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IN REPLY REFER TO
5090
EV31KRC:lfm
November 21, 2008

Ms. Evelyn Rodríguez Cintron
Manager, Air Quality Area
Puerto Rico Environmental Quality Board
Piso 5 Ave. Ponce de León #1308
Carr Estatal 8838
Sector El Cinco
Rio Piedras, PR 00926

Re: LETTER FROM USEPA TO PREQB DATED OCTOBER 27, 2008 REGARDING THE
OPEN BURNING VARIANCE REQUEST BY THE NAVY AT THE FORMER VIEQUES
NAVAL TRAINING RANGE, VIEQUES, PUERTO RICO

Dear Ms. Cintron:

Attached for your review is the Navy's response to the comments in the letter from USEPA referenced above, dated October 27, 2008, regarding the open burning variance request by the Navy at the former Vieques Naval Training Range, Vieques, Puerto Rico. The responses are in response to the request in your letter dated November 17, 2008.

Most of EPA's comments have been previously addressed within the documents previously submitted to EPA and PREQB associated with the open burning variance application. These documents were the result of collaboration on several conference calls between the Navy PREQB, USEPA; and each agency's consultants. Previous EPA and PREQB comments were addressed and incorporated into draft final documents that were previously approved by the agencies, contingent upon final comments from the public during the public review period.

If you have any questions regarding the attached comment responses, please don't hesitate to contact me at 757-322-4815 or by e-mail: Christopher.penny@navy.mil.

Sincerely,

CHRISTOPHER T. PENNY, P.E.
Head, Vieques Restoration Section
Environmental Restoration Branch

Copy to:

NAVFAC ATLANTIC (Mr. Dan Hood, Mr. Kevin Cloe, Ms. Madeline Rivera, Mr. Pedro Ruiz)
PREQB (Ms. Wilmarie Rivera)
CH2MHILL (Mr. John Tomik)

ATTACHMENT A

RESPONSE TO THE COMMENTS IN USEPA LETTER DATED OCTOBER 27, 2008 REGARDING THE NAVY'S OPEN BURNING VARIANCE APPLICATION FOR FORMER VIEQUES NAVAL TRAINING RANGE VIEQUES, PUERTO RICO

USEPA Region 2 Technical Review of Vieques "Open Burning" Variance Request

Background

Puerto Rico Regulation for the Control of Atmospheric Pollution
Part 301, "Variances"

"PREQB may preliminarily approve variances from the strict application of the substantive requirements established in this Regulation, except for SPNSS and NESHAPS."

Requirements

Pursuant to Part 301 - Standards for Granting Variances

1. The variance will not cause or contribute to cause air pollution in violation of any NAAQS or in the case of non-attainment areas will not exacerbate any existing violation of the NAAQS.

Navy performed modeling using CALPUFF to model emissions (150km x 100km grid domain with 1km resolution). Emissions from the explosion of ordinances were included in modeling. Modeling showed that burning earlier in the day (8:00 AM) was better than later (12:00 PM), due to the calmer meteorological conditions later in the day leading to less pollutant dispersion. Earlier burn times allow for smoldering emissions to be distributed more evenly. The initial burn area modeled was 640 acres. The actual prescribed burn area is now about 192 acres, so the modeling is conservative. Modeling showed the following levels of emissions:

- Max 24 hr PM10 is 25.9 ug/m³ (below NAAQS - 150 ug/m³).
- Max 24 hr PM2.5 is 25.9 ug/m³ (below NAAQS - 35 ug/m³).
- Max 8 hr CO 652 ug/m³ (below NAAQS - 10,000 ug/m³).
- Max 1 hr CO 1462 ug/m³ (below NAAQS - 40,000 ug/m³).

The maxes given above are at the monitoring locations. Two monitoring locations will be set at the areas with the highest residential impact (approx 8.5 miles and 7 miles from burn location). Modeling isopleths show higher concentrations of pollutants near the burn area.

EPA Comment

The use of CALPUFF to model emissions from open burning and detonation may not provide the most accurate results. The Open Burning/Open Detonation Model (OBODM) would be a more appropriate model to use. OBODM is used in evaluating the air impacts of the open burning and detonation of obsolete munitions and solid propellants. Information on the model and its use can be found at:

http://www.epa.gov/scram001/dispersion_alt.htm#obodm

The results from the OBODM should be evaluated to determine if the monitoring locations selected are still appropriate.

Navy Response to EPA Comment

OBODM was used to evaluate the dispersion of emissions from the munitions destroyed on the site either from Blow-in-place (BIP) operations or incidental detonations associated with the controlled burning of munitions. The BIP activities are different from the vegetation burns and were addressed separately and presented in the report Air Dispersion Modeling of TCRA/BIP Activities on the Former Vieques Naval Training Range U.S. Navy, February 2007. The BIP modeling predicted that emission concentrations in populated areas resulting from BIPs in the center and on the western edge of the LIA are below both regulatory standards and reasonable analytical detection limits for all compounds. Modeled concentrations of both CO and PM10 are less than 0.5 percent of their respective NAAQS in ambient air. The approach and model selection was developed based on consensus between the Navy, PR EQB and EPA; and their consultants based on several conference calls.

Open, prescribed, or controlled burning of vegetation is fundamentally different from the open burning of munitions. Open burning of vegetation is a relatively long duration event (hours to days) with time variant emission profiles and a large mass of relatively low energy fuels. Open burning of munition items and energetics is a very short duration event (seconds to minutes) with a discrete emission profile and a small mass of high energy fuel.

The modeling approach was developed by consensus through lengthy (1-2 year) collaboration between the Navy, PREQB, USEPA, and several consultants.

CALPUFF was chosen to model the emissions from the open burning of vegetation on the site to address several requirements:

- *CALPUFF is a USEPA designated and accepted dispersion model for a broad range of sources including both area and volume sources,*
- *CALPUFF accurately predicts the dispersion of emissions over the medium to long distances required for this project,*
- *CALPUFF specifically allows the input of time-variant variable emission sources such as open burning of vegetation,*
- *CALPUFF allows for the use of multiple meteorological site data to represent and address complex, time-variant wind fields,*
- *CALPUFF addresses the effects of open water bodies on the dispersion.*

OBODM is a specialized derivative of ISC v2 and was developed at Dugway Proving Grounds for the specific purpose of modeling the dispersion of the emissions from the open burning or open detonation of energetics and munition items. It is a simple Gaussian dispersion model that can only accept meteorological data from one site and does not address complex time-variant wind fields, large water body effects, or large scale time-variant variable sources such as vegetation burns. OBODM is well suited for near-field dispersion of emissions from short duration, discrete events such as the detonations and munition burns that occur during munitions disposal and range clearance. OBODM does not address the medium to far field dispersion of emissions from the open burning of vegetation.

EPA Comment

Navy should provide an explanation on why the max mass is the same for both species of PM. It would be expected that $PM_{10} > PM_{2.5}$ since $PM_{2.5}$ is a component of PM_{10} , unless this is a function of emissions from land clearing fires.

Navy Response to EPA Comment

AP-42 and numerous other sources describe the particulate emissions from vegetation burns as being bimodal with a significant $PM_{2.5}$ component and a second component (ash and soot) larger than PM_{10} . Section 13.1 of AP-42 describes the prescribed burning and its emissions in this manner; "Prescribed burning is a land treatment, used under controlled conditions, to accomplish natural resource management objectives. It is one of several land treatments, used individually or in combination, including chemical and mechanical methods. Prescribed fires are conducted within the limits of a fire plan and prescription that describes both the acceptable range of weather, moisture, fuel, and fire behavior parameters, and the ignition method to achieve the desired effects. Prescribed fire is a cost-effective and ecologically sound tool for forest, range, and wetland management. Its use reduces the potential for destructive wildfires and thus maintains long-term air quality. Also, the practice removes logging residues, controls insects and disease, improves wildlife habitat and forage production, increases water yield, maintains natural succession of plant communities, and reduces the need for pesticides and herbicides. The major air pollutant of concern is the smoke produced. Smoke from prescribed fires is a complex mixture of carbon, tars, liquids, and different gases. This open combustion source produces particles of widely ranging size, depending to some extent on the rate of energy release of the fire. For example, total particulate and particulate less than 2.5 micrometers (μm) mean mass cutpoint diameters are produced in different proportions, depending on rates of heat release by the fire.² This difference is greatest for the highest-intensity fires, and particle volume distribution is bimodal, with peaks near 0.3 μm and exceeding 10 μm .³ Particles over about 10 μm , probably of ash and partially burned plant matter, are entrained by the turbulent nature of high intensity fires." Given the reference material describing that most, if not all, of the PM_{10} generated in vegetation burns is $PM_{2.5}$ and a pragmatic review of the modeling which showed that the PM_{10} concentrations were well below the NAAQS in ambient air, the use of the $PM_{2.5}$ emission factor is believed to be both representative and protective.

The emission factors used for modeling of the prescribed burns were generated with the US Forest Service's Fire Emission Predictor System (FEPS). The predecessor to FEPS was EPM; EPM is referenced in Section 13 of AP-42 as a model being developed (1996) for management of wildfires. CALPUFF is capable of directly using the time-variant and vegetation specific emission factors and emission characteristics provided by FEPS and EPM. Guidance for usage of the FEPS and EPM generated emission characteristics is provided in the CALPUFF users manual. FEPS was developed in 2003-2004 specifically for the purpose of accurately predicting the emissions from wildfires and prescribed burns. FEPS is being used by the EPA to quantify the emissions from wildfires and prescribed burns in the National Emission Inventories (NEIs).

EPA Comment

AP-42 establishes emission factors for both PM10 and PM2.5 from "prescribed burn" operations though Section 4.1 of the Variance Air Monitoring Plan indicates otherwise.

Navy Response to EPA Comment

Several of the various vegetation types identified in Section 13 of AP-42 (wildfires and prescribed burns) do not have both PM2.5 and PM10 emission factors. Of the vegetation types identified in AP-42, no one type clearly fits the vegetation on the LIA. The AP-42 section pertaining to wildfire emissions (13) was published in 1996 and includes the following caveat regarding the wildfire emission factors presented in AP-42; "It must be emphasized that the factors presented here are adequate for laboratory-scale emissions estimates, but that substantial errors may result if they are used to calculate actual wildfire emissions.". The emission factors selected for both PM10 and PM2.5 were based on the references identified in Table 4-1 of the modeling report. The reference to the emission factors for PM10 and PM2.5 do not have any relevance to the selection of the monitoring criteria.

EPA Comment

Monitoring for PM2.5 should be performed since the above mentioned max concentration for PM2.5 is approx 75% of the NAAQS.

Navy Response to EPA Comment.

As stated in the Air Monitoring Plan, the PM2.5 NAAQS is a statistical standard based on 3 complete years of data. An exceedance of the PM2.5 NAAQS cannot occur based on a single 24-hour sample or without a sufficient number of 24-hour samples exceeding the threshold to cause the statistical standard to be violated. The anticipated controlled burning is anticipated to be two 48 hour burn events spaced over a 13 week period. The purpose of air monitoring the prescribed burns on VNTR is to determine if there is an acute impact resulting from the prescribed burns; it is not an attempt to characterize general air quality over a 3-year period. It is expected that PM10 measurements will most accurately represent the total respirable particulate in the air and there is a 24-hour NAAQS for PM10 with a clear compliance threshold and duration consistent with these infrequent and short-term events.

EPA Comment

A schedule should be provided that establishes the burn rate of the remaining 192 acres.

Navy Response to EPA Comment

Based on data from previous accidental burns, a 100 acres parcel can be completely burned between 24 and 48 hours. The rate for the removal of munitions from an area where the vegetation has been cleared has averaged 7.6 acres/week. Therefore, it is estimated that it will take approximately 13 weeks to surface clear the munitions of a 100 acre parcel. Based on this information, it is anticipated that the controlled burn will consist of two burn events (~95 acres/event) that are scheduled 13 weeks apart.

EPA Comment No. 6

The rate of the burn is limited to 100 acres per day – PREQB may want to lower this to minimize even further the emissions generated from the burn.

Navy Response to EPA Comment No. 6

The air modeling was based on a maximum 125 acre burn area. The modeling results concluded that the worst case emissions on populated areas from a controlled burn would range from 8% of the NAAQS (for CO) to 17% of the NAAQS (for PM10). This was supported by previous air monitoring which has not detected emissions above the NAAQS. Based on this information it is believed that the 100 acre/ day burn limit is a very conservative limit to maintain air emissions below the NAAQS and is consistent with the size of the parcels to be burned.

2. Compliance with the rules and regulations would produce practical difficulties or hardships without equal or greater benefits to the public or to the betterment of air quality;

This is adequately addressed in the Variance Air Monitoring Plan and the Technical Evaluation Report

3. The owner or operator of the source for which a variance is sought has made efforts to control or prevent the conditions which may have prompted the variance request;

This is adequately addressed in the Variance Air Monitoring Plan and the Technical Evaluation Report

4. The public health safety and general welfare are not threatened;

This is adequately addressed in the Variance Air Monitoring Plan and the Technical Evaluation Report – monitoring will be performed in the residential areas closest to the “open burning”. Adequate steps will be taken to consider the meteorological conditions (strong winds, temperature inversion, air stagnation advisory, or natural events advisory from Sahara dust or volcanic ash) air pollution emergency episodes, the use of emission reduction techniques to minimize the emissions from the fire, such as, but not limited to

minimize the areas to be burned, extinguish the smoldering burns, burn before precipitation. These types of considerations are consistent with EPA's Interim Air Quality Policy on Wildland and Prescribed Fires (May 1998).

5. A public notice has been issued in accordance with Rule 111 pertaining to the variance request and an opportunity for public hearing has been offered therewith;

A public notice was issued on August 22, 2008, a public hearing is scheduled for September 22, 2008 and public comments by September 24, 2008.

6. The variance shall not cause or contribute to an air pollution emergency, nor shall it prevent or limit the application of the emergency emissions reductions provisions or Rule 107; and

EPA Comment

Documents did not include contingency action plans and responses to exceedences/ violations of PM or CO. Action plans should document PM and CO levels when burning activities should be reduced or ceased to protect site workers and nearest receptors.

Appropriate short-term (less than 24-hour) contingency actions may, among other things, may include:

- **Notifying the affected public (especially sensitive populations) of elevated pollutant concentrations,**
- **Suggesting actions to be taken by sensitive persons to minimize their exposure (e.g., remain indoors, avoid vigorous activity, and avoid exposure to tobacco smoke and other respiratory irritants),**
- **Providing clean-air facilities for sensitive persons,**
- **Halting ignitions of any new open burning that could impact the same area,**
- **Consulting State/tribal air quality managers regarding appropriate short-term fire management response to abate verified impacts,**
- **Implementing management responses that will mitigate the adverse impacts to public health**
- **Reporting the steps taken to mitigate adverse impacts to the public and appropriate State/tribal agencies after they have been completed.**

Navy Response to EPA comment

On December 13, 2007 the Navy submitted to EQB and EPA a Contingency Plan to respond to exceedences of the PM10 or CO NAAQS. The specific requirements proposed by EQB incorporate corrective actions. The most recent version of the Contingency Plan developed by the Navy and EQB's specific requirements is provided as Attachment B. With respect to short term corrective actions; corrective actions can only be taken after monitoring data is collected for the monitoring periods and an exceedance is detected. The PM10 monitoring period is 24 hours. The monitoring periods for CO are 8 and one hours. It is unlikely that the CO standards will be

exceeded. Corrective actions for exceedances can be implemented following a review of the data as described in the Contingency Plan.

7. An application for a location approval, permit to construct, or permit to operate, whichever applicable, has been submitted.

Not Applicable

No variance shall be deemed approved until it has been approved by the US-EPA

EPA Comment

In General, variances must be submitted to EPA as SIP revisions. Variance SIP revision submittals must go through the public participation process, include documentation of PREQB's responses to comments and include air quality analysis and any other relevant technical support documents.

Navy Response to EQB Comment

This comment contradicts EPA's cover letter to these comments where they state:

"Our interpretation of the regulation, which is part of the SIP, is that it is not necessary to treat the PREQB –issued variance as if it were a proposed SIP revision requiring notice and comment by EPA. Therefore, the PREQB Chairman should submit the variance request after it is approved by PREQB". "The decision resulting from our review will then be communicated by letter from the Regional Administrator."

