Columbia River Gorge Air Quality Project

Work Plan Addendum

July 25, 2003

Developing a Regional Air Quality Strategy for the Columbia River Gorge National Scenic Area

Note: This addendum contains proposed revisions to the scientific study program and project timing as originally described in the 2001 project Work Plan. It augments and in some cases supercedes the 2001 Work Plan.

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Thank You
To all who participated in the work plan redesign effort, and those who contributed to the original 2001 project work plan.

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The Technical Team wishes to express its gratitude to those local and national experts in air science who contributed to the technical study plan.

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Preface

July 15, 2003

The Columbia River Gorge is an area of astounding beauty and diversity, and it is home to over 70,000 residents of Oregon and Washington. The National Scenic Area Act of 1986 lays out a unique challenge. Namely, to protect and enhance the scenic, natural, cultural, and recreational resources of this National Scenic Area while at the same time supporting the local economies so vital to the area's future prosperity. Meeting these two goals is not always an easy task.

Achieving these goals will require us to look both locally and regionally at sources influencing air quality in the Gorge, and to develop an air quality strategy that closely involves stakeholders and the public. Our first step was to develop the 2001 Gorge Air Quality Project Work Plan. It provided our first "road map" of how we would approach developing an equitable air quality strategy. The unfortunate downturn in our national economy and recent reductions in state agency budgets for both Washington and Oregon require us to revise our approach to this work.

Our mission is still to develop an equitable air quality strategy for the Gorge that is consistent with both the resource and economic objectives of the National Scenic Area Act. The Gorge air quality study will focus primarily on haze (visibility) in the Scenic Area, and on those pollution sources that degrade the scenic vistas of the Gorge. Those air pollutants that degrade visibility and scenic resources can also degrade the natural, recreational, and cultural resources of the Scenic area. By working to improve visibility in the Gorge; we will both directly and indirectly benefit all the valued resources to be protected under the Scenic Area Act.

This 2003 Work Plan Addendum continues to lay out a process for increasing our scientific understanding of air quality in the Gorge and for engaging the public in the development of a regional air quality strategy. Ultimately, the Columbia Gorge Air Quality Advisory Committee will lead a public process to design an air quality strategy that helps protect valued resources in the Gorge and meets the duel purposes of the Scenic Area Act. The Columbia Gorge Commission will be asked to decide if the strategy developed through this collaborative process meets the objectives of the Gorge Management Plan and the National Scenic Area Act.

With your help, decision-makers will develop an air quality strategy based on sound science that reflects a truly collaborative approach to making decisions about the future of air quality in the Gorge.

Thank You.

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Columbia River Gorge Air Quality Project
Redesign - 2003

Section I. Background

National Scenic Area Act

The Columbia River Gorge is our nation's only National Scenic Area. The 292,500 acre Columbia River Gorge National Scenic Area (NSA) was created by act of Congress in 1986 (PL92-663, 1986). The purposes of the Act are to–

1. establish a national scenic area to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and

2. protect and support the economy of the Columbia River Gorge area by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that is consistent with paragraph (1).

Scenic Area Management Plan: Protecting Air Quality and Valued Gorge Resources.

Preserving and enhancing air quality is an integral part of protecting the scenic, cultural, natural, and recreational resources in the Gorge. In May 2000, the Columbia River Gorge Commission approved an air quality amendment to the National Scenic Area Management Plan that states:

"Air quality shall be protected and enhanced, consistent with the purposes of the Scenic Area Act. The States of Oregon and Washington shall: (1) continue to monitor air pollution and visibility levels in the Gorge; (2) conduct an analysis of monitoring and emissions data to identify all sources, both inside and outside the Scenic Area that significantly contribute to air pollution. Based on this analysis, the States shall develop and implement a regional air quality strategy to carry out the purposes of the Scenic Area Act, with the U.S. Forest Service, the Southwest Air Pollution Control Authority [now the Southwest Clean Air Agency] and in consultation with affected stakeholders. [1]

[1] Management Plan amendment language adopted by the Columbia River Gorge Commission on May 9, 2000. SMA Natural Resources Policy 12[pages I-123]

The Gorge Commission adopted the air quality language as regional policy because air quality monitoring indicates some threat to scenic, natural, cultural, and recreational resources in the Scenic Area. In adopting this policy, the Gorge Commission recognized that while a Class I[2] designation is not appropriate for the Gorge; air quality degradation can jeopardize those resources that must be protected under the National Scenic Area Act. An air quality strategy for the Gorge is therefore an important part of the Commission's overall effort to achieve the purposes of the Scenic Area Act.

The Gorge Commission has responsibility under the Scenic Area Management Plan to protect the valued Gorge resources that may be threatened by air quality degradation. It is recognized however, that the Commission itself does not have expertise in air quality issues, and that they will rely on the state air quality agencies to develop an air quality strategy for the Scenic Area.

The state air quality agencies will develop the air quality strategy through a collaborative public process. As the regional policy-making body for the Scenic Area, the Gorge Commission must also ensure that any proposed air quality strategy meets the purposes of the Scenic Area Act. Therefore, in its review of the strategy, the Gorge Commission must find that the strategy is consistent with the purposes of the Scenic Area Act.

Resource Protection

The Lead Agencies' approach to studying and protecting air quality in the Gorge will focus chiefly on visibility and the emission sources that contribute to haze in the Scenic Area. Focusing on visibility improvement in the Gorge will both directly and indirectly benefit all the valued resources to be protected under the Scenic Area Act. The main visibility impairing pollutants include sulfates, nitrates, organic and elemental carbon, and fine soil. These air pollutants not only impair visibility and degrade scenic resources in the Gorge, but can also degrade the natural, recreational, and cultural resources of the Scenic Area. These pollutants are created by a wide variety of sources (primarily combustion sources) both inside and outside the Scenic Area. An air quality strategy that reduces these pollutants will improve visibility and thereby protect air quality and other resources in the Gorge.

It should be noted that the scope and funding for this project do not allow for a comprehensive and exhaustive evaluation of all possible air pollution effects on scenic, cultural, natural, and recreational resources. For example, this study will not evaluate air pollution impacts on the full range of possible ecosystem issues, including Columbia River fisheries and native plants. However, as stated above, the agencies expect that an air quality strategy that addresses visibility and haze will also benefit broader ecosystem issues in the Gorge. In addition, there are several other air quality efforts underway, not directly associated with this project that should provide an air quality benefit to the Gorge. These include the Portland-Vancouver ozone maintenance plan, as well as state and federal programs to reduce hazardous air pollutants.

[2] A "Class-I" designation is used to identify federal wilderness areas and National Parks for visibility protection.

Cultural Resources-Native American Rock Art in the Gorge

Two key visibility impairing pollutants (sulfates and nitrates), are especially significant in the formation of acid rain and fog that may damage cultural resources, primarily Native American rock art, and natural resources (including culturally significant plants). Given the special historic and cultural value of Native American rock art in the Gorge, the Forest Service has funded an independent special study ($54,000) to sample and analyze fog and cloud water chemistry as a first step in a process for assessing potential risks to culturally significant artifacts and ecosystems in the Scenic Area.

The fog-water study will not provide a definitive assessment of the risk to rock-art or cultural resources. It is a first step, and the results can help inform decision-makers as to the next steps that could be taken to evaluate this issue. This study element is described further in the Addendum document and **Appendix A: Technical Study Plan.**

Section II: Work Plan Development: 2001 and 2003 (Scope, Progress, Funding, and Changes)

The first step for Oregon and Washington air quality agencies was to develop a Work Plan describing the scientific and public policy processes to be used in developing the Gorge air quality strategy. The Lead Agencies (Oregon Dept. of Environmental Quality, Washington Dept. of Ecology, and Southwest Clean Air Agency) began work on the Work Plan in late 2000; and after a lengthy public process, the Work Plan was presented to the Gorge Commission in August 2001.

Revised Work Plan

Good progress was made on the project in 2001-2002. The Lead Agencies began the selection of members for the project's bi-state Air Quality Advisory Committee, and funding was sought to begin the first phase of the Gorge air quality study.

In March 2002, the Lead Agencies, together with a coalition of project partners, asked the U.S. Congress for an appropriation of $1.2 million dollars to support the first phase of a multi-million dollar scientific study of Gorge air quality. Congress has provided $670,000 for that purpose.

In the last two years, national and state economic realities have changed drastically, and budget reductions have seriously reduced the availability of funding for many projects. As a result, the air quality agencies believe that significant additional funding for the Gorge project is not likely to be available in a reasonable timeframe. Therefore, the scientific study initially outlined in the 2001 work plan is being redesigned. A new study approach has been developed that will provide an initial assessment of Gorge air quality within 2-3 years. The new study takes advantage of opportunities for leveraging other technical work on the regional and national level that did not exist at the time the 2001 Work Plan was developed. Even if the current economic realities did not exist, leveraging other studies is good financial stewardship. In redesigning the study, the Lead Agencies gave the following charge to the project's technical work group:

Develop a "stand alone" study, leveraging other studies and within the available resources, that would:

a) provide an assessment of the causes of visibility impairment in the Columbia River Gorge National Scenic Area; b) identify emission source regions, emission source categories, and individual emission sources significantly contributing to visibility impairment in the Gorge; c) provide predictive modeling tools or methods that will allow the evaluation of emission reduction strategies; d) provide an initial assessment of air quality benefits to the Gorge from upcoming state and federal air quality programs; and e) refine or adapt predictive modeling tools already being developed for visibility or other air quality programs, including but not limited to Regional Haze.

Advisory Committee

State resources for supporting the Advisory Committee have also been severely curtailed. The bi-state Advisory Committee initially planned for 2003 must now be delayed until the redesigned air quality study is completed (about 2-3 years). The Lead Agencies hope to have adequate resources available in the 2005-06 timeframe to support the Advisory Committee effort. At that time, if resources are still not available for Committee support, the Lead Agencies will evaluate other options for proceeding.

Project Mission

It is important to note that the project's essential mission and scope has not changed. It is still to develop an equitable air quality strategy for the Gorge that is consistent with both the resource and economic objectives of the National Scenic Area Act. This includes evaluating emission sources from both inside and outside the Scenic Area to ensure geographic fairness.

This 2003 Addendum to the Work Plan has been developed over several months primarily by the Lead Agencies, in consultation with elected officials, stakeholder groups, tribes, and the public. The Lead Agencies hosted three public/stakeholder information sessions and requested comment on the Redesigned Technical Study. Public, stakeholder and tribal comment have been incorporated into the redesigned study plan to the greatest extent possible.

Washington State Visibility Disinvestment

Over the last four years, the state of Washington has dealt with a series of budgetary crises demanding ever-increasing resource reductions. The latest state budget forecasts predict additional significant state budgetary shortfalls for the FY 2003/05 biennium. These anticipated shortfalls necessitate elimination of various ongoing state programs including disinvestment from the state-wide visibility protection program of which the Columbia Gorge NSA Air Quality Study is a part.

This disinvestment means that, effective July 1, 2003, Ecology will no longer be able to participate as one of the Lead Agencies in the Gorge Air Quality study. Specifically, Ecology will not chair the Study's Technical/Re-design Team, operate Gorge study air quality monitoring sites, provide modelers/meteorologists and other experts for technical analysis, serve as a repository for Gorge data, provide quality control/quality assurance functions or continue to manage and participate in federal Gorge grants and related contract activities.

Many of these functions, including Ecology's participation in the management and oversight of the Gorge Air Quality Project will become the responsibilities of either the SW Clean Air Agency, Oregon Department of Environmental Quality, or others.

Key Elements Addressed in the Revised Work Plan:

As in the original Work Plan, the product of this 2003 Addendum will not be a recommended air quality strategy. The Addendum describes the process for gaining scientific knowledge about Gorge air quality, and the process to be used in making decisions about the future of air quality in the Gorge.

This Work Plan Addendum describes the revised technical study that will begin identifying emission sources, both inside and outside the Scenic Area, that significantly contribute to air pollution in the Gorge. The technical study will provide information about the physical, chemical, and cause-and-effect relationships influencing air quality and will help decision-makers make more informed choices about the future of air quality in the Gorge. This Work Plan also recognizes the role of economic analysis in developing air quality strategies. Economic and air quality analysis are used together to weigh important cost/benefit questions and develop a recommended air quality strategy that meets the dual purposes of the Scenic Area Act.

The Work Plan Addendum outlines a collaborative, public process for developing the air quality strategy. The Lead Agencies intend to convene a bi-state, Air Quality Advisory Committee to lead the strategy development process. The Committee will reflect a broad representation of interests in and around the Gorge. This decision-making process will also rely heavily on input from the public, Gorge-area tribes, and stakeholder groups.

Study Kick-Off

The air quality study's monitoring program is scheduled to begin this winter (2003/04), with subsequent study tasks conducted through approximately 2005/06. The start of the winter monitoring program is contingent on the timely availability of EPA funding and the ability to operationally deploy the monitoring equipment in the field. If logistics delay the winter 2003/04 sampling schedule, then the monitoring program will begin with the summer monitoring study scheduled for the summer of 2004. The winter monitoring program would then be conducted in the winter of 2004/05. This flexible schedule will provide initial study results to the Advisory Committee in the planned 2005-2006 timeframe.

Timing for Strategy Development and the Decision-Making Process.

Results from the upcoming technical study will be available beginning in 2-3 years (approx 2005-2006). The results will include an assessment of visibility in the Gorge and an initial identification of contributing emission sources, both inside and outside the Gorge. It will also provide some analysis tools for evaluating future air quality in the Gorge. The Advisory Committee will be convened just prior to the completion of the monitoring study so that it can begin to review initial results. Committee meetings will be open to the public. As final study results become available, the Committee will lead a public process to evaluate results and discuss options for an air quality strategy.

While the technical study proceeds, voluntary pollution prevention initiatives could be pursued. The Lead Agencies are currently working on voluntary initiatives to reduce emissions from several diesel vehicle fleets that travel in the Gorge. Unfortunately, the Lead Agencies do not have the resources at this time to lead an effort to explore additional pollution prevention opportunities.

Section III: Air Quality in The Columbia River Gorge

What We Know Now

Monitoring of visibility, air quality, and ecosystem conditions has been ongoing in the Scenic Area since 1993. Visibility has been monitored at two sites, one near the west end (Mt. Zion-since 1996), and another near the east end (Wishram-since 1993). Monitoring of ozone and acid deposition (through lichen sampling) has also occurred since 1993. We have much more to learn about air quality and its cause and effect relationships: such as understanding the complex meteorology, the physical and chemical processes, and the major source types and source regions that affect the Scenic Area.

The following are some highlights of what we know so far.

Visibility in the west end of the Scenic Area

Very small particles of sulfate in the air are the most significant contributors to visibility impairment, followed by organic carbon and nitrate. On average, visibility is worse in the summer and early fall and better in the winter, excluding natural causes such as rain, clouds, and fog. Poor summer visibility can be mostly attributed to significantly high sulfate levels. Visibility on average is worse in the west end than the east end. Much of this difference is due to the fact that the types of pollutants present in the west end, such as sulfate particles, are more efficient at impairing visibility under the higher relative humidity found there. Geographic source regions of pollutant-laden air reaching the west end in summer are generally the industrialized and populated areas west of the Cascades from Vancouver B.C. southward to Eugene, internal sources, and in rare instances, pollutant impacts from as far away as Asia have been identified.

Visibility in the east end of the Scenic Area

Very small particles of sulfate are a significant source of visibility impairment, but are not as large a contributor to impairment as in the west end. Organic carbon and nitrate are also significant contributors to impairment. On average, visibility is worse in the late fall and winter and better in the summer, excluding natural causes such as rain, clouds, and fog. This is the opposite of observed conditions at the west end of the NSA. Poor winter visibility levels can mostly be attributed to a relative increase in nitrate. Visibility on average is better in the eastern Gorge than the west end largely because of lower relative humidity.

Over the last ten years, pollutant concentrations in the Portland/Vancouver airshed have either remained about the same (e.g. ozone) or have decreased (e.g. nitrogen oxides, fine particulate, and carbon monoxide), even with the area's growth. This trend is likely to continue because of new air quality programs (regulations) currently being implemented. These programs are discussed later.

Although we have not identified specific sources that contribute to visibility impairment in the Scenic Area, we do know the types of sources on a regional basis that emit pollutants that have the ***potential*** to impair visibility. These are:

- Sulfate – from combustion of fuels containing sulfur, such as coal-fired power plants, and any form of diesel fuel and oil fired combustion.
- Nitrate – from any high temperature fuel combustion, mostly motor vehicles, also industrial boilers.
- Organic carbon – from wood burning, motor vehicles, industrial processes, restaurants, and natural sources.
- Elemental carbon – soot from wood burning and diesel engines.
- Soil – windblown dust, road dust, agricultural and construction activities.

Emission inventories of these pollutants are being completed and refined in each state. These inventories will support the initial air quality study, and later, the development of air quality strategy options. Emission inventories are being refined as part of both national programs and as part of this project. The Advisory Committee will review periodic emission inventory updates as they become available.

From the monitoring and analysis of lichen species in the Scenic Area, we know that air pollution is likely causing some level of ecosystem disturbance. Lichen species that are sensitive to sulfur pollution are largely absent in the Scenic Area and those that thrive in high nitrogen polluted conditions are abundant. This is an indicator of unnatural environmental conditions for the NSA ecosystem.

Ozone (smog) in the eastern portion of the Scenic Area has been measured at levels that are known to harm vegetation.

Meteorology and climate

The meteorology and climatic conditions in the Scenic Area and surrounding source regions are in general terms well known. However, the specific structure of the horizontal and vertical winds, associated turbulent air motions, moisture, and temperatures has not been well studied or documented. Regional and local wind patterns determine the transport and dispersion of air pollutants, while the moisture fields affect gas-to-particle conversion, particle growth, and deposition. A better understanding of these processes is important for the computer modeling simulations that would be used to identify sources and their relative contribution to air quality in the Scenic Area.

What We Don't Know:

There is much we have yet to learn about the physical and chemical process of air pollution within the Scenic Area. The topography, meteorological conditions, emission sources, and chemical transformations in and around the Scenic Area are very complex. A better understanding of these processes is necessary in order to evaluate cause-and-effect relationships between emissions and air pollution in the Gorge. Some of the key questions that need further study include better defining the contribution of emission sources from areas west and east of the Scenic Area, as well as, the contribution from sources within the Gorge. Further study is needed on the potential for ecosystem disturbance (i.e. ozone or other air pollutant impacts on trees, vegetation, and crops). Additional study is also needed on potential risks to cultural artifacts, such as Native American rock art that can be degraded by acidic aerosols.

Meteorology and other factors influencing chemical transformation within the Gorge must be better understood. It is important to better understand seasonal changes in air pollution, and to better identify the key geographic areas in the region that significantly contribute to air pollution in the Gorge. It is also necessary to better define and understand the characteristics of sulfates, nitrates, ammonia, organic and elemental carbon in the formation of visibility impairing pollutants, and the impacts from ground-level ozone within the Gorge.

Section IV: Redesign of Air Quality Study (2003)

Original 2001 Technical Study Plan

In July of 2001, The Columbia River Gorge Technical Team (Technical Team) and Interagency Coordination Team (Coordination Team), with the assistance of national and global experts in air quality science, developed a phased technical study plan for the Columbia River Gorge National Scenic Area (See "Columbia River Gorge Visibility and Air Quality Study – Working Draft: Existing Knowledge and Recommended Scientific Assessment to Consider", June 2001, Green et al). That study plan was submitted to the Columbia River Gorge Commission and approved in August of 2001.

Initial Study Approach in 2001

The initial study approach began with a Technical Foundation Study (TFS) that would begin to characterize the physical, meteorological and chemical processes governing air quality in the Scenic Area, and the development of an initial conceptual model of causes of haze and other air quality issues. The TFS was not designed to support the development of air quality strategies, but rather to guide the development of the study's second phase.

The second phase of the study was to be designed based upon what we learned in the TFS. Results of the Technical Foundation Study were to be used to verify the conceptual model of air quality, to identify contributing pollution sources and source areas, and to support the final development, testing, validation and selection of an air quality predictive model to be used later for strategy development.

The original TFS was estimated to cost about $1.8 dollars. The second phase of the technical study program was initially estimated to cost between $3 and $8 million dollars. The states had previously received approximately $600,000 for initial study work, and requested that Congress provide $1.2 million dollars to fully fund the TFS. Congress has provided an appropriation of $670,000. It should also be noted that when the $670,000 congressional appropriation is combined with previous funding, a total of $1,358,000 will have been devoted to studying air quality in the Scenic Area.

Redesigned Study (2003)

Significant progress has been made over the past several years in developing air quality data and analysis tools that can provide information about visibility in the Gorge. Many of these advancements were not available in 2001 when the initial study was conceived. They can now be used in designing the new air quality study.

Given that progress, the reduced appropriation from Congress, and the scarcity of significant additional funding, the Lead Agencies directed staff to redesign the Gorge air quality study; combining elements from both phases of the initial approach into a single core study that can begin to inform decision-makers about sources of air pollution influencing visibility in the Scenic Area.

The following is a list of what the Redesigned Study, will and will not accomplish. The new study design also allows for add-on study elements that can be conducted later (if needed and as funding is available) to clarify specific questions. **A more detailed description of the redesigned air quality study is provided in Appendix A.**

The Redesigned Study Will Provide:

1) Additional measurement data to support the development of a conceptual understanding of the causes of haze in the Gorge; (CoHaGo);

2) Additional measurement data to evaluate the predictive numerical model's ability to mimic and predict haze in the Scenic Area;

3) Additional certainty about what we know and what we do not know as a result of the CoHaGo assessment and the predictive, numerical modeling activities;

4) An assessment of what we know today (based on previous and planned additional measurements) and present this information in one clearly organized document;

5) Refine, adapt and select a predictive numerical model specifically for assessing haze conditions in the Scenic Area;

6) Modeled results for a base case; (Presumably 2004) based on two, 6-week intensives that will characterize the worst-case seasons of the year;

7) Predictive numerical model results for a future year (presumably 2018) to determine what trend, if any, is apparent for haze in the Scenic Area that can be attributed to the implementation of new state and federal programs;

8) Leveraging of current knowledge and studies;

9) A new data set from which future studies can leverage;

10) Additional measurement data that will help us understand historic trends and support models to predict future trends from either existing or new state and federal programs not yet implemented;

11) Enhanced knowledge and understanding of the complex processes that lead to the formation of haze in the Scenic Area so that informed management decisions can be made regarding any needed future measurement and modeling tasks; and

12) A better understanding of emission regions, categories and possible individual sources located both inside and outside the Scenic Area, that contribute to haze.

13) A Forest Service study to sample and analyze fog and cloud water chemistry as a first step in a process for assessing potential risks to culturally significant artifacts and ecosystems in the Scenic Area;

The Redesigned Study Will Not Provide:

1) The complete suite of measurements that were envisioned under the original study plan;

2) The temporal (time) and spatial (space) resolutions that are necessary to achieve the same degree of confidence anticipated in the original study plan;

3) The fog-water study will not provide a definitive assessment of the risk to rock-art or cultural resources. It is a first step, and the results can help inform decision-makers as to the next steps that could be taken to evaluate this issue.

4) The generation of a complete set of meteorological data for the Scenic Area for use in validating the meteorological model. The Redesigned Study relies on the ability of the meteorological model (MM5) to accurately simulate wind fields with less data than would have been generated by the original study plan;

5) A full year of analysis via the predictive numerical model; instead, it will use two, seasonal intensive 6-week periods (summer and winter) that represent the two worst periods of the year; and

6) An assessment of the impacts or benefits from additional emission reduction strategies beyond those existing, but not yet fully implemented, state and federal programs.

Section V: Project Management Activities

The technical work plan will be managed by the Southwest Clean Air Agency (SWCAA). SWCAA will serve as the grant administrator for this study, and provide management oversight. SWCAA and Oregon DEQ will host meetings when necessary and will also make arrangements for meetings, as necessary, at remote locations including holding public meetings and updates as requested by the Gorge Commission.

Section VI: Project Reports

Reports will be provided for several of the activities described in the redesigned technical study plan. At a minimum, these will include:

- The Causes of Haze Assessment (CoHaGo) (prepared by contractor).
- Data reports on an annual or episode basis depending on the sampling method.
- Detailed modeling protocol document for CMAQ and PMCAMx (prepared by Technical Team).
- CMAQ modeling results for base year and out year and sensitivity analysis (prepared by contractor).
- PMCAMx modeling results for base year and out year and sensitivity analysis (prepared by contractor).
- Outside comment and peer review of each of the modeling analysis (prepared by contractors).
- Summary Report and Management Recommendations to Gorge Commission annually and at project end (prepared by Technical Team).

These reports will be available as portions of the study program conclude (2004-2006 timeframe).

Section VII: Decision-Making: Using the Study Results

The redesigned study will not be as comprehensive as the initial technical program outlined in 2001, and will not provide the same level of certainty. It will however, when combined with previous Gorge air quality studies, and parallel processes, provide a significant amount of information regarding the emission source regions, source categories, and (potentially) individual sources that significantly contribute to air quality degradation in the Gorge.

It is recognized that the redesigned technical study will not provide answers to all possible questions about air quality in the Gorge. Additional follow-up study may be needed to better answer specific questions. Nonetheless, the Lead Agencies believe the new study will allow decision-makers to:

1. Gain a good understanding of the physical and chemical processes that influence air quality in the Gorge.
2. Draw reasonable conclusions about many (but likely not all) emission source regions, categories, and individual sources affecting the Scenic Area.
3. Evaluate the air quality benefit that is expected from existing state and federal air quality programs.
4. Conduct a discussion among the Advisory Committee, elected officials, tribes, stakeholders groups, and the public as to whether any additional emission reduction measures (beyond those already anticipated) might be desired to further protect and improve Gorge air quality.

The study is designed to give the Advisory Committee and others sufficient information to begin their evaluation of Gorge air quality, and identify any additional study that may be needed.

Setting an Air Quality Goal

The first use of the redesigned technical study will be an evaluation of the air quality benefit to the Gorge expected from existing state and federal programs that will phase in over the next several years. **These programs are listed in Appendix B**. The Advisory Committee, elected officials, tribes, stakeholder groups and the public will evaluate the predicted benefit of these programs and discuss whether any additional emission reduction strategies are desired. Initial results of the redesigned study will become available in the 2005-2006 timeframe.

If additional air quality improvement is desired, the Advisory Committee will lead a public process to agree on an air quality goal for the Scenic Area and evaluate options for developing the most equitable and cost effective strategy for meeting that goal. Additional measures, if needed, could range from voluntary efforts to state or local requirements; and could phase-in under various timeframes. Significantly contributing emission sources that are clearly identified through the 2003-2005 study could be addressed at that time. Other sources that are suspected contributors to Gorge air quality

could be studied further, if necessary, and addressed after their contribution has been clarified.

Advisory Committee First Steps

Before evaluating study results, one of the Advisory Committee's first steps will be to develop a set of rules by which the Committee can operate effectively. This includes agreeing on a set of collaboration principles that will govern decision-making. The Committee must also go through a learning process to become familiar with the complex issues governing air quality and visibility. **Appendix C** includes a more detailed description of the proposed Advisory Committee structure, and the collaborative public process to be used in decision-making.

Coordinated Implementation

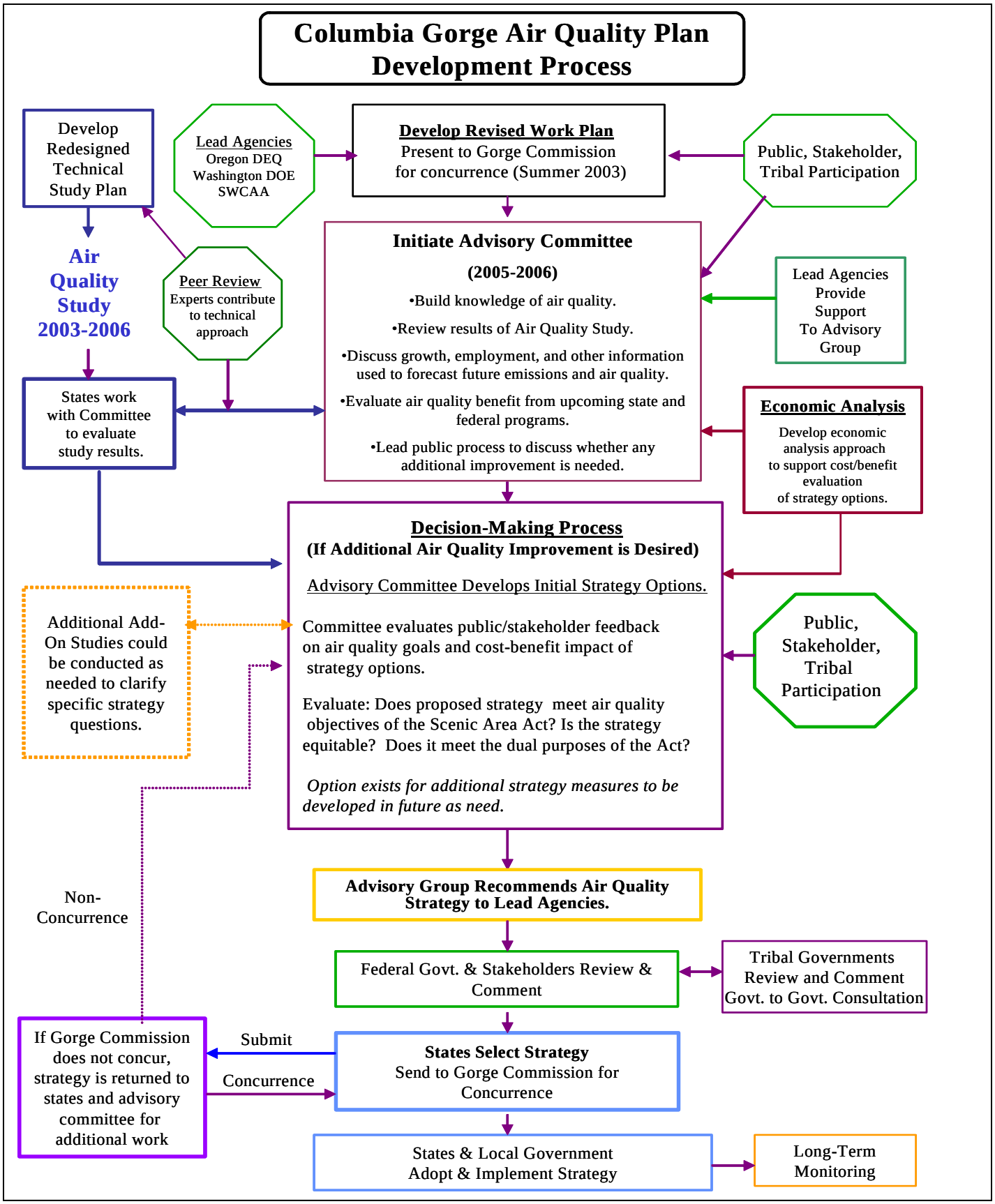
The states have experience in coordinating with various agencies and local governments to achieve concurrent adoption of an integrated, bi-state air quality plan. This means that emission reduction measures, whether they are for sources inside or outside the Scenic Area, could move forward toward adoption and implementation on the same schedule regardless of location. It would not be equitable to proceed with measures for the Scenic Area while needed measures affecting sources outside the Gorge fail to move forward. The Advisory Committee will however have the flexibility to develop a strategy using a phased approach, adopting and implementing some measures early, and others at a later date as needed. The Committee will carefully consider questions of geographic fairness when developing a comprehensive strategy for the Scenic Area.

Each emission reduction strategy may have differing phase–in schedules depending on cost and complexity. For example, some measures such as local ordinances or improvements to the state's prescribed forestry smoke management plan could proceed rapidly. Other strategies could be phased in on a multi-year schedule due to cost and other factors. The final recommended air quality strategy will describe the various timelines for implementing individual emission reduction measures.

Continued Study of Gorge Air Quality

Monitoring and study of air quality in the Gorge will continue during and after implementation of the regional strategy. Air quality trends in the National Scenic Area (NSA) will be tracked to ensure that improvement is made as expected.

Overview of Project Relationships



Appendix A

Redesigned Air Quality Study Program

Appendix B

Upcoming State and Federal Air Quality Programs

The Advisory Committee will evaluate air quality improvement in the Gorge that can be expected from existing state and federal programs such as new federal emission standards for cars and trucks, as well as information from prior studies relevant to air quality in the Gorge. Some of the existing programs from which information will be evaluated include:

1. Regional Haze Program: The Gorge will likely benefit from the federal Regional Haze Program designed to improve air quality in Class I areas (Mt. Hood, Mt. Adams).

2. Ozone Strategies: Ozone plan updates for Portland/Vancouver and Seattle.

3. New Source Review: New or expanding major point sources must evaluate air quality impacts on Class I areas. Given the Gorge's proximity to the adjacent Class I areas, the Gorge NSA will benefit indirectly from the New Source Review program.

4. National Programs for On-Road Mobile Sources & Heavy Duty Diesel Vehicles & Engines. Emission standards (new tail pipe standards for vehicles and light duty trucks, low sulfur gasoline, low sulfur diesel fuel, heavy duty diesel vehicle standards, non-road diesels).

5. National Programs: Nonroad Engines, including new standards for trains & marine vessels.

6. National Air Toxics Emission Standards: Maximum Achievable Control Technology Standards for some major point sources (Air Toxics Rules).

7. Washington's RACT for the Centralia Coal Fired Power Plant with the full sulfur dioxide scrubbing that is online as of December 31, 2002.

8. Oregon and Washington Smoke Management Programs: Designed to reduce smoke impacts from prescribed forestry burning.

9. Washington's Yakima Maintenance Plan status for Carbon Monoxide (CO) and Particulate Matter – Coarse Particles (PM10) and Wallula's non-attainment status for PM10.

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Appendix C

Columbia Gorge Air Quality Advisory Committee

Collaboration Principles: Initial Draft for Committee Review

For any complex collaborative process, the participants should agree on the procedures to govern decision-making. Such agreement increases success and decreases meeting time by assuring a good faith process that explores competing needs and fashions equitable, practical, and durable solutions. This section contains a framework for a collaboration process that could be used by the Columbia River Gorge Air Quality Advisory Committee. A final collaboration principles document will be developed by the Committee, in collaboration with the Lead Agencies and an independent facilitator.

I. Process Scope and Advisory Committee Charge

A. Scope: In order to protect and enhance the scenic, natural, recreational, and cultural resources of the Gorge, the Advisory Committee must first understand the air pollution characteristics that may threaten those resources. The committee will be briefed on the study and characterization of air quality and the identification of air pollution sources, both inside and outside of the Gorge NSA, that significantly impact the Gorge. The committee will review the results of the air quality study with air scientists and discuss the strengths and limitation of study results, the ability to draw conclusions from those results¸ and help identify any additional follow-up study that may be needed.

B. Charge: The Advisory Committee will evaluate the air quality benefit expected from existing state and federal programs that are scheduled to phase in over the next several years. (See Appendix C)

The Committee will lead a public process to: (1) evaluate the need to improve air quality further (beyond upcoming state and federal programs), (2) if further improvement is desired, establish the level of improvement to be achieved and in what timeframe; (3) develop strategy options (both short and long term) as needed to provide the desired improvement; and (4) evaluate the results of economic analysis and weigh cost-benefit questions if additional strategy options are desired.

The Advisory Committee will (as needed) make recommendations for air quality strategies to the Lead Agencies. Committee recommendations can be developed over time as information becomes available. The ultimate objective is to build a comprehensive regional air quality strategy that meets the objectives of the Scenic Area Act.

II. Advisory Committee Membership and Public Involvement

A. Members: The Advisory Committee has broad representation reflecting the many diverse interests in the Gorge NSA and those who may be impacted by decisions made in developing the regional strategy. The challenge of developing any broad-based advisory group is in having a representative cross section of interests while keeping the group to a size that can function effectively. The Advisory Committee membership was developed after reviewing public and stakeholder comment in 2001, and includes representatives from each Gorge area county, local and regional business interests, environmental interests, tourism, economic development, agriculture, transportation, recreation, ports, Gorge-area tribes, US Forest Service, US Environmental Protection Agency, and the public. The list of committee seats is described in more detail in the 2001 work plan.

B. Lead Agencies and Their Role: The Lead Agencies will be non-voting members of the Advisory Committee. The Southwest Clean Air Agency (SWCAA), based in Vancouver, Washington is responsible for enforcing federal, state, and local outdoor air quality standards and regulations in Clark, Cowlitz, Lewis, Skamania, and Wahkiakum counties of southwest Washington State. The Lead Agencies will rely heavily on the U.S. Forest Service's expertise and perspective. They will also work closely with the EPA to ensure consistency between the Gorge Act and the Clean Air Act. Additionally, the Oregon Department of Community and Economic Development and the Washington Office of Trade and Economic Development will help evaluate economic factors when considering options for air quality strategies. Finally, the Gorge Commission staff will also be a resource to answer questions regarding the Gorge Act and Gorge Management Plan.

C. Advisory Committee Alternates: Advisory Committee members may select and formally designate one delegate to be their exclusive alternate for the entire process. A member unable to attend an Advisory Committee meeting may give full and complete authority to his or her exclusive alternate. That alternate may then sit at the table, participate fully, and vote on all issues consistent with the authority granted by the designating Advisory Committee member.

D. Loss of Member: If the Advisory Committee loses a member, the Lead Agencies will appoint a substitute Member from the same general interest group as the original Member. The votes of the substituted Advisory Committee Member(s) will be effective from the day of his or her appointment, and a substituted Advisory Committee Member will not be able to vote retroactively.

E. Work Groups: The Advisory Committee will need to evaluate many complex issues. It will have the option to form Work Groups as needed to focus on specific issues and ideas, and bring back recommendations to the full Advisory Committee. This allows stakeholders with expertise in certain fields to focus intensely on a complex question or issue. Work Groups are open to any Advisory Committee member or the member's alternate, and other individuals the Advisory Committee believes would enhance the functioning of a Work Group. All Advisory Committee members will be notified of all

Work Group meetings. These Work Group meetings or informal meetings between Advisory Committee members and/or their staff are not a substitute for the full exploration of topics at formal Advisory Committee meetings. The full Advisory Committee provides the integrating structure where issues and ideas can be understood in context.

F. Public Involvement: The Advisory Committee members recognize that their actions will impact the lives of citizens and businesses. To ensure success in developing a balanced recommendation, it is vital that all groups have opportunities to interact with the Advisory Committee. As a result, the Advisory Committee will utilize a public involvement program. The tools being considered by the Lead Agencies for communicating with the public and stakeholder groups include: (a) working with local and regional media; (b) special publications; (c) public workshops; (d) town meetings; (e) constituent and public focus groups; (f) surveys; (g) individual meetings with stakeholder groups; (h) discussions with civic organizations; and (i) the Project web site at: www.gorgeair.org.

IV. The Advisory Committee Process Work Plan

A. Preliminary Work: The Advisory Committee will have several issues to address during the first months of the process. These include:

1. Education: The states will work with the Advisory Committee to develop a common understanding of air quality issues in the Gorge. There will be a process Glossary. During this process, the Committee will discuss the air quality study results and the role of scientific "confidence" in making good public policy decisions.

2. Problem, Vision and Values Statement: The Advisory Committee will create a Problem, Vision and Values Statement to guide its work.

3. Review Air Quality Study: The Advisory Committee will review the air quality study results as they become available.

4. Pollution Prevention Opportunities: The two states will not impose interim regulations solely targeted to sources in the Gorge during the Advisory Committee process. Because the air quality study will take several years to complete, the Advisory Committee may evaluate possible opportunities that could be taken quickly to reduce emissions believed to impact the Gorge. Existing air quality data and early results from the air quality study also may be useful in evaluating candidate emission sources for voluntary pollution prevention measures.

5. Growth and Change: The Advisory Committee will assist the states in reviewing expectations for future growth and change in the Gorge and in the Region. This will include developing forecasts for population and employment.

B. Air Quality Goal*:* The first outcome of the redesigned study will be an evaluation of the air quality benefit to the Gorge expected from existing state and federal programs that will phase in over the next several years. These programs are listed in Appendix C. The Advisory Committee, elected officials, tribes, stakeholder groups and the public will evaluate the predicted benefit of these programs and discuss whether any additional emission reduction strategies are desired. Initial results of the redesigned study will become available in the 2005-2006 timeframe.

If additional air quality improvement is desired, the Advisory Committee will lead a public process to agree on an air quality goal for the Scenic Area and evaluate options for developing the most equitable and cost effective strategy for meeting that goal. Additional measures, if needed, could range from voluntary efforts to state or local requirements; and could phase-in under various timeframes.

The Advisory Committee will have the flexibility to develop a strategy using a phased approach; adopting and implementing some measures early, and others later, as needed. The Advisory Committee will carefully consider questions of geographic fairness when developing a comprehensive strategy for the Gorge.

V. Collaboration Protocols:

A. Participation: Each Advisory Committee member will make a good faith effort to attend each meeting, and at a minimum, have her or his alternate attend.

B. Good Faith: Good faith is defined by the process participants' agreement, among other things, to: 1) Only make promises they can keep; 2) Accurately summarize the Advisory Committee process and meetings; 3) Act consistently during the process and in other forums; 4) Exchange information; 5) Achieve external political support, without "end runs" around the Advisory Committee process to achieve partisan changes; 6) Not attempt to affect a different outcome once the Advisory Committee has reached a consensus recommendation; and 7) Follow the Meeting Ground Rules.

C. Information Exchange: Advisory Committee members will provide information as much in advance as possible of the meeting at which such information is used. The members also agree to share all relevant information with each other to the maximum extent possible. If a member believes the relevant information is proprietary in nature, the member will provide a general description of the information and the reason for not providing it.

D. Quorum: A quorum is a simple majority of members or their alternates.

E. Open Meetings: Advisory Committee meetings are open to the public and will be held in locations inside and outside the Gorge, pursuant to public notices provided by the Lead Agencies.

F. Public Comment: A period for public comment for non-Advisory Committee members will be provided at the beginning or end of every meeting. Speakers will be

limited to 1-2 minutes each to allow sufficient time to conduct the Advisory Committee business. Citizens who wish to submit comments are also encouraged to communicate directly with an Advisory Committee member or to communicate by submitting written comments to process facilitator.

G. Meeting Agendas: The Lead Agencies will develop Working Agendas in consultation with the facilitator and committee chair(s).

H. Meeting Ground Rules: The Advisory Committee members will: 1) Participate fully and in Good Faith; 2) Comment constructively and specifically; 3) Allow one person to speak at a time; 4) Address issues without personal criticism; 5) Explore all options with an open mind; 6) Strive for consensus; 7) Agree to set aside the required time; 8) Achieve closure on issues as they are processed; and 9) Consult regularly with constituencies and provide their input.

I. Caucus: When necessary and appropriate, Advisory Committee members may request a break during meetings for a reasonable period of time to meet with other members. Additionally, there may be informal meetings of members and/or their staff between formal Advisory Committee meetings to exchange perspectives and develop the groundwork for future consensus. These conversations are not a substitute for full exploration and transparent decision-making at the formal, public Advisory Committee meetings.

J. Communications Outside the Advisory Committee: While free to communicate with the media and others, Advisory Committee members recognize that the collaborative process is enhanced when they raise all of their ideas and concerns, especially those being raised for the first time, at a formal Advisory Committee meeting. Additionally, members recognize that the way in which positions are publicly represented may affect the ability of the Advisory Committee to achieve consensus. Therefore, whenever reasonable, members will refer press, constituent and other inquiries to the Lead Agencies or the Facilitator. Finally, each Advisory Committee member agrees not to knowingly mischaracterize the views of any member, group, or the Advisory Committee as a whole. It is often advisable to simply refer others to: www.gorgeair.org.

K. Meeting Summaries: Lead Agency staff will prepare Advisory Committee meeting summaries. They will be provided in draft form to the Advisory Committee for correction and comment. The meeting summaries will be posted on the Project website at: www.gorgeair.org.

L. Public Records: Advisory Committee records, such as formal documents, discussion drafts, transcripts, meeting summaries, and exhibits are public records. Advisory Committee communications are not confidential and may be disclosed. However, the private documents of individual Advisory Committee members and the Facilitator are not considered public records.

M. Process Conclusion: The Advisory Committee process will conclude with submission of its recommendations, when necessary funding and resources are no longer

available, or at such time as the Lead Agencies determine it is unlikely the Advisory Committee will fulfill its Charge.

VI. Decision-Making Process

A. Developing Recommendations: The Facilitator will assist the Advisory Committee in identifying objectives, addressing the diversity of perspectives and developing substantive, practical recommendations to implement its Charge. The Facilitator will use a Discussion Draft process and a Consensus Decision-Making model to assist the Advisory Committee. Recommendations will be appropriately noted as either: "Working Draft," "Draft," or "Final" as they evolve throughout the process. The Advisory Committee may decide to make its recommendations as a "package" where nothing is "final" until all of the strategy elements have been agreed to in principle and then a collaborative discussion takes place to finalize the entire recommendation.

B. Discussion Draft: A Discussion Draft provides an opportunity for many parties to collaborate in drafting a single document. The process will allow the Advisory Committee to evaluate existing draft recommendations and propose changes. Advisory Committee members will have the opportunity to respond to each portion of the Discussion Draft with the goal of achieving consensus on the final recommendations.

C. Consensus Decision-Making Model: Consensus decision-making is a process that allows Advisory Committee members to distinguish underlying values and concerns from stated positions, in hopes of developing widely accepted solutions. The process requires that all participants commit to work in Good Faith toward consensus recommendations. Consensus does not mean 100% agreement on each part of every issue, but rather support for a decision, "taken as a whole." This means that a member may vote to support a consensus proposal even though they would prefer to have it modified in some manner in order to give it their support. Consensus is reached if all members at the table support an idea or can say: "I can live with that."

D. Representative Voting: Members agree to work toward fair, practical and durable recommendations that reflect the diverse interests of the Advisory Committee members and the public. Each Advisory Committee Member will have one vote except those non-voting members noted above. A vote represents that the member will recommend to his or her government, organization or group that they should support or oppose the voted-upon proposal consistent with the member's vote. The names of those voting in favor and those voting against a proposal will be noted.

E. Cooling-Off Period: If consensus cannot be reached, the Facilitator may table the issue for additional discussion with constituencies, the gathering of new information, or perhaps just sufficient time to consider options more carefully. The Advisory Committee will then revisit the issue.

F. No Consensus – Majority View – Lead Agency Resolution: The Advisory Committee will go to great lengths to make decisions through consensus. However, if it cannot reach consensus on an issue, the votes of those present at the meeting will be recorded as a

majority - minority vote. The proposed language supported by the majority will be noted as such and incorporated into the then current Discussion Draft. Members voting in the minority will have the opportunity to have their proposed language noted in the record or in the "Minority Report". The Facilitator will then document the issue, the differences of opinion involved, and submit the issue to the Oregon DEQ, the Washington DOE, and the SWCAA for resolution. In resolving any such issue, the Lead Agencies will consult with the U.S. Forest Service, and the Oregon and Washington Economic Development Agencies.

G. Guiding Principles for Lead Agency Action: While the Advisory Committee may not be able to agree on resolution of the issue itself (failure to reach consensus), its members may reach agreement on some basic Guiding Principles to be used by the Lead Agencies in resolving the issue. These Guiding Principles will reflect the key values and priorities expressed in the Advisory Committee's Problem, Vision and Values Statement. Any resolution of a contested issue by the three Lead Agencies will reflect the expressed Guiding Principles of the Advisory Committee to the greatest extent possible, consistent with their statutory charges.

VII. Government Concurrence with Advisory Committee Recommendations

A. Lead Agencies: ODEQ, WDOE and SWCAA will work with the Advisory Committee during the process to develop a strategy based on sound science that meets the purposes of the Gorge Act. These three Lead Agencies will then make an initial assessment as to whether an Advisory Committee recommendation meets the purposes of the Gorge Act. The Lead Agencies will place great weight on a consensus recommendation developed through this collaborative process. Barring any clear conflict with the Gorge Act or the federal and state Clean Air Acts, the Lead Agencies will accept the consensus recommendation of the Advisory Committee. The Lead Agencies will give less deference to recommendations that receive a Majority Vote.

B. Gorge Commission: The Gorge Commission will rely on the Lead Agencies to develop an air quality strategy for the Gorge. However, as the regional policy-making body for the Gorge NSA, the Gorge Commission must concur that any proposed air quality strategy meets the purposes of the Gorge Act and the Gorge Management Plan. The Gorge Commission and the U.S. Forest Service will also exercise their responsibilities for consultation with Gorge area Indian Nations. See, 16 USC 544d(e).

If the Gorge Commission concurs with the proposed air quality strategy, the strategy will be taken forward by the Lead Agencies for implementation. If the Gorge Commission fails to concur, finding the proposed strategy does not meet the Scenic Act's purposes, the Gorge Commission will send the strategy back to the Lead Agencies and the Advisory Committee for further work. The Gorge Commission will provide a clear explanation of where it believes the air quality strategy is deficient in meeting the purposes of the Gorge Act.

VIII. Coordinated Implementation and Monitoring

A. Implementation: Once the Gorge Commission concurs with the recommended air quality strategy, the Lead Agencies, together with local governments as needed, will move forward to implement the strategy, which may include a phase-in approach. Federal agencies will implement strategies, as needed, on federal lands. The final air quality strategy may include a combination of mandatory and voluntary measures, along with regulation of emission sources, both inside and outside the NSA. It may also rely on state rules, local ordinances and existing federal programs.

B. Monitoring: Monitoring and study of air quality in the Gorge will continue during and after implementation of the Gorge air quality strategy. Air quality trends in the Gorge will be tracked to ensure anticipated results. Progress towards the air quality goal will be checked at periodic intervals of approximately every 3 to 5 years. If the acceptable rate of progress is not achieved, then intensified modeling and monitoring may be necessary to ascertain why the strategy is not achieving reasonable progress. This, in turn, could lead to the development of new or modified strategies.

IX. Role of a Facilitator

The Lead Agencies envision using a third-party facilitator to help guide the committee process. As a neutral collaborative process provider, the facilitator will not act as an advocate on any substantive issue for anyone. However, the facilitator may propose substantive suggestions for Advisory Committee consideration. Committee members will be encouraged to communicate information or concerns to the facilitator. The Facilitator may have non-confidential, informal communications and perform facilitation activities with staff and committee members, between and during meetings. The facilitator will address situations where it appears a participant is not acting according to these Collaboration Principles and will advise the Lead Agencies if it appears probable that the Advisory Committee will be unable to fulfill its Charge.

The Facilitator shall lead an Advisory Committee discussion designed to reach a consensus on any process dispute surrounding these Collaboration Principles.

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