

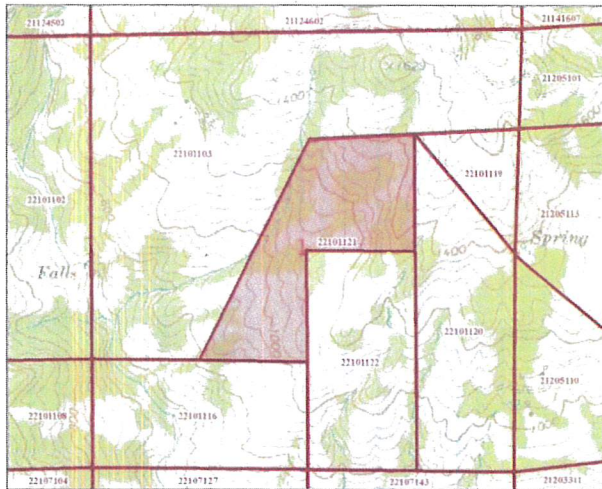
Water Resource Protection Plan (WRPP)

for

APN 221-011-021

Located at
8200 Salmon Creek Road, Miranda,
Humboldt County, California

February, 2017



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Water Resource Protection Plan (WRPP)
APN 221-011-021
8200 Salmon Creek Road
Miranda, California

1.0 PROJECT SUMMARY

This report documents Pacific Watershed Associate's (PWA)¹ Water Resource Protection Plan (WRPP) for APN 221-011-021, located at 8200 Salmon Creek Road, Miranda, CA, as shown on Figure 1. This property is located approximately 2.5 miles southwest of Meyers Flat, Humboldt County, CA, and hereinafter is referred to as the "Project Site." Based on either site conditions and/or total cultivation area, this property falls within **Tier 2** of the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023, Waiver of Waste Discharge and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects ("Order"). Properties that fall into Tier 2 of the Order are required to develop a WRPP. Therefore, as required, this WRPP has been developed for you based on site inspections made by PWA on your property. PWA's recommendations for any remediation or corrective actions are a result of water quality requirements under the Order, including Best Management Practices (BMPs) designed to meet those requirements (Appendix A). This WRPP documents the findings of a site visit conducted on March 18, 2016 by PWA geologists Christopher Herbst and Kathy Moley, when a reconnaissance level investigation of the property was conducted and the conditions of the property noted.

2.0 CERTIFICATIONS, LIMITATIONS AND CONDITIONS

This WRPP has been prepared by, or under the responsible charge of, a California licensed professional geologist or engineer at PWA and all information herein, including treatment recommendations, are based on observations, data and information collected by PWA staff.

This WRPP has been prepared to: 1) describe the general conditions of the property at the time of our inspection; 2) summarize the site conditions and how they relate to the NCRWQCB twelve (12) Standard Conditions of the Order; 3) provide recommendations for remediation and/or correction of existing or potential water quality threats or impacts; and 4) recommend work to be conducted on this property to meet the 12 Standard Conditions of the Order. The analysis and recommendations submitted in this WRPP are based on PWA's evaluation of the Project Site and your activities which fall under the Order.

In this WRPP we have described the current conditions of the property and any water resource and water quality risk factors we observed at the time of our site inspection. PWA is not responsible for problems or issues we did not observe on our site inspection, or for changes that have naturally occurred or been made to the property after our site review. The interpretations and conclusions presented in this WRPP are based on a reconnaissance level site investigation of inherently limited scope. Observations are qualitative, or semi-quantitative, and confined to surface expressions of

¹ PWA is an approved Third Party Program for the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023, Waiver of Waste Discharge and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects ("Order").

limited extent and artificial exposures of subsurface materials. Interpretations of problematic geologic, geomorphic or hydrologic features such as unstable hillslopes, erosional processes and water quality threats are based on the information available at the time of our inspection and on the nature and distribution of existing features we observed on the property.

We have also included recommendations for remediation and/or correction that are based on these observations. The recommendations included in this WRPP are professional opinions derived in accordance with current standards of professional practice, and are valid as of the date of field inspection. No other warranty, expressed or implied, is made. Furthermore, to ensure proper applicability to existing conditions, the information and recommendations contained in this report shall be regularly reevaluated and it is the responsibility of the landowner and/or lessee operating under the Order to ensure that no recommendations are inappropriately applied to conditions on the property that have changed since the recommendations were developed.

If site conditions have changed for any reason, the site should be reevaluated and the WRPP revised and updated as required. These conditions include any changes in land management activities or property conditions that have occurred since our site visit (regardless of what they are, how they occurred or who performed them). Similarly, if the landowner/lessee uses portions of this property not identified or covered under the current WRPP, this Water Resource Protection Plan will need to be updated with the new information, including possible additions or changes to the recommended remedial or corrective actions and BMPs (Appendix A).

If the property owner has enrolled their property under the Order, they are responsible for complying with all the requirements thereunder, regardless of who is operating or cultivating on that property. If the property is being formally or informally leased to an operator, and the lessee has enrolled under the Order, then the lessee is responsible for complying with the Order's requirements, including the WRPP and related recommendations and requirements. If the lease expires or the lessee is not otherwise available or does not respond to information requests by the NCRWQCB or PWA, then the landowner automatically assumes responsibility under the Order for the requirements therein and for all related penalties or actions brought by the NCRWQCB.

If at any time in the future the property is to transfer ownership, it is the responsibility of the current owner, or their representatives, to ensure that the information and recommendations contained herein are called to the attention of any future owner or agent for the property. Unless this WRPP is modified by the NCRWQCB, or another approved Third Party Program representative, the findings and recommendations contained in this WRPP shall be utilized as a tool while implementing the recommendations made within this WRPP. Necessary steps shall be taken to see that contractor(s) and subcontractor(s) carry out such recommendations in the field in accordance with the most current WRPP and BMP standards.

As a Third Party Program, PWA will be responsible for the data, interpretations and recommendations developed by PWA, but will not be responsible for the interpretation by others of that information, for implementation of corrective actions by others, or for additional or modified work arising out of those plans, interpretations and recommendations. PWA assumes no liability for the performance of other workers or suppliers while following PWA's recommendations in the WRPP, unless PWA is under contract to perform or oversee those

activities. Additionally, PWA is not responsible for changes in applicable or appropriate standards beyond our control, such as those arising from changes in legislation or regulations, or the broadening of knowledge which may invalidate or alter any of our findings or recommended actions.

Any WRPP plan review or construction management services that may be needed or identified in the recommendations sections of this report are separate tasks from the preparation of this WRPP, and are not a part of the contract under which this WRPP was prepared. If requested, additional PWA field inspections, surveys, WRPP revisions/updates, project layout, design, permitting, construction oversight/management, or other related services arising from tasks described and recommended in the WRPP may be performed under separate agreements requiring advance notice and contracting.

PWA's services consist of professional opinions and recommendations made in accordance with generally accepted principles and practices. No warranty, expressed or implied, or merchantability or fitness, is made or intended in connection with our work, by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings. If the client desires assurances against project failures, they shall obtain appropriate insurance through their own insurance broker or guarantor.

This WRPP is considered a living document and shall be updated at least annually, or sooner if conditions have changed or land management actions have been undertaken after our site inspection. As an official part of the Waiver Program, this WRPP (including all its text, appendices, maps and photos) shall remain onsite and available for NCRWQCB staff to inspect and review upon request.

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Insert Figure 1 here.....

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3.0 INTRODUCTION

This Water Resources Protection Plan (WRPP) summarizes the results of Pacific Watershed Associates' (PWA) site visit and subsequent analysis and documentation of site conditions on APN 221-011-021, located at 8200 Salmon Creek Road, Miranda, California, as shown on Figure 1 and hereinafter referred to as the "Project Site." The WRPP describes and addresses the required elements and compliance with the 12 Standard Conditions established by the North Coast Regional Water Quality Control Board's (NCRWQCB) Order No. 2015-0023 to protect water quality from cannabis cultivation and related activities (Order). PWA has identified certain areas where the Project Site does not fully meet all 12 of the Standard Conditions of the Order. Section 4, below, identifies and discusses each of the 12 Standard Conditions as related to your property with regard to compliance with the NCRWQCB's Order.

The WRPP contains the following required sections:

1. Legible map (Figure 2) depicting the required site elements and features associated with the 12 Standard Conditions of the Order;
2. Description of current site conditions, compliance with the 12 Standard Conditions, and prioritized remediation or corrective actions needed to bring the site into compliance with the requirements of the Order;
3. A monitoring and inspection plan to ensure BMPs used to protect and prevent impacts to water quality are being implemented as recommended by PWA (implementation monitoring), and that they are effective (effectiveness monitoring);
4. A water use plan, including water sources, water use and storage rights documentation, monthly water use documentation (quantity), and water conservation measures that are employed to prevent adverse impacts to water quality and water quantity in the watershed;
5. List of fertilizers and chemicals stored and used onsite, including a log of the frequency and quantity of these materials used.

4.0 STANDARD CONDITIONS CHECKLIST FOR APN 221-011-021 as of 3/18/2016

The NCRWQCB has developed a set of 12 Standard Conditions that shall be followed and implemented to protect and improve water quality as required under the NCRWQCB's Order. For a property to become compliant with the Order, all 12 Standard Conditions must be fully satisfied.

The following section details the specific requirements listed and described in the Order for each of the 12 Standard Conditions. Each Standard Condition has from 1 to 6 sub-requirements (*listed in italic type*), each of which must be satisfied to protect water quality and comply with the Order. The checklist developed by PWA for your property indicates: 1) whether the Standard Condition or Standard Condition sub-requirement was adequately met as of the date of PWA's field inspection, 2) PWA's observations and comments related to the Standard Condition or Standard Condition sub-requirement, 3) whether a relevant photo has been taken and included in the WRPP, and 4) recommended corrective or remedial actions that need additional work to meet the requirements of the Order.

Insert Map 2 here.....

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In Section 5 of this WRPP, PWA has provided a summary prioritized list (Table 1) of the recommended treatments and actions to be implemented by you to meet the requirements of the Order. PWA will consult with you to review the WRPP document and findings, and to set a preliminary schedule for implementation of the recommended measures for achieving compliance with the Order. Please note that some of the PWA recommended actions are based on regulatory requirements and deadlines, while others can be scheduled to fit the needs of both you and your property.

4.1 Standard Condition #1. Site Maintenance, Erosion Control and Drainage Features

- a) *Roads shall be maintained as appropriate (with adequate surfacing and drainage features) to avoid developing surface ruts, gullies, or surface erosion that results in sediment delivery to surface waters.*

Meets condition? Yes

Observations/Comments: Approximately 0.75 mile of road was inspected during the site inspection. The roads within the Project site are well maintained, rocked and stable with only minor rills in isolated spots. On the other hand, the road surfaces lack sufficient drainage features to disperse road surface runoff along long segments of road that concentrate road surface runoff. This creates larger impacts to the discharge points of the relatively limited road drainage features.

Photos: None

Corrective or remedial actions needed: Optional suggestions (not a required corrective action): Install permanent road drainage structures which shape the road surface (such as rolling dips) where feasible to disperse road surface runoff; reduce surface erosion and lower annual road maintenance costs. Maintain the roadside ditch as necessary to ensure proper drainage and disperse runoff.

- b) *Roads, driveways, trails, and other defined corridors for foot or vehicle traffic of any kind shall have adequate ditch relief drains or rolling dips and/or other measures to prevent or minimize erosion along the flow paths and at their respective outlets.*

Meets condition? No

Observations: Even though in general, road surface erosion is fairly low, the Project Site roads lack sufficient drainage structures to effectively disperse flow. There is a gully below DRC #1's outlet, caused by concentrated ditch flow passing through the culvert.

Photos: Photos 16-17

Corrective or remedial actions needed: See 4.1a. above. A combination of rolling dips, outsloping, and/or additional ditch relief culverts can be used to disperse road surface and ditch flow. Specific recommendations include installing a rolling dip just up-grade of the upper-most greenhouse pad, but down-grade of the entry point to the mixing tanks site (Tanks 3-5). Install another rolling dip immediately down-grade of the shop before the road grade steepens too much. Additional DRCs could be installed: one up-grade of DRC#1 in order to try to split the amount of flow heading to DRC #1, and install another DRC up-grade of DRC #2 to split flow and hydrologically disconnect flow heading to DRC #2. Due to the proximity of DRC #2's outlet and downspout to the creek, it will likely always be hydrologically disconnected so any amount of road draining to it would be a positive step toward protecting water quality.

- c) *Roads and other features shall be maintained so that surface runoff drains away from potentially unstable slopes or earthen fills. Where road runoff cannot be drained away from an unstable feature, an engineered structure or system shall be installed to ensure that surface flows will not cause slope failure.*

Meets condition? No

Observations/Comments: The runoff coming out of DRC #1's outlet runs downslope to a short road or terrace. Flow spreads out and drains across the flat before spilling over a sharp break-in-slope down a near vertical slope directly of a Class II stream. The slope appears stable at the present, though the amount of water (as indicated by the gully below the outlet) and the sharp break-in-slope indicate a significant potential exists for outflow to destabilize the steep streamside slope.

Photos: Photo 18

Corrective or remedial actions needed: The recommended road surface drainage treatments may be effective at cutting off a large portion of flow delivering to this location. If so, it may be adequate to reduce the risk of slope failure to a level where it may not be a concern. The more direct treatment is to install another ditch relief culvert on the lower road (directly downslope of DRC #1) and install a downspout (or rock armor) that will convey flow to the base of the steep slope.

- d) *Roads, clearings, fill prisms, and terraced areas (cleared/developed areas with the potential for sediment erosion and transport) shall be maintained so that they are hydrologically disconnected, as feasible, from surface waters, including wetlands, ephemeral, intermittent and perennial streams.*

Meets condition? No

Observations/Comments: A significant portion of the Project road between the terminal end and SC#1 is hydrologically connected. Two distinct points of connectivity include DRC #1 and SC#1.

Photos: Photos 15-18, 19-22

Corrective or remedial actions needed: See 4.1a. above. Due to the close proximity of streams on both sides of the road, and limited opportunities to drain the road, it will be difficult to hydrologically disconnect the project roads. Paving the road would eliminate the potential for road surface erosion to deliver to the stream network, though targeted road surface drainage structures would go a long way to reducing the impacts and frequency of hydrologic connectivity.

- e) *Ditch relief drains, rolling dip outlets, and road pad or terrace surfaces shall be maintained to promote infiltration/dispersal of outflows and have no apparent erosion or evidence of soil transport to receiving waters.*

Meets condition? No

Observations/Comments: There is a gully below DRC #1, a ditch relief culvert from concentrated ditch flow from passing through the culvert.

Photos: Photos 16-17

Corrective or remedial actions needed: Create a rock armored spillway leading from the outlet of DRC #1 down to the road below the outlet. The flow will need to be

controlled from that point as well to prevent further erosion from occurring. See comments from 4.1c above.

- f) *Stockpiled construction materials are stored in a location and manner so as to prevent their transport to receiving waters.*

Meets condition? Yes

Observations/Comments: Currently, construction materials are stockpiled in a location with no erosion or transport to surface waters.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #1. - General comments and recommendations: Approximately 0.75 mi. of road was inspected, which was in general, in very good condition with only minor signs of surface erosion. However, some road segments lack sufficient drainage structures to effectively disperse flow resulting in much of the road being hydrologically connected and excessive flow passing through the limited existing drainage structures. The roads in the Project Site are in general, quite steep and traverses topography that sometimes confines the road to a narrow ridge bounded on either side by streams, making it difficult to drain and hydrologically disconnect. Paving the road would eliminate the potential for road surface erosion to deliver to the stream network, though targeted road surface drainage structures would go a long way to reducing the impacts and frequency of hydrologic connectivity.

Besides the two stream crossings, there were two other road surface drainage points associated with sediment delivery:

- 1) DRC #1, a ditch relief culvert (DRC) with a gully below the outlet due to excessive ditch water passing through it, and
- 2) DRC #2, where a cutbank slide buried the inlet of the culvert, forcing ditch flow onto the road surface ultimately delivering to a stream crossing (SC #1).

Besides cleaning out the inlet of DRC #2, we recommend road shaping and/or installing additional road drainage structures (where feasible), such as rolling dips and DRCs, to break up the road and disperse flow at frequent intervals. In general, install rolling dips near breaks in road grade, especially just up-grade of steep sections of road and at the first opportunity below steep road segments. Drainage features must be strategically placed to avoid unstable areas or erosion prone slopes. Factors to consider include the amount of water to be discharged at a location, the slope shape, grade, and underlying geologic materials.

Specific recommendations include installing a rolling dip just up-grade of the upper-most greenhouse pad, but down-grade of the entry point to the mixing tanks site (Tanks 3-5). Install another rolling dip immediately down-grade of the shop before the road grade steepens too much.

Install another DRC up-grade of DRC #2 to split flow and hydrologically disconnect flow heading to DRC #2. Another DRC could be installed up-grade of DRC#1 in order to try to

split the amount of flow DRC #1 receives, however the stability of the hillslope below any proposed DRC installation location would need to be carefully evaluated to prevent the potential of triggering a mass-wasting event.

Create a rock armored spillway leading from the outlet of DRC #1 down to the road below the outlet. Install another ditch relief culvert on the lower road (directly downslope of DRC #1) and install a downspout (or rock armor) that will convey flow to the base of the steep slope.

4.2 Standard Condition #2. Stream Crossing Maintenance

- a) *Culverts and stream crossings shall be sized to pass the expected 100-year peak streamflow.*

Meets condition? Yes

Observations/Comments: Two stream crossings on the property (SC#1 and SC#2).

Photos: Photos 21-24 (SC#1) and Photo 25 (SC#2)

Corrective or remedial actions needed: None

- b) *Culverts and stream crossings shall be designed and maintained to address debris associated with the expected 100-year peak streamflow.*

Meets condition? Yes

Observations/Comments: Stream crossings appear to be adequately sized based on field criteria. It appears that SC#1 and SC#2 have been upgraded in the last 10 years or less.

Photos: None

Corrective or remedial actions needed: None

- c) *Culverts and stream crossings shall allow passage of all life stages of fish on fish-bearing or restorable streams, and allow passage of aquatic organisms on perennial or intermittent streams.*

Meets condition? Yes

Observations/Comments: Both stream crossing culverts are set at the natural channel grade and are not located on a fish bearing stream. They do not appear to represent an impediment to aquatic organisms.

Photos: None

Corrective or remedial actions needed: None

- d) *Stream crossings shall be maintained so as to prevent or minimize erosion from exposed surfaces adjacent to, and in the channel and on the banks.*

Meets condition? Yes

Observations/Comments: No current fillslope or stream bank erosion was observed that appeared to be caused by the stream crossings.

Photos: None

Corrective or remedial actions needed: None

- e) *Culverts shall align with the stream grade and natural stream channel at the inlet and outlet where feasible.*

Meets condition? Yes

Observations/Comments: See 4.2c above.

Photos: None

Corrective or remedial actions needed: None

- f) *Stream crossings shall be maintained so as to prevent stream diversion in the event that the culvert/crossing is plugged, and critical dips shall be employed with all crossing installations where feasible.*

Meets condition? Yes

Observations/Comments: The stream crossings did not hold a diversion potential.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #2. - General comments and recommendations: Both SC#1 and SC#2 have been upgraded to what appears to be adequately sized culverts installed properly with no diversion potential.

4.3 Standard Condition #3. Riparian and Wetland Protection and Management

- a) *For Tier 1 Dischargers, cultivation areas or associated facilities shall not be located within 200 feet of surface waters. While 200 foot buffers are preferred for Tier 2 sites, at a minimum, cultivation areas and associated facilities shall not be located or occur within 100 feet of any Class 1 or 2 watercourse or within 50 feet of any Class 3 water course or wetlands.*

Meets condition? No

Observations/Comments: The cultivation area is spread out on a narrow ridge running approximately north-south between two streams. There is a small Class III stream in close proximity to the north side of the ridge, with a much larger and more incised Class II stream to the south. The cultivation area is separated into two main areas along this ridge, in relatively close proximity to one another: 1) an upper pad containing three greenhouses, and 2) a lower flat containing two large greenhouses.

The north side of the upper cultivation area (and back end of greenhouses #3-#5) are within 20 to 35 feet of the Class III stream. The north side of the pad containing the three greenhouses extends almost all the way to the edge of the creek (Photos 9, 12-13). The south side of the greenhouses #1-2 appear to be close to the 75 ft. minimum buffer from the larger Class II stream that is located on the south side of the ridge containing the cultivation area (Photo 8, 14).

Photos: Photos 7-14

Corrective or remedial actions needed: The north end of greenhouses #3-#5 will need to be shortened (moved back) to ensure a 50 ft. minimum setback from the Class III stream. Ensure that the front side of the greenhouses are outside the 75 ft. minimum setback from the Class II stream on the north side. Short of these actions, a variance

will need to be sought, along with actions to provide protections to mitigate the close proximity to the streams.

- b) *Buffers shall be maintained at natural slope with native vegetation.*

Meets condition? No

Observations/Comments: Because of the close proximity of the upper cultivation pad to the Class III stream (to the north), it is assumed that some of the native vegetation was cleared during construction and grading activities. There may have been some clearing of native vegetation on the south side of the cultivation areas as well (Photo 8). Based on vegetation patterns visible on imagery in other areas in the general vicinity of the Project Site, it does not appear that there was a large amount of clearing of trees or larger types of vegetation.

Photos: Photos 8-13

Corrective or remedial actions needed: Replant riparian buffers with native vegetation and maintain until they are self-sufficient.

- c) *Buffers shall be of sufficient width to filter wastes from runoff discharging from production lands and associated facilities to all wetlands, streams, drainage ditches, or other conveyances.*

Meets condition? No

Observations/Comments: See comments from 4.3a above.

Photos: None

Corrective or remedial actions needed: See comments from 4.3a above. It may be possible using a combination of French drains and ditches to try to isolate or re-direct potentially nutrient rich water associated with the greenhouses toward a location farther down the ridge below the lower cultivation area where nutrient rich water will have a better chance to infiltrate and be filter before reaching the stream network.

- d) *Riparian and wetland areas shall be protected in a manner that maintains their essential functions, including temperature and microclimate control, filtration of sediment and other pollutants, nutrient cycling, woody debris recruitment, groundwater recharge, streambank stabilization, and flood peak attenuation and flood water storage.*

Meets condition? No

Observations/Comments: See comments from 4.3b above.

Photos: None

Corrective or remedial actions needed: See comments from 4.3b above.

Standard Condition #3. - General comments and recommendations: For this Project Site, the cultivation areas are located within 200 feet of watercourses (Figure 2). The cultivation area is tightly sandwiched between two creeks and creates a challenge to mitigate for potential impacts associated with the cultivation-related activities. The north side of the upper-most greenhouse pad was constructed right up to the edge of a small Class III stream and does not meet the minimum riparian setbacks detailed in the Order. It is questionable whether or not the front side of the greenhouses meet the minimum setbacks as well. The slope buffer is probably less than adequate to serve as a filter for any

errant waste or entrained sediment. Though the degree of vegetative clearing associated with the cultivation areas does not appear to be large, there were observable impacts.

In addition, the shop/indoor nursery is likewise located within 200 ft. of a Class II stream, though the structure is located farther than the 75 ft. minimum allowed buffer distance.

4.4 Standard Condition #4. Spoils Management

- a) *Spoils shall not be stored or placed in or where they can enter any surface water.*
Meets condition? Yes
Observations/Comments: See general comment below.
Photos: None
Corrective or remedial actions needed: None
- b) *Spoils shall be adequately contained or stabilized to prevent sediment delivery to surface waters.*
Meets condition? Yes
Observations/Comments: See general comment below.
Photos: No
Corrective or remedial actions needed: None
- c) *Spoils generated through development or maintenance of roads, driveways, earthen fill pads, or other cleared or filled areas shall not be sidecast in any location where they can enter or be transported to surface waters.*
Meets condition? No
Observations/Comments: See general comment below.
Photos: Photos 9-13
Corrective or remedial actions needed: See general comments below.

Standard Condition #4 - General comments and recommendations: As previously addressed, spoils material associated with construction of the upper-most greenhouse pad was sidecast along the edge of a small Class III stream. It appears that the potential for a shallow fillslope failure off the edge of the pad is relatively low. There is greater potential for some minor surface or gully erosion if surface drainage patterns change over time and if concentrated water flows down the perched fillslope. There has been an attempt on the part of the operator to manage runoff and outflow from a French drain system to prevent flow from draining down this slope (Photo 13). The flex pipe associated with the French drain system is resting on the top of the surface and hold potential to fail and create problems, if not properly maintained. Spoils material appears to be relatively rocky, which generally reduces erosion potential.

It is recommended that if the north ends of the greenhouses are shortened to stay within the 50 ft. minimum setback requirements, that side of the greenhouse pad should be pulled back to remove all perched fill with potential to deliver to the creek. Graded slopes should not exceed 50% upon treatment. In addition, a combination of grading, berms, roof gutter drains, and French drains should be installed to create a relatively low maintenance

drainage system to prevent water from draining down fill-slopes in close proximity to the creek. In addition, fill-slopes should be covered in mulch and densely planted with native vegetation to aid in stabilizing the spoils material.

4.5 Standard Condition #5. Water Storage and Use

- a) *Size and scope of an operation shall be such that the amount of water used shall not adversely impact water quality and/or beneficial uses, including and in consideration with other water use operations, instream flow requirements and/or needs in the watershed, defined at the scale of a HUC 12 watershed or at a smaller hydrologic watershed as determined necessary by the Regional Water Board Executive Officer.*

Meets condition? Unknown

Observations/Comments: See general comment below.

Photos: None

Corrective or remedial actions needed: A Water Budget should be developed to determine the required volume of water storage you will need so as to forbear (not divert surface flows) during the low flow period from May 15 through October 31 each year. A Water Monitoring Plan will also need to be developed and implemented to document the exact timing and volume of your water diversion, storage and use throughout the year (see general comments below).

- b) *Water conservation measures shall be implemented. Examples include use of rainwater catchment systems or watering plants with a drip irrigation system rather than with a hose or sprinkler system.*

Meets condition? No

Observations/Comments: No cultivation activities occurred during the 2016 growing season. In the past, water conserving strategies do not appear to have been utilized and irrigation appear to have been comprised of controlled hand watering.

Photos: None

Corrective or remedial actions needed: Employ current conservation techniques if cultivation activities continue. Evaluate and employ: 1) timed or volume-limited drip irrigation; 2) irrigation scheduling; 3) capturing and storing rainwater and 4) the use of cover crops during rotations and winter, to protect and increase soil fertility. Begin quantifying water use, testing drip rates, using timed and/or volume limited drip emitters, and incorporating water holding amendments and native soil during the initial soil preparation at the start of the season. Other water conservation measures should continue to be investigated and employed in order to most effectively maximize water use efficiency and minimize or eliminate summer diversions, including additional water storage and rainwater harvesting that will allow you to forbear in the dry summer months.

- c) *For Tier 2 Dischargers, if possible, develop off-stream storage facilities to minimize surface water diversion during low flow periods.*

Meets condition? No

Observations/Comments: There is a relatively small amount of potential water storage potential compared to the expected need based off the size and scope of the cultivation infrastructure. Currently the Project Site has approximately 20,000 gallon water storage capacity and all of the storage comes in the form of tanks.

Photos: None

Corrective or remedial actions needed: Develop a water budget to determine overall water needs for both domestic and irrigation uses during the dry season. The water budget and water monitoring is needed to ensure you limit or eliminate diversion of surface flows for cultivation purposes during the dry season low flow period from May 15- October 31. It is recommended that a significant amount of water storage (100,000-200,000 gallons) be added to support the operation, once it commences. Adding rainwater-fed water storage, in the form of an off-stream pond and /or rigid water tanks, is encouraged.

d) *Water is applied using no more than agronomic rates.*

Meets condition? Unknown

Observations/Comments: According to the landowner, water is applied sparingly, as needed, using controlled hand watering.

Photos: None

Corrective or remedial actions needed: To verify compliance and further refine water use efficiency, start measuring and recording your average water usage on a per plant basis, based on type and size of plant pot, full term versus short season (light deprivation) plant, and type of irrigation. Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided. This will allow you to refine the Water Budget for your operation and verify agronomic rates of watering.

e) *Diversion and/or storage of water from a stream should be conducted pursuant to a valid water right and in compliance with reporting requirements under Water Code section 5101.*

Meets condition? No

Observations/Comments: According to the operator, there has been one point of diversion (POD) on a Class II stream on the property (Map 2). There was no active diversion during the 2016 season due to a lack of cultivation activities on the property. To legally divert surface waters for domestic and commercial purposes, you will need to file for water rights. See general comments below.

Photos: None

Corrective or remedial actions needed: You will need to file an Initial Statement of Diversion and Use (see below). You may want to apply for a Small Domestic Use Appropriation (SDU) to cover your domestic use requirements such as drinking, bathing, cooking and fire control. As it currently stands, according to regulatory requirements, this type of water right cannot be used for commercial crop irrigation. The SWRCB is in the process of developing a small irrigation appropriative water right in this region and you will need to file for this type of appropriative water right once it becomes available. The landowner should consult with SWRCB, Division of Water Rights to determine if it is necessary to apply to appropriate water through a permit. If you plan to continue flow diversions for your agricultural water needs, you need to file and obtain water rights for your parcel, or provide other documentation of your legal water rights. Work with the SWRCB to determine if any of the following are applicable to your site:

- Initial Statement of Diversion and Use (ISDU)
http://www.waterboards.ca.gov/waterrights/water_issues/programs/diversion_use/docs/intl_stmnt_form.pdf
- Small Domestic Use (SDU) Appropriation Registration
http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/sdu_registration.pdf

4) Additionally, if you are directly diverting water from a jurisdictional spring or stream, you are required to file a Lake and Streambed Alteration Agreement (LSA) with the California Department of Fish and Wildlife (CDFW):

- Lake and Streambed Alteration Agreement (LSA).
<https://www.wildlife.ca.gov/Conservation/LSA>

Note: As opposed to employing one or more surface water diversions, irrigation waters could be secured by developing rainwater capture systems or drilling a well.

f) *Water storage features, such as ponds, tanks, and other vessels shall be selected, sited, designed, and maintained so as to insure integrity and to prevent release into waters of the state in the event of a containment failure.*

Meets condition? No

Observations/Comments: Water tanks #3 and #4 are perched near the edge of a break-in-slope directly above a Class II stream. These tanks have been used as fertilizer mixing tanks for use in irrigating the greenhouses. Due to their proximity to the stream, they are considered a potential threat to water quality.

Photos: Photos 5-6

Corrective or remedial actions needed: The two 2,500 gallon tanks will need to be moved outside the 75 foot buffer to the Class II watercourse.

Standard Condition #5 - General comments and recommendations: Currently, there are five (5) storage tanks totaling approximately 20,000 gallons of water storage on the Project Site (Figure 2). Though not currently in use, all tanks were fed from a single diversion located in a Class II watercourse.

At this time PWA recommends the following approach to water security on your property: 1) registering your diversion with the SWRCB by filing an Initial Statement of Use and Diversion. Once a small irrigation use appropriation becomes available in this area, file for this type of appropriation. 2) develop a water monitoring plan to log water production at the diversion, as well as water storage and water use; 3) develop a water budget to determine the storage volumes required for forbearing during the low flow period (May 15 – October 31); and 4) if necessary, increase water storage capacity through construction of an off-stream, rainwater-fed pond or the addition of rigid tank storage to service your irrigation needs during the dry summer months from May 15 through October 31 each year.

PWA highly recommends, and state agencies may require, that you install flow meters on your water tanks and/or on your diversion lines, to accurately document your diversion

volumes and rates. You will need to document the amount of water you are diverting, storing and using through time. PWA has created a simple log sheet to help you monitor your water usage

4.6 Standard Condition #6. Irrigation Runoff

- a) *Implementing water conservation measures, irrigating at agronomic rates, applying fertilizers at agronomic rates and applying chemicals according to the label specifications, and maintaining stable soil and growth media should serve to minimize the amount of runoff and the concentration of chemicals in that water. In the event that irrigation runoff occurs, measures shall be in place to treat/control/contain the runoff to minimize the pollutant loads in the discharge. Irrigation runoff shall be managed so that any entrained constituents, such as fertilizers, fine sediment and suspended organic particles, and other oxygen consuming materials are not discharged to nearby watercourses. Management practices include, but are not limited to, modifications to irrigation systems that reuse tailwater by constructing off-stream retention basins, and active (pumping) and or passive (gravity) tailwater recapture/redistribution systems. Care shall be taken to ensure that irrigation tailwater is not discharged towards or impounded over unstable features or landslides.*

Meets condition? Unknown

Observations/Comments: See general comments below.

Photos: None

Corrective or remedial actions needed: Ensure that French drains that might intercept nutrient laden irrigation water do not discharge water where it can connect to the stream network.

Standard Condition #6 - General comments and recommendations: Irrigation has been limited to controlled hand watering and no runoff gullies or any other signs of irrigation runoff were observed. Even with the close proximity of the upper-most greenhouses to the small Class III stream, it is not likely that runoff will leave the greenhouse area unless the French drains intercept heavy watering and discharge flow in close proximity to the stream. Once the greenhouses are modified to come into compliance with setback requirements, it will be even more unlikely that irrigation runoff will have potential to deliver to the stream network without some kind of major oversight or accident.

According to the Order, irrigation and fertilization shall occur at agronomic rates and chemicals shall be applied according to the label instructions and specifications. Agronomic rates are those rates of application of water, fertilizers and other amendments that are sufficient for utilization of the crop being grown, but not at a rate that would result in surface runoff or infiltration below the root zone of the crop being grown.

In the event that irrigation runoff occurs, or could occur, the discharger shall ensure that contaminated runoff does not enter nearby watercourses. If needed, this can be accomplished by constructing or designing containment measures, including sediment basins, berms, infiltration ditches and/or other Best Management Practices (BMPs), as needed, to contain and control surface runoff (see Appendix A).

4.7 Standard Condition #7. Fertilizers and Soil Amendments

- a) *Fertilizers, potting soils, compost, and other soils and soil amendments shall be stored in locations and in a manner in which they cannot enter or be transported into surface waters and such that nutrients or other pollutants cannot be leached into groundwater.*

Meets condition? Yes

Observations/Comments: All fertilizer, soil amendments or any plant related chemical that are not directly being used within the planting beds or greenhouses are being stored in a watertight shop.

Photos: None

Corrective or remedial actions needed: When not being used on the planting beds or in greenhouses, all fertilizers, soil amendments, potting soils and compost shall continue to be stored within the watertight shop or in a stable location with no chance of delivery to surface waters. Also see general comments and recommendations below.

- b) *Fertilizers and soil amendments shall be applied and used per packaging instructions and/or at proper agronomic rates.*

Meets condition? Unknown

Observations/Comments: There were no records from past years to verify whether the Project Site was in compliance with this section of the Order.

Photos: None

Corrective or remedial actions needed: To verify compliance with the Order, you are required by the Order to keep detailed records of the timing and volume of any fertilizers and/or other soil amendments you use in your operations. They can be recorded on log sheets such as those provided in Appendix E or by using some other record keeping method. Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided. Also see general comments and recommendations below.

- c) *Cultivation areas shall be maintained so as to prevent nutrients from leaving the site during the growing season and post-harvest.*

Meets condition? No

Observations/Comments: At the time of the inspection, the greenhouses had no covers and raised beds were for the most part, uncovered as well. Due to the close proximity cultivation areas are to nearby watercourses, it is assumed that there have been impacts to surface waters.

Photos: Photos 7-11, 14

Corrective or remedial actions needed: If greenhouses are not covered, tarp or cover soil when you store spent soils during the wet season (November 1 – May 14) to prevent nutrient leaching. You may also plant cover crops in spent pots, holes and beds to enrich soil and lock up nutrients and reincorporate the cover crops as a green mulch to help build soil health and fertility.

Standard Condition #7 - General comments and recommendations:

Past cultivation activities took place almost entirely in greenhouses. At the time of the inspection, the greenhouse covers were off and interior raised beds were for the most part, uncovered. When storing spent soil through the wet season, it should be covered or stored

in a location where it has no chance of leaching nutrients into the stream network. It did appear that there were shelves and storage areas in the shop such that fertilizers and soil amendments were likely properly stored indoors in previous growing seasons.

Ensure that growing amendments stored indoors, in the shop, or inside the greenhouses during use, such that they are protected from the elements.

Under the Order, you are required to keep track of the timing and volume of fertilizers and other soil amendments that are applied. This can be done using a simple log form we have provided in Appendix E.

4.8 Standard Condition #8. Pesticides/Herbicides

- a) *At the present time, there are no pesticides or herbicides registered specifically for use directly on cannabis and the use of pesticides on cannabis plants has not been reviewed for safety, human health effects, or environmental impacts. Under California law, the only pesticide products not illegal to use on cannabis are those that contain an active ingredient that is exempt from residue tolerance requirements and either registered and labeled for a broad enough use to include use on cannabis or exempt from registration requirements as a minimum risk pesticide under FIFRA section 25(b) and California Code of Regulations, title 3, section 6147. For the purpose of compliance with conditions of this Order, any uses of pesticide products shall be consistent with product labelling and any products on the site shall be placed, used, and stored in a manner that ensures that they will not enter or be released into surface or ground waters.*

Meets condition? N/A

Observations/Comments: If chemical pesticides and herbicides are used in the future, they should be properly stored in a watertight location, secure from rodents and other wildlife. In order for the Site to be compliant with this condition the use of chemical pesticides and herbicides shall be consistent with product labeling.

Photos: None

Corrective or remedial actions needed: All pesticides, herbicides and related materials (e.g., fungicides) must be used and applied consistent with product labeling. When present, these chemicals should be stored within enclosed buildings in such a way they cannot enter or be released into surface or ground waters. Under the Order you are required to document the type, timing and volume of pesticide, herbicide, and fungicide use on log sheets provided in Appendix F1.

Standard Condition #8 - General comments and recommendations: No pesticide or herbicide chemicals were observed on the site during our inspection. When present, pesticides and herbicides should be stored within enclosed buildings in such a way they cannot enter or be released into surface or ground waters. Have separate storage areas for incompatible materials such as amendments/chemicals and petroleum products (see standard condition #9 general comments below).

For the health of the environment and your workers, you are encouraged to utilize organic or biologic controls, rather than highly toxic petro-chemicals, to prevent pest and mildew problems. Several safe alternatives are available.

Under the Order you are required to keep records (logs) of the type, timing and volume of pesticides and herbicides used in your operations. This can be done using a simple log form, such as the one included in Appendix F1. Additionally, for any pesticide use you must comply with any Pesticide Registration Requirements. See Appendix E2 included in the NCRWQCB Order, or on their web site at:

http://www.waterboards.ca.gov/northcoast/board_decisions/adopted_orders/pdf/2015/150728_Appendix_E2_DPR_MJ%20Pesticide%20Handout.pdf

4.9 Standard Condition #9. Petroleum Products and other Chemicals

- a) *Petroleum products and other liquid chemicals, including but not limited to diesel, biodiesel, gasoline, and oils shall be stored so as to prevent their spillage, discharge, or seepage into receiving waters. Storage tanks and containers must be of suitable material and construction to be compatible with the substance(s) stored and conditions of storage such as pressure and temperature.*

Meets condition? No

Observations/Comments: There is currently one large diesel storage tank on site (Photo 29), located under cover next to the generator shed. . This tank has a secondary containment basin to contain fuel in the case of a spill and is considered compliant with the terms of the Order. There were several small gas cans stored under cover on the side of the shop that were sitting on the ground and lacked any kind of secondary containment. These gas cans were relatively new and had the “no-spill” dispensers so the potential for a substantial spill is very low.

Photos: Photos 27 – 29

Corrective or remedial actions needed: 1) All petroleum products onsite will need to be stored under cover and off the ground and in a secondary containment basin (tote, tub, impermeable basin/floor, etc.) capable of containing the entire stored volume. 2) You should not store petroleum products in the same building/area as combustible or hazardous materials such as soil amendments, fertilizers, pesticides/herbicides, and other hazardous chemicals (see general comments below). 3) Diesel storage tanks that are not in use should have a sign mounted on them clearly stating ‘NOT IN USE.’ 4) Because you are storing more than 55 gallons of petroleum products or other liquid chemicals (including but not limited to diesel, biodiesel, gasoline and oils) you are required to develop and submit a Hazardous Material Business Plan (HMBP) and a Petroleum Storage Spill Prevention, Control and Countermeasures (SPCC) Plan for your Project Site. See the details in the Summary, below.

- b) *Above ground storage tanks and containers shall be provided with a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation.*

Meets condition? No

Observations/Comments: See comments for 4.9a above.

Photos: Photos 27 – 29

Corrective or remedial actions needed: See comments for 4.9a above.

- c) *Dischargers shall ensure that diked areas are sufficiently impervious to contain discharged chemicals.*

Meets condition? N/A

Observations/Comments: N/A

Photos: None

Corrective or remedial actions needed: None

- d) *Discharger(s) shall implement spill prevention, control, and countermeasures (SPCC) and have appropriate cleanup materials available onsite.*

Meets condition? Yes

Observations/Comments: A spill prevention cleanup kit is kept onsite to help clean up small spills.

Photos: None

Corrective or remedial actions needed: You will continue to have one or more spill prevention cleanup kits onsite and easily assessable at all times. They should be located in areas where fuel is stored and utilized to help clean up small spills.

- e) *Underground storage tanks 110 gallons and larger shall be registered with the appropriate County Health Department and comply with State and local requirements for leak detection, spill overflow, corrosion protection, and insurance coverage.*

Meets condition? N/A

Observations/Comments: N/A

Photos: None

Corrective or remedial actions needed: None

Standard Condition #9 - General comments and recommendations: There is currently one diesel storage tanks on site, located next to the generator shed and under cover and with a secondary containment basin. There also were several small gas cans stored on the ground under cover on the side of the shop. These lacked secondary containment bins. The Order requires all petroleum products and other liquid chemical storage tanks including generators to be stored under cover and off the ground, and have secondary means of containment (tote, tub, etc.). The diesel storage tank and any generator which is not in use needs to have a sign stating 'NOT IN USE.' Based on the total volume of petroleum stored on site, you must complete and submit a Hazardous Materials Business Plan to Humboldt County Division of Environmental Health to be compliant with the Order and County requirements. You must also prepare a Petroleum Storage Spill Prevention, Control and Countermeasures (SPCC) Plan for your operations.

Hazardous Material Business Plan (HMBP) - Note that the State of California requires an owner or operator of a facility to complete and submit a Hazardous Material Business Plan (HMBP) if the facility handles a hazardous material or mixture containing a hazardous material that has a quantity at any one time during the reporting year equal to or greater than: 55 gallons (liquids), 500 pounds (solids), or 200 cubic feet for compressed gas

(propane) used for the cultivation operations. If at any time during the year your operations exceed any one of these quantities, you need to prepare and file a HMBP for your operation. Information regarding HWBPs can be found at <http://ca-humboldtcounty.civicplus.com/DocumentCenter/Home/View/3224>.

Additionally, while it is not explicitly stated in the Order, please note that the Humboldt County Division of Environmental Health (HCDEH) also requires that anyone that has over 55 gallons or more of any petroleum liquid at any time of the year, including fuels and waste oil, develop a HMBP.

Proper storage of hazardous materials (e.g., flammable liquids or gasses, many agricultural chemicals, oxidizers, acids, caustic substances) is essential for maintaining safe operations and for protection of the environment. Commercial operations that store hazardous materials are required to prepare a hazardous materials business plan (HMBP) and maintain Material Safety Data Sheets (MSDS) for each hazardous chemical that they store or use. County health agencies may require HMBPs to be submitted for their review. The HMBP information must be communicated to employees annually and be kept in a location that is readily accessible by employees. MSDSs explain how to medically treat a person that has been exposed to a hazardous substance and how to safely cleanup a spill.

Finally, the Order requires that a Petroleum Storage Spill Prevention, Control and Countermeasures (SPCC) Plan be developed for the site (see the CA-EPA fact sheet: <http://www.rivcoeh.org/Portals/0/documents/guidance/hazmat/FactSheetSPCC.pdf>).

Hazardous liquids and chemical storage - Generally, incompatible hazardous materials must be stored in separate locations, with distinct secondary containment vessels for each type of material. Secondary containment is required for hazardous liquids and must be sized to contain a spill volume equivalent to the largest hazardous material container or 10% of the total volume, whichever is greater. Flammable and combustible hazardous materials must be separated from oxidizers by a distance of no less than 20 feet. The following guidelines should be followed when handling and storing hazardous materials.

Always label containers with the substance inside for both hazardous and non-hazardous materials. For flammable hazardous materials, make certain that an appropriate fire extinguisher is available nearby the storage area. Dry powder fire extinguishers are the most versatile. Water filled fire extinguishers should not be used on certain types of hazardous material fires (e.g. water-reactive metals, strong acids, petroleum).

- Acids (e.g., hydrochloric acid, pool cleaner, citric acid) must be segregated from:
 - ✓ Reactive metals such as sodium, potassium, magnesium, etc.
 - ✓ Flammable and combustible materials.
 - ✓ Chemicals which could generate toxic or flammable fumes when mixed.
 - ✓ Bases.

- Bases (e.g., Portland cement, lime, lye, or drain cleaner) must be segregated from:

- ✓ Acids, metals, organic peroxides and flammable liquids, and other easily ignitable materials.
 - ✓ Solvents
 - ✓ Oxidizing acids and oxidizers.
- Oxidizers (e.g., ammonium nitrate, ammonium phosphate, oxygen gas cylinders) must be segregated from:
- ✓ Combustible and flammable liquids and gasses (e.g. petroleum, acetylene cylinders, solvents) with at least 20 feet of separation.
 - ✓ Reducing agents such as zinc, alkali metals, and formic acid.
- Flammable materials (e.g., gasoline, fuses, gunpowder, acetylene cylinders) must be segregated from:
- ✓ Oxidizers, caustic materials, acids, and bases.

It is good housekeeping practice to store compatible hazardous materials exclusively away from agricultural chemicals. Although uncommon, even some organic agricultural amendments may be reactive, caustic, ignitable, or corrosive. Segregation of hazardous materials from non-hazardous materials eliminates the potential for cross-contamination of agricultural amendments and exposure of workers to hazardous fumes or residues.

4.10 Standard Condition #10. Cultivation-Related Wastes

- a) *Cultivation-related wastes including, but not limited to, empty soil/soil amendment/fertilizer/pesticide bags and containers, empty plant pots or containers, dead or harvested plant waste, and spent growth medium shall, for as long as they remain on the site, be stored at locations where they will not enter or be blown into surface waters, and in a manner that ensures that residues and pollutants within those materials do not migrate or leach into surface water or groundwater.*

Meets condition? Yes

Observations/Comments: The site appeared clean and free of any cultivation related waste.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #10 - General comments and recommendations: Based on field observations, it is PWA's opinion that the Project Site was compliant with the cultivation-related wastes condition.

We encourage you to chip or shred your plant stalks and compost them after harvest. If you burn the stalks, you must first obtain burn permits from CAL FIRE and the North Coast Unified Air Quality Management District (or other relevant jurisdiction for your area). You can then recycle the ash and add minerals to the soil by mixing the ash into your spent pots and plant holes prior to planting a cover crop at the end of the season. Other cultivation-

related waste should be kept contained and located greater than 200 feet from streams or wetlands.

4.11 Standard Condition #11. Refuse and Human Waste

- a) *Disposal of domestic sewage shall meet applicable County health standards, local agency management plans and ordinances, and/or the Regional Water Board's Onsite Wastewater Treatment System (OWTS) policy, and shall not represent a threat to surface water or groundwater.*

Meets condition? No

Observations/Comments: The Project site has an approved OWTS system design including a backup leach field. The building permit is simply being held up until the property gets an approved LSAA (1602 permit) from CDFW for the stream diversion.

Photos: None

Corrective or remedial actions needed: 1) Once the LSAA is approved, follow up with the county to move forward with the installation of the approved OWTS system.

- b) *Refuse and garbage shall be stored in a location and manner that prevents its discharge to receiving waters and prevents any leachate or contact water from entering or percolating to receiving waters.*

Meets condition? Yes

Observations/Comments: All refuse and garbage is both secured properly and periodically hauled offsite to be disposed of at an appropriate waste disposal facility.

Photos: None

Corrective or remedial actions needed: None

- c) *Garbage and refuse shall be disposed of at an appropriate waste disposal location.*

Meets condition? Yes

Observations/Comments: All refuse and garbage is both secured properly and periodically hauled offsite to be disposed of at an appropriate waste disposal facility

Photos: No

Corrective or remedial actions needed: None

4.12 Standard Condition #12. Remediation/Cleanup/Restoration

- a) *Remediation/cleanup/restoration activities may include, but are not limited to, removal of fill from watercourses, stream restoration, riparian vegetation planting and maintenance, soil stabilization, erosion control, upgrading stream crossings, road outsloping and rolling dip installation where safe and suitable, installing ditch relief culverts and overside drains, removing berms, stabilizing unstable areas, reshaping cutbanks, and rocking native-surfaced roads. Restoration and cleanup conditions and provisions generally apply to Tier 3 sites, however owners/operators of Tier 1 or 2 sites may identify or propose water resource improvement or enhancement projects such as stream restoration or riparian planting with native vegetation and, for such projects, these conditions apply similarly.*

Appendix A accompanying the NCRWQCB Order, (and Appendix A in your WRPP), includes environmental protection and mitigation measures that apply to cleanup activities such as: temporal limitations on construction; limitations on earthmoving and construction equipment; guidelines for removal of plants and revegetation; conditions for erosion control, limitations on work in streams, riparian and wetland areas; and other measures.

These protection and mitigation measures have been developed to prevent or reduce the environmental impacts and represent minimum, enforceable standards by which cleanup activities shall be conducted under this Order.

Meets condition? Yes

Observations/Comments: No remediation/cleanup/restoration required.

Photos: None

Corrective or remedial actions needed: None

Standard Condition #12 - General comments and recommendations: No major site remediation or clean-up work that otherwise threatened water quality was identified at the Project Site. All corrective and remedial actions needed to satisfy the other 11 Standard Conditions have been outlined above.

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5.0 PRIORITIZED CORRECTIVE ACTIONS AND SCHEDULE TO REACH FULL COMPLIANCE

The following check list should be followed to become fully compliant with the Order. Please see the detailed comments and recommendations above for a more complete description of the problems and the needed corrective actions and monitoring requirements.

Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)						
Standard Condition Requiring Action	Treatment Priority	Schedule	Summary of Corrective Actions/Recommendations (see more detailed listing of corrective actions in Section 4. above)	Map Point and Photo #	Estimated Cost	Date Completed
4.1 Site Maintenance, Erosion Control and Drainage Features	Moderate	October 15, 2018	<ul style="list-style-type: none"> - We recommend carrying out road shaping and/or installing additional road drainage structures (where feasible), such as rolling dips and DRCs, to break up road surface drainage and disperse flow at frequent intervals. - Clean the inlets of the ditch relief culverts DRC #1 and DRC #2 to restore functionality and prevent plugging. - Install a rolling dip just tip-grade of the upper-most greenhouse pad, but down-grade of the entry point to the mixing tanks site (Tanks 3-5). Install another rolling dip immediately down-grade of the shop before the road grade steepens too much. - Install another DRC approximately half-way between DRC #2 and the shop in order to split flow and to reduce the hydrologic connectivity of DRC #2. Another DRC could be installed up-grade of DRC#1 in order to try to split the amount of flow DRC #1 receives, however the stability of the hillslope below any proposed DRC installation location should be carefully evaluated before-hand to prevent the potential of triggering a mass-wasting event. - Create a rock armored spillway leading from the outlet of DRC #1 down to the road below the outlet. Install another ditch relief culvert on the lower road (directly downslope of DRC #1) and install a downspout (or rock armor) to convey flow to the base of the steep slope. 	DRC #1 (MP #3) Photos 15-18 DRC #2 (MP #4) Photos 19-20		

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Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)

Standard Condition Requiring Action	Treatment Priority	Schedule	Summary of Corrective Actions/Recommendations (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Estimated Cost	Date Completed
4.3 Riparian and Wetland Protection and Management 3a-d	High	December 31, 2017	<ul style="list-style-type: none"> The north end of greenhouses #3-#5 will need to be shortened (moved back) to ensure a 50 ft. minimum setback from the Class III stream. Ensure that the front side of the greenhouses are outside the 75 ft. minimum setback from the Class II stream on the north side. Short of these actions, a variance will need to be sought, along with actions to provide protections to mitigate the close proximity to the streams. Plant the riparian buffer disturbed by the greenhouse pad/s with native tree seedlings and maintain until they are self-sufficient. 	F #1 (MP#2) Photos 9-13		
4.4 Spoils Management 4c	Low	October 15, 2017	<ul style="list-style-type: none"> If the north ends of greenhouses 1-3 are shortened to stay within the 50 ft. minimum setback requirements, the edge of the greenhouse pad should be pulled back (excavated) to remove all perched fill with potential to deliver to the creek. Graded slopes should not exceed 50% upon completion. In addition, a combination of grading, berms, roof gutter drains, and French drains should be considered to prevent concentrated water from draining down fill-slopes in close proximity to the creek. In addition, fill-slopes should be covered in mulch and densely planted with native vegetation to aid in stabilizing the spoils material. 	F #1, (MP- #2) Photos 11-13		

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Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)

Standard Condition Requiring Action	Treatment Priority	Schedule	Summary of Corrective Actions/Recommendations (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Estimated Cost	Date Completed
5a, b, c	High	March 1, 2017 and then annually	<ul style="list-style-type: none"> - Develop and refine the Water Budget for your Project Site to determine the required volume of water storage you will need so as to forbear (not divert surface flows) from May 15 through October 31 each year. - Develop and implement a Water Monitoring Plan to document the exact timing and volume of your water diversion, storage and use throughout the year using log sheets provided in Appendix D. - Begin quantifying use, testing drip rates, incorporating water holding amendments and native soil during the initial soil preparation at the start of the season. In addition, evaluate and employ: 1) timed or volume-limited drip irrigation; 2) irrigation scheduling; 3) capturing and storing rainwater and 4) the use of cover crops during rotations and winter. 	None		
4.5 Water Use			<ul style="list-style-type: none"> - Install float valves, water monitoring flow meters and other equipment to quantify your water diversion, storage and use. - Investigate the feasibility of constructing an off-stream, rainwater-fed-pond and developing a rainwater catchment system to provide for your cultivation and irrigation water needs so you can forbear during the dry growing season. 	None	Float valves: \$10 - \$40: Flow meters: \$120 - \$2,000	
5c	High	October 15, 2018	<ul style="list-style-type: none"> - Add more rainwater-fed water storage, including an off-stream, rainwater-fed pond and /or rigid water tanks. 	None		
5d	High	March 1, 2017	<ul style="list-style-type: none"> - To verify compliance and further refine water use efficiency, start measuring and recording your average water usage on a per plant basis, based on type and size of plant pot, full term versus short season (light deprivation) plant, and type of irrigation. - Observe and monitor soil moisture so watering, fertilizer and chemical applications are made only when necessary and overwatering and excess infiltration is avoided. 	None	-	

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Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)

Standard Condition Requiring Action	Treatment Priority	Schedule	Summary of Corrective Actions/Recommendations (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Estimated Cost	Date Completed
5e	Moderate	October 15, 2017	<p>Register your diversion and water use with the SWRCB by completing an Initial Statement of Use and Diversion.</p> <ul style="list-style-type: none"> - Consult with SWRCB, Division of Water Rights and file to obtain water rights for your irrigation needs. - File a Lake and Streambed Alteration Agreement (LSAA) notification with CDFW for the spring diversions. - If necessary, increase water storage capacity through the addition of rigid storage tanks to limit or eliminate water diversion during the low flow period from May 15 through October 31 each year. - As soon as feasible, move water tanks #3 and #4 at least 75ft. from the Class II stream and ensure that in case of a failure, that flow will not be directly discharged to the stream network. 	None		
5f	High	October 15, 2017	<ul style="list-style-type: none"> - To verify compliance with the Order, you are required to keep detailed records of the timing and volume of any fertilizers and/or other soil amendments you use in your operations. Use log sheets found in Appendix E. - To verify compliance with the Order, you are required to keep detailed records of the type, timing and volume of any pesticides or herbicides you use in your operations. Use log sheets found in Appendix F. 	MP-1 Photos 5-6		
4.7 Fertilizers and Soil Amendments	High	2016 and then annually		None		
4.8 Pesticides/Herbicides	High	2016 and then annually		None		

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Table 1. Features Needing Improvement or Action Items (Prioritized implementation schedule for corrective actions)

Standard Condition Requiring Action	Treatment Priority	Schedule	Summary of Corrective Actions/Recommendations (see more detailed listing of corrective actions in Section 4, above)	Map Point and Photo #	Estimated Cost	Date Completed
4.9 Petroleum Product and other Chemicals	Moderate	May 1, 2017	<ul style="list-style-type: none"> - All gas tanks and cans onsite and in use must be stored under cover and off the ground and must have a secondary containment basin capable of containing the entire stored volume. - You should maintain separate storage areas for incompatible materials such as soil amendments, fertilizers, chemicals, etc. and petroleum products. - Because of the fuel storage volumes, you are required to develop and submit a Hazardous Material Business Plan (HMBP) and a Petroleum Storage Spill Prevention, Control and Countermeasures (SPCC) Plan for your Project Site. See Standard Condition 9 for more details. - Once the property has an approved LSAA from CDFW for the point of diversion, move forward with the Humboldt County Planning Department to install the approved On-Site Waste Water Treatment System. (OWTS) 	Photo 27		
#11 Refuse and Human Waste	Moderate	December 31, 2018		None		

6.0 MONITORING AND INSPECTION PLAN

Under the Order, sites are required to be monitored and inspected periodically to ensure conformance with the 12 Standard Conditions. In most cases, inspections and records of inspections identify conditions that have been corrected and are now in compliance; conditions that remain in compliance; and conditions that have changed and may no longer be in compliance with the Order. An inspection and monitoring plan is used to document these conditions, identify problems and make corrections using best management practices (BMPs) to protect water quality (Appendix A).

Monitoring Plan – Please refer to Appendix B and Figure 2 to review the monitoring plan and specific monitoring points for which you are responsible.

Monitoring guidelines and reporting standards have been created by the NCRWQCB as part of the Order. Monitoring of the Project Site includes visual inspection and photographic documentation of each feature of interest listed on the Project Site map, with new photographic documentation recorded with any notable changes to the feature of interest.

Site inspection schedule - According to the NCRWQCB, periodic inspections should include visual inspection of the site, including any management measures/practices, to ensure they are being implemented correctly and are functioning as expected. Inspections include photographic documentation of any controllable sediment discharge sites, as identified on the site map, and a visual inspection of those locations on the site where pollutants or wastes, if uncontained, could be transported into receiving waters, and those locations where runoff from roads or developed areas drains into or towards surface water.

At a minimum, sites shall be inspected at the following times to ensure timely identification of changed site conditions and to determine whether implementation of additional management measures is necessary to prevent or minimize discharges of waste or pollutants to surface water:

- 1) Before and after any significant alteration or upgrade to a given stream crossing, road segment, or other controllable sediment discharge site. Inspection should include photographic documentation, with photo records to be kept onsite.
- 2) Prior to October 15th to evaluate site preparedness for storm events and stormwater runoff.
- 3) Following the accumulation of 3 inches cumulative precipitation (starting September 1st) or by December 15th, whichever is sooner.
- 4) Following any rainfall event with an intensity of 3 inches precipitation in 24 hours. Precipitation data can be obtained from the National Weather Service by entering the site zip code at <http://www.srh.noaa.gov/forecast>. Pick the nearest or most relevant zip code and then select the 3 day history that will also show precipitation totals.

Inspection and Monitoring Checklist – Appendix B contains a checklist data form that will be used by the landowner and/or operator to: 1) document inspection dates, 2) document visual and photographic inspection results, 3) describe remediation and management measures that are being applied, 4) identify new problems and their treatments, and 5) document the progress and effectiveness of implementing remedial and corrective measures that are needed to meet the 12 Standard Conditions, as outlined in this WRPP. Appendix C contains photo documentation of your

monitoring points and will need to be updated as corrective treatments are implemented and treatments are monitored and evaluated over time.

Annual Reporting – An Annual Report is to be submitted directly to the NCRWQCB or to PWA (through our 3rd Party Program). The information in the annual reporting form must be submitted by March 31st of each year. The reported information is to be reflective of current site conditions, and includes monitoring data and tasks accomplished to protect water quality. Among other things, the report includes such items as the reporting of monthly monitoring data collected during the year (e.g., chemical use, water diversions, water storage, water use, etc.), management measures (BMPs) applied during the year and their effectiveness, and tasks accomplished during the year towards meeting each of the 12 Standard Conditions identified as deficient in this WRPP.

7.0 WATER USE PLAN

Requirements - According to the Order, a Water Use Plan (WUP) shall record water source, relevant water right documentation, and amount used monthly. All water sources shall be recorded, including alternative sources such as rain catchment and groundwater, and/or hauled water. Other elements of the WUP will include:

- Developing a Water Budget for determining the timing and volume of actual water use on the site. Water related data will be summarized monthly for the preceding month.
- Designing and implementing water conservation measures to reduce water diversion and water use.
- Calculating water storage requirements needed to support cultivation activities during the dry season, and implementing those required storage measures.

The Water Use Plan must also describe water conservation measures and document your approach to ensure that the quantity and timing of water use is not impacting water quality objectives and beneficial uses (including cumulative impacts based on other operations using water in the same watershed). Water use will only be presumed to not adversely impact water quality under one of the following scenarios:

- No surface water diversions occur from May 15th to October 31st.
- Water diversions are made pursuant to a local plan that is protective of instream beneficial uses.
- Other options that may affect water quality: (e.g., percent of flow present in stream; minimum allowable riffle depth; streamflow gage at bottom of Class I stream; AB2121 equations; CDFW instream flow recommendations; promulgated flow objective in Basin Plan; etc.).

Site Water Use Plan -The record of activities, accomplishments and water monitoring results for the Water Use Plan for this site will be logged and recorded in data tables and site records (data forms) included in Appendix D of this WRPP. These will be tracked and kept up-to-date by the landowner or cultivator of the site.

Water Storage and Forbearance - There is approximately 20,000 gallons of water storage in five tanks on the Project Site. The ultimate goal of the applicant is to accumulate enough water storage

capacity to forebear from surface water diversion for the entire period from May 15th to October 31st. This will ensure the timing of water use is not impacting water quality objectives and beneficial uses. To accomplish this, additional water storage will be required, preferably water tanks and/or an off-stream, rainwater-fed pond(s) that are filled during the rainy season and which provide sufficient irrigation water for dry season operations. The setting provides stable locations where water tanks or a larger capacity pond may be safely placed.

Water Conservation – Water conservation measures such as 1) drip irrigation; 2) the use of compost and mulch fertilizer to improve soil structure and increase its water-holding capacity; and 3) the use of soil mediums that retain moisture and therefore limit the frequency of irrigation, 4) irrigation scheduling; and 5) capturing and storing rainwater, should be employed. Begin quantifying use, testing drip rates, incorporating water holding amendments and native soil during the initial soil preparation at the start of the season. And lastly, water conservation measures should continue to be investigated and employed in order to most effectively maximize water use efficiency.

Water sources and use – Water for the site is supplied from a single point of diversion (POD) on a Class II stream.

At the time of the site inspection, neither PWA nor the operator had data that quantified the overall water use on the property. Under the Order it is required that you monitor and record all water data for the Project Site, including diversion, storage and water use through time. Develop a water budget to determine overall water needs for both domestic and irrigation uses throughout the year. The water budget and water monitoring is needed to ensure you limit or eliminate diversion of surface flows during the low flow period from May 15 through October 31 each year.

Over the course of the current season, water use will be documented using the log forms attached in Appendix D. As more accurate data is gathered, refined targets can be made to ensure adequate storage exists to protect downstream water quality and beneficial uses during the driest time of the year. Water rights notifications and registrations will be submitted to the State Water Resource Control Board (Division of Water Rights) and a Lake and Streambed Alteration Agreement (LSAA) sought through the California Department of Fish and Wildlife (CDFW) for the current diversions.

8.0 LIST OF CHEMICALS

The WRPP must contain a list of chemicals being stored onsite, in addition to quantities used and frequency of application. These include fertilizers/soil amendments, pesticides, herbicides, fungicides, petroleum products and other chemicals used in, or associated with, your cultivation activities and related operations.

Because this is the first year of enrollment, information regarding chemical use and storage is deficient or anecdotal. Appendixes E and F contain monitoring forms that should be used to list the chemical inventory record over time, as supplies are added to the site and used during the growing season. The landowner or operator will use these forms to track the types, storage volumes, timing of application, and volume of use of these products throughout the year. Because

there was no cultivation at the Project Site in the 2016 season. there was a minimal amount of chemicals stored onsite. These include

Fertilizers and amendments:

N/A

Pesticides, Herbicides, and Fungicides:

N/A

Petroleum and Other Chemicals:

Diesel
Gasoline

9.0 LANDOWNER/LESSEE CERTIFICATION/SIGNATURES

This Water Resource Protection Plan (WRPP) has been prepared by Pacific Watershed Associates, an approved Third Party Program acting on behalf of the North Coast Regional Water Quality Control Board (NCRWQCB).

"I have read and understand this WRPP, including Section 2.0 – Certifications, Conditions and Limitations. I agree to comply with the requirements of the California Regional Water Quality Control Board North Coast Region Order No. 2015-0023 (Waiver of Waste Discharge Requirements and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects in the North Coast Region), including the recommendations and actions listed in this WRPP."

Name of Legally Responsible Person (LRP): _____

Title (owner, lessee, operator, etc.): _____

Signature: _____ Date: _____

WRPP prepared by (if different from LRP): **Pacific Watershed Associates, Inc.**

WRPP prepared and finalized on (date): _____

Signature: _____ Date: _____

Appendix A

Best Management Practices for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects

Best Management Practices for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects

I. Introduction

Best management practices (BMPs) provided here may be applicable to prevent, minimize, and control the discharge of waste and other controllable water quality factors associated with site restoration/cleanup/remediation and site operations and maintenance. These BMPs are all considered enforceable conditions under the Order as applicable to a given site, and are referenced by and made conditions in the mitigated negative declaration (CEQA document) for the Order, as well.

This appendix to Order No. R1-2015-0023 includes section II. Standard BMPs for Construction, section III. BMPs for Site Maintenance and Operations (per standard conditions), and section IV. References. For additional BMP suggestions, staff encourage consultation of the various manuals listed in section IV. References, many of which are available online for free.

II. Standard BMPs for Construction

Where applicable during restoration, remediation, cleanup, or site maintenance activities, the following BMPs will be used.

A. General BMPs to Avoid or Minimize Adverse Impacts

Temporal Limitations on Construction

1. To avoid impacting migrating fish and causing erosion and sedimentation of the stream channel, the project work season shall be from May 1 to October 15. If operations are to be conducted during the winter period from October 15 to May 1, a winter period operating plan must be incorporated into the project work plan. This plan shall include specific measures to be taken in the winter operating period to avoid or substantially lessen erosion and sedimentation into surface waters.
2. A 2-day (48-hour) forecast¹ of rain shall be the trigger for temporary cessation of project activities and winterization/erosion protection of the work site.

¹ Any weather pattern that is forecasted by NOAA to have a 50% or greater probability of producing precipitation in the project area. The permittee shall obtain and keep for record likely precipitation forecast information from

Limitation on Earthmoving

3. Disturbance to existing grades and vegetation shall be limited to the actual site of the cleanup/remediation and necessary access routes.
4. Placement of temporary access roads, staging areas, and other facilities shall avoid or minimize disturbance to habitat.
5. Disturbance to native shrubs, woody perennials or tree removal on the streambank or in the stream channel shall be avoided or minimized. If riparian trees over six inches dbh (diameter at breast height) are to be removed, they shall be replaced by native species appropriate to the site at a 3:1 ratio. Where physical constraints in the project area prevent replanting at a 3:1 ratio and canopy cover is sufficient for habitat needs, replanting may occur at a lesser replacement ratio.
6. If shrubs and non-woody riparian vegetation are disturbed, they shall be replaced with similar native species appropriate to the site.
7. Whenever feasible, finished grades shall not exceed 1.5:1 side slopes. In circumstances where final grades cannot achieve 1.5:1 slope, additional erosion control or stabilization methods shall be applied as appropriate for the project location.
8. Spoils and excavated material not used during project activities shall be removed and placed outside of the 100-year floodplain, and stored/disposed of in compliance with Order conditions related to spoils management.
9. Upon completion of grading, slope protection of all disturbed sites shall be provided prior to the rainy season through a combination of permanent vegetative treatment, mulching, geotextiles, and/or rock, or equivalent.
10. Vegetation planting for slope protection purposes shall be timed to require as little irrigation as possible for ensuring establishment by the commencement of the rainy season.
11. Only native plant species shall be used with the exception of non-invasive, non-persistent grass species used for short-term vegetative cover of exposed soils.
12. Rock placed for slope protection shall be the minimum necessary to avoid erosion, and shall be part of a design that provides for native plant revegetation and minimizes bank armoring.

Limitations on Construction Equipment

13. Dischargers and/or their contractors shall ensure that chemical contamination (fuel, grease, oil, hydraulic fluid, solvents, etc.) of water and soils is prohibited during routine equipment operation and maintenance.
14. Heavy equipment shall not be used in flowing water. Please refer to BMPs 57 through 64 for dewatering of live streams.

the National Weather Service Forecast Office (e.g. by entering the zip code of the project's location at <http://srh.noaa.gov/forecast>).

15. When possible, existing ingress or egress points shall be used or work shall be performed from the top of the creek banks.
16. Use of heavy equipment shall be avoided or minimized in a channel bottom with rocky or cobbled substrate.
17. If project work or access to the work site requires heavy equipment to travel on a channel bottom with rocky or cobbled substrate, wood or rubber mats shall be placed on the channel bottom prior to use by heavy equipment.
18. Heavy equipment shall not introduce chemicals or foreign sediment to the channel (e.g., remove mud from tracks or cover channel work area with plastic sheeting prior to heavy equipment entry).
19. The amount of time this equipment is stationed, working, or traveling within the channel shall be minimized.
20. When heavy equipment is used, any woody debris and stream bank or streambed vegetation disturbed shall be replaced to a pre-project density with native species appropriate to the site. If riparian trees over six inches dbh are to be removed, they shall be replaced by native species appropriate to the site at a 3:1 ratio per BMP 5.
21. The use or storage of petroleum-powered equipment shall be accomplished in a manner that prevents the potential release of petroleum materials into waters of the state (Fish and Game Code 5650). To accomplish this, the following precautionary measures shall be followed:
 - Schedule excavation and grading activities for dry weather periods.
 - Designate a contained area for equipment storage, short-term maintenance, and refueling. Ensure it is located at least 50 feet from waterbodies.
 - Inspect vehicles for leaks and repair immediately.
 - Clean up leaks, drips and other spills immediately to avoid soil or groundwater contamination.
 - Conduct major vehicle maintenance and washing offsite (except as necessary to implement BMP 18).
 - Ensure that all spent fluids including motor oil, radiator coolant, or other fluids and used vehicle batteries are collected, stored, and recycled as hazardous waste offsite.
 - Ensure that all construction debris is taken to appropriate landfills and all sediment disposed of in upland areas or offsite, beyond the 100-year floodplain.
 - Use dry cleanup methods (e.g., absorbent materials, cat litter, and/or rags) whenever possible. If necessary for dust control, use only a minimal amount of water.
 - Sweep up spilled dry materials immediately.

Revegetation and Removal of Exotic Plants

22. The work area shall be restored to pre-project work condition or better.

23. All exposed soil resulting from the cleanup/restoration activities shall be revegetated using live planting, seed casting or hydroseeding.
24. Any stream bank area left barren of vegetation as a result of cleanup/restoration activities shall be stabilized by seeding, replanting, or other means with native trees, shrubs, and/or grasses appropriate to the site prior to the rainy season in the year work was conducted.
25. Soil exposed as a result of project work, soil above rock riprap, and interstitial spaces between rocks shall be revegetated with native vegetation by live planting, seed casting, or hydroseeding prior to the rainy season of the year work is completed.
26. The spread or introduction of exotic plant species shall be avoided to the maximum extent possible by avoiding areas with established native vegetation during cleanup/restoration activities, restoring disturbed areas with appropriate native species, and post-project monitoring and control of exotic species.
27. Removal of invasive exotic species is strongly recommended. Mechanical removal (hand tools, weed whacking, hand pulling) of exotics shall be done in preparation for establishment of native perennial plantings.
28. Revegetation shall be implemented after the removal of exotic vegetation occurs. Erosion control implementation shall be timed in accordance with BMPs 1 and 2.
29. Native plants characteristic of the local habitat shall be used for revegetation when implementing and maintaining cleanup/restoration work in riparian and other sensitive areas. Non-invasive, non-persistent grass species (e.g., barley grass) may be used for their temporary erosion control benefits to stabilize disturbed slopes and prevent exposure of disturbed soils to rainfall.
30. Annual inspections for the purpose of assessing the survival and growth of revegetated areas and the presence of exposed soil shall be conducted for three years following project work.
31. Dischargers and/or their consultant(s) or third party representative(s) shall note the presence of native/non-native vegetation and extent of exposed soil, and take photographs during each inspection.
32. Dischargers and/or their consultant(s) or third party representative(s) shall provide the location of each work site, pre- and post-project work photos, diagram of all areas revegetated and the planting methods and plants used, and an assessment of the success of the revegetation program in the annual monitoring report as required under the Order.

Erosion Control

33. Erosion control and sediment detention devices and materials shall be incorporated into the cleanup/restoration work design and installed prior to the end of project work and before the beginning of the rainy season. Any continuing, approved project work conducted after October 15 shall have erosion control works completed up-to-date and daily.

34. Erosion control materials shall be, at minimum, stored on-site at all times during approved project work between May 1 and October 15.
35. Approved project work within the 5-year flood plain shall not begin until all temporary erosion controls (straw bales or silt fences that are effectively keyed-in) are installed downslope of cleanup/restoration activities.
36. Non-invasive, non-persistent grass species (e.g., barley grass) may be used for their temporary erosion control benefits to stabilize disturbed slopes and prevent exposure of disturbed soils to rainfall.
37. Upon work completion, all exposed soil present in and around the cleanup/restoration sites shall be stabilized within 7 days.
38. Soils exposed by cleanup/restoration operations shall be seeded and mulched to prevent sediment runoff and transport.

Miscellaneous

39. During temporary stream crossing siting, locations shall be identified where erosion potential is low. Areas where runoff from roadway side slopes will spill into the side slopes of the crossing shall be avoided.
40. Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored in the wet or dry portions of a waterbody where wetland vegetation, riparian vegetation, or aquatic organisms may be impacted.
41. Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth. Access roads and work areas built over riparian vegetation shall be covered by a sufficient layer of clean river run cobble to prevent damage to the underlying soil and root structure. The cobble shall be removed upon completion of project activities.
42. Avoidance of earthwork on steep slopes and minimization of cut/fill volumes, combined with proper compaction, shall occur to ensure the area is resilient to issues associated with seismic events and mass wasting. If cracks are observed, or new construction is anticipated, consultation with a qualified professional is appropriate.
43. Operations within the 100-year floodplain shall be avoided. Refuse and spoils shall not be stored within the hundred-year floodplain. If roads are located within the 100-year floodplain, they shall be at grade; bridges shall have vented approaches and bridge deck shall be above anticipated 100-year flood water surface elevations. Consultation with a qualified professional is required for project work within the floodplain.
44. Project work-related dust shall be controlled. Dust control activities shall be conducted in such a manner that will not produce sediment-laden runoff. Dust control measures, including pre-watering of excavation/grading sites, use of water trucks, track-out prevention, washing down vehicles/equipment before leaving site, and prohibiting grading/excavation activities during windy periods, shall be implemented as appropriate.

45. Short term impacts from project work-related emissions can be minimized via retrofitting equipment and use of low emissions vehicles when possible.
46. Position vehicles and other apparatus so as to not block emergency vehicle access.

B. BMPs for Specific Activities

Critical Area Planting, Channel Vegetation and Restoration and Management of Declining Habitats

The following measures shall be employed:

47. Plant materials used shall be native to the site and shall be locally collected if possible.
48. Straw mulch shall be applied at a rate of 2 tons per acre of exposed soils and, shall be secured to the ground.
49. When implementing or maintaining a critical area planting above the high water line, a filter fabric fence, straw wattles, fiber rolls and/or hay bales shall be utilized to keep sediment from flowing into the adjacent water body.

Structure for Water Control and Stream Crossings

These practices shall be used generally to replace or retrofit existing culverts and to install culverts where water control is needed at a stream crossing or road ditch to restore natural hydrology, and to reduce potential diversions and road-related erosion. In addition to the general limitations set forth in the previous section, the following measures shall be employed for these types of projects:

50. Culvert fill slopes shall be constructed at a 2:1 slope or shall be armored with rock.
51. All culverts in fish-bearing streams and in streams where fish have historically been found and may potentially re-occur, shall be designed and constructed consistent with NMFS Southwest Region's Guidelines for Salmonid Passage at Stream Crossings (NMFS 2000) and CDFG's Culvert Criteria for Fish Passage (CDFG 2002).

Limitations on Work in Streams and Permanently Poned Areas

52. If it is necessary to conduct work in or near a live stream, the work space shall be isolated to avoid project activities in flowing water.
53. Water shall be directed around the work site.
54. Ingress/egress points shall be utilized and work shall be performed from the top of the bank to the maximum extent possible.
55. Use of heavy equipment in a channel shall be avoided or minimized. Please refer to BMPs 57 through 64 for dewatering of live streams. The amount of time construction equipment is stationed, working or traveling within the creek bed shall be minimized.

56. If the substrate of a seasonal pond, creek, stream or water body is altered during work activities, it shall be returned to approximate pre-construction conditions after the work is completed.

Temporary Stream Diversion and Dewatering: All Live Streams

57. For project work in a flowing or pooled stream or creek reach, or where access to the stream bank from the channel bottom is necessary, the work area shall be isolated with the use of temporary cofferdams upstream and downstream of the work site and all flowing water shall be diverted around the work site throughout the project period.
58. Other approved water diversion structures shall be utilized if installation of cofferdams is not feasible.
59. Cofferdam construction using offsite river-run gravel and/or sand bags is preferred. If gravel materials for cofferdams are generated onsite, measures shall be taken to ensure minimal disturbance to the channel, such as careful extraction from elevated terraces. The upstream end of the upstream cofferdam shall also be reinforced with thick plastic sheeting to minimize leakage.
60. Gravity diversions are preferred to pumping as dewatering techniques. If pumping is required to supplement gravity diversions, care shall be taken to minimize noise pollution and prevent the pump or generator-borne pollution to the watercourse.
61. The diversion pipe shall consist of a large plastic HDPE or ADS pipe or similar material, of a sufficient diameter to safely accommodate expected flows at the site during the full project period.
62. The pipe shall be protected from project activities to ensure that bypass flows are not interrupted.
63. Continuous flow downstream of the work site shall be maintained at all times during project work.
64. When project work is complete, the flow diversion structure shall be removed in a manner that allows flow to resume with a minimum of disturbance to the substrate.

Protection of Sensitive Species

65. Sensitive species - Consult with federal, state and local agencies regarding location of rare, threatened or endangered species.
66. Prior to commencing work, designate and mark a no-disturbance buffer to protect sensitive species and communities.
67. All work performed within waters of the state shall be completed in a manner that minimizes impacts to beneficial uses and habitat. Measures shall be employed to minimize land disturbances that shall adversely impact the water quality of waters of the state. Disturbance or removal of vegetation shall not exceed the minimum necessary to complete Project implementation.

68. All equipment, including but not limited to excavators, graders, barges, etc., that may have come in contact with extremely invasive animals (e.g. zebra mussels or new Zealand mud snails) or plant (e.g., *Arundo donax*, scotch broom, pampas grass) or the seeds of these plants, shall be carefully cleaned before arriving on site and shall also be carefully cleaned before removal from the site, to prevent spread of these plants.
69. Vegetation shall be established on disturbed areas with an appropriate mix of California native plants and/or seed mix. All initial plantings and seed shall be installed prior to completion of the project work.

III. BMPs for Site Maintenance and Operations (per standard conditions)

The following BMPs are intended to address compliance with the standard conditions. Individual or multiple BMPs may be selected to address compliance with a given standard condition depending on site-specific conditions. BMPs are considered enforceable conditions as applicable to a given site.

A. Site Maintenance, Erosion Control, Drainage Features

70. Drainage of roads, clearings, fill prisms, and terraced areas is critical to ensuring their integrity and to prevent or minimize sediment discharges to watercourses. Proper design and location of roads and other features is critical to ensuring that a road or other feature be adequately drained and is best accomplished through consultation with a qualified professional. If inspection identifies surface rills or ruts, surfacing and drainage likely needs maintenance.
71. Surfacing of exposed/disturbed/bare surfaces can greatly reduce erosion associated with runoff. BMP features such as vegetative ground cover, straw mulch, slash, wood chips, straw wattles, fiber rolls, hay bales, geotextiles, and filter fabric fences may be combined and implemented on exposed/disturbed/bare surfaces as appropriate to prevent or minimize sediment transport and delivery to surface waters. Non-invasive, non-persistent grass species (e.g. barley grass) may be used for their temporary erosion control benefits to stabilize bare slopes and prevent exposure of bare soils to rainfall. If utilized, straw mulch shall be applied at a rate of 2 tons per acre of exposed soils and, if warranted by site conditions, shall be secured to the ground. Consultation with a qualified professional is recommended for successful site-specific selection and implementation of such surface treatments. Guidance literature pertaining to such BMPs is referenced in section IV. of this document.
72. Road surfacing, especially within a segment leading to a watercourse, is critical to prevent and minimize sediment delivery to a watercourse and maintain road integrity for expected uses. Road surfacing can include pavement, chip-seal, lignin, rock, or other material appropriate for timing and nature of use. Steeper sections of road require higher quality rock (e.g. crushed angular versus river-run) to remain in place.

73. Road shaping to optimize drainage includes out-sloping and crowning; shaping can minimize reliance on inside ditches. Drainage structures can include rolling dips and water bars within the road surface and ditch-relief culverts to drain inside ditches. Adequate spacing of drainage structures is critical to reduce erosion associated with runoff. Generally speaking, steep slopes require greater frequency of drainage structures. The drainage structures shall be maintained to ensure capture of and capacity for expected flow. The outlets of the structures shall be placed in such a manner as to avoid discharge onto fill, unstable areas, or areas that can enter a watercourse. If site conditions prohibit drainage structures at an adequate interval to avoid erosion, bioengineering techniques² are the preferred solution (e.g. live fascines), but other techniques may also be appropriate including armoring (i.e. rock of adequate size and depth to remain in place under traffic and flow conditions) and velocity dissipaters (e.g. gravel-filled "pillows" in an inside ditch to trap sediment). In the case that inside ditches need maintenance, grade ditches only when and where necessary, since frequent routine mechanical grading can cause erosion of the ditch, undermine banks, and expose the toe of the cutslope to erosion. Do not remove more leaves and vegetation than necessary to keep water moving, as vegetation prevents scour and filters out sediment.
74. Road drainage shall be discharged to a stable location away from a watercourse. Use sediment control devices, such as check dams, sand/gravel bag barriers, and other acceptable techniques, when it is neither practical nor environmentally sound to disperse ditch water immediately before the ditch reaches a stream. Within areas with potential to discharge to a watercourse (i.e. within riparian areas of at least 200 feet of a stream) road surface drainage shall be filtered through vegetation, slash, or other appropriate material or settled into a depression with an outlet with adequate drainage. Caution should always be exercised with catchment basins in the event of failure.
75. Any spoils associated with site maintenance shall be placed in a stable location where it cannot enter a watercourse. Sidecasting shall be minimized and shall be avoided on unstable areas or where it has the potential to enter a watercourse.
76. Do not sidecast when the material can enter the stream directly or indirectly as sediment. Sidecast material can indirectly enter the stream when placed in a position where rain or road runoff can later deliver it to a channel that connects with the stream.
77. Disconnect road drainage from watercourses (drain to hill slopes), install drainage structures at intervals to prevent erosion of the inboard ditch or gull formation at the hill slope outfall, outslope roads.

² A Primer on Stream and River Protection for the Regulator and Program Manager: Technical Reference Circular W.D. 02-#1, San Francisco Bay Region, California Regional Water Quality Control Board (April 2003) http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stream_wetland/streamprotectionircular.pdf

78. Ditch-relief culverts shall also be inspected regularly, and cleared of debris and sediment. To reduce plugging, 15 to 24-inch diameter pipes shall be the minimum size considered for ditch relief culverts and shall be informed by site-specific conditions.
79. Grade ditches only when and where necessary, since frequent routine mechanical grading can cause erosion of the ditch, undermine banks, and expose the toe of the cutslope to erosion. Do not remove more grass and weeds than necessary to keep water moving, as vegetation prevents scour and filters out sediment.
80. Use sediment control devices, such as check dams, sand/gravel bag barriers, and other acceptable techniques, when it is neither practical nor environmentally sound to disperse ditch water immediately before the ditch reaches a stream.

B. Stream Crossing Maintenance

81. Proper maintenance of stream crossings is critical to ensure support of beneficial uses of water. Regular inspection and maintenance is necessary to identify, in a timely manner, if problems are occurring. Crossings include rock fords³, armored fills with culverts³, and bridges³.
82. Rock fords are appropriate when temporary and minor moisture or over-land flow is expected, not typically when a bed and bank is present; exceptions may be justified if warranted by site specific conditions. Additionally, rock fords are appropriate if aquatic life is not present. An adequate layer of crushed angular rock shall be maintained at rock fords such that soil compaction is minimized under expected traffic levels.
83. Stream crossings consisting of armored fills with culverts and bridges are appropriate for streams with defined bed and bank². They shall be sized to ensure the 100-year streamflow event can pass unimpeded. Additionally, crossings shall allow migration of aquatic life during all life stages potentially supported by that stream reach; water depth and velocity can inhibit migration of adult and juvenile fish species.
84. Stream crossing design and installation is best accomplished with the assistance of a qualified professional. Site conditions can change over time (e.g. channel filling or incision); consultation with a qualified professional is appropriate to evaluate maintenance or replacement needs and opportunities.
85. Regular inspection of the stream crossing is appropriate to identify changed conditions within the stream channel (e.g., bank erosion, headward incision, and channel filling).
 - If large wood is accumulated upstream or within the crossing that could impede or deflect flow and result in erosion or debris capture, the wood

³ Explanation of term, available within the following document (as of the date of the Order):
http://www.pacificwatershed.com/sites/default/files/handbook_chapter_download_page.pdf

- should generally be removed. In some cases, it may be appropriate to re-orient debris with the streamflow.
- If sediment or debris is accumulated within a culvert and limits flow capacity, the short term solution should generally be to clean out the culvert and place the debris and sediment in a stable location with no potential to discharge into a stream. In some cases a trash rack, post, or other deflection structure at the culvert inlet can reduce plugging.
 - If sediment is accumulated in a culvert without other debris accumulation and limits flow capacity, the long term solution may generally involve changing the culvert's slope, diameter, or embedment in the streambed.
86. The roadway adjacent to and over the crossing is an area of potential discharge. All road surfaces approaching a crossing shall be drained before the crossing, adequately filtered through vegetation or other material, and not discharged to a watercourse. If turbid water is discharged at a stream crossing, additional measures to control erosion at the source(s) or to remove sediment prior to discharge shall be implemented. Road surfaces shall be of rock, pavement, or other material appropriate for type and level of use.
87. If a culvert is used, the approaches and fill slopes shall be properly compacted during installation and shall be stabilized with rock or other appropriate surface protection to minimize surface erosion and slumping to the receiving waters. If possible, the road surface over the culvert shall have a critical-dip to ensure that if the culvert becomes plugged, water can flow over the road surface without washing away the fill prism. If site-specific conditions do not allow for a critical dip, alternatives such as emergency overflow culverts, oversized culverts, flared inlets, and debris racks may be warranted.

C. Riparian and Wetland Protection and Management:

88. Buffer width will be in compliance with Tier category.
89. Trees within riparian areas shall be retained for natural recruitment to streams. Large woody debris (LWD) shall be retained in stream or within riparian areas. The size of wood that can be beneficial to the stream will vary depending on the size of the stream (i.e., larger pieces of wood are necessary to withstand flows in large streams). In the event that LWD or trees are disturbed during excavation, care shall be taken to separate the LWD from soil. The pieces shall be stockpiled separately until they can be replaced in appropriate locations to enhance instream or riparian conditions. Placement of instream wood for habitat enhancement should be done under the consultation of a qualified professional and in conformance with applicable regulatory permits.
90. Avoidance of disturbance in riparian areas (within 200 feet of a watercourse) should result in protection and restoration of the quality/health of the riparian stand so as to promote: 1) shade and microclimate controls; 2) delivery of wood to channels, 3) slope stability and erosion control, 4) ground cover, and 5) removal of excess nutrients. This recognizes the importance of the riparian zone

with respect to temperature protection, sediment delivery, its importance with respect to the potential for recruitment of large wood, and removal of nutrients transported in runoff. In the event that past disturbance has degraded riparian conditions, replanting with native species capable of establishing a multi-storied canopy will ensure these riparian areas can perform these important ecologic functions.

D. Spoils Management

To ensure spoil pile stability and to reduce the potential for spoil pile slope failure or transport to waters of the state, the following measures shall be implemented when placing or disposing of spoils onsite:

91. Rip compacted soils prior to placing spoils to prevent the potential for ponding under the spoils that could result in spoil site failure and subsequent sedimentation;
92. Compact and contour stored spoils to mimic the natural slope contours and drainage patterns to reduce the potential for fill saturation and failure;
93. Ensure that spoil materials are free of woody debris, and not placed on top of brush, logs or trees.
94. Spoils shall not be placed or stored in locations where soils are wet or unstable, or where slope stability could be adversely affected.
95. Do not locate spoil piles in or immediately adjacent to wetlands and watercourses.
96. Store spoil piles in a manner (e.g. cover pile with plastic tarps and surround base of pile with straw wattle) or location that would not result in any runoff from the spoil pile ending up in wetlands and watercourses.
97. Separate organic material (e.g., roots, stumps) from the dirt fill and store separately. Place this material in long-term, upland storage sites, as it cannot be used for fill.
98. Keep temporary disposal sites out of wetlands, adjacent riparian corridors, and ordinary high water areas as well as high risk zones, such as 100-year floodplain and unstable slopes.
99. After placement of the soil layer, track walk the slopes perpendicular to the contour to stabilize the soil until vegetation is established. Track walking creates indentations that trap seed and decrease erosion of the reclaimed surfaces.
100. Revegetate the disposal site with a mix of native plant species. Cover the seeded and planted areas with mulched straw at a rate of 2 tons per acre. Apply jute netting or similar erosion control fabric on slopes greater than 2:1 if site is erosive.

E. Water Storage and Use

WATER USE

101. Conduct operations on a size and scale that considers available water sources and other water use and users in the planning watershed.
102. Implement water conservation measures such as rainwater catchment systems, drip irrigation, mulching, or irrigation water recycling. (Also see BMPs for Irrigation, below)
103. Take measures to minimize water diversion during low flow periods.
104. Options for documentation of water diversions and/or water usage may include the use of water meter devices and date-stamped photographs of water meter readings.
105. Hauled water utilized for irrigation shall be documented via receipt or similar, and show the date, name, and license plate of the water hauler, and the quantity of water purchased.
106. Apply water at agronomic rates (do not overwater plants).

WATER STORAGE

107. If using a water storage tank, do not locate the tank in a flood plain or next to equipment that generates heat. Locate the tank so it is easy to install, access, and maintain.
108. Vertical tanks should be installed according to manufacturer's specifications and placed on firm, compacted soil that is free of rocks/sharp objects and capable of bearing the weight of the tank and its maximum contents. In addition, a sand or pea gravel base with provisions for preventing erosion is highly recommended. Installation sites for tanks 8,000 gallons or more must be on a reinforced concrete pad providing adequate support and enough space to attach a tank restraint system (anchor using the molded-in tie down lugs with moderate tension, being careful not to over-tighten), especially where seismic or large wind forces are present.
109. Horizontal tanks shall be secured with bands and/or hoops to prevent tank movement.
110. Design and construct storage ponds in properly sited locations, off-stream. Plant vegetation along the perimeter of the pond. Construct berms or excess freeboard space around the perimeter of the pond to allow for sheet flow inputs.
111. Provide adequate outlet drainage for overflow of ponds, including low impact designs, to promote dispersal and infiltration of flows.
112. Place proper lining or sealing in ponds to prevent water loss.

113. Storage bladders are not encouraged for long term water storage reliability. If they are utilized, ensure that they are designed to store water, and that they are sited to minimize potential for water to flow into a watercourse in the event of a catastrophic failure. Used bladders (e.g. military surplus bladders) shall be checked for interior residual chemicals and integrity prior to use. Inspect bladder and containment features periodically to ensure integrity.

F. Irrigation Runoff

114. Irrigate at rates to avoid or minimize runoff.
115. Regularly inspect for leaks in mains and laterals, in irrigation connections, or at the ends of drip tape and feeder lines. Repair any found leaks.
116. Design irrigation system to include redundancy (i.e., safety valves) in the event that leaks occur, so that waste of water is prevented and minimized.
117. Recapture and reuse irrigation runoff (tailwater) where possible, through passive (gravity-fed) or active (pumped) means.
118. Construct retention basins for tailwater infiltration; percolation medium may be used to reduce pollutant concentration in infiltrated water. Constructed treatment wetlands may also be effective at reducing nutrient loads in water. Ensure that drainage and/or infiltration areas are located away from unstable or potentially unstable features.
119. Regularly replace worn, outdated or inefficient irrigation system components and equipment.
120. Use mulches (e.g. wood chips or bark) in cultivation areas that do not have ground cover to prevent erosion and minimize evaporative loss.
121. Leave a vegetative barrier along the property boundary and interior watercourses to act as a pollutant filter.
122. Employ rain-triggered shutoff devices to prevent irrigation after precipitation.

G. Fertilizers, Soil Amendments, Pesticides, Petroleum Products, and Other Chemicals

123. Evaluate irrigation water, soils, growth media, and plant tissue to optimize plant growth and avoid over-fertilization.
124. Reference Department of Pesticide Regulations Guidance (see Attachments E-1 and E-2 of Order No. R1-2015-0023)
125. All chemicals shall be stored in a manner, method, and location that ensures that there is no threat of discharge to waters of the state.
126. Products shall be labeled properly and applied according to the label.
127. Use integrated pest management strategies that apply pesticides only to the area of need, only when there is an economic benefit to the grower, and at times when runoff losses are least likely, including losses of organic matter from dead plant material.

128. Periodically calibrate pesticide application equipment.
129. Use anti-backflow devices on water supply hoses, and other mixing/loading practices designed to reduce the risk of runoff and spills.
130. Petroleum products shall be stored with a secondary containment system.
131. Throughout the rainy season, any temporary containment facility shall have a permanent cover and side-wind protection, or be covered during non-working days and prior to and during rain events.
132. Materials shall be stored in their original containers and the original product labels shall be maintained in place in a legible condition. Damaged or otherwise illegible labels shall be replaced immediately.
133. Bagged and boxed materials shall be stored on pallets and shall not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials shall be covered during non-working days and prior to rain events.
134. Have proper storage instructions posted at all times in an open and conspicuous location.
135. Prepare and keep onsite a Spill Prevention, Countermeasures, and Cleanup Plan (SPCC Plan) if applicable⁴.
136. Keep ample supply of appropriate spill clean-up material near storage areas.

H. Cultivation-Related Wastes

137. Cultivation-related waste shall be stored in a place where it will not enter a stream. Soil bags and other garbage shall be collected, contained, and disposed of at an appropriate facility, including for recycling where available. Pots shall be collected and stored where they will not enter a waterway or create a nuisance. Plant waste and other compostable materials be stored (or composted, as applicable) at locations where they will not enter or be blown into surface waters, and in a manner that ensures that residues and pollutants within those materials do not migrate or leach into surface water or groundwaters.
138. Imported soil for cultivation purposes shall be minimized. The impacts associated with importation of soil include, but are not limited to increased road maintenance and the increased need for spoils management. Use of compost increases the humic acid content and water retention capacity of soils while reducing the need for fertilizer application. In the event that containers (e.g. grow bags or grow pots) are used for cultivation, reuse of soil shall be maximized to the extent feasible.

⁴ SPCC plans are required for over 1,320 gallons of petroleum stored aboveground or 42,000 gallons below ground. Additionally, any type of storage container requires an SPCC if it is larger than 20,000 gallons, or if the cumulative storage capacity on-site exceeds 100,000 gallons (Health and Safety Code section 25270-25270.13) A sample SPCC can be found here:
<http://www.calcupa.net/civica/filebank/blobdload.asp?BlobID=3186>

139. Spent growth medium (i.e. soil and other organic medium) shall be handled to minimize discharge of soil and residual nutrients and chemicals to watercourses. Proper handling of spent soil could include incorporating into garden beds, spreading on a stable surface and revegetation, storage in watertight dumpsters, covering with tarps or plastic sheeting prior to proper disposal, and use of techniques to reduce polluted runoff described under Item F. Irrigation Runoff.
140. Other means of handling cultivation-related waste may be considered on a site-specific basis.

I. Refuse and Human Waste

141. Trash containers of sufficient size and number shall be provided and properly serviced to contain the solid waste generated by the project. Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers. Use lined bins or dumpsters to reduce leaking of liquid waste. Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater. Make sure trash container areas are screened or walled to prevent off-site transport of trash. Consider using refuse containers that are bear-proof and/or secure from wildlife. Refuse shall be removed from the site on a frequency that does not result in nuisance conditions, transported in a manner that they remain contained during transport, and the contents shall be disposed of properly at a proper disposal facility.
142. Ensure that human waste disposal systems do not pose a threat to surface or ground water quality or create a nuisance. Onsite treatment systems should follow applicable County ordinances for human waste disposal requirements, consistent with the applicable tier under the State Water Resources Control Board Onsite Waste Treatment System Policy⁵.

⁵ Available at: http://www.waterboards.ca.gov/water_issues/programs/owts/docs/owts_policy.pdf (as of the date of the Order).

IV. References

Handbook for Forest, Ranch, & Rural Roads: A Guide for Planning, Designing, Constructing, Reconstructing, Upgrading, Maintaining, and Closing Wildland Roads
http://www.pacificwatershed.com/sites/default/files/handbook_chapter_download_page.pdf

A Water Quality and Stream Habitat Protection Manual for County Road Maintenance in Northwestern California Watersheds
<http://www.5counties.org/roadmanual.htm>

Construction Site BMP Fact Sheets
<http://www.dot.ca.gov/hq/construc/stormwater/factsheets.htm>

EPA Riparian/Forested Buffer
<http://water.epa.gov/polwaste/npdes/swbmp/Riparian-Forested-Buffer.cfm>

Creating Effective Local Riparian Buffer Ordinances
http://www.rivercenter.uga.edu/publications/pdf/riparian_buffer_guidebook.pdf

How to Install Residential Scale Best Management Practices (BMPs) in the Lake Tahoe Basin
<http://www.tahoebmp.org/Documents/Contractors%20BMP%20Manual.pdf>

Spoil Pile BMPs
http://michigan.gov/documents/deq/deq-wb-nps-sp_250905_7.pdf

Sanctuary Forest Water Storage Guide
http://agwaterstewards.org/images/uploads/docs/1213661598_Water_Storage_Guide.pdf

Natural Resources Conservation Service-USDA, "Ponds – Planning, Design, Construction", Agriculture Handbook
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_030362.pdf

Division of Safety of Dams size requirements
<http://www.water.ca.gov/damsafety/jurischart/>

Water Tanks: Guidelines for Installation and Use
http://dnn7.snydernet.com/_pdf/_septic/Septic%20Catalog%202010.pdf

BEST MANAGEMENT PRACTICES (BMP's) University of California Cooperative Extension
http://www.waterboards.ca.gov/sandiego/water_issues/programs/wine_country/docs/updates081910/ucce_bmps.pdf

California Stormwater Quality Association
Section 4: Source Control BMPs
<https://www.casqa.org/sites/default/files/BMPHandbooks/sd-12.pdf>

CA DOT Solid Waste Management Plan
<http://www.dot.ca.gov/hq/construc/stormwater/WM-05.pdf>

State Water Resources Control Board Onsite Wastewater Treatment System (OWTS) policy
http://www.waterboards.ca.gov/water_issues/programs/owts/docs/owts_policy.pdf

California Stormwater Quality Association

Section 4: Source Control BMPs

<https://www.casqa.org/sites/default/files/BMPHandbooks/sd-32.pdf>

California Riparian Habitat Restoration Handbook

http://www.conservation.ca.gov/dlrp/watershedportal/InformationResources/Documents/Restoration_Handbook_Final_Dec09.pdf

The Practical Streambank Bioengineering Guide

http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmcpu116.pdf

150720_KVG_of_AppendixB_BMP

MONITORING PLAN AND PHOTO LOGS

Monitoring Plan – In general, the entire road network, cultivation area and associated facilities need to be monitored over the year to catch any problems that might arise. Check (and clean) all culvert inlets for signs of plugging prior to, and after large storm events to prevent uncontrolled flow from causing much larger problems. Refer to Figure 2 for the location of site specific monitoring points for which you are responsible for continued monitoring. For this project site, five (5) monitoring points have been designated. The goal of the monitoring is to ensure that once the original problem/feature has been treated, there is no subsequent erosion at that location or at a new location. Monitoring Point #5 was added just upstream of the inlet of SC#1 due to the stream’s high transport capacity and the potential for debris or future mass wasting events to plug the inlet and impact the crossing. Consult with PWA if a problem is detected anywhere on the project site.

Photo Log of features of interest and monitoring points before, during, and/or after treatment

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description
1	N/A		3/18/16	N/A	View of beautiful oak tree growing at the Project Site.
2	N/A		3/18/16	N/A	Closer-up view of the same tree.
3	N/A	Upper-most water storage tanks	3/18/16	N/A	View of the two 5,000 gallon water tanks located near the upper end of the property.
4	N/A	Distribution manifold	3/18/16	N/A	View of the distribution manifold at the base of the slope below the two water tanks depicted in Photo 3. Note the intake line running to the manifold is secured with concrete. This was constructed to mitigate for the stress caused by turning valves on and off under the high pressures created by the elevation difference between the tanks at the top of the slope and the manifold.
5	MP-1	Water Tanks #3-4	3/18/16	Pre	View of water tanks #3-4 located near the distribution manifold depicted in Photo 4. These tanks are used as fertilizer mixing tanks for use in irrigating the greenhouses.
6	MP-1	Water Tanks #3-4	3/18/16	Pre	View showing the same water tanks depicted in Photo 5 perched above a Class II stream below.
7	N/A	Upper cultivation area	3/18/16	N/A	View of the upper-most cut-slope created when the upper greenhouse pad holding Greenhouses 1-3 was constructed.
8	N/A	Lower cultivation area	3/18/16	N/A -	Photo looking toward the south end of Greenhouses 4-5 showing the sharp break-in-slope leading down to the Class II stream depicted in Photo 6.
9	MP-2	Upper cultivation area	3/18/16	Pre -	View of the north end of Greenhouses 1-3 and the small Class III stream running along the edge of the graded pad.
10	N/A	Upper cultivation area	3/18/16	Pre -	Another view of the north end of Greenhouses 1-3 located less than 50 ft. from the stream. View is looking toward the south.

Photo #	Monitoring Point	Feature #	Date	Pre-, during, or post-treatment	Description
11	N/A	Upper cultivation area	3/18/16	Pre -	Another view of the north end of Greenhouses 1-3 located less than 50 ft. from the stream. View is looking toward the south.
12	N/A	Upper cultivation area	3/18/16	Pre -	Closer-up view of the north end of the graded pad and the fillslope that is perched above the Class III stream. The flex pipe visible in the photo is connected to a French drain system installed to convey elevated spring water away from the greenhouses.
13	N/A	Upper cultivation area	3/18/16	Pre -	Another close-up view of the north end of the graded pad and the fill-slope that is perched above the Class III stream. View looking down toward the creek from the edge of the graded pad.
14	N/A	Lower and Upper cultivation area	3/18/16	N/A	View of Greenhouses 4-5 in the foreground and Greenhouses 1-3 in the distance. Note the rocked and well maintained access road.
15	N/A	DRC #1	3/18/16	N/A -	Looking at the inlet of the DRC and the inboard ditch leading to it. This DRC receives a significant amount of flow during storm events.
16	N/A	DRC #1	3/18/16	Pre -	View of the gully below the DRC outlet. Note the road located a short distance downslope.
17	MP-3	DRC #1	3/18/16	N/A	View of the gully below the DRC outlet. View looking upslope toward the outlet from the road depicted in Photo 16.
18	MP-3	Potential unstable slope	3/18/16	Pre -	View looking the opposite direction from the view in Photo 17. Sediment-laden water discharged from DRC #1's outlet fans out, causing some of the sediment in transport to deposit on the road. The sharp break-in-slope located on the other side of the woody debris pile presents a potential risk of slope failure due to the elevated levels of water discharged to this location from DRC#1.
19	MP-4	DRC #2	3/18/16	Pre --	Looking toward the plugged inlet of the DRC and the hydrologically connected road reach and ditch approach leading to it.
20	N/A	DRC #2	3/18/16	N/A -	View to the outlet of DRC #2 and the long downspout used to convey flow beyond the steep fill-slope.
21	N/A	SC #1	3/18/16	N/A	View looking toward the right road approach to the stream crossing showing the road surface rills draining down the outboard fill-slope toward the stream below.
22	N/A	SC #1	3/18/16	N/A	View looking down the hydrologically connected left road approach toward the stream crossing.
23	MP-5	SC #1	3/18/16	N/A	View of the inlet of the stream crossing. This culvert appears to be adequately sized though the transport potential of the Class II stream increases risk of sediment and debris to partially plug the inlet and decrease the capacity of the culvert to convey flow. Both stream crossings should be inspected before and after storm events and maintenance conducted to keep the inlets clear of debris and deposits.

PHOTOS



Photo 1

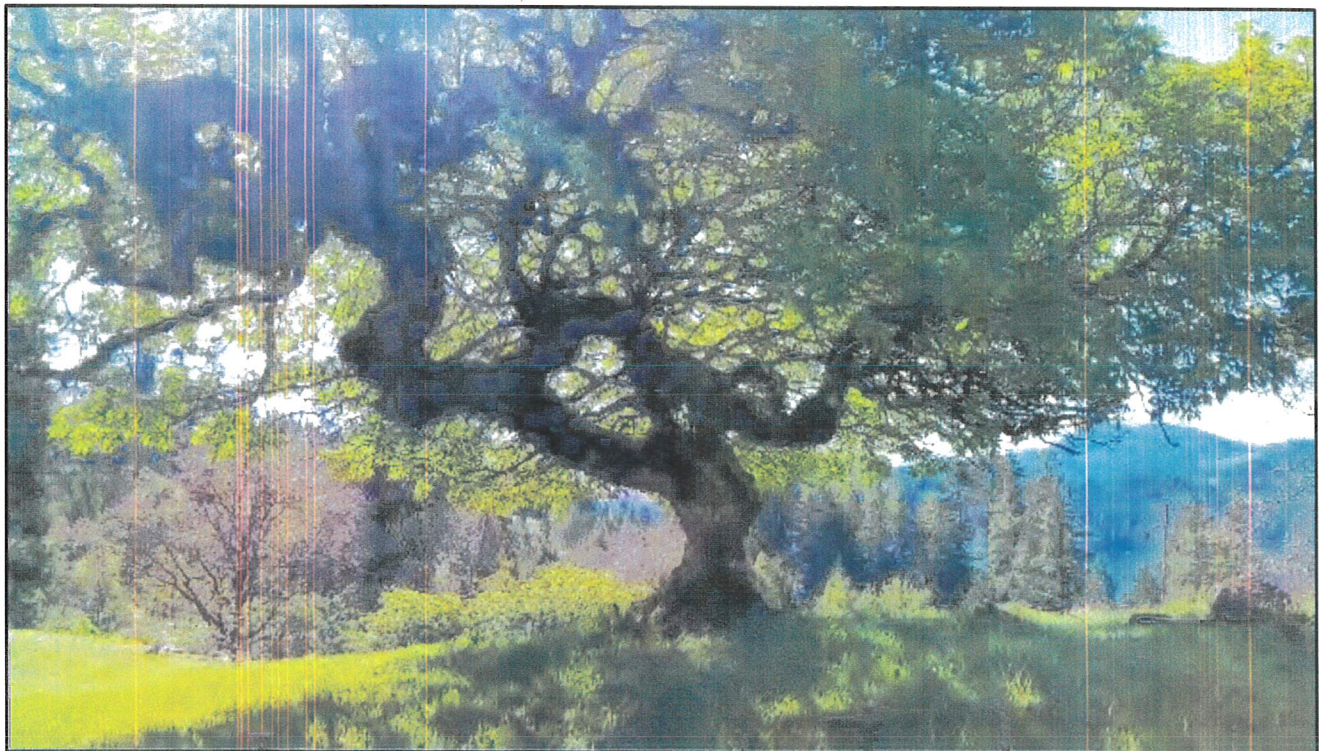


Photo 2

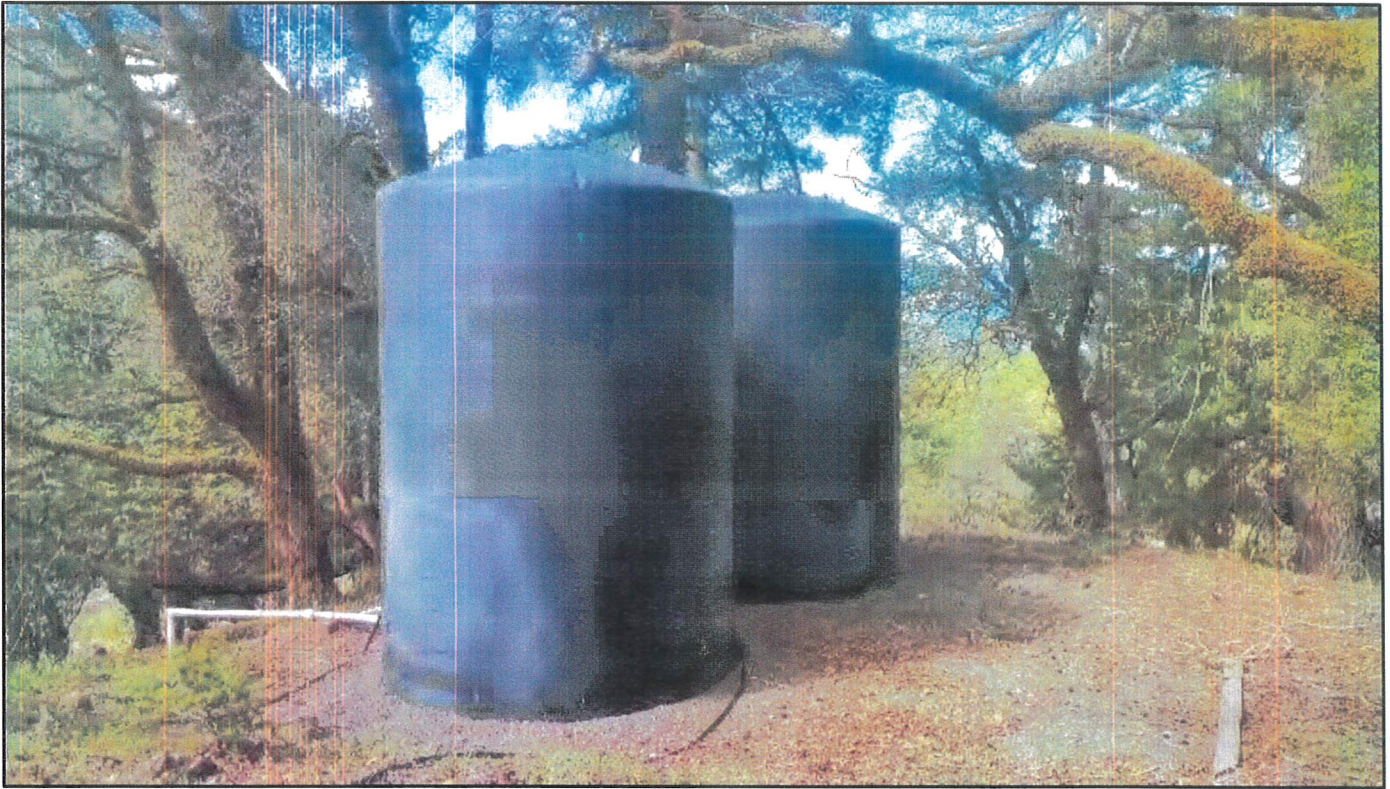


Photo 3

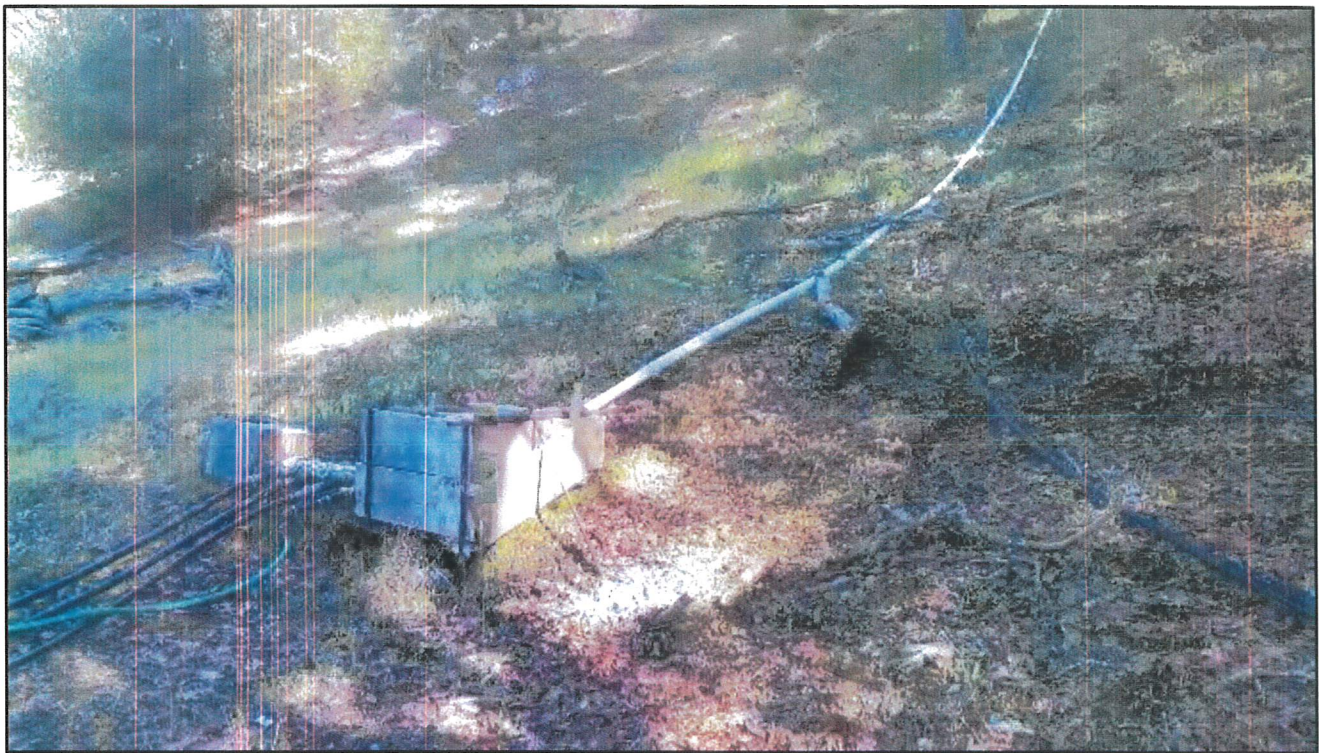


Photo 4

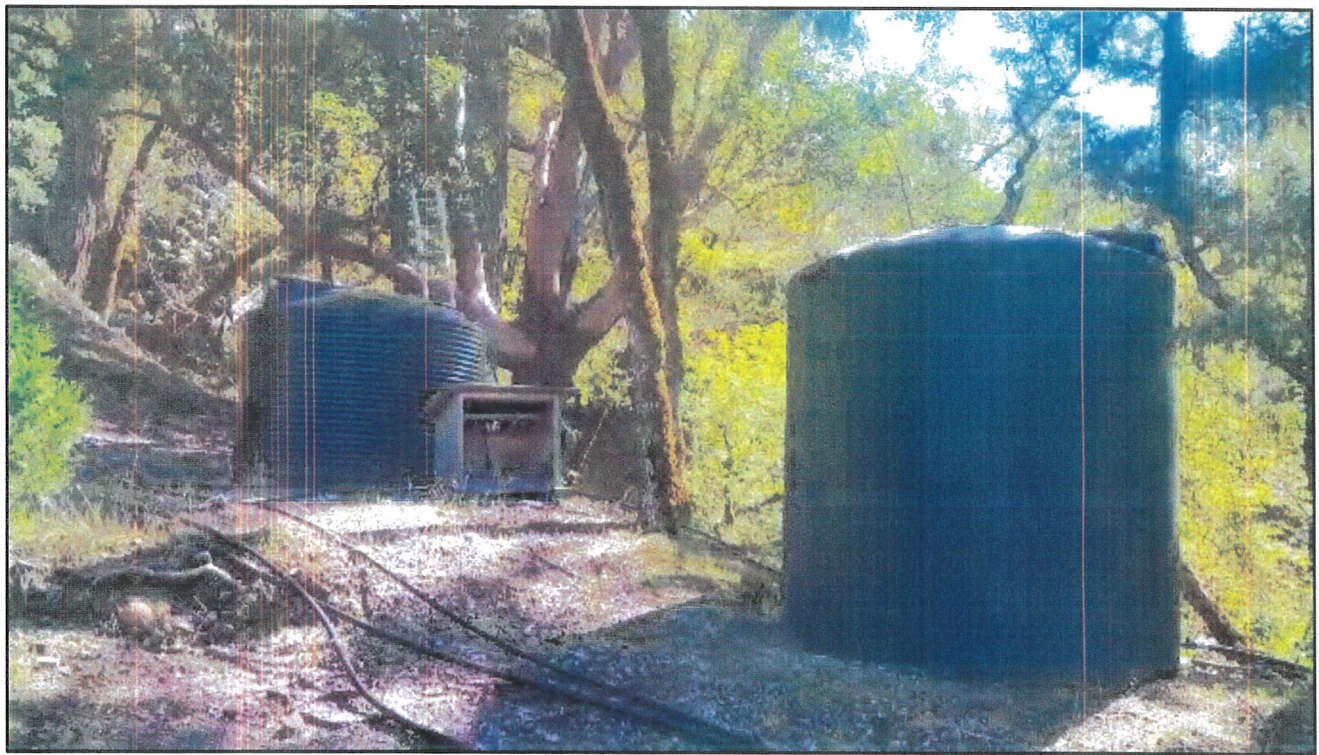


Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12

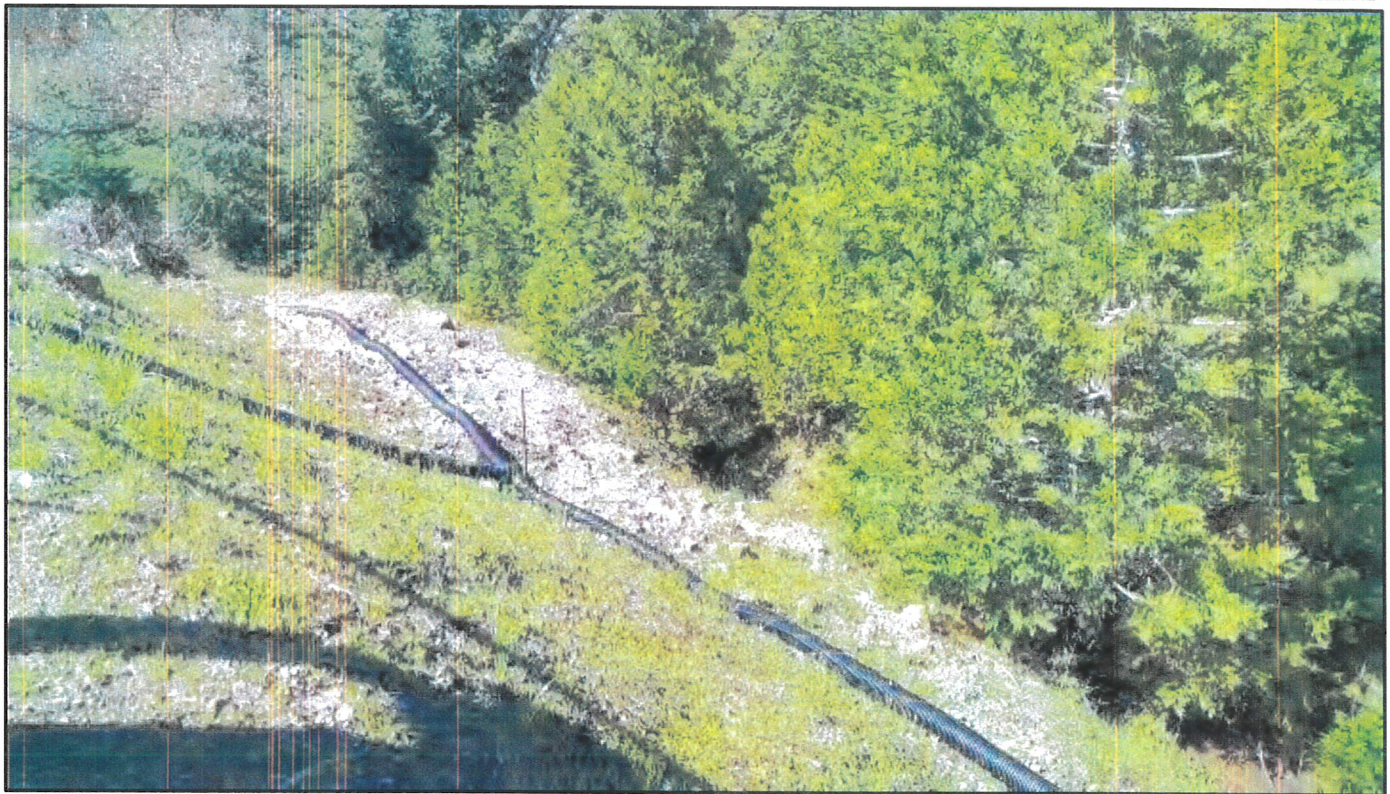


Photo 13



Photo 14

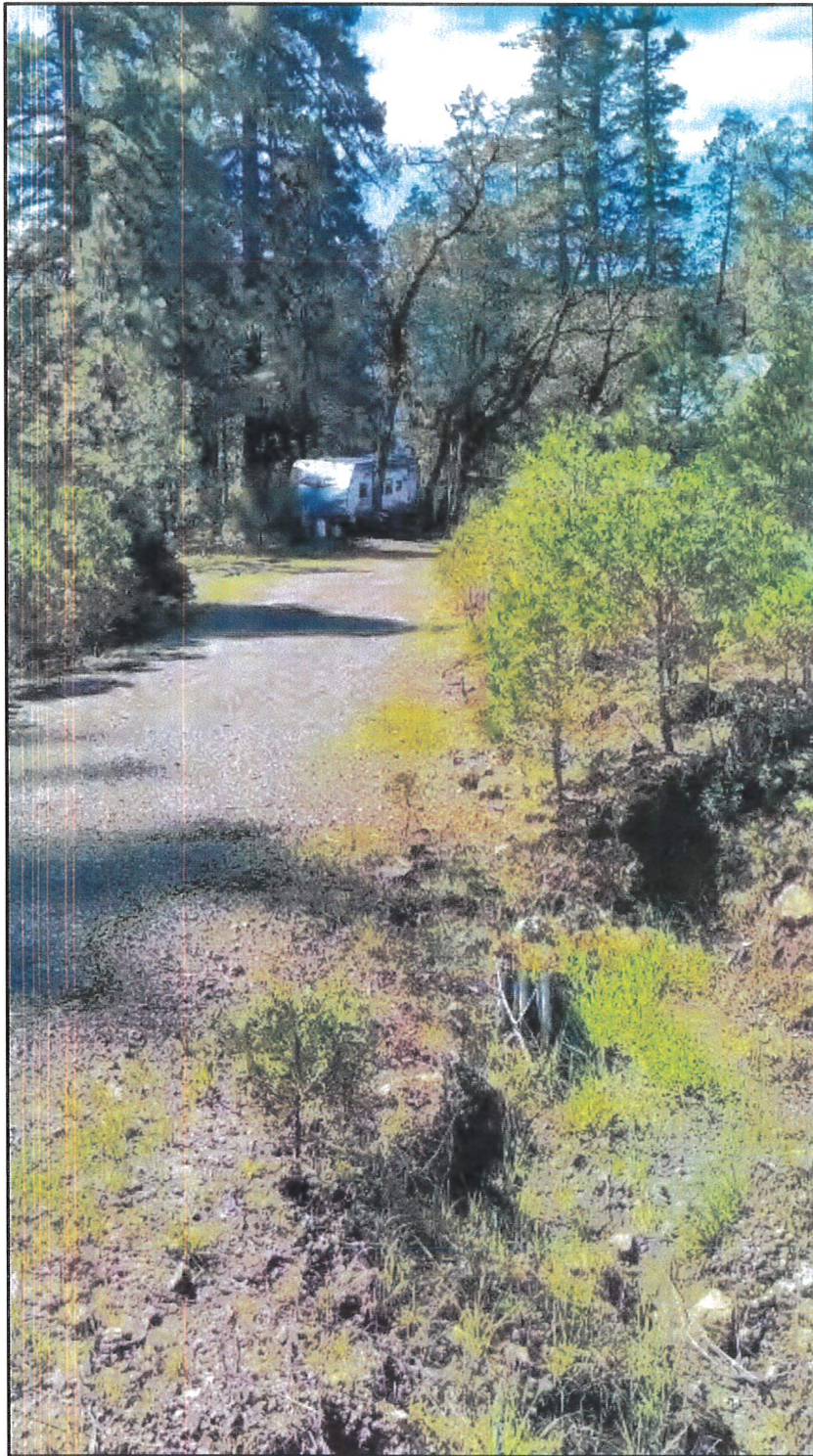


Photo 15

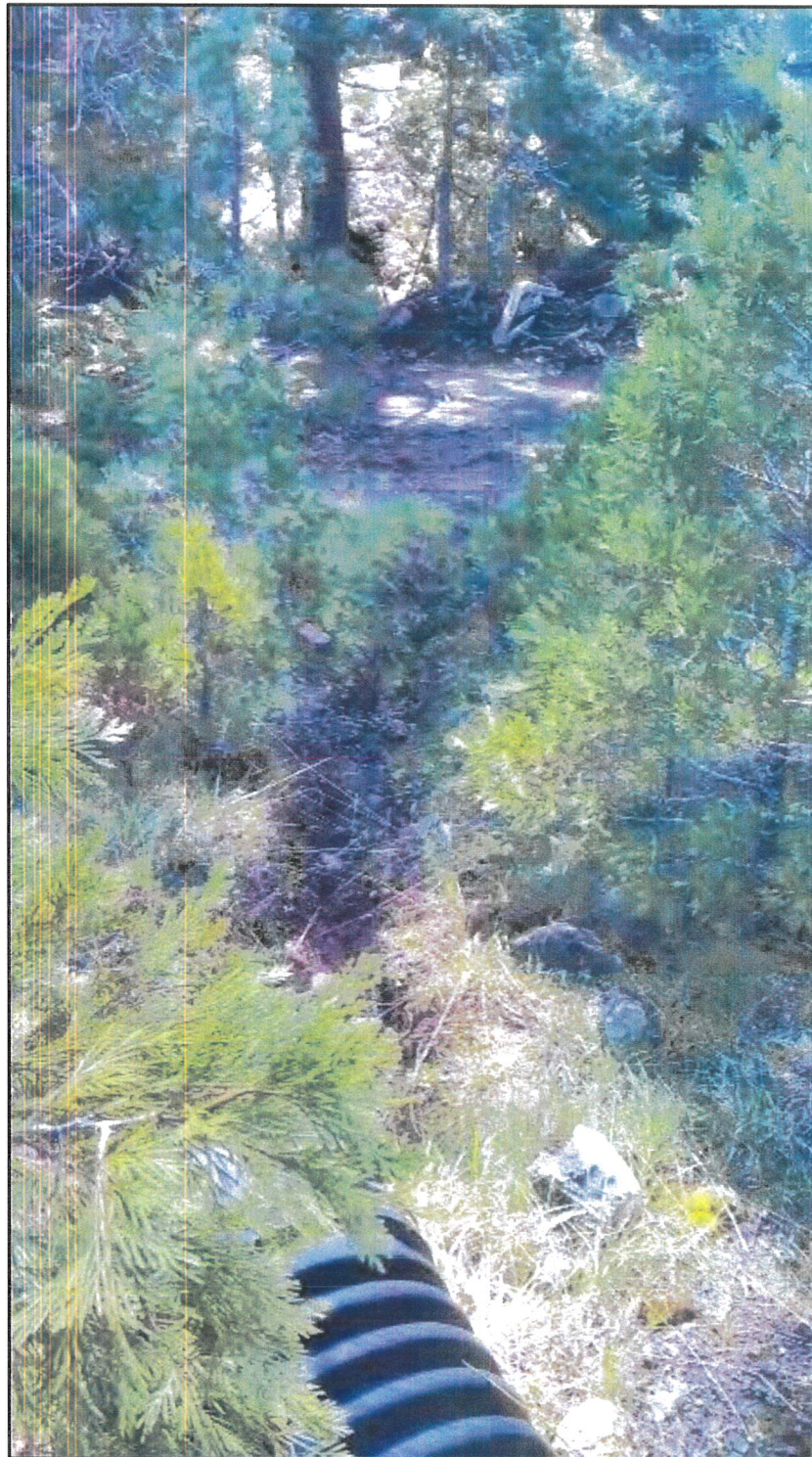


Photo 16

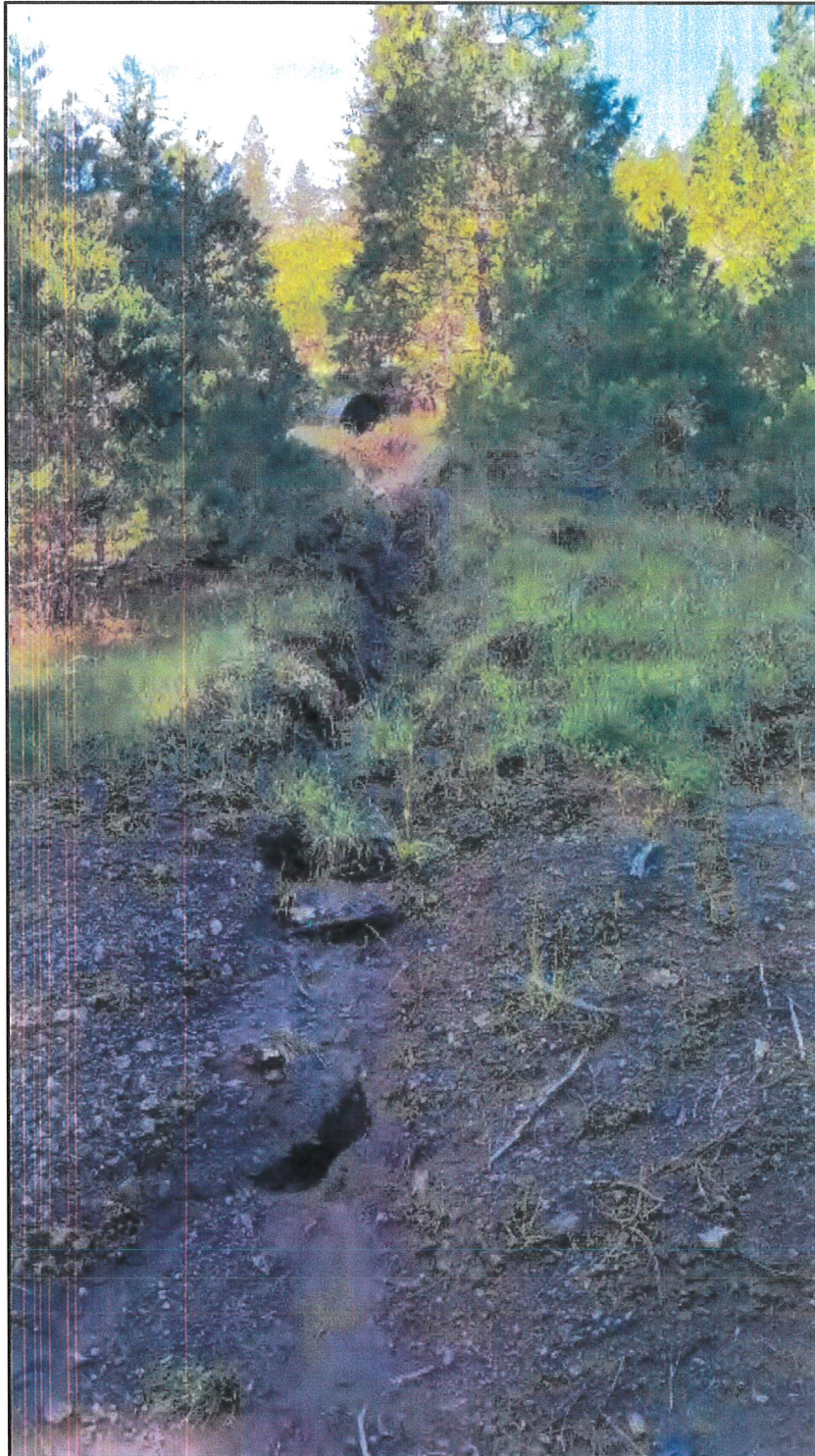


Photo 17



Photo 18

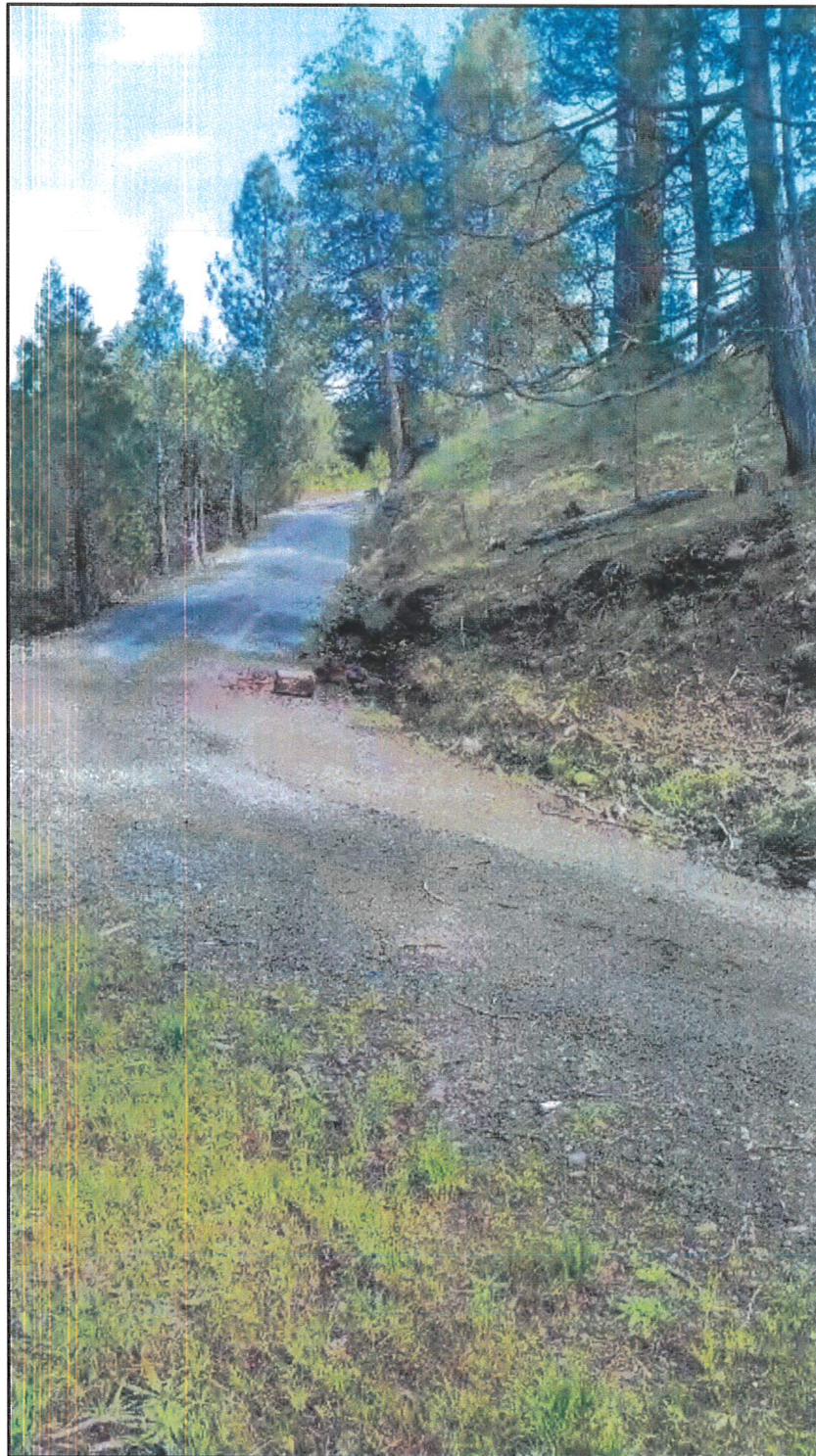


Photo 19



Photo 20



Photo 21



Photo 22

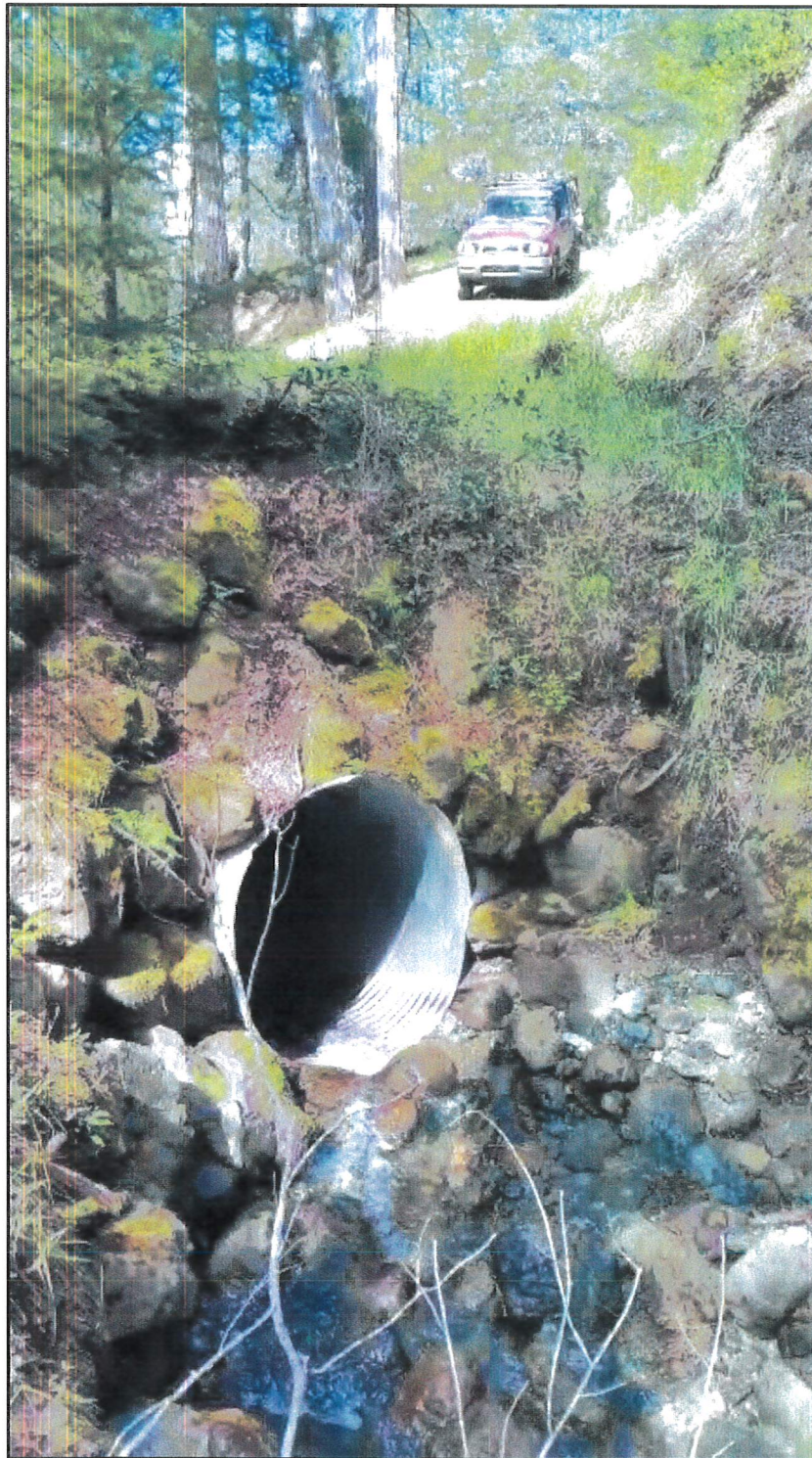


Photo 23

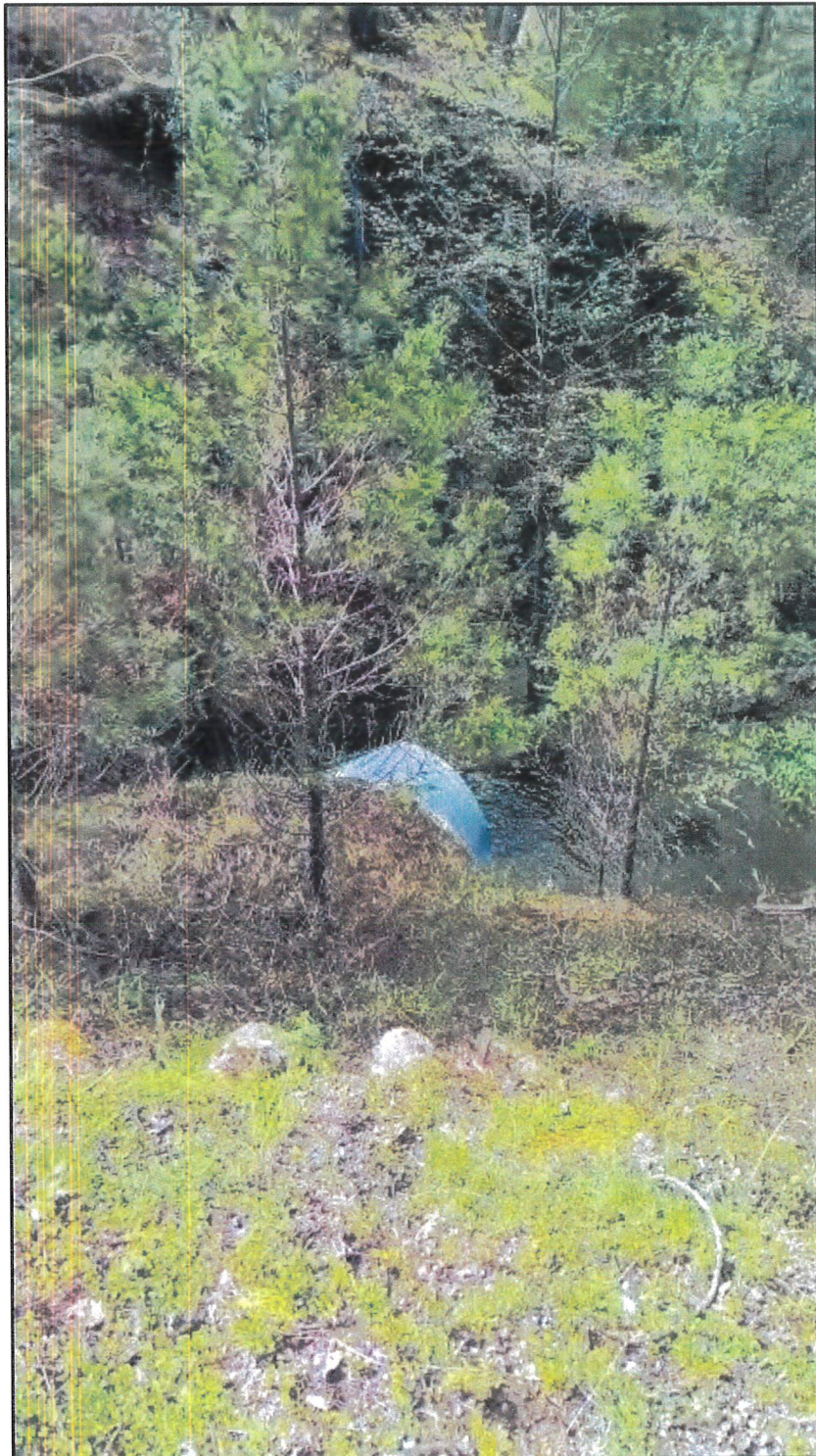


Photo 24



Photo 25



Photo 26



Photo 27

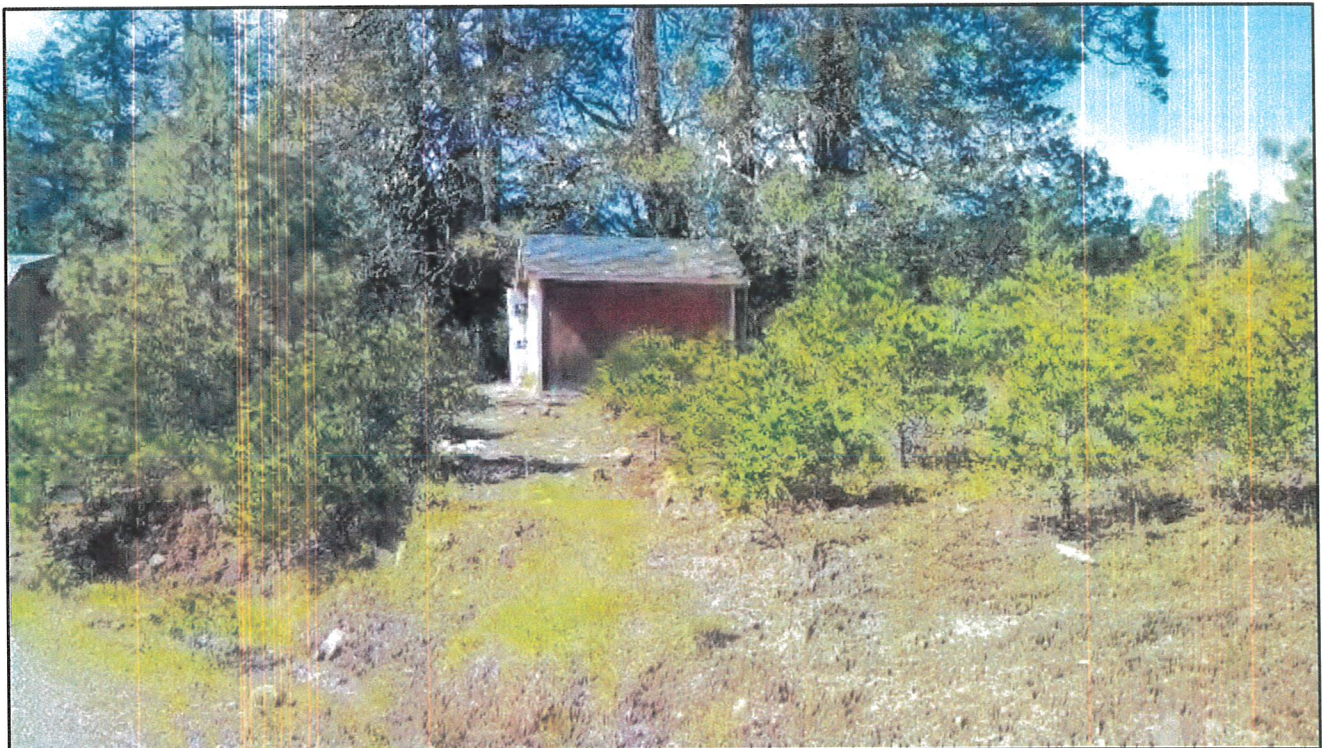


Photo 28

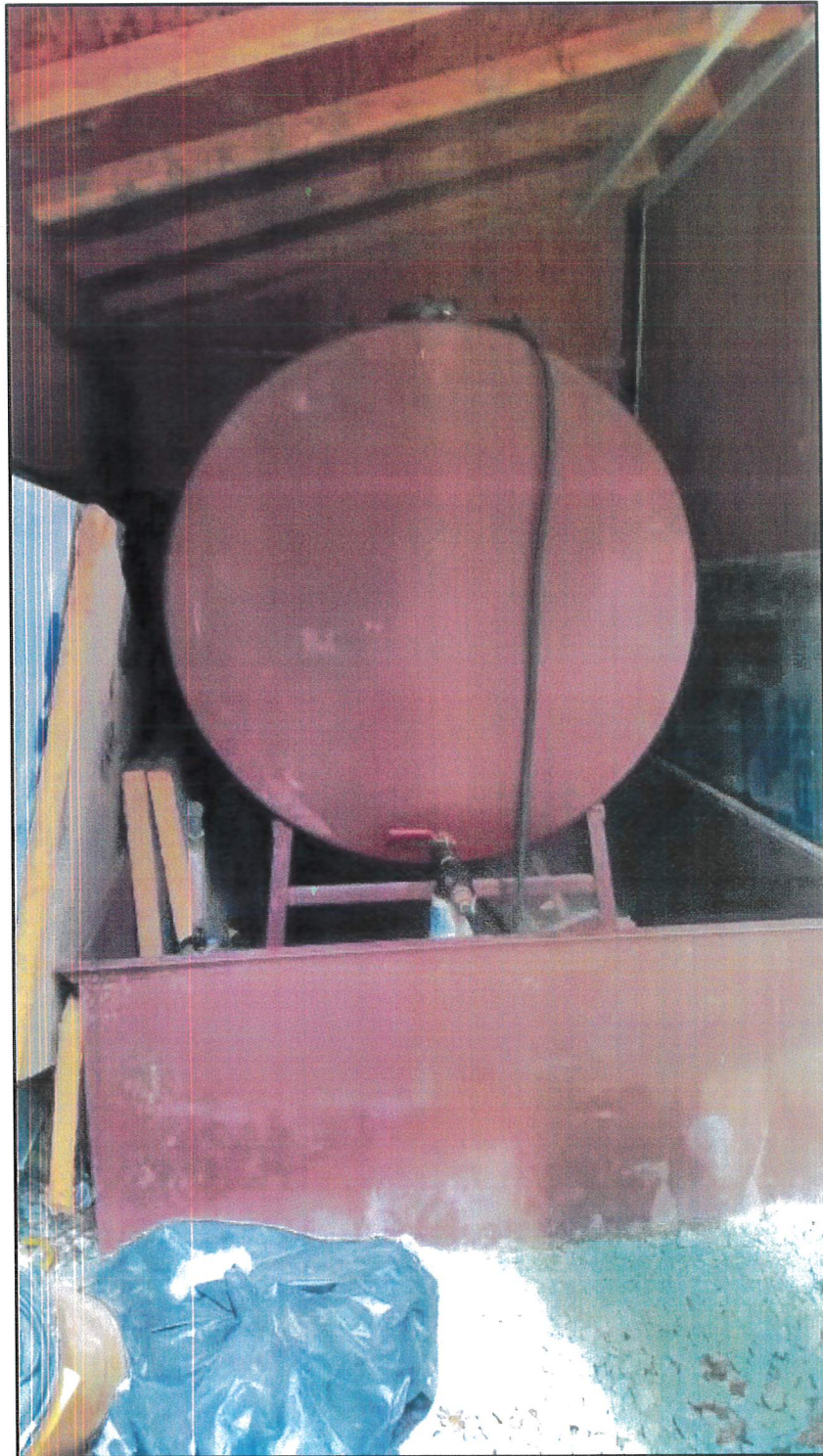


Photo 29

Water Input to Storage - Log Sheet -

	WD ID:	PWA ID:	Watershed:										
Location:			Sheet ___ of ___	Year: _____									
<i>Water Source</i> (e.g., rainwater catchment, stream diversion, spring delivery, well, water delivery, etc.)	Water unit (gallons or acre feet)	Amount input to storage per month (gallons or acre feet), by source											
		January	February	March	April	May	June	July	August	September	October	November	December
Monthly Totals													
Comments: As per NCRWQCB: "Report water volume input to storage, listing each source separately. This may include inputs from rainfall catchment, surface water diversions													

Fertilizer and Amendment Application Log Sheet

WD ID:				PWA ID:				Watershed:			
Product name	Fertilizer or Amendment (circle one)	Type (circle type)	Nutrient content (N-P-K ratio)	Year:				Initials	Comments		
				Recommended application amount from product label (e.g. # of ounces per application)	Application units (grams, ounces, liters, gallons, etc.)	Recommended application schedule (daily, weekly, etc.)	Actual amount applied in this application (same units)			Date applied (Mo/Day)	Location (Cultivation area #, Greenhouse #, Hoophouse #, etc.)
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
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	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									
	Fert./Amend.	liquid/solid									

Pesticide and Herbicide Application Log Sheet

WD ID: _____		PWA ID: _____		Watershed: _____					
Location: _____									
Product name	Pesticide or Herbicide (circle one)	Product type (circle type)	Recommended application amount from product label (e.g. # of ounces per application)	Application units (grams, ounces, liters, gallons, etc.)	Recommended application schedule (daily, weekly, etc.)	Actual amount (in same units) used per application	Date applied (mo./day)	Initials	Comments
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							
	Pest./Herb.	liquid/solid							

LEGAL PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWERS IN CALIFORNIA

PESTS OF MARIJUANA IN CALIFORNIA

Marijuana pests vary according to cultivar (variety), whether the plants are grown indoors or outdoors, and where the plants are grown geographically. The pests included in this review are based on two sources: a presentation given in 2013 by Whitney Cranshaw, an extension entomologist at Colorado State University, and a review article by John M. McPartland, a professor of family medicine at the University of Vermont.

HOW TO INTERPRET THE TABLES

Table 1 lists active ingredients not illegal to use on marijuana and the pests that these active ingredients target.

These active ingredients are exempt from **residue tolerance requirements**¹ and either exempt from **registration requirements**² or registered for a use that's broad enough to include use on marijuana. Residue tolerance requirements are set by U.S. EPA for each pesticide on each food crop and is the amount of pesticide residue allowed to remain in or on each treated crop with "reasonable certainty of no harm." Some pesticides are exempted from the tolerance requirement when they're found to be safe. Some of these pesticides are bacterial-based insect pathogens (e.g., *Bacillus thuringiensis*) or biofungicides (e.g., *Bacillus subtilis*, *Gliocladium virens*).

Active ingredients exempt from registration requirements are mostly food-grade essential oils such as peppermint oil or rosemary oil.

Tables 2 and 3 list pests of marijuana grown outdoors and indoors, and **Table 3** shows pests arranged by the portion of the plant they attack. An explanation of the column labels for Tables 2 and 3 follow.

PESTS. The tables show the most likely pests in California based on Cranshaw's presentation and McPartland's list and gleaned from California-based web sites and blogs. Some pests that drew attention on several blogs (e.g., hemp russet mite) may be

worse during drought years. Many have cyclic population fluctuations and others are mainstays of general greenhouse cultivation (e.g., whiteflies, thrips, and fungus gnats). We'll add weeds to this compendium when we have more information.

DAMAGE. For damage caused by greenhouse pests, we derived information from Cranshaw's presentation; for that of outdoor pests when there wasn't any overlap, McPartland's list was used and information from UC IPM for various crops. Accounts of damage by rodents is anecdotal.

IPM PRACTICES. Most of these are standard practices for pests on hosts other than marijuana. For more detailed explanations, see information compiled by the University of California Statewide IPM Program (UC IPM) at www.ipm.ucdavis.edu. You can enter a pest name in the search box (e.g., cutworm) and read about IPM practices for the pest on crops other than marijuana. For marijuana grown indoors, go to the UC IPM [home page](#), click on [Agricultural Pests](#) and scroll down the alphabetical list until you reach [ornamental nurseries](#).

Some practices were excluded because they apply to nearly all of the pests. For example, when targeting aphids, whiteflies, and thrips, growers can attract predaceous and parasitic arthropods by planting cover crops (e.g., California buckwheat) and insectary plants—especially those in the carrot, mustard, and sunflower families.

LEGAL PESTICIDES. These are covered above in the Table 1 description and are exempt from **residue tolerance requirements** and either exempt from **registration requirements** or registered for a use that is broad enough to include use on marijuana.

Table 4 shows marijuana pests by plant part. Not all of these pests are important, but their collective damage may affect the overall health of the plant.

REFERENCES

Cranshaw, Whitney. 2013. Challenges and opportunities for pest management of medical marijuana in Colorado. Presentation.

McPartland, J.M. 1996. *Cannabis* pests. J. Internatl. Hemp Assoc. 3(2): 49, 52–55.

¹ 40 CFR (Code of Federal Regulations)

² under FIFRA section 25(b) and 3 CCR section 6147

Table 1. Active ingredients that are exempt from residue tolerance requirements^a and either exempt from registration requirements^b or registered for a use broad enough to include use on marijuana.

ACTIVE INGREDIENT	PEST OR DISEASE
azadirachtin ^a	aphids, whiteflies, fungus gnats, leafminers, cutworms
<i>Bacillus subtilis</i> QST ^{a1}	root diseases, powdery mildew
<i>Bacillus thuringiensis</i> ^{a2} subsp. <i>aizawai</i> or <i>kurstaki</i>	moth larvae (e.g., cutworms, budworms, hemp borer)
<i>Bacillus thuringiensis</i> ^{a2} subsp. <i>israelensis</i>	fly larvae (e.g., fungus gnats)
<i>Beauveria bassiana</i> ^{a3}	whiteflies, aphids, thrips
cinnamon oil ^b	whiteflies
<i>Gliocladium virens</i> ^{a1}	root diseases
horticultural oils ^a (petroleum oil)	mites, aphids, whiteflies, thrips; powdery mildew
insecticidal soaps ^a (potassium salts of fatty acids)	aphids, whiteflies, cutworms, budworms
iron phosphate ^a ; sodium ferric EDTA ^a	slugs and snails
neem oil ^a	mites; powdery mildew
potassium bicarbonate ^a ; sodium bicarbonate ^a	powdery mildew
predatory nematodes ^b	fungus gnats
rosemary + peppermint essential oils ^b	whiteflies
sulfur ^a	mites, hemp flea beetles
<i>Trichoderma harzianum</i> ^{a1}	root diseases

^a 40 CFR (Code of Federal Regulations)

^b FIFRA §25(b) and 3 CCR §6147 [FIFRA = the Federal Insecticide, Fungicide, and Rodenticide Act; CCR = California Code of Regulations]

¹ Biofungicides

² Bacterial-based insect pathogen

³ Fungal-based insect pathogen

Table 2. PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWN OUTDOORS

PEST	DAMAGE	IPM PRACTICES (monitoring; cultural, physical, mechanical, biological)	PESTICIDES
MITES & INSECTS			
two-spotted spider mites <i>Tetranychus urticae</i>	Suck plant sap; stipple leaves	<ul style="list-style-type: none"> ▪ Keep dust down by hosing off plants (if dust is a problem) ▪ Release predatory mites 	neem oil, horticultural oil, sulfur
hemp russet mites <i>Aculops cannabicola</i>	Suck plant sap; kill leaves and flowers	<ul style="list-style-type: none"> ▪ Release predatory mites 	neem oil, horticultural oil, sulfur
crickets (field & house) <i>Gryllus desertus</i> , <i>G. chinensis</i> , <i>Acheta domesticus</i>	Eat seedlings	<ul style="list-style-type: none"> ▪ Use floating row covers or cones on individual plants 	—
termites	Eat roots	<ul style="list-style-type: none"> ▪ Flood nests 	—
leafhoppers	Suck plant sap; weaken plants	<ul style="list-style-type: none"> ▪ Encourage natural enemies by planting nectar sources 	horticultural oil or insecticidal soaps for nymphs
aphids <i>Phorodon cannabis</i> , <i>Myzus persicae</i> , <i>Aphis fabae</i>	Suck plant sap; weaken plants <i>P. cannabis</i> (bhang aphid) vectors tobacco mosaic virus	<ul style="list-style-type: none"> ▪ Hang up yellow sticky cards (alates) ▪ Hose off plants 	azadirachtin, horticultural oil, insecticidal soaps, <i>Beauveria bassiana</i>
whiteflies <i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i> , <i>B. argentifolii</i>	Suck plant sap; weaken plants	<ul style="list-style-type: none"> ▪ Hang up yellow sticky cards ▪ Reflective plastic mulch 	azadirachtin, horticultural oil, insecticidal soaps, rosemary + peppermint oils, <i>Beauveria bassiana</i>
leafminers <i>Liriomyza</i> spp.	Bore into roots and leaves	<ul style="list-style-type: none"> ▪ Remove older infested leaves ▪ Use biocontrol: release <i>Diglyphus</i> parasitoids 	azadirachtin

PEST		DAMAGE	IPM PRACTICES (monitoring; cultural, physical, mechanical, biological)	PESTICIDES
LEPIDOPTERA	cutworms <i>Agrotis ipsilon</i> , <i>A. segetum</i> , <i>Spodoptera litura</i> , <i>S. exigua</i> , <i>Mamestra brassicae</i> (Noctuidae)	Eat seedlings	<ul style="list-style-type: none"> Use pheromone traps to detect adults. Remove weeds, which serve as a reservoir for cutworms and other noctuids 	Vegetative stage only: Use <i>Bacillus thuringiensis kurstaki</i> if egg-laying adults found, insecticidal soap; azadirachtin
	budworms <i>Helicoverpa armigera</i> , <i>H. zea</i> (Noctuidae)	Eat flowering buds	<ul style="list-style-type: none"> Shake plants to dislodge larvae Remove infested buds Plant corn as trap crop 	Vegetative stage only: Use <i>Bacillus thuringiensis kurstaki</i> , insecticidal soap
	hemp borers (= hemp moth) <i>Grapholita delineana</i> (Tortricidae)	Bore through stalks (caterpillars)	<ul style="list-style-type: none"> Plow crop under in fall; remove plants still standing; remove nearby hemp and hop plants Use light traps at night for monitoring Use biocontrol: <i>Trichogramma</i> 	<i>Bacillus thuringiensis kurstaki</i>
COLEOPTERA	hemp flea beetles <i>Psylliodes attenuata</i> (Chrysomelidae)	Bore into stems (grubs); feed on seedlings and leaves of larger plants (beetles)	<ul style="list-style-type: none"> Use reflective mulches Plant trap crops (e.g., radish or Chinese mustard) 	sulfur
	scarab grubs (possibly other beetles)	Bore into stems	<ul style="list-style-type: none"> Use parasitic nematodes 	—
MAMMALS				
mice (e.g., house mice)	Eat young sprouts and seeds	Strip bark from stems to build nests	<ul style="list-style-type: none"> Double wrap a 3'-tall chicken wire fence around plants 	Rodenticides (see footnote below)
roof rats , <i>Rattus rattus</i> wood rats , <i>Neotoma</i> spp.			<ul style="list-style-type: none"> Trap (minus rodenticides) Mount barn owl boxes 	
pocket gophers , <i>Thomomys</i> spp.	Tunnel through planting areas; feed on plants; gnaw on irrigation lines		<ul style="list-style-type: none"> Install underground fencing (hardware cloth or ¾" mesh poultry wire) Mount barn owl boxes 	
Columbian black-tailed deer , <i>Odocoileus hemionus columbianus</i>	Knock over plants; leave dander, droppings, and ticks behind		<ul style="list-style-type: none"> Install deer fencing 	—
black bears , <i>Ursus americana</i>	Knock over plants		<ul style="list-style-type: none"> Install electric fencing 	—

Rodenticides that are not DPR-restricted materials or federally restricted use pesticides *and* are registered for a broad enough use to include use in or around marijuana cultivation sites. If using a rodenticide always read and follow the label and check to make sure that the target rodent is listed. Second-generation anticoagulant products are DPR-restricted materials not labeled for field use and as such, should never be used in or around marijuana cultivation sites.

Table 3. PEST MANAGEMENT PRACTICES FOR MARIJUANA GROWN INDOORS
(e.g., greenhouses, sheds, and grow rooms)

PEST	DAMAGE	IPM PRACTICES (monitoring; cultural, physical, mechanical, biological)	PESTICIDES
DISEASES			
powdery mildew <i>Sphaerotheca macularis</i>	Grow on leaves as white and gray powdery patches	<ul style="list-style-type: none"> Use fans to improve air circulation 	horticultural oil; neem oil; sodium bicarbonate, potassium bicarbonate; <i>Bacillus subtilis</i>
pythium root rots <i>Pythium</i> spp.	Attack root tips and worsens when plants grow in wet soil	<ul style="list-style-type: none"> Avoid hydroponic production or wet soil conditions 	Incorporate biocontrol agents into root-growing media (e.g., <i>Gliocladium virens</i> , <i>Trichoderma harzianum</i> , <i>Bacillus subtilis</i>)
MITES & INSECTS			
two-spotted spider mite <i>Tetranychus urticae</i>	Suck plant sap; stipple leaves	<ul style="list-style-type: none"> Disinfest cuttings before introducing to growing area Release predatory mites 	neem oil, horticultural oil, sulfur
leafhoppers	Suck plant sap; weaken plants	<ul style="list-style-type: none"> Encourage natural enemies by planting nectar sources 	horticultural oil or insecticidal soaps for nymphs
whiteflies <i>Trialeurodes vaporariorum</i> , <i>Bemisia tabaci</i> , <i>B. argentifolii</i>	Suck plant sap; weaken plants	<ul style="list-style-type: none"> Hang up yellow sticky cards Use biocontrol: <i>Encarsia formosa</i> 	azadirachtin, <i>Beauveria bassiana</i> , cinnamon oil, horticultural oil
thrips <i>Heliethrips haemorrhoidalis</i> , <i>Frankliniella occidentalis</i> , <i>Thrips tabaci</i>	Stipple leaves and vector viruses	<ul style="list-style-type: none"> Hang up yellow or blue sticky cards 	
dark-winged fungus gnats (Diptera: Sciaridae) <i>Bradysia</i> spp.	Damage roots and stunt plant growth	<ul style="list-style-type: none"> Avoid overwatering Use growing media that deters gnat development Hang up yellow sticky cards Use biocontrol: soil-dwelling predatory mites 	<i>Bacillus thuringiensis israelensis</i> (BTI); predatory nematodes; azadirachtin soil drenches

Table 4. PESTS OF MARIJUANA BY PLANT PART

Seedlings	Flower & Leaf (grown outdoors)	Flower & Leaf (grown indoors)	Stalk & Stem	Root
cutworms	hemp flea beetle	spider mites	hemp borer	hemp flea beetle
birds	hemp borer	aphids	rats	white root grubs
hemp flea beetle	budworms	whiteflies		root maggots
crickets	leafminers	thrips		termites & ants
slugs		leafhoppers		fungus gnats
rodents				wireworms

Appendix G. Hazardous Materials Storage Guidelines

Proper storage of hazardous materials (e.g., flammable liquids or gasses, many agricultural chemicals, oxidizers, acids, caustic substances) is essential for maintaining safe operations and for protection of the environment. Commercial operations that store hazardous materials are required to prepare a Hazardous Materials Business Plan (HMBP) and maintain Material Safety Data Sheets (MSDS) for each hazardous chemical that they store or use. County health agencies may require HMBPs to be submitted for their review. The HMBP information must be communicated to employees annually and be kept in a location that is readily accessible by employees. MSDSs explain how to medically treat a person that has been exposed to a hazardous substance and how to safely cleanup a spill.

Generally, incompatible hazardous materials must be stored in separate locations, with distinct secondary containment vessels for each type of material. Secondary containment is required for hazardous liquids and must be sized to contain a spill volume equivalent to the largest hazardous material container or 10% of the total volume, whichever is greater. Flammable and combustible hazardous materials must be separated from oxidizers by a distance of no less than 20 feet. The following guidelines should be followed when handling and storing hazardous materials.

Always label containers with the substance inside for both hazardous and non-hazardous materials. For flammable hazardous materials, make certain that an appropriate fire extinguisher is available nearby the storage area. Dry powder fire extinguishers are the most versatile. Water filled fire extinguishers should not be used on certain types of hazardous material fires (e.g. water-reactive metals, strong acids, petroleum).

Acids (e.g., hydrochloric acid, pool cleaner, citric acid) must be segregated from:
Reactive metals such as sodium, potassium, magnesium, etc.
Flammable and combustible materials.
Chemicals which could generate toxic or flammable fumes when mixed.
Bases.

Bases (e.g., Portland cement, lime, lye, or drain cleaner) must be segregated from:
Acids, metals, organic peroxides and easily ignitable materials.
Solvents.
Oxidizing acids and oxidizers.

Oxidizers (e.g. ammonium nitrate, ammonium phosphate, oxygen gas) must be segregated from:
Combustible and flammable liquids and gasses (e.g. oxygen-acetylene torches) by at least 20 feet of separation.
Reducing agents such as zinc, alkali metals, and formic acid.

Flammable materials (e.g., gasoline, fuses, gunpowder, acetylene cylinders) must be segregated from:

Oxidizers, caustic materials, acids, and bases.

It is good housekeeping practice to store compatible hazardous materials exclusively away from agricultural chemicals. Although uncommon, some organic agricultural amendments may be caustic, ignitable, or corrosive. Segregation of hazardous materials from non-hazardous materials eliminates the potential for cross-contamination of materials and exposure of workers to hazardous fumes or residues.

Guidelines for proper storage of hazardous materials and regulatory oversight (California Code of Regulations Title 22) are provided by the California Department of Toxic Substances Control (DTSC). The regulations are located in Social Security, Division 4.5, Environmental Health Standards for the Management of Hazardous Waste.

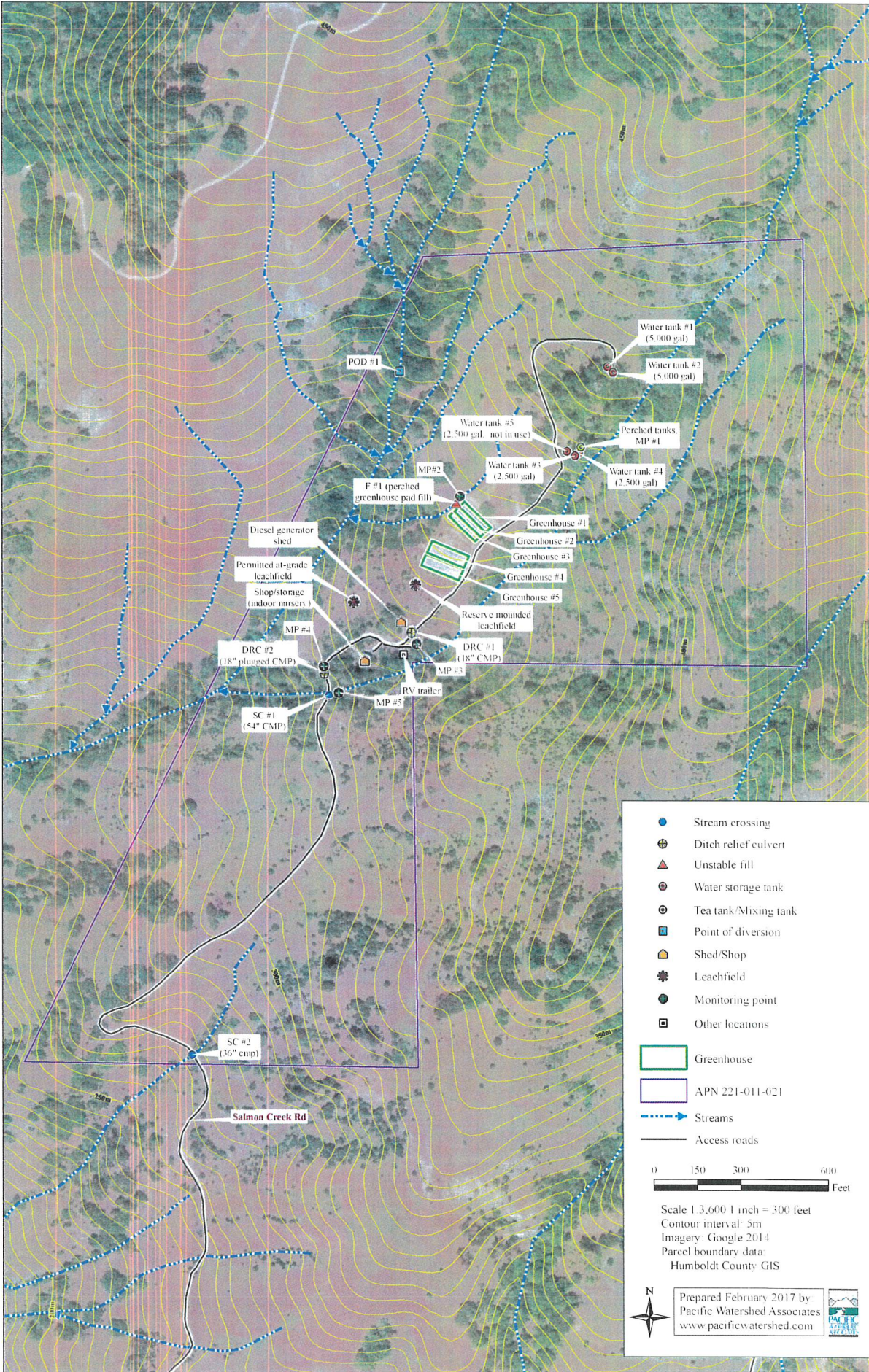


Figure 2. Site map for WDID #1B16553CHUM, APN 221-011-021, located at 8200 Salmon Creek Road, Miranda, Humboldt County, California.

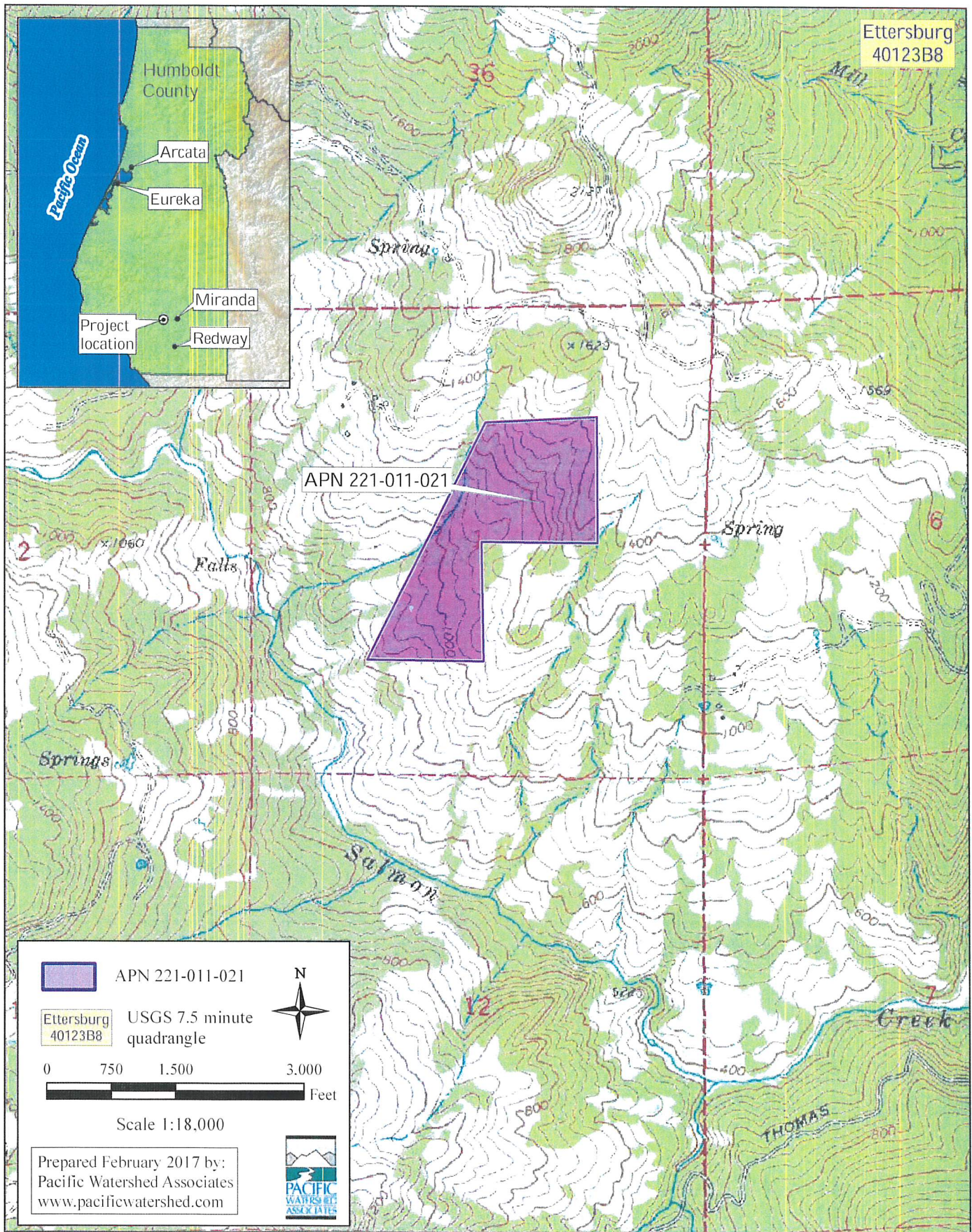


Figure 1. Location map for WDID #1B16553CHUM, APN 221-011-021, located at 8200 Salmon Creek Road, Miranda, Humboldt County, California.