

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**Bureau of Waterways Engineering and Wetlands**

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**TITLE:** Guidance for Developing Chapter 105 Alternatives Analysis for Proposed Impacts to Aquatic Resources

STAKEHOLDER DRAFT

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<b>Acronyms</b>	
AA	Alternatives Analysis
ABACT	Antidegradation Best Available Combination of Technologies
ACOE	Army Corp of Engineers
AMD	Acid Mine Drainage
ASTM	American Society for Testing and Materials
CEA	Comprehensive Environmental Assessment
CFR	Code of Federal Regulations
CSL	Clean Streams Law
DCNR	Department of Conservation and Natural Resources
DSEA	Dam Safety and Encroachments Act
EA	Environmental Assessment
eMap	Electronic Mapping using GIS
EQB	Environmental Quality Board
EU	Existing Use
EV	Exceptional Value
FERC	Federal Energy Regulatory Commission
GIS	Geographic Information System
GPS	Global Positioning System
HDD	Horizontal Directional Drilling
HQ	High Quality
kmz	Keyhole Markup language Zipped
NEPA	National Environmental Policy Act
NWI	National Wetlands Institute
O&G	Oil and Gas
PA	Pennsylvania
PADEP (or DEP)	Pennsylvania Department of Environmental Protection
PAFBC	Pennsylvania Fish and Boat Commission
PASDA	Pennsylvania Spatial Data Access
PHMC	Pennsylvania Historical and Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory
ROW	Right-of-Way
T&E	Threatened and Endangered
TGD	Technical Guidance Document
WSS	Web Soil Survey

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60 **PREAMBLE**

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**Disclaimer:**

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The guidance outlined in this document is intended to supplement existing requirements. Nothing in the guidance shall affect regulatory requirements.

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The guidance presented herein is not an adjudication or a regulation. There is no intent on the part of the DEP to give this guidance that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this guidance if circumstances warrant.

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**Authority:**

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This document is established in accordance with Section 1917-A of The Administrative Code of 1929, Act of April 9, 1929, P.L. 177, as amended, 71 P.S. § 510-17; The Clean Streams Law, Act of June 22, 1937, P.L. 1987, as amended, 35 P.S. §§ 691.1- 691.1001; Dam Safety and Encroachments Act, Act of November 26, 1978, P.L. 1375, as amended, 32 P.S. §§ 693.1- 693.27; Flood Plain Management Act, Act of October 4, 1978, P.L. 851, No. 166, as amended, 32 P.S. §§ 679.101- 679.604 .; Oil and Gas Act of 2012, Act of February 14, 2012, P.L.87, No.13, 58 Pa. C.S. §§ 3201-3274; the Pennsylvania Safe Drinking Water Act, Act of May 1, 1984, P.L. 206, as amended, 35 P.S. §§ 721.1- 721.17; the Solid Waste Management Act, Act of July 7, 1980, P.L. 380, as amended, 35 P.S. §§ 6018.101- 6018.1003; and the regulations promulgated under these statutes, including 25 Pa. Code Chapters 78, 78a, 91, 92a, 93, 95, 96, 102, 105, 106, 109, 287, 288, 289, 293 295, 297 and 299.

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**Policy:**

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Aquatic resources, including watercourses, wetlands and other bodies of water, are valuable public natural resources. It is the policy of the Department to protect the natural condition of watercourses and other bodies of water §105.16(d), as well as wetlands and their functions and values §96.3(g) to fullest extent of the law by enforcing existing regulations. Regulations require applicants proposing impacts to aquatic resources to conduct an Alternatives Analysis that demonstrates that there is no alternative to the proposed activity that will not involve an aquatic resource or have less adverse impacts on the environment.

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**Purpose:**

To consolidate existing guidance and to expand upon that guidance as follows:

- To clarify the appropriate level of analysis required for evaluating alternatives for projects requiring an Individual Water Obstruction and Encroachment Permit;
- To provide guidelines for determining whether or not an alternative should be considered practicable;
- To establish a common, complete, and consistent level of understanding of the information needed by the Department to adequately review alternative analyses for water obstruction and encroachment permit applications with proposed impacts to aquatic resources.

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## Applicability:

This guidance applies to all proposed projects involving a water obstruction or encroachment located in, along, across or projecting into an aquatic resource that are not eligible for a general permit or do not qualify for a waiver of permit requirements.

This guidance should be applied when projects are water dependent, meaning that the project requires access or proximity to or siting within water to fulfill the basic purposes of the project (25 PA Code § 105.13)

## I. SCOPE

This technical guidance document is intended to provide guidance for evaluating alternatives pursuant to the Applicability Section **LEGAL INPUT** as they relate to 25 Pa. Code §105.13(e)(1)(viii), 105.14(b)(4), 105.14(b)(7), 105.16(d), 105.18a(a)(3), 105.18a(b)(2), and 105.18a(b)(3).

The burden of proof for demonstrating that a practicable alternative does not exist is the responsibility of the applicant, not the Department. The Department, however, must taking into account the objectives of the applicant's proposal and not change a legitimately stated basic purpose of the proposed project.

## II. DEFINITIONS:

1. **Antidegradation Best Available Combination of Technologies (ABACT)** - Environmentally sound and cost effective treatment, land disposal, pollution prevention and stormwater reuse BMPs that individually or collectively manage the difference in the net change in stormwater volume, rate, and quality for storm events up to and including the 2-year/24-hour storm when compared to the stormwater rate, volume and quality prior to the earth disturbance activities to maintain and protect the existing quality of the receiving surface waters of this Commonwealth. [25 Pa. Code §102.1]
2. **Alternatives Analysis** - A detailed analysis of alternatives to the proposed action, including alternative locations, routings or designs to avoid or minimize adverse environmental impacts. [25 Pa. Code §105.13(e)(1)(viii)]
3. **Aquatic Resources** - For the purposes of this document, the term aquatic resource refers to Regulated waters of this Commonwealth, as defined in 25 Pa. Code §105.1, which includes watercourses, streams or bodies of water (e.g. all wetlands) and their floodways wholly or partly within or forming part of the boundary of this Commonwealth. [25 Pa. Code §105.1]
4. **Body of Water** - A natural or artificial lake, pond, reservoir, swamp, marsh or wetland. [25 Pa. Code §105.1]
5. **Environmental Assessment** – For the purposes of this document, the term Environmental Assessment refers to the assessment as defined by the State of Pennsylvania under the Dam Safety and Encroachments Act and the 25 Pa. Code §105 regulations. [25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form]

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## 6. **Impacts:**

- a. **Cumulative Impact** – The summation of temporary, permanent, direct, and indirect impacts.
  - b. **Direct Impact** - consist of filling, draining or conversion of a resource to another type such as a wetland to an open body of water. Examples include placement of fill in a wetland, placement of a box culvert in a stream, placement of fill in the floodplain and/or building a dam where the impoundment area will flood resources (stream, floodplain or wetlands) with a sufficient depth as to change the existing aquatic resource to another aquatic resource type. This would include changes such as converting a riverine system to a lacustrine system, changing a palustrine wetland to a lacustrine system, etc. [25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form]
  - c. **Indirect Impact** - consist of altering the chemical, physical or biological components of an aquatic resource to the extent that changes to the functions of the resource results. However, indirect impacts do not result in a loss of resource acreage. Changes include such things as conversion of a forested wetland system to a non-forested state through chemical, mechanical or hydrologic manipulation that results in a maintained state of vegetation; altered hydrologic conditions (increases or decreases) such as stormwater discharges or water withdrawals that alter the chemical, physical or biological functions of the resource, areas upstream and downstream of a culvert or bridge that require periodic excavation to ensure waterway openings (e.g. bedload deposition removal), etc. [25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form].
  - d. **Permanent Impacts** - are those areas affected by a water obstruction or encroachment that consist of both direct and indirect impacts that result from the placement or construction of a water obstruction or encroachment and include areas necessary for the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water [25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form].
  - e. **Temporary Impact** – are those areas affected during the construction of a water obstruction or encroachment that consists of both direct and indirect impacts located in, along or across, or projecting into a watercourse, floodway or body of water that are restored upon completion of construction. This does not include areas that will be maintained as a result of the operation and maintenance of the water obstruction or encroachment located in, along or across, or projecting into a watercourse, floodway or body of water (these are considered permanent impacts) [25 Pa. Code §105.15 and Document No: 3150-PM-BWEW0017 Environmental Assessment Form].
7. **Mitigation** - An action undertaken to accomplish one or more of the following: (A) Avoid and minimize impacts by limiting the degree or magnitude of the action and its implementation. (B) Rectify the impact by repairing, rehabilitating or restoring the impacted environment. (C) Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action. If the impact cannot be

203 eliminated by following clauses (A) - (C), compensate for the impact by replacing the  
204 environment impacted by the project or by providing substitute resources or  
205 environments. [25 Pa. Code §105.1]  
206

- 207 8. **Non-Water Dependent Activity** - An activity that does not require access or proximity to  
208 or siting within a wetland or other regulated water of the Commonwealth to fulfill the basic  
209 purpose of the project being proposed. [25 Pa. Code §105.13(e)(1)(iii)(D);  
210 10513(e)(1)(x)(C); 105.14(b)(7)]  
211
- 212 9. **Practicable Alternative** - An alternative that is available and capable of being carried out  
213 after taking into consideration construction cost, existing technology, and logistics. An area  
214 not presently owned by the applicant which could reasonably be obtained, utilized, expanded  
215 or managed to fulfill the basic purpose of the project shall be considered as a practicable  
216 alternative [§105.18a(3), §105.18b(3)].  
217
- 218 10. **Project Purpose** – The reason a project is being proposed.  
219
- 220 11. **Restoration** – the manipulation of the physical, chemical, or biological characteristics of a  
221 site with the goal of returning natural/historic functions to a former or degraded aquatic  
222 resource.  
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- 224 12. **Regulated Waters of this Commonwealth** - Watercourses, streams or bodies of water and  
225 their floodways wholly or partly within or forming part of the boundary of this  
226 Commonwealth. [25 Pa. Code §105.1]  
227
- 228 13. **Right-of-Way (ROW)** - For highways, pipelines, and utility lines, it is the boundary line  
229 within which the applicant/operator has a legal right to do earthwork, and following  
230 construction, maintain and operate [adapted from 2012 E&S Manual].  
231
- 232 a. **Permanent ROW** - is a permanent corridor that is maintained by the utility operator  
233 for the life of the utility.  
234
- 235 b. **Temporary ROW** - is a corridor used during construction for the installation of the  
236 utility. Temporary ROW is often wider than the Permanent ROW to allow for access  
237 and staging of construction equipment, supplies, and soil. The temporary ROW is no  
238 longer maintained by the utility operator following site restoration.  
239
- 240 14. **Secondary Impacts** – Environmental impacts on adjacent land and water resources  
241 associated with but are not a direct result of the project. [adapted from Document No: 3150-  
242 PM-BWEW0017 Environmental Assessment Form]  
243
- 244 15. **Sensitive Resource** - Areas that will be affected by a project, crossing, or activity, such as  
245 floodplains, wetlands, streams, water bodies, springs, wells, riparian buffers, mature forests,  
246 rare, threatened and endangered species habitat.  
247
- 248 16. **Special Concern Species** - Plant and animal species that are not listed as threatened or  
249 endangered by a jurisdictional agency but are identified on a PNDI Receipt as an at risk  
250 species. These include: (1) plant and animal species that are classified as rare, vulnerable,  
251 tentatively undetermined or candidate, (2) taxa of conservation concern and (3) special

- 252 concern plant populations. [Document No. 021-0200-001 Policy for Pennsylvania Natural  
253 Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation]  
254
- 255 17. **Threatened and Endangered Species** – Those animal and plant species identified as a  
256 threatened or endangered species, as determined under: Endangered Species Act of 1973, 16  
257 U.S.C.A. § 1531 et seq.; Wild Resources Conservation Act, 32 P.S. § 5301; Fish and Boat  
258 Code, 30 Pa. C.S.A. § 101 et seq.; and Game and Wildlife Code, 34 Pa. C.S.A. § 101 et seq.  
259 This also includes animal and plant species proposed for listing as endangered and  
260 threatened, pursuant to the Endangered Species Act of 1973, 16 U.S.C.A. § 1531 et seq.  
261
- 262 18. **Water Dependency** - A project is water dependent when the project requires access or  
263 proximity to or siting within water to fulfill the basic purposes of the project [25 Pa. Code  
264 §105.13(e)(1)(iii)(D); 10513(e)(1)(x)(C); 105.14(b)(7)]  
265
- 266 19. **Watercourse** - A channel or conveyance of surface water having defined bed and banks,  
267 whether natural or artificial, with perennial or intermittent flow [25 Pa. Code §105.1].  
268
- 269 20. **Wetlands** - Those areas that are inundated or saturated by surface or ground water at a  
270 frequency and duration sufficient to support, and that under normal circumstances do  
271 support, a prevalence of vegetation typically adapted for life in saturated soil conditions.  
272 Wetlands generally include swamps, marshes, bogs and similar areas. [25 Pa. Code §105.1].  
273 Wetlands are categorized as either Exceptional Value (EV) or Other [25 Pa. Code §105.17].  
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### III. FOREWORD/EXECUTIVE SUMMARY

The Clean Streams Law (CSL) and Dam Safety and Encroachments Act (DSEA) are legislation that grants the Environmental Quality Board (EQB) the power and duty to adopt regulations and standards that are necessary and proper to carry out their purposes. The CSL, enacted in 1937, is broad reaching legislation which was designed to “preserve and improve the purity of the waters of the Commonwealth”, and provide for “the protection of water supply and water quality” through regulating various discharges and related activities. The DSEA, enacted in 1979, applies to certain types of dams and all water obstructions and encroachments (i.e. structures and activities) that affect watercourses, floodways and bodies of water, including wetlands (i.e. aquatic resources). The rules and regulations that are adopted by the EQB are contained in PA Code, Title 25. Environmental Protection, Department of Environmental Protection (DEP), Chapter 105, *Dam Safety and Waterway Management* (Chapter 105), which defines how DEP is to regulate water obstructions and encroachments. One of the purposes of the DSEA, CSL and the Chapter 105 rules and regulations is to protect the natural resources, environmental rights and values, and protect the water quality, natural regime, and carrying capacity of watercourses. A person may not construct, operate, maintain, modify, enlarge or abandon a dam, water obstruction or encroachment without first obtaining a written authorization from DEP which can be in the form of either a General Permit, Individual Permit, Small Projects Permit, Environmental Assessment (EA) Approval or waiver of permit requirements (25 Pa. Code 105.12).

Regulations, by nature, contain general language because they are intended to apply to a variety of circumstances and situations. Similarly, the language in Chapter 105 relating to alternatives analysis is intentionally general because the analysis is very often project specific. This guidance document is intended to provide further explanation of the requirements for an alternatives analysis as it relates to Chapter 105. This document is not intended to be an exhaustive discussion of the alternatives analysis process, but rather to provide a broad overview.

An Alternatives Analysis is a component of DEP’s Individual Water Obstruction and Encroachment Permit Application. Per §105.13(e)(1)(viii), an alternatives analysis is “A detailed analysis of alternatives to the proposed action, including alternative locations, routings or designs to avoid or minimize adverse environmental impacts”. The intent of the analysis is aimed at protecting aquatic resources and requires that an applicant thoroughly identify all aquatic resources at risk and evaluate whether the location, route and/or design of a proposed project can be altered or changed to avoid and minimize impacts. For instance, a consideration of alternative locations might include looking at whether another property is available or is more suitable for a proposed project. It might also consider whether a proposed structure, such as an access road, or a proposed activity, such as an excavation, could be located elsewhere to avoid or minimize impacts to existing aquatic resources. For complex projects, a project applicant might evaluate whether alternate locations for the project could allow for avoidance or minimization of environmental impacts.

An alternatives analysis should also include an evaluation of whether the design or footprint of a structure or activity can be changed to avoid or minimize impacts to aquatic resources. An alternative design may include a reduction in the size, scope, configuration or density of the project.

In many cases, a combination of alternatives may be appropriate. As an example, perhaps the design of a building can be altered, so that the building can be constructed at a different location on a property or with a different configuration to avoid or minimize an environmental impact.

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To authorize structures and activities in wetlands, the Chapter 105 Regulations state that the applicant must demonstrate that there is “no practicable alternative to a proposed project that would not involve a wetland or that would have less effect on the wetland...”[(105.18a(a)(3), 105.18a(b)(3)]. The same approach should be followed when looking at the broader context of aquatic resources. The alternatives analysis should begin in the early stages of project development and should continue throughout all phases of project design. All aquatic resources should be identified within a project area, and shown on project drawings, so that a project can be designed to avoid or minimize impacts on these resources from the start. In other words, a project should be designed to complement the natural conditions of the site. If a legitimate effort is made to avoid and minimize environmental impacts to the aquatic resources within a project area, then the alternatives analysis becomes written documentation of these efforts.

While some projects inherently require access or proximity to an aquatic resource (e.g. docks), in general it shall be presumed that an alternative not involving an aquatic resource exists and that the alternative would have less environmental impacts. In those situations, an applicant shall be required to evaluate opportunities to, first, avoid the resource impact altogether and, second, to minimize impacts to the resource when total avoidance is not feasible. Losses to the resource shall be permitted only when impacts to aquatic resources are deemed to be both necessary and unavoidable. Chapter 105.18a(a)(7) and Chapter 105.18a(b)(7) both reference that the applicant shall replace affected wetlands to compensate for unavoidable impacts and that to rebut the presumption that a practicable alternative does exist, the applicant shall demonstrate with evidence and documentation that (25 Pa. Code §105.14(b)(7), 105.18(a)(2), 105.18(b)(3)(i)):

1. The basic project purpose cannot be accomplished utilizing one or more other sites that would avoid or result in less environmental impacts (i.e. an off-site or location alternatives analysis).
2. A reduction in the proposed project’s size, scope, or density or an alternative project design or configuration that would avoid, or result in fewer or less severe, adverse impacts on an aquatic resource will not accomplish the basic purpose of the project (i.e. an onsite or design alternatives analysis).

It is recommended that the same approach be followed when looking at the broader context of all aquatic resources.

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## IV. ALTERNATIVES ANALYSIS

### A. Background

The alternatives analysis is the project applicant's written documentation of efforts to avoid or minimize environmental impacts and to demonstrate to the Department that impacts from the proposed water obstruction(s) and encroachment(s) have been avoided and minimized. The alternatives analysis should be a thorough process that evaluates the practicability of the alternatives independently. The analysis should be prepared by individuals with appropriate experience, education, training, local knowledge and familiarity with both state and federal regulations.

An alternatives analysis should be reflective of project type, scope, and proposed impacts. In addition, an alternatives analysis should be consistent with existing policy and guidance including both the Environmental Assessment (EA) (Document No. 3150-PM-BWEW0017) and the Comprehensive Environmental Assessment (CEA) Policy (Document No. 310-2137-006). Please refer to Appendix E. for flowcharts demonstrating alternatives analysis expectations as they relate to both the EA and the CEA. Additional information regarding policies and guidance is found within section (V; C – Components of an Alternatives Analysis) of this document.

It is important to note that the DSEA and its companion 25 Pa. Code Chapter 105 regulations are narrower in scope than the Federal National Environmental Policy Act (NEPA) process. The Chapter 105 process applies almost exclusively<sup>1</sup> to water obstructions and encroachments focusing on impacts to aquatic resources. Therefore, the Chapter 105 alternative analysis is separate from the alternative analysis conducted under the Federal NEPA process (40 CFR 1508.18). As such, a NEPA alternative analysis does not satisfy the Chapter 105 alternative analysis.

In general, most alternative analyses consist of an offsite or location alternative analysis and an onsite or design alternative analysis.

### B. Off-Site or Location Alternatives

When alternatives are evaluated, areas including those not presently owned by the applicant, which could reasonably be obtained, utilized, expanded, or managed to fulfill the basic purpose of the proposed project, should be considered as a practicable alternative. The context for this consideration is specific to wetlands per §105.18a(a)(3) and §105.18a(b)(3) but it is recommended that the same approach be followed when looking at the broader context of all aquatic resources. Additional factors that influence the feasibility of a location alternative are project specific. It is the responsibility of the applicant to identify additional factors these factors. Examples of influencing factors may include, but are not limited to:

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<sup>1</sup> Ch. 105 also applies to dams which are specialized in nature and are not subject to this guidance document.

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Table 1. Examples of additional factors to consider when evaluating the feasibility of an offsite or location alternative

<b>Additional Factors</b>
1. Utility Issues
a. Utility or infrastructure availability (e.g. public water, sewer)
b. Location of existing utilities
c. Joint utility easements
d. Lack of ROW for collocation of utility lines
2. Rerouting, re-siting or relocating the project
a. Availability of other sites
b. Willingness of current owners to sell or lease
c. Property rights/eminent domain
3. Site size (to meet project purpose)
4. Site constraints (e.g. roads, buildings, railways, fences, property boundaries, size, slope, floodplains, riparian buffers, highly erodible soils, geologic/geotechnical concerns)
5. Constructability of project (as designed)
6. Operation and maintenance concerns
7. Demographics
8. Presence of wetland and stream resources (See Section D.1)
a. Resource size
b. Resource value
i. Special Protection Waters
ii. Stream impairment
iii. T&E species
9. Public health and safety
10. Other environmental concerns (e.g. riparian forest, interior forest, prime agricultural lands, upland T/E species/habitat)
11. Local land use regulations (e.g. zoning, subdivision land development ordinances)
12. Historic resources
13. Parks and recreation
14. Cost concerns
15. Conformance with local watershed plans
16. Private Water Supplies and protected groundwater areas
17. Brownfields, superfund sites, contaminated soils

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Per §105.13(k), the Department has the authority to waive specific information regarding regulated activities in the record of decision if upon review of the permit application, the Department finds that specific information is not necessary to review the application. This information waiver could include off-site alternatives analyses. The following listing includes situations wherein it may make sense to waive the information requirements for off-site alternatives pending Department approval. However, applicants must realize that every situation is unique and should not presume that information waivers are automatic. It is strongly encouraged that applicants reach out to the Department during the preapplication process regarding the potential information waiver of an alternatives analysis component. In addition, although the off-site component of the alternatives analysis may be waived in the below instances, a thorough evaluation of onsite alternatives to avoid or minimize the aquatic resource impact to the maximum extent possible is still required.

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1. Temporary impacts associated with ancillary features of a project that are directly related to the overall project being proposed (e.g. timber mat bridge next to a pipeline).
2. Structures or activities that are a component of a larger project where impacts to aquatic resources are expected to recover either within 1 year of completion of the activity or within the following growing season (e.g. cutting of regenerative emergent vegetation, matting or geotextile on emergent wetlands, temporary above-ground water pipelines with no earth disturbance, coffer dams, pipe flumes, dam and pump around, causeways).
3. Projects that include cumulative wetland impacts less than 0.05 acres.
4. Projects that are replacement of or maintenance to existing structures.
5. Projects that include the installation, enlargement, or expansion of a structure entirely within the footprint of an area previously-disturbed and presently-disturbed via a permitted activity.
6. Projects that have cumulative impacts of 0.5 acre or less to wetlands which are not Exceptional Value Wetlands as defined at 25 Pa. Code §105.17(1), AND that meet one or more of the following qualifications:
  - a. An expansion of an existing facility where the expansion is directly related to existing operations of that facility.
  - b. The construction or expansion of a barn or other agricultural building located on an existing farm.
  - c. The construction of single-family home where some upland exists, or expansion of a single-family home and its attendant features such as a driveway, garage or storage shed.
  - d. Construction activities that will provide significant economic, social or environmental benefits in the area where the wetlands are located such, brownfield/grayfield sites and environmental restoration projects (i.e., Acid Mine Drainage (AMD) abatement)

As mentioned above, applicants should not presume that a component of information, including an off-site alternatives analysis, may be waived. Accordingly, there are some circumstances whereupon off-site alternatives analyses are typically warranted regardless of project type. Examples of these circumstances include but are not limited to:

1. Projects that include adverse impacts to aquatic resources per §105.14(b) and §105.15.
2. Projects that propose the conversion of a resource type.
3. Projects that include new structures or activities in special protection aquatic resources, including EV wetlands, that cannot be authorized via a general permit or cannot be waived per §105.12.

### 479 **C. Onsite or Design Avoidance and Minimization**

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481 The purpose of the onsite or design alternatives analysis is to identify opportunities to first avoid and  
482 then minimize any impacts to aquatic resources after a project location has been selected. An applicant  
483 should demonstrate that all necessary steps have been taken to avoid and minimize resource impacts by  
484 considering alternate onsite designs, routings, layouts and engineering and construction techniques. In  
485 general, the factors listed in Table 1. of the off-site or location section of this document are also  
486 applicable to this onsite or design alternatives section. In addition to those factors, the applicant should  
487 take into consideration the following information in the evaluation of onsite avoidance and  
488 minimization:

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490 1. The spatial requirements of the proposed project;

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492 2. The project's purpose, and how the purpose relates to placement or configuration;

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494 3. Efforts to reduce the scope of the proposed project;

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496 4. The location and designation (e.g. EV, HQ) of any natural feature;

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498 5. The location of existing infrastructure that may dictate the placement or configuration of the  
499 proposed project;

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501 6. Site constraints including local zoning requirements and site access;

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503 7. Engineering and safety practices;

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505 8. Landowner concerns or limitations

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### 507 **D. Components of All Alternatives Analyses**

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509 In most circumstances, an alternatives analysis will be expected to include an off-site or location  
510 component, an onsite or design component, be project-specific, and be commensurate to project scope.  
511 As such, variations are expected. However, the following components are central to all water  
512 obstructions and encroachments and should be considered regardless of project scope.

513

514 1. Aquatic Resource Impact – An alternatives analysis must demonstrate that there is no practicable  
515 alternative to the proposed activity that would have less environmental impacts. In order to  
516 achieve this demonstration, each alternative should be evaluated in terms of impacts.  
517 Fundamental to a proper evaluation of impacts is an accurate identification/delineation of the  
518 aquatic resources at risk. Field delineations of these resources may not be practicable for off-  
519 site or location alternatives analyses, especially if access cannot be obtained. Available digital  
520 resources can be used in conducting an analysis of off-site alternatives. The approximate  
521 locations of many watercourses, their PA-designated and existing uses, and their attainment  
522 status can be identified from data available at PASDA (approximate stream locations also can  
523 be obtained from the USGS National Hydrography Dataset).

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527 For some wetlands, the National Wetlands Inventory (NWI) mapping by USFWS can be used,  
528 but only as a partial resource because it is based on high-altitude aerial photography and omits  
529 many actual, regulated wetlands. NWI mapping should not be relied upon as the only source in  
530 identifying possible wetlands. Rather, it is recommended that other data such as the wetland  
531 probability data **INSERT SYNOPSIS FROM BWEW** as well as information derived from the  
532 Web Soil Survey (WSS) should be used to supplement NWI wetland mapping. For example,  
533 the WSS identifies soil drainage classes - those soils that are classified as "poorly drained" or  
534 "very poorly drained" generally are hydric and should be identified as wetlands in any desktop  
535 analysis. Those WSS soil-derived "wetlands" should then be combined with any additional  
536 wetlands identified in NWI mapping and together be used as a proxy/screening for likely  
537 wetlands on an alternative location site. Aerial photography can be used to help determine the  
538 type of wetlands (PFO, PEM, etc.) Please refer to the references in Section VI for links to the  
539 NWI, WSS, PASDA, etc. For onsite alternatives analyses, project proponents should not rely  
540 upon desktop resources for identifying wetlands, streams, and other aquatic resources. Rather,  
541 a field delineation of all Waters of the Commonwealth, including wetlands, must be conducted  
542 as the basis for the onsite analysis. A Preliminary Jurisdictional Determination (PJD) from the  
543 Army Corps of Engineers is recommended.

544  
545 Finally, native and indigenous vegetation are fundamental to the natural function and biology of  
546 aquatic resources. Therefore, DEP expects that aquatic resource vegetation, including riparian  
547 vegetation, will be restored to natural conditions using native vegetation which is indigenous to  
548 the appropriate landscape of Pennsylvania. A detailed explanation should be included as a  
549 component of the alternatives analysis if this cannot be accomplished.

- 550
- 551 2. Construction Cost - If cost is a delimiting factor for an alternative, the applicant should provide  
552 a discussion on how the cost in USD and other financial information for impacted the decision.  
553 The analysis for cost for specific techniques should be compared with evaluation of the aquatic  
554 resource impacts. The evaluation of cost should be based on whether the costs associated with  
555 an alternative will be substantially greater than the costs associated with other identified  
556 alternatives in the application. The financial standing of the applicant cannot be considered.  
557
  - 558 3. Existing Technology- An alternatives analysis should consider all practicable environmental  
559 engineering and construction techniques recognized by the scientific community. The analysis  
560 should include discussion and support, through documentation and scientific reasoning, why a  
561 technology was chosen and why it was considered the most practicable alternative.  
562
  - 563 4. Environmental Policy Consistency - An alternative should be considered not practicable if it  
564 will have more effect or adverse impact on resources or environmental values. In addition, per  
565 §105.14(b)(5), impact on nearby natural areas, wildlife sanctuaries, public water supplies, other  
566 geographical or physical features including cultural, archaeological and historical landmarks,  
567 national wildlife refuges, national natural landmarks, national and state local parks and  
568 recreation areas, and national, state, and local historical sites must also be considered. In  
569 addition, the Department maintains policies on how it should conduct business to avoid conflicts  
570 with the following Socio-Cultural/Environmental Concerns. The following sections discuss  
571 how an evaluation of alternatives relate to these policies and best management practices:  
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- 575 a) *Special Concern Species and Resources* - It is the policy of the Department to fully  
576 support and embrace the protection of special concern species and resources during the  
577 implementation of its functions. This policy should be extended to the evaluation of  
578 practicable alternatives as well. If an alternative to avoid or minimize an impact on a  
579 wetland is identified that will have a negative effect on special concern species or  
580 resources as defined in the Department's document entitled "Policy for Pennsylvania  
581 Natural Diversity Inventory (PNDI) Coordination During Permit Review and  
582 Evaluation" (Document No: 021-0200-011), that alternative may be considered not  
583 practicable. The comments received from the resource agency responsible for the special  
584 concern species shall be used to assist in the determination of whether the alternative  
585 will have a negative effect. It shall be the responsibility of the applicant to contact and  
586 solicit comments from the appropriate resource agencies.  
587
- 588 b) *Local Comprehensive Plans and Zoning Ordinances* - Acts 67, 68 and 127 of 2000 (Acts  
589 67, 68 and 127) amended the Municipalities Planning Code to provide new tools for local  
590 governments to plan for and manage growth. Section 1105 of Act 67 and Section 619.2  
591 of Act 68 directs that state agencies "shall consider and may rely upon comprehensive  
592 plans and zoning ordinances when reviewing applications for the funding or permitting  
593 of infrastructure or facilities." In accordance with the Department's guidance document  
594 entitled "Final Revision of Policy for Consideration of Local Comprehensive Plans and  
595 Zoning Ordinances in DEP Review of Permits for Facilities and Infrastructure"  
596 (Document No: 012-0200-001), comprehensive planning and zoning ordinances must be  
597 considered when evaluating practicable alternatives. It shall be the responsibility of the  
598 applicant to document consistency with any local land use laws and regulations relative  
599 to a potential alternative. If the selection of an alternative will result in a land use conflict,  
600 the alternative may not be considered practicable.  
601
- 602 c) *Prime Agricultural Lands* - In accordance with the Department's guidance document  
603 entitled "Guidance for Implementation of the Agricultural Land Preservation Policy  
604 "(Document No. 012-0700-002), it is the policy of the Department to protect the  
605 Commonwealth's primary agricultural land from irreversible conversion to uses that  
606 result in its loss as an environmental and essential food production resource. When  
607 evaluating an alternative, the alternative being considered should not promote adverse  
608 condemnation of agricultural lands. It shall be the responsibility of the applicant to  
609 document that prime agricultural lands will not be affected. If an alternative under  
610 consideration will adversely affect prime agricultural lands, that alternative may not be  
611 considered practicable.  
612
- 613 d) *Archeological Resources and Historic Structures* - In accordance with the Department's  
614 policy entitled "Implementation of the Pennsylvania State History Code: Policy and  
615 Procedures for Applicants for DEP Permits and Plan Approvals" (Document No. 012-  
616 0700-001), it is the policy of the Department cooperate with the Pennsylvania Historical  
617 and Museum Commission (PHMC) in the protection of significant archaeological  
618 resources and historic structures. As such, an alternative analysis should include  
619 investigations consistent with the Pennsylvania State Historic Preservation Office (PA  
620 SHPO) "Guidelines for Archaeological Investigations in Pennsylvania". If an alternative  
621 under consideration will adversely affect an archeological resource or historic structure,  
622 that alternative may not be considered practicable.  
623



- 624 e) *Special Protection Waters* – All commonwealth waters are protected for designated and  
625 existing aquatic life use as well as for a number of water supply and recreational uses as  
626 defined in Chapter 93. Water Quality Standards. Streams with excellent water quality  
627 are qualified as Exceptional Value Waters (EV) or High-Quality Waters (HQ). EV  
628 waters are to be protected in their existing quality and water quality should not be  
629 lowered. The water quality in an HQ stream can be lowered only if a discharge is the  
630 result of necessary social or economic development, the water quality criteria are met,  
631 and all existing uses of the stream are protected. It shall be the responsibility of the  
632 applicant to ensure that the project alternatives are evaluated in a manner that provides  
633 for the aforementioned protections of special protection waters. If an alternative under  
634 consideration will adversely affect special protection waters, that alternative may not be  
635 considered practicable.  
636
- 637 f) *Scenic Rivers* - Federal and state legislation allows waterway segments to be designated  
638 as part of the Scenic Rivers System. This designation is intended to protect the natural,  
639 aesthetic, and recreational values of a waterway. The protection efforts are largely  
640 carried out through a partnership between DCNR and other state agencies, whereby  
641 construction projects in the vicinity of a designated Scenic River are required to undergo  
642 a more rigorous permitting process and may be required to adjust the project design  
643 and/or construction practices to ensure that the natural and aesthetic values of the  
644 waterway are maintained. It shall be the responsibility of the applicant to ensure that the  
645 project alternatives are evaluated in a manner that provides for the aforementioned  
646 protections of the scenic rivers in Pennsylvania.  
647
- 648 g) *Other Regulatory Considerations* – Other project-specific regulatory considerations  
649 could include but are not limited to public safety, aviation issues (e.g. Federal Aviation  
650 Administration considerations such as height, visibility, and bird strikes), maritime,  
651 navigation, and shipping lane issues (e.g. Coast Guard requirements, aids to navigation,  
652 public land trusts such as public access and submerged lands license agreements). It is  
653 strongly encouraged that applicants reach out to the Department during the  
654 preapplication process regarding other considerations not detailed above.  
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## V. ENVIRONMENTAL AND PROJECT SPECIFIC CONSIDERATIONS

The Department has identified certain types of projects where alternative considerations may vary or only apply in certain situations. The Department may also request a site-specific alternatives analysis if warranted by unique, rare or complex circumstances where typical construction methods or best management practices may not be sufficient or practicable to ensure protection of public health, safety, or the environment. These potential considerations are listed below by project category. Applicants should read through all these considerations, as their project may fall under more than one category as identified in this project section.

### A. Land Development Projects

Land development projects include residential, commercial, industrial, institutional developments in “green field” sites, redevelopment sites, and “brown field” sites. Impacts to aquatic resources via land development projects can be associated with the construction of, among other things, buildings, parking lots, utility lines, docks, access roads, and trails. NEPA assessments are seldom conducted for these mostly “private” projects. Both offsite or location and onsite or design alternatives analyses are appropriate for new development sites. Alternative site designs can sometimes be achieved for land development sites if local municipalities cooperate as it relates to relief from their ordinances. The inability to utilize eminent domain in most cases limits some development options. In addition, local, county, state and federal regulations may limit available development options. Land development sites share common issues but are also somewhat unique in terms of site design and type and extent of impacts. Examples of land development considerations include the following:

1. Residential Development – this type of development can have a variety of site designs ranging from high density units with little open-space to multi-acre lots with extensive open space.
2. Commercial Development – this type of development may need a larger/flatter footprint which would require more cut/fill and potential impacts to aquatic resources.
3. Industrial Development – this type of development normally requires access to regional roads, rail, and/or waterways.
4. Institutional/Educational Development – these types of developments are large areas of land, which typically have a master plan.

### B. Linear Projects

A linear project is a type of project that in general has an elongated shape relative to end points and corridor width. Unlike land development sites, some linear projects may include a NEPA assessment. Typically, the project type (e.g., gas or electric transmission line, gas or electric distribution line, water line) will dictate the necessary corridor width while terrain and local ordinances influence location. In many instances of pipeline route development, eminent domain is not available for use by the developer. Rather, the route location is dictated through negotiations with the property owner. These linear projects may also have associated disturbances beyond the linear corridor to accommodate site access and appurtenant facilities such as compressor stations, electrical substations, etc. Examples of linear project considerations include the following. Please note that information regarding roadway linear projects can be found in Section C. Transportation Projects of this document section.

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1. Pipelines, Utility lines, and Energy and Power Transmission Lines - This section attempts to identify unique situations associated with pipelines, utility lines, and energy and power lines – including overlap with feasibility analyses (both surface and subsurface). These types of projects relate to the transportation of energy, water, sewage, etc.

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Pipelines, utility lines, and energy and power lines are projects that, due to their linear nature, may have multiple aquatic resource impacts. In addition to the impacts associated with the linear project itself, cumulative impacts of the project ancillary features as well as long-term operation and maintenance needs are important considerations that must be included during the development of alternatives analyses. Examples of these considerations include, but are not limited to valve sites, meter stations, manholes, pump stations, and junction boxes.

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Although these projects have a set start and endpoint, there is some flexibility in how they may be routed, and that flexibility is proportional to the length of the line. Projects that are fully located within an existing right-of-way (ROW) may not warrant an offsite or location alternatives analysis. However, projects that are not fully located within an existing right of way will likely always require offsite alternatives analysis.

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In addition to the items discussed in Section IV. D. (Components of Alternatives Analyses) of this document, there are additional components specific to these projects that warrant additional discussion. This is not intended to be an “all inclusive” list and other considerations may be applicable as dictated by site specific constraints.

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- a) *Open Cut vs. Trenchless Method Technologies* - If trenchless technology (e.g. conventional boring, HDD) is identified as an alternative construction method, reasoning must be given as to why this alternative was not suitable or feasible. If this reason includes cost, refer to Section IV. D. 2. “Cost” of this document. Applicants should refer to the Department’s Trenchless Technology Technical Guidance Document (Document No. XXXX) for additional information regarding this technology type.
  - b) *Special Protection Waters* – It is strongly recommended that trenchless technology alternatives be considered if the project crosses an EV or HQ water. Regardless of technologies utilized to cross these waters preservation of existing forested riparian buffers and forested steep slopes should be considered and implemented.
  - c) *Right of Way Reduction Best Management Practices* - When an aquatic resource is crossed, the applicant should reduce the ROW to the greatest extent possible and avoid and minimize temporary workspaces. If reducing the ROW is not possible the applicant should explain in detail why this is the case to justify the expansion.
  - d) *Collocation Best Management Practices* - Collocation involves installation of a new facility either within an existing ROW corridor or adjacent to an existing ROW corridor. These ROWs could include existing pipeline corridors, existing overhead electrical corridors, existing roadway corridors, and new or greenfield areas. Applicants should prioritize existing disturbed ROWs over unmaintained or fully vegetated ROWs as an alternative whenever possible and should attempt to locate features such as temporary work spaces to active ROWs. Applicants are encouraged to work with other operators and entities to share ROWs and thereby maximize collocation capabilities.

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756 2. FERC Regulated Projects - The overall route of projects regulated by the Federal Energy  
757 Regulatory Commission are often determined prior to submittal of a Chapter 105 application  
758 to the Department. As such, offsite or wholesale locational alternatives prescribed by the  
759 Department may be difficult to accommodate but important to protecting aquatic resources  
760 of the Commonwealth. To reduce these challenges, the Department recommends early  
761 consultation and coordination with state agencies during FERC-filing and other related  
762 processes. Onsite or design alternatives should be thoroughly vetted and explored as part of  
763 the application to the Department.

### 764 765 **C. Transportation Projects**

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767 Transportation projects cover a wide range of activities that include roadways, highways, bridges,  
768 culverts, rail lines, airports, ports, rest areas, bus routes, bike lanes, walking paths and other associated  
769 support facilities. As with linear projects, some transportation projects may include a NEPA assessment.  
770 A driving force behind many of these projects is safety, accessibility, and mobility for the public, which  
771 needs to be considered in the alternatives analysis. Although their functions are varied, transportation  
772 projects generally fall into one of the following three categories:

- 773  
774 1. New Alignments & Facilities – An offsite or location alternatives analysis is anticipated for  
775 these project types. If the NEPA process is applicable, the alignment needs to be correlated  
776 to the NEPA document. For example, if a NEPA document has recommended a preferred  
777 alternative for the overall alignment, then the Chapter 105 alternative analysis needs to  
778 consider individual activities on the preferred alignment. However, if the NEPA process is  
779 not applicable, the cumulative impacts for the overall alternative alignments need to be  
780 documented and justification is needed for the preferred alignment. In addition, individual  
781 activities on the preferred alternative impacting aquatic resources need to be avoided and  
782 minimized.
- 783  
784 2. Existing Alignments & Facility Expansions - An offsite or location analysis is not  
785 anticipated for these types of projects based on the project purpose. Individual activities  
786 impacting aquatic resources, which independently would not meet a waiver or general  
787 permit, need to be analyzed and minimized. Impacts as outlined Chapter 106 need to be  
788 considered.
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790 3. Bridge or Culvert Replacement & Restoration - An offsite or location analysis is not  
791 anticipated for these types of projects based on the project purpose. Individual activities  
792 impacting aquatic resources, which independently would not meet a waiver or general  
793 permit, need to be analyzed and minimized. Impacts as outlined in 25 PA Code §105.161  
794 and Chapter 106 need to be considered.
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## D. Restoration and Pollution Abatement Projects

Restoration and pollution abatement projects cover a wide range of activities that include, among other things, restoration of aquatic resources, abandoned mine reclamation, acid mine drainage treatment and brownfields. For the purposes of this technical guidance document, compensatory mitigation related to unavoidable project impacts to aquatic resources is not considered a restoration and pollution abatement project. This project-type is covered in the Chapter 105 mitigation plan.

The intent of many restoration and pollution abatement projects is the restoration or creation of an aquatic resource or the abatement of an environmental or health and safety concern. Projects generally fall into one of the following categories. Please note that this listing is not intended to be all inclusive. If an activity is not otherwise covered in this section, applicants are reminded that an alternatives analysis should always be commensurate to project type and scope. In addition, it is strongly recommended that applicants reach out to the Department during the preapplication project regarding projects not listed below.

1. Aquatic Resource Restoration - Due to the unique nature of aquatic resource restoration and current program development efforts, readers of this technical guidance document are directed to the “Restoration Environmental Assessment Form” and associated instructions which are being developed to specifically address activities related to this category of project. Further information about the Restoration EA can be found on the DEP’s website at ([www.XXXXXXX](http://www.XXXXXXX)) or by contacting the Bureau of Waterways Engineering and Wetlands at (717-787-3411).
2. Abandoned Mine Reclamation - These pollution abatement projects are designed to restore areas previously impacted by mining activities and often include restoring a stable vegetated cover on the landscape. Since these projects are intended to abate a specific issue at a specific site, a detailed offsite or location alternatives analysis is not typically necessary. Instead, an alternatives analysis for this type of project may include a discussion regarding why the proposed activity is the most appropriate activity to accomplish the project goal(s). For example, if an existing coal spoil pile is located within a floodway, the alternatives analysis may discuss why it is more appropriate to remove the spoil pile as opposed to simply amending the soil and revegetating the area.
3. Acid Mine Drainage or Other Drainage Treatment – These pollution abatement projects are projects with the intent of providing water quality treatment to a discharge or drainage such as existing acid mine drainage. Since these projects are intended to abate a specific issue at a specific site, a detailed offsite or location alternatives analysis is not typically necessary. However, onsite or design alternatives for the treatment system must still be considered to avoid and minimize impacts to the maximum extent practicable. An alternatives analysis for this type of project may include a discussion regarding why a treatment system cannot be located outside the boundaries of an aquatic resource area and why the selected treatment technology (e.g. passive treatment or active treatment) is the most appropriate technology based on that specific site and water quality characteristics.
4. Brownfields – For the purposes of this document a brownfield is an area or site that has been affected by the release of a regulated substance and where the existing levels of that substance are above the Statewide Residential Health Standards. As with abandoned mine restoration and acid mine drainage projects, a detailed offsite or location alternatives analysis is not typically necessary for brownfield sites given the nature of the project. The onsite or

852 design alternatives analysis however should include a discussion regarding how the  
853 proposed activity will address the regulated substance while still avoiding and minimizing  
854 impacts to aquatic resources to the maximum extent practicable. If the restoration of the  
855 brownfield is associated with a redevelopment project, the alternatives analysis should still  
856 include a discussion regarding the alternatives for the ultimate redevelopment of the project  
857 and its related impacts to aquatic resources. It is recognized, and the discussion should  
858 mention, that the redevelopment of a brownfield site is usually more desirable than the  
859 development an undisturbed” greenfield” site.

860  
861 5. Recreational Projects – As the name implies, recreational projects provide for a  
862 recreational use of the land or aquatic resource. These project types can include both  
863 active recreation which is associated with the alteration of surface and or land use (e.g.  
864 ballfields, parks and playgrounds, sport utility vehicle parks, and campgrounds) and  
865 passive recreation which will not change or only minimally change surface and or land use  
866 (e.g. walking trails). Alternatives analyses will vary depending on project type could  
867 include both an offsite or location analysis and an onsite or design analysis.  
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## **VI. Alternatives Analysis Process & Template of Items to Submit to the Department**

This process description and template checklist provide a framework for evaluating alternatives pursuant to 25 Pa. Code Sections 105.13(e)(1)(iii), 105.13(e)(1)(viii), 105.14(b)(7), 105.18a(a)(3) and 105.18a(b)(3) and offers guidance regarding what should be submitted to the Department. These are not intended to be stand-alone documents. Instead, this process description and template checklist should be considered companions of the Alternative Analyses Technical Guidance Document and should not be utilized without proper reference and examination of the referenced guidance. Prior to utilizing the following checklist, it is strongly recommended that all sections of the Alternative Analyses Technical Guidance Document are read thoroughly.

### **A. Alternatives Analysis Process**

As referenced throughout the Alternative Analysis Technical Guidance Document, alternative analyses are expected to be commensurate to project type and scope. Fundamental to a proper alternatives analysis is a complete and accurate identification of the aquatic resources on and near the project site. The alternatives analysis is a means for an applicant to document the necessity of aquatic resource impacts and to document that those impacts cannot be further avoided and minimized. The alternatives analysis process should begin during the initial project planning phase (e.g. when property acquisition is conducted). It is not appropriate to begin exploring alternatives analyses during the permit application phase. In addition, it is the responsibility of the applicant to prepare and present a thoroughly vetted and defensible alternatives analysis to the Department. The Department realizes the uniqueness of project types and therefore does not prescribe site alternatives.

In general, when preparing an alternatives analysis, applicants should first determine if their project is water dependent and recognize the regulatory distinctions associated with impact requirements in §105.13, §105.14 & §105.18 for non-water dependent activities. It is recommended that initial assessments of properties for anticipated impacts to aquatic resources occur during the “due diligence” phase of project planning. Site restrictions due to environment resources (including but not limited to PNDI reviews, wetland delineations, wetland and stream classification determinations, historical conflicts, scenic river conflicts, seasonal work restrictions, etc.) should also be explored during this early phase of the project. It is also recommended that requirements of other agencies such as the U.S. Army Corps of Engineers be explored and considered during this project phase.

For an offsite analysis it may not be practicable to field-delineate all Waters of the Commonwealth along alternative routes, and so a desktop assessment using available digital resources may be appropriate. The approximate locations and nature of watercourses, wetlands, and other sensitive resources can be identified from sources such as PASDA, the Web Soil Survey (WSS), USGS, aerial photography, and the NWI.

After offsite or location alternatives have been explored and an appropriate site is selected, the applicant should complete a full delineation of the aquatic resources on site. For the onsite or design alternatives analysis, project proponents should not rely upon desktop resources for identifying wetlands, streams, and other aquatic resources. Rather, a field delineation of all Waters of the Commonwealth, including wetlands, should be conducted. A Preliminary Jurisdictional Determination (PJD) from the Army Corps of Engineers is recommended to confirm the accuracy of the onsite delineations. The onsite analysis should evaluate, the potential direct and indirect environmental effects of the proposed plan. Factors such as site re-design and lay-outs including “green infrastructure” design options for structures and

918 storm water management, should be assessed and documented to avoid and minimize aquatic resource  
 919 impacts to the greatest extent practicable.

920  
 921 It is important to remember that if avoidance and minimization of aquatic resource impacts is not possible  
 922 due to issues such as protection of public health and safety, correction of pollution, and/or economic  
 923 factors the applicant must accurately assess and present these issues in the alternatives analysis.

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 925 **B. Template of Items to Submit to the Department**

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<input type="checkbox"/>	<b>Water Dependency / Purpose Narrative</b> – This narrative should be contained within the project description. See Environmental Assessment Instructions.
<input type="checkbox"/>	<b>Location or Offsite Alternatives Narrative and Tables</b> – This narrative should include a discussion of environmental impacts and site constraints associated with each location alternative. The discussion should clearly explain how aquatic resources were identified along the alternative locations (i.e., if desktop sources were used, explain which ones) and should quantify the impacts to aquatic resources associated with each alternative.
<input type="checkbox"/>	<b>Selected Location Description</b> – A detailed explanation of why the proposed site was chosen. This description should include the following:
<input type="checkbox"/>	<b>Aquatic Resource Impact(s) Description</b> - Impacts to aquatic resources should be detailed and quantified for the selected alternative. This effort should be completed for each sensitive resource and resources identified in §105.14b(5) as well as for every aquatic resource (in acres or linear feet, as appropriate) impacted by project. An analysis of resource type and impact to each resource identified and aquatic resource is recommended. A Pre-application meeting with the Department is recommended for unique sites or aquatic resources.
<input type="checkbox"/>	<b>Other Environmental Considerations</b> – Environmental policies and other best management practices that influenced the selection of the chosen location.
<input type="checkbox"/>	<b>Future Impacts</b> - Potential future impacts, if applicable, of the chosen alternative location.
<input type="checkbox"/>	<b>Alternate Location(s) Description(s)</b> – Alternative locations not utilized or selected should be described and compared. If an alternative location has less environmental impacts than the chosen location, a detailed explanation that takes into consideration construction cost, existing technology, and logistics of why the alternative is not capable of being carried out should be provided.
<input type="checkbox"/>	<b>Design or Onsite Alternatives Narrative and Tables</b> – This narrative should include a discussion of onsite avoidance and minimization efforts. This discussion should identify the aquatic resources as field-delineated on the site, and should detail environmental impacts impacts and site constraints associated with each design or onsite alternative. The discussion should clearly explain why the proposed alternative was chosen.
<input type="checkbox"/>	<b>Selected Onsite Alternative</b> - An explanation of why the proposed alternative was chosen.



<input type="checkbox"/>	<b>Aquatic Resource Impact(s) Description-</b> Impacts to field-delineated aquatic resources should be detailed and quantified for the selected design or onsite alternative. This effort should be completed for each sensitive resource and resources as identified in §105.14b(5) as well as for every aquatic resource (in acres or linear feet, as appropriate) impacted by project. An analysis of resource type and impact type to each resource identified and aquatic resource is recommended. A Pre-application meeting with the Department is recommended and for unique sites or aquatic resources, a Preliminary Jurisdictional Determination is recommended.
<input type="checkbox"/>	<b>Other Environmental Considerations</b> – Environmental policies and other best management practices that influenced the selection of the chosen location.
<input type="checkbox"/>	<b>Future Impacts</b> - Potential future impacts, if applicable, for each alternative
<input type="checkbox"/>	<b>Design or Onsite Alternatives Description</b> - Alternative designs not utilized or selected should be described. If an alternative has less environmental impacts than the proposed alternative, a detailed explanation that takes into consideration construction cost, existing technology, and logistics of why the alternative is not capable of being carried out should be provided.
<input type="checkbox"/>	<b>Alternative Location and Design Exhibits</b> – maps, drawings, standard details
<input type="checkbox"/>	<b>Location Maps</b> - Resource crossings, sensitive resources, and other pertinent information related to selection of the alternative should be included. If these files are subject to the “Protected Critical Infrastructure Information (PCII) Program” and not available to the public, appropriate documentation must be submitted to the Department in order to be labeled confidential.
<input type="checkbox"/>	<b>Selected location</b> - Aquatic resources within the selected location should be field verified or delineated by someone with expertise in delineating streams and wetlands. Wetlands should be delineated according the Army Corp of Engineers Wetlands Delineation Manual and applicable regional supplement.
<input type="checkbox"/>	<b>Alternate locations</b> - Applicants may utilize remote sensing, digital geo-spatial data, geographic information systems (GIS), light detection and ranging (LiDAR), eMAP, and other similar available sources for evaluating alternatives.
<input type="checkbox"/>	<b>Design Exhibits</b> - Drawings and/or maps for each alternative. These exhibits should include specific details of layout, design, and crossing methodologies
<input type="checkbox"/>	<b>Geospatial Data</b> (if available) - Geospatial data, such as shapefiles or kmz files, should be provided of alternate routes/locations evaluated in the offsite analysis. It is recommended that known aquatic resources and other sensitive resources within and along all alternative routes/locations be provided if data are available. For the selected location/site, similar geospatial data should be provided for field-delineated aquatic resources (corresponding to field flagging) and for proposed temporary and permanent limits of disturbance.
<input type="checkbox"/>	<b>Data Resources</b> – list of data resources analyzed
<input type="checkbox"/>	<b>Summary Table</b> –See Section VI. C.

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934 **C. Example Location and Design Alternatives Analysis Tables**

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936 The following tables are examples of what should be submitted to the Department as a supplement to the  
 937 alternatives analysis narrative. These tables should succinctly describe both the location (i.e. offsite) and  
 938 design (i.e. onsite) alternatives evaluated during the project planning process. These tables should not be  
 939 used as a surrogate for the alternatives analysis narrative.

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- 942 1. Location Alternatives Summary Table - A location alternatives summary table will include  
 943 information related to offsite alternatives. These alternatives include sites both owned and  
 944 not owned by the applicant which could reasonably be obtained, utilized, expanded or  
 945 managed to fulfill the basic purpose of the proposed project. If the project is linear in nature  
 946 (e.g. utility line or pipeline), this table could summarize the various routes explored during  
 947 project planning. If the project is related to land development (e.g. residential or commercial  
 948 development), this table could summarize the different parcel locations evaluated during the  
 949 planning process.

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952 Table 3. Example Location Alternatives Summary Table

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Alternatives ‡	Description	Practicability Rationale*
Alternative # 1		
Alternative # 2		
Alternative # 3		

‡ Additional alternatives summary rows should be added as necessary

\* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

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2. Design Alternatives Summary Table - A design alternatives summary table will include information related to onsite avoidance and minimization efforts. This table should include alternate onsite designs, routings, layouts and engineering and construction techniques. For example, if the project is linear in nature (e.g. utility line or pipeline), this table could summarize the feasibility of crossing resources utilizing open-cut and trenchless technologies. If the project is transportation related (e.g. bridge or culvert installation or replacement), this table could summarize the different structure types evaluated during the planning process.

Table 4. Example Design Alternatives Summary Table

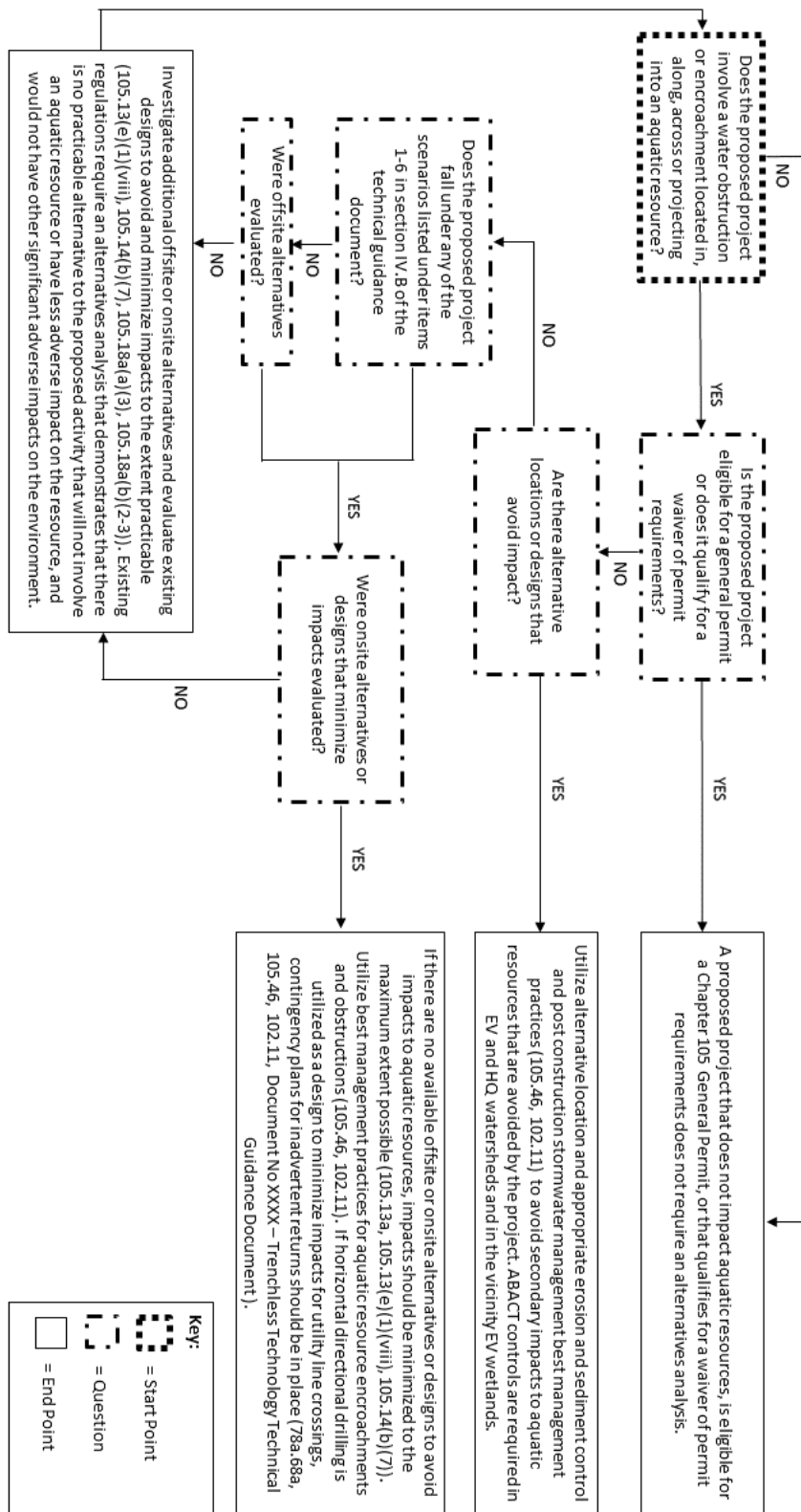
Resource Information					Alternatives ‡								
Resource					Alternative #1			Alternative #2			Alternative #3		
Unique Resource Identifier	Aquatic Resource Type	Waters Name	PA Code Chapter 93 / 105 Designation †	Resource Narrative Description	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*	Cumulative Resource Impact	Chosen Alternative?	Practicability Rationale*
ST023	Perennial Stream	Adams Run	EV	pg. 13 EA	Bottom-less arch			20" Culvert			Bridge		
					100 SF	No	pg. 3 Alt Analysis	110 SF	Yes	pg. 3 Alt Analysis	60 SF	No	Cost; pg 13 Alt Analysis
W-001	PFO Wetland	-	Other	pg. 27 EA	Open-Cut Trench			Conventional Bore Trenchless Technology			HDD Trenchless Technology		
					250 SF	Yes	pg. 3 Alt Analysis	25 SF	No	Unsuitable geology; Pg 3 Alt	25 SF	No	Cost; pg 5 Alt Analysis

‡ Additional alternatives summary columns should be added as necessary  
 † Stream designation per Chapter 93, Wetland designation per Chapter 105  
 \* e.g. construction cost, existing technology, logistics and items listed in §105.14(b)

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989 **D. Flowchart for Evaluating Project Alternatives**



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## VI. REFERENCES

- 25 PA Code Chapter 105. Dam Safety and Waterway Management  
<https://www.pacode.com/secure/data/025/chapter105/chap105toc.html>
- 40 CFR Part 230- Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material  
<https://www.nap.usace.army.mil/Portals/39/docs/regulatory/regs/40cfr230.pdf>
- Commonwealth of Virginia DEQ “Guidance Memorandum Number 04-2007 Avoidance & Minimization of Impacts to Surface Waters.” Feb. 6, 2004.  
<https://www.deq.virginia.gov/Portals/0/DEQ/Water/Guidance/042007.pdf>
- Comprehensive Environmental Assessment (CEA) of Proposed Project Impacts for Chapter 105 Water Obstruction and Encroachment Permit Applications; and Comment and Response Document. Document No. 310-2137-006 & 310-2137-006 CR  
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4679>
- DEP Environmental Assessment Form and Instructions (Document No. 3150-PM-BWEW0017)  
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4048>
- Draft ASTM Standard for Good & Customary Practice for Evaluating Practicable Alternatives Under the Clean Water Act Section 404 Program. August 12, 1999. <https://www.hklaw.com/publications/proposed-astm-standard-for-good-and-customary-practice-in-evaluating-practicable-alternatives-for-wetlands-permitting-09-01-1999/?nomobile=perm>
- EPA Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements  
<https://www.epa.gov/cwa-404/memorandum-appropriate-level-analysis-required-evaluating-compliance-section-404b1>
- EPA Memorandum: Individual Permit Flexibility for Small Landowners  
<https://www.epa.gov/cwa-404/memorandum-individual-permit-flexibility-small-landowners>
- Final Guidance - Substantive Revision Agricultural Land Preservation Policy (Document No. 012-0700-002)  
<https://www.dep.state.pa.us/hosting/growingsmarter/012-0700-002%5B2%5D.pdf>
- Pennsylvania Department of Environmental Protection: Erosion and Sediment Pollution Control Program Manual, March 2012 (Technical Guidance 363-2134-008).  
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4680>
- Policy for Pennsylvania Natural Diversity Inventory (PNDI) Coordination During Permit Review and Evaluation” (Document No. 021-0200-001)  
<http://www.depgreenport.state.pa.us/elibrary/GetFolder?FolderID=4637>
- The Federal Wetland Permitting Program: Avoidance and Minimization Requirements, Environmental Law Institute, March 2008  
<https://www.lrl.usace.army.mil/Portals/64/docs/regulatory/Permitting/ELI.pdf>
- US Army Corps of Engineers: Corps of Engineers Wetlands Delineation Manual.  
<https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/4532/>

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**VII. APPENDICES**

**A. EA, CEA, & AA Flowchart**

PADEP RPCO DR rev 04-24-2019  
DRAFT – NOT FOR DISTRIBUTION

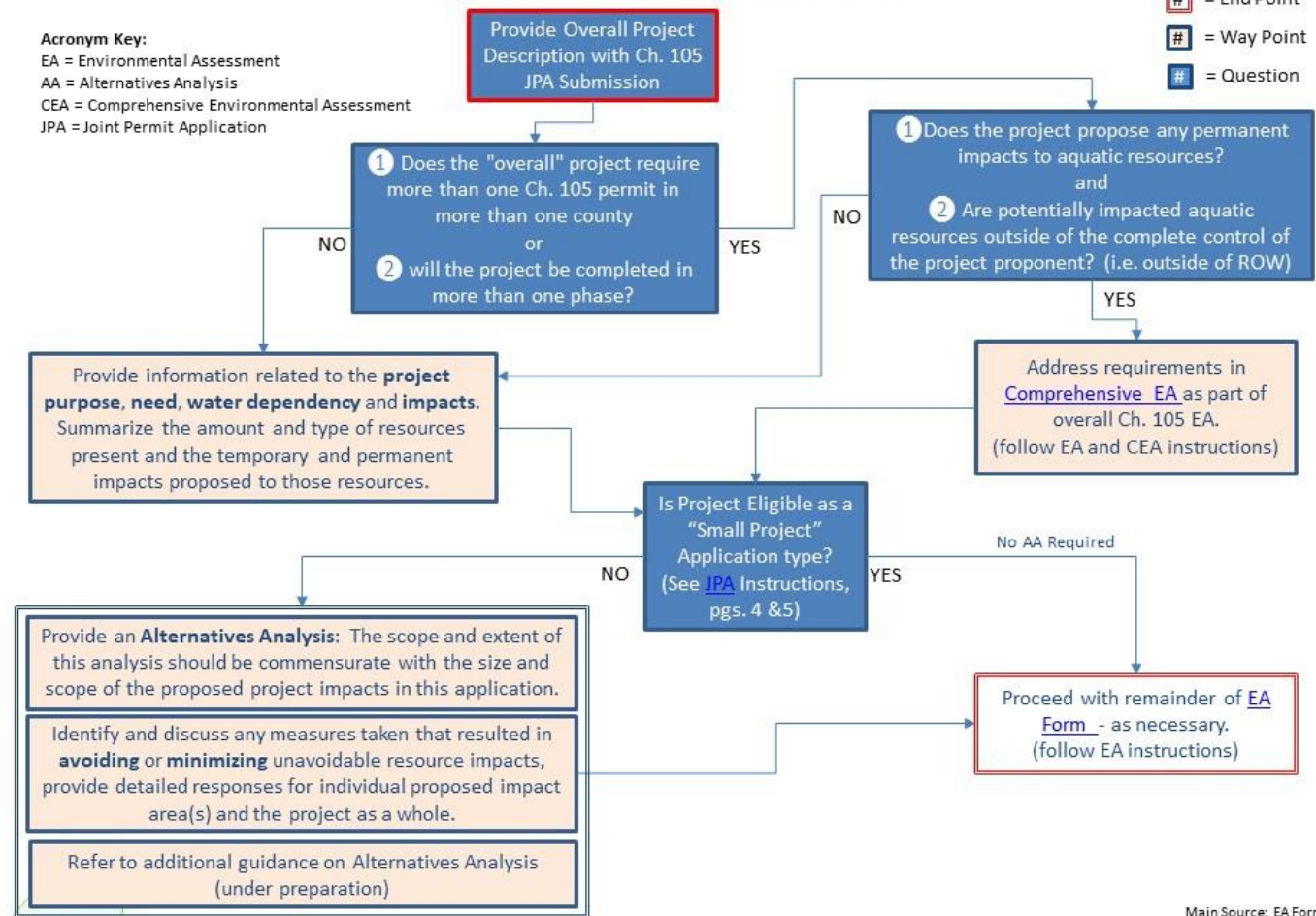
**ITEMS OF COMMON INTEREST in CH. 105 EA, CEA & AA**

[See [Ch. 105 Regulations](#), [JPA](#), [EA Form](#) and [CEA Requirements](#)]

- # = Start Point
- # = End Point
- # = Way Point
- # = Question

**Acronym Key:**

- EA = Environmental Assessment
- AA = Alternatives Analysis
- CEA = Comprehensive Environmental Assessment
- JPA = Joint Permit Application



1051

Main Source: EA Form

## B. NEPA vs. 25 Pa. Code Chapter 105 Clarification Statement of Alternative Analysis

Due to similarities in commonly used terms for environmental analysis and permitting, it is necessary in this document to describe the differences between an alternatives analysis following “NEPA” versus one following “Ch. 105”.

### **Environmental Assessment (EA) can be defined as –**

1. An exploratory report under NEPA, that is prepared for environmental clearance when the significance of impacts is not clearly known. An EA provides the analysis and documentation to determine whether an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) should be prepared.
2. A section of the DEP Joint Permit Application that presents the potential impacts on the physical, chemical, and biological characteristics of the aquatic ecosystems and Special Aquatic Sites in the project area.

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The National Environmental Policy Act (NEPA) is a federal law enacted on January 1, 1970. NEPA requires federal agencies to assess the environmental effects of their proposed actions prior to making decisions. The range of actions covered by NEPA is broad and includes:

- making decisions on permit applications,
- adopting federal land management actions, and
- constructing highways and other publicly-owned facilities.

Using the NEPA process, agencies evaluate the environmental and related social and economic effects of their proposed actions. This evaluation includes looking at an equally broad alternatives analysis which goes beyond impacts to aquatic resources.

**Source:** <https://www.epa.gov/nepa/what-national-environmental-policy-act>

The NEPA process begins when a federal agency develops a proposal to take a major federal action or proposes to use federal funding. These actions are defined at [40 CFR 1508.18](#). The environmental review process under NEPA can involve three different levels of analysis, listed here from least to most complex:

1. [Categorical Exclusion determination \(CATEX\)](#)
2. [Environmental Assessment/Finding of No Significant Impact \(EA/FONSI\)](#)
3. [Environmental Impact Statement \(EIS\)](#)

**Source:** <https://www.epa.gov/nepa/national-environmental-policy-act-review-process>

1096 In comparison, the Dam Safety and Encroachments Act and its companion 25 Pa. Code [Chapter 105](#)  
 1097 [regulations](#) is narrower in scope and applies almost exclusively<sup>2</sup> to water obstructions and encroachments  
 1098 focusing on impacts to aquatic resources. To further understand this, one needs only to examine the  
 1099 definitions in 25 Pa. Code § 105.1, where water obstruction is defined as:

- 1100 (i) A dike, bridge, culvert, wall, wingwall, fill, pier, wharf, embankment, abutment or other  
 1101 structure located in, along or across or projecting into a watercourse, floodway or body of  
 1102 water.
- 1103 (ii) In the case of ponds, lakes and reservoirs, a water obstruction is considered to be in or  
 1104 along the body of water if, at normal pool elevation, the water obstruction is either in the  
 1105 water or adjacent to and abutting the water's edge.

1106 And encroachment is defined as:

- 1107 (iii) A structure or activity which changes, expands or diminishes the course, current or cross  
 1108 section of a watercourse, floodway or body of water.

1109 The definitions found within the NEPA process, while similar, are also quite different and do not  
 1110 supersede or nullify those found in Chapter 105. With that said, information within an alternatives  
 1111 analysis done to satisfy NEPA can have information extracted to help satisfy an alternatives analysis for  
 1112 Ch. 105.

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1114 **25 Pa. Code § 105.2 Purposes**

1115 The purposes of chapter 105 are laid out in 25 Pa. Code § 105.2 Purposes, pages 105-12 and 105-13. The  
 1116 stated purposes are as follows:

- 1117 (1) Provide for the comprehensive regulation and supervision of dams, reservoirs, water obstructions  
 1118 and encroachments in the Commonwealth in order to protect the health, safety, welfare and  
 1119 property of the people.
- 1120 (2) Assure proper planning, design, construction, maintenance, monitoring and supervision of dams  
 1121 and reservoirs, including preventive measures necessary to provide an adequate margin of safety.
- 1122 (3) Assure proper planning, design, construction, maintenance and monitoring of water obstructions  
 1123 and encroachments, in order to prevent unreasonable interference with water flow and to protect  
 1124 navigation.
- 1125 (4) Protect the natural resources, environmental rights and values secured by PA. CONST. art. I, § 27  
 1126 and conserve and protect the water quality, natural regime and carrying capacity of watercourses.
- 1127
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<sup>2</sup> Ch. 105 also applies to dams which are specialized in nature and are not subject to this guidance document.



## C. Data Resource List

### Key

**Bold** – Name of Data Source

Underline – Sub-category name of data source

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Blue underline – Weblink to data source (if available)

Parenthesis / Black Underline / Italics – Listing of available data w/major data headings having sub-categories underlined and sub-categories italicized

- **Municipality / Township and County Websites and Contact** (\$, Aerials, Topography, Tax / Parcel, Plats, Easements, Deed information, Hydrology, Hydrogeology, Manmade features, Geologic, Soil, Site specific impediments, Sewage service areas, private septic systems) Note: Township has contact information for sewage utility to obtain sewage service areas. Township Sewage Enforcement Officers keep records of private septic systems, though older systems may lack any record.
- **United States Geological Survey (USGS)**
  - ☐ Earth Explorer (EE) - <https://earthexplorer.usgs.gov/> (Aerials, LIDAR / DEMS, Historic manmade features, Historic and current land uses)
  - ☐ Historical Topographic Map Explorer (HT) - <http://historicalmaps.arcgis.com/usgs/> (Historic topography, Historic manmade features, Historic and current land use)
  - ☐ National Geologic Map Database (NGMDB) and Association of American State Geologist (AASG) - [https://ngmdb.usgs.gov/ngmdb/ngmdb\\_home.html](https://ngmdb.usgs.gov/ngmdb/ngmdb_home.html) (Geologic overview, Strike and dip, Fractures and faults, Karst, Subsurface voids, Caves, Subsidence features)
  - ☐ Pennsylvania Water Science Center - <https://pa.water.usgs.gov/infodata/groundwater.php> (Groundwater, Groundwater table, Well and spring locations)
- **National Water Quality Monitoring Council** - <https://www.waterqualitydata.us/portal/> (Groundwater table, Well and spring locations, USGS well water supply sampling)
- **Unites States Department of Agriculture Natural Resources Conservation Service (USDA)** - <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm> (Soil interfaces and unconsolidated material)
- **U.S. Fish and Wildlife Services (FWS)**
  - ☐ FWS - <https://www.fws.gov/gis/data/national/> (Critical habitat, Regional boundaries)
  - ☐ National Wetland Inventory (NWI) - <https://www.fws.gov/wetlands/> (Wetlands)
- **Federal Emergency Management Act (FEMA)**
  - ☐ National Flood Hazard Layer (NFHL) - <https://catalog.data.gov/dataset/national-flood-hazard-layer-nfhl> (Floodplain)
  - ☐ NFHL Viewer - <https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd> (Floodplain)
- **Pennsylvania Spatial Data Access (PASDA)**
  - ☐ PASDA - <https://www.pasda.psu.edu/> (Aerials; LIDAR / DEM; Topography; County boundaries; Municipalities; Tax / Parcel information; Rivers; Streams; Wetlands; Springs; Geologic overview; Soil interfaces; Geologic Contacts; Known contamination: *Beneficial land use, Captive hazardous waste operation, Commercial hazardous waste operation, Erosion & sediment control facilitates, Land recycling cleanup locations, Municipal waste operations, Residual waste operations, Storage tanks locations active or inactive, Water pollution control facility, Water resources, Encroachment Locations related to water resources*; Subsurface voids; Unconsolidated material; Surface and deep mines: *Abandoned mine land inventory - points, polygons, sites, Active underground permit boundaries, Coal mining operations, Coal pillar mining, Coal pillar location oil & gas, Digitized mined areas, Industrial mineral mining operations, Longwall mining panels, Mine drainage treatment / Land recycling project*; Known oil and gas wells and related features – Active and abandon: *Conservation wells – plugged and unplugged, Encroachment locations for oil & gas, Oil Gas locations – conventional and unconventional, Oil & Gas Locations – wells, pits, land application, Oil & gas water pollution control facilities*; Public water supplier areas; Manmade features; Cultural / architecture features; Historic / Current land use) Note 1: PASDA does not include all County or Municipality or Tax / Parcel boundary data in PA, if data is not listed on PASDA check specific County or Municipality website and/or contact. Note 2: PA DEP public records search to obtain soil and groundwater contamination area delineations.

- 1186  Pennsylvania Imagery Navigator (PSIEE) - <https://maps.psiee.psu.edu/ImageryNavigator/> (Aerials – Limited areas of  
1187 PA)  
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- 1189 • **Pennsylvania Department of Conservation & Natural Resources (DCNR)** -  
1190 <https://www.dcnr.pa.gov/Pages/default.aspx> or <http://data-dcnr.opendata.arcgis.com/>  
1191  Pennsylvania GEOlogic Data Exploration (PaGEODE) - <http://www.gis.dcnr.state.pa.us/> (Topography, Groundwater,  
1192 Groundwater table, Geologic overview, Geologic mapping, Strike and dip, Formation identification, Fractures /  
1193 Faults, Subsurface voids, Karst, Caves, Subsidence features, Wells and springs)  
1194  Open Data Portal - <http://data-dcnr.opendata.arcgis.com/> (Aerials, DEM / LIDAR, Groundwater, Groundwater table,  
1195 Geologic overview, Geologic mapping, Formation identification, Fractures / Faults, Soil interfaces and geologic  
1196 contacts, Subsurface voids, Karst, Caves, Subsidence features, Unconsolidated material)  
1197  Pennsylvania Groundwater Information System (PAGWIS) -  
1198 <https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx>  
1199 (Well and spring locations, Private well supply locations, Well construction, Groundwater table)  
1200
  - 1201 • **Department of Environmental Protection (DEP)** – <https://www.dep.pa.gov/Pages/default.aspx> and  
1202 <https://www.dep.pa.gov/DataandTools/Pages/GIS.aspx>  
1203  eMapPA - <http://www.depgis.state.pa.us/emappa/> (Web application for interactive mapping of: Complaints; Federal  
1204 EPA sites; Regulated facilities and related information: *Air, Land reuse, Mining, Oil and gas, Radiation, Sample*  
1205 *information system, Streams and water resources, Storage tanks, Waste, Water including public water service areas*  
1206 *and public supply well listings; Areas POI – geological; Areas POI – Environmental; Areas POI – General;*  
1207 Boundaries) Note 1: See eMapPA attachment for obtaining a detailed listing of: Public supply wells, Sewage  
1208 discharge, Sewage treatment plant and Surface water intakes within a search radius. For related location information,  
1209 wellhead protection area delineations and source water assessment reports, must public records search and/or contact  
1210 the water / sewer authority. Note 2: Web application data layers available for download via: PASDA, PaGEODE,  
1211 DCNR, DEP Open Portal.  
1212  DEP Environmental Site Assessment Search Tool - <https://www.depgis.state.pa.us/esaSearch/> (Web application for  
1213 interactive mapping of: Air emissions, Known contamination, Surface and deep mines, Known oil and gas wells, and  
1214 related subcategories) Note: Data layers available for download on PASDA or DEP OPEN DATA.  
1215  DEP Activity and Use Limitations Registry (AUL) - <http://www.depgis.state.pa.us/pa-aul/> (Activity and use  
1216 limitations: including not limited to Fencing, Groundwater use prohibition, Groundwater treatment, Health and safety  
1217 plan, Leachate collection system, Maintenance of cap, Municipal ordinance, Non-residential use, Other engineering  
1218 control, Other institutional control, Maintenance of point-of-entry treatment systems, Slab on grade construction,  
1219 Slurry wall, Soil management, Stormwater management, Vapor barrier, Vapor mitigation, Vapor investigation,  
1220 Groundwater use monitoring) Note: PA AUL provides direct links to AUL documents associated with a particular  
1221 property (Document examples: Administrative Orders, EPA Consent Decrees, Consent Orders and Agreements, Deed  
1222 restrictions, Environmental Covenants, Military master plans, Municipal ordinances, Post-remediation care plans)  
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  - 1224 • **Pennsylvania Historical & Museum Commission** - [http://www.phmc.state.pa.us/bah/dam/rg/di/r17-](http://www.phmc.state.pa.us/bah/dam/rg/di/r17-114CopiedSurveyBooks/r17-114MainInterfacePage.htm)  
1225 [114CopiedSurveyBooks/r17-114MainInterfacePage.htm](http://www.phmc.state.pa.us/bah/dam/rg/di/r17-114CopiedSurveyBooks/r17-114MainInterfacePage.htm) (Surveyed drawing - shows the name of the individual for whom  
1226 the tract was surveyed, the acreage, the courses and distances and the names of adjoining property owners, and  
1227 occasionally other significant geographical features of the landscape) Note: Not all parcels in Pennsylvania are included.  
1228
  - 1229 • **Pennsylvania Utility Commission (PUC)** - <http://www.puc.state.pa.us/> (Existing utilities PA one call and survey  
1230 markings and/or contact PUC for data)  
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  - 1232 • **Pennsylvania Department of Transportation (PennDOT)**  
1233  General Site - <https://www.penndot.gov/Pages/default.aspx> (Municipalities, Tax / Parcel Information in PDF or  
1234 contact for GIS or CAD layers)  
1235  Open Portal for GIS data download - <https://data-pennshare.opendata.arcgis.com/> (Manmade features and cultural /  
1236 architectural features)  
1237  PennDOT online map viewer - <https://www.dot7.state.pa.us/onemap/>  
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  - 1239 • **Delaware River Basin Commission** –  
1240  DRBC GIS - <https://www.state.nj.us/drbc/basin/map/GIS.html> (Municipalities, Water resources, Geologic overview,  
1241 Rivers, Streams, Wetlands)  
1242  DRBC SE PA Ground Water Protected Area GIS - <https://www.nj.gov/drbc/programs/project/pr/gwpa-data.html>  
1243 (Municipalities, Water resources, Geologic overview, Rivers, Streams, Wetlands)  
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- **Susquehanna River Basin Commission** –
    - **SRBC Map Viewer** - <https://www.srbc.net/portals/susquehanna-atlas/projects-map/> (Municipalities, Water resources, Geologic overview, Rivers, Streams, Wetlands)
    - **SRBC Data Request** - <https://services.srbc.net/request-data/> (\$, surface water and groundwater withdrawals, consumptive use facilities, oil and gas) Note: PASDA has search tool and offers a subset of data layers for download for free.
  - Environmental Protection Agency -
    - **Operating Procedure – Groundwater Sampling (3/6/2013)** - <https://www.epa.gov/sites/production/files/2015-06/documents/Groundwater-Sampling.pdf>
  - U.S. Office of Surface Mining Reclamation and Enforcement -
    - **Well Purging Procedures for Obtaining Valid Water Samples from Domestic and Monitoring Wells (5/21/2012)** - [https://www.arcc.osmre.gov/about/techDisciplines/hydrology/docs/techGuidance/2012/tsd-wggb-Well\\_Purging.pdf](https://www.arcc.osmre.gov/about/techDisciplines/hydrology/docs/techGuidance/2012/tsd-wggb-Well_Purging.pdf)
  - National Wetland Inventory - <https://www.fws.gov/wetlands/>
  - Pennsylvania Groundwater Information System (PaGWIS) - <https://www.dcnr.pa.gov/Conservation/Water/Groundwater/PAGroundwaterInformationSystem/Pages/default.aspx>

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