HARQMC2.DOC
12/21/99

Model Clearinghouse Information Storage and Retrieval System

Record Information Report

Record Number: 00-IX -01 Fiscal Year: 1900 Region: 09 Last Update: 12/21/99
Name: Harquahala Power Plant-Oct. 99

State(s): ARIZONA
Pollutant(s): PM-10
SO2
Regulation(s): SIP
Source(s): Power Plant
Model(s): ISC3
SCREEN3
Subject(s): Representativeness of Meteorological Data
Screening Procedures
Time Scaling
Urban/Rural: Rural Only
Oral/Written: Oral
Terrain: Both High and Low Terrain
Guideline: Guideline & Non-guideline
Database: Both Off-site & On-site
Involvement: Review and Comment
Record Comments:
10/22/99
Background:
The meteorological network is AZMET: "The Arizona Meteorological Network (AZMET) is part of the Extension Biometerology Program, which is a service of the University of Arizona Cooperative Extension within the College of Agriculture. " (see <http://ag.arizona.edu/azmet/>) They collect data for agricultural purposes. They use an anemometer height of 3 meters. While they do QA on the data (maintenance checks every 3 months, annual anemometer replacement, various computer and human checks of the data), they do not meet the QA description in "On-Site Meteorological Program Guidance for Regulatory Modeling Applications". At this site, over 2 years of data is available.
The source would be a power plant (4 combustion turbine generators with heat recovery steam generators) about 2 km away from the meteorological site, in flat terrain with low brush, though with various mountains around, starting at 4 miles away; it's about 50 miles west of Phoenix, AZ.
Region IX talked with Kevin Golden (R.8), Mick Day (R.7), Stan Krivo (R.4), and Rob
Wilson (R.10). They were of various opinions, but the consensus seemed to be

that though they would be skeptical of the use of this data, they felt that our Guideline is flexible enough so that it could be allowed -- it comes down to a judgement call about whether this data would give reasonably representative model results based on the particulars of the situation.

Issues:

1. Does the 3 m height automatically rule out use of this data?
2. Does not meeting EPA's QA guidelines automatically rule out use of this data?
3. Is there any precedent for rotating wind directions (by 1 sector) to make data from a different nearby site (20 miles away but with more years of data and better QA) match the predominant wind rose wind directions of a site very near a source?

C/H Comments: Basically all three questions pose difficult issues. On question 1,
the G/L, at Section 9.3.3.2h, recommends that data be collected at 100m or at plume
height, whichever is less. Thus even if the data were at 10 meters it would be troublesome accepting it because of its representatives of the plume transport. Going down to 3 meters is even more troublesome.

On Question 3, we have accepted wind rotations on rare occasions and with a great
deal of analysis and common agreement between all involved. It would have to be shown that the data are indeed representative and the degree of rotation is pretty
unambiguous.

Even if we could somehow come to an acceptance of the proposals for either issue 1,
or issue 3, it seems that the Q/A requirements will make the AZ agricultural met data not acceptable. We believe that the PSD regulations require that the PSD Monitoring Guideline be followed in all PSD data collection. Region IX should check on this Guideline and see if the AG network data would meet standard Q/A procedures.

Follow up on Issues 1:

RECORD OF COMMUNICATION

___TELEPHONE CALL ___MEETING __x_CONFERENCE CALL ___OTHER

INFORMATION COPIES TO: Scott, Warren, John Irwin, Desmond, Dan

TO: D. Wilson, D. Bailey

FROM: Scott Bohning, Region IX

DATE: 10/26/99

TIME:

SUBJ: Proposed W. AZ Power Plant

SUMMARY OF COMMUNICATION:

This call was in follow up to earlier communications which involved Q/A, Guideline
conformity, spatial representativeness and length of record for AZ Ag-network met

data from a 3 meter tower 2 km from the proposed PP location.
The purpose of this call was primarily to discuss the technical pros and cons of accepting the 3 meter AZ net data for use in modeling the proposed power plant.
Some other info on the pp is that it will ultimately be about 1000 MW, will be located about 50 miles West of PHX, and just south of I-10. It is natural gas fired
with 100-150 foot stacks and with 2 cooling towers. Emissions are low. Preliminary
estimates are NOx-286 T/Y; CO-285 T/Y, PM-10--?; SO2-61 T/Y. It is not clear yet
whether there will be an EIS. Some of the land around the plant is Class II wilderness areas, and the FLM is involved. The area is basin and range country with
widely, mostly randomly, scattered low mountain ranges separated by broad areas of
nearly flat desert. The permitting authority is joint between Maricopa County (PHX)
and Region IX. Both have to agree on the method of impact analysis.

Issue: The discussion quickly focused on whether data from the 3 meter tower would
be representative of plume height transport. There was some discussion on wind speed profiling under the log law, and whether one could scale up from 3 meters as
well as 10 meters. The major issue however, seem to be the wind direction. Accurate plume level wind direction may be quite important because of the impacts on
Class II wilderness areas and on terrain features is very dependent on the direction
of plume travel. There was a discussion on whether the area is subject to daily wind reversal. In spite of the flat nature of the land, much of AZ is subject to
up-valley/down-valley winds. These winds, which would be reflected in met data from
either 3 to 10 meters, might be almost independent of transport level winds for 100+ foot stacks with significant buoyant plume rise. The consensus of the group
was that the diurnal wind pattern from the 3 meter data should be examined for daily
wind reversals. If the winds are found to be highly katabatic, it may be necessary
to find another way to determine plume level winds.
Ancillary to this issue is whether it is even important to know accurate winds at
plume level since the impacts may be so low in any direction. We discussed

whether
worst case met conditions in SCREEN3 and/or Valley might clear the plant thru impacts below significance levels, or at least less than increment/NAAQS levels. Scott thought probably not since the plant is asking that met data be allowed for
impact assessment.
The bottom line is that the Guideline and PSD regulations provide the necessary authority to require collection of on-site met data at stack height. On the other
hand, there may be some practical considerations that render that data collection
unnecessary, but if we go that way it will be important to carefully word the rationale so as not to create an undesirable precedent. Scott also pointed out the
acceptance of the AZ Ag met data may set a precedent for other sources wanting to
use such data as there are a number of these sites Statewide.
11/17/99
Issue 4:
On Issue 1-3 Region IV tentatively recommended that the source collect on-site meteorological
data, though this is still not totally decided. Since the project proponents claim that a year of
on-site data collection would kill the project, they favor using a screening method instead.
The question is, is it acceptable to use the ISCST3 model with screening meteorology (i.e., the combinations of wind speed and stability class used in SCREEN, instead of actual meteorological data) for the PSD increment cumulative / full impact analysis? (The source would be well below the PSD increment for PM10 and NO2, the pollutants for which it exceeds the modeling significance level. The source is in flat terrain, with maximum impact is on a hillside about 4 miles away. It also appears that nearby sources' significant impact areas would not overlap with that of the proposed source.) Region IX view at this
time is that this would give a conservative estimate of the source plus nearby source impacts. Nevertheless, Region IX is troubled by the fact that this technique is
not in the Guideline in Air Quality Models, and that for averaging times greater than 1 hour one would have to use the averaging time conversion factors, which also are not in the Guideline.
C/H Comments:
From: Dean Wilson
To: RTPHUB.IN."Bohning.Scott@epamail.epa.gov"
Date: 11/18/99 7:55am
Subject: ISC using SCREEN meteorology -Reply

(5)

Hi Scott--If I understand the technique that is being proposed here, it has been used before and
can be acceptable. I think what you are saying is to model all the screening wind speed and
stability combinations that are in SCREEN, but in addition model them for each of the 36 wind
directions. This is what has been used before. I don't know that the C/H has ever formally
reviewed it but is aware of it and don't see any problem. At one point in time I tried to encourage
AQMG to include it in SCREEN but think the cost did not warrant its development.
There are a couple of key questions for your power plant. First, the source does have to indeed
be isolated. You mentioned that there is no overlap from other background sources. Does that
mean that if this source were modeled with real met data there would be no nearby background
sources that would need to be explicitly modeled per Table 9.1/9.2 of the G/L? If so, then it
qualifies for screening.
Second, I am a bit troubled by the fact that max impacts are on terrain. Are they above stack
height, making this a complex terrain modeling situation? If so, we probably need to talk further.
I am not sure that the time scaling factors are considered valid for complex terrain. Plus, I don't
know that the array of met conditions has ever been evaluated as appropriate for complex terrain.
Call me if you want to discuss further. 520-818-0299. We may want to hook Dennis Atkinson in
on the call also.
Follow up conference call with Dennis Atkinson:

RECORD OF COMMUNICATION

___TELEPHONE CALL ___MEETING _x__CONFERENCE CALL ___OTHER

INFORMATION COPIES TO:
TO: D. Wilson, D. Atkinson
FROM: S. Bohning
DATE: 11/22/99
TIME:
SUBJ: Harquahala PP
SUMMARY OF COMMUNICATION:
Source wants to use the ISC3 model in a screening mode by modeling the 1-hour impacts of the power plant plus nearby sources, then use the time scaling factors in
the screening procedures to obtain screening estimates for longer averaging

times.
The result of the 1-hour screening was that the maximum impacts are on terrain above
stack height.
Issues: 1. Can one use the time scaling factors for multiple sources. 2. Can one
use the time scaling factors for complex terrain.
Discussion: 1. Since the proposed screening procedures are kind of a nonguideline
technique (although EPA has likely accepted that technique before), its use with the
time scaling factors has to be a judgment call. 2. We talked about what is in the
screening procedures regarding time scaling for complex terrain. Dennis stated that
they are for simple terrain. There was some discussion about 1993 modelers workshop
report where the issue of time scaling factors was dealt with. However, it appears
that the workgroup that dealt with this issue didn't make a recommendation that
would be useful for this issue. We also talked about the earlier study done by
Region X and D. Wilson where time scaling factors for 1 hour to annual were
examined. This study also is not really applicable to the issue at hand.
Recommendation: To use the screening ISC3 procedure is a Regional judgment call.
There is some greater risk in this situation because the impacts are on terrain
where there is little data to support time scaling factors.
FOLLOW UP ANTICIPATED: Region IX will decide on whether to accept the technique.
Follow up comments from Region IX:
From: <Bohning.Scott@epamail.epa.gov>
To: RTP10.RTPTSD(ATKINSON-DENNIS,WILSON-DEAN)
Date: 11/22/99 12:46pm
Subject: Complex terrain screening for annual
Dean & Dennis -
Thanks again for your time today.
After I got off the phone, I looked in the 1993 workshop report again, and found
that I had missed the workgroup's own report... I'd been looking only at the
OAQPS (Joe's?) summary. Below is what I found. Sorry I didn't find this
sooner, I could have saved you some trouble!
It looks as though 0.08 to convert from 1-hour to annual might be OK for complex
terrain on case by case basis.
- Scott B.
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1993 Modelers' Workshop report, Issues 4.8 and 4.9, 9/1/93
Workgroup recommended 0.08 +/- 0.02 for point, area, and volume sources in both

simple and complex terrain, and point downwash impact in simple terrain.
(Complex terrain was included in data set used to arrive at factor.) Should put in section 4.5.2 of Screening Procedures Manual, to use with 24-hour impacts from the Valley model (or SCREEN & COMPLEX I). I.e. multiply VALLEY result by 4 to get 1-hour average, then by 0.08 to get annual average (for overall factor of 0.32 to apply to VALLEY output).
However, OAQPS summary with action items stated that there guidance is adequate and there are already a number of complex terrain screening methodologies.
Changing SPM to deal with complex terrain would require public comment, would be of limited value.
[The 0.08 factor was put into SPM only for simple terrain.]
CC: RTP10.RTPTSD(PETERS-WARREN),RTPMAINHUB.INTERNET(BO...