Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: Karen Bullard
New Source Review Program
Air Permitting Division

Date: July 3, 1995

Thru: James Red, Team Leader
Permit Modeling Unit
Air Quality Planning Division

From: Waldon Boecker, P.E.
Permit Modeling Unit
Air Quality Planning Division

Subject: **Department of Army - Camp Stanley Audit**

I evaluated the dispersion modeling for the following project:

Project Title:	Department of Army Camp Stanley
Facility Type:	Permanent - Storage Activity
Permit Number:	29466 / BG-0841-5
County:	Bexar
Modeled by:	Department of Army
Submittal Date:	June 20, 1995 (received)

The above referenced dispersion modeling for Isopropyl Alcohol, Mineral Spirits, and Stoddard Solvent (as supplemented by my evaluation) is accepted. The Applicant's submittal did not include some suggested information and was inconsistent in several areas. The methods used to address these deficiencies are briefly summarized in the attached comments.

Enclosure

Comments:

1. The Applicant only evaluated one emission point for Isopropyl Alcohol (EPN1 at 0.052 g/s), four emission points for Mineral Spirits (EPN1 at 0.0355 g/s, EPN2 at 0.0426 g/s, EPN3 at 0.0355 g/s and EPN5 at 0.013 g/s) and one emission point for Stoddard Solvent (EPN4 at 0.0341g/s);

2. Some of the Applicant's receptors are about 100 meters from the property line (Figure A.1). In addition, the electronic boundary line file defines a west property line that is about 75 meters from the location specified for EPN2 (emission point that is sole contributor to the maximum worst case impact predicted in test runs for one pollutant evaluated). The Applicant's Attachment VI.B-2 Detailed Plot Plan specifies a location for EPN2 that is about 25 meters from the property line (the 25 meter distance is also more consistent with the distance taken from the U.S.G.S. 7.5' topographic map). In addition, the southern boundary of the Applicant's electronic boundary line file is about 200 meters to the north of the boundary specified on the Applicant's plot plan. The Applicant should correct this information if additional evaluation is needed. Test runs were conducted to evaluate the significance of these and other deficiencies as discussed in the following comments:

3. There was a note regarding EPN5 on my copy as follows:

   ? Should this be modeled as a pt. source? The emissions are leaving through doors etc.

   EPN5 is described as a 10' long by 5' wide fugitive emission point in the Table 1(a) dated April 10, 1995. The Applicant divided the emission rate by the area (4.65 m^2) to calculate the area source emission rate. The Applicant's output file specified a width of area = 4.65 meters which should have been 2.155 meters. Test runs were conducted (with the corrected area source width and other corrections) for comparison with results using the traditional pseudo point source. EPN5 did not contribute to the maximum off-property concentration in either case.

4. The portion of the Applicant's submittal I reviewed did not include a physical description of EPN1, EPN2, or EPN3 defining the releases as vertical, without flow restrictions (rain caps, covers, etc.). The physical descriptions provided in the April 10, 1995 Table 1(a) were as follows:

EPN1 & 2	L=0.83', W=0.83'
EPN3	L=1.83', W=2.08'

The Applicant calculated an effective diameter based on these areas. These physical descriptions could be for a horizontal release. Therefore, these emission points were evaluated as pseudo point sources with fugitive parameters as a worst case. Maximum concentrations predicted for some of the pollutants evaluated were near the ESLs with this worst case assumption. However, when building wake effects were considered the predicted impacts dropped to well below the ESLs. The Applicant should provide complete physical descriptions of these emission points if additional evaluation is needed;

5. The building coordinates included in the Applicant's electronic BPIP input files were not entered in order. Also, there was an error in the coordinates for building 98. However, the emission points evaluated were not in the building 98 area of influence. The corrected coordinates were entered in order, and BPIP was run to calculate building dimensions used in staff test runs. The Applicant should correct the errors in the BPIP input files if additional evaluation of this facility is needed;

6. The Applicant used an anemometer height of 10 meters. Our records specify a seven-meter height for the San Antonio station. If additional evaluation of this facility is needed, then the Applicant should use the actual station anemometer height rather than the default 10 meter height. Test runs conducted in my review used a seven-meter height;

7. The Area map included in my copy of the submittal did not specify the location of the nearest residence. The electronic ISCST2 input files included coordinates for a residence about 1200 meters to the south of the property line. Review of the area map indicates there may be a residence nearer the Applicant's west property line. The location of the nearest residence and other sensitive receptors (if any, along the west property line near the emission points evaluated) should be specified if additional evaluation of this facility is needed; and

8. More detailed worst case evaluation of the facility may result in one or more exceedances of the ESLs near the west property line with magnitudes less than twice the ESL. However, I understand this would be acceptable to our effects evaluation staff. Therefore, more detailed dispersion modeling evaluation of this facility is not recommended.

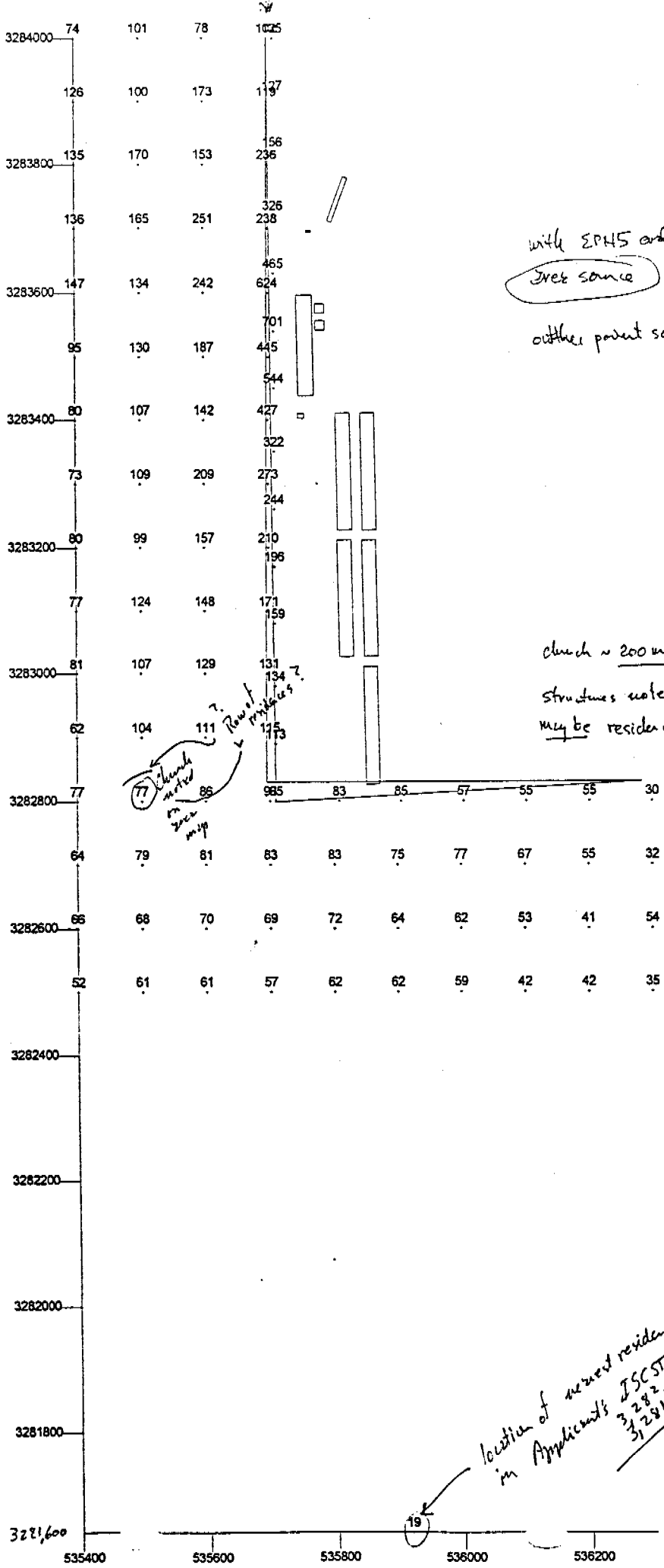
   The Applicant's Figure A-1, Locations of Receptors and Concentration Maxima, does not demonstrate the maximum off-property concentrations have been located, does not specify UTM coordinates, and does not provide other suggested information.

   If additional evaluation is needed, then the Applicant should provide the following:

   a. Concentration array maps for each pollutant. These maps should specify locations of receptors and predicted concentrations along the west property line in the area of the emission points evaluated. Receptors should cover a sufficient distance along the property line to demonstrate the maximum off-property concentration has been located;

   b. These maps should specify concentrations for three or more rows of receptors west of the property line. These receptors should also demonstrate the maximum off-property concentration has been located; and

   c. Maps specifying the number of times the ESLs are exceeded, if any.



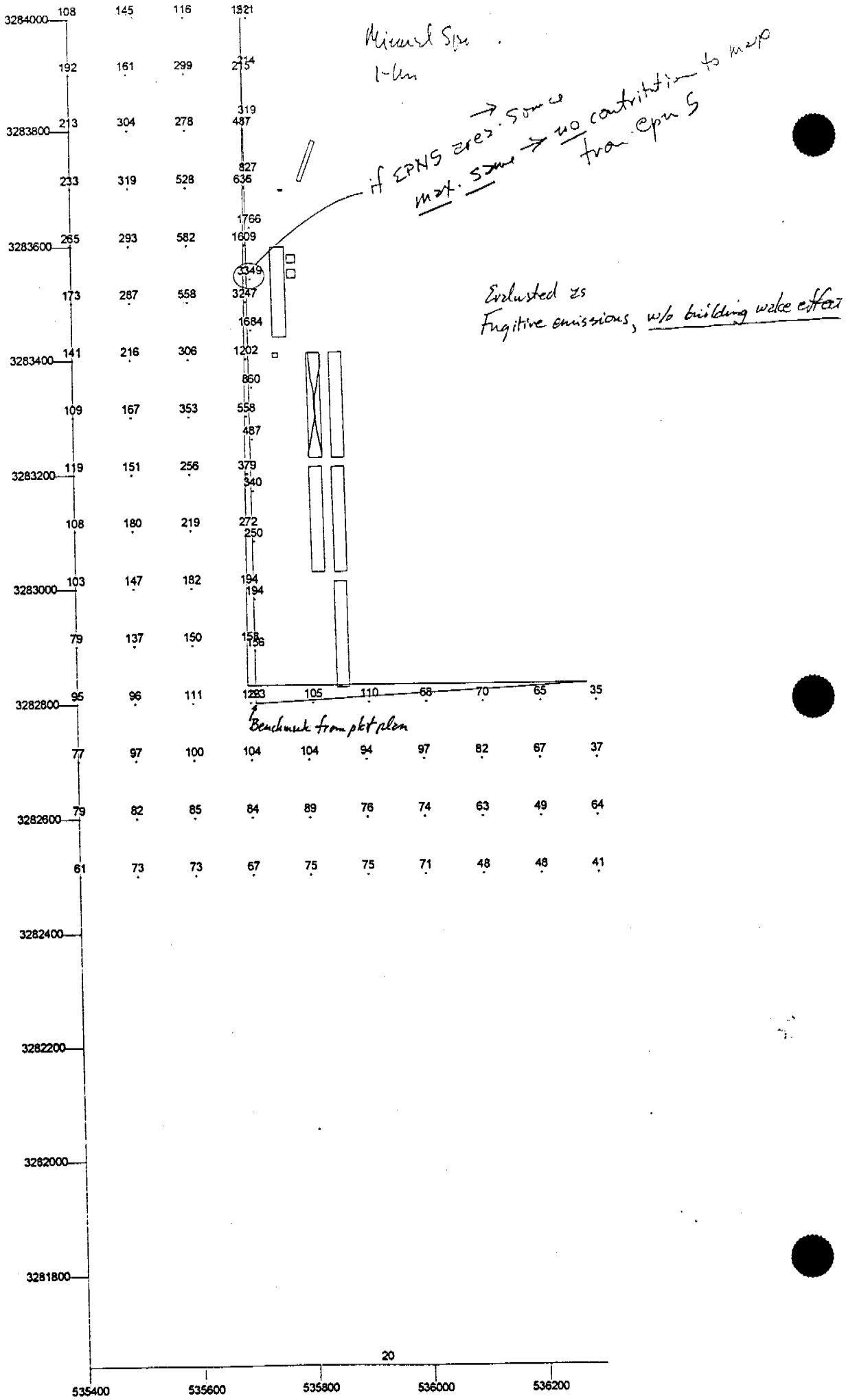
with EPH5 evaluated as
Area source

outlines point sources → fugitive w/ dw

church ~ 200 meters from SW corner

structures noted on topo near church
may be residences / parsonage, etc.

location of nearest residence in Applicant's ISCST2 input file
3,282,800
3,281,600
1200 meters south of property line


Mineral Spr.
1-hr
if EPNS area → source
max. same → no contribution to max from epn 5
Evaluated as
Fugitive emissions, w/o building wake effect
Benchmark from plot plan
3284000
3283800
3283600
3283400
3283200
3283000
3282800
3282600
3282400
3282200
3282000
3281800
535400
535600
535800
536000
536200
108 145 116 1321
192 161 299 214 215
213 304 278 319 487
233 319 528 827 636
265 293 582 1766 1609
173 287 558 3349 3247
141 216 306 1684 1202
109 167 353 860 558
119 151 256 487 379
108 180 219 340 272
103 147 182 250 194
79 137 150 194 158
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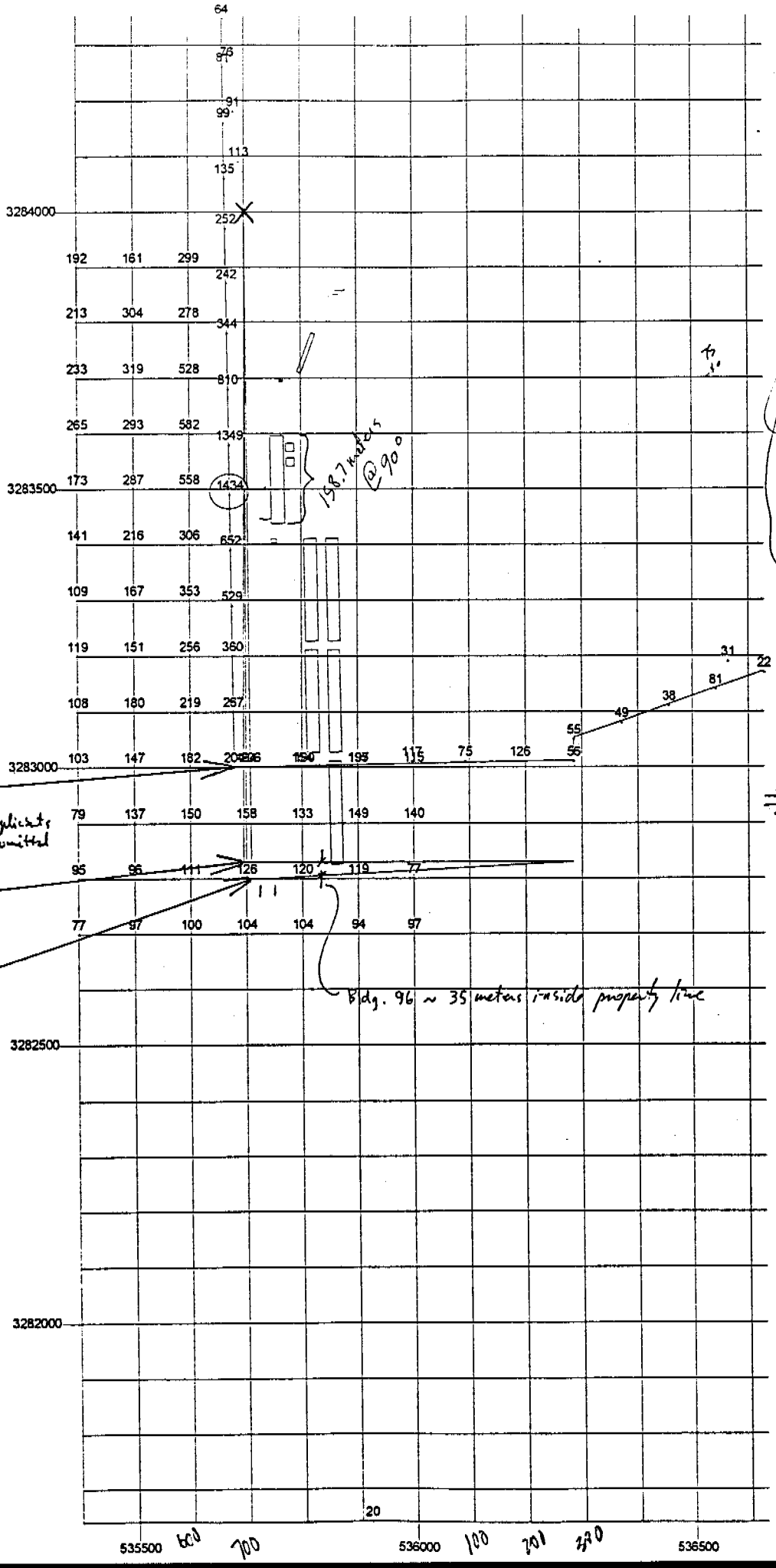
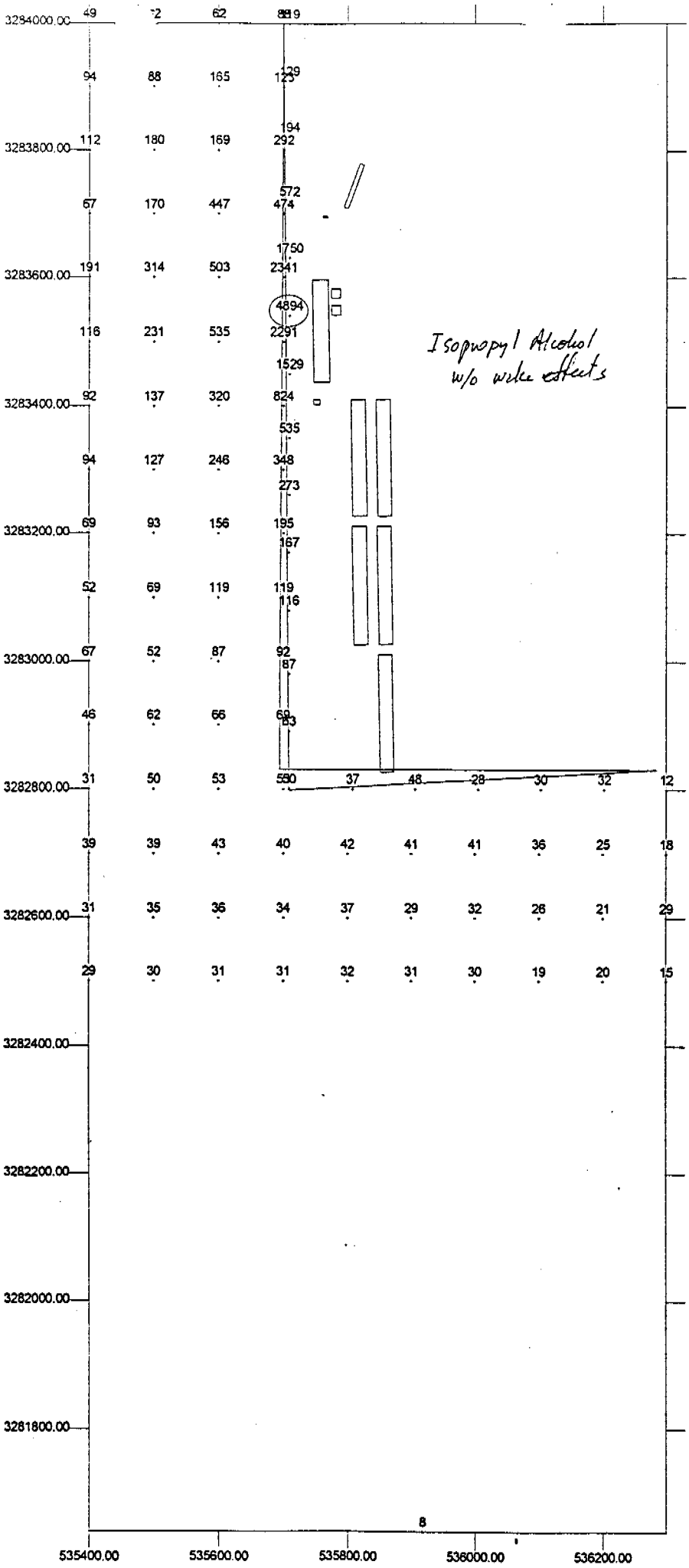
79 82 85 84 89 76 74 63 49 64
61 73 73 67 75 75 71 48 48 41
20


3284000
3283500
3283000
3282500
3282000
535500
536000
536500
158.7 meters @ 90°
Elec. Applicant's Boundary line file has property line ~ 35 meters further out.
topo → 40 meters
→ 75 meters
plot plan ~ 25 meters to prop. line
SW corner per elec. boundary line file in Applicants Submitted
SW corner per 7.5' topo
Southwest corner Benchmark as specified on applicants plot plan
Bldg. 96 ~ 35 meters inside property line
Applicants Electronic Boundary line file in error
property line ~ 200 meters south of coordinates in Elec. Bdy. file.
Elec. Bdy. file also specifies a west property boundary which is ~ 25 meters to the west of property line from 7.5 USGS topo


3284000.00
3283800.00
3283600.00
3283400.00
3283200.00
3283000.00
3282800.00
3282600.00
3282400.00
3282200.00
3282000.00
3281800.00
535400.00
535600.00
535800.00
536000.00
536200.00
Isopropyl Alcohol
w/o wine effects

PRELIMINARY MODELING ANALYSIS

Model Input

Proposed VOC emissions were modeled according to the TNRCC Air Quality Modeling Guidelines, November 1993. Impacts from speciated VOC emissions were compared to the short term and long term Effects Screening Levels (ESLs) as established by the TNRCC.

The EPA's regulatory dispersion model ISCST2 was used for determining average one hour and period (annual) concentrations at receptors outside the CSSA property line.

Modeling Scenarios

A separate modeling scenario was run for each of the three VOC compounds, isopropyl alcohol, mineral spirits and stoddard solvent. Isopropyl alcohol is emitted from the VCI vat (EPN 1) in Building 90. Mineral spirits emissions come from the solvent vats (EPNs 1, 2, 3, 5) in Building 90. Stoddard solvent is emitted from the fingerprint remover (EPN 4) in Building 90.

Modeling Options

The scenarios were run using the default regulatory options for concentrations in a flat, rural terrain.

Rural Model Option

CSSA is located in a rural area north of the San Antonio and Leon Springs urban areas of Bexar County. The model was run using the rural option. The rural option outputs higher concentrations than the urban option. Rather than doing a land use analysis to try to justify use of the urban modeling option, the rural option was used.

Receptor Grid

Discrete receptors were placed in a 100 meter grid out to 1500 meters around the western and southern boundaries of the CSSA installation. The receptors were placed in these locations because the emission sources are all located in the southwestern corner of the CSSA property. The emission sources are bounded by CSSA 3300 meters to the west, and 5,000 meters to the north. CSSA itself is bounded another 5700 meters to the west and 1500 meters to the north by the Camp Bullis Military Reservation. Figure A.1 shows the locations of the modeled EPNs, receptors and resulting concentration maximum for each model run.

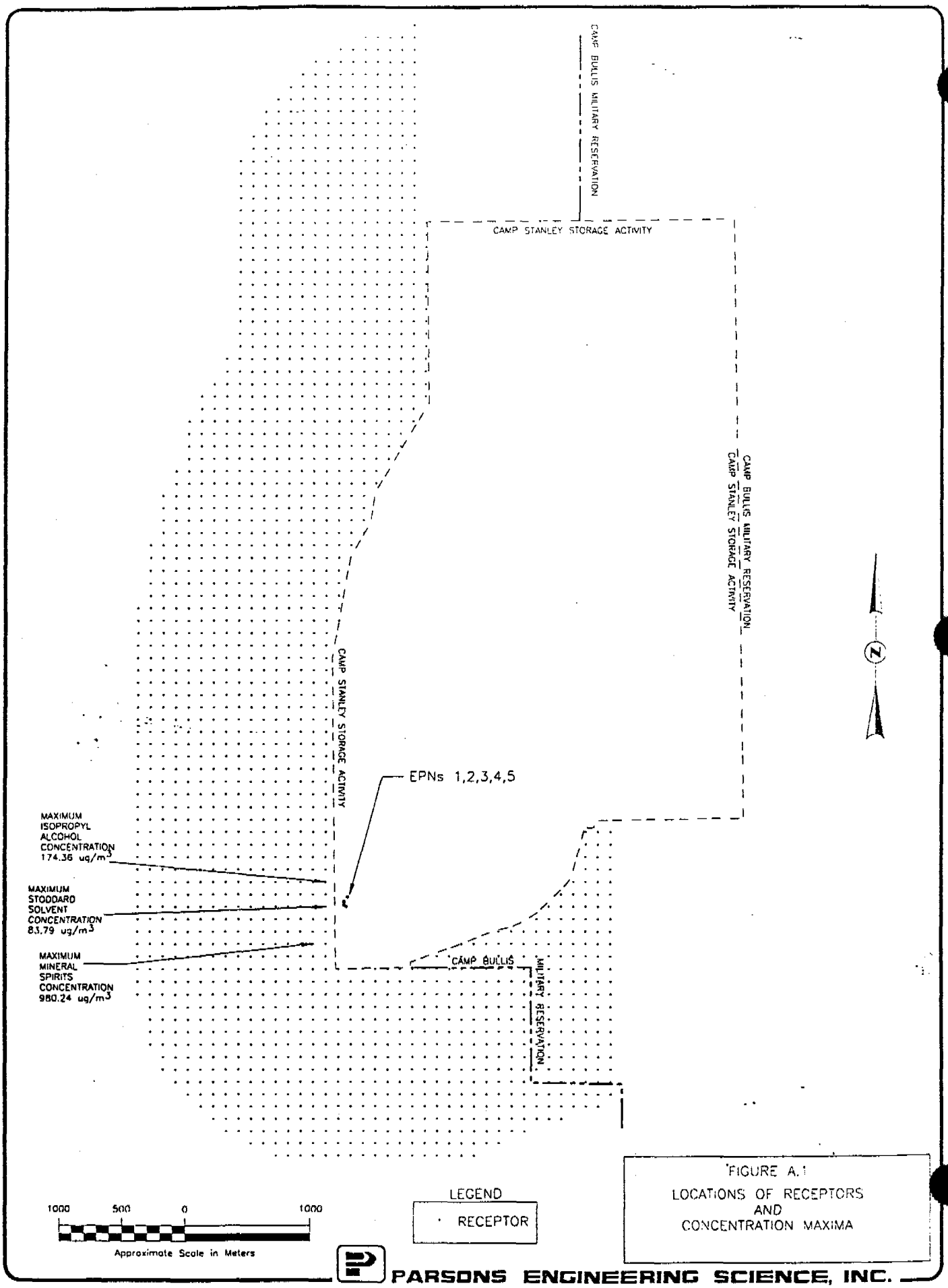


FIGURE A.1
LOCATIONS OF RECEPTORS
AND
CONCENTRATION MAXIMA

Building Downwash

Building downwash effects were incorporated into each modeling run using results from the EPA's Building Profile Input Program (BPIP.)

Meteorological Data

Surface meteorological data from the San Antonio airport (Station # 12921) for 1988, and upper air meteorological data from Del Rio (Station # 22010) for 1988 were combined and used for the model runs.

Modeling Results

The results from modeling are shown in the tables below.

Speciated VOC Short-Term Impact Summary

Pollutant	Short-Term ESL (mg/m^3)	Maximum Modeled Short-Term Impact (mg/m^3)
Isopropyl Alcohol	7856	174
Mineral Spirits	3500	980
Stoddard Solvent	3500	83.8

Speciated VOC Annual Impact Summary

Pollutant	Annual ESL (mg/m^3)	Maximum Modeled Annual Impact (mg/m^3)
Isopropyl Alcohol	980	1.56
Mineral Spirits	350	4.49
Stoddard Solvent	350	0.97

• 30-min or 1-hr ESL is less than annual average ESL

Impacts

The modeling results indicate that for the speciated VOCs, all of the predicted off-site short term concentrations are at least three times less than the TNRCC's associated ESL. For the long term period average, all the predicted off-site concentrations are at least 78 times less than the corresponding ESL.

Based on these results, there appear to be no adverse ambient impacts resulting from the proposed sources.