Application for Temporary Derogation – Hexazinone

July 23, 2014

This is a joint application for a temporary derogation to use a ‘Highly Hazardous’ Pesticide on FSC-certified forestland. The summary below provides a high level overview of the demonstrated need of the pesticide and will include stakeholder consultation feedback following the close of the consultation period. Each forest management certificate holder has submitted a separate application providing more specific information that demonstrates the need for the pesticide in their certified forest operations as well as explaining their considerations of alternative control methods and preventative measures. The applications for derogation can be found at the end of this document as it was submitted by the forest manager.

Summary

The joint application has been submitted by the following forest managers for a temporary derogation to use herbicide formulations containing the active ingredient of hexazinone, and each application submitted can be found by navigating to the corresponding page number provided within the list below.

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The forest managers applying for this derogation manage certified forest operations across the United States, and are using herbicide formulations containing the active ingredient hexazinone for conifer release from competition with other broadleaf shrub and herbaceous vegetation. The use of herbicide treatments containing hexazinone are presented to be the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe challenges to stand regeneration in natural forests.

Hexazinone overview

Hexazinone is a contact and residual herbicide that is absorbed by leaves and roots. In forestry, it is most commonly used in site preparation and for conifer release. Hexazinone is tolerated by conifers, thus it is a very effective herbicide in forestry for reducing competition from weeds and other broad leaf woody species. The pesticide is available for use in both granular and foliar spray formulations. The granular form is activated (Hexazinone is released into the soil) with rain or snow and the pesticide is absorbed by plant roots. When applied as a foliar spray, some uptake occurs by absorption through leaves.

Hexazinone is identified by FSC to be highly hazardous due to reported high persistence in soils (half-life in soil or water (DT50) greater than 100 days). Reports state that Hexazinone is of moderate to high persistence in the soil environment with estimates of half-lives ranging from 30 to 180 days with the mean to be about 90 days. As is the case for other chemicals, the persistence of Hexazinone is dependent on local environmental conditions, including sunlight, rainfall, soil type, and rate of application.
Hexazinone does not meet the thresholds to be considered “highly hazardous” from FSC use in categories other than persistence. It is slightly toxic via the oral route for mammals, is very low in toxicity via inhalation, close to non-toxic through dermal exposure; however, it can cause severe eye irritation with acute exposure. It is low in toxicity to most aquatic organisms; however there is some concern with amphibians.

There is much evidence supporting the claims that Hexazinone is generally safe for use in forestry situations apart from issues with persistence and contamination of water, especially when used in granular form.

**Demonstrated Need**

Herbicide treatments containing hexazinone are shown to be in many situations the most effective, environmentally, socially friendly, and safe way for managers of conifer forests in the US to release conifer seedlings from competition with broadleaf brush and weeds. Following a stand replacing event, such as a fire or harvest in a conifer forest, herbaceous vegetation and broadleaf shrubs may outcompete young conifer seedlings for the available water and nutrient resources. In situations where brush vegetation is not controlled, conifer seedlings struggle to survive due to moisture stress and increased susceptibility to insect and disease. Herbicide applications containing hexazinone are used when it is the best option for the success of the stand and in situations where better alternatives do not exist.

**Specified Controls to Mitigate the Hazard**

US federal, state, and county laws strictly regulate the use of pesticides. The regulations include specific requirements around formulations, concentration levels, human health and safety precautions, and environmental protections. Hexazinone has been approved for use in forestry practice by both the Environmental Protection Agency (EPA). All forest managers applying for the temporary derogation follow all laws required by these agencies during the application of the herbicide treatment.

Environmental impacts to water are mitigated through the use of formulations and application methods that reduce risk of runoff and the instatement of buffer zones around water courses during application. Licensed applicators are trained and instructed on how to correctly apply the herbicide to the target species as well as how to keep out of protected sensitive areas and buffer zones around water features.

**Program to Identify Alternatives**

Various alternatives have been researched by forest managers throughout the US, and some regions have been successful at replacing hexazinone specific situations while the same treatment in another region or location on the forest might not be as successful. There have also been research organizations created to assist forest managers in researching alternatives to the use of pesticides containing active ingredients found on the FSC ‘Highly Hazardous’ Pesticides list. Numerous studies and research has been conducted on alternative chemical treatment methods as well as mechanical treatment. The research has shown that while there are similar herbicide treatments available for the release of conifers, these herbicides are less effective and less selective to competing weed species. Using other herbicides leads to higher amounts and frequency with which the herbicides need to be applied as well as significantly higher costs.

Mechanical treatments are not only impractical due to the high cost but the treatments are ineffective as the target species readily resprouts after treatment. Additionally, mechanical treatments may have more severe negative environmental and social effects as they involve soil disturbance, which often leads to increased erosion, soil compaction, and disruption of desired understory communities.
Stakeholder support

Stakeholders are asked to comment on the joint application and submit them to Lori Knosalla at FSC US at l.knosalla@us.fsc.org. At this time, the section for stakeholder comments remains blank. Once comments are received following the close of the consultation, all comments will be included within this section of the application.
Collins Almanor Forest – Application form for a temporary derogation to use Hexazinone

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<td><strong>Application Submission Date:</strong></td>
<td>7/01/14 for public consultation</td>
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| **Name, and contact details of certification body requesting a temporary derogation:** | SCS GLOBAL SERVICES  
Brendan Grady  
2000 Powell Street, Ste. 600  
Emeryville, CA 94608 USA  
bgrady@scsglobalservices.com  
www.SCSglobalServices.com |
| **Active ingredient for which a derogation is being requested:** | Hexazinone |
| **Trade name and formulation type of the active ingredient or formulation:** | Velpar L, Velpar DF |
| **Method of application and application equipment:** | Aerial – broadcast application (using helicopter).  
Ground – back pack (broadcast and spot treatments). |
| **Common and scientific name of the pest species:** | Target species generally include grasses, forbs, and various brush species.  
Typical brush species targeted for control may include one, or a combination, of the following: pinemat manzanita (*Arctostaphylos nevadensis*) greenleaf manzanita (*Arctostaphylos patula*), chinkapin (*Castanopsis sempervirens*), deerbrush (*Ceanothus integerrimus*), snow brush (*Ceanothus velutinus*), huckleberry oak (*Quercus vaccinifolia*), Pacific Dogwood (*Cornus nuttallii*), mountain whitethorn (*Ceanothus cordulatus*), and squaw carpet (*Ceanothus prostrates*). |
| **Name and FSC certification codes of certificate holders for which a temporary derogation is being requested:** | Collins Almanor Forest  
SCS-FM/COC-00006N |
**Scope for which a temporary derogation is being requested:**

**Collins Almanor Forest (Cub Fire 2008)**

The Collins Almanor Forest (CAF) approach to herbicide utilization is well established as being very conservative. Generally, herbicides are not relied upon to create a forest structure. Instead, natural seeding is usually satisfactory for tree regeneration and unwanted vegetation is controlled by the continuous stocking found within CAF’s unevenaged stands. However, having stated this, Collins wishes to maintain its options for achieving desired resource goals through the use of appropriate physical, cultural, biological and chemical methods. Generally, an application of hexazinone will be limited to those larger areas that need to be regenerated because of a catastrophic event, such as a wildfire or an insect/disease infestation.

### 1. Demonstrated Need

Explain how the proposed use complies with the specified criteria for need, including consideration of non-highly hazardous alternatives and preventative silvicultural measures. (Include a list of all non-highly hazardous chemicals registered in the country)

**Demonstrated need criteria**

The use of hexazinone is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage in natural forests.

**Usual practices for harvesting**

Emergency salvage of fire damaged areas, rehabilitation of understocked areas, and group selection

**Usual practices for re-planting/regeneration**

Hand planting of containerized coniferous seedlings.

**Tree species grown**
Ponderosa pine, Jeffrey pine, sugar pine, Douglas-fir, red fir, white fir, incense cedar, and giant sequoia.

**Methods for site preparation**

1. Treat existing and resprouting brush with a directed foliar herbicide application (e.g. products containing Imazapyr and glyphosate).
2. Broadcast application of products containing hexazinone.
3. Directed foliar herbicide release application (e.g. products containing glyphosate).

**Basis for inclusion on the Forest Stewardship Council™ (FSC®) list of 'highly hazardous' pesticides**

Hexazinone is included on the FSC® list of 'highly hazardous' pesticides because it exceeds the threshold of the indicator for persistence. The half-life in soil or water (DT50) is 90 days and the FSC® threshold for inclusion on list is ≥90 days. Since persistence can be considered a benefit in reducing the total amount of herbicides used via the number of applications needed, a chemical that exceeds the FSC® threshold for persistence is not considered highly hazardous if chemical characteristics indicate it is not water soluble and mobile. However hexazinone does not meet this exception and so has been listed by FSC® as “highly hazardous”. These mitigating factors are:

- Soil sorption coefficient (KOC): 54 ml/g (cannot be exempted from the list for persistence if chemical is <300 ml/g) and water solubility (S) >30 mg/l (hexazinone is 29,800 mg/l)

The values for KOC and water solubility are based on a laboratory test of the active ingredient alone and not the herbicide product formulation (Velpar).

**Statement of pest problem**

The Collins Almanor Forest is comprised of approximately 94,000 acres of mainly mixed conifer forest in northeastern California. Most artificially regenerated acres are the result of reforestation efforts on timberland destroyed by wildfire. Without reforestation following wildfires large areas would become dominated by brush species because natural conifer regeneration following said event rarely occurs predictably and may take decades to achieve through natural succession.

**Collins Almanor Forest (Planted Ponderosa Pine 1982) No Herbicide Treatment**

**Need for hexazinone**

Newly planted areas require some form of weed control to ensure their growth to maturity. Hand grubbing and/or grazing are less effective than herbicide treatments and can result in increased
environmental degradation and reduction of vegetative diversity (McDonald et al. 1996). Prompt control of annual, perennial, and woody weeds is essential for the successful establishment and growth of young conifers in forest planted stands and in maintaining historical and or desired forest species composition on the Collins Almanor Forest. Without weed control, commercial conifer seedlings may die due to inability to compete for water and nutrients. In addition, young trees that are stressed by weed competition are much more susceptible to insect attack. The effect of weed competition on conifer seedlings is well documented in Lewis et al. (1993).

**Effects of not using herbicides**

Early vegetation management in planted forests is the most critical factor for achieving success in the long-term reforestation of native commercial forests. This is especially true for hot arid climates where available soil water is the single most important limiting factor. Powers & Ferrell, 1996, found significant gains in nutrient availability and soil moisture where competing vegetation was controlled. The study was replicated over a range of site qualities, with the largest gains appearing on average to low sites. Long-term growth projections using System 1 (Ritchie & Powers, 1994) resulted in 200 percent increases in stand volume at 50 years for stands which had been treated with herbicides compared to those that had not.

**Justification**

Vegetation management through the prudent use of herbicides has repeatedly been shown to be a very safe and effective method for aiding in the establishment and growth of young planted forests. The use of hexazinone will be limited to those areas that need to be regenerated because of a catastrophic stand replacing event. As stated above, we do not use hexazinone on a regular basis within the general management of the Collins Almanor Forest. However, we realize that within a forest ecosystem, when it comes to reforestation efforts, pioneering plant species can greatly hamper the ability to regenerate a site with conifers; either by natural or artificial means. Again, once the forest cover is removed, the potential for pioneer species to occupy the site is a very real prospect. In addition, thinking that by just planting tree seedlings into a site will ensure a successful reforestation effort, and alleviate the need for herbicide use, is ill-advised. In most cases, without the judicious use of herbicides, re-establishing a forest on a given site will be highly unpredictable.
2. Stakeholder consultation

In California, logging on private and corporate land is regulated by the 1973 Z'berg-Nejedly Forest Practice Act. This Act established the Forest Practice Rules (FPRs) and a politically-appointed Board of Forestry to oversee their implementation. The California Department of Forestry (CDF) works under the direction of the Board of Forestry and is the lead government agency responsible for approving logging plans and for enforcing the FPRs.

To log on private, a Registered Professional Forester must prepare a document which outlines the proposed logging operations, to include the potential use of herbicides, known as a Timber Harvest Plan (THP), and submit this to the state. The FPRs describe THPs as having two functions: to provide information for the CDF director to determine if the proposed harvest plan conforms to the rules; and to provide direction to logging operators who carry out the THP. These documents were certified as the "functional equivalent" of an Environmental Impact Report, and evaluate all of the potential direct and cumulative impacts that might occur as a result of the logging plan and to implement any feasible measures which would reduce this impact to a level of insignificance.

The FPRs state that CDF "shall disapprove a plan as not conforming to the rules" if it does not contain enough information to evaluate potential environmental effects, if it would cause "significant, long-term damage" or cause a "taking" of a threatened or endangered species or if it would cause irreparable harm to rare or endangered plant species.

When a THP is prepared, the submitter is required to notify landowners within 1,000 feet downstream of its boundary and request information on domestic water sources that could be affected by the proposed logging operations. At least ten days after providing this notice, the THP may be submitted, and CDF then has ten days to accept it for filing or return it to the submitter. THPs are available for interested people to obtain through their local or regional office of CDF.

Before being accepted for filing or within five days after filing, the plan undergoes "first review" to determine if an on-the-ground inspection, known as a "pre-harvest inspection" (PHI), is necessary and to help identify potential problems which should be considered during the review of the THP. The first review team includes a representative from CDF, and may include a representative from other agencies (i.e. the Department of Fish and Game, the California Regional Water Quality Control Board, the California Geological Survey, and other agencies as needed). These state agencies are able to make recommendations on THPs. Also, a Notice of Intent is sent, by CDF, to landowners within 300 feet of the proposed THP, the office of the county clerk within the THP county, and the local CAL FIRE unit headquarters.

If a PHI is deemed necessary a CDF Forester and other agency officials who choose to participate do an on-site inspection of the area to be subjected to the THP. The CDF Forester and any other agency officials who might have attended the PHI then prepare and submit a report on the inspection. These PHI reports, as well as any other reports and documents that are submitted in relation to the THP, are included in the official file for the THP and can be obtained at the local or regional office of CDF. The RPF who prepared and submitted the THP must respond to any recommendations that are made by CDF and other agencies, and this response is also included in the file and available for citizens to review and obtain.

After the PHI, the THP goes through its "second review" and a recommendation for denial or approval of the THP is made. This meeting is again comprised of a CDF representative, who is the Chair, and other agency officials who elect to participate. If agencies outside of CDF do not agree with the Chair's recommendation, they may file a "non-concurrence." These meetings, although not considered a formal public hearing, are open for interested members of the public to attend and make comments.

Public comment periods vary from county to county but are often accepted until one week after second review. CDF is required to consider and respond to these comments, and an "Official Response" is prepared and sent out upon the plan's approval.
CDF is required to give notification on THPs that are filed to any interested party. These lists give basic information about the THP, such as who the submitter is, the acreage and location of the proposed logging operation, and the silvicultural method that is proposed (i.e. clearcut, commercial thin, etc). To receive these notifications, one can call their regional CDF office and request to be added to the mailing list.

A THP must comply with all regulations as described within the California Forest Practice Rules (Title 14, California Code of Regulations – Chapters 4, 4.5 and 10) to include notice of proposed plan to the general public and other stakeholders.

**General Outline of when a THP is submitted to CAL FIRE:**

**Within 10 days of receipt:**

- The THP is assigned a number.
- Copies are distributed to all state and federal reviewing agencies.
- A Notice of Intent is sent to landowners within 300 feet of the THP, the office of the county clerk within the THP county, and the local CAL FIRE unit headquarters.
- A Notice of Submission is sent to anyone who has requested notification in writing.
- A first review of the THP is done by a multi-agency team that includes CAL FIRE, the California Department of Fish and Game, the California Regional Water Quality Control Board, the California Geological Survey, and other agencies as needed. This first review is meant to assess whether the THP is complete, accurate and in proper order. Any incomplete applications are returned to the Registered Professional Forester (RPF) who prepared the THP. The RPF must answer any questions or concerns raised by the review team before the THP is processed any further.
- Once all review team concerns are clarified and the THP is deemed complete, it is officially "filed." A Notice of Filing is sent to the person who submitted the THP, the office of the County Clerk, and to anyone who has requested notification in writing.

The public may submit to CAL FIRE comments concerning a filed THP. Comments will be accepted by the Department in writing or via e-mail up until the close of business on the designated final date for public comment. The public shall be informed as to where they may send their e-mail comments on all public notices and postings. All comments regarding plans shall be in writing and shall be addressed to the Director at the regional office where the plan is filed. CAL FIRE responds in writing to public comments that raise significant environmental issues. Addresses for written comments to CAL FIRE facilities can be found at CAL FIRE Contacts.

### B. Forest Management Enterprise Specific Requirements

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<td>FSC Certificate Code:</td>
<td>SCS-FM/COC-00006N</td>
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<tr>
<td>Location /region:</td>
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1. **Specified controls to prevent, minimise and mitigate hazards:**

In California, the Department of Pesticide Regulation (CDPR) is responsible for evaluating and
registering all pesticides used within the State. No pesticide may be used within the State of California without the material first being registered through CDPR. CDPR registration evaluation procedure includes review of toxicology studies and the preparation of a risk assessment. CDPR registration process establishes the label restriction of how materials may be applied and used. CDPR determines in their evaluation process what testing is necessary so the material can become registered. Materials registered with the State must be used consistent with label instructions. Collins Pine Company, like any responsible individual or corporation, will follow the law regarding herbicide use. A State Licensed Pest Control Advisor must write a recommendation prior to herbicide use. This recommendation must be consistent with label instructions.

Based on the extensive testing by herbicide manufacturers, the Department of Food and Agriculture, the Department of Pesticide Regulation, the application by a state licensed Pest Control Operator and the recommendations and supervision of a state licensed Pest Control Advisor, and the fact that these herbicides are not repeatedly used in forest conditions on the same acreage, as they might be used in other agricultural applications - no significant cumulative impacts are anticipated to occur.

**Mitigations to reduce the potential for significant adverse impacts to wildlife and water resources:**

All required buffers near watercourses and wetlands will be established and herbicide use within will be avoided.

It does not appear that there is a substantial risk of a significant adverse environmental impact to wildlife and water resources for the following reasons:

- The relatively low toxicity of the chemicals based on laboratory testing to date
- The proper application methodologies as discussed above
- The label restrictions regarding the use around water and wetlands as specified above
- The fact that these products are not repeatedly used in forest conditions on the same acreage, as they might be used in other agricultural applications

The following are bulleted items that are typically required by the State of California to ensure that the health and safety to the public and all individuals who work with registered herbicides is maintained to the highest standard possible:

**Training & Records**

- Employee job-specific refresher safety training
- Hazardous Materials Awareness training with hazardous communications
- Spray Operations Records & Communications
- All licenses and certifications, such as Pesticide Applicator License, completed and current
- Current First Aid/CPR
- Daily spray operations log form completed
- All incidents, exposures, accidents recorded
- MSDS information reviewed and updated if necessary

**Checklists & Equipment Inspections**

- Equipment properly cleaned and inspected
- Prior to use, equipment properly cleaned and wash water properly disposed of
- Equipment inspected and in good working order
- First aid, wash up equipment in place, tested and in proper working order
- Spill Kit suitable for quantity and type of chemical being stored, transported and used.
- Spray equipment should be calibrated correctly. Leaking nozzles will be cleared or replaced immediately.

**Weather check before spray operations**

- Operations suspended if too windy or other weather conditions render operations unsafe or ineffective
- Care taken to mitigate risk of over-sprays, run-off and wetlands considered
- Cease spraying at any time if weather conditions are affecting spray performance. As a guide the
following weather conditions apply for aerial applications of herbicides:
  · Spraying should cease when wind speed reaches 8mi/hr.
  · Spraying should cease when temperature reaches 70 degrees F

Application
  · Proper Chemical Operations - MSDS reviewed and label reviewed
  · Proper PPE used where appropriate and according to label directions
    · Use of long sleeves, pants or coveralls.
    · Use of rubber work glove
    · Use of Heavy work boots, 8” for ankle protection
    · Use of N-95 or N-99 HEPA filter dusk mask
    · Use of face shield, goggles or other eye protection
    · Use of hearing protection if needed (noise level above 80 decibels)
  · Proper mixing of chemicals with proper ventilation
    · Chemicals should be stored and mixed on sites where any spillage will not enter a watercourse, stream or riparian zone.
    · Mixing is to be measured accurately and without spillage (in the event of spillage occurring disposal must be undertaken in a safe manner away from any watercourse, stream or riparian area).
    · Where practical water should be clean and free of dirt particles.
    · An emergency spill kit must be available and suitable for quantity and type of chemical being stored, transported and used.
    · Waste water from cleaning of storage tanks, equipment and containers must be disposed of in a safe manner away from any watercourse, stream or riparian zone

Proper wash up and decontamination
  · PPE properly removed, proper wash up and decontamination or disposal of equipment
  · Equipment properly cleaned and wash water properly disposed of
  · Chemical containers should be disposed off-site and in the appropriate manner. The preferred method is to send the containers back to the company it was purchased from.

Additionally the following steps will be adhered to when applying the chemicals
  · The spray method must ensure that no spray drift reaches surrounding forest stands, streams, riparian zones, neighboring properties, archaeological sites or other non-target areas. This may mean leaving an unsprayed margin. Chemical mixes should avoid killing non-target species.
  · Rates should not exceed the recommended dosage required to effectively control the targeted species.
  · For aerial application the Daily Aerial Spray Record Form must be completed for every area treated.

2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures. Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

The Collins Almanor Forest developed the Certified Forests Cooperative in conjunction with other large forestland managers. The purpose of the cooperative is to cooperatively participate in field trials and research pursuant to the Forest Stewardship Council™ (FSC®) United States (US) and individual FSC® Forest Management certificate holders’ derogations for the use of FSC® listed “high hazardous” chemicals, and to help satisfy requirements and management objectives of the Sustainable Forestry Initiative (SFI) standard set forth in performance measure 2.2.

Since the establishment of the Forest Stewardship Council Research Group in the spring of 2010, it has been a priority of the group to evaluate new chemistries for forestry site preparation or herbaceous release
that may be an alternative to products containing hexazinone. These new chemistries have either been
used alone or in combination with reduced rates of products containing hexazinone or other soil active
herbicides and compared to the operational standard rates of products containing hexazinone alone. It
was the objective of these trials to evaluate both efficacy and conifer tolerance of several conifer species
including ponderosa pine, Douglas-fir, white fir and western larch. The trials were structured as
completely randomized block designs with three to four replications per treatment. Data was collected
and analyzed using SAS statistical software using analysis of variance and orthogonal contrasts to
determine significance. Several of the trials were also replicated within the Sierra Cascade Intensive
Forest Management Cooperative and the data from analogous trials was shared between the two research
groups.

Several new herbicides were of interest due to low use rates, favorable environmental profiles and proven
efficacy in applications outside of forestry. The three alternative products for which we have data are
Milestone (aminopyralid), MAT 28 (aminocyclopyrochlor) and an experimental compound GF 9999.
Milestone and MAT 28 are in the same family of herbicides. Both have very low use rates and act as an
auxin type growth regulator herbicide. Each also has a very favorable environmental profile and have
both foliar and residual activity. GF 9999 is a new chemistry being tested under a secrecy agreement. It
controls annual herbaceous broadleaved weeds and annual grasses. It also has a favorable environmental
profile. Several more trials have been installed with different products, but to date, no data has been
collected. Only the products for which we have data will be discussed here. These include four sites for
the Milestone trials, three sites for the MAT 28 trials and two sites for the GF 9999 trials. The trials have
been replicated in both time and space.

Soil active products registered in forestry are extremely limited. Currently products containing
hexazinone, atrazine, and sulfometuron are the only choices available for landowners. Products
containing atrazine have dramatically declining due to perceived ground water concerns and products
containing sulfometuron only has limited use due to conifer tolerance issues. Hence, products containing
hexazinone are the most important tool of all the residual herbicides registered for use in forestry and is
the most widely used among landowners. The availability of new soil active herbicides would
significantly broaden management options for landowners provided efficacy and conifer tolerance are
acceptable.

Based on the data presented within these trials, it does not appear at this time there is a suitable alternative
to products containing hexazinone that provides adequate vegetation control and acceptable conifer
tolerance. Products containing hexazinone out-performed all products tested here. If the new products
tested were to be used in practice as an alternative to products containing hexazinone, it would most likely
increase total herbicide use due to the need for repeat treatments. It does appear that Milestone and GF
9999 may have a partial fit in combination with products containing hexazinone, but are not strong
enough on their own to be feasible. Due to the conifer tolerance issues, MAT 28 is not acceptable as
either a release or site preparation treatment in forestry at all.

The importance of vegetation management in the Western United States cannot be overstated. Extreme
temperatures, limited rainfall and extremely competitive herbaceous vegetation and brush can severely
hinder establishing a new forest. Products containing hexazinone have long been and will continue to be
the most important and consistent herbicide used in western forestry. The use of products containing
hexazinone over the last several decades has reduced herbicide use as a whole, due to extremely broad
spectrum control and longevity. What can be done with one application of products containing
hexazinone may take several using other products. Water is the most limiting factor in the western United
States and (to date) products containing hexazinone remain the most efficient herbicide to maximize
water use by young conifers.

Refer to the following results summary paper prepared for the Certified Forests Cooperative for more
information:

Fredrickson, Ed. 2013. Evaluation of Hexazinone Efficacy and Conifer Tolerance Based on
Several Replicated Trials for the Forest Stewardship Council Research Group.
Collins Lakeview Forest – Application form for a temporary derogation to use Hexazinone

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Brendan Grady  
2000 Powell Street, Ste. 600  
Emeryville, CA 94608 USA  
510.452.8007  
bgrady@scsglobleservices.com  
www.SCSglobelServices.com |
| **Active ingredient for which a derogation is being requested:** | Hexazinone |
| **Trade name and formulation type of the active ingredient or formulation:** | Velpar L (liquid, 75% active ingredient)  
Velpar DF (dry flowable, 75% active ingredient) |
| **Method of application and application equipment:** | Aerial helicopter application and ground application using manually operated backpack sprayers. |
| **Common and scientific name of the pest species:** | Arctostaphylos nevadensis  
Arctostaphylos patula  
Artemisia tridentate  
Ceanothus prostrates  
Ceanothus velutinus  
Chrysolepis sempervirens  
Corylus cornuta var. californica  
Ericameria nauseosa  
Prunus emarginata  
Prunus virginiana  
Purshia tridentate  
Ribes sanguineum  
Rosa ssp.  
Salix ssp.  
Symphoricarpos albus  
Symphoricarpos mollis  
Achillea millefolium  
Crsium ssp.  
Lupinus ssp.  
Ranunculus ssp.  
Verbascum thapsus  
Wyethia mollis  
Miscellaneous grass and forb species  
pine mat manzanita  
green leaf manzanita  
sagebrush  
Mahala mat  
snowbrush  
Chinquapin  
California hazel  
rabbitbrush  
bitter cherry  
choke cherry  
bitterbrush  
red-flowering current  
willow rose  
willow  
snowberry  
creeping snowberry  
common yarrow  
common thistle  
wild lupine  
buttercup  
common mullen  
Mule's ear |
| **Name and FSC certification codes of certificate holders for which a temporary derogation is requested:** | Collins Lakeview Forest  
SCS-FM/COC-00012N |
temporary derogation is being requested:

| Scope for which a temporary derogation is being requested: | Coniferous forestlands in northeastern California and southeastern Oregon, USA.  
Hexazinone may be applied as a site preparation prior to reforestation or as an early silvicultural release. |

1. Demonstrated need

Explain how the proposed use complies with the specified criteria for need, including consideration of non highly hazardous alternatives and preventative silvicultural measures. (include a list of all non highly hazardous chemicals registered in the country)

**Demonstrated need criteria**
The use of Hexazinone is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage to natural forests.

**Usual practice of harvesting**
Emergency areas of fire damage areas, rehabilitation of understocked areas, and regeneration silvicultural areas.

**Usual practice of re-planting/regeneration**
Hand planting of bare root and containerized seedlings.

**Tree species grown**
Ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), western white pine, (*Pinus monticola*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*).

**Average time between successive rotations**
80 to 120 years.

**Method for site preparation**
1. Treat existing and re-sprouting brush with a directed foliar herbicide application (e.g. products containing Imazapyr and/or Glyphosate).
2. Broadcast application of products containing Hexazinone.
3. Directed foliar herbicide release application (e.g. products containing glyphosate).

**Basis for inclusion on the Forest Stewardship Council™ (FSC®) list of 'highly hazardous' pesticides**
Hexazinone is included on the FSC® list of 'highly hazardous' pesticides because it exceeds the threshold of the indicator for persistence. The half-life in soil or water (DT50) is 90 days and the FSC® threshold for inclusion on list is ≥90 days. Since persistence can be considered a benefit in reducing the total amount of herbicides used via the number of applications needed, a chemical that exceeds the FSC® threshold for persistence is not considered highly hazardous if chemical characteristics indicate it is not water soluble and mobile. However Hexazinone does not meet this exception and so has been listed by FSC® as “highly hazardous”. These mitigating factors are:

- Soil sorption coefficient (KOC): 54 ml/g (cannot be exempted from the list for persistence if chemical is <300 ml/g) and water solubility (S) >30 mg/l (Hexazinone is 29,800 mg/l)

The values for KOC and water solubility are based on a laboratory test of the active ingredient alone and not the herbicide product formulation (Velpar).
Statement of pest problem

Collins Lakeview Forest is comprised of approximately 97,000 acres of natural and planted eastside pine forest located in northeastern California and southeastern Oregon. The majority of planted stands area are the result of regeneration following stand replacing wildfire. Planted stands have also occurred in areas of harvest following severe bark beetle outbreaks. The additional planted stands are the result of regeneration harvest of stagnated conifer stand. Artificial regeneration following catastrophic wildfire is required to re-occupy the impacted area to a preexisting conifer dominated ecosystem. Without artificial conifer regeneration the area would be dominated by brush for decades, effectively setting the successional stages on pause.

Due to the low annual precipitation occurring in the region, control of annual, perennial and woody vegetation is paramount in achieving seedling survival and growth. Controlling competing vegetation during the establishment stage has been demonstrated to show three to four fold increases in ponderosa pine stem volume eight year following treatment versus untreated stands (Powers and Ferrell, 1994). Long-term soil productivity studies conducted by Powers in the “Garden of Eden” demonstrated that controlling competing vegetation in xeric sites significantly increased conifer survival and growth. Early tree silviculture has been demonstrated as the most critical factor in achieving the end goal of re-establishing a long-term native commercial forest.

Need for Hexazinone

Hexazinone is used by Collins Lakeview Forest to control competing vegetation during conifer establishment. One early application of hexazinone will reduce the competing vegetation and is planned to provide for both conifer establishment and growth as well a reduction of future fuel loading risks. Young conifer stand are at significant risk to even low intensity wildfire if competing vegetation has created both a vertical and horizontal fuel profile within the stand.

Post emergent foliar treatment of competing vegetation following conifer establishment is not a viable alternative as the seedlings are vulnerable at this stage. Post emergent treatment of vegetation; so allows for the competition to extract limit water resources from the upper portion of the soil profile directly impacting seedlings. This treatment is effectively “too little too late”. Use of other forestry registered pre-emergent chemical such as Oust (sulfometuron methyl) are not viable as the interaction with ponderosa pine on xeric sites is detrimental to root growth to the point of mortality.

Effects of not using herbicides

Prior to the Barry Point Fire Collins Lakeview Forest had examples of planted stands that were not treated with herbicide. These stands typically showed half of the initially established stocking levels, drought and insect susceptibility and minimal height and crown growth. Manual scalping of brush and grasses around seedling following establishment was show to increase seedling survival in year two, but was cost prohibitive and has short term effects as the exposed area is quickly reinvaded.

Two examples of planted stands within the 2012 Barry Point Fire demonstrate wildfire impacts and herbicide usage. One stand was treated with hexazinone prior to planting. This nine year old stand was free of brush and well stock with conifers. The wildfire burned on all sides of the stand at a catastrophic level, though the planted stand sustained nominal impacts. The second stand was a fifteen year old planted stand that was not treated. The wildfire rendered the stand to a moonscape. The characteristics of the surviving planted stand contrasted to the “moonscape” stand that contributed to its surviving the catastrophic wildfire were: low vertical fuel continuity and high plant moisture content due to tree vigor.

Justification

Chemical vegetation control has repeatedly demonstrated to be a safe and the most effective method for
assisting in conifer establishment. Products containing hexazinone have been shown to have a high level of safety regarding water quality (Neary 1983), forest microbes (Busse et al., 2001, Rhodes et al., 1980), fish (Rhodes, 1980), invertebrates (Mayack, 1982) and mammals (Newton & Dost, 1984).

Early conifer establishment and growth is greatly impacted by competing vegetation. Keyser C.E. and Milner, K. S. (2003) found significant height (11% - 28%) and diameter (25% - 44%) growth in both ponderosa and lodgepole pine with a single application of hexazinone. In untreated planting units, seedling mortality results in up to 75% in the first year on stands on the Collins Lakeview Forest. The costs of replanting a failed, untreated unit often exceeds the initial planting cost and requires the use of additional chemical volume over that of one hexazinone treatment prior to planting.

2. Stakeholder consultation

Collins Lakeview Forest has distributed letters to stakeholders associated with our forest management and the use of chemical. This list includes: adjacent landowners, permittees, contractors, agency representatives, resource managers, environmental advocates and local government.

Responses generated from the letters sent to stakeholders were favourable to the usage per the product label as part of proper land management. Mike Anderson from the Wilderness Society stated “The Wilderness Society is not aware of any problems with the Collins Companies use of herbicides, and we are not concerned about Collins’ proposed use of them in the future.”

Responses from the stakeholders were limited, though significant effort was made to address any concerns or questions they might have. Some stakeholders have responded verbally, all of which affirmed our actions. Collins Lakeview Forest assumes that those stakeholders that did not respond to our request to comment did not have concern with the use of these or other chemicals when used as described and in accordance with labels and state regulations.

B. Forest Management Enterprise Specific Requirements

<table>
<thead>
<tr>
<th>Forest Management Enterprise:</th>
<th>Collins Lakeview Forest</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSC Certificate Code:</td>
<td>SCS-FM/COC-00012N</td>
</tr>
<tr>
<td>Location/region:</td>
<td>Northeast CA, Southeast Oregon</td>
</tr>
</tbody>
</table>

1. Specified controls to prevent, minimise and mitigate hazards

In our effort to show a commitment to adopting a more far-reaching safety control structure for herbicide application, Collins Lakeview Forest will use, in conjunction with the herbicide label instructions and Federal and State law, the following points for worker safety. This list will be used not only to mitigate risks but to reduce or eliminate risks associated with the application of herbicides as much as is feasible.

Training & Records
- Employee job-specific refresher safety training
- Hazardous Materials Awareness training with hazardous communications
- Spray Operations Records & Communications
- All licenses and certifications, such as Pesticide Applicator License, completed and current
- Current First Aid/CPR
Daily spray operations log form completed
• All incidents, exposures, accidents recorded
• MSDS information reviewed and updated if necessary

Checklists & Equipment Inspections
• Equipment properly cleaned and inspected
• Prior to use, equipment properly cleaned and wash water properly disposed of
• Equipment inspected and in good working order
• First aid, wash up equipment in place, tested and in proper working order
• Spill Kit suitable for quantity and type of chemical being stored, transported and used.
• Spray equipment should be calibrated correctly. Leaking nozzles will be cleared or replaced immediately.

Weather check before spray operations
• Operations suspended if too windy or other weather conditions render operations unsafe or ineffective
• Care taken to mitigate risk of over-sprays, run-off and wetlands considered
• Cease spraying at any time if weather conditions are affecting spray performance. As a guide the following weather conditions apply for aerial applications of herbicides:
  • Spraying should cease when wind speed reaches 8mi/hr.
  • Spraying should cease when temperature reaches 70 degrees F

Application
• Proper Chemical Operations - MSDS reviewed and label reviewed
• Proper PPE used where appropriate and according to label directions
  • Use of long sleeves, pants or coveralls.
  • Use of rubber work glove, Nitrile under glove
  • Use of Heavy work boots, 8” for ankle protection
  • Use of N-95 or N-99 HEPA filter dusk mask
  • Use of face shield, goggles or other eye protection
  • Use of hearing protection if needed (noise level above 80 decibels)
• Proper mixing of chemicals with proper ventilation
  • Chemicals should be stored and mixed on sites where any spillage will not enter a watercourse, stream or riparian zone.
  • Mixing is to be measured accurately and without spillage (in the event of spillage occurring disposal must be undertaken in a safe manner away from any watercourse, stream or riparian area).
  • Where practical water should be clean and free of dirt particles.
  • An emergency spill kit must be available and suitable for quantity and type of chemical being stored, transported and used.
  • Waste water from cleaning of storage tanks, equipment and containers must be disposed of in a safe manner away from any watercourse, stream or riparian zone

Proper wash up and decontamination
• PPE properly removed, proper wash up and decontamination or disposal of equipment
• Equipment properly cleaned and wash water properly disposed of
• Chemical containers should be disposed off-site and in the appropriate manner. The preferred method is to send the containers back to the company it was purchased from.
Additionally the following steps will be adhered to when applying the chemicals

- The spray method must ensure that no spray drift reaches surrounding forest stands, streams, riparian zones, neighboring properties, archaeological sites or other non-target areas. This may mean leaving an unsprayed margin. Chemical mixes should avoid killing non-target species.
- Rates should not exceed the recommended dosage required to effectively control the targeted species.
- For aerial application the Daily Aerial Spray Record Form must be completed for every area treated.

2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures. Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

The Collins Lakeview Forest developed the Certified Forests Cooperative in conjunction with other large forestland managers. The purpose of the cooperative is to cooperatively participate in field trials and research pursuant to the Forest Stewardship Council™ (FSC®) United States (US) and individual FSC® Forest Management certificate holders' derogations for the use of FSC® listed “high hazardous” chemicals, and to help satisfy requirements and management objectives of the Sustainable Forestry Initiative (SFI) standard set forth in performance measure 2.2.

Since the establishment of the Forest Stewardship Council Research Group in the spring of 2010, it has been a priority of the group to evaluate new chemistries for forestry site preparation or herbaceous release that may be an alternative to products containing hexazinone. These new chemistries have either been used alone or in combination with reduced rates of products containing hexazinone or other soil active herbicides and compared to the operational standard rates of products containing hexazinone alone. It was the objective of these trials to evaluate both efficacy and conifer tolerance of several conifer species including ponderosa pine, Douglas-fir, white fir and western larch. The trials were structured as completely randomized block designs with three to four replications per treatment. Data was collected and analyzed using SAS statistical software using analysis of variance and orthogonal contrasts to determine significance. Several of the trials were also replicated within the Sierra Cascade Intensive Forest Management Cooperative and the data from analogous trials was shared between the two research groups.

Several new herbicides were of interest due to low use rates, favorable environmental profiles and proven efficacy in applications outside of forestry. The three alternative products for which we have data are Milestone (aminopyralid), MAT 28 (aminocyclopyrochlor) and an experimental compound GF 9999. Milestone and MAT 28 are in the same family of herbicides. Both have very low use rates and act as an auxin type growth regulator herbicide. Each also has a very favorable environmental profile and have both foliar and residual activity. GF 9999 is a new chemistry being tested under a secrecy agreement. It controls annual herbaceous broadleaved weeds and annual grasses. It also has a favorable environmental profile. Several more trials have been installed with different products, but to date, no data has been collected. Only the products for which we have data will be discussed here. These include four sites for the Milestone trials, three sites for the MAT 28 trials and two sites for the GF 9999 trials. The trials have been replicated in both time and space.

Soil active products registered in forestry are extremely limited. Currently products containing hexazinone, atrazine, and sulfometuron are the only choices available for landowners. Products containing atrazine have dramatically declining due to perceived ground water concerns and products containing sulfometuron only has limited use due to conifer tolerance issues. Hence, products containing hexazinone are the most important tool of all the residual herbicides registered for use in forestry and is the most widely used among landowners. The availability of new soil active herbicides would significantly broaden management options for landowners provided efficacy and conifer tolerance are acceptable.
Based on the data presented within these trials, it does not appear at this time there is a suitable alternative to products containing hexazinone that provides adequate vegetation control and acceptable conifer tolerance. Products containing hexazinone out-performed all products tested here. If the new products tested were to be used in practice as an alternative to products containing hexazinone, it would most likely increase total herbicide use due to the need for repeat treatments. It does appear that Milestone and GF 9999 may have a partial fit in combination with products containing hexazinone, but are not strong enough on their own to be feasible. Due to the conifer tolerance issues, MAT 28 is not acceptable as either a release or site preparation treatment in forestry at all.

The importance of vegetation management in the Western United States cannot be overstated. Extreme temperatures, limited rainfall and extremely competitive herbaceous vegetation and brush can severely hinder establishing a new forest. Products containing hexazinone have long been and will continue to be the most important and consistent herbicide used in western forestry. The use of products containing hexazinone over the last several decades has reduced herbicide use as a whole, due to extremely broad spectrum control and longevity. What can be done with one application of products containing hexazinone may take several using other products. Water is the most limiting factor in the western United States and (to date) products containing hexazinone remain the most efficient herbicide to maximize water use by young conifers.

Refer to the following results summary paper prepared for the Certified Forests Cooperative for more information:

Potlatch – Application form for a temporary derogation to use Hexazinone

A. General Requirements

| Name and contact details of certification body requesting derogation: | Melanie Potts  
Bureau Veritas Certification North America, Inc.  
390 Benmar Drive, Suite 100  
Houston, TX 77060  
Main: (281) 986-1300 Toll Free: (800) 937-9311  
Direct: (281) 310-3090 Fax: (281) 310-3101  
melani.potts@us.bureauveritas.com |
<table>
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<tbody>
<tr>
<td>Active ingredient for which a temporary derogation is being requested:</td>
</tr>
</tbody>
</table>
| Trade name and formulation type of the active ingredient or formulation: | Velpar L, Velpar DF, Pronone  
Example formulations are liquid, dry flowable and granular. |
| Method of application and the application equipment: | Applications include aerial application by helicopter, ground application by tractor, ATV, or backpack applicators. |
| Common and scientific name of the pest species: | Aster Family  
Thistle, (Cirsium arvense)  
Common Mullein, (Verbascum Thapsus)  
Orchardgrass, (Dactylis glomerata)  
Pinegrass, (Calamagrostis rubescens)  
Fescue, (Festuca spp)  
Elksedge, (Carex geyeri)  
Deerbrush, (Ceanothus integerrimus) |
| Name and FSC certification codes of certificate holders requesting a temporary derogation: | Potlatch Forest Holdings, Inc.  
BV-FM/CoC-004589 |
| Scope for which a temporary derogation is being requested: | Potlatch ownership in Idaho, USA. |
| Requested time period for derogation: | 5 years from the date of approval of this request. |
normally be issued for a five-year period. Extension of a temporary derogation after the expiry of the five-year period will only be granted in exceptional circumstances as outlined in section 11 above).

<table>
<thead>
<tr>
<th>1. Demonstrated need</th>
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Explain how the proposed use complies with the criteria for need specified below, including consideration of non highly hazardous alternatives and preventative silvicultural measures.

<table>
<thead>
<tr>
<th>Need may be demonstrated where:</th>
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<tbody>
<tr>
<td>- The pesticide is used for protecting native species and forests against damage caused by introduced species or for protecting human health against dangerous diseases, OR</td>
</tr>
<tr>
<td>- Use of the pesticide is obligatory under national laws or regulations, OR</td>
</tr>
<tr>
<td>- Use of the pesticide is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage in natural forests or plantations in the specified country (as indicated by consideration, assessments and preferably field-trials of alternative non-chemical or less toxic pest-management methods, cost-benefit analysis, social and environmental</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Explain how the proposed use complies with the specified criteria for need, including the consideration of alternatives which do not require the use of pesticides on the FSC list of ‘highly hazardous pesticides’:</th>
</tr>
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</table>

This application is being submitted under the third bulleted item in the list to the left: “Use of the pesticide is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage in natural forests.”

<table>
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<tr>
<th>Statement of Pest Problem</th>
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Control of annual, perennial and woody weeds is essential for the prompt establishment and vigorous early growth of native tree species in Potlatch forests. Effects of plant competition for water and nutrients in establishing stands can range from widespread seedling mortality to severe suppression of growth of entire stands for long periods. The effect that vegetation competition has on stand growth has been demonstrated in numerous peer-reviewed scientific publications.

Rapid establishment of a vigorous new forest after final harvest and slash disposal is the key objective of regeneration prescriptions. Multiple efforts to establish a stand are much less desirable economically, socially and environmentally.

Hexazinone applications are prescribed when hexazinone is the best choice for site and soil conditions and integrated with other management actions used to control competing vegetation. These actions may include mechanical site preparation, site preparation burning, and use of other forest herbicides for site preparation and/or release of trees.

<table>
<thead>
<tr>
<th>Economics</th>
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Potlatch forests contribute to the economic well being of our employees, contractors and local communities. High levels of forest production on Potlatch lands make it possible to supply needed forest products and resource based jobs.

Natural regeneration is not a viable economic alternative; the tendency is to end up with delayed stand establishment, too many or too few trees, an undesirable species mix and/or clumpy distribution. All of these outcomes greatly reduce the economic benefits from the forest. In addition, even under good site conditions, natural regeneration typically results in a 5- to 10-year delay in stand establishment; this results in a significant decrease in the economic benefits from the forest. Finally, naturally regenerated trees are subject to the same pressures from competing vegetation as planted trees. There are many places in Idaho where significant natural regeneration has yet to occur following the wildfires in the early 1900’s.

Mechanical site preparation treatments have been and are continually researched as one potential way to reduce the need for pesticide use. However, across-the-board replacement of chemicals by mechanical methods is undesirable for several reasons. Specifically with respect to economics, mechanical site preparation is expensive, especially compared to chemical control. Costs are also prohibitive for mechanized or manual release treatments for young stands. Several other aspects of mechanical treatments are discussed below in the sections titled Environmental and Technical Feasibility.

**Environmental**

Our forests provide environmental services such as water and soil protection, flood abatement, carbon sequestration, biodiversity, landscape enhancement and recreation. All of these services are enhanced by prompt regeneration of harvested areas with native species.

Seedlings can survive and establish robust root systems if plant competition is controlled for the first few years after establishment. Grasses and herbaceous plants are a major concern. With proper vegetation control, soils retain sufficient available soil water for seedling establishment and good growth throughout the summer and early fall months. Our objective is for trees to dominate the root zone prior to the eventual reestablishment of native plant understory communities. Similarly, brush species compete for water and nutrients and some can also overtop seedlings and compete effectively for light.

Replacement of this chemical by mechanical treatments is undesirable. With respect to environmental effects, mechanical treatment of competing vegetation often leads to soil loss through erosion as well as soil displacement and compaction. Further, approximately one-third of Potlatch’s ownership requires aerial logging approaches (generally high lead).
Mechanical site preparation is not allowed by regulation.

**Social**

Potlatch works within a highly developed federal and state government regulatory system controlling all hazardous substances including pesticides. This system ensures that all chemicals used are acceptable after consideration of input from the full range of U.S. stakeholders.

Prescribed fire is one alternative to chemical use for some site preparation objectives. However, there are significant social issues regarding burning including considerable social pressure in all areas to reduce burning due to public health concerns. In Idaho, voluntary participation in our local smoke management cooperative greatly reduces our ability to burn during optimal conditions.

**Technical Feasibility**

In north Idaho, hexazinone is effective on limited areas of ceanothus brush competition and grassy sites. In central Idaho, pinegrass, elk sedge, forbs and low shrubs provide serious competition for moisture to seedlings. The granitic lands in that area and emphasis on ponderosa pine, Douglas-fir, lodgepole pine, Engelmann spruce and grand fir management, leads to an increased need in Idaho for chemical site preparation. These dry sites are very difficult to effectively regenerate naturally, and planting high quality seedlings after herbicide application is the only effective means of prompt regeneration after harvest. One alternate chemical, sulfometuron methyl, has been demonstrated in laboratory and field trials to inhibit root growth in newly planted seedlings.

Categorical replacement of chemical applications by mechanical methods will not be sufficiently effective and may cause site damage. Mechanical treatment is not possible on steep slopes; On some soils, mechanical activity increases risk of erosion, may cause detrimental compaction or displacement, and is potentially damaging to nutrient management by disrupting the forest floor and surface soil. Finally, mechanical treatment is often not effective in controlling re-sprouting from roots or germination from soil-stored or windblown seed.

Specifically in Idaho, state forest practices forbid ground-based operations on steep slopes (steep slopes characterize approximately one-third of Potlatch’s ownership in Idaho).

Mechanical release treatments are not feasible since the small trees cannot be protected during equipment operations, and repeated control may be required for manual or mechanized treatments.

Burning is commonly part of site preparation activities. However, this practice is not sufficiently effective in controlling re-establishment of competing vegetation due to re-sprouting
from roots or germination from soil-stored or wind-blown seed. This is especially true since the goal of burning is to reduce fine, above-ground fuels while protecting soil productivity. Cool burns do not consume the soil organic layer and maintain larger slash for future decomposition; this approach addresses the goal of nutrient conservation to support long term productivity, sustainability, forest health, and wildlife habitat.

In Idaho particularly, competing vegetation is well adapted to fire.

Prescribed fire is not an alternative for release from competing vegetation in young stands. The young trees are very likely to be damaged or killed outright by the fire.

2. Stakeholder consultation

All applications for derogations shall present the results of the stakeholder opinions and comments on the need to use the 'highly hazardous' pesticide in the country/region concerned and on adequacy of control mechanisms to prevent, minimize and mitigate negative impacts. It shall also demonstrate how stakeholder comments were taken into account in its derogation application.

In our 2007 application, Potlatch solicited feedback from its Idaho Community Advisory Council (CAC). The CAC represented a set of individuals selected to articulate the range of social, environmental, and economic interests in the two operating areas. CAC members included representatives from local citizens groups, environmental organizations, state agencies, sportsmen’s groups, timber producers, universities and schools, tribal organizations, and others.

Letters soliciting comments were sent to the CAC members, representative samples of Potlatch contractors, and recreational leaseholders. Potlatch also solicited comments from scientists at academic and research institutions. Only one comment was received in response; to address the concerns expressed about risks to applicators and mobility of herbicides, we expanded our explanation/description of operational practices to clarify the control measures we have in place.

Stakeholder consultation for 2014 was conducted through the FSC-US National Initiative.

B. Forest Management Enterprise Specific Requirements

Forest Management Enterprise:
Potlatch Forest Holdings Inc.
Idaho Unit
301 D Street
Lewiston, ID 83501

FSC Certificate Registration Code:
BV-FM/CoC-004589
1. Specified controls to prevent, minimize and mitigate the hazards

<table>
<thead>
<tr>
<th>The derogation shall specify the controls that will be implemented to prevent, minimize and mitigate the hazards associated with the use of the pesticide, for example restrictions related to weather conditions, soil types, application method, water courses, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specify the controls that will be implemented to mitigate the hazard:</td>
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</table>

Hexazinone is an herbicide with both pre- and post-emergent properties, it is effective against a number of herbaceous and woody weeds, and can be used effectively as part of an Integrated Pest Management (IPM) program.

**Laws and Regulations**

The US Environmental Protection Agency (EPA) is the agency directed by the US Congress to create and enforce regulations related to the environment. These regulations include registration, labeling, and proper use of pesticides. Pesticide labels state the regulations for procedures for handling and application and use of each herbicide, and applicators are legally bound to follow the label. Hexazinone is applied as Velpar (trade name). Velpar is registered by EPA (EPA Reg. No. 352-392) for forestry use for weed and brush control in site preparation and release.

Each pesticide label includes information on Agricultural Use Requirements, which requires use of the product in accordance with its labeling and the Worker Protection Standard, 40 CFR part 170. The Standard contains requirements for the protection of workers handling agricultural pesticides, training, decontamination, notification, and emergency procedures. Specifications for restricted entry interval (REI) and personal protective equipment (PPE) are included.

Each state has specific legal requirements for the training and licensing of pesticide applicators. Potlatch foresters who prescribe hexazinone maintain private applicator licenses issued by the Department of Agriculture in Idaho. Contractors who apply hexazinone are required to have commercial applicator licenses from the Idaho Department of Agriculture. Each license category requires periodic training and examination to maintain the license.

Idaho also specifies forestry Best Management Practices (BMPs) for silvicultural activities including chemical applications. These practices include establishing and maintaining buffer strips in the form of streamside management zones, buffering neighboring property, specifying weather conditions for applications, and other restrictions.

Sites and activities may be inspected by either Idaho Department of Lands or Idaho Department of Agriculture.
Potlatch Operational Practices

For all herbicides, procedures for safe and proper use are followed. The health and safety of applicators is the foremost concern, so among these procedures are the requirements that proper safety and protective gear is used and label directions are followed. Potlatch personnel ensure that proper PPE is available and used and that labels and MSDS are available at application sites.

Potlatch operational procedures are documented in the Potlatch Resource Management System (RMS, an ISO 14001-based environmental management system). Environmental aspects of these procedures that are not mandated by law include:

- Aerial applications systems are under constant improvement. GPS and avionic systems allow pilots to precisely control flight path and overlap to ensure accurate placement. Tract maps (shapefiles) are uploaded into aircraft GPS systems to ensure that pilots understand exact tract boundaries, buffer areas, reserved areas, etc. Flow meters and calibrated spray booms ensure that the spray solution is accurately applied. All aspects of aerial applications are monitored and recorded for tracking application area, amount applied, weather conditions, and other information as part of ensuring compliance with legal requirements, and Potlatch's RMS and contract specifications.

- Spot or banded applications, implemented with ground equipment or crews with backpack sprayers, are employed where practical, cost effective, and/or required to protect sensitive areas. Banded applications reduce herbicide use for site preparation and release by reducing the area treated by as much as 75%. As with aerial applications, application area, amount applied, weather conditions, and other information are tracked to ensure compliance with legal requirements, and Potlatch's RMS and contract specifications.

- Applicators use spray nozzles that produce consistently large droplets to minimize potential for drift. Other equipment and solution attributes are specified to rigorously control drift.

- Pesticide rates are reduced by targeting vegetation when it is most susceptible, therefore requiring less active ingredient. Other timing issues include using pre-emergent and contact herbicides to avoid multiple treatments to control vigorous competition with potentially less benign pesticides. Application rates prescribed by Potlatch foresters are usually lower than manufacturer's recommended rates.

- Alternative treatments must not cause unacceptable resource damage and economics of timber production over time must not be significantly impaired. For example, mechanical site preparation treatments are not feasible or advisable for sensitive soils or on steep slopes.

- Buffer widths generally exceed those specified in BMPs. In addition to vegetated stream buffers, spray applications may
provide for buffers along adjacent property ownership lines, roads, utility rights-of-way, wildlife corridors and retention areas, and other landscape features that may be identified by the prescribing forester.

- All chemical applications are monitored and inspected during and after operations to ensure safe, accurate, and effective application. Contractors are trained in procedures for spills and emergency procedures and Potlatch personnel inspect chemical loading and application operations to ensure compliance.

- After application each site is inspected and documented for herbicide effectiveness, quality of application or any indication of application outside the target area. This information is used to annually evaluate contractor performance to ensure legal and internal requirements are met before being re-hired by Potlatch in subsequent years. Inspections are completed by Potlatch foresters, while audits are conducted by Potlatch foresters as well as external auditors under our FSC certification.

Other Considerations

The cost of pesticides and their application ensures that pesticide use is continually and carefully reviewed.

Spray applications may utilize a mixture of compatible herbicides and adjuvants to best tackle the weed spectrum.

- Certain situations, such as compliance with noxious weed regulations or controlling non-native invasive plants, may require prescriptions and operations not typically covered by BMPs and/or the Potlatch RMS.

2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures.

Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

<table>
<thead>
<tr>
<th>The forest management enterprise shall describe the program(s) which are in place in or which will be put in place during the period over which the derogation will be applicable, designed to identify alternative pest control methods which do not use ‘highly hazardous’ pesticides.</th>
<th>Describe the program(s) that are in place to identify alternatives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved Planting Stock</td>
<td>Improved Planting Stock</td>
</tr>
<tr>
<td>Improvements in planting stock are continually sought, through genetic improvement, better nursery and/or greenhouse practices, and improvements in seedling handling and planting. More vigorous seedlings will promote higher survival and more rapid early height growth and root proliferation, resulting in less need for follow up weed control and herbicide use.</td>
<td></td>
</tr>
</tbody>
</table>
Improving Site Specific Prescriptions

Herbicides with soil active residual control are very sensitive to soil properties. Soils that have high content of clay, silt, and organic matter or high cation exchange capacity may reduce the effectiveness of herbicides such as hexazinone through adsorption on exchange surfaces.

In Idaho, Potlatch’s soils have been mapped so that alternatives to hexazinone can be prescribed for sites with finer textured soils. These include EPA registered forestry herbicides such as imazapyr, glyphosate, metsulfuron, sulfometuron methyl or a combination of these.

Monitoring External Research

Publications of the Weed Science Society of America, regional silviculture proceedings, and other resources are regularly reviewed by Potlatch foresters for new, effective, and less hazardous herbicides, adjuvants that will lower herbicide rates, application methods, and newly discovered weed control methods. Such new developments are routinely assessed for potential implementation.

With developing herbicide technology, there is a gradual reduction in the active ingredient concentration per acre of pesticide use. For example, various adjuvants such as surfactants are used that allow the achievement of vegetation management goals with less pesticide active ingredient. In the U.S. there is an extensive program of testing.

Potlatch Research and Testing

We are experimenting with a variety of application variables to find an alternative or to reduce the amount of herbicide used and increase its effectiveness. Examples include:

- Application before or after planting.
- Spot, strip or broadcast application.
- Chemical mixes.

During the period of the past derogation permit Potlatch established herbicide trials with alternatives such as sulfometuron methyl, imazapyr and combinations of other EPA registered forest herbicides to evaluate the biological and economic impact of alternatives to hexazinone.

We wish to stress to FSC that this is complicated; our property contains nine commercial tree species, with each stand commonly composed of at least three species; there are significant differences between species in their tolerance to both soil active and contact herbicides; in addition, our mountainous terrain results in significant variation in aspect and elevation, this manifests itself in a wide variety of competing vegetation; there are significant differences between competing vegetation species in their tolerance to both soil active and contact herbicides; finally, we have significant differences in soils across
our ownership resulting from differing bedrock types, geologic and geomorphic settings. Of all these issues, the tree species sensitivity is the most difficult. The last layer of complication results from the chemical mixes and trying to understand antagonistic and synergistic interactions. These interactions are often functions of the exact ratio of the mix and therefore there are numerous possibilities to be tested.

Please see attached spreadsheet for summary of Potlatch Research Trials established since 2007. These results are for Potlatch only, even though some of the testing has been done in cooperation with other FSC Certificate Holders in the northwest U.S. (W.M. Beaty and Associates, Red River Forests, Shasta Forests, Collins Pine, Roseburg Lumber) and contractors (Thunderoad Resources, Wilbur-Ellis).

The results of these trials show that some chemicals (or mixes) may provide an alternative to hexazinone in some particular tree species-soil-competing vegetation situations. Further testing is needed and it will continue under a renewed derogation.
# Red River Forests and Shasta Forests - Application form for a temporary derogation to use Hexazinone

<table>
<thead>
<tr>
<th>A. General Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application Submission date:</strong></td>
</tr>
</tbody>
</table>
| **Name, and contact details of certification body requesting a temporary derogation:** | SCS GLOBAL SERVICES  
Brendan Grady  
2000 Powell Street, Ste. 600  
Emeryville, CA 94608 USA  
bgrady@scsglobalservices.com  
www.SCSglobalServices.com |
| **Active ingredient for which a derogation is being requested:** | Hexazinone |
| **Trade name and formulation type of the pesticide:** | Velpar L, (liquid, 75% active ingredient)  
Velpar DF (dry flowable, 75% active ingredient) |
| **Method of application and application equipment:** | Aerial helicopter application and application using hand operated backpack sprayers. |
| **Common and scientific name of the pest species:** | Achillea millefolium | Common yarrow  
Arctostaphylos patula | Greenleaf manzanita  
Arctostaphylos viscida | Whiteleaf manzanita  
Artemisia tridentate | Sagebrush  
Asarum hartwegii | Wild ginger  
Ceanothus cordulatus. | Whitethorn  
Ceanothus cuneatus | Buckbrush  
Ceanothus integerimus | Deerbrush  
Ceanothus prostrates | Mahala mat  
Ceanothus velutinus. | Snowbrush  
Centaurea solstitialis. | Yellow Star Thistle  
Chimaphila umbellata | Pipsissewa  
Cirsium spp. | Common thistle  
Clarkia spp. | Clarkia  
Claytonia parviflora ssp. | Miner’s lettuce  
Cornus nuttalli | Pacific dogwood  
Chrysolepis Sempervirens | Chinquapin  
Dietes iridiodes | Wild iris  
Dodecatheon hendersonii | Shooting star  
Equisetum spp. | Horsetail  
Ericameria nauseosa | Rabbitbrush  
Eucalyptus regnans | Mountain ash  
Erodium cicutarium | Redstem filaree  
Fragaria vesca | Wild strawberry  
Hypericum perforatum | Klamath weed |

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<table>
<thead>
<tr>
<th>Name and FSC certification codes of certificate holders  requesting a temporary derogation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red River Forests LLC</td>
</tr>
<tr>
<td>c/o W. M. Beaty &amp; Associates, Inc.</td>
</tr>
<tr>
<td>PO Box 990898</td>
</tr>
<tr>
<td>Redding, CA 96099-0898</td>
</tr>
<tr>
<td>SCS-FM/COC-00023N</td>
</tr>
<tr>
<td>Shasta Forests Timberlands, LLC, et al.</td>
</tr>
<tr>
<td>c/o W. M. Beaty &amp; Associates, Inc.</td>
</tr>
<tr>
<td>PO Box 990898</td>
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<tr>
<td>Redding, CA 96099-0898</td>
</tr>
<tr>
<td>SCS-FM/COC-00024N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope for which a temporary derogation is being requested:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coniferous forests in Northeastern California, United States.</td>
</tr>
<tr>
<td>Products containing hexazinone may be applied as a site preparatory application prior to planting or as a release application after planting to reduce the competition from herbaceous weeds (grasses, forbs, and brush).</td>
</tr>
</tbody>
</table>
1. Demonstrated need

Explain how the proposed use complies with the criteria for need specified below, including consideration of non-highly hazardous alternatives and preventative silvicultural measures.

<table>
<thead>
<tr>
<th>Need may be demonstrated where:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The pesticide is used for protecting native species and forests against damage caused by introduced species or for protecting human health against dangerous diseases, OR</td>
</tr>
<tr>
<td>- Use of the pesticide is obligatory under national laws or regulations, OR</td>
</tr>
<tr>
<td>– Use of the pesticide is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage in forest management units in the specified region (as indicated by documented evidence of current feasibility study reports: field-trials of alternative non-chemical or less toxic pest-management methods, cost-benefit analysis, social and environmental impact assessment);</td>
</tr>
</tbody>
</table>

Please indicate briefly the usual practices for harvesting and re-planting /regeneration practices, in particular the method of harvesting (e.g. clear-cut, using a mechanized harvester, etc.), which tree species are grown, the average time between successive rotations and harvest, and methods for site preparation.

**Demonstrated need criteria**

This application is submitted under the third option: Use of products containing hexazinone is the only economically, environmentally, socially, and technically feasible way of controlling specific organisms which are causing severe damage in natural forests. Products containing hexazinone are also used to reduce fuel loading to protect forests from destruction from fire and to control noxious weeds.

**Usual practices for harvesting**

Emergency salvage of fire damaged areas, rehabilitation of understocked areas, group selection, and clearcut.

**Usual practices for re-planting/regeneration**

Hand and/or machine planting of containerized coniferous seedlings.

**Tree species grown**

Ponderosa pine, Jeffrey pine, sugar pine, Douglas-fir, red fir, white fir, incense cedar, and giant sequoia.

**Average time between successive rotations**

90 to 120 years.
Methods for site preparation

4. Treat existing and resprouting brush with a directed foliar herbicide application (e.g. products containing imazapyr and glyphosate).
5. Broadcast application of soil active products (e.g. products containing atrazine, hexazinone, aminiopyralid, etc.)
6. Directed foliar herbicide release application (e.g. products containing glyphosate).

Basis for inclusion on the Forest Stewardship Council™ (FSC®) list of 'highly hazardous' pesticides

Hexazinone is included on the FSC® list of 'highly hazardous' pesticides because it exceeds the threshold of the indicator for persistence. The half-life in soil or water (DT50) is 90 days and the FSC® threshold for inclusion on list is ≥90 days. Since persistence can be considered a benefit in reducing the total amount of herbicides used via the number of applications needed, a chemical that exceeds the FSC® threshold for persistence is not considered highly hazardous if chemical characteristics indicate it is not water soluble and mobile. However hexazinone does not meet this exception and so has been listed by FSC® as “highly hazardous”. These mitigating factors are:

- Soil sorption coefficient (KOC): 54 ml/g (cannot be exempted from the list for persistence if chemical is <300 ml/g) and water solubility (S) >30 mg/l (hexazinone is 29,800 mg/l)

The values for KOC and water solubility are based on a laboratory test of the active ingredient alone and not the herbicide product formulation (Velpar). In actual field applications in the geographic settings and mitigations typical of Red River Forests and Shasta Forests uses, hexazinone has not shown to move through the soil profile into underground or above ground water resources.

Statement of pest problem

Red River Forests and Shasta Forests is comprised of approximately 140,000 acres of natural and planted mixed conifer and eastside pine forests in northeastern California. Red River Forests is comprised of approximately 130,000 acres of natural and planted mixed conifer and eastside pine forests in northeastern California.

Most planted forests are the result of reforestation of areas destroyed by stand replacing wildfire or less frequently, following regeneration harvests that occur to restore a more natural species mix (i.e., where shade tolerant white fir has invaded shade intolerant native pine stands). Without reforestation following wildfires large areas would become dominated by brush species because natural conifer regeneration following catastrophic wildfires rarely occurs predictably and within acceptable timeframes or at all. As such, to maintain native species composition, newly planted areas require some form of weed control to ensure their growth to maturity. Hand grubbing and/or grazing are less effective than herbicide treatments and can result in increased environmental degradation and reduction of vegetative diversity (McDonald et al. 1996).

Control of annual, perennial, and woody weeds is essential for the successful establishment and growth of young conifers in forest planted stands and in maintaining historical and or desired forest species composition on Red River Forests and Shasta Forests. Without weed control, commercial conifer seedlings may die due to inability to compete for water and nutrients or growth rates may be so low that timber production is not economically viable. Effects can range from widespread mortality in young forest stands to severe suppression of entire stands for indefinite periods that exacerbates fire hazard. Young trees that are stressed by weed competition are much more susceptible to insect attack
and therefore the judicious use of herbicides to control competing vegetation greatly reducing the need for later use of much more toxic insecticides. The effects of weed competition on conifer seedlings is well documented in Lewis et al. (1993).

Early vegetation management in planted forests is the most critical factor for achieving success in the long-term reforestation of native commercial forests. This is especially true for hot arid climates where available soil water is the single most important limiting factor. Powers & Ferrell, 1996, showed three to four fold increases in ponderosa pine stem volume eight years after treatment with herbicides compared to untreated controls. They also found significant gains in nutrient availability and soil moisture where competing vegetation was controlled. The study was replicated over a range of site qualities, with the largest gains appearing on average to low sites. Long-term growth projections using System 1 (Ritchie & Powers, 1994) resulted in 200 percent increases in stand volume at 50 years for stands which had been treated with herbicides compared to those that had not.

Need for hexazinone

Products containing hexazinone are used by Red River Forests and Shasta Forests as part of an integrated vegetation management program to prevent the build-up of hazardous fuel loads which is critical for managing forestland in northeastern California. Managing hazardous brushy fuel loads is very important in a region like northeastern California that is practically rainless for several months between the late spring and summer and experiences prolonged hours of extremely low humidities during many of those days. Plantations that are stagnated in brush are subject to many more decades of exposure to risk of complete loss of investment compared with faster growing conifer planted stands that have been treated for brush control early in the establishment phase. Hexazinone is a key ingredient in herbicide products used in the control of many weeds that are deleterious to the survival and growth of commercial conifer seedlings.

Hexazinone is a triazine herbicide used for pre and post emergent control of many annual, biennial, and perennial weeds, as well as some woody plants. Hexazinone is a systemic herbicide that works by inhibiting photosynthesis in the target plants. It is registered for use in forestry by both the U.S. Environmental Protection Agency and the California Department of Pesticide Regulation.

Products containing hexazinone are primarily soil active herbicides with some contact control, readily absorbed by leaves and roots. Since it is tolerated by many conifer species it is a very effective herbicide for reducing competition from broad-leaf trees and bushes as well as annual and perennial weeds. Products containing hexazinone are used primarily on Red River Forests and Shasta Forests as pre-emergent control of weeds. By effectively controlling a broad spectrum of weeds prior to germination or in the very early stages of post germination growth, the use of products containing hexazinone significantly reduces the number of subsequent foliar weed control treatments as well as overall chemical use that would be needed to successfully establish a ponderosa pine/fir plantation. Additionally, pre-emergent weed control is essential in the climatic region of Red River Forests and Shasta Forests where during most years there is no significant rainfall from late spring through early fall when seedlings are growing and newly planted seedlings need all available soil moisture during their first growing season to become established. Also without pre-emergent control of introduced exotic species (such as European cheatgrass which can effectively remove all soil moisture in the top several inches of the soil profile) prior to planting conifers, the shallow roots of planted seedlings do not have access to adequate soil moisture. Applying a post emergent foliar contact herbicide after planting is
One application of a soil active pre-emergent herbicide such as products containing hexazinone can be very effective in controlling future weeds and greatly reduces the number of follow up treatments and overall herbicide use. In California the only other pre-emergent herbicide registered for forestry use on ponderosa pine on droughty sites typical of Red River Forests and Shasta Forests is atrazine. There are some limited situations where products containing atrazine a better alternative than products containing hexazinone, but in most situations it would take two or three applications of products containing atrazine plus one application of a foliar active herbicide to equal the control of just one application of a product containing hexazinone. Atrazine is also on FSC’s ‘highly hazardous’ pesticide list.

Oust (a.i. sulfometuron methyl) is registered for forestry use and has some pre-emergent characteristics, but on droughty sites typical of inland California, ponderosa pine is very susceptible to damage from Oust. So Oust is not a viable alternative on Red River Forests and Shasta Forests except in very limited situations. Also the use of Oust in many situations would require more treatments than if a product containing hexazinone was used.

Effects of not using herbicides

There are numerous examples in Red River Forests and Shasta Forests’ specific reforestation history prior to their use of products containing hexazinone that demonstrate not only a severe reduction in growth from competing vegetation but in many cases a complete loss of the reforestation investment on several hundred acres. These losses occurred during the long dry summer and early fall periods the first year after spring planting due to moisture stress on seedlings that was greatly exacerbated by competing vegetation (e.g. 1977 Pondosa Burn, 1978 Whitmore Burn, etc.). Manual scalping on these planted stands was conducted but it was expensive and did not significantly reduce mortality due to stress from competing vegetation because the competing vegetation rapidly re-sprouted. On the 1977 Pondosa Burn plantation, losses also occurred several years after “establishment” due to insect attacks (i.e. pine reproduction weevil) on sapling size trees that were under severe moisture and nutrient stress from competing brush during a drought in the late 1980’s (extended droughts such as this occur periodically in Northeastern California). Trees on adjacent areas that were more vigorous because they were free of competing brush where chemicals were used were able to survive the attacks from the pine reproduction weevil. Conifer mortality losses on the Pondosa Burn plantation cost Red River Forests and Shasta Forests tens of thousands of dollars due to the direct loss of reforestation investment along with the significant additional site preparation costs incurred because brush that had time to become well established prior to re-planting needed to be cleared at a cost of $250 per acre or more. Financial losses also occurred in areas where conifers survived the brush competition because of the significant reduction in growth which greatly lengthens the opportunity cost until a return can be expected. All of Red River Forests and Shasta Forests planted stands which were established without the use of herbicides, most commonly products containing hexazinone, to control competing vegetation are also at a significantly greater financial risk of investment loss from wildfires due to the significant brushy fuel loading intertwined with slow growing, stressed conifer trees.
Chemical vegetation management has repeatedly been shown to be the safest and most effective method for aiding in the establishment and growth of young conifer planted forests. Specifically, products containing hexazinone are one of the most widely used and most effective products in forestry, especially in regions with similar climates (e.g. dry summers) and forest types (e.g. ponderosa pine) with Red River Forests and Shasta Forests (i.e. northeastern California). Products containing hexazinone have been shown to have high margins of safety regarding water quality (Neary, 1983), forest microbes (Busse et al., 2001, Rhodes et al., 1980), fish (Rhodes, 1980), invertebrates (Mayack et al., 1982) and mammals (Newton & Dost, 1984).

Increasing conifer survival and growth with herbicides has been well documented. Early work with products containing 2,4-D, 2-ethylhexyl ester for snowbrush (ceanothus velutinus) showed Douglas-fir growth increases of 70 to 150 percent of untreated controls (Gratkowski & Lauterbach, 1974). MacLean & Morgan (1983), showed volume increases in balsam fir from 157 to 265 percent over non-treated control plots 28 years after treatment. Manual release treatments which were also included in the study showed only a 64 percent volume gain. It has been shown that stem volume of five-year old Douglas-fir and ponderosa pine was reduced as manzanita density, biomass, leaf area index and canopy cover increased (White & Newton, 1989).

Products containing hexazinone are by far the most important herbicides for conifer establishment and early growth in Mediterranean climates where ponderosa pine and Douglas-fir are grown. Temperatures range between 90 to 115 degrees Fahrenheit in summer months, and rainfall occurs between November and March. Soils in northern California are mostly well-drained volcanic sandy loams with fairly low moisture holding capacities. Water is the main limiting factor regarding tree survival and growth. Products containing hexazinone are primarily used for herbaceous control, but can also control some brush species when individual plants are small. The importance of herbaceous weed control has been demonstrated by many (White et al., 1990, White & Newton, 1989).

Herbaceous weed control with products containing hexazinone increased noble fir survival by roughly 100 percent and increased noble and Douglas-fir diameters by 38 and 25 percent, respectively after two years (White et al., 1990). White and Newton, 1989, demonstrated that herbaceous competition negatively affected both conifer and manzanita growth by the third year following treatment. Products containing hexazinone have been shown to increase ponderosa pine and Douglas-fir stem volume by as much as 387 and 650 percent and seedling survival by 45 and 10 percent, respectively (Dimock et al., 1982). A study by Oester et al. 1995, showed a tenfold increase in ponderosa pine stem volume five years after treatment compared to untreated controls and an 887 percent increase in seedling survival. Roth & Newton, 1996, demonstrated a fourfold increase in stem volume after two growing seasons with treatments of products containing hexazinone on Douglas-fir and as high as a 65% percent increase in seedling survival, compared to control plots.

### 2. Stakeholder consultation

All applications for derogations shall present the responses of the consulted stakeholders, including opinions and original comments on the need to use the 'highly hazardous' pesticide in the region concerned and on adequacy of control mechanisms to prevent, minimise and mitigate negative impacts on human health (of forest workers and the public) and the
environment. The application shall also demonstrate how stakeholder comments were taken into account in its derogation application.

Stakeholder consultation is included with the consultation summaries provided as part of the national coordinated consultation. Parties which could be affected are consulted prior to spray operations as outlined in W. M. Beaty & Associates, Inc. “Vegetation Management and Herbicide Use Policy”. Additionally, during the initial derogation application development, W. M. Beaty & Associates, Inc. distributed letters regarding this derogation application to many of the following entities because they have in the past shown interest in vegetation management activities on Red River Forests and Shasta Forests and/or are neighboring forest landowners with significant acreage and/or demonstrated competency in safely managing weeds in natural areas.

Although many of the stakeholders are familiar with Red River Forests and Shasta Forests, its management, and the rules and best management practices relevant to pesticide use, they are unfamiliar with FSC’s pesticide policy, guidance, and implementation documents (including the derogation process).

During the initial derogation application development, W. M. Beaty & Associates, Inc. spent significant time and effort reaching out to all stakeholders who have indicated any interest in forest management activities, particularly in regards to the use of products containing hexazinone and 2,4-D, 2-ethylhexyl ester on Red River Forests and Shasta Forests or Red River Forests within the past three decades. All of our spray operations are part of a publicly available record that interested state-wide and regional NGO’s have reviewed extensively. Although these groups have commented several times on other forestry companies’ use of these and other chemicals, they have not once commented on Red River Forests and Shasta Forests’ use of these chemicals. There has not been one instance in the past three decades of any pesticide application conducted on Red River Forests and Shasta generating a written or even verbal comment let alone a complaint from the local public or any local or regional NGO.

We consulted with local Resource Conservation Districts which are non-profit local agencies which have wildlife and habitat conservation as important natural resource conservation objectives. The Fall River Resource Conservation District has supported millions of dollars worth of studies and projects that improve wildlife habitat, including fisheries and riparian areas. We also consulted with The Nature Conservancy, which is actively involved in acquiring and managing both forested and non-forested lands, with native wildlife habitat conservation as a major objective.

Although we did not send our derogations out to the state agency responsible for fish and wildlife (California Department of Fish and Wildlife) we continually consult with them in preparation and the annual implementation of our long term Sustained Yield Plans. Some of this consultation involves study design and implementation for evaluating pesticide impacts on sensitive plants. For example, on a reforestation project after the 2003 Whitmore Fire in which products containing 2,4-D, 2-ethylhexyl ester were used to return the land to a native forest, we installed and monitored plots in cooperation with California Department of Fish and Wildlife to monitor the short and long term effects on a rare plant (fritillaria eastwoodiae). The study found that the population actually increased in the reforestation project area compared to the control area where nothing was done after the fire (and is now occupied by brush). The California Department of Fish and Wildlife has used products containing 2,4-D, 2-ethylhexyl ester extensively in the local Ash Creek Wildlife Refuge and other wildlife refuges in the state as a selective tool to control non-native weeds that are threatening native habitats, so we assume that they would have no problem with Red River Forests and Shasta Forests using products
containing 2,4-D, 2-ethylhexyl ester as a management tool.

During development of the original derogation application, we consulted with the premier scientific experts on forest management research and forest ecology of California’s “Mediterranean climate” at the USFS Pacific Southwest Redding Research Lab. We also consulted with the premier government, university, and private research and management experts on California forest pest management issues at the California Forest Pest Council. We consulted with some of the premier governmental scientists on pesticide toxicity and use at the California Department of Pesticide Regulations. We also consulted with scientific experts from the University of California, by sending our derogations to the U.C. Cooperative Extension Office in Redding, CA. Although we did not list him as a “stakeholder”, we consulted extensively with Dr. Frank Dost, one of the premier experts on the toxicological effects of pesticides, particularly products containing 2,4-D, 2-ethylhexyl ester, on humans and other animals. Dr. Dost reviewed the draft derogations pro-bono and provided suggestions for improvement, all of which were incorporated into the initial derogation applications submitted to FSC IC.

W. M. Beaty & Associates, Inc. has and will continue to actively engage with any person or organization who has shown an interest in the management of Red River Forests and Shasta Forests, including our use of products containing 2,4-D, 2-ethylhexyl ester. Should FSC US or FSC IC request us to conduct stakeholder consultation with any other organizations, who to date have not expressed an interest in the use of products containing 2,4-D, 2-ethylhexyl ester on S Red River Forests and Shasta Forests, then W. M. Beaty & Associates, Inc. is more than willing to do so.
**B. Forest Management Enterprise Specific Requirements**

**Forest Management Enterprise:** Red River Forests LLC, Shasta Forests Timberlands, LLC, et al.

**FSC Certificate Registration Code:** SCS-FM/COC-00023N, SCS-FM/COC-00024N

**Location/region:** Redding, CA

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### 1. Specified controls to prevent, minimise and mitigate hazards.

The derogation shall specify the controls that have been implemented to prevent, minimise and mitigate the hazards associated with the use of the pesticide, for example restrictions related to sensitive areas (e.g. groundwater zones or wildlife habitats), weather conditions, soil types, application method, water courses, etc.

If the specified formulation is considered to reduce the level of hazard then the information on which this claim is based shall be presented, and the applicant shall provide credible independent, third party support for the claimed reduction of hazard. The applicant shall indicate all pesticides in the formulation, including other active ingredients in mixtures.

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W. M. Beaty & Associates, Inc. has a well-developed process and operational procedures for the use and handling of hexazinone that comply with State and Federal Government requirements. Use of products containing hexazinone are reduced because applications on Red River Forests and Shasta Forests employ voluntary watercourse exclusion buffers for products containing hexazinone that exceed regulations and label requirements.

Controls include an Integrated Pest Management Plan approach, detailed site operation plans and site specific consideration to ensure the most appropriate control measures are applied in each instance where it is necessary to apply products containing hexazinone. Some examples include ongoing staff training, detailed edaphic, climatic and weather prescriptions and buffers and monitoring systems to ensure the protection of sensitive crops, vegetation and stream water quality.

The majority of ponderosa pine planted stands on Red River Forests and Shasta Forests are established in response to catastrophic wildfire and are grown to rotations of 90 to >120 years. Products containing hexazinone are used primarily on ponderosa pine or pine/fir planted stands and applied just prior to winter snowfalls at higher elevations or in the spring after most of the winter rains have ceased at lower elevations. Unlike agricultural applications of products containing hexazinone, forest applications are not followed by irrigation. So in most situations where a product containing hexazinone is used on Red River Forests and Shasta Forests almost all of the water that falls on the soils within five to six months after application is taken up by plant transpiration and soil evaporation and not available for movement into groundwater. Application of products containing hexazinone generally occurs once at the commencement of the rotation as a pre or post planting application. At maximum
broadcast rates this equates to the equivalent of 125 grams of active ingredient per hectare per year.

Frequently the application may be as a strip or spot application where as little as 10% to 20% of the site will be treated with the herbicide.

Compliance with regulations

Products containing hexazinone are approved by federal and state agencies for applications in forest and woodland management. California’s Pesticide Regulatory Process is one of the world’s most stringent. To mitigate potential hazards, the proper handling and application of the product is identified on the herbicide label and Material Safety Data Sheet.

Forest applications are carried out in accordance with the US Environmental Protection Agency and the California Department of Pesticide Regulation licensing and permitting procedures and all proposed treatment areas are examined by a PCA. As required by law all applications of products containing hexazinone are reported to the appropriate county agricultural commissioner.

Site Specific PCA Recommendations

All applications of products containing hexazinone on Red River Forests and Shasta Forests are prescribed by a PCA after an onsite visit and consideration of alternative treatment methods. The PCA recommendations consider alternative treatments (both pesticide and non-pesticide), and include a description of location, most appropriate chemical, rate, hazards, use restrictions, identification of sensitive areas within or near the project area and mitigations that many times exceed minimum regulations or label requirements.

As managers for Red River Forests and Shasta Forests, W. M. Beaty & Associates, Inc. evaluates all environmental conditions when determining whether to apply products containing hexazinone. When applications of products containing hexazinone are necessary to meet the objectives of Red River Forests and Shasta Forests, a PCA recommends when, where, and how products containing hexazinone will be applied based on site-specific circumstances. Professionally trained foresters and wildlife biologists are consulted. Information concerning impacts to non-target organisms (particularly threatened or endangered species) is evaluated and mitigations applied as necessary. Label instructions, regulations and the PCA recommendation are followed on all applications by a Licensed Pest Control Operator (PCO).

Application is limited consistent with the weather parameters and timing restrictions identified on the label and as recommended by a Licensed Pest Control Advisor (PCA). Minimum effective rates are applied.

Watercourse buffers

Buffer widths adjacent to watercourses and lakes are established specifically for products containing hexazinone that exceed minimum label requirements and regulations. Aerial application buffers for perennial watercourses (or any other classification of watercourse that is running water at time of application) are at least 100 feet and for dry ephemeral watercourses are at least 50 feet. Ground application buffers for perennial or intermittent watercourses are at least 50 feet and for dry ephemeral watercourses are 25 feet. Although these exceed requirements in regulation, even wider buffers are established if the PCA determines that conditions (soils, slope, climate etc.) require it. During operations the W. M. Beaty & Associates, Inc. forester monitoring the application and/or the Licensed Pest Control Operator conducting the application can further widen the buffers should wind conditions (speed and direction) at the time of application warrant it.

Timing

Timing of applications of products containing hexazinone is carefully planned such that most of the rainfall that occurs within 6 months after application is enough to activate the chemical but not enough to leach out of the rooting zone of vegetation that uptakes it with the soil water. In areas where most
of the annual precipitation comes in the form of snow, applications of products containing hexazinone are applied after initiation of fall rains (if any occur) just prior to snowfall and then it is activated a few months later by spring snowmelt. At lower elevations (2,000 to 4,000 feet) products containing hexazinone are usually applied after fall and most of the winter rainfall but prior to the end of spring rains. Very little precipitation occurs between late spring and early fall in NE California and irrigation is not used on Red River Forests and Shasta Forests. So during these months while products containing hexazinone are degrading, the movement of it in the soil profile is primarily upward with soil water being taken up by vegetation.

Experience

As managers for Red River Forests and Shasta Forests, W. M. Beaty & Associates, Inc. has planned and successfully implemented reforestation projects on tens of thousands of acres over the past three decades utilizing safe and effective applications of products containing hexazinone products as an integral part of those projects. Due to the climatic and geographical conditions of Northeast California and also to W. M. Beaty & Associates, Inc.’s stellar record of professional planning and compliance with internal policies, manufacturers label requirements and laws and regulations of the state of California, there has not been one complaint received from any regulatory agency, adjacent landowner or community group or individual in the twenty plus years of use of products containing hexazinone.

Mitigations

See mitigations for products containing hexazinone noted above and also the specific controls outlined in the following “W. M. Beaty & Associates, Inc. Vegetation Management Policy and Pesticide Use Guidelines”:

The judicious use of herbicides when combined as part of an integrated pest management program is an important tool to achieve forest management objectives. These objectives include sustaining the growth and production of large diameter sawlogs, maintaining the diversity and viability of natural vegetative community structure and composition, and minimizing the risk of catastrophic loss due to fire, insects and pathogens. It is therefore W. M. Beaty & Associates, Inc. policy to integrate the wise use of the most appropriate vegetation management tools available which consider silvicultural, biological (wildlife), environmental (air, soil, water), economic and social factors. An integrated program will consider all tools including silvicultural, chemical, prescribed fire, manual, mechanical, and biological means to control vegetation and include guidelines for their use.

The following are guidelines for the use of pesticides on W. M. Beaty & Associates, Inc. managed lands:

1. Pest management decisions will include an evaluation of economic, environmental (water, soil, air), biological (wildlife and habitat), silvicultural (forest health, growth, stocking), and social factors. Professional input from licensed PCAs, Registered Professional Foresters (RPF), and certified Wildlife Biologists (CWB) will be utilized in the decision making process.

2. Written recommendations will be prescribed by a licensed PCA for all pesticide applications. All PCA recommendations will be based upon on-site visits and will include at least the following information: specific location of treatment, most appropriate method of application, pests to be controlled, name(s) of most appropriate pesticide to use, descriptions of hazards, restrictions, schedule, time and/or conditions of proper application, locations of all watercourses in or adjacent to treatment area with minimum buffers stated, proximity to and likelihood of recreational or residential use by humans, presence of livestock, and consideration of alternative treatments.

3. All applicable federal and state laws and regulations and all label requirements as regulated by the California Environmental Protection Agency Department of Pesticide Regulations and the local County Agricultural Commissioner will be complied with. For all counties in which spray operations will be performed, W. M. Beaty & Associates, Inc. will annually register with each County Agricultural Commissioner to obtain landowner identification numbers and restricted materials permits.
4. All applications will be conducted by licensed Pest Control Businesses.

5. Prior to all spray applications Pest Control Businesses will be shown all boundaries and sensitive areas. To the greatest extent feasible W. M. Beaty & Associates, Inc. personnel will be on site during aerial applications.

6. Buffers will be established which meet and often exceed labels and regulations. For all aerial applications a minimum of at least 100 foot buffers will be used on all watercourses with running or standing water. Watercourses that are dry at the time of application will have minimum buffers of at least 25 feet. Should specific chemical, site (slope, soil type, beneficial uses of water, vegetation etc.) or climatic (wind speed & direction, thermal etc.) conditions warrant, then this minimum buffer may be increased in the prescription and/or at any time during application.

7. All treatments will consider community concerns, particularly neighboring landowners. To the greatest extent feasible all adjacent landowners will be notified prior to treatments and their concerns will be considered when establishing chemical use, application methods and property line buffers. In situations where neighbors have expressed concern, have not been contacted or have not responded, methods will be selected and minimum buffers established to insure no off-site drift or movement of chemical will impact their property. In these situations a minimum buffer of two swath widths will be used for aerial and mechanical applications. Should site (slope, soil type, vegetation etc.) or climatic (wind speed & direction, thermal etc.) conditions warrant, then this minimum buffer may be increased in the prescription or at any time during application.

8. Records of all treatments will be kept including maps, chemicals and methods used and completed W. M. Beaty & Associates, Inc. Daily Spray Report forms. Pest Control Operators shall submit Pesticide Use Reports to the appropriate counties and shall send copies of all use reports to W. M. Beaty & Associates, Inc. to keep on file.

9. Applications will be appropriately monitored for effectiveness and compliance. W. M. Beaty & Associates, Inc. personnel will be on-site to the greatest extent feasible to monitor all aerial applications. This will include recording chemical, application and climatic information on the W. M. Beaty & Associates, Inc. Spray Report form. In some environmentally or socially sensitive situations this may include the use of spray droplet detection cards and/or water quality monitoring. All treatment areas will be revisited by W. M. Beaty & Associates, Inc. personnel at least once to monitor compliance with and effectiveness of the prescription. Any suggestions for improvement of developing or implementing future prescriptions will be communicated to the W. M. Beaty & Associates, Inc. Project Forester.

Pesticide registration

Prior to any pesticide being available for use, it must first go through a comprehensive federal registration process. The Federal Environmental Protection Agency regulates pesticides under two major statutes, Federal Insecticide, Fungicide and Rodenticide Act and the Federal Food, Drug and Cosmetic Act. The registration process involves over 120 tests on product chemistry, human and environmental assessment for food safety, tolerance information concerning pesticide residues on food, and proof the manufacturing process is reliable. In addition to the Federal registration process, the state of California through the Department of Pesticide Regulation requires a pesticide registrant to go through California’s pesticide registration process. This involves more testing and data gathering specific to California. In 1996, the Federal Worker Protection Standards were also adopted to further protect applicators, field workers, mixers/loaders and other people that may come in contact with treated areas. Primarily, the act increased the scope of people who require pesticide safety training, increased restricted entry intervals and broadened the requirement for personal protective equipment.
Regulations

On a local level in the State of California, pesticide applications are monitored and enforced by the County Agricultural Commissioner. Field inspections are carried out by qualified county staff for both ground and aerial applications. Use reports of all pesticide applications must be filled out by operators and submitted to the County Agricultural Commissioner within seven days of application.

All applications made on Red River Forests and Shasta Forests adhere strictly to the pesticide label, federal laws, state and local regulations, and requirements in a written pest control recommendation prepared by a California licensed Pest Control Advisor. It is a violation of federal law to apply a pesticide in a manner inconsistent with its labeling. The intent of the pesticide label is to give clear and concise directions for use while minimizing risks to human health and the environment. The label has specific directions for rates used, personal protective equipment, restricted entry intervals, hazards to humans and wildlife, special restrictions near water, lists of active ingredients, directions for container disposal, specific application instructions and signal word denoting the level of hazard.

The managers of Red River Forests and Shasta Forests, W. M. Beaty & Associates, Inc. adhere to strict guidelines for mitigating risks associated with pesticide applications. All state and federal labels and laws as well as all state and local county regulations in addition to W. M. Beaty & Associates, Inc. Pesticide Use Policy are strictly followed in all pesticide applications on Red River Forests and Shasta Forests. All chemical applications are applied by California licensed applicators only. California applicators are required to pass a rigorous exam to show competence, and may only keep their license after accumulating 20 to 40 hours of continuing education within their two year certification period. No applications are made unless a written recommendation has been obtained by a licensed PCA. The PCA’s must have at least a bachelor’s degree in forestry, crop science, biology or related field. Pest control advisors must complete 40 hours of continuing education within their two year certification period. The written recommendation must be on site during the pesticide application.

Recommendations include such things as pesticide(s) to be used, the rate at which the pesticide is to be applied, dilution, method of application, environmental conditions, hazards and mitigation measures, label precautions, and directions for use. PCA’s are also required to consider and evaluate all feasible alternatives and select the most appropriate method and pesticide(s) available.

Worker protection

All personnel including applicators, mixers/loaders, contractors and W. M. Beaty & Associates, Inc. employees who enter treated units within 30 days of the expiration of the restricted entry interval on the pesticide label are all safety trained on an annual basis by licensed professionals in the use and safety of pesticides. Any person applying, mixing/loading, or entering a treated unit within the restricted entry interval must wear coveralls, rubber gloves, safety goggles, boots, and socks.

During applications, on site decontamination facilities are available which include soap, disposable towels, clean change of clothes, eyewash and wash water. Emergency medical information is posted at the site for the nearest hospital. All spray tanks and backpacks are labeled with the product, rate, signal word, Environmental Protection Agency registration number, manufacturer and the name, address and phone number of the applicator. All workers are required to wash their hands before eating, drinking or using tobacco. Mixing and loading of restricted materials is only done by a licensed professional.
Prior to applications a meeting is conducted with the applicator to insure they understand all unit boundaries, buffer zones, sensitive areas, property lines, the PCA recommendation and any additional concerns the situation may pose.

**Water quality protection**

Water quality protection is of the utmost importance. No ground water contamination from a forestry application has ever occurred through leaching with any of the products used on Red River Forests and Shasta Forests. There are many mitigation measures used for protection of water. Watercourse buffer zones are used in all pesticide applications. The width of buffer zones vary depending on product used, application method (ground or aerial), slope, soil type and type of watercourse or water body. Generally, buffer zones range from 10 to 200 feet depending on the above circumstances. Buffers established for applications of products containing hexazinone are usually the widest, generally from 50 to 200 feet. Watercourse buffers for 2,4-D may range from 10 to 100 feet. Domestic water sources are buffered 75 to 200 feet. Buffer zones are also established for other reasons (e.g. adjacent landowners, crops, dwellings, etc.) and usually much greater than even required by the very strict California Department of Pesticide Regulations.

Soil types and slopes are evaluated for runoff and leaching potential prior to application. Well drained soils with low organic matter percent require larger buffers (>50'). Steeper slopes are afforded a relatively larger buffer.

**Application technology**

Application technology required of operators applying pesticides on Red River Forests and Shasta Forests also plays a significant role in reducing spray drift. Helicopter applicators are required to use large nozzles which produce larger droplets which minimize potential for drift. Also, along all water courses, sensitive areas and property lines, split boom applications are required. This is where the side of the boom closest to the sensitive area is shut off and the buffer is flown with the outside boom only, thus eliminating any rotor wash along the edge of the buffer. Nozzle angle is also a critical factor in maintaining droplet size and thereby reducing drift potential. Nozzles are oriented at an angle from forty-five degrees to ninety degrees straight back to reduce wind shear of the spray droplets. Helicopter applications are not flown in wind speeds greater than five miles per hour on units that have watercourses or other sensitive boundaries or buffers. In units without any sensitive boundaries, buffers or watercourses helicopter applications are not flown in wind speeds greater than eight miles per hour. Wind direction is also monitored during applications in order to modify operations to further reduce potential for drift towards sensitive areas by enlarging buffer widths and/or altering timing of spraying near buffers etc. Applications are not flown when wind direction causes spray particles to drift into sensitive areas.

W. M. Beaty & Associates, Inc. and its aerial applicators also utilize GPS, geo-referenced GIS shape files and AgNav in-flight computers to aid in boundary and buffer identification and location of heliports. Prior to spraying all units, a W. M. Beaty & Associates, Inc. forester conducts a pre-spray flight reconnaissance with the pilot. During the pre-spray reconnaissance flight unit boundaries and buffers on the map and helicopter’s AgNav shape files are confirmed and if needed modified and/or additional sensitive areas are identified and GPS’d into the AgNav and appropriately buffered. Also W. M. Beaty & Associates, Inc. foresters have radio communication with the pilot at all times during aerial spray operations. During aerial spray operations W.M. Beaty & Associates, Inc. foresters monitor & record
weather conditions including wind speed, direction, humidity and temperature.

Method

Where needed to avoid impacts to water quality and other sensitive areas, ground spray operations are used instead of aerial applications. Buffer zones and sensitive areas are flagged ahead of time. Ground broadcast applications are carried out with the nozzles pointed in a downward direction to ensure proper placement of product. Applicators are taught to spray away from water and sensitive areas when doing their buffer passes. Ground applications are not done in winds that exceed ten miles per hour. Large nozzles are also used that minimize drift. If needed, drift control agents may be added to the spray mix.

2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures.

Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

The forest management enterprise shall describe the programs which will be put in place during the proposed derogation period, designed to identify and develop alternative pest control methods which do not use ‘highly hazardous’ pesticides. Forest management enterprises shall describe in detail what kind of alternatives or silvicultural measures will be investigated on what area and what research partners may be involved (e.g. university, enterprise, government agency, or other certificate holders). A timetable and documentation (on ongoing activities, targets, resources) has to be provided regarding the program for alternatives. The applicant should include information on the authorities for pesticide registration and which other non ‘highly hazardous’ pesticides are registered in their country for controlling the pest organism.
Alternative pesticides explored during derogation

W. M. Beaty & Associates, Inc. on behalf of Red River Forests and Shasta Forests, developed the Certified Forests Cooperative in conjunction with other large forestland managers. The purpose of the cooperative is to cooperatively participate in field trials and research pursuant to the Forest Stewardship Council™ (FSC®) United States (US) and individual FSC® Forest Management certificate holders’ derogations for the use of FSC® listed “high hazardous” chemicals, and to help satisfy requirements and management objectives of the Sustainable Forestry Initiative (SFI) standard set forth in performance measure 2.2.

Since the establishment of the Forest Stewardship Council Research Group in the spring of 2010, it has been a priority of the group to evaluate new chemistries for forestry site preparation or herbaceous release that may be an alternative to products containing hexazinone. These new chemistries have either been used alone or in combination with reduced rates of products containing hexazinone or other soil active herbicides and compared to the operational standard rates of products containing hexazinone alone. It was the objective of these trials to evaluate both efficacy and conifer tolerance of several conifer species including ponderosa pine, Douglas-fir, white fir and western larch. The trials were structured as completely randomized block designs with three to four replications per treatment. Data was collected and analyzed using SAS statistical software using analysis of variance and orthogonal contrasts to determine significance. Several of the trials were also replicated within the Sierra Cascade Intensive Forest Management Cooperative and the data from analogous trials was shared between the two research groups.

Several new herbicides were of interest due to low use rates, favorable environmental profiles and proven efficacy in applications outside of forestry. The three alternative products for which we have data are Milestone (aminopyralid), MAT 28 (aminocyclopyrochlor) and an experimental compound GF 9999. Milestone and MAT 28 are in the same family of herbicides. Both have very low use rates and act as an auxin type growth regulator herbicide. Each also has a very favorable environmental profile and have both foliar and residual activity. GF 9999 is a new chemistry being tested under a secrecy agreement. It controls annual herbaceous broadleaved weeds and annual grasses. It also has a favorable environmental profile. Several more trials have been installed with different products, but to date, no data has been collected. Only the products for which we have data will be discussed here. These include four sites for the Milestone trials, three sites for the MAT 28 trials and two sites for the GF 9999 trials. The trials have been replicated in both time and space.

Soil active products registered in forestry are extremely limited. Currently products containing hexazinone, atrazine, and sulfometuron are the only choices available for landowners. Products containing atrazine have dramatically declining due to perceived ground water concerns and products containing sulfometuron only has limited use due to conifer tolerance issues. Hence, products containing hexazinone are the most important tool of all the residual herbicides registered for use in forestry and is the most widely used among landowners. The availability of new soil active herbicides would significantly broaden management options for landowners provided efficacy and conifer tolerance are acceptable.

Based on the data presented within these trials, it does not appear at this time there is a suitable alternative to products containing hexazinone that provides adequate vegetation control and acceptable conifer tolerance. Products containing hexazinone out-performed all products tested here.
If the new products tested were to be used in practice as an alternative to products containing hexazinone, it would most likely increase total herbicide use due to the need for repeat treatments. It does appear that Milestone and GF 9999 may have a partial fit in combination with products containing hexazinone, but are not strong enough on their own to be feasible. Due to the conifer tolerance issues, MAT 28 is not acceptable as either a release or site preparation treatment in forestry at all.

The importance of vegetation management in the Western United States cannot be overstated. Extreme temperatures, limited rainfall and extremely competitive herbaceous vegetation and brush can severely hinder establishing a new forest. Products containing hexazinone have long been and will continue to be the most important and consistent herbicide used in western forestry. The use of products containing hexazinone over the last several decades has reduced herbicide use as a whole, due to extremely broad spectrum control and longevity. What can be done with one application of products containing hexazinone may take several using other products. Water is the most limiting factor in the west and products containing hexazinone remain the most efficient herbicide to maximize water use by young conifers.

Refer to the following results summary paper prepared for the Certified Forests Cooperative for more information:


Exploration of alternatives

W. M. Beaty & Associates, Inc. continually explores alternative methods of vegetation management to establish planted forests and to control unwanted highly hazardous brushy fuel loads. While W. M. Beaty & Associates, Inc. has effectively diminished the number of entries and amount of herbicide applied, complete elimination currently is not economically viable or environmentally responsible. As a result, W. M. Beaty & Associates, Inc. continues to use the most safe, effective, and environmentally appropriate options available to control unwanted competing vegetation and highly hazardous fuel loads, while exploring ways to keep herbicide use to a minimum.

Over the past several decades, W. M. Beaty & Associates, Inc. has conducted monitoring and research on its managed lands as well as collaboratively with other forest managers and research organizations to minimize the use of chemicals. Trials have been conducted and monitored that evaluate manual, mechanical, cultural and chemical use for vegetation control including combinations of methods. Chemical trials include alternative chemicals, surfactants, timing, rates, and application methods to explore feasibility of alternatives such as lower rates, less toxic chemicals, surfactants, methods and/or timing of applications, etc. as well as non-herbicide treatments. These trials are monitored for relative costs, effectiveness in controlling target weed species, and safety to crop trees, human health and the environment. Since many competing weed species resprout, monitoring on many trial sites is usually conducted for more than one year after the trial application.

Economic losses from alternate chemical prescriptions or non-chemical methods of weed control would be significant. Current applications of products containing hexazinone on W. M. Beaty & Associates, Inc. managed lands range between $75 and $145 per acre including labor, depending on rates and whether they are aerial or ground applications. Alternative chemicals on Red River Forests and Shasta Forests are not feasible in many vegetation management control situations for several reasons. For example in situations where products containing hexazinone are recommended as the best alternative,
it usually would take multiple treatments of a products containing glyphosate. This would not only end up costing $200 to $400 per acre versus only one treatment of products containing hexazinone that would be needed. It would also significantly increase the total pounds of pesticide applied. Also in most circumstances it would not provide the same level of control as products containing hexazinone.

Alternatives to products containing hexazinone in situations where products containing hexazinone are recommended as the best alternative by a California Licensed Pest Control Advisor on Red River Forests and Shasta Forests are extremely impractical for many reasons. There are currently no alternative soil active chemicals registered in California that either do not harm ponderosa pine (e.g. tests on W. M. Beaty & Associates, Inc. managed lands have demonstrated that products containing sulfometuron and imazapyr damage ponderosa pine) and/or are not already on FSC’s list of highly hazardous pesticides (e.g. atrazine). Alternative herbicides such as products containing sulfometuron which have soil activity are not a viable option in most cases due to conifer tolerance issues. Although less expensive than products containing hexazinone, products containing atrazine do not provide the same level of control, usually require repeated treatments (i.e. more herbicide is used), and are not available for use because atrazine is on FSC’s list of highly hazardous pesticides. In circumstances where products containing hexazinone are used on Red River Forests and Shasta Forests, a licensed Pest Control Advisor determines that applications of products containing glyphosate or other alternative herbicides are not effective and/or are cost prohibitive (e.g. $150 to $300 per acre or more versus $75 to $125 per acre) because they require multiple treatments.

Herbicide Field Trials

W. M. Beaty & Associates, Inc. establishes stand-alone study plots as well as study plots within numerous operational spray projects to evaluate methods that maximize efficacy while minimizing chemical use. Trials examine pesticide, application timing, surfactant rate and type, volume per acre, droplet size, and pesticide rate as factors that influenced control of target vegetation and impact on crop trees and other non-target plants.

Several trials have been established to try and fine tune applications to provide more control with less chemical. Trials were established in 2006 and 2008 looking at various rates and combinations of Garlon 4, 2,4-D, 2-ethylhexyl, Chopper, and Roundup with various rates of surfactants. Results of these trials have allowed W. M. Beaty & Associates, Inc. to choose the most effective treatment for individual brush species. This should improve control and reduce the number of future treatments.

One example of the many trials conducted where alternatives to products containing hexazinone was the primary goal are: Oust plots at various rates for pre and post emergent weed control in Modoc County on the “Scarface Fire”. Plots which were monitored for control of target weeds (grasses forbs and brush species such as manzanita and snowbrush) and for impact on crop trees (ponderosa pine) and non-target plants. Results showed that Oust did not provide as good pre-emergent control and almost no post emergent control versus the hexazinone control plots which provided excellent pre-emergent and satisfactory post emergent control of most weeds. But more importantly Oust caused unacceptable levels of damage to ponderosa pine seedlings (both visible bud and foliage damage as well as stunted root growth) and products containing hexazinone caused no damage to foliage, buds or roots or negative effect on growth (growth actually was better on plots with products containing hexazinone). Although Oust can be safely used in other regions of the west coast on most other crop tree species, in northeast California with relatively low rainfall and much lighter soils (very low clay and
organic matter content) and ponderosa pine type it is not a viable alternative. Oust is the only one of the three pre-emergent herbicides registered for forestry use in California. The other two products contain hexazinone and atrazine which are on FSC’s list of ‘Highly Hazardous’ pesticides. Another example is a trial using imazapyr (formulated as Chopper) as an alternative to products containing hexazinone in eastern Siskiyou County on Indian Springs Mountain. Imazapyr formulated as Chopper is a foliar herbicide with some ability to be taken up from the soil so it was tested to see if it would be an alternative to hexazinone in certain situations. The results clearly demonstrated that Chopper did even more damage to ponderosa pine on a site typical of northeast California than Oust did. The damage occurred both in foliar and soil uptake trials.

There are many herbicides that are registered for forestry use in the other 49 states in the United States but are not registered in California for forestry use (e.g. products containing picloram), because the potential forestry use market in California does not justify the expense to conduct all of the additional field tests and registration costs that California requires in addition to federal U.S. registration. Two of these products that did not have a California label for several years but are now registered for use in California thanks in part to support from W. M. Beaty & Associates, Inc. contained imazapyr as the active ingredient. W. M. Beaty & Associates, Inc. was one of several land managers involved in supporting the registration of products containing imazapyr for forestry use in California. Products containing imazapyr are one of the lowest use rate products ever developed and have one of the lowest toxicities. Field trials conducted by W. M. Beaty & Associates, Inc. on its managed lands in the late 1990’s were used to aid in the label rates and use restrictions. The data from those field trials was used in developing new prescriptions for pre-clearing site preparation sprays on mature evergreen brush. These new treatments virtually replaced the previous practice using a mixture of products containing 2,4-D, 2-ethylhexyl and Garlon 4 to pre-treat brushfields prior to clearing or burning. However data from field trials also showed that products containing imazapyr were not a safe alternative to products containing 2,4-D, 2-ethylhexyl or hexazinone for site preparation on cleared ground immediately prior to planting or for release treatments on established planted stands because of the extensive damage to ponderosa pine in these treatments. W. M. Beaty & Associates, Inc. has continued to further develop rate, timing and tolerance tests to further minimize the rates applied and maximize results.

**Manufacturer trials**

To continue to reduce pesticide amounts and find alternatives for products containing hexazinone and other chemicals, W. M. Beaty & Associates, Inc. actively partners with major manufacturers to conduct trials to evaluate new products that have very low rates and environmentally and toxicologically friendly profiles. Several trials have been conducted in cooperation with DuPont, Bayer, and BASF looking at new low use rate products. Some of the treatments are new soil active products with short residual activity that could replace or reduce the use of products containing hexazinone. In addition, new chemistry for low use rate products, and new application techniques to minimize worker exposure are under review. These products have not yet been registered for use, but the prospects are promising. Currently, there are some opportunities with Dow AgroSciences examining new chemistry which is short duration, low use rate technology. W. M. Beaty & Associates, Inc. continues to work in cooperation with the chemical companies to establish field trials that look at this new technology.

A field trial was installed on Red River Forests and Shasta Forests in the spring of 2009 in Shasta County. The trial consisted of two new soil residual products by BASF that are low use rate technology. The
studies evaluated efficacy on herbaceous and brush competition as well as conifer tolerance on Douglas-fir and ponderosa pine. Bayer Crop Science also tested several new products on these plots. These products are also low use rate technology.

**USDA, USFS, Pacific Southwest Forest Experiment Station**

W. M. Beaty & Associates, Inc. has for several decades allowed the USDA, USFS, Pacific Southwest Forest Research Station to conduct numerous studies on lands it manages, including Red River Forests and Shasta Forests. Some of these studies include the effects of alternative fuel reduction treatments, including various herbicide treatments such as products containing hexazinone, on forest resources. Some of these studies include the effects of brush on conifer growth and the effects of brush control on forest resources such as soil, soil biota, water, etc.

**North Sierra Tree Improvement Association**

An important long term partnership that Red River Forests and Shasta Forests has invested in for three decades is the North Sierra Tree Improvement Association (NSTIA). The NSTIA has been improving natural seedling genetics and conserving a strong diverse natural genetic base through superior tree selection and establishment of a ponderosa pine seed orchard, progeny test sites that have been intensively measured for 20 years. Through controlled breeding in the seed orchard the cooperative is currently in their second generation breeding program. Seed orchard stock is currently out-performing general collection seed sources by twenty to thirty percent. By increasing seedling growth rates, the amount of chemical use is reduced because the trees outgrow the brush in a shorter period of time. The faster the trees can close canopy, the quicker they shade out the competition.

**Sierra Cascade Intensive Forest Management Research Cooperative**

New research is also conducted by involvement in the Sierra Cascade Intensive Forest Management Research Cooperative, in which Red River Forests and Shasta Forests is a dues paying member and W. M. Beaty & Associates, Inc.’s Project Forester serves on the Executive Committee. As an active and dues paying member of this cooperative we have supported numerous research projects investigating the long-term results of manual treatments vs. chemical treatments in post-fire stands, long-term competition studies looking at various levels of brush control, new application techniques to minimize chemical use, and stock type trials with and without vegetation control. Valuable data has been obtained from this cooperative, much of which supported what was already suspected. Manual or mechanical treatments without chemical use are ineffective and unfeasible in Mediterranean climates. Also striking was how low levels of competition affect planted forest survival and growth in our region. Data from the co-op has also shown that large seedlings and fertilization can have a short term effect on growth, but by year three or four after planting, treatment differences disappear. Thus, there may be some benefit from planting large seedlings initially to aid in the reduction of chemical use. Fertilizers also provided a short-term gain, but the fertilizers themselves posed a risk to conifers due to salinity levels increasing and damaging root tissue.

**Pre-clearing site preparation**

W. M. Beaty & Associates, Inc. was one of the first companies in California to conduct pre-clearing site preparation sprays with products containing imazapyr and one of the early companies in California to practice pre-harvest site preparation with products containing imazapyr. This “new” practice alone,
eliminated the need to use products containing 2,4-D, 2-ethylhexyl ester in pre-clearing or pre-harvest applications and also has reduced the amount of products containing hexazinone needed. Pre-treatment involves treating vegetation one to two years prior to harvest. This has several benefits. It allows us to use products containing imazapyr which is the only herbicide available that totally controls species such as snowbrush and chinquapin. It cannot be used within one year prior to planting or once the seedlings have been planted due to poor conifer tolerance. It also has one of the lowest use rates of any product available in forestry and has one of the lowest toxicities. With pre-treatment, the brush is already stressed from low carbohydrate reserves due to the conifer over-story, and therefore requires less chemical to achieve control. Prior to the registration of products containing imazapyr, it may have taken two or more treatments to achieve the desired control, whereas now it takes just one. An added benefit of this treatment is that the time it takes to treat a unit is drastically reduced compared to release treatments. Worker exposure to pesticides is therefore minimized. This treatment also reduces the amount of residual herbicide needed for effective control. Historically, three pounds of products containing hexazinone were used as a site preparation treatment prior to planting. With pre-harvest site preparation, the brush has already been controlled so lower rates of products containing hexazinone (on average about 30% less products containing hexazinone is used) can be used since only one year or younger seedling plants are the target weed.

Chemical reduction efforts made by W. M. Beaty & Associates, Inc.

As managers for Red River Forests and Shasta Forests W. M. Beaty & Associates, Inc. continuously evaluates alternatives to herbicides listed as “Highly Hazardous” by FSC. In general, we:

1. Consider alternative herbicides registered for forestry use in California that are not designated by FSC as “highly hazardous”.
2. Read and evaluate technical publications and scientific literature regarding state-of-the-art research and development in pest control.
3. Attend technical seminars and confer with experts regarding alternative approaches including Integrated Pest Management.
4. Undergo continuous training required to maintain licensures as Pest Control Advisors and Qualified Applicators.
5. Use Geographic Positioning and Geographic Information Systems to improve application precision thereby reducing application rates on a site specific.

W. M. Beaty & Associates, Inc. cooperates with and is involved in several organizations conducting research aimed at minimizing use of herbicides in general and stays abreast advances in technology. The approach taken by Red River Forests and Shasta Forests to comply with FSC guidelines includes:

1. Alternative chemicals. Investigate chemical alternatives using products that are not included in the FSC “highly hazardous” list.
2. Improved chemical use strategies. Continue to look for chemical use strategies that apply less chemical, more precisely targeted to reduce overall quantity of chemical applied.

Alternative non-chemical treatments. Continue to look for effective mechanical, fire and biological control methods.

Non-chemical methods

Non-chemical vegetation control methods have been evaluated on Red River Forests and Shasta
Forests and quite extensively throughout regions with similar climates and forest types over the years and consistently fail to achieve the desired results at an economically viable level. Two of the more popular non-chemical methods are hand-grubbing and mulch mats. McDonald & Fiddler (1992), looked at over 40 vegetation management studies, 16 of which involved hand grubbing. Costs for complete grubbing in 1990 averaged $410 per acre and ranged as high as $2,000 per acre where repeat treatments were necessary. There were also several problems associated with grubbing, most notable is that it fails to control vegetation that sprouts or has rhizomes. It also needs to be done repeatedly to achieve adequate levels of vegetation control. The studies also noted considerable soil displacement as a result of grubbing. Hand grubbing trials on Red River Forests and Shasta Forests (e.g. Squirrel Fire) showed considerable costs (more than twice as much cost per treatment and several more treatments are needed than the one chemical treatment that would have been needed) for very short term results (rapid re-sprouting of brush and scarification of brush seed that led to germination of brush seedlings) and much higher negative impacts to the environment (loss of litter layer around seedlings, exposed top soil and increased erosion) and negative impacts to worker safety (dust inhalation and greater risk of physical injury from scalping tools).

**Biological control**

Biological control agents (plant diseases and defoliating insects) have not been successful in controlling competing vegetation in the Pacific Northwest. Usually, insects are specific to certain species of vegetation and therefore are not suitable for large scale release opportunities, since only a small portion of the vegetative complex would be affected (Newton & Dost, 1984). Native pathogenic fungi have also been unsuccessful in controlling competing vegetation (Wall & Shuman, 1990).

**Mechanical control**

Mechanical site preparation with tractors, excavators, mulching heads or rippers can be useful tools, but when used, must be integrated with chemical control to provide adequate and environmentally safe levels of vegetation control for cost effectively establishing new forests and managing hazardous fuel levels. Most brush species in the region of Red River Forests and Shasta Forests re-sprout aggressively after mechanical treatments and most brush and other weed species seed germinate after being scarified by mechanical treatments. Invasion by grasses and gminating brush still require an herbicide application to achieve success (Newton & Dost, 1984). Releasing established planted forests from large brush competition using mechanical methods has also proven ineffective and cost prohibitive (Fiddler et al., 2000). Only when mechanical treatments were followed up with herbicide applications did the researchers note any gains in growth. Mechanical site preparation and fuel reduction activities alone also cause more top soil disturbance than chemical treatments or mechanical treatments combined with chemical treatments. Properly prescribed chemical treatments reduce the need for mechanical treatments to excavate the root systems of re-sprouting brush species and therefore avoid topsoil disturbance, erosion and significantly reduce costs. On W. M. Beaty & Associates, Inc.’s reforestation and hazardous fuel management projects, $50 to $100 chemical treatments prior to mechanical clearing brush save $200 to $500 in mechanical clearing costs because re-sprouting root systems do not need to be excavated or the chemical site preparation treatment completely negates the need for mechanical treatment at all.

W. M. Beaty & Associates, Inc. has monitored trials of mechanical treatments (piling, ripping, VH mulching, and mastication) with and without chemical vegetation control, and also manual hand
While these mechanical treatments alone initially reduced the amount of competing vegetation present, brush and/or grass re-invaded the sites soon after treatments. Levels of vegetation control necessary to achieve conifer establishment and necessary for long term fuels management, were not possible without follow-up chemical treatments. In Mediterranean climates, very small amounts of vegetation can significantly influence success or failure of newly planted forests, and neither mechanical nor manual treatments alone can provide the necessary level of vegetation control. Cost was also a considerable factor, with hand grubbing treatments running as high as $500 per acre with minimal or no gains.

While it has been well established that mechanical treatments alone are not a suitable alternative to chemical treatments, W. M. Beaty & Associates, Inc. evaluates projects to determine under what conditions the combinations of the two may reduce overall chemical use in the long-term.

**Mastication:** W. M. Beaty & Associates, Inc. have conducted some mastication trials on Red River Forests and Shasta Forests (e.g. Shasta County) both as the only treatment and in combination with chemical treatments to reduce chemical use. Mastication can be very expensive depending upon site conditions (e.g. rock, slope, access etc.) costing from $300 per acre to $500 per acre or more. Mastication with some chemical follow up treatment appears to work best in stands of brush that consist of non-sprouting species (e.g. whiteleaf manzanita). Although most brush species on Red River Forests and Shasta Forests re-sprout (e.g. greenleaf manzanita, snowbrush, chinquapin, Ceanothus spp. etc.) these trials and others in the general region have provided W. M. Beaty & Associates, Inc. with information that indicate mastication in certain circumstances (e.g. pre-sprayed and/or non-sprouting brush) can be used as a tool to lessen the amount of herbicide used.

**VH Mulcher:** Other mechanical techniques have been tried on W. M. Beaty & Associates, Inc. managed lands and in particular on Red River Forests and Shasta Forests (e.g. Lassen County) include the use of the VH Mulcher. This piece of equipment has a rotating head with blades that grinds slash and brush incorporating it into the soil. The machine makes planting spots roughly four feet in diameter. The hope was that by incorporating organic matter into the soil along with severely disturbing the root systems of competing vegetation this treatment would serve a two-fold purpose, control unwanted vegetation and increase water holding capacity and nutrient content in the planting spot. The treatments provided short-term reductions in the amount of competing vegetation and lessened the amount of chemical needed but did not eliminate the need for chemical treatment(s). In order to reduce the high per acre cost of a VH Mulcher treatment (normally $350 to $400 per acre) W. M. Beaty & Associates, Inc. widened the spacing out to fourteen by fourteen feet (222 trees per acre) and sixteen feet by sixteen feet (170 trees per acre) versus the industry norm of ten by ten (436 trees per acre) to twelve by twelve (300 trees per acre). The cost per acre of the VH Mulcher treatment at the wide spacing was still somewhat higher than hoped for at about $180 to $230 per acre. Also there were other problems with the VH Mulcher method that depended upon specific sites, including increased tree mortality from increased gopher activity. This method is still a tool that is considered by W. M. Beaty & Associates, Inc. but only used in very limited situations where it is appropriate.

**Mulching**

Known paper mulching studies had costs that ranged from $249 to $1,985 per acre (McDonald & Fiddler, 1992, Kintop, 1992). Treatments tend to be extremely labor intensive and the mats need to be fairly large to achieve adequate vegetation control. Mats vary in their longevity. Typically, mats that
can last long enough to achieve results are cost prohibitive. Seedling damage from installation of mats was also a concern. In northeastern California where high winds occur mats have dislodged from anchoring points and blown over to cover young conifer seedlings. Another concern with using paper mulches is that where woody vegetation is present, it must be removed prior to matting, adding to the installation costs.

**Prescribed herbivory**

W. M. Beaty & Associates, Inc. has evaluated alternative vegetation control methods using animals on Red River Forests and Shasta Forests Glass Mountain Tract in the late 1990's. Sheep grazing under a long standing grazing permit was evaluated on the Long Fire Plantation for its value in reducing competing vegetation. It was determined that while the sheep reduced the height and total biomass of vegetation on site, no long-term or significant effects on vegetation or conifer survival and growth were achieved by the grazing alone. This is primarily due to the animals only reducing the above ground portion of grazed plants. By not controlling the root systems, water is still removed from the soil profile and unavailable for conifers. Also there is far more soil disturbance and exposed bare soil that is subject to erosion after intensive grazing treatment than after a herbicide treatment which leaves dead plant material in place which covers the soil. This practice was used on the Long Fire Plantation (and may be used again where appropriate) in conjunction with chemical treatments to achieve adequate control and still reduce the overall chemical use that would have been needed without the grazing. So far vegetation control by grazing has only been financially feasible when it can be incorporated into activities occurring under Red River Forests and Shasta Forests’ long standing annual grazing permits that generate a very modest level of income. The use of grazing by goats for vegetation control only without the marketing of livestock is extremely expensive costing from $500 per acre or more. W. M. Beaty & Associates, Inc. is currently in discussions with a large scale goat operator in Woodland, California, Lee Hazeltine, regarding the feasibility of developing pilot projects that would significantly reduce animal control costs by integrating livestock production more fully into his vegetation management business.

**Stock type trials**

W. M. Beaty & Associates, Inc. continually tests and evaluates conifer seedling stock types and physiology as a method to reduce chemical vegetation management needs. Starting twenty years ago, W. M. Beaty & Associates, Inc. has installed and monitored several stock type trials comparing small, medium and large container stock with various bare root stock types such as 1-0 and 2-0 nursery stock. The objective was to see what seedlings survived and grew the best for each conifer species, with the hope of occupying the site in the shortest amount of time, reducing the need for additional chemical treatments. Although trials in other regions have shown that for coastal Douglas-fir large seedlings, particularly plug-1’s grew faster and stayed larger several years after planting, results for our ponderosa pine, eastside Douglas-fir and true fir tests show a very shorter duration effect with any differences attributable to initial stock size disappearing after only two years.

W. M. Beaty & Associates, Inc. have also conducted stock trials in combination with different chemical site preparation treatments for ponderosa pine. The studies looked at the interaction between stock type (containerized versus bare-root) and chemical choice. The results showed that treatments with sulfometuron (Oust), severely stunted root growth, height and caliper for both types. Survival was no better than the control (no treatment). Atrazine (Aatrex 9-0) treatments were safe on both stock types,
but only controlled annual grasses and germinating broadleaves and did not control established brush or most perennial grasses. Products containing hexazinone (Velpar L and Pronone 10G) treatments were the most effective on herbaceous and brush competition. Both stock types were very tolerant to products containing hexazinone. Treatments with products containing hexazinone had the largest caliper and height as well as the best survival.

References
Trevethan, 2002. Hexazinone. Pesticide Fact Sheet: Forestry Use. Agriculture Chemistry Research and Extension, Department of Environmental and Molecular Toxicology, Oregon State University, and National Institute of Environmental Health Sciences Center, Community Outreach Program, Oregon State University.
<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Product</th>
<th>Study Cooperator</th>
<th>Use</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D, 2-ethylhexyl ester</td>
<td>Weedone LV6 EC</td>
<td>CFRC</td>
<td>Release</td>
<td>Post emergent selective control only.</td>
</tr>
<tr>
<td>Aminocyclopyrachlor</td>
<td>MAT 28</td>
<td>CFRC</td>
<td>Site Prep or Release</td>
<td>Conifer tolerance issues. May be effective as a preharvest treatment.</td>
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<tr>
<td>Aminopyralid</td>
<td>Milestone</td>
<td>CFRC</td>
<td>Site Prep or Release</td>
<td>In-effective control of vegetation unless tank mixed with hexazinone. Results in reduced rate of hexazinone. Efficacy less than operational standard of Velpar alone. May require less precipitation.</td>
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<tr>
<td>Atrazine</td>
<td>atrazine</td>
<td>WBA</td>
<td>Site Prep</td>
<td>Effective at suppressing germination. Does not control established vegetation greater than one-year old. Use in combination with glyphosate enables control of established grasses and forbs.</td>
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<tr>
<td>Fluroxypyr</td>
<td>Vista</td>
<td>CFRC</td>
<td>Release</td>
<td>Post emergent selective control only.</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Accord XRT II</td>
<td>SCIFMRC</td>
<td>Release</td>
<td>Post emergent broad spectrum control only.</td>
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<tr>
<td>Imazapyr</td>
<td>Chopper</td>
<td>SCIFMRC</td>
<td>Site Prep</td>
<td>Effective preharvest and post fire salvage treatment for brush and hardwood control. Can reduce amount of hexazinone needed for subsequent site prep. Conifer tolerance issues if used as release. Increased control on more species if tank mixed with glyphosate.</td>
</tr>
<tr>
<td>Indaziflam</td>
<td>Esplanade</td>
<td>CFRC</td>
<td>Site Prep</td>
<td>Currently being tested alone and in combination with aminocylopyrachlor and hexazinone.</td>
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<td>Oxyflourfen</td>
<td>Goaltender</td>
<td>CFRC</td>
<td>Site Prep</td>
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<tr>
<td>Oxyflourfen</td>
<td>Pindar GT</td>
<td>CFRC</td>
<td>Site Prep</td>
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<td>Penoxsulam</td>
<td>Pindar GT</td>
<td>SCIFMRC</td>
<td>Site Prep</td>
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<td>Rimsulfuron</td>
<td>Matrix SG</td>
<td>CFRC</td>
<td>Site Prep</td>
<td>Currently being tested alone and in combination with hexazinone.</td>
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</tr>
<tr>
<td>Sulfometuron</td>
<td>Oust</td>
<td>WBA</td>
<td>Site Prep or Release</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Conifer tolerance issues. Highly hazardous pesticide.</td>
<td></td>
</tr>
<tr>
<td>Triclopyr</td>
<td>Garlon</td>
<td>WBA</td>
<td>Site Prep or Release</td>
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<td></td>
<td></td>
<td></td>
<td>Not labeled for release over conifers and can cause severe damage. Use in combination with 2,4-D, 2-ethylhexyl ester for increased control.</td>
<td></td>
</tr>
<tr>
<td>Undisclosed</td>
<td>GF 9999</td>
<td>CFRC</td>
<td>Site Prep</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In-effective control of vegetation.</td>
<td></td>
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CFRC: Certified Forests Research Cooperative

SCIFMRC: Sierra Cascade Intensive Forest Management Research Cooperative

WBA: W. M. Beaty & Associates, Inc.
<table>
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<th>Illustrative Photographs</th>
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| Previously forested area that was burned in the 1990 “Day Fire” in Modoc County, California.  
Foreground: Brush covered U.S. Bureau of Land Management (BLM) land that was planted after the fire but had no herbicide treatments.  
Background: Privately owned FSC certified forests that were planted after the fire with native ponderosa pine and white fir and treated with hexazinone and 2,4-D 2-ethylhexyl ester to control brush during establishment phase.  |
| Close up of one of the few scattered 15-year-old ponderosa pines planted after the 1990 “Day Fire” on BLM with no herbicide treatment that survived the brush competition. After 15 years it is only five feet tall and is still very stressed by the brush competition for limited soil moisture and therefore growing very slowly and much more susceptible to death from periodic insect outbreaks (e.g. pine reproduction weevil) than a vigorous tree. These trees are not growing at an economically viable rate for a private landowner. These trees also present too high of a risk of death by wildfire or insects for a private landowner to assume. These trees have small boles, thin bark and crowns, and are intertwined with brush. Hence, they will not survive any wildfire that occurs in this brushfield and are at a very high risk of being destroyed by the next wildfire before they reach merchantability. The “natural” fire cycle in this area is about 10 to 20 years.  |
| Close up of 15-year-old native ponderosa pine on W. M. Beaty & Associates, Inc. managed private FSC certified forest treated with hexazinone and 2,4-D 2-ethylhexyl ester during early plantation establishment. Trees in this planted forest are growing at an economically acceptable rate even though this a dry, low to moderately productive site. Because native conifers in this young forest are vigorously growing they are much more likely to resist periodic insect attacks than trees in the nearby BLM plantation that was not treated with herbicides during the establishment phase. Trees in this planted forest have a much better chance of surviving a wildfire since the crowns are not intertwined with heavy brush and their boles are growing large enough to soon survive most ground fires. The risk to the FSC certified landowner’s investment in this planted forest from being destroyed by insects or fire prior to becoming merchantable is much less than had the landowner not used hexazinone and 2,4-D 2-ethylhexyl ester.  |
| 1990 “Day Fire” area: 15 year old native conifers on W. M. Beaty & Associates, Inc. managed private FSC certified forest that were treated with hexazinone and 2,4-D 2-ethylhexyl ester during early plantation establishment to control brush and weeds competing for limited soil moisture. This area of Modoc County receives only approximately 25 inches average annual precipitation with little or no precipitation during the hot summer months while trees and weeds are growing and actively transpiring water out of the soil.  |
Wisconsin Department of Natural Resources – Application form for a temporary derogation to use Hexazinone

### A. GENERAL REQUIREMENTS

<table>
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<tr>
<th><strong>Application Submission Date</strong></th>
<th>June 30, 2014 for public consultation</th>
</tr>
</thead>
</table>
| **Name and contact details of certification body requesting derogation:** | Brendan Grady  
SCS Global Services  
2000 Powell St. Suite Number 600  
Emeryville, CA 94608, USA  
510-452-8034  
bgrady@scsglobalservices.com |
| **Active Ingredient for which derogation requested:** | Hexazinone (3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione) |
| **Trade name and formulation type of the active ingredient or formulation:** | Velpar L, Velpar DF, Pronone  
Example formulations are liquid, dry flowable and granular. |
| **Method of application and the application equipment:** | Applications include aerial application by helicopter, ground application by tractor, ATV, or backpack applicators. |
| **Common and scientific name of the pest species:** | Grasses, shrubs and broadleaved weeds (native and non-native) including:  
Thistle, (Cirsium arvense)  
Common Mullein, (Verbascum Thapsus)  
Common buckthorn (Rhamnus cathartica L)  
Spotted Knapweed (Centaurea biebersteinii DC.)  
Northern pin oak (Quercus ellipsoidalis)  
Chokecherry (Prunus virginiana)  
Aspen (populus)  
Beaked hazelnut (Corylus cornuta)  
Dandelion (Taraxacum officinale)  
Poison-ivy (Rhus toxicodendron L.)  
Pennsylvania sedge (Carex pensylvanica Lam) |
| **Name and FSC certification codes of certificate holders requesting a temporary derogation:** | Wisconsin Department of Natural Resources  
c/o Joe Schwantes, County Forest Specialist  
PO Box 7921  
Madison, WI 53707-7921  
SCS-FM/COC-083G (Wisconsin County Forest Program) |
| **Scope for which a temporary derogation is being requested:** | Wisconsin County Forest ownership, with FMUs located across the northern 2/3 of the State of Wisconsin, USA.  
Hexazinone may be applied as a site preparatory application prior to planting or as a release application after planting to reduce the competition from herbaceous weeds (grasses, forbs, and brush). |
| **Requested time period for derogation:** | 5 years from the date of approval of this request. |
| **Category of Derogation** | E – Regular non-emergency use |
1. **DEMONSTRATED NEED:**

**Statement of Pest Problem**

Control of annual, perennial and woody weeds is essential for successful establishment and vigorous early growth of certain native tree species grown in Wisconsin’s County Forests. Effects of plant competition for water and nutrients in establishing stands can range from widespread seedling mortality to severe suppression of growth of entire stands for long periods. Hexazinone is used primarily for release of coniferous plantings (red pine and white spruce) from herbaceous / woody / grass competition. It has also been used to suppress woody brush competition in managed wildlife openings (Pronone). To a lesser extent it has been used in site preparation for conifer plantings.

**Environmental, Economic, Social, and Technical Feasibility Considerations:**

Velpar products have proven effective in suppressing many of the main competitors found in Wisconsin including, but not limited to; aspen, oak spp., red maple, hazel, and cherry spp. As a soil active herbicide it is readily absorbed by roots when applied in the late spring / early summer after competing hardwoods have broken bud, but prior to hardening off. Since it is tolerated by many conifer species it has proven to be a very safe and effective herbicide on both new and established plantings. Unlike other herbicides, it has the advantage of use in the spring and mid-summer when red pine is producing new growth. It is also uniquely suited for spot treatments of plantings and spot treatments of woody competition in maintaining wildlife openings. Many of our wildlife openings are located in remote locations and being able to utilize products such as Pronone 10G has eliminated the need to find / haul water for mixing. Applications for release occur on average once or rarely twice, for each planted stand rotation (90 – 130 years). On wildlife openings, the spot applications are only necessary on roughly a 5 year schedule. Nearly all applications are ground-based. Wisconsin’s Dept. of Natural Resources and each of our County Forest partners continually strive to use products and methods that effectively and economically satisfy the silvicultural need, in the most environmentally-conscious manner. Forgoing treatments is always one option, but is not preferred because it would not be consistent with our forest management goals, which include maintenance of a variety of cover types, including red pine and non-forested openings within a forest matrix. Mechanical treatments can be used but are often cost prohibitive, involve an element of risk to workers conducting mechanical release, and have shorter-lived control effects. Alternative chemical treatments are suitable in some circumstances but are more challenging in others, such as for red pine release. In some cases effectiveness and cost of alternative chemical treatments makes them unacceptable. A 5-year renewal derogation time frame would allow for us to continue providing effective release & control of competition, while further investigating reasonable alternatives.

2. **STAKEHOLDER CONSULTATION:**

A public input process is built into our long-range planning on County Forests, during which a broad group of stakeholders is engaged to provide input into the Management Plan. All meetings are publicly noticed and open to the public. While specific use of products with the active ingredient of hexazinone is not addressed in the plans, the use of pesticides as part of our Integrated Pest Management program is clearly documented and was subject to input from local stakeholders. One County Forest (Douglas) participating in the FSC group administered through the DNR does not currently allow pesticide usage on their forest unless specific authorization is granted by the entire county board (permission has been granted in limited cases to address aggressive invasive plant infestations). This is based on local government ordinance / policy and the input from their local public.

On the other County Forests the public has supported the use of pesticides in IPM through their approval of the Plans. In addition to long range plans, the public is able to provide feedback on the development of annual work plans, which guide the specific management activities scheduled for each year. This derogation request is on behalf of the FSC certified County Forests and County Forests contemplating affiliating with FSC in the future.

As a part of this derogation application process, additional stakeholder comments and support will be solicited by FSC-US National Initiative from a broad group of stakeholders.
### B. Forest Management Enterprise Specific Requirements

**Forest Management Enterprise:**

Wisconsin Department of Natural Resources, WI County Forest Program Certification Group Manager

101 S Webster Street – FR/4
PO Box 7921
Madison WI 53707-7921
(608) 264-9217

**FSC Certificate Registration Code:** SCS-FM/COC-083G (Wisconsin County Forest Program)

**Location /region:** Wisconsin, USA.

1. **SPECIFIED CONTROLS TO PREVENT, MINIMIZE, AND MITIGATE HAZARDS**

   **Specific controls that will be implemented to mitigate the hazard:**

   **Laws and Regulations**

   All herbicides registered for use in the U.S. are reviewed and regulated by the U.S. Environmental Protection Agency (EPA) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA 1974; 7 U.S.C. 135 et seq., Public laws 92-516, 94-140, and 95-356) and recent amendments. Herbicides sold in the United States must be registered with the Federal governmental and in some cases by state regulatory agencies. EPA regulations are enforced at the state level through approved agencies. These agencies administer federal legal requirements through training and enforcement programs within each state. Applicator certification or licensing, auditing, pesticide registration and enforcing the terms of the pesticide labels fall within the jurisdiction of the state agencies (Dept. of Agriculture, Trade and Consumer Protection in Wisconsin).

   **Wisconsin County Forest Operational Practices**

   The individual County Forests included under certificate # SCS-FM/COC-083G, are required through their FSC participation to prepare a written prescription for each herbicide application and to keep that on file. This is referenced in the 15-year County Forest Comprehensive Land Use Plans – 2006-2020 (Section 505). Application of pesticides is only made by trained applicators.

   - **Approved applicators**

     All herbicide applications on County Forest land are supervised by at least one person that is a licensed applicator through the WI Dept. of Agriculture, Trade, and Consumer Protection.

   - **Method of purchase**

     County Forest purchases of pesticides are consistent with the application needs and expected use. Chemical release and site prep procedures are described in each of the County Forest Comprehensive Land Use Plans. The Department of Natural Resources approves all County Forest Plans.

   - **Operational controls**

     All pesticides are applied with strict adherence to the EPA product label specifications, any applicable requirements of Chapter ATCP 29, DNR Manual Code 4230.1, and Wisconsin Administrative Code NR 150 (Environmental Analysis & Review Procedures of Procedures for Department Actions). Applicators must use equipment and methodologies prescribed on the product label or the equipment instructions to prevent significant human or environmental risk during, or after, application. Container rinsate must be applied or disposed according to label directions. Water needed in applications is to be obtained with equipment in a manner that fully protects the source from backflow, back-siphonage, overflow, leakage, spillage or any potential route of contamination. Any contracting for commercial pesticide application requires the contractor be licensed, employ licensed and certified applications in Wisconsin, and follow all
other requirements outlined in Chapter ATCP 29, Wis. Administrative Code.

Hexazinone (Velpar) applications - Velpar is not to be used on droughty sands or rocky soils with less than 1% organic matter. These are typically sites where we plant jack pine, which is intolerant of Velpar anyway. Release applications are made typically once for a 90 – 130 year rotation on red pine. Applications on wildlife openings are typically applied as spot treatments, further minimizing the amount of herbicide put on site.

2. PROGRAM TO IDENTIFY ALTERNATIVES TO A ‘HIGHLY HAZARDOUS’ PESTICIDE INCLUDING PREVENTATIVE SILVICULTURAL MEASURES.

A significant role of the U.S. EPA which regulates and controls pesticide use in the U.S. is to continually review and assess pesticides that are lower risk alternatives. Since 1996 the EPA has reviewed tolerances on nearly 10,000 chemicals and introduced new safety standards. As cumulative risk is evaluated and new standards are developed product labels are updated to reduce application rates or even remove products from use. This ongoing review is also incorporated into the North American Free Trade Agreement (NAFTA) and subsequently supported by similar initiatives in Canada. This program gives preference in pesticide registration to reduced risk products. As a result pesticide use in North America continues to develop lower risk products and application techniques. (U.S. EPA, 2007).

Indicator 6.6.b, United States Forest Management Standard requires that “All toxicants used to control pests and competing vegetation, including rodenticides, insecticides, herbicides, and fungicides are used only when and where non-chemical management practices are: a) not available; b) prohibitively expensive, taking into account overall environmental and social costs, risks and benefits; c) the only effective means for controlling invasive and exotic species; or d) result in less environmental damage than non-chemical alternatives (e.g., top soil disturbance, loss of soil litter and down wood debris). If chemicals are used, the forest owner or manager uses the least environmentally damaging formulation and application method practical. Written strategies are developed and implemented that justify the use of chemical pesticides. Whenever feasible, an eventual phase-out of chemical use is included in the strategy. The written strategy includes an analysis of options for, and the effects of, various chemical and non-chemical pest control strategies, with the goal of reducing or eliminating chemical use.” Therefore, conformance to indicator 6.6.b requires safe, low-risk applications when needed. Performance against label instructions (federal law) and state law is auditable as are on-the-ground effects. These should all be used to verify conformance to the standard.

Red Pine site locations (primary forest type where Velpar products are used) – The Wisconsin County Forests strive to site planted red pine stands on appropriate sites. Use of the Forest Habitat Typing system, soil mapping, and site visits all help our foresters ensure that red pine plantings are on suitable sites, avoiding both the droughty sands where Velpar cannot be used, and the more productive sites where hardwood competition is particularly aggressive. These tools help us to minimize herbicide use for site prep and potential future release.

On the DNR internet site (http://dnr.wi.gov/topic/forestmanagement/silviculturetrials.html) there is on-going research into improving silvicultural prescriptions, including herbicide applications. The trials are posted and available for County Forest personnel, DNR staff, and the general public. Herbicide tables are also maintained by DNR Forest Health staff to assist county foresters in keeping current on herbicide applications and to assist them in finding and selecting appropriate herbicides for the specific situation. These are available on the DNR internet site http://dnr.wi.gov/topic/foresthealth/herbicides.html.

The use of Garlon 4 (triclopyr), among other products and methods, is becoming more common in the maintenance of wildlife openings. It has proved effective in the spot treatment of woody vegetation. A primary concern for Velpar use in wildlife openings maintenance is being able to use up remaining Velpar product (primarily Pronone) as we convert to other pesticides and non-chemical maintenance methods. The use of Hexazinone for red pine release has long been a very effective treatment and alternatives are limited. It would be beneficial to allow for renewal of the derogation for 5 years so that field trials of other chemical and non-chemical treatments can be completed for red pine release treatments. Alternative products include herbicides containing glyphosate and triclopyr, but the success of these alternatives requires additional review. In Wisconsin many red pine stands are approaching or are at their desired rotation ages and it is essential that we have effective tools for regenerating and maintaining this important native forest type on our landscape.

In addition to the silvicultural trials mentioned above, County Forests are advocates of Integrated Pest Management. Each County Forest Comprehensive Land Use plan specifically addresses integrated pest management and directs use of effective and environmentally sound use of silvicultural, biological, chemical, and mechanical control of destructive agents. There is an on-going process to develop not only the most effective, but the most cost-effective way of completing site preparation or release work.

Incorporating mechanical site preparation and competition control into the silvicultural prescription for timber sales has become more commonplace in recent years. On some sites this practice has reduced the need for post-sale treatments and the necessity for future release of red pine sites. Additional mechanical site preparation treatments conducted post timber sale have also reduced release needs. Nearly all of the jack pine plantings originating in the 1930’s and 1940’s (Civilian
Conservation Corps plantings) have been harvested and regenerated. As a result, the reforestation efforts on the County Forests have been scaled back significantly from the efforts in the 1980’s and 1990’s. Total pesticide use on County Forests in Wisconsin has gone down accordingly.

Additionally, improvements in planting stock are continually sought, through genetic improvement, better nursery and/or greenhouse practices, and improvements in seedling handling and planting. More vigorous seedlings will promote higher survival and more rapid early height growth and root proliferation, resulting in less need for follow up weed control and herbicide use.

During the derogation period the proportion of pest control intended to be achieved with hexazinone is quite low (<5%), based on a history of fairly low use of this chemical over the past several years and based on our commitment to explore alternatives. The vast majority will be achieved via a combination of mechanical and non-“highly hazardous” chemical means; however, the proportion achieved via mechanical versus other chemical methods is difficult to quantify.
The Westervelt Company – Application form for a temporary derogation to use Hexazinone

A. General Requirements

Application Submission date: August 1, 2013

Name, and contact details of certification body requesting a temporary derogation:

Bureau Veritas

Active ingredient for which a derogation is being requested: Hexazinone

Trade name and formulation type of the pesticide: Oustar
Hexazinone – 63.2%
Sulfometuron Methyl – 11.8%

Method of application and application equipment: Aerial helicopter application and application using hand operated backpack sprayers.

Common and scientific name of the pest species: Grasses and herbaceous weeds

Name and FSC certification codes of certificate holders requesting a temporary derogation:

The Westervelt Company
Tuscaloosa, Alabama USA
BV-FM/COC-010674

Scope for which a temporary derogation is being requested:

Herbacious weed control to be used in the establishment of Loblolly and Longleaf pine forests in the SE (MS, AL, GA, SC, VA) United States. The Oustar will be applied 2-4 months after the seedlings are planted to reduce the competition from grasses and herbaceous vegetation.
1. Demonstrated need

Explain how the proposed use complies with the criteria for need specified below, including consideration of non highly hazardous alternatives and preventative silvicultural measures.

Need may be demonstrated where:

Apply where grass and herbaceous weeds are deemed to be a problem. Oustar will be used where it is the most effective herbicide treatment. This includes on coarse/sandy soils and over longleaf pine which is particularly sensitive to Imazypyr. Imazypyr is not a highly hazardous chemical and will be used where possible.

Oustar is the only economical means of controlling herbacious Weeds in certain situations. Imazypyr has significant detrimental effects on growth and survival in longleaf pine. It is by far the most economical treatment for treating loblolly plantings in sandy soils, requiring only 10-12 ounces per acre. Higher rates are required on clay loam soils.

Westervelt’s rotation for Loblolly pine is normally 20-25 years. The rotation for Longleaf pine is approximately 35 years. Loblolly will be thinned once at year 12-14. Longleaf may receive 2 thinnings at ages 18 and 25. Either species management regime will receive a single weed control application during the 1\textsuperscript{st} year following planting. Harvesting at thinning and clear-cut is done using fellerbuncher/skidder system.

2. Stakeholder consultation

Stakeholder consultation with the State BMP Coordinator (Alabama Forestry Commission) indicated that label directions and state BMPs should be followed. No problems have resulted from the use of this chemical. The Alabama Forestry Commission (AFC) has a Memorandum of Understanding with the Alabama Department of Environmental Management (ADEM) that AFC will be the front-line inspector of BMPs (including chemical application) and ADEM provides regulator enforcement in problem situations.

The Alabama Department of Environmental Management (ADEM) was also consulted. They advised following all label requirements (FIFRA requires) including keeping records of treatments.

Responses from neighboring landowners did not indicate concern about using hexazinone. Proper/labeled use of the herbicide was felt to be a requirement during application.

The most frequent comment from hunting clubs was to apply after hunting season. This request will be followed. One response from a person associated with a club was extremely negative. This hostile attack against industrial forestry was general in nature and not specific (or useful) to Hexazinone use. Hunting clubs are also representative of neighbors and general members of the community.

The applicators response was very favorable as expected. Chem-Air is very well regarded in the forestry field. There comments involving control measures stated: “Among all the Oustar acres Chem-Air has treated over the years, we have never had any violations, investigations or claims related to off-site movement of Oustar causing water contamination or other damage.
Oustar label requirements provide ample environmental safety measures to protect watersheds and surface waters.

A consultation response was received from The Nature Conservancy, who along with being an environmental organization is a neighbor with our Virginia property. We have conducted a cooperative restoration project with them involving planting Longleaf Pine on the FMU. They were very appreciative of being contacted and had no problems with the application of Hexazinone in an environmentally responsible manner.

B. Forest Management Enterprise Specific Requirements

Forest Management Enterprise:
FSC Certificate Registration Code:
Location /region:

1. Specified controls to prevent, minimise and mitigate hazards.

During the planting season of 2012-2013 Westervelt planted about 12,000 acres. Not all acres will be treated with Oustar. Only Longleaf plantings and Loblolly on sandy soils will receive Hexazinone. Previous experience estimates that this will be between 1000-2000 acres per year. The vast majority of weed control will be done with Imazapyr/Oust or Oust Extra added to the late site-prep treatment.

We will also use hand application (banding) in situations not conducive to aerial application. This reduces the amount of chemical applied per acre to about half and the application is very precisely targeted. There has been concern that hexazinone can experience movement in the soil. Our observation of controlled verses uncontrolled zones in all sites where banding is utilized seems to refute this concern.

Strict observance of Streamside Management Zone (SMZ) buffer to assure that chemical is prevented from “moving” into the stream. Shape file indicating SMZ’s and any additional prescribed buffers will be provided the applicator for precise control during the application.

Controls to mitigate social and environmental damage include, but are not limited to minimal application of chemical, adherence to label specifications regarding ounces per acre and monitoring of results to ascertain effectiveness for continued or non-use.

Employees of the certificate holder will not apply or handle the pesticide, a contractor will be retained with the specifics of application included in the contract. The contractor will be a state certified pesticide applicator. Contract will specify the use of appropriate PPE. Contract will specify and certificate holder will administer the contractor in proper disposal of containers. The applicator is required to monitor weather (temperature and wind speed) and record conditions (spray log) during the application to prevent application in unacceptable, risky conditions.

Our applicator Chem-Air in their formal comment stated: “Chem-air company policy is to take additional safety measures to ensure there are no off-site movement, run-off or water contamination issues arising from our application of Oustar. Examples of these measures include leaving buffer zones adjacent to all SMZs (Streamside Management Zones), and other boundaries in close proximity to surface or watersheds, avoid application to sites with standing water which could possibly run off-site and avoid making application prior to known significant
rainfall events. We are confident that these measures, in connection with the legal requirements contained in the Oustar label, make Oustar applications environmentally safe.”

Surveys of chemical application results are conducted annually on all tracts treated for site-prep and weed control to assess treatment effectiveness and to determine if any off-target damage occurred. This survey is the basis for improving processes regarding lowering application rates and buffer changes required to minimize off-target damage.

Records of application will be retained showing date, area and rate of application. Weather conditions including Temperature and wind speed are also recorded when making aerial applications.

2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures. Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

We will participate in the North Carolina State University and Virginia Tech University Forest Productivity Research Cooperative. This cooperative investigates new technologies that can improve management techniques for pine management. If herbicide trials are initiated around herbaceous weed control we will participate to gain additional knowledge about treatment thresholds and alternatives. At the minimum this knowledgeable group of scientists will stay abreast of the latest technology (other university and chemical company Research) and alternatives available.

Westervelt will also stay tuned into Forest Service and other university research involving alternatives in herbaceous weed control and hexazinone use.

Westervelt will also install operational trials in borderline situations where using hexazinone is questionable or the application rate might be reduced. This experience with trials will help us understand where we can reduce or eliminate hexazinone use. Testing alternative will include using Imazapyr as a replacement for Hexazinone in weed control treatments. Also tests will be conducted to eliminate the weed control application entirely by adding Oust Extra in late site-prep treatments. These studies will be conducted over the next 1-2 years in cooperation with applicators and DuPont chemical company representatives.
### RoyOMartin Company – Application form for a temporary derogation to use Hexazinone

**A. General Requirements**

<table>
<thead>
<tr>
<th><strong>Application Submission Date:</strong></th>
<th>June 6, 2014</th>
</tr>
</thead>
</table>
| **Name and contact details of certification body requesting derogation:** | Jamie L. Overton  
Forest Certification Coordinator, US Region  
Rainforest Alliance  
65 Millet Street, Suite 201  
Richmond, Vt 05477  
**Phone: (802)-923-3765**  
Fax: (802)434-3116  
Email:joverton@ra.org |
| **Active ingredient for which a temporary derogation is being requested:** | Hexazinone |
| **Trade name and formulation type of the active ingredient or formulation:** | Velpar L, Oustar |
| **Method of application and the application equipment:** | Applications include aerial application by helicopter (broadcast treatments) or ground application by tractor or backpack applicators (typically banded treatments) |
| **Common and scientific name of the pest species:** | Crabgrass  
Dogfennel  
Panicums  
Goldenrod  
Pokeweed  
Ragweed  
Nutsedge |
| **Name and FSC certification codes of certificate holders requesting a temporary derogation:** | RoyOMartin  
RA-FM/COC-000186 |
| **Scope for which a temporary derogation is being requested derogation:** | RoyOMartin forestlands in Louisiana, USA |
| **Requested time period for derogation:** | 5 years from the date of approval of this request. |
1. Demonstrated need

Hexazinone is used by ROM for the pre-emergent treatment control of weeds and grasses. Hexazinone inhibits photosynthesis, and is absorbed by plants both through the root system and through the leaves of the target species. The herbicide is usually applied within 30-60 days of plantation establishment of loblolly pine seedlings. ROM historically applies 0.5 pound ai/ac on 1% of its pine land annually being approximately 6,000 acres. This application rate is 6.4% of the United States’ Environmental Pollution Agency’s maximum recommended rate of 8 pounds per acre of active ingredient.

The control of competing vegetation allows more of the available site resources (water and nutrients) to be utilized by the crop trees. Since loblolly pines have a high tolerance to hexazinone, beneficial results in survival and growth are recognized.

Studies have recognized that control of weeds and grasses have increased the survival and growth of recently planted Loblolly seedlings. Without weed control, crop trees may die due to inability to compete for water and nutrients or growth rates may be so low that timber production becomes uneconomical. Effects can range from widespread mortality to severe depression of growth for indefinite periods. The effect competition has on loblolly seedling survival and growth has been demonstrated and replicated in numerous publications over many years (see for an example, Miller, James H., Zutter, Bruce R., Zedaker, Shep M., Edwards, M. Boyd, and Newbold, Ray M. 2003). The seedling mortality or growth suppression can have adverse effects on the current level of timber production and, consequently could negatively influence the current level of the Annual Allowable Cut (AAC). Thus, a potential risk to achieve or maintain the current level of sustainability of raw material needs of the mills. Many Louisiana communities’ prosperity directly relates to the fiber and solid wood product producing mills located within their respective areas.

Timber harvesting is a beneficially interactive, integrated silvicultural treatment maintaining forest health by regulating tree density and age. Although timber harvesting is beneficial to forest health, site productivity can be adversely impacted due to soil compaction and the displacement of nutrient-rich biomass. Any site degradation resulting from timber harvesting can be mitigated with weed control or a combination of weed control and site preparation methods. An ongoing study by Mason C. Carter, Thomas J. Dean, Ziyin Wang, and Ray A. Newbold (2006) has demonstrated that weed control, on some sites, mitigates soil compaction and the loss of nutrients from mechanized whole tree harvesting operations.

Using calendar year 2008, Roy O. Martin Companies forestry planted 8,809 acres. These acres were planted in areas where the site preparation methods included mechanical such as sub-soiling, 3N1 Bedding, Shear/Pile, Shear only, chemical site prep and burn, and burn only. The generally accepted goal for stems per acre on the Martin properties is 545 TPA with the species being primarily Loblolly Pine (Pinus taeda), however, small areas of Slash Pine (Pinus elliottii) are planted. Our Forest Managers use Hexazinone (Oustar®) as a first treatment of these newly installed pine plantings to implement Herbaceous Weed Control (HWC).

Relying on internal proprietary growth/yield programs the following data is revealed using as a basis treatment on an average acre of pine land as it applies to the Martin ownership. The rotation is set at 31 years with volumetric measurements being reported by age and starting at 5. The average tract is scheduled for thinning at age 13 and 21. The tract would receive an HWC treatment immediately after planting.
1. Demonstrated need

Comparing Non-Treatment (NT) versus Treatment (T);

<table>
<thead>
<tr>
<th>Non-Treated</th>
<th>Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant Height</td>
<td>59.7</td>
</tr>
<tr>
<td>QMD (inches)</td>
<td>8.5</td>
</tr>
<tr>
<td>Total Yield/Tons</td>
<td>71.2</td>
</tr>
<tr>
<td>PPW Yield/Tons</td>
<td>9.5</td>
</tr>
<tr>
<td>CNS Yield/Tons</td>
<td>61.3</td>
</tr>
<tr>
<td>Peeler Yield/Tons</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Above chart recites growth/yield model per acre. Using these specific numbers and applying average pricing this date for specified products generated, the following is projected:

<table>
<thead>
<tr>
<th>NT Tons</th>
<th>$/Stump</th>
<th>$/Product</th>
<th>Treated Tons</th>
<th>$/Stump</th>
<th>$/Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPW Yield/Tons</td>
<td>9.5</td>
<td>$8.00</td>
<td>$76.00</td>
<td>0.9</td>
<td>$8.00</td>
</tr>
<tr>
<td>CNS Yield/Tons</td>
<td>61.3</td>
<td>$12.00</td>
<td>$735.60</td>
<td>54.9</td>
<td>$12.00</td>
</tr>
<tr>
<td>Peeler Yield/Tons</td>
<td>0.4</td>
<td>$30.00</td>
<td>$12.00</td>
<td>25.7</td>
<td>$30.00</td>
</tr>
</tbody>
</table>

The return to the stump is obvious due to the treatment of the Herbaceous Weed Control Treatment. Costs of chemical, application, site preparation, planting are all included in the growth/yield model application.

The Martin Companies are very cognizant of cost and applications as they impact the profitability to the organization. Hexazinone, in the opinion of the Martin organization is a very cost effective and safe chemical to use in HWC applications. Referring to Table 1, The Relative Toxicity of Commonly Used Silvicultural Herbicides per article from http://www.forestproductivity.net/herbicides/safety.html with said article label of ANR-846, Reprinted Mar 1997, Ken McNabb, Extension Forester, Associate Professor, Forestry, Auburn University, the LD 50 (dose that is lethal to 50% of a test animal population, expressed as milligrams (mg) of chemical per kilogram (kg) of body weight) of active ingredient of Velpar® (containing hexazinone) is 1,690 mg as compared to Aspirin which is 1,700 mg, Malthion® (insecticide) with 370 mg and caffeine with 200 mg.

Regarding alternative or preventative practices, the Martin Companies reviews each tract planted and does not blanket treat every acre planted. Various contingencies include no treatment due to no need because of no grassy competition, reduced treatment by the banding method such that only the row of trees is treated and not the complete planted area and complete treatment with specified labelled applications as regulated by the various regulating bodies. Due to the locale, herbaceous treatment on most planted acres is a consideration due to the fact of the extended growing seasons,
1. Demonstrated need

The climate, the precipitation and the ever present invasive exotic threats. Steps must be taken early in the age of the pine tree establishment to ensure its survivability as well as merchantability. An additional alternative could be that the use of imazapyr would be used where practical and applicable as it is not on the FSC Highly Hazardous List. This alternative is used where it fits, but crop tree sensitivity and spectrum of competing weeds dictate that it is not a fit on all sites.
2. Stakeholder consultation

Included with consultation summaries provided as part of national coordinated consultation. Immediate potentially affected parties are consulted prior to operations as part of normal procedure.

ROM has sent to stakeholders a letter soliciting their comments concerning ROM’s use of hexazinone in its timber management operations. Stakeholders to be consulted, but not limited to, are landowners, regulatory officials, university researchers, recreational users, contractors, environmental groups. See attached list of stakeholders contacted and responses received.

B. Forest Management Enterprise Specific Requirements

Forest Management Enterprise:
RoyOMartin
Louisiana Timberlands
2189 Memorial Drive
Alexandria, La. 71303

FSC Certificate Registration Code:
RA-FM/CoC-000186

Location /region:
Louisiana, USA

1. Specified controls to prevent, minimize and mitigate the hazards

ROM contracts the application of hexazinone. Contract language states that contractor shall ensure that all personnel are legal to be working in the USA; and, contractor shall furnish the personnel necessary to operate the type of equipment approved by all Federal and State agencies governing the work to be performed; and that the operators shall be of the qualifications and in possession of the licenses(s) required by Federal and State agencies governing the work to be performed.

Because hexazinone is potentially mobile into streams, ROM mitigates this potential risk with vegetation strips, Streamside Management Zones (SMZ), adjacent to water bodies and are installed and maintained per “Recommended Forestry Best Management Practices of Louisiana” guidelines. (Note: ROM timberland is located exclusively in Louisiana.) The SMZ’s serve as natural filter strips preventing, or greatly reducing, the chance of hexazinone-contained runoff to be introduced to a body of water. No herbicide treatments are applied to these buffers and these areas act as natural sinks for any residual herbicide, intercepting herbicide before its movement into benthic habitats. ROM and its contractors currently use GIS modeling and modern GPS satellite location to monitor, record, and design flight plans that reduce the danger of overspray into protected areas and ensure only the targeted areas, not riparian buffers or benthic habitat are inadvertently treated. And, ROM requires its contractors not to apply hexazinone to sites having ‘standing’ water.
1. Specified controls to prevent, minimize and mitigate the hazards

The role of the Martin Forestry worker as it applies to HWC applications by air and ground are primarily as contract administrators, which denotes that these applications are contracted on a turn-key basis or whereby the contractor and his/her employees are actually involved with the mixing and applications of the product. Martin furnishes maps and shape files to the applicator which are then downloaded into aircraft, if applicable, and then treated according to the prescriptions denoted on the Map and Rate Sheets.

Martin workers verify the treatments, the application areas and the payment procedures. However, Martin does specify in the contract with the applicator all OSHA guidelines are to be followed for the protection of the worker and the contractor is also responsible for the proper PPE for his/her workers as specified by product labels. Martin Companies request, and have received, Pesticide Application Policies and Procedures from its current applicator and they are as follows:

### Pesticide Application Policies and Procedures

(This is a generic guideline for safety procedures on Martin Lands)

1: Pesticide Transportation & Storage

- All unopened and partially full containers shall be stored in a locked trailer per state law
- Prevent any leakage of pesticides from transportation and storage vehicles by inspecting containers for damage and ensuring that containers are properly sealed and stored
- Damaged containers should immediately be sealed and any leakage contained - see Spill Procedures. Transfer remaining pesticide to an undamaged container with proper labeling.

2: Mixing

- Maintain air gap when filling tank with water to prevent back flow
- PPE’s listed on the pesticide labels will be worn at all times when mixing herbicides or when working on application equipment.
- Read and follow all label directions for mixing
- Chemical mixing should only be done at the application site
- Mix chemicals only where possible spills will not enter streams, lakes, or any water bodies
- Do not mix or clean/flush tanks near any body of water or wellhead
- When containers are emptied, they shall be triple rinsed and the rinse added to the mix tank. Plastic or paper bags are to be emptied, cut on all sides to fully open the bag, and all pesticide added to the mix tank
- Anyone who mixes pesticides will have an Applicators License or Worker Protection Standards Pesticide Handlers ca

3: Decontamination

- PPE's will be washed daily
1. Specified controls to prevent, minimize and mitigate the hazards

- If skin is exposed to pesticides, wash with soap and water thoroughly
- If clothing becomes contaminated with pesticide residues they are to be removed, any exposed skin washed with soap and water, check label for any additional procedures
- Always have extra clean clothes to wear or utilize the clean coveralls in the decontamination kit

4: Empty Containers

- Once containers are properly rinsed, they shall be returned to contractors’ office location to be returned to the manufacturer or recycled.
- Bags shall be cut on all sides, opened fully, and emptied completely into the mix tank per state law. Then they shall be sealed in a trash bag and returned to a contractors’ office for disposal in a solid waste facility per state law.

5: Application Equipment

- All equipment must be free of leaks and have a functioning pressure gauge per state law.
- Boom should be capable of immediate shut off.

6: Application

- Applications will be planned to avoid direct and indirect entry of chemicals into any bodies of water or Streamside Management Zones
- Buffer zones should be left between swath and SMZ’z and any water bodies
- All restricted-use pesticides shall be applied under the supervision of a certified pesticide applicator
- Do not apply to open water unless specifically prescribed and approved for aquatic weed management
- Do not apply in the rain
- Do not apply when rain is eminent
- No applications when wind speed exceeds 10 MPH unless label is more restrictive, then label restrictions apply

7: Spill Procedures

- Immediately contain the spill
- Contact your supervisor
- Use absorbent material to soak up fluid
- All uncontained spills of more than one gallon liquid or 4 pounds dry weight must be reported.
1. Specified controls to prevent, minimize and mitigate the hazards

LA - Bobby Simoneaux  225/925-3763
AR - AR State Plant Board  501/225-1598
OK - DEQ & Pesticide Mgmt.  405/702-5100
TX - Texas Department of AG  713/666-8491

Emergency Contacts:

<table>
<thead>
<tr>
<th></th>
<th>Office</th>
<th>Home</th>
<th>Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robby Keen</td>
<td>318/425-5944</td>
<td>318/929-7497</td>
<td>318/469-4606</td>
</tr>
<tr>
<td>Mike Cage</td>
<td>318/425-5944</td>
<td>318/965-9944</td>
<td>318/469-4605</td>
</tr>
<tr>
<td>Shannon Taylor</td>
<td>870/246-5968</td>
<td>501-860-7018</td>
<td>318-470-1090</td>
</tr>
<tr>
<td>CHEMTREC</td>
<td>800/424-9300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BASF</td>
<td>800/832-HELP MONSANTO 314/694-4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOWELANCO</td>
<td>800/992-5994</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DUPONT</td>
<td>800/441-3637</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8: Helicopter Crash Procedures

- Secure and care for pilot and passengers if it can be done safely
- Call emergency personnel ie 911
- Call your supervisor
- Contain any leakage of pesticides and/or fuel if it can be done safely
- Contact FAA  # 225/358-6800
- NTSB  # 817/652-7820
- Contact Dept of Ag and Forestry if any leakage is of reportable amounts - see Spill Procedures
- Do not move any involved equipment - secure site for FAA

9: Adjacent Property

- No applications within 100 feet from the edge of the swath to any inhabited structure or within 1000 feet of any school grounds during normal school hours, unless the label is more restrictive, then the label shall apply per state law.

10: Record Keeping

- All application records shall be kept per state law.
2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures.

Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

<table>
<thead>
<tr>
<th>ROM is a proven player to implement environmentally favorable, state of the art integrated pest management products and methods that will achieve a sustained supply of forest products and services. Sustainability of universal forest resources is the measure or standard to implement current and future IPM products and methods. Forest managers read professional and technical reports, attend forestry seminars, consult with experts, and disperse the gained knowledge to their peers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>In some cases ROM has opted to control competing weed vegetation by mixing sulfometuron (OustTM, trade name) with late (October) site preparation treatments. This action has reduced the number of acres exposed to hexazinone. ROM is currently in the process of evaluating the results of such treatments and its effectiveness.</td>
</tr>
<tr>
<td>A hexazinone reduction practice that is currently being evaluated is a banded versus a broadcast application. The banding method, especially on sandy sites has a secondary benefit, Town ant (Atta texana) control. A residual vegetation strip resulting from a banded hexazinone application produces an alternative source of vegetative medium other than pine needles from recently planted seedlings. The town ant is a pest on ROM lands defoliating pine seedlings in extreme West Louisiana. These ants produce a trail of defoliated vegetation as well as creating large underground colonies disturbing natural pine rooting habitat. Noteworthy, is the hexazinone mobility factor/issue has not affected the non-targeted treatment zone between bands. Distinct, zones of controlled and uncontrolled weeds are observed in all sites where banding is used. This observation could be a refutation of the potentially severe concerns about the mobility of hexazinone. This use of banding does not appear to control the population of town ants, however, a banded treatment can somewhat mitigate the severe economic impact that these ants have on potential pine regeneration.</td>
</tr>
<tr>
<td>ROM is conducting a weed control trial using sulfometuron only. This trial will evaluate the effectiveness of an application without the hexazinone component as found in OustarTM. This trial will examine the biological, economic, and social impacts that this alternative will produce. Furthermore, Roy O. Martin Lumber Company, LLC participates in the Cooperative Research for Sustainable Silviculture and Soil Productivity. ROM is partnered with the United States Forest Service (USFS), Louisiana State University (LSU), and other timber companies to examine alternative silvicultural methods for weed control.</td>
</tr>
<tr>
<td>Intercompany strategy to approach replacement, reduction and/or removal of pesticide use (as it pertains to Hexazinone) is as follows:</td>
</tr>
<tr>
<td>Current &amp; Historical Hexazinone use on ROMLC lands</td>
</tr>
<tr>
<td>- Used exclusively for Herbaceous Weed Control (HWC) in forestry districts.</td>
</tr>
<tr>
<td>- Approximately 6-8K acres (1.0-1.4%of ownership) are planted and HWC treated annually. In the 2009 HWC treatments 69% of treated acres had Oustar® treatments and 31%of treated acres had Arsenal® Oust®. This ratio has been improved to 52% hexazinone and 48% imazapyr treatments.</td>
</tr>
<tr>
<td>- 13 ounces per acre of Oustar® is the standard prescribed treatment; Hexazinone is the A. I.</td>
</tr>
</tbody>
</table>
2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures.

Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

• 0.5315 lbs per acre is A. I. (Hexazinone) yield.

Strategy to Reduce Hexazinone:

• Future Oustar ROA (Rate of Application) will consider the minimum label recommendations per soil characteristics as shown below to achieve the percent rate reduction.

<table>
<thead>
<tr>
<th>SOIL TEXTURE</th>
<th>ROA PER LABEL</th>
<th>APPLY MINIMUM RATES</th>
<th>A. I. DISTRICT ACRES</th>
<th>DISTRICT TOTAL A. I.</th>
<th>CURRENT A. I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(oz.)</td>
<td>(oz.)</td>
<td>(lbs)</td>
<td>(K)</td>
<td>(lbs)</td>
</tr>
<tr>
<td>Course Textured</td>
<td>10-12</td>
<td>10</td>
<td>0.395</td>
<td>1.2</td>
<td>474</td>
</tr>
<tr>
<td>loamy sand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sandy loam sand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Textured</td>
<td>12-16</td>
<td>12</td>
<td>0.474</td>
<td>1.2</td>
<td>568.8</td>
</tr>
<tr>
<td>loam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sandy clay loam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>silt loam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fine Textured</td>
<td>16-19</td>
<td>16</td>
<td>0.632</td>
<td>0.6</td>
<td>379.2</td>
</tr>
<tr>
<td>clay loam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sandy clay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>silty clay loam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>silty clay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,422 &lt;8.4%&gt; 1,541</td>
</tr>
</tbody>
</table>


2. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures.

Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

Hexazinone Replacement, Removal Strategy

• A strategy is being employed to replace hexazinone with imazypyr where practicable.
• Further reductions in ROA, or even the removal of hexazinone use, would impact negatively forest productivity and, as a result, negatively impact optimum carbon sequestration rates.

See the Journal of Forestry (April 2001) article, titled CARBON SEQUESTRATION AND SOUTHERN PINE FORESTS, whereby a statement reads, “Intensive forest management (i.e., weed control, fertilization, and genetics) can increase net ecosystem productivity (NEP) and forest sequestration largely through increases in net primary productivity (NPP). Also related in the same article, “Unlike most broadleaf species, most coniferous species are able to absorb CO2 nearly year-round under favorable climatic conditions.”

Also, Borders and Bailey are cited with “Intensive management of southern pine plantations, using competition control, fertilization, and superior genotypes, can now increase productivity three fold.”

• ROMLC will continue to fully support and to actively strive to meet the goal stated in the introduction to FSC PESTICIDES POLICY (FSC-POL-30-001).
## Roseburg Resource Company – Application form for a temporary derogation to use Hexazinone

### C. General Requirements

<table>
<thead>
<tr>
<th>Application Submission Date:</th>
<th>July 8(^{th}), 2014</th>
</tr>
</thead>
</table>
| Name, and contact details of certification body requesting a temporary derogation: | Rainforest Alliance  
Jamie Overton, Forest Certification Coordinator –  
US Region  
65 Millet Street, Suite 201  
Richmond, Vermont 05477  
802-923-3765  
joverton@ra.org |
| Active ingredient for which a derogation is being requested: | Hexazinone  
(3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione) |
| Trade name and formulation type of the active ingredient or formulation: | Velpar DF  
Water dispersible granule |
| Method of application and application equipment: | Aerial helicopter application and application using hand operated backpack sprayers |
| Common and scientific name of the pest species: | Grasses and broadleaved weeds (native and non-native) |
| Name and FSC certification codes of certificate holders for which a temporary derogation is being requested: | Roseburg Resource Company  
SW-FM/COC-000134 |
| Scope for which a temporary derogation is being requested: | Roseburg ownership in California, USA  
Vegetation control in the early establishment of conifer plantations in Northern California. This derogation for Hexazinone will be for the control of grass or broadleaf vegetation during the critical early establishment phase in conifer plantations. |

### 3. Demonstrated need

Explain how the proposed use complies with the specified criteria for need, including consideration of non-highly hazardous alternatives and preventative silvicultural measures. (include a list of all non-
highly hazardous chemicals registered in the country)

**Statement of Pest Problem:**
Chemical vegetation management has repeatedly been shown to be the safest and most effective method for aiding in the establishment and growth of young conifer planted forests. Specifically, Hexazinone is one of the most widely used and most effective products in forestry. Soils in northern California are mostly well-drained volcanic sandy loams with fairly low moisture holding capacities. Water is the main limiting factor regarding tree survival and growth in young conifer plantations on Roseburg property (especially in regard to typical silvicultural methods of even-aged management), and it is critical to reduce all competition during the establishment of conifer plantations (Ponderosa pine, Douglas-fir, and true fir).

**Economics, Environmental, Technical Feasibility:**
Hexazinone has shown to be the safest, most economical, and most effective herbicide in our region for controlling broadleaf competition; it also has a much lower potential to impact water quality compared to mechanical methods, which have a high degree of ground disturbance. Hexazinone is only applied where plantations will suffer without treatment, and weather allows for successful application; all water courses are buffered in the treatment areas, and all safety measures are accounted for.

Hexazinone, used in accordance with labeling recommendations and today’s environmental mitigation measures has proven to be a very safe and effective tool in forestry. Extensive water monitoring over the last several decades in forestry has proven that Hexazinone can be kept out of water in forestry systems. Buffer zones, application techniques, spray additives, and proper site reconnaissance ensure safe and effective use.

**Social:**
Roseburg applies Hexazinone as minimally as possible, usually only once per rotation (50-80 years). Roseburg has made significant efforts to utilize chemicals that result in the least amount of applications, as well as participating in research to test alternatives, amounts, and timing that will result in best efficacy. Hexazinone is the only economical means of controlling grass and broadleaf species in young conifer plantations.

See Appendix I for a summary table of alternatives.

4. **Stakeholder consultation**

FSC-US National Initiative has taken charge of stakeholder consultation for this derogation.

In previous derogation applications, Roseburg has sent letters soliciting comments regarding the use of Hexazinone on timberlands in California. Stakeholders include representatives with a range of social, environmental, and economic interests.

Roseburg has consulted with stakeholders to provide comment on the use of Hexazinone on Roseburg timberlands in California for the current 2014 application. Comments will be included if received.

See Appendix II for consultation letter that was sent to stakeholders.
See Appendix III for list of stakeholders that were sent letters for consultation.

### D. Forest Management Enterprise Specific Requirements

| Forest Management Enterprise: | Roseburg Resource Company  
98 Mill Street  
Weed, CA 96094 |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FSC Certificate Code:</td>
<td>SW-FM/CoC-000134</td>
</tr>
<tr>
<td>Location /region:</td>
<td>Roseburg ownership, California, USA</td>
</tr>
</tbody>
</table>

3. Specified controls to prevent, minimise and mitigate hazards

Hexazinone is a herbicide with both pre- and post-emergent properties, it is effective against a number of herbaceous and woody weeds, and can be used effectively as a part of an Integrated Pest Management (IPM) program.

### Laws and Regulations

Prior to any pesticide being legally available for use in the US, it must first go through a comprehensive federal registration process. The Federal Environmental Protection Agency (E.P.A) regulates pesticides under two major statutes, Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the Federal Food, Drug and Cosmetic Act (FFDCA). The registration process involves over 120 tests on product chemistry, human and environmental assessment for food safety, tolerance information concerning pesticide residues on food, and proof the manufacturing process is reliable. In addition to the Federal registration process, the state of California through the Department of Pesticide Regulation (D.P.R.) requires a pesticide registrant to go through California's pesticide registration process. This involves more testing and data gathering specific to California. In 1996, the Federal Worker Protection Standards were also adopted to further protect applicators, field workers, mixers/loaders and other people that may come in contact with treated areas. Primarily, the act increased the scope of people who require pesticide safety training, increased restricted entry intervals and broadened the requirement for personal protective equipment.

On a local level, pesticide applications are monitored and enforced by the County Agricultural Commissioner, as well as the local Water Quality Board. Field inspections are carried out by the county for both ground and aerial applications. Use reports of all pesticide applications are filed within seven days of application.

### Roseburg Operational Practices

All applications made by Roseburg and their contractors adhere strictly to the pesticide label instructions. It is a violation of federal law to apply a pesticide in a manner inconsistent with its labeling. The intent of the pesticide label is to give clear and concise directions for use while minimizing risks to human health and the environment. The label has specific directions for rates of application, personal protective equipment, restricted entry intervals, hazards to humans and wildlife, special restrictions near water, lists of active ingredients, directions for container disposal, specific application instructions and signal word denoting the level of hazard. Roseburg adheres to strict guidelines for mitigating risks associated with pesticide applications. All chemical applications are applied by licensed applicators only.
Licensed California applicators are required to pass a rigorous exam to show competence, and may only keep their license after accumulating 20 to 40 hours of continuing education within their two year certification period. No applications are made unless a written recommendation has been obtained by a licensed Pest Control Advisor (PCA). PCA’s must have at least a bachelor’s degree in forestry, crop science, biology or related field. Pest Control Advisors must complete 40 hours of continuing education within their two year certification period. The written recommendation must be completed prior to the pesticide application, and on site during application along with maps of areas to be treated. Non treatment areas and their buffers must also be identified on these maps. Recommendations include such things as the pesticide(s) to be used, the rate at which the pesticide is to be applied, dilution, method of application, environmental conditions under which the pesticide can be applied, hazards and mitigation measures, label precautions, buffer widths, and directions for use.

All personnel including applicators, mixers/loaders, contractors and Roseburg employees who enter treated units within 30 days of the expiration of the restricted entry interval on the pesticide label are all safety trained on an annual basis by licensed professionals in the use and safety of pesticides. Any person applying, mixing/loading, or entering a treated unit within the restricted entry interval must wear coveralls, rubber gloves, safety goggles, shoes and socks.

During applications, on site decontamination facilities are available which include soap, disposable towels, clean change of clothes, eyewash and wash water. Emergency medical information is posted at the site for the nearest hospital. All herbicide containers are labeled with the product, dilution rate, signal word, EPA number, and the manufacturer’s name, address and phone number of the manufacturer. All workers are required to wash their hands before eating, drinking or using tobacco. Mixing and loading of restricted materials is only done by a licensed professional.

Prior to applications, a work meeting is conducted with the applicator to insure they understand all unit boundaries, buffer zones, property lines and any additional concerns the situation may pose.

**Other Considerations**

Protection of state waters is of the utmost concern. To our knowledge, no ground water contamination has ever occurred through leaching with any of the products used by Roseburg. There are many mitigation measures used for protection of water. Buffer zones are used with all pesticide applications. The width of buffer zones varies depending on product used, application method (ground or aerial), slope, soil type and type of water. Generally, buffer zones may range from 10 to 200 feet depending on the above circumstances. Hexazinone buffers tend to be wider, generally from 50 to 200 feet. Domestic water sources are buffered 75 to 200 feet, and non-timberland neighbors are buffered a minimum of 20 feet. Soil types are evaluated for runoff and leaching potential prior to application. Well drained soils with low organic matter percentages require larger buffers (> 50’). Steeper slopes are afforded a relatively larger buffer.

Application technology also plays a large role in mitigating drift. Helicopter applications use large nozzles which produce larger droplets minimizing drift. Also, along all water courses, sensitive areas and property lines, split boom applications are utilized. This is where the side of the boom closest to the sensitive area is shut off and the buffer is flown with the outside boom only, thus negating any rotor wash. Nozzle angle is also a critical factor reducing drift. Nozzles are at an angle from forty five degrees to ninety degrees straight back to reduce wind shear of the spray droplets. Helicopter applications are not flown in wind speeds greater than five miles per hour. Wind direction is also accounted for.
Applications are not flown when wind direction is taking spray particles towards sensitive areas. Roseburg also utilizes GPS to aid in boundary definition and location of heliports. The Roseburg representative also has radio communication with the pilot at all times. In extremely sensitive areas, ground spray operations are used instead of aerial applications. Buffer zones and sensitive areas are flagged ahead of time. Ground broadcast applications are carried out with the nozzles pointed in a downward direction to ensure proper placement of product. Applicators are instructed to spray away from water and sensitive areas when doing their buffer passes. Ground applications are not conducted in winds that exceed ten miles per hour. Large nozzles are also used that minimize drift. If needed, drift control agents may be added to the spray mix.

4. Program to identify alternatives to a ‘highly hazardous’ pesticide including preventative silvicultural measures. Describe the programs that are in place to identify alternatives, include a timetable and indicate research partners and targets:

Roseburg’s partnership with the Sierra Cascade Intensive Forest Management Research Cooperative has contributed to numerous studies to explore alternatives to FSC’s list of ‘highly hazardous’ herbicides. As a member of this cooperative, Roseburg has supported research projects investigating the long-term efficacy of manual treatments vs. chemical treatments in young plantations, long-term competition studies looking at various levels of herbaceous control, new application techniques to minimize chemical use, and stock type trials with and without vegetation control. Valuable data has been obtained from this cooperative, much of which supported what was already suspected. Manual or mechanical treatments without chemical use are ineffective and infeasible in Mediterranean climates, especially with the desire and legal obligations to establish adequate stocking in plantations.

Since the establishment of the Forest Stewardship Council Research Group in 2010, it has been a priority of the group to evaluate new chemistries for forestry site preparation or herbaceous release that may be an alternative to Hexazinone. These chemistries have both been used alone, or in combination to reduce rates of Hexazinone or other soil active herbicides and compared to the operational standard rated of Hexazinone alone. Several new herbicides were of interest due to low use rates, favorable environmental profiles, and proven efficacy in applications outside of forestry. The three alternative products for which we have data for are Milestone (aminopyralid), MAT 28 (aminocyclopyrochlor), and an experimental compound GF 9999. At the conclusion of the trials, Milestone did not provide adequate vegetation control by itself to be a suitable replacement for Hexazinone on any of the sites tested. The data did show that by adding a much lower rate of Velpar (Hexazinone) in combination with Milestone, some control was achieved; while still not as good of control as the operational standard of Hexazinone alone. MAT 28 proved to be unacceptable as a forest site preparation, mainly due to decreased control after several growing seasons, even when coupled with Hexazinone at lower rates. Hexazinone once again proved to be the most consistent, safest on conifers, and longest lasting treatment. While GF 9999 and Hexazinone have similar selectivity on conifers, trials indicate that Hexazinone alone had significantly more control than any rate of GF 9999 alone or the control.

Based on the data presented within these trials, it does not appear there is a suitable alternative to Hexazinone that provides adequate vegetation control and acceptable conifer tolerance. If the new products tested here were to be used in practice as an alternative to Hexazinone, it would most likely increase total herbicide use due to the need for repeat treatments. It does appear that Milestone and GF9999 may have a partial fit in combination with Hexazinone; but are not strong enough on their own to be feasible for adequate control. Due to conifer tolerance issues, MAT 28 is not acceptable as either a release or site preparation treatment in forestry at all.
Preventative Silvicultural Measures

Roseburg is primarily an even-aged management company; there isn’t a viable economic alternative to stay competitive in the forest products market for the products we produce without the application of Hexazinone. Improvements in planting stock are continually sought through genetic improvement, as well as improvements in seedling handling and planting. Stock continues to improve and grow more vigorously with the application; which promotes higher survival and more rapid early height growth; though removal of competition during the early establishment phase is essential for conifer survival.

Hexazinone, when used in according to label recommendations and today’s environmental mitigation measures has proven to be a very safe and effective tool in forestry. Extensive water monitoring over the last several decades in forestry has proven that Hexazinone can be kept out of ware in forestry systems. Buffer zones, application techniques, spray additives, and proper site reconnaissance ensure safe and effective use. The importance of vegetation management in the Western United States cannot be overstated. Extreme temperatures, limited rainfall, and extremely competitive herbaceous vegetation and brush can severely hinder establishing a new forest. Hexazinone has long been the most important and consistent herbicide used in western industrial forestry. The use of Hexazinone over the last several decades has reduced herbicide use as a whole, due to extremely broad spectrum control and longevity.

Roseburg Resources Company continues to explore all options for vegetation management to establish planted forest. While Roseburg has effectively diminished the number of entries and amount of herbicide applied, complete elimination is not economically viable. As a result, Roseburg continues to use all safe and effective options at its disposal, while exploring ways to keep herbicide use to a minimum.

See Appendix I for a table of Hexazinone alternatives.
### APPENDIX I

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Active Ingredient</th>
<th>Brand Name</th>
<th>Manufacturer</th>
<th>Tested for Site Prep or Release Treatment</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Grazing</td>
<td></td>
<td></td>
<td></td>
<td>Release</td>
<td>No long-term effects on vegetation or conifer survival and growth were achieved</td>
</tr>
<tr>
<td>Piling and Ripping (with and w/o chemicals)</td>
<td></td>
<td></td>
<td></td>
<td>Site Prep</td>
<td>Initial reduction of competing veg., Conifer establishment control would need follow-up chemical treatment; very expensive ($650+ /ha)</td>
</tr>
<tr>
<td>Mastication</td>
<td></td>
<td></td>
<td></td>
<td>Site Prep or Release</td>
<td>Still requires follow-up chemical treatment to maintain site suitable for conifer establishment</td>
</tr>
<tr>
<td>Herbicide</td>
<td>Imazaquin</td>
<td>Chopper</td>
<td>BASF Specialty Products</td>
<td>Site Prep or Release</td>
<td>Good for brush and hardwood control, conifer tolerance issues, but can reduce amount of hexazinone needed.</td>
</tr>
<tr>
<td>Herbicide</td>
<td>sulfometuron</td>
<td>Oust</td>
<td>DuPont Crop Protection</td>
<td>Site Prep or Release</td>
<td>Sustained root, height, and collar growth of planted conifers; very poor conifer survival (hexazinone is a better alternative), also listed on Highly Hazardous List</td>
</tr>
<tr>
<td>Herbicide</td>
<td>atrazine</td>
<td>atrazine</td>
<td>various</td>
<td>Site Prep</td>
<td>Only controlled annual grasses and broadleafers (not an alternative to hexazinone)</td>
</tr>
<tr>
<td>Herbicide</td>
<td>aminopyralid</td>
<td>Milestone</td>
<td>Dow AgroSciences</td>
<td>Site Prep or Release</td>
<td>Does not provide adequate veg. control to be used as a replacement for hexazinone</td>
</tr>
<tr>
<td>Herbicide</td>
<td>amiprophospyrphor</td>
<td>MAT 28</td>
<td>DuPont Crop Protection</td>
<td>Site Prep or Release</td>
<td>Decreased control after several growing seasons, even when coupled with hax at lower rates, hexazinone is more consistent alone at normal rates</td>
</tr>
<tr>
<td>Herbicide</td>
<td>experimental compound</td>
<td>GF 9999</td>
<td>various</td>
<td>Site Prep</td>
<td>Similar conifer selectivity, much less control than hax</td>
</tr>
<tr>
<td>Herbicide</td>
<td>combination</td>
<td>Milestone + Valpar</td>
<td>Dow and DuPont</td>
<td>Site Prep or Release</td>
<td>Low rates of vetap combined with hax does provide some control, still not as good of control as operational standard of hexazinone alone</td>
</tr>
<tr>
<td>Herbicide</td>
<td>triclopyr</td>
<td>Garlon</td>
<td>Dow AgroSciences</td>
<td>Site Prep or Release</td>
<td>Not labeled for release over pine and can cause severe damage, does not replace hexazinone</td>
</tr>
<tr>
<td>Herbicide</td>
<td>glyphosate</td>
<td>Ascend XRT II</td>
<td>Dow AgroSciences</td>
<td>Release</td>
<td>Post-emergent broad spectrum control only.</td>
</tr>
<tr>
<td>Herbicide</td>
<td>2,4-D</td>
<td>Weedone LHE EC</td>
<td>Nuform Americas</td>
<td>Release</td>
<td>Post-emergent selective control only.</td>
</tr>
<tr>
<td>Herbicide</td>
<td>fluroxypyr</td>
<td>Visa</td>
<td>Dow AgroSciences</td>
<td>Release</td>
<td>Post-emergent selective control only.</td>
</tr>
</tbody>
</table>