

Topic Options for Council / AQMS / HES / EES Review

May 26, 2006 – REVISION A

The Project Team working on the second prospective 812 study currently faces several important methodological choices for which Council and Council subcommittee advice would be helpful. In addition, several issues being confronted in the 812 study are also relevant for current rulemaking analyses, including the critically important ozone and PM NAAQS Regulatory Impact Analyses (RIAs).

The purpose of this document is to propose a set of topics for which a meeting of the Council and selected subcommittees could provide timely advice in support of the 812 study and/or current RIAs.

The remainder of this document presents brief summaries of each of the analytical issues for which Council advice is sought. These topic summaries include a definition of the problem, key considerations, relevant analyses and schedules, suggested Council panels, review objectives, and suggested options for the timing of Council review.

A table is also presented at the end which tallies potential review topics by panel.

Topic #1

Topic Title	812 Study Core Scenarios Emissions Report
Problem Definition	<p>A draft report documenting the methodologies and results of the core with-CAAA90 and without-CAAA90 scenario emissions inventories has been essentially completed (though work continues on identifying some additional reductions from local controls pursuant to the 8-hour ozone NAAQS implementation and PM2.5 NAAQS implementation).</p> <p>The Project Team plans to initiate the air quality modeling step for the core scenarios in August, following completion of the additional reductions achieved by the two aforementioned programs. Review of the core scenarios draft emissions report will help identify any issues which need to be addressed before resources are expended to complete the emissions inventories and air quality model runs for the full suite of scenarios (including the major sector disaggregation and the high / low growth cases).</p> <p>A particular subtopic for which Council and AQMS advice would be helpful is the year 2000 emissions reductions from electric generating units (EGUs). Unlike the first prospective study, the new 812 analysis has the year 2000 as an historical target year. The IPM model used by EPA to model the EGU sector is configured as a forecast tool and is not configured for backcasting. The Project Team chose to adapt some existing model validation runs for the year 2001 to provide the foundation for the required with-CAAA90 and without-CAAA90 differential cases. However, the results appear anomalous, likely due to the model adaptation imposing constraints on scenario differences in capital investment and allowance banking. The Project Team is now exploring an alternative approach using historical EGU analysis by Denny Ellerman of MIT. The Project Team seeks advice from the Council and AQMS regarding the relative merits of these two alternative approaches for estimating emissions inventories for the year 2000.</p>
Key Considerations	<ul style="list-style-type: none"> In addition to using the draft emissions report as the basis for the emissions chapter and appendix for the 812 report, the Project Team intends to publish the draft emissions report as a freestanding document and data set which may be used by others for research and analysis purposes. The sooner these data are reviewed and made available, the more valuable they will be to researchers, decisionmakers, and the public. Although advances have been made in reduced form, reduced cost air quality simulation using the new Response Surface Models (RSMs), the Project Team plans to use the full CMAQ for the core scenarios. CMAQ is still expensive, especially when using a 12km grid resolution.
Relevant Analyses	812 Prospective II
Schedule	<ul style="list-style-type: none"> The core scenario air quality model runs are scheduled to begin in August. Publication of the draft emissions report is scheduled for September / October.
Review Panel(s)	<ol style="list-style-type: none"> Council AQMS
Review Objective(s)	Complete review of the draft emissions report so EPA may publish it in September / October as a freestanding, peer-reviewed analysis of the emissions changes attributable to the 1990 Clean Air Act Amendments
Review Options	<p><u>Option #1:</u> Council and AQMS conduct joint review in the July-September timeframe.</p> <p><u>Option #2:</u> AQMS conducts review of emissions report in July and provides its advice to the Council in time for the Council to conduct a simultaneous review of the emissions and direct costs reports in September (see Topic Option #3 re direct cost report).</p> <p><u>Option #3:</u> Council and AQMS defer review until after the full set of benefit and cost analysis components are completed.</p>

Topic #2

Topic Title	Design of 812 Study local control measures
Problem Definition	<p>As noted above under Topic #1, the core scenarios emissions inventories are largely complete. A key component of the costs and emissions reductions achieved by Title I programs include local measures required to attain the NAAQS where federal program reductions are insufficient to achieve attainment. These local measures are typically more variable in scope, cost, and reductions achieved than are federal measures. EPA seeks Council advice on three particular issues regarding the specification, variability and uncertainty associated with these local measures and their effects:</p> <ol style="list-style-type: none"> 1. estimating cost-effectiveness of unidentified measures, particularly the reasonableness of assuming a cost-effectiveness cap where a given area may need to rely on unidentified measures for some of the reductions required to attain, 2. estimating costs and emissions reductions when local implementation of a given program may vary significantly, such as Inspection and Maintenance (I/M) programs, and 3. the appropriateness of constraining options for local measures when sources are already subject to federal requirements, such as assuming electric generating units (EGUs) subject to the Clean Air Interstate Rule or CAIR are off-limits for further local controls.
Key Considerations	<ul style="list-style-type: none"> • For costing unidentified measures, the prior 812 study assumed that unidentified VOC control measures would cost no more than \$10,000 per ton on the premises that (a) the unidentified measures were at the margin of attainment strategies and options for marginal controls would likely become more numerous and cheaper by the time distant attainment dates were reached and (b) it was considered unlikely that measures costing more than \$10,000 per ton VOC could and would be adopted by local authorities. • With respect to constraining options for local measures, EPA decided in the draft PM NAAQS RIA to assume EGU controls beyond CAIR would not or could not be adopted even if they were more cost-effective than other local measures. It is unclear to the 812 Project Team whether it is appropriate to use a paradigm other than cost-minimization for modeling local attainment strategies in the 812 study.
Relevant Analyses	812 Prospective II
Schedule	<ul style="list-style-type: none"> • As discussed under Topics #1 and #3, EPA would like to publish the draft emissions and direct cost reports in September / October.
Review Panel(s)	<ol style="list-style-type: none"> 1. Council 2. AQMS (to provide any input needed on local measures)
Review Options	<p><u>Option #1:</u> Council and AQMS conduct joint review in the July-September timeframe.</p> <p><u>Option #2:</u> AQMS conducts review in July and provides its advice to the Council in time for the Council to conduct a simultaneous review of the emissions and direct cost reports in September.</p> <p><u>Option #3:</u> Council and AQMS defer review until after the full set of benefit and cost analysis components are completed.</p>

Topic #3

Topic Title	812 Study Core Scenarios Direct Cost Report
Problem Definition	<p>A draft report documenting the methodologies and results of the core with-CAAA90 and without-CAAA90 direct cost estimates will be largely completed by July, and is expected to be fully completed and documented in August. The Project Team proposes to issue a draft direct cost report simultaneously with the draft emissions report for the core scenarios. Review of the core scenarios draft direct cost report will help identify any issues pertaining to the sector-specific model runs before resources are expended to complete the air quality model runs for the full suite of scenarios.</p> <p>A specific subtopic for which Council advice would be helpful is the year 2000 cost estimates for EGUs. (See related subtopic under Topic #1 above). Unlike the first prospective study, the new 812 analysis has the year 2000 as an historical target year. The IPM model used by EPA to model the EGU sector is configured as a forecast tool and is not configured for backcasting. The Project Team chose to adapt some existing model validation runs for the year 2001 to provide the foundation for the required with-CAAA90 and without-CAAA90 differential cases. However, the results appear anomalous, likely due to the model adaptation imposing constraints on scenario differences in capital investment and allowance banking. The Project Team is now exploring an alternative approach using historical EGU analysis by Denny Ellerman of MIT. The Project Team seeks advice from the Council regarding the relative merits of these two alternative approaches for estimating EGU costs for the year 2000.</p>
Key Considerations	<ul style="list-style-type: none"> In addition to using the draft cost report as the basis for the relevant chapter and appendix of the 812 report, the Project Team intends to publish the draft cost report as a freestanding document and data set which may be used by others for research and analysis purposes. The sooner these data are reviewed and made available, the more valuable they will be to researchers, decisionmakers, and the public. The emissions inventory and direct cost reports are closely linked because the same sector models are generally used to estimate both emissions changes and direct compliance costs (e.g., IPM for EGUs). Simultaneous review of the emissions and direct cost reports would be the most effective way to ensure all potentially relevant issues with the sector model runs are identified.
Relevant Analyses	812 Prospective II
Schedule	<ul style="list-style-type: none"> The core scenario air quality model runs are scheduled to begin in August. Publication of the draft direct cost report is scheduled for September / October.
Review Panel(s)	1. Council
Review Objective(s)	Complete review of the draft direct cost report so EPA may publish it September / October as a freestanding, peer-reviewed analysis of the direct compliance costs attributable to the 1990 Clean Air Act Amendments, to be issued simultaneously with the draft emissions report.
Review Options	<p><u>Option #1:</u> Council conducts review in the July-September timeframe.</p> <p><u>Option #2:</u> Council reviews the draft direct cost report in September as part of a simultaneous review of the emissions and direct costs reports.</p> <p><u>Option #3:</u> Council defers review until after the full set of benefit and cost analysis components are completed.</p>

Topic #4

Topic Title	812 Study Uncertainty Analysis Plan Update
Problem Definition	<p>The 2003 analytical blueprint described the proposed concepts and general plans for uncertainty analysis in the second prospective study. However, the blueprint did not provide a detailed plan describing the specific analyses and approaches which would be used for each of the key uncertainties to be addressed in the study. Two of the more important uncertainty analyses being planned are:</p> <p>(a) an integrated sensitivity analysis assessing the potential significance of uncertainty in the emissions and air quality modeling steps, and</p> <p>(b) a sensitivity analysis examining the potential significance of differential toxicity among the various components of PM2.5.</p> <p>Advice from the Council and relevant subcommittees on the plans for these analyses would help the Project Team optimize the analyses to be most useful to researchers, decisionmakers, and the public.</p>
Key Considerations	<ul style="list-style-type: none"> The GAO is currently auditing EPA's progress in implementing the recommendations of the NRC 2002 report, and plans to issue their report later this year. EPA has been working to meet the NRC recommendations on emissions and air quality modeling uncertainty as well as differential toxicity. Council review of the sensitivity analyses planned for these areas would both improve the analyses and further document EPA's progress in meeting the NRC recommendations.
Relevant Analyses	812 Prospective II
Schedule	<ul style="list-style-type: none"> An updated version of the September 2004 emissions and air quality sensitivity analysis strategy memo will be delivered to EPA no later than July. A strategy memo proposing the approach for analyzing differential toxicity of PM2.5 components will be delivered to EPA no later than July.
Review Panel(s)	<ol style="list-style-type: none"> Council AQMS (for emissions and air quality analysis) HES (for differential toxicity analysis)
Review Objective(s)	Complete review of the detailed uncertainty analysis plans so EPA may initiate some of the uncertainty analysis work during the current fiscal year, and complete the two key, critical path sensitivity analyses early in FY07.
Review Options	<p><u>Option #1:</u> Council and subcommittees conduct review in the July-September timeframe.</p> <p><u>Option #2:</u> AQMS and HES conduct review of respective subtopics in July and provide advice for a Council review in September.</p> <p><u>Option #3:</u> Council demurs on providing additional pre-analysis advice and instead focuses review on the completed uncertainty analyses.</p>

Topic #5

Topic Title	Methods for Managing Uncertain Results in 812 Study and RIAs
Problem Definition	<p>The choice of methods used to manage and present uncertain results has emerged as a key issue for the Agency. For example, some involved in the development of RIAs argue for emphasizing ranges to present net benefit information whereas others are concerned that emphasizing ranges is potentially misleading if range endpoints have undefined or extremely low probabilities, or the underlying distribution of potential outcomes is asymmetric. Key subtopics include:</p> <ol style="list-style-type: none"> 1. characterization of ranges versus distributions, 2. alternative sources of distributions and probability weights for uncertain input variables, 3. proposed hierarchical structure for classifying uncertainties and appropriate strategies for characterizing those uncertainties; example: allowing distinctions between expert-based distributions and empirically derived estimates, 4. methods and principles for setting priorities for investments in managing uncertainties across, and within, different study components; example: choosing between investing scarce health effects model resources in improving estimates of variability in baseline health effect incidences versus expanding coverage of health effect outcomes, and 5. alternative graphical methods for presenting uncertain results to decisionmakers and the public.
Key Considerations	<ul style="list-style-type: none"> • OMB Circular A-4 requires probabilistic uncertainty analysis for rules where benefits and/or costs exceed \$1 billion per year. • Currently, little or no additional guidance is available; and EPA/NCEE does not plan to update the relevant parts of the EPA Economic Guidelines until 2007. In the meantime, EPA/OAR has several critically important RIAs to be completed in 2006 and early 2007.
Relevant Analyses	PM NAAQS RIA Ozone NAAQS RIA 812 Prospective II
Schedule	<ul style="list-style-type: none"> • The court-ordered deadline for the PM NAAQS is September 27, 2006. • The court-ordered deadline for the Ozone NAAQS is March 28, 2007. • Planning for the full 812 uncertainty analysis is already underway (see Topic #4).
Review Panel(s)	<ol style="list-style-type: none"> 1. Council 2. HES
Review Objective(s)	Provide advice prior to completion of the PM and Ozone NAAQS RIAs to resolve persistent issues surrounding the assessment, categorization, and characterization of uncertain analytical results. This schedule would also provide timely input for the final planning steps of the 812 study uncertainty analyses.
Review Options	<p><u>Option #1:</u> Council conducts teleconference review in July. This option may provide Council advice which is still timely for PM NAAQS as well as Ozone NAAQS analysis, with written advisory potentially available prior to PM NAAQS RIA publication.</p> <p><u>Option #2:</u> Council conducts review in the September. This option allows timely Council input for Ozone NAAQS but not PM NAAQS RIA.</p> <p><u>Option #3:</u> Council defers to SAB EEAC and their possible 2007 review of updated EPA Economic Guidelines.</p>

Topic #6

Topic Title	Methods for Estimating Adverse Health Effects for 812 Study and RIAs
Problem Definition	<p>The 812 Project Team and OAR's regulatory analysts are currently facing a number of difficult analytical choices pertaining to estimation of avoided health effects. The three most contentious issues involve (a) treatment of ozone mortality, (b) analysis of assumed thresholds, and (c) potential differential toxicity of PM2.5 components. Council and Council/HES review would help resolve these issues for the upcoming PM and Ozone NAAQS RIAs and also help the 812 Project Team improve planning and implementation of the 812 study health effects analysis. In particular, the three subtopics involve:</p> <ol style="list-style-type: none"> 1. evaluation of a potential ozone-related mortality effect additive to mortality effects from other criteria pollutants, 2. alternative methods for analyzing the effect of potential thresholds in short and long term exposure concentration-response functions (extension / elaboration of CASAC advice), and 3. design of sensitivity analyses to gauge the significance of potential differences in the toxicity of various components of PM2.5.
Key Considerations	<ul style="list-style-type: none"> • The differential toxicity analysis described above in subtopic 3 is related to, but different from, the sensitivity analysis described under Topic Option #4 (b). The former focuses on the effects of assuming differential toxicity among the particular set of PM2.5 reductions achieved by the new PM NAAQS. These reductions will be incremental to conditions prevailing at promulgation and so are significantly smaller and more geographically limited than the reductions achieved nationwide pursuant to all post-1990 CAA Amendment programs. • EPA and OMB have taken steps toward requesting NAS review of the risk assessment and economic valuation issues surrounding ozone mortality. However, it is expected this review, if conducted, will not be completed until late 2007 or 2008, after the NAAQS RIAs and 812 study are completed.
Relevant Analyses	PM NAAQS RIA Ozone NAAQS RIA 812 Prospective II
Schedule	<ul style="list-style-type: none"> • The court-ordered deadline for the PM NAAQS is September 27, 2006. • The court-ordered deadline for the Ozone NAAQS is March 28, 2007. • The 812 health effects analysis will be initiated in late 2006.
Review Panel(s)	<ol style="list-style-type: none"> 1. Council 2. HES
Review Options	<p><u>Option #1:</u> Council and HES conduct teleconference review in July, either separately or jointly. This option may provide Council advice which is still timely for PM NAAQS as well as Ozone NAAQS analysis, with written advisory potentially available prior to PM NAAQS RIA publication.</p> <p><u>Option #2:</u> Council conducts review in the September, either contemporaneously with a September HES review or following a July HES teleconference. This option allows timely Council input for Ozone NAAQS but not PM NAAQS RIA.</p> <p><u>Option #3:</u> Council and HES defer review until after the full set of benefit and cost analysis components are completed.</p>

Topic #7

Topic Title	Economic valuation of changes in air pollution below assumed threshold
Problem Definition	<p>Controversy persists regarding the economic valuation of reductions in ambient concentrations below the NAAQS.</p> <p>Some in the federal government argue that the NAAQS is supposed to be set at a level which ensures adverse health effects are avoided, and so any further pollution reductions below the NAAQS must therefore have zero health and economic value. Others argue that, for PM and ozone, there is no definitive evidence of an absolute effects threshold. These latter analysts argue that, while benefits below the NAAQS may be more uncertain than benefits above the NAAQS, it is appropriate for benefits analysis purposes to quantify and monetize benefits in a manner consistent with the chosen concentration-response model, including capturing benefits estimated to occur below the NAAQS, but above the levels included in the underlying epidemiological studies.</p> <p>Advice from the Council and relevant subcommittees on the appropriate principles and methods for evaluating benefits below the NAAQS would help resolve a difficult issue for the upcoming PM and Ozone NAAQS RIAs. Near-term advice from the Council and Council/HES would also help the 812 Project Team set priorities for the 812 analysis.</p>
Key Considerations	<ul style="list-style-type: none"> • As noted under Topic Option #6, EPA and OMB have taken steps toward requesting NAS review of ozone mortality, including the economic valuation aspects, though any such review is unlikely to be completed until late 2007 or 2008. Also, the particular issue of monetizing benefits below a relevant NAAQS is not an explicit part of the draft NAS review charge so it is not clear whether NAS would address this issue. • In anticipation of a lengthy NAS review, EPA/NCEE has indicated to the SAB EEAC that their advice may be sought on an appropriate interim analytical policy, at least with respect to the economic valuation aspects of the NAS review charge. It is not clear when such an EEAC review will occur and therefore whether any EEAC advice will be timely for the Ozone NAAQS RIA. • Ozone mortality has thus far been most significantly associated with short-term exposure changes as opposed to PM mortality which has been associated with both short-term and long-term exposure changes. Some argue this implies a harvesting effect and that EPA therefore needs to apply methods for valuing relatively short changes in expected remaining life. Others argue that ozone-related premature mortality may involve potentially transitory disease such as pneumonia which, if triggered by short-term ozone exposure but then survived, may allow those affected to live for many more years.
Relevant Analyses	Ozone NAAQS RIA 812 Prospective II
Schedule	<ul style="list-style-type: none"> • The court-ordered deadline for the Ozone NAAQS is March 28, 2007. • The 812 health effects analysis will be initiated in late 2006.
Review Panel(s)	<ol style="list-style-type: none"> 1. Council 2. HES (to provide input on character of ozone mortality effect)
Review Options	<p><u>Option #1:</u> Council and HES conduct separate or joint teleconference review in July. This option may provide advice which is still timely for PM as well as Ozone NAAQS analysis, with written advisory potentially available prior to PM NAAQS RIA publication.</p> <p><u>Option #2:</u> Council conducts review in the September, either contemporaneously with a September HES review or following a July HES teleconference. This option allows timely Council input for Ozone NAAQS but not PM NAAQS RIA.</p> <p><u>Option #3:</u> Council defers to SAB EEAC and their planned review of mortality valuation.</p>

Review Topics by Panel

Council	<ol style="list-style-type: none">1. 812 Study Core Scenarios Emissions Report2. Design of 812 Study Local Control Measures3. 812 Study Core Scenarios Direct Cost Report4. 812 Study Uncertainty Analysis Plan Update5. Methods for Managing Uncertain Results in 812 Study and RIAs6. Methods for Estimating Adverse Health Effects for 812 Study and RIAs7. Economic Valuation of Changes in Air Pollution Below Assumed Threshold
AQMS	<ol style="list-style-type: none">1. 812 Study Core Scenarios Emissions Report2. Design of 812 Study Local Control Measures4. 812 Study Uncertainty Analysis Plan Update
HES	<ol style="list-style-type: none">4. 812 Study Uncertainty Analysis Plan Update5. Methods for Managing Uncertain Results in 812 Study and RIAs6. Methods for Estimating Adverse Health Effects for 812 Study and RIAs7. Economic Valuation of Changes in Air Pollution Below Assumed Threshold