4.0 AIR QUALITY MODELING

Air dispersion modeling was conducted to assess SO_2 and PM_{10} PSD increment consumption in HA64. The modeling study also identified portions of the planning area where the PSD increment has been expanded since the baseline date. The following sections discuss the model selection, model setup, and model application.

4.1 MODEL SELECTION

Several options were considered for the appropriate dispersion model for this analysis. Because there are significant terrain features in HA64, a model suited for addressing complex terrain issues was essential. The Industrial Source Complex Model (ISC3) was eliminated from consideration because it is not able to address complex terrain as well as other models considered. The enhanced Complex Terrain Dispersion Model (CTDMPLUS) has been used for complex terrain modeling in the region, but is cumbersome to run and must be used in conjunction with another model for simple terrain applications. After considering several options, a next-generation dispersion model called AERMOD was selected for this PSD increment consumption modeling analysis. AERMOD combines the ability to address both complex terrain and simple terrain issues, and has improved dispersion algorithms for addressing boundary-layer meteorology. It is currently in the process of receiving official EPA approval for regulatory analysis, and is now being used in several states for compliance modeling.

AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes (Federal Register 2000). AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor, and AERMOD includes the dispersion modeling algorithms.

AERMOD was developed to handle simple and complex terrain issues using improved algorithms. As with CTDMPLUS, AERMOD uses the dividing streamline concept to address plume interactions with elevated terrain. However, AERMOD is less cumbersome to use than CTDMPLUS.

On April 21, 2000 EPA proposed revising the *Guideline On Air Quality Models* (40 CFR, Part 51, Appendix W) to replace the ISC3 model with AERMOD as the preferred model for many air quality

impact assessments including complex terrain applications. EPA's proposal came after the results of model evaluation studies indicated that AERMOD performs better than ISC3, and also as well or better than CTDMPLUS in complex terrain applications. AERMOD will replace ISC3 as the preferred state-of-the-practice dispersion model for evaluating potential impacts from industrial sources within a 50-km radius of the source.

After concluding that AERMOD was the model best suited for use in this PSD increment consumption study, BAPC sought approval for its use from EPA Region 9. After reviewing the goals of the project and the changing EPA guidance on the application of dispersion models, EPA Region 9 approved the use of AERMOD for this study.

Use of AERMOD for the study has two distinct advantages. The first advantage is that AERMOD uses improved model algorithms that more closely simulate plume dispersion in the atmosphere than many other models; and the second advantage is that modeling data developed for this study will not become outdated when AERMOD is officially recognized as the standard model for PSD increment applications.

4.2 MODELING METHODOLOGY

The dispersion modeling analysis was performed to estimate the PSD increment consumed or expanded from industrial and other pollutant emission sources in the planning area. Modeling was performed to evaluate incremental impacts of SO_2 and PM_{10}, as triggered in HA64, for all applicable averaging periods. The applicable averaging periods and associated PSD increments addressed in this study are shown in Table 4-1.

Separate model runs were executed for SO_2 and PM_{10} for both the baseline year and the current year emission inventories and for short-term and long-term averaging periods. One current and one baseline model were run for each facility where applicable. This allowed for an easy integration of changes that were made to the model on a facility-by-facility basis after the initial model runs. In all, a total of 52 model runs were completed. These model runs were based on emissions of PSD triggered pollutants as described in Section 3.0. Emissions from all sources that were operating as of the baseline date were included in the baseline year modeling runs. Emissions from all applicable sources operating as of the study year 2001 were modeled in the current year modeling runs. Output files from these two sets of modeling were post-processed to subtract baseline year impacts from current year impacts, resulting in PSD increment consumption. Using this methodology provides output that can account for PSD increment expansion as well as increment consumption.

TABLE 4-1

PREVENTION OF SIGNIFICANT DETERIORATION INCREMENTS

Averaging Period	Prevention of Significant Deterioration Increment ($\mu g/m^3$)	
	SO_2	PM_{10}
3-Hour	512	N/A
24-Hour	91	30
Annual	20	17

Notes:

N/A Not applicable
$\mu g/m^3$ micrograms per cubic meter

When conducting modeling for increment tracking, all PSD increment consuming and expanding emissions located in the specified planning area were included in the analysis. In addition, all PSD increment consuming and expanding emissions from major stationary sources within 50 km of HA64 were included in the analysis.

4.3 MODEL SETUP AND APPLICATION

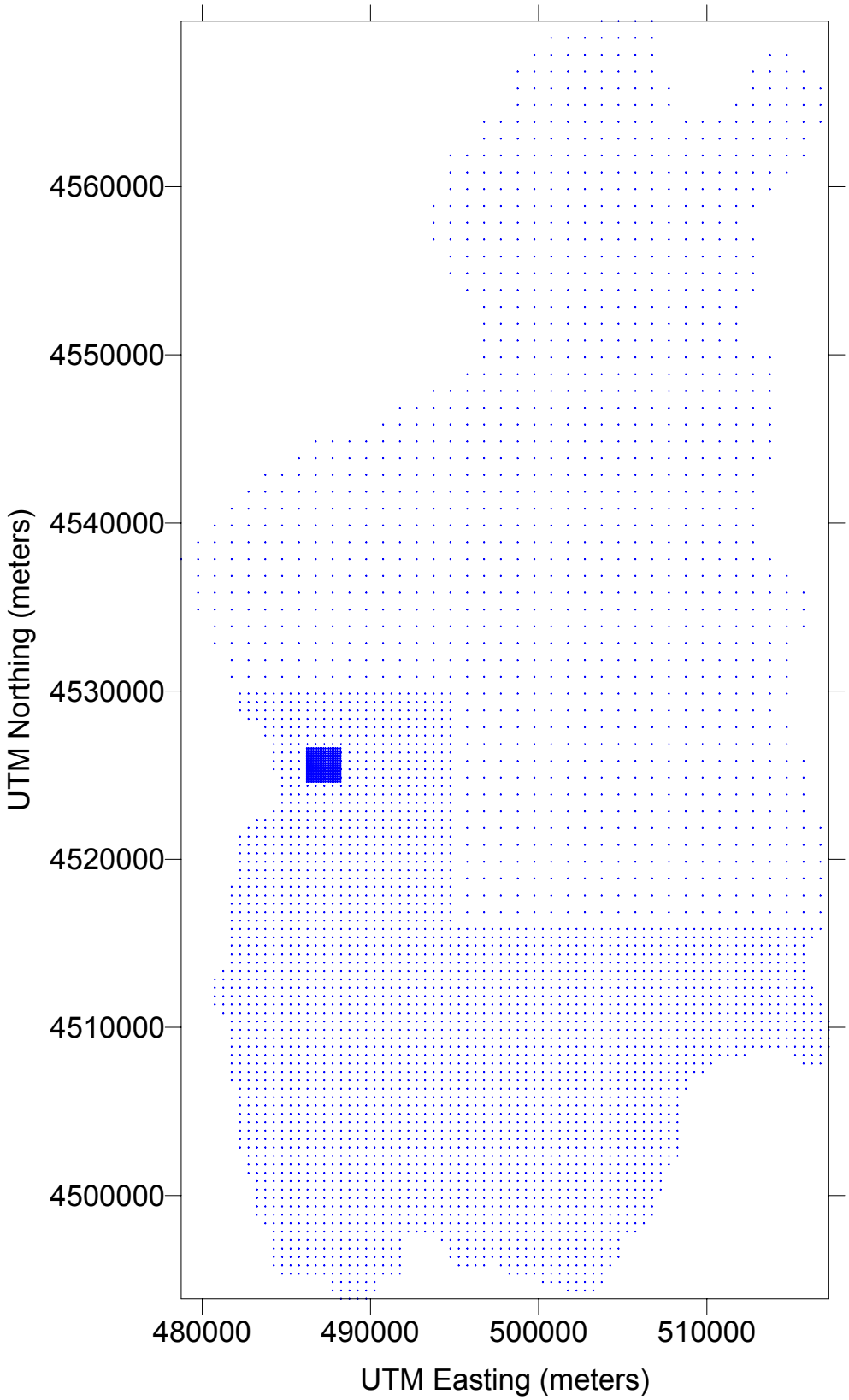
The AERMOD model contains three modules: two pre-processors and the dispersion model. Model receptors are developed with the AERMAP pre-processor, meteorological data are developed with the AERMET pre-processor, and the model algorithms are applied with AERMOD. Applications of these three modules are discussed in the following sections.

4.3.1 AERMAP

The terrain preprocessor AERMAP was used to extract receptor elevation data from USGS Digital Elevation Model (DEM) files for use as input to AERMOD. DEM data files were downloaded from the USGS Internet site in 7.5-minute resolution (1-degree resolution is also available). The selected data files covered the complete geographic study area. Receptor locations for the study area were based on North American Datum of 1983 (NAD 83); however, because the DEM data available through the USGS are based on North American Datum of 1927 (NAD 27), Tetra Tech converted the receptor locations to NAD 27 for processing with the NAD 27 DEM files. Following processing, the receptor coordinates were converted back to NAD 83. Upon successful completion of the program, AERMAP generated a text output file containing a receptor elevation for each receptor coordinate in the receptor grid files. In addition, AERMAP generated a height scale for each receptor. A height scale is a measure of the height and distance of the local terrain feature that has the greatest influence on dispersion for that receptor.

The receptor grid covered the entire HA64 area. There were three different methods of receptor spacing within the grid. A fine grid was created for the area around the Valmy Power Plant. These receptors are spaced 100 meters apart and the grid is 2-km by 2-km with Valmy situated in the center of the grid. A less dense grid was assembled to cover the southern third of HA64. The receptors in the southern third of HA64 were spaced 500 meters apart. A receptor grid with 1,000 meter spacing covered the remainder of HA64. Receptors located inside stationary source fencelines were not eliminated from the initial modeling analysis. Figure 4-1 shows the receptor grid used for the HA64 analysis.

FIGURE 4-1
HA64 Receptor Grid



4.3.2 AERMET

The meteorological data pre-processor AERMET was used to develop meteorological input data for the AERMOD modeling analysis. The AERMET software processes surface meteorological data and twice-daily upper air sounding data into the proper format using a three-stage process. The first stage extracts the data and administers several data quality checks. The second stage merges the data, and the third stage estimates required boundary layer parameters and writes the data in a format readable by AERMOD.

Meteorological data collected from Valmy during 2001 were used for the modeling analysis. These data were processed into model-ready format using AERMET. An additional surface dataset collected from the National Weather Service (NWS) station in Winnemucca was used as input to AERMET. This dataset was used to substitute for any missing values from the Valmy data, and to provide additional information for AERMET processing. The final surface data requirement included estimates of the albedo of the ground, Bowen ratio, and surface roughness. These input values were estimated using guidance in the *User's Guide for the AERMOD Meteorological Preprocessor (AERMET)*. The last input data requirement for AERMET is twice-daily upper air sounding data. Sounding data were obtained from the National Climatic Data Center (NCDC), and include upper air soundings from Reno, Nevada for the year 2001.

On-Site Surface Data

The Valmy meteorological tower collects data from many atmospheric variables. Most of the collected data were used in AERMET processing, including wind speed and wind direction at three levels (10, 50, and 100 meters), barometric pressure, temperature, relative humidity, standard deviation of horizontal wind direction at all three levels, and standard deviation of vertical wind speed at all three levels. Use of data at three wind levels provides a better estimate of boundary layer conditions.

NWS Surface Data

AERMET is designed to extract NWS surface data from several different formats including CD-144, SCRAM, and SAMSON. NCDC's standard data storage format has been CD-144 format for many years. However, NCDC no longer uses this format and any newer data is stored in TD-3280 format, which is not easily converted to a format usable by AERMET. Since the 2001 NWS Winnemucca data were stored in the new format, they had to be converted to CD-144 format. After NWS Winnemucca surface data were

converted to a usable format, they were extracted, quality checked, and merged with quality checked on-site data.

NWS Upper Air Data

Reno, Nevada upper air sounding data for 2001 were obtained in TD-6201 format. These data were extracted by AERMET, quality checked, and merged with the two surface datasets.

After all three datasets were merged, the final processing stage was executed to produce the model ready data. This final stage calculates boundary layer parameters that are subsequently used by AERMOD. The final processing stage was completed with modified AERMET software that corrected problems that occurred when missing data were encountered in the upper air soundings.

4.3.3 AERMOD

AERMOD was run using the regulatory default mode. Emission sources, model receptors, and meteorological data were contained in separate files and opened during model execution. Output from the model was stored in binary files and used for post-processing. See Section 4.5 for a discussion of post-processing techniques.

4.4 EMISSION SOURCE CHARACTERIZATION

A PSD increment emission inventory was developed for each applicable pollutant for input into AERMOD (see section 3). Emission source data collected by Tetra Tech were used to establish an emission inventory that details emissions and source parameters for the following:

- SO_2 and PM_{10} emissions and source parameters for major stationary sources that existed on the HA64 major source baseline date of January 6, 1975
- SO_2 and PM_{10} emissions and source parameters for major and minor stationary sources that existed on:
  - The HA64 SO_2 minor source baseline date of January 1, 1978
  - The HA64 PM_{10} minor source baseline date of January 1, 1978
- SO_2 and PM_{10} emissions and source parameters from major and minor stationary sources, area sources, and mobile sources that existed in the HA64 most current model year 2001

Dispersion modeling was conducted using the emission inventories listed above to identify increment consuming and expanding sources.

The emission inventories represent potential emissions for the current inventory and permitted emissions for the baseline inventories. Because historical records for sources dating back to 1976 and 1977 did not contain any actual emissions data, permitted emissions were used. Baseline sources that are fully represented with allowable emissions instead of actual emissions are:

- Battle Mountain Gold Company
- M-I Drilling Fluids Company

The emission inventories were constructed for the modeling study with three basic types of emission sources: industrial sources; mobile sources such as on-road vehicles and locomotives; and county-wide emission sources representing all other emissions that cannot be individually quantified. The following subsections detail how these emission types were characterized in the dispersion modeling analysis.

4.4.1 Industrial Sources

Industrial sources were input to the model using source parameters and emission data obtained during Tetra Tech's data collection activities. Current emissions were based on the most recent available data on a source's permitted allowable emissions. Most of this information came from a file search performed by Tetra Tech at NDEP headquarters. Some information was obtained from the Paradox database, which keeps track of current permitted emissions and source parameters. The date of emissions information used in the analysis was documented for each stationary source.

Baseline emission source data represent stationary source operations as of a given baseline date, and were based on available records from the closest date prior to the baseline date. In other words, Tetra Tech used emission data as near to the baseline date as possible where records exist, but before the baseline trigger date. In some cases, the only recorded emission data are two to three years prior to the baseline date.

Generally, industrial sources were modeled using AERMOD's point source algorithms. Stack-type emissions from the industrial facilities were modeled as point sources using stack parameters obtained during data collection activities. In some cases, stack parameters are different between the baseline year and the current year. In these cases, the modeling took into account the changes in stack parameters (provided both sets of stack parameters were reliable) to more accurately reflect the impact the changes

had on the increment. Process fugitive emission units (such as conveyor transfer points) were also modeled as point sources. Typically, NDEP models process fugitive emission units as appropriately represented volume sources. However, due to the complexity of the modeling analysis and the additional detailed descriptive information that would need to be determined for these types of emission units, NDEP decided it was more prudent to represent these emission unit types as pseudo-stack sources. As such, these types of emission units were assigned low values for stack velocity and diameter, which tends to limit plume buoyancy and better represent the emission source. Therefore, following guidance from NDEP, process fugitive emission units were assigned a 10 meter stack height, ambient temperature, 0.01 meters per second exit velocity, and 1.0 meter stack diameter, which represents an average equivalent diameter for these types of sources.

Some sources are limited to fewer than 24 daily operation hours and it is impossible to know which hours a source will operate. Therefore, each source in the inventory that is limited to less than 24 operation hours per day was carefully evaluated. It was determined that these sources have an insignificant impact on PSD increment consumption due to their low emission rates. As a result, these sources were simulated in the model as if they operated 24-hours per day in order to simplify the model input.

AERMOD currently uses the same direction-specific building downwash algorithms used by the ISC3 model. Although it is NDEP policy to include building downwash in dispersion modeling analyses, it was considered prohibitive to include building downwash for all sources in this study because of the overall large number of sources in the modeling analysis. Due to the potential relative importance of impacts from major sources, Tetra Tech attempted to include building downwash parameters for major sources in the modeling for HA64. However, building downwash parameters were not available for major sources during data collection activities, and were subsequently not included as input to AERMOD to calculate building downwash effects.

4.4.2 Mobile Sources

Mobile source emissions data for the year representing the minor source baseline date are not available from the EPA NET database because the data only goes back to 1985. As a screening level analysis, only current mobile sources were modeled to determine if the impact from mobiles sources is significant. This methodology assumes all mobile source emissions are increment consuming. For the current mobile source analysis, emissions were apportioned into 1-km by 1-km grid cells across HA64. The countywide emissions from the NET Tier database were apportioned into the separate appropriate grid cells by the

ratio of known length of roads in the county to the known length of road in each grid cell, and by the VMT data available from the U.S Department of Transportation (DOT). The EPA State Implementation Plan guidance was used as a technical reference for these analyses. The SIP guidance provides selection of road mileage distribution for emission apportionment as an option, which is consistent with this analysis.

The estimated emissions of SO_2 and PM_{10} from vehicle mobile sources that are apportioned to each 1-km grid cell were added to the total fugitive emissions from that grid cell. The total fugitive emissions of each pollutant from that grid cell were modeled as area sources using AERMOD for separate predicted SO_2, PM_{10}, and NO_2 increment impacts.

4.4.3 Fugitive Sources

As with mobile sources, baseline date fugitive emissions data were not available from the NET Tier database, so only current emissions were modeled in this analysis. All fugitive emissions were assumed to be increment consuming. Current fugitive emissions from the NET Tier database were distributed on a county-by-county basis within the 1-km grid cells for use in AERMOD. As with the mobile source inventory, the established EPA SIP guidance was used as a technical reference. The SIP guidance for rural/small urban emission allocation was used as a protocol to distribute the NET emission data based on population in HA64. For example, assume the study area is exactly 25 percent (%) of the county size, and contains 50% of the county's population. Also assume that population data are organized in exactly the same shape as the study area. Tetra Tech reviewed the population of the study area in relation to the population of the entire county. The emission data allocated to the study area were the same percentage as the population of the study area compared to the population of the entire county, in this example, 50%. These data were then distributed to the grid cells for modeling purposes accordingly so the sum of the emission data for each grid cell in the study area will equal 50% of the county's total emissions, even though the study area only represents 25% of the county’s area.

Each 1-km by 1-km area source used in the modeling was assigned an elevation equal to the average elevation within the grid cell. This approach has been used for fugitive sources in similar studies (SW Colorado Increment consumption study), and is supported by EPA (EPA 2001). Because there are many area sources within HA64, and area sources require considerable processing time for the dispersion model, area sources were excluded from the modeling analysis if they were determined to have an insignificant impact on air quality. For purposes of this study, an area source was estimated to have an

insignificant impact if its emissions would contribute less than or equal to 1% of the applicable PSD increment limit. A source's significance was estimated based on its total emissions and from test model runs. An area source with a total emission rate less than or equal to 6.5E-09 grams per second per square meter was estimated to have an insignificant impact based on model test runs.

4.5 POST-PROCESSING

Model output files from AERMOD were combined in a post-processing step to determine PSD increment consumption. Pollutant impacts from baseline sources were subtracted from pollutant impacts from current sources on a receptor-by-receptor basis, with the difference resulting in PSD increment consumption. In some cases, the baseline impacts were greater than current impacts. This scenario resulted in PSD increment expansion at those receptors.

The post-processor is a FORTRAN executable program that was written in Lahey FORTRAN 90. The name of the program is GETINCSS. The source code for the program is provided in Appendix G.

The purpose of the program is to read input data files, and combine these into predicted increment values at each receptor. GETINCSS combines the predicted baseline-year and current-year impacts into a predicted increment value at each receptor by subtracting the baseline-year impacts from the current-year impacts. It then writes these results to an output file.

The predicted impact files are unformatted output data from the AERMOD dispersion modeling for the averaging period of interest. The program uses the AERMOD modeling receptor set to assign increment values to each receptor. It is critical that the receptor file used is the exact same file used in the AERMOD modeling so that predicted impacts and receptor locations can be properly paired.

Each unformatted predicted impact file must contain predicted concentrations for a single averaging period. The program is designed to work with input data files that contain predicted impacts for one year of meteorological data at every receptor for a single averaging period. The averaging periods may range from 1 hour to 24 hours or the modeling period, typically 1 year. Averaging periods between 24 hours and the modeling period will not work with the post-processor.

GETINCSS uses the files specified in the post-processor input file to create an output file called *incrment.dat*. The following process allows the user to get the predicted increment value:

- Assemble all baseline and current binary output files of the same averaging period into one folder
- Make sure that the GETINCSS executable is in the folder with the files to be processed
- Create an input file named "GETINCSS.inp" that tells the post-processor what files to combine
- Specify a multiplier after each listed binary file
- For baseline files, use a multiplier of –1.0, and for current files, use a multiplier of 1.0
- Double click on the GETINCSS executable icon
- Rename the GETINC1 output file, *incrment.dat*, with identifying characters (see the recommended naming convention in the text below)
- If the AERMOD unformatted files were renamed, rather than copied, rename them again to their original names

It is recommended that the *incrment.dat* output file from GETINCSS be renamed using the following nomenclature:

AAPPINMM.HH

Where:

AA = Two characters representing the air quality control region, such as 64 for HA64

PP = Two characters representing the pollutant modeled, such as SO for SO_2, and PM for PM_{10}

IN = Two characters that would be 'IN' for increment results

MM = Two characters representing the year of the meteorological data used, such as 01 for 2001.

HH = Two characters representing the averaging period of the modeling, such as 24 for 24-hour, 03 for 3-hour and AN for annual

4.6 PSD INCREMENT CONSUMPTION RESULTS

The modeling showed that there are no SO_2 PSD increment exceedences in HA64. Additionally, there are no 24-hour or annual PM_{10} PSD increment exceedences outside facility boundaries in HA64. There are 24-hour PM_{10} PSD increment exceedences within Sierra Pacific Power's Valmy Generating Station

boundary, but they are caused by emissions from the Valmy station and are, therefore, not considered to be violations of PSD increment standards.

The following sections give more details about the modeling results for HA64.

4.6.1 HA64 – SO_2

HA64 was modeled for SO_2 impacts using the protocol described in Section 4.2 through Section 4.5. The modeling, which used stationary source data collected by Tetra Tech and fugitive emissions from the NET Tier database, showed that there were no 3-hour, 24-hour, or annual SO_2 PSD increment exceedences predicted in HA64. Table 4-2 shows the highest modeled SO_2 PSD increment values in HA64. The modeling results for 3-hour, 24-hour, and annual SO_2 increment are shown graphically in Figures 4-2a through 4-4b. The highest, second-high predicted 3-hour SO_2 increment consumption value in HA64 was 203.3 $\mu g/m^3$. The predicted high, second-high 24-hour value for SO_2 increment consumption was 38.5 $\mu g/m^3$, and the highest annual SO_2 increment consumption was 4.8 $\mu g/m^3$. These values were modeled using 2000 meteorological data. The highest SO_2 increment consumption predictions generally occur in the elevated terrain on the south and east sides of HA64. All of these modeled values are less than half of the respective SO_2 PSD increment.

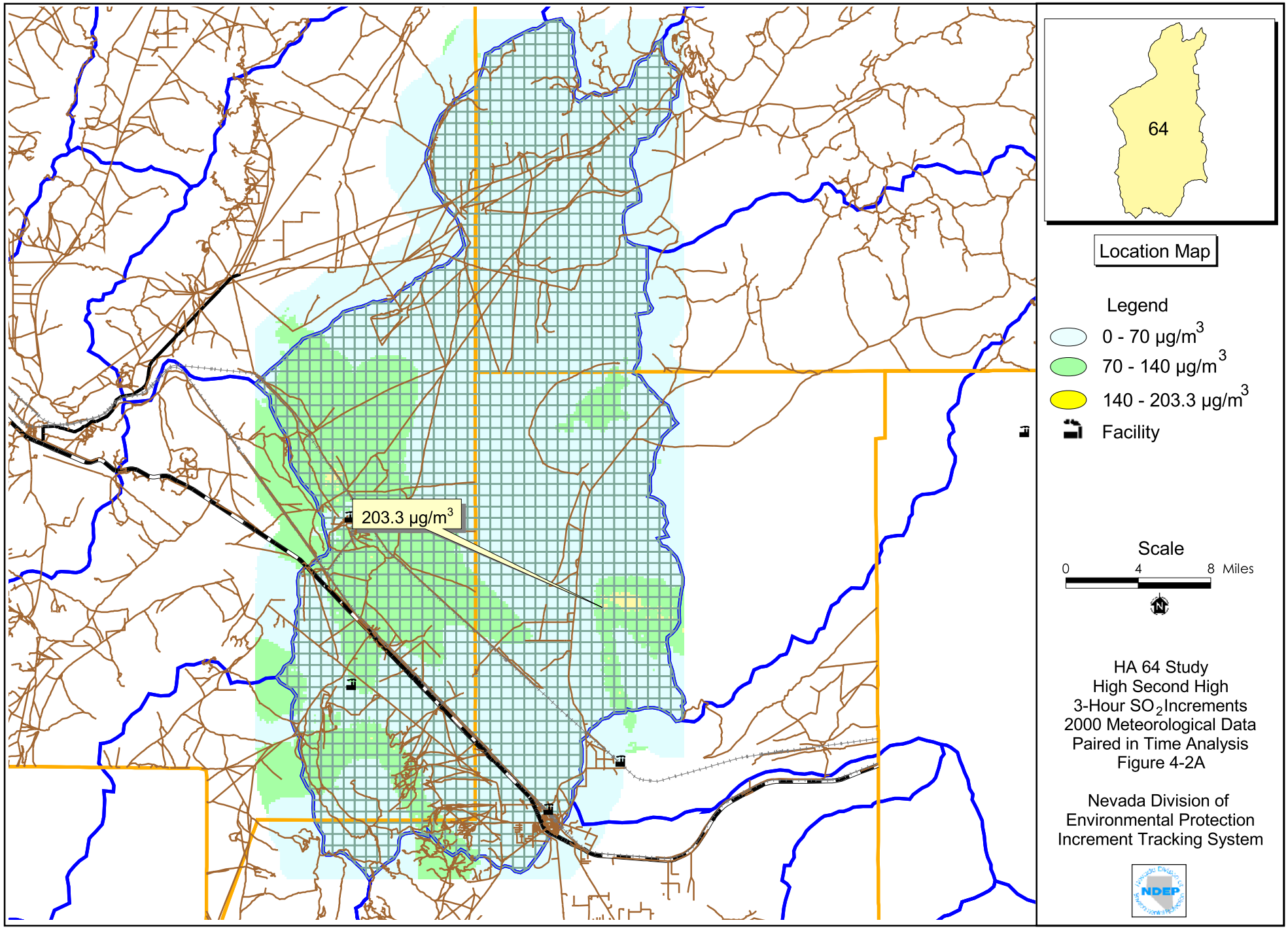
TABLE 4-2

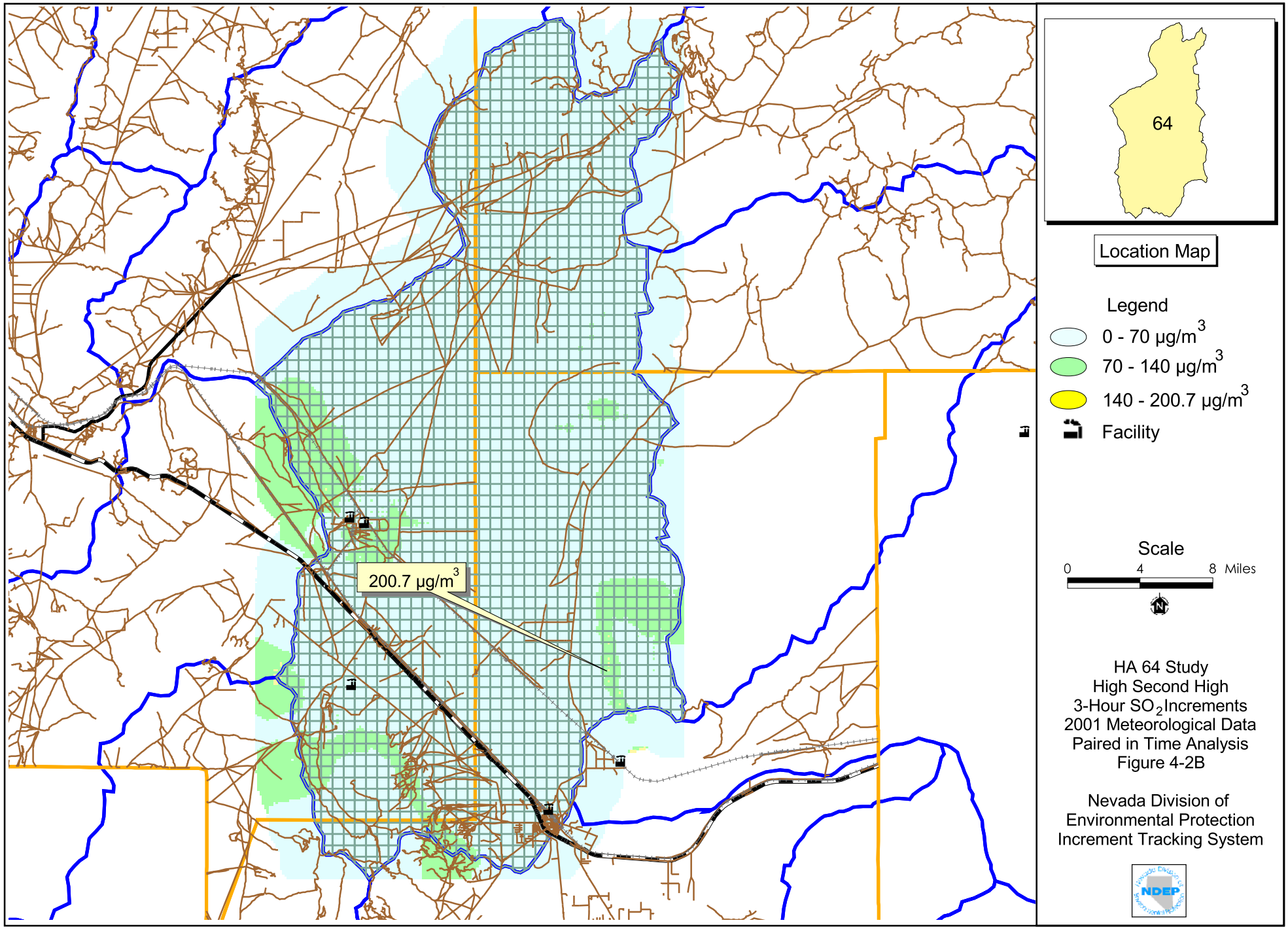
HIGHEST MODELED SO_2 PSD INCREMENT CONSUMPTION VALUES IN HA64 FOR EACH APPLICABLE AVERAGING PERIOD

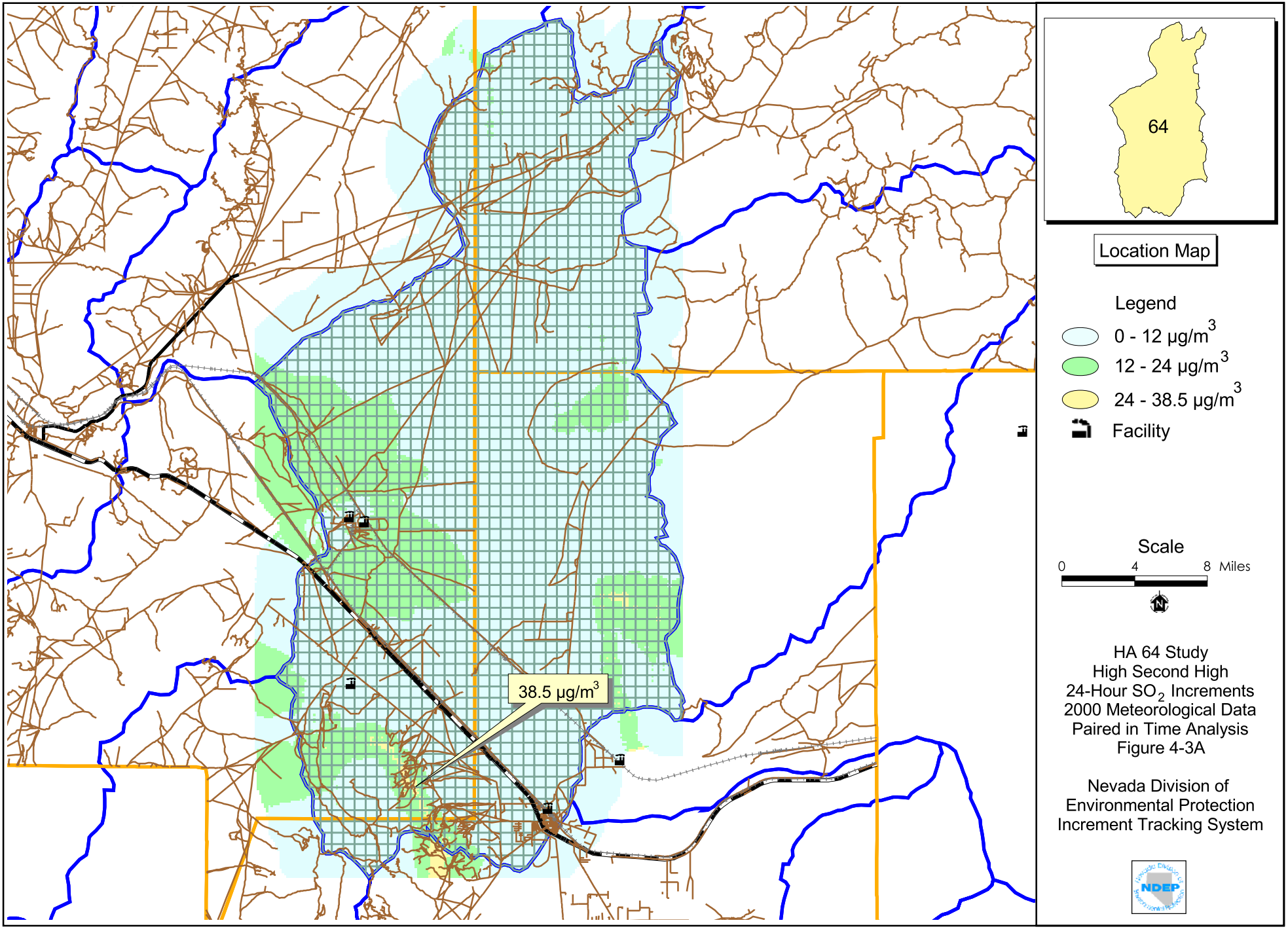
Averaging Period	X – Coordinate (UTM)	Y – Coordinate (UTM)	Total SO_2 Increment Consumption ($\mu g/m^3$)[A]	Meteorological Year
3-Hour	509750	4517850	203.3	2000
24-Hour	493250	4501850	38.5	2000
Annual	490750	4505350	4.8	2000

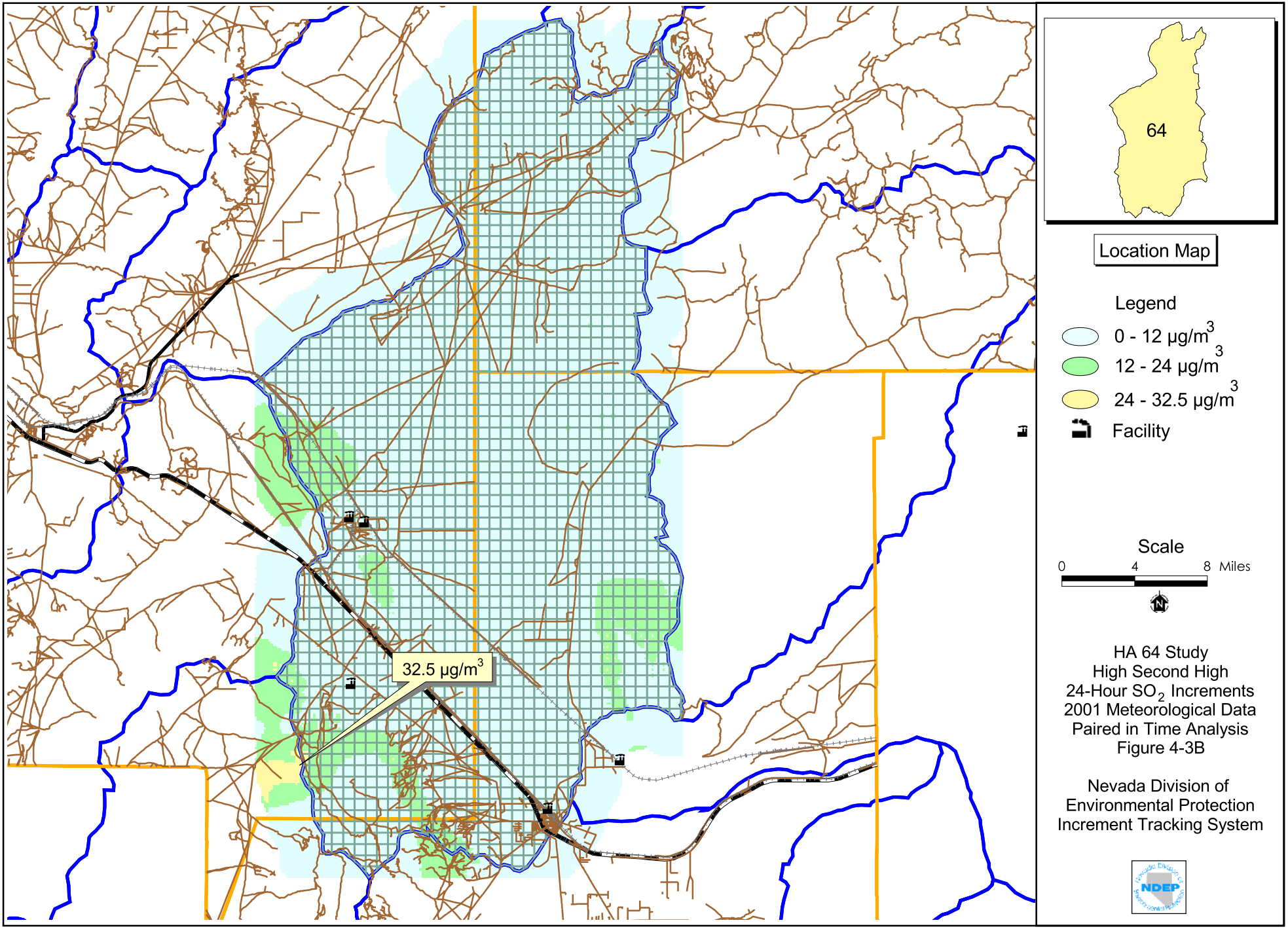
Notes:

[A] Micrograms per cubic meter

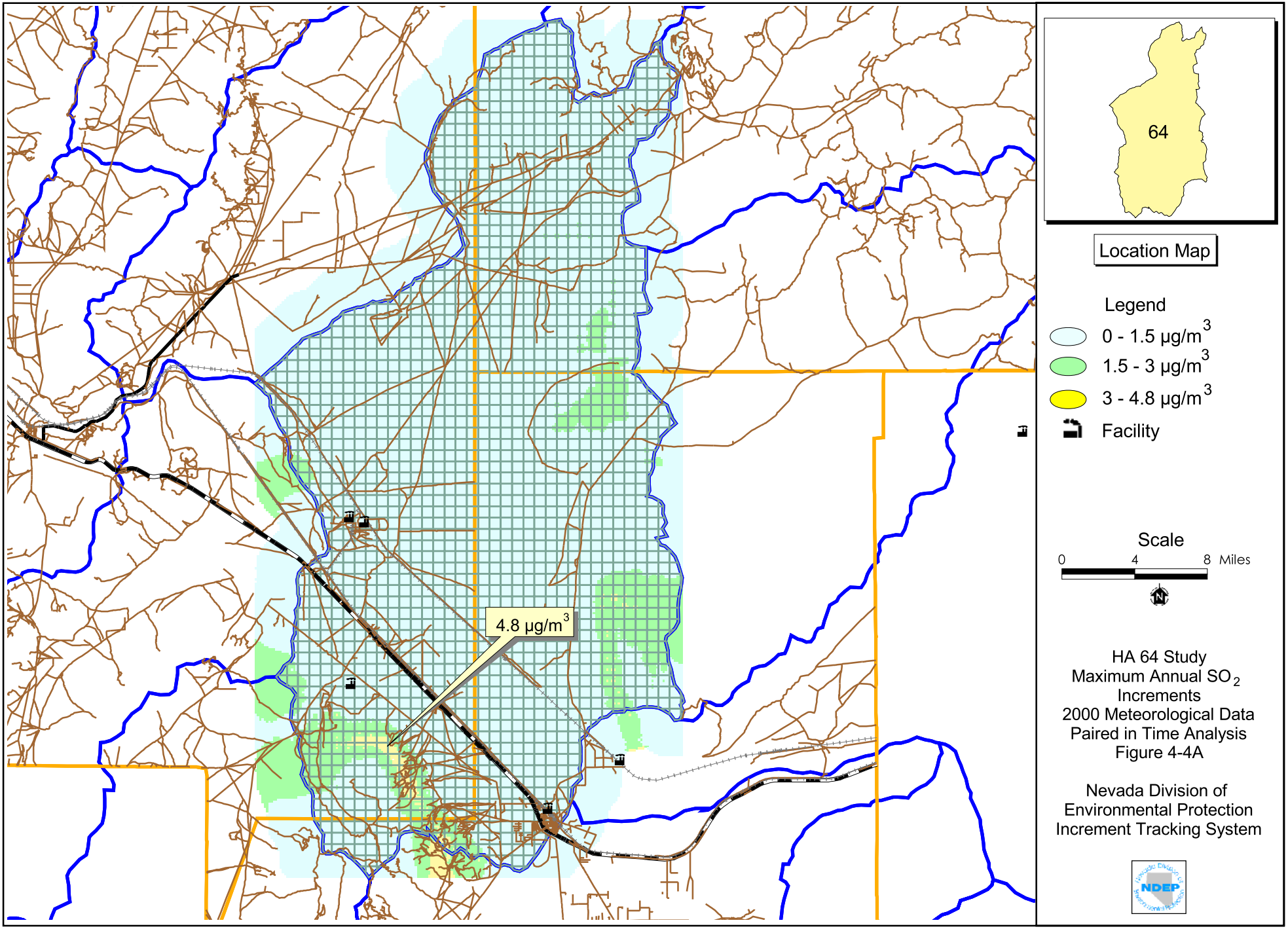

203.3 µg/m3
64
Location Map
Legend
0 - 70 µg/m3
70 - 140 µg/m3
140 - 203.3 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
High Second High
3-Hour SO2 Increments
2000 Meteorological Data
Paired in Time Analysis
Figure 4-2A
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
09/09/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 3hr 2000 layout dn prr

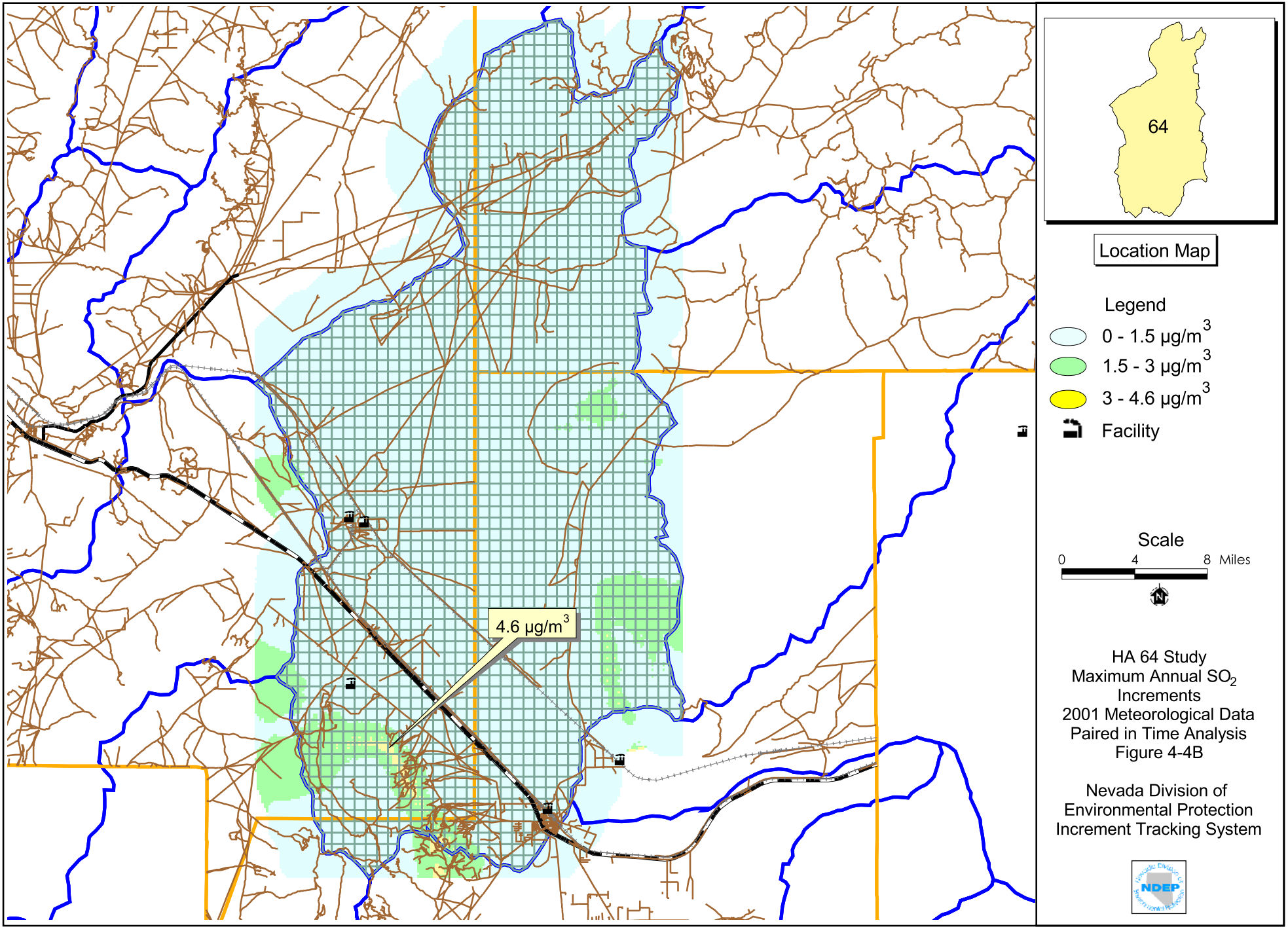

200.7 µg/m3
64
Location Map
Legend
0 - 70 µg/m3
70 - 140 µg/m3
140 - 200.7 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
High Second High
3-Hour SO2 Increments
2001 Meteorological Data
Paired in Time Analysis
Figure 4-2B
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
04/08/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 3hr 2001 layout dn prr


38.5 µg/m3
64
Location Map
Legend
0 - 12 µg/m3
12 - 24 µg/m3
24 - 38.5 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
High Second High
24-Hour SO2 Increments
2000 Meteorological Data
Paired in Time Analysis
Figure 4-3A
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
09/09/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 24hr 2000 layout dn sp



09/09/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 24hr 2001 layout dn prr


4.8 µg/m3
64
Location Map
Legend
0 - 1.5 µg/m3
1.5 - 3 µg/m3
3 - 4.8 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
Maximum Annual SO2
Increments
2000 Meteorological Data
Paired in Time Analysis
Figure 4-4A
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
09/09/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 annual 2000 layout dn prr


4.6 µg/m3
64
Location Map
Legend
0 - 1.5 µg/m3
1.5 - 3 µg/m3
3 - 4.6 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
Maximum Annual SO2
Increments
2001 Meteorological Data
Paired in Time Analysis
Figure 4-4B
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
09/09/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 so2 annual 2001 layout dn prr

4.6.2 HA64 – PM_{10}

HA64 was modeled for PM_{10} impacts using the protocol described in Section 4.2 through Section 4.5. The modeling was completed using existing input data from the increment tracking database. The area source modeling was updated by Tetra Tech using an updated threshold value of 6.5E-09 g/s-m^2. PM_{10} impacts from area source emissions have little effect on maximum predicted PM_{10} concentrations. The only modeled concentrations exceeding the 24-hour PM_{10} PSD increment occur within Sierra Pacific Power's Valmy Generating Station boundary. Some of these modeled exceedences occur outside the Valmy property boundary. There were no predicted exceedences of the annual PM_{10} PSD increment. Maps representing 24-hour and annual PM_{10} increments are shown in Figures 4-5a through 4-6b. Table 4-3 shows the highest modeled PM_{10} ambient impacts in HA64. The model results given in Table 4-3 do not include impacts at receptors inside Valmy's property boundary because an emission source does not consume PSD increment within its own fenceline. Since the Valmy emission sources are the main contributor to modeled concentrations inside their fenceline, the concentrations at those receptors do not represent PSD increment consumption and were not included in Table 4-3. The Valmy Generating Station has an inner facility fenceline and an outer property boundary. Both of these boundaries are controlled with fences.

The highest, second-high modeled value outside Valmy's outer property boundary was 17.5 $\mu g/m^3$. This concentration is located approximately 17 km south of Valmy. The largest contributor to this concentration is the Glamis-Marigold Mine. For the annual modeling results, the highest modeled PM_{10} concentration was 3.8 $\mu g/m^3$, which is below the PSD increment of 17 $\mu g/m^3$. The location of this modeled concentration is approximately 30 km south-southeast of Valmy.

4.7 SUMMARY AND CONCLUSIONS

This study presented a PSD increment consumption analysis for HA 64 in central Nevada. The modeling of impacts described in this study predicted compliance with 3-hour, 24-hour, and annual SO_2 PSD increments, as well as 24-hour and annual PM_{10} PSD increments. There are no SO_2 or PM_{10} PSD increment exceedences in HA64.

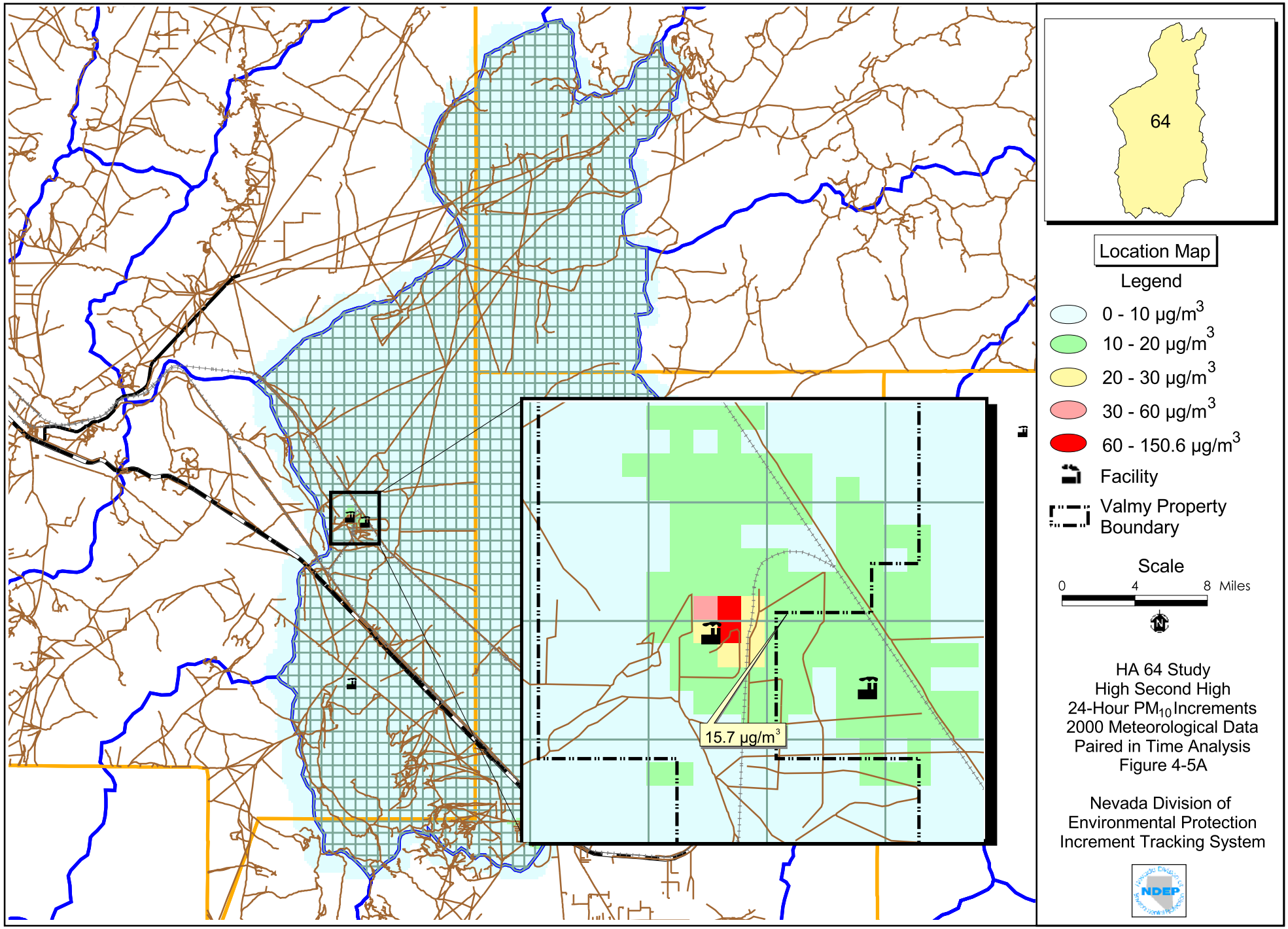
TABLE 4-3

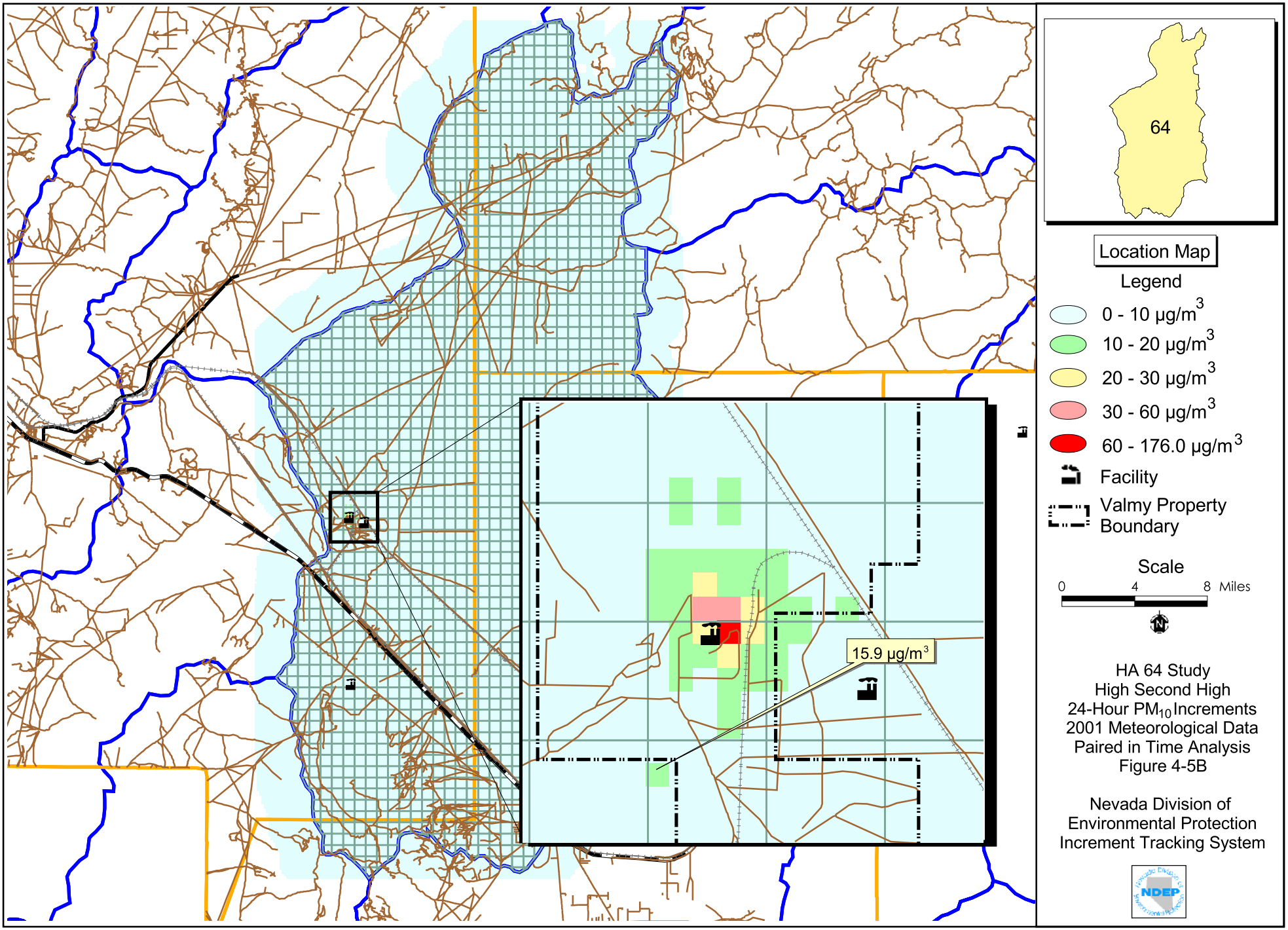
HIGHEST MODELED PM_{10} PSD INCREMENT CONSUMPTION VALUES IN HA64 FOR EACH APPLICABLE AVERAGING PERIOD

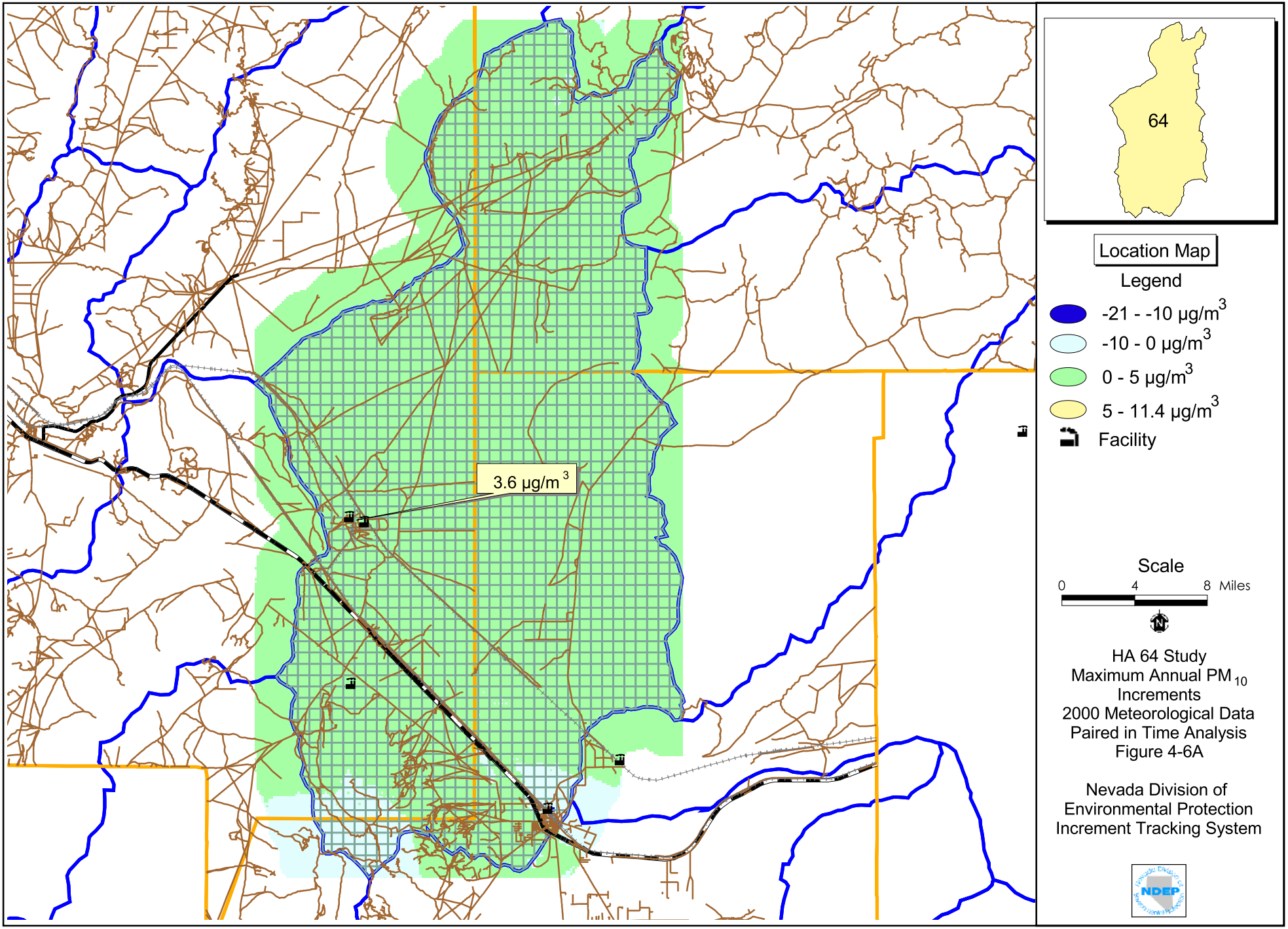
Averaging Period	X – Coordinate (UTM)	Y – Coordinate (UTM)	Total PM_{10} Increment Consumption ($\mu g/m^3$)[A]	Meteorological Year
24-Hour	487521	4525802	15.9	2001
Annual	487521	4525802	3.6	2000

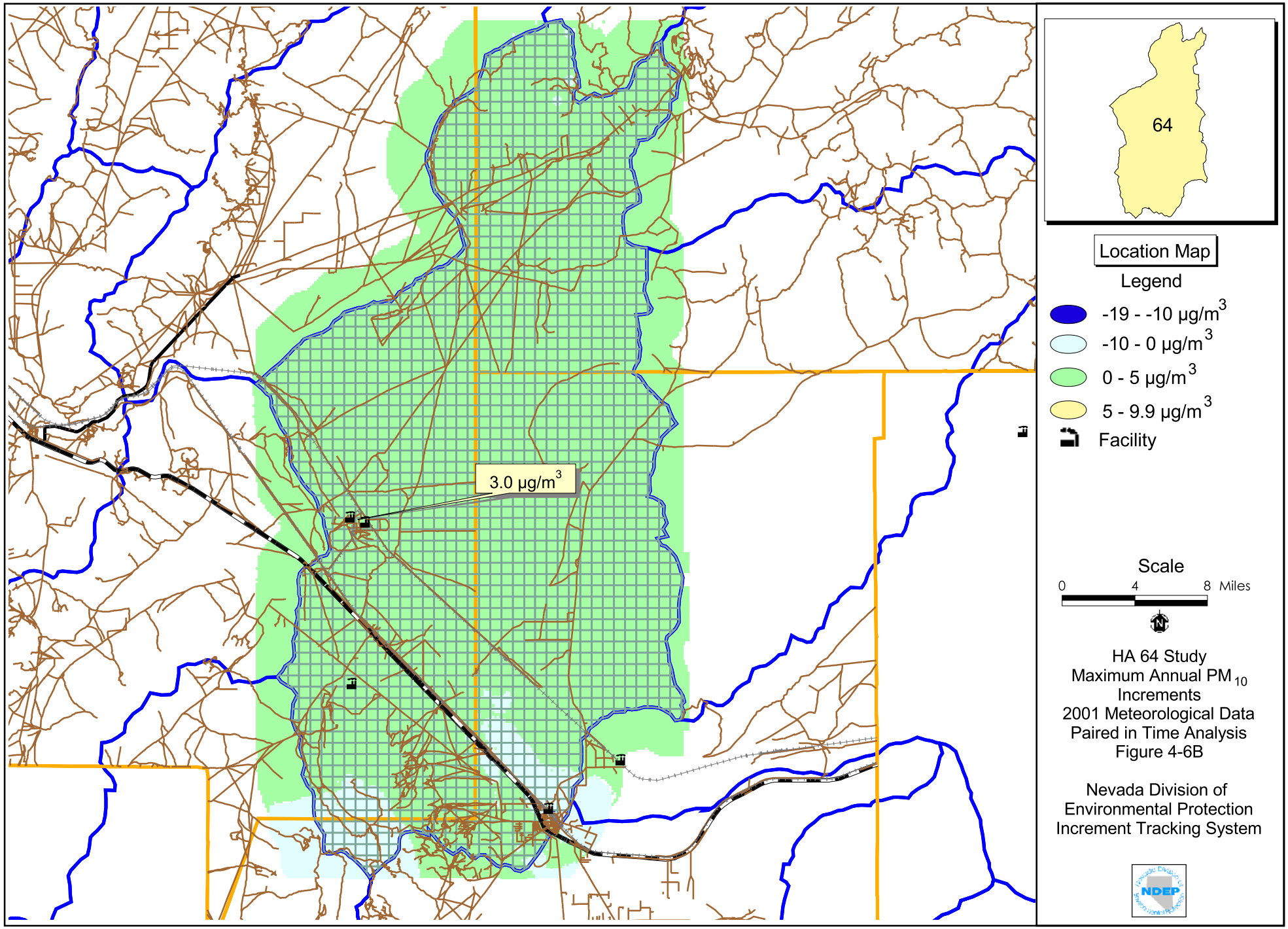
Notes:

[A] Micrograms per cubic meter


64
Location Map
Legend
0 - 10 µg/m3
10 - 20 µg/m3
20 - 30 µg/m3
30 - 60 µg/m3
60 - 150.6 µg/m3
Facility
Valmy Property Boundary
Scale
0
4
8 Miles
15.7 µg/m3
HA 64 Study
High Second High
24-Hour PM10 Increments
2000 Meteorological Data
Paired in Time Analysis
Figure 4-5A
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
11/17/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 24 hr pm10 2000 layout dn prr


64
Location Map
Legend
0 - 10 µg/m3
10 - 20 µg/m3
20 - 30 µg/m3
30 - 60 µg/m3
60 - 176.0 µg/m3
Facility
Valmy Property Boundary
Scale
0
4
8 Miles
15.9 µg/m3
HA 64 Study
High Second High
24-Hour PM10 Increments
2001 Meteorological Data
Paired in Time Analysis
Figure 4-5B
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
11/17/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 24 hr pm10 2001 layout dn prr


3.6 µg/m 3
64
Location Map
Legend
-21 - -10 µg/m3
-10 - 0 µg/m3
0 - 5 µg/m3
5 - 11.4 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
Maximum Annual PM 10
Increments
2000 Meteorological Data
Paired in Time Analysis
Figure 4-6A
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
11/17/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 pm10 annual 2000 layout dn prr


3.0 µg/m3
64
Location Map
Legend
-19 - -10 µg/m3
-10 - 0 µg/m3
0 - 5 µg/m3
5 - 9.9 µg/m3
Facility
Scale
0
4
8 Miles
N
HA 64 Study
Maximum Annual PM10
Increments
2001 Meteorological Data
Paired in Time Analysis
Figure 4-6B
Nevada Division of
Environmental Protection
Increment Tracking System
NDEP
11/17/03 O:/incrementtracking/basin_64_stoplight.apr ha 64 pm10 annual 2001 layout dn prr