21.50	Active
GW-271	Y-12 Salvage Yard	59.33	Inactive
GW-272	Y-12 Salvage Yard	19.16	Active
GW-273	Y-12 Salvage Yard	35.00	Inactive
GW-274	Y-12 Salvage Yard	36.12	UCOR-Active/SMPL
GW-275	Y-12 Salvage Yard	68.47	UCOR-Active/SMPL
GW-276	S-3 Site	21.34	UCOR-Active/WL
GW-277	S-3 Site	80.63	Inactive
GW-281	Y-12 Fuel Station	14.85	UCOR-Active
GW-282	Y-12 Fuel Station	13.23	Inactive
GW-283	Y-12 Fuel Station	21.10	Inactive
GW-284	Y-12 Fuel Station	18.04	Inactive
GW-285	Y-12 Fuel Station	20.51	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-286	Bear Creek Burial Grounds WMA	34.78	Inactive
GW-287	Bear Creek Burial Grounds WMA	15.19	Active/WL
GW-288	Bear Creek Burial Grounds WMA	62.70	Inactive
GW-289	Bear Creek Burial Grounds WMA	43.14	UCOR-Active/SMPL/WL
GW-290	Bear Creek Burial Grounds WMA	38.18	Inactive
GW-291	Bear Creek Burial Grounds WMA	19.92	UCOR-Active/SMPL/WL
GW-292	East Chestnut Ridge Waste Pile	187.59	UCOR-Active/WL
GW-293	East Chestnut Ridge Waste Pile	216.40	UCOR-Active
GW-294	East Chestnut Ridge Waste Pile	130.76	UCOR-Active
GW-296	East Chestnut Ridge Waste Pile	148.16	UCOR-Active
GW-298	Chestnut Ridge Borrow Area Waste Pile	189.36	UCOR-Active/WL
GW-299	Chestnut Ridge Borrow Area Waste Pile	169.23	Active/WL
GW-300	Chestnut Ridge Borrow Area Waste Pile	149.24	Active/WL
GW-301	Chestnut Ridge Borrow Area Waste Pile	165.23	UCOR-Active/WL
GW-302	UNC Site	138.23	Active/WL
GW-303	Chestnut Ridge Sediment Disposal Basin	322.10	Active/WL
GW-304	Chestnut Ridge Sediment Disposal Basin	167.78	Active/WL
GW-305	Industrial Landfill IV	181.06	UCOR-Active/WL
GW-306	Rust Spoil Area	60.66	Active
GW-307	Rust Spoil Area	43.60	Active/WL
GW-308	Rust Spoil Area	40.61	Inactive
GW-309	Rust Spoil Area	40.06	Active/WL
GW-310	Rust Spoil Area	30.47	Active/WL
GW-311	Rust Spoil Area	43.64	Inactive
GW-312	Rust Spoil Area	42.10	Active
GW-313	Spoil Area I	121.40	Inactive
GW-314	Spoil Area I	118.15	Inactive
GW-315	Spoil Area I	105.98	Active
GW-316	Spoil Area I	81.64	Active/WL
GW-317	Spoil Area I	133.33	Inactive
GW-318	Rogers Quarry	82.62	Inactive
GW-319	Rogers Quarry	26.21	Inactive
GW-322	Chestnut Ridge Security Pits	191.99	Active/WL
GW-323	Spoil Area I	109.59	Active/WL
GW-324	S-3 Site	81.80	Inactive
GW-325	S-3 Site	19.87	Active/WL
GW-331	Waste Coolant Processing Facility	32.60	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-332	Waste Coolant Processing Facility	27.07	Active
GW-333	Waste Coolant Processing Facility	27.46	Inactive
GW-334	Waste Coolant Processing Facility	29.72	Active/WL
GW-335	Waste Coolant Processing Facility	17.29	Active/WL
GW-336	Waste Coolant Processing Facility	23.93	Inactive
GW-337	Waste Coolant Processing Facility	25.33	Active
GW-338	Waste Coolant Processing Facility	20.20	Inactive
GW-339	UNC Site	116.92	Active/WL
GW-342	Bear Creek Burial Grounds WMA	72.28	Inactive
GW-343	Bear Creek Burial Grounds WMA	198.70	Inactive
GW-344	Bear Creek Burial Grounds WMA	317.92	Inactive
GW-345	S-3 Site	29.16	Active/WL
GW-346	S-3 Site	68.13	Inactive
GW-347	S-3 Site	30.52	Active/WL
GW-348	S-3 Site	83.33	Inactive
GW-349	S-2 Site	27.81	Active/WL
GW-350	S-2 Site	46.85	Inactive
GW-363	Oil Landfarm WMA	77.27	UCOR-Active
GW-364	Industrial Landfill I	62.86	Active/WL
GW-365	Industrial Landfill I	152.49	Active
GW-366	Industrial Landfill I	104.43	Inactive
GW-367	Industrial Landfill I	153.48	Active
GW-368	Industrial Landfill I	247.46	Inactive
GW-369	Industrial Landfill I	150.30	Inactive
GW-370	Bear Creek Burial Grounds WMA	35.44	Active/WL
GW-371	Bear Creek Burial Grounds WMA	127.56	Inactive
GW-372	Bear Creek Burial Grounds WMA	54.24	Active/WL
GW-373	Bear Creek Burial Grounds WMA	159.06	Inactive
GW-374	Bear Creek Burial Grounds WMA	152.43	Inactive
GW-375	Bear Creek Burial Grounds WMA	163.33	Inactive
GW-376	Lysimeter Demo	221.92	Inactive
GW-380	New Hope Pond	15.80	UCOR-Active/WL
GW-381	New Hope Pond	61.01	UCOR-Active/SMPL
GW-382	New Hope Pond	173.20	UCOR-Active
GW-383	New Hope Pond	26.54	UCOR-Active/SMPL/WL
GW-384	New Hope Pond	58.21	UCOR-Active
GW-385	New Hope Pond	180.32	Inactive
GW-505	Rust Garage Area	16.80	Active
GW-508	Rust Garage Area	15.11	Active
GW-511	Chestnut Ridge Security Pits	156.00	Active/WL
GW-512	Filled Coal Ash Pond	64.28	Active/WL

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-513	Filled Coal Ash Pond	127.53	Inactive
GW-514	Filled Coal Ash Pond	197.13	UCOR-Active/SMPL
GW-520	Industrial Landfill I	82.76	Inactive
GW-521	Industrial Landfill IV	136.70	UCOR-Active/WL
GW-522	Industrial Landfill IV	197.10	UCOR-Active/WL
GW-526	S-3 Site	123.80	Active
GW-531	Lysimeter Demo	41.28	Active/WL
GW-532	Lysimeter Demo	31.71	Inactive
GW-533	Lysimeter Demo	32.70	Inactive
GW-534	Lysimeter Demo	60.20	Inactive
GW-535	Lysimeter Demo	27.36	Inactive
GW-537	Oil Landfarm WMA	27.35	Active/WL
GW-538	Lysimeter Demo	45.33	Inactive
GW-539	Industrial Landfill II	158.76	Active/WL
GW-540	Industrial Landfill II	173.83	UCOR-Active
GW-541	Construction/Demolition Landfill VI	106.10	Active/WL
GW-542	Construction/Demolition Landfill VI	79.09	Active/WL
GW-543	Construction/Demolition Landfill VI	96.24	Active/WL
GW-544	Construction/Demolition Landfill VI	111.80	Active/WL
GW-546	Construction/Demolition Landfill VI	86.96	Active/WL
GW-557	Industrial Landfill V	136.07	UCOR-Active/WL
GW-558	South Side Chestnut Ridge	77.60	Active/WL
GW-559	South Side Chestnut Ridge	170.23	Active/WL
GW-560	Construction/Demolition Landfill VII	82.90	UCOR-Active/WL
GW-562	Construction/Demolition Landfill VII	61.24	UCOR-Active/WL
GW-563	South Side Chestnut Ridge	97.63	Inactive
GW-564	Construction/Demolition Landfill VII	78.74	UCOR-Active/WL
GW-567	South Side Chestnut Ridge	81.89	Inactive
GW-569	South Side Chestnut Ridge	113.14	Inactive
GW-576	South Side Chestnut Ridge	70.10	Inactive
GW-601	Oil Landfarm WMA	358.61	Active
GW-602	Oil Landfarm WMA	211.27	Inactive
GW-603	New Hope Pond	76.78	Active/WL
GW-604	New Hope Pond	114.28	Inactive
GW-605	Exit Pathway - Traverse I	42.00	UCOR-Active/WL
GW-606	Exit Pathway - Traverse I	174.36	UCOR/Active/WL
GW-608	Chestnut Ridge Security Pits	219.80	UCOR-Active/SMPL/WL
GW-609	Chestnut Ridge Security Pits	268.80	UCOR-Active/SMPL/WL
GW-610	Chestnut Ridge Security Pits	120.21	Active/WL
GW-611	Chestnut Ridge Security Pits	120.26	Active/WL
GW-612	Chestnut Ridge Security Pits	256.28	Active/WL

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-613	S-3 Site	45.08	Active/WL
GW-614	S-3 Site	93.07	Inactive
GW-615	S-3 Site	246.84	UCOR-Active/SMPL
GW-616	S-3 Site	270.59	Active
GW-617	Exit Pathway - Traverse E	20.69	Active/WL
GW-618	Exit Pathway - Traverse E	38.30	UCOR-Active
GW-619	Fire Training Facility	43.63	Active/WL
GW-620	Fire Training Facility	77.91	Active
GW-621	Exit Pathway - Traverse B	42.52	Active/WL
GW-622	Bear Creek Burial Grounds WMA	22.05	Active/WL
GW-623	Bear Creek Burial Grounds WMA	277.93	Active
GW-624	Bear Creek Burial Grounds WMA	30.60	Active/WL
GW-625	Bear Creek Burial Grounds WMA	284.83	Inactive
GW-626	Bear Creek Burial Grounds WMA	80.92	Active/WL
GW-627	Bear Creek Burial Grounds WMA	270.96	Active
GW-628	Bear Creek Burial Grounds WMA	290.70	Inactive
GW-629	Bear Creek Burial Grounds WMA	314.59	Active
GW-630	Lysimeter Demo	30.92	Active/WL
GW-631	Rust Garage Area	15.36	Inactive
GW-632	Rust Garage Area	14.20	Inactive
GW-633	Rust Garage Area	15.75	Active
GW-634	Rust Garage Area	14.94	Inactive
GW-636	Oil Landfarm WMA	120.63	Inactive
GW-637	Oil Landfarm WMA	30.87	Inactive
GW-638	Oil Landfarm WMA	15.48	Active/WL
GW-639	Bear Creek Burial Grounds WMA	129.64	UCOR-Active
GW-640	Bear Creek Burial Grounds WMA	49.88	Inactive
GW-641	Bear Creek Burial Grounds WMA	26.32	Active/WL
GW-642	Bear Creek Burial Grounds WMA	39.90	Active/WL
GW-643	Bear Creek Burial Grounds WMA	31.48	Inactive
GW-645	Oil Landfarm WMA	83.42	Active/WL
GW-646	Oil Landfarm WMA	78.04	Inactive
GW-647	Oil Landfarm WMA	91.91	Inactive
GW-648	Rust Spoil Area	82.47	Inactive
GW-649	S-3 Site	23.49	Inactive
GW-651	Bear Creek Burial Grounds WMA	54.50	Inactive
GW-652	Bear Creek Burial Grounds WMA	33.67	Active/WL
GW-653	Bear Creek Burial Grounds WMA	41.53	Active/WL
GW-654	Bear Creek Burial Grounds WMA	19.14	Active/WL
GW-655	Bear Creek Burial Grounds WMA	67.26	Inactive
GW-656	Y-12 Plant Site	20.60	Active
GW-657	Y-12 Plant Site	15.03	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-658	Y-12 Fuel Station	2064.00	UCOR-Active
GW-659	Y-12 Fuel Station	16.10	Inactive
GW-673	Filled Coal Ash Pond	116.39	Inactive
GW-674	Filled Coal Ash Pond	16.84	Active/WL
GW-676	Filled Coal Ash Pond	20.35	Active/WL
GW-677	Filled Coal Ash Pond	160.44	Active/WL
GW-678	Filled Coal Ash Pond	133.08	Active/WL
GW-679	Filled Coal Ash Pond	134.28	Active/WL
GW-680	Filled Coal Ash Pond	122.24	Active/WL
GW-681	Filled Coal Ash Pond	172.28	Inactive
GW-682	Filled Coal Ash Pond	161.30	Inactive
GW-683	Exit Pathway - Traverse A	199.83	UCOR-Active/WL
GW-684	Exit Pathway - Traverse A	132.21	UCOR-Active/WL
GW-685	Exit Pathway - Traverse A	141.83	Inactive
GW-686	Coal Pile Trench	16.23	Active/WL
GW-690	Coal Pile Trench	54.89	Active
GW-691	Coal Pile Trench	20.39	Active/WL
GW-692	Coal Pile Trench	53.05	Active
GW-693	Coal Pile Trench	22.93	Inactive
GW-694	Exit Pathway - Traverse B	207.27	Inactive
GW-695	Exit Pathway - Traverse B	65.28	Active/WL
GW-696	Y-12 Plant Site	31.70	Active/WL
GW-697	Y-12 Plant Site	20.32	Inactive
GW-698	Building 8110	74.88	Active
GW-699	Y-12 Plant Site	16.33	Inactive
GW-700	Building 8110	33.19	Active
GW-701	Y-12 Plant Site	27.82	Inactive
GW-702	Y-12 Plant Site	22.64	Inactive
GW-703	Exit Pathway - Traverse B	185.29	Active
GW-704	Exit Pathway - Traverse B	258.65	UCOR-Active
GW-705	Exit Pathway - Traverse B	312.76	Inactive
GW-706	Exit Pathway - Traverse B	185.79	UCOR-Active
GW-709	Industrial Landfill II	83.52	UCOR-Active/WL
GW-710	Exit Pathway - Traverse W	750.73	Inactive
GW-711	Exit Pathway - Traverse W	668.57	Inactive
GW-712	Exit Pathway - Traverse W	460.53	UCOR-Active
GW-713	Exit Pathway - Traverse W	318.39	UCOR-Active
GW-714	Exit Pathway - Traverse W	146.90	UCOR-Active
GW-715	Exit Pathway - Traverse W	45.96	Active/WL
GW-722	Exit Pathway - Traverse J	642.68**	UCOR-Active/SMPL
GW-723	Exit Pathway - Traverse C	447.24	Inactive
GW-724	Exit Pathway - Traverse C	293.60	Active

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-725	Exit Pathway - Traverse C	145.42	Active
GW-726	Bear Creek Burial Grounds WMA	602.62**	Active
GW-727	Bear Creek Burial Grounds WMA	1002.77**	Active
GW-728	Bear Creek Burial Grounds WMA	122.05	Inactive
GW-729	Bear Creek Burial Grounds WMA	1363.24**	Active
GW-730	Bear Creek Burial Grounds WMA	1428.25**	Active
GW-731	Chestnut Ridge Sediment Disposal Basin	178.53	UCOR-Active/WL
GW-732	Chestnut Ridge Sediment Disposal Basin	192.84	UCOR-Active/WL
GW-733	Exit Pathway - Traverse J	259.93	UCOR-Active/WL
GW-734	Exit Pathway - Traverse J	60.32	UCOR-Active/WL
GW-735	Exit Pathway - Traverse J	81.81	UCOR-Active/WL
GW-736	Exit Pathway - Traverse C	104.00	Inactive
GW-737	Exit Pathway - Traverse C	92.03	Inactive
GW-738	Exit Pathway - Traverse C	91.78	Active
GW-739	Exit Pathway - Traverse C	322.88	Inactive
GW-740	Exit Pathway - Traverse C	192.67	Active
GW-742	Chestnut Ridge Security Pits	422.03	Inactive
GW-743	Chestnut Ridge Security Pits	162.56	Active/WL
GW-744	Y-12 Grid Well K1	69.28	UCOR-Active/SMPL
GW-745	Y-12 Grid Well K1	35.25	Inactive
GW-746	Y-12 Grid Well K1	17.14	Active/WL
GW-747	Y-12 Grid Well K2	82.33	UCOR-Active/SMPL
GW-748	Y-12 Grid Well K2	29.80	Active/WL
GW-750	Exit Pathway - Traverse J	75.49	UCOR-Active/SMPL
GW-751	Y-12 Grid Well J3	63.33	Inactive
GW-752	Y-12 Grid Well J3	18.80	Active/WL
GW-753	Y-12 Grid Well J2	73.76	Inactive
GW-754	Y-12 Grid Well J2	27.19	Active/WL
GW-755	Y-12 Grid Well J1	63.17	Inactive
GW-756	Y-12 Grid Well J1	18.95	Active/WL
GW-757	Industrial Landfill II	168.54	UCOR-Active/WL
GW-758	Y-12 Grid Well G1	52.04	Inactive
GW-759	Y-12 Grid Well G1	32.56	Active/WL
GW-760	Y-12 Grid Well G2	63.30	Inactive
GW-761	Y-12 Grid Well G2	18.51	Active/WL
GW-762	Y-12 Grid Well J-Primary	62.04	UCOR-Active
GW-763	Y-12 Grid Well J-Primary	20.41	UCOR-Active/SMPL
GW-764	Y-12 Grid Well E1	68.14	Inactive
GW-765	Y-12 Grid Well E1	35.05	Active/WL
GW-766	Y-12 Grid Well I2	48.38	Inactive
GW-767	Y-12 Grid Well I2	21.44	Active/WL

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-768	Y-12 Grid Well I1	67.63	Inactive
GW-769	Y-12 Grid Well G3	62.73	Active
GW-770	Y-12 Grid Well G3	21.68	Active/WL
GW-773	Y-12 Grid Well H2	61.66	Inactive
GW-774	Y-12 Grid Well H2	28.87	Active/WL
GW-775	Y-12 Grid Well H3	55.98	Active
GW-776	Y-12 Grid Well H3	21.92	Active/WL
GW-779	Y-12 Grid Well F2	65.35	Active
GW-781	Y-12 Grid Well E3	71.07	Active
GW-782	Y-12 Grid Well E3	38.23	Active
GW-783	Y-12 Grid Well E3	17.98	Active/WL
GW-790	Bear Creek Burial Grounds WMA	1042.32**	Active
GW-791	Y-12 Grid Well D2	72.45	Active
GW-792	Y-12 Grid Well D2	31.99	Active/WL
GW-794	Above Grade LL Waste Storage Fac.	42.43	Inactive
GW-795	Above Grade LL Waste Storage Fac.	22.61	Active/WL
GW-796	Industrial Landfill V	139.82	UCOR-Active/WL
GW-797	Industrial Landfill V	135.71	UCOR-Active/WL
GW-798	Construction/Demolition Landfill VII	134.00	UCOR-Active/WL
GW-799	Industrial Landfill V	97.58	UCOR-Active/WL
GW-800	Oil Landfarm WMA	32.86	Active/WL
GW-801	Industrial Landfill V	190.92	UCOR-Active/WL
GW-802	Y-12 Fuel Station	25.42	UCOR-Active
GW-803	Y-12 Fuel Station	27.76	Inactive
GW-804	Y-12 Fuel Station	27.79	Inactive
GW-811	Spoil Area I	67.77	Inactive
GW-812	Spoil Area I	48.26	Inactive
GW-813	SY-200 Yard	28.05	Inactive
GW-814	SY-200 Yard	26.28	Inactive
GW-815	SY-200 Yard	23.84	Inactive
GW-816	Exit Pathway Scarboro Road/Pine Ridge	17.99	Active/WL
GW-819	Building 9201-2	16.44	Inactive
GW-820	Building 9201-2	17.18	Active
GW-827	Construction/Demolition Landfill VI	137.22	Active/WL
GW-828	S-3 Site	169.36	Inactive
GW-829	S-3 Site	118.68	Active/WL
GW-831	Chestnut Ridge Security Pits	198.06	UCOR-Active/WL
GW-832	New Hope Pond	10.36	UCOR-Active/WL
GW-834	S-3 Site	16.60	Inactive
GW-835	S-3 Site	19.20	Active/WL
GW-836	S-3 Ponds	27.57	Inactive

Well Number	Location	Reference Tag Depth	Well Status/Function
GW-841	South Campus Fac., Bethel Valley	10.30	UCOR-Active
GW-842	South Campus Fac., Bethel Valley	28.00	UCOR-Active
GW-843	South Campus Fac., Bethel Valley	69.80	Active
GW-844	South Campus Fac., Bethel Valley	180.10	Active
GW-845	Y-12 Plant Site	440.06	UCOR-Active
GW-854	S-3 Ponds	16.52	Inactive
GW-855	S-3 Ponds	20.91	Inactive
GW-880	S-3 Ponds	21.54	Inactive
GW-883	S-3 Ponds	21.96	Inactive
GW-914	Oil Landfarm WMA	32.95	Inactive
GW-916	EMWMF	37.9 (est.)	UCOR-Active/WL
GW-917	EMWMF	53.1 (est.)	UCOR-Active/WL
GW-918	EMWMF	33.0 (est.)	UCOR-Active/WL
GW-920	EMWMF	56.4 (est.)	UCOR-Active
GW-921	EMWMF	51.3 (est.)	UCOR-Active/WL
GW-922	EMWMF	46.9 (est.)	UCOR-Active/WL
GW-924	EMWMF	55.9 (est.)	UCOR-Active/WL
GW-925	EMWMF	150.1 (est.)	UCOR-Active
GW-926	EMWMF	145.9 (est.)	UCOR-Active
GW-927	EMWMF	93.2 (est.)	UCOR-Active
GW-928	Y-12 Grid Well C1	45.39	Active
GW-929	Y-12 Grid Well C1	30.36	Active/WL
GW-930	Y-12 Grid Well D1	44.52	Active
GW-931	Y-12 Grid Well D1	22.98	Active
GW-934	New Hope Pond	N/A**	Active
GW-954	Y-12 Plant Site	N/A#	Active
GW-956	Y-12 Plant Site	N/A#	Active
GW-959	Big Spring Mercury Treatment Facility	8.10	Active
GW-960	Y-12 Grid Well F2	27.29	Active/WL
GW-961	EMWMF	N/A	UCOR-Active
GW-964	EMWMF	N/A	UCOR-Active
GW-965	EMWMF	N/A	UCOR-Active
GW-966	Y-12 Fuel Station	18.73	Active

Notes:
WL: Water level well
SMPL: UCOR well sampled by GWPP
?: Unknown
N/A: not applicable/no depth available
**: Westbay™ well
#: Barcad® well
Est.: estimated depth – from elevation data
UCOR: monitored and maintained under a UCOR program/project
EMWMF: Environmental Management Waste Management Facility