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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Three Mile Island Nuclear Station Unit 1  
Facility Operating License No. DPR-50  
NRC Docket No. 50-289

Subject: Three Mile Island Nuclear Station Unit 1 License Renewal Updated  
Environmental Information

- References:
1. "Three Mile Island Nuclear Station Unit 1 License Renewal Application Environmental Report", submitted 1/8/2008.
  2. Teleconference held 7/17/2008 between the staff and Amergen regarding follow-up questions from the April 28 – May 1 Environmental site audit.

To facilitate the NRC Staff's review of the Three Mile Island Nuclear Station Unit 1 License Renewal Application (LRA) Environmental Report, Exelon Generation Company (EGC) is submitting three documents listed below as Enclosure A. These documents update previously provided information concerning ground water usage and protection of historical and archaeological resources.

This letter and its enclosures contain no commitments.

If you have questions, please contact Fred Polaski, Manager License Renewal, at 610-765-5935.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

Executed on: 03-25-2009

  
Michael P. Gallagher  
Vice President, License Renewal  
Exelon Generation Company, LLC

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Enclosure A:

1. Letter from Exelon Generation (T. Dougherty) to the Susquehanna River Basin Commission (P. Ballaron) regarding "Combined Docket Application, Water Withdrawals and Consumptive Use, Three mile Island Nuclear Station," with enclosures. Letter No. 5532-2009-022. March 12, 2009.
2. Exelon Nuclear Procedure SA-AA-117, Revision 10. "Excavation, Trenching, and Shoring," modified February 13, 2009.
3. Exelon Nuclear Procedure EN-AA-103-0001, Revision 5, "Environmental Evaluations," modified January 21, 2009.

cc: Regional Administrator, USNRC Region I, w/o Enclosure  
USNRC Project Manager, NRR - License Renewal, Safety, w/o Enclosure  
USNRC Project Manager, NRR - License Renewal, Environmental, w/ Enclosure  
USNRC Project Manager, NRR - TMIGS, w/o Enclosure  
USNRC Senior Resident Inspector, TMIGS, w/o Enclosure  
File No. 08001

## Enclosure A

1. Letter from Exelon Generation (T. Dougherty) to the Susquehanna River Basin Commission (P. Ballaron) regarding "Combined Docket Application, Water Withdrawals and Consumptive Use, Three mile Island Nuclear Station," with enclosures. Letter No. 5532-2009-022. March 12, 2009.
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## **EXCAVATION, TRENCHING, AND SHORING**

### **1. PURPOSE**

- 1.1. To provide safe work practices for excavating, trenching, and shoring.
- 1.2. To provide instructions for identifying overhead high voltage hazards associated with excavation activities.
- 1.3. This procedure is applicable to all excavation activities, including drilling and piercing, and is based on the requirements of 29 CFR 1926, Subpart P.

### **2. TERMS AND DEFINITIONS**

- 2.1. **Cave-In:** The separation of soil or rock, due to falling or sliding, from the side of an excavation or from under a trench shield that is of sufficient quantity to entrap, engulf, or bury a person.
- 2.2. **Cemented Soil:** Soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample **cannot** be crushed into powder or individual soil particles by finger pressure.
- 2.3. **Cohesive Soil:** Clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does **not** crumble, can be excavated with vertical side-slopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include sandy clay, silty clay, clay, and organic clay.
- 2.4. **Competent Person:** A Competent Person is one who is trained in and capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees and who is authorized to take prompt corrective measures to eliminate them.
- 2.5. **Cross Braces:** The horizontal members of a shoring system installed perpendicular to the sides of the excavation. The ends of crossbraces bear against either uprights or wales.

- 2.6. **Cultural, Historical or Paleontological Resources:** Includes any of the following;
- 2.6.1. **Cultural Resource** - Any man-made or associated prehistoric, historic, architectural, sacred, or traditional cultural property and associated objects and documents that are of interest to archaeology, anthropology, history, or other associated disciplines. Cultural resources include archaeological resources, historic properties, traditional cultural properties, sacred sites, and cultural landscapes that are associated with human activity or occupation.
- 2.6.2. **Historic Resource** - Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.
- 2.6.3. **Paleontological Resource** - Any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth, except that the term does not include an archaeological or cultural resource.
- 2.7. **Excavation:** Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal.
- 2.8. **Excavation work:** the use of powered equipment or explosives in the movement of earth, rock or other material, and includes but is not limited to anchoring, auguring, backfilling, blasting, boring, digging, ditching, drilling, driving-in, grading, plowing-in, pulling-in, ripping, scraping, trenching and tunneling, but does not include soft excavation technology such as vacuum, high pressure air or water, tilling of soil for agricultural purposes to a depth of less than eighteen inches and operations necessary or incidental to the purposes of finding or extracting natural resources.
- 2.9. **Fillcrete:** A flowable, self-leveling and self-compacting cementitious material used in place of traditional compacted fill. Fillcrete will decrease time it takes to backfill a project (also known as Flowable-Fill).
- 2.10. **Kickout:** The unintentional release of a crossbrace within a shoring system.
- 2.11. **Line or Facility** – means an underground conductor or underground pipe or structure used in providing electric or communication service, or an underground pipe used in carrying or providing gas, oil or oil product, sewage, water or other service.
- 2.12. **Scan “as you go”** – means to perform scanning evaluations as the excavation is conducted (i.e., as the depth below the starting grade increases).

- 2.13. **Sheeting**: The members of a shoring system that retain the earth in position and are supported by other components of the system (e.g., plywood, plank or other sheeting).
- 2.14. **Shields**: A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields".
- 2.15. **Shoring**: A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.
- 2.16. **Site Excavation Coordinator**: A position within Exelon Nuclear that coordinates excavation activities during excavation work.
- 2.17. **Soil Classification System**: A method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits, the characteristics of the deposits, and the environmental conditions of exposure.
- 2.18. **Spoil**: The dirt, rocks, and other materials removed from an excavation and either temporarily or permanently put aside.
- 2.19. **Surcharge** - means an excessive vertical load or weight caused by spoil, overburden, vehicles, equipment, or activities that may affect trench stability.
- 2.20. **Stable Rock**: Natural solid mineral material that can be excavated with vertical sides and remain intact while exposed.
- 2.21. **Structured Ramp**: A ramp built of steel or wood, usually used for vehicle access. Ramps made of soil/rock or are made for personnel access only are **not** considered structural ramps. Suitably rated manufactured ramps are acceptable.
- 2.22. **Tolerance Zone** - The horizontal and vertical space within 24" of the outside wall or edge of a line or facility. Excavation within the tolerance zone requires extra care and precaution (i.e., digging conducted by hand, air suction (vacuum truck), pressurized air, and/or pressurized water).
- 2.23. **Trench**: A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is **not** greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

## WARNING

NO SOIL IS TYPE A IF SOIL IS FISSURED, SUBJECT TO VIBRATION, PREVIOUSLY DISTURBED, OR PART OF A LAYERED SYSTEM WHERE THE LAYERS DIP INTO THE EXCAVATION ON A SLOPE OF 4H:1V OR GREATER.

2.24. **Type A Soil:** Cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A. However, no soil is Type A if:

1. The soil is fissured; or
2. The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or
3. The soil has been previously disturbed; or
4. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or
5. The material is subject to other factors that would require it to be classified as a less stable material.

2.25. **Type B Soil:**

1. Cohesive soil with an unconfined compressive strength greater than 0.5tsf (48 kPa) but less than 1.5 tsf (144 kPa); or
2. Granular cohesionless soils including angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.
3. Previously disturbed soils except those, which would otherwise be classed as Type C soil.
4. Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or
5. Dry rock that is not stable; or
6. Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

2.26. **Type C Soil:**

1. Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or
2. Granular soils including gravel, sand, and loamy sand; or
3. Submerged soil or soil from which water is freely seeping; or
4. Submerged rock that is not stable; or
5. Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

2.27. **Unconditional Release:** Article/material that has **no** detectable licensed radioactive material above background.

2.28. **Uprights:** The vertical members of a trench shoring system placed in contact with earth and usually positioned so that individual members do **not** contact each other. Uprights placed so that individual members are closely spaced, in contact with, or interconnected to each other, are often called "sheeting".

2.29. **Utility Locating Service (ULS):** Utility Locating Service for locating underground utility lines, electrical or piping. ULS notifies affected utilities of excavation location. Location of underground utility services that are owned by the notified utilities is the responsibility of those utilities.

2.30. **Wales:** Horizontal members of a shoring system placed parallel to the excavation sides that bear against the vertical members (uprights) of a shoring system.

3. **RESPONSIBILITIES**

3.1. **Exelon/Contracted Competent Person or Site Excavation Coordinator Responsibilities**

NOTE: The contracted Excavation Coordinator shall be qualified and assigned by the Manager of Contract Services. (CM-1)

3.1.1. **COMPLETE** the review of Attachment 1, Section II when evaluating the protective measures to be implemented when performing an excavation, trenching, and shoring activity.

3.1.2. **ASSIST** the responsible Work Planner in planning activities and permit completion as needed.

3.1.3. **PERFORM**, once per shift, Attachment 2, Daily Trenching Log.



- 3.1.4. **REMOVE or SUPPORT** any surface encumbrances that may be a hazard to employees, as necessary.
- 3.1.5. **MONITOR** equipment and operations for the removal of water from excavations.
- 3.1.6. **INSPECT** materials or equipment used for the construction of protective or support systems.
- 3.1.7. **CLASSIFY** each soil and rock deposit as Stable Rock, Type A, Type B, or Type C, for the purpose of selecting shoring or sloping in accordance with the definitions set forth in this procedure. **USE** T&RM SA-AA-117-2129, Soil Classification, when performing this activity.
- 3.1.8. **DETERMINE** the degree to which the actual slope must be reduced below the maximum allowable slope when surcharge loads from stored equipment, material, or traffic are present.
- 3.1.9. **ENSURE** employees required to handle equipment have been properly trained and fully alerted to potential hazards associated with equipment operation. (CM-1)
- 3.1.10. **REMOVE** exposed employees from the excavation when evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions exist.
- 3.1.11. **ENSURE** Radiation Protection and Environmental are notified to examine the debris and provide appropriate release documentation as needed.
- 3.1.12. **COORDINATE** with Environmental personnel in the event that Cultural, Historical or Paleontological Resources are discovered to assist with salvage or disposition of the resources and release of the excavation site to resume work.
- 3.1.13. **REVIEW** applicable state and/or local ordinances pertaining to excavation or underground utility protection. In cases where the state and/or local ordinance requirements are more restrictive than the requirements of this procedure, **VERIFY** that the state and/or local ordinance requirements will be met in addition to the requirements of this procedure.
- 3.2. Work Planning
  - 3.2.1. **COMPLETE** Attachment 1, Excavation Permit, Section II through consultation with Maintenance and Engineering personnel.
  - 3.2.2. **ENSURE** a review of underground commodities is conducted and that a mark-up or sketch of the trench work site is provided in the work package.
  - 3.2.3. **IDENTIFY** in the work package, through consultation with Site Industrial Safety, whether air sampling will be required during the excavation/trenching evolution.

3.2.4. **INCLUDE** manufacturer's specifications, engineering design documents, and other supportive materials mandated by this procedure within the applicable work package.

3.3. First Line Supervisor Responsibilities

3.3.1. **ENSURE** that the pre-job briefings include all **WARNING** items outlined in this procedure.

3.3.2. **ENSURE** that a Competent Person is present at the station **and ASSIGNED** for all excavation trenching and shoring activities.

3.3.3. **ENSURE** that only qualified personnel perform excavation activities. (CM-1)

3.3.4. **If** the Competent Person is a short-term contracted individual, **then ENSURE** the following:

1. The role of the Competent Person is clearly defined for employees and that the direction of the Competent Person is understood and followed. (CM-1)
2. That Exelon Nuclear procedural guidance concerning radiation protection, warning systems, and station nuclear safety (plant components and systems) are adhered to and considered by the Competent Person.

3.3.5. **If** excavation activities are to be turned over to the next shift or a different work group, **then** the Supervisor currently in charge shall ensure that a thorough turnover is performed prior to start of work.

3.3.6. **If** existing underground commodities are damaged during excavation activity, **then** Supervisor shall **STOP** work, **PLACE** work area in a safe condition, **and NOTIFY** Competent Person, Site Excavation Coordinator, Work Control Center, and Plant Operations. Should any unexpected condition be encountered, re-survey and obtain a qualified peer check prior to continuing.

3.3.7. **If** Cultural, Historic or Paleontological resources are uncovered during excavation activity, **then** Supervisor shall perform the following: (CM-7)

1. **STOP** work,
2. **PLACE** work area in a safe condition,
3. **NOTIFY** Competent Person, Site Excavation Coordinator, Work Control Center, Environmental personnel and Plant Operations.
4. **COVER** the resources with a tarp or other suitable covering to protect from the elements.

5. **CONTROL** personnel and vehicle access through the area by placing barriers and / or posting signs.

Work shall **not** resume until the Cultural, Historic or Paleontological resources have been salvaged or otherwise dispositioned, and Environmental personnel authorize work to resume.

- 3.3.8. If mechanical or electrical systems are **not** blocked, **then** Control Room shall be notified when excavation activity could jeopardize the operation of plant systems.

#### 3.4. Engineering Responsibilities

- 3.4.1. If the techniques and designs described in this procedure **cannot** be utilized, **then** it is the responsibility of a Registered Professional Engineer to perform one or more of the following:
  1. **DESIGN and APPROVE** a protective system that will protect employees performing the evolution.
  2. **DESIGN and APPROVE** a program that provides guidance, in tabular form similar to this procedure that will adequately protect employees.
  3. **INDICATE** by signature and date the name and certification of the Registered Professional Engineer designing the program or system indicated above.
- 3.4.2. Engineering will support Work Planning in identifying and evaluating applicable drawings to identify buried utilities and commodities, Attachment 1, Section IIA and Attachment 1, Section IIB (Shoring Design Section). This review is conducted by a qualified engineer or design engineer at the discretion of Engineering departmental management.
- 3.4.3. **PERFORM** independent review of Attachment 1, Section II.
- 3.5. Excavation Employee Responsibilities
  - 3.5.1. **DON** warning vests or other suitable garments marked with or made of reflectorized or high-visibility material when exposed to public vehicular traffic.
  - 3.5.2. **RESTRICT** movement underneath loads handled by lifting or digging equipment.
  - 3.5.3. **VACATE** the excavation immediately if bulging or tension cracks appear.
  - 3.5.4. **CONSULT** with the Competent Person or Site Excavation Coordinator in situations where water is infiltrating the excavation.
  - 3.5.5. **INSTALL** appropriate marking material (i.e., Ribbon, flagging, etc.) when performing re-burial of excavated utilities in a manner prescribed by applicable Exelon burial specifications.

- 3.5.6. **MONITOR** water removal equipment, if present, to ensure proper operation.
- 3.5.7. **ERECT** barricades to keep unauthorized personnel a minimum of five feet away from digging equipment and the excavation. An individual designated to prevent access may be used in lieu of a physical barricade.

3.6. Excavation Equipment Operators Responsibilities

**WARNING**

**WHEN AN OPERATOR IS ISOLATED IN THE EQUIPMENT CAB AND CONTACTS A LINE, THE WORKER SHALL REMAIN REASONABLY STILL IN THE CAB UNTIL THE LINE IS DE-ENERGIZED. UNDER NO CIRCUMSTANCES EXCEPT FOR EXTREME CASES, SUCH AS FIRE, SHALL THE OPERATOR LEAVE THE CAB.**

- 3.6.1. **UTILIZE** warning systems such as barricades, hand or mechanical signals, or stop logs in instances when mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge.
- 3.6.2. **STAGE** excavated materials, other materials, and equipment a minimum of 2 feet away from the edge of the excavation **and/or ERECT** suitable barricades to prevent material from falling or rolling into the excavation.
- 3.6.3. Electrically **GROUND** power operated equipment.
- 3.6.4. **Never** undermine sidewalks and/or pavements unless a support system is present.
- 3.7. Radiation Protection & Chemistry Department Responsibilities
  - 3.7.1. **DETERMINE** what analysis is required for soil release. Soils can include gravels, silty gravels, clayey gravels, sands, and sand silt mixes.
  - 3.7.2. **AUTHORIZE** release of excavated materials in accordance with station unconditional release procedures.
  - 3.7.3. **If** Cultural, Historical or Paleontological Resources are identified during excavation, **then** Environmental Personnel **COORDINATE** actions involving the salvage and/or disposition of the resources, and **RELEASE** the excavation site to resume work once these activities are completed.

3.8. Departmental Training Coordinator

3.8.1. **MAINTAIN** up-to-date training records for all Competent Persons. Training will include, but not be limited to, specific focus areas such as knowledge of protective systems, soil classifications, standards, and regulations governing excavations.

4. **MAIN BODY**

### **WARNING**

USE OF ATTACHMENT 1 PROVIDED IN THIS PROCEDURE IS REQUIRED PRIOR TO EXCAVATION ACTIVITIES TO ENSURE OPTIMUM SAFETY AT ALL TIMES. ALL REVIEWS REQUIRE SIGNATURE AND DATE. THE INFORMATION REQUIRED TO COMPLETE THE SPECIFIC WORK ACTIVITY AS LISTED ON THE WORK ORDER/ACTION REQUEST OR IN THIS PROCEDURE NEEDS TO BE RECORDED. ALL SIGNOFFS AND DATA BLANKS NOT REQUIRED SHOULD BE MARKED N/A TO INDICATE THE STEPS HAVE NOT BEEN MISSED UNINTENTIONALLY.

### **WARNING**

AN EVALUATION OF BELOW GROUND UTILITY INSTALLATIONS (SEE SECTION 4.1.1) IS REQUIRED FOR ALL EXCAVATIONS. THIS IS TO ENSURE THAT DIGGING EVOLUTIONS OF ANY KIND DO NOT DAMAGE SHALLOW BURIED EQUIPMENT.

### **WARNING**

IF MECHANICAL OR ELECTRICAL SYSTEMS ARE NOT BLOCKED, THEN CONTROL ROOM SHALL BE NOTIFIED WHEN EXCAVATION ACTIVITY COULD JEOPARDIZE THE OPERATION OF PLANT SYSTEMS.

### **WARNING**

ALL BURIED Q-LISTED YARD COMMODITIES SHALL REMAIN COVERED ON ALL SIDES BY AT LEAST 4 FEET 1 INCH (OR AS STATED IN SITE SPECIFIC UFSAR) OF SOIL OR FILLCRETE UNLESS OTHERWISE EXEMPTED BY ENGINEERING.

### **WARNING**

IF, DURING PERFORMANCE OF AN EXCAVATING ACTIVITY, IT IS IDENTIFIED THAT THE WORK GROUP MUST DEVIATE FROM THE APPROVED LAYOUT SHOWN ON ATTACHED DRAWINGS BY MORE THAN 18 INCHES, THEN THE SUPERVISOR SHALL STOP WORK, PLACE THE WORK AREA IN A SAFE CONDITION AND NOTIFY THE CONTRACTED SITE EXCAVATION COORDINATOR OR COMPETENT PERSON FOR RESOLUTION. (CM-1)

### **WARNING**

IF AN ABNORMAL CONDITION IS FOUND OR AN UNEXPECTED COMMODITY IS ENCOUNTERED, THEN A SAFE CONDITION SHALL BE ESTABLISHED AND THE CONTRACT SUPERVISOR, FIRST LINE SUPERVISOR, OR LEAD MAINTENANCE TECHNICIAN SHALL BE NOTIFIED IMMEDIATELY. ABNORMAL CONDITIONS AND CORRECTIVE ACTIONS TAKEN SHALL BE DOCUMENTED IN THE WORK ORDER OR THE SPECIAL PRECAUTIONS BOX IN SECTION II OF ATTACHMENT 1.

#### 4.1. Pre-Job Planning

- 4.1.1. For all excavations, **DETERMINE** the location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installation by reviewing plant site-specific drawings and by contacting a Utility Locating Service in accordance with state and local laws. Refer to Attachment 5 for guidance to consider when selecting various ground scan technologies that can be used.

**NOTE**

Soils on all Exelon Nuclear property areas described in the UFSARs for NRC licensed generating stations have been previously surveyed for Cultural, Historical or Paleontological Resources as part of the licensing process and are considered to be previously disturbed. Therefore, new surveys are normally not required for excavations in these areas.

- 4.1.2. If performing excavation for new construction in areas previously surveyed for Cultural, Historical or Paleontological Resources, **then REVIEW** the previously performed Cultural, Historical or Paleontological surveys to ensure excavation does not disturb identified resources. (CM-7)
- 4.1.3. If excavation is to be performed in areas not previously surveyed for Cultural, Historical or Paleontological Resources, **then CONTACT** Environmental personnel to arrange for a survey to determine impacts. (CM-7)
- 4.1.4. **CONDUCT** a walk down of the area to ensure all identified underground installations are appropriately marked prior to excavation activity.
- 4.1.5. **PROVIDE** detection equipment or other acceptable means to locate utility installations in instances when utility companies, owners, or independent locators cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law) or cannot determine the precise location of these installations.

**WARNING**

**THE USE OF POWERED EXCAVATION EQUIPMENT (E.G., BACKHOE, ETC.) WITHIN A "TOLERANCE ZONE" IS PROHIBITED.**

- 4.1.6. **ENSURE** that any excavation within a "tolerance zone" is conducted by hand, air suction (vacuum truck), pressurized air, and/or pressurized water. Refer to Attachment 6 for a typical details of a "tolerance zone."

Exception:

**USE** of powered equipment may be utilized within the tolerance zone of mechanical lines, or electrical lines that are verified to be de-energized and known to be encased in rigid conduit, if approved by the Site Maintenance Director or Site Manager of Project Management.

## WARNING

**WHEN UNCOVERING UNDERGROUND INTERFERENCES USE  
EXTREME CAUTION TO PREVENT INJURY/ELECTRICAL SHOCK.**

- 4.1.7. **USE** methods to protect the employee from electrical contact when excavating within the "tolerance zone" of any electric utility or when removing soil to determine the exact location of buried electrical utilities and other potential under soil hazards. At least one (1) of the following four (4) options is required:
1. **USE** non-conductive ladders and wood or fiberglass handled tools while wearing insulated protective gloves, where applicable, when "hand digging" to determine the location of buried electrical utilities. **DIG** towards underground interference markings using a fiberglass handled digging tool.
  2. **USE** air suction, typically through the use of a vacuum truck, to remove soil.
  3. **USE** pressurized air, typically through an air lance, to blow soil away from buried components.
  4. **USE** pressurized water, typically through a water lance, to wash soil away from buried components.
- 4.1.8. **If possible, then use a "scan as you go technique."**
- 4.2. Pre-Excavation Evaluations and Activities
- 4.2.1. **SECURE and STUDY** all available information and drawings regarding the area where the work is to be done to determine the location of all underground structures, pipes, wiring, and power cables.
- 4.2.2. **DETERMINE** the protective systems to be used for the excavation, trenching and shoring activity based on guidance contained in Attachment 3, Selection of Protective Systems.
- 4.2.3. **CHECK** the area, prior to starting any excavation, to estimate the location and depth of underground cables or pipes. **MARK**, on the surface, the location of underground facilities plainly by stakes, flagging, or some other means.
- 4.2.4. **EVALUATE** having underground cables de-energized through applicable procedures. This may include initiating a Clearance Request.
- 4.2.5. **EVALUATE** having overhead lines de-energized through applicable procedures. This may include an Out-of Service request.



- 4.2.6. **ERECT** flagging or other types of visible barriers around the work area to prevent unauthorized access into the work area.
- 4.2.7. **CONDUCT** a pre-job briefing to review the job and potential hazards of the job with all workers involved including a walkdown of the job.
- 4.2.8. **NOTIFY** Radiation Protection prior to performing any excavation, digging, or trenching on the site property to determine if any requirements must be met before any soils and/or materials can be excavated.
- 4.2.9. **NOTIFY** the Operations and Security departments prior to performing any excavation, digging, or trenching on the site property.
- 4.2.10. **ENSURE** that operators and drivers of heavy equipment as well as any other outside contracted services in the work area are included in the Pre-Job Brief.
- 4.2.11. **NOTIFY** other affected departments as necessary prior to performing any excavation, digging, or trenching on the site property.
- 4.3. Access and Egress from Excavations
  - 4.3.1. If structured ramps are used as a means of vehicle access/egress from excavations, **then ENSURE** that structured ramps are designed and approved by an Engineer qualified in structural design. Assignment of this individual is at the discretion of site Engineering department management.
  - 4.3.2. **ENSURE** that ramps or runways constructed of two or more structural members have the structural members connected together.
  - 4.3.3. **USE** structural members of uniform thickness for ramps and runways.
  - 4.3.4. **ATTACH** cleats, or other means used to connect runway structural members, to the bottom of the runway in a manner that prevents tripping.

**CAUTION**

Stairways, ladders and ramps are required for safe means of egress for all trenches and excavations 4 feet or greater in depth.

- 4.3.5. **PROVIDE** stairways, ladders, ramps, or other safe means of egress for all excavations and trenches 4 feet deep or more. The maximum distance between any worker and a ladder shall **not** be more than 25 feet.
- 4.4. Hazardous Atmosphere Determination
  - 4.4.1. **TEST** the atmosphere before permitting employee entry into excavations greater than 4 feet in instances where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist. **CONDUCT** testing as often as necessary to ensure the atmosphere remains safe as per confined

space procedures. The Site Industrial Safety professional determines if trenching activity meets the requirements for a confined space.

- 4.4.2. **SUPPLY** respiratory protection when atypical situations exist, such as an oxygen deficient or hazardous atmosphere, as determined by the Station Respiratory Protection Coordinator or Site Safety Professional.

**WARNING**

**DO NOT CUT GRIND, OR BURN IN ATMOSPHERES IN EXCESS OF  
10% OF THE LOWER FLAMMABLE LIMIT OF THE GAS.**

- 4.4.3. **PROVIDE** ventilation in atmospheres containing a concentration of a flammable gas in excess of 10% of the lower flammable limit of the gas. **No** entry shall be made into an excavation when the flammable gas limit is greater than 10% of the LEL.

4.5. Heavy Equipment Operation and Energized Overhead Line Requirements

**WARNING**

**IN THE EVENT OF A CAVE-IN, IMMEDIATELY CEASE ALL EQUIPMENT OPERATION TO PREVENT FURTHER MATERIAL FROM COLLAPSING INTO THE EXCAVATION.**

4.5.1. When operating heavy equipment such as backhoes, cranes, bulldozers etc., in areas with energized overhead lines, the following specific precautions are required:

1. **FLAG** the worksite to indicate safe paths of heavy equipment travel and operation to prevent the equipment from being in an area where energized line contact is possible.
2. **FLAG** poles or other components to indicate the safe set back distance for overhead lines.
3. **REVIEW** SA-AA-129 Electrical Safety for setback distances from energized electrical conductor.
4. **ASSIGN** a spotter to assist the operator of the heavy equipment.
5. The spotter is expected to perform the following:
  - **COMMUNICATE** to the operator the position of the heavy equipment in relation to hazards such as overhead line.
  - **ASSIST** the operator by providing instruction through hand signals, radio, or other means regarding operation of the vehicle.
  - **OBSERVE and ENSURE** that the operator is complying with safety flagging, access routes, and other safety precautions as discussed in the pre-job brief and based on work site conditions.

4.6. Specific Excavation Requirements

**WARNING**

**WHEN CLEANING DISTURBED DIRT OUT FROM A HOLE, THIS MAY REMOVE SOME PREVIOUSLY UNDISTURBED DIRT. REMOVAL OF UNDISTURBED DIRT HAS THE POTENTIAL TO UNCOVER UTILITIES.**

**CAUTION**

In the past when installing utilities, "Caution Tape," Boards, or Patio Block, etc., may **not** have been used. This makes conservative digging practice of watching for utilities even more important during excavation.

- 4.6.1. **PROTECT, SUPPORT, OR REMOVE** underground installations, as necessary, to safeguard employees while the excavation is open.
- 4.6.2. **REMOVE or SUPPORT** all surface encumbrances, such as trees and boulders, prior to initiating excavation activities.
- 4.6.3. **EMPLOY** sloping, shoring, or use a manufactured protective system approved by a registered professional engineer in all cases where the depth of an excavation or trench exceeds 5 feet.
- 4.6.4. **PROHIBIT** employees from working in excavations in which there is accumulated water, or where water is accumulating, unless adequate job-specific precautions have been employed.
- 4.6.5. **PREVENT** surface water from entering the excavation.
- 4.6.6. **INSTALL** support systems, as necessary, in situations where the stability of adjoining buildings, walls, or other structures are compromised by the excavation.
- 4.6.7. **INCORPORATE** scaling, **ERECT** barricades, or **PROVIDE** equivalent protection to protect employees from loose rock or soil that could fall or roll into the excavation.
- 4.6.8. **USE** GFCI protection when using electrical equipment.
- 4.6.9. **INSTALL** guardrails on all walkways installed 6 feet or more above lower levels.
- 4.7. Exposing Underground Piping, Structural Steel, or Concrete During Excavation (CM-2, CM-3, CM-4, CM-5, CM-6, CM-8)
  - 4.7.1. If underground piping, structural steel, or concrete is exposed during excavation, **then PERFORM** the following:
    - 1. **NOTIFY** Engineering to inspect piping, structural steel or concrete for evidence of coating degradation or corrosion, concrete cracking or spalling, and signs of corrosion in steel.

2. Engineering **INSPECT** piping or structural steel for evidence of coating degradation (if coated pipe or steel components) or corrosion (if uncoated metal pipe or steel components). Engineering **INSPECT** concrete components for cracking or spalling. **RECORD** results of inspections in ACTION TRACKING and record the Action Tracking Number In the Comments Section of the Excavation Permit.
  3. **INSPECT** any exposed bolting for material condition **AND RECORD** results in the Action Tracking Item referenced in Step 2 Above.
  4. **If** degradation, corrosion, or leakage is observed, **then INITIATE** the Corrective Action Program and take appropriate corrective action to evaluate if additional piping or bolting should be inspected.
  5. **If** any repairs were performed, **then RECORD** Work Order information and final inspection results in Action Tracking Item listed in Step 2.
- 4.8. Protective System Selection and General Requirements
- 4.8.1. **PROVIDE** protective systems such as a shoring system, safe sloping of the ground, or equivalent means of protection such as a trench shield or boxes on all sides of excavations that measure 5 feet or more in depth. **REFERENCE** Attachment 3, Selection of Protective Systems, Figures 1-3 for a decision tree to aid in the selection process.
  - 4.8.2. **USE** sloping or shoring on excavations less than 5 feet deep if hazardous ground movement is possible. **REFERENCE** Attachment 3, Selection of Protective Systems, Figures 1-3 for a decision tree to aid in the selection process.
  - 4.8.3. **EVALUATE** available space, soil type, presence of filled ground, or other excavations nearby, vibrations, and groundwater conditions prior to deciding whether to slope or shore an excavation. **REFERENCE** Attachment 3, Selection of Protective Systems for shoring and sloping options based on soil types.
- 4.9. Use of Slope and Benching Systems
- 4.9.1. **CUT BACK** the actual slope to less than the slopes allowed in the table below in the following circumstances:
    1. Whenever there are signs of distress or when fissures/cracks develop in the excavation walls.
    2. When materials slump or bulge from the face or when small clumps of material suddenly start separating from the face and rolling into the excavation.
    3. When there are surcharges from adjacent material, equipment or traffic.
  - 4.9.2. **COMPLY** with the sloping requirements contained in Table 1.

**TABLE 1. MAXIMUM ALLOWABLE SLOPES**

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (Horizontal:Vertical) FOR EXCAVATIONS LESS THAN 20 FEET DEEP
STABLE ROCK	VERTICAL (90° from the horizontal)
TYPE A	3/4:1 (53° from the horizontal)
TYPE B	1:1 (45° from the horizontal)
TYPE C	1 1/2:1 (34° from the horizontal)

4.9.3. Protective Systems using Sloping may be designed that are not in compliance with Table 1 above or Attachment 3 of this procedure provided that one (1) of the following two (2) methods are met:

1. The Sloping or Benching System is designed by a registered Professional Engineer, that copies of the design plan are maintained at the trenching site, and that the written design documentation shall include:
  - A. The magnitude of the slopes that were determined to be safe,
  - B. The configurations that were determined to be safe,
  - C. And, that the identity of the registered professional engineer is indicated on the design plan/materials.
2. The Sloping or Benching System is designed from written tabulated data or charts, a copy of which is maintained at the job site, that specifies:
  - A. The parameters that effect the selection of the type of sloping or benching system,
  - B. The limits of using the written table and charts including the dimensions of the slope and benching system approved for use,
  - C. All explanatory information necessary to ensure that the user can make a correct selection for the approved system,
  - D. And, the written tabulated or chart data identifies the registered Professional Engineer that approved the data for use.

4.10. Use of Shoring Systems

- 4.10.1. **CONSULT** a registered professional engineer to design a shoring system if any of the following conditions are met:
- If the excavation exceeds 20 feet in depth.
  - When loads imposed by equipment, structures, or stored materials adjacent (closer to the edge than the trench is deep) to the trench weigh in excess of the load imposed by a two-foot soil surcharge.
  - When surcharge loads are present from equipment weighing in excess of 20,000 pounds.
- 4.10.2. Protective Systems using pre-engineered components, hydraulic shoring, air (pneumatic) shoring, trench jacks, and shields may be utilized provided the following requirements are met.
1. The system components are used in full compliance with all manufacturer specifications, recommendations, and limitations.
  2. The manufacturer's limitations, specifications, and recommendations are maintained, in written form, on the job site during construction of the system.
- 4.10.3. **UTILIZE** the requirements contained in Attachment 4-Timber Shoring, Minimum Timber Requirements.
- 4.10.4. Protective Systems using Shoring may be designed that are **not** in compliance with Attachment 4 -Timber Shoring, Minimum Timber Requirements provided that one of the following two (2) methods are met:
1. The Shoring System is designed by a registered Professional Engineer, copies of the design plan are maintained at the trenching site, and that the written design documentation shall include:
    - A. The sizes, types and configurations of the materials to be used in the designed system,
    - B. And, that the identity of the registered professional engineer is indicated on the design plan/materials.
  2. The Shoring System may be designed from written tabulated data or charts, a copy of which is maintained at the job site, that specifies:
    - A. The parameters that effect the selection of the type of protective shoring system,
    - B. The limits of using the written table and charts including the dimensions of the slope and benching system approved for use,

- C. All explanatory information necessary to ensure that the user can make a correct selection for the approved system,
- D. And, the written tabulated or chart data identifies the Registered Professional Engineer that approved the data for use.

### WARNING

**USE OF THE SYSTEM DESCRIBED IN 4.10.5 IS ONLY APPLICABLE TO EXCAVATIONS LESS THAN 8 FEET IN DEPTH WITHOUT WRITTEN AUTHORIZATION OF A REGISTERED PROFESSIONAL ENGINEER.**

- 4.10.5. Aluminum equipment exists, such as the speed shore system that consists of aluminum rails, hydraulic cylinders, pumps, and accessories for supporting plywood sheeting in excavations. The plywood shall be CDX grade size 4' X 8' X 1 1/8" and may be cut as needed for each excavation. **ENSURE** tabulated data, tables, or drawings approved by a registered professional engineer and used to design and construct the protective system are on-site when using this option in any system.
- 4.10.6. **COMPLY** with the following when installing or removing shoring:
  - 1. **PLACE** cross braces in a true horizontal position.
  - 2. **SECURE** bracing by cleats or wedging to prevent "kick out."
  - 3. **BEGIN** at, and **PROGRESS** from, the bottom of the excavation for all removal activities. **RELEASE** structural members slowly and carefully; **WATCH** for possible cave-in. Cross braces may be removed by tying a rope around them and removing without entering the hole.
  - 4. **BACKFILL** the hole as soon as the shoring is removed. When backfilling, care shall be taken **not** to dump backfill directly on cables or piping exposed in the trench.
- 4.11. Trench Boxes

### WARNING

**A TRENCH BOX MAY NOT BE USED IN EXCAVATIONS GREATER THAN 20 FEET IN DEPTH WITHOUT THE WRITTEN AUTHORIZATION OF A REGISTERED PROFESSIONAL ENGINEER.**



- 4.11.1. The Competent Person may permit the use of a trench box. Trench boxes must be designed by a registered professional engineer or obtained manufactured from a vendor.
- 4.11.2. **RETAIN** the engineer's or manufacturer's specifications, recommendations, and limitations during construction and when the system is in use.
- 4.11.3. **INSTALL** boxes in such a way as to prevent sideways movement in the event of a cave-in.
- 4.11.4. **PROTECT** personnel from cave-in when entering or exiting the area protected by the trench box. Personnel shall not be inside the boxes while they are being installed, removed, or repositioned.
- 4.11.5. **MAINTAIN** tabulated data on the trench box on-site.
- 4.12. Modular Aluminum Panels
- 4.12.1. Equipment exists such as the mighty lite aluminum panel system that consists of aluminum panels generally 2' X 5' X 2.5" and screw jack adjustable spreaders. This system can be assembled and disassembled quickly. When using the system with the screw jacks, **USE** only screw jacks approved for use with this system. In an excavation, **SLOPE BACK** the vertical ends of the trench based on the soil classification. A four-sided box may be constructed with corner connections. Screw jacks do not have to be used in conjunction with the four-sided box. **MAINTAIN** tabulated data at the trench location.
- 4.13. Mini-Mighty Lite System

### WARNING

THE MINI-MIGHTY LITE SYSTEM CAN ONLY BE USED IN EXCAVATIONS LESS THAN 12 FEET IN DEPTH FOR TYPE B SOIL AND LESS THAN 6 FEET IN DEPTH FOR TYPE C SOIL WITHOUT THE WRITTEN AUTHORIZATION OF A REGISTERED PROFESSIONAL ENGINEER.

- 4.13.1. **MAINTAIN** tabulated data for this system.
- 4.13.2. This protective system is designed for protecting workers in excavations with fixed dimensions. The systems consist of a 42" X 42" X 32" aluminum box with removable aluminum sheeting which can be placed around utilities and other obstructions
- 4.13.3. **RETAIN** tabulated data at worksite during construction and when system is in use.

4.14. Using Heavy Equipment Near Trenches

4.14.1. When trenching machines and other mobile equipment are used near trenches, the following shall apply:

1. If mobile equipment is required to approach the edge of an excavation and the operator does **not** have a clear view of the edge, **then USE** a warning system such as hand signals or stop logs.
2. **STAGE** all equipment at least 2 feet from the edge of excavations.
3. **SHORE** the trench as necessary.
4. **INSTALL** shoring as machine trenching proceeds.

**WARNING**

**STAND AWAY FROM ANY VEHICLE BEING LOADED OR UNLOADED TO AVOID BEING STRUCK BY SPILLAGE AND RAW MATERIALS.**

4.15. Inspections

Note: When any portion of a buried concrete foundation is exposed, notify Engineering to perform an inspection of the buried concrete foundation for settlement, deterioration, damage or other signs of degradation that would jeopardize its function.

4.15.1. Competent Person shall **INSPECT** all excavations using Attachment 2, Daily Excavation/Trenching Log. **FOCUS** inspections on the following:

1. Situations which could result in possible cave-ins, such as fissures, slumping of material from the excavation face, bulging, spalling and raveling (small amounts of material such as pebbles or clumps of material suddenly separating from the face and rolling down).
2. Indications of failure of the shoring system.
3. Hazardous atmospheres or other hazardous condition.
4. Improper/Proper operation of water removal equipment.
5. Surcharge loads from equipment and materials that were not considered in the design of the protective system.

6. IF trench/excavation is in use, then **CONDUCT** inspections daily and after every rain event.

#### 4.16. Excavation Permit

##### 4.16.1. Excavation Permit (Attachment 1) - Section I

1. Initiator requesting the excavation activity, **COMPLETE** Attachment 1, Section I of the Excavation Permit as follows:
  - A. **SIGN and DATE** Section I. **COMPLETE** description of excavation and trenching activity.
2. Permit Initiator **FORWARD** Attachment 1 to the appropriate Work Planner.
3. Site Excavation Coordinator or Competent Person **CONTACTS** a Utility Locator Service in accordance with state or local laws. This notification should be at least 72 hours in advance of starting work.

##### 4.16.2. Excavation Permit - Section II

NOTE: The latest revision of available drawings and associated drawing change documents should be used to perform reviews.

1. Responsible Work Planner, with assistance of Engineering department staff and assigned Competent Person, **COMPLETE** Section II of Attachment 1 as follows:
  - A. **OBTAIN** information pertaining to underground utilities that may be encountered.
  - B. If available, **ATTACH** a copy of the applicable Electrical Layout Drawing(s) for the proposed excavation area.
  - C. If available, **ATTACH** a copy of the applicable drawing(s) showing existing underground commodities for the proposed excavation area.
  - D. If drawing(s) are available, then **MARK-UP** drawing(s) showing proposed depth and/or line of excavation area.
  - E. If drawing(s) are not available, then **SKETCH** area showing proposed depth and/or line of excavation area.
  - F. **DETERMINE** if Q-Listed, ASME, Fire Protection, or Reg. Guide 1.143 commodities will be exposed during excavation activity.

- G. **WALKDOWN** area of proposed excavation activity for commodities which cannot be scanned or verified accurately by drawing review to determine the most likely locations in the field.
- H. **If** applicable, **LIST** in Sections II those mechanical and electrical commodities that will be exposed.
- I. **If** applicable, **LIST** precautions that shall be taken to support or protect those exposed commodities. **INCLUDE** protection from potential tornado generated missiles, impacts of objects falling into excavation area, objects falling from nearby structures during a seismic event, or other concerns such as damage to coating, aluminum pipes, energized electrical conduits & cables and telephone wires.
- J. **If** applicable, **LIST** in Section II any other commodities (e.g. telephone, sewer lines, etc.) that may be encountered.
- K. **DETERMINE** if a security barrier will be affected. **If** necessary, **DISCUSS** excavation activity with Plant Security to determine required support

**CAUTION**

At Limerick Generation Station, **REVIEW** Specification G-42, Site Flood Protection, for compliance with Flood Protection requirements.

- L. **OBTAIN** Engineering approval to perform any excavation activity that would compromise the site flood protection requirements.
- M. **REVIEW** plan with Cathodic Protection System Engineer relative to equipment disturbance and potential need to re-connect wiring, changes in soil type effects, etc.
- N. **IDENTIFY** minimum clearances for overhead high voltage (HV) lines.
- O. **MARK-UP** applicable drawings or sketch, recording depth, size, and service line of any existing underground commodities within 10 feet of proposed excavation area.
- P. **DETERMINE** acceptable laydown areas for stock piling excavated material.
- Q. **OBTAIN** approvals prior to establishing a laydown area.
- R. **REVIEW** and **IDENTIFY** backfill placement and compaction requirements.

- S. **RECORD** in Section II all drawing numbers and revisions reviewed.
- T. As appropriate, **DEVELOP** a plan for restoring any commodity disrupted during excavation activity. The plan should consider material availability, work package approvals, TCA, ECR approvals, etc. **DOCUMENT** plan in Special Precautions box of Attachment 1, Section II.
- U. **DETERMINE**, in cooperation with the assigned Competent Person, safety measures required for proposed excavation activity considering as a minimum:
  - Electrical safety watch requirements
  - Equipment grounding
  - Energized equipment blocking
  - Special permits (Confined space, Hot Work, RWP)
  - Shoring and support (Attach sketch as required)
  - Flood protection requirements
  - Radiological hazards
  - Method of excavation
  - Daily safety hazard inspections requirements
  - Excavation area access restrictions and safety barricades
- V. **ENSURE** that a review of safety measures with or by the assigned Competent Person or Site Excavation Coordinator is conducted.
- W. **SIGN and DATE** upon completion of Section II.
- X. **FORWARD** Attachment 1 to an Independent Engineering Reviewer.

NOTE: Independent reviews may be performed by a single individual knowledgeable in the necessary reference drawings at the discretion of Engineering Management.

- 2. Independent Engineering Reviewer, **PERFORM** review of Attachment 1, Section II as follows:
  - A. This reviewer can also be the same Engineer that signed as the Mechanical Structural Engineer.
  - B. **VERIFY** applicable drawings or sketch and mark-ups are correct, including depth and line of proposed excavation activity.
  - C. **DISCUSS** any required additions or changes with the work group performing the excavation.

- D. **SIGN and DATE** indicating review complete.
- E. **FORWARD** Attachment 1 to the responsible work planner for inclusion in work package.

- 3. **OBTAIN** Competent Person or Site Excavation Coordinator signature and **DATE** upon completion of review and before start of job.

4.16.3. Excavation Permit - Revision

- 1. Responsible Work Planner, **NOTIFY** Site Excavation Coordinator or Competent Person of work that **cannot** be performed in accordance with Attachment 1, drawing mark-ups and special instructions.
- 2. **REVISE** Excavation Permit as follows:
  - A. **REVISE** original Attachment 1 sheets and drawing mark-ups as necessary or **ISSUE** new Attachment 1 sheets and drawing mark-ups.
  - B. **ENSURE** all reviews and signatures required for original excavation permit sections are completed for the revised or new permit sections.
  - C. **FORWARD** revised or new excavation permit to Site Excavation Coordinator or Competent Person for final review and approval of the revision.
  - D. **CONTINUE** excavation activities after approval from Site Excavation Coordinator or Competent Person.

4.16.4. Return To Normal

- 1. Contract Supervisor, First Line Supervisor or Lead Maintenance Technician, **ENSURE** the following:
  - A. Tools and equipment are returned to designated storage location and work area is clean.
  - B. Procedure is complete and Attachment 1 is attached to completed Work Order/Action Request/Work Package.

5. **DOCUMENTATION** - None

6. **REFERENCES**

6.1. Commitments

6.1.1 Limerick

(CM-1) A/R# A0789662, (LGS) LER 1-93-011 (T02973)

6.1.2 Peach Bottom

(CM-2) PBAPS License Renewal Outdoor, Buried, and Submerged Component Inspection Activities (T04329) (Step 4.7)

6.1.3 Dresden

(CM-3) Action Tracking Item AR 00101522.34.15, License Renewal Aging Management – NUREG – 1801 “Generic Aging Lessons (GALL) Report, Section XI.M34 Buried Piping and Tanks Inspections. (Step 4.7)

(CM-6) Action Tracking Item AR 00101522.40.12, License Renewal Aging Management – NUREG – 1801 “Generic Aging Lessons (GALL) Report, Section XI.S6 Structures Monitoring Program. (Step 4.7)

6.1.4 Quad Cities

(CM-4) Action Tracking Item AR 00101562.34.11, License Renewal Aging Management – NUREG – 1801 “Generic Aging Lessons (GALL) Report, Section XI.M34 Buried Piping and Tanks Inspections. (Step 4.7)

(CM-5) Action Tracking Item AR 00101562.40.12, License Renewal Aging Management – NUREG – 1801 “Generic Aging Lessons (GALL) Report, Section XI.S6 Structures Monitoring Program. (Step 4.7)

6.1.5 Three Mile Island

(CM-7) Action Tracking Item AR 00764374-04, NRC Environmental Site Audit Regarding Three Mile Island Nuclear Station, Unit 1, License Renewal application (TAC No. MD7702), dated April 1, 2008, Cultural Resources Review (ML080840029).

6.1.6 Oyster Creek

(CM-8) Action Tracking Item AR 00330592.26, License Renewal Aging Management – Buried Piping and Tank Inspections. (Step 4.7)

6.2. 29 CFR, 1926, Subpart P, Excavations.

6.3. OSHA Technical Manual, Section V: Chapter 2, Excavations: Hazard Recognition in Trenching and Shoring.

6.4. Nuclear Regulatory Commission, Reg. Guide 1.143 - Design Guidance for Radioactive Waste Management Systems, Structures and Components Install in Light-Water Cooled Nuclear Power Plants.

6.5. EN-AA-103-0001, Environmental Evaluations.

7. **ATTACHMENTS**

7.1. Attachment 1, Excavation Permit

7.2. Attachment 2, Daily Trenching Log

7.3. Attachment 3, Selection of Protective Systems

7.4. Attachment 4, Timber Trench Shoring – Minimum Timber Requirements

7.5. Attachment 5, Available Ground Scan Technologies

7.6. Attachment 6, Tolerance Zones

**ATTACHMENT 1**  
**Excavation Permit**  
**Page 1 of 2**

<b>SECTION I – EXCAVATION DESCRIPTION</b>	
SITE LOCATION:	
INITIATOR:	DATE: _____ TIME: _____
Print Name & Sign _____	AR/WO Number _____
DESCRIPTION OF ACTIVITY:	
<b>SECTION IIA - MECHANICAL AND ELECTRICAL COMMODITIES REVIEW</b>	
THE FOLLOWING DRAWING(S) WERE REVIEWED AND THE ATTACHED DRAWING(S) ARE MARKED-UP FOR EXISTING UNDERGROUND MECHANICAL COMMODITIES:	
DRAWING NUMBER: _____ REV: _____	DRAWING NUMBER: _____ REV: _____
DRAWING NUMBER: _____ REV: _____	DRAWING NUMBER: _____ REV: _____
DRAWING NUMBER: _____ REV: _____	DRAWING NUMBER: _____ REV: _____
DRAWING NUMBER: _____ REV: _____	DRAWING NUMBER: _____ REV: _____
MECHANICAL Q-LISTED, ASME, FP, Reg. Guide 1.143 COMMODITIES WILL BE EXPOSED DURING EXCAVATION: YES <input type="checkbox"/> NO <input type="checkbox"/> IF YES; LIST EXPOSED COMMODITIES:	
SUPPORT OR PROTECTION MEASURES FOR EXPOSED COMMODITIES:	
EVALUATION OF BURIED UTILITIES THAT MAY BE ENCOUNTERED (LIST):	
REVIEW FOR COMPLIANCE WITH SITE FLOOD PROTECTION REQUIREMENTS: YES ( <input type="checkbox"/> ) N/A ( <input type="checkbox"/> ) SITE ENGINEERING APPROVAL REQUIRED FOR YARD WORK WHICH WOULD COMPROMISE THE SITE FLOOD PROTECTION REQUIREMENTS ( <input type="checkbox"/> ) NO ( <input type="checkbox"/> ) YES	
RECOMMENDED LAYDOWN AREA FOR STOCKPILING EXCAVATION MATERIAL:	
BACKFILL DESCRIPTION:	
PLACEMENT AND COMPACTION REQUIREMENTS:	
ECR, NCR, ETT GENERATED AND/OR ATTACHED YES ( <input type="checkbox"/> ) NO ( <input type="checkbox"/> ) N/A ( <input type="checkbox"/> )	
MINIMUM CLEARANCES FOR OVERHEAD HIGH VOLTAGE LINES (10' Up to 50 Kv add .4 inch for every 1000 volts over 50 Kv)	
SECURITY BARRIER AFFECTED: YES ( <input type="checkbox"/> ) NO ( <input type="checkbox"/> ) IF YES; LIST REQUIRED SECURITY SUPPORT	



**ATTACHMENT 1**  
**Excavation Permit**  
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<b>SECTION IIB – SAFETY EVALUATION</b>		
ROCK or SOIL TYPE:		
EXCAVATION DEPTH:	EXCAVATION WIDTH:	EXCAVATION LENGTH:
TYPE OF PROTECTIVE SYSTEM SELECTED: ( ) Sloping ( ) Shoring ( ) Shielding ( ) Combination		
MECHANICAL STRUCTURAL ENGINEER Name _____ Signature _____ DATE _____		
SHORING AND SUPPORT REQUIREMENTS (ATTACH SKETCH AS REQUIRED):		
FLOOD PROTECTION REQUIREMENTS:		
CATHODIC PROTECTION SYSTEM IMPACTS:		
RADIOLOGICAL HAZARDS:		
METHOD OF EXCAVATION:		
EXCAVATION AREA ACCESS RESTRICTIONS AND SAFETY BARRICADES:		
ELECTRICAL SAFETY WATCH REQUIRED? [ ] Yes [ ] No	HIGH VOLTAGE HAZARDS? [ ] Yes [ ] No	
EQUIPMENT GROUNDING:		
ENERGIZED EQUIPMENT BLOCKING:		
SPECIAL PERMITS REQUIRED (CONFINED SPACE, HOT WORK, RWP, etc.): YES [ ] NO [ ] IF YES, REQUEST GENERATED: [ ]		
ENVIRONMENTAL HAZARDS OR CONCERNS		
SPECIAL PRECAUTIONS AND OTHER REQUIREMENTS		
SECTION II PERFORMED BY:		DATE:
INDEPENDENT ENGINEERING REVIEW PERFORMED BY:		DATE:
COMPETENT PERSON/SITE EXCAVATION COORDINATOR REVIEW BY:		DATE:

**ATTACHMENT 2**  
**Daily Excavation/Trenching Log**  
**Page 1 of 3**

<b>1. General Inspection of Jobsite</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
A. Are surface encumbrances removed or supported?			
B. Are employees protected from loose rock or soil that could pose a hazard by falling or rolling into the Excavation?			
C. Are hard hats worn by all employees?			
D. Are spoils, materials, and equipment set back at least 2 feet from the edge of the excavation?			
E. Are barriers provided at all remotely located excavations, wells, pits, shafts, etc.?			
F. Are walkways and bridges over excavations 4 feet or more in depth equipped with standard guardrails and toeboards?			
G. Are warning vests or other highly visible clothing provided and worn by all employees exposed to public vehicular traffic?			
H. Are employees required to stand away from vehicles being loaded or unloaded?			
I. Is a warning system established and utilized when mobile equipment is operating near the edge of the excavation?			
J. Are employees prohibited from going under suspended loads?			
K. Are employees prohibited from working on the faces of sloped or benched excavations above other employees?			
<b>2. Means of Access and Egress</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
A. Is the lateral travel to a means of egress no greater than 25 feet in excavations 4 feet or more in depth?			
B. Are ladders used in excavations secured, and extend 3 feet above the edge of the trench?			
C. Are structural ramps used by employees designed by a Competent Person?			
D. Are ramps constructed of materials of uniform thickness, cleated together on the bottom, and equipped with a no-slip surface?			

**ATTACHMENT 2**  
**Daily Excavation/Trenching Log**  
**Page 2 of 3**

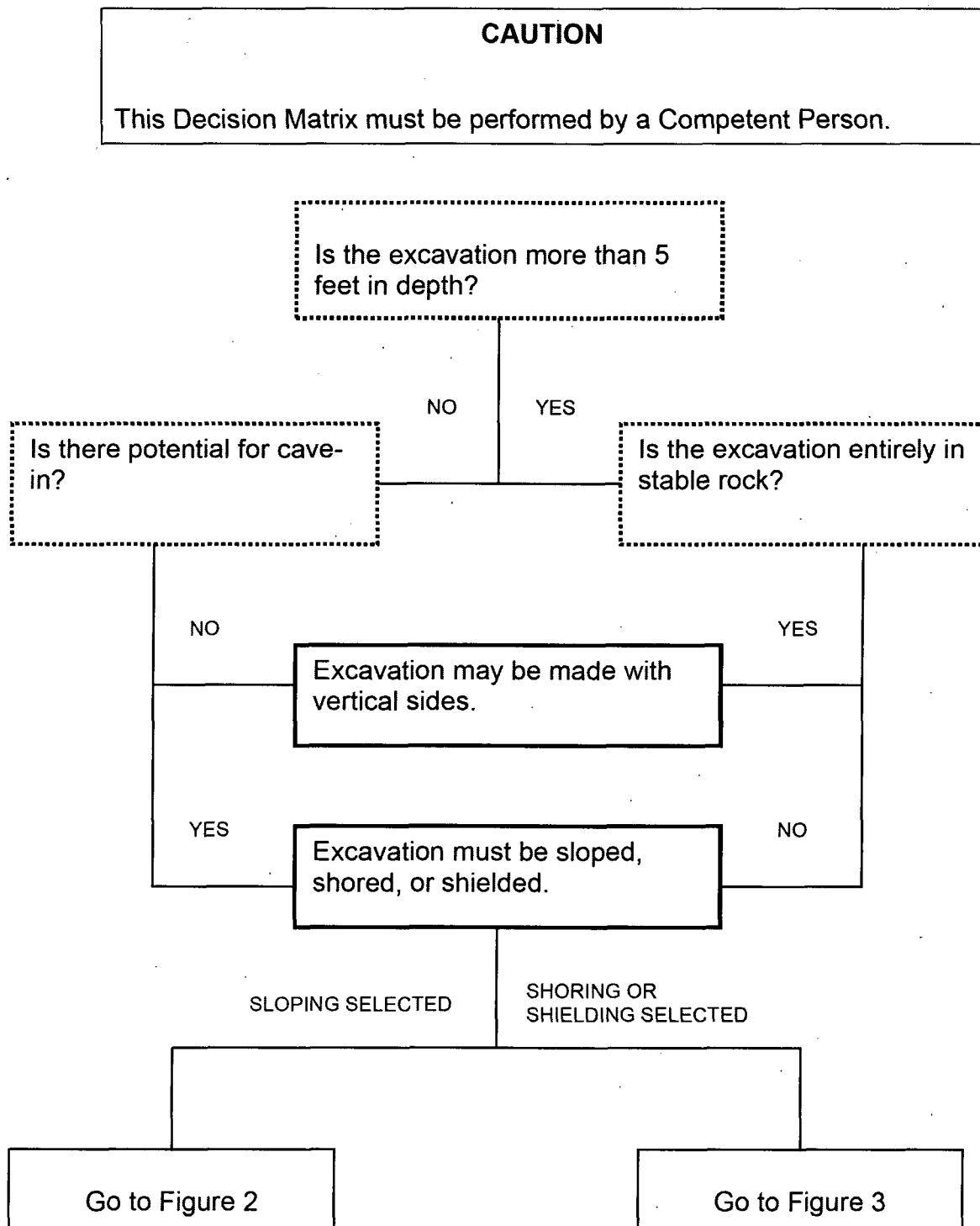
E. Are employees protected from cave-ins when entering or exiting the excavation?			
F. All confined space procedure rescue equipment in place?			
<b>3. Wet Conditions</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
A. Are precautions taken to protect employees from the accumulation of water?			
B. Is water removal equipment monitored by a Competent Person?			
C. Is surface water or runoff diverted or controlled to prevent accumulation in the excavation?			
D. Are inspections made after every rainstorm or other hazard increasing occurrence?			
<b>4. Hazardous Atmosphere</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
A. Is atmosphere within the excavation tested where there is a reasonable possibility of an oxygen deficiency, combustible, or other harmful contaminant exposing employees to a hazard?			
B. Are adequate precautions taken to protect employees from exposure to an atmosphere containing less than 19.5% oxygen and/or to other hazardous atmospheres?			
C. Is ventilation provided to prevent employee exposure to an atmosphere containing flammable gas in excess of 10% of the lower explosive limit of the gas?			
D. Is testing conducted often to ensure that the atmosphere remains safe?			
E. Is emergency equipment, such as breathing apparatus, safety harness and lifeline, and/or basket stretcher readily available where hazardous atmospheres could or do exist?			
F. Are employees trained to use personal protective and other rescue equipment?			
G. Are safety harness and lifeline used and individually attended when entering bell bottom or other deep confined excavations?			
<b>5. Support Systems</b>	<b>YES</b>	<b>NO</b>	<b>N/A</b>
A. Are materials and/or equipment for support systems selected based on soil analysis, trench depth, and expected loads?			
B. Are materials and equipment used for protective systems inspected and in good condition?			

**ATTACHMENT 2**  
**Daily Excavation/Trenching Log**  
**Page 3 of 3**

C. Are materials and equipment not in good condition removed from service?			
D. Are damaged materials and equipment used for protective systems inspected by a registered professional engineer (RPE) after repairs and before being placed back into service?			
E. Are protective systems installed without exposing employees to the hazards of cave-ins, collapses, or threat of being struck by materials or equipment?			
F. Are members of support systems securely fastened to prevent failure?			
G. Are support systems provided to insure stability of adjacent structures, buildings, roadways, sidewalks, walls, etc.?			
H. Are excavations below the level of the base or footing supported, and approved by an RPE?			
I. Do removal of support systems progress from the bottom and members are released slowly as to note any indication of possible failure?			
J. Does backfilling progress with the removal of the support system?			
K. Is material excavated to a level no greater than 2 feet below the bottom of the support system and only if the system is designed to support the loads calculated for the full depth?			
L. Is a shield system in place to prevent lateral movement?			
Competent Person Comments			
Competent Person Signature			Date

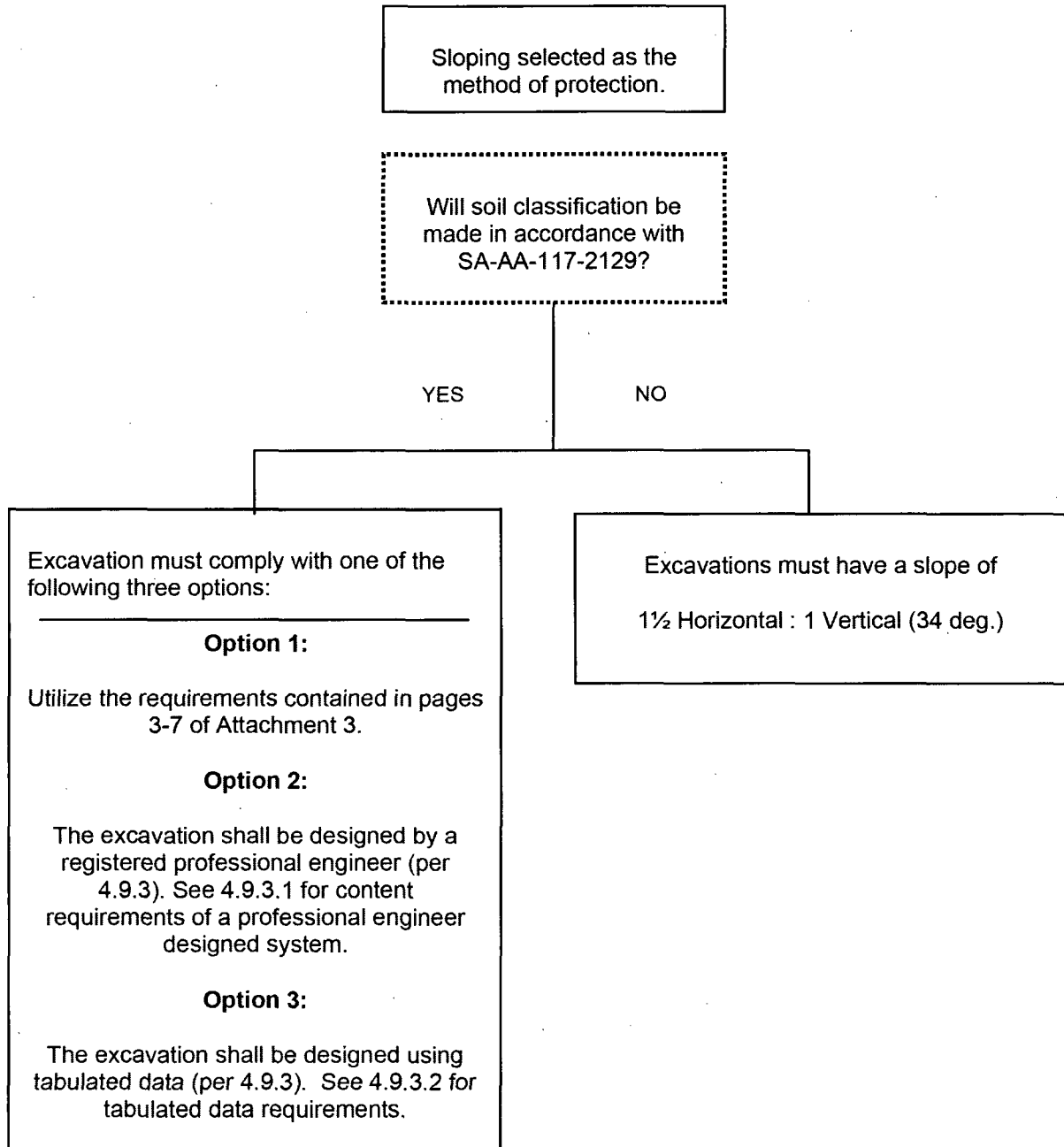
**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 1 of 7**

FIGURE 1 – PRELIMINARY DECISIONS



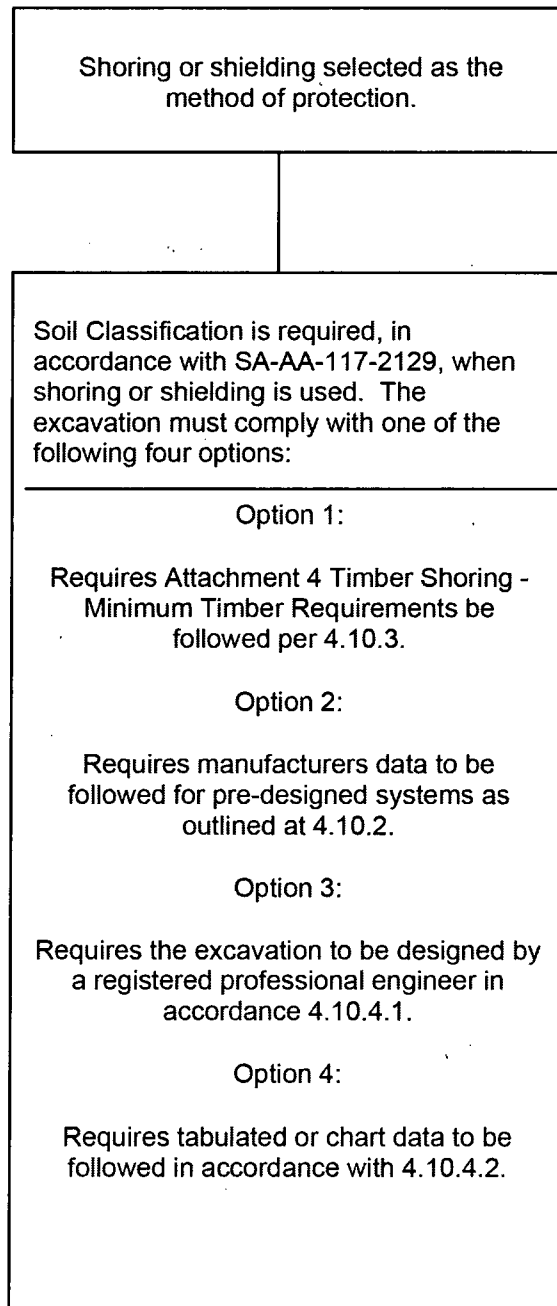
**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 2 of 7**

**FIGURE 2 – SLOPING OPTIONS**



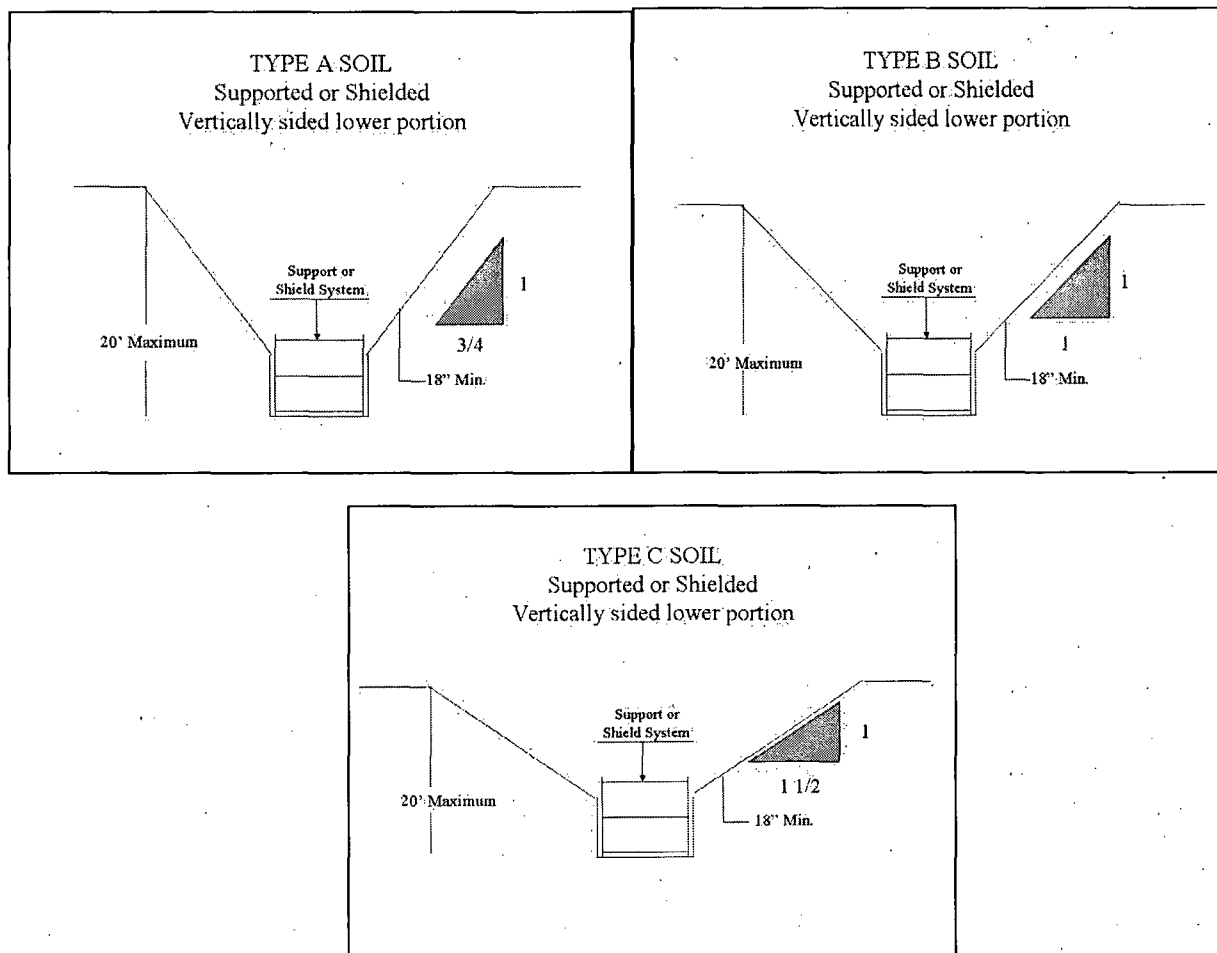
**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 3 of 7**

FIGURE 3 – SHORING AND SHIELDING OPTIONS



**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 4 of 7**

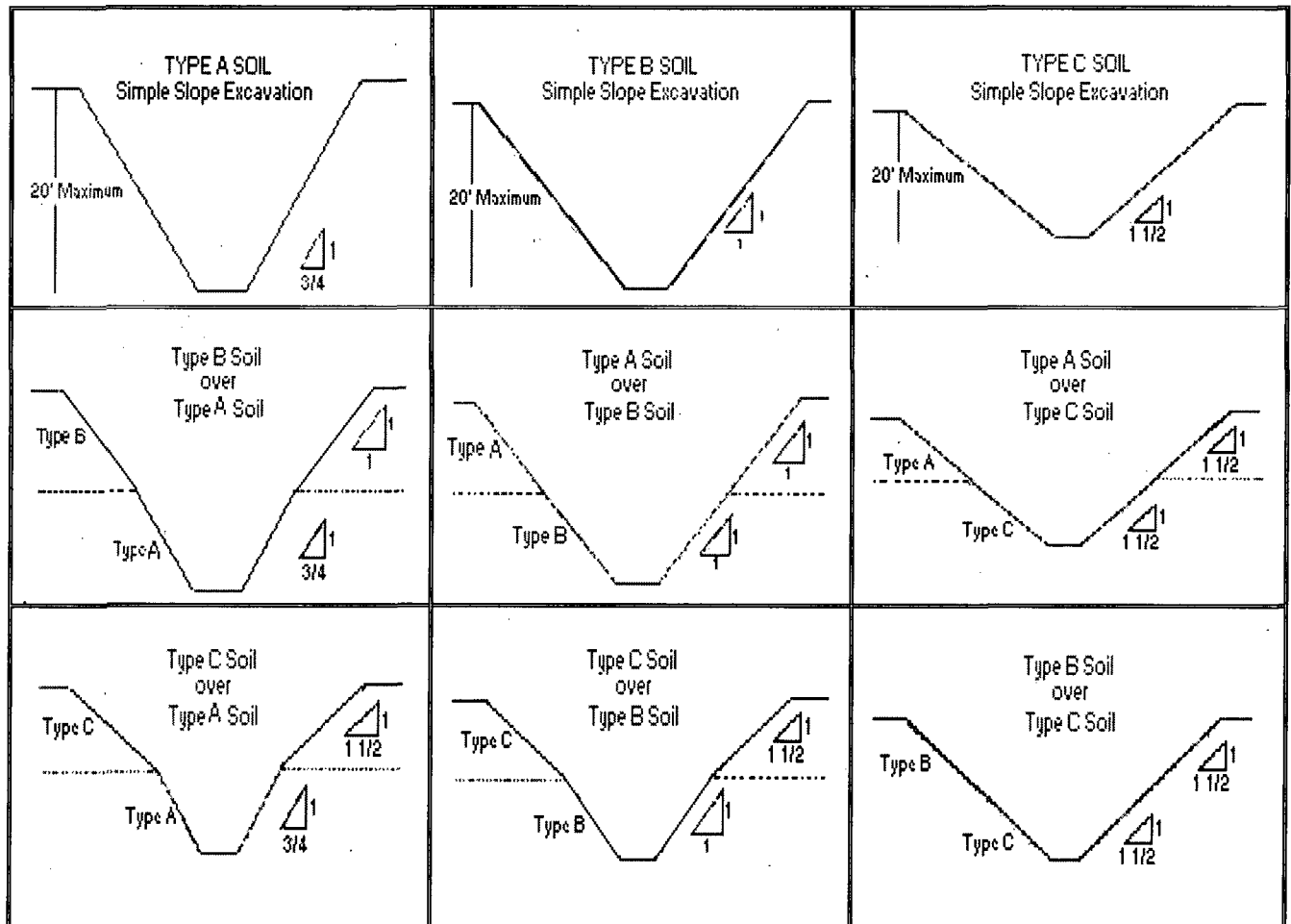
**FIGURE 4 – SLOPE AND SHIELD CONFIGURATIONS**





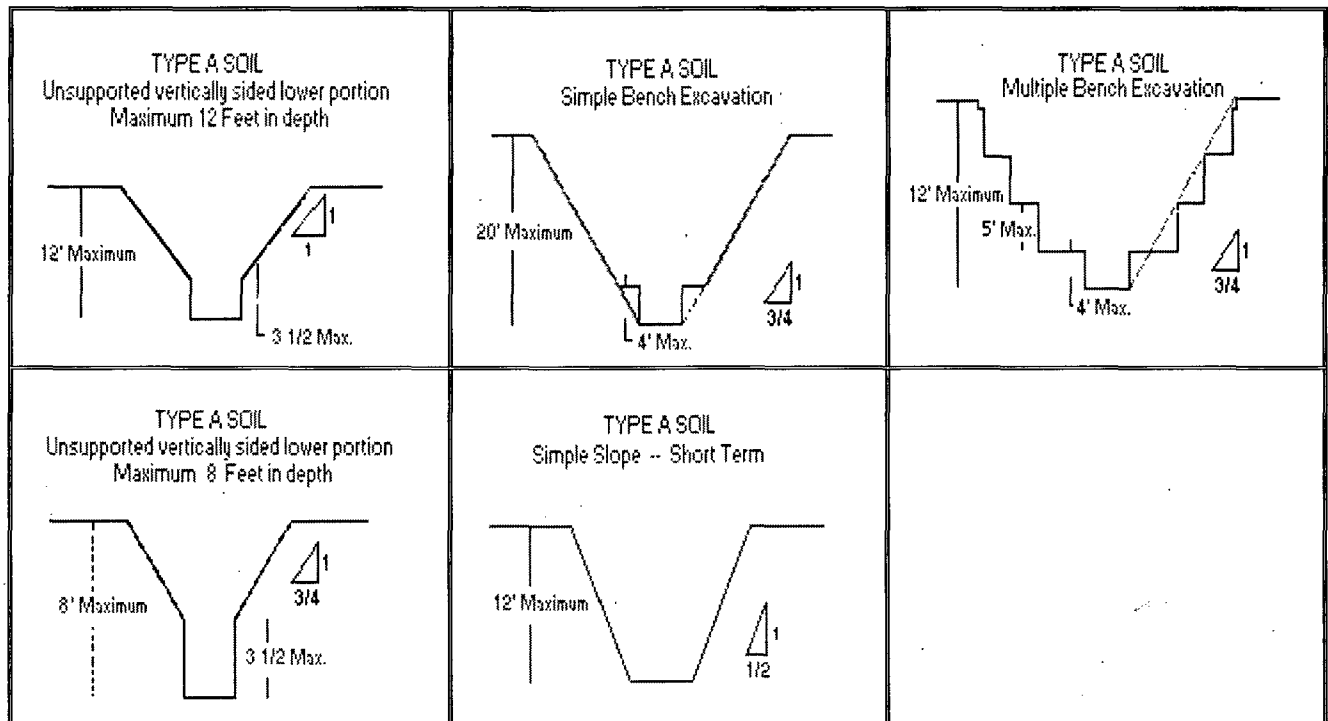
**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 5 of 7**

**FIGURE 5 – SLOPE CONFIGURATIONS: EXCAVATIONS IN LAYERED SOILS**



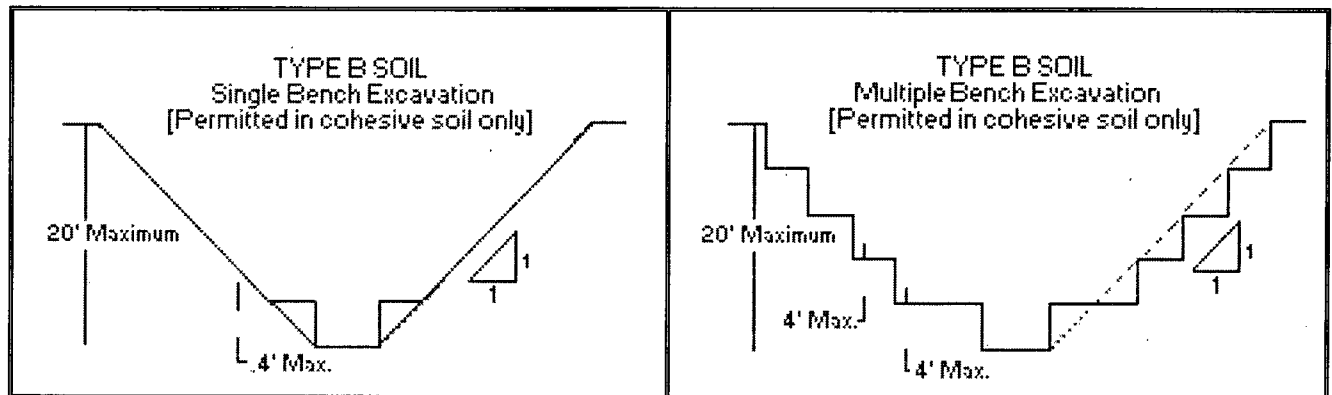
**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 6 of 7**

**FIGURE 6 – EXCAVATIONS MADE IN TYPE A SOIL**

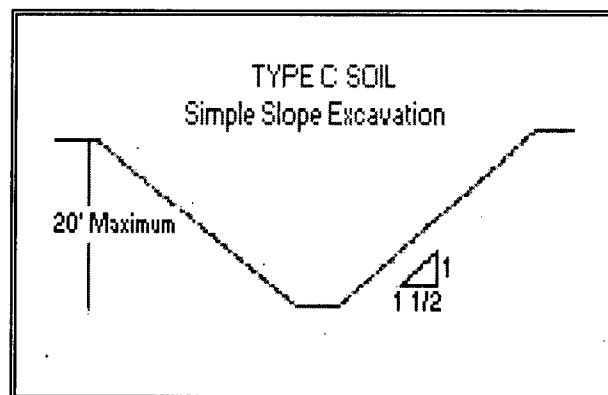


**ATTACHMENT 3**  
**Selection of Protective Systems**  
**Page 7 of 7**

**FIGURE 7 – EXCAVATIONS MADE IN TYPE B SOIL**



**FIGURE 8 - EXCAVATIONS MADE IN TYPE C SOIL**



**ATTACHMENT 4**  
**Timber Shoring - Minimum Timber Requirements**  
**Page 1 of 3**

**Table 1. Mixed Oak or Equivalent - Timber Dimensions Full Size as Shown**

<div> <div>CAUTION</div> <div>WOOD DIMENSIONS - all dimensions in the table below are actual dimensions. That is, a 6" X 6" member shall measure 6" X 6" <b><u>NOT</u></b> 5 1/2" X 5 1/2".</div> </div>										
DEPTH OF TRENCH (FEET)	SOIL TYPE	CROSS BRACES					STRINGERS		UPRIGHTS	
		HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)				VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	HORIZONTAL SPACING (FEET)
			UP TO 6	UP TO 9	UP TO 12	UP TO 15				
										CLOSE 2 3 4 5 6
5 TO <10	A	UP TO 6 FEET	4X4	4X6	6X6	6X8	4	NR	-	2X?
	B		4X6	6X6	6X6	6X6	5	6X8	5	2X6
	C		6X8	6X8	8X8	8X8	5	8X10	5	2X6
10 TO <15	A	UP TO 6 FEET	4X4	4X6	6X6	6X6	4	NR	-	3X?
	B		6X6	6X6	6X8	6X8	5	8X8	5	2X6
	C		8X8	8X8	8X8	8X10	5	10X12	5	2X6
15 TO <20	A	UP TO 6 FEET	6X6	6X8	6X8	6X8	4	6X8	4	3X6
	B		6X8	6X8	8X8	8X8	5	8X10	5	3X6
	C		8X10	8X10	8X10	10X10	5	12X12	5	3X6

**ATTACHMENT 4**  
**Timber Shoring - Minimum Timber Requirements**  
**Page 2 of 3**

- **CONSTRUCT** timber shoring in accordance with the timber dimensions for oak timber and for Douglas fir shown Table 2 below.

**Table 2. Mixed Oak, Douglas Fir or Equivalent - Timber Dimensions**

DEPTH OF TRENCH (FEET)	SOIL TYPE	CROSS BRACES						STRINGERS		UPRIGHTS					
		HORIZ. SPACING (FEET)	WIDTH OF TRENCH (FEET)				VERT. SPACING (FEET)	SIZE (IN)	VERT. SPACING (FEET)	HORIZONTAL SPACING (FEET)					
			UP TO 6	UP TO 9	UP TO 12	UP TO 15				CLOSE	2	3	4	5	6
5 TO <10	A	UP TO 6 FEET	4X4	4X4	4X4	4X6	4	NR	-	4X6					
	B		4X6	4X6	6X6	6X6	5	6X8	5	4X8					
	C		6X6	6X6	6X6	8X8	5	8X8	5	3X6					
10 TO <15	A	UP TO 6 FEET	4X4	4X4	6X6	6X6	4	NR	-	4X10					
	B		6X6	6X6	6X8	6X8	5	8X8	5	3X6	4X10				
	C		6X8	6X8	8X8	8X8	5	10X10	5	4X6					
15 TO 20	A	UP TO 6 FEET	6X6	6X6	6X6	6X6	4	6X8	4	3X6					
	B		6X8	6X8	6X8	8X8	5	8X10	5	4X6					
	C		8X8	8X8	8X10	8X10	5	10X12	5	4X8					

**NOTE:** WOOD DIMENSIONS - all dimensions in the table above are actual dimensions. That is, a 6" X 6" member shall measure 6" X 6" NOT 5 1/2" X 5 1/2".

**ADDITIONAL NOTES:**

- All spacing indicated is measured center to center.
- **INSTALL** stringers with the greater dimensions horizontal.
- **PLACE** the top cross brace no more than two and one-half feet below the top of the trench.
- **Never** hang loads on cross braces.

**ATTACHMENT 4**  
**Timber Shoring - Minimum Timber Requirements**  
**Page 3 of 3**

- **PLACE** uprights behind the stringers. The cross braces should bear upon the stringers at the location of the uprights. If the table does not require stringers, the cross braces should bear upon the uprights.
- **If** the distance from the center of the lowest cross brace to the bottom of the trench exceeds two and one-half feet (30 inches), **DRIVE** uprights below the bottom of the trench until the upright bottom is in stable soil. **Where** uprights are driven, the distance from the center of the lowest cross brace to the bottom of the trench shall not exceed 36 inches. **If** this 36-inch distance is exceeded, **then INSTALL** additional cross braces and stringers at the toe (bottom) of the excavation.
- **MAINTAIN** materials used for shoring in good condition, free of defects such as large or loose knots, and in accordance with OSHA specifications.

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 1 of 7**

As described in this attachment, there are five main methods to locate underground utilities: ground penetrating radar (GPR/GPIR), magnetic, electromagnetic, active line tracing (radio frequency (RF) and audio frequency (AF)), and acoustic pipe tracing. Guidance for selecting the most appropriate method is outlined on pages 1 through 7 of this attachment.

The most suitable location techniques would be GPR, magnetic, active line tracing, and acoustic pipe tracing. Active/acoustic line tracing involves introducing a signal into an identified line and allows the line to be traced. Although electromagnetic technologies provide great depth of penetration, the background EM present at the utilities will interfere with the instrumentation per discussion with ARM Group Inc., an earth resource engineering/consulting firm. It must be noted that the chart provided below provides the *maximum* depth of penetration based on *ideal* soil conditions. If possible, use a "scan as you go technique" to monitor the depth of buried utility. It must be noted that these are general characteristics associated with the various technologies. It is customary to use various technologies during scans to verify the identity of a suspect utility line. Thus, the major factors that affect the accuracy of the scans are the experience level for the surveyors, equipment, and soil conditions. Prior to use of this equipment, the site excavation coordinator, excavation contractor, ground scan surveyor, and engineering should be contacted to determine the feasibility of using this equipment based on the scope and location of the activity.

Number	Method	Pipes Locatable	Depth of Penetration
1.	GPR/GPIR	Metallic, plastic concrete, transite, terra-cotta	15 feet
2.	Magnetic	Ferromagnetic metals	5-10 feet
3.	Electromagnetic (EM)	See 3.a and 3.b	See 3.a and 3.b
3.a	Conventional	Metallic or metallic reinforced	6 feet
3.b	Geophysical EM-31	Metallic or metallic reinforced	Maximum 20 feet. Generally 10 feet for metal utilities
3.b	Geophysical EM-61	Metallic or metallic reinforced	6 feet
4.	Active Line Tracing	Copper/Aluminum	10 feet
5.	Acoustic Pipe Tracing	Non-metallic, poor conducting metallic, or cast-iron	4-5 feet

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 2 of 7**

1. **GPR/GPIR**

Ground Penetrating Radar (GPR) is a technique that uses high frequency radar waves to image the subsurface. The GPR instrument consists of a recorder and a transmitting and receiving antenna. Different antennas provide different frequencies, which usually vary between 25 and 1,500 MHz. Lower frequencies provide greater depth penetration but lower resolution. However, GPR using 100 MHz is regulated by the FCC and may not be usable at some utilities. The technique can be used where the overburden (top layer of soil) contains little clay or silt. An unsaturated overburden will provide the best penetration depths. If these conditions exist, then penetration depths may be a few meters. A 400 MHz antenna is used for fairly shallow applications to depths of about 10 feet. To calculate the depth to the utility, the speed of the GPR signal in the soil at the site needs to be obtained. This can be estimated from charts showing speeds for typical soil types, or it can be obtained in the field by conducting a small traverse across a buried feature whose depth is known. GPIR is a method developed by Witten Technologies which is an advanced GPR method that can produce 3D images of the underground scanned utilities.

Advantages: The GPR method provides a rapid technique for locating utilities. Since the data is viewed on a screen on the instrument, the data can be viewed in the field and the locations of anomalies marked on the ground. This method has good discrimination of targets *unless* they are stacked.

Limitations: Probably the most limiting factor for GPR surveys is that their success is very site specific occasionally varying 500% within 20 feet, and depends on having a contrast in the dielectric properties of the target compared to the host overburden, along with sufficient depth penetration to reach the target. Penetration depends on the frequency of the antenna, the conductivity of the overburden, and whether clay is present in the overburden. Signal penetration decreases with increased soil conductivity. In addition, for lower frequencies, where the antenna is not shielded, reflections can occur from other objects. Generally, this should not be a problem for utility searches since most of the higher frequency antennas are shielded and are the ones used for buried utility surveys. Good to 12-15 ft dependent on soil conditions. Optimum soils types for GRP penetration are gravels with minimum clay and silt content. Hard rock, ice, and fresh water environs are also well suited to GPR.

Pipes locatable: Metallic, plastic, concrete, transite, terra-cotta.



**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 3 of 7**

Pipes not locatable: General rule of thumb is 1" for every 1' of depth for location. 6" of diameter for each foot over 12'.

2. **Magnetic**

To be able to use magnetic methods, the utility must be constructed from, or have included in its construction, some ferromagnetic material. Ferromagnetic materials become magnetized by the earth's magnetic field, which then produce a secondary magnetic field. The resulting field at the ground surface is a combination of the earth's magnetic field and the secondary field from the utility. This creates an anomaly in the resultant magnetic field that can be detected by the instrument. Two kinds of magnetic detection instruments are used. One detects the strength of the magnetic field using one sensor, and the other detects the gradient of the magnetic field using two sensors. Depth of penetration for iron containing materials is typically 5-10 feet.

Advantages: Magnetic locators are simple to operate and provide a field readout or signal when an anomaly is detected.

Limitations: Magnetic locators will only respond to metal that is ferromagnetic. Metals such as copper, aluminum, and stainless steel are not magnetized by the Earth's field and, therefore, do not produce a magnetic anomaly. The method will also not detect plastic, clay, or concrete pipes. A follow-up investigation using GPR, terrain conductivity, utility-location, and/or excavation methods may be required.

Pipes locatable: Ferromagnetic metals.

Pipes not locatable: Non-ferromagnetic metals: copper, aluminum, and stainless steel. Plastic, clay, and concrete pipe.

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 4 of 7**

3. **Electromagnetic (EM)**

Electromagnetic instruments for detecting utilities produce and sense electromagnetic fields. These instruments will only work if the utility is made from an electrically conductive material. The instruments produce the electromagnetic fields using a coil through which oscillating current is made to flow, thus producing an oscillating electromagnetic field. Another coil is used to sense this oscillating electromagnetic field. When a coil senses a changing electromagnetic field, a voltage is produced that can be displayed or activate a sound. If a utility is not made from metal, sometimes a metal tracer wire is placed along with the utility, thereby allowing electromagnetic instruments to be used to locate the utility. There are two types of EM instruments used: conventional and geophysical.

- 3.a **Conventional:** This instrument has several modes of operation and can do both inductive and conductive pipe and cable locating. It also has a passive mode in which it responds to the electromagnetic fields from 50/60 Hz signals. It provides the ability to directly connect to a metal pipe, thus allowing the pipe to be energized. In addition, a clamp can be used to connect to a pipe where no direct connection is available. This clamp then inductively energizes the pipe and allows it to be located.

**Advantages:** The instruments are simple to use and provide anomaly indications while the survey is being conducted.

**Limitations:** The limitations are generally the depth of the utility, size of the utility (amount of metal), proximity to other local surface or buried metal, and local power line noise. Generally, these instruments are not significantly influenced by power line noise unless the power line is very close. Passive mode has a 6' maximum effective locating depth.

- 3.b **Geophysical:** Two instruments are commonly used by geophysical companies for utility location: EM-31 and EM-61.

**Pipes locatable:** Metallic or with metallic reinforcement.

**Pipes not locatable:** Non-metallic.

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 5 of 7**

**EM-31:** This instrument uses two coils, one of which transmits electromagnetic energy at about 9.8 kHz, and the other coil receives the resulting signal. The coils are located at the ends of the boom. Because the instrument uses oscillating electromagnetic fields, this instrument is said to operate in the frequency domain. The EM-31 can be used to locate buried pipes. It is particularly effective when a long pipe is to be located, since it produces a large response when a length of buried pipe extends on either side of the instrument. The instrument can be used in various modes. Its boom can be held parallel to the direction of travel or perpendicular. It can be used in a normal operating orientation (vertical dipole mode) or turned 90 degrees about its long axis (horizontal dipole mode). The EM-31 has a maximum depth of penetration of about 20 feet. The depth at which it can detect a metal pipe will depend on the conductivity of the soil, local electromagnetic interference, and the amount of metal that the pipe contains. Thus, the diameter and wall thickness of the pipe each influence the data.

**Advantages:** The EM-31 is simple to use and provides a readout on the instrument allowing field evaluations of the anomalies. This instrument will generally find metal utilities to depths up to about 10 feet.

**Limitations:** Probably the largest limitation is that the electromagnetic fields generated by the instrument produce secondary fields, not only in utilities, but also in any other local metal objects, which then radiate their own field that is also detected by the instrument. The instrument is quite long and may be difficult to use in spatially restrictive areas. Furthermore, background EM may cause inaccurate readings rendering the information as unreliable.

**EM-61:** The EM-61 transmits pulses of electromagnetic energy, rather than a continuous frequency as with the EM-31. Two square-shaped coils are used. The lower coil transmits the electromagnetic energy, and both the lower and upper coils receive the resulting signals. In general, this instrument is not as proficient at detecting pipes as is the EM-31.

**Advantages:** The EM-61 is an excellent instrument for locating metal in the top 6 feet of the ground surface.

**Limitations:** As with the EM-31, the instrument produces electromagnetic fields and can energize local metal. However, this is a much less serious problem with this instrument than with the EM-31. Because of its size, the EM-61 may be difficult to use in confined areas. If that is the case, the hand-held EM-61 can be used. Furthermore, background EM may cause inaccurate readings rendering the information as unreliable. Depth estimation accuracy +/- 15% under ideal conditions. Poor discrimination of multiple targets and backfill effects if contains metallic objects.

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 6 of 7**

4. **Active Line Tracing**

This method uses radio frequency (RF) and audio frequency (AF) for tracing cables.

Radio Frequency (RF) - Used for tracing cables and water and gas distribution lines since the high frequency signal can jump insulators and rubber gaskets often found in these systems. It is advantageous for inductive locating since the RF travels easily through the ground. In addition, the flood-like quality of the RF signal will induce a signal onto conductors 8 to 10 feet on either side of the transmitter. The instrument's design minimizes electrical interference.

Audio Frequency (AF) - Also used for tracing cables and water and gas distribution lines; however, the low frequency signal does not bleed off a conductor as easily as RF signals. This technique works well in conductive mode and is much more effective in discriminating signals from other nearby conductors.

Advantages: Good for inductive location since RF travels easily through the ground and good for blind searches. AF does not bleed off a conductor as easily as RF signals. Good up to 10 feet.

Limitations: Poor tracing in dry or high iron content soils.

5. **Acoustic Pipe Tracing**

An identifiable acoustic signal is introduced into the pipe via a RF transmitting sound. The receiver detects the sound waves that radiate from the pipe. An acoustic driver is used to put the signal into the pipe, and the sound is detected by sensors attached to a portable receiver and is used to trace and map the pipes. Depth of penetration is around 4-5 ft.

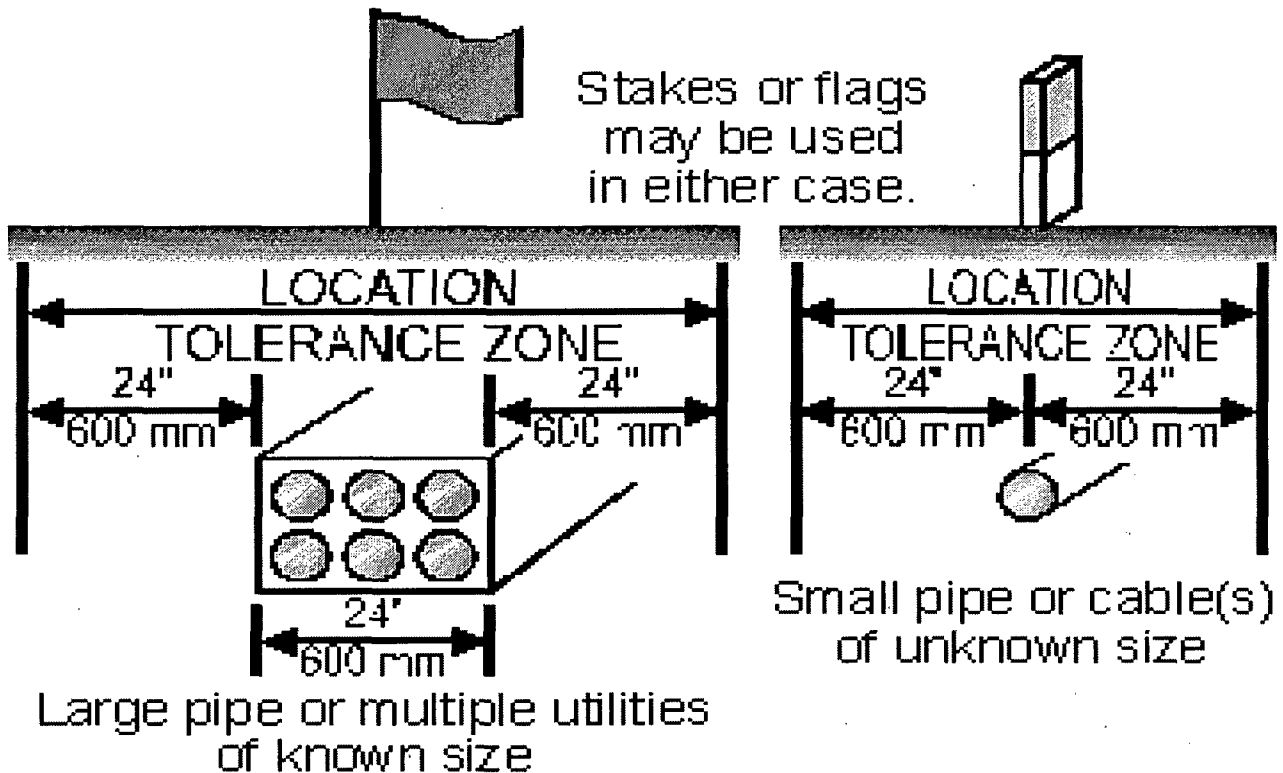
Pipes locatable: Non-metallic, poor conducting metallic, or cast-iron.

**ATTACHMENT 5**  
**Available Ground Scan Technologies**  
**Page 7 of 7**

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ATTACHMENT 6  
Tolerance Zones  
Page 1 of 1



Notes:

1. For markings that indicate width, the horizontal tolerance zone is the width of the line or facility plus 2 feet on either side.
2. For markings that do not indicate width, the horizontal tolerance zone is 2 feet on either side of the markings.
3. Typical Markings (refer to local code).
4. "Hand Dig" refers to the cautious techniques outlined in Section 4.1 for excavations conducted within a "tolerance zone" (i.e., conducted by hand, air suction (vacuum truck), pressurized air, and/or pressurized water).
5. "Paint" may be used in lieu of stakes or flags to mark the location of lines of facilities.

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 12, 2009  
5532-2009-022

Paula B. Ballaron, P.G.  
Regulatory Program Director  
Susquehanna River Basin Commission  
1721 North Front Street  
Harrisburg, Pennsylvania 17102-2391

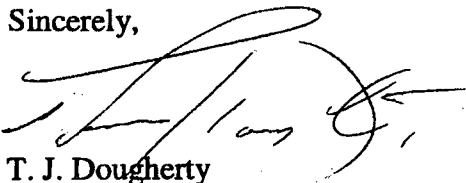
Dear Ms. Ballaron:

**SUBJECT: COMBINED DOCKET APPLICATION  
WATER WITHDRAWALS AND CONSUMPTIVE USE  
THREE MILE ISLAND NUCLEAR STATION**

Please find attached one original and two copies of the completed Susquehanna River Basin Commission (SRBC) application package covering surface water withdrawal, ground water withdrawal, and consumptive water use for TMI Unit 1. The enclosed application packages include a detailed application cover letter, the application documentation, and a check in the amount of \$305,625.00 for the application fees. The attached applications were prepared by URS Corporation for Exelon Generation Company, LLC.

Should the commission have questions concerning the attached combined docket applications, please contact S. Chris Baker, Manager Chemistry, Environmental and Radwaste, at (717) 948-8983; or John Dayman, URS Project Engineer, at (215) 367-2570.

Sincerely,



T. J. Dougherty  
Plant Manager

TJD/src

Attachments



March 9, 2009

Ms. Paula B. Ballaron  
Regulatory Program Director  
Susquehanna River Basin Commission  
1721 North Front Street  
Harrisburg, PA 17102-2391

**Re: Exelon Generation Company, LLC  
Three Mile Island Generating Station, Unit 1  
Londonderry Township, Dauphin County, PA  
Application for Water Withdrawals and Consumptive Use**

Dear Ms. Ballaron:

Enclosed are one original and two copies of an Application that addresses each of the following for Exelon Generation Company, LLC's (Exelon Generation) Three Mile Island Generating Station, Unit 1 (TMI-1), and a check in the amount of \$305,625, computed using the Susquehanna River Basin Commission (SRBC) 2009 Project Review Fee Schedule:

- Modification to TMI-1's Consumptive Water Use Docket No. 19950302 (application fee of \$73,475);
- Modification to TMI-1's Ground Water Withdrawal Docket No. 19961102 (Revised) (application fee of \$5,900); and
- Surface Water Withdrawal (currently "grandfathered") (application fee of \$226,250).

Approval of the Aquifer Pump Test Waiver Request submitted by Exelon Generation to SRBC in February 2009 is pending.

We also wish to address the following topics:

Expiration Date of Modified/New SRBC Dockets

As you are aware, Exelon Generation has applied to the U.S. Nuclear Regulatory Commission (USNRC) for a 20-year extension of TMI-1's operating license (the "License Renewal" Project), and anticipates that the USNRC will grant a renewed license later this year that will authorize Exelon Generation to operate TMI-1 through April 19, 2034. Exelon hereby requests that the expiration of the new/modified SRBC dockets for TMI-1 also expire on April 19, 2034.

Consumptive Use Mitigation

Exelon Generation expects to mitigate the increased consumptive water use through maintained storage and wishes to discuss alternatives with SRBC during its project review period.

URS Corporation  
335 Commerce Drive, Suite 300  
Fort Washington, PA 19034-2623  
Tel: 215.367.2500  
Fax: 215.367.1000



Hydro-fracturing of Wells A, B, and C

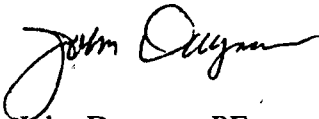
At the pre-application meeting for this project, Exelon Generation indicated that it was planning to hydro-fracture the existing production wells at TMI-1 to restore their yields. We wish to inform SRBC that the wells have been disassembled, cleaned, reassembled, and tested. These maintenance activities served to improve well operation, making hydro-fracturing unnecessary at this time.

Notifications

Municipal and public notifications are underway. Proof of notifications and publication and associated certification form (SRBC Form #55) will be sent expeditiously under separate cover after such notifications are completed and proofs received.

If you have any questions, please do not hesitate calling me at 215-367-2570. Thank you very much for your time and effort.

Sincerely,  
**URS Corporation**



John Dayman, PE  
Project Engineer

cc: T. Dougherty (Exelon Generation)  
S. C. Baker (Exelon Generation)  
A. Polonsky (Morgan, Lewis & Bockius, LLP)

Enclosures

COPY

**APPLICATION FOR  
SUSQUEHANNA RIVER BASIN COMMISSION  
PROJECT APPROVAL**

**Consumptive Water Use Modification  
Groundwater Withdrawal Modification  
Surface Water Withdrawal**

**Three Mile Island Generating Station, Unit 1**

**Prepared for:**

**Exelon Generation Company, LLC  
Kennett Square, Pennsylvania**

A business unit of

**Exelon Corporation**

**Exelon** SM

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**Prepared by:**

**URS Corporation  
335 Commerce Drive, Suite 300  
Fort Washington, PA 19034**

**March 2009**

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# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## PROJECT INFORMATION

### 1. Applicant Information:

Applicant Name or Registered Fictitious Name Exelon Generation Company, LLC

Parent Corporation Name, if different Exelon Corporation

Mailing Address Three Mile Island Generating Station

Route 441 South, P.O. Box 480

City Middletown State PA Zip 17057

Contact Person S. Chris Baker Title Manager

Telephone (717) 948.8983 Fax (717) 948.8502 E-Mail chris.baker@exeloncorp.com

### 2. Preparer (Hydrogeologist/Engineer):

Name John Dayman, PE

Title Project Engineer

Company URS Corporation

Address 335 Commerce Drive, Suite 300

Fort Washington, PA 19034-2623

Phone (215) 367.2570 Fax (215) 367.1000

Signature John Dayman

Date March 9, 2009 E-Mail Address john\_dayman@urscorp.com

### 3. Project Engineer:

Name same as preparer

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_ E-Mail Address \_\_\_\_\_

4. Location of proposed source(s), if applicable:

State PA County Dauphin

Municipality Londonderry Township

Latitude 40 Deg N - 09' - 13.75" Longitude 76 Deg W - 43' - 24.12"

5. State, county, or other regulatory/permitting contacts:

Agency Not applicable Department \_\_\_\_\_

Name \_\_\_\_\_ Position \_\_\_\_\_

Permit/Area of Concern: \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ E-Mail \_\_\_\_\_

Agency \_\_\_\_\_ Department \_\_\_\_\_

Name \_\_\_\_\_ Position \_\_\_\_\_

Permit/Area of Concern: \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ E-Mail \_\_\_\_\_

Agency \_\_\_\_\_ Department \_\_\_\_\_

Name \_\_\_\_\_ Position \_\_\_\_\_

Permit/Area of Concern: \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_ E-Mail \_\_\_\_\_



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Surface Water Withdrawal Instructions and Application

### Who Must Submit an Application:

An application must be submitted by anyone proposing :

- A new withdrawal from a surface source(s) in excess of 100,000 gallons per day (gpd).
  - A new surface withdrawal or an increased withdrawal for a project that has an SRBC approved surface water withdrawal, regardless of the quantity of the proposed increase or the proposed withdrawal from the new source.
  - An increase in any surface water withdrawal initiated prior to November 11, 1995, by 100,000 gpd or more.
  - An increase in any surface water withdrawal initiated on or after November 11, 1995, to 100,000 gpd or more.
- NOTE: All quantities are 30-day averages. Surface water sources include stream and river intakes, reservoirs, lakes, and springs.**

### Check List of Items to Accompany Application:

- ☒ 1. All appropriate attachments:
  - a. Public water suppliers must complete the attached Public Water Supply Information, SRBC #24P; and
  - b. All water users except agriculture must complete the attached Consumptive Use Application, SRBC #24C.
- ☒ 2. Copy of USGS 7 1/2' quadrangle map showing project location. Proposed intakes, existing sources and any water storage facilities must be identified on the map.
- ☒ 3. Attach sheets showing method of safe yield computations, present and future use, and alternate sources of supply considered. (See application Sections 4, 6, and 8.)
- ☒ 4. The application must be signed by the preparer and the applicant
- ☒ 5. Submit the appropriate application fee based on Fee Resolution 98-19 (available on our web site). If you also have a consumptive use application, submit the higher fee.

### Notification Material:

Please submit the appropriate notification material, as required by Section 803.25 of our *Regulations and Procedures for Review of Projects* (all of which are available on our web site), within 10 days of the application submittal.

### Where to File Application:

Project Review Coordinator  
Susquehanna River Basin Commission  
1721 N. Front Street  
Harrisburg, PA 17102-2391

**If you need assistance, contact the Susquehanna River Basin Commission, Water Management Division at (717) 238-0425, fax (717) 238-2436, or via e-mail addressed to [srbc@srbc.net](mailto:srbc@srbc.net).**



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Surface Water Withdrawal Application

### 1. Applicant Information:

Company Name Exelon Generation Company, LLC  
Mailing Address Three Mile Island Generating Station  
Route 441 South, P.O. Box 480  
City Middletown State PA Zip 17057  
Contact Person S. Chris Baker Title Manager  
Telephone (717) 948.8983 Fax (717) 948.8502 E-mail chris.baker@exeloncorp.com

### 2. a. Location of proposed source(s):

State PA County Dauphin  
Municipality Londonderry Township

b. You must attach a copy of a USGS 7 1/2 Minute Quadrangle map indicating location of proposed intake(s), all existing project sources, and any water storage facilities.

### 3. Purpose of proposed withdrawal(s):

The purpose of the withdrawal is to supply cooling water for operation of Three Mile Island Generating Station, Unit 1 (TMI-1). A full project description is included in Appendix 2 of the Application.

Provide method of computation for the safe yield estimates of all sources of water supply or submit copies of flow or pumping test data. (See Application Sections 4 and 8.) For all run-of-stream sources and sources with limited storage, compute 7-day, 10-year low flow (Q7-10) using low flow statistical data and appropriate hydrologic engineering techniques. Whenever an intake is located on an ungaged stream, the applicant must use an acceptable method for computing the safe yield or Q7-10, such as selecting a reference U.S. Geological Survey gaging station and proportioning the yield based on drainage area. The selected gaging station must be on a watershed having similar geologic and climatic characteristics to those of the ungaged watershed. Other factors to consider are relative size of drainage areas and whether the reference gaging station is influenced by upstream reservoirs or other flow regulation activities. Up-to-date low flow data for specific gaged watersheds may be obtained from the U.S. Geological Survey district offices. Actual flow data collected at the project intake may be used to supplement the use of a reference gaging station. Any data provided should indicate the method used to measure the flow (current meter, weir, etc.), the dates of observation and the flow observed. In application Section 6, show calculation for determining the quantity of withdrawal requested for present and future use (over the next 25 years). Describe alternate sources of supply considered in lieu of requesting a new or increased withdrawal for the sources listed in Application Section 4.

4. Source(s) from which withdrawal is being requested:

Name of Source	Quantity of Withdrawal Requested		Safe Yield or Q7-10 Low Flow <sup>2</sup> at Point of Taking (mgd <sup>1</sup> )	Drainage Area (square miles)	Location of Taking Point (latitude/longitude)
	Maximum 30-Day Average (mgd <sup>1</sup> )	Maximum Day (mgd <sup>1</sup> )			
Susquehanna River	122.8	122.8	2,256	24,100	40 deg 09' 17" N 76 deg 43' 39" W
<b>Total</b>	<b>122.8</b>	<b>122.8</b>	<b>2,256</b>		

<sup>1</sup> mgd = million gallons per day

<sup>2</sup> Use acceptable hydrologic practices in determining 7-day, 10-year low flow.

5. Prior or pending state or federal permits:

Permit Name	Status <sup>1</sup>	Agency	Permit Issue Date	Permit Number
Safe Drinking Water Permit	(NA)			
Dams Permit	(NA)			
Encroachment or Water Obstruction Permit	(NA)			
Water Allocation/Appropriation Permit	(NA)			
Other (Please Specify)	(NA)			
Other (Please Specify)	(NA)			

<sup>1</sup> If not applicable list (NA); if pending, (P); if required but not applied for, (R)



6. Show by calculation how the "Quantity of Withdrawal Requested" was determined. (See Application Section 4.) Describe how sufficient this allocation will be in meeting the future needs of this project. Describe alternative sources of supply considered in lieu of requesting a new or increased allocation from the sources listed in Application Section 4. (Attach additional sheets, as necessary.)

Attachment 2 (in Appendix 1) of this Application includes detailed computations of withdrawals.

TMI-1 operation was initiated prior to November 11, 1995. TMI-1 is now seeking renewal of its NRC operating license, which, if granted, would extend its period of operation until April 2034. Possible operational changes during the period of extended operation may require increased surface water withdrawals by >100,000 gallons per day, based on a 30-day average. The requested withdrawal quantity will be sufficient for operation including possible changes that may be approved by the NRC during the period of extended operation. The Susquehanna River has been the surface water withdrawal source since TMI-1 commenced operation in 1974. Ground water is used for other purposes, but is not available in sufficient quantity to be a viable alternative source of supply for cooling system usage. The river is in immediate proximity to TMI-1 and can yield the requested withdrawal amounts. Low flow and drainage area statistics are for Harrisburg USGS Gage 01570500.

7. Existing and projected total water use:

Total Project Water Usage <sup>1</sup>	Existing (mgd) <sup>2</sup>	Projected (mgd) <sup>3</sup> for Design Year 2034
Average Daily Water Demand	104.2	122.8
Maximum Daily Water Demand	104.2	122.8
System Capacity <sup>4</sup>	104.2	122.8

Explanation

<sup>1</sup> Project water usage should be on an annual basis, unless the application is for a seasonal operation. For seasonal uses, indicate the duration of the use (the number of months on which the average is based).

<sup>2</sup> For new projects, the existing use should be the proposed use during the first year of operation.

<sup>3</sup> The projected use should be for 25 years in the future (design year). If the project duration is less than 25 years, indicate the year for which projections were made.

<sup>4</sup> The existing system capacity should not include the proposed sources unless the application is for a new project having no prior withdrawal.

**8. Existing sources of water:****a. Wells**

Well Identification	Frequency of Use <sup>1</sup>	Purpose <sup>2</sup>	Well Depth (ft)	Cased Depth (ft)	Screened Interval (ft to ft)	Existing Pump Capacity (mgd)	Number of Days Used During Calendar Year	Metered (yes/no)	Average Daily Withdrawal (mgd)	Safe Yield <sup>3</sup> (mgd)
A	R	Industrial	400	52	NA	0.072	365	Yes	0.072	0.078
B	R	Industrial	500	52	NA	0.043	365	Yes	0.043	0.042
C	R	Industrial	400	52	NA	0.053	365	Yes	0.053	0.053
OSF	R	Potable and Industrial	775	121' 6"	NA	0.058	365	Yes	0.057	0.055
48S	R	Potable	996	123' 6"	NA	0.043	365	Yes	0.012	0.035
Total									0.237	0.263

<sup>1</sup> Indicate if well is used on Regular (R), Auxiliary (A), or Emergency (E) basis.<sup>2</sup> Indicate purpose such as potable supply, non-contact cooling, or water quality remediation.<sup>3</sup> Provide method of computation or submit copies of pumping test data. (See Pump Test Waiver Request Package for approximate safe yields.)**b. Other sources of water (stream intakes, interconnections, reservoirs, springs, etc.):**

Name	Description	Frequency of Use <sup>1</sup>	Purpose <sup>2</sup>	Drainage Area, If Applicable (square miles)	Existing Pump Capacity <sup>3</sup> (mgd)	Number of Days Used During Calendar Year	Metered (yes/no)	Average Daily Withdrawal (mgd)	Safe Yield or Q7-10 Low Flow <sup>4</sup> (mgd)
None									
Total									

<sup>1</sup> Indicate if source is used on Regular (R), Auxiliary (A), or Emergency (E) basis.<sup>2</sup> Indicate purpose such as potable supply, process water, non-contact cooling, or irrigation.<sup>3</sup> If gravity-fed, give maximum hydraulic capacity and label as such.<sup>4</sup> Provide method of computation for 7-day, 10-year low flow for run-of-stream sources.

9. Raw water ponds, lakes, intake dams, and storage dams (existing and/or proposed):

Name	Year Constructed	Year of Last Sedimentation Survey	Storage Capacity (mg)	Surface Area (acres)	Drainage Area (sq mi)	Release Works <sup>1</sup>	
						(yes)	(no)
None							

<sup>1</sup> Does the dam have facilities to provide a release of water to the stream when water is not flowing over the spillway or top of dam? If yes, describe length, diameter, depth, valving, etc.

10. Preparer:

Name John Dayman, PE

Title Project Engineer

Company URS Corporation

Address 335 Commerce Drive

Suite 300

Fort Washington, PA 19034-2623

Phone (215) 367.2570

Fax (215) 367.1000

Signature 

Date March 9, 2009

E-mail Address john\_dayman@urscorp.com

11. Applicant:

Name (print or type) Thomas J. Dougherty

Title TMI-1 Plant Manager

Signature 

Date MARCH 12, 2009



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Ground-Water Withdrawal Instructions and Application

### Who Must Submit an Application:

An application must be submitted by anyone proposing :

- A new withdrawal from a single well or well field in excess of 100,000 gallons per day (gpd).
- A new well(s) or an increased withdrawal for a project that has an SRBC approved ground-water withdrawal, regardless of the quantity of the proposed increase or the withdrawal from the new well(s).
- An increase in any ground-water withdrawal initiated prior to July 13, 1978, by 100,000 gpd or more.
- An increase in any ground-water withdrawal initiated on or after July 13, 1978, to 100,000 gpd or more.

**NOTE: All quantities are 30-day averages.**

### Check List of Items to Accompany Application:

- X 1. All appropriate attachments:
  - a. Public water suppliers must complete the attached Public Water Supply Information, SRBC #24P, and
  - b. All other users except agriculture must complete the attached Consumptive Use Application, SRBC #24C.
- W 2. Copy of USGS 7 1/2' quadrangle map showing project location. Proposed and nearby wells must be identified on the map.
- W 3. Well Record - Proposed Well(s). (See application section 8.)
- W 4. Well Record - Existing Nearby Well(s). (See application section 9.)
- W 5. Copy of pumping test data sheets, etc.

**NOTE: Review and approval by the Susquehanna River Basin Commission of the test procedures to be used by the applicant are necessary before the test is started.**
- NR 6. Copy of chemical analysis. Public water suppliers should submit a copy of the analysis required by the respective state for new sources. Other users must provide the analyses listed on Chemical Analysis of Ground Water, SRBC #24A.
- X 7. The application must be signed by the preparer and the applicant.
- X 8. Submit the appropriate application fee based on Fee Resolution 98-19 (available on our web site). If you also are submitting a consumptive use application, submit the higher fee.

**W = submitted with pump test waiver request package      NR = Not Required**

### Notification Material:

Please submit the appropriate notification material, as required by Section 803.25 of our *Regulations and Procedures for Review of Projects* (all of which are available on our web site), within 10 days of application submittal.

### Where to File Application:

Project Review Coordinator  
Susquehanna River Basin Commission  
1721 N. Front Street  
Harrisburg, PA 17102-2391

If you need assistance, contact the Susquehanna River Basin Commission, Water Management Division at (717) 238-0426, fax (717) 238-2436, or via e-mail addressed to [srbc@srbc.net](mailto:srbc@srbc.net).



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Ground-Water Withdrawal Application

### 1. Applicant Information:

Company Name Exelon Generation Company, LLC  
Mailing Address Three Mile Island Generating Station  
Route 441 South, P.O. Box 480  
City Middletown State PA Zip 17057  
Contact Person S. Chris Baker Title Manager  
Telephone (717) 948.8983 Fax (717) 948.8502 E-mail chris.baker@exeloncorp.com

### 2. a. Location of proposed well(s):

State PA County Dauphin  
Municipality Londonderry

b. You must attach a copy of a USGS 7 1/2 Minute Quadrangle map indicating location of proposed well(s), all existing project wells, and any nearby wells. See Pump Test Waiver Request Package

3. Purpose of proposed withdrawal(s): TMI-1 industrial uses, including demineralized water production, pump lube, pump seal, makeup for industrial cooler blowdown and evaporation, and chemical addition.

### 4. Requested withdrawal from proposed well(s) (based on a 30-day average):

Well Number OSF (Pump capacity = 40 gpm) - 0.057 mgd.  
Well Number A (Pump Capacity = 50 gpm) - 0.072 mgd.  
Well Number B (Pump Capacity = 30 gpm) - 0.043 mgd.  
Well Number C (Pump Capacity = 37 gpm) - 0.053 mgd.

5. Total combined withdrawal from proposed well(s) 0.225<sup>a</sup> mgd (based on a 30-day average).

<sup>a</sup> SRBC Docket No. 19961102 approved the combined 30-day average groundwater withdrawal of 0.225 MGD from industrial wells A, B and C. This request is to utilize an existing potable groundwater well ("OSF") for both potable and industrial purposes with no increase in the approved groundwater withdrawal quantity for existing and possible future groundwater uses.

6. Existing and projected total water use:

Total Project Water Usage <sup>1</sup>	Existing (mgd) <sup>2</sup>	Projected (mgd) <sup>3</sup> for Design Year 2034
Average Daily Water Demand <sup>a</sup>	0.225	0.225
Maximum Daily Water Demand <sup>a</sup>	0.225	0.225
System Capacity <sup>4</sup>	0.226	0.226

Explanation

<sup>1</sup> Project water usage should be on an annual basis, unless the application is for a seasonal operation. For seasonal uses, indicate the duration of the use (the number of months on which the average is based).

<sup>2</sup> For new projects, the existing use should be the proposed use during the first year of operation.

<sup>3</sup> The projected use should be for 25 years in the future (design year). If the project duration is less than 25 years, indicate the year for which projections were made.

<sup>4</sup> The existing system capacity should not include the proposed sources unless the application is for a new project having no prior withdrawal.

<sup>a</sup> Existing and Projected Demands are reported as the 30-day average amount currently approved for TMI-1 in SRBC Docket No. 19961102 (Revised) because the application requests only the addition of one supply well and no increase in the approved withdrawal amount is projected.

7. Existing sources of water:

a. Wells

Well Number	Well Depth (ft)	Cased Depth (ft)	Screened Interval (ft to ft)	Existing Pump Capacity (mgd)	Average Daily Withdrawal (mgd)	Metered (yes/no)
A	400	52	NA*	0.072	0.072	Yes
B	500	52	NA*	0.043	0.043	Yes
C	400	52	NA*	0.053	0.053	Yes
OSF	775	121	NA*	0.058	0.057	Yes
48S	996	123	NA*	0.043	0.012	Yes

\*NA = Not Applicable

b. Other sources of water (stream intakes, interconnections, reservoirs, springs, etc.):

Name	Description	Average Daily Withdrawal (mgd)	Number Days Used During Calendar Year	Safe Yield (mgd)	Metered (yes/no)
Susquehanna River	Stream Intake	122.8	365	2,256	No

8. Well record (proposed well(s)):

Well No. OSF Geologic Formation Gettysburg Shale  
Date Drilled 6/19/1986 Well Driller Harrisburg's Kohl Brothers, Inc.  
Depth Drilled 775 ft Diameter 6 in  
Casing: Min. Diameter 6 in Max. Length 121 ft  
Well Screen: Type Not Available Diameter 6 in  
Top of Screen Not Available ft Bottom of Screen Not Available ft  
Well Yield 38 gpm Specific Capacity Not Available gpm/ft  
Permanent Pump: Type Submersible  
Capacity 40 gpm Intake Setting Not Available ft  
Air Line Depth Not Available ft Type of Metering Not Available

Well No. Not Applicable Geologic Formation \_\_\_\_\_  
Date Drilled \_\_\_\_\_ Well Driller \_\_\_\_\_  
Depth Drilled \_\_\_\_\_ ft. Diameter \_\_\_\_\_ in  
Casing: Min. Diameter \_\_\_\_\_ in Max. Length \_\_\_\_\_ ft  
Well Screen: Type \_\_\_\_\_ Diameter \_\_\_\_\_ in  
Top of Screen \_\_\_\_\_ ft Bottom of Screen \_\_\_\_\_ ft  
Well Yield \_\_\_\_\_ gpm Specific Capacity \_\_\_\_\_ gpm/ft  
Permanent Pump: Type \_\_\_\_\_  
Capacity \_\_\_\_\_ gpm Intake Setting \_\_\_\_\_ ft  
Air Line Depth \_\_\_\_\_ ft Type of Metering \_\_\_\_\_

Attach copies of this page as needed.

**9. Existing nearby wells:**

**Attach map identifying all nearby wells owned by others that could be affected by pumpage of the proposed well(s) and complete items below for each well. See Pump Test Waiver Request Package**

Existing nearby wells:

Owner Exelon Generation Company, LLC Phone (717) 948.8881  
Address Three Mile Island Generating Station, Route 441 South, Middletown, PA  
Well No. Visitor Center Well Use Noncommunity Public Drinking Water  
Date Drilled Approx 1971 Well Driller Unknown  
Well Depth 121 ft Estimated Yield 10 gpm  
Depth to Water-Bearing Zone(s) static water level- 56 ft Screened Interval Not Applicable ft to      ft  
Pump Type Submersible Pump Intake Setting 105 ft  
Distance from Proposed Well(s) Approx 1/2 mile -ft

Owner Exelon Generation Company, LLC Phone (717) 948-8881  
Address Three Mile Island Generating Station, Route 441 South, Middletown, PA  
Well No. Training Center / Simulator Building Well Use Noncommunity Public Drinking Water  
Date Drilled 1981 Well Driller Eichelberger's Inc.  
Well Depth 100 ft Estimated Yield 30 gpm  
Depth to Water-Bearing Zone(s) 88 ft Screened Interval Not Applicable ft to      ft  
Pump Type Submersible Pump Intake Setting Not Available ft  
Distance from Proposed Well(s) Approx 1/2 mile -ft

Attach copies of this page as needed.

**10. Driller's log:**

Attach separate sheet describing the nature and depth interval of subsurface materials and water-bearing zones penetrated during drilling of each proposed well. (See Pump Test Waiver Request Package)

**11. Pumping test: (Note: Pump Test Waiver Request Package submitted to SRBC in February 2009)**

**NOTE: Review and approval by the Susquehanna River Basin Commission of the test procedures to be used by the applicant are necessary before the test is started.**

Attach copies of basic data sheets and any resultant water level charts, tables, graphs, etc., for the pumped well, monitoring wells, and nearby perennial stream sites. The pumping test shall be of not less than 48 hours pumping duration and at a constant withdrawal rate not less than the proposed rate. A step-drawdown pumping test may precede the 48-hour test, however, water levels should be allowed to essentially recover prior to the constant rate test. The following information from the test is generally required:

- a. Date and time of all static, pumping, and recovery water level measurements.
- b. Record of pumping rate measured frequently throughout the test.



- c. Sufficient static water level measurements in all wells to determine any trends in water level changes prior to the beginning of pumping. All water levels are to be measured to an accuracy of one-tenth of a foot.
- d. Pumping and recovery measurements from the pumped well.
- e. Monitoring data from a sufficient number of wells to determine all possible interference.
- f. Records of precipitation, measurements or observations of nearby streamflows, and weather conditions throughout the test.

**12. Preparer:**

Name John Dayman, PE

Title Project Engineer

Company URS Corporation

Address 335 Commerce Drive, Suite 300

Fort Washington, PA 19034-2623

Phone (215) 367-2570

Fax (215) 367-1000

Signature 

Date March 9, 2009

E-mail Address john\_dayman@urscorp.com

**13. Applicant:**

Name (print or type) Thomas J. Dougherty

Title TMI-1 Plant Manager

Signature 

Date March 12, 2009



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Consumptive Water Use Instructions and Application

### Definition:

**Consumptive Use of Water**—Consumptive use is the loss of water from a ground-water or surface water source through a manmade conveyance system (including such water that is purveyed through a public water supply system) due to transpiration by vegetation, incorporation into products during their manufacture, evaporation, diversion from the Susquehanna River Basin, or any other process by which the water withdrawn is not returned to the waters of the basin undiminished in quantity. Deep well injection below freshwater aquifers shall not be considered a return to the waters of the basin.

### Who Must Submit an Application:

An application is required for new consumptive uses or consumptive use increases exceeding a 30-day average of 20,000 gallons per day since January 23, 1971.

### Compliance Action:

The project sponsor is required to select a compliance action to compensate for the water consumptively used. Alternatives are listed in the Susquehanna River Basin's *Regulations and Procedures for Review of Projects* Section 803.42. (See application section 9.)

### Fees and Notification Material:

Submit the appropriate application fee with the application. This fee is based on Fee Resolution 98-19 (available on our web site). If you also are submitting a water withdrawal application, submit the higher fee.

Please submit the appropriate notification material, as required by Section 803.25 of our *Regulations and Procedures for Review of Projects* (all of which are available on our web site), within 10 days of application submittal.

### Where to File the Application:

Project Review Coordinator  
Susquehanna River Basin Commission  
1721 N. Front Street  
Harrisburg, PA 17102-2391

For assistance, contact the Susquehanna River Basin Water Management Division at (717) 238-0426, fax (717) 238-2436, or via e-mail addressed to [srbc@srbc.net](mailto:srbc@srbc.net).



# Susquehanna River Basin Commission

*a water management agency serving the Susquehanna River Watershed*

## Consumptive Water Use Application

### 1. Project Sponsor Information:

Company Name Exelon Generation Company, LLC  
Mailing Address Three Mile Island Generating Station  
Route 441 South, P.O. Box 480  
City Middletown State PA Zip 17057  
Contact Person S. Chris Baker Title Manager  
Telephone (717) 948.8983 Fax (717) 948.8502 E-mail chris.baker@exeloncorp.com

### 2. Company or Facility Description:

Type of facility Nuclear-Fueled Steam Electric Power Generating Facility  
Date operations began or will begin September 2, 1974

### 3. a. Location of Facility:

State PA County Dauphin  
Municipality Londonderry Township

b. You must attach a copy of a USGS 7 ½ minute quadrangle map indicating the location of the facility, all water resources, and discharges. Please indicate quadrangle name. Middletown, PA

### 4. Water Sources (s) (well, spring, stream, public supply, etc.)

Source	Location
Susquehanna River	40 degrees - 09' - 17" N; 76 degrees- 46' -39" W (Intake Structure)
Well A	N300695.40 E2286529.05
Well B	N300598.48 E2285893.85
Well C	N300494.91 E2285893.09
OSF Well	N301273.16 E2286224.56
48S Well (potable use only)	N302084.92 E2286529.05

5. **Water Requirements:**

Water Use	Prior to January 23, 1971	January 23, 1971, to Present	Future Use (25 years)
	gallons per day		
Maximum Daily Total Withdrawal	0	104.2 million	122.8 million
Maximum Daily Consumptive Use	0	15.1 million <sup>a</sup>	19.2 million
Maximum Average Daily Consumptive Use*	0	15.1 million <sup>b</sup>	19.2 million

\*based on maximum consecutive 30-day period

<sup>a, b</sup> Present consumptive use rates are less than currently approved maximum 30-day average consumptive use rate of 18.0 MGD.

6. **Metering:**

Inflow to the facility \_\_\_\_\_ yes ☒ no

Effluent ☒ yes \_\_\_\_\_ no

7. **Provide method of computing consumptive use.**

Maximum daily consumptive use has been computed using cooling tower performance curve that provides the  
evaporation rate at the design wet-bulb temperature, and is based on the design efficiency of the towers and  
maximum plant output. Added to this are evaporation from industrial coolers and spent fuel pool, both supplied by  
groundwater, and an allowance for in-stream evaporation due to the thermally-enhanced discharge through Outfall  
001. Maximum 30-day average consumptive use is based on operation of facility at rated output over an entire  
monthly period of maximum daily usage. Future use based on projections for possible future operations.

8. **Provide flow chart showing the movement of water through the facility, including location and amount of any losses. See Attachment 2**

9. **Consumptive Use Compensation Options (please choose one):**

Discontinue consumptive water use \_\_\_\_\_ Provide water storage ☒ \_\_\_\_\_

Reimburse Commission for water storage \_\_\_\_\_ Other (explain) \_\_\_\_\_

10. **Preparer:**

Name John Dayman, PE

Title Project Engineer

Company URS Corporation

Address 335 Commerce Drive, Suite 300

Fort Washington, PA 19034-2623

Phone (215) 367.2570

Fax (215) 367.1000

Signature John Dayman

Date March 9, 2009

E-mail Address john\_dayman@urscorp.com

11. **Project Sponsor:**

Name (print or type) Thomas J. Dougherty

Title TMI-1 Plant Manager

Signature Thomas J. Dougherty

Date March 10, 2009

**SRBC Form #55**

**Certification of Notification under SRBC Regulation  
18 CFR § 806.15**

**(This form will be signed and forwarded under separate  
cover along with proofs of notifications)**

## **APPENDICES**

## **Appendix 1**

### **Project Location and Description**

## **Project Description**

### **Background**

Exelon Generation Company, LLC ("Exelon Generation") owns Unit 1 of Three Mile Island Generating Station ("TMI-1" or "facility"). The Susquehanna River Basin Commission ("SRBC") approved consumptive water use<sup>1</sup> for electric power generation at TMI-1 of up to 18 million gallons per day ("MGD"), on a 30-day average.

In a separate action, the SRBC approved groundwater withdrawals<sup>2</sup> from Wells A, B, and C for industrial use at TMI-1 in the amount of 0.225 MGD (30-day average).

Surface water withdrawals at TMI-1 were initiated prior to November 11, 1995 (when surface water withdrawals became subject to SRBC regulation) and have been in "grandfathered" status.

### **Purpose of Application**

This Application is to request SRBC approval of water withdrawals and consumptive water use to accommodate TMI-1 water needs for possible future operations, as follows:

1. Maximum daily/maximum 30-day average consumptive water use of 19.2 MGD;
2. Addition of the Operations Support Facility/North Office Building Well ("OSF" Well) to the wells currently serving TMI-1 for industrial use (i.e., Wells A, B, and C) with no increase in the currently approved withdrawal of 0.225 MGD, based on a 30-day average; and
3. Maximum daily/maximum 30-day average surface water withdrawal of 122.8 MGD.

### **Identification of Project Sponsor**

Exelon Generation Company, LLC ("Exelon Generation"), the Project Sponsor, is a limited liability company organized under the laws of the Commonwealth of Pennsylvania with its headquarters and principal place of business in Kennett Square, Pennsylvania. Exelon Generation owns and controls a generation portfolio composed of a diverse mix of fossil, hydroelectric, nuclear, and renewable facilities. TMI-1 is one of Exelon Generation's ten nuclear facilities.<sup>3</sup> Mr. Christopher M. Crane is Chief Operating Officer of Exelon Generation.

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<sup>1</sup> SRBC Decision dated March 9, 1995, on Application 19950302.

<sup>2</sup> SRBC Decision dated January 14, 1999, on Application 19961102 (Revised)

<sup>3</sup> In January 2009, Exelon Generation officially integrated the nuclear generation assets held by its AmerGen Energy Company LLC subsidiary into Exelon Nuclear and dissolved the AmerGen legal entity. TMI-1 was one of those assets.



With regard to this Application, Mr. Tom Dougherty, the TMI-1 Plant Manager, is authorized to act on behalf of the Project Sponsor.

Exelon Generation is one of three principal business units<sup>4</sup> of Exelon Corporation, a registered public utility holding company and a publicly traded corporation, organized under the laws of the Commonwealth of Pennsylvania with its headquarters and principal place of business in Chicago, Illinois. Mr. John Rowe is the Chairman and Chief Executive Officer of Exelon Corporation.

Exelon Nuclear, one of three principal divisions<sup>5</sup> of Exelon Generation, operates the nuclear fleet, including TMI-1. Exelon Nuclear is headquartered in Warrenville, Illinois, and operates the largest nuclear fleet in the U.S. with 17 reactors at 10 stations, representing approximately 20 percent of the U.S. nuclear industry's power capacity, and about three percent of all U.S. power generation. Mr. Charles Pardee is the President and Chief Nuclear Officer of Exelon Nuclear. TMI-1's Site Vice President is Mr. William Noll.

### **Description of Project and Site**

TMI-1 is located at 40° 9' 13.75" N, 76° 43' 24.12" W on Three Mile Island, a 370-acre island situated in the Susquehanna River. A topographic map is attached after this project description (Attachment Figure 1). The island is located in Londonderry Township, Dauphin County, Pennsylvania, about 10 miles southeast of the state capitol at Harrisburg. At this location, Dauphin County is bordered by York County at the west shore of the Susquehanna River and Lancaster County just below the southern tip of Three Mile Island. TMI-1 employs over 500 full-time personnel.

TMI-1 is a base load nuclear generating facility<sup>6</sup> currently licensed by the NRC to operate at a thermal power level of 2,568 megawatts (MWt). TMI-1 uses a pressurized water reactor ("PWR") in its nuclear steam supply system. The PWR core generates heat, and pressurized-water in the primary coolant loop carries the heat to two steam generators. Inside the steam generators, heat from the primary coolant loop vaporizes the water in a secondary loop producing steam. The steam line directs the steam to the main turbine causing it to turn the turbine generator, which produces electricity. The unused steam is

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<sup>4</sup> The other two divisions of Exelon Corporation are Commonwealth Edison Company and PECO Energy Company.

<sup>5</sup> The other two divisions of Exelon Generation are Exelon Power (operates the fossil, hydroelectric, and renewable fleet) and Exelon Power Team (markets Exelon's generated electric power).

<sup>6</sup> Unit 2 of Three Mile Island Generating Station ("TMI-2"), situated next to TMI-1, had been part of the original facility, but has been shut down since the March 28, 1979 accident. TMI-2 is now owned by FirstEnergy Corporation and is no longer licensed to operate. TMI-2 is in a safe storage mode called Post-Defueling Monitored Storage. The only TMI-2 systems, structures or components that are relied upon for the operation of TMI-1 are the Station Blackout Diesel Generator Building and the TMI-2 Fuel Handling Building.

exhausted to the condenser where it is condensed into water using circulated cooling water. The resulting condensate water is pumped out of the condenser with a series of pumps, reheated, and pumped back as feedwater to the steam generators.

### **Water Withdrawal, Use, and Outflow at TMI-1**

A flow chart is attached (Attachment 2), which depicts the flow of surface and ground water through the TMI-1 and reflects the uses and quantities that are the subject of this Application.

Surface water is supplied from the Susquehanna River to TMI-1 via an excavated intake channel leading to a cooling water intake structure ("CWIS"). The surface water is used for:

- Makeup water to TMI-1's cooling system to replace consumptive and non-consumptive losses;
- Non-contact service cooling water for normal and emergency component cooling; and
- Wash and sluice water to maintain the trash rakes and traveling screens located in the CWIS in a clean condition.

Ground water is supplied to TMI-1 from three production wells (Wells A, B, and C) and the OSF Well for use in:

- Industrial applications, including demineralized water production, pump lubrication and seal water, industrial coolers, and chemical addition; and
- Fire protection service.

The OSF well additionally may supply potable water.

A fifth well (the "48S Well") is used solely for drinking water. Therefore, its output is not considered in this Application.

TMI-1's consumptive use of surface water is primarily due to natural-draft cooling tower evaporation, plus a relatively small amount of in-stream evaporation from the heated cooling tower blowdown. Consumptive use of ground water is due to evaporation during industrial cooler and spent fuel pool operation. Other consumptive uses of ground water (e.g., filter cake disposal, steam leakage) are *de minimis*.

Outflows of surface water and ground water from the facility are returned to the Susquehanna River through National Pollutant Discharge Elimination System ("NPDES") permitted outfalls.

Detailed descriptions of the water systems follow.

## Surface Water Withdrawal and Use

TMI-1 withdraws water for consumptive and non-consumptive cooling needs from the Susquehanna River via an excavated intake channel that conveys water into the TMI-1 CWIS<sup>7</sup> on the western shore of Three Mile Island.

### Surface Water Withdrawal

The CWIS provides a continuous supply of water from the Susquehanna River to support TMI-1 operation. The front face of the CWIS, where the water enters from the intake channel, is oriented parallel to the Three Mile Island's western shoreline. The water enters the CWIS under a skimmer wall through two openings into the three intake bays. The skimmer wall prevents floating objects from entering the intake bays when the river is at or above normal flow. Also, fixed bar grid panels with 24-inch spacing cover the intake bay openings to exclude very large objects.

From the intake bay, the water passes through bar rakes with parallel vertical bars spaced 1-inch apart to exclude coarse objects and materials. Each bar rake is equipped with an automated (traveling) trash rake to remove debris. After coarse screening, the intake water passes through vertical traveling screens with 3/8-inch square mesh openings, which remove small objects and fine materials. A water spray system is used to maintain the bar screens and traveling screens in a clean condition.

The bar rakes and traveling screens normally operate automatically, but can be operated manually from a local control panel. In the normal (automatic) mode of operation, the bar rakes and screens start periodically, actuated either by high differential water level between the upstream and downstream sides of the bars and screens or a timer.

Also, during automatic operation, a screen wash pump starts to supply wash water to the traveling screens and bar rakes. The bar rakes, traveling screens, and screen wash pump stop when the differential level reaches a set low value or the timer times out signifying that a clean condition has been restored.

Debris from the traveling screens and bar rakes is sluiced to a trash pit on the south side of the CWIS, from which the debris is hauled away periodically for off-site landfill disposal.

In cross section, the CWIS has two levels, the wetted lower level and the operating deck on the upper level. The operating deck houses the drive mechanisms for the screens and pumps and supporting equipment (electrical switchgear, control panels, etc.).

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<sup>7</sup> Originally, a second CWIS, which shared the intake channel, was used to supply TMI-2. This CWIS was deactivated in 1993, following the placement of the TMI-2 nuclear reactor into Post-Defueling Monitored Storage. At that time, all equipment in the second CWIS was removed. All pump motors, piping, and equipment were removed down to the floor level, all power and switchgear were removed from the building, and all underground piping (greater than 8-inches) was plugged. As a result, there is currently no flow into and through the second CWIS.

The invert of the intake channel is at an elevation ("El") of 264.5' above Mean Sea Level ("AMSL") and the bottom floor of the CWIS is slightly higher at El 265.0' AMSL. The floor of the operating deck is at El 308.0' AMSL, above the high water level of the river. The structure occupies the water column from the river surface down to the bottom floor level. The normal water surface level is at approximately 278.0' AMSL, providing an approximately 13-foot depth of water in the intake fore bay and bar and screen area. The extreme low water surface mark is at approximately 271.0' AMSL. The CWIS is designed to operate in the unlikely event that the downstream York Haven Dam is lost.

The screened water flows from the three intake bays into a common pump suction bay, which serves as a sump ("wetwell") for a total of sixteen (16) installed vertical intake pumps. The floor elevation in the wetwell is at 262.5' AMSL, which is 2.5 feet lower than the floor of the intake bays, to provide sufficient water depth for proper intake pump operation. The intake pumps are used for nuclear services, secondary services, reactor decay heat removal, reactor building emergency cooling, screen wash and sluice water, fire emergencies, and intake structure ventilation. A table of existing and projected surface water withdrawal quantities for each system is attached (Attachment 3). The projected total maximum daily/maximum 30-day average withdrawal of surface water during possible TMI-1 future operations is 122.8 MGD.

#### Surface Water Use

TMI-1 is a base-load generating facility that normally operates year-round to produce electrical power, except for scheduled outages (approximately once every two years for several weeks duration) for refueling and planned maintenance activities. In general, the surface water withdrawal system operates to support electrical generation with minor seasonal changes.

#### Consumptive Use of Surface Water

TMI-1's consumptive use of surface water is associated with the operation of the circulating water system. This includes natural-draft cooling tower evaporation and in-stream evaporation resulting from cooling tower blowdown.

TMI-1 uses a closed-cycle recirculating cooling system to condense the steam in the condenser. The circulating water system for TMI-1 consists of the following major components: six (6) circulating water pumps, two natural-draft cooling towers, and a main condenser. During plant operation, circulating water is pumped continuously by the circulating water pumps through pipelines in a loop between cooling towers and the condenser. The design recirculating flow rate is 430,000 gpm. The cooling water absorbs heat in the condenser and releases the majority of the heat to the atmosphere via the towers through the process of evaporation. The cooled water flows from the towers back to the pumps and is re-used to condense steam in the condenser.

During plant operation, water is continuously bled from the circulating water system back to the Susquehanna River as blowdown in order to maintain circulating water chemistry within acceptable limits and avoid excessive concentration of solids in the water. For

TMI-1's closed cycle cooling system, which uses a fresh water source (i.e., the Susquehanna River) for makeup, the ratio of total dissolved solids ("TDS") in the recirculating water to the TDS in the makeup water ("cycles of concentration") is normally within a range of about 3 to 6. Approximately 0.5 to 1.2 percent of the total circulating water is let off continually as blowdown to control the solids build-up and to minimize scale formation in the system.

The temperature of the blowdown is normally higher than the ambient stream temperature in the Susquehanna River. The blowdown stream mixes with the river water in a "mixing zone" in which the two temperatures equalize. The warmer blowdown rises to the water surface while mixing, which causes the rate of evaporation to be higher than from unheated river water surface areas. This in-stream evaporative loss of surface water is additional to loss via the cooling towers.

#### Non-Consumptive Use of Surface Water

The TMI-1 River Water System supplies water from the CWIS for non-consumptive cooling of heat exchangers and coolers in several normal and emergency service water systems including secondary services, nuclear services, reactor decay heat removal, and reactor building emergency cooling. Other non-consumptive applications include cooling of ventilation equipment inside the CWIS, and automatic wash water for the traveling screens, and wash water for the bar and traveling screen sluice canals.

Strainers with 1/8-inch mesh openings are installed on the discharges of the river pumps to protect downstream components. The strainers are continually backwashed by a portion (about 2 percent) of typical river pump flow.

Makeup to the natural-draft cooling tower basins to replace evaporative and blowdown losses (described above) is supplied from the outlet headers of the secondary service heat exchangers. Most of the river water that passes through the secondary services coolers is re-used as cooling tower makeup, and the balance is mixed with the cooling tower blowdown. In addition to a portion of the water that passes through the secondary service coolers, all the river water that passes through the nuclear services coolers is mixed with the cooling tower blowdown. The mixture of the secondary services river water, nuclear services river water, and cooling tower blowdown water (plus, when used, the discharges from the decay heat removal river water system and reactor building emergency cooling river water system) is discharged to the Susquehanna River through a permitted outfall.

#### **Ground Water Withdrawal and Use**

##### Ground Water Withdrawal

Ground water for industrial use is supplied from three production wells (A, B, and C) and the OSF Well. The projected withdrawal of ground water from these four wells will not exceed the existing approved amount of 225,000 gallons per day ("gpd") during possible future TMI-1 operations. When the demand for ground water can be fully supplied from the A, B, and C wells, the OSF well will be used for potable applications.

### Ground Water Use

As stated earlier, TMI-1 uses ground water for industrial applications including demineralized water production, pump lubrication and seal water, industrial coolers, and chemical addition. Ground water is also supplied as makeup to the fire service system and for potable water applications at TMI-1.

### Consumptive Use of Ground Water

The consumptive use of ground water is associated with evaporation from the industrial coolers and the spent fuel pool.

### Non-Consumptive Use of Ground Water

Non-consumptive discharges from these systems are directed, after treatment as required, to the Susquehanna River through permitted outfalls.

### **Summary of Consumptive Use of Surface Water and Ground Water**

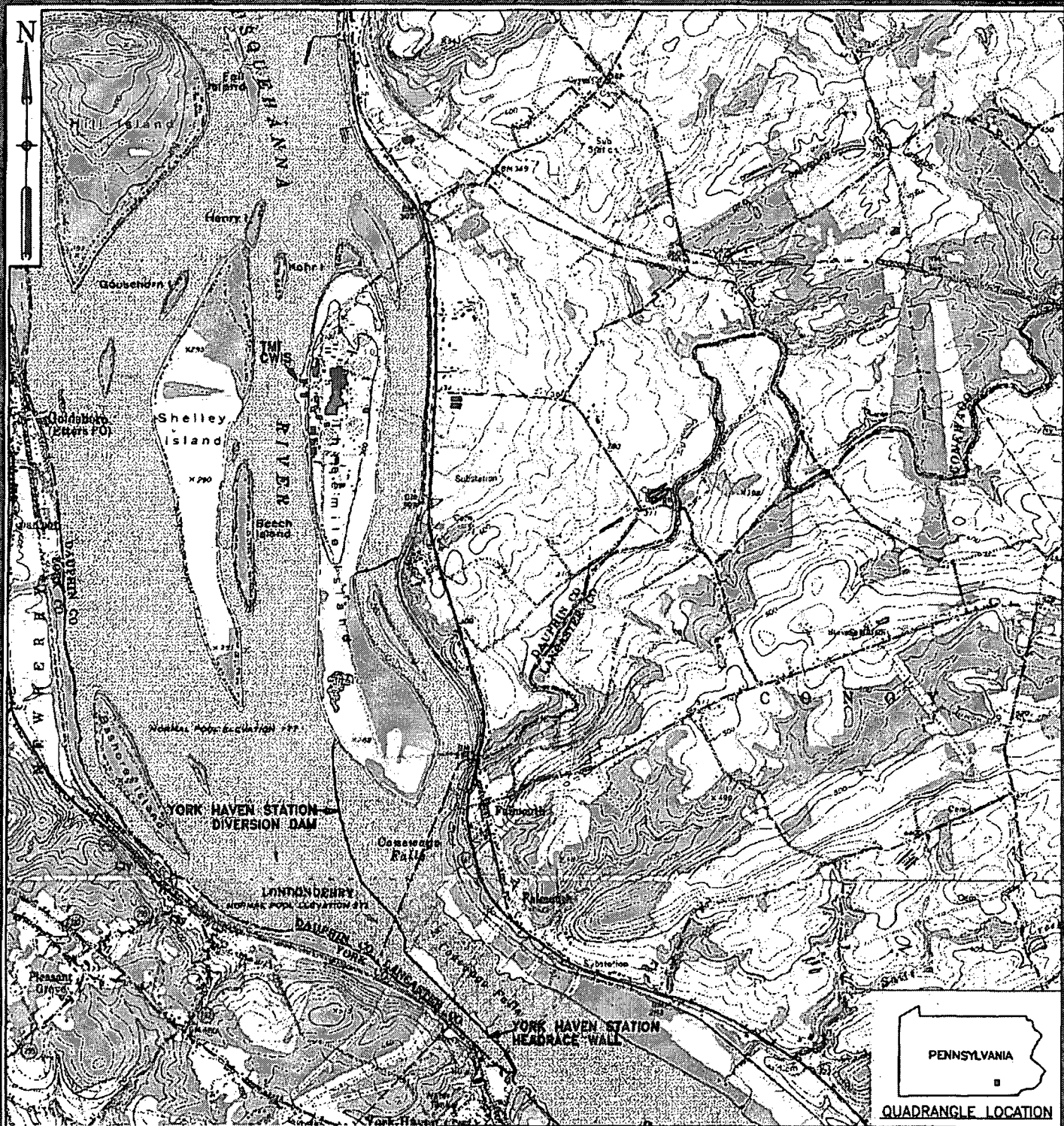
The consumptive use of surface water is associated with cooling tower evaporation and in-stream evaporation. Exelon Generation utilizes methodologies for estimating these consumptive losses as described in previous correspondence with the SRBC<sup>8</sup>. The consumptive use of ground water is associated with industrial cooler evaporation and spent fuel pool evaporation. A table of existing and projected consumptive use quantities is attached (Attachment 4). The projected total maximum daily/maximum 30-day average consumptive use of surface water and ground water during possible future TMI operations is 19.2 MGD (rounded).

### **Outflows**

Surface water and ground water non-consumptive outflows are discharged from TMI-1 in accordance with its NPDES Permit No. PA0009920.

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<sup>8</sup> A discussion of the methodologies for estimating TMI-1's consumptive use of surface water from cooling tower evaporation and in-stream evaporation was provided in a letter (subject: 1992 TMI-1 Daily Water Use Estimate) from J.C. Phillips, GPU Service Corporation, to Paul O. Swartz, SRBC, dated February 26, 1993.



0 1500 3000 FEET

GRAPHIC SCALE

CONTOUR INTERVAL = 20 FEET

REFERENCE:  
A PORTION OF USGS 7.5 MINUTE TOPOGRAPHIC  
MAP; MIDDLETOWN & YORK HAVEN QUADS, PA.  
1955, PHOTOREVISED 1983.

## TOPOGRAPHIC MAP

PROJECT

EXELON GENERATION COMPANY, LLC  
THREE MILE ISLAND GENERATING STATION  
LONDONDERRY TOWNSHIP, DAUPHIN COUNTY, PA

**Exelon**<sub>SM</sub>

SCALE

AS SHOWN

DWN. BY

TFP

JOB NO.

19998129.00002

DATE

01/29/09

APPR. BY

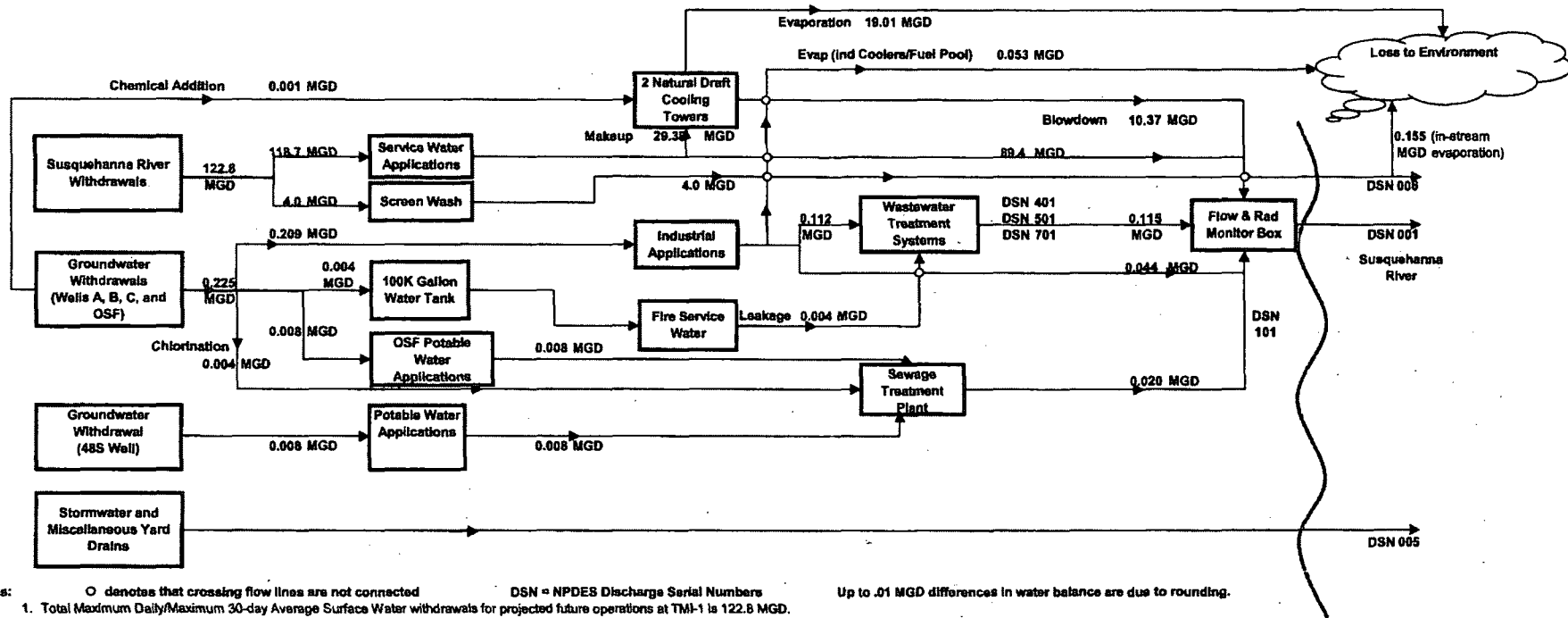
JD

FIG. NO.

1

QUADRANGLE LOCATION

**ATTACHMENT 2  
FLOW CHART**  
Exelon Generation Company, LLC  
Three Mile Island Generating Station, Unit 1



1. Total Maximum Daily/Maximum 30-day Average Surface Water withdrawals for projected future operations at TMI-1 is 122.8 MGD.
2. Total Maximum Daily/Maximum 30-day Average Ground Water Demand for projected future TMI-1 operations is 0.225 MGD (no increase from presently approved amount).
3. Total Maximum Daily/Maximum 30-day Average Consumptive Use for projected future TMI-1 operations is equal to 19.2 MGD, assuming base-load facility operates continuously during maximum month at rated output and atmospheric conditions that would maximize evaporation.
4. Service water applications are for non-contact cooling of components in the following systems: secondary services, nuclear services, reactor building emergency cooling, decay heat removal, and fire service.
5. Industrial uses of groundwater include: demineralized water production, pump lubrication and seal water, chemical addition, chlorination, and industrial coolers.
6. DSN 005 miscellaneous yard drains includes intermittent flows (screenhouse deslitting, cooling tower dewatering, fire brigade training, fuel-oil offloading station, industrial cooler maintenance, emergency diesel generator floor drains, and operation of east dike settling basin drain valve).
7. The fire service system tank is an elevated ("altitude") tank to provide static head to the system.
8. Groundwater well discharges for industrial use are accumulated in a 200,000 gallon capacity pretreatment clearwell (sump).
9. Fire service water leakage may go to the Industrial Wastewater Treatment System, to ground, to sumps, stormwater, etc.
10. Backwash of river pump strainers will result in about 2% of service water to be discharged through DSN 008 (backwash line not shown in diagram).



**Attachment 3 - Existing and Projected Surface Water Withdrawal Quantities**

System	Number of Installed Pumps	Pump Design Capacity	Maximum Daily/ Maximum 30-Day Average Withdrawal (see Note 1)	
			gpm	MGD
<b>Existing</b>	<b>#</b>	<b>gpm</b>	<b>gpm</b>	<b>MGD</b>
Nuclear Services River Water	3	6,000	18,000	25.9
Secondary Services River Water	3	7,250	21,750	31.3
Decay Heat River Water	2	7,000	14,000	20.2
Reactor Building Emergency Cooling Water	2	5,400	10,800	15.6
Screen Wash & Sluice	2	1,400	2,800	4.0
Fire Protection	2	2,500	5,000	7.2
Screen House Ventilation (see Note 2)	2	150	-	-
<b>Total</b>	<b>16</b>		<b>72,350</b>	<b>104.2</b>

Projected	#	gpm	Maximum Daily/ Maximum 30-Day Average Withdrawal (see Note 1)	
			gpm	MGD
<b>Projected</b>	<b>#</b>	<b>gpm</b>	<b>gpm</b>	<b>MGD</b>
Nuclear Services River Water	3	7,200	21,600	31.1
Secondary Services River Water	3	8,700	26,100	37.6
Decay Heat River Water	2	8,400	16,800	24.2
Reactor Building Emergency Cooling Water	2	6,480	12,960	18.7
Screen Wash & Sluice	2	1,400	2,800	4.0
Fire Protection	2	2,500	5,000	7.2
Screen House Ventilation (see Note 2)	2	150	-	-
<b>Total</b>	<b>16</b>		<b>85,260</b>	<b>122.8</b>

**Notes:**

1. Maximum 30-day withdrawal assumes TMI-1 operating at maximum daily withdrawal for 30 consecutive days.
2. Screen House Ventilation Pump only recirculates water inside the Screen House area of the CWIS.

#### Attachment 4 - Existing and Projected Consumptive Water Use Quantities

	Existing		Projected	
	gpm	MGD	gpm	MGD
Cooling tower evaporation and drift	10,400	14.98	13,200	19.0
In-stream evaporation	90	0.129	108	0.155
Evaporation from industrial coolers	30	0.043	36	0.052
Spent fuel pool surface evaporation	1	0.001	1	0.001
<b>Total</b>	<b>10,521</b>	<b>15.1</b>	<b>13,345</b>	<b>19.2</b>

Notes:

1. Quantities shown represent both maximum daily use and maximum 30-day average use assuming continuous operation of TMI-1 for a 30-day period at maximum power and atmospheric conditions that would maximize evaporative loss.
2. Existing in-stream evaporation estimated using the Edinger formula and is conservatively based on a constant 90 gpm.
3. Other identifiable consumptive water use sources at TMI-1 are *de minimis*.

## **Appendix 2**

### **Notifications**

## **Municipal Notices**

**Note:**

**Copies of signed letters of notification to county planning and township officials are included after this page. Exelon Generation will provide copies of proof of notification, as required, under separate cover.**

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Nick DiFrancesco, Commissioner  
Dauphin County Planning Commission  
Dauphin County Veterans Memorial Building  
112 Market Street, 2<sup>nd</sup> floor  
Harrisburg, PA 17101

**Re: Notification of Submittal of Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. DiFrancesco:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

TMI-1 is currently approved by SRBC (Docket No. 19950302) to consumptively use up to 18 MGD, based on a 30-day average, and is requesting a 1.2 MGD increase. TMI-1 is approved for groundwater withdrawal up to 0.225 MGD (SRBC Docket No. 19961102), and no increase in this amount is being requested. Surface water withdrawals at TMI-1 were initiated prior to the effective date of applicable SRBC regulations and, therefore, no docket exists. A new docket is being requested that would approve surface water withdrawal in the amount of 122.8 MGD for use primarily as cooling water.

Interested parties should submit comments or inquires to the attention of Ms. Paula Ballaron, Regulatory Program Director, Susquehanna River Basin Commission, by mail at 1721 N. Front Street, Harrisburg, PA 17102-2391; by telephone: 717-238-0423; fax: 717-238-2436; or by e-mail at [pballaron@srbc.net](mailto:pballaron@srbc.net).

Thank you for your attention to this matter.

Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

cc: S. Chris Baker – Exelon Generation

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Daryl LeHew, Chairman  
Londonderry Township Board of Commissioners  
783 South Geyers Church Road  
Middletown, PA 17057

**Re: Notification of Submittal of Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. LeHew:

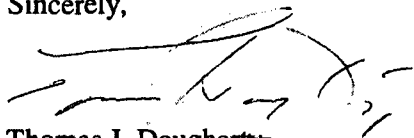
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Thank you for your attention to this matter.

Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

cc: Chris Baker – Exelon Generation

## **Publication of Notice in Newspaper**

### **Note:**

**The notice to be published in the area newspaper is included after this page. Exelon Generation is arranging for publication and will provide a copy of the proof of publication, as required, under separate cover.**

## **PUBLIC NOTICE**

Notice is hereby given that Exelon Generation Company, LLC (Exelon Generation) has filed an application with the Susquehanna River Basin Commission for Three Mile Island Generating Station, Unit 1 (TMI-1) located in Londonderry Township, Dauphin County. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

TMI-1 is currently approved by SRBC (Docket No. 19950302) to consumptively use up to 18 MGD, based on a 30-day average, and is requesting a 1.2 MGD increase. TMI-1 is approved for groundwater withdrawal up to 0.225 MGD (SRBC Docket No. 19961102), and no increase in this amount is being requested. Surface water withdrawals at TMI-1 were initiated prior to the effective date of applicable SRBC regulations and, therefore, no docket exists. A new docket is being requested that would approve surface water withdrawal in the amount of 122.8 MGD for use primarily as cooling water.

Interested parties should submit comments or inquires to the attention of Ms. Paula Ballaron, Regulatory Program Director, Susquehanna River Basin Commission, 1721 N. Front Street, Harrisburg, PA 17102-2391; telephone: 717-238-0423; fax: 717-238-2436; or e-mail at [pballaron@srbc.net](mailto:pballaron@srbc.net).



## **Notification of Contiguous Property Owners**

### **Note:**

**A list of contiguous property owners and a copy of signed notification letters have been included after this page.**

**The list was developed based on a review of tax maps to identify island properties surrounding TMI (excluding seasonal usage lots) and shoreline properties in Dauphin County east of TMI. Shoreline properties west of TMI (in York County) are separated from TMI by island properties west of TMI and, therefore, were deemed non-contiguous and excluded from the list. Shoreline properties in Lancaster County are south of TMI and, therefore, were deemed non-contiguous and also excluded from the list.**

**Notifications are in progress. Exelon will provide proof of notifications, as required, under separate cover.**

**TMI-1**  
**List of Contiguous Property Owners**

TAX PARCEL NUMBER	TOWNSHIP	COUNTY	STATE	WATER USER OR CONTIGUOUS PROPERTY OWNER	CURRENT OWNER(S)	CURRENT OWNERS ADDRESS	COMMENTS
Island Parcels							
34-027-102	Londonderry	Dauphin	PA	WATER USER	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Three Mile Island - Located in the Susquehanna River
34-027-102	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER (OWNER LOCATED ON SAME PARCEL AS WATER USER)	FirstEnergy Corporation	2800 Pottsville Pike, Reading, PA 19605	Owner of Three Mile Island Generating Station, Unit 2
34-021-039	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER (SAME OWNER AS WATER USER)	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Evergreen Island - Located in the Susquehanna River
34-021-045	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER (SAME OWNER AS WATER USER)	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Saint John Island - Located in the Susquehanna River
34-035-002	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER (SAME OWNER AS WATER USER)	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Exclusion area located on Shelley Island - Located in the Susquehanna River
34-027-101	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	York Haven Power Company	Hydro Park Drive & Locust St., York Haven, PA 17370	Sand Beach Island - Located in the Susquehanna River
34-021-038	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	William K. Metzler III et al, c/o Barbara Metzler	4213 Valley Road, Harrisburg, PA 17112	Metzlers Island 1 - Located in the Susquehanna River
34-021-023	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	William K. Metzler III et al, c/o Barbara Metzler	4213 Valley Road, Harrisburg, PA 17112	Metzlers Island 2 - Located in the Susquehanna River
34-027-026	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	Warren J. Schreiner	511 Linden Street, Middletown, PA 17057	Susquehanna River (Island located north of Beech Island) - Located in the Susquehanna River
34-027-025	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	Frank Jr. and Betty T. Garman	1875 Aeronca Street, Carlisle, PA 17013	Beech Island (aka Beach Island) - Located in the Susquehanna River. There are 72 seasonal usage lots on Beech Island. The parcel provided is the main parcel.
34-035-001	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	York Haven Power Company	Hydro Park Drive & Locust St., York Haven, PA 17370	Shelley Island - Located in the Susquehanna River.
34-035-003	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	Richard G. Krehling	306 Waters Street, Ebers, PA 17319	Shelley Island - Located in the Susquehanna River. There are 23 seasonal usage lots on Shelley Island. The parcel provided is the main parcel.
34-030-002	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	York Haven Power Company	Hydro Park Drive & Locust St., York Haven, PA 17370	Beshore Island (aka Bashore Island) - Located in the Susquehanna River
34-030-100	Londonderry	Dauphin	PA	CONTIGUOUS PROPERTY OWNER	York Haven Power Company	Hydro Park Drive & Locust St., York Haven, PA 17370	Rush or Battery Island - Located in the Susquehanna River

**TMI-1**  
**List of Contiguous Property Owners**

TAX PARCEL NUMBER	TOWNSHIP	COUNTY	STATE	WATER USER OR CONTIGUOUS PROPERTY OWNER	CURRENT OWNER(S)	CURRENT OWNERS ADDRESS	COMMENTS
Shoreline Parcels							
34-031-51	Londonderry	Dauphin	PA	CONTIGUOUS OWNER (SAME OWNER AS WATER USER)	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Shoreline parcel - Located across the Susquehanna River from the southern portion of the TMI plant site
34-021-287	Londonderry	Dauphin	PA	CONTIGUOUS OWNER (SAME OWNER AS WATER USER)	Exelon Generation Company, LLC	300 Exelon Way, KSB3 W, Kennett Square, PA 19348	Shoreline parcel - Located across the Susquehanna River from the TMI plant site
34-021-235	Londonderry	Dauphin	PA	CONTIGUOUS OWNER	Tri-County Boat Club	2229 River Road, Middletown, PA 17057	Shoreline parcel - Located across river starting NE of the parcel and running parallel to the shoreline
34-028-20	Londonderry	Dauphin	PA	CONTIGUOUS OWNER	York Haven Power Company	Hydro Park Drive & Locust St., York Haven, PA 17370	Shoreline parcel - Located across the Susquehanna River from the southern portion of the TMI plant site
34-031-48	Londonderry	Dauphin	PA	CONTIGUOUS OWNER	Jeffrey and Yolanda Leer	4077 River Road, Middletown, PA 17057	Shoreline parcel - Located across the Susquehanna River from the southern tip of Sand Beach Island (neck of TMI)

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

FirstEnergy Corporation  
2800 Pottsville Pike  
Reading, PA 19605

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Sir or Madam:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

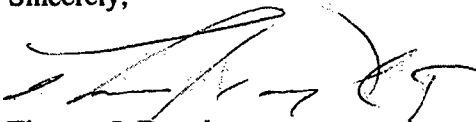
SRBC regulations require Exelon Generation to notify property owners who have a property line in common ("contiguous") with TMI-1 of the filing of this Application. This notification allows an opportunity for you to submit comments on the application to the SRBC. Public Records show that you own property contiguous with TMI-1.

TMI-1 is currently approved by SRBC (Docket No. 19950302) to consumptively use up to 18 MGD, based on a 30-day average, and is requesting a 1.2 MGD increase. TMI-1 is approved for groundwater withdrawal up to 0.225 MGD (SRBC Docket No. 19961102), and no increase in this amount is being requested. Surface water withdrawals at TMI-1 were initiated prior to the effective date of applicable SRBC regulations and, therefore, no docket exists. A new docket is being requested that would approve surface water withdrawal in the amount of 122.8 MGD for use primarily as cooling water.

If you wish to submit any comments regarding this project, please direct them to:

Susquehanna River Basin Commission  
Attn: Ms. Paula B. Ballaron, Regulatory Program Director  
1721 N. Front Street  
Harrisburg, PA 17102-2391  
Phone (717) 238-0425, Fax (717) 238-2436, or [pballaron@srbc.net](mailto:pballaron@srbc.net)

Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

York Haven Power Company  
Hydro Park Drive & Locust Street  
York Haven, PA 17370

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Sir or Madam:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

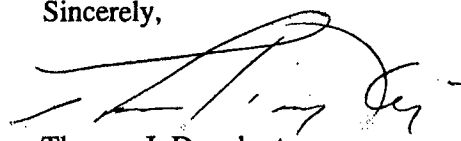
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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. William K. Metzler III et al, c/o Ms. Barbara Metzler  
4213 Valley Road  
Harrisburg, PA 17112

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. or Ms. Metzler:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Warren J. Schreiner  
511 Linden Street  
Middletown, PA 17057

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. Schreiner:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

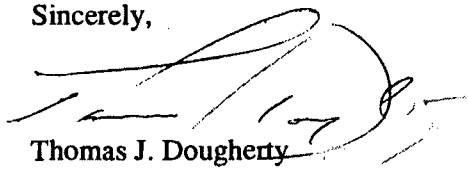
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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Frank Garman and Ms. Betty T. Garman  
1875 Aeronca Street  
Carlisle, PA 17013

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. Garman and Ms. Garman:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.


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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager



Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Richard G. Krehling  
306 Waters Street  
Etters, PA 17319

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. Krehling:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

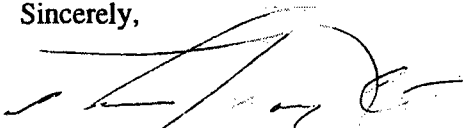
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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Tri-County Boat Club  
2229 River Road  
Middletown, PA 17057

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

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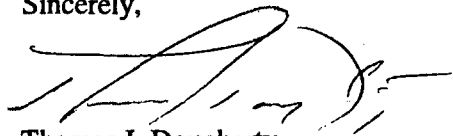
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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

Three Mile Island Unit 1  
Route 441 South, P.O. Box 480  
Middletown, PA 17057

Telephone 717-948-8000

March 9, 2009

*via Certified Mail*

Mr. Jeffrey Leer and Ms. Yolanda Leer  
4077 River Road  
Middletown, PA 17057

**Re: Notification of Submittal of an Application to SRBC  
Water Withdrawals and Consumptive Use  
Three Mile Island Generating Station, Unit 1**

Dear Mr. Leer and Ms. Leer:

Exelon Generation Company, LLC ("Exelon Generation"), the owner of Three Mile Island Generating Station, Unit 1 ("TMI-1", which is located in Londonderry Township, Dauphin County, Pennsylvania) has filed an application with the Susquehanna River Basin Commission. The application requests docketed approval for surface water withdrawals from the Susquehanna River. Also requested in the application are approval for (1) an increase in existing consumptive water use from 18 million gallons per day ("MGD") to 19.2 MGD and (2) conversion to industrial purposes of an existing drinking water well (referred to as the "OSF Well"). The water withdrawals and consumptive use covered by the application would accommodate TMI-1 water needs for possible future operations.

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Sincerely,



Thomas J. Dougherty  
TMI-1 Plant Manager

## **ENVIRONMENTAL EVALUATIONS**

### **1. PURPOSE**

This guidance provides Environmental personnel with direction on performing Environmental Evaluations to identify impacts, if any, of proposed configuration changes or work packages. Early identification of environmental impacts can be addressed prior to initiation of configuration changes or work packages to avoid penalties and minimize delays and cost escalation.

### **2. TERMS AND DEFINITIONS**

2.1. Configuration Change – is defined in EN-AA-103, Environmental Review.

2.2. Cultural, Historical or Paleontological Resources: Includes any of the following: (CM-1)

2.2.1. Cultural Resource - Any man-made or associated prehistoric, historic, architectural, sacred, or traditional cultural property and associated objects and documents that are of interest to archaeology, anthropology, history, or other associated disciplines. Cultural resources include archaeological resources, historic properties, traditional cultural properties, sacred sites, and cultural landscapes that are associated with human activity or occupation.

2.2.2. Historic Resource - Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

2.2.3. Paleontological Resource - Any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth, except that the term does not include an archaeological or cultural resource.

2.3. Environmental Evaluation – is defined in EN-AA-103, Environmental Review.

2.4. Environmental Impact – is defined in EN-AA-103, Environmental Review.

2.5. Environmental Review – is defined in EN-AA-103, Environmental Review.

2.6. Environmentally Sensitive Area – Rivers, streams, wetlands, coastal areas, or areas of land containing an endangered species.

- 2.7. Erosion – The detachment and movement of soil or rock fragments by water, wind, ice, or gravity.
- 2.8. Erosion and Sedimentation Control (ESC) Plan – A plan that is designed to minimize accelerated erosion and sedimentation. The plan contains a strategy to minimize erosion and prevent off-site sedimentation by containing sediments on-site or passing sediment laden runoff through sediment controls or facilities.
- 2.9. Excavation – A cavity formed by boring, digging, quarrying, uncovering, displacing, or relocating soil or rock.
- 2.10. Land Disturbance – Construction or other activity which disturbs the surface of the land, including, but **not** limited to, excavations, embankments, road development, land development, subdivision development, mineral extraction, vegetation removal, and the moving, depositing, or storing of soil, rock or earth.
- 2.11. Major Modification, Expansion or Development – Changes to an existing facility that have the potential to increase emissions or wastes generated by the facility, to impact land usage at the facility, or to require changes to existing facility permits.
- 2.12. New Source Review (NSR) – A pre-construction permit program for new major stationary sources of air pollution and major modifications to major stationary sources. NSR permits in attainment areas are referred to as prevention of significant deterioration (PSD) permits and permits in non-attainment areas are referred to as non-attainment area (NAA) permits.
- 2.13. Polychlorinated Biphenyl (PCB) – Includes any compound of biphenyl and chlorine or any mixture or combination of substances that contain compounds of chlorine and biphenyl.
- 2.14. Release – An intentional or unintentional action or omission resulting in the direct or indirect releasing, spilling, leaking, pumping, emitting, emptying or dumping of non-radiological regulated substances onto the land, into the air or into the water.
- 2.15. Sediment – Soil or other surficial material transported by surface water as a product of erosion.
- 2.16. Sedimentation – The process of depositing sediment on the bottom of water bodies.
- 2.17. Unreviewed Environmental Condition – is defined in EN-AA-103, Environmental Review.
- 2.18. Wetlands – Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs and similar areas.

### 3. **RESPONSIBILITIES**

- 3.1. Upon receipt of an Environmental Review or after a request for assistance with an environmental review, Site Environmental Personnel are responsible for:
- Conducting Environmental Evaluations that identify environmental impacts, federal, state or local regulatory actions (e.g., permit applications, Agency notifications, licensing changes, recordkeeping changes, etc.); and all environmental conditions or risks that must be addressed for the proposed activity to proceed;
  - Communicating environmental impacts, regulatory actions, and environmental conditions or risks to the individual(s) or group(s) providing or requesting the Environmental Review and, if necessary, to Facility Management and Nuclear Corporate Environmental Staff;
  - Working with the individual(s) providing or requesting the Environmental Review to ensure that the scope of the proposed activity is understood, environmental impacts are identified, and actions are developed consistent with applicable environmental laws, regulations, permits, and Corporate and Station environmental policy and procedures;
  - Completing studies, notifications, environmental plans, and/or permit applications;
  - Contacting Regulatory Assurance for submittal of any final studies to the Nuclear Regulatory Commission (NRC) or other environmental agency, as applicable per the Operating License Appendix B, Environmental Protection Plan/Technical Specifications, or other requirement.
- 3.2. The responsibilities of the Engineer in charge of a proposed activity are defined in EN-AA-103 and CC-AA-102.
- 3.3. The responsibilities of the Screening Committee are defined in EN-AA-103 and WC-AA-106.

### 4. **MAIN BODY**

#### 4.1. **Environmental Basis**

The environmental basis for the site is the collective sum of all information that characterizes the environmental operations of the site (see Figure 1 through Figure 4). The environmental basis consists of commitments to external stakeholders (e.g. permit basis), bounds of environmental analysis presented to the NRC (e.g. licensing basis), and capabilities maintained to respond to environmental conditions beyond the scope of normal operations (e.g. contingency planning basis).

## 4.2. Environmental Evaluations

4.2.1 If an Environmental Review (see EN-AA-103, Environmental Review) reveals potential environmental impacts, **then** the Chemistry Manager or their designee should assess whether sufficient internal resources and expertise exists to complete an Environmental Evaluation.

4.2.2 Site environmental personnel and/or support contractors should interview the individual(s) responsible for the proposed activity and other pertinent personnel and review the plans and specifications for the proposed activity, as necessary, to identify potential environmental impacts. Environmental Evaluations assess the proposed activity in relation to the Environmental Basis for the Station including, but **not** limited to:

- Air quality impacts,
- Archeological and cultural impacts,
- Asbestos Surveys,
- Aquatic ecology and endangered species impacts,
- Clean Water Act Certifications,
- Clean Water Act Section 404 compliance,
- Erosion and sedimentation controls,
- Flood plain determinations,
- Hazardous material handling and storage,
- Impacts to groundwater and hydrology,
- Impingement and entrainment impacts,
- National Pollutant Discharge Elimination System (NPDES) impacts,
- Polychlorinated biphenyl management,
- Resource Conservation Recovery Act (RCRA) impacts,
- Safe Drinking Water Act impacts,
- Significant Environmental Aspects,
- Storage tank impacts,
- Stormwater drainage review and quality impacts,
- Stream encroachments, dikes and dams,
- Superfund Amendments Reauthorization Act (SARA) Title III impacts,
- Terrestrial ecology and endangered species impacts,
- Thermal Discharge impacts,
- Unreviewed environmental conditions,
- Waste Handling/Disposal impacts,
- Wetlands Delineations.

Additional details on these types of Environmental Evaluations can be found in Attachment 4. Proposed activities may have environmental impacts in more than one area. Attachment 2 contains a checklist that may be used to identify potential environmental impacts of proposed projects.

Environmental Evaluation results will be communicated to the originator of the proposed activity. If the Environmental Evaluation concludes that the proposed activity has an environmental impact, the proposed activity shall not be initiated until the environmental impact is resolved. Resolution of Environmental Evaluation findings may be in the form of compliance plans, where allowed by regulation.

4.2.3 **DOCUMENT** the results of Environmental Evaluations **and FORWARD** to the individual(s) responsible for the proposed activity.

4.2.4 If the Environmental Evaluation concludes that the implementation of the proposed activity results in an unacceptable environmental condition or risk, **then** Site Environmental Personnel should work jointly with the individual(s) responsible for the proposed activity to identify acceptable alternatives or modifications to the proposed activity that resolve the Environmental Impact(s). The proposed configuration change or work package should **not** be implemented until the Environmental Impact(s) is addressed.

## 5. **DOCUMENTATION**

5.1. Environmental Evaluation documents shall be maintained with the Site environmental records per the retention schedule for the affected environmental program area.

## 6. **REFERENCES**

### 6.1. Exelon Corporate Procedures

- EN-AC-101-1, Exelon Environmental Aspects and Impacts Assessment

### 6.2. Exelon Nuclear Procedures

- EN-AA-103, Environmental Reviews
- SA-AA 117, Excavation, Trenching, and Shoring

### 6.3. Federal Emergency Management Agency (FEMA), Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners

### 6.4. Illinois Administrative Code (IAC)

Department of Natural Resources (IDNR), Title 17

- 17 IAC 370, The Protection of Archaeological Resources
- 17 IAC 3700, Construction in Floodways of Rivers, Lakes, and Streams
- 17 IAC 3702, Rules for Construction and Maintenance of Dams
- 17 IAC 3704, Regulation of Public Waters
- 17 IAC 3706, Regulations of Construction within the Floodplain
- 17 IAC 4170, Rules for the Protection, Treatment and Inventory of Unmarked Human Burial Sites and Unregistered Graves



- 17 IAC 4190, The Protection, Treatment, and Inventory of Archaeological and Paleontological Resources on Public Lands

Environmental Protection Agency (IEPA), Title 35

- 35 IAC 201, General Provisions [Air Pollution]
- 35 IAC 202, Alternative Control Strategies [Air Pollution]
- 35 IAC 203, Major Stationary Sources Construction and Modification
- 35 IAC 211, Definitions and General Provisions [Air Pollution]
- 35 IAC 212, Visible and Particulate Matter Emissions
- 35 IAC 214, Sulfur Limitations
- 35 IAC 215, Organic Material Emissions Standards and Limitations
- 35 IAC 216, Carbon Monoxide Emissions
- 35 IAC 217, Nitrogen Oxides Emissions
- 35 IAC 218, Organic Material Emission Standards and Limitations for the Chicago Area
- 35 IAC 220, Nonmethane Organic Compounds
- 35 IAC 228, Asbestos
- 35 IAC 230, New Source Performance Standards
- 35 IAC 232, Toxic Air Contaminants
- 35 IAC 237, Open Burning
- 35 IAC 240, Mobile Sources
- 35 IAC 241, Clean Fuel Fleet Program
- 35 IAC 243, Air Quality Standards
- 35 IAC 244, Episodes [Air Pollution]
- 35 IAC 245, Odors
- 35 IAC 254, Annual Emissions Report [Air Pollution]
- 35 IAC 270, Clean Air Act Permit Program Procedures
- 35 IAC 275, Alternate Fuels Program
- 35 IAC 276, Procedures to be Followed in the Performance of Annual Inspections of Motor Vehicle Exhaust Emissions
- 35 IAC 301, Introduction [Water Pollution]
- 35 IAC 302, Water Quality Standards
- 35 IAC 303, Water Use Designations and Site Specific Water Quality Standards
- 35 IAC 304, Effluent Standards
- 35 IAC 305, Monitoring and Reporting [Water Pollution]
- 35 IAC 306, Performance Criteria [Water Pollution]
- 35 IAC 307, Sewer Discharge Criteria
- 35 IAC 309, Permits [Water Pollution]

- 35 IAC 310, Pretreatment Programs
- 35 IAC 312, Treatment Plant Operator Certification
- 35 IAC 352, Procedures for Determining Water Quality Based Permit Limitations for National Pollutant Discharge Elimination Discharges
- 35 IAC 355, Determination of Ammonia Nitrogen Water Quality Based Effluent Limits for Discharge to General Use Waters
- 35 IAC 370, Illinois Recommended Standards for Sewage Works
- 35 IAC 373, Third Stage Treatment Lagoon Exemptions
- 35 IAC 378, Effluent Disinfection Exemptions
- 35 IAC 380, Procedure for the Certification of Operators of Wastewater Treatment Works
- 35 IAC 391, Design Criteria for Sludge Application on Land
- 35 IAC 601, Introduction [Public Water Supplies]
- 35 IAC 602, Permits [Public Water Supplies]
- 35 IAC 603, Ownership and Responsible Personnel [Public Water Supplies]
- 35 IAC 607, Operation and Recordkeeping [Public Water Supplies]
- 35 IAC 611, Primary Drinking Water Standards
- 35 IAC 615, Existing Activities in a Setback Zone or Regulated Recharge Area
- 35 IAC 616, New Activities in a Setback Zone or Regulated Recharge Area
- 35 IAC 617, Regulated Recharge Areas
- 35 IAC 620, Groundwater Quality
- 35 IAC 651, Introduction and Definitions [Public Water Supplies]
- 35 IAC 652, Permits [Public Water Supplies]
- 35 IAC 653, Design, Operation and Maintenance Criteria [Public Water Supplies]
- 35 IAC 654, Raw and Finished Water Quality and Quantity [Public Water Supplies]
- 35 IAC 670, Minimal Hazard Certification [Public Water Supplies]
- 35 IAC 671, Maximum Setback Zone for Community Water Supply Wells
- 35 IAC 680, Water Supply Operator Certification
- 35 IAC 702, RCRA and UIC Permit Programs
- 35 IAC 703, RCRA Permit Program
- 35 IAC 705, Procedures for Permit Issuance
- 35 IAC 709, Wastestream Authorizations
- 35 IAC 720, Hazardous Waste Management System: General
- 35 IAC 721, Identification and Listing of Hazardous Waste
- 35 IAC 722, Standards Applicable to Generators of Hazardous Waste

- 35 IAC 725, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- 35 IAC 726, Standards for the Management of Specific Hazardous Waste and Specific Types of Hazardous Waste Management Facilities
- 35 IAC 728, Land Disposal Restrictions
- 35 IAC 729, Prohibited Hazardous Wastes in Land Disposal Units
- 35 IAC 731, Underground Storage Tanks
- 35 IAC 732, Petroleum Underground Storage Tanks
- 35 IAC 733, Standards for Universal Waste Management
- 35 IAC 739, Standards for the Management of Used Oil
- 35 IAC 740, Site Remediation Program
- 35 IAC 741, Proportionate Share Liability
- 35 IAC 742, Tiered Approach to Corrective Action Objectives
- 35 IAC 807, Solid Waste
- 35 IAC 808, Special Waste Classifications
- 35 IAC 809, Nonhazardous Special Waste Hauling and the Uniform Program
- 35 IAC 810, Solid Waste Disposal: General Provisions
- 35 IAC 900, General Provisions [Noise]
- 35 IAC 901, Sound Emission Standards and Limitations for Property Line Noise Sources
- 35 IAC 951, Measurement Procedures for the Enforcement of 35 Ill. Adm. Code 900 & 901
- 35 IAC 1010, Procedures for Reporting Releases of Radionuclides at Nuclear Power Plants
- 35 IAC 1420, General Provisions [Potentially Infectious Medical Waste]
- 35 IAC 1421, Activity Standards [Potentially Infectious Medical Waste]
- 35 IAC 1422, Design and Operation of Facilities [Potentially Infectious Medical Waste]

Office of the State Fire Marshal (OSFM), Title 41

- 41 IAC 160, Storage, Transportation, Sale and Use of Gasoline and Volatile Oils: Rules and Regulations Relating to General Storage
- 41 IAC 170, Storage, Transportation, Sale and Use of Petroleum and Other Regulated Substances
- 41 IAC 180, Storage, Transportation, Sale and Use of Gasoline and Volatile Oils

Department of Public Health (IDPH), Title 77

- 77 IAC 900, Drinking Water Supply Code
- 77 IAC 930, Surface Source Water Treatment Code

6.5. Illinois Compiled Statutes (ILCS)

- 20 ILCS 830, Interagency Wetland Policy Act
- 20 ILCS 2305, Department of Public Health Act
- 20 ILCS 2905, State Fire Marshal Act
- 20 ILCS 3305, Illinois Emergency Management Agency Act
- 20 ILCS 3405, Historic Preservation Agency Act
- 20 ILCS 3410, Illinois Historic Preservation Act
- 20 ILCS 3415, Historical Sites Listing Act
- 20 ILCS 3420, Illinois State Agency Historic Resources Preservation Act
- 20 ILCS 3435, Archaeological and Paleontological Resources Protection Act
- 20 ILCS 3440, Human Skeletal Remains Protection Act
- 415 ILCS 5, Environmental Protection Act
- 415 ILCS 20, Illinois Solid Waste Management Act
- 415 ILCS 25, Water Pollutant Discharge Act
- 415 ILCS 55, Illinois Groundwater Protection Act
- 415 ILCS 60, Illinois Pesticide Act
- 415 ILCS 70, Hazardous Substances Construction Disclosure Act
- 415 ILCS 85, Toxic Pollution Prevention Act
- 415 ILCS 115, Illinois Pollution Prevention Act
- 415 ILCS 130, Interstate Ozone Transport Oversight Act
- 430 ILCS 15, Gasoline Storage Act
- 430 ILCS 30, Illinois Hazardous Materials Transportation Act
- 430 ILCS 45, Illinois Chemical Safety Act
- 430 ILCS 50, Hazardous Materials Emergency Act
- 430 ILCS 100, Illinois Emergency Planning and Community Right to Know Act
- 520 ILCS 7, Illinois Endangered Species Protection Act
- 525 ILCS 5, Illinois Cave Protection Act
- 525 ILCS 25, Illinois Lake Management Program Act
- 525 ILCS 45, Water Use Act of 1983
- 615 ILCS 5, Rivers, Lakes and Streams Act
- 615 ILCS 15, Flood Control Act of 1945

6.6. New Jersey Administrative Code (NJAC)

Department of Environmental Protection (NJDEP), Title 7

- NJAC 7:1G, Worker and Community Right to Know Regulations
- NJAC 7:4, The New Jersey Register of Historic Places Rules
- NJAC 7:7, Coastal Permit Program Rules

- NJAC 7:7A, Freshwater Wetlands Protection Act Rules
- NJAC 7:7E, Coastal Zone Management Rules
- NJAC 7:7E-3.13, Shipwreck and Artificial Reef Habitats
- NJAC 7:7E-3.36, Historic and Archaeological Resources
- NJAC 7:26, Solid Waste Regulations
- NJAC 7:31, Toxic Catastrophe Prevention Act (TCPA)
- NJAC 7:50, Pinelands Comprehensive Management Plan
- NJAC 7:50, Part XV - Historic, Archaeological, and Cultural Preservation
- NJAC 7:10, Safe Drinking Water Act
- NJAC 7:13, Flood Hazard Area Control
- NJAC 7:14, Water Pollution Control Act
- NJAC 7:14A, Pollutant Discharge Elimination System
- NJAC 7:18, Regulations Governing Certification of Laboratories and Environmental Measures
- NJAC 7:19, Water Supply Allocation Permits
- NJAC 7:20, Dam Safety Standards
- NJAC 7:26, Solid Waste
- NJAC 7:26G, Hazardous Waste
- NJAC 7:27, Air Pollution Control

Department of Health and Senior Services (NJDHSS), Title 8

- NJAC 8:59, Worker and Community Right to Know Act Rules

6.7. New Jersey Statutes Annotated (NJSA)

- NJSA 2C:22-1, Disturbing, Desecrating Human Remains; Offenses
- NJSA 4:24-39, Soil Erosion and Sediment Control Act
- NJSA 13:1B-15.128 et seq., New Jersey Register of Historic Places Act
- NJSA 13:1L-10, Destruction of Park Property, Archaeological Findings, Sites Prohibited
- NJSA. 23:7-1.2, Archaeological Findings in Wildlife Management Area Protected
- NJSA 27:5J-1, Archaeological Findings on Property of DOT, Various Authorities, Protected
- NJSA 40:10D-2, Archaeological Findings on Lands Owned by Political Subdivision Protected
- NJSA 52:17B-219, Custody of Human Remains, Notification if Remains Unidentified
- NJSA 58 et. seq., Waters and Water Supply
- NJSA 58:4-14, Archaeological Findings on Reservoir Lands Protected

## 6.8. Operating License

- Appendix B, Environmental Protection Plan/Environmental Technical Specifications (Except Dresden)
- Section 3.B (Peach Bottom Atomic Power Station)
- National Marine Fisheries Service (NMFS) Endangered Species Act, Section 7, Consultation Biological Opinion (Oyster Creek)
- Final Environmental Statement (FES-OL)
  - Braidwood Station Units 1 and 2, NUREG-1026, dated June 1984
  - Byron Station, Units 1 and 2, NUREG-0848, dated April 1982
  - Clinton Power Station, Unit 1, NUREG-0854, dated May 1982
  - Dresden Nuclear Power Station, Units 1, 2, and 3, dated November 1973
  - LaSalle County Station, Units 1 and 2, NUREG-0486, dated November 1978
  - Limerick Generating Station, Units 1 and 2, dated November 1973
  - Oyster Creek Nuclear Generating Station, dated December 1974
  - Peach Bottom Atomic Power Station, Units 1, 2, and 3, dated April 1973
  - Quad Cities Nuclear Power Station, Units 1 and 2, dated September 1972
  - Three Mile Island, Unit 1, dated December 1972
  - Zion Nuclear Power Station, Units 1 and 2, dated December 1972
- NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Volume 1, Volume 1 – Addendum 1, and Volume 2
  - Supplement 10, dated January 2003 - Peach Bottom Atomic Power Station, Units 2 and 3
  - Supplement 16, dated June 2004 - Quad Cities Nuclear Power Station, Units 1 and 2
  - Supplement 17, dated June 2004 - Dresden Nuclear Power Station, Units 2 and 3

## 6.9. Pennsylvania Code

Department of Environmental Protection (PADEP), Title 25

- Chapter 91, General Provisions [Water Resources]
- Chapter 92, National Pollutant Discharge Elimination System Permitting, Monitoring and Compliance
- Chapter 93, Water Quality Standards
- Chapter 102, Erosion Control
- Chapter 105, Dam Safety and Waterway Management
- Chapter 106, Flood Plain Management
- Chapter 109, Safe Drinking Water
- Chapter 121, General Provisions [Air Resources]
- Chapter 122, National Standards of Performance for New Stationary Sources
- Chapter 123, Standards for Contaminants

- Chapter 127, Construction, Modification, Reactivation and Operation of Sources
- Chapter 135, Reporting of Sources
- Chapter 139, Sampling and Testing
- Chapter 245, Administration of the Storage Tank and Spill Prevention Program
- Chapter 262a, Standards Applicable to Generators of Hazardous Waste
- Chapter 265a, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities
- Chapter 284, Infectious and Chemotherapeutic Waste
- Chapter 287, Residual Waste Management – General Provisions
- Chapter 299, Storage and Treatment of Residual Waste
- Chapter 301, General Provisions [Certification of Sewage Treatment Plant and Waterworks Operators]
- Chapter 303, Certification of Operators

Labor and Industry, Title 34

- Chapters 301 through 323, The Worker and Community Right-to-Know Act

6.10. Pennsylvania Statutes (P.S.) and Pennsylvania Consolidated Statutes Abbreviated (Pa.C.S.A.)

- 9 Pa.C.S.A. §1 through §215, Burial Grounds
- 9 P.S. §202 through §215, Historical Burial Places Preservation Act
- 32 P.S. §5602 through §5607, Cave Protection Act
- 35 P.S. §6021.101 through 6021.2104, Pennsylvania Storage Tank and Spill Prevention Act
- 35 P.S. §7301 through 7320, The Worker and Community Right-to-Know Act
- 37 Pa.C.S.A. §101 through §906, Historical and Museums (History Code)
- 37 Pa.C.S.A. §501 through §512, Historic Preservation Act

6.11. Delaware River Basin Commission (DRBC)

- LGS Docket No. D-69-210CP

6.12. Susquehanna River Basin Commission (SRBC)

- PBAPS Docket No. 20061209
- TMI Docket No. 11950302

6.13. County and Local Regulations

County and Local regulations are maintained in a SharePoint drive on Exelon's Intranet. The SharePoint location is:

<http://exelonwss.exeloncorp.com/bsc/municipalregs/default.aspx>.

#### 6.14. United States Code of Federal Regulations (CFR)

##### Nuclear Regulatory Commission, Title 10 CFR

- 10 CFR 50, Domestic Licensing Of Production And Utilization Facilities
- 10 CFR 51, Environmental Protection Regulations For Domestic Licensing And Related Regulatory Functions

##### Occupational Safety and Health Administration, Title 29 CFR

- 29 CFR 1910, Occupational Safety and Health Standards

##### Army Corps of Engineers, Title 33 CFR

- 33 CFR 153, Control of Pollution by Oil and Hazardous Substances, Discharge Removal
- 33 CFR 321, Permits for Dams and Dikes in Navigable waters of the U.S
- 33 CFR 323, Permits for Discharges of Dredged or Fill Material into waters of the U.S.
- 33 CFR 324, Permits for Ocean Dumping of Dredged Material
- 33 CFR 325, Processing of Department of the Army Permits
- 33 CFR 330, Nationwide Permit Program

##### Advisory Council On Historic Preservation, Title 36 CFR

- 36 CFR 800, Protection of Historic Properties

##### Environmental Protection Agency, Title 40 CFR

- 40 CFR 50, National Primary and Secondary Ambient Air Quality Standards
- 40 CFR 52, Approval and Promulgation of Implementation Plans
- 40 CFR 60, New Source Performance Standards
- 40 CFR 61, National Emission Standards for Hazardous Air Pollutants
- 40 CFR 63, National Emission Standards for Hazardous Air Pollutants for Source Categories
- 40 CFR 64, Compliance Assurance Monitoring
- 40 CFR 65, Consolidated Federal Air Rule
- 40 CFR 68, Chemical Accident Prevention Provisions
- 40 CFR 75, Continuous Emission Monitoring
- 40 CFR 80, Regulation of Fuels and Fuel Additives
- 40 CFR 81, Designation of Areas for Air Quality Planning Purposes
- 40 CFR 82, Protection of Stratospheric Ozone
- 40 CFR 85, Control of Air Pollution from Mobile Sources
- 40 CFR 88, Clean Fuel Vehicles
- 40 CFR 110, Discharge of Oil
- 40 CFR 112, Oil Pollution Prevention



- 40 CFR 116, Designation of Hazardous Substances
- 40 CFR 117, Determination of Reportable Quantities for Hazardous Substances
- 40 CFR 121, State Certification of Activities Requiring a Federal License or Permit
- 40 CFR 122, The National Pollutant Discharge Elimination System
- 40 CFR 125, Criteria and Standards for the National Pollutant Discharge Elimination System
- 40 CFR 129, Toxic Pollutant Effluent Standards
- 40 CFR 131, Water Quality Standards
- 40 CFR 132, Water Quality Guidance for the Great Lakes System
- 40 CFR 133, Secondary Treatment Regulation
- 40 CFR 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants
- 40 CFR 141, National Primary Drinking Water Regulations
- 40 CFR 142, National Primary Drinking Water Regulations Implementation
- 40 CFR 143, National Secondary Drinking Water Regulations
- 40 CFR 171, Certification of Pesticide Applicators
- 40 CFR 204, Noise Emission Standards for Construction Equipment
- 40 CFR 230, Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material
- 40 CFR 232, 404 Program Definitions: Exempt Activities not Requiring 404 Permits
- 40 CFR 260, Hazardous Waste Management System: General
- 40 CFR 261, Identification and Listing of Hazardous Waste
- 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
- 40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
- 40 CFR 266, Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
- 40 CFR 268, Land Disposal Restrictions
- 40 CFR 280, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- 40 CFR 302, Designation, Reportable Quantities and Notification
- 40 CFR 355, Emergency Planning and Notification
- 40 CFR 370, Hazardous Chemical Reporting: Community Right-to-Know
- 40 CFR 372, Toxic Chemical Release Reporting: Community Right-to-Know
- 40 CFR 401, General [Pretreatment] Provisions
- 40 CFR 403, General Pretreatment Regulations for Existing and New Sources of Pollution

- 40 CFR 423, Steam Electric Power Generating [Pretreatment] Point Source Category
- 40 CFR 503, Standards for the Use and Disposal of Sewage Sludge
- 40 CFR 749, Water Treatment Chemicals
- 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
- 40 CFR 1068, General Compliance Provisions for Non-Road Programs

Office of the Secretary of the Interior, Title 43 CFR

- 43 CFR 7, Protection of Archaeological Resources

Department of Transportation, Title 49 CFR

- 49 CFR 130, Oil Spill Prevention and Response Plans
- 49 CFR 171, General Information, Regulations and Definitions

6.15. United States Code (USC)

- 7 USC 136 & 16 USC 460 et seq., Endangered Species Act
- 15 USC 2601, Toxic Substances Control Act
- 16 USC 431-433, Antiquities Act of 1906
- 16 USC 469-469c-2, Archeological and Historic Preservation Act of 1974
- 16 USC 470 et seq., National Historic Preservation Act of 1966 (NHPA)
- 16 USC 470aa-mm, Archaeological Resources Protection Act of 1979
- 25 USC 3001-3013, Native American Grave Protection and Repatriation Act
- 33 USC 1251 et seq., Clean Water Act
- 33 USC 2702-2761 Oil Pollution Act
- 42 USC 300, Safe Drinking Water Act
- 42 USC 321 et seq., Resource Conservation and Recovery Act
- 42 USC 4321-4347, as amended, National Environmental Policy Act
- 42 USC 4910, Noise Control Act
- 42 USC 7401 et seq., Clean Air Act
- 42 USC 9601 et seq., Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
- 42 USC 9601 et seq., Superfund Amendments and Reauthorization Act
- 42 USC 11011 et seq., Emergency Planning and Community Right-to-Know Act
- 42 USC 13101 & 13102, et seq., Pollution Prevention Act
- 43 USC 2101-2106, Abandoned Shipwreck Act of 1987.

6.16. **Three Mile Island (CM-1)**

Action Tracking Item AR 00764374-04, NRC Environmental Site Audit Regarding Three Mile Island Nuclear Station, Unit 1, License Renewal Application (TAC No. MD7702), dated April 1, 2008, Cultural Resources Review (ML080840029)

- 6.17. Nuclear Energy Institute (NEI) 07-07, Industry Groundwater Protection Initiative - Final Guidance Document, August 2007

7. **ATTACHMENTS**

- 7.1. Attachment 1 – Environmental Evaluation Form – Example (A Word Version of this form is available in the EN Forms folder under Chemistry under NGG Procedure Project in the Public Folders in Outlook.)
- 7.2. Attachment 2 – Checklist for Identifying Potential Environmental Impacts
- 7.3. Attachment 3 – Environmental Program Areas and Applicable Regulatory Standards
- 7.4. Attachment 4 – Environmental Basis

8. **FIGURES**

- 8.1 Figure 1 – Environmental Basis
- 8.2 Figure 2 – Environmental Applicability of Proposed Change
- 8.3 Figure 3 – Preparation of Environmental Evaluation

**ATTACHMENT 1**  
**Environmental Evaluation Form – Example**  
**Page 1 of 2**

Preparer:		Organization:	
<u>Proposed Activity:</u>			
<p>1. Will the proposed change increase environmental impacts from noise levels at the site boundary or generation of regulated air pollutants (e.g., dusts, vapors, asbestos, etc.) hazardous waste, solid waste, or wastewater?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>2. Will the proposed change increase the potential to release any chemical (e.g., gas, oil, PCB, hydraulic fluid, anti-freeze, etc) to the environment or introduce new chemicals to the Site?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>3. Will the proposed change disturb land, streams or wetlands or modify stormwater drainage systems that would change site stormwater runoff or increase the sediment loading of stormwater runoff?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>4. Will the proposed change affect the existing capability to control, treat, or monitor release to the environment?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>5. Will the proposed change result in a physical or chemical change in the characteristics of discharges, effluents, emissions, or withdrawals?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>6. Will the proposed change result in permanent or temporary storage (for re-use, disposal, or offsite transfer) of a hazardous or regulated chemical or waste outside of established handling facilities; or reduce the margin of control or containment (i.e., increase the potential of a release to the environment?)</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>7. Will the proposed change result in an alteration to a plant system or component, (e.g., wastewater treatment operation, air emission filter, etc.) regulated by an environmental permit, surface water use or discharge permit, etc.) or require a modification to an environmental permit?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>8. Will the proposed change alter the drinking water treatment system or cause the drinking water distribution system to be opened?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			

**ATTACHMENT 1**  
**Environmental Evaluation Form – Example**  
**Page 2 of 2**

<p>9. Will the proposed change be consistent with the Facility Operating License, Appendix B, Environmental Protection Plan / Environmental Technical Specification, and / or the Final Environmental Statement by the NRC?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>10. Does the proposed activity affect a significant environmental aspect?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>11. Does the proposed activity modify an existing environmental permit?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>12. Does the proposed activity involve a change to Environmental Technical Specifications?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>13. Does the proposed activity involve an environmental impact different than analyzed in the Final Environmental Statement?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>14. Does the proposed activity require NRC approval in accordance with 10 CFR 50.59 or Operating License, Appendix B?</p> <p>Yes _____ No _____</p> <p>Explain:</p>			
<p>Technical review of the following documents was performed:</p>			
<p>Review:</p>			
Preparer[s]		Date	
Peer Reviewer[s]		Date	
<p>Comments:</p>			

**ATTACHMENT 2**  
**Checklist for Identifying Potential Environmental Impacts**  
**Page 1 of 2**

This checklist provides questions and examples that, when answered, may indicate areas of possible environmental impact. The list is not all-inclusive and is meant to compliment the checklist of EN-AA-103, Attachment 1. The judgment of the Environmental Subject Matter Expert is necessary to determine whether all potential impacts have been identified.

Aspect	Complete	N/A
1. Identify all relevant federal state and local laws and regulations (see Attachment 3)		
2. Identify all current permits, licenses and certificates (including contractual, regulatory, or other binding commitments) made with a government agency or Non-Governmental Organization (NGO):		
a. The scope, timing and impact of the proposed activity are consistent with permit modifications and commitments		
b. New licenses, permits or certificates have been identified		
c. The compliance record/history of the proposed activity has been evaluated		
d. The proposed operating plan includes consideration of potential limits Imposed in permits or commitments		
e. Agency and NGO notification has been evaluated		
3. Identify all liabilities created or retained by the proposed activity		
4. Identify all options to mitigate environmental impacts		
5. Identify opportunities to enhance environmental performance for:		
a. Greenhouse gas emission reductions		
b. Increased use of renewable energy		
c. Increased energy efficiency		
d. Reduced solid and liquid waste generation		
e. Improved water quality		
f. Decreased water consumption/use		
g. Reuse of previously-disturbed land instead of virgin (greenfield) land		
h. Adequate controls to minimize environmental non-compliances		
6. Include an assessment of past environmental performance in contractor selection		

**ATTACHMENT 2**  
**Checklist for Identifying Potential Environmental Impacts**  
**Page 2 of 2**

7. Include the following in contracts for services that may impact the environment:			
	a. Clarification of vendor training and approval of vendor training content		
	b. Environmental expectations that are clearly stated in contract documents		
	c. Communication expectations between vendor, project manager and Environmental SME		
	d. Appropriate indemnification and/or insurance requirements in contracts		

**ATTACHMENT 3**  
**Environmental Program Areas and Applicable Regulations**  
**Page 1 of 2**

<b>Program Area Aspect</b>	<b>Code of Federal Regulations</b>	<b>New Jersey Regulations</b>	<b>Pennsylvania Regulations</b>	<b>Illinois Regulations</b>
<b>Air Emissions</b>	40 CFR 50, 52, 64, 65, 70, 81	NJAC 7:27	25 PAC §121-143	35 IAC 201-203, 211-218, 220, 237, 243-244, 254, 270
New Source Performance Standards	40 CFR 60	NJAC 7:27-18	25 PAC §122	35 IAC 230 415 ILCS 5/9
Hazardous Air Pollutants	40 CFR 61, 63	NJAC 5:16, 8:60	25 PAC §124	35 IAC 228, 232
Motor Vehicle Diesel and Gasoline Storage	40 CFR 80	NJAC 7:27-14, 15	25 PAC §129	35 IAC 215, 218
Ozone Depleting Substances	40 CFR 82	NJAC 7:13.6	N/A	N/A
Mobile Sources	40 CFR 85, 88, 1068	NJAC 7:27	25 PAC §126	35 IAC 240-241, 275, 276
Odors	N/A	NJAC 7:27-5	25 PAC §123.31	35 IAC 245
Noise	40 CFR 204 42 USC 4910	NJAC 7:29	N/A	35 IAC 900-901, 951
<b>Water Discharges</b>	40 CFR 116-117, 121	NJAC 7:14A	25 PAC §92-93	35 IAC 301, 303, 312, 370, 380
Oil Pollution/Spill Prevention Control and Countermeasure	40 CFR 110 40 CFR 112	NJAC 7:1.E	25 PAC §245	415 ILCS 25
National Pollutant Discharge Elimination System	40 CFR 121, 122	NJAC 7:14A	25 PAC §92	35 IAC 305, 309, 310, 373
Water Quality Limits and Standards	40 CFR 116, 125, 129, 131-133, 136, 401-403, 423	NJAC 7:14A	25 PAC §93	35 IAC 302, 304, 307, 352, 355, 378
Intake Structures	33 USC 1251			35 IAC 306
Stormwater	40 CFR 122	NJAC 7:8	25 PAC §111	N/A
Land Application of Sewage Sludge	40 CFR 503	NJAC 7:14A-20	25 PAC §271, 275	35 IAC 391
Wetlands Encroachment, Dredge and Fill	10 CFR 1022 18 CFR 725 33 CFR 323, 324, 325, 330 40 CFR 230, 232	NJAC 7:7A	25 PAC §105	17 IAC 3700, 3704, 3706, 3708 20 ILCS 830
Dikes and Dams	33 CFR 321	NJAC 7:20	25 PAC §105	17 IAC 3700, 3702 615 ILCS 5
<b>Drinking Water</b>	40 CFR 141, 143	NJAC 7:10	25 PAC §109	35 IAC 601-611, 651-654, 680 77 IAC 900, 930
Groundwater	N/A	NJAC 9-6, 14A	N/A	35 IAC 615-620, 670-671, 1010



**ATTACHMENT 3**  
**Environmental Program Areas and Applicable Regulatory Standards**  
**Page 2 of 2**

Program Area Aspect	Code of Federal Regulations	New Jersey Regulations	Pennsylvania Regulations	Illinois Regulations
<b>Land Management</b>	NA	NA	NA	N/A
Hazardous Waste	40 CFR 260-262, 265-268	NJAC 7:14A, 7:26, 7:26G	25 PAC §260a-262a, 266a, 268a, 287, 299	35 IAC 702-703, 705-722, 725-729
Mixed Waste	40 CFR 266	N/A	N/A	35 IAC 726
Universal Waste	40 CFR 273	NJAC 7:26A-7	25 PAC §266b	35 IAC 733
Medical Waste	NA	NJAC 7:26-3A	25 PAC 284	35 IAC 1420-1422
Special/Residual Waste	40 CFR 240-258	NJAC 7:26, 7:26A	25 PAC 287, 299	35 IAC 807-810
Used Oil	40 CFR 279	NJAC 7:26, 7:26A, 7:27	25 PAC §266a, 287	35 IAC 739
Storage Tanks	40 CFR 280	NJAC 7:1E, 7:14B	25 PAC §245	41 IAC 160-180 35 IAC 731-732
Property Transfer	42 USC 9601			
<b>Chemical Management</b>	40 CFR 117, 302	NJAC 7:26	25 PAC §301-303, 307	N/A
Chemical Accident Prevention	40 CFR 68			
Pesticides	40 CFR 171			
Emergency Planning and Notification	40 CFR 355	NJAC 7:1G		430 ILCS 100
Community Right-to-Know	40 CFR 370, 372	NJAC 8:59	34 PAC §305	430 ILCS 100
Water Treatment Chemicals	40 CFR 749			
PCBs	40 CFR 761	NJAC 7:26	25 PAC §273, 287, 299	N/A
Emergency Response, Site Remediation	29 CFR 1910.120	NJAC 7:31	34 PAC §305, 307	35 IAC 740-742 415 ILCS 70
Hazardous Materials Shipping	49 CFR 171-180	NJAC 16:49, 12:205	67 PAC §403	430 ILCS 30 430 ILCS 50
<b>Operating License</b>	10 CFR 50, 51	Appendix B Sect. 7 Consultation Biological Opinion (OC)	Appendix B	Appendix B (Except Dresden)
<b>Other</b>				
Endangered Species	7 USC 136 16 USC 460			520 ILCS 7
Cultural, Historical and Paleontological Resources ( <b>CM-1</b> )	36 CFR 800 43 CFR 7 16 USC 431-433, 469-469c-2, 470 25 USC 3001-3013 43 USC 2101-2106	NJAC 7:4, 7:7E-3.13, 7:7E-3.36, 7:50 NJSA 2C:22-1, 13:1B-15.128, 13:1L-10, 23:7-1.2, 27:5J-1, 40:10D-2, 52:17B-219, 58:4-14	9 Pa.C.S.A. §1 – 215 9 P.S. 202 – 215 32 P.S. 5602 – 5607 37 Pa.C.S.A. 101 - 906	17 IAC 370, 4170, 4190 20 ILCS 3405, 3415, 3420, 3435, 3440, 525 ILCS 25
County and Local	Applicable County and Local regulations are provided on Exelon's SharePoint drive at: <a href="http://exelonwss.exeloncorp.com/bsc/municipalregs/default.aspx">http://exelonwss.exeloncorp.com/bsc/municipalregs/default.aspx</a>			

**ATTACHMENT 4**  
**Environmental Basis**  
**Page 1 of 7**

1. Air Quality Evaluation – Equipment or processes that emit air pollutants must be considered in the permitting of existing operations, the design of new processes, and changes in existing operations that alter air emissions. For example, temporary generators are needed on site for the proposed activity, they must be addressed through the appropriate State Permitting Sections (35 IAC 201.142 and 201.152; NJAC 7:27 Subchapter 22; 25 PA Code 127.1).
2. Cultural, Historical or Paleontological Resource Evaluation – Soils on all Exelon Nuclear property areas described in the UFSARs for NRC licensed generating stations have been previously surveyed for Cultural, Historical or Paleontological Resources as part of the licensing process and are considered to be previously disturbed. Therefore, new surveys are normally not required for excavations in these areas. **REVIEW** as applicable, the FES-OL and supplements, FES-CP, Environmental Reports to the NRC and supplements, NUREG-1437 and applicable supplements, and/or Appendix B to the Operating License to obtain information pertaining to the cultural, historical or paleontological significance of the location where ground will be disturbed. **(CM-1)**
  - 2.1. If the document review indicates the excavation site has **not** been previously evaluated by the NRC, **then CONTACT** Environmental personnel to arrange for a survey to determine impacts per SA-AA-117. The State Historic Preservation Office may be consulted for guidance on how to proceed.
  - 2.2. If the document review indicates the NRC has previously evaluated the location where ground will be disturbed as **not** significant, **then no** further action is needed.
  - 2.3. If Cultural, Historical or Paleontological Resources are inadvertently discovered during excavation, **then REFER** to SA-AA-117. Work will be stopped, and Environmental personnel will coordinate the salvage or disposition of the Cultural, Historic or Paleontological resources. The State Historic Preservation Office may be consulted for guidance on how to proceed. Work shall **not** resume until the salvage or disposition of the resources is complete, and Environmental personnel authorize work to resume.
3. Asbestos Survey – Each employer who has a workplace or work operation shall ensure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected asbestos exposures during that operation. The assessment must be completed in time to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly (29 CFR 1926.1101).

**ATTACHMENT 4**  
**Environmental Basis**  
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4. Aquatic Ecology and Endangered Species Evaluation – The U.S. Army Corps of Engineers (ACOE), U.S. Fish and Wildlife Service, Illinois Environmental Protection Agency (IEPA), New Jersey Department of Environmental Protection (NJDEP), Pennsylvania Department of Environmental Protection (PADEP) or county conservation district may determine that a proposed earth-disturbing activity will adversely impact an endangered or threatened species or critical habitat. The likelihood of such species or habitats occurring in the affected area should be determined prior to commencing the land disturbance. Agencies or county conservation districts shall be consulted on ways to avoid or prevent impacts to any species or habitats identified. If impacts cannot be avoided or prevented, a demonstration on how the impacts will be minimized shall be prepared according to State and Federal laws pertaining to the protection of threatened or endangered species and their habitat (16 USC Chapter 35; 25 PA Code 102.6; 520 ILCS 10).

Effects on threatened or endangered aquatic species must be considered prior to disturbing riparian sediments or increasing water withdrawals above previously evaluated levels. Ocean plants, such as Oyster Creek, should review their current National Marine Fisheries Service (NMFS) Endangered Species Act, Section 7, Consultation Biological Opinion.

5. Clean Water Act Certification – For activities involving Federal licenses or permits, including but not limited to construction or operations that may result in discharges to navigable waters, the State or interstate water pollution control agency having jurisdiction over the navigable waters in which the discharge originates or will originate, must certify to the Federal licensing or permitting agency that the discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended (33 U.S.C. ss/1251 et seq.). This may be done through the issuance or revision of an NPDES permit. In cases where NPDES permits or permit revisions are not needed, a Section 401 Certification may be needed. The State water pollution control agency should be consulted to determine if Clean Water Act certification is needed.
6. Clean Water Act Section 404 Evaluation – Under 33 U.S.C. 401, et seq., the ACOE issues permits to prevent unauthorized obstruction or alteration of navigable waters of the United States. The most frequently exercised authority is contained in Section 10 (33 U.S.C. 403), which covers construction, excavation, or deposition of materials in, over, or under such waters, or any work that would affect the course, location, condition, or capacity of those waters. The authority is granted to the Secretary of the Army. Other permit authorities in the Act are Section 9 for dams and dikes, Section 13 for refuse disposal, and Section 14 for temporary occupation of works built by the United States.

**ATTACHMENT 4**  
**Environmental Basis**  
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7. Erosion Control – Land disturbance activities shall be conducted to prevent accelerated erosion and the resulting sedimentation (40 CFR 122.26; NJAC 7:7A-2.2; or 25 PA Code 102).
  - 7.1. Erosion and Sedimentation Control (ESC) Plans and/or stormwater permits (Section 4.13) may be required prior to disturbing the following acreages:
    - 7.1.1. Illinois – 40 CFR 122.26 is incorporated by reference (35 IAC 301.442).
    - 7.1.2. New Jersey – ESC plan approval is required in New Jersey if an earthmoving activity disturbs more than 5,000 square feet of the surface area for the accommodation of construction for which the State Uniform Construction Code requires a construction permit. Proposed activities impacting waters of NJ (wetlands, rivers, streams, and lakes) or the shorelines must obtain water obstruction or encroachment permits (NJAC 7:7A-2.2).
    - 7.1.3. Pennsylvania – An ESC plan is required for any activity that results in a total earth disturbance of 5,000 square feet. A permit must be obtained prior to commencing earthmoving activities disturbing over 5 acres (25 PA Code 102). Proposed activities, which disturb five or more acres, must obtain an NPDES permit for storm water discharges associated with construction activities. Proposed activities that change, expand or diminish the course, current or cross section of a watercourse, floodway, or body of water must obtain water obstruction and encroachment permits (25 PA Code 105). The ESC Plan must be approved by the County Conservation District.
  - 7.2. A copy of the ESC Plan must be available for inspection at the site of the land disturbance. The primary objective of the plan is to have methods in place to control runoff and water discharges to prevent accelerated erosion and sedimentation in any nearby water body. A Professional Engineer must certify the ESC plan.
  - 7.3. Local construction permits may also be required for construction activities. ESC Plan approval from the local conservation district, county, township, or municipality may be a requirement to obtaining construction permits. Notification to local authorities may also be required prior to construction activities.
8. Flood Plain Determination – Areas that have been identified by the Federal Emergency Management Agency (FEMA) as being subject to inundation by a 100-year flood are flood hazard areas. Areas subject to inundation by a 100-year flood are identified in flood insurance studies and on maps provided by FEMA. **No** person may construct, modify, remove, destroy, or abandon a highway obstruction or an obstruction in a floodplain without first applying for and obtaining a written permit from the Department (25 PA Code 106.11).

**ATTACHMENT 4**  
**Environmental Basis**  
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9. Hazardous Material Handling and Storage – HazMat Pre-Incident Plans, Spill Prevention, Control and Countermeasure Plans, Risk Management Plans, and Stormwater Pollution Prevention Plans may specify hazardous material handling and storage areas. Proposed changes to hazardous material handling and storage should be evaluated against these plans to determine if plan revisions are necessary.
10. Impingement and Entrainment – The USEPA has finalized the rule implementing Section 316(b) of the Clean Water Act for existing cooling water intakes on lakes, rivers, estuaries, and oceans. The rule for existing cooling water intakes imposes performance standards requiring that plant operations reduce fish impingement mortality by 80 to 95 percent and entrainment of fish eggs and larvae in the cooling water system by 60 to 90 percent. Changes in the characteristics of water withdrawals from waters of the Nation (e.g. increasing the intake velocity, changing structural components of the intake, etc.) must be evaluated for potential permitting issues related to the 316(b) implementation rule and NRC notification per the Facility Operating License, Appendix B, Environmental Protection Plan / Environmental Technical Specifications (Except Dresden).
11. National Pollutant Discharge Elimination System (NPDES) Point Source Review – The NPDES program requires permits for the discharge of "pollutants" from any "point source" into "waters of the United States." The terms "pollutant", "point source" and "waters of the United States" are defined in 40 CFR 122.2 (35 IAC 309.102; NJAC 7:14A-2.4; 25 PA Code 92.2(b)). Activities which involve an increase of existing pollutants in process effluents or the introduction of new pollutants to process effluents must be evaluated for potential permitting and NRC notification per the Facility Operating License, Appendix B, Environmental Protection Plan / Environmental Technical Specifications (Except Dresden).
12. Polychlorinated Biphenyl (PCB) Management – The use, storage, marking, remediation, transportation and disposal of material or equipment containing PCB or contaminated with PCB is regulated by the Toxic Substances Control Act (15 USC 2601) and 40 CFR 761. An evaluation should be conducted to determine if the proposed activity will involve the relocation or removal of any material or equipment containing PCB or contaminated with PCB. Transformers, capacitors and other electrical equipment with dielectric fluid may contain PCB. Florescent light ballasts may contain PCB in the potting material. In the past, PCB were also used in ceiling tile coatings, and certain painted surfaces, hydraulic fluids, lubricants, heat transfer fluids, and insecticides. Material manufactured prior to July 2, 1979 may contain PCB. Material manufactured after July 2, 1979 may also contain PCB if it was exposed to PCB or retrofilled with a PCB-containing substance.

**ATTACHMENT 4**  
**Environmental Basis**  
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13. Resource Conservation Recovery Act (RCRA) Review – An evaluation should be conducted to determine if the proposed activity will result in the generation of regulated wastes not listed on the Form 8700-12 Notification of Regulated Waste Activity for the Facility, the notification for conditional exemption for the storage and treatment of mixed waste, and the notification for conditional exemption for the transportation and disposal of mixed waste. Additionally, the Part A Interim Status application, the Interim Status Waste Analysis Plan, the Hazardous Waste Contingency Plan, and the Part A Interim Status Closure Plan may need to be amended, as applicable (40 CFR 262 and 264). If the type of regulated waste activity changes at the facility, a revised Form 8700-12 shall be submitted to the USEPA and affected plans and applications shall be updated.
14. Safe Drinking Water Act Review – The Safe Drinking Water Act (42 USC s/s 300f et seq.) was established to protect the quality of drinking water. The Act focuses on all surface water or underground water sources, actually or potentially designed for drinking use. For Facilities that supply drinking water, compliance with the Act includes complying with well-head protection standards, monitoring drinking water purity and meeting primary (health-related) standards. States may also require attainment of nuisance-related secondary standards. Activities that require opening the drinking water system for connection, maintenance, or inspection are subject to disinfection to maintain drinking water purity.
15. Significant Environmental Aspects (SEA) – Proposed activities that affect processes contributing to or controlling SEA must be evaluated for potentially unacceptable impacts on the SEA. Unacceptable impacts may be in the form of missed objectives and targets, delays or disruptions in improvement plan implementation, reduced effectiveness of control or monitoring equipment, or elevated risk as scored using EN-AC-101-1, Exelon Environmental Aspects and Impacts Assessment.
16. Storage Tank Review – Registration, notification or permitting may be required to install, remove or change the contents of storage tanks. Underground storage tanks require special consideration because of cathodic protection and leak detection systems that are mandated by regulation. Storage tank review shall also include the piping systems associated with the tank(s).
17. Stormwater Drainage Review and Quality Assessment – General Storm Water permits are required for any construction activity including clearing, grading, and excavation operations that result in the disturbance of more than one acre of total land area. Construction activity also includes the disturbance of less than one acre of total land area that is a part of a larger common plan of development or sale if the larger common plan will ultimately disturb more than one but less than five acres or more (40 CFR 122.26(c)). Permits must be received before qualifying land disturbances can commence.

**ATTACHMENT 4**  
**Environmental Basis**  
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- 17.1. A stormwater assessment should be conducted if any activity involves modification or extension of stormwater drainage systems, including pipes, open channels, and storage basins. These changes, in addition to changes in chemical handling and storage, should be evaluated with respect to the Facility Stormwater Pollution Prevention Plan.
18. Stream Encroachment Determination – Proposed activities that place an encroachment or obstruction within a stream channel encroachment line shall have permits as required. Activities that require permits when conducted within encroachment lines include the removal or deposition of material, any alteration of the land or watercourse, construction of structures, filling, dredging, clearing, grubbing, grading, piping, culverting, channelizing, diverting, damming, dewatering, and any other activity that temporarily or permanently alters the character of the floodplain or watercourse. Additionally, major repair of structures that existed before the stream channel encroachment lines were established may also require a permit (17 IAC 3706.720; NJAC 7:13.4; 25 PA Code 105).
19. Superfund Amendments Reauthorization Act (SARA) Title III Evaluation – SARA Title III, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), creates a cooperative effort among government, business, and the public to disclose potential hazards and develop prevention and preparation plans to manage chemical emergencies. SARA Title III requires facilities that manufacture, process, or store certain hazardous or toxic chemicals above established thresholds to annually report the presence of these chemicals to state and local governments and to report any accidental releases on a timely basis (40 CFR 312).
  - 19.1. A SARA Title III evaluation shall determine if the proposed configuration change or construction activity will include the storage or use of hazardous chemicals at the Facility in amounts above the established reporting thresholds that apply to:
    - 19.1.1. Hazardous substances, or hazardous chemicals in quantities equal to or greater than 10,000 pounds, and/or
    - 19.1.2. Extremely hazardous substances in quantities equal to or greater than 500 pounds, or the threshold planning quantity, whichever is less.
  - 19.2. If hazardous chemicals will be stored in quantities equal to or above the threshold planning quantities, the facility should organize, analyze and disseminate the resulting information on hazardous chemicals to local governments and the public using the SARA Tier II forms.

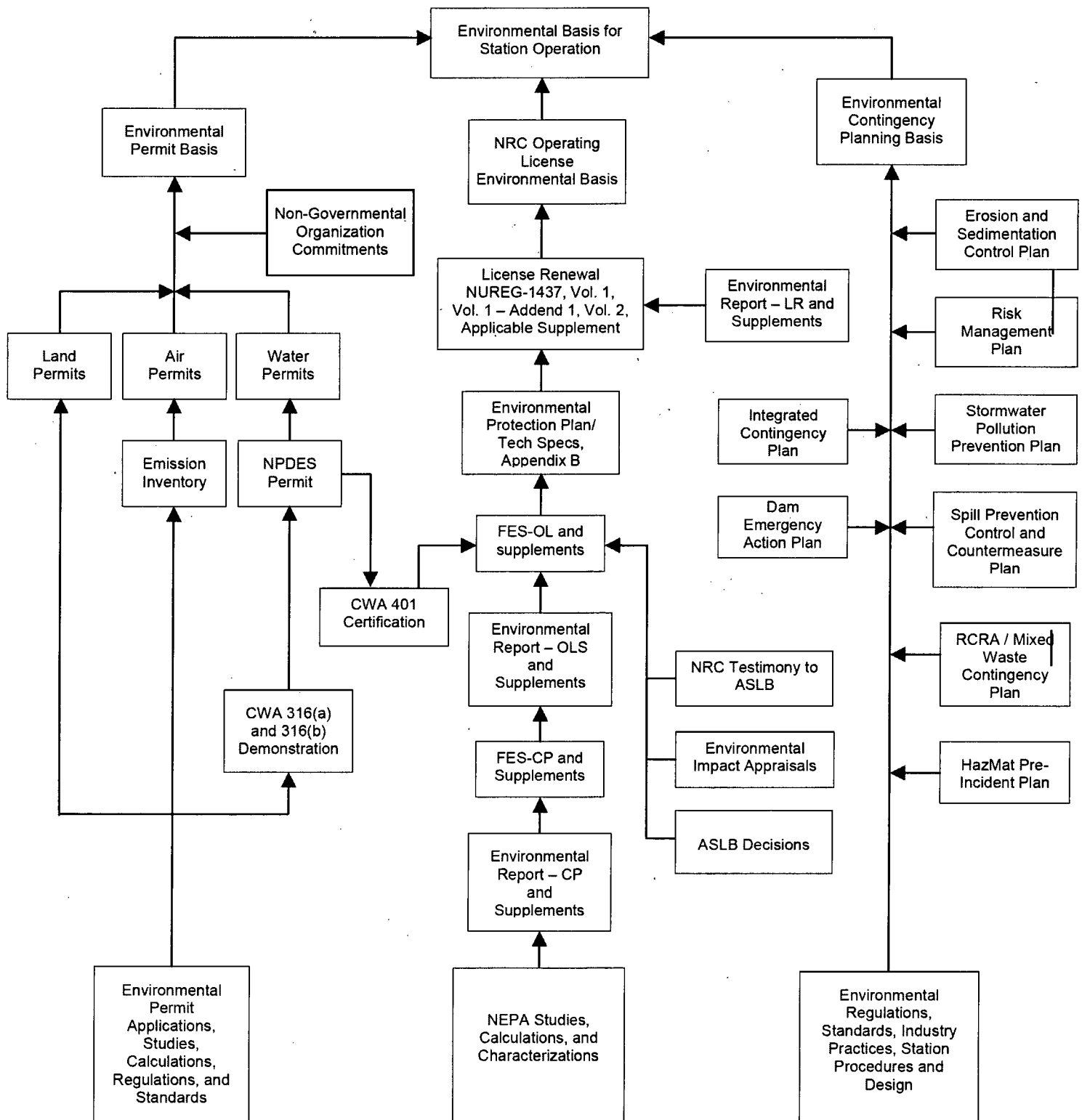
**ATTACHMENT 4**  
**Environmental Basis**  
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20. Unreviewed Environmental Conditions – Where applicable, Environmental Protection Plans / Environmental Technical Specifications (Except Dresden) (Operating License, Appendix B) establish the total environmental information collected and evaluated for the purpose of obtaining permits, obtaining a NRC operating license, and complying with environmental regulations as the Environmental Basis for the Station (Figures 2, 3, and 4). Changes in Station design or operation or the performance of tests or experiments **not** enveloped by the bounds of the Environmental Basis for the Station constitute Unreviewed Environmental Conditions that must be evaluated prior to the initiation of the change in Station design or operation or the performance of the test or experiment.
21. Waste Handling and Disposal Evaluation – If the proposed work package or configuration change will increase the short term or long term quantity of waste generated (other than normal refuse), or result in the generation of waste **not** previously stored or disposed, an evaluation of the waste shall be made for container compatibility and appropriate staging location. Approvals shall also be secured from acceptable disposal outlets prior to shipment off site.
22. Wetlands Delineation – A review of the area affected by the proposed activities is needed to determine if any streams, wetlands, or environmentally sensitive areas are located on or immediately adjacent to the affected area.



**Figure 1. Environmental Basis**

NOTE: Some environmental basis elements are not applicable to all Sites.



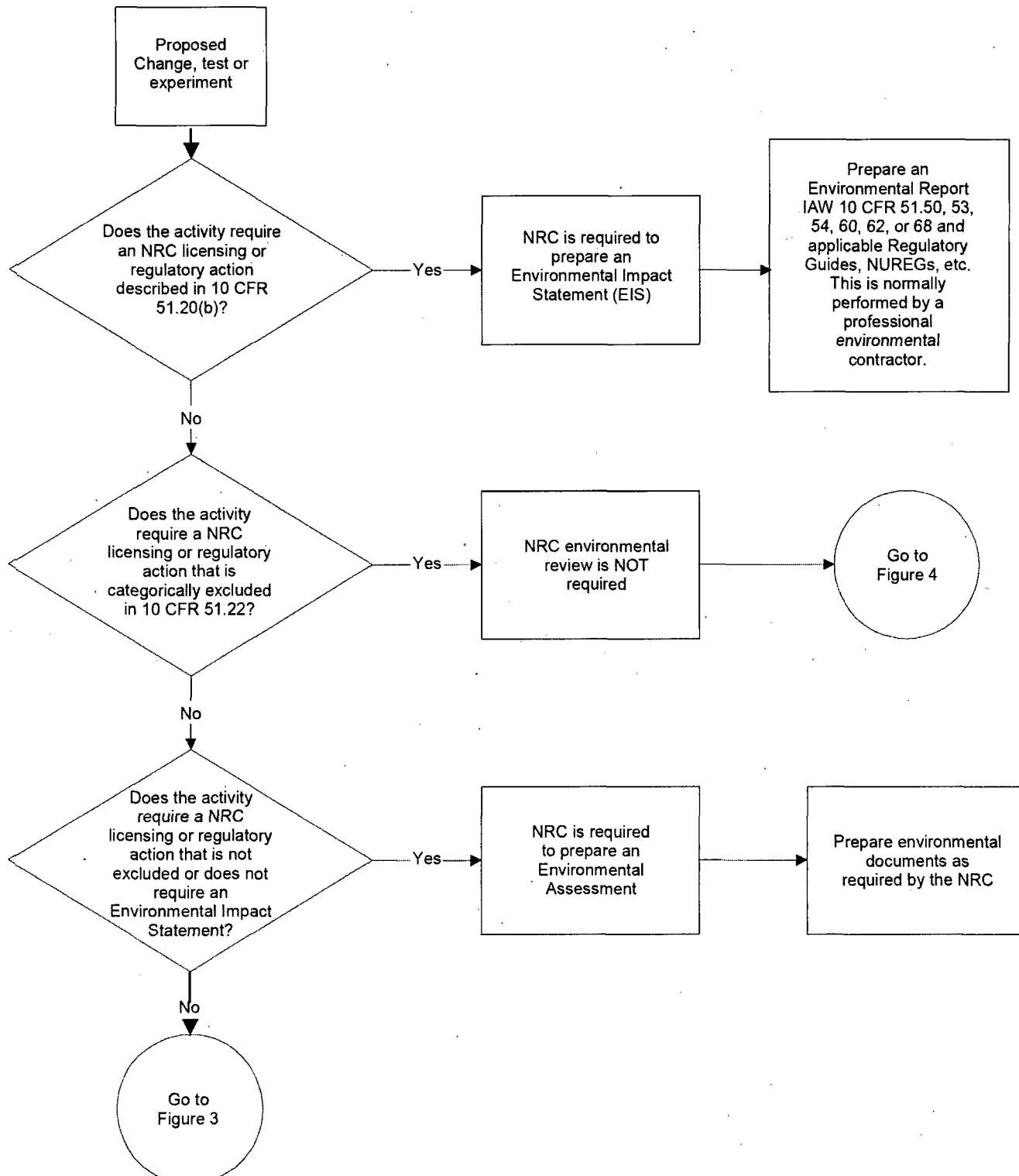
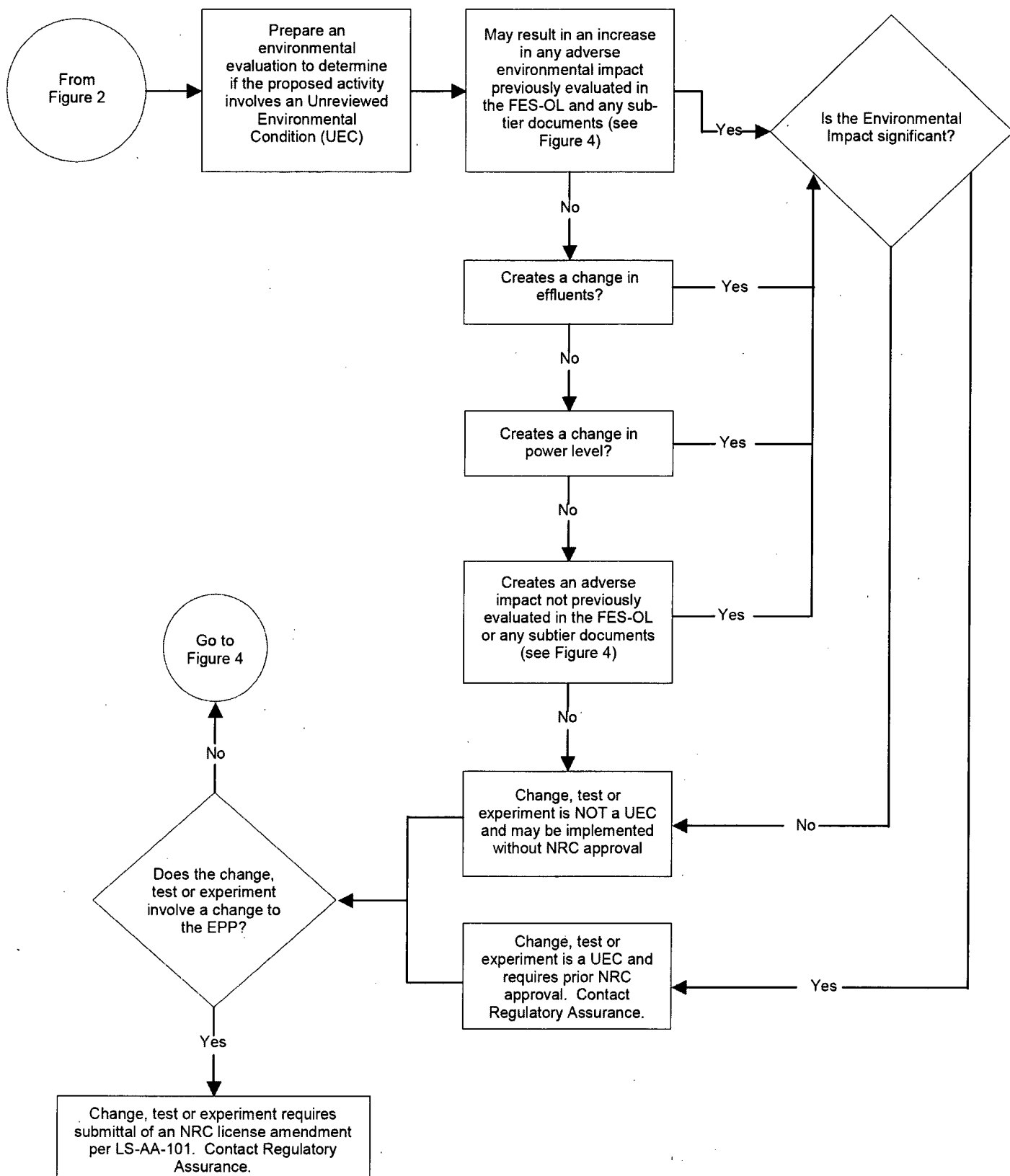
**Figure 2. Environmental Applicability of Proposed Change**

Figure 3. Preparation of Environmental Evaluation



**Figure 4. Screening Unreviewed Environmental Conditions**