Surface Water
Discipline Report Technical Guidance

A Surface Water Discipline Report is prepared during development of a new transportation project, and is intended to provide information required for EAs, EISs, and a variety of water quality permits, certificates, and approvals. The study must be thorough enough to provide data necessary to recognize and assess water quality and quantity impacts of a proposed project. Once the need for a Surface Water Discipline Report has been established as described in **Section 430.05** of the *Environmental Procedures Manual*, the report should be prepared in accordance with this document, and the following other Exhibits and technical guidance documents:

- Exhibit 430-1: Surface Water Discipline Report Checklist
- Technical Guidance: Information Source listing for WSDOT Surface Water Discipline Reports
- Technical Guidance: Quantitative Procedures for Surface Water Impact Assessments

The *Surface Water Discipline Report Checklist* (**Exhibit 430-1**) helps ensure that all project-related surface water issues are adequately considered. The checklist is meant to be fairly comprehensive. Not all of the elements listed in the checklist are required, which is why there is a checkbox for NA (Not Applicable). On the other hand, issues that are not addressed in this checklist may be identified for a project. If issues arise that are not referenced in the list, consult with the Environmental Services Office Water Quality Program staff on how to best address them.

The *Information Source listing for WSDOT Surface Water Discipline Reports* provides contact information to help report writers more quickly identify information sources. The *Quantitative Procedures for Surface Water Impact Assessments* describes methods for comparing surface water impacts of project alternatives. Note, over the next year WSDOT will be reevaluating existing impact assessment methods with the intent of incorporating a watershed based approach.

The requirements below are listed by report section headings. The names of some section headings have been changed from previous guidelines to simplify the use of discipline study contents in EIS's that follow the *Reader-Friendly Document Toolkit*. Information on using the toolkit and access to the document are on the Environmental Services Office web site:

http://www.wsdot.wa.gov/Environment/ReaderFriendly.htm.

Some of the features discussed in the Surface Water Discipline Report refer to related discipline reports, and coordination with the authors of related reports is required to evaluate relevant data**.**

I. Summary of Conclusions

A brief summary of conclusions relating to the water quality effects of the proposed project appears at the beginning of the report. This summary should highlight the water quality issues that need to be presented in the EIS/EA.

II. Purpose and Need for the Action

This section should present the purpose and need for the project. The purpose of the project should include what the project entails and why the project is being conducted. It is critical that the project description, and purpose and need are consistent with other discipline reports. The scope of the project and final use of the discipline study (e.g., as part of a project-specific EIS) should also be presented. Relevant background information on the project should be included, along with an identification of entities with vested interests. If the purpose and need are

thoroughly described in another document, it may be best to reference that document to avoid duplication of effort and ensure consistency.

III. Description of Alternatives

This section should include a succinct description of each alternative being evaluated, including the no-action or no-build alternative. The descriptions of the alternatives should include the proposed actions to be taken under the alternative, and the site-specific requirements and constraints associated with each action. A summary description of the major water quality and quantity concerns for the project and the general differences between alternatives as they relate to these concerns should also be included.

Detailed information and maps should be obtained from the Project Office. (Since these details can be expected to change over the course of a project, the Project Office should be contacted on a regular basis to verify details.) The project boundaries should be clearly defined and shown on a map(s) of the area encompassed by all of the alternatives, including the no-build alternative.

WSDOT may develop one report that describes the project alternatives and construction methods rather then repeating the description in each technical or discipline report. Reference such documents when they exist and only include discipline-specific information in the discipline report.

IV. Studies, Coordination, Methods, and Regulations

The purpose of this section is to document the process, resources, and tools used to develop the Surface Water Discipline Reports for use in the water quality and quantity section of EAs and EISs and build the framework with which impacts can be analyzed. This section should justify the approach taken in the analysis. The level of detail required for the discipline study will vary with the complexity and planning stage of the project. Generally, the process includes: acquiring reports, plans, and data, making contacts with agencies and stakeholders in the project area, reviewing applicable rules and regulations, and summarizing pertinent information.

The information source listing includes resources commonly used determine the applicability of **Exhibit 430-1** checklist items. As the resource listing is not exhaustive, additional sources may also be required. All of the resources and contacts identified during this process should be listed in an appendix to the Discipline Report; while only those directly utilized for the analysis should be cited in the report and included in the References section of the report. This section of the Discipline Report should contain a summary of which reports or data sets were relied upon for the analysis and why they were selected. For example, the analyst could choose to not use water quality data that is more than 20 years old when defining the existing environment. This rationale would be included in this section of the Discipline Report.

The resources and reports identified should be used to obtain data for documenting baseline conditions as well as to summarize major concerns and recommendations related to surface water resources in the project area. This summary of concerns and recommendations may be valuable for identifying possible mitigation opportunities. Applicable rules, regulations, plans and policies should also be summarized in sufficient detail to determine project compliance.

This section must identify the tools or methods used for technical evaluation of water quality and quantity data (e.g., hydrological methods and pollutant loading calculations). Since the methods described in *Quantitative Procedures for Surface Water Impact Assessments* have already been approved for use in Discipline Reports, writers may simply identify the method selected, provide the rationale for selecting that method, and reference the technical guidance document. The analyst is not constrained to using the methods in this technical guidance if more recent, site specific data is available. However, if a quantification method is selected for use that has not already been described in this technical guidance, a detailed description of the method and rationale for its use must be provided.

Discipline studies are based on the best available data. In rare cases, however, additional baseline data may be required to document current water quality conditions. Determine early in the project scoping process whether additional data collection activities may be required and notify the Project Office of budget and scheduling revision requirements. Consult with the Environmental Services Office prior to making any commitments to collect baseline data, as monitoring and quality assurance plans would be required. These efforts should also be coordinated with other disciplines.

If the project is complex or controversial, take steps to obtain informal approval for the analysis approach from the Project Office. If necessary, prepare a technical memo for submittal to the Project Office that describes the list of studies and reports that are to be relied upon for the analysis and a description of the quantification or estimation methods that will be used. The Project Office may choose to send this memo to permitting agencies and other interested parties for comment.

V. Project Area Then and Now

The primary function of this section is to describe the framework against which the effects of the project can be compared. Generally, this framework is easier to write and understand if the analyst first describes the natural environment and then overlays the existing built environment. Consequently, discipline reports typically begin with descriptions of soils, topography, geology, and natural watershed and stream characteristics and sensitive areas or issues associated with them. The description of the existing built environment then should superimpose land use patterns, features associated with land use (e.g., stormwater outfalls, instream structures, impervious area, and stream hydrology and morphology changes) and how they influence the natural framework.

There are two issues to consider when developing both the Project Area Then and Now and Environmental Consequences sections: the focus of the analysis and amount of detail required. A soil scientist's description of site soils might include information on plasticity, compressability, pore strength, color, and organic content as well as information on slope, drainage capacity and potential to erode. However, in terms of water quality impacts, it is slope, drainage, and erosion that are important and these characteristics should be the focus of the descriptions. Information provided outside of this focus will simply add to the length of the report without enhancing its value. The level of detail should be correlated to the importance of the item to the project or project area. For example, the description of soils and topography might simply be a few sentences describing a "flat to rolling topography with well-drained loamy soils". Or, if there are steep slopes coupled with poorly drained soils that cause special concerns related to erosion or site drainage problems, then more detail and explanation and possibly a map showing problem areas is warranted. The level of detail required also changes with respect to the project phase. If it is the first phase in planning for a regional road network then most of the checklist items will be addressed with a broad brush when compared to the assessment detail required for comparison of specific road alignment and design alternatives.

By nature the Surface Water Discipline Report will be linked to the Groundwater, Floodplains, Wetlands, and Fisheries Discipline Reports. The Surface Water Discipline Report should be written to minimize redundancy while also insuring there are no conflicts with the other reports. This requires coordination with authors of the other discipline reports and inclusion of references to those reports. For example, in a project where a stream side channel would be lost as a result of project construction, the water quality and quantity impact discussion might focus on increased flooding and changes in stream channel characteristics. Impacts to fisheries can be limited to a statement such as: "The potential impacts of side-channel loss on Coho are evaluated in the Fisheries Discipline Report (WSDOT, 2003b)."

VI. Environmental Consequences

A. Comparison of Alternatives

As described in the Project Area Then and Now section, the focus and level of detail provided should reflect the level of concern associated with the issue. Typically the evaluation of consequences for the first alternative is detailed. It contains information on why the issue is important, how it might affect water quality, and how it was evaluated. For example, in terms of clearing and grading, it would describe the direct relationship between the number of acres that are cleared and graded and the potential for impact to surface water. This information might be further refined to identify those cleared and graded acres that are within 100 feet of surface water, or near steep slopes. The effects associated with remaining alternatives can then be evaluated by comparing them to the first alternative, without reiterating the background information about why the issue is important. This minimizes redundancy and clarifies the comparison between alternatives. Typically short term consequences (those that occur or have the potential to occur during project construction) are addressed separately from long-term effects, for each of the project alternatives.

It is critical to clearly identify all significant project consequences. It is not appropriate to provide a paragraph of text describing the potential for effect and how it will be avoided without providing the reader with a final statement about its significance. A table, graph or list that contains all the potential consequences and their final evaluation result (i.e., significant, insignificant, discountable, minimal), or a one sentence summary statement are typical means of insuring the final effects have been identified.

B. Indirect and Cumulative Effects

Indirect and Cumulative Effects must also be addressed in this section. The following definitions should be used as a guide to defining these:

- **Indirect Effects** are caused by the proposed project, but occur later in time and are further removed in distance than Direct Effects. An indirect effect of increased stormwater runoff that is directly attributable to the increased impervious surface associated with a project, would be the eventual changes in stream channel morphology as caused by the change in flow pattern.
- **Cumulative Effects** are direct and indirect effects that result from incremental impacts of the proposed project when added to the other past, present, and foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative environmental effects of the proposed actions associated with each alternative should be addressed on a watershed basis in the context of other actions in the surrounding environment. To use the example above, even if the increase in stormwater runoff was considered to be undetectable or insignificant, the project would still contribute to the cumulative effects associated with increased impervious surface in the basin.

Two important factors to consider in determining the potential for Cumulative Effects are: the potential for future development and the type of project. In areas experiencing little growth, an individual highway project will contribute negligibly to Cumulative Effects because of the absence of other development activity. Conversely, in areas of rapid development, a highway improvement can add measurably to aggregate change leading to long-term effects. Capacity improvements, additional interchanges, and construction in a new location generally have greater potential for Cumulative Effects than upgrades of existing facilities.

C. Conservation and Mitigation

Conservation measures are required activities or standard practices that are routinely employed on WSDOT projects to avoid or minimize impacts on water quality and quantity.

These activities are often incorrectly considered mitigation measures and should be discussed separately. Some projects are recommended to summarize these required activities in the surface water discipline report, however it is not essential.

Mitigation measures must be identified for all adverse effects (both significant and non-significant). The analyst should use the following "mitigation sequence" recommended by FHWA when considering mitigation options. The sequence is:

1. Avoid the impact altogether (Conservation).
2. Minimize impacts by limiting the scale of the action (Conservation).
3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment (Mitigation).
4. Reducing or eliminating the impact over time by preservation and maintenance operations (Mitigation).
5. Compensating for the impact by replacing or providing substitute resources or environments (Mitigation).

The analyst is expected to use professional knowledge and expertise to demonstrate mitigation strategies that are based on solving project-specific impacts. Not all project effects can be fully mitigated. If no mitigation options have been identified for a specific effect, this should be stated. All relevant, reasonable mitigation measures that could improve the project should be identified, even if they are outside the jurisdiction of WSDOT. The probability of successfully implementing a mitigation measure should also be addressed in an EIS to ensure that project effects are fairly assessed.

There is often confusion over what constitutes a true mitigation measure. For example, it is tempting to describe stormwater treatment facilities as a project mitigation measure for reducing stormwater impacts. Yet these facilities are not optional; they are a required part of the project design, not mitigation measures. In order to make this distinction clear, it can be an advantage to begin the mitigation discussion with a summary of "conservation measures" included in the project design to avoid and minimize project effects. This could easily segue into a simple summary or bulleted list of the effects that remain despite the conservation measures.

General Guidance to Avoid Common Problems

Discipline report writers should be aware that:

- All WSDOT projects are required to employ an appropriate combination of approved Best Management Practices (BMPs) in accordance with WSDOT's *Highway Runoff Manual* (M31-16, June 2008) as part of their design.
- The BMPs in the *Highway Runoff Manual* constitute All Known and Reasonable Treatment (AKART) and are presumed to effectively treat runoff to meet water quality standards.
- The appropriate combination of BMPs can only be selected after adequate design information has been developed.
- The effectiveness of approved BMPs along with the maintenance needs are evaluated on a programmatic, statewide basis.
- The BMP maintenance activities are established on a programmatic basis.

It is inappropriate for Discipline Reports, which are informational documents, to include statements that could later be interpreted as design, research, or maintenance commitments. The policies governing those activities are set on a programmatic level in accordance with appropriate

permits and resources. As such, statements of the following nature that have been included in past Surface Water Discipline Studies must be avoided:

- Suggestions to evaluate the effectiveness of approved BMPs as mitigation measures.
- Suggestions to monitor the receiving waters as a mitigation measure.
- Stating the type, number, size or location of BMPs that will be employed prior to design certainty.
- Suggestions to use alternative, experimental stormwater treatment approaches.
- Setting of specific maintenance frequencies or methods.

Statements concerning stormwater facilities should primarily reference the programs or guidance documents that establish the criteria for designing and maintaining stormwater facilities and not attempt to describe facilities in detail. This approach helps maintain consistency and accurate expectations, especially when unpredictable changes in treatment facility design or policies related to stormwater are likely.