



Technical Evaluation Document for the Preparation of the Preliminary Variance Draft

Controlled Burning in Association with the Munitions Removal Plan Live Impact Area and Eastern Conservation Area in Vieques, PR

Project Description

The US Navy implemented in July 2005 the Time Critical Removal Action (TCRA) for munitions in the Live Impact Area (LIA) and the Eastern Conservation Area (ECA), in the area known as Naval Training Range in the Vieques Island. The plan consists of removing the munitions from the land surface in an expedite manner to reduce the explosive safety risk to the public. Several of the munitions that remain on the surface are dangerous and can explode from even the slightest disturbance. The remainder of the LIA and the ECA where munitions removal has yet to be completed is covered by dense brush vegetation. The Navy understands that the controlled burning is the safest way to remove the vegetation, since the use of manual vegetation cutting equipment poses the risk of coming in contact with the munitions. The controlled burning will allow the cleanup workers to more readily see the ground and avoid the accident contact with these munitions. The Regulations for the Control of Atmospheric Pollution (RCAP) does not allow open burning, except for certain authorized uses (Rule 402 of the RCAP).

Variance Application

On February 14, 2007, the Navy applied for a variance to allow the use of controlled vegetation burning for the munitions removal activities in the Vieques Island. With the application, the Navy submitted work plan drafts (*Prescribed Burn Plan*), an air monitoring plan for the variance and the air dispersion modeling for the activities that will be done. Actually the Navy has an air monitoring program in the vicinity of the LIA for the removal actions. However, the monitoring plan to be implemented for the variance shall demonstrate that there will not be adverse air quality impacts outside of the LIA.

The *Prescribed Burn Plan* includes the work plan that must be followed to carry out the controlled burning of the vegetation. It includes the medical emergency plan, environmental parameters, contingency plan, the responsibilities for the personnel in

charge of the burning, monitoring provisions during the burn, and activities after the burn, among other things. According to the original document, the burn area consists of 688.9 acres, in a range of 3.9 to 75.7 acres per compartment (23 compartments). The plan includes a map marking the compartments.

The Navy mentions that if there are natural events such as volcanic activities or fine particulates from the Sahara, which causes the environmental concentrations for particulates to exceed the federal standards, the fire would not be initiated. The document mentions that according to the models, the burn that starts at noon or later, tends to have a bigger impact on the air, so the burn will commence after 8:00 a.m., but before noon.

The closest receptors to the burn area are located within 4 miles of the place (public beach). The communities are located between 8 to 10 miles from the burn area. The airport is 11 miles from the place. The turtle nesting areas could be at ½ mile from the place. The Navy indicates that they have met with the Fish and Wildlife Service (FWS) to discuss the situation.

Emissions from the controlled burning and emissions modeling

According to the documents submitted, the emissions factors for the vegetation burning were calculated using the computer program Fire Emission Production Simulator (FEPS), created by the US Department of Agriculture Forest Service. The model predicts fuel consumption, emissions, and heat release characteristics of prescribed burns. Trace gas emission factors were predicted using the CO emission factors correlation developed from the emissions measurements taken during a series of Australian forest fires (Walsh, Jones, and Wilson) and from an emission study of smoldering fires (Mckenzie, Hao, Richards, and Ward). It was assumed that 5 pounds of net weight of explosives will detonate in each acre of land burned in the prescribed burn. This value is based on observations during past control fires in the LIA, and is consistent with observations in the literature. (Cover, Siemann, Ortega). Emissions from the incidental initiation of ordnance items were added to the prescribed burns emissions. The emission factors for the various ordnance types were obtained from two sources: AP-42 Chapter 15¹ and *Emissions from the Energetic Component of Energetic Wastes During Treatment by Open Detonation*, released by the Naval Air Warfare Center Weapons Division.

The emissions from the burning were revised in April 2008 to reduce the area to be burned to 192 acres, which represents 496.9 acres less than what was requested

¹ *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources, Fifth Edition*

initially. However, the ignition of the compartments is limited to 100 acres per day, as mentioned in the Work Plan Itinerary section in the *Prescribed Burn Plan*.

In the emissions that were submitted in the February 2007 documents, we found formaldehyde and methanol emissions that exceeded the major source emission limits for hazardous air pollutants, so the Navy was requested to do a risk analysis for these contaminants. The Data Validation and Mathematical Modeling Division of the Planning and Strategic Evaluation Area of the EQB evaluated the results of the modeling and determined that this risk analysis is not necessary because, according to the modeling presented, there is no potential risk for contamination that could affect the environment or the populated areas. The Data Validation and Mathematical Modeling Division pointed out that the model results for the criteria pollutants and for other pollutants are below the air quality standards or are insignificant. In respect to formaldehyde and methanol, the concentrations for the 1 and 8-hour periods were insignificant and consequently do not exceed the allowed limits. With the reduction in area to be burned, the emissions of these two pollutants are below the major source emission limits for hazardous air pollutants.

Based on the predicted emissions and the resulting concentrations, the Navy determined that the particulate matter emissions (PM_{10}), which include $PM_{2.5}$, and carbon monoxide were the most significant ones that could be in measurable quantities outside of the restricted area. Therefore, monitoring will be carried out for these contaminants. The Navy determined that the resulting emissions from the incidental munitions detonations inside the controlled burning are insignificant in comparison to the resulting emissions from the controlled vegetation burning.

The Navy proposes an air monitoring program with a 1 year duration, with a revision of the semiannual data to determine the benefit of having a full year of monitoring. According to the proposal, the monitoring program will last 12 months, unless it is determined that the pollutant concentrations are below the NAAQS, and the program is ended. However, the Air Quality Area recommends that the monitoring program remain in place until the controlled burning jobs are completed. Nevertheless, with the reduction in the total area to be burned, the job will be realized in a period that will not exceed 12 months, so it is justified that the monitoring is done until the controlled burning activities are finished.

The original documents of the variance (in draft) were submitted in February 2007, and on June 2008 the following documents were submitted:

1. *Variance Air Monitoring Plan*, June 2008
2. *Variance Air Dispersion Modeling for TCRA Prescribed Vegetation Burn*, June 2008
3. *Prescribed Burn Plan*, June 2008

The changes done in the documents are mostly clarifications requested by EPA in a letter sent to the Navy on April 2007, which intend to clarify the information that was submitted. In addition, the documents include information about the reduction in the total area to be burned (from 640 to 192 acres) that was notified by the Navy to EQB on April 2008. Although there is a reduction in the total area to be burned, the documents include the corrected emissions (with the reduction in the area to be burned) as well as the original data, for reference, as indicated by the Navy.

Compliance with Rule 301 of the RCAP

Rule 301 of the RCAP requires that the variance application includes a certification that the filing fee and 25% of the excess emissions fee, as prescribed by the Board under Rule 502 of the RCCA, have been deposited. The Governing Board ordered, by the Resolution R-08-18-B, that the Navy shall be exempt from the filing fees of Rule 501 of the RCAP and from the excess emission charges of Rule 502 of the RCAP, because the proposed action is a remedial one under CERCLA (*Comprehensive Environmental Response, Compensation and Liability Act*, (42 USC §9601 et seq)). The actions under CERCLA can only be carried out in places specifically listed by the EPA in the National Priority List (NPL). The area included in the variance is part of the area known as the Atlantic Fleet Weapons Training Area, which is included in the National Priority List. Under CERCLA, the removal or remedial action conducted entirely onsite, where such remedial action is selected and carried out in compliance with CERCLA, are exempt from federal, state or any local permit. However, a state or territory may enforce any standard, requirement, limitation or local condition applicable to the remedial action. Rule 301 of the RCAP also requires that a permit application to construct or operate (whichever applicable) is submitted. The Board determined that it would not be appropriate to apply for a permit for a prohibition. We understand that the variance application complies with all other requirements of Rule 301 of the RCAP.

Once the comments from the EQB, EPA and the community are incorporated, the Navy shall provide to the EQB a detailed implementation itinerary for review and approval. The variance shall not be deemed approved until it has been approved by the Administrator of the Environmental Protection Agency – Region II from New York.

The conditions proposed for the preliminary variance are the following

1. The Navy shall maintain a copy of this variance at all times. It shall be available for inspection by EQB's technical personnel.
2. The controlled burning of vegetation in association with the Munitions Removal Plan will be done according to the Prescribed Burn Plan that was submitted. If there is any change, it shall be submitted to the Board for review.
3. The total area to be burned covers an area of 192 acres. However, each individual burn shall not exceed 100 acres per day.
4. The controlled burning of vegetation shall not be extended for a period greater than 12 consecutive months. Each individual burn shall be started between 8:00 a.m. and noon.
5. The Navy shall use diesel or gasoline to initiate the burn. The use of tires, rubber, hazardous waste, treated wood, asbestos containing material, coated electrical wires, or any other similar material is prohibited to initiate the burn.
6. The Navy shall have an observer present at all times while the burn occurs until the fire is completely extinct and there is no fire or flames visible in the area.
7. The Navy shall have available all the necessary equipment, such as water supply, hoses, shovels, sand, etc. to control the burn, if the need arises.
8. Previous to the commencement of each controlled burn, the Navy shall verify the meteorological conditions to ensure that the conditions are favorable. The burning shall not be initiated if it is determined that there are no favorable conditions for the burning, such as strong winds, temperature inversion, if there is an air stagnation advisory by the National Weather Service, or natural events (volcano ashes or dust from the Sahara). The burning shall cease immediately if it is determined that the favorable conditions for the burn have changed and that could cause possible violations to the Air Quality Standards.
9. The burning shall not be started during an air pollution incident declared under Rule 107 of the RCAP.
10. The Navy shall only burn during wind conditions that: a) prevent the dispersion of smoke to populated areas, b) do not cause visibility problems in traveled roads or airports, c) do not cause a public safety or health problem, d)

do not cause a public nuisance, and, e) do not cause that the fire extends uncontrolled.

11. The Board may ask the Navy to extinguish the fire or to abstain to initiate the burn during periods of inadequate smoke dispersion, excessive visibility impairment or at any other times that the public health and safety could be adversely affected.
12. According to Rule 107(B)(1) of the RCAP, when the Board declares an air pollution alert, warning or emergency, and determines that such condition requires immediate action for the protection of the health of human beings, the Board will order persons causing or contributing to the atmospheric pollution to reduce their emissions in order to eliminate such condition, or to immediately discontinue the emission of pollutants.
13. The Navy shall use emission reduction techniques to minimize the emissions from the fire, such as, but not limited to:
 - a. Minimize the areas to be burned.
 - b. Extinguish the smoldering burns.
 - c. Burn before precipitation.
14. The Navy shall coordinate the burn with the Board to ensure that the project remains under the specifications in the plan, or if there are additional contingency measures required.
15. Previous to the burning, the Navy shall submit to the Board a detailed implementation itinerary for review and approval.
16. The Navy shall conduct air monitoring according to the Monitoring Plan approved by the Board, except that the air monitoring shall be conducted for the entire duration of the controlled burning jobs. Any additional change in the monitoring plan shall be submitted to the Board for evaluation.
17. The Navy shall continually review the results of the monitoring network to ensure that the air quality standards are not exceeded for any of the pollutants whose concentration was detected by modeling, especially in populated areas.

18. The Navy shall inform immediately to the Board if, during the monitoring elevated levels of the monitored pollutants (particulates or CO) are measured, which violate or have the potential to violate the National Emission Standards caused by the burning of vegetation. The Navy shall notify the Board in writing no later than 24 hours after the incident. This notification shall include a specific description of the incident, value of the monitored parameters, date and time of the incident, causes of the incident, and corrective measures taken or to be taken. The Navy shall also indicate which are the measures to be taken to ensure that this incident does not occur again.
19. No later than 30 days of the following month for which is representative, The Navy shall send a monthly report to the Board with the following information:
 - a. date of the burn.
 - b. compartments burned each day.
 - c. total burn area per day.
 - d. a summary with the daily air monitoring results performed in the place.
20. All notifications and reports required by this variance shall be sent to the following address:

Environmental Quality Board
Air Quality Area
PO Box 11488, San Juan, PR 00926-2604

Alternatively, The Navy could send it by fax to 787-756-5906.

21. The Navy shall keep records with the checklists included in the Prescribed Burn Plan that are done previous to the start of each burn. They shall be available for inspection by EQB's technical personnel.
22. The Navy shall take the necessary contingency measures to minimize the impact of smoke in sensitive areas.
23. The authorization to conduct the controlled burning authorized by this variance could be revoked or suspended for fire prevention reasons or during

adverse weather conditions, or for violations of any term, condition in this variance or applicable laws and regulations.

24. This variance will be valid for 3 years after the date of approval.

August 18, 2008