Appendix A – PRD/RD Use Description Memo: "Verification Memorandum for Methyl Bromide for San Francisco Bay Species"

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

MEMORANDUM

PC Code: 053201

DATE: December 14, 2011

SUBJECT: Verification Memorandum for Methyl Bromide for SF Bay Species

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This memorandum serves to provide additional information on the use pattern of methyl bromide not captured in the LUIS process. RD and PRD's role in the verification process is to fill information gaps and provide division appropriate expertise as outlined in the LUIS Verification SOP for RD and PRD.

PRD provides information and status regarding changes to the chemical use (such as application parameters, cancellations, or label language) that occurred as a result of the reregistration process. RD provides information regarding changes to the chemical use that may have occurred after the date of the LUIS label extraction. In the case a "Data Doer Only"[1] report was conducted, the CRM and PM will ensure that all highest application rates are reflected on the EFED Spreadsheet. The CRM and PM have drafted the "Registration and Reregistration Verification" section of this memo to clarify knowledge gaps a risk assessor may encounter while using the data contained in the LUIS report.

[1] This type of LUIS report is conducted when the AI of interest has more than 50 products. This report will contain: (1) products actively registered to the data doer, (2) all technical registrations regardless of registrant, and (3) all active California special local needs (SLN) registrations.

If further clarification is needed, please contact Susan Bartow or Steve Weiss.

Registration and Reregistration Verification

Date and Scope of the TRED and REDs

- The Tolerance Reassessment and Risk Management Decision (TRED) for methyl bromide, and Reregistration Eligibility Decision (RED) for methyl bromide's commodity uses was issued in August 2006 (EPA-HQ-OPP-2005-0123-0231).

- The RED for soil and non-food structural uses of methyl bromide was issued in July 2008 (EPA-HQ-OPP-2005-0123-0470). The methyl bromide RED for soil and non-food structural uses was amended in May 2009 (EPA-HQ-OPP-2005-0123-0716).

- Besides the parent compound, the RED does not identify methyl bromide metabolites or degradates of toxicological concern.

  There are several types of application methods used for soil fumigation including shank injection and hot gas methods. Commodity applications are preformed under tarps, in fumigation chambers, or on large structures (e.g., flour mills).

Label Uses / Rates and Mitigation

- Separate risk mitigation measures were developed for commodity uses in the 2006 TRED/RED and the 2008 RED for soil and non-food structural uses.

- Risk mitigation measures required by the 2006 TRED/RED include:
  - Site-specific fumigation management plans (FMPs),
  - Buffer zones during the treatment and aeration periods,
  - Respiratory protection requirements for fumigation workers and other on-site workers,
  - Air monitoring requirements of all storage areas where fumigated commodities are located,
  - New maximum application rates and maximum dosage times for crops, and
  - Establishment of minimum aeration times.

- In 2009, EPA issued a Generic Data Call-in for a study to measure worker exposure at cold storage facilities. Based on preliminary results from phase 1 of the study which indicate risks of concern, EPA is requiring registrants to (1) develop interim risk mitigation and (2) amend final phases of the study protocol.

- Risk mitigation measures required by the 2006 TRED/RED have not been implemented to date. A mitigation implementation schedule is currently in the process of being developed for commodity uses and is expected to occur in late 2012.

- Current use restrictions for methyl bromide labels with commodity uses are summarized in the 2008 document, Methyl Bromide, PC Code 053201, DP Barcode 304612; Health Effects Division (HED), Second Addenda to the 2006 (DP Barcode 304623) Phase 5 Human Health Risk Assessment For Commodity Uses.

- Risk mitigation measures for methyl bromide soil uses (required by the 2008 RED and 2009 RED Amendment) will be implemented in two phases. Phase 1 mitigation measures were placed on product labels in 2010 and have become effective in 2011. Phase 2 mitigation measures, including buffer zone requirements, will be placed on product labels in 2011 and will become effective in 2012.

Table 1. Implementation Schedule for Soil Fumigant Risk Mitigation Measures

Risk Mitigation Measure	Phase 1	Phase 2
Restricted Use	●	●
New Good Agricultural Practices	●	●
Rate reductions	●	●
Use site limitations	●	●
New handler protections	●	●
Tarp cutting and removal restrictions	●	●
Extended worker reentry restrictions	●	●
Training information for workers	●	●
Fumigant Management Plans	○	●
First responder and community outreach	○	●
Applicator training	○	●
Compliance assistance and assurance measures	○	●
Restrictions on applications near sensitive areas		●
Buffer zones around all occupied sites		●
Buffer credits for best practices		●
Buffer posting		●
Buffer overlap prohibitions		●
Emergency preparedness measures		●

○ = under development
● = adopt completely

Phase 1 Label Changes for Soil Fumigants

- **Removal of Uses** - Only uses with very high benefits and no economically or technologically feasible alternatives are eligible for reregistration (i.e., uses, users, and locations that qualify for exemptions under the Montreal Protocol). Additionally, the following uses were determined to provide benefits for growers and are allowed for a finite period of time. These uses include fresh market tomatoes and peppers in California (allowed until 12/31/12), Vidalia onions in Georgia (allowed until 12/31/12), ginger in Hawaii (allowed until 12/31/12), athletic fields (allowed until 12/31/13), golf course tees/greens/fairways (allowed

until 12/31/13), caneberries (allowed until 12/31/14), and tobacco seedling trays (allowed until 12/31/14).

Formulations with 98 percent methyl bromide and 2 percent chloropicrin are only allowed for uses that have been determined to be essential, which include orchard replant, ornamentals (hot gas method only), forest seedlings, and quarantine uses. These 98 percent methyl bromide formulations are also allowed for use on golf courses, athletic fields, and tobacco seed trays until the scheduled phase out of these uses is completed.

- **Reduced Application Rates** – The maximum application rate for all pre-plant soil fumigation including quarantine applications with methyl bromide products is 400 lbs ai/acre. The following tables summarize the maximum application rates for soil applications by crop/use site.

Table 2. Maximum Rates for Crops/Uses with Critical Use Exemptions (CUEs).

Crop	Treated Area Rate (lb ai/acre)
Eggplant	350
Cucurbits (including muskmelons, cantaloupe, watermelon, cucumber, squash, pumpkin, and gourds)	250
Forest Nursery Seedlings	300 sandy soils 400 clay loam soils with less than 30% clay
Orchard Nursery Seedlings (raspberry, deciduous trees, roses)	
Strawberry Nurseries	
Ornamentals[1, 2]	200
Orchard Replant[3, 4] (walnuts, almonds, stone fruit, table and raisin grapes, wine grapes)	300
Pepper, Bell	200
Strawberry Fruit[5]	175 California 240 Eastern US
Sweet Potato Slips (CA)	350
Tomato (grown for fresh market)	240

[1] The maximum rate for greenhouse hot gas applications is 1 lb ai/100 ft^2

[2] The maximum rate for fumigating potting mixes used for ornamentals (including decomposed compost, soil mixes and manure) is 1 lb ai/100 ft^2

[3] The maximum application rate when applying methyl bromide to individual tree holes using handheld equipment is 1.0 lb ai/100 ft^2 in light soils and 1.5 lb ai/100 ft^2 in fine-textured soils.

[4] The maximum rate to control infestation of Oak Root Fungus (*Armillaria mellea*) and/or endoparasitic nematodes such as root-knot (*Meloidogyne* spp.), dagger (*Xiphinema* spp.), ring (*Criconemoides* spp.), lesion (*Pratylenchus* spp.), and pin (*Paratylenchus* spp.) nematodes is 400 lb ai/A. Documentation of the pest(s) must be included in the site-specific fumigant management plan.

[5] The maximum rate to control infestation of *Fusarium*, *Macrophomina*, and/or *Verticillum* is 235 lbs ai/A.

Table 3. Maximum Rates for Crops/Uses without Critical Use Exemptions (CUEs).

Crop	Treated Area Rate (lb ai/acre)
Peppers (fresh market in CA)	330
Tomato (fresh market in CA)	220
Caneberries (Raspberries, Blackberries, Boysenberries)	200
Ginger (HI)	400
Vidalia Onion (GA)	350
Golf Course Tees, Greens, and Fairways[1]	400
Athletic Fields[1]	400
Tobacco Seedling Trays	3 lbs/1000 cu. feet
[1] For resurfacing with hot gas method only	

- **Reduced Application Areas** – The maximum application block sizes were restricted as follows:
  - 100 acres for tarped bedded and broadcast applications,
  - 40 acres for untarped deep applications (e.g., California orchard replant),
  - 10 acres for outdoor hot gas applications, and
  - 45,000 square feet for greenhouse hot gas applications.

- **Respiratory and Dermal Protection** – Handlers will rely on sensory irritation and/or air monitoring to trigger additional respiratory protection. If methyl bromide concentrations are detected above specific levels, handlers are required to wear respirators or stop work. Additional dermal personal protective equipment (PPE) is also required for handler tasks that have potential for liquid contact.

- **Tarp Requirements** – Methyl bromide applications must be tarped in all cases, except very limited circumstances including (1) deep (18 inches or greater) untarped shank applications for California orchard replant uses that qualify for a CUE or QPS exemption and (2) tree-hole applications with deep (18 inches or greater) injection auger probes.
  - Tarps cannot be perforated (i.e., cut or punched) for a minimum of 5 days (120 hours) after the fumigant application is completed;
  - A minimum of 2 hours must pass between perforation and tarp removal;
  - Tarps may be perforated manually only for the following situations: (1) at the beginning of each row when a coulter blade (or a similar device) is used on a motorized vehicle (i.e., all-terrain vehicle), (2) in fields that are one acre in size or less, or (3) during flood-prevention activities.

- **Entry Restrictions** – Only properly trained and equipped handlers can be in the field during treatment for 5 days after the application is completed.

- **Good Agricultural Practices (GAPs)** – Mandatory GAPs must be followed during all soil applications. GAPs specify appropriate weather conditions; injection depth and spacing; soil sealing; use of tarps; soil temperature; soil

moisture; soil preparation; prevention of end-row spillage; planting interval; and calibration, set-up, repair, and maintenance of application equipment.

Phase 2 Label Changes for Soil Fumigants

- **Buffer Zones** – Buffer zones of varying sizes, based on application method and rate, application block size, and emission control measures, will be required. Buffer zones will be in effect from the time the fumigation begins until 48 hours following the application.

- **Posting** – The Agency is requiring that buffer zones be posted at usual points of entry and along likely routes of approach to the buffer zone unless a physical barrier, such as a fence, prevents bystander access to the buffer zone. The posting requirement is intended to prevent passers-by from entering a buffer zone before the restricted entry period terminates.

- **Fumigant Management Plans (FMPs)** – The certified applicator supervising the application must verify that a site-specific FMP exists for each application block. The FMP must include site information, a map of the treated field and adjacent property, list of authorized personnel to perform application, application procedures, posting procedures, and emergency procedures. Within 30 days of completing the application portion of the fumigation process, the certified applicator who supervised the application must complete a post-fumigation application summary that describes any deviations from the FMP that occurred, measurements taken to comply with FMPs, and any complaints and/or incidents that have been reported to the certified applicator. The summary also must include the actual date of the application, application rate, and size of application block(s).

- **Emergency Preparedness and Response Measures** – The Agency is requiring emergency preparedness measures at the community level in the form of information and education for first responders and site-specific response and management activities. These measures will ensure early detection and quick response to situations as they arise.

- **Notice to State and Tribal Lead Agencies** – Assuring compliance with new label requirements is an important part of the package of mitigation measures. The Agency will work with all states to amend their cooperative agreements to include strategies for compliance assistance and assurance to aid the transition from current labels to labels that reflect the new mitigation. The Agency is also requiring applicators to provide notice to the state and tribal lead agencies that choose to be notified of fumigant applications.

- **Outreach Program for Communities** – The registrants must disseminate health and safety information to communities, including first responders, in areas where there is high use of methyl bromide.

- **Training Program and Training Materials** – The registrants must propose and develop a training program approved by EPA that provides information to applicators and handlers on how to correctly apply the fumigant, including how to protect themselves and other handlers and bystanders, how to determine buffer zone distances, how to develop an FMP, and how to determine when weather and other site-specific factors are not favorable for fumigant application.

- **Ambient Air Monitoring Program** – The registrants must develop an air monitoring program in areas where there is high use of methyl bromide to evaluate whether ambient air concentrations of methyl bromide exceed the Agency's level of concern (LOC).

Product Reregistration

- Methyl bromide soil fumigant product reregistration for the phase 1 label changes is complete. Labels were stamped "Accepted with Comments" between April and October of 2010.

- Methyl bromide soil fumigant labels are scheduled to be updated with the phase 2 label changes in December 2011.

Registration Division Review

No changes have occurred in the use patterns since the last accepted labels and no changes are pending.

Table 4. Active Soil Fumigant Registrations for Methyl Bromide
(only CA SLNs included, other state's SLNs excluded)

Registration #	Registration Name	Company Name	Form	% Active Ingredient	Restricted Use
3377-27	M-B-R 98 Technical	Albemarle Corporation	Technical Chemical	98	No
5785-19	Terr-O-Gas 70 Preplant Soil Fumigant	Great Lakes Chemical Corporation	Pressurized Gas	70	Yes
5785-22	Terr-O-Gas 98	Great Lakes Chemical Corporation	Pressurized Gas	98	Yes
5785-24	Terr-O-Gas 67	Great Lakes Chemical Corporation	Pressurized Gas	67	Yes
5785-28	Terr-O-Gas 57 Preplant Soil Fumigant	Great Lakes Chemical Corporation	Pressurized Gas	57	Yes
5785-40	Terr-O-Gas 75	Great Lakes Chemical Corporation	Pressurized Gas	75	Yes
5785-42	Brom-O-Gas 2%	Great Lakes Chemical Corporation	Pressurized Gas	98	Yes
5785-47	Terr-O-Gas 80	Great Lakes Chemical Corporation	Pressurized Gas	80	Yes
5785-48	Terr-O-Gas 50	Great Lakes Chemical Corporation	Pressurized Gas	50	Yes
5785-52	67-33	Great Lakes Chemical Corporation	Formulation Intermediate	67	No
5785-56	98-2	Great Lakes Chemical Corporation	Formulation Intermediate	98	No
8536-5	Pic-Brom 33	Soil Chemicals Corporation	Pressurized Gas	67	Yes
8536-6	Pic-Brom 55	Soil Chemicals Corporation	Pressurized Gas	45	Yes
8536-7	Pic-Brom 43	Soil Chemicals Corporation	Pressurized Gas	43	Yes
8536-9	Pic-Brom 50	Soil Chemicals Corporation	Pressurized Gas	50	Yes
8536-11	Pic-Brom 25	Soil Chemicals Corporation	Pressurized Gas	75	Yes
8536-19	Methyl Bromide 98%	Soil Chemicals Corporation	Pressurized Gas	98	Yes
8536-20	Pic-Brom 67	Soil Chemicals Corporation	Pressurized Gas	33	Yes
8622-12	98-2	ICL-IP America, Inc.	Pressurized Gas	98	Yes
8622-13	67-33 Preplant Soil Fumigant	ICL-IP America, Inc.	Pressurized Gas	67	Yes
8622-15	75-25 Preplant Soil Fumigant	ICL-IP America, Inc.	Pressurized Gas	75	Yes
8622-39	50-50 Preplant Soil Fumigant	ICL-IP America, Inc.	Pressurized Gas	50	Yes
11220-4	Tri-Con 57/43 Preplant Soil Fumigant	Trical Inc.	Pressurized Gas	57.2	Yes
11220-7	Tri-Con 67/33	Trical Inc.	Pressurized Gas	67	Yes
11220-8	Tri-Con 75/25	Trical Inc.	Pressurized	75	Yes

Registration #	Registration Name	Company Name	Form	% Active Ingredient	Restricted Use
			Gas		
11220-10	Tri-Con 50/50	Trical Inc.	Pressurized Gas	50	Yes
11220-11	Tri-Con 45/55	Trical Inc.	Pressurized Gas	45.2	Yes
11220-17	Methyl Bromide 89.5%	Trical Inc.	Pressurized Gas	89.5	Yes
11220-32	MBC Concentrate Soil Fumigant	Trical Inc.	Pressurized Gas	98	Yes
15298-4	Methyl Bromide 100	Bromine Compounds Ltd.	Technical Chemical	100	No
58266-1	Tri-Con 80/20	Shadow Mountain Products Corporation	Pressurized Gas	80	Yes
87224-1	MEBROM 98	Mebrom NV	Technical Chemical	98	No
87224-2	MEBROM 100	Mebrom NV	Technical Chemical	100	No
87224-3	MEBROM 70-30	Mebrom NV	Pressurized Gas	70	Yes
87224-4	MEBROM 67-33	Mebrom NV	Pressurized Gas	67	Yes
87224-5	MEBROM 75-25	Mebrom NV	Pressurized Gas	75	Yes
87224-6	MEBROM 50-50	Mebrom NV	Pressurized Gas	50	Yes
87224-7	MEBROM 80-20	Mebrom NV	Pressurized Gas	80	Yes
87994-1	MBC Soil Fumigant	Triest Ag Group Inc.	Pressurized Gas	68.6	Yes
87994-2	MBC-33 Soil Fumigant	Triest Ag Group Inc.	Pressurized Gas	67	Yes
CA770058	Pic-Brom 50	Soil Chemicals Corporation	Ready-to-Use Solution	50	No
CA970016	Methyl Bromide 98%	Soil Chemicals Corporation	Pressurized Gas	98	No

Table 5. Active Post-Harvest Commodity Registrations for Methyl Bromide (only CA SLNs included, other state's SLNs excluded)

Registration #	Registration Name	Company Name	Form	% Active Ingredient	Restricted Use
5785-11	Meth-O-Gas 100	Great Lakes Chemical Corporation	Pressurized Gas	100	Yes
5785-41	Meth-O-Gas Q	Great Lakes Chemical Corporation	Pressurized Gas	100	Yes
5785-51	Methyl Bromide 100%	Great Lakes Chemical Corporation	Technical Chemical	100	No
8536-15	Methyl Bromide 100	Soil Chemicals Corporation	Pressurized Gas	100	Yes
8536-29	Methyl Bromide Quarantine Fumigant	Soil Chemicals Corporation	Pressurized Gas	100	Yes
8622-16	Metabrom 100	ICL-IP America, Inc.	Pressurized Gas	100	Yes
8622-55	Metabrom Q	ICL-IP America, Inc.	Pressurized Gas	100	Yes
CA900001	Methyl Bromide 100	Soil Chemicals Corporation	Pressurized Gas	100	No