

**WestJumpAQMS
Response to Comments by Air Quality Stakeholder Review**

Document: [Western Regional Air Partnership \(WRAP\) West-wide Jump-start Air Quality Modeling Study \(WestJumpAQMS\) Draft Final Modeling Protocol dated October 19, 2012](http://www.wrapair2.org/pdf/WestJumpAQMS_Modeling_Protocol_and_SourceApportionment_Design_Draft_Final.pdf)

http://www.wrapair2.org/pdf/WestJumpAQMS_Modeling_Protocol_and_SourceApportionment_Design_Draft_Final.pdf

Response-to-Comments Dated May 1, 2013

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
Comments from U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Kirk Baker, Received 10/29/12					
1	EPA OAQPS	7.1	54	CMAQ 5 does not use JTABLE photolysis rates, they are calculated internally	Comment noted, text will be corrected.
2	EPA OAQPS	7.1	55	I don't know that the application of plume-in-grid for NOX only is a good idea. Since SOX and NOX compete for ammonia it doesn't make sense to keep NOX in a sub-plume module and allow the SOX to be participating in chemistry in the 3D grid cell. The other thing with this is that the mass in the plume gets advected a little different than what is in the 3D cell so it's possible that SOX and NOX from the same source can go in slightly different directions. Unless full chemistry PiG is used I think you all should not use PiG. This might be less of an issue if you all were only interested in ozone.	Commenter misunderstands text on Subgrid-scale Plumes in Table 7-1. Point sources for treatment by the subgrid-scale Plume-in-Grid (PiG) module in CAMx will be selected based on magnitude of their NOx emissions using a NOx emissions cut-off value. But all emissions in a selected point source will be treated by the PiG module using full chemistry involving all emissions from the point source.
3	EPA OAQPS	8.0	62	In the model performance evaluation section there is a lot of discussion of the 1991 EPA modeling guidance document and I really don't think that is a good reference. You all will be modeling an entire ozone season not a single day that is initialized with observations the day before like photochemical models were run in the 1980s and early 90s. The reference to the later EPA guidance document is good. We published a paper recently that compiles ozone and PM model performance and I suggest you all consider taking a look at that and consider using some of the tables of compiled performance metrics as a way to frame model performance. I am attaching that paper.	The 1991 EPA guidance document ozone performance goals are still used as references for model performance evaluation. The Simon, Baker and Philips (2012) paper has some good recommendations that will be incorporated into the next version of the Modeling Protocol. Unfortunately, it wasn't published in time to incorporate the recommendations in the October 19, 2012 version of the Modeling Protocol.
4	EPA OAQPS	9.2.2		On the source apportionment, I was surprised you all are using OSAT just to figure out whether ozone is VOC or NOX limited. If that is the goal I suggest using process analysis. If the goal for the level 1 and 2 is to provide 2 estimates of "background" then I can see where these tasks are coming from. Overall the source apportionment stuff looks ok. I got the impression you all will have a more detailed proposal on that later so I figured I would wait for that to get into details	This is a good comment that we will consider if add-on funding is available to explore the Process Analysis probing tool. Might be good to compare the OSAT and Process Analysis estimates of VOC-limited and NOx-limited ozone formation. We will consider the additional sensitivity tests as suggested if time and resources are available.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
5	EPA OAQPS	NA	NA	I don't know exactly when WRF is next year (it seems to be the last week in June recently) but that general time frame is what I was thinking about. I'm still kind of trying to figure out if it's better to be the same week as WRF or try to be before or after it. Ideally though I think mid to late June would be a good time for a face to face meeting and Boulder seems like a good place to meet. That time of year can get filled up quickly there so even though it seems really far away its probably worth thinking about the logistics sooner rather than later.	We will consider another western U.S. ozone workshop and the Boulder location and June 2013 time period are good suggestions. In addition to the WRF workshop, consideration that it does not conflict with the June 25-28, 2013 Annual AWMA Conference should also be accounted for.
Comments from U.S. Environmental Protection Agency, Region 8, Gail Tonnesen, Received 11/19/12					
1	EPA R8	1.4.2	7	<p>Page 7: <i>“Although the EAC SIP modeling used grid spacing as small as 1.33 km and found improved meteorological model performance at the finer grid spacing, there were little benefits in the photochemical modeling using the 1.33 km versus 4 km grid spacing. In fact ozone model performance degraded somewhat using the 1.33 km grid and the computational requirements increased substantially. Thus, the final Denver EAC SIP attainment demonstration modeling was based on the 4 km modeling results.”</i></p> <p>Regarding the text quoted above, we agree that higher resolution 1.33 km sensitivity studies should not be performed in this study due to resource limitations, however, it is possible that higher grid resolutions could result in improved performance in future modeling studies, and the states could use the WestJump data sets to nest down to higher resolution grids. We recommend adding a statement that the use of 1.33 km grid resolutions for urban areas should be examined in future model evaluation studies.</p>	Purpose of describing the Denver EAC SIP experience stating factual results and not to discourage future high resolution modeling of urban areas and/or point source plumes. The dilution of emissions across a 4 km grid cell may result in the wrong chemical regimes for high density emissions sources. So higher resolution modeling should be encouraged. We will add text to the effect in Section 1.4.2.
2	EPA R8	4.2	33-34	<p>Pages 33-34: Vertical Domain Structure</p> <p>The Denver SIP vertical layer collapsing study focused on summer ozone episodes. It is possible that layer collapsing could have larger negative impacts on model performance for: (1) winter inversion conditions; (2) episodes of stratospheric intrusion; and (3) large wildfire events. We appreciate the computational limitations imposed by the very large 4-km grid and recognize that layer collapsing could be a reasonable compromise to allow the use of the larger 4 km grid. However, we recommend performing additional sensitivity tests for winter inversion conditions for ozone and PM2.5 episodes. If time and resources are available, it would also be useful to perform layer collapsing sensitivity tests for conditions with stratospheric intrusion of ozone and for large wildfire events.</p>	<p>The WestJumpAQMS modeling is not being set up to simulate winter high ozone conditions as exist in southwest WY and Uinta Basin UT with winter inversion and cold pooling events. Although the WestJumpAQMS modeling could provide boundary conditions for such a focused application.</p> <p>Additional sensitivity tests will be performed if additional resources are available.</p>
3	EPA R8	5.10	38	Page 38: We recommend that the model performance evaluation include analysis of daily snow cover and cloud cover, perhaps using	The inclusion of snow cover and cloud cover in the WRF meteorological model is a good suggestion. However,

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				comparisons of model data to satellite data. We also recommend that diagnostic outputs be included for both CMAQ and CAMx simulations for the hourly, gridded photolysis rates. The photorate data will be useful for diagnostic model performance evaluations.	<p>the WestJumpAQMS WRF modeling and model performance evaluation has already been completed (see final report dated February 29, 2012 at: http://www.wrapair2.org/pdf/WestJumpAQMS_2008_Annual_WRF_Final_Report_February29_2012.pdf)</p> <p>We will consider this in future studies.</p> <p>The comparison of the photolysis rates used inside CAMx and CMAQ is also a good suggestion. We will try to work this into the evaluation for an important summer ozone period.</p>
4	EPA R8	7.1	54	Page 54: <i>“Average values for typical snow cover will be utilized; note that this is in contrast to the more highly reflective white snow that typically occurs during winter high ozone events in southwest Wyoming and the Uinta Basin in Utah.”</i> Albedo is a critical input for simulating winter ozone formation, so we recommend using the best estimate of actual snow albedos for rural areas such as southwest Wyoming and the Uintah Basin in Utah.	The WestJumpAQMS is configuring CAMx/CMAQ to look at regional transport issues not for highly localized winter ozone events that would require a different model configuration. There is a wide range of albedo values associated with snow cover. Using the highest albedo associated with fresh white snow with little weathering and no vegetation intrusion, as occurs for the SWWY and Uinta winter ozone events, would be an inappropriate assumption to assume to occur all the time across the western U.S. when snow is on the ground. However, the WestJumpAQMS results could be used to provide BCs for a model configured to simulate winter ozone events.
5	EPA R8	7.1	54	Page 54: <i>“Photolysis rates for the CMAQ model will be base in the JPROC65 processor. CMAQ will also be operated using the in-line photolysis rates option so that photolysis rates can be adjusted based on the current modeled concentrations.”</i> It is not clear from the above text if separate model simulations will be done using JPROC photorates and the in-line calculation. We recommend using only the in-line method, along with the diagnostic outputs discussed in the above comment.	The mentioning of JPROC is left over from earlier versions of CMAQ. We are planning to use CMAQ V5.0.1 (or newer) that has in-line photolysis rate calculations. Modeling Protocol will be updated to remove JPROC reference.
6	EPA R8	7.1	54	Page 54: Boundary Condition. Given the importance of international transport and stratospheric intrusion of ozone, boundary conditions are a very important input data set. We recommend that model experiments be designed to evaluate how accurately contributions from boundary conditions are represented by the coupled global and regional models. We also recommend that BC values from MOZART be compared with those from GEOS-Chem to determine how consistent the two models are in their boundary conditions. If there are significant differences in the BC data from	At the time of the writing of the Modeling Protocol, 2008 day-specific global chemistry model output was only available from MOZART. Since that time 2008 GEOS-Chem global chemistry model output data has become available. The suggestion to use inert ozone BC only CAMx or CMAQ runs using the two sets of ozone BCs (MOZART and GEOS-Chem) is a cost-effective strategy and can be used to evaluate whether one set of BCs is better than the other for simulating documented observed

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				MOZART and GEOS-Chem, model sensitivity simulations would be useful to evaluate how the choice of BC affects model performance. A relatively easy test would be to run CAMx with only BC inputs derived from both GEOS-Chem and MOZART (with no emissions or chemistry) and compare differences in the resulting ozone fields. This test has low computational cost and could be performed while work on emissions processing is in progress.	stratospheric ozone intrusions (or simulate them when none exist). Whether additional sensitivity tests can be conducted will depend on time and resources.
7	EPA R8	8.0	56	Model Performance Evaluation (MPE) Consistent with Simon et al, 2012, we recommend discontinuing the use of the mean normalized bias (MNB) and mean normalized error (MNE) because these metrics are strongly influenced by low concentrations. Instead, we recommend using either mean bias and error, fractional bias and error, or median bias and error. When aggregating bias and error metrics over multiple sites, we recommend grouping the urban and rural monitoring sites separately in the MPE so that performance metrics can be reported separately for urban versus rural/remote areas.	The MNB and MNGE performance statistics have been used extensively in the past using a 60 ppb observed ozone cut-off so have not had the problem that the commenter states. Problems occur when low or no cut-off is used. They are still useful performance statistics if used correctly (i.e., with an observed ozone cutoff). All three forms of bias and error will be calculated (FB/FE, NMB/NME and MNB/MNGE) These are good suggestions and will be incorporated into the study. As noted above in the response to EPA/OAQPS comments, the Simon et al. (2012) paper was published after the preparation of the draft final Modeling Protocol.
8	EPA R8	8.0	56	In general, a higher priority should be placed on graphical evaluation instead of aggregated error and bias performance metrics. For example, time-series plots and spatial plots, with measured data overlaid on model predicted concentration fields, are especially useful for evaluating model performance. We recommend generating hourly ozone spatial plots of model and data, and making these results available either through the interactive website or at an ftp site.	We agree that graphical displays of model performance are necessary to understand model performance and will be used extensively in the evaluation process. We believe it is very important to look at the actual model concentrations predictions that are compared to the observations rather than just calculate a series of model performance statistics. That being said, we believe model performance statistics can be useful when combined with graphical comparisons of model performance. They allow the comparison against a long history of performance statistics (e.g., as summarized by Simon, Baker and Philips, 2012).
9	EPA R8	8.0	56	We also recommend writing and saving the model 3-d output files for selected species, including O3, NOy species, CO, and HCHO. At a minimum, 3-d files for these species should be saved on those days on which ozonesondes or other vertical profile data are available.	We will restart the model and save 3-D concentrations as indicated on those days with relevant ozonesonde observations (e.g., at Boulder, CO). Similar procedures were recently performed for the Denver RAQC/CDPHE May-Aug 2008 modeling.
10	EPA R8	8.0	56	For the diagnostic model evaluation, we also recommend including a limited set of the 3-d process analysis outputs, including O3	We agree that use of process analysis and other Probing Tools (e.g., HDDM) would be enlightening and useful

#	Commenter	Section	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				production, Ox production, and the attribution of O3 and Ox production to NOx sensitive and VOC sensitive regimes. This analysis could be limited to a few episodes with high ozone concentrations, possibly in summer and winter. These results would complement the OSAT/APCA analysis and could be very useful for comparing CAMx and CMAQ and for performing diagnostic evaluations.	and would complement the source apportionment modeling. However, current resources are limited to just using the source apportionment Probing Tool. The use and interpretation of Probing Tools is quite labor and resource intensive. Our hope is that once the WestJumpAQMS 2008 modeling platform is established, the investigation using other Probing Tools would occur in follow-up studies.
11	EPA R8	--	--	<p>Page ii: Need to correct numbering in Chapter headings and TOC</p> <p>Page 2: An initial implementation Memorandum was released by EPA on September 22, 2011 (McCarthy, 2011) that identified 52 potential areas that would be violating the 0.075 ppm 8-hour Ozone NAAQS based on 2008-2010 observations, including many in the western U.S. EPA has finalized the designations of ozone nonattainment areas on March 30, 2012</p> <p>Page 8: add comma</p> <p>Page 13: One of the key objectives</p> <p>Page 73: Although a brute force sensitivity simulation can be performed for any model attribute, it is most frequently applied to changes in emissions. For example, multiple brute force simulations of across-the-board VOC and/ or NOx emission reductions can be...</p>	The list of minor comments of typos will be corrected in the next version of the Modeling Protocol.
Comments from Bureau of Land Management National Operations Center, Craig Nicholls, Received 11/26/12					
1	BLM NOC	1.1	2	"EPA finalized the designations of ozone nonattainment areas on March 30, 2012	Typo will be corrected in next version of the Modeling Protocol.
2	BLM NOC	2.1.1	11	Footnote #5 (http://www.wrf-model.org/wrfadmin/publications.php) I looked at the publications page, and it appears there is nothing more recent than 2008, which contradicts the statement made in the text. We should consider some kind of change here.	It appears that the WRF publications list on the NCAR website has not been updated. Will revise text accordingly and remove link in footnote
3	BLM NOC	2.1.2	12	EPA has developed the MOteor Vehicle Emissions Simulator (MOVES)	Typo will be corrected.
4	BLM NOC	2.2	15	"The WRAP WBD model will also be used." Define the acronym here as it is the first use.	Wind Blown Dust (WBD). Will update Modeling Protocol.
5	BLM NOC	6.9	48	"WestJumpAQMS emissions Technical Memorandum Number 13 on SMOKE modeling parameters." When can we expect memo #13?	We have an internal draft of Emissions technical Memorandum Number 13 on SMOKE emissions modeling parameters. We expect to make it available in early 2013.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
6	BLM NOC	7.1	53	Will the latest update to CAMx (5.4.1) be used?	We will use the latest version of CAMx, which is currently V5.4.1.
7	BLM NOC	8.5.1	65	The link for VERDI (footnote # 72) is dead. Replace with http://www.verdi-tool.org/	Will correct footnote.
8	BLM NOC	9.2.4	79	“Based on the preliminary source apportionment results, we would also prepare a detailed source apportionment design for the next round of ozone and particulate source apportionment modeling.” Is this second round of modeling included in the current budget or will it require additional funding?	This second round of source apportionment modeling is planned under the current budget. However, the extent will be limited by resource availability and schedule.
9	BLM NOC	“8.0”	86	This section, “WEBSITE AND REPORTING” s/be Section 10	Section number will be corrected.
Comments from Bureau of Land Management National Operations Center, Dave Maxwell, Received 11/30/12					
1	BLM NOC	9.0	90	On page 90 (references) I noticed two misspellings. Kristy Gebhart and Bret Schichtel were names misspelled.	Misspelling will be corrected in next version of the Modeling Protocol.
2	BLM NOC	5.10	38	On page 38, Section 5.10, Paragraph 3, Line 2: The acronym should be NOAA (not NOAH).	Typo will be corrected in next version.
3	BLM NOC	--	--	I realize this is a very technical document, but even to some technical reviewers, some of the acronyms are not common. As a result, perhaps the acronyms could be listed up front or at the end of the document.	Will add acronym list to next version of the document.
Comments from Bureau of Land Management Colorado State Office, Chad Meister, Received 11/30/12					
1	BLM COSO	4.1.2	27	Now may not be the appropriate time, but for the record I would like to inquire about the possibility of expanding the “DJ Basin” DSAD 4km polygon (Ref: pg. 27) south to southern Colorado boarder. The expansion would fully encompass the Raton, Anadarko, and Las Animas Arch basins and may be of some use to us as we look to possibly update the applicable RMP for the region in the next couple of years. Is this possible?	An updated 4 km DSAD domain has been defined that addresses this issue.
2	BLM COSO	9.2.9	80	Further, I would hope the website and reporting tools would be capable of producing or providing detailed emissions data at sub domain/regional scales (if not at the SMOKE/PGM grid scale). Emissions data pertaining to source classes and the associated modeled impacts may be useful in analyzing proposed emissions changes (at those scales) from NEPA projects and potentially teasing out any air quality impacts or changes, given the extensive source apportionment and sensitivities analysis that will be conducted for this study.	This is a good idea to add the emissions for the different Source Groups to the on-line tool so emissions displays can be generated and emissions data can be extracted from the tool.
Comments from Bureau of Land Management Utah State Office, Leonard Herr, Received 11/20/12					
1	BLM UTSO	4.1.2	29	BLM Utah would like to use the DSAD for the North and South San Juan Basins to analyze source contributions in two Class I areas in southeast Utah: Canyonlands and Arches National Parks. Based on the	The updated 4 km DSAD domain will include the North and South San Juan oil and gas Basins as well as Arches NP.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				domain boundaries as shown in Figure 4-9 it appears the domain needs to be shifted perhaps 50 miles to the north to adequately cover these areas. We anticipate using the entire suite of apportionment tools as described in the protocol to evaluate source contributions to these two areas.	
Comments from Bureau of Land Management New Mexico State Office, Mary Uhl, Received 11/8/12					
1	BLM NMSO	1.4.1	6	On page 6 under 1.4.1, second sentence, eliminate “as”;	Will make change as indicated.
2	BLM NMSO	1.4.1	7	On Page 7, the explanation of the list of potential actions needs some clarification or further explanation, as I think it could be confusing to the reader. Some of the items in the list are actually in place in the west or nationwide, and some, like CSAPR and the NOx SIP call, apply only in the eastern US right now. Additionally, CSAPR has been vacated and EPA has petitioned for an en banc hearing. IS CSAPR the program you refer to in the second to last sentence of the paragraph? I understand what you are trying to convey here, but found the explanation and list somewhat confusing. Also, there is a colon after NOx SIP call that I am not sure belongs there, unless I really just don’t understand this list.	Good point, we will remove references to NOx SIP Call and CSAPR as they will not result in any emission reductions in the western U.S.
3	BLM NMSO	2.2	15	On page 15, “lighting” should be “lightning”.	Will correct typo.
4	BLM NMSO	2.1.3	14	On page 14, “available” should be “availability”.	Will change “Publicly Available” to “Public Availability”.
5	BLM NMSO			I think that TCEQ and CENRAP have done some detailed oil and gas inventory work for Texas and maybe Oklahoma, as well. Is it beyond the scope and budget of the project to include these inventories instead of using the NEI data? The TX and OK emissions outside the Permian could have an impact at least in SE NM.	We contacted the TCEQ about obtaining their 2008 oil and gas emissions data and they noted that both Texas and Oklahoma submitted their 2008 oil and gas emissions to EPA to be part of the 2008 NEI. Thus, TCEQ referred us to the 2008 NEI to obtain their latest 2008 oil and gas emissions data.
Comments from Colorado Department of Health and Environment (Kevin Briggs) that were seconded by Denver Regional Air Quality Council (Jerry Dilley), Received 11/16/12					
1	CDPHE & RAQC	--	--	APCD is supportive of the WestJumpAQMS modeling protocol for the model performance evaluation and source apportionment analysis portion of the WestJump study. The protocol generally follows the modeling methodologies that were done for the WRAP RH SIPs, FCAQTF modeling, various SIPs like the Denver Ozone EAC and the Denver Ozone SIP which all have proven track records of success. The WestJumpAQMS modeling protocol incorporates the best known science for PGM and for particulate modeling, producing WRF meteorological fields for the PGM, and the best known science for	No response needed.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				producing emission inventories and processing of those emission inventories.	
2	CDPHE & RAQC	1.1	2	EPA finalized the designations of ozone nonattainment areas on March 30, 2012. EPA has also initiated the next round of Ozone NAAQS review with the new Ozone NAAQS currently scheduled to be proposed in March 2013 and finalized in March 2014.	Change will be made as indicated.
3	CDPGE & RAQC	1.1	2	Ozone Design Values in excess of the current (75 ppb) Ozone NAAQS generally occur in urban areas in the western U.S.	Change will be made as indicated.
4	CDPHE & RAQC	1.4.8	9	<p>“Details on the ROMANS study can be found at:</p> <p>http://www.cdphe.state.co.us/ap/rmnp.htm “</p> <p>Comment:</p> <p>This link takes you to the top of the CDPHE Department page where it is very hard to drill down to the ROMans study web page. A more direct link is:</p> <p>http://www.colorado.gov/cs/Satellite?c=Page&childpagename=CDPHE-AP%2FCBONLayout&cid=1251594862555&pagename=C BONWrapper</p> <p>The NPS website is also very good:</p> <p>http://www.nature.nps.gov/air/studies/romans.cfm</p>	We will update the website reference for the ROMANS study to the CDPHE and NPS websites as suggested
5	CDPHE & RAQC	2.2	14	Within the suite of models, it would be useful to have a discussion on the global model (in this case MOZART) and how it is used to interact with the boundaries with CAMx/CMAQ modeling domains.	We will add a discussion of the interaction between Global Chemistry Model (MOZART) and CAMx/CMAQ to the Section 2.2 Model Interaction section.
6	CDPHE & RAQC	4.1.1	20	It is hard to tell from Figure 4-3, but it looks like the O&G development area near Raton, NM and Trinidad, CO may be outside the two IADs. Could one of the IADs be expanded to include the O&G development in these areas?	We are updating the definitions of the stand-alone 4 km Impact Assessment Domains (IADs) so that we only develop databases that will be used. Currently, due to the availability of new observed ozone data Utah BLM is pursuing a 2010 PGM modeling platform and BLM Montana/Dakotas is pursuing a 2013 modeling platform so both have no use for a 2008 modeling platform from WestJumpAQMS. However, BLM CO and NM are performing a West-CARMMS study that does need a 2008 IAD modeling platform that uses an expanded IAD

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
					that includes the Raton NM and Trinidad CO areas.
7	CDPHE & RAQC	6.0	40	In the past, ammonia from soils has been ignored in the PGM since it is highly variable and uncertain. The CMU ammonia model attempts to estimate NH3 emissions by land use categories. Not knowing if the CMU ammonia model will produce better soil ammonia emissions, will there be an effort to include soils ammonia in this analysis or as a sensitivity analysis?	We plan to document how the CMU ammonia model was run to generate the ammonia emissions in the 2008 NEIv2.0. Our current plan is to use the NEIv2.0 ammonia emissions in the WestJumpAQMS modeling. If additional resources are available, ammonia emissions sensitivity tests and ammonia emissions refinements should be considered.
8	CDPHE & RAQC	6.0	40	Although the DEASCO3 or FINN fire databases should be used for the model performance evaluation, are there plans to revisit the typical fire year emissions that were used in the base year for the WRAP and were kept constant for the future year?	At this time WestJumpAQMS is planning to run the PGMs using 2008 actual emissions and not do any future year runs or run with 2008 typical emissions. So there is no need to develop a 2008 typical emissions inventory.
9	CDPHE & RAQC	6.2.2	43	Would it be possible to include the 2008 on-road CONCEPT MV produced emissions for the Denver/NFR rather than the county level SMOKE-MOVES produced emissions for at least the high ozone summer period?	This would be possible, but involve additional work with limited benefits given that RAQC/CDPHE has a database already using these data for looking at elevated ozone concentrations in the Denver NAA.
10	CDPHE & RAQC	8.0	56	For further model performance evaluations such as the indicator species analysis and ozonesonde measurement analysis would it be possible to save the 3d/layer model output (or even a subset) or would that require too much storage.	We will restart the model for days with relevant ozonesonde observations (e.g., at Boulder) to obtain 3-D ozone concentration outputs for comparison with the ozonesonde measurements.
11	CDPHE & RAQC	8.0	--	Many of the rural areas where O&G development is taking place was unmonitored for both PM and O3 in 2008. Since then, the monitoring network has improved, however, there are probably areas that should be considered for monitoring based on the spatial model results. It would be useful, in the model performance evaluation, to suggest areas that would benefit from having an ozone and/or particulate monitor placed there.	We will include spatial maps of ozone and PM concentrations in the model evaluation that may indicate "hot spot" locations that may benefit from additional monitoring sites.
12	CDPHE & RAQC	8.0	--	It seems like the model performance sometimes gets skewed by what would be considered exceptional events like stratospheric ozone, windblown dust, and wildfire smoke. Would it make sense to exclude these type of events from the model performance evaluation for a given geographic area and time?	We would like to believe that a PGM should be able to simulate these kinds of exceptional events if they are characterized in the inputs. However, such characterization may not be present so this is a good suggestion and will be considered if such events can be identified.
13	CDPHE & RAQC	9.0	--	Would it be possible to report on the contribution, by source area, for NO2 and SO2 (i.e. interstate transport) similar to PM and O3?	This is a good suggestion and reporting on source apportionment for daily maximum 1-hour SO2 and NO2 is possible, with one caveat. However, 1-hour SO2 and NO2 is mainly a near-source problem that is difficult to characterize using the PGM with a 12 or 4 km grid cell resolution. The caveat is for 1-hour NO2 is that OSAT/APCA carries the NOx (NO+NO2) as a reactive tracer, not NO2. However, at further downwind distances

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
					NO _x should be dominated by NO ₂ so the NO _x tracer should be close to NO ₂ and would be a conservative estimate.
14	CDPHE & RAQC	9.0	--	A couple other suggestions for presenting source apportionment results are 1) a spatial plot showing the extent of the urban plume for ozone; 2) the EKMA type diagrams produced as part of the FCAQTF were interesting.	1) Since source apportionment source regions are planned for states and DSAD domains then showing the spatial extent of ozone for an urban plume is not possible. 2) In order to generate an EKMA diagram, as was done in the FCAQTF, a sensitivity method (e.g., HDDM as used in FCAQTF) has to be used not a source apportionment method. Thus, neither of these suggestions are possible under the current WestJumpAQMS plans, but could be performed as follow up studies.
15	CDPHE & RAQC	9.0	--	For Denver/NFR, we look forward to seeing the 2008 Base Year source apportionment results. The Denver/NFR has always used a future year to do SA analysis for planning purposes and really has never had to budget to do both a base year and future year SA analysis. It will be interesting to see how the source contribution changes from the base year 2008 to work the RAQC/CDPHE are doing for 2018.	Comment noted.
16	CDPHE & RAQC	10.0	86	It would be worth noting that the various databases will also be available through the Three-State Study Data Warehouse website.	A reference to the Three-State Study Data Warehouse will be added to this section.
17	CDPHE & RAQC	10.0	86	It should be noted that the "Section 8.0 Website and Reporting" should be "Section 10.0 Website and Reporting". Another TOC/Section Title comment is that some of the section titles should be capitalized.	Comment noted.
Comments from Washington Department of Ecology, Doug Schneider, Received 11/16/12					
1	WA ECY	8.2	56	The text of EPA AQS Surface Air Quality Data and (p. 56) and the information presented on figure 8-1 (p. 57) are inconsistent. Confining my comment to Washington State alone, I note that monitoring sites are <u>not</u> mainly located around the "larger city" of Seattle.	Text will be re-worded. Point was AQS sites tend to be located near population areas in contrast to CASTNet sites that are more rural.
2	WA ECY	8.2	60	Figure 8-4. Locations of CASTNet monitoring sites is out-of-date. The North Cascades National Park site NCS415 was terminated on December 31, 2007.	Map is labeled "as of December 2007" so figure is consistent with its description. When we start doing the model evaluation we will make new maps of site locations using monitoring sites available during 2008, which will also be "out-of-date" but consistent with our 2008 modeling year.
3	WA ECY	6.0	--	Looking not at the WESTJump study but ahead to future inventories for the 2018 regional haze control SIP, the commercial marine transport and port emissions need to include Port Metro Vancouver. In	Comment noted. It should also be noted that we are using a 2006 emissions inventory from Environmental Canada that includes Port Metro Vancouver emissions.

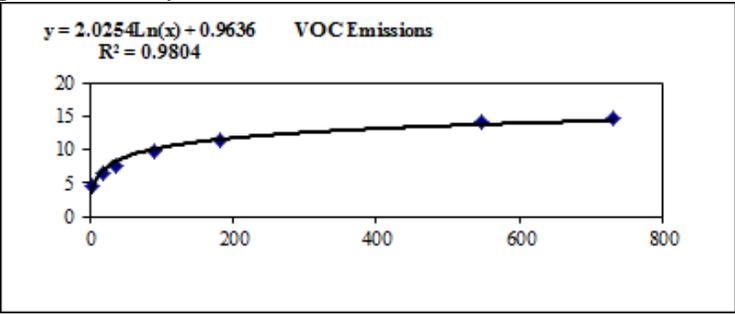
#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				2010 by tonnage, Port Metro Vancouver was Canada’s largest port and the fourth largest port in North America. My understanding is that Northwest Ports (Metro Vancouver, Seattle, and Tacoma) are updating inventories). Here’s a starter link to Northwest Ports activities http://www.portseattle.org/Environmental/Air/Seaport-Air-Quality/Documents/2011_NWPortCleanAir.pdf	Need to add references for the Canada and Mexico emissions to the Modeling Protocol.
4	WA ECY	9.0	--	Let me turn to source apportionment. My understanding from the protocol (basically section 9.2) supplemented by Tom’s October 31 st overview of the WESTJump project is that the modeling will allow even a WESTUS state such as Washington to determine anthropogenic ozone and direct PM contributions to downwind states. Is this correct? If so, do you know of any reasons why this modeling could not serve as a technical basis for 110(a)(2)(D) transport SIP?	One of the uses of the WestJumpAQMS could be part of the information provided in a Section 110(a)(2)(D) transport SIP. In fact, WestJumpAQMS intends to calculate the same ozone and PM _{2.5} contribution metrics that EPA used to determine which states had a significant contribution to downwind nonattainment in CSAPR, Except WestJumpAQMS is using a 2008 emissions year instead of 2012 in CSAPR.
Comments from New Mexico Environmental Department, Mark Jones, Received 12/5/12					
1	NM ED	--	--	We don’t have any additional comments at this time. It looks good.	Comment noted.
Comments from Doug Blewitt, Received 12/1/12					
1	D. Blewitt	1.0	1	“Provide a modeling platform to begin addressing the next generation of air quality issues related to Ozone, PM (PM2.5 and PM10), visibility and nitrogen and sulfur (acid) deposition.” Comment Change above sentence to read. “Provide a modeling platform to begin addressing the next generation of air quality issues related to Ozone, PM (PM2.5, PM10 as well as both primary and secondary PM), visibility and nitrogen and sulfur (acid) deposition.”	Will make change as indicated.
2	D. Blewitt	1.1	2	“But EPA is also proposes a new secondary PM2.5 NAAQS to protect against visibility impairment in urban areas with a proposed threshold in the 28 to 30 deciview range.” Comment Change above sentence to read. “But EPA is also proposes a new secondary PM2.5 NAAQS to protect against visibility impairment in urban areas with a proposed threshold in the 28 to 30 deciview range and an averaging time in the range of 4 to 24 hours.”	After the writing of the Draft Modeling Protocol and this comment, EPA promulgated the new PM _{2.5} NAAQS on December 14, 2012. So this section has been re-written to reflect EPA’s final decision not to adopt a secondary PM _{2.5} NAAQS based on visibility impairment and instead set the secondary PM _{2.5} NAAQS the same as the 35 µg/m ³ 24-hour primary NAAQS noting that it will also protect against urban visibility impairment.
3	D. Blewitt	1.1	2	“Ozone NAAQS generally just occur in urban areas in the western U.S., (e.g., California, Denver, Salt Lake City and Las Vegas). However, there are numerous more rural areas that are in the 70-75	Will make change as indicated.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				<p>ppb range”</p> <p>Comment Change above sentence to read.</p> <p>“Exceedances of the Ozone NAAQS generally just occur in urban areas in the western U.S., (e.g., California, Denver, Salt Lake City and Las Vegas). However, there are numerous more rural areas that are in the 70-75 ppb range and also large areas of the West where there is no monitoring data.”</p>	
4	D. Blewitt	1.1	2	<p>Add the following language “There would be no new PM2.5 nonattainment counties in the western U.S. under the new proposed annual PM2.5 NAAQS levels.” EPA has also not provided any data regarding compliance with the proposed urban visibility standard.</p>	<p>Changed language in this section to reflect actual EPA December 14, 2012 decision on the revised PM_{2.5} NAAQS.</p>
5	D. Blewitt	1.4.1	7	<p>Provide references to the list of new air quality regulations that will affect air quality in the West.</p> <p>Also provide a listing on proposed regulations that may affect air quality in the West but have not been finalized. Include references and estimated promulgation date.</p> <p>Add to the list of new regulations to affect air quality in the West</p> <ul style="list-style-type: none"> e.g., Oil and Gas NSPS (8-16-12) 	<p>Will add the new oil and gas NSPS regulation to the list. Do not see need to add references for each regulation since a reader can find such information and more just by plugging the text stream into Google.</p>
6	D. Blewitt	1.4.7	8	<p>“1.4.7 Environmental Impact Statements (EISs) and Related Modeling” The information referenced in this section should include information baseline emissions being modeled as well as estimates of emissions related to new development. Some information should also be included regarding the EIS modeling that is being conducted in Wyoming.</p>	<p>Section will be expanded to discuss RMP and EIS modeling activities in Wyoming and other states. Since the current WestJumpAQMS Modeling Protocol addresses 2008 base case and source apportionment modeling using a 2008 baseline emissions year, the inclusion of emissions for future development activities is not relevant. If WestJumpAQMS is expanded to model a future year then such information would be included in the documentation.</p>
7	D. Blewitt	1.5	9	<p>Comment Boundary Conditions “Boundary conditions (BCs) for the lateral boundaries of the 36 km CONUS domain will be based on the MOZART global chemistry model.”</p> <p>A technical discussion should be provided regarding the use of MOZART compared to GEOSChem or other global models.</p>	<p>When the Modeling Protocol was written, the only global climate model output data available to the modeling team was from MOZART. Since then output from GEOS-Chem 2008 simulation has become available. We are currently looking at the two global chemistry model simulations for 2008 and plan to perform a sensitivity simulation to determine which one may be more suitable.</p>

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
					We are adding a paragraph to Section 2.2 Model Interaction that describes in more detailed how the global chemistry models (e.g., MOZART and GEOS-Chem) interact with CAMx/CMAQ through the 36 km CONUS BCs.
8	D. Blewitt	1.5	14	<p>“ CAMx17: The Comprehensive Air Quality Model with Extensions (CAMx) modeling system is a state-of-science ‘One-Atmosphere’ photochemical grid model capable of addressing Ozone, particulate matter (PM), visibility and acid deposition at regional scale for periods up to one year (ENVIRON, 2011). CAMx is a publicly available open-source computer modeling system for the integrated assessment of gaseous and particulate air pollution. Built on today’s understanding that air quality issues are complex, interrelated, and reach beyond the urban scale, CAMx is designed to (a) simulate air quality over many geographic scales, (b) treat a wide variety of inert and chemically active pollutants including ozone, inorganic and organic PM2.5 and PM10 and mercury and toxics, (c) provide source-receptor, sensitivity, and process analyses and (d) be computationally efficient and easy to use. The U.S. EPA has approved the use of CAMx for numerous Ozone and PM State Implementation Plans throughout the U.S. and EPA has used CAMx to evaluate regional mitigation strategies including those for recent regional rules (e.g., CSAPR, CATR, CAIR, NOx SIP Call, etc.). Of particular importance for the WestJumpAQMS study is the available of Ozone and Particulate Source Apportionment Technology (OSAT/PSAT) that will be used to perform source apportionment modeling across the western states.”</p> <p>Comment In addition to OSAT and PSAT, HDDM should be considered as an option for source apportionment. There is ongoing HDDM work being conducted for 2006 that potentially can be used to leverage the WESTJump analysis.</p>	<p>HDDM (Higher order Decoupled Direct Method) is a sensitivity and not a source apportionment tool. Among other things, HDDM can provide valuable information on the potential effects of emission control strategies on ozone and PM (e.g., EKMA diagram), but should not be used for source apportionment.</p> <p>The current resources for WestJumpAQMS are limited to developing the 2008 modeling platform and performing ozone and PM source apportionment modeling. As seen in other studies (e.g., the Four Corners Air Quality Task Force [FCAQTF] modeling), once the 2008 modeling platform is developed, HDDM could be applied in a follow-up study if additional resources become available.</p>
9	D. Blewitt	1.5	15	<p>Oil and Gas Inventories “Oil and gas emissions will be based on the latest WRAP Phase III oil and gas emissions inventory”</p> <p>Has the Green River Basin WRAP Phase III inventory been finalized? If not what inventory will be used?</p>	Yes, the WRAP Phase III 2006 oil and gas emissions for the Southwest Wyoming (Green River) Basin are final and were discussed on a WRAP Phase III Study conference call on December 14, 2012. The WRAP Phase III 2006 O&G emissions were used as a starting point for generated the 2008 Southwest Wyoming oil and gas emissions whose development are described in Emissions Technical Memorandum Number 4c dated December 18, 2012 that is available on the

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
					WestJumpAQMS website under wrapair2.org. A conference call was held January 4, 2013 to discuss this memo.
10	D. Blewitt	3.0	19	<p>3.0 EPISODE SELECTION The entire Episode Selection is redundant. The section should simply present that annual simulation is being conducted without the need to provide criteria for episode selection.</p> <p>Pages 21 through 25 Comment Figures 4-2, 4-3, 4-4, 4-5 and 4-6 Include rural CASTNet monitoring sites on this figure. This will ensure that the 4 km grids are aligned to the maximum extent possible to include CASTNet monitors for model performance evaluations.</p>	<p>Although the WestJumpAQMS is not being performed to fulfill a specific regulatory requirement (e.g., ozone SIP), its results may ultimately be used in regulatory decision making. Thus, we are attempting to follow EPA’s ozone, PM_{2.5} and visibility modeling as much as possible (EPA, 2007). This includes justifying the episode selection using EPA’s episode selection criteria in their modeling guidance.</p> <p>Locations of CASTNet monitoring sites are given in Figure 8-4 on page 60. We are refining the definitions of the Impact Assessment Domains (IADs).</p>
11	D. Blewitt	4.1.2	27	<p>Figure 4-7 For the Southeast New Mexico (NM_SE) DSAD (Figure 4-8), plot the sources in the Permian Basin.</p>	The updated 4 km DSAD domain does not includes the Permian Basin.
12	D. Blewitt	4.1.2	31	<p>Proposed Denver-Julesburg Basin 4 km DSAD domain I am concerned that both the Rawah and Rocky Mountain Class I Areas are very close to the edge of the proposed 4 kilometer domain and the modeling results may be affected by edge effects.</p>	The updated 4 km DSAD domain alleviates this concern. Since the 4 km DSAD domains are run using two-way grid nesting with the 12 km WESTUS domain, then there are no “edge effects” as seen when using one-way grid nesting or using other models (e.g., CALPUFF and MM5/WRF).
13	D. Blewitt	4.2	33	Please provide additional discussion regarding the sensitivity testing regarding collapsing of vertical layers in Wyoming. This testing should be factored into the decision regarding level collapsing. The Wyoming example is important because it pertains to a rural environment compared to the urban setting for Denver.	The Wyoming layer collapsing sensitivity test is a little different case where all the layer collapsing occurred in the upper layers that are mostly above the PBL height rather than also in a couple of the lowest layers as in this case. But this section can be expanded to include the Wyoming example as well as another one that did the same lower layer collapsing as WestJumpAQMS performed as part of the Liberty-Clairton (Pittsburgh) PM _{2.5} SIP modeling.
14	D. Blewitt	4.2	39	“Major (≥25 MWe) Electrical Generating Units (EGUs) point source SO ₂ and NO _x emissions will use Continuous Emissions Monitor (CEM) measurement data that are available online from the EPA Clean Air Markets Division (CAMD34). These data are hour-specific for SO ₂ , NO _x and heat input. The temporal variability of other pollutant emissions (e.g., PM) for the CEM sources will be simulated using the hourly CEM heat input data to allocate the annual emissions from the NEIv2.0 to each hour of the	As noted on page 55, the Plume-in-Grid (PiG) module will be used to treat all emissions from major NO _x point sources in the western U.S. We will rank point sources in the western U.S. by NO _x emissions and select a NO _x emissions cut-off value above which a point source emissions will be treated with PiG so that we obtain an appropriate number of point sources treated by the PiG (several hundred), but not so many that it becomes a big

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				<p>year. Emissions, locations and stack parameters for point sources without CEM devices will be based on the 2008 NEIv2.0”.</p> <p>Comment To what extent will the EGUs be modeled using PIG?</p>	computational burden.
15	D. Blewitt	6.1	40	<p>“The WRAP-IPAMS Phase III 2006 oil and gas emission inventories will be projected to 2008 for all Phase III basins that are currently available. In addition, new oil and gas emissions inventory will be developed for the Permian Basin in southeastern New Mexico/northwestern Texas.”</p> <p>Comment Please provide details regarding how the WRAP Phase III emissions will be scaled to represent 2008 emissions.</p>	<p>WestJumpAQMS has prepared 5 oil and gas emissions inventory Technical Memorandums that provide details on who the 2008 oil and gas exploration and production emissions will be prepared. The five Memorandums are available on the WRAP WestJumpAQMS website and cover: (a) the Colorado Basins; (b) the Uinta and South San Juan Basins; (c) the Wyoming Basins; (d) the Permian Basin; and (e) Basins not covered by the WRAP Phase III study.</p> <p>http://www.wrapair2.org/WestJumpAQMS.aspx</p>
16	D. Blewitt	6.1	40	<p>“New spatial surrogates for the emissions will be developed using the latest 2010 Census data that are now available and will include population and housing statistics for 2010 and interpolations for the years between 2000 and 2010.”</p> <p>Comment Please provide details on which sources this change applies to.</p>	WestJumpAQMS Emissions Technical Memorandum No. 13 will have detailed information on the SMOKE emissions processing parameters including the new spatial surrogates and the cross-referencing of source categories to the spatial surrogate distributions.
17	D. Blewitt	6.2	42	<p>“On-road mobile sources include light-duty vehicles, light-duty trucks, heavy-duty vehicles, buses and motorcycles used for transportation of goods and passengers on established roadways. On-road vehicles may be fueled with gasoline, diesel fuel, or alternative fuels such as alcohol or natural gas.”</p> <p>Comment Change to “... alternative fuels such as alcohol blends or natural gas.”</p>	Change will be made as indicated.
18	D. Blewitt	6.4	44	<p>General Comment 2008 oil and gas emission projections need to be reviewed prior to any modeling.</p>	WestJumpAQMS prepared 5 oil and gas emissions development memorandum that discuss the 2008 O&G emissions and had staged conference calls on each of the memos.
19	D. Blewitt	6.4	44	<p>General Comment The document needs to address how production data for 2008 will be used to scale 2006 emissions from dehydration units. Emissions from dehydration units are not linear with changes in production (Figure 1). Figure 1. Changes in VOC Emissions Versus Production (x axis is</p>	Details on the 2008 O&G emission projections are contained in the five Emissions technical Memorandums discussed above.

#	Commen-ter	Sec-tion	Page	Draft Modeling Plan Comment	Response for Final Modeling Plan
				<p>production and y axis is emissions)</p> 	
20	D. Blewitt	6.4	45	<p>“Where specific scaling factors are estimated to be less than one (1), indicating a reduction in an activity parameter from 2006 to 2008, all emissions factors and activity data will be assumed to be identical in 2008 as in 2006 and no further analysis will be needed for those source categories matched to the activity parameter.”</p> <p>Comment If scaling factors are less than 1, emissions for 2008 should be based on projected emissions not simply assuming that 2008 emissions are equal to 2006 emissions.</p>	<p>The reviewer is interpreting the discussion incorrectly. The paragraph above the one highlighted by the reviewer discusses the 2006 to 2008 projection factors based on production statistics that allow the emission projection factors to increase or decrease. What this paragraph is discussing is the need for additional emission controls analysis on any new O&G equipment. This paragraph says that if the production statistics are less in 2008 than 2006 (i.e., scaling factor less than 1), then we assume the same equipment is operating in 2008 and 2006 and there is no need to do a controls analysis to see what new controls equipment would have. However, if the production statistics are greater in 2008 than 2006, then we are assuming there is new equipment going into the field and we need to do a controls analysis to determine what emission factors should be used for the new equipment since there may be new rules that are implemented between 2006 and 2008. This section will be reworded to be clearer.</p>

21	D. Blewitt	6.4.1	45	<p>“In addition, the Colorado Department of Health and Development (CDPHE) has found that not all condensate Flash VOC emissions that were assumed to be WestJumpAQMS 46 Draft Final Modeling Protocol controlled 95% by flares make it to the flare and are instead vented to the atmosphere. Thus, CDPHE has introduced the concept of a Capture Efficiency (CE) for condensate flare control that assumes only 75% of the condensate Flash VOC emissions are actually controlled by the flare and the other 25% is released to the atmosphere. The WRAP Phase III 2006 unpermitted condensate tank O&G emissions are either projected to 2008 (D-J Basin) or the 2008 APEN condensate tank emissions are reduced (Piceance Basin) in order for the total 2008 condensate production in the inventory to match the 2008 IHS database production statistics.”</p> <p>Comment Table 1 presents the control efficiency of flares for nine different wells.</p> <p>Table 1.</p> <p style="text-align: center;">Flare/Combustor Efficiency</p> <table border="1" data-bbox="632 743 1014 1089"> <thead> <tr> <th>Test Location</th> <th>Average Distraction Efficiency (%)</th> </tr> </thead> <tbody> <tr><td>Test 1</td><td>98.80</td></tr> <tr><td>Test2</td><td>98.98</td></tr> <tr><td>Test 3</td><td>99.98</td></tr> <tr><td>Test 4</td><td>99.60</td></tr> <tr><td>Test 5</td><td>98.90</td></tr> <tr><td>Test 6</td><td>98.40</td></tr> <tr><td>Test 7</td><td>99.10</td></tr> <tr><td>Test 8</td><td>99.90</td></tr> <tr><td>Test 9</td><td>99.70</td></tr> <tr><td>Average</td><td>99.26</td></tr> </tbody> </table> <p style="text-align: center;">Note Average Distraction Efficiency is an average of three individual tests</p> <p>As indicated in this table, measured flare efficiency is in excess of 95 percent that is defined in the CDPHE regulations and means that actual controlled flare emissions are less than calculated. In addition, CDPHE does not have any quantitative data to support the assumption that 25 percent of the tank emissions are emitted as leaks. This is an area that needs additional documentation.</p>	Test Location	Average Distraction Efficiency (%)	Test 1	98.80	Test2	98.98	Test 3	99.98	Test 4	99.60	Test 5	98.90	Test 6	98.40	Test 7	99.10	Test 8	99.90	Test 9	99.70	Average	99.26	<p>CDPHE/APCD gave a paper on this topic at the annual EPA Emissions Inventory Conference that was held August 13-16, 2012 in Tampa, Florida. More details on the CDPHE assumptions are available from this paper at:</p> <p>http://www.epa.gov/ttn/chief/conference/ei20/session6/dwells.pdf</p> <p>http://www.epa.gov/ttn/chief/conference/ei20/session6/dwells_pres.pdf</p>
Test Location	Average Distraction Efficiency (%)																										
Test 1	98.80																										
Test2	98.98																										
Test 3	99.98																										
Test 4	99.60																										
Test 5	98.90																										
Test 6	98.40																										
Test 7	99.10																										
Test 8	99.90																										
Test 9	99.70																										
Average	99.26																										
22	D. Blewitt	6.11	49	<p>6.11 CHEMICAL SPECIATION</p>	<p>As noted on page 50, for the WRAP Phase III O&G VOC emissions Basin-specific VOC speciation profiles will be</p>																						

				<p>Comment Speciation for oil and gas emission sources should be based on actual compositions rather than default profiles from SPECIATE. Profiles should be reviewed prior to performing actual modeling.</p>	<p>used. The SPECIATE speciation profiles will only be used for the non-WRAP Phase III Basins. For the Permian Basin we reviewed the SPECIATE database VOC speciation profile condensate VOC emissions and it looked more appropriate for oil VOC emissions than condensate VOC emissions. Thus, we used the D-J Basin condensate VOC emissions speciation profile for condensate VOC emissions in the Permian Basin.</p>
23	D. Blewitt	7.0	53	<p>Photochemical Modeling</p> <p>Comment It is recommended that detailed discussions regarding source attribution be deferred until after the model performance evaluation is completed. Emissions should be processed with the finest source categories so that additional source apportionment can be performed at a later date.</p>	<p>Emissions are being processed with several streams of emissions processing so that source category specific source apportionment modeling can be performed at a later date.</p> <p>It is important to inform the community of the ultimate uses of the modeling platform so the source apportionment modeling is discussed in the Modeling Protocol. But we agree that the Model Performance Evaluation is needed to determine whether the source apportionment modeling is reliable.</p>
24	D. Blewitt	8.0	53	<p>8.0 MODEL PERFORMANCE EVALUATION</p> <p>Comment Model performance evaluations need to be individually performed for all monitors as opposed to using spatial averaging. It is recommended that model evaluations be conducted using the approach that Emory et.al. 2011 used in a recent Atmospheric Environment paper.</p>	<p>The Emery et al paper just looked at model performance at the ~80 CASTNet sites across the U.S. Since we will also be looking at model performance at the AQS, FRM, CSN and NADP sites that represent thousands of sites across the U.S. the examination of model performance at each individual site is not practical. However, we understand how large spatial averaging in model performance evaluations can mask performance problems. We will examine model performance individually at each CASTNet site separately and perform subregional model performance (e.g., by state and/or urban area).to avoid large spatial averaging. The focus of the model performance will be on the western U.S.</p>

Updates to the DSAD and IAD Domains

We have received several written and verbal comments on the definition of the 4 km Detailed Source Apportionment Domains (DSADs) that can be linked to the 36/12 km domains for two-way CAMx simulations and the 4 km Impact Assessment Domains (IADs) that area standalone 4 km CAMx databases that can be used for local air quality impact assessments (e.g., EISs and RMPs). For the IADs, the BLM Colorado State Office and New Mexico State Office has indicated a desire for a 2008 4 km IAD platform that they can use. However, other BLM state offices have not; BLM Utah is pursuing a 2010 modeling platform and BLM Montana/Dakotas has indicated they will look at a 2013 modeling year. Thus, the final Modeling Protocol will document the Colorado and northern New Mexico IAD.

In the comments concerns were raised that oil and gas development that occurred between the 4 km DSAD domains in the draft Modeling Protocol would not be treated using the 4 km grid resolution and the DSAD domains were missing some oil and gas development areas (e.g., southeast Colorado). We had concerns that use of all of the 4 km DSAD domains in a source apportionment run may require more computation time than available in the schedule. Thus instead of running with multiple small 4 km DSAD domains the final Modeling Protocol defines one large DSAD domain that covers the oil and gas development areas in the Southwest Wyoming, Uinta, Piceance, Denver-Julesburg, North San Juan and South San Juan Basins. Figure 1 displays the updated 4 km DSAD.

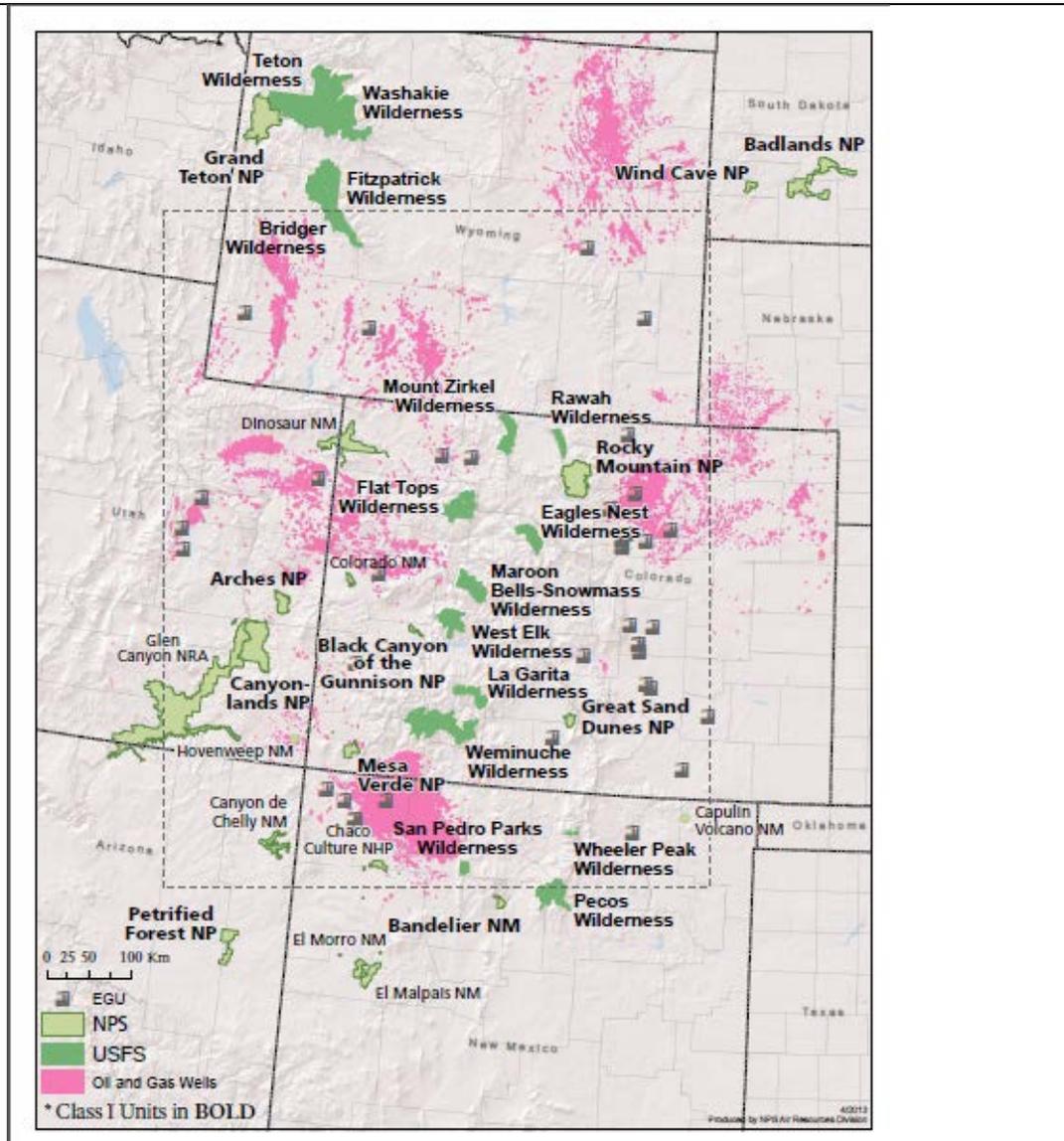


Figure 1. Updated 4 km DSAD domain.