# 5. MODELING RESULTS

## EMISSION SCENARIOS

As discussed in Chapter 3, the potential air quality, visibility, and acid deposition impacts for the Pinedale Anticline Gas Development Project were analyzed for several different production alternatives that included the following:

- Well drilling activities that are Project Wide (PW) over the Project area and a scenario where the drilling activities are on the Anticline Crest (AC);
- For both the Project Wide (PW) and Anticline Crest (AC) well drilling activity scenarios, scenarios with 500 and 700 wells;
- Three potential locations for the compressors (see Figure 4-2 or Figure 3-1 for locations):
    1. Slightly southeast of the centroid of the Project (C1);
    2. Slightly northwest of the centroid of the Project (C2); and
    3. Immediately south of the Project area (C3).
- Three different NOx emission rates were analyzed for the compressor engines:
    1. 0.7 g/hp-hr;
    2. 1.0g/hp-hr; and
    3. 1.5 g/hp-hr.

With the two well drilling activity configurations (PW Project Wide and AC Anticline Crest), two different total number of wells in operation (500 and 700), and three possible locations for the compressors (C1, C2, and C3) potentially operating at three different emission rates (0.7, 1.0, and 1.5), there are 36 different alternatives for the Project whose impacts must be analyzed. Complete tables of estimated impacts for all 36 Project alternatives are provided in the Appendices. The air quality, visibility, and acid deposition impacts from the 36 Project scenarios are quite similar. Thus, for the sake of brevity, in the case of small impacts well below levels of concern we just present the air quality impacts for two of the worst case (i.e., highest) emissions scenarios, the 700 well Project Wide (PW) and Anticline Crest (AC) drilling configuration with compressor location C1 operating at the maximum NOx emissions rate of 1.5 g/hp-hr (i.e., scenarios PW-700-C1-1.5 and AC-700-C1-1.5 scenarios). Complete results for all 36 scenarios are provided in the Appendices. These two scenarios represent maximum potential emissions and the air quality impacts for the other Project alternatives are nearly identical or lower than these two "worst case" scenarios. In the case of the visibility calculations, the cumulative impacts for the different project alternatives estimated visibility degradation that are at the thresholds of concern and such impacts varied across the different Project alternatives. Thus, the visibility results for all of the Project alternative emissions scenarios are presented in this chapter.

## NEAR-FIELD CRITERIA AND PSD POLLUTANT AMBIENT CONCENTRATIONS

The potential near-source air quality impacts from the Pinedale Anticline Gas Development Project, other expected new sources since June 30, 1995 (post-95), cumulative impact (Project+post-95), and total concentrations (i.e., current background plus cumulative impact) for the PW-700-C1-1.5 and AC-700-C1-1.5 scenarios are given in Tables 5-1 and 5-2.

Table 5-1 displays the CALPUFF near-source impacts using the Project annual average emissions, whereas Table 5-2 displays the CALPUFF estimated near-source impacts for criteria pollutants and short-term averaging times (24-hour or less) using the Project maximum hourly emissions.

### Long-Term Near-Source Impacts

Table 5-1 compares the CALPUFF estimated air quality concentration impacts for the Project using annual average emissions, post-95 impact, and cumulative impact on the near-source receptor grids that are compared with the PSD Class II increments. The maximum annual cumulative concentrations for all PSD pollutants and all Project emission scenarios (see Appendix A) are 1 percent or less of the applicable PSD Class II increments at the near-source receptors in the Project area and vicinity (e.g., Pinedale). Thus, emissions from the Project and expected sources since 1995 do not pose any threat of violating the annual Class II PSD increments in the Project area and vicinity. Similarly, when the maximum annual CALPUFF-estimated cumulative concentrations are added to the existing maximum annual background concentrations, the total estimated concentrations for all criteria pollutants are less than the applicable NAAQS and WAAQS. In fact, the estimated total concentrations due to the Project, all new sources (post-95), and existing sources (maximum background) are less than 50 percent of any of the annual NAAQS and WAAQS for all of the Project emission scenarios. Thus, the proposed Project development scenarios, along with the anticipated sources since 1995 and existing sources (background), do not have the potential to violate any annual NAAQS or WAAQS.

### Short-Term Near-Source Impacts

The maximum CALPUFF-estimated near-source concentrations impacts during 1995 for the short-term concentration averages using the Project maximum hourly emissions for the PW-700-C1-1.5 and AC-700-C1-1.5 emissions scenarios are provided in Table 5-2 (summaries of near-source short-term air quality concentration impacts for all Project emissions scenarios are provided in Appendix B). The CALPUFF-estimated maximum near-source 24-hour and 3-hour $SO_2$ concentrations due to the Project maximum hourly emissions and post-95 emissions sources are less than 1 $\mu g/m^3$. This is well below the 24-hour and 3-hour $SO_2$ PSD Class II increments of 91 and 512 $\mu g/m^3$, respectively. The maximum estimated $PM_{10}$ 24-hour concentrations due to the Project and post-95 sources is approximately 6 $\mu g/m^3$, which is below the PSD Class II increment of 30 $\mu g/m^3$. For all of the Project emissions scenarios and the short-term (1-, 3-, 8-, and 24-hour) averaging periods, the maximum impacts due to the Project maximum hourly emissions, post-95 sources, and existing sources (i.e., maximum current background) are always less than 20 percent of the applicable NAAQS and WAAQS. Therefore, the Project alternatives and post-95 emissions do not endanger the PSD Class II increments nor any air quality standards within and in the vicinity (out to 5-km) of the Project area.

## FAR-FIELD CRITERIA AND PSD POLLUTANT AMBIENT CONCENTRATIONS

Table 5-3 summarizes the CALPUFF-estimated maximum criteria and PSD pollutant concentrations at the sensitive receptor areas; the Bridger, Fitzpatrick, Washakie, and Popo Agie

Wilderness Areas, the Wind River Roadless Area, and Grand Teton National Park. The Popo Agie Wilderness Area and Wind River Roadless Area are both PSD Class II areas, whereas the remaining other four sensitive receptor areas are PSD Class I areas. The results in Table 5-3 are for the Project worst case emission scenarios, the Project Wide (PW-700-C1-1.5) and concentrated (AC-700-C1-1.5) well drilling scenarios. The far-field ambient concentration impact results for all of the Project emissions scenarios are given in Appendix C. The CALPUFF-estimated cumulative concentrations (Project + post-95) for all pollutants are always less than 1 $\mu g/m^3$, well below the applicable PSD increments for all of the Project emissions scenarios (see Appendix C). The maximum concentration impacts due to the Project alone tend to occur at the Bridger Wilderness Area, whereas the maximum concentration impacts due to the post-95 sources alone tend to occur at the Wind River Roadless Area. The maximum cumulative concentration impacts, which occurs at either the Bridger Wilderness Area or Wind River Roadless Area depending on the pollutant, is always 1 percent or less of the applicable PSD increment for all pollutants and all of the Project alternatives.

When the maximum cumulative concentrations are added to the maximum potential background concentrations (which occurred away from the sensitive areas), then the estimated total concentrations for all pollutants are always less than 20 percent of the NAAQS and WAAQS at the sensitive Class I and II receptor areas. Thus, the Project and post-95 sources would not come close to violating any PSD Class I or II increments or any ambient standard at the sensitive receptor areas.

## FAR-FIELD VISIBILITY IMPACTS

The effects of the Project alternative emissions scenarios, the post-95 sources, and the cumulative emissions (Project+post-95) on visibility degradation at the sensitive receptor areas was evaluated using the IWAQM/FLAG-recommended method as discussed in Chapter 4 and the Modeling Protocol (BLM, 1999). In this method, the visibility degradation due to the Project sources alone, the post-95 sources alone, and the combined cumulative impact due to the Project plus post-95 sources are compared against a background visibility based on the mean of the 20 percent cleanest days from a long-term (8 years) record of the IMPROVE reconstructed mass measurement data. For the sensitive receptor areas studied in this analysis, the Bridger IMPROVE data was most representative so it was used.

Two thresholds of visibility change are reported here, days with greater than 1.0 deciview change, and days with greater than 0.5 deciview change. The USDA Forest Service uses the 0.5 deciview as a LAC threshold in order to protect visibility in sensitive area from visibility changes. The 1.0 deciview threshold is used in the Regional Haze Regulations as a small but potentially visible change in visibility, and therefore will also be used for comparison. The 0.5 $\Delta dv$ and 1.0 $\Delta dv$ thresholds are neither standards nor regulatory limits. Rather, they are used to alert the affected land managers that potential adverse visibility impacts may exist and the land manager may wish to look at the magnitude, duration, frequency, and source of the impacts in more detail and the weather conditions under which the impacts occurred in order to make a significance determination. The number of days in which the incremental extinction coefficient due to the new sources is greater than 5 percent and 10 percent of the background extinction is also used to report the significance of the new sources on visibility degradation. The results of the deciview change and change in extinction coefficient visibility analysis for the Project, post-95, and cumulative changes are reported below.

**Deciview Change Impacts**

Appendix D summarizes the Project, post-95, and cumulative (Project+post-95) maximum deciview change and number of days the 0.5 Δdv and 1.0 Δdv thresholds are exceeded during 1995 using the IWAQM/FLAG-recommended method. For all of the Project alternatives, the maximum visibility impacts occur at the Bridger Wilderness Area.

The maximum deciview change due to any of the Project Alternative emissions scenarios is 0.46 Δdv at the Bridger Wilderness Area for the PW-700-C3-1.5 emissions scenario (i.e., 700 wells using the compressor location C3 just south of the Project area operating at 1.5 g/hp-hr NOx emissions). Thus, for all of the potential Project Alternatives, the estimated visibility impacts due to the Project emissions alone are below the USDA Forest Service 0.5 Δdv LAC threshold.

The maximum deciview change due to the post-95 sources is 0.61 Δdv and occurs at the Bridger Wilderness Area. Using 1995 data, there are estimated to be two days in which the post-95 sources would result in deciview changes exceeding the 0.5 Δdv threshold at the Bridger Wilderness Area (Table 5-4). The post-95 sources were estimated not to cause any Δdv values greater than the 0.5 Δdv threshold at any of the other sensitive receptor areas, and the 1.0 Δdv threshold was never exceeded at any sensitive area.

The number of days the deciview change exceeds the 0.5 Δdv threshold at the sensitive receptor areas due to the cumulative emissions (Project and post-95 sources) vary for the different Project alternative emissions scenarios. The largest impacts (number of days that the 0.5 Δdv is exceeded) occur at the Bridger Wilderness Area (Table 5-4), and there are also 1-2 days that the cumulative increment Δdv exceeds the 0.5 Δdv threshold at the Fitzpatrick and Popo Agie Wilderness Areas, as well as the Wind River Roadless Area (Appendix D). For all of the Project Alternatives and all sensitive receptor areas, the visibility impacts due to the cumulative (Project+post-95) emissions never exceeds the 1.0 Δdv threshold. The number of days that the 0.5 Δdv threshold is exceeded at the Bridger Wilderness area due to the cumulative emissions ranges from 4 to 9 depending on the Project Alternative. For the Project emissions scenarios with the compressor engines operating at 0.7 g/hp-hr with 500 wells, it is estimated that there would be only 4 days in which the 0.5 Δdv threshold is exceeded at the Bridger Wilderness Area, 2 days at the Fitzpatrick Wilderness Area, and 1 day each at the Popo Agie Wilderness Area and Wind River Roadless Area. For the Project Alternatives with 700 wells, the number of days the 0.5 Δdv threshold is exceeded at the Bridger Wilderness area varies from 5 (0.7 gm/hp-hr) to 6-7 (1.0 gm/hp-hr) to 7-9 (1.5 gm/hp-hr). The worst case cumulative visibility impacts occur for the 700 Project Wide well configuration with the compressor engines operating at 1.5 g/hp-hr located at location C1 (i.e., PW-700-C1-1.5) with 9 days exceeding the 0.5 Δdv threshold at the Bridger Wilderness Area and 2 days each exceeding the 0.5 Δdv threshold at the Fitzpatrick Wilderness Area, Popo Agie Wilderness Area, and Wind River Roadless Area. That is, the worst case Project alternative is estimated to produce 15 total sensitive area-days of visibility events that exceeded the 0.5 Δdv threshold at the sensitive receptor areas. As will be discussed in more detail below, due to the close proximity of the four sensitive areas located in the Wind River

Range, one bad day could produce up to 4 sensitive-area-days exceeding the 0.5 Δdv threshold. For example, for the 15 sensitive areas-days worse case (PW-700-C1-1.5) scenario discussed above, there are actually only 9 different distinct days that the 0.5 Δdv threshold was exceeded.

### Change in Extinction Coefficients

The number of days in which the Project, post-95, and cumulative change in extinction coefficient exceeds 5 percent and 10 percent of the visibility background extinction based on the mean of the 20 percent cleanest days at the Bridger IMPROVE site are provided in Appendix E. The number of days in which the change in extinction coefficient exceeds the 5 and 10 percent LAC thresholds are nearly identical to the number of days the deciview change exceeds the 0.5 and 1.0 Δdv thresholds. The Project, post-95, and cumulative change in extinction coefficient never exceeds the 10 percent threshold. The Project change in coefficient extinction alone also never exceeds the 5 percent threshold. The discussion above on the effects of the different Project Alternatives on the number of days the cumulative deciview change is greater than 0.5 also holds for the number of days the cumulative change in extinction coefficient is greater than 5 percent of background (Appendix E).

## ACID DEPOSITION IMPACTS

The impacts of the Project alone and cumulative (Project + post-95) sources on acid deposition were analyzed using the Fox and co-workers (1989) method. This method was used to estimate the potential change in acid neutralizing capacity (ANC) and change in pH at each of the five sensitive lakes under study:

- Black Joe Lake in southeastern Bridger Wilderness Area;
- Deep Lake in southeastern Bridger Wilderness Area;
- Hobbs Lake in Central Bridger Wilderness Area;
- Ross Lake in northern Fitzpatrick Wilderness Area; and
- Lower Saddleback Lake in southern Popo Agie Wilderness Area.

For lakes with background minimum measured ANC values of 25 μeq/l or greater, the USDA Forest Service (FS) has identified a Level of Acceptable Change (LAC) threshold of 10 percent change. For lakes with a minimum ANC background of less than 25 μeq/l, the FS has identified a LAC threshold of 1 μeq/l change. The five lakes under study all have minimum ANC values above 25, so the 10 percent change LAC threshold is the relevant threshold in this analysis. The background to be used for the LAC ANC calculation is the 10 percent most sensitive ANC measured background values at each lake (see Table 4-5).

Appendix F summarizes the acid deposition impacts for the Project alone and the cumulative impacts (Project+post-95) for all of the Project Alternatives. The change in ANC at any of the sensitive lakes due to the Project alone is always less than 1.0 percent, well below the 10 percent LAC threshold. The estimated change in ANC at any sensitive lake, due to the cumulative emissions (Project plus post-95), is less than 1 percent of the background ANC, also well below the 10 percent LAC threshold. Thus, all potential changes in lake acidity due to the proposed development and all new sources since 1995 are estimated to be well below the acceptable limits established by the FS.

## DETAILED EXAMINATION OF ANY POTENTIAL ADVERSE EFFECTS DUE TO THE PROJECT AND POST-95 CUMULATIVE EMISSIONS

All of the Project Alternatives alone did not have any potential adverse air quality or AQRV (i.e., visibility and acid deposition) impacts. The post-95 sources alone did not have any adverse air quality impacts, but there were 2 days of visibility impacts at Bridger Wilderness Area that exceeded the USDA Forest Service 0.5 Δdv Limit of Acceptable Change (LAC) threshold. Furthermore, the cumulative (Project+post-95) estimated impacts resulted in 8-15 sensitive area-days exceeding the 0.5 Δdv threshold. But, the 1.0 Δdv threshold was never exceeded at any of the sensitive receptor areas. These thresholds are not regulatory standards; rather they indicate the need to examine the visibility impacts in more detail to assess the frequency, duration, magnitude, and conditions under which the impacts occur. This information will allow the applicable land managers to make determination on the significance of such impacts and the potential need for mitigation.

Appendix G summarizes details concerning the contributions of the Project and post-95 sources to visibility degradation for all of the Project Alternatives and each sensitive area-day in which the cumulative incremental visibility impact exceeded the 0.5 Δdv threshold. The results for the PW-500-C1-0.7, PW-700-C1-0.7, PW-700-C1-1.0, and PW-700-C1-1.5 scenarios are from Appendix G and are reproduced in Table 5-5. These scenarios represent the range of visibility contributions from least to most number of sensitive area-days exceeding the 0.5 Δdv threshold, from 8 (for the PW-500-C1-0.7 Project alternative) to 15 (for the PW-700-C1-1.5 Project alternative). Thus, the results for the other Project Alternatives are similar or within the range of those provided in Table 5-5. Details on all of the Project Alternatives can be found in Appendix G.

The cumulative visibility impacts for the PW-500-C1-0.7 alternative results in 8 sensitive area-days in which the 0.5 Δdv threshold is exceeded. As seen in Table 5-5a, there are actually only four distinct different days of 0.5 Δdv or more visibility degradation (March 2, 3, and 18 and April 1). The maximum Δdv impact under this scenario is 0.81 which occurred at the Bridger Wilderness Area on March 2, 1995. The Project is contributing approximately 15 percent of this maximum impact, whereas the post-95 sources are contributing approximately 85 percent (note, because Δdv is a logarithmic scale of extinction, the individual Δdv increments for the Project and post-95 sources do not linearly add up to the cumulative Δdv impact). The Project is contributing 3-30 percent of the cumulative Δdv for these sensitive area-days. The most dominant species to the extinction budget during these visibility impacts is ammonium nitrate ($NO_3$), which contributes 70 to 98 percent to the cumulative extinction. On March 2-3, there is also a substantial sulfate contribution (13-27 percent); the sulfate contribution is much lower on the other days (-2 to 6 percent). The negative sulfate contribution on April 1 is due to the modeling of emission decreases as part of the post-95 scenario.

Increasing the number of wells from 500 to 700 (i.e., the PW-700-C1-0.7 alternative) results in one additional day of the cumulative impacts exceeding the 0.5 Δdv threshold (0.50 on March 14, see Table 5-5b). There are 9 total sensitive area-days when the 0.5 Δdv was exceeded which cover 5 distinct days for this scenario. The maximum Δdv cumulative impact under the PW-700-C1-0.7 alternative was 0.83, a majority of the degradation (approximately 80 percent) was due to the post-95 sources. For all sensitive-area-days in which the cumulative visibility impact exceeded the 0.5 Δdv threshold, a majority of the visibility degradation was always due to the post-95 sources.

Under the Project PW-700-C1-1.0 Alternative, the cumulative visibility impacts results in 10 sensitive- area-days of exceedances of the 0.5 Δdv threshold covering 6 unique days (Table 5-5c). In 90 percent of the cases, the post-95 emission sources contribute more than the Project sources. For the one case in which the Project contributes a majority to the extinction (March 26 at Bridger), the cumulative deciview change is 0.53, just slightly greater than the 0.5 Δdv threshold.

Finally, Table 5-5d summarizes the details of the cumulative greater than 0.5 Δdv sensitive-area-days for the maximum emission PW-700-C1-1.5 Project Alternative. There are 15 sensitive-area-days exceeding 0.5 Δdv covering 9 different days. The maximum cumulative deciview change impact is 0.91 Δdv at Bridger on April 1, 1995. The Project PW-700-C1-1.5 alternative is contributing approximately 40 percent to this value. Of the 15 sensitive-area-days exceeding 0.5 Δdv for the PW-700-C1-1.5 Project Alternative, over half (8) are just over the 0.5 threshold (less than 0.60 Δdv).

**Presence of Weather Events**

The presence of precipitation (rain or snow) or heavy fog during a 24-hour period coinciding with a 24-hour visibility degradation event could make such an event not visible and inconsequential. Thus, in the evaluation of any adverse visibility impacts of the cumulative (Project+post-95) sources, a discussion of the potential of weather events that obscure visibility on those days should be included.

Without the presence of an observer's log that completely documents the presence of weather events that obscure visibility during the entire 24-hour period of the day in question, it is difficult to fully document such a weather event. Thus, in this section we examine the readily available information and discuss the days in which we believe weather may have existed that may have obscured any adverse visibility impacts for all or part of a 24-hour period. There were two main sources of information that were used: (1) the spatial patterns of 24-hour precipitation from the Daily Weather Maps published by NWS/NOAA; and (2) the 24-hour precipitation observations at Pinedale and three other sites near (within 25-km of) Pinedale on the west side of the Wind River Range, and Lander on the east side of the Wind River Range.

Table 5-6 summarizes the precipitation results for each day in which the cumulative visibility impacts greater than 0.5 Δdv at a sensitive receptor area for any Project Alternative. On March 2, 1995, the Daily Weather Maps indicated precipitation was present in the Wind River Range area, but none was recorded at either the Pinedale or Lander measurement sites. However, on this day the Bridger transmissometer data was ruled invalid due to weather. Thus, there was the potential for a weather event on March 2.

On March 3, both the Daily Weather Maps and 24-hour precipitation measurements around the Pinedale area verify the presence of significant precipitation. Thus, on March 3 there was the potential for weather obscuring any adverse visibility impacts.

On March 14 and 17, the Daily Weather Maps and precipitation observations indicate no precipitation in the region. Thus, there is likely no precipitation weather event occurred on these two days.

On March 18, the Daily Weather Maps suggested there may be precipitation, but none was recorded at the precipitation measurement sites. Similarly, the Daily Weather Maps for March 26 indicate precipitation was present in the region but none was measured at the Coop observation sites. Thus, the available information is inconsistent and no estimates of whether weather events existed can be made for these days.

On April 1, both the Daily Weather Maps and precipitation observations indicate no rain or snow or occurred so there were likely no weather events.

Finally, on April 17 and 20, both the Daily Weather Maps and precipitation observations suggest there was precipitation in the region that may have obscured any visibility degradation events.

Based on the results in Table 5-6, there were likely weather events on March 2 and 3 and April 17 and 20 that may have obscured visibility thereby making the visibility impacts of the new sources inconsequential. Weather events may have also occurred in the region on March 18 and 26, although the evidence is mixed. Finally, based on the available information, there did not appear to be any precipitation weather events on March 14 and 17, and April 1 that would obscure visibility. These results suggest that the presence of weather events may reduce the number of sensitive area-days when cumulative visibility degradation impacts were greater than 0.5 $\Delta$dv.

## MODELING OF NAUGHTON NOx EMISSIONS REDUCTIONS

As discussed in Chapter 4 and in the Modeling Protocol (BLM, 1999), some of the Pinedale Anticline Gas Development Project operators assisted in the purchase of Low-NOx Burner Technology (LNBT) controls for Unit 3 of the Naughton coal-fired Generating Station (Naughton) located near Kemerrer in southwestern Wyoming. The LNBT control is expected to result in approximately 2,000 tons per year (TPY) reduction in NOx emissions from Unit 3 of Naughton. Note that the actual guaranteed permitted NOx reductions is 1,000 TPY. The BLM and cooperating agencies agreed to examine the benefits of the Naughton LNBT controls at 2,000 TPY reduction in NOx. These NOx emissions reductions could result in corresponding reductions in air quality concentrations and visibility degradation. Below we document the expected benefits of the Naughton NOx emissions reductions and their mitigation effects on any air quality or visibility adverse effects due to the Project and post-95 sources. This mitigation is examined two ways:

1. The visibility benefits of the Naughton LNBT NOx emissions reduction are first first examined concurrently with the cumulative visibility impacts of the Project plus post-95 sources at the sensitive receptor areas; and

2. The benefits of the Naughton LNBT NOx emissions reduction in reducing ambient Concentrations and visibility impacts are then analyzed separately from the Project plus post-95 cumulative impacts.

The reason for analyzing the Naughton benefits these two ways is that the impacts of the Naughton plume on the sensitive receptor areas may occur on different days or different locations than the Project + post-95 cumulative impacts. Thus, there could be benefits of the Naughton NOx emissions reductions that would not directly cancel out any adverse effects of the Project+post-95 sources. Approach 2 above would document these benefits of the Naughton NOx controls.

The effects of the Naughton emissions on visibility in the sensitive receptor areas under current and LNBT emissions was performed in the same fashion that the visibility impacts of the Project and post-95 sources were performed. That is, the current and LNBT Naughton scenarios NOx, $SO_2$, and $PM_{10}$ emissions from Naughton units 1, 2, and 3 were simulated using CALPUFF to estimate the visibility impacts. These impacts were compared against a visibility background based on the mean of the 20 percent cleanest days from a long-term (approximately a decade) of the Bridger IMPROVE data. Note that because Naughton is an existing source in the region, there is a potential for double counting its effect; once in the CALPUFF modeling and once in the background. However, this "double counting" is highly unlikely since when the Naughton plume is impacting the Bridger IMPROVE monitor it would almost certainly not be included in the 20 percent of the cleanest days.

**Project/Post-95 Source Visibility Impacts Concurrent with the Naughton NOx Reductions**

The Project and post-95 CALPUFF-estimated visibility impacts were processed with the Naughton LNBT NOx emissions reductions to determine the extent to which the Naughton NOx emissions reductions would directly cancel out (mitigate) any estimated adverse visibility impacts due to the cumulative (Project+post-95) impacts of the new sources. Tables 5-7 through 5-9 summarize the Project, post-95, and cumulative visibility impacts for the Project Wide well drilling configuration (PW) scenario with compressor location C1 operating at, respectively, 0.7, 1.0, and 1.5 g/hp-hr NOx emissions with and without accounting for the benefits of the Naughton NOx emission reductions. The Project and post-95 visibility impacts concurrent with the Naughton NOx emission reductions for all of the Project Alternative emissions scenarios are displayed in Appendix H, these can be compared with the Project and post-95 sources cumulative visibility impacts without the Naughton benefits in Appendix D.

The concurrent benefits of the Naughton NOx emissions reductions on the Project+post-95 cumulative emissions scenario visibility impacts are to reduce the number of days the 0.5 Δdv threshold is exceeded at any sensitive area by 1-2 days, depending on the Project Alternative. The Naughton NOx emission reductions directly eliminate the one day of visibility greater than 0.5 Δdv at the Popo Agie Wilderness Area. However, even with the Naughton NOx emission reductions, the cumulative (Project+post-95) visibility impacts are still estimated to have 4-8, 2, 0-1, and 1-2 days exceeding the 0.5 Δdv at the, respectively, Bridger, Fitzpatrick, Popo Agie Wilderness Areas, and Wind River Roadless Area sensitive receptor areas. Thus, it appears that the days in which the cumulative emissions scenario is estimated to exceed the 0.5 Δdv threshold at the sensitive receptor areas occur under meteorological conditions when there is little or no impact from the Naughton Generating Station. Thus, in order to fully analyze the benefits and the potential mitigation effects of the Naughton NOx emissions reduction, they need to be assessed independently (i.e., not concurrently) of the adverse effects of the Project+post-95 sources.

**Visibility Impacts Due to the Naughton LNBT NOx Emissions Reductions**

Air Quality Concentration Reductions

Appendix I displays the maximum Naughton air quality and visibility impacts under the current NOx emissions (Base) and the LNBT emissions control scenario. The high plume rise of the Naughton plume results in no near-source impacts, so the benefits of the Naughton NOx emissions reductions are seen at the far-field receptors. Since only NOx is reduced, the largest ambient concentrations reductions due to the Naughton NOx controls are for $NO_2$; the magnitudes of the maximum $NO_2$ concentration reductions at the sensitive receptor areas due to the Naughton controls are comparable to the maximum cumulative $NO_2$ concentration impact due to the Project and the post-95 sources (i.e., around 0.01 $\mu g/m^3$).

Visibility Benefits

The visibility benefits from the Naughton NOx emissions reductions are shown in Table 5-10. The Naughton LNBT NOx controls reduce the number of sensitive area-days in which the 0.5 and 1.0 Δdv thresholds are exceeded due to emissions from Naughton Generating Station by 12 and 3 days, respectively. Note that there is only one Project Alternative in which the cumulative (Project+post-95) visibility impacts are estimated to have more than 12 sensitive area-days with visibility degradation exceeding the 0.5 Δdv threshold (15 sensitive areas-days for the PW-700-C1-1.5 scenario). Furthermore, the cumulative visibility impacts never exceed the 1.0 Δdv threshold. Thus, for 35 out of the 36 Project Alternatives analyzed, it can be argued that the Naughton LNBT NOx emission reductions completely mitigate the visibility impacts of the Project+post-95 sources at the sensitive receptor areas in southwestern Wyoming as there are as many or more sensitive-area-days in which visibility is reduced by greater than 0.5 Δdv as there are that it is increased by greater than 0.5 Δdv. In fact, because the Naughton NOx emission reductions eliminates 3 days in which emissions from the Naughton Generating Station are estimated to cause visibility impacts in sensitive areas that exceed the 1.0 Δdv threshold, then it can be argued that the Naughton NOx emission reductions more than mitigate the Project+post-95 cumulative visibility impacts.

Although the Naughton NOx emission reductions appear to mitigate the cumulative visibility impacts of the Project Alternatives plus post-95 emissions across all sensitive area-days, the results for any individual sensitive receptor area may or not be mitigated. The visibility benefits due to the Naughton controls and the adverse effects due to the Project+post-95 sources for several of the different Project alternatives across all and for each individual sensitive receptor area are shown in Figures 5-1 through 5-5. In Figures 5-1 through 5-5, the displays of days with Δdv greater than 0.5 were prepared for just the compressor location C1 at their NOx emission rates (0.7, 1.0, and 1.5 g/hp-hr) because it represented the range of least to greatest visibility impacts. The impacts for the other Project Alternatives are either identical or bounded by those in Figures 5-1 through 5-5. However, this selection should not be viewed as a preference for this Project Alternative over the others.

For the one National Park sensitive receptor area (Grand Teton National Park), the proposed Project and new (post-95) sources never exceed the visibility 0.5 Δdv LAC threshold, yet the Naughton emission reduction eliminates one day in which the current Naughton emissions cause this threshold to be exceeded. Thus, there is a net visibility benefit in Grand Teton National Park when analyzing the cumulative (Project + post-95) impacts and Naughton NOx emission reductions together.

Across the four Wilderness Areas there are mixed results on whether the Naughton NOx emission reductions eliminate the days in which the cumulative new source visibility impacts exceed the 0.5 Δdv threshold. In three out of the four Wilderness Areas, the Naughton emission reductions result in a complete mitigation or a net visibility benefit of the visibility impacts of the cumulative new sources. However, for the Bridger Wilderness Area, the number of days in which the new emissions cumulative (Project+post-95) impacts exceed the 0.5 Δdv threshold exceed the number of days the Naughton NOx emission reductions result in reductions of this threshold from 2 to 7 days. However, the Naughton NOx emission reductions do result in 1 and 2 days reductions of the Naughton plume exceeding the more perceptible 1.0 Δdv threshold. Thus, when looking across all wilderness areas, it can be argued that there is a net visibility benefit when analyzing the cumulative (Project + post-95) adverse effects and Naughton benefits together. At the Wind River Roadless Area, the Naughton NOx emission reductions reduces the number of days that the Naughton plume causes visibility degradation that exceeds the 0.5 Δdv threshold by 4, which is greater than the number of days the cumulative (Project + post-95) emissions where the 0.5 Δdv threshold is exceeded (1 day).

Finally, at the Wind River Roadless Area, the Naughton NOx emission reductions reduces the number of days of visibility greater than 0.5 Δdv at this sensitive receptor. Thus, there is a net visibility benefit.

**Table 5-1a.** Maximum near-source CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Project Wide operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using annual emissions.

(PW-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | Annual | Near_Source | 0.00 | 0.01 | 0.01 | 20 | 9.00 | 9.01 | 60.0 | 80.0 |
| SO2 | 24-hour | Near_Source | 0.04 | 0.21 | 0.22 | 91 | 43.00 | 43.22 | 260.0 | 365.0 |
| SO2 | 3-hour | Near_Source | 0.10 | 0.82 | 0.82 | 512 | 132.00 | 132.82 | 1300.0 | 1300.0 |
| PM10 | Annual | Near_Source | 0.24 | 0.01 | 0.24 | 17 | 8.00 | 8.24 | 50.0 | 50.0 |
| PM10 | 24-hour | Near_Source | 2.74 | 0.21 | 2.87 | 30 | 18.00 | 20.87 | 150.0 | 150.0 |
| PM25 | Annual | Near_Source | 0.08 | 0.01 | 0.09 | -999 | 5.00 | 5.09 | 15.0 | 15.0 |
| PM25 | 24-hour | Near_Source | 0.93 | 0.12 | 0.99 | -999 | 10.00 | 10.99 | 65.0 | 65.0 |
| NO2 | Annual | Near_Source | 0.16 | 0.10 | 0.19 | 25 | 9.00 | 9.19 | 100.0 | 100.0 |
| CO | 1-hour | Near_Source | 0.00 | 0.00 | 0.00 | -999 | 3500.00 | 3500.00 | 40000.0 | 40000.0 |
| CO | 8-hour | Near_Source | 0.00 | 0.00 | 0.00 | -999 | 1500.00 | 1500.00 | 10000.0 | 10000.0 |

**Table 5-1b.** Maximum near-source CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Anticline Crest operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using annual emissions.

(AC-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | Annual | Near_Source | 0.00 | 0.01 | 0.01 | 20 | 9.00 | 9.01 | 60.0 | 80.0 |
| SO2 | 24-hour | Near_Source | 0.03 | 0.21 | 0.22 | 91 | 43.00 | 43.22 | 260.0 | 365.0 |
| SO2 | 3-hour | Near_Source | 0.09 | 0.82 | 0.82 | 512 | 132.00 | 132.82 | 1300.0 | 1300.0 |
| PM10 | Annual | Near_Source | 0.21 | 0.01 | 0.22 | 17 | 8.00 | 8.22 | 50.0 | 50.0 |
| PM10 | 24-hour | Near_Source | 2.17 | 0.21 | 2.26 | 30 | 18.00 | 20.26 | 150.0 | 150.0 |
| PM25 | Annual | Near_Source | 0.07 | 0.01 | 0.07 | -999 | 5.00 | 5.07 | 15.0 | 15.0 |
| PM25 | 24-hour | Near_Source | 0.74 | 0.12 | 0.78 | -999 | 10.00 | 10.78 | 65.0 | 65.0 |
| NO2 | Annual | Near_Source | 0.15 | 0.10 | 0.18 | 25 | 9.00 | 9.18 | 100.0 | 100.0 |
| CO | 1-hour | Near_Source | 0.00 | 0.00 | 0.00 | -999 | 3500.00 | 3500.00 | 40000.0 | 40000.0 |
| CO | 8-hour | Near_Source | 0.00 | 0.00 | 0.00 | -999 | 1500.00 | 1500.00 | 10000.0 | 10000.0 |

**Table 5-2a.** Maximum near-source CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Project Wide operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using maximum hourly emissions.

(PW-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | 24-hour | Near_Source | 0.04 | 0.24 | 0.24 | 91 | 43.00 | 43.24 | 260.0 | 365.0 |
| SO2 | 3-hour | Near_Source | 0.12 | 0.95 | 0.95 | 512 | 132.00 | 132.95 | 1300.0 | 1300.0 |
| PM10 | 24-hour | Near_Source | 6.00 | 0.42 | 6.02 | 30 | 18.00 | 24.02 | 150.0 | 150.0 |
| PM25 | 24-hour | Near_Source | 1.59 | 0.41 | 1.65 | -999 | 10.00 | 11.65 | 65.0 | 65.0 |
| CO | 1-hour | Near_Source | 89.28 | 0.00 | 89.28 | -999 | 3500.00 | 3589.28 | 40000.0 | 40000.0 |
| CO | 8-hour | Near_Source | 58.77 | 0.00 | 58.77 | -999 | 1500.00 | 1558.77 | 10000.0 | 10000.0 |

**Table 5-2b.** Maximum near-source CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Anticline Crest operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using maximum hourly emissions.

(AC-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | 24-hour | Near_Source | 0.04 | 0.19 | 0.24 | 91 | 43.00 | 43.24 | 260.0 | 365.0 |
| SO2 | 3-hour | Near_Source | 0.13 | 0.75 | 0.95 | 512 | 132.00 | 132.95 | 1300.0 | 1300.0 |
| PM10 | 24-hour | Near_Source | 5.96 | 0.38 | 6.01 | 30 | 18.00 | 24.01 | 150.0 | 150.0 |
| PM25 | 24-hour | Near_Source | 1.52 | 0.38 | 1.55 | -999 | 10.00 | 11.55 | 65.0 | 65.0 |
| CO | 1-hour | Near_Source | 89.92 | 0.00 | 89.92 | -999 | 3500.00 | 3589.92 | 40000.0 | 40000.0 |
| CO | 8-hour | Near_Source | 59.08 | 0.00 | 59.08 | -999 | 1500.00 | 1559.08 | 10000.0 | 10000.0 |

**Table 5-3a.** Maximum far-field CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Project Wide operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using annual average.

(PW-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | Annual | Bridger_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Fitzpatrick_ | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Popo_Agie_WA | 0.00 | 0.00 | 0.00 | 20 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Wind_River_R | 0.00 | 0.00 | 0.00 | 20 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | 24-hour | Bridger_WA | 0.00 | 0.09 | 0.09 | 5 | 43.00 | 43.09 | 260.0 | 365.0 |
| SO2 | 24-hour | Fitzpatrick_ | 0.00 | 0.07 | 0.07 | 5 | 43.00 | 43.07 | 260.0 | 365.0 |
| SO2 | 24-hour | Washakie_WA | 0.00 | 0.04 | 0.04 | 5 | 43.00 | 43.04 | 260.0 | 365.0 |
| SO2 | 24-hour | Grand_Teton_ | 0.00 | 0.04 | 0.04 | 5 | 43.00 | 43.04 | 260.0 | 365.0 |
| SO2 | 24-hour | Popo_Agie_WA | 0.00 | 0.11 | 0.11 | 91 | 43.00 | 43.11 | 260.0 | 365.0 |
| SO2 | 24-hour | Wind_River_R | 0.00 | 0.22 | 0.22 | 91 | 43.00 | 43.22 | 260.0 | 365.0 |
| SO2 | 3-hour | Bridger_WA | 0.01 | 0.28 | 0.28 | 25 | 132.00 | 132.28 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Fitzpatrick_ | 0.00 | 0.22 | 0.22 | 25 | 132.00 | 132.22 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Washakie_WA | 0.00 | 0.17 | 0.17 | 25 | 132.00 | 132.17 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Grand_Teton_ | 0.00 | 0.18 | 0.18 | 25 | 132.00 | 132.18 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Popo_Agie_WA | 0.00 | 0.24 | 0.24 | 512 | 132.00 | 132.24 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Wind_River_R | 0.00 | 0.75 | 0.75 | 512 | 132.00 | 132.75 | 1300.0 | 1300.0 |
| PM10 | Annual | Bridger_WA | 0.02 | 0.00 | 0.02 | 4 | 8.00 | 8.02 | 50.0 | 50.0 |
| PM10 | Annual | Fitzpatrick_ | 0.01 | 0.00 | 0.01 | 4 | 8.00 | 8.01 | 50.0 | 50.0 |
| PM10 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 4 | 8.00 | 8.00 | 50.0 | 50.0 |
| PM10 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | 4 | 8.00 | 8.00 | 50.0 | 50.0 |
| PM10 | Annual | Popo_Agie_WA | 0.01 | 0.00 | 0.01 | 17 | 8.00 | 8.01 | 50.0 | 50.0 |
| PM10 | Annual | Wind_River_R | 0.01 | 0.00 | 0.01 | 17 | 8.00 | 8.01 | 50.0 | 50.0 |

**Table 5-3a.** Concluded.

(PW-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| PM10 | 24-hour | Bridger_WA | 0.19 | 0.05 | 0.20 | 8 | 18.00 | 18.20 | 150.0 | 150.0 |
| PM10 | 24-hour | Fitzpatrick_ | 0.09 | 0.02 | 0.09 | 8 | 18.00 | 18.09 | 150.0 | 150.0 |
| PM10 | 24-hour | Washakie_WA | 0.02 | 0.01 | 0.03 | 8 | 18.00 | 18.03 | 150.0 | 150.0 |
| PM10 | 24-hour | Grand_Teton_ | 0.05 | 0.01 | 0.06 | 8 | 18.00 | 18.06 | 150.0 | 150.0 |
| PM10 | 24-hour | Popo_Agie_WA | 0.09 | 0.04 | 0.10 | 30 | 18.00 | 18.10 | 150.0 | 150.0 |
| PM10 | 24-hour | Wind_River_R | 0.10 | 0.03 | 0.10 | 30 | 18.00 | 18.10 | 150.0 | 150.0 |
| PM25 | Annual | Bridger_WA | 0.01 | 0.00 | 0.01 | -999 | 5.00 | 5.01 | 15.0 | 15.0 |
| PM25 | Annual | Fitzpatrick_ | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Popo_Agie_WA | 0.00 | 0.00 | 0.01 | -999 | 5.00 | 5.01 | 15.0 | 15.0 |
| PM25 | Annual | Wind_River_R | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | 24-hour | Bridger_WA | 0.09 | 0.05 | 0.10 | -999 | 10.00 | 10.10 | 65.0 | 65.0 |
| PM25 | 24-hour | Fitzpatrick_ | 0.05 | 0.02 | 0.05 | -999 | 10.00 | 10.05 | 65.0 | 65.0 |
| PM25 | 24-hour | Washakie_WA | 0.01 | 0.01 | 0.02 | -999 | 10.00 | 10.02 | 65.0 | 65.0 |
| PM25 | 24-hour | Grand_Teton_ | 0.03 | 0.01 | 0.03 | -999 | 10.00 | 10.03 | 65.0 | 65.0 |
| PM25 | 24-hour | Popo_Agie_WA | 0.05 | 0.04 | 0.06 | -999 | 10.00 | 10.06 | 65.0 | 65.0 |
| PM25 | 24-hour | Wind_River_R | 0.05 | 0.03 | 0.05 | -999 | 10.00 | 10.05 | 65.0 | 65.0 |
| NO2 | Annual | Bridger_WA | 0.01 | 0.01 | 0.03 | 2 | 9.00 | 9.03 | 100.0 | 100.0 |
| NO2 | Annual | Fitzpatrick_ | 0.00 | 0.01 | 0.01 | 2 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 100.0 | 100.0 |
| NO2 | Annual | Grand_Teton_ | 0.01 | 0.00 | 0.01 | 2 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Popo_Agie_WA | 0.01 | 0.01 | 0.01 | 25 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Wind_River_R | 0.01 | 0.01 | 0.01 | 25 | 9.00 | 9.01 | 100.0 | 100.0 |

**Table 5-3b.** Maximum far-field CALPUFF-estimated air quality concentrations due to the Pinedale Anticline Project alone, all expected additional sources since 1995 alone (post-95), cumulative impacts (Project+post-95), and total concentration including background for the 700 Anticline Crest operating wells using compressor location C1 with a NOx emissions rate of 1.5 g/hp-hr emissions scenario using annual average.

(AC-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| SO2 | Annual | Bridger_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Fitzpatrick_ | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Popo_Agie_WA | 0.00 | 0.00 | 0.00 | 20 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | Annual | Wind_River_R | 0.00 | 0.00 | 0.00 | 20 | 9.00 | 9.00 | 60.0 | 80.0 |
| SO2 | 24-hour | Bridger_WA | 0.00 | 0.09 | 0.09 | 5 | 43.00 | 43.09 | 260.0 | 365.0 |
| SO2 | 24-hour | Fitzpatrick_ | 0.00 | 0.07 | 0.07 | 5 | 43.00 | 43.07 | 260.0 | 365.0 |
| SO2 | 24-hour | Washakie_WA | 0.00 | 0.04 | 0.04 | 5 | 43.00 | 43.04 | 260.0 | 365.0 |
| SO2 | 24-hour | Grand_Teton_ | 0.00 | 0.04 | 0.04 | 5 | 43.00 | 43.04 | 260.0 | 365.0 |
| SO2 | 24-hour | Popo_Agie_WA | 0.00 | 0.11 | 0.11 | 91 | 43.00 | 43.11 | 260.0 | 365.0 |
| SO2 | 24-hour | Wind_River_R | 0.00 | 0.22 | 0.22 | 91 | 43.00 | 43.22 | 260.0 | 365.0 |
| SO2 | 3-hour | Bridger_WA | 0.01 | 0.28 | 0.28 | 25 | 132.00 | 132.28 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Fitzpatrick_ | 0.00 | 0.22 | 0.22 | 25 | 132.00 | 132.22 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Washakie_WA | 0.00 | 0.17 | 0.17 | 25 | 132.00 | 132.17 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Grand_Teton_ | 0.00 | 0.18 | 0.18 | 25 | 132.00 | 132.18 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Popo_Agie_WA | 0.00 | 0.24 | 0.24 | 512 | 132.00 | 132.24 | 1300.0 | 1300.0 |
| SO2 | 3-hour | Wind_River_R | 0.00 | 0.75 | 0.75 | 512 | 132.00 | 132.75 | 1300.0 | 1300.0 |
| PM10 | Annual | Bridger_WA | 0.01 | 0.00 | 0.02 | 4 | 8.00 | 8.02 | 50.0 | 50.0 |
| PM10 | Annual | Fitzpatrick_ | 0.01 | 0.00 | 0.01 | 4 | 8.00 | 8.01 | 50.0 | 50.0 |
| PM10 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 4 | 8.00 | 8.00 | 50.0 | 50.0 |
| PM10 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | 4 | 8.00 | 8.00 | 50.0 | 50.0 |
| PM10 | Annual | Popo_Agie_WA | 0.01 | 0.00 | 0.01 | 17 | 8.00 | 8.01 | 50.0 | 50.0 |
| PM10 | Annual | Wind_River_R | 0.01 | 0.00 | 0.01 | 17 | 8.00 | 8.01 | 50.0 | 50.0 |

**Table 5-3b.** Concluded.

(AC-700-C1-1.5) 1995_Concentrations_(ug/m^3)_using_c1 1.5g/hp-hr and 700. wells.

| Pollutant | Avg_Time | Area | Project | Post-95 | Cumulative | PSD | Background | Total | WAAQS | NAAQS |
|---|---|---|---|---|---|---|---|---|---|---|
| PM10 | 24-hour | Bridger_WA | 0.15 | 0.05 | 0.16 | 8 | 18.00 | 18.16 | 150.0 | 150.0 |
| PM10 | 24-hour | Fitzpatrick_ | 0.07 | 0.02 | 0.07 | 8 | 18.00 | 18.07 | 150.0 | 150.0 |
| PM10 | 24-hour | Washakie_WA | 0.02 | 0.01 | 0.02 | 8 | 18.00 | 18.02 | 150.0 | 150.0 |
| PM10 | 24-hour | Grand_Teton_ | 0.04 | 0.01 | 0.05 | 8 | 18.00 | 18.05 | 150.0 | 150.0 |
| PM10 | 24-hour | Popo_Agie_WA | 0.08 | 0.04 | 0.08 | 30 | 18.00 | 18.08 | 150.0 | 150.0 |
| PM10 | 24-hour | Wind_River_R | 0.08 | 0.03 | 0.08 | 30 | 18.00 | 18.08 | 150.0 | 150.0 |
| PM25 | Annual | Bridger_WA | 0.01 | 0.00 | 0.01 | -999 | 5.00 | 5.01 | 15.0 | 15.0 |
| PM25 | Annual | Fitzpatrick_ | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Popo_Agie_WA | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | Annual | Wind_River_R | 0.00 | 0.00 | 0.00 | -999 | 5.00 | 5.00 | 15.0 | 15.0 |
| PM25 | 24-hour | Bridger_WA | 0.07 | 0.05 | 0.08 | -999 | 10.00 | 10.08 | 65.0 | 65.0 |
| PM25 | 24-hour | Fitzpatrick_ | 0.04 | 0.02 | 0.04 | -999 | 10.00 | 10.04 | 65.0 | 65.0 |
| PM25 | 24-hour | Washakie_WA | 0.01 | 0.01 | 0.02 | -999 | 10.00 | 10.02 | 65.0 | 65.0 |
| PM25 | 24-hour | Grand_Teton_ | 0.03 | 0.01 | 0.03 | -999 | 10.00 | 10.03 | 65.0 | 65.0 |
| PM25 | 24-hour | Popo_Agie_WA | 0.04 | 0.04 | 0.06 | -999 | 10.00 | 10.06 | 65.0 | 65.0 |
| PM25 | 24-hour | Wind_River_R | 0.04 | 0.03 | 0.05 | -999 | 10.00 | 10.05 | 65.0 | 65.0 |
| NO2 | Annual | Bridger_WA | 0.01 | 0.01 | 0.02 | 2 | 9.00 | 9.02 | 100.0 | 100.0 |
| NO2 | Annual | Fitzpatrick_ | 0.00 | 0.01 | 0.01 | 2 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Washakie_WA | 0.00 | 0.00 | 0.00 | 2 | 9.00 | 9.00 | 100.0 | 100.0 |
| NO2 | Annual | Grand_Teton_ | 0.00 | 0.00 | 0.01 | 2 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Popo_Agie_WA | 0.00 | 0.01 | 0.01 | 25 | 9.00 | 9.01 | 100.0 | 100.0 |
| NO2 | Annual | Wind_River_R | 0.00 | 0.01 | 0.01 | 25 | 9.00 | 9.01 | 100.0 | 100.0 |

**Table 5-4.** CALPUFF-estimated visibility impacts at the Bridger Wilderness Area due to the potential Pinedale Anticline Project alternatives, new sources since June 30, 1995 (Post-95_Sources), and cumulative impacts (Project+Post-95_Sources) using a visibility background based on the mean of the 20 percent cleanest days from the Bridger IMPROVE reconstructed mass data.

Deciview_Change_using_c1 . Pinedale,1995
PW-700-c1-0.7

| Sensitive Area | Project_Sources . . #days >0.5dv | #days >1.0dv | Max dv | Post-95_Sources . . #days >0.5dv | #days >1.0dv | Max dv | Cumulative_Sources #days >0.5dv | #days >1.0dv | Max dv | Date of_Max | Change_on_Max_Date Project | Post-95 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PW-700-C1-0.7 | 0 | 0 | 0.29 | 2 | 0 | 0.61 | 5 | 0 | 0.83 | 3/ 2/95 | 0.13 | 0.61 |
| PW-700-C1-1.0 | 0 | 0 | 0.34 | 2 | 0 | 0.61 | 6 | 0 | 0.83 | 3/ 2/95 | 0.16 | 0.61 |
| PW-700-C1-1.5 | 0 | 0 | 0.42 | 2 | 0 | 0.61 | 9 | 0 | 0.91 | 4/ 1/95 | 0.41 | 0.52 |
| PW-700-C2-0.7 | 0 | 0 | 0.26 | 2 | 0 | 0.61 | 5 | 0 | 0.83 | 3/ 2/95 | 0.11 | 0.61 |
| PW-700-C2-1.0 | 0 | 0 | 0.28 | 2 | 0 | 0.61 | 6 | 0 | 0.84 | 3/ 2/95 | 0.13 | 0.61 |
| PW-700-C2-1.5 | 0 | 0 | 0.37 | 2 | 0 | 0.61 | 7 | 0 | 0.86 | 3/ 2/95 | 0.16 | 0.61 |
| PW-700-C3-0.7 | 0 | 0 | 0.31 | 2 | 0 | 0.61 | 5 | 0 | 0.82 | 3/ 2/95 | 0.13 | 0.61 |
| PW-700-C3-1.0 | 0 | 0 | 0.37 | 2 | 0 | 0.61 | 7 | 0 | 0.83 | 4/ 1/95 | 0.35 | 0.52 |
| PW-700-C3-1.5 | 0 | 0 | 0.46 | 2 | 0 | 0.61 | 8 | 0 | 0.91 | 4/ 1/95 | 0.43 | 0.52 |
| PW-500-C1-0.7 | 0 | 0 | 0.24 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.11 | 0.61 |
| PW-500-C1-1.0 | 0 | 0 | 0.29 | 2 | 0 | 0.61 | 5 | 0 | 0.82 | 3/ 2/95 | 0.14 | 0.61 |
| PW-500-C1-1.5 | 0 | 0 | 0.37 | 2 | 0 | 0.61 | 5 | 0 | 0.86 | 4/ 1/95 | 0.36 | 0.52 |
| PW-500-C2-0.7 | 0 | 0 | 0.20 | 2 | 0 | 0.61 | 4 | 0 | 0.89 | 3/ 2/95 | 0.09 | 0.61 |
| PW-500-C2-1.0 | 0 | 0 | 0.25 | 2 | 0 | 0.61 | 4 | 0 | 0.83 | 3/ 2/95 | 0.11 | 0.61 |
| PW-500-C2-1.5 | 0 | 0 | 0.34 | 2 | 0 | 0.61 | 5 | 0 | 0.85 | 3/ 2/95 | 0.14 | 0.61 |
| PW-500-C3-0.7 | 0 | 0 | 0.26 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.11 | 0.61 |
| PW-500-C3-1.0 | 0 | 0 | 0.32 | 2 | 0 | 0.61 | 4 | 0 | 0.82 | 3/ 2/95 | 0.13 | 0.61 |
| PW-500-C3-1.5 | 0 | 0 | 0.41 | 2 | 0 | 0.61 | 7 | 0 | 0.87 | 4/ 1/95 | 0.39 | 0.52 |
| AC-700-C1-0.7 | 0 | 0 | 0.25 | 2 | 0 | 0.61 | 4 | 0 | 0.82 | 3/ 2/95 | 0.12 | 0.61 |
| AC-700-C1-1.0 | 0 | 0 | 0.29 | 2 | 0 | 0.61 | 5 | 0 | 0.83 | 3/ 2/95 | 0.14 | 0.61 |
| AC-700-C1-1.5 | 0 | 0 | 0.38 | 2 | 0 | 0.61 | 5 | 0 | 0.87 | 4/ 1/95 | 0.37 | 0.52 |
| AC-700-C2-0.7 | 0 | 0 | 0.21 | 2 | 0 | 0.61 | 4 | 0 | 0.82 | 3/ 2/95 | 0.10 | 0.61 |
| AC-700-C2-1.0 | 0 | 0 | 0.27 | 2 | 0 | 0.61 | 5 | 0 | 0.84 | 3/ 2/95 | 0.11 | 0.61 |
| AC-700-C2-1.5 | 0 | 0 | 0.36 | 2 | 0 | 0.61 | 5 | 0 | 0.85 | 3/ 2/95 | 0.14 | 0.61 |
| AC-700-C3-0.7 | 0 | 0 | 0.27 | 2 | 0 | 0.61 | 5 | 0 | 0.82 | 3/ 2/95 | 0.11 | 0.61 |
| AC-700-C3-1.0 | 0 | 0 | 0.32 | 2 | 0 | 0.61 | 5 | 0 | 0.82 | 3/ 2/95 | 0.14 | 0.61 |
| AC-700-C3-1.5 | 0 | 0 | 0.42 | 2 | 0 | 0.61 | 7 | 0 | 0.87 | 4/ 1/95 | 0.39 | 0.52 |
| AC-500-C1-0.7 | 0 | 0 | 0.21 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.10 | 0.61 |
| AC-500-C1-1.0 | 0 | 0 | 0.26 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.13 | 0.61 |
| AC-500-C1-1.5 | 0 | 0 | 0.34 | 2 | 0 | 0.61 | 5 | 0 | 0.84 | 4/ 1/95 | 0.34 | 0.52 |
| AC-500-C2-0.7 | 0 | 0 | 0.19 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.08 | 0.61 |
| AC-500-C2-1.0 | 0 | 0 | 0.25 | 2 | 0 | 0.61 | 4 | 0 | 0.82 | 3/ 2/95 | 0.10 | 0.61 |
| AC-500-C2-1.5 | 0 | 0 | 0.34 | 2 | 0 | 0.61 | 5 | 0 | 0.84 | 3/ 2/95 | 0.13 | 0.61 |
| AC-500-C3-0.7 | 0 | 0 | 0.23 | 2 | 0 | 0.61 | 4 | 0 | 0.80 | 3/ 2/95 | 0.10 | 0.61 |
| AC-500-C3-1.0 | 0 | 0 | 0.29 | 2 | 0 | 0.61 | 4 | 0 | 0.81 | 3/ 2/95 | 0.12 | 0.61 |
| AC-500-C3-1.5 | 0 | 0 | 0.38 | 2 | 0 | 0.61 | 6 | 0 | 0.84 | 4/ 1/95 | 0.36 | 0.52 |

**Table 5-5.** Details on the sensitive areas-days with cumulative visibility increment greater than 0.5 Δdv for several Project Alternatives (results for all alternatives are contained in Appendix G).

(a) Sensitive area-days in which the cumulative visibility impacts are greater than 0.5 Δdv for the PW-500-C1-0.7 Project Alternative

| Run | Wilderness | Date | Change_in_Deciview | | | Percent_Contribution_to_Extinction | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Project | Post95 | NO3 | SO4 | PM25 | PM10 | NO2 |
| PW-500-c1-0.7 | Bridger_WA | 3/ 2/95 | 0.81 | 0.11 | 0.61 | 70.4 | 27.2 | 0.6 | 1.3 | 0.5 |
| PW-500-c1-0.7 | Fitzpatric | 3/ 2/95 | 0.66 | 0.05 | 0.49 | 77.5 | 20.3 | 0.5 | 1.2 | 0.5 |
| PW-500-c1-0.7 | Popo_Agie_ | 3/ 2/95 | 0.58 | 0.08 | 0.39 | 70.4 | 27.2 | 0.6 | 1.3 | 0.5 |
| PW-500-c1-0.7 | Wind_River | 3/ 2/95 | 0.63 | 0.07 | 0.45 | 74.6 | 22.9 | 0.7 | 1.3 | 0.5 |
| PW-500-c1-0.7 | Bridger_WA | 3/ 3/95 | 0.67 | 0.03 | 0.42 | 84.3 | 12.8 | 0.8 | 1.3 | 0.7 |
| PW-500-c1-0.7 | Fitzpatric | 3/ 3/95 | 0.52 | 0.01 | 0.30 | 84.4 | 12.6 | 0.5 | 1.5 | 1.0 |
| PW-500-c1-0.7 | Bridger_WA | 3/18/95 | 0.56 | 0.09 | 0.38 | 87.4 | 6.0 | 1.3 | 4.3 | 0.9 |
| PW-500-c1-0.7 | Bridger_WA | 4/ 1/95 | 0.74 | 0.24 | 0.52 | 98.3 | -2.0 | 0.7 | 2.1 | 0.9 |

(b) Sensitive area-days in which the cumulative visibility impacts are greater than 0.5 Δdv for the PW-700-C1-0.7 Project Alternative

| Run | Wilderness | Date | Change_in_Deciview | | | Percent_Contribution_to_Extinction | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Project | Post95 | NO3 | SO4 | PM25 | PM10 | NO2 |
| PW-700-c1-0.7 | Bridger_WA | 3/ 2/95 | 0.83 | 0.13 | 0.61 | 70.6 | 26.7 | 0.8 | 1.4 | 0.5 |
| PW-700-c1-0.7 | Fitzpatric | 3/ 2/95 | 0.67 | 0.06 | 0.49 | 77.5 | 20.0 | 0.6 | 1.3 | 0.5 |
| PW-700-c1-0.7 | Popo_Agie_ | 3/ 2/95 | 0.59 | 0.10 | 0.39 | 70.6 | 26.7 | 0.8 | 1.4 | 0.5 |
| PW-700-c1-0.7 | Wind_River | 3/ 2/95 | 0.63 | 0.08 | 0.45 | 74.7 | 22.4 | 0.8 | 1.5 | 0.5 |
| PW-700-c1-0.7 | Bridger_WA | 3/ 3/95 | 0.68 | 0.04 | 0.42 | 84.3 | 12.8 | 0.8 | 1.3 | 0.7 |
| PW-700-c1-0.7 | Fitzpatric | 3/ 3/95 | 0.52 | 0.01 | 0.30 | 84.3 | 12.6 | 0.5 | 1.5 | 1.0 |
| PW-700-c1-0.7 | Bridger_WA | 3/14/95 | 0.50 | 0.11 | 0.39 | 90.7 | 2.8 | 0.9 | 4.6 | 1.0 |
| PW-700-c1-0.7 | Bridger_WA | 3/18/95 | 0.58 | 0.12 | 0.38 | 86.9 | 5.8 | 1.7 | 4.7 | 0.9 |
| PW-700-c1-0.7 | Bridger_WA | 4/ 1/95 | 0.79 | 0.28 | 0.52 | 97.6 | -1.9 | 0.9 | 2.4 | 0.9 |

**Table 5-5.** Concluded.

(c) Sensitive areas-days in which the cumulative visibility impacts are greater than 0.5 Δdv for the PW-700-C1-1.0 Project Alternative

| Run | Wilderness | Date | Change_in_Deciview | | | Percent_Contribution_to_Extinction | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Project | Post95 | NO3 | SO4 | PM25 | PM10 | NO2 |
| PW-700-c1-1.0 | Bridger_WA | 3/ 2/95 | 0.83 | 0.16 | 0.61 | 71.3 | 26.0 | 0.7 | 1.5 | 0.5 |
| PW-700-c1-1.0 | Fitzpatric | 3/ 2/95 | 0.68 | 0.07 | 0.49 | 77.8 | 19.7 | 0.6 | 1.4 | 0.5 |
| PW-700-c1-1.0 | Popo_Agie_ | 3/ 2/95 | 0.61 | 0.12 | 0.39 | 71.3 | 26.0 | 0.7 | 1.5 | 0.5 |
| PW-700-c1-1.0 | Wind_River | 3/ 2/95 | 0.65 | 0.10 | 0.45 | 75.2 | 21.8 | 0.8 | 1.6 | 0.5 |
| PW-700-c1-1.0 | Bridger_WA | 3/ 3/95 | 0.68 | 0.05 | 0.42 | 84.3 | 12.8 | 0.8 | 1.3 | 0.7 |
| PW-700-c1-1.0 | Fitzpatric | 3/ 3/95 | 0.52 | 0.01 | 0.30 | 84.3 | 12.5 | 0.5 | 1.6 | 1.1 |
| PW-700-c1-1.0 | Bridger_WA | 3/14/95 | 0.51 | 0.11 | 0.39 | 90.7 | 2.8 | 0.9 | 4.7 | 1.0 |
| PW-700-c1-1.0 | Bridger_WA | 3/18/95 | 0.58 | 0.12 | 0.38 | 87.0 | 5.7 | 1.6 | 4.7 | 0.9 |
| PW-700-c1-1.0 | Bridger_WA | 3/26/95 | 0.53 | 0.34 | 0.27 | 95.9 | 0.7 | 1.0 | 2.1 | 0.4 |
| PW-700-c1-1.0 | Bridger_WA | 4/ 1/95 | 0.83 | 0.33 | 0.52 | 97.6 | -1.9 | 0.9 | 2.5 | 0.9 |

(d) Sensitive areas-days in which the cumulative visibility impacts are greater than 0.5 Δdv for the PW-700-C1-1.5 Project Alternative

| Run | Wilderness | Date | Change_in_Deciview | | | Percent_Contribution_to_Extinction | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Project | Post95 | NO3 | SO4 | PM25 | PM10 | NO2 |
| PW-700-c1-1.5 | Bridger_WA | 3/ 2/95 | 0.85 | 0.20 | 0.61 | 72.3 | 24.9 | 0.7 | 1.6 | 0.6 |
| PW-700-c1-1.5 | Fitzpatric | 3/ 2/95 | 0.69 | 0.09 | 0.49 | 78.3 | 19.2 | 0.6 | 1.4 | 0.5 |
| PW-700-c1-1.5 | Popo_Agie_ | 3/ 2/95 | 0.64 | 0.15 | 0.39 | 72.3 | 24.9 | 0.7 | 1.6 | 0.6 |
| PW-700-c1-1.5 | Wind_River | 3/ 2/95 | 0.66 | 0.13 | 0.45 | 76.0 | 21.0 | 0.8 | 1.7 | 0.6 |
| PW-700-c1-1.5 | Bridger_WA | 3/ 3/95 | 0.70 | 0.06 | 0.42 | 84.3 | 12.8 | 0.8 | 1.3 | 0.7 |
| PW-700-c1-1.5 | Fitzpatric | 3/ 3/95 | 0.52 | 0.02 | 0.30 | 84.3 | 12.5 | 0.5 | 1.6 | 1.1 |
| PW-700-c1-1.5 | Bridger_WA | 3/14/95 | 0.51 | 0.12 | 0.39 | 90.6 | 2.8 | 0.9 | 4.7 | 1.0 |
| PW-700-c1-1.5 | Bridger_WA | 3/17/95 | 0.51 | 0.28 | 0.19 | 93.5 | 0.8 | 1.6 | 3.3 | 0.7 |
| PW-700-c1-1.5 | Bridger_WA | 3/18/95 | 0.59 | 0.13 | 0.38 | 87.1 | 5.7 | 1.6 | 4.7 | 0.9 |
| PW-700-c1-1.5 | Bridger_WA | 3/26/95 | 0.61 | 0.42 | 0.27 | 96.1 | 0.6 | 0.9 | 2.0 | 0.4 |
| PW-700-c1-1.5 | Popo_Agie_ | 3/26/95 | 0.52 | 0.34 | 0.19 | 96.1 | 0.6 | 0.9 | 2.0 | 0.4 |
| PW-700-c1-1.5 | Wind_River | 3/26/95 | 0.56 | 0.39 | 0.19 | 95.4 | 0.6 | 0.9 | 2.4 | 0.7 |
| PW-700-c1-1.5 | Bridger_WA | 4/ 1/95 | 0.91 | 0.41 | 0.52 | 97.5 | -1.8 | 0.9 | 2.5 | 0.9 |
| PW-700-c1-1.5 | Bridger_WA | 4/17/95 | 0.52 | 0.41 | 0.14 | 75.0 | 22.4 | 0.7 | 1.6 | 0.3 |
| PW-700-c1-1.5 | Bridger_WA | 4/20/95 | 0.52 | 0.28 | 0.31 | 89.6 | 6.9 | 1.2 | 1.9 | 0.4 |

**Table 5-6.** Summary of precipitation during days in which the cumulative (Project + post-95) visibility increment is greater than 0.5 Δdv at a sensitive receptor area for any Project Alternative.

| | | Pinedale Area Precipitation Stations (mm/day) | | | | Precipitation |
|---|---|---|---|---|---|---|
| | Daily Weather Maps Precipitation | Pinedale 0726 | 22-km SE 0951 | 13-km SW 2054 | 22-km WSW 2242 | Lander 5390 (mm/day) |
| March 2, 1995 | Yes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March 3, 1995 | Yes | 0.5 | 0.5 | 0.3 | 2.8 | 0.0 |
| March 14, 1995 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March 17, 1995 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March 18, 1995 | Maybe | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| March 26, 1995 | Yes | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| April 1, 1995 | No | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| April 17, 1995 | Yes | 0.0 | 0.0 | 0.0 | 1.3 | 8.0 |
| April 20, 1995 | Maybe | 4.6 | 3.4 | 1.0 | 2.0 | 1.0 |

**Table 5-7.** Comparisons of the Pinedale Anticline Project, post-95, and cumulative (Project+post-95) visibility impacts at the sensitive receptor areas with (a) and without (b) the concurrent benefits of the Naughton LNBT NOx emission reductions -- 700 wells Project Wide with compressor location C1 operating at 0.7 gm/hp-hr NOx emissions (PW-700-C1-0.7).

**(a) PW-700-c1-0.7 Without Naughton NOX Emissions Reductions**

| Sensitive Area | Project_Sources #days >0.5dv | Project_Sources #days >1.0dv | Project_Sources Max dv | Post-95_Sources #days >0.5dv | Post-95_Sources #days >1.0dv | Post-95_Sources Max dv | Cumulative_Sources #days >0.5dv | Cumulative_Sources #days >1.0dv | Cumulative_Sources Max dv | Date of_Max | Change_on_Max_Date Project | Change_on_Max_Date Post-95 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bridger_WA | 0 | 0 | 0.29 | 2 | 0 | 0.61 | 5 | 0 | 0.83 | 3/ 2/95 | 0.13 | 0.61 |
| Fitzpatrick_ | 0 | 0 | 0.18 | 0 | 0 | 0.49 | 2 | 0 | 0.67 | 3/ 2/95 | 0.06 | 0.49 |
| Washakie_WA | 0 | 0 | 0.05 | 0 | 0 | 0.28 | 0 | 0 | 0.36 | 3/ 2/95 | 0.04 | 0.28 |
| Grand_Teton_ | 0 | 0 | 0.10 | 0 | 0 | 0.15 | 0 | 0 | 0.30 | 5/ 6/95 | 0.10 | 0.05 |
| Popo_Agie_WA | 0 | 0 | 0.22 | 0 | 0 | 0.39 | 1 | 0 | 0.59 | 3/ 2/95 | 0.10 | 0.39 |
| Wind_River_R | 0 | 0 | 0.25 | 0 | 0 | 0.45 | 1 | 0 | 0.63 | 3/ 2/95 | 0.09 | 0.45 |

(b) PW-700-c1-0.7 With Naughton NOX Emissions Reductions

| Sensitive Area | Project_Sources #days >0.5dv | Project_Sources #days >1.0dv | Project_Sources Max dv | Post-95_Sources #days >0.5dv | Post-95_Sources #days >1.0dv | Post-95_Sources Max dv | Cumulative_Sources #days >0.5dv | Cumulative_Sources #days >1.0dv | Cumulative_Sources Max dv | Date of_Max | Change_on_Max_Date Project | Change_on_Max_Date Post-95 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bridger_WA | 0 | 0 | 0.29 | 1 | 0 | 0.58 | 5 | 0 | 0.78 | 4/ 1/95 | 0.28 | 0.42 |
| Fitzpatrick_ | 0 | 0 | 0.18 | 0 | 0 | 0.44 | 2 | 0 | 0.57 | 3/ 2/95 | 0.06 | 0.00 |
| Washakie_WA | 0 | 0 | 0.05 | 0 | 0 | 0.08 | 0 | 0 | 0.16 | 3/ 2/95 | 0.04 | 0.00 |
| Grand_Teton_ | 0 | 0 | 0.10 | 0 | 0 | 0.17 | 0 | 0 | 0.29 | 5/ 6/95 | 0.10 | 0.17 |
| Popo_Agie_WA | 0 | 0 | 0.22 | 0 | 0 | 0.38 | 0 | 0 | 0.50 | 3/ 2/95 | 0.10 | 0.00 |
| Wind_River_R | 0 | 0 | 0.25 | 0 | 0 | 0.40 | 1 | 0 | 0.53 | 3/ 2/95 | 0.09 | 0.00 |

**Table 5-8.** Comparisons of the Pinedale Anticline Project, Post-95, and cumulative (Project+post-95) visibility impacts at the sensitive receptor areas with (a) and without (b) the concurrent benefits of the Naughton LNBT NOx emission reductions -- 700 wells Project Wide with compressor location C1 operating at 1.0 gm/hp-hr NOx emissions (PW-700-C1-1.0).

**(a) PW-700-c1-1.0 Without the Naughton Emissions Reductions**

| Sensitive Area | Project_Sources . . | | | Post-95_Sources . . | | | Cumulative _Sources | | | Date of_Max | Change_on_Max_Date | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | | Project | Post-95 |
| Bridger_WA | 0 | 0 | 0.34 | 2 | 0 | 0.61 | 6 | 0 | 0.83 | 3/ 2/95 | 0.16 | 0.61 |
| Fitzpatrick_ | 0 | 0 | 0.21 | 0 | 0 | 0.49 | 2 | 0 | 0.68 | 3/ 2/95 | 0.07 | 0.49 |
| Washakie_WA | 0 | 0 | 0.07 | 0 | 0 | 0.28 | 0 | 0 | 0.37 | 3/ 2/95 | 0.04 | 0.28 |
| Grand_Teton_ | 0 | 0 | 0.12 | 0 | 0 | 0.15 | 0 | 0 | 0.32 | 5/ 6/95 | 0.12 | 0.05 |
| Popo_Agie_WA | 0 | 0 | 0.26 | 0 | 0 | 0.39 | 1 | 0 | 0.61 | 3/ 2/95 | 0.12 | 0.39 |
| Wind_River_R | 0 | 0 | 0.30 | 0 | 0 | 0.45 | 1 | 0 | 0.65 | 3/ 2/95 | 0.10 | 0.45 |

(b) PW-700-c1-1.0 With the Naughton Emission Reductions

| Sensitive Area | Project_Sources . . | | | Post-95_Sources . . | | | Cumulative _Sources | | | Date of_Max | Change_on_Max_Date | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | | Project | Post-95 |
| Bridger_WA | 0 | 0 | 0.34 | 1 | 0 | 0.58 | 5 | 0 | 0.83 | 4/ 1/95 | 0.33 | 0.42 |
| Fitzpatrick_ | 0 | 0 | 0.21 | 0 | 0 | 0.44 | 2 | 0 | 0.58 | 3/ 2/95 | 0.07 | 0.00 |
| Washakie_WA | 0 | 0 | 0.07 | 0 | 0 | 0.08 | 0 | 0 | 0.17 | 3/ 2/95 | 0.04 | 0.00 |
| Grand_Teton_ | 0 | 0 | 0.12 | 0 | 0 | 0.17 | 0 | 0 | 0.31 | 5/ 6/95 | 0.12 | 0.17 |
| Popo_Agie_WA | 0 | 0 | 0.26 | 0 | 0 | 0.38 | 1 | 0 | 0.52 | 3/ 2/95 | 0.12 | 0.00 |
| Wind_River_R | 0 | 0 | 0.30 | 0 | 0 | 0.40 | 1 | 0 | 0.54 | 3/ 2/95 | 0.10 | 0.00 |

**Table 5-9.** Comparisons of the Pinedale Anticline Project, Post-95, and cumulative (Project+post-95) visibility impacts at the sensitive receptor areas with (a) and without (b) the concurrent benefits of the Naughton LNBT NOx emission reductions -- 700 wells Project Wide with compressor location C1 operating at 1.5 gm/hp-hr NOx emissions (PW-700-C1-1.5).

**(a) PW-700-c1-1.5 Without the Naughton Emission Reductions**

| Sensitive Area | Project_Sources . . | | | Post-95_Sources . . | | | Cumulative _Sources | | | Date of_Max | Change_on_Max_Date | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | | Project | Post-95 |
| Bridger_WA | 0 | 0 | 0.42 | 2 | 0 | 0.61 | 9 | 0 | 0.91 | 4/ 1/95 | 0.41 | 0.52 |
| Fitzpatrick_ | 0 | 0 | 0.26 | 0 | 0 | 0.49 | 2 | 0 | 0.69 | 3/ 2/95 | 0.09 | 0.49 |
| Washakie_WA | 0 | 0 | 0.09 | 0 | 0 | 0.28 | 0 | 0 | 0.38 | 3/ 2/95 | 0.06 | 0.28 |
| Grand_Teton_ | 0 | 0 | 0.16 | 0 | 0 | 0.15 | 0 | 0 | 0.35 | 5/ 6/95 | 0.15 | 0.05 |
| Popo_Agie_WA | 0 | 0 | 0.34 | 0 | 0 | 0.39 | 2 | 0 | 0.64 | 3/ 2/95 | 0.15 | 0.39 |
| Wind_River_R | 0 | 0 | 0.39 | 0 | 0 | 0.45 | 2 | 0 | 0.66 | 3/ 2/95 | 0.13 | 0.45 |

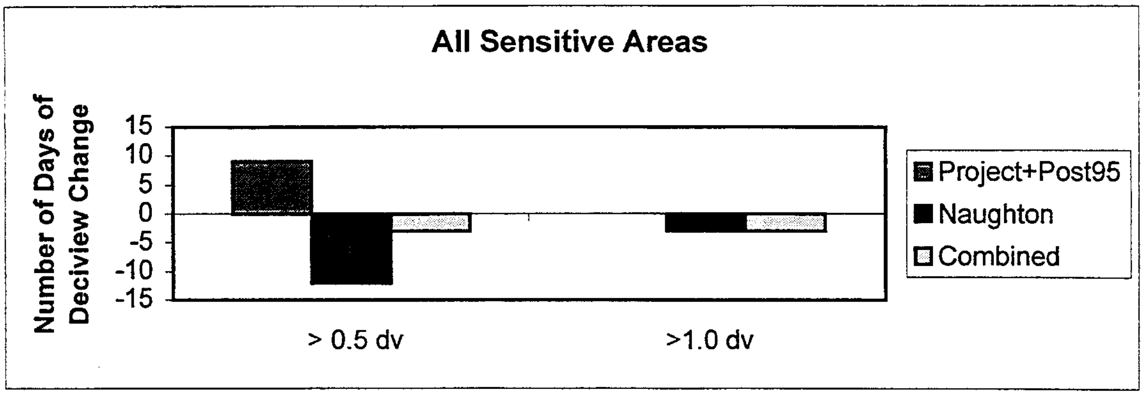
(b) PW-700-c1-1.5 With the Naughton Emission Reductions

| Sensitive Area | Project_Sources . . | | | Post-95_Sources . . | | | Cumulative _Sources | | | Date of_Max | Change_on_Max_Date | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| . | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | #days >0.5dv | #days >1.0dv | Max dv | | Project | Post-95 |
| Bridger_WA | 0 | 0 | 0.42 | 1 | 0 | 0.58 | 8 | 0 | 0.91 | 4/ 1/95 | 0.41 | 0.42 |
| Fitzpatrick_ | 0 | 0 | 0.26 | 0 | 0 | 0.44 | 2 | 0 | 0.60 | 3/ 2/95 | 0.09 | 0.00 |
| Washakie_WA | 0 | 0 | 0.09 | 0 | 0 | 0.08 | 0 | 0 | 0.17 | 3/ 2/95 | 0.06 | 0.00 |
| Grand_Teton_ | 0 | 0 | 0.16 | 0 | 0 | 0.17 | 0 | 0 | 0.34 | 5/ 6/95 | 0.15 | 0.17 |
| Popo_Agie_WA | 0 | 0 | 0.34 | 0 | 0 | 0.38 | 1 | 0 | 0.55 | 3/ 2/95 | 0.15 | 0.00 |
| Wind_River_R | 0 | 0 | 0.39 | 0 | 0 | 0.40 | 2 | 0 | 0.56 | 3/ 2/95 | 0.13 | 0.00 |

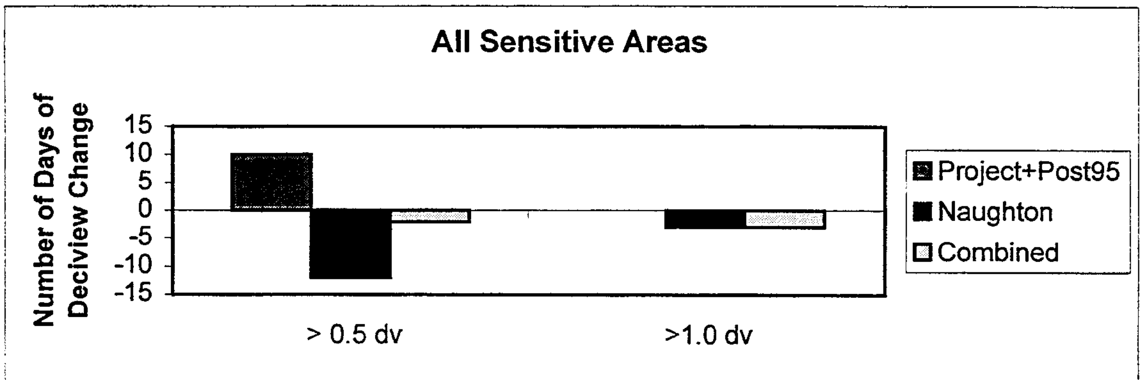
**Table 5-10.** CALPUFF-estimated visibility impacts at the sensitive receptor areas for the current Naughton Generating Station Units 1, 2, and 3 SOx, PM, and NOx emissions and the Naughton Generating Station emissions with the LNBT NOx controls on Unit 3 (visibility background based on the mean of the 20 percent cleanest days from the Bridger IMPROVE reconstructed mass data).

| Sensitive Area | LNBT #days >0.5dv | #days >1.0dv | Max dv | Naughton #days >0.5dv | #days >1.0dv | Max dv | Date of_Max |
|---|---|---|---|---|---|---|---|
| Bridger_WA | 48 | 23 | 2.67 | 50 | 23 | 2.85 | 3/ 2/95 |
| Fitzpatrick_ | 34 | 12 | 3.45 | 37 | 13 | 3.64 | 3/ 1/95 |
| Washakie_WA | 19 | 4 | 3.00 | 19 | 6 | 3.21 | 3/ 2/95 |
| Grand_Teton_ | 63 | 37 | 2.66 | 64 | 37 | 2.78 | 9/25/95 |
| Popo_Agie_WA | 27 | 10 | 1.93 | 29 | 10 | 2.11 | 2/11/95 |
| Wind_River_R | 32 | 12 | 3.42 | 36 | 12 | 3.61 | 3/ 1/95 |
| **TOTAL** | **223** | **98** | | **235** | **101** | | |

PW-700-C1-0.7




PW-700-C1-1.0




PW-700-C1-1.5

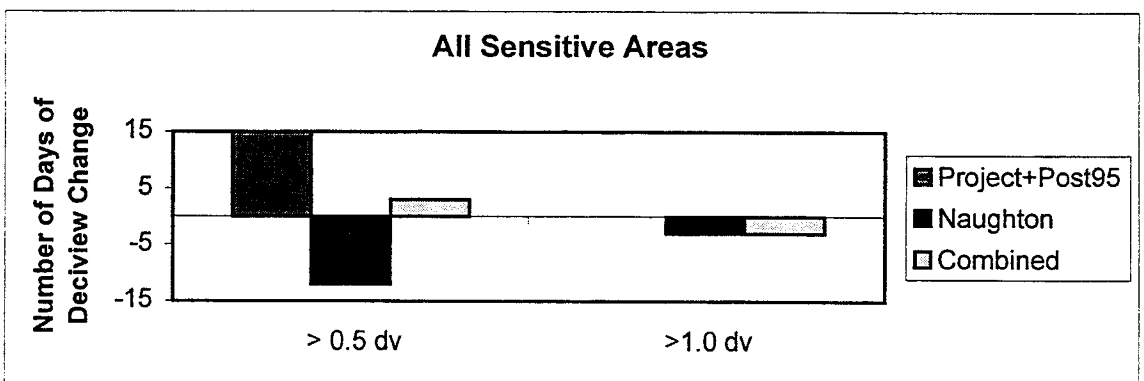
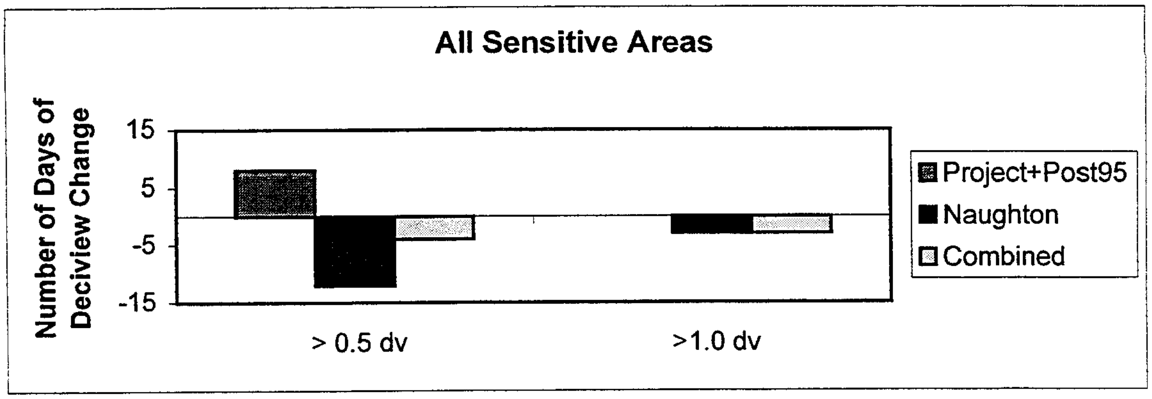
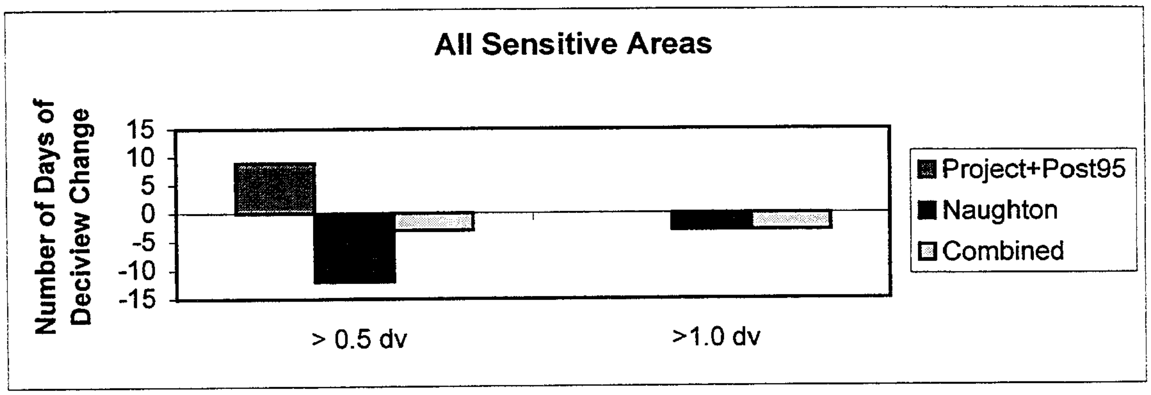



**Figure 5-1a.** Number of sensitive area-days the 0.5 Δdv and 1.0 Δdv LAC thresholds are exceeded combining the Naughton benefit and cumulative (Project + post-95) increment impacts for the PW-700-C1-0.7, PW-700-C1-1.0, and PW-700-C1-1.5 Project Alternatives.

PW-500-C1-0.7




PW-500-C1-1.0




PW-500-C1-1.5

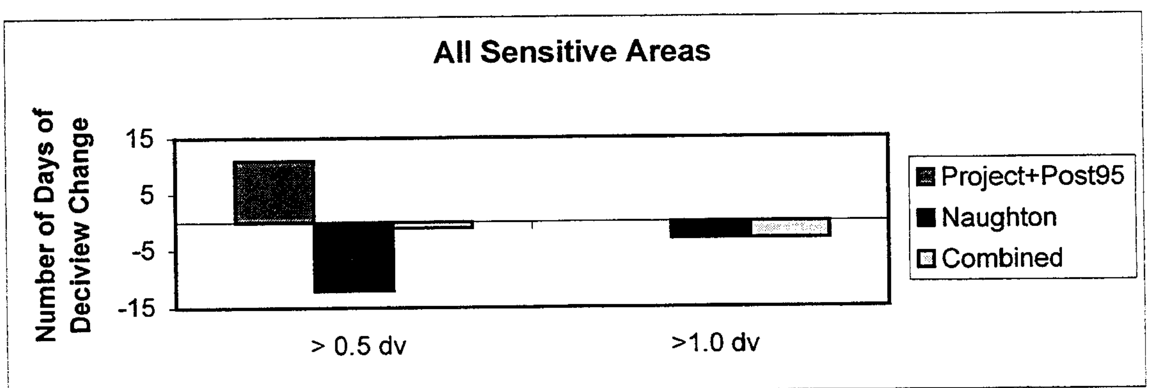



**Figure 5-1b.** Number of sensitive area-days the 0.5 Δdv and 1.0 Δdv LAC thresholds are exceeded combining the Naughton benefit and cumulative (Project + post-95) increment impacts for the PW-500-C1-0.7, PW-500-C1-1.0, and PW-500-C1-1.5 Project Alternatives.

PW-700-C1-0.7

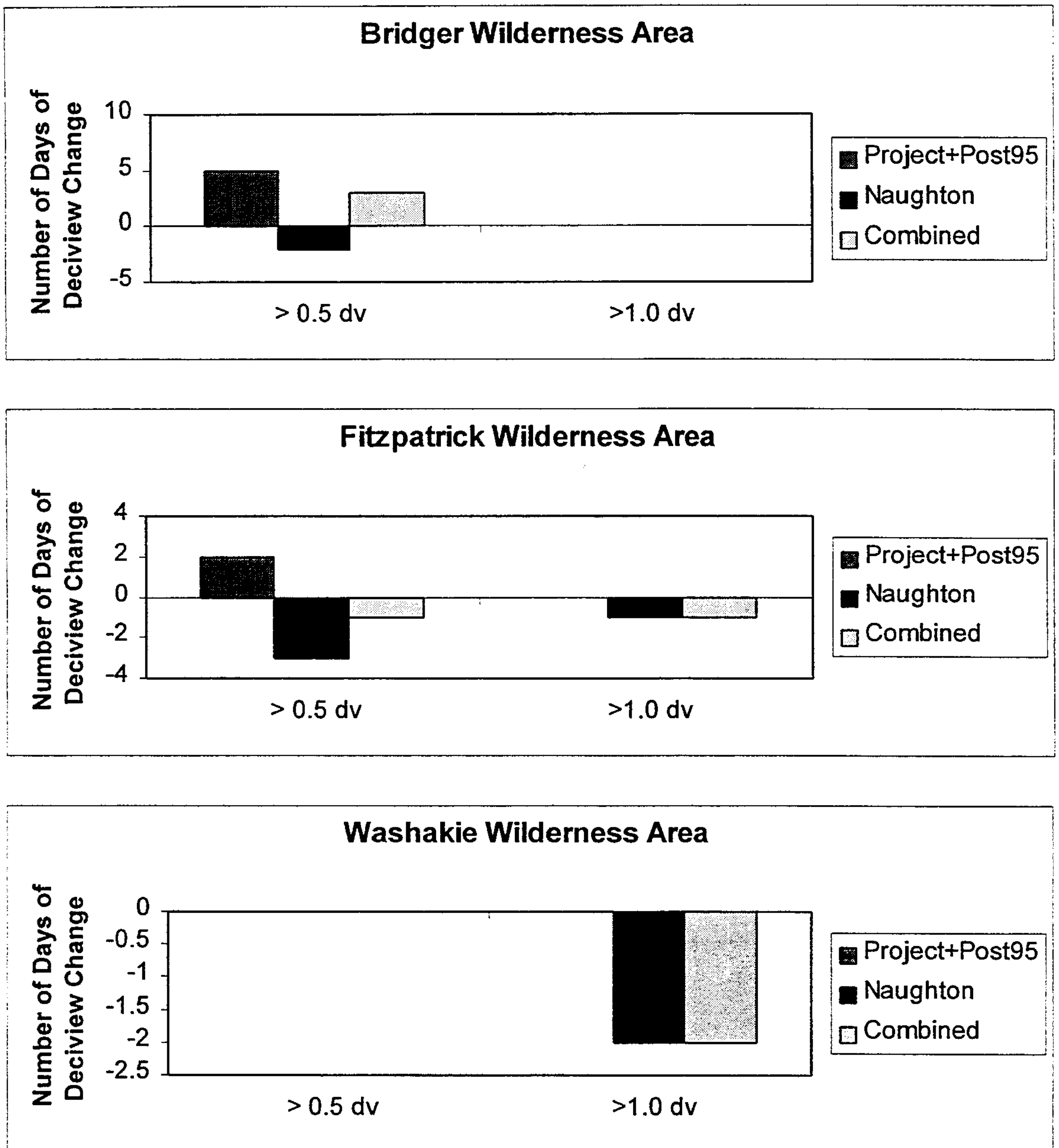



**Figure 5-2.** Number of days the 0.5 Δdv and 1.0 Δdv LAC thresholds are exceeded at reach sensitive receptor area due to the Naughton benefit, cumulative (Project + post-95) impact, and combined for the PW-700-C1-0.7 Project Alternative.

PW-700-C1-0.7

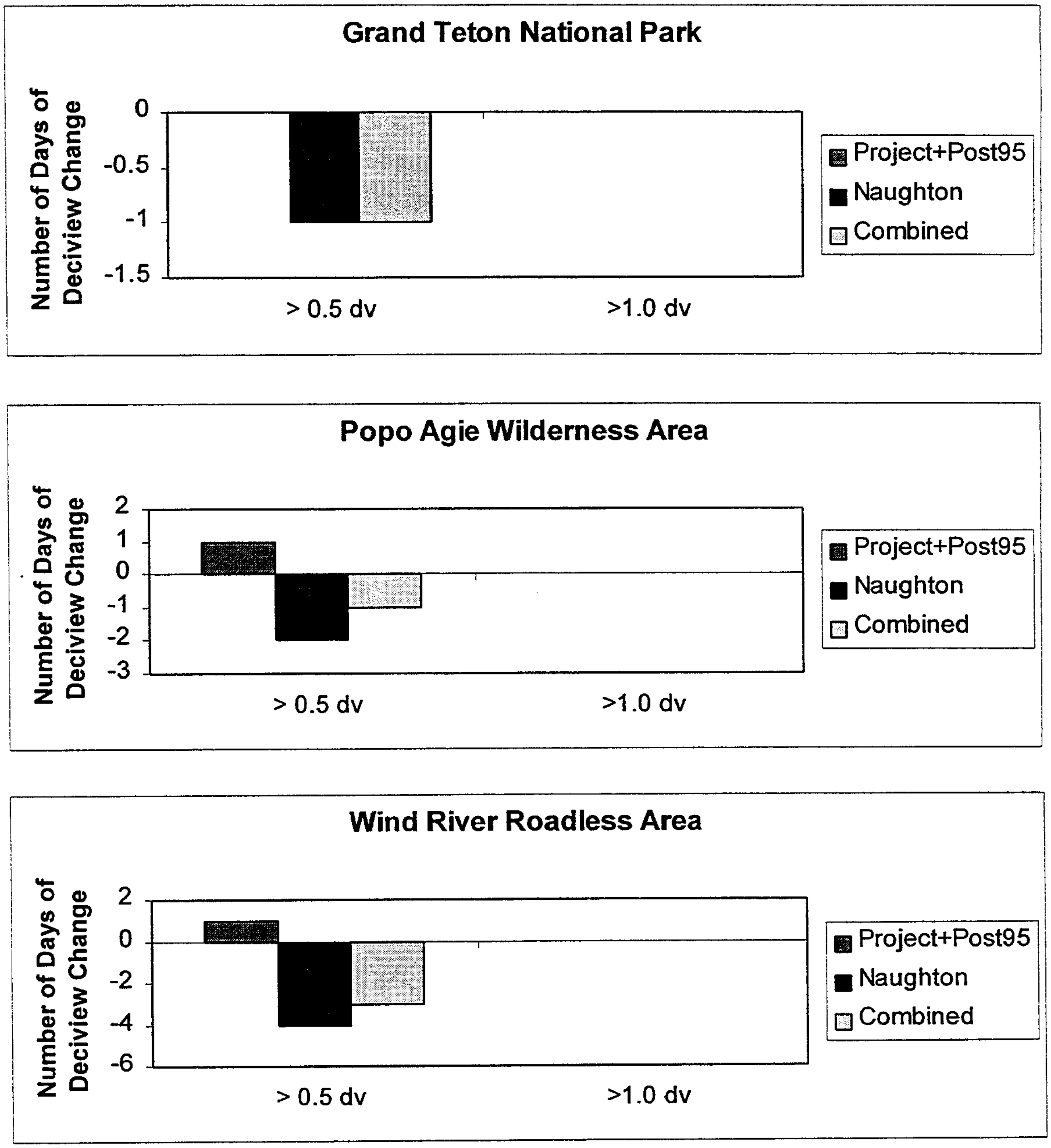



**Figure 5-2.** (concluded)

PW-700-C1-1.0

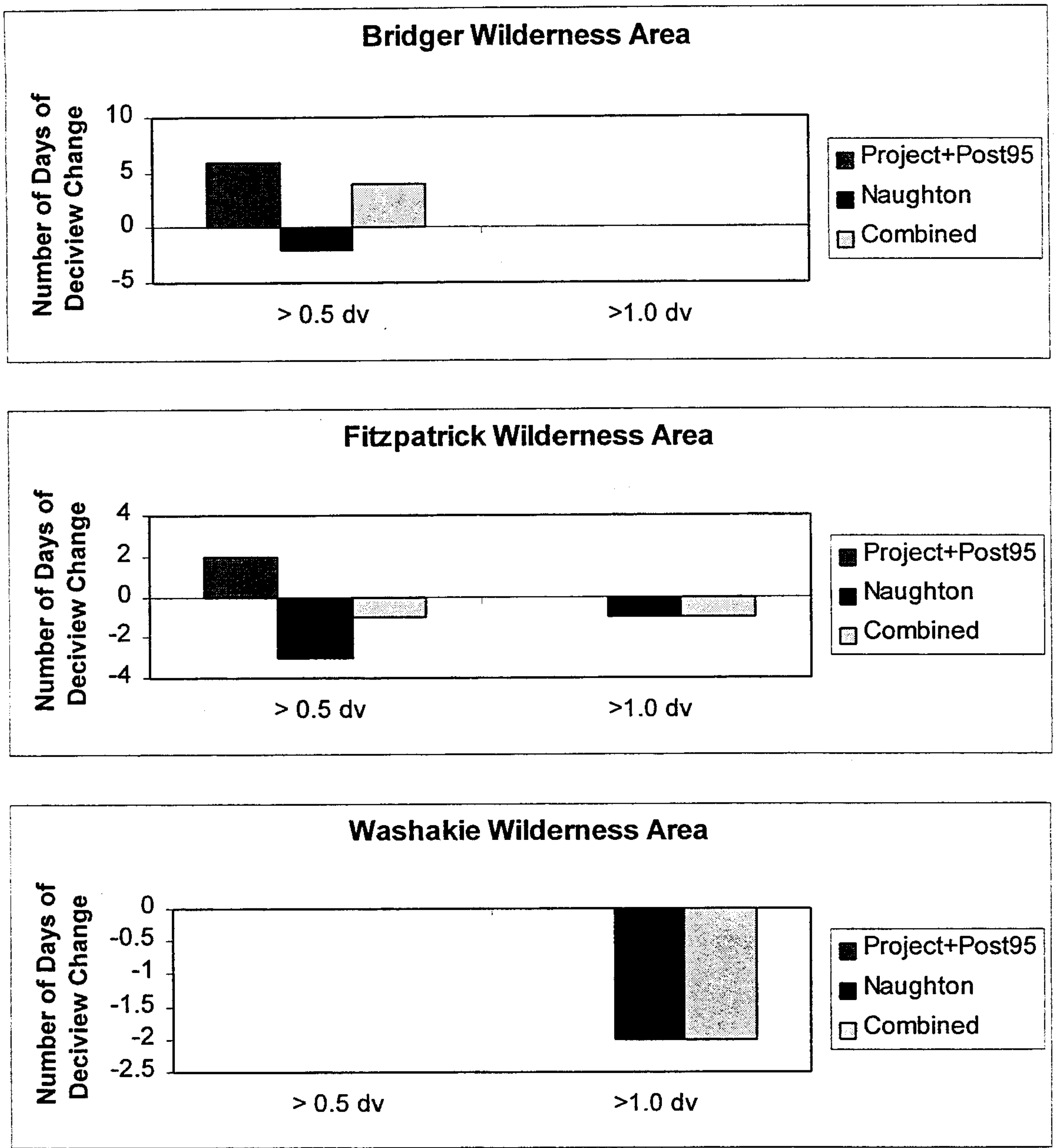
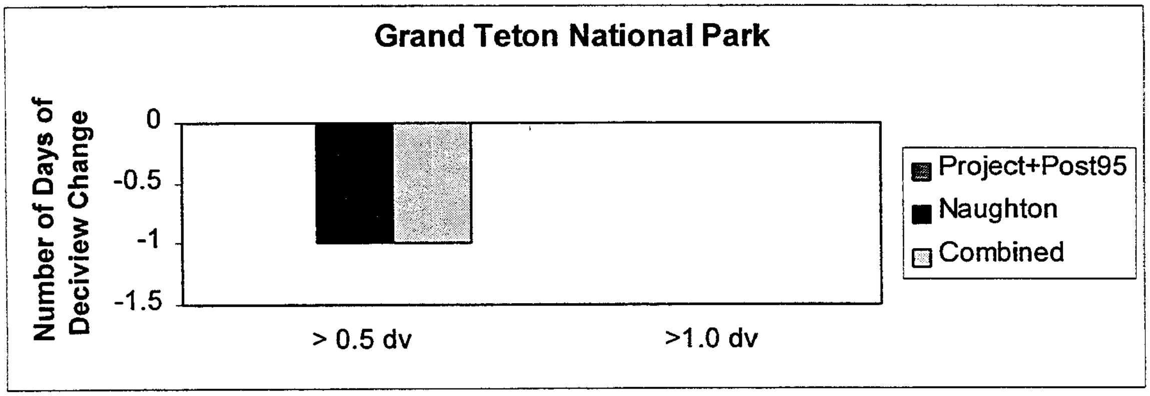
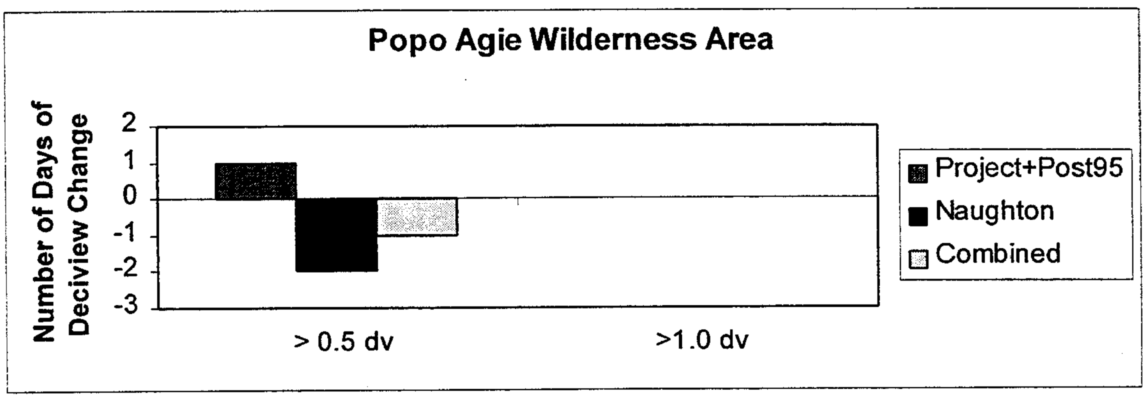



**Figure 5-3.** Number of days the 0.5 Δdv and 1.0 Δdv LAC thresholds are exceeded at reach sensitive receptor area due to the Naughton benefit, cumulative (Project + post-95) impact, and combined for the PW-700-C1-1.0 Project Alternative.

PW-700-C1-1.0



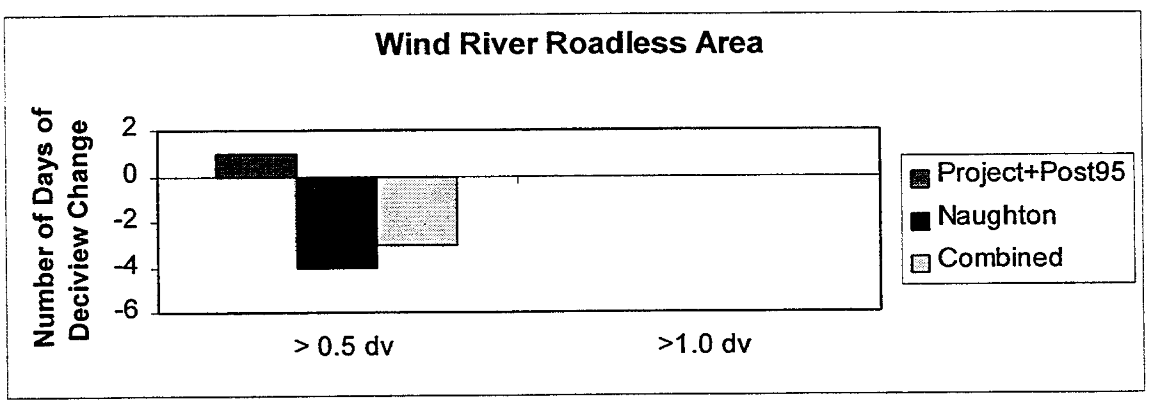




**Figure 5-3.** (concluded)

PW-700-C1-1.5

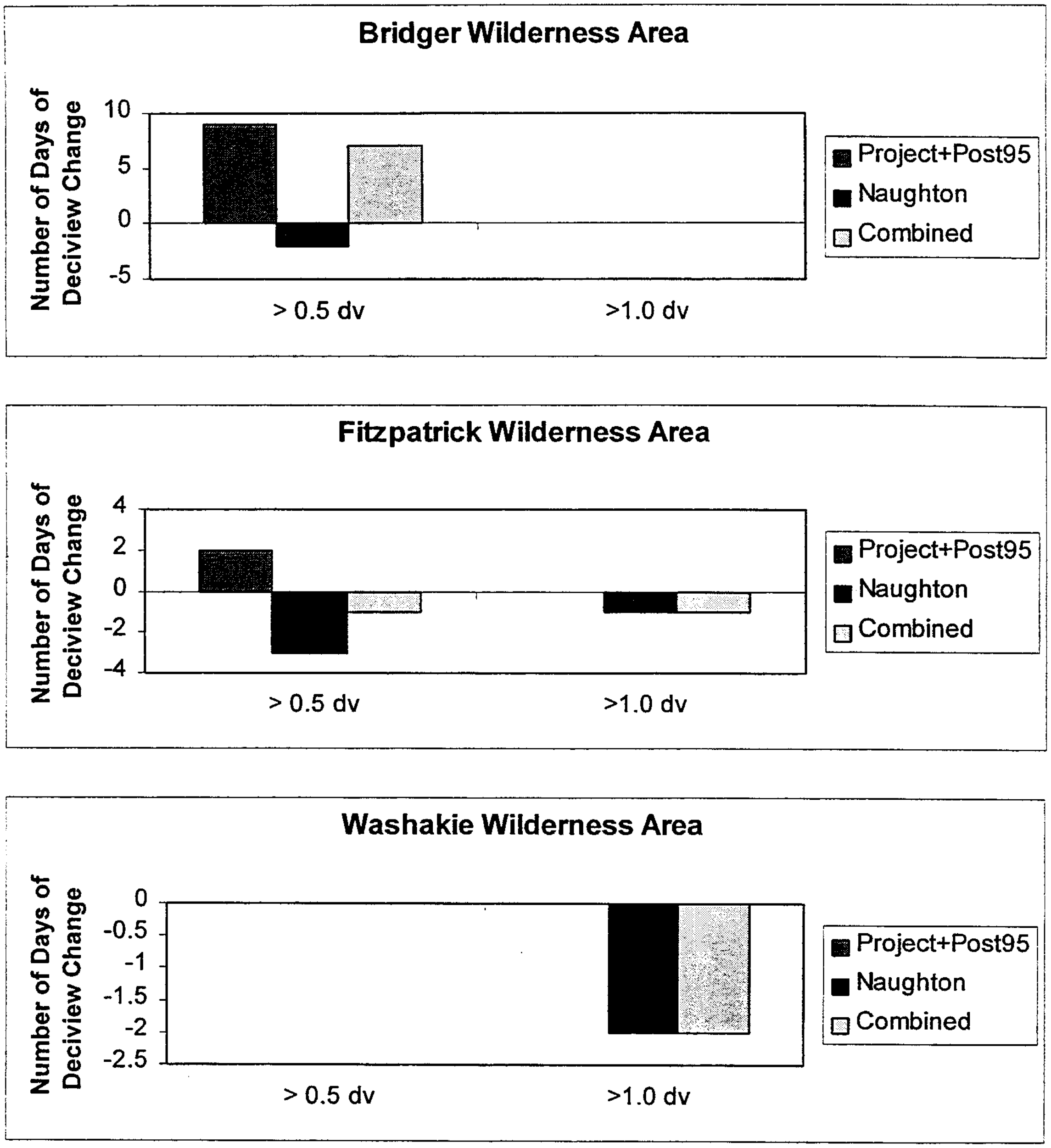
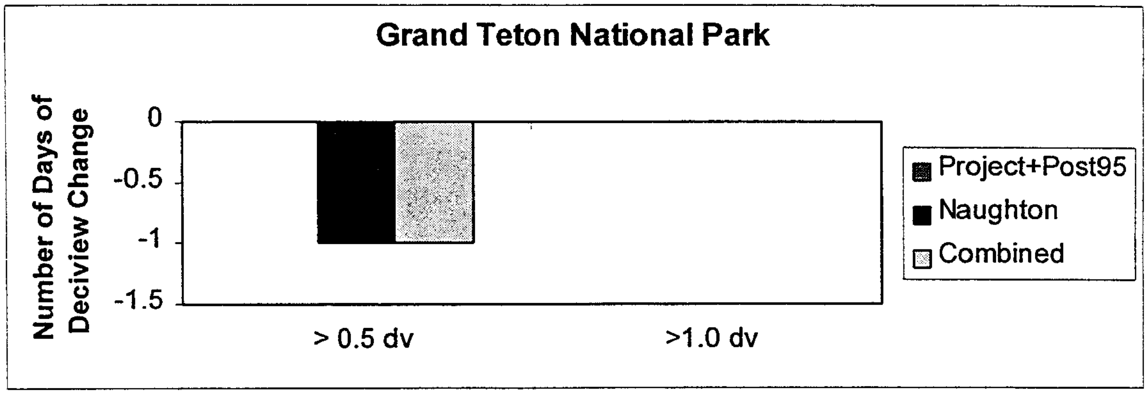
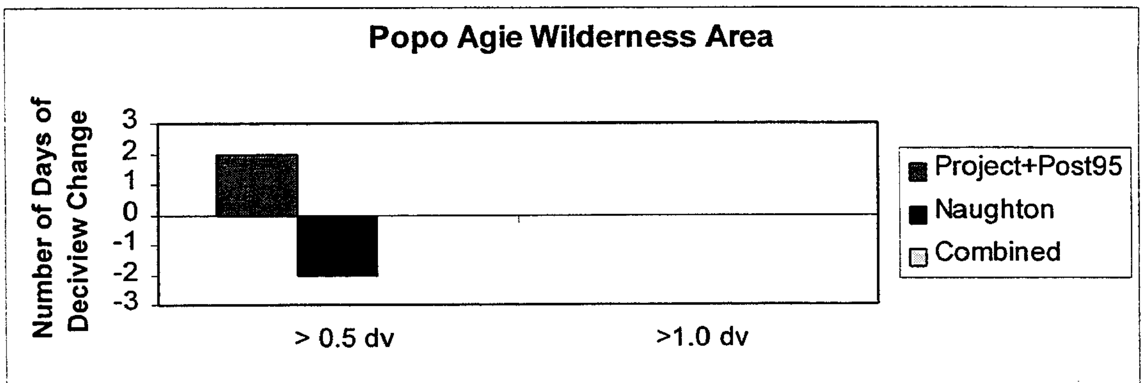



**Figure 5-4.** Number of days the 0.5 Δdv and 1.0 Δdv LAC thresholds are exceeded at reach sensitive receptor area due to the Naughton benefit, cumulative (Project + post-95) impact, and combined for the PW-700-C1-1.5 Project Alternative.

PW-700-C1-1.5



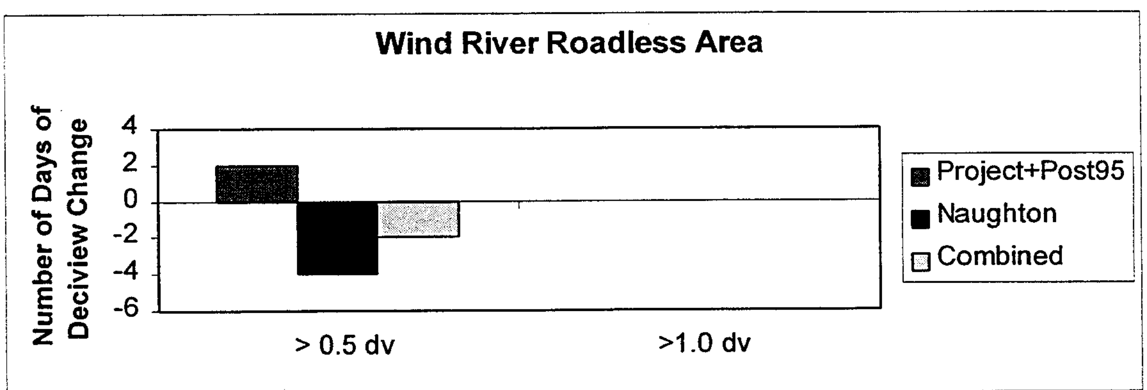




**Figure 5-4.** (concluded)