COUNTY OF SACRAMENTO

AGRICULTURAL ADVISORY COMMITTEE

4137 Branch Center Rd.
Sacramento, CA 95827
(916) 875-6603
(916) 875-6150 FAX
www.saccounty.net

AGENDA

November 13, 2019; 6:30pm
Valley Oak Room
4137 Branch Center Rd., Sacramento, California

Public testimony will be received on each agenda item as it is called. The applicant is allocated 10 minutes to speak; individual comments are limited to 3 minutes; and individuals representing a group are allocated 5 minutes.

Items not on the agenda may be addressed by the general public during Public Forum. Comments are limited to 3 minutes per person. The Committee reserves the right to waive said rules by a majority vote. Public Forum is for comments only. No action will be taken on these items unless they are scheduled on a future agenda.

To ensure timely delivery to the Agricultural Advisory Committee, written information from the public must be received by the Agricultural Commissioner by the last Wednesday prior to the meeting. The Agricultural Commissioner cannot guarantee that any FAX or mail received the day of the meeting will be delivered to the Committee prior to action on the subject matter.

All Agricultural Advisory Committee meetings are recorded. Anyone wishing to receive a copy of a recording of an Agricultural Advisory Committee meeting may do so under the California Public Records Act by requesting a copy through https://saccounty.nextrequest.com/.

Written minutes of the Agricultural Advisory Committee can be accessed at http://www.agcomm.saccounty.net or by contacting the Agricultural Commissioner's Office utilizing the California Public Records Act request process.

Pursuant to Government Code §54954.2, any person with a disability who requires a modification or accommodation in order to participate in this public meeting is to contact the Agricultural Commissioner's Office by 4:00pm the day of the meeting.

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1. Call to Order
2. Approval of Agenda
3. Approval of Minutes (Meeting of September 11, 2019)
4. Approval of 2020 Meeting Calendar
5. Public Comment
6. New Business:
    a. PLNP2017-00199; Operating Engineers (OE3) Training Center: Request for a Use Permit to build and operate a new campus and equipment training facilities. Request to cancel existing WAC 69-AP-035a on the 25-acre portion of the project site. – Associate Planner Leanne Mueller
    b. PLNP2017-00270; Silva Ranch Biosolids Use Permit Amendment: Request for a Use Permit Amendment to renew Use Permit 04-UPB-0427. – Associate Planner Leanne Mueller
7. Informational Items:
8. Adjournment – Next Meeting: January 8, 2020; 6:30 p.m.

Office of Planning and Environmental Review
Leighann Moffitt, Director

County Executive
Navdeep S. Gill

November 13, 2018

Sacramento County Agricultural Advisory Committee
4137 Branch Center Rd.
Sacramento, CA 95827

Subject: PLNP2017-00199. Operating Engineers (OE3) Training Center.

1. **Request:**
   - A Use Permit for a private school to allow 450-acres of 1,500-acre site to be utilized as an Operating Engineers training center in the AG-80 zone.
   - A Williamson Act Cancellation to cancel the existing contract on the 25-acre campus site.
   - A Williamson Act Contract to re-enter into contract and prevent non-renewal scheduled to occur December 2024 on portions of the subject property.
   - A Design Review to comply with Countywide Design Guidelines.
2. **Location:** 13800 Meiss Road; at the northeast corner of the intersection Apple Road and Riza Road in the Cosumnes community.

Sacramento County Agricultural Advisory Committee,

The Office of Planning and Environmental Review (PER) received an application requesting a use permit to build and operate a new campus and equipment training activities. This new use permit would replace the existing mining use permit on the subject property. The new campus and training center includes the following: 1) construction and operation of a new 25 acre campus facility (without dormitory); and 2) allowance for field instruction with construction equipment on the property. The field instruction area will cover 425 acres; however, only 80 acres will be actively disturbed at one time. The applicant proposes a five year rotation cycle, so that the land can rest and revegetate. The project will include the relocation of existing classrooms and equipment training from the Rancho Murieta Training Center; the dormitory and food preparation will continue to reside at the current campus location in Rancho Murieta.

Campus
Approximately 25 of the 450 acres will be used for the campus and associated facilities. The campus will include administrative offices, classrooms, maintenance facilities, parking areas, and landscaping. The campus population will not exceed approximately 20 administrative personnel and faculty and 150 students during peak training periods.

The campus area will include buildings, parking, and ancillary facilities to support up to 150 students for training periods lasting either 2 or 8 weeks. Within this 25-acre campus area will be approximately 150,200 square feet of building infrastructure. Each of the proposed campus facilities are summarized in the list below.

- Classrooms: Approximately 17 classrooms will be located within a building consisting of two halves (13,500 square feet) joined by a breezeway. Classroom sizes will depend on their use.
- HDR and Maintenance and Repair Facilities: Equipment repair and maintenance is offered as part of the training program. All mobile training equipment maintenance and repairs will occur within designated campus buildings. Facilities will include a 13,500 square foot HDR building containing an indoor/outdoor welding shop, machine shop, engine shop, and electrical/hydraulic shop. In addition, mobile equipment

will be serviced on-site in the 10,000 square foot Maintenance Building, which will have three drive-through service bays and one wash bay. These areas will also contain the tools, fuels, oils, and lubricants necessary to perform these repairs.

- Administration: This building consists of two halves joined by a common entry way. A lobby, a front desk, and administration offices will be located in the westerly portion to support student registration, training center administration, and other ancillary support of the training center. Offices, a break room, bathroom facilities, and common areas will also be included to support administration staff. The other half of the administration building consists of a dining room, kitchen, and restrooms/locker rooms to provide lunches and changing facilities to students in easterly portion.
- Covered Dig Building: This is an 94,000 square foot, large covered area, similar to covered arena for training during inclement weather.

It is anticipated that campus facilities will be constructed over a 10-year period, based on funding allocation and other factors.

Field Instruction Area

Approximately 425 of the 450 acres will allow for expanded equipment movement and field instruction currently unavailable at the Rancho Murieta Training Center. Field instruction includes training students to use various pieces of mobile construction equipment by simulating real-world construction activities. Only 80 acres will be subject to field training activities at a time, with the remainder lying fallow for cattle grazing on a rotational basis. Rotation will occur every 5 years. The remaining 1,050 acres on-site will be permanently preserved. On-site preservation will occur in two locations: (1) the eastern portion of the site will be used to mitigate project-related biological impacts. (2) The western portion of the site will be permitted as a mitigation bank or managed under the South Sacramento Habitat Conservation Plan through separate permitting processes. To maximize habitat values, OE3 proposes to create improved habitat, which will require some equipment movement and surface disturbance within the preservation areas.

The scale, type, and variety of field instruction will not change from the current field instruction activities that are conducted on the project site, with the exception that additional field instruction acreage will be used over time. Consistent with current activities, field instruction will continue to involve a variety of earth moving, equipment operation, and simulated construction projects

Cranes currently located at the site will continue to operate within the vicinity of their current location. The field instruction area will continue to include an equipment operating area, portable bathroom facilities, mobile equipment storage, and parking areas.

Field instruction will only take place in one 80 acre area during any one period and field instruction will remain within a given area for approximately 5 years prior to revegetation and moving into the next area. The remaining 345 acres would be open to grazing. Before surface disturbance begins within a new area, OE3 will ensure that all measures necessary to comply with conditions of approval are implemented and regulatory approvals necessary for that phase are obtained; however, the number of years and areas of surface disturbance in any given year may vary.

Williamson Act Cancellation

The entire project site is currently encumber by Williamson Act contract 69-AP-035a. The applicant applied for a non-renewal of the contract in 2014 and the property will be out of contract in 2024. In order to be able to develop and use the campus before 2024, the applicant has applied for a cancellation on the 25-acre campus portion of the project site.

Government Code Section 51282(a) allows a landowner to petition the Board of Supervisors for cancellation of a Williamson Act contract. The Board of Supervisors can approve cancellation of the contract if one of the following findings in made:

1. Cancelation is consistent with the purposes of the Williamson Act.
2. Cancellation is in the public interest.

To be considered consistent with Government Code Section 51282(a)(1) (the cancellation criteria) the Board of Supervisors must make all of the following findings:

1. That the cancellation is for land on which a notice of non-renewal has been served.
2. That the cancellation is not likely to result in the removal of adjacent lands from agricultural use.
3. That the cancellation is for an alternative use which is consistent with the applicable provisions of the city or county general plan.
4. That cancellation will not result in discontiguous patterns of urban development.
5. That there is no proximate noncontracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or that development of the contracted land would provide more contiguous patterns of urban development that development of proximate noncontracted land.

"Proximate noncontracted land" means land not restricted by contract pursuant to the Williamson Act, which is sufficiently close to land which is also restricted that it can serve as a practical alternative for the use which is proposed for the restricted land.

"Suitable" for the proposed use means that the salient features of the proposed use can be served by land not restricted by Williamson Act contract. Such nonrestricted land may be a single parcel or may be a combination of contiguous or discontiguous parcels.

The cancellation application identifies how each of the required findings (1-5 above) can be made in the affirmative and also discusses how the cancellation is in the public interest. Specifically, as previously stated a notice of non-renewal has been filed, the applicant indicates the campus use is a small portion of the overall property which is buffered from the surrounding properties by the remaining property and is a self-contained facility which will not require other uses on the adjacent lands to operate. An analysis of the projects consistency with the General Plan Policies has been provided.

In determining whether there is "proximate suitable and available non-contracted land" the applicant evaluated properties within a 3.5 mile radius of the proposed campus location. Parcels that did not meet the following criteria were eliminated as not being "suitable":

- Less than 15-acres
- Williamson Act contracted
- Parcels with zoning prohibiting campus development
- Parcels designated as Prime Farmland by the California Department of Conservation
- Parcels encumbered and/or surrounded existing land uses that would be incompatible with the OE3 campus (residential, commercial, solar)

After applying the criteria listed above 16 of the initial 3,504 parcels remained. Subsequently, 12 of these parcels were not considered "suitable and proximate" for development because they included a significant amount of biological resources or were not close enough to the proposed field instruction area to be used without significant additional travel time or effort to transport equipment. As a result, four adjacent parcels were considered "proximate". However, they also have significant biological resources and are not for sale making them not "available".

Environmental Document

Sacramento County is preparing an Environmental Impact Report (EIR) to evaluate the potential environmental impacts associated with the project. The EIR focuses on the potential impacts to Agricultural Resources, Air Quality, Biological Resources, Climate Change, and Cultural Resources.

Staff is seeking review and recommendations on this proposal from Agricultural Advisory Committee that will be reflected in PER's Board Letter and recommendation to the Board of Supervisors, as they are the final hearing authority for this project.

Sincerely,
Leanne Mueller
Senior Planner
muellerl@saccounty.net

916-874-6155

Enclosures: Site Plan, Campus Plan, Cancellation package

SACRAMENTO COUNTY
Department of Community Development, Planning and Environmental Review

AGRICULTURAL PRESERVE PROGRAM
APPLICATION FOR DISESTABLISHMENT OR DIMINISHMENT OF AN AGRICULTURAL PRESERVE

Incomplete applications will not be accepted

Case Number _____ **Date Submitted** _____

APPLICATION INFORMATION

APPLICANT OWNERS NAME			**PHONE**
OE3 CA AAT			916-354-1126
MAILING ADDRESS	**CITY**	**STATE**	**ZIP CODE**
14738 Cantova Way	Sloughhouse,	CA	95683
PROPERTY OWNERS NAME	**CITY**	**STATE**	**ZIP CODE**
OE3 CA AAT			
MAILING ADDRESS (street/PO)	**CITY**	**STATE**	**ZIP CODE**
1640 South Loop Road	Alameda	CA	94502

If the property is owned by more than one person, attach a separate page that reference the application case number and lists the names, mailing addresses, and phone numbers of all persons having an interest in the real property or properties involved in this application.

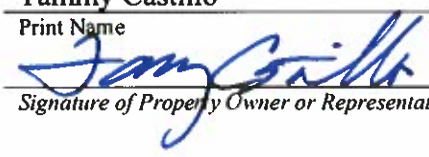
The Department of Community Development, Planning and Environmental Review will primarily direct communications regarding this application to the person identified above as the Applicant. The Applicant may be the property owner, representative, or other assigned agent.

Fees collected in excess of the actual cost of providing specific services will be refunded. If additional funds are needed to complete the processing of your application, you will be billed, and processing of the application will cease until the outstanding balance is paid and sufficient funds are available to continue the processing of the application. The applicant understands the deposit fee process as described above, and that there will be NO refund of fees which have been expended as part of the application review or other related activities or services, even if the application is withdrawn or the application is ultimately denied.

I CERTIFY THAT I AM THE OWNER OR AUTHORIZED REPRESENTATIVE OF THE OWNER OF RECORD AND THE INFORMATION SUPPLIED, TO THE BEST OF MY KNOWLEDGE, IS TRUE AND CORRECT.

Tammy Castillo
Print Name

7/31/19
Date



Signature of Property Owner or Representative

AUTHORITY FOR THIS APPLICATION IS HEREBY GIVEN:

If the subject property is owned by persons who have not signed as owners above, attach a separate sheet that references the application case number and lists the printed names and signatures of all persons having an interest in the property. Additionally, an authorized agent must submit a letter from the owner(s) indicating authority to sign the application on the owner's behalf.

PROPERTY INFORMATION:

PROPERTY ADDRESS	
13800 Meiss Road Sloughhouse, CA 95683	**Latitude:** 38°26'52.34"N **Longitude:** 121°7'48.17"W
ASSESSOR'S PARCEL NO.	**SIZE OF PROPERTY** ***(in gross acres)***
128-0090-032-0000	1,237.52
LEGAL DESCRIPTION	
See Appendix B, "Legal Description of Property"	
GENERAL LOCATION	
Approximately 3½ miles south of Rancho Murieta and State Route 16/Jackson Road and 20 miles southeast of the city of Sacramento	

PROJECT INFORMATION:

Purpose of Request (Check one):

___ Disestablishment (Termination of entire Agricultural Preserve)
_X_ Diminishment (Removal of a portion of the land in an Agricultural Preserve).

Name or Number of the affected Agricultural Preserve: 69-AP-035

Number of Petitions for Cancellation of Contract attached: 1

Has a Notice of Nonrenewal been served on the land involved in this application? ***Yes*** X ***No*** __
If yes, state the date(s) of said Notice of Nonrenewal served: November 21, 2014

Related cases filed in conjunction with this request: OE3 Training Center and Open Space Preservation Project Use Permit and Reclamation Plan Amendment (March 2018)

AGRICULTURAL PRESERVE PROGRAM
PETITION FOR CANCELLATION OF CONTRACT

A separate petition for Cancellation of Contract must be completed for each separate ownership of land to be removed from an agricultural preserve.

I, the undersigned, the owner or authorized to act on behalf of all owners of land described herein, respectfully petition the Honorable Board of Supervisors of the County of Sacramento to withdraw said property a 25-acre portion of Accessor's Parcel No.128-0090-032 from Agricultural Preserve 69-AP-035, and to cancel a portion of the Land Conservation Contract or Agreement dated February 20, 1969, and recorded on May 1, 1969 as Instrument No. Book 9-05-01, Page 1379 in the Office of the County Recorder of Sacramento County, California, as it pertains to said property.

Owner's Signature		***Date:***	
Owner's Printed Name	Tammy Castillo	***Phone***	916-354-1126
Owner's Address	14738 Cantova Way	***Fax***	
	Sloughhouse, CA 95683	***E-mail***	TCastillo@OE3JAC.org

AGRICULTURAL PRESERVE PROGRAM
PETITION FOR CANCELLATION OF CONTRACT

1. **Please list all the names and addresses of all owners as shown on the recorded deed. (If the owner is a corporation, please state the type of corporation, place and date of incorporation.**

   Sloughhouse Apple, LLC
   14738 Cantova Way
   Sloughhouse, CA 95683
   Attention: Tammy Castillo

   Date of Incorporation: December, 19, 2012

2. **Please attach site plan with the general location of the property, including the major crossroads.**

   See Appendix A, "Project Site Plan"

3. **Please attach a complete legal description of this property as shown in the deed or the title insurance policy.**

   See Appendix B, "Legal Description of Property"

4. **Please provide the parcel number and acreage of this property.**

Assessor's Parcel Number(s)	**Acreage:**
128-0090-032-0000	1,237.52

5. **Attach a statement outlining the proposed alternative land use for this property.**

   See Appendix C, "OE3 Training Center Description."

6. **Attach any written evidence establishing the lack of nearby property, not subject to a Land Conservation Contract, which is both available and suitable for the proposed alternative land use.**

   See Appendix D, "Available and Suitable Lands Analysis."

7. **Attach a statement explaining how the cancellation of this contract will not result in premature conversion of nearby property presently under a Williamson Act Agricultural Preserve Contract.**

   See Appendix D.

LIST OF APPENDICES

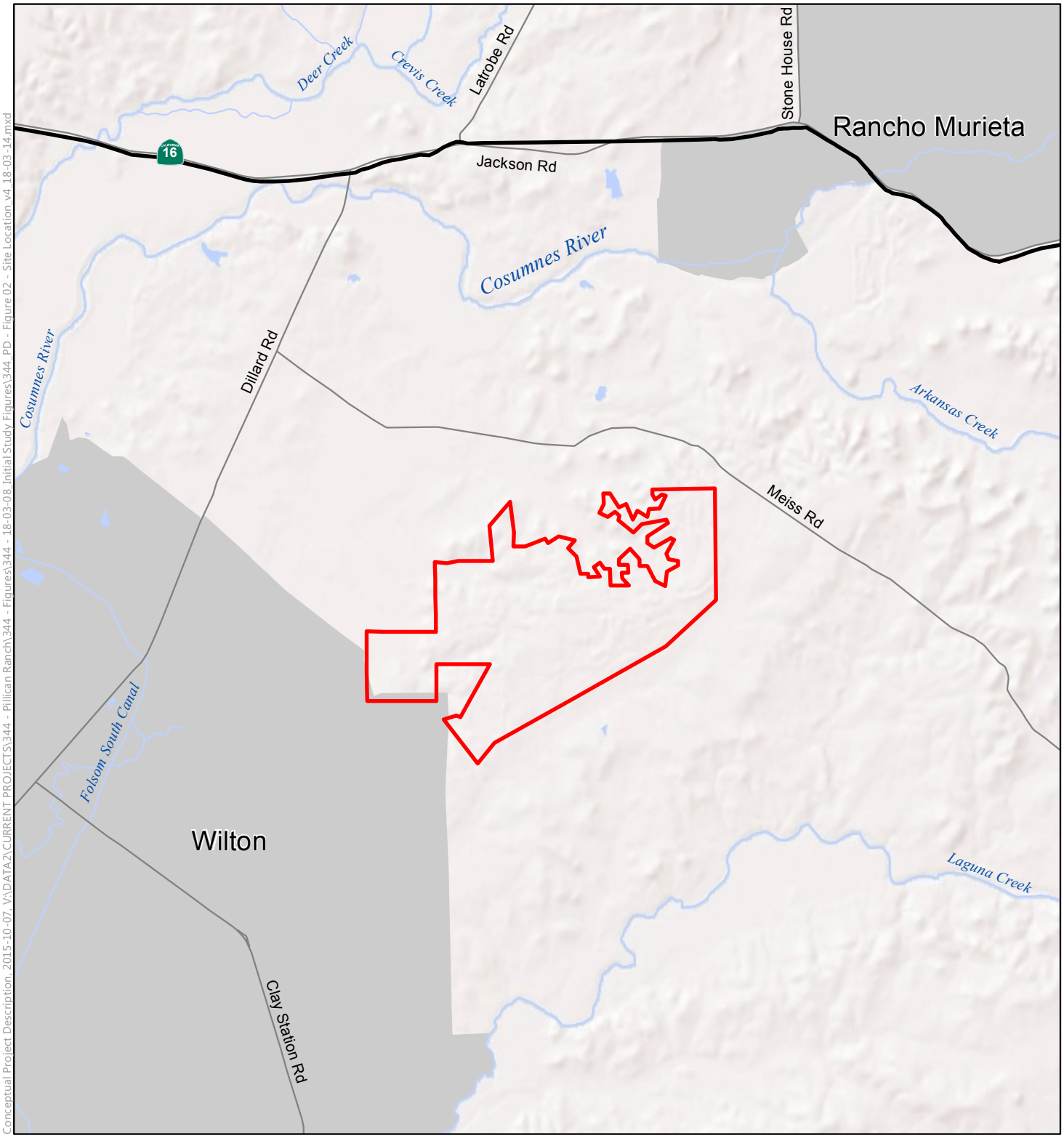
Appendix A: Project Site Plan

Appendix B: Legal Description of Property

Appendix C: OE3 Training Center Description

Appendix D: Available and Suitable Lands Analysis

APPENDIX A
PROJECT SITE PLAN



SOURCE: ESRI World Shaded Relief (2014), ESRI World Streetmap (2009); compiled by Benchmark Resources in 2016

LEGEND

- Site Boundary
- City or Community
- Water Body
- Highway
- Major Road
- River

N

0 0.5 1 1.5 2 Miles

BENCHMARK RESOURCES

Site Location

OE3 TRAINING CENTER & OPEN SPACE PRESERVATION PROJECT
PROJECT DESCRIPTION

Figure 2

FACE-1, 2015-10-15, V:\DATA2\CURRENT PROJECTS\404 - Idaho-Maryland Mine\404 - Figures\404 - Project Description\344_PDS - Figure 04 - Site Plan_v4_19-09-27.mxd

SOURCE: TerraServer Aerial flown on 2016-09-28; ESRI World Streetmap (2009); compiled by Benchmark Resources in 2016

N

0 600 1,200 1,800 2,400 Feet

BENCHMARK RESOURCES

LEGEND

- Site Boundary
- Campus Boundary
- Major Road
- Field Instruction Area
- Preservation Areas

Site Plan

OE3 TRAINING CENTER & OPEN SPACE PRESERVATION PROJECT

Figure 4

LEGEND

WILLIAMSON ACT
REVISION AREA
+/- 24.987 ACRES

OPERATING ENGINEERS
LOCAL 3

Williamson Act Site Plan
26 September 2019

Scale: 1"=50'-0"

APPENDIX B
LEGAL DESCRIPTION OF PROPERTY

Exhibit 1 to Quitclaim Deed

All that real property in the State of California, County of Sacramento, Unincorporated Area including all privileges, rights, easements, hereditaments and appurtenances thereto belonging, including, without limitation, all minerals, oil, gas and other hydrocarbon substances on and under the real property, as well as all air rights, water, water rights and water stock relating to the real property, and all rights, title and interest of Owner in and to any streets, easements and other rights-of-way or appurtenances included therein or adjacent thereto used in connection with the beneficial use and enjoyment of the real property, described as follows:

A parcel of land situate in the County of Sacramento, State of California, being a portion of Fractional Section 24, Township 7 North, Range 7 East, M.D.M. and Section 17, 18, 19, 20 and 30, Township 7 North, Range 8 East, M.D.M., more particularly described as follows:

Beginning at the section corner common to Section 18 and 19, Township 7 North, Range 8 East, M.D.M. and corners common to Fractional Sections 13 and 24, Township 7 North, Range 7 East, M.D.M., said corner is marked with a brass cap in a 2 inch iron pipe; thence from said point of beginning running along said range line South 00 deg. 14' 11" West 2642.93 feet to the approximate one quarter corner of said Sections 24 and 19; thence Westerly along the approximate center one-quarter line of said Fractional Section 24 North 89 deg. 31' 30" West 2661.82 feet; thence running Southerly along the Westerly boundary of the approximate Southeast one-quarter of said Fractional Section 24, South 00 deg. 39' 15" East 2642.29 feet to the Southwest corner of the Southeast one-quarter of said Fractional Section 24; thence along the Southerly boundary of said Fractional Section 24 South 89 deg. 30' 01 " East 2620.75 feet to the Section corner of Fractional Sections 24 and 25, Township 7 North, Range 7 East and Sections 19 and 30 Township 7 North, Range 8 East, M.D.M.; thence Northerly along said range line North 00 deg. 14' 11" East 1434.09 feet; thence North 89 deg. 30' 01" West 2021.99 feet; thence South 17 deg. 09' 45" West 2628.79 feet; thence North 65 deg. 11' 00" West 173.00 feet; thence South 71 deg. 03' 00" West 500.00 feet; thence South 38 deg. 00' 00" East 1840.60 feet; thence North 34 deg. 56' 00" East 1000.00 feet; thence North 60 deg. 27' 00" East 7449.80 feet; thence North 47 deg. 44' 00" East 2580.00 feet to a point on the approximate section line common to said Sections 20 and 21; thence along said line North 01 deg. 05' 00" East 1590.00 feet to the approximate section corner common to said Sections 16, 17, 20 and 21, Township 7 North, Range 8 East, M.D.M.; thence Northerly along the approximate section line common to said Sections 16 and 17 North 00 deg. 34' 47" West 2649.05 feet to the approximate one-quarter corner common to said Sections 16 and 17; thence along the approximate center one-quarter line of said Section 17 South 89 deg. 50' 42" West 2357.63 feet thence South 01 deg. 10' 26" East 199.81 feet; thence South 57 deg. 45' 22" East 199.99 feet; thence North 55 deg. 17' 37" East 230.31 feet; thence North 88 deg. 45' 30" East 148.60 feet; thence South 26 deg. 49' 18" West 539.21 feet; thence South 88 deg. 53' 44" West 392.70 feet; thence South 10 deg. 47' 47" West 299.59 feet; thence North 60 deg. 25' 32" West 439.99 feet; thence South 29 deg. 14' 54" West 372.07 feet; thence North 23 deg. 16' 44" West 635.64 feet; thence South 66 deg. 31' 12" West 300.56 feet; thence North 33 deg. 51' 29" West 627.78 feet; thence South 88 deg. 40' 34" West 233.28 feet; thence South 01 deg. 06' 13" East 378.99 feet; thence South 23 deg. 39' 31" West 381.10 feet; thence South 66 deg. 10' 29" East 350.00 feet; thence North 56 deg. 34' 59" East 329.20 feet; thence South 48 deg. 04' 01" East 228.52 feet; thence South 16 deg. 49' 14" West 168.47 feet; thence South 51 deg. 20' 21" East 725.60 feet; thence North 44 deg. 06' 42" East

432.85 feet; thence North 80 deg. 57' 32" East 961.22 feet; thence South 24 deg. 41' 03" East 131.22 feet, thence South 57 deg. 02' 32" West 929.47 feet; thence South 01 deg. 13' 17" East 258.05 feet; thence South 53 deg. 31' 39" East 310.23 feet; thence North 60 deg. 21' 31 " East 770.47 feet; thence South 46 deg. 12' 04" East 120.08 feet; thence South 28 deg. 56' 51" West 599.87 feet; thence South 21 deg. 42' 47" East 220.11 feet; thence South 78 deg. 25' 26" East 370.31 feet; thence South 01 deg. 13' 02" East 168.04 feet; thence South 61 deg. 47' 42" West 479.70 feet; thence South 06 deg. 31' 44" West 555.05 feet; thence North 64 deg. 19' 49" West 443.65 feet; thence North 26 deg. 08' 14" West 649.66 feet; thence South 88 deg. 48' 57" West 292.76; thence North 01 deg. 07' 35" West 231.96 feet; thence North 41 deg. 08' 48" West 554.63 feet; thence South 46 deg. 47' 12" West 569.74 feet; thence South 01 deg. 13' 19" East 218.04 feet; thence North 88 deg. 53' 29" East 348.34 feet; thence South 01 deg. 13'42" East 308.36 feet; thence South 88 deg. 45' 39" West 242.78 feet; thence South 01 deg. 13' 32" East 198.23 feet; thence South 43 deg. 00' 16" East 367.36 feet; thence South 88 deg. 45' 38" West 694.35 feet; thence North 01 deg. 07' 12" West 651.24 feet; thence South 88 deg. 02' 24" West 204.08 feet; thence North 34 deg. 49' 26" West 288.61 feet; thence South 51 deg. 04' 55" West 271.96 feet; thence South 31 deg. 27' 25" East 422.16 feet; thence South 88 deg. 22' 43" West 434.38 feet; thence North 01 deg. 21' 10" West 113.10 feet; thence South 86 deg. 22' 45" West 296.95 feet; thence North 13 deg. 03' 36" West 689.12 feet; thence North 46 deg. 04' 14" West 454.57 feet; thence North 39 deg. 29' 54" East 396.79 feet; thence North 76 deg. 44' 13" West 630.67 feet; thence South 57 deg. 28' 11 "West 463.12 feet; thence North 39 deg. 02' 26" West 194.17 feet; thence South 69 deg. 22' 44" West 797.42 feet; thence South 89 deg. 56' 57" West 461.15 feet; thence North 02 deg. 47' 07" East 557.71 feet; thence North 07 deg. 08' 52" West 1125.95 feet; thence South 41 deg. 31' 27" West 1189.43 feet; thence South 05 deg. 10' 52" East 1352.77 feet; thence North 89 deg. 50' 11" West 1275.77 feet; thence South 81 deg. 55' 33" West 433.52 feet; thence North 86 deg. 18' 31" West 421.70 feet to the point of beginning.

Excepting Therefrom that portion of Section 19, Township 7 North, Range 8 East, M.D.M., more particularly described as follows:

Beginning at the most Northwesterly corner of said parcel, said point is in the Westerly boundary of said Section 19 from which the Northwest section corner of said Section 19 bears North 00 deg. 14' 11 " East 3383.63 feet; thence, from said point of beginning along an existing fence line North 73 deg. 58' 30" East 2477.48 feet to a 5/8 inch rebar; thence approximately along an existing fence South 17 deg. 09' 45" West 1224.21 feet to a 3/4 inch capped iron pipe stamped LS 3646; thence, North 89 deg. 30' 01" West 2021.99 feet to a 3/4 inch capped iron pipe stamped LS 3646; said pipe is in a fence line marking the Westerly boundary of said Section 19; thence approximately along said fence line North 00 deg. 14' 11" East 468.14 feet to the point of beginning containing 40.00 acres more or less.

And Excepting Therefrom a strip of land 45.00 foot in width situate in the County of Sacramento, State of California, being a portion of Fractional Section 24, Township 7 North, Range 7 East, M.D.M., as described in that certain Grant of Easement from Fern Pilliken ("Grantor") to Marie A. Cammarata ("Grantor") recorded September 24, 1990.

APN: 128-0060-001-0000; 128-0090-032-0000; and 128-0110-011-0000

APPENDIX C
OE3 TRAINING CENTER DESCRIPTION

APPENDIX C
OE3 TRAINING CENTER DESCRIPTION

The alternative land use description provided below is an excerpt from the *OE3 Training Center and Open Space Preservation Project* use permit and reclamation plan amendment application (March 2018). The excerpt provides a description of the campus and associated activities to occur within the campus area that would be located within this 25-acre area subject of this petition for partial cancellation of the existing Williamson Act contract.

"6.1 Campus

As shown on Figure 10, campus facilities will be located within the northern portion of the project site on approximately 25 acres. The campus area will include buildings, parking, and ancillary facilities to support up to 80 students for training periods lasting either 2 or 8 weeks. Within this 25-acre campus area will be approximately 60,000 square feet of building infrastructure. Each of the proposed campus facilities are summarized in the list below.

- Classrooms: Approximately 17 classrooms will be located within the campus. Classroom sizes will depend on their use.
- Lunch/Breakroom: A lunch/breakroom will be located on campus for students attending training. The lunch/breakroom will have the capacity to hold a maximum of 80 students at a time. Food preparation facilities and service will not occur on-site.
- Maintenance and Repair Facilities: Equipment repair and maintenance is offered as part of the training program. All mobile training equipment maintenance and repairs will occur within designated campus buildings. Facilities will include an indoor/outdoor welding shop, machine shop, engine shop, and electrical/hydraulic shop. In addition, mobile equipment will be serviced on-site in three drive-through service bays. These areas will also contain the tools, fuels, oils, and lubricants necessary to perform these repairs.
- Administration: A front desk, administration offices, and a conference room will be located on campus to support training center administration and other ancillary support of the training center. Bathroom facilities and utility room will also be included to support training center administration.

It is anticipated that campus facilities will be constructed over a 10-year period, based on funding allocation and other factors. As funding is available for construction of some or all of the buildings, OE3 will prepare the necessary architectural designs and other technical analysis to obtain building permit approvals for the individual structures. The campus will be designed and constructed in compliance with AG-80 zoning standards, County Building Code, Sacramento Metropolitan Fire District rules, Health and Safety Code, and other applicable County and state regulations."

"7. TRAINING CENTER OPERATIONS

7.1 Typical Campus and Equipment Training Schedule

Training courses at the project site will occur year-round consistent with existing training. Classroom and field instruction will be Monday through Saturday, 7:30 a.m. to 4:00 p.m. No classroom or field instruction will occur on Sundays.

Students attending a 2-week training course will typically have 1 day of classroom activity and the remaining time on campus will be field instruction. For those students that attend an 8-week training course, approximately 5 days will be classroom instruction and the remaining time will be field instruction. Table 7, "Typical Daily Schedule," provides a typical daily schedule for students attending either the 2-week or 8-week training course.

TABLE 7
TYPICAL DAILY SCHEDULE

Hours	Activity
7:00 a.m.–7:30 a.m.	Transport from Rancho Murieta to campus
7:30 a.m.–12:00 p.m.	Classroom or field instruction
12:00 p.m.–1:00 p.m.	Lunch
1:00 p.m.–4:00 p.m.	Classroom or field instruction
4:00 p.m.–4:30 p.m.	Transport from campus to Rancho Murieta

7.2 Student and Faculty Population

The training center will employ up to approximately 20 full-time employees. These employees will provide classroom and field instruction, administrative functions, and ancillary functions (e.g., janitorial, maintenance). Typically, 60 students will attend training at any one time but overlapping classes may increase the total to 80 students. The total number of students will vary depending on the training courses offered, time of year, economy, and other factors."

APPENDIX D
AVAILABLE AND SUITABLE LANDS ANALYSIS

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AVAILABLE AND SUITABLE LANDS ANALYSIS

The following memorandum provides an analysis of the California Land Conservation Act, California Government Code 51200 et seq. (Williamson Act) cancellation criteria. Operating Engineers Local 3 (OE3) is requesting cancellation of 25 acres of Williamson Act–contracted land to construct a new state-of-the-art campus to support field instruction training. Williamson Act Section 51282 allows cancellation of a Williamson Act contract if certain findings can be satisfied. The following sections provide summaries of the proposed OE3 Training Center and Open Space Preservation Project (project) and Williamson Act contract 69-AP-035 and an analysis of the Williamson Act Section 51282 cancellation criteria.

I. Project Summary

OE3 proposes to develop the project on a 1,500-acre site in unincorporated Sacramento County (see Figure 1, "Regional Location," and Figure 2, "Site Location"). The project comprises three primary elements: (1) a 25-acre state-of-the-art training center and 80-acre field instruction area for journeyman and apprentice operating engineers, (2) permanent preservation and maintenance of more than 1,050 acres of open space grazing lands containing federally and state-protected species and habitat, and (3) grazing of 345 acres of fallowed field instruction lands.

The new OE3 training center will be located on approximately 450 acres within the 1,500 project site. Approximately 25 of the 450 acres will be used for the campus and associated facilities. The campus will include administrative offices, classrooms, parking areas, and landscaping. The campus population will not exceed approximately 20 administrative personnel and faculty and 80 students during peak training periods.

Approximately 425 of the 450 acres will allow for expanded equipment movement and field instruction currently unavailable at the existing Rancho Murieta Training Center. Field instruction includes training students to use various pieces of mobile construction equipment by simulating real-world construction activities. Only 80 acres at a time will be subject to field training activities, with the remainder lying fallow for cattle grazing on a rotational basis. Rotation will occur every 5 years.

The remaining 1,050 acres on-site will be permanently preserved. On-site preservation will occur in two locations: (1) The eastern portion of the site will be used to mitigate project-related biological impacts. (2) The western portion of the site will be permitted as a mitigation bank or managed under the *South Sacramento Habitat Conservation Plan*. To maximize habitat values, OE3 proposes to create improved habitat, which will require some equipment movement and surface disturbance within the preservation areas.

II. Williamson Act Contract 69-AP-035

The entire project site is subject to a Williamson Act contract. Land Conservation Agreement No. 69-AP-35 was entered into with the County in 1969. Exhibit B defines permitted agricultural uses including raising of "crops of all kinds" and "raising, maintaining, breeding, boarding, training" of livestock. Exhibit C illustrates compatible uses including farm labor camps, oil and gas drilling and production including equipment and structure necessary for such activities, and sand and gravel mining. A notice of nonrenewal for Land Conservation Agreement No. 69-AP-35 was filed with the County in December 2014 and will nonrenew January 2025.

Attachment A includes a copy of Land Conservation Agreement No. 69-AP-35 and Attachment B includes a copy of the notice of nonrenewal.

III. Williamson Act Cancellation

Government Code Section 51282(a) allows a landowner to petition the county board of supervisors for cancellation of a Williamson Act contract. The board of supervisors can approve cancellation of the contract if *one* of the following findings is made:

1. Cancellation is consistent with the purposes of the Williamson Act
2. Cancellation is in the public interest

To be considered consistent with Government Code Section 51282(a)(1) the board of supervisors must make all of the following findings:

1. That the cancellation is for land on which a notice of nonrenewal has been served.
2. That cancellation is not likely to result in the removal of adjacent lands from agricultural use.
3. That cancellation is for an alternative use which is consistent with the applicable provisions of the city or county general plan.
4. That cancellation will not result in discontiguous patterns of urban development.
5. That there is no proximate noncontracted[1] land which is both available and suitable2 for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

Cancellation of a Williamson Act contract shall be in the public interest, and consistent with Williamson Act Section 51282(a)(2), if the board of supervisors can make the following findings:

1. Other public concerns substantially outweigh the objectives of this chapter; and
2. That there is no proximate noncontracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

The following two sections demonstrate how the OE3 project satisfies these sections providing the Sacramento County Board of Supervisors the discretion to partially cancel Land Conservation Agreement No. 69-AP-35.

[1] "Proximate, noncontracted land" means land not restricted by contract pursuant to this chapter, which is sufficiently close to land which is so restricted that it can serve as a practical alternative for the use which is proposed for the restricted land.

[2] "Suitable" for the proposed use means that the salient features of the proposed use can be served by land not restricted by contract pursuant to this chapter. Such nonrestricted land may be a single parcel or may be a combination of contiguous or discontiguous parcels.

a. 51282(b)—Chapter Consistency

(1) Notice of Nonrenewal Served

A notice of nonrenewal was recorded on December 17, 2014, and became effective on December 31, 2014. The nonrenewal initiates a 10-year period after which the lands will no longer be under contract; thus, with no further action, the Williamson Act contract on the project site will expire on December 31, 2024.

(2) Removal of Adjacent Lands from Agricultural Use

The requested partial cancellation applies to one percent (25 acres) of the 1,500-acre Williamson Act Contract that extends across the entire property. The cancellation would not result in the direct or indirect removal of adjacent contracted land from agricultural or open-space use. The project has not been designed to require—nor is it expected to require—the use of adjacent land beyond the property for any purpose. All project purposes will be fulfilled through the use of the property alone. Cancellation of 25 acres in the center of the 1,500-acre Williamson At contract will not precipitate removal of adjacent lands from agricultural use because the surrounding "buffer" of the vast majority of the property would remain under contract. In addition, the proposed use (training campus and field instruction), is not a growth-inducing use. The OE3 training center and field instruction center, in conjunction with OE3's existing Rancho Murieta campus, is designed to provide students and faculty all the facilities and infrastructure necessary to support campus and training activities. In addition, as a self-contained training facility, it will not remove obstacles to existing population growth and needed infrastructure, such as the development of new roads or utilities, that would cause growth-inducing effects. As a result, no other off-site residential, commercial, industrial, or other land uses are necessary to support campus operations.

(3) Consistency with General Plan

An evaluation of the project's consistency with policies of the *Sacramento County General Plan* (County General Plan) is presented in Table 1, "Project Consistency with Sacramento County General Plan Goals and Policies." As demonstrated below, the project is consistent with all County General Plan applicable goals and policies.

TABLE 1
PROJECT CONSISTENCY WITH SACRAMENTO COUNTY GENERAL PLAN GOALS AND POLICIES

Goals/Objectives/Policies	Consistency Analysis
AGRICULTURAL ELEMENT	
Policy AG-15 The County shall pursue opportunities to create mitigation banks, environmental mitigation sites, wildlife refuges, or other natural resource preserves wherein substantial agricultural activities that are compatible with protection of high habitat values continue, but incompatible activities and conversion for development are precluded by conservation easements.	**Consistent** The project includes permanent preservation of 1,050 acres of open space containing federally and state-protected species and habitat.
AIR QUALITY ELEMENT	
Policy AQ-4 Developments which meet or exceed thresholds of significance for ozone precursor pollutants as adopted by the Sacramento Metropolitan Air Quality Management District (SMAQMD), shall be deemed to have a significant environmental impact. An Air Quality Mitigation Plan shall	**Consistent** All project emissions are below SMAQMD thresholds of significance for ozone precursors. Please see the air quality technical report included in this application package.

Goals/Objectives/Policies	Consistency Analysis
be submitted to the County of Sacramento prior to project approval, subject to review and recommendation as to technical adequacy by the Sacramento Metropolitan Air Quality Management District.	
Objective A reduction in motor vehicle emissions through a decrease in the average daily trips and vehicle miles traveled and an increasing reliance on the use of low emission vehicles.	**Consistent** Students would be bused to the proposed project site rather than driving individually.
Policy AQ-10 Encourage vehicle trip reduction and improved air quality by requiring development projects that exceed the SMAQMD's significance thresholds for operational emissions to provide on-going, cost-effective mechanisms for transportation services that help reduce the demand for existing roadway infrastructure.	**Consistent** See Policy AQ-4 and the objective above.
Policy AQ-11 Encourage contractors operating in the county to procure and to operate low-emission vehicles, and to seek low emission fleet status for their off-road equipment.	**Consistent** OE3 would encourage 3rd party contractors to operate low-emission vehicles and seek low-emission fleet status.
Objective Compliance with federal and state air quality standards to reduce all air pollutants, including ozone-depleting compounds to ensure the protection of the stratospheric ozone layer.	**Consistent** The Yorke Engineering (2018) air quality analysis determines the project would comply with these federal and state air quality standards.
Policy AQ-13 Use California State Air Resources Board (ARB) and SMAQMD guidelines for Sacramento County facilities and operations to comply with mandated measures to reduce emissions from fuel consumption, energy consumption, surface coating operations, and solvent usage.	**Consistent** The Yorke Engineering (2018) air quality analysis determines the project would comply with these guidelines.
Policy AQ-16 Prohibit the idling of on-and off-road engines when the vehicle is not moving or when the off-road equipment is not performing work for a period of time greater than five minutes in any one-hour period.	**Consistent** OE3 on- and off-road equipment operators would comply with the California's truck idling law prohibiting diesel-fueled trucks, with a gross vehicle weight rating greater than 10,000 pounds, from idling for more than 5 minutes (Title 13, California Code of Regulations [CCR], Section 2485).
Policy AQ-17 Promote optimal air quality benefits through energy conservation measures in new development.	**Consistent** The campus would incorporate energy conservation measures as required in the current building code when built.
Policy AQ-19 Require all feasible reductions in emissions for the operation of construction vehicles and equipment on major land development and roadway construction projects.	**Consistent** Campus construction and field instruction would comply with SMAQMD *Basic Construction Emission Control Practices,* including District Rule 403 and CCR, Title 13, Sections 2449(d)(3) and 2485.
Policy AQ-22 Reduce greenhouse gas emissions from County operations as well as private development.	**Consistent** The Yorke Engineering (2018) air quality analysis determines project greenhouse gas emissions would be below both the SMAQMD 1,100 metric tons a year and 10,000 metric tons a year thresholds for greenhouse gas emissions.

Goals/Objectives/Policies	Consistency Analysis
CIRCULATION ELEMENT	
Goal Manage travel demand on the roadway system and maximize the operating efficiency of transportation facilities in order to reduce impacts on air quality and to minimize the need for new or expanded facilities.	**Consistent** Students would be bused to the proposed project site rather than driving individually. The project would not generate enough trips to require a traffic impact study, based on the volume thresholds identified in the *County of Sacramento Traffic Impact Analysis Guidelines* (Fehr & Peers Transportation Consultants 2018).
Policy CI-67 When feasible, incorporate lighter colored (higher albedo) materials and surfaces, such as lighter-colored pavements, and encourage the creation of tree canopy to reduce the built environment's absorption of heat to reduce the urban "heat island" effect.	**Consistent** The campus landscaping would incorporate energy conservation measures as required in the current building code when built.
CONSERVATION ELEMENT: WATER RESOURCES	
Goal Ensure that a safe, reliable water supply is available for existing and planned urban development and agriculture while protecting beneficial uses of Waters of the state of California, including important associated environmental resources.	**Consistent** Based on EMKO Environmental's (2018) hydrology and water quality analysis, the project would not result in significant impacts related to water quality, depletion of groundwater supplies, or interference with groundwater recharge.
Objective Manage groundwater to preserve sustainable yield.	**Consistent** Based on EMKO Environmental's (2018) hydrology and water quality analysis, the project would not result in significant impacts related to depletion of groundwater supplies or interference with groundwater recharge.
Policy CO-7 Support the Water Forum Agreement Groundwater Management Element. Prior to approving any new development water supply plan shall be approved that demonstrates consistency with an adopted groundwater management plan.	**Consistent** Based on EMKO Environmental's (2018) Senate Bill (SB) 610 and SB 1262 water supply assessment analysis, the project's water demand would be available within the projected available groundwater supply over the next 20 years under average normal-year, single dry-year, and multiple dry-year rainfall conditions.
Policy CO-8 Applicants proposing developments in areas with significant groundwater recharge characteristics shall evaluate the impact of said development on groundwater recharge and quality. This evaluation should recognize criteria defined in any broader Countywide determination and/or evaluation of groundwater recharge areas.	**Consistent** Based on EMKO Environmental's (2018) hydrology and water quality analysis, which included review of the determinations and designations in California Department of Water Resources' *California Groundwater*, Bulletin 118, the project would not result in significant impacts related to depletion of groundwater supplies or interference with groundwater recharge.
Objective Ensure the most efficient use of water in urban and agricultural areas.	**Consistent** The campus would incorporate water conservation measures as required by the AG-80 zoning standards, County building code, and the County Water Efficient Landscape Ordinance when built.
Policy CO-14 Support the use of recycled wastewater to meet non-potable water demands where financially feasible.	**Consistent** The project includes directing and collecting stormwater in detention basins. Collected water would be used for on-site dust control in field instruction areas.

Goals/Objectives/Policies	Consistency Analysis
Policy CO-16 Ensure developments are consistent with the County Water Efficient Landscape Ordinance, which shall be updated as needed to conform to state law.	**Consistent** Landscaping would only be located on the campus and would be designed to comply with all AG-80 zoning standards, County building code, and the County Water Efficient Landscape Ordinance.
Objective Manage water supply to protect valuable water-supported ecosystems.	**Consistent** Based on EMKO Environmental's (2018) hydrology and water quality analysis, the project would not alter the course of any stream or river and would not alter existing drainage patterns or increase the rate or amount of surface runoff. In addition, WRA (2018) provides mitigation that would reduce project impacts to aquatic features that are potentially subject to federal and state jurisdiction (2.51 acres of seasonal wetland, 0.86 acre of vernal pool, and 0.27 acres of stock pond) to less than significant
CONSERVATION ELEMENT: MINERAL RESOURCES	
Goal Mineral resource protected for economic extraction with minimal adverse impacts.	**Consistent** No identified mineral resources would be covered by the campus portion of the site. Some mineral resources (i.e., dredge tailings) would be moved, stockpiled, and/or processed and used for internal road construction (i.e., no off-site sales). Any resources that exist on the remaining portions of the site would be accessible for mining at a future date, if desired.
Objective Known mineral resources protected from land uses which would preclude or inhibit timely mineral extraction to meet market demand.	**Consistent** See the goal above.
Objective Orderly extraction of minerals and subsequent reclamation of mined areas with minimal adverse impacts on aquifers, streams, scenic values, and surrounding residential uses.	**Consistent** The project site would be reclaimed per the Surface Mining and Reclamation Act with minimal adverse impacts on aquifers, streams, scenic values, and surrounding residential uses per the relevant technical analysis (Benchmark 2018, EMKO Environmental 2018, WRA 2018, Bollard Acoustical Consultants 2018, Fehr & Peers Transportation Consultants 2018).
CONSERVATION ELEMENT: VEGETATION AND WILDLIFE	
Goal Preserve and manage natural habitats and their ecological functions throughout Sacramento County.	**Consistent** The project includes preservation of natural habitats and their ecological functions, especially vernal pool habitats, through the proposed mitigation bank or conveyance to management under the *South Sacramento Habitat Conservations Plan*.
Objective Mitigate and restore for natural habitat and special status species loss.	**Consistent** With implementation of the mitigation provided in WRA's biological assessment of the project site (WRA 2018) all impacts would be less than significant under CEQA.
Policy CO-58 Ensure no net loss of wetlands, riparian woodlands, and oak woodlands.	**Consistent** As identified in the biological assessment of the project site (WRA 2018), the project would affect approximately 2.84 acres of wetlands and 0.86 acres of vernal pool. With the incorporation of measures provided by WRA (2018), impacts to aquatic features would be reduced to less than significant

Goals/Objectives/Policies	Consistency Analysis
	under CEQA. No oak woodlands exist within the project site, but mitigation measures are provided to avoid and/or replace individual oak trees if affected.
Policy CO-59 Ensure mitigation occurs for any loss of or modification to the following types of acreage and habitat function: • vernal pools, • wetlands, • riparian, • native vegetative habitat, and • special-status species habitat.	**Consistent** The biological assessment identified potential impacts to a variety of habitats, including vernal pools, wetlands, and habitat for special-status species. With implementation of the mitigation provided in WRA's biological assessment of the project site (WRA 2018) all impacts to these types of habitats would be less than significant under CEQA.
Policy CO-60 Mitigation should be directed to lands identified on the Open Space Vision Diagram and associated component maps (please refer to the Open Space Element).	**Consistent** The project includes permanent preservation of approximately 1,050 acres of open space containing federally and state-protected species and habitat. This land is also identified on the Open Space Diagram as "Vernal Pools and Vernal Pool Grasslands," "Protected," "Priority 3," and "Priority 4."
Policy CO-61 Mitigation should be consistent with Sacramento County-adopted habitat conservation plans.	**Consistent** The entire project area is located within the geographic area that will be covered by the *South Sacramento Habitat Conservation Plan* (SSHCP). While not finalized, the SSHCP was used as an information source and the project's biological resources assessment (WRA 2018) includes covered species and habitats as defined by the SSHCP.
Objective Establish and manage a preserve system with large core and landscape level preserves connected by wildlife corridors throughout Sacramento County to protect ecological functions and species populations.	**Consistent** The project includes permanent preservation of approximately 1,050 acres of open space containing federally and state-protected species and habitat.
Policy CO-64 Consistent with overall land use policies, the County shall support and facilitate the creation and biological enhancement of large natural preserves or wildlife refuges by other government entities or by private individuals or organizations.	**Consistent** The project includes permanent preservation of approximately 1,050 acres of open space containing federally and state-protected species and habitat.
Policy CO-66 Mitigation sites shall have a monitoring and management program including an adaptive management component including an established funding mechanism. The programs shall be consistent with Habitat Conservation Plans that have been adopted or are in draft format.	**Consistent** Mitigation sites would have a monitoring and management program and funding mechanism and would be consistent with the SSHCP.
Policy CO-68 Preserves shall be planned and managed to the extent feasible so as to avoid conflicts with adjacent agricultural activities (Please also refer to the Agricultural Element).	**Consistent** OE3 would incorporate measures to avoid conflicts with on-site and adjacent agricultural activities as recommended by federal and state agencies during the permitting of the mitigation bank.
Objective Manage and maintain special status species and their respective habitat in a manner that resolves conflicts with adjacent privately owned-land and agricultural operations.	**Consistent** See above.

Goals/Objectives/Policies	Consistency Analysis
CONSERVATION ELEMENT: AQUATIC RESOURCES	
Goal Preserve and enhance self-sustaining vernal pool habitats.	**Consistent** The project includes permanent preservation of open space containing approximately 9.7 acres of vernal pool habitat.
Objective Establish vernal pool preserves that enhance and protect the ecological integrity of vernal pool resources.	**Consistent** The project includes permanent preservation of vernal pool habitat. To maximize habitat values, OE3 proposes to both protect and enhance this habitat.
Policy CO-83 Preserve a representative portion of vernal pool resources across their range by protecting vernal pools on various geologic landforms, vernal pools that vary in depth and size, and vernal pool complexes of varying densities; in order to maintain the ecological integrity of a vernal pool ecosystem.	**Consistent** The project would preserve approximately 1,050 acres of open space containing approximately 9.7 acres of vernal pool habitat. In addition, OE3 proposes to enhance and/or create up to approximately 20 acres of sensitive habitat in the permanent preservation areas.
Policy CO-84 Ensure that vernal pool preserves are large enough to protect vernal pool ecosystems that provide intact watersheds and an adequate buffer, have sufficient number and extent of pools to support adequate species populations and a range of vernal pool types.	**Consistent** See Policy CO-83 above.
Policy CO-85 Utilize proper vernal pool restoration techniques as approved by United States Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDF&G) and the Army Corps of Engineers (CORPS).	**Consistent** Qualified biologists identified the areas for habitat improvements. Each wetland feature anticipated to be created occurs on slopes of less than 2 percent. The density of wetlands would not exceed 25 percent to allow adequate watershed to support each wetland. Each anticipated wetland would be buffered by at least 50 feet to avoid impacts to existing wetland habitat. Prior to habitat improvement, necessary permits and consultation (as required) would be acquired to ensure proper restoration techniques are used.
Policy CO-86 Limit land uses within established preserves to activities deemed compatible with maintenance of the vernal pool resource, which may include ranching, grazing, scientific study and education.	**Consistent** Land uses on the preserves would be consistent with those uses listed in Policy CO-86.
CONSERVATION ELEMENT: TERRESTRIAL RESOURCES	
Policy CO-140 For projects involving native oak woodlands, oak savannah or mixed riparian areas, ensure mitigation through either of the following methods: • An adopted habitat conservation plan. • Ensure no net loss of canopy area through a combination of the following: (1) preserving the main, central portions of consolidated and isolated groves constituting the existing canopy and (2) provide an area on-site to mitigate any canopy lost. Native oak mitigation area must be a contiguous area on-site which is equal to the size of canopy area lost and shall be adjacent to existing oak canopy to ensure opportunities for regeneration. • Removal of native oaks shall be compensated with	**Consistent** As identified in the biological assessment of the project site (WRA 2018), the project would not disturb oak woodlands habitat. Some individual oak trees may be affected by field instruction activities, and mitigation measures are provided to avoid and/or replace individual oak trees if necessary.

Goals/Objectives/Policies	Consistency Analysis
native oak species with a minimum of a one to one dbh replacement. • A provision for a comparable on-site area for the propagation of oak trees may substitute for replacement tree planting requirements at the discretion of the County Tree Coordinator when removal of a mature oak tree is necessary. • If the project site is not capable of supporting all the required replacement trees, a sum equivalent to the replacement cost of the number of trees that cannot be accommodated may be paid to the County's Tree Preservation Fund or another appropriate tree preservation fund. • If on-site mitigation is not possible given site limitation, off-site mitigation may be considered. Such a mitigation area must meet all of the following criteria to preserve, enhance, and maintain a natural woodland habitat in perpetuity, preferably by transfer of title to an appropriate public entity. Protected woodland habitat could be used as a suitable site for replacement tree plantings required by ordinances or other mitigations. • Equal or greater in area to the total area that is included within a radius of 30 feet of the dripline of all trees to be removed; • Adjacent to protected stream corridor or other preserved natural areas; • Supports a significant number of native broadleaf trees; and • Offers good potential for continued regeneration of an integrated woodland community.	
CONSERVATION ELEMENT: CULTURAL RESOURCES	
Objective Attention and care during project review and construction to ensure that cultural resource sites, either previously known or discovered on the project site, are properly protected with sensitivity to cultural and ethnic values of all affected.	**Consistent** InContext (2018) prepared a cultural resources survey report for the project and identified two cultural resources, dredge tailings and a homestead. The report concludes the dredge tailings are ineligible for both the National Register of Historic Places (NRHP) and California Register of Historic Places (CRHR). The report assumes the homestead is eligible under NRHP and CRHR criteria and mitigation measures are included to avoid disturbance of the area. In addition, mitigation measures are provided for inadvertent discoveries, including human remains.
Policy CO-150 Utilize local, state and national resources, such as the NCIC, to assist in determining the need for a cultural resources survey during project review.	**Consistent** InContext (2018) performed a records search on September 9, 2016, at the North Central Information Center (NCIC) of the California Historical Resources Information System, located at California State University, Sacramento.

Goals/Objectives/Policies	Consistency Analysis
Policy CO-152 Consultations with Native American tribes shall be handled with confidentiality and respect regarding sensitive cultural resources on traditional tribal lands.	**Consistent** Native American consultation consistent with Section 106 was conducted in 2016. The details of the consultation performed can be found in the InContext (2018) cultural resources survey report.
Policy CO-155 Native American burial sites encountered during preapproved survey or during construction shall, whenever possible, remain in situ. Excavation and reburial shall occur when in situ preservation is not possible or when the archeological significance of the site merits excavation and recording procedure. On-site reinterment shall have priority. The project developer shall provide the burden of proof that off site reinterment is the only feasible alternative. Reinterment shall be the responsibility of local tribal representatives.	**Consistent** The InContext (2018) cultural resources survey report for the project includes mitigation measures to ensure that, if found, burial sites and human remains would be appropriately addressed.
Policy CO-157 Monitor projects during construction to ensure crews follow proper reporting, safeguards, and procedures.	**Consistent** InContext (2018) prepared a cultural resources survey report for the project. The report includes mitigation measures to ensure that activities would be appropriately monitored during construction.
Policy CO-158 As a condition of approval of discretionary permits, a procedure shall be included to cover the potential discovery of archaeological resources during development or construction.	**Consistent** InContext (2018) prepared a cultural resources survey report for the project. The report includes mitigation measures to cover the potential discovery of archaeological resources during development or construction.
Objective Protect any known cultural resources from vandalism, unauthorized excavation, or accidental destruction.	**Consistent** The known eligible cultural resource on-site is located within fenced private property without public access, and is not located in an area designated for surface disturbance.
CO-169. Restrict the circulation of cultural resource location information to prevent potential site vandalism. This information is exempt from the "Freedom of Information Act".	**Consistent** The resource location information provided in the appendices of the InContext (2018) report is marked as "Not for Publication."
CONSERVATION ELEMENT: ECONOMIC DEVELOPMENT ELEMENT	
Policy ED-33 Partner to create and maintain an adaptive/skilled workforce to meet the needs of existing and future businesses.	**Consistent** The project would continue to allow apprentice and journeymen operating engineers to train and increase their skillset to adapt to changing construction work and equipment demands. This continuing education would provide a skilled labor force necessary to meet the needs of existing and future businesses, construction projects, and equipment repair in northern California.
Objective Generate new jobs by enabling existing companies and growth industries to retain and expand their businesses in Sacramento County and by attracting new growth industries to the unincorporated area.	**Consistent** By providing apprentice and journeymen operating engineers a state-of-the-art facility to continue their education, local businesses would have a competitive advantage in the labor market and when competing for public and private work.
Policy ED-34 Identify and attract industries that are consistent with the County's goal of economic vitality and providing a high quality of life.	**Consistent** The continuing education provided by the project would result in the ability for apprentice and journeymen operating engineers to obtain or maintain high-paying jobs.

Goals/Objectives/Policies	Consistency Analysis
Institutions of Higher Education: Goal Provide a diversity of higher educational opportunities within Sacramento County.	**Consistent** The project would provide higher education opportunities for journeyman and apprentice operating engineers that do not exist anywhere else in California.
Objective Attract new institutions of higher education to the region and further integrate new and existing institutions into the local and regional economy.	**Consistent** See Institutions for Higher Education Goal above.
Policy ED-69 Support the continued integration of the regional institutions of higher education into the local and regional economies.	**Consistent** The project would provide apprentice and journeymen operating engineers from northern California the opportunity to continue their education to support their local and reginal economies.
LAND USE ELEMENT	
Objective Reduced levels of light pollution in both new and existing communities.	**Consistent** Lighting would only be located on the campus and would be designed to comply with all AG-80 zoning standards and County building codes. Lighting would include shielded fixtures to minimize light pollution and nighttime glare.
Policy LU-31 Strive to achieve a natural nighttime environment and an uncompromised public view of the night sky by reducing light pollution.	**Consistent** See above.
Objective A sufficient, yet efficient supply of parking.	**Consistent** The campus area would include the parking necessary to support employee vehicles, student transport vans, and ancillary delivery vehicles.
Policy LU-87 Because land use decisions around airports by local governments have a direct impact on an airport's long-term viability and utility, proposed new land use projects and land use practices near airports within Sacramento County shall consider consistency with current federal, State, and local airport land use compatibility regulations, orders, policies, plans, standards and guidance pertaining to public safety and minimization of hazardous wildlife attractants within five statute miles of County airports.	**Consistent** Rancho Murieta Airport is a private airport located approximately 2.6 miles from the campus that would be built on-site, and approximately 1.7 miles from the closest boundary of the project site. No project features would decrease public safety or increase hazardous wildlife attractants beyond the baseline environment.
NOISE ELEMENT	
Policy NO-6 Where a project would consist of or include non-transportation noise sources, the noise generation of those sources shall be mitigated so as not exceed the interior and exterior noise level standards of Table 2 at existing noise-sensitive areas in the project vicinity.	**Consistent** No significant off-site noise impacts are expected based on the Table 2 noise-level standards in the County General Plan (Bollard Acoustical Consultants 2018).
Policy NO-8 Noise associated with construction activities shall adhere to the County Code requirements. Specifically, Section 6.68.090(e) addresses construction noise within the County.	**Consistent** Project construction activities would adhere to County Code noise requirements. No significant noise impacts associated with project construction are identified for this project (Bollard Acoustical Consultants 2018).

Goals/Objectives/Policies	Consistency Analysis
Policy NO-12 All noise analyses prepared to determine compliance with the noise level standards contained within this Noise Element shall be prepared in accordance with Table 3.	**Consistent** The noise analysis was prepared in accordance with Table 3 of the County General Plan.
Policy NO-13 Where noise mitigation measures are required to satisfy the noise level standards of this Noise Element, emphasis shall be placed on the use of setbacks and site design to the extent feasible, prior to consideration of the use of noise barriers.	**Consistent** No mitigation measures are required to satisfy the noise level standards of the Noise Element.
OPEN SPACE ELEMENT	
Policy OS-1 Actively plan to protect, as open space, areas of natural resource value, which may include but are not limited to wetlands preserves, riparian corridors, woodlands, and floodplains associated with riparian drainages.	**Consistent** The project includes permanent preservation of 1,050 acres of open space containing federally and state-protected species and habitat.
Policy OS-2 Maintain open space and natural areas that are interconnected and of sufficient size to protect biodiversity, accommodate wildlife movement and sustain ecosystems.	**Consistent** The project includes permanent preservation of 1,050 acres of open space. Special-status species and habitats identified to either be present or have the potential to occur within these two on-site preservation areas include five potentially sensitive biological communities, 10 special-status plant species, and 12 special-status wildlife species.
Objective Effective open space preservation strategy that supports the Open Space Vision Diagram.	**Consistent** Lands that would be preserved on-site are designated on the Open Space Vision Diagram as Priority 3 and 4 protected areas and are marked as vernal pool and vernal pool grasslands.
Policy OS-4 Open space acquisition shall be directed to lands identified on the Open Space Vision Diagram and associated component maps.	**Consistent** Lands that would be preserved on-site are designated on the Open Space Vision Diagram as Priority 3 and 4 protected areas and are marked as vernal pool and vernal pool grasslands.
PUBLIC FACILITIES ELEMENT	
Goal Adequate Sheriff Services and Facilities for the Unincorporated Areas of Sacramento County.	**Consistent** The site is currently covered by sheriff services and facilities and the coverage would not be required to increase under the proposed project.
Goal Efficient and effective fire protection and emergency response serving existing and new development.	**Consistent** The site is currently covered, and would continue to be covered, by fire protection and emergency response services.
Objective Fire and emergency safety measures integrated into all neighborhood and building design.	**Consistent** The buildings will be designed and constructed in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, Health and Safety Code, and other applicable County and state regulations.
PF-54 Require new development to install fire hydrants and associated water supply systems which meet the fire flow requirements of the appropriate fire district.	**Consistent** Water supply systems that meet the fire flow requirements of the Sacramento Metropolitan Fire District would be included in the project.

Goals/Objectives/Policies	Consistency Analysis
PF-55 New development shall provide access arrangements pursuant to the requirements of the California Fire Code.	**Consistent** Access would be provided consistent with the California Fire Code.
Objective Minimize the health, safety, aesthetic, cultural, agricultural and biological impacts of energy facilities in Sacramento County.	**Consistent** Upgrades to the existing power line would be installed consistent with all regulatory requirements and would be overseen by the serving utility. The location of upgrades would be within the campus area or along the current utility alignment.
Policy PF-67 Cooperate with the serving utility in the location and design of production and distribution facilities so as to minimize visual intrusion problems in urban areas and areas of scenic and/or cultural value including the following: • Visually prominent locations such as ridges, designated scenic corridors, and open viewsheds.	**Consistent** The project would not include the addition of utility poles or facilities in visually prominent locations. Any upgrades to power lines would occur in the existing locations. Utility facilities would be located in the campus area, which would not be visible from a publically accessible viewpoint.
Policy PF-68 Cooperate with the serving utility in the location and design of energy production and distribution facilities in a manner that is compatible with surrounding land uses by employing the following methods when appropriate to the site: • Visually screen facilities with topography and existing vegetation and install site-appropriate landscaping consistent with surrounding land use zone development standards where appropriate, except where it would adversely affect access to utility facilities, photovoltaic performance or interfere with power generating capability. • Provide site-compatible landscaping. • Minimize glare through siting, facility design, nonreflective coatings, etc. except for the use of overhead conductors. • Site facilities in a manner to equitably distribute their visual impacts in the immediate vicinity.	**Consistent** The project site is immediately surrounded by rolling hills and undeveloped open space/grazing land. Rural residential properties are located west and southwest of the site. Utility facilities would be located in the campus area, which would not be visible from a publically accessible viewpoint because this area would be screened by the surrounding terrain, trees, and/or distance of views from the campus area.
PF-69 Cooperate with the serving utility to minimize the potential adverse impacts of energy production and distribution facilities to environmentally sensitive areas by, when possible, avoiding siting in the following areas: • Wetlands. • Permanent marshes. • Riparian habitat. • Vernal pools. • Oak woodlands. • Historic and/or archaeological sites and/or districts.	**Consistent** Upgrading the existing power lines would not include disturbing additional habitat.

Goals/Objectives/Policies	Consistency Analysis
PF-70 Cooperate with the serving utility so that energy production and distribution facilities shall be designed and sited in a manner so as to protect the residents of Sacramento County from the effects of a hazardous materials incident.	**Consistent** The upgraded energy production and distribution facilities would be designed and constructed in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, health and safety code, and other applicable County and state regulations.
SAFETY ELEMENT	
Goal Minimize the loss of life, injury, and property damage due to seismic and geological hazards.	**Consistent** The site is in an area with low potential for seismic and geologic hazards. The following information was determined based on review of the background section of Safety Element for the *Sacramento County General Plan* (Sacramento County 2011). No faults run through the project site and the nearest faults are to the east, outside the Sacramento County boundary, in El Dorado County. Potential for liquefaction on-site is low. The site is not in a known subsidence area but, like most of the county, is in a "Principle Ground Water Basin," which is considered a potential subsidence area. In accordance with the State Subdivision Map Act, the County Grading Ordinance, and Chapter 70 of the Uniform Building Code, a soil report would be provided to the County before issuance of building permits in areas where the potential for expansive soils is present. The site is not in an area with landslide potential. The project would be designed, constructed, and operated in compliance with AG-80 zoning standards, County building code, the health and safety code, and other applicable County and state regulations.
SA-1. The County shall require geotechnical reports and impose the appropriate mitigation measures for new development located in seismic and geologically sensitive areas.	**Consistent** The site is in an area with low potential for seismic and geologic hazards. See the response in the row above for additional details. The applicant would provide reports and implement appropriate mitigation measures as required in building permit process.
Goal Minimize the loss of life, injury, and property damage due to fire hazards.	**Consistent** The project would be designed, constructed, and operated in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, health and safety code, and other applicable County and state regulations.
SA-23. The County shall require that all new development meets the local fire district standards for adequate water supply and pressure, fire hydrants, and access to structures by firefighting equipment and personnel**.**	**Consistent** The project would be designed, constructed, and operated in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, health and safety code, and other applicable County and state regulations.
SA-27. The County shall require, where appropriate, the use of fire resistant landscaping and building materials for new construction developments that are cost effective.	**Consistent** The project would be designed, constructed, and operated in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, health and safety code, and other applicable County and state regulations.

Goals/Objectives/Policies	Consistency Analysis
SA-28. The County shall encourage and require, to the maximum extent feasible, automatic fire sprinkler systems for all new commercial and industrial development to reduce the dependence on fire department equipment and personnel.	**Consistent** The project would be designed, constructed, and operated in compliance with AG-80 zoning standards, County building code, Sacramento Metropolitan Fire District rules, health and safety code, and other applicable County and state regulations.

Source: Sacramento County 2011

(4) Discontiguous Patterns of Urban Development

The proposed OE3 campus will not result discontigious patterns of urban development. The OE3 campus is not a typical "urban" development. The campus, for which the Williamson Act cancellation is requested, is one element of the larger training center. The campus supports field instruction, which requires large areas of open space to train students on various pieces of construction equipment. To ensure proper training, students require both classroom and field instruction. These two elements sometimes occur in the same day. The project will not be served by urban services and it does not expand residential or commercial uses. In this situation, the campus is analogous to nonurban uses like agricultural facilities that support the greater agricultural land use. One of the primary reasons OE3 purchased the project site is because urban-residential development in Rancho Murieta has increasingly encroached upon the former Rancho Murieta Training Center field instruction site where students learned to operate heavy machinery. Building the campus at the proposed project site would avoid discontiguous patterns of development by moving to a more rural location and avoiding further conflict with encroaching residential and commercial uses near the Rancho Murieta field instruction site.

(5) Proximate Suitable and Available Noncontracted Land

To determine whether there was "proximate suitable and available noncontracted land" able to support the OE3 campus, a 3.5-mile perimeter surrounding the proposed campus location was examined (see Figure 3, "Parcels within 3.5 Miles of Site Boundary"). To identify "suitable" parcels within this perimeter, parcels were eliminated based on the following criteria:

- less than 15 acres (see Figure 4, "Parcels over 15 Acres"),
- Williamson Act contracted (see Figure 5, "Non-Williamson Act Parcels"),
- parcels with zoning prohibiting campus development (see Figure 6, "Parcels with Suitable Land Use Designations"),
- parcels designated as Prime Farmland by the California Department of Conservation, Division of Land Resource Protection (see Figure 7, "Non-Prime Farmland"), and
- parcels encumbered and/or surrounded by existing land uses that would be incompatible with the OE3 campus (e.g. residential, commercial, solar) (see Figure 8, "Parcels without Competing Land Uses")

Initially, 3,504 parcels were identified within the 3.5-mile perimeter from the proposed OE3 campus site. After eliminating all parcels based on the criteria listed above, as illustrated in Figures 9, "Potentially Suitable and Proximate Parcels", 16 parcels remained. Attachment C,

"Parcel Data Table", provides a list of the parcels included in the 3.5 mile radius and by which criteria they were determined not to be proximate suitable and available parcels.

Twelve of the remaining 16 parcels are not considered suitable or proximate for development of the OE3 campus. As shown on Figure 10, "Aquatic Resources Inventory," and Figure 11, "CNDDB Review," these properties are not suitable because they include a significant amount of waters of the United States and wetlands, sensitive-species habitat, and potentially sensitive species. If any of these parcels were developed for purposes of the OE3 campus, a significant portion of those resources would be eliminated. In addition to being a negative environmental impact to the area, developing these parcels would also require substantial state and federal permitting. Mitigation associated with this permitting may make construction of the OE3 campus on any one of these parcels financially infeasible. Construction of the OE3 campus, as currently proposed, is located on property already disturbed by field instruction and, therefore, no impact to biological species or habitat would occur.

In addition, these 12 parcels would not be considered proximate. A critical aspect of this OE3 training center is the ability for students to receive both classroom and field instruction within the same day. In addition, the maintenance and repair of vehicles is conducted by students at the campus as part of classroom instruction. As a result, the campus facilities need to be adjacent to, and directly accessible to, the field instruction area. The two parcels located on Meiss Road, which would be passed by the students coming and going to the dormitories, would be more convenient than more distant parcels. More distant parcels would require constant vehicle trips between the field instruction area and the campus. In addition, vehicles used for instruction or in need of repair or maintenance (also conducted as part of training) would require transport to and from the campus and field instruction area. The time, effort, and interruption necessary for student and vehicle transport to an off-site location would be a significant impedance to the education process. Therefore, the only proximate parcels are those directly adjacent to the existing OE3 field instruction area.

As a result, only four of the remaining 16 parcels are considered proximate to the existing OE3-owned parcel. As described above, these parcels also contain significant biological resources that could affect permitting and construction of the OE3 campus. Assuming this challenge could be overcome, none of these four parcels are currently for sale based on available public records and are therefore not available.

b. 51282(a)(2)—Public Interest

(1) Public Concerns Outweigh Objectives of Williamson Act

The public interest in authorizing the cancellation outweighs the objectives of the Williamson Act. OE3 is the largest construction trades local in the United States, representing members across four states, including California. OE3 is a member owned and operated organization that represents over 35,000 members in both the public and private sectors. Operating engineers are a specialized class of skilled labor that includes heavy-equipment operators, mechanics, surveyors, construction inspectors, highway maintenance workers, police officers, and other public employees. Operating engineers are an integral part of regional construction projects

such as road, dam, and bridge construction projects; housing developments; and mining operations. A key mission of OE3 is providing members apprenticeship and ongoing education programs to ensure they receive training on using state-of-the-art equipment, the most recent technology, and the latest safety practices to ensure they are the most skilled workforce in the respective industry. The training center facilities OE3 proposes covers 46 of California's 58 counties, from the Kern County line to the Oregon border.

This site will be used to provide the members the specialized training necessary to practice their trades. This is in the public interest because it is necessary to provide a training facility for the skilled laborers that will construct private and public development and infrastructure projects that are essential to the growth of communities and economies across a four-state region.

The facility offers the following classes:

- **Supplemental Related Training (SRT)/Journeyman Training (JYN):** Required annual training for apprentice and journeyman operating engineers. Classes include classroom and field instruction on a large variety of mobile construction equipment, cranes, and heavy-duty vehicle repair.
- **Probationary Orientation Period (POP) Training:** An 8-week class for new apprentices.
- **International Union of Operating Engineers (IUOE) Pipeline Training:** A 2-week training course focused on construction techniques and equipment applicable to pipeline work.

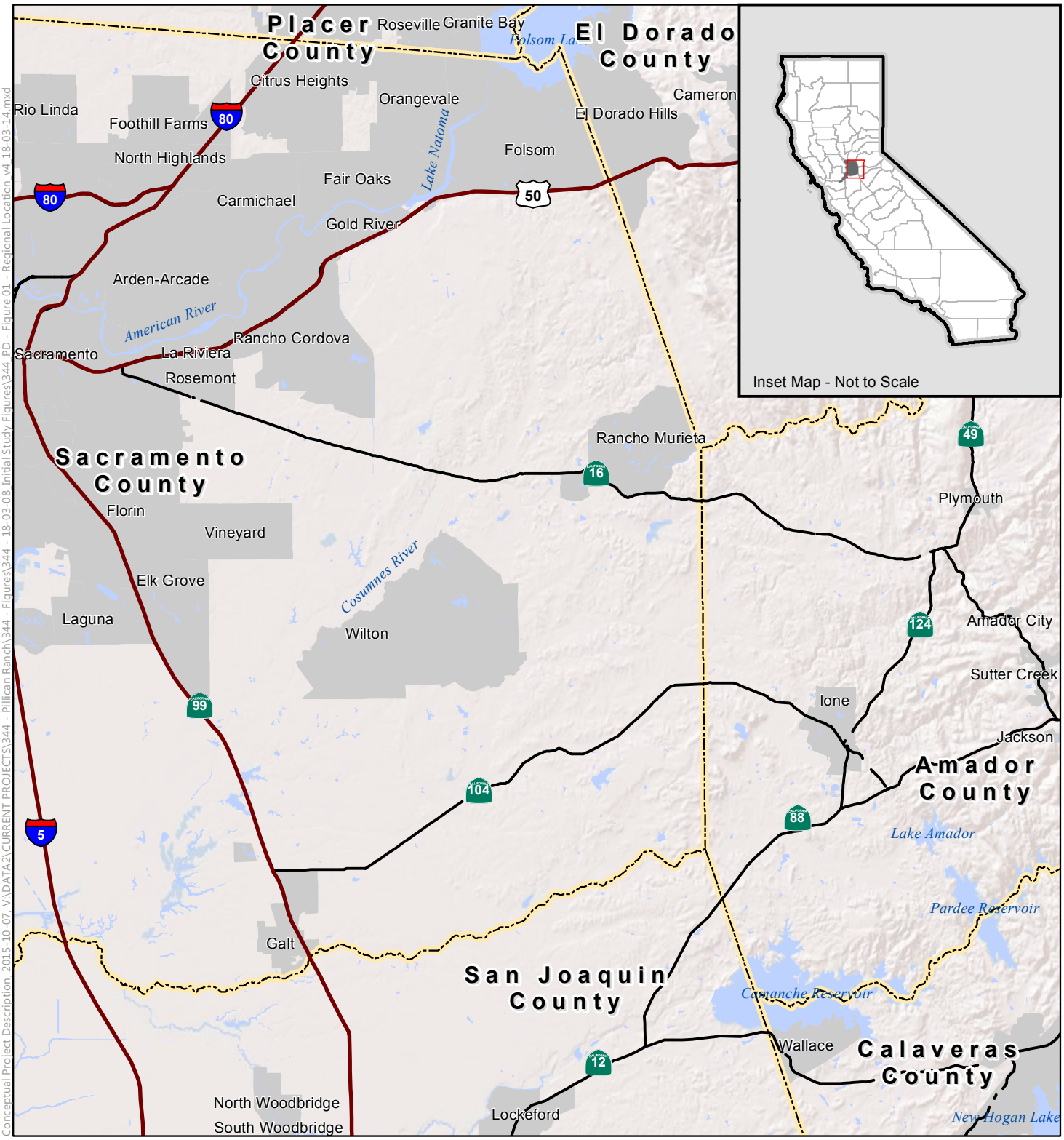
In 2018 alone, OE3 provided 80,000 hours of training to more than 800 students for positions such as construction equipment operators, mechanics, and operators of cranes, dredges, and drills. Helped in part by more than 2,000 signatory contractors, OE3 trainees will work on dams, residential and commercial developments, energy projects, roadways, highways, and other infrastructure projects.

OE3 trainees receive a livable wage. Hourly wages range from $23 to $36 per hour, depending on the level of training obtained, with an additional $30 per hour in apprentice fringe benefits, such as health care and pension funding. At these rates, OE3 training originates up to $96 million of California wages and benefits per year, with even greater downstream "multiplier" economic effects as those wages and benefits are spent throughout the regional economy. The loss of 25 acres of Williamson Act contracted lands is far outweighed by the public benefits conferred by development of the campus, particularly when the objectives of the Williamson Act will continue to be met over the balance of the 1,500-acre parcel, which would continue to remain under the Williamson Act contract.

(2) Proximate Suitable and Available Noncontracted Land

See Section III.a. above for a discussion of proximate suitable and available noncontracted lands.

FIGURES



Conceptual Project Description, 2015-10-07, V:\DATA2\CURRENT PROJECTS\344 - Pillican Ranch\344 - Figures\344 - 18-03-08_Initial Study Figures\344 PD - Figure 01 - Regional Location_v4 18-03-14.mxd

SOURCE: ESRI World Shaded Relief (2014); ESRI World Streetmap (2009); compiled by Benchmark Resources in 2016

LEGEND

- Site Boundary
- County Boundary
- City or Community
- Water Body
- Major Highway
- Highway

N

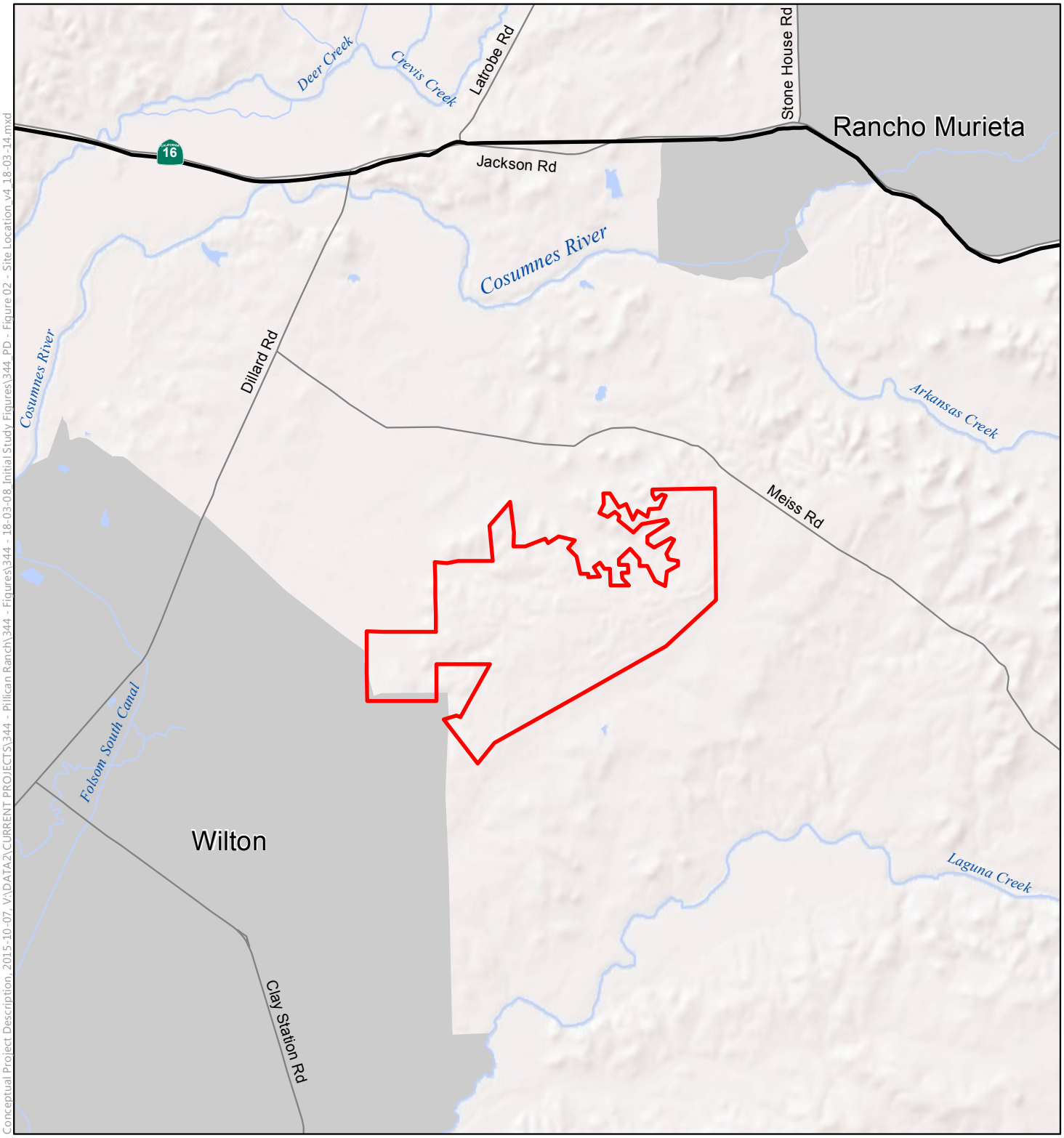
0 2.5 5 7.5 10 Miles

BENCHMARK RESOURCES

Regional Location

OE3 TRAINING CENTER & OPEN SPACE PRESERVATION PROJECT
PROJECT DESCRIPTION

Figure 1



SOURCE: ESRI World Shaded Relief (2014), ESRI World Streetmap (2009); compiled by Benchmark Resources in 2016

LEGEND

- Site Boundary
- City or Community
- Water Body
- Highway
- Major Road
- River

N

0 0.5 1 1.5 2 Miles

BENCHMARK RESOURCES

Site Location

OE3 TRAINING CENTER & OPEN SPACE PRESERVATION PROJECT
PROJECT DESCRIPTION

Figure 2

DATA	FILENAME	UPDATED	WEBSITE	
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data	
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data	
General Plan	General_Plan_2030	9/17/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/general-plan-2030?geometry=-123.368%2C37.999%2C-119.517%2C38.752	
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html	
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/	
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html	https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Parcels within 3.5 Miles of Site Boundary

OE3 SUITABLE PARCEL ANALYSIS

Figure 3

V:\DATA2\CURRENT PROJECTS\414 - Tivey Valley Granite\414 - Figures\414 - Reclamation Plan\344-01 24x36 OE3 Sheet 1 within 3.5 miles_v3_19-09-23.mxd

V:\DATA2\CURRENT PROJECTS\344 - Pilliar Ranch\344 - Figures\344 - 19-02-07 Williamson Act Parcels\344-01_24x36 OE3 Sheet 2_v2_15 Acres.mxd

DATA	FILENAME	UPDATED	WEBSITE	
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data	
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data	
General Plan	General_Plan_2030	9/17/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/general-plan-2030?geometry=-123.368%2C37.999%2C-119.517%2C38.752	
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html	
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/	
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html	https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Parcels Over 15 Acres

OE3 SUITABLE PARCEL ANALYSIS

Figure 4

DATA	FILENAME	UPDATED	WEBSITE
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data
General Plan	General_Plan_2030	9/17/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/general-plan-2030?geometry=-123.368%2C37.999%2C-119.517%2C38.752
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html https://www.fws.gov/gis/data/national/

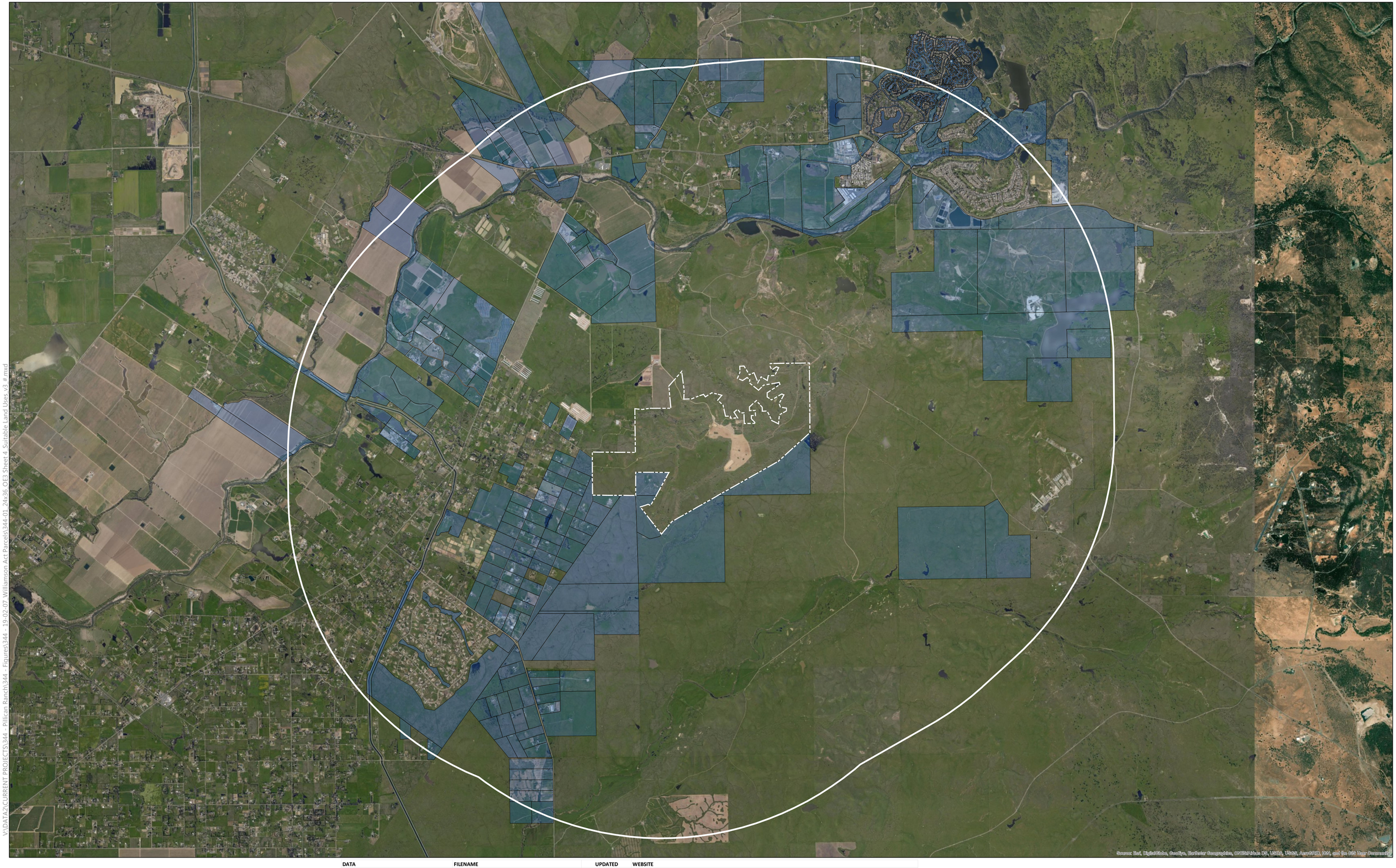
BENCHMARK RESOURCES

Non-Williamson Act Parcels

OE3 SUITABLE PARCEL ANALYSIS

Figure 5

V:\DATA2\CURRENT PROJECTS\344 - Pillican Ranch\344 - Figures\344 - 19-02-07_Williamson Act Parcels\344-01_24x36_OE3 Sheet 3_v6_deep check.mxd



DATA	FILENAME	UPDATED	WEBSITE
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data
Zoning	Zoning	9/17/2018	https://data-sacramentocounty.opendata.arcgis.com/search?content=spatial%20dataset&type=Feature%20Layer
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Parcels with Suitable Land Use Designations

OE3 SUITABLE PARCEL ANALYSIS

Figure 6

V:\DATA2\CURRENT PROJECTS\344 - Pilliran Ranch\344 - Figures\344 - 19-02-07 Williamson Act Parcels\344-01_24x36_OE3 Sheet 4_Suitable Land Uses_v3_#.mxd

V:\DATA2\CURRENT PROJECTS\344 - Pillican Ranch\344 - Figures\344 - 19-02-07_Williamson Act Parcels\344-01_24x36_OE3 Sheet 5_v2_Not Prime FMML.mxd

DATA	FILENAME	UPDATED	WEBSITE
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data
Zoning	Zoning	9/17/2018	https://data-sacramentocounty.opendata.arcgis.com/search?content=spatial%20dataset&type=Feature%20Layer
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Non-Prime Farmland

OE3 SUITABLE PARCEL ANALYSIS

Figure 7

V:\DATA2\CURRENT PROJECTS\344 - Pilliican Ranch\344 - Figures\344 - 19-02-07 Williamson Act Parcels\344-01_24x36_OE3 Sheet 6_Conservation Areas_v3_#29.mxd

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DATA	FILENAME	UPDATED	WEBSITE
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data
Zoning	Zoning	9/17/2018	https://data-sacramentocounty.opendata.arcgis.com/search?content=spatial%20dataset&type=Feature%20Layer
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Parcels without Competing Land Uses

OE3 SUITABLE PARCEL ANALYSIS

Figure 8

DATA	FILENAME	UPDATED	WEBSITE
Sacramento County Parcels	Parcels	1/27/2019	http://data-sacramentocounty.opendata.arcgis.com/datasets/parcels/data
Williamson Act Parcels	Williamson_Act_Parcels	12/23/2018	http://data-sacramentocounty.opendata.arcgis.com/datasets/williamson-act-parcels/data
Zoning	Zoning	9/17/2018	https://data-sacramentocounty.opendata.arcgis.com/search?content=spatial%20dataset&type=Feature%20Layer
Conservation Plan Boundaries	Conservation Plan Boundaries, HCP and NCCP [ds760]	11/1/2017	https://map.dfg.ca.gov/metadata/ds0760.html
Farmland Designations	FMMP_sacramento2016	7/28/2017	ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/2016/
Critical Habitat	CritHab_sacramento2016.shp	12/5/2018	https://ecos.fws.gov/ecp/report/table/critical-habitat.html https://www.fws.gov/gis/data/national/

BENCHMARK RESOURCES

N

0 1,200 2,400 4,800 7,200 Feet

Potentially Suitable Parcels

Potentially Suitable and Proximate Parcels

Potentially Suitable and Proximate Parcels

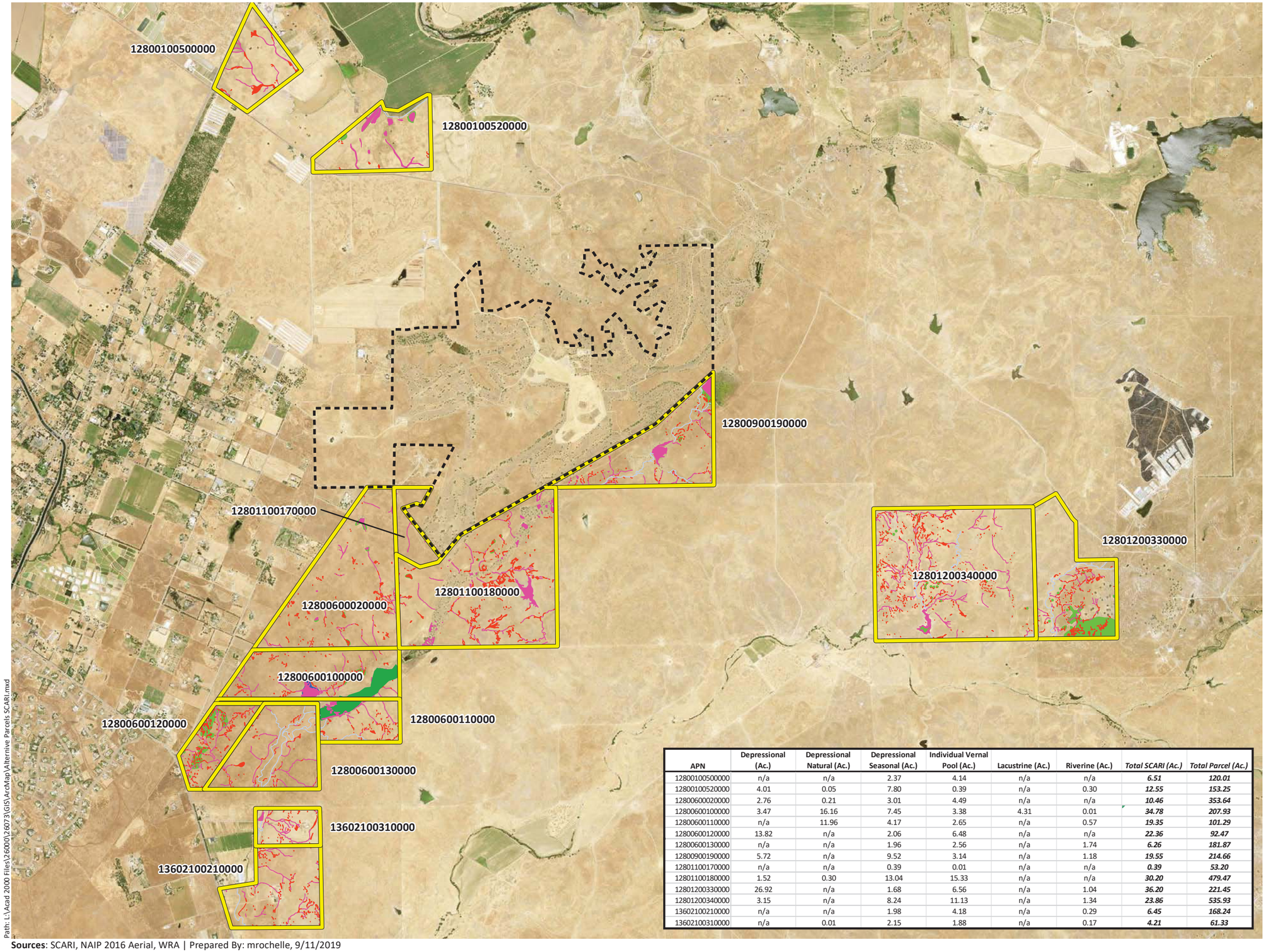
OE3 SUITABLE PARCEL ANALYSIS

Figure 9

V:\DATA2\CURRENT PROJECTS\344 - Pilliican Ranch\344 - Figures\344 - 19-02-07 Williamson Act Parcels\344-01 24x36 OE3 Sheet 7 Suitable and Proximate Parcels v2 #29.mxd

Six Counties Aquatic Resources Inventory (SCARI) for Alternative Parcels

OE3
Sacramento County, California



Alternative Parcels

Project Area

SCARI Data

- Depressional
- Depressional Natural
- Depressional Seasonal
- Individual Vernal Pool
- Lacustrine
- Riverine

APN	Depressional (Ac.)	Depressional Natural (Ac.)	Depressional Seasonal (Ac.)	Individual Vernal Pool (Ac.)	Lacustrine (Ac.)	Riverine (Ac.)	*Total SCARI (Ac.)*	*Total Parcel (Ac.)*
12800100500000	n/a	n/a	2.37	4.14	n/a	n/a	***6.51***	***120.01***
12800100520000	4.01	0.05	7.80	0.39	n/a	0.30	***12.55***	***153.25***
12800600020000	2.76	0.21	3.01	4.49	n/a	n/a	***10.46***	***353.64***
12800600100000	3.47	16.16	7.45	3.38	4.31	0.01	***34.78***	***207.93***
12800600110000	n/a	11.96	4.17	2.65	n/a	0.57	***19.35***	***101.29***
12800600120000	13.82	n/a	2.06	6.48	n/a	n/a	***22.36***	***92.47***
12800600130000	n/a	n/a	1.96	2.56	n/a	1.74	***6.26***	***181.87***
12800900190000	5.72	n/a	9.52	3.14	n/a	1.18	***19.55***	***214.66***
12801100170000	n/a	n/a	0.39	0.01	n/a	n/a	***0.39***	***53.20***
12801100180000	1.52	0.30	13.04	15.33	n/a	n/a	***30.20***	***479.47***
12801200330000	26.92	n/a	1.68	6.56	n/a	1.04	***36.20***	***221.45***
12801200340000	3.15	n/a	8.24	11.13	n/a	1.34	***23.86***	***535.93***
13602100210000	n/a	n/a	1.98	4.18	n/a	0.29	***6.45***	***168.24***
13602100310000	n/a	0.01	2.15	1.88	n/a	0.17	***4.21***	***61.33***

N

0 0.5 1

Miles

Path: L:\Acad 2000 Files\26000\26073\GIS\ArcMap\Alternive Parcels SCARI.mxd

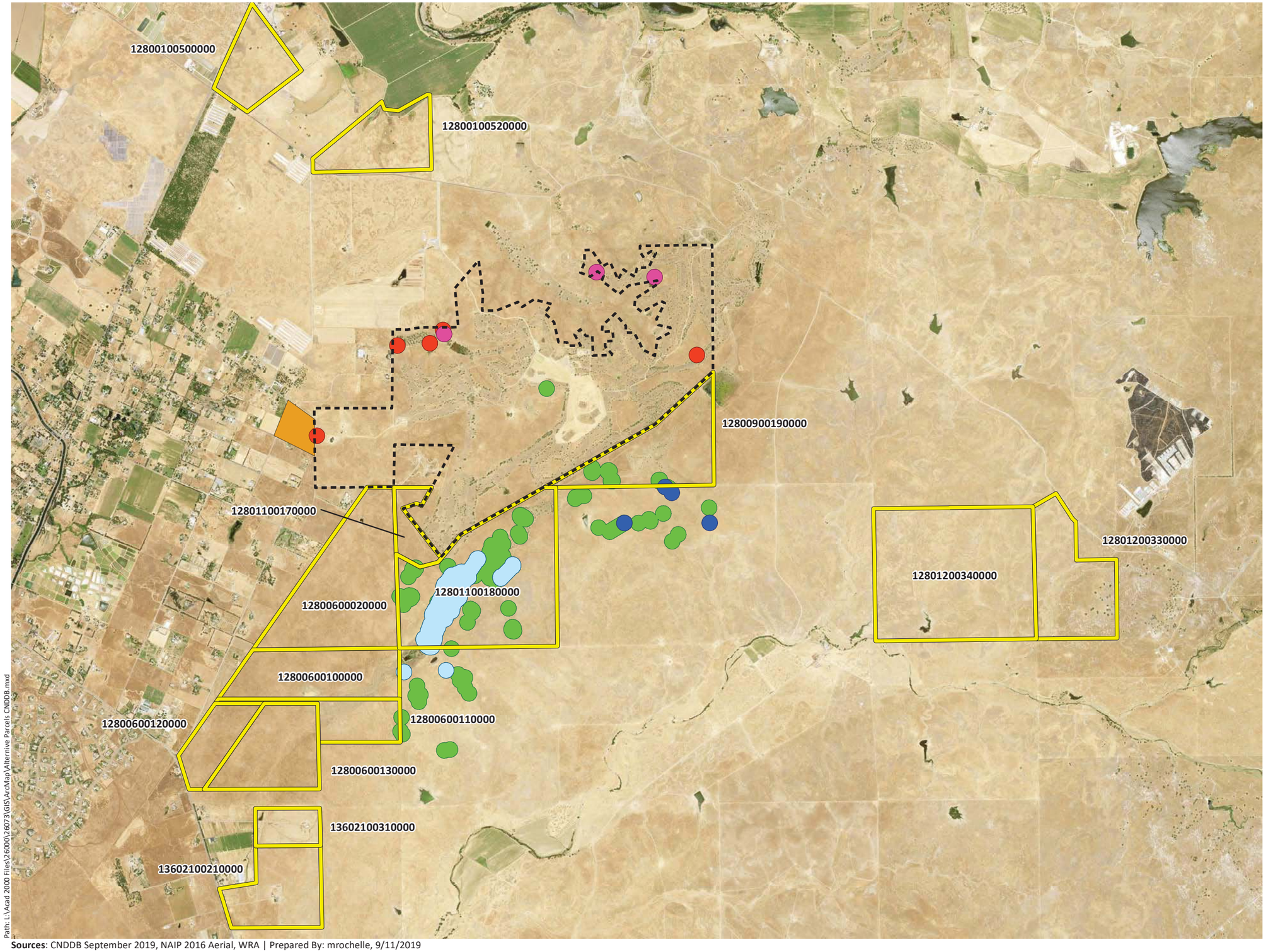
Sources: SCARI, NAIP 2016 Aerial, WRA | Prepared By: mrochelle, 9/11/2019

wra

Aquatic Resources Inventory
OE3 SUITABLE PARCEL ANALYSIS
Figure 10

CNDDB for Alternative Parcels

OE3
Sacramento County, California



Alternative Parcels

Project Area

CNDDB

- California linderiella
- Sanford's arrowhead
- legenere
- midvalley fairy shrimp
- vernal pool fairy shrimp
- vernal pool tadpole shrimp

N

0 0.5 1

Miles

Path: L:\Acad 2000 Files\26000\26073\GIS\ArcMap\Alternive Parcels CNDDB.mxd

Sources: CNDDB September 2019, NAIP 2016 Aerial, WRA | Prepared By: mrochelle, 9/11/2019

wra

CNDDB Review
OE3 SUITABLE PARCEL ANALYSIS
Figure 11

ATTACHMENT A

69-AP-35A WILLIAMSON ACT CONTRACT

BOOK 69-05-01 PAGE 1391 075 - Pilliken

NO FEE

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OFFICIAL RECORDS
SACRAMENTO COUNTY, CALIF.
MAY 1 10 18 AM 1969
COUNTY RECORDER

RESOLUTION NO. 69-AP-35 A

RESOLUTION AUTHORIZING THE CHAIRMAN OF THE BOARD OF SUPERVISORS TO EXECUTE CALIFORNIA LAND CONSERVATION AGREEMENT.

WHEREAS, the Board of Supervisors of Sacramento County has established an agricultural preserve by its Resolution No. 69-AP-35, as authorized by the California Land Conservation Act; and

WHEREAS, GLENN E. PILLIKEN and FERN E. PILLIKEN

~~is~~ (are) the legal owner(s) of real property within the boundaries of the above described agricultural preserve, and has made application in proper form for a Land Conservation Agreement for land within the agricultural preserve; and

WHEREAS, all procedural requirements prerequisite to execution of such an agreement have been fulfilled;

NOW, THEREFORE, BE IT RESOLVED that the Chairman of the Board of Supervisors be authorized to execute on behalf of the County of Sacramento a California Land Conservation Agreement with the party hereinbefore named.

PASSED AND ADOPTED by the Board of Supervisors of the County of Sacramento, State of California, this 9th day of April, 19 69, by the following vote, to wit:

AYES: Supervisors, Gualco, Kloss, Phelan, Wood, O'Brien

NOES: Supervisors, None

ABSENT: Supervisors, None

30987 MAY 1 1969

Chairman of the Board of Supervisors
of Sacramento County, California

(SEAL)

ATTEST: Earl D. Jack
Clerk of the Board of Supervisors

RECORDER'S MEMO: Legibility of writing, typing or printing UNSATISFACTORY FOR MICROFILMING in this document when received.

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BOOK 9-05-01 PAGE 1392

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

This LAND CONSERVATION AGREEMENT, made and entered into this 9th day of April, 1969, by and between GLENN E. PILLIKEN and FERN E. PILLIKEN hereafter referred to as "OWNER" and the County of Sacramento, a political subdivision of the State of California, hereinafter referred to as "COUNTY":

W I T N E S S E T H:

WHEREAS, Owner is the legal owner of certain real property situate in the County of Sacramento, State of California, hereinafter referred to as the "subject property"; and

WHEREAS, the subject property is described in Exhibit "A" which is made a part of this Agreement; and

WHEREAS, the subject property is located in an agricultural preserve heretofore established by County by Resolution Number 69-AP-35; and

WHEREAS, Owner and County desire to limit the use of the subject property to agricultural and compatible uses in order to preserve the limited supply of agricultural land and to discourage premature and unnecessary conversion of such lands from agricultural use; and

WHEREAS, Owner and County recognize that such agricultural land has definite public value as open space and that the preservation of such land in agricultural production will assure an adequate food supply and constitute an important physical, social, esthetic

economic asset to County to maintain the agricultural economy of County and the State of California; and

WHEREAS, both Owner and County intend that the terms, conditions and restrictions of this Agreement are substantially similar to Contracts authorized by the California Land Conservation Act of 1965 so as to be an enforceable restriction under the provisions of California Revenue and Taxation Code Section 422; and

WHEREAS, it is the intent of County and Owner that the continued existence of the within Agreement is made dependent upon the existence of legislation implementing Article XXVIII of the California Constitution so the effect of the terms, conditions and restrictions of the Agreement on property values for taxation purposes is as favorable to Owner as the legislation existing on the last renewal date.

NOW, THEREFORE, the parties, in consideration of the mutual covenants and conditions set forth herein and the substantial public benefits to be derived therefrom, do hereby agree as follows:

1. Agreement Made Pursuant to California Land Conservation Act. The within Agreement is made and entered into pursuant to the California Land Conservation Act of 1965 (Chapter 7 of Part 1 of Division 1 of Title 5 of the California Government Code commencing with Section 51200) and is subject to all the provisions thereof specifically applicable to Article 3.5 Agreements (commencing with Section 51255) and such other provisions of said Act as are specifically made applicable to this Agreement.

2. Limitation on Use of Subject Property. During the term of this Agreement or any renewal or reinstatement thereof, the subject

property shall not be used for any purpose other than the "permitted agricultural uses" or "compatible uses" as the same are defined in Resolution No. 69-AP-35 declaring the policy and rules for the agricultural preserve in which the subject property is located which said policy and rules are incorporated herein by reference. Owner shall be limited to the uses specified in the aforementioned Resolution even though the Zoning Ordinance or other land use ordinances or regulations authorize different uses. In the event the Zoning Ordinance or other land use ordinances or regulations are or should become more restrictive than the uses authorized by the aforementioned Resolution and this Agreement, the zoning ordinance or other land use ordinances or regulations shall prevail.

3. Additional Uses. The Board of Supervisors may from time to time during the term of this Agreement or any extension or reinstatement thereof, by resolution revise the policy, rules or the lists of "permitted agricultural uses" or "compatible uses" for the agricultural preserve in which the subject property is located; provided however, said Board shall not eliminate, without the written consent of Owner, an authorized use during the term of this Agreement or any extension or reinstatement thereof.

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4. Term of Agreement. This Agreement shall be effective on the last day of February next succeeding the date of execution of this Agreement by the parties hereto and shall remain in effect for a period of ten (10) years therefrom. This Agreement shall be automatically renewed and extended for a period of one (1) year on the last day of February of each year unless notice of nonrenewal is given as provided by Section 51245 of the Government Code.

If neither party to this Agreement serves written notice of nonrenewal, the Clerk of the Board of Supervisors of County shall cause a notice of renewal and the new termination date of this Agreement to be recorded with the County Recorder. A failure by County to cause a notice of renewal to be recorded shall not between the parties hereto affect in any manner the automatic renewal or extension of this Agreement.

5. Consideration. It is agreed that the consideration for the execution of this Agreement is the substantial public benefit to be derived by County from the preservation of land in agricultural production and the advantage which will accrue to Owner as a result of the effect on the method of determining the assessed value of the subject property and any reduction thereto due to the imposition of limitations on its use set forth in this Agreement. County and Owner shall not receive any payment in consideration of the obligations imposed herein.

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6. Cancellation. This Agreement may be cancelled as to all or a portion of the subject property by mutual agreement of County and Owner, after a public hearing has been held and notice thereof given in accordance with Section 51284 of the Government Code. This Agreement shall be cancelled only upon a finding by the Board of Supervisors that such cancellation is in the public interest. It is understood by the parties that the existence of an opportunity for another use of the subject property shall not be a sufficient reason for cancellation of this Agreement. The uneconomic character of the existing use will be considered only if the subject property cannot reasonably be put to a permitted or compatible use specified

in the rules of the agricultural preserve in which the subject property is located. In no event shall this Agreement be cancelled if owners of fifty-one per cent (51%) of the acreage in the Preserve in which the subject property is located protest the cancellation at the hearing or prior thereto in writing.

7. Valuation of Subject Property After Cancellation of Agreement. Upon approval of cancellation by Owner and County, the Assessor of County shall immediately revalue the land to which the cancellation applies using the date of cancellation as the valuation date and apply County's announced ratio to the full cash value to determine the assessed value. The assessed value shall be subject to equalization pursuant to Section 1604 of the Revenue and Taxation Code.

8. Cancellation Fee. Owner shall pay, as a cancellation fee, an amount equal to 50% (fifty percentum) of the final new assessed valuation of the subject property. If after the effective date of this Agreement, County's announced ratio of assessed full cash value is changed, the percentage payment in determining the cancellation fee shall be changed so that no greater percentage of full cash value will be paid. The cancellation fee shall be considered as deferred taxes and shall be distributed as provided in Section 51283(c) of the Government Code.

9. Cancellation Upon Substitution of New Restrictions. This Agreement may be cancelled by mutual agreement of County and Owner without payment of cancellation fee or public hearings if it is replaced by an enforceable restriction authorized by Article XXVIII of the California Constitution or whenever there is no operative

legislation implementing said article at the time the cancellation is requested by Owner.

10. When Payment of Cancellation Fee Creates a Lien. The provisions of Section 51283.3 of the Act shall be applicable to any cancellation fee as a deferred tax payment payable pursuant to this Agreement including the rules of the agricultural preserve in which the subject property is located, except references to the Director of Agriculture shall be construed to refer to the Board of Supervisors of County.

11. Division of Subject Property. In the event the subject property is divided, Owner agrees as a condition of such division to execute an Agreement identical to the Agreement then covering the subject property. County, any other political entity, or any court having jurisdiction and making an order of division of the subject property, shall as a condition of such division, require the execution of the Agreements provided for in this paragraph.

12. Information for Assessment Purposes. Owner, on or before the first day of February of each year, shall provide information relating to Owner's obligation under this Agreement to determine the value of the subject property for assessment purposes. County shall provide forms for this purpose.

13. Action in Eminent Domain. Upon the filing of an action in eminent domain for the condemnation of the fee title of any of the subject property or of less than a fee interest which will prevent the land from being used for any use set forth in the rules for the agricultural preserve, or upon the acquisition in lieu of condemnation of the fee of subject property or of less than a fee interest which will prevent the subject property from being used for any

authorized use, this Agreement is null and void upon such filing of suit or acquisition as to the land condemned or acquired, and the condemning agency shall proceed as if the Agreement never existed. This Agreement may be amended to correctly reflect the description of any property not so acquired by the condemning agency.

14. Abandonment of Action in Eminent Domain. In the event the condemnation suit is abandoned in whole or part or if funds are not provided to acquire the property, this Agreement shall automatically be reinstated subject to terms identical to those when suit was filed or the property acquired; provided however, a notice of nonrenewal had not been given by either party and the property at the time of the abandonment of the condemnation is within the boundaries of the agricultural preserve in which the subject property was first located. County shall record the reinstated Agreement.

15. Notice of Nonrenewal. If Owner desires in any year not to renew this Agreement, Owner shall serve written notice of nonrenewal of the Agreement upon the Clerk of the Board of Supervisors of County at least ninety (90) days prior to the annual renewal date. If County desires not to renew this Agreement, County shall serve written notice of nonrenewal to Owner at least sixty (60) days prior to the annual renewal date. Notices of nonrenewal by County shall be sent to the address set forth in Exhibit "B" provided by Owner for this purpose. A notice of nonrenewal irrespective of which party gives notice shall be recorded by County. Owner shall have the right to protest the nonrenewal by County provided such protest is made in writing and filed with the Clerk of the Board of Supervisors of County not later than sixty (60) days after receipt of

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the notice of nonrenewal from County or the last day of February of the calendar year in which the notice was mailed, whichever date is first to occur.

16. Removal of Subject Land from Preserve by County. Removal of any land under this Agreement from the agricultural preserve in which it is located either by change of boundaries of the preserve, or disestablishment of the preserve, shall be equivalent of a notice of, and protest of, nonrenewal by County.

17. Enforcement of Agreement. Any conveyance, contract or authorization (whether written or oral) by Owner or his successors in interest which would permit use of the subject property contrary to the terms of this Agreement or the rules of the agricultural preserve in which the subject property is located, or failure to use the property consistent with the provisions herein, may be declared void by County's Board of Supervisors and will be deemed a breach of this Agreement. Such declaration or breach of the provisions of this Agreement may be enforced by County by an action filed in the Superior Court of the County for the purpose of compelling compliance or restraining breach thereof. It is understood and agreed that the enforcement proceedings provided in this Agreement are not exclusive and both Owner and County may pursue their legal and equitable remedies.

18. Termination of Agreement by County. County may declare this Agreement terminated if it (or other substantially similar Agreement) is declared invalid or ineffective in any Court adjudication accepted by County as final, but no cancellation fee or other penalty shall be assessed against Owner upon such termination.

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BOOK 9-05-01 PAGE 1400

19. Recording of Documents. In the event of termination of this Agreement (a) after notice of nonrenewal, (b) cancellation, (c) nullification by annexation, condemnation or acquisition County shall record the appropriate documents with the County Recorder and file a copy with the Director of Agriculture.

20. Successors in Interest. The within Agreement shall run with the land described herein and upon division, to all parcels created therefrom, and shall be binding upon the heirs, successors and assigns of Owner. This Agreement shall also be transferred from County to a succeeding city or county acquiring jurisdiction over all or any portion of the subject property. On the completion of annexation proceedings by a city, that city shall succeed to all rights, duties and powers of County under this Agreement, unless the subject property or portion thereof was within one mile of said city at the time this Agreement was initially executed, and said city protested the execution of this Agreement pursuant to Section 51243.5 of the Government Code and said city states its intent not to succeed in the resolution of intention to annex. If the city does not exercise its option to succeed, this Agreement becomes null and void as to the subject property actually annexed on the date of annexation.

IN WITNESS WHEREOF the parties hereto have executed the within Agreement the day and year first above written.

COUNTY OF SACRAMENTO, a political subdivision of the State of California

By _____
Chairman of the Board of Supervisors

"COUNTY"

ATTEST: _____
Clerk of the
Board of Supervisors

Glenn E. Pilliken

Fern E. Pilliken

"OWNER"

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BOOK 69-05-01 PAGE 1401

STATE OF CALIFORNIA,
County of Sacramento } ss.

On this 25th day of February in the year one thousand nine hundred and sixty-nine before me, THOMAS A. DARLING, a Notary Public, State of California, duly commissioned and sworn, personally appeared GLENN E. PILLIKEN and FERN E. PILLIKEN known to me to be the person s whose name s are subscribed to the within instrument, and acknowledged to me that t he y executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal in the County of Sacramento the day and year in this certificate first above written.

Thomas A. Darling

Notary Public, State of California. My Commission Expires Sept. 20, 1969

Cowdery's Form No. 34—(Acknowledgment—General) (C. C. Sec. 1189) (PRINTED 1/19/66) 61-0420

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BOOK 9-05-01 PAGE 1402

We the undersigned trust deed or other encumbrance holders do hereby agree to be bound by the restrictions imposed by this Agreement and the policy and rules of the agricultural preserve in which the subject property is situated.

(Attach acknowledgment for each signature)

APPROVAL AS TO FORM:
JOHN B. HEINRICH,
County Counsel

By ____________

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EXHIBIT A TO

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

Subject Property is described as:

All that real property situated in the County of Sacramento, State of California, described as follows:

PARCEL NO. 1:

All that portion of the South half of Section 17 and the North half of Section 20, Township 7 North, Range 8 East, Mount Diablo Base and Meridian described as follows:

Beginning at the quarter section corner common to Sections 16 and 17, said township and range, being also the Northeast corner of the lands formerly owned by Mooney; thence South 1° 05' West along the East line of Sections 17 and 20, a distance of 3811.1 feet; South 52° 55' West 829.1 feet; North 89° 00' West 3938.6 feet; North 1° 05' East 686.4 feet; North 89° 00' West203.0 feet; North 331.0 feet; East 433.0 feet; North 30° 40' West 420.0 feet; North 52° 30' East 270.0 feet; South 38° 15' East 290.0 feet; East 203.0 feet; South 652.0 feet; East 695.0 feet; North 41° 50' West 366.8 feet; North 198.0 feet; East 243.0 feet; North 308.0 feet; West 348.0 feet North 218.0 feet; North 48° 00' East 570.0 feet; South 40° 00' East 550.0 feet; South 232.0 feet; East 293.0 feet; South 25° 00' East 650.0 feet; South 63° 10' East 440.0 feet North 7° 45' East 550.0 feet; North 63° 00' East 480.0 feet; North 168.0 feet; North 77° 15' West 370 feet; North 20° 30' West 220.0 feet; North 30° 10' East 600.0 feet; North 45° 00' West 120.0 feet, South 61° 30' West 770.0 feet; North 52° 40' West 310.0 feet; North 258.0 feet; North 58° 15' East 930.0 feet; North 23° 45' West 130.0 feet; South 82° 00' West 960.0 feet; South 45° 40' West 430.0 feet; North 49° 45' West 730.0 feet; North 17° 50' East 170.0 feet; North 46° 30' West 230.0 feet; South 57° 40' West 330.0 feet; North 65° 10' West 350.0 feet; North 24° 50' East 380.0 feet; North 378.0 feet; East 233.0 feet; South 32° 40' East 624.0 feet; North 68° 05' East 300.00 feet; South 22° 00' East 640 feet; North 30° 40' East 370.0 feet; South 59° 20' East 440.0 feet; North 12° 00' East 300.00 feet; East 393.0 feet; North 28° 00' East 540.0 feet; West 148.49 feet; South 56° 30' West 230.0 feet; North 57° 30' West 200.0 feet; thence North 253.3 feet to the Northerly boundary line of said Mooney Tract; thence South 89° 03' East along said Northerly boundary line, a distance of 770.0 feet; thence continuing along said boundary line, South 89° 00' East 1608.0 feet, more or less, to the point of beginning, containing 300 acres, more or less.

PARCEL NO. 2:

Commencing at the corner common to Sections 16, 17, 20, 21, Township 7 North, Range 8 East, M. D. B. & M., thence South 1° 05' West 1191.10 feet to the Southeast corner of a 300 acre tract required by Cosumnes Gold Dredging Company by deed dated September 6, 1935, of record in Book 535 of Official Records, page 337, Sacramento County Records; thence South 52° 55' West 829.10 feet; thence North 89° 00' West 3938.60 feet to the point of beginning; thence from said point of beginning the following fourteen courses and distances, vis: North 1° 05' East 686.40 feet; North 89° 00' West 203.00 feet; North 445.00

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feet; West 296.00 feet; North 11° 37' West 694.00 feet; North 44° 27' West 456.10 feet; North 40° 31' East 400.00 feet; North 75° 05' West 630.00 feet; South 58° 56' West 460.00 feet; North 37° 27' West 195.00 feet; South 70° 55' West 793.00 feet; North 89° 10' West 460.00 feet; South 50° 32 1/2' East 3567.26 feet and South 89° 00' East 261.75 feet to the place of beginning, containing 74.00 acres, more or less.

PARCEL NO. 3:

Commencing at the section corner common to Sections 16, 17, 20 and 21, Township 7 North, Range 8 East, M. D. M., thence South 1° 05' West 1191.10 feet to Southeast corner of a 300 acre tract heretofore acquired by Cosumnes Gold Dredging Company; thence South 52° 55' West 829.10 feet; thence North 89° 00' West 4200.35 feet; thence North 50° 32 1/2' West 3067.26 feet to the place of beginning; thence the following courses and distances:

1. North 50° 32 1/2' West 500.00 feet;
2. North 4° 07' East 555.00 feet;
3. North 5° 52' West 1120.00 feet;
4. South 42° 12' West 1187.00 feet;
5. South 3° 45' East 1342.30 feet;
6. North 88° 26' West 1281.60 feet;
7. South 82° 14' West 451.00 feet;
8. North 86° 26' West 457.00 feet to the range line between Ranges 7 and 8 East;
9. South 2° 16' West 400.00 feet along said range lines;
10. South 84° 20 1/2' East 2674.88 feet;
11. North 39° 28' East 1139.92 feet to the place of beginning, containing 75.00 acres, more or less.

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PARCEL NO. 4:

That portion of Section 20, Township 7 North, Range 8 East, Mt. Diablo Base and Meridian, described as follows:

Beginning at a point in the East line of said Section, located South 1° 05' West 1191.10 feet from the Northeast corner thereof; said point of beginning being the Southeast corner of a 300 acre tract of land acquired by Cosumnes Gold Dredging Company, by deed dated September 6, 1935, and recorded in the office of the County Recorder of Sacramento County, in Book 535 of Official Records, page 337; thence from said point of beginning, South 1° 05' West along the East line of said Section 264.40 feet; thence South 56° 33' West 3813.90 feet; thence North 13° 52' West 1976.33 feet to the South line of said 300 acre tract ofland; thence South 89° 00' East along the South line of said 300 acre tract of land, a distance of 3000.00 feet to a corner in the South line of said 300 acre tract of land; thence north 52° 55' East 829.10 feet to the point of beginning, containing 75 acres, more or less.

continued on next page

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PARCEL NO. 5: BOOK 79-05-01 PAGE 1405

That portion of Section 20, Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at the Northwest corner of a 75 acre tract of land acquired by the Cosumnes Gold Dredging Company by deed dated October 27, 1937, recorded in the office of the County Recorder of Sacramento County, in Book 659 of Official Records, page 52, which corner is located South 1° 05' West 1191.10 feet; South 52° 55' West 829.10 feet and North 89° 00' West 3000.00 feet from the Northeast corner of said Section 20; thence North 89° 00' West along the South line of a 300 acre tract and of a 74 acre tract of land both of which are described in deed to the Cosumnes Gold Dredging Company, dated September 6, 1935, and April 28, 1937, respectively and recorded in the office of the County Recorder of Sacramento County the former in Book 535 of Official Records, page 337, and the latter in Book 615 of Official Records, page 462, a distance of 1190.35 feet to a point located South 89° 00' East 10.00 feet from the Southwest corner of said 74 acre tract of land; thence South 5° 13' East 2877.62 feet; thence North 56° 33' East 1680.30 feet to the Southwest corner of said 75 acre tract of land; thence North 13° 52' West along the West line of said 75 acre tract of land, 1976.33 feet to the point of beginning, containing 75 acres, more or less.

PARCEL NO. 6:

That portion of Section 18, 19 and 20, Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at the Northwest corner of a 75 acre tract of land described in deed from Hugh Mooney and others, to Cosumnes Gold Dredging Company, dated December 23, 1937, of record in Book 659 of Official Records, page 451, Sacramento County Records, which corner is located South 1° 05' West 1191.10 feet; South 52° 55' West 829.10 feet and North 89° 00' West 4190.35 feet from the Northeast corner of said Section 20; thence from said point of beginning, South 5° 13' East 2877.62 feet to the Southwest corner of said 75 acre tract of land; thence South 56° 33' West 604.69 feet; thence North 2880.35 feet; thence West 3607.38 feet; thence North 1462.17 feet to the South line of a 75 acre tract of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 26, 1937, of record in Book 621 of Official Records, page 170, Sacramento County Records; thence along the South line of said last mentioned 75 acre tract of land, South 84° 20 1/2' East 751.20 feet and North 39° 28' East 1139.92 feet to the Southwesterly line of a 74 acre tract of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 28, 1937, of record in Book 615 of Official Records, page 462, Sacramento County Records; thence along the Southwesterly and South lines of said 74 acre tract of land, South 50° 32 1/2' East 3067.26 feet and South 89° 00' East 10 feet to the point of beginning, containing 150 acres, more or less.

PARCEL NO. 7:

That portion of Sections 19, 20, and 30, Township 7 North, Range 8 East Mt. Diablo Base and Meridian, described as follows:

Beginning at the most Southerly corner of the 150 acre tract of land

continued on next page

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described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated May 31, 1938, recorded June 3, 1938, in Book 684 of Official Records, page 307, Sacramento County Records, which corner is located South 1° 05' West 1455.50 feet and South 56° 33' West 6098.89 feet from the Northeast corner of said Section 20; thence from said point of beginning along the boundary of said 150 acre tract, North 2880.35 feet to a corner and thence West 2264.83 feet; thence leaving said boundary, South 4376.56; thence North 56° 33' East 2714.41 feet to the point of beginning.

PARCEL NO. 8:

That portion of Sections 19 and 30, Township 7 North, Range 8 East, Mt. Diablo Base and Meridian, described as follows:

Beginning at the Southwest corner of the 150 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated November 30, 1938, recorded December 8, 1938, in Book 716 of Official Records, page 420, Sacramento County Records, which corner is located South 1° 05' West 1455.50 feet and South 56° 33' West 8813.30 feet from the Northeast corner of said Section 20; thence from said point of beginning along the West line of said 150 acre parcel of land, North 4376.56 feet to the Northwest corner thereof; thence along the boundary of the 150 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated May 31, 1938, recorded June 3, 1938, in Book 684 of Official Records, page 307, Sacramento County Records, West 1342.55 feet to the Southwest corner thereof, and thence North 1462.17 feet to the South line of a 75 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 26, 1937, of record in Book 621 of Official Records, page 170, Sacramento County Records; thence along the South line of said 75 acre parcel of land, North 84° 20 1/2' West 1923.68 feet to the range line between Ranges 7 and 8 East, M. D. B. & M., thence South 2° 16' West along said range line 2988.0 feet; thence North 75° 34' East 2575.0 feet; thence South 18° 41' West 3853.00 feet; thence North 65° 11' West 173.00 feet; thence South 71° 03' West 500.00 feet; thence South 38° 00' East 1840.60 feet; thence North 34° 56' East 1000.00 feet; and thence North 56° 33' East 1245.30 feet to the point of beginning, containing 301 acres, more or less.

PARCEL NO. 9:

The East half of the Southeast quarter and lots 3 and 4 of the Southeast quarter of Section 24, in Township 7 North, Range 7 East, M. D. B. & M., containing 159.89 acres, more or less.

PARCEL NO. 10:

All that portion of Sections 20 and 30, in Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at a point located South 1° 05' West 1455.50 feet from the Northeast corner of Section 20, Township 7 North, Range 8 East; thence South 1° 05' West 134.50 feet; thence South 47° 44' West 2580.00 feet thence South 60° 27' West 7449.80 feet; thence North 56° 33' East 10058.6

continued on next page

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feet to the point of beginning.

EXCEPTING THEREFROM that portion lying in Section 19 of said Township and Range.

ALSO EXCEPTING ANY PORTION thereof that may lie in Section 29 of said Township and Range, and containing after said exceptions 60 acres, more or less.

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EXHIBIT B TO

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

INFORMATION RE NOTICES OF NONRENEWAL
(See Paragraph 15 of Agreement)

Notice to County:

Notice must identify:

1. Owner
2. Resolution number establishing agricultural preserve
3. Resolution number authorizing execution of the Agreement

Address notice to:

Clerk of the Board of Supervisors
County of Sacramento
County Administration Building
827 - 7th Street
Sacramento, California 95814

Address Notice to Owner:

Glenn E. Pilliken and Fern E. Pilliken

at Sloughhouse, California 95683

19803

ATTACHMENT B

DECEMBER 17, 2014 WILLIAMSON ACT NONRENEWAL

TO: COUNTY RECORDER
MAIL CODE: 11-112

Sacramento County Recorder
Donna Allred, Clerk/Recorder
BOOK 20141217 PAGE 0791
Wednesday, DEC 17, 2014 2:06:34 PM
Ttl Pd $0.00 Rcpt # 0008454322
JLM/15/1-31

NO FEE RECORDING
GOVERNMENT CODE
SECTION 6103

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:
08-2450
ATTENTION: Kevin Romo

Phone: 874-8178

NOTICE OF NON-RENEWAL
FOR A PORTION OF LAND CONSERVATION AGREEMENT

WILLIAMSON LAND CONSERVATION AGREEMENT NO. 69-AP-35A
ASSESSOR PARCEL (S): 128-0110-01, 02; 128-0060-001; 128-0090-03, 04, 11, 10, 13,14, 15, 16, 20, 18, 7

RE: NO ITEM NUMBER/DOESN'T HAVE TO HAVE BOARD APPROVAL

U: Recording Memo to County Clerk Recorder

RECEIVED

NOV 2 1 2014

County of Sacramento
Department of Community Development
Planning and Environmental Review Division

PLNP 2014 - 00220

Return to:
Planning and Community Development Department
County of Sacramento
827 7th Street, Suite 230
Sacramento, CA 95814

NOTICE OF NON-RENEWAL FOR A PORTION OF LAND CONSERVATION AGREEMENT

Pursuant to Sections 51245 and 51246 of the Government Code, on NOVEMBER 21, 2014, the undersigned OPERATING ENGINEERS LOCAL UNION #3, AS CURRENT OWNERS OF SUBJECT PROPERTY PREVIOUSLY OWNED BY THE FERN E PILLIKEN TRUST hereby gives notice of non-renewal of Williamson Land Conservation Agreement No. 69-AP-35 A

Particulars relating to said Land Conservation Agreement are as follows:

Assessor Parcel(s) 128-0110-001,02; 128-0060-001; 128-0090-03,04,11,10,13,14, 15,16,20,18 ?.

Total number of acres being non-renewed: 1508 ACRES

Williamson Land Conservation Agreement No. 69-AP-35 (Contract rescinded per 20131101 at page 0404)

Name(s): GLENN E. PILLIKEN AND FERN E PILLIKEN

Recorded Book and Page Number(s): 69-05-01 PAGES 1391-1408

Address to which correspondence should be sent: 14738 CANTOVA WAY
SLOUGHHOUSE CA 95683

Phone: 916-354-2029

By this notice of non-renewal filed with the Board of Supervisors of the County of Sacramento, Agreement noted above will then expire automatically nine (9) years from and after February 28, 20 15, but that in the intervening nine (9) years, this agreement will, by law, remain in full force and effect.

Dated: November 21, 2014

By: (Print name) Tammy Castillo

Sign: Tammy Castillo

(Attach Notary Public Acknowledgement for each Signature)

This Notice of Non-Renewal was received on December 2, 20 14, in the office of the Clerk of the Board of Supervisors of the County of Sacramento.

Dated: 12-2-14

COUNTY OF SACRAMENTO

BY: Cyndi Lee

Cyndi Lee,
Clerk of the Board of Supervisors
County of Sacramento

(Attach map showing property for which the Notice of Non-Renewal is filed)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGEMENT

State of California)
County of Sacramento)

On November 21, 2014 before me, Pauline McCullough, Notary Public,

personally appeared, Tammy Castillo

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

PAULINE MCCULLOUGH
COMM. #1959246
Notary Public • California
Sacramento County
Comm. Expires Nov 4, 2015

Pauline McCullough
Notary Public Signature

(Notary Public Seal)

---------- OPTIONAL INFORMATION ----------

THIS OPTIONAL INFORMATION SECTION IS NOT REQUIRED BY LAW BUT MAY BE BENEFICIAL TO PERSONS RELYING ON THIS NOTARIZED DOCUMENT

Title or Type of Document _____

Date of Document _____ Number of Pages _____

Signers(s) Other Than Named Above _____

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

State of California
County of Sacramento }

On Dec 10, 2014 (Date) before me, Paula Yvette Walton, Notary Public (Here Insert Name and Title of the Officer)

personally appeared Cyndi Lee (Name(s) of Signer(s))

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Paula Yvette Walton (Signature of Notary Public)

PAULA YVETTE WALTON
Commission # 2030444
Notary Public - California
Sacramento County
My Comm. Expires Jun 22, 2017

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could prevent fraudulent removal and reattachment of this form to another document.

Description of Attached Document

Title or Type of Document: _____

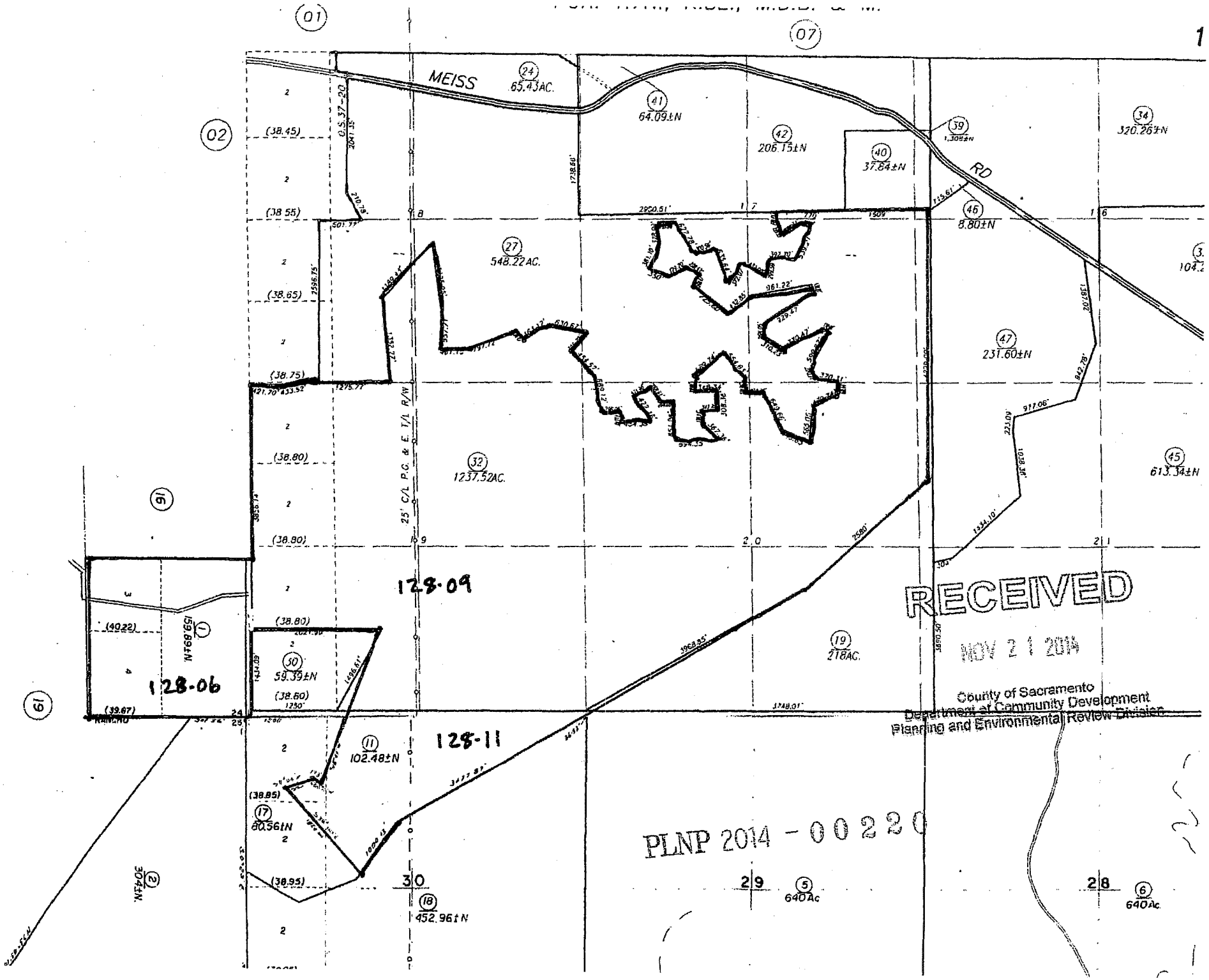
Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer — Title(s): _____	☐ Corporate Officer — Title(s): _____
☐ Individual	☐ Individual
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Attorney in Fact	☐ Attorney in Fact
☐ Trustee	☐ Trustee
☐ Guardian or Conservator	☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: _____	Signer Is Representing: _____

 Item #5907



RECEIVED
NOV 21 2014
County of Sacramento
Department of Community Development
Planning and Environmental Review Division

PLNP 2014 - 00220

OPERATING AGREEMENT
OF
SLOUGHHOUSE APPLE, LLC
a California limited liability company

This Operating Agreement ("**Agreement**"), effective as of December 19, 2012, is hereby duly adopted as the operating agreement of Sloughhouse Apple, LLC, a California limited liability company (the "**Company**"), and is made among the Company, the sole Member of the Company, and Operating Engineers and Participating Employers Pre-Apprentice, Apprentice and Journeyman Affirmative Action Training Fund (the "**Member**").

RECITALS

A. The Articles of Organization of the Company were filed in the Office of the Secretary of State of the State of California on December 19, 2012.

B. It is the specific intent of the parties to this Agreement that the Company be a disregarded entity for federal and California tax purposes only.

ARTICLE 1

DEFINITIONS

1.1 "Act" means the Beverly-Killea Limited Liability Company Act, codified in the California Corporations Code, § 17000 *et seq.*, as amended from time to time.

1.2 "Person" means an individual, partnership, limited partnership, trust, estate, association, corporation limited liability company, or other entity, whether domestic or foreign.

ARTICLE 2

ORGANIZATION AND POWERS

2.1 Name and Formation. The name of the Company is "Sloughhouse Apple, LLC". All business of the Company must be conducted in that name or in one or more other names that comply with applicable law and that are selected by the Member from time to time. The Company was formed as of the date set forth in the Recitals.

2.2 Principal Place of Business. The initial principal office and place of business of the Company is 14738 Cantova Way, Sloughhouse, California. The Company may locate its place of business at any other place or places selected by the Member from time to time.

2.3 Registered Office and Agent. The registered office of the Company shall be the office of the initial registered agent named in the Articles of Organization or such other office selected by the Member from time to time. The registered agent of the Company is the initial registered agent named in the Articles of Organization or another Person or Persons selected by the Member from time to time.

2.4 Term. The term of existence of the Company shall be perpetual, unless the Company is earlier dissolved in accordance with either this Agreement, the Articles of Organization or the Act.

2.5 Purpose. The Company's purpose is to engage in any lawful act or activity for which a limited liability company may be organized under the Act on the terms and conditions and subject to the limitations set forth in this Agreement.

2.6 Member-Managed. All of the business and affairs of the Company shall be managed solely by the Member. Accordingly, unless otherwise limited by the Articles or this Agreement, the Member shall have full, complete and exclusive authority, power, and discretion to manage and control the Company's business, property and affairs, to make all decisions regarding those matters, and to perform any and all other acts or activities customary or incident to the management of the Company's business, property and affairs. The Member may delegate its authority hereunder to any person or officer. Unless and until otherwise notified in writing by the Member in writing, Tom Hendricks, Executive Director of the Member, is hereby authorized to act on behalf of the Member and the Company and shall have the power and authority on behalf the Member and in the name of the Company to carry out any and all of the objects and purposes of the Company set forth in Section 2.5 and to perform all acts and enter into and perform all contracts and other undertakings which it may deem necessary or advisable or incidental thereto, including, without limitation, the power and authority to (i) enter into, make and perform contracts and other undertakings, (ii) establish, maintain and close accounts with financial institutions, (iii) employ or engage at the expense of the Company such agents, employees, managers, accountants, attorneys, consultants, contractors and other persons necessary or appropriate to carry out the business and affairs of the Company whether or not such Persons so employed are Affiliates of the Member, (iv) determine the amount and timing of distributions and payments to the Member in accordance with this Agreement, (v) make, execute, assign, acknowledge, file and deliver any and all documents or instruments and amendments thereto, and to take any and all other actions, that the Member may deem appropriate to carry out the purposes and business of the Company as set forth herein.

ARTICLE 3

DISTRIBUTIONS

3.1 Distributions. Distributions shall be made at such times, and from time to time, as the Member may determine. Any such distributions shall be subject to any restrictions in loan documents to which the Company is a party.

3.2 Restrictions on Distributions. Notwithstanding Section 3.1, no distribution shall be made if, after giving effect to the distribution: (i) the Company would not be able to pay its debts as they become due in the usual course of business; or (ii) the Company's total assets would be less than the sum of its total liabilities.

ARTICLE 4

CAPITAL CONTRIBUTIONS

4.1 Initial Capital Contribution. The Member shall contribute assets it deems appropriate to the Company.

4.2 Additional Capital Contributions. The Member may contribute any additional capital deemed necessary or appropriate for the operation of the Company.

4.3 Capital Account. Although the Company will not be a separate entity for federal and California income tax purposes, a Capital Account will be maintained for the Member. The Member's Capital Account will be increased by (i) the amount of money contributed by the Member to the Company; (ii) the book value of any property (net of liabilities secured by such contributed property that are assumed or taken subject to by the Company); and (iii) allocations to the Member of net profits of the Company. The Member's Capital Account will be decreased by (i) the amount of money distributed to the Member by the Company; (ii) the book value of any property distributed to the Member by the Company (net of liabilities secured by such distributed property that are assumed or taken subject to by the Member); and (iii) allocations of the Member of net losses of the Company.

ARTICLE 5

INSURANCE AND INDEMNIFICATION

5.1 Insurance. During the course of the term for which this Company is formed, the Company may purchase and maintain insurance on the business and on behalf of any Person who is or was a Member, manager, officer, employee, partner, venturer, proprietor, trustee, agent or similar functionary against any liability, in such amounts as are deemed appropriate by the Member.

5.2 Indemnification. The Company shall indemnify the Member and may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending, or completed action, suit, or proceeding because he or she is or was an officer, employee or agent against any and all claims and demands whatsoever, subject to any limitations in the Act.

ARTICLE 6

ACCOUNTS, BOOKS, RECORDS AND REPORTING

6.1 Method of Accounting. The Company's accounting records shall be kept in accordance with the accounting method selected by the Member.

6.2 Books and Records. The Company shall keep books and records separate from those of its Member and shall at all times segregate and account for all of its assets and liabilities separately from those of its Member. Complete books of account of the Company's business, in which each Company transaction shall be fully and accurately entered, shall be kept at the Company's principal executive office.

6.3 Tax Classification. The Member acknowledges that because the Company is formed to have a single Member pursuant to Treasury Regulations Section 301.7701-3, the Company shall be disregarded as an entity separate from its owner for federal income tax purposes. The Company shall be treated as a division of the Member pursuant to Treasury Regulations Sections 301.7701-2(a), 301.7701-2(c)(i) and 301.7701-3(b)(ii). Accordingly, the profits and losses of the Company and all items of Company income, gain, loss, deduction, or credit shall be reported, for Company book purposes and tax purposes, by the Member.

6.4 Reports. The Member shall also prepare and timely file, with appropriate authorities, amendments to, or restatements of, the Articles and all reports required to be filed by the Company with those entities under the Act or other applicable laws, rules, or regulations.

ARTICLE 7

DISSOLUTION, WINDING UP AND CANCELLATION

7.1 Event of Dissolution. The Company shall dissolve, dispose of its assets, and wind up its affairs upon the written consent of the Member.

7.2 Procedures upon Dissolution. Upon dissolution, the Company shall continue solely for the purpose of winding up its affairs in an orderly manner, liquidating its assets, and satisfying the claims of its creditors pursuant to the appropriate provisions of the Act and the procedures set forth in this Section 7.2. The Member shall have all the duties and responsibilities associated with winding up the Company's affairs. The Member shall determine the time, manner, and terms of the sale of the Company assets, consistent with its fiduciary responsibilities and having due regard to the activity and condition of the relevant market and general financial and economic conditions. Following the Company's dissolution, the Company's assets shall be applied to satisfy claims of creditors and distributed to the sole Member in liquidation as provided in the Act.

7.3 Certificate of Cancellation. On completion of the Company's winding up, the Member shall file a Certificate of Cancellation in the office of, and on a form prescribed by, the Secretary of State. As soon as possible following the occurrence of a Dissolution Event, the Member shall (a) execute a Certificate of Cancellation (the **"Certificate"**) in such form as shall be prescribed by the Secretary of State, and (b) file the Certificate as required by the Act.

ARTICLE 8

MISCELLANEOUS

8.1 Other Activities of Member. The Member may engage or invest in, independently or with others, any business activity of any type or description, including without limitation those that might be the same as or similar to the Company's business and that might be in direct or indirect competition with the Company. The Company shall not have any right in or to such other ventures or activities, or to the income or proceeds derived therefrom. The Member is not obligated to present any opportunity to the Company.

8.2 Limited Liability. The Member shall not be bound by, or personally liable for, the expenses, debts, liabilities, losses or obligations of the Company except as otherwise provided in the Act or in this Agreement.

8.3 Restrictions on Transfer. The Member shall not transfer any part of its membership interest in the Company.

8.4 Application of Law. This Agreement, and the application or interpretation hereof, shall be governed exclusively by the laws of the State of California, and specifically the Act.

8.5 Binding Effect. Except as herein otherwise provided to the contrary, this Agreement shall be binding upon and inure to the benefit of the Member, and its distributees, legal representatives, successors and assigns.

8.6 Third Parties - No Interest. Nothing in this Agreement (whether express or implied) is intended to or shall (i) confer any rights or remedies under or by reason of this Agreement on any Person other than the parties hereto and their respective successors and assigns, (ii) relieve or discharge the obligation or liability of any third Person to any party hereto, or (iii) give any third Person any right of subrogation or action against any party to this Agreement.

8.7 Severability. If any provision of this Agreement is held to be illegal, invalid or unenforceable under present or future laws effective during the term hereof, the legality, validity, and enforceability of the remaining provisions of this Agreement shall not be affected thereby, and in lieu of such illegal, invalid, or unenforceable provision, there shall be added automatically as a part of this Agreement a provision as similar in terms to such illegal, invalid, or unenforceable provision as may be legal, valid and enforceable.

8.8 Waiver. A party's waiver of any breach of any provision contained in this Agreement shall not constitute a continuing waiver or a waiver of any subsequent breach of such provision or any other provision contained in this Agreement.

8.9 Amendments. The Articles of Organization and this Agreement may be amended, supplemented or restated with the written consent of the Member.

8.10 Recitals; Interpretation. All recitals set forth in this Agreement are incorporated into this Agreement by this reference. This Agreement shall be interpreted in an even-handed manner. The singular and plural shall include each other.

8.11 Entire Agreement. This Agreement constitutes the entire agreement between the parties relating to the subject matter hereof, and supersede all previous contracts and agreements between the parties hereto, both oral and written.

8.12 Counsel to the Company. Counsel to the Company may also be counsel to the sole Member first set forth above. The sole Member or the Company may execute on behalf of the Company and the Member any consent to the representation of the Company that counsel may request pursuant to the California Rules of Professional Conduct or similar rules in any other jurisdiction (the "**Rules**"). The Company has initially selected Downey Brand LLP ("**Counsel**") as the Company's legal counsel. If any dispute or controversy arises between the

Member, Counsel may represent either the Company or the initial Member, or both, in any such dispute or controversy to the extent permitted by the Rules, and the Member and the Company hereby consent to such representation.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the undersigned has made and entered this Agreement to be effective as of the date and year set forth above.

Member:

Operating Engineers and Participating Employers Pre-Apprentice, Apprentice and Journeyman Affirmative Action Training Fund

BOOK 69-05-01 PAGE 1391 075 - Pilliken

NO FEE

30987

OFFICIAL RECORDS
SACRAMENTO COUNTY, CALIF.
MAY 1 10 16 AM 1969
COUNTY RECORDER

RESOLUTION NO. 69-AP-35 A

RESOLUTION AUTHORIZING THE CHAIRMAN OF THE BOARD OF SUPERVISORS TO EXECUTE CALIFORNIA LAND CONSERVATION AGREEMENT.

WHEREAS, the Board of Supervisors of Sacramento County has established an agricultural preserve by its Resolution No. 69-AP-35, as authorized by the California Land Conservation Act; and

WHEREAS, GLENN E. PILLIKEN and FERN E. PILLIKEN

is (are) the legal owner(s) of real property within the boundaries of the above described agricultural preserve, and has made application in proper form for a Land Conservation Agreement for land within the agricultural preserve; and

WHEREAS, all procedural requirements prerequisite to execution of such an agreement have been fulfilled;

NOW, THEREFORE, BE IT RESOLVED that the Chairman of the Board of Supervisors be authorized to execute on behalf of the County of Sacramento a California Land Conservation Agreement with the party hereinbefore named.

PASSED AND ADOPTED by the Board of Supervisors of the County of Sacramento, State of California, this 9th day of April, 19 69, by the following vote, to wit:

AYES: Supervisors, Gualco, Kloss, Phelan, Wood, O'Brien

NOES: Supervisors, None

ABSENT: Supervisors, None

30987 MAY - 1 1969

Chairman of the Board of Supervisors of Sacramento County, California

(SEAL)

ATTEST: Earl D. Jack
Clerk of the Board of Supervisors

RECORDER'S MEMO: Legibility of writing, typing or printing UNSATISFACTORY FOR MICROFILMING in this document when received.

075

BOOK 9-05-01 PAGE 1392

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

This LAND CONSERVATION AGREEMENT, made and entered into this 9th day of April, 1969, by and between GLENN E. PILLIKEN and FERN E. PILLIKEN hereafter referred to as "OWNER" and the County of Sacramento, a political subdivision of the State of California, hereinafter referred to as "COUNTY":

W I T N E S S E T H:

WHEREAS, Owner is the legal owner of certain real property situate in the County of Sacramento, State of California, hereinafter referred to as the "subject property"; and

WHEREAS, the subject property is described in Exhibit "A" which is made a part of this Agreement; and

WHEREAS, the subject property is located in an agricultural preserve heretofore established by County by Resolution Number 69-AP-35; and

48602

WHEREAS, Owner and County desire to limit the use of the subject property to agricultural and compatible uses in order to preserve the limited supply of agricultural land and to discourage premature and unnecessary conversion of such lands from agricultural use; and

WHEREAS, Owner and County recognize that such agricultural land has definite public value as open space and that the preservation of such land in agricultural production will assure an adequate food supply and constitute an important physical, social, esthetic

economic asset to County to maintain the agricultural economy of County and the State of California; and

WHEREAS, both Owner and County intend that the terms, conditions and restrictions of this Agreement are substantially similar to Contracts authorized by the California Land Conservation Act of 1965 so as to be an enforceable restriction under the provisions of California Revenue and Taxation Code Section 422; and

WHEREAS, it is the intent of County and Owner that the continued existence of the within Agreement is made dependent upon the existence of legislation implementing Article XXVIII of the California Constitution so the effect of the terms, conditions and restrictions of the Agreement on property values for taxation purposes is as favorable to Owner as the legislation existing on the last renewal date.

NOW, THEREFORE, the parties, in consideration of the mutual covenants and conditions set forth herein and the substantial public benefits to be derived therefrom, do hereby agree as follows:

1. Agreement Made Pursuant to California Land Conservation Act. The within Agreement is made and entered into pursuant to the California Land Conservation Act of 1965 (Chapter 7 of Part 1 of Division 1 of Title 5 of the California Government Code commencing with Section 51200) and is subject to all the provisions thereof specifically applicable to Article 3.5 Agreements (commencing with Section 51255) and such other provisions of said Act as are specifically made applicable to this Agreement.

2. Limitation on Use of Subject Property. During the term of this Agreement or any renewal or reinstatement thereof, the subject

property shall not be used for any purpose other than the "permitted agricultural uses" or "compatible uses" as the same are defined in Resolution No. 69-AP-35 declaring the policy and rules for the agricultural preserve in which the subject property is located which said policy and rules are incorporated herein by reference. Owner shall be limited to the uses specified in the aforementioned Resolution even though the Zoning Ordinance or other land use ordinances or regulations authorize different uses. In the event the Zoning Ordinance or other land use ordinances or regulations are or should become more restrictive than the uses authorized by the aforementioned Resolution and this Agreement, the zoning ordinance or other land use ordinances or regulations shall prevail.

3. Additional Uses. The Board of Supervisors may from time to time during the term of this Agreement or any extension or reinstatement thereof, by resolution revise the policy, rules or the lists of "permitted agricultural uses" or "compatible uses" for the agricultural preserve in which the subject property is located; provided however, said Board shall not eliminate, without the written consent of Owner, an authorized use during the term of this Agreement or any extension or reinstatement thereof.

4. Term of Agreement. This Agreement shall be effective on the last day of February next succeeding the date of execution of this Agreement by the parties hereto and shall remain in effect for a period of ten (10) years therefrom. This Agreement shall be automatically renewed and extended for a period of one (1) year on the last day of February of each year unless notice of nonrenewal is given as provided by Section 51245 of the Government Code.

If neither party to this Agreement serves written notice of nonrenewal, the Clerk of the Board of Supervisors of County shall cause a notice of renewal and the new termination date of this Agreement to be recorded with the County Recorder. A failure by County to cause a notice of renewal to be recorded shall not between the parties hereto affect in any manner the automatic renewal or extension of this Agreement.

5. Consideration. It is agreed that the consideration for the execution of this Agreement is the substantial public benefit to be derived by County from the preservation of land in agricultural production and the advantage which will accrue to Owner as a result of the effect on the method of determining the assessed value of the subject property and any reduction thereto due to the imposition of limitations on its use set forth in this Agreement. County and Owner shall not receive any payment in consideration of the obligations imposed herein.

6. Cancellation. This Agreement may be cancelled as to all or a portion of the subject property by mutual agreement of County and Owner, after a public hearing has been held and notice thereof given in accordance with Section 51284 of the Government Code. This Agreement shall be cancelled only upon a finding by the Board of Supervisors that such cancellation is in the public interest. It is understood by the parties that the existence of an opportunity for another use of the subject property shall not be a sufficient reason for cancellation of this Agreement. The uneconomic character of the existing use will be considered only if the subject property cannot reasonably be put to a permitted or compatible use specified

in the rules of the agricultural preserve in which the subject property is located. In no event shall this Agreement be cancelled if owners of fifty-one per cent (51%) of the acreage in the Preserve in which the subject property is located protest the cancellation at the hearing or prior thereto in writing.

7. Valuation of Subject Property After Cancellation of Agreement. Upon approval of cancellation by Owner and County, the Assessor of County shall immediately revalue the land to which the cancellation applies using the date of cancellation as the valuation date and apply County's announced ratio to the full cash value to determine the assessed value. The assessed value shall be subject to equalization pursuant to Section 1604 of the Revenue and Taxation Code.

8. Cancellation Fee. Owner shall pay, as a cancellation fee, an amount equal to 50% (fifty percentum) of the final new assessed valuation of the subject property. If after the effective date of this Agreement, County's announced ratio of assessed full cash value is changed, the percentage payment in determining the cancellation fee shall be changed so that no greater percentage of full cash value will be paid. The cancellation fee shall be considered as deferred taxes and shall be distributed as provided in Section 51283(c) of the Government Code.

9. Cancellation Upon Substitution of New Restrictions. This Agreement may be cancelled by mutual agreement of County and Owner without payment of cancellation fee or public hearings if it is replaced by an enforceable restriction authorized by Article XXVIII of the California Constitution or whenever there is no operative

legislation implementing said article at the time the cancellation is requested by Owner.

10. When Payment of Cancellation Fee Creates a Lien. The provisions of Section 51283.3 of the Act shall be applicable to any cancellation fee as a deferred tax payment payable pursuant to this Agreement including the rules of the agricultural preserve in which the subject property is located, except references to the Director of Agriculture shall be construed to refer to the Board of Supervisors of County.

11. Division of Subject Property. In the event the subject property is divided, Owner agrees as a condition of such division to execute an Agreement identical to the Agreement then covering the subject property. County, any other political entity, or any court having jurisdiction and making an order of division of the subject property, shall as a condition of such division, require the execution of the Agreements provided for in this paragraph.

12. Information for Assessment Purposes. Owner, on or before the first day of February of each year, shall provide information relating to Owner's obligation under this Agreement to determine the value of the subject property for assessment purposes. County shall provide forms for this purpose.

13. Action in Eminent Domain. Upon the filing of an action in eminent domain for the condemnation of the fee title of any of the subject property or of less than a fee interest which will prevent the land from being used for any use set forth in the rules for the agricultural preserve, or upon the acquisition in lieu of condemnation of the fee of subject property or of less than a fee interest which will prevent the subject property from being used for any

authorized use, this Agreement is null and void upon such filing of suit or acquisition as to the land condemned or acquired, and the condemning agency shall proceed as if the Agreement never existed. This Agreement may be amended to correctly reflect the description of any property not so acquired by the condemning agency.

14. Abandonment of Action in Eminent Domain. In the event the condemnation suit is abandoned in whole or part or if funds are not provided to acquire the property, this Agreement shall automatically be reinstated subject to terms identical to those when suit was filed or the property acquired; provided however, a notice of nonrenewal had not been given by either party and the property at the time of the abandonment of the condemnation is within the boundaries of the agricultural preserve in which the subject property was first located. County shall record the reinstated Agreement.

15. Notice of Nonrenewal. If Owner desires in any year not to renew this Agreement, Owner shall serve written notice of nonrenewal of the Agreement upon the Clerk of the Board of Supervisors of County at least ninety (90) days prior to the annual renewal date. If County desires not to renew this Agreement, County shall serve written notice of nonrenewal to Owner at least sixty (60) days prior to the annual renewal date. Notices of nonrenewal by County shall be sent to the address set forth in Exhibit "B" provided by Owner for this purpose. A notice of nonrenewal irrespective of which party gives notice shall be recorded by County. Owner shall have the right to protest the nonrenewal by County provided such protest is made in writing and filed with the Clerk of the Board of Supervisors of County not later than sixty (60) days after receipt of

30987

the notice of nonrenewal from County or the last day of February of the calendar year in which the notice was mailed, whichever date is first to occur.

16. Removal of Subject Land from Preserve by County. Removal of any land under this Agreement from the agricultural preserve in which it is located either by change of boundaries of the preserve, or disestablishment of the preserve, shall be equivalent of a notice of, and protest of, nonrenewal by County.

17. Enforcement of Agreement. Any conveyance, contract or authorization (whether written or oral) by Owner or his successors in interest which would permit use of the subject property contrary to the terms of this Agreement or the rules of the agricultural preserve in which the subject property is located, or failure to use the property consistent with the provisions herein, may be declared void by County's Board of Supervisors and will be deemed a breach of this Agreement. Such declaration or breach of the provisions of this Agreement may be enforced by County by an action filed in the Superior Court of the County for the purpose of compelling compliance or restraining breach thereof. It is understood and agreed that the enforcement proceedings provided in this Agreement are not exclusive and both Owner and County may pursue their legal and equitable remedies.

30887

18. Termination of Agreement by County. County may declare this Agreement terminated if it (or other substantially similar Agreement) is declared invalid or ineffective in any Court adjudication accepted by County as final, but no cancellation fee or other penalty shall be assessed against Owner upon such termination.

19. Recording of Documents. In the event of termination of this Agreement (a) after notice of nonrenewal, (b) cancellation, (c) nullification by annexation, condemnation or acquisition County shall record the appropriate documents with the County Recorder and file a copy with the Director of Agriculture.

20. Successors in Interest. The within Agreement shall run with the land described herein and upon division, to all parcels created therefrom, and shall be binding upon the heirs, successors and assigns of Owner. This Agreement shall also be transferred from County to a succeeding city or county acquiring jurisdiction over all or any portion of the subject property. On the completion of annexation proceedings by a city, that city shall succeed to all rights, duties and powers of County under this Agreement, unless the subject property or portion thereof was within one mile of said city at the time this Agreement was initially executed, and said city protested the execution of this Agreement pursuant to Section 51243.5 of the Government Code and said city states its intent not to succeed in the resolution of intention to annex. If the city does not exercise its option to succeed, this Agreement becomes null and void as to the subject property actually annexed on the date of annexation.

IN WITNESS WHEREOF the parties hereto have executed the within Agreement the day and year first above written.

COUNTY OF SACRAMENTO, a political subdivision of the State of California

By _____
Chairman of the Board of Supervisors
"COUNTY"

ATTEST: _____
Clerk of the
Board of Supervisors

_____
Fern E. Pilliken

_____

_____
"OWNER"

BOOK 69-05-01 PAGE 1401

STATE OF CALIFORNIA,
County of Sacramento } ss.

On this 25th day of February in the year one thousand nine hundred and sixty-nine before me, THOMAS A. DARLING, a Notary Public, State of California, duly commissioned and sworn, personally appeared GLENN E. PILLIKEN and FERN E. PILLIKEN

known to me to be the person s whose name s are subscribed to the within instrument, and acknowledged to me that they executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal in the County of Sacramento the day and year in this certificate first above written.

Thomas A. Darling

Notary Public, State of California. My Commission Expires Sept. 20, 1969

Cowdery's Form No. 34—(Acknowledgment—General) (C. C. Sec. 1189) (PRINTED 1/19/641 61-0420

20987

We the undersigned trust deed or other encumbrance holders do hereby agree to be bound by the restrictions imposed by this Agreement and the policy and rules of the agricultural preserve in which the subject property is situated.

(Attach acknowledgment for each signature)

APPROVAL AS TO FORM:
JOHN B. HEINRICH,
County Counsel

By ________________

30987

EXHIBIT A TO

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

Subject Property is described as:

All that real property situated in the County of Sacramento, State of California, described as follows:

PARCEL NO. 1:

All that portion of the South half of Section 17 and the North half of Section 20, Township 7 North, Range 8 East, Mount Diablo Base and Meridian described as follows:

Beginning at the quarter section corner common to Sections 16 and 17, said township and range, being also the Northeast corner of the lands formerly owned by Mooney; thence South 1° 05' West along the East line of Sections 17 and 20, a distance of 3811.1 feet; South 52° 55' West 829.1 feet; North 89° 00' West 3938.6 feet; North 1° 05' East 686.4 feet; North 89° 00' West203.0 feet; North 331.0 feet; East 433.0 feet; North 30° 40' West 420.0 feet; North 52° 30' East 270.0 feet; South 38° 15' East 290.0 feet; East 203.0 feet; South 652.0 feet; East 695.0 feet; North 41° 50' West 366.8 feet; North 198.0 feet; East 243.0 feet; North 308.0 feet; West 348.0 feet North 218.0 feet; North 48° 00' East 570.0 feet; South 40° 00' East 550.0 feet; South 232.0 feet; East 293.0 feet; South 25° 00' East 650.0 feet; South 63° 10' East 440.0 feet North 7° 45' East 550.0 feet; North 63° 00' East 480.0 feet; North 168.0 feet; North 77° 15' West 370 feet; North 20° 30' West 220.0 feet; North 30° 10' East 600.0 feet; North 45° 00' West 120.0 feet, South 61° 30' West 770.0 feet; North 52° 40' West 310.0 feet; North 258.0 feet; North 58° 15' East 930.0 feet; North 23° 45' West 130.0 feet; South 82° 00' West 960.0 feet; South 45° 40' West 430.0 feet; North 49° 45' West 730.0 feet; North 17° 50' East 170.0 feet; North 46° 30' West 230.0 feet; South 57° 40' West 330.0 feet; North 65° 10' West 350.0 feet; North 24° 50' East 380.0 feet; North 378.0 feet; East 233.0 feet; South 32° 40' East 624.0 feet; North 68° 05' East 300.00 feet; South 22° 00' East 640 feet; North 30° 40' East 370.0 feet; South 59° 20' East 440.0 feet; North 12° 00' East 300.00 feet; East 393.0 feet; North 28° 00' East 540.0 feet; West 148.49 feet; South 56° 30' West 230.0 feet; North 57° 30' West 200.0 feet; thence North 253.3 feet to the Northerly boundary line of said Mooney Tract; thence South 89° 03' East along said Northerly boundary line, a distance of 770.0 feet; thence continuing along said boundary line, South 89° 00' East 1608.0 feet, more or less, to the point of beginning, containing 300 acres, more or less.

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PARCEL NO. 2:

Commencing at the corner common to Sections 16, 17, 20, 21, Township 7 North, Range 8 East, M. D. B. & M., thence South 1° 05' West 1191.10 feet to the Southeast corner of a 300 acre tract required by Cosumnes Gold Dredging Company by deed dated September 6, 1935, of record in Book 535 of Official Records, page 337, Sacramento County Records; thence South 52° 55' West 829.10 feet; thence North 89° 00' West 3938.60 feet to the point of beginning; thence from said point of beginning the following fourteen courses and distances, vis: North 1° 05' East 686.40 feet; North 89° 00' West 203.00 feet; North 445.00

feet; West 296.00 feet; North 11° 37' West 694.00 feet; North 44° 27' West 456.10 feet; North 40° 31' East 400.00 feet; North 75° 05' West 630.00 feet; South 58° 56' West 460.00 feet; North 37° 27' West 195.00 feet; South 70° 55' West 793.00 feet; North 89° 10' West 460.00 feet; South 50° 32 1/2' East 3567.26 feet and South 89° 00' East 261.75 feet to the place of beginning, containing 74.00 acres, more or less.

PARCEL NO. 3:

Commencing at the section corner common to Sections 16, 17, 20 and 21, Township 7 North, Range 8 East, M. D. M., thence South 1° 05' West 1191.10 feet to Southeast corner of a 300 acre tract heretofore acquired by Cosumnes Gold Dredging Company; thence South 52° 55' West 829.10 feet; thence North 89° 00' West 4200.35 feet; thence North 50° 32 1/2' West 3067.26 feet to the place of beginning; thence the following courses and distances:

1. North 50° 32 1/2' West 500.00 feet;
2. North 4° 07' East 555.00 feet;
3. North 5° 52' West 1120.00 feet;
4. South 42° 12' West 1187.00 feet;
5. South 3° 45' East 1342.30 feet;
6. North 88° 26' West 1281.60 feet;
7. South 82° 14' West 451.00 feet;
8. North 86° 26' West 457.00 feet to the range line between Ranges 7 and 8 East;
9. South 2° 16' West 400.00 feet along said range lines;
10. South 84° 20 1/2' East 2674.88 feet;
11. North 39° 28' East 1139.92 feet to the place of beginning, containing 75.00 acres, more or less.

PARCEL NO. 4:

That portion of Section 20, Township 7 North, Range 8 East, Mt. Diablo Base and Meridian, described as follows:

Beginning at a point in the East line of said Section, located South 1° 05' West 1191.10 feet from the Northeast corner thereof; said point of beginning being the Southeast corner of a 300 acre tract of land acquired by Cosumnes Gold Dredging Company, by deed dated September 6, 1935, and recorded in the office of the County Recorder of Sacramento County, in Book 535 of Official Records, page 337; thence from said point of beginning, South 1° 05' West along the East line of said Sectior 264.40 feet; thence South 56° 33' West 3813.90 feet; thence North 13° 52' West 1976.33 feet to the South line of said 300 acre tract ofland; thence South 89° 00' East along the South line of said 300 acre tract of land, a distance of 3000.00 feet to a corner in the South line of said 300 acre tract of land; thence north 52° 55' East 829.10 feet to the point of beginning, containing 75 acres, more or less.

continued on next page

PARCEL NO. 5: BOOK 79-05-01 PAGE 1405

That portion of Section 20, Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at the Northwest corner of a 75 acre tract of land acquired by the Cosumnes Gold Dredging Company by deed dated October 27, 1937, recorded in the office of the County Recorder of Sacramento County, in Book 659 of Official Records, page 52, which corner is located South 1° 05' West 1191.10 feet; South 52° 55' West 829.10 feet and North 89° 00' West 3000.00 feet from the Northeast corner of said Section 20; thence North 89° 00' West along the South line of a 300 acre tract and of a 74 acre tract of land both of which are described in deed to the Cosumnes Gold Dredging Company, dated September 6, 1935, and April 28, 1937, respectively and recorded in the office of the County Recorder of Sacramento County the former in Book 535 of Official Records, page 337, and the latter in Book 615 of Official Records, page 462, a distance of 1190.35 feet to a point located South 89° 00' East 10.00 feet from the Southwest corner of said 74 acre tract of land; thence South 5° 13' East 2877.62 feet; thence North 56° 33' East 1680.30 feet to the Southwest corner of said 75 acre tract of land; thence North 13° 52' West along the West line of said 75 acre tract of land, 1976.33 feet to the point of beginning, containing 75 acres, more or less.

PARCEL NO. 6:

That portion of Section 18, 19 and 20, Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at the Northwest corner of a 75 acre tract of land described in deed from Hugh Mooney and others, to Cosumnes Gold Dredging Company, dated December 23, 1937, of record in Book 659 of Official Records, page 451, Sacramento County Records, which corner is located South 1° 05' West 1191.10 feet; South 52° 55' West 829.10 feet and North 89° 00' West 4190.35 feet from the Northeast corner of said Section 20; thence from said point of beginning, South 5° 13' East 2877.62 feet to the Southwest corner of said 75 acre tract of land; thence South 56° 33' West 604.69 feet; thence North 2880.35 feet; thence West 3607.38 feet; thence North 1462.17 feet to the South line of a 75 acre tract of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 26, 1937, of record in Book 621 of Official Records, page 170, Sacramento County Records; thence along the South line of said last mentioned 75 acre tract of land, South 84° 20 1/2' East 751.20 feet and North 39° 28' East 1139.92 feet to the Southwesterly line of a 74 acre tract of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 28, 1937, of record in Book 615 of Official Records, page 462, Sacramento County Records; thence along the Southwesterly and South lines of said 74 acre tract of land, South 50° 32 1/2' East 3067.26 feet and South 89° 00' East 10 feet to the point of beginning, containing 150 acres, more or less.

PARCEL NO. 7:

That portion of Sections 19, 20, and 30, Township 7 North, Range 8 East Mt. Diablo Base and Meridian, described as follows:

Beginning at the most Southerly corner of the 150 acre tract of land

continued on next page

described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated May 31, 1938, recorded June 3, 1938, in Book 684 of Official Records, page 307, Sacramento County Records, which corner is located South 1° 05' West 1455.50 feet and South 56° 33' West 6098.89 feet from the Northeast corner of said Section 20; thence from said point of beginning along the boundary of said 150 acre tract, North 2880.35 feet to a corner and thence West 2264.83 feet; thence leaving said boundary, South 4376.56; thence North 56° 33' East 2714.41 feet to the point of beginning.

PARCEL NO. 8:

That portion of Sections 19 and 30, Township 7 North, Range 8 East, Mt. Diablo Base and Meridian, described as follows:

Beginning at the Southwest corner of the 150 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated November 30, 1938, recorded December 8, 1938, in Book 716 of Official Records, page 420, Sacramento County Records, which corner is located South 1° 05' West 1455.50 feet and South 56° 33' West 8813.30 feet from the Northeast corner of said Section 20; thence from said point of beginning along the West line of said 150 acre parcel of land, North 4376.56 feet to the Northwest corner thereof; thence along the boundary of the 150 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated May 31, 1938, recorded June 3, 1938, in Book 684 of Official Records, page 307, Sacramento County Records, West 1342.55 feet to the Southwest corner thereof, and thence North 1462.17 feet to the South line of a 75 acre parcel of land described in deed from Hugh Mooney, et al., to Cosumnes Gold Dredging Company, dated April 26, 1937, of record in Book 621 of Official Records, page 170, Sacramento County Records; thence along the South line of said 75 acre parcel of land, North 84° 20 1/2' West 1923.68 feet to the range line between Ranges 7 and 8 East, M. D. B. & M., thence South 2° 16' West along said range line 2988.0 feet; thence North 75° 34' East 2575.0 feet; thence South 18° 41' West 3853.00 feet; thence North 65° 11' West 173.00 feet; thence South 71° 03' West 500.00 feet; thence South 38° 00' East 1840.60 feet; thence North 34° 56' East 1000.00 feet; and thence North 56° 33' East 1245.30 feet to the point of beginning, containing 301 acres, more or less.

PARCEL NO. 9:

The East half of the Southeast quarter and lots 3 and 4 of the Southeast quarter of Section 24, in Township 7 North, Range 7 East, M. D. B. & M., containing 159.89 acres, more or less.

20987

PARCEL NO. 10:

All that portion of Sections 20 and 30, in Township 7 North, Range 8 East, M. D. B. & M., described as follows:

Beginning at a point located South 1° 05' West 1455.50 feet from the Northeast corner of Section 20, Township 7 North, Range 8 East; thence South 1° 05' West 134.50 feet; thence South 47° 44' West 2580.00 feet thence South 60° 27' West 7449.80 feet; thence North 56° 33' East 10058.6

100586

continued on next page

feet to the point of beginning.

EXCEPTING THEREFROM that portion lying in Section 19 of said Township and Range.

ALSO EXCEPTING ANY PORTION thereof that may lie in Section 29 of said Township and Range, and containing after said exceptions 60 acres, more or less.

BOOK 69-05-01 PAGE 1408

EXHIBIT B TO

LAND CONSERVATION AGREEMENT NO. 69-AP-35 A

INFORMATION RE NOTICES OF NONRENEWAL
(See Paragraph 15 of Agreement)

Notice to County:

Notice must identify:

1. Owner
2. Resolution number establishing agricultural preserve
3. Resolution number authorizing execution of the Agreement

Address notice to:

Clerk of the Board of Supervisors
County of Sacramento
County Administration Building
827 - 7th Street
Sacramento, California 95814

Address Notice to Owner:

Glenn E. Pilliken and Fern E. Pilliken

at Sloughhouse, California 95683

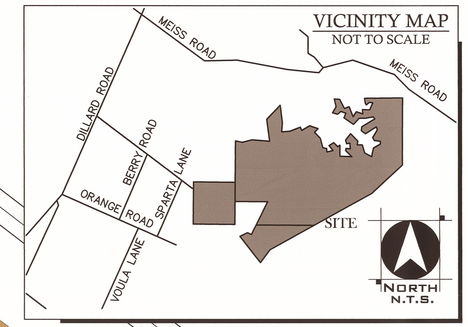
30987

PRELIMINARY SITE PLAN

OPERATING ENGINEERS TRAINING FACILITY

COUNTY OF SACRAMENTO, CA

VICINITY MAP
NOT TO SCALE



OWNER(S)
SLOUGHHOUSE APPLE LLC

APPLICANT
ANDREW WHITE
BENCHMARK RESOURCES
2515 EAST BIDWELL STREET
FOLSOM, CA 95630
awhite@benchmarkresources.net

ENGINEER/PLANNER
TSD ENGINEERING, INC
785 ORCHARD DRIVE, SUITE 110
FOLSOM, CA 95630
(916) 608-0707
ATTN: CHRIS SCHULZE
cschulze@tsdeng.com

MEISS ROAD
DEVELOPMENT SUMMARY

ASSESSORS PARCEL NO/OWNER
128-0060-001 / SLOUGHHOUSE APPLE LLC
128-0090-032 / SLOUGHHOUSE APPLE LLC
128-0110-011 / SLOUGHHOUSE APPLE LLC

PROPOSED USE
OPERATING ENGINEERS #3 APPRENTICE TRAINING CENTER FACILITY

ZONING
AG-80 & AG-80(SM)

EXISTING PARCEL AREA
AREA TOTAL = ±65,335,208 SQFT
OR ±1,499.89 ACRES

GENERAL PLAN
GA 80-GENERAL AGRICULTURE

EXISTING USE
AGRICULTURAL PRESERVE

PROPOSED DEVELOPMENT SUMMARY

BLDG 1 - ADMINISTRATION (1 STORY):	±19,200 SQFT
BLDG 2 - CLASSROOM (1 STORY):	±13,500 SQFT
BLDG 3 - HDR TRAINING (1 STORY):	±13,500 SQFT
BLDG 4 - MAINTENANCE (1 STORY):	±10,000 SQFT
BLDG 5 - COVERED DIG (1 STORY):	±94,000 SQFT

PARKING PROVIDED:

STANDARD STALLS	51 STALLS
ACCESSIBLE STALLS	4 STALLS
TOTAL	55 STALLS

RECEIVED
MAY 11 2018
County of Sacramento
Planning and Environmental Review

PLNP2017-00199

SITE NOTES

1. PROPOSED CURB RAMP
2. PROPOSED CROSSWALK
3. PROPOSED CURB
4. PROPOSED ACCESSIBLE PARKING
5. PROPOSED TRASH ENCLOSURE
6. PROPOSED FUEL ISLAND
7. PROPOSED FIRE PUMP FUEL
8. PROPOSED ART INSTALLATION (VINTAGE TRACTORS/EQUIPMENT)
9. PROPOSED WATER TANK
10. PROPOSED BUS SHELTER
11. PROPOSED FUEL TANK

SITE LEGEND

- ASPHALT CONCRETE (AC) ON AGGREGATE BASE (AB)
- PROPOSED LANDSCAPE AREA
- BUILDING AREA - FUTURE DESIGN REVIEW APPROVAL
- CONCRETE PAVING AREA
- CONCRETE SIDEWALK AREA

scale: 1"=50'

50 0 25 50 100

PRELIMINARY SITE PLAN
APRIL 25, 2018

TSD ENGINEERING, INC.
expect more.
785 Orchard Drive, Suite #110
Folsom, CA 95630
Phone: (916) 608-0707
Fax: (916) 608-0701

SP2

P:\Projects\383-002\02 DWG\B- Planning\PLN\383-002P Preliminary Site Plan SP2 - V3.0.dwg, Kathi, 13:01:17, 04-24-18

Office of Planning and Environmental Review
Leighann Moffitt, Director

County Executive
Navdeep S. Gill

November 13, 2018

Sacramento County Agricultural Advisory Committee
4137 Branch Center Rd.
Sacramento, CA 95827

Subject: PLNP2017-00270. Silva Ranch Biosolids Use Permit Amendment

1. **Request:** A Use Permit Amendment to renew an existing use permit to allow the continuation of a biosolids spreading operation on approximately 3,336-acres covering various APN's in the agricultural zoning districts.
2. **Location:** 13955 Twin Cities Road in the Southeast community.

Sacramento County Agricultural Advisory Committee,

The Office of Planning an Environmental Review (PER) received an application requesting a Use Permit Amendment to renew existing permits to allow the continuation of the spreading and disking into the topsoil of digested municipal sewage biosolids on approximately 3,336-acres, as a use not otherwise allowed for in the Agricultural zones, pursuant to Zoning Code Section 3.2.4.A.

This project will renew Use Permit 04-UPB-0427 that was approved by the Board of Supervisors on October 12, 2005 and expired on December 31, 2017. Other Use Permits, include, Use Permit No. 92-UPB-0726, approved March 15, 1995; 96-UPB-XXX-0323, approved October 22, 1997; and 96-UPB-0576, approved June 11, 1997.

Biosolids are the soil-like residue of materials removed from sewage during the treatment process. Further, the difference between biosolids and sludge is that biosolids are treated sewage sludge. Biosolids are carefully treated and monitored and must be used in accordance with regulatory requirements. Biosolids are graded into two classes:

- Class A: Material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR 503. Processes include composting, heat drying, heat treatment, thermophilic (high temperature) aerobic digestion, beta or gamma ray irradiation and pasteurization.
- Class B: Material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR 503. Processes include aerobic digestion, composing, anaerobic digestion, lime stabilization and air drying.

Silva Ranch biosolids land application accepts both Class A and Class B biosolids.

Regulatory Authority
The land application of biosolids at Silva Ranch is regulated by Federal and State regulations, site specific Waste Discharge Requirement (WDR's) and the use permits issued by Sacramento County.

40 CFR 503 are the Federal Regulations governing biosolids application that were adopted in approximately 1994. They provide the following requirements:

- Ceiling concentration limits and cumulative loading rates for 10 regulated pollutants. If the biosolids do not meet concentrations they cannot be land applied. It also establishes a maximum amount of each

pollutant concentration that can be applied to each site during the lifetime of the site. (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, Zinc).
- Identify and define biosolids as either Class A or Class B.

Order No. 2004-0012 is the Biosolids General Order issued by State Regional Water Quality Control Board. This order is based upon 40 CFR 503, but is generally considered more restrictive. In addition to complying with the requirements of the General Order Waste Discharge Requirements (WDR's) are also required because the facility is greater than 2000 acres. The application of biosolids at Silva Ranch pre-dates the issuance of the General Order.

Updated WDR's issued by the Central Valley Regional Water Quality Control Board (CVRWQCB) specific to Silva Ranch. (R5-2049-0002 were adopted February 2019. The WDR's require the operator to do the following:
- Have a Monitoring and Reporting Program
- Perform soil monitoring
- Perform stormwater retention pond monitoring
- Submit monthly monitoring reports

Sacramento County, based upon its local land use authority, has also issued use permits for the application of biosolids, subject to conditions of approval. The most recent Use Permit conditions provided an expiration date of December 31, 2017. The applicant applied for a use permit amendment to extend the expiration date. During this process conditions have been updated/amended or added to reflect current circumstances and the updated WDR's.

Environmental Determination
The size and scope of the project is not changing from what was permitted under the previous Use Permits. The baseline condition is continuing; therefore, the recommendation will be to recognize the previously adopted Negative Declaration and Mitigation Monitoring and Reporting Program (MMRP) are adequate and complete. The MMRP will remain in effect.

Proposed Conditions
Work has occurred on the draft conditions and some recommended changes are as follows:

- The Environmental Management Department will continue to conduct inspections.
- Reduce the overall amount of material that can be spread on the site. Recommending 160,000 tons annually instead of 184,000 tons.
- Increased setbacks based upon review of other jurisdictions ordinances.
- For fields adjacent to public road and off-site buildings recommending biosolids be incorporated within six hours.
- No landspreading or incorporating biosolids if wind speed exceeds 25 miles per hour.
- Provide sanitary facilities (toilet and hand wash sink) to application personnel.
- Track out prevention
- Depth of tilling in for material and monitoring protocol
- Groundwater monitoring

Groundwater Monitoring
Currently, the State (WDR's) and County (use permit) do not require groundwater monitoring associated with the proposed use. However, the neighbors and the CPAC have indicated they would like monitoring to occur. The WDR's do not require groundwater monitoring due to the depth to groundwater (greater than 150 feet below ground surface). However, the WDR'S (Section F) provide groundwater limitations where the operator is required to not exceed certain standards.

The CVRWQCB has adopted an Irrigated Lands Program. This program regulates irrigated land from discharges of waste that could affect the quality of waters of the State. The property owner is required to participate as part of a coalition group (Sacramento-Amador Water Quality Alliance). Under this program a drinking water supply well monitoring requirement starts in 2022 and applies to wells used for drinking water on enrolled parcels.

Annual monitoring is required for conductivity, pH, dissolved oxygen, temperature, and nitrate. Initially, and once every five years total dissolved solids and general minerals testing will also occur. Members of the coalition also have to prepare a Nitrogen Management Plan for enrolled parcels. The owner has proposed to monitor two wells located within Silva Ranch according to the requirements of the Irrigated Lands Program and proposes to begin monitoring within one year of the use permit approval.

Staff is seeking review and recommendations on this proposal from Agricultural Advisory Committee that will be reflected in PER's Board Letter and recommendation to the Board of Supervisors, as they are the final hearing authority for this project.

Sincerely,
Leanne Mueller
Senior Planner
muellerl@saccounty.net
916-874-6155

Enclosures: Application materials, Site Plan, WDR's

PLNP 2017 - 00270

Use Permit 04-UPB-0427

RECEIVED

SEP 28 2017

County of Sacramento
Department of Community Development
Planning and Environmental Review Division

County of Sacramento
Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Planning Application Form

This application form must accompany all Planning Entitlement requests.
Other required items are indicated on the Application Instructions and Checklist.
It is the applicant's responsibility to ensure that the application package is complete and accurate.

Application Requests (check all that apply; complete additional pages as indicated)

☐ General Plan Amendment	☐ Community Plan Amendment	☐ Rezone (Pg. 7)
☐ Tentative Subdivision Map	☐ Tentative Parcel Map	☐ Affordable Housing Plan
☐ Variance (Pg. 9)	☐ Special Review of Parking	☐ Special Development Permit
☐ Exception	☐ Design Review (Pg. 8)	☐ Development Plan Review
☒ Use Permit	☐ Other	

☐ This request is part of a pending or approved application Control #

Site address: 11540 Clay Station Road; Herald, CA 95638	Assessor's Parcel Number(s)* 136-0280-023,24,25,36; 138-0060-025,28,30,31,49, 138-0060-053,54,59,61,64; 140-0030-028,29; 140-0050-021	
Project Name: Silva Ranch		
Gross Acres: +/- 3,000 acres		

Contact Information

Indicate Billing Party in check box below

☒	Applicant	Name: Synagro West, LLC		Contact: Madison Holsinger
		Address: 3110 Gold Canal Drive, Suite E		City: Rancho Cordova
		State/Zip: CA, 95670	Email: mholsinger@synagro.com	Phone: (916) 862-9305
☐	Owner	Name: Gary Silva. Sr.		Contact: Gary Silva
		Address: 11540 Clay Station Road		City: Herald
		State/Zip: CA, 95638	Email: silvaranches@yahoo.com	Phone: (209) 993-6004
☐	Other	Name:		Contact:
		Address:		City:
		State/Zip:	Email:	Phone:

☐ Engineer ☐ Architect ☐ Developer ☐ Other_____

☐	Other	Name:		Contact:
		Address:		City:
		State/Zip:	Email:	Phone:

☐ Engineer ☐ Architect ☐ Developer ☐ Owner

*Parcel numbers may be obtained from the Assessor's website at www.assessor.saccounty.net, by calling their office at **(916) 875-0700,** or by visiting in person at **3701 Power Inn Road, Suite 3000, Sacramento, CA.***

PLNP 2017 - 00270

Use Permit 04-CUP-042?

RECEIVED
SEP 28 2017
County of Sacramento
Department of Community Development
Planning and Environmental Review Division

County of Sacramento
Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Legal Authority and Consent to File Application

Hyperlink to Instructions: http://www.per.saccounty.net/applicants/Pages/FormsandFees.aspx

Fee Consent and Other Acknowledgements

An initial below indicates that you understand and agree to the item. If you do not understand an item please ask the intake planner for an explanation.

GS. I understand that if the initial entitlement fee is a deposit, actual costs will be based on set hourly rates and actual **time and materials** used. Please refer to the Planning Fee Schedule to determine if your selected entitlements will be subject to a flat fee or time and materials.

GS. I understand that if actual costs exceed the amount of the deposit I will be billed for the additional costs based on **time and materials** used.

GS. I understand that additional fees for the preparation of an environmental document, which is required pursuant to the California Environmental Quality Act (CEQA), may be required.

GS. I understand that if necessary, I will receive a separate letter requesting a deposit for the environmental document. The typical range for an environmental document for small maps and use permits is **$6,000 – $12,000** depending on the specifics of the site and the complexity of the project. For projects with complex environmental issues the deposit amount could be substantially higher.

GS. I agree to pay all fees required to complete processing of this application. I understand that my application will not be deemed complete until the environmental document deposit has been received.

GS. I hereby give permission to County staff and other authorized personnel to conduct site inspections and post public notification signs on my property during the processing of this application. I consent to the posting of the address and contact information of all parties to this application on any website maintained by the County of Sacramento (the County).

GS. I agree not to alter the physical condition of the property during the processing of this application by removing trees, demolishing structures, altering streams, and/or grading or filling. I understand that such alteration of the property may result in the imposition of criminal, civil or administrative fines or penalties, or delay or denial of the project.

GS. Applicant shall defend, indemnify and hold harmless the County and its agents, including consultants, officers and employees from any claim, action or proceeding against the County or its agents, including consultants, officers or employees to attack, set aside, void, or annul the approval of this application or adoption of the environmental document which accompanies it. This indemnification obligation shall include, but not be limited to, damages, costs, expenses, attorney's fees, or expert witness costs that may be asserted by any person or entity, including the applicant, arising out of or in connection with the approval of this application, including any claim for private attorney general fees claimed by or awarded to any party against the County, and shall also include the County's costs incurred in preparing the administrative record which are not paid by the petitioner. The County shall promptly notify the applicant of any claim, action or proceeding. Notwithstanding the foregoing, the County shall control the defense of any such claim, action or proceeding unless the settlement is approved by the applicant and that the applicant may act in its own stead as the real party in interest in any such claim, action or proceeding.

GS. I have checked the current Hazardous Waste and Substances Sites List pursuant to Government Code Section 65962.5(f). www.envirostor.dtsc.ca.gov/public/ The proposed project site ☐is ☒is not included on the most recent list.

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Department of Community Development
Planning and Environmental Review Division
SEP 28 2017
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The signature below signifies legal authority and consent to file an application in accordance with the information above. The signature also signifies that the submitted information and accompanying documents are true and accurate, and that the items initialed above have been read and agreed to.

APPLICATIONS WILL NOT BE ACCEPTED WITHOUT SIGNATURE(S) OF LEGAL OWNERSHIP OR OFFICIAL AGENT/ AUTHORITY TO FILE (check one)

☒ Ownership ☐ Contract to Purchase* ☐ Letter of Authorization* ☐ Power of Attorney*
*Must Attach Evidence

Owners/Agents* Name: Gary Silva, Sr.	
Signature:	Date:

Owners Name:	
Signature:	Date:

Owners Name:	
Signature:	Date:

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Use Permit 04-UPB-0427

County of Sacramento
Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Statement of County Responsibility

Hyperlink to Instructions: http://www.per.saccounty.net/applicants/Pages/FormsandFees.aspx

Please read the following statement outlining your responsibilities in the application hearing process.

An amendment to California Law (AB 884), adopted in 1977 and effective January 1, 1978, requires the County and all other jurisdictions in the state to take final action to approve or disapprove a request like yours within one year of the County's acceptance of your application as complete. In most cases, the County has approved requests like yours in significantly less time. However, the legislation now requires the County to "count down" the days so that requests are not inadvertently approved without approval by the Board of Supervisors or a designated body.

The law requires the County to inform you within 30 days after the application is submitted if your application is incomplete for our needs. If the application is complete and has all the information we need, the processing will be initiated immediately. If additional data is needed, a letter will be sent to you specifically stating the information needed. The staff will not certify that the application is complete until all the requested items have been submitted to the County and the required fees have been paid.

Your application will be heard in a public hearing. The County is required by law to notify all those property owners within 500 feet with a minimum of 30 property owners as shown on the latest assessment roll. This provides an opportunity for those most affected by a proposed use to provide input to the hearing body.

PLEASE BE ADVISED THAT THIS APPLICATION IS NOT APPROVED UNTIL THE ULTIMATE HEARING BODY HAS TAKEN ITS FINAL ACTION AND ALL APPEALS EXHAUSTED. ANY RECOMMENDATIONS OR COMMENTS BY STAFF OR ACTIONS BY INTERMEDIATE HEARING BODIES ARE ONLY ADVISORY AND SHOULD NOT BE RELIED ON FOR THE PURPOSES OF MAKING FINANCIAL COMMITMENTS.

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County of Sacramento

Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Use Permit 04-UPB-0427

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County of Sacramento
Department of Community Development
Planning and Environmental Review Division

Additional Requirements

GS

An initial below indicates that you have read the item.

GS I understand that pursuant to State Fish and Games Code Section 711.4, a filing fee is required for all projects processed with a Negative Declaration or Environmental Impact Report unless it has been determined by the California Department of Fish and Wildlife (CDFW) that the project will have no effect on fish and wildlife. The fees are collected by the County Community Development Department, Planning and Environmental Review Division (PER) for payment to the State. I understand that I will be notified of the fee amount upon release of the environmental document for the project.

GS. I understand that all applicants are required to provide a Neighborhood Outreach Plan. I will include my neighborhood outreach plan in my Project Description.

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County of Sacramento
Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Use Permit 04-UPB-0427

Project Description and Neighborhood Outreach Plan

The Project Description is a comprehensive explanation of the applicant's project/request. It should include background information, reasoning, and the goal(s) of the project/request. The Neighborhood Outreach Plan describes how the applicant plans to inform the neighboring property owners (those within a 500 foot radius of the project site) about the project and address community concerns. Please see the application instructions for more information.

Project Description

Please see attached two-page project description summary, Attachment 1 and Silva Ranch Biosolids Management Plan, Attachment 2.

Neighborhood Outreach Plan

Please find attached summary of the adjacent property owner notification process, Attachment 3.

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Rezone Application
(*For Rezone Requests Only*)

General Plan Amendments

Entire parcel(s) to be rezoned? **Yes** ☐ **No** ☐
Existing General Plan Designation _____
Existing General Plan Designation _____

Gross Acres being rezoned: _____ ± acres
Proposed General Plan Designation _____
Proposed General Plan Designation _____

Community Plan Amendments and Rezones

Entire parcel(s) to be rezoned? **Yes** ☐ **No** ☐
Existing Zone Designation _____
Existing Zone Designation _____

Gross Acres being rezoned: _____ ± acres
Proposed Zone Designation _____
Proposed Zone Designation _____

Description of existing zoning and any proposed zoning changes and of existing and proposed uses of the property:

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Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Design Review Narrative
(For Design Review Requests Only)

Hyperlink to Instructions: http://www.per.saccounty.net/applicants/Pages/FormsandFees.aspx

The Design Review Narrative is an explanation of how the proposed project meets the County's Commercial and Mixed Use Community Design Guidelines and/or the interim Multi-family Design Guidelines.

Design Review Narrative

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Community Development Department
Planning and Environmental Review Division (PER)
827 7th Street, Room 225
Sacramento, CA 95814
(916) 874-6141

Variance
(For Variance Requests)

Supplemental Application Form
Hyperlink to Instructions: http://www.per.saccounty.net/applicants/Pages/FormsandFees.aspx

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In order for a Variance to be granted, mandatory findings must be made. To assist in understanding why a Variance is necessary for your project, please describe below how your project qualifies under the following findings. Variances shall not be granted for authorized uses or activities which are not otherwise expressly authorized by the Zoning regulation governing the parcel.

Finding 110-20 (a): Because of special circumstances peculiar to the subject property, including size, shape, topography, location or surroundings; or because of the location of Heritage or Land Mark Trees as defined and regulated by Chapter 19.04 of the County Code the strict application of the requirements of this Code would deprive the subject property of privileges enjoyed by other properties in the vicinity and under identical zone classifications.

DESCRIBE WHAT SPECIAL CIRCUMSTANCES ARE APPLICABLE TO THE PROPERTY THAT PREVENT CONFORMANCE TO PERTINENT ZONING REGULATIONS:

Finding 110-20 (b): The grant of the variance would not constitute a grant of special privilege inconsistent with the limitations upon other properties in the vicinity and zone in which the subject property is situated. (Special circumstances particular to subject property are leading the property owner to be deprived of privileges).

DESCRIBE WHY GRANTING A VARIANCE WOULD NOT BE A SPECIAL PRIVILEGE:

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Attachment 1

Silva Ranch Use Permit Project Summary

SYNAGRO

Use Permit Project Description
Silva Ranch

Prepared by:

Synagro West, LLC

Technical Services Department
Rancho Cordova, California

September 2017

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PROJECT INTRODUCTION

Silva Ranch operates under Sacramento County Use Permit 04-UPB-0427 that permits the land application of municipal sewage sludge (biosolids) to grazing land located within an approximately 3,000-acre farm in the vicinity of Herald, California; the permit also allows storage of biosolids. Zoning across the entire Silva Ranch includes AG-20, AG-20(F), AG-80, and AG-80(F). Biosolids are a safe and effective soil amendment that provide organic matter and plant nutrients for Silva's farming operations and also benefit society as a whole by recycling the solids produced during wastewater treatment, minimizing the need for chemical fertilizers, and reducing greenhouse gas emissions.

OVERVIEW OF OPERATIONAL PARAMETERS

Biosolids from municipal wastewater treatment plants are delivered to Silva Ranch in 20 to 25 wet ton loads, typically as semi-wet cake at approximately 20% solids. From approximately April 15 to November 1 annually (dry weather season), biosolids are delivered from the wastewater treatment plant directly to the field approved for land application. The biosolids are unloaded in a defined "staging area" within the field to be applied with biosolids. Staging areas are selected to provide maximum access to the field, while minimizing the number and distance of trips spreader vehicles must make in order to fertilize the field. Experience at Silva Ranch has shown that staging areas located away from public roads (Twin Cities Road and Clay Station Road) or residences minimizes the potential for nuisance odor complaints or accidental spills and tracking of biosolids onto roadways.

Once unloaded onto the ground, the biosolids are reloaded into a manure spreader using a front-end loader (or excavator in some cases) and applied to a field at a prescribed agronomic rate. Typically, biosolids are delivered, unloaded, and reloaded into manure spreaders and the biosolids are land applied within 24 hours of delivery to the field.

Between approximately November 1 and April 15 annually (wet weather season), biosolids are delivered from municipal wastewater treatment plants to Silva Ranch and unloaded at a clay-lined storage area accessed off of Twin Cities Road. This is done so that delivery tractor-trailers do not have to enter fields during wet soil conditions. Once a load is delivered to the storage area, it is unloaded onto a clay-lined surface and re-loaded into manure spreaders for delivery to a field using roads within Silva Ranch. Each manure spreader load contains approximately 12 to 13 wet tons of biosolids. This practice is performed to minimize potential damage to an agricultural field from tractor-trailers and for driver safety reasons, as the manure spreaders are equipped with all-weather balloon tires and the tractors pulling the spreaders are equipped with traction tires and 4-wheel drive. Currently, biosolids cannot be stored longer than 7 consecutive days at the storage area before it must be loaded into manure spreaders and land applied. Long term storage more than 7 days is prohibited.

Silva Ranch is inspected monthly by the Sacramento County Environmental Management Department to ensure compliance with all conditions in Use Permits 04-UPB-0427. In addition, Silva Ranch receives at least annual inspections by the Sacramento County Department of Environmental Review and Assessment to ensure that Mitigation Monitoring and Reporting Programs contained in the Use Permit is implemented and followed. The California Regional Water Quality Control Board, Central Valley Region and the US EPA, Region IX staff conduct inspections as well.

SILVA RANCH LOCATION

Silva Ranch is located in the Vicinity of Herald, California, approximately 25 miles southeast of Sacramento. It is accessed from SR-99, east via Twin Cities Road (SR-104).

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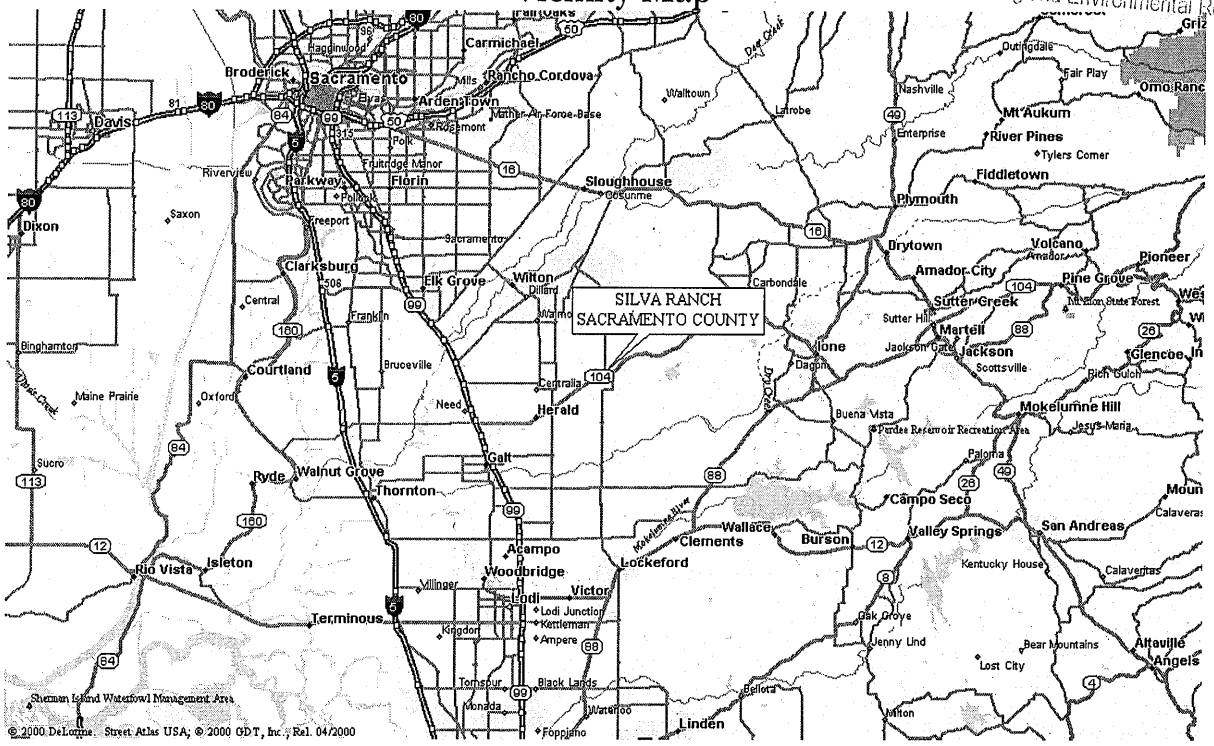
Silva Ranch, Sacramento County
Vicinity Map



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Attachment 2

Silva Ranch Biosolids Management Plan

SYNAGRO

Biosolids Management Plan
Silva Ranch

Prepared by:

Synagro West, LLC

Technical Services Department
Rancho Cordova, California

September 2017

Table of Contents

Introduction

Synagro-WWT, Inc. (Synagro) is North America's leading provider of beneficial use management services for municipal biosolids (biosolids) and other organic residuals. Synagro provides high-quality, cost-effective management and beneficial use services for municipal and industrial water and wastewater treatment plants.

In California, Synagro West, LLC recycles approximately 1500 tons per day of biosolids using a combination of land application and composting. Synagro West, LLC has relationships with more than 50 separate public and private entities that rely on Synagro for land application and composting services. These customers are located throughout northern and southern California.

Synagro West, LLC
3110 Gold Canal Drive, Suite E.
Rancho Cordova, CA 95670
916-862-9300

Synagro West, LLC, a Delaware limited liability company, is 100% owned by Synagro-WWT, Inc. The sole member and manager of the LLC is Synagro-WWT, Inc.

Table 1
LLC Officers

Name	Position	Business Address
Steven Cole	President/CEO	435 William Court, Suite 100 Baltimore Maryland 21220
Mary Lynn Smedinghoff	Chief Human Resources	435 William Court, Suite 100 Baltimore Maryland 21220
Al Slepian	General Counsel and Chief Compliance Officer	435 William Court, Suite 100 Baltimore Maryland 21220
Barry Clements	Sr. Vice President Services	435 William Court, Suite 100 Baltimore Maryland 21220

Table 2
Local Management Team

Name	Position	Business Address
Northern California Office.		3110 Gold Canal Dr. Suite E. Rancho Cordova CA 95670 Office(916) 862-9300 Fax (916) 853-2065
Synagro West, LLC Regional Staff		**Phone/ Email**
Ken Noble	Area Director	(916) 862-9308 knoble@synagro.com
Madison Holsinger	Technical Services Manager	(916) 862-9305 mholsinger@synagro.com
Simranpreet Kaur	Technical Services Specialist	(916) 862- 9304 skaur@synagro.com
Diana Fjalstad	Administrative Assistant	(916) 862-9300 dfjalstad@synagro.com

Biosolids Characteristics

Overview

Synagro manages biosolids from water reclamation or wastewater treatment plants that produce clean, stabilized biosolids. The criteria that Synagro uses to determine the acceptability of biosolids from any given source are:

a. The biosolids must be non-hazardous. This can be demonstrated in accordance with the procedures that are specified in Title 22, Division 4.5, Chapter 11, Article 3, California Code of Regulations (Title 22), or by other tests acceptable to the Regional Water Quality Control Board, for each plant from which biosolids are to be accepted.

b. The biosolids must meet, at a minimum, the land application standards specified in 40 CFR 503 for metals, Class A or B pathogen reduction, and vector attraction reduction either at the treatment plant or in the field via incorporation or injection. The biosolids generator is required to provide Synagro Notice and Necessary Information (NANI) on an ongoing basis regarding the biosolids meeting 40 CFR 503 requirements relative to metals, pathogen reduction and vector attraction reduction. Synagro requests the biosolids generators provide this information through the use of a NANI form. Any "process to significantly reduce pathogens" (PSRP), as defined in 40 CFR 503 Appendix B, will produce biosolids that meet Class B pathogen reduction standards. In addition, the biosolids must meet standards for vector attraction reduction by one of the options specified in 40 CFR 503.33.

c. The biosolids must meet Synagro's standards of suitability for agricultural use, which includes or exceeds the standards expressed in 40 CFR 503.

Synagro provides analytical data for any source of biosolids used within Silva Ranch. These data are reported to the CVRWQB on a monthly basis as part of the approved Monitoring and Reporting Program (MRP).

Biosolids Characterization and Evaluation

Biosolids used in Synagro's program are characterized and evaluated with respect to the criteria listed above. Past and current biosolids analyses are examined before Synagro characterizes a plant as having consistent biosolids quality. Potential new sources are evaluated in a number of ways:

a. Pathogen reduction and vector attraction reduction treatments are evaluated by Synagro and certification is provided on the NANI form.

b. Each candidate biosolids will be sampled and analyzed for agronomic parameters, and for metals analyzed in accordance with 40 CFR 503. The suitability of the biosolids for agricultural use will be evaluated based on this analysis.

Metals

Biosolids contain trace amounts of various metals. These metals come from the wastewater discharges into sewer collection systems that convey wastewater to the treatment plant. The small amounts of metals in biosolids are useful to crops as micronutrients, supplying elements needed in small quantities to strengthen the crops and aid growth and development.

The metals of particular interest to land application practices are arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc. The amounts of these metals in the biosolids are monitored on an ongoing basis by sampling and lab analysis to ensure they are at safe levels as regulated under 40 CFR 503.

Organic Chemical Constituents

Traces of organic chemicals have been noted in some wastewater processed in treatment facilities. Although these chemicals could potentially be left in biosolids as trace residues, industrial pretreatment programs and other facility treatment controls assure that influent wastewater, and hence processed biosolids, are safe for beneficial use. Analysis of biosolids determines the concentrations of various compounds of interest, if any are present.

Stabilization

All biosolids used in Synagro's program are stabilized to meet at least Class B pathogen reduction standards prior to application. In most cases, the treatment process will be anaerobic digestion, but aerobic digestion, lime stabilization, or other Class B compliant processes may be used.

The same treatment processes used for pathogen reduction, as specified in 40 CFR 503.32, typically result in achieving the requirements for vector attraction reduction. In some cases, however, Synagro assures that vector attraction reduction requirements are met by incorporation of the biosolids into the soil within six hours of application, as described in 40 CFR 503.33(b)(10).

Synagro's Request and Consent for Biosolids and Landowner Consent for Biosolids Application forms are signed by the farm operator and the landowner respectively. These forms contain information about compliance requirements at the local, regional, state, and federal level when utilizing biosolids and insure that precautions for use of biosolids are observed and followed. Signed request and consent forms for the sites on which Synagro proposes to spread biosolids are maintained in Synagro's regional offices.

Moisture and Consistency

Biosolids used in this program will usually be de-watered by centrifuge, belt press, or drying beds, depending on practices at the source plants. The biosolids will contain from about 13 percent to about 90 percent total solids. These biosolids will have little or no free water. At the lower end of the total solids range, biosolids typically have a consistency of a paste or mush. At total solids contents over 50 percent, the consistency is much like that of moist to dry soil. Liquid biosolids (solids content two to 10 percent) may also be used.

Suitability for Agriculture

Biosolids contain nutrients and organic matter that are useful as an agricultural fertilizer and/or soil amendment. Details are provided below.

Nitrogen

Nitrogen in biosolids is in the form of nitrogen-containing organic compounds, ammonia (ammonia-N), and typically small amounts of nitrates (nitrate-N). After biosolids are incorporated into the soil, the process of mineralization gradually transforms the organic nitrogen into forms that can be used by the crop. Ammonia-N and nitrate-N are immediately plant available. The plants benefit by the slow-release availability of the organic nitrogen, rather than having all the nitrogen made available in only a brief interval, as is the case with chemical fertilizers. Most of the nitrogen is made available to the crop the first year, but some of the organic nitrogen continues to mineralize over time to provide small amounts of nitrogen in subsequent years.

Organic Matter

Organic matter in biosolids provides a benefit to the soil by improving tilth and water retention, providing plant nutrients, stabilizing micronutrients, and facilitating aeration and release of carbon dioxide from beneficial microorganisms already present in the soil.

Sulfate

Sulfate is soluble in water, thus much of the sulfate in biosolids is removed with the filtrate in the de-watering process. Any sulfate remaining in the biosolids is a benefit to the growers, as growers often apply sulfur as a supplement.

Micronutrients

Biosolids commonly contain a number of minor essential elements, called micronutrients, needed by plants to grow and maintain health. Boron, copper, manganese, molybdenum, and zinc are examples of the micronutrients found in biosolids. The concentration limits of 9 different metals are regulated in accordance with 40 CFR 503.

Agronomic Sampling

Biosolids samples will be obtained from each source that Synagro uses within Silva Ranch. These samples will be analyzed for a number of elements and compounds of interest for agricultural fertilizers, and as required by the site specific monitoring and reporting requirements.

The biosolids will be compared with the suitability criteria in 40 CFR 503. Additional evaluation by Synagro will be performed to determine whether the biosolids meet local, regional and state criteria for land application. Agronomic data for suitable biosolids will be used to calculate appropriate application rates for each crop that will be grown on the application sites.

Sources of Biosolids

Currently, the biosolids land applied at Silva Ranch come from the California wastewater treatment plants listed below. Other sources of biosolids may be added as appropriate and approved by the Lead Enforcement Agency (LEA).

Burlingame WWTP
Calaveras County Water District
Daly City, CA North San Mateo SD
Delta Diablo Sanitation District
Eureka, Elk River WWTP
Grass Valley WWTP
Groveland CSD WWTP
Hughson WWTP
Ironhouse Sanitary District WWTP
Jackson WWTP
Millbrae WWTP
Pacifica, Calera Creek WRP
Placerville, Hangtown WWTP
Roseville, Dry Creek WWTP
San Francisco PUC, Oceanside
San Francisco PUC, Southeast
Silicon Valley Clean Water WWTP
Stockton WWTP
Sunnyvale WPCP
Tuolumne U.D., Regional WWTP
Union Sanitary District
Windsor WWTP

Application Rate Design

For agricultural land, application rates are based on matching the nitrogen requirement of the crop to be grown with the available nitrogen supplied through the biosolids application. This is referred to as the agronomic rate.

To ensure the appropriate amount of biosolids are applied to a field, the Technical Services Specialist calculates the total amount of material to be applied to each field using biosolids analyses and site specific information. All trucks will be issued either a weight or volume ticket. These tickets are used to track the amount of biosolids delivered to each field. The Site Manager uses these weight tickets to maintain a cumulative subtotal of tonnage entering the field.

The equipment used for spreading the biosolids is calibrated by measuring the amount handled on a known square footage. The rate of discharge from the spreader boxes or application vehicles can be

controlled by both speeds of the vehicle, gear ratios, and/or the speed of the hydraulic ram, which pushes the biosolids into the beater drum thereby achieving specific application rates.

The procedure for calculating biosolids application rates are detailed below:

1. Assemble data on biosolids, soil, cropping system, and fertilizer recommendations.
2. Determine amounts of nitrogen the biosolids need to supply for the crop to be grown. This information is available through various published sources including fertilizer guides and University of California Cooperative Extension recommendations.
3. Calculate the amount of plant available nitrogen (PAN) per dry ton of biosolids. This is accomplished by combining the available nitrate-N, ammonia-N, and organic-N.

To calculate plant available nitrogen in pounds per dry ton of biosolids:
PAN = [(ppm NH_3) K + (ppm NO_3) + (ppm ON) F] * .002

PAN = plant available nitrogen
NH_3 = ammonia nitrogen
K = ammonia nitrogen volatilization factor - 0.5 for surface applications and 1.0 for subsurface injection
NO_3 = nitrate nitrogen
ON = organic nitrogen
F = organic nitrogen mineralization factor

Available data suggest that 20% of the organic nitrogen is converted to plant available forms the first year for anaerobically digested biosolids and 30% for aerobically digested biosolids. For surface applied biosolids approximately 50% of ammonia-N is considered plant available with the remaining 50% volatilized. If biosolids are subsurface injected 100% of the ammonia-N is assumed plant available.

4. Calculate the agronomic loading rate. Divide pounds of nitrogen required for the crop by pounds of PAN per dry ton of biosolids. This will yield the amount of biosolids to be applied in dry tons per acre.
5. Calculate the maximum cumulative loading rates. Most biosolids are low in metals and do not require tracking of cumulative trace metal loading rates per 40 CFR 503; however, if the biosolids quality meets EPA's metal concentration requirements for land application (Table 1 of the 40 CFR 503) but does not meet *alternative pollutant limits* from Table 3 of 40 CFR 503, cumulative loading rates must be calculated and reported. This ensures that the application rate will not exceed the cumulative loading limits allowed for the field. These limits represent the maximum amount of the nine metals that can be applied to a particular unit area of land from biosolids. Should any of these cumulative limits be reached for one metal, no additional biosolids can be applied to the land. Therefore, the land applier must keep records in order to track the total amount of each metal applied to the land. To calculate the cumulative loading rate, multiply the agronomic loading rate (dt/ac) by the concentrations (lb/dt) of metals found in the biosolids. Add to this figure any metal amounts previously applied through biosolids applications.

Plan of Operation

a. Generalized Description of Biosolids Application

Dewatered or dry biosolids will be transported from the wastewater treatment facility in dump trailers with watertight tailgates to approved land application sites within Silva Ranch. Liquid biosolids will be transported from the wastewater treatment facility in totally enclosed watertight tank units to approved land application sites at the Silva Ranch. There are two general types of land application that are proposed depending on the moisture content of the biosolids.

i. Dewatered or Dry Biosolids

Dewatered biosolids generally have a solids content of 10-30 percent while dry biosolids have solids content of 30 percent and greater. Biosolids will be off-loaded at locations within the approved field boundaries. Acceptable locations for biosolids unloading are determined case-by-case by the site manager. Consideration is given to the distance the application vehicle must travel to apply the biosolids and availability of truck access. There may be several unloading areas for an individual field depending on the size of the field, application rate, application procedure, and transportation requirements. In all cases, unloading areas are selected in order to maintain required buffer distances.

After the biosolids are off-loaded at the application site, they will be loaded into the surface application equipment (e.g. cake or modified manure spreader) with a front-end loader and then distributed on the field from the spreader. The land application vehicle will perform all biosolids distribution. This method allows total coverage of the fields so that unloading vehicles will not drive through areas where biosolids have been applied.

All biosolids delivered to the field will be spread as soon as possible with the intent that none will remain stockpiled for more than 24 hours. If necessary short term storage of up to 7 days will be utilized in accordance with the CVRWQCB approved Short Term Storage Plan for the Silva Ranch. The project will be managed so that individual fields will receive biosolids application on a rotational basis as determined by the farm operator to accommodate cropping schedules.

ii. Liquid Biosolids

Liquid biosolids are typically less than 10 percent solids. Biosolids will be transported from the wastewater treatment facility in totally enclosed watertight tank units to approved land application sites. The transport trucks will deliver the biosolids to high-flotation land application vehicles stationed on the field receiving biosolids.

Locations for biosolids transfer to application vehicles will be established in areas within the approved field boundaries.

The biosolids transfer will be through a large diameter reinforced suction hose directly from the trailer unit to the land application vehicle. The land application vehicle will perform all

biosolids distribution insuring uniformity throughout the area. The mode of application will be surface application or subsurface injection. The land application vehicles used for subsurface injection of the biosolids have hollow ripper shanks. The biosolids are injected 4-10 inches below the surface through the trailing ripper shanks. A pump on the vehicle tank forces the biosolids through the shanks. This pump is also the mechanism for unloading the trailers directly into the application vehicle.

b. Description of Equipment to be used

A summary of equipment to be employed that is common to both application methods is as follows:

a. Twenty-five ton end dump trailers, or 6,000 – 7,000 gallon tanker trailer units. The number will vary depending on travel time to land application sites. All trailer units will meet Department of Transportation (D.O.T.) specifications.
b. A tractor and disc assembly used for biosolids incorporation.
c. Water truck or tank.

A summary of equipment employed for cake (dewatered) biosolids application is as follows:

1. One or two front-end loaders.
2. One or two cake or modified manure spreaders with a 10-14 wet ton capacity. The number will vary depending on the configuration of the land application sites as it affects application time efficiency. The spreader boxes will either be a type which can be pulled behind a farm tractor or the box will be mounted on the frame of a high-flotation land application vehicle.

A summary of equipment employed for liquid biosolids application is as follows:

1. One or two high-flotation land application vehicles of 2,000 to 4,000 gallon capacity. The number will vary depending on the configuration of land application sites as it affects application time efficiency.
2. One 12,000 gallon portable field transfer tank may be used.

c. Special Procedures for Equipment Breakdown

Under unusual emergency circumstances (e.g. equipment breakdowns), all of the off loaded biosolids may not be spread the same operating day. The immediate priority will be repairing the equipment as soon as possible. If the biosolids cannot be spread within 24 hours, temporary in field storage will be used. If existing or predicted weather conditions present a potential for movement of biosolids off the permitted area due to water run-on or runoff appropriate measures will be implemented to prevent this from occurring (e.g. hay bales, earth embankments, tarping over the offloaded biosolids, metal or plastic transfer boxes). . The CVRWQCB and Sacramento County Environmental Health Department will be promptly notified if temporary field storage is necessary.

d. Spill Prevention and Response Plan

In the unlikely event of a spill, Synagro will take the following action immediately:

1. HALT SOURCE OF SPILL. Use of any leaking or damaged unit that is causing the spill will cease immediately. The unit will be repaired before resuming its use.
2. CONTAIN SPILL. In the event large quantities of biosolids have been spilled, straw bales will be used where available to either form a barrier or soak up the biosolids.
3. CLEAN-UP. Depending upon the type and amount of material spilled, a variety of equipment may be used to remove the material: front-end loader, shovels and brooms, and vacuum equipment of a liquid biosolids applicator. Any biosolids removed from the spill site will be spread on an approved application site.
4. FINAL CLEAN-UP. Flush roadways with water or sweep as necessary to clean. Allow to dry and incorporate if spill occurs on non-paved and tillable area. In the event a spill occurs on private property, final clean-up should be completed to the satisfaction of the owner.
5. MANAGEMENT OF CLEAN-UP EFFORT. The Project Manager will take immediate charge and initiate clean-up activities. Synagro labor will be used with additional labor secured as needed. The Project Manager will also communicate with the public on the scene, answering questions and advising of clean-up activities.
6. REPORTING. **All spills will be reported by telephone as soon as possible** to Synagro's regional and project offices as well as appropriate state, regional and local regulatory agencies.

Synagro, Rancho Cordova Office:	916-862-9300
CVRWQCB:	916-464-3291

Synagro will be responsible for reporting to the appropriate agencies by telephone and submitting any required written report of the spill and clean-up actions.

7. SPILL PREVENTION. The Project Manager will take the following steps:
   a. Ensure truck drivers watch trailer while loading and do not overload.
   b. Ensure trailer hatches/tailgates are closed and latched while transporting.
   c. Inspect trailer seals regularly and replace as necessary.
   d. Ensure off-loading operations in the field are conducted to minimize any potential runoff or tracking.

e. Soil Incorporation Methods

Land applied biosolids will be incorporated into the soil using an appropriate agricultural implement within 24 hours after the biosolids are applied. Biosolids meeting vector attraction reduction through incorporation are incorporated within 6 hours after application.

f. Inclement Weather Plan

Operations will be discontinued when soils are saturated and will not be resumed until sufficient drying of the field has occurred to allow equipment access without damage to the soil.

Seasonally, wet areas are of concern during periods of the year with high precipitation. Good agronomic practice requires that areas that are unseasonably wet and would produce rutting or

damage to the field should not be utilized for biosolids application or any other farming operation during those periods. These areas will be delineated using flagging during field operation. The amount of liquid biosolids applied will not exceed the hydraulic capacity of the soil at the time of each application. If a subsequent pass across a field is necessary to achieve the desired application rate, sufficient drying time will be allowed between passes.

g. Soil Testing Methodology

Provided below is a brief description of the soil information that Synagro investigates and the general methods used to gather the data.

The USDA Soil Conservation Service soil survey provides information regarding soil names, types, depth to ground water, and environmental sensitivities. This information is used to help determine the suitability for each area of the site.

The Central Valley Region Water Quality Control Board Monitoring and Reporting Program for the Silva Ranch includes an annual soil sampling program. This program can change over time. The current program includes annual sampling of background areas (areas where biosolids are not applied) and biosolids application areas. Samples are taken at 3 depth intervals (i.e. 0 to 1 foot, 2 to 3 feet, and 5 to 6 feet) and the samples are analyzed for: pH, Total Solids, Total Alkalinity, Cation Exchange Capacity, Electrical Conductivity, Chloride, Iron, and Manganese.

h. Dust Control Plan

Dust controls are implemented to preclude dust movement off-site. Dust control is accomplished with periodic watering down of access roadways and staging areas as needed based on road conditions and weather. Other aspects of land application operations such as disking are typical of standard farming practices. Typically there is less dust created from fields disked after biosolids applications than non-applied fields due to the moisture content and organic nature of the biosolids applied.

i. Transportation Plan

Trucks will observe all highway regulations, weight limits, and other applicable local ordinances. Trailer units will be inspected, licensed, and appropriately marked as required by federal, state, and local regulations for the purpose of transporting the biosolids. These units are periodically inspected by the California Highway Patrol for conformance to provisions of state and federal vehicle codes.

i. Delivery Truck Routes

The proposed haul routes include CA State Highway 99, Twin Cities Road, and Clay Station Road. A flexible transportation system is essential to allow for the minimizing of potential nuisance problems such as road closures or heavy traffic conditions. Local routes will be planned to minimize travel through populated areas and avoid residential areas whenever possible. Farm access roads will be clearly marked with flags so that truck drivers can easily identify the entrances.

ii. Frequency and Hours of Delivery

The schedule for Silva Ranch allows for 24 hour deliveries, seven days per week, 365 days per year weather permitting.

The number of trucks per day which will be traveling to the land application sites will vary from 10 up to 70 depending on the availability of biosolids and municipal wastewater treatment production.

iii. Local Traffic Conditions

The Silva Ranch site is located in rural, remote area of southern Sacramento County where there is very little traffic. Trucks will use State or Federal Highways where feasible to minimize impacts on county roadways.

iv. Proposed Measures to Prevent Tracking of Biosolids on Roadways

To prevent tracking biosolids from the fields to adjacent areas, all equipment will be inspected and cleaned as required before exiting the application site. In addition, biosolids spreading operations will cease when the soil is saturated. The transport trucks and trailers will be equipped with mud flaps. The mud flaps will preclude biosolids from adhering to the tires and undercarriage of the transport vehicle during the off-loading process, thereby minimizing the possibility of tracking the material onto the roadways. Biosolids adhering to the mud flap will be scraped or washed off in the field before the truck returns to the roadway. If a significant amount of biosolids is tracked onto the roadway it will be cleaned off by the operations crew.

j. Nuisance Avoidance Measures

A land application program must address aesthetic concerns. Nuisance potential is mitigated by the following:

i. Odor prevention and control
ii. Mud/track-out control
iii. Traffic and noise control

i. Odor Prevention and Control

Land application of biosolids (like many other agricultural practices) has the potential for producing odors. The most common nuisance controls in this program center around minimizing or eliminating objectionable odors. The odor control measures generally utilized in Synagro's biosolids application operation include the following:

- Proper biosolids stabilization
- Site specific Set-backs/Buffer zones
- Incorporation into the soil

- Appropriate application rates
- Transportation considerations

Proper biosolids treatment is the most effective means of odor reduction or elimination. Treatment processes (which destroys pathogens) also typically reduce the volatile solids concentration of the material. These processes cause sulfur and organic compounds that could produce odor in the biosolids to decompose and/or to become inert.

Incorporation of biosolids into the soil and appropriate application rates contribute to odor prevention and control by limiting the amount of time biosolids are exposed to the open air. In addition, buffer zones provide distance between application areas and residences, roads, and property lines.

All truck trailers will be fully covered with a tarp or enclosed during transportation to the land application site. Truck trailers will be either covered with a tarp or thoroughly cleaned after unloading and prior to returning to the wastewater treatment facility.

ii. Mud Control

To minimize mud being tracked from the sites onto roadways, operations will cease when the soil is saturated. In addition, the transport trucks and trailers will be equipped with mud flaps. The mud flaps will preclude mud and biosolids from adhering to the tires and undercarriage of the transport vehicle during the off-loading process, thereby minimizing the possibility of tracking the material onto the roadways. Mud and biosolids adhering to the mud flap will be scraped or washed off in the field before the truck returns to the roadway. If a significant amount of mud is tracked onto the roadway it will be cleaned off by the operations crew.

iii. Traffic and Noise Control

Traffic impacts are discussed above and site specific haul routes are provided to the transporter prior to delivery to Silva Ranch. General mitigating measures will include:

- Haul routes established to avoid residential areas and minimize impact to the community

PLNP2017 - 00270

Attachment 3

Neighborhood Outreach - Adjacent Landowner Notification Summary

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Neighborhood Outreach Plan

Silva Ranch

Prepared by:

Synagro West, LLC

Technical Services Department
Rancho Cordova, California

September 2017

OVERVIEW

As part of the Use permit renewal Synagro West, LLC. (Synagro) will notify neighboring property owners (all APNs within a 500-foot radius of the Silva Ranch) of proposed biosolids land application activities and provide an opportunity to seek input and address community concerns. This will be done using the Sacramento County required process for neighboring property owner notification (as described on page 4, Planning Application Form). In completing this process, Synagro will provide a description of the biosolids land application program at Silva Ranch.

The program description will contain the following information:

- Sources of biosolids and how and when they are delivered to the Silva Ranch
- Where and how biosolids are applied at the Silva Ranch
- What environmental protection measures are used
- Identification of permits required by the California Regional Water Quality Control Board (Regional Board)
- How the public can provide input and express concerns
- Identification of responsible management personnel from Synagro and Silva Ranch
- Contact information should the public want additional information beyond that included in the description of the biosolids land application program, or wish to request a site visit/meeting with responsible persons.

Synagro and Silva Ranch have completed the neighboring property owner notification process in the past, as part of the UP renewal process, and provide as part of operating procedures access to Silva Ranch at any time, should the public wish to provide input or express concerns or learn more about biosolids land application. Mr. Gary Silva lives on and within Silva Ranch, and maintains longstanding relationships with many of the adjacent property owners or tenants of property owners. Site visits may be pre-arranged and are coordinated by Synagro.

POINT OF CONTACT

Primary Neighborhood Outreach Contact Person:

Madison Holsinger, Technical Services Manager, Synagro West
mholsinger@synagro.com
3110 Gold Canal Drive Suite E Rancho Cordova, CA 95670
916-862-9305 (office)
916-216-4741 (cell)
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SEPTEMBER 15, 2017

Ms. Leanne Mueller
Sacramento County, Office of Planning and Environmental Review
827 7th Street, Room 225
Sacramento, CA, 95814

RE: Renewal of Use Permit (UP) #04-UPB-0427, Silva Ranch Biosolids Land Application; Control No.: PAMP2016-00005 (Silva Ranch/Synagro Use Permit)

Dear Ms. Mueller,

With this letter, Synagro West, LLC (Synagro) and Mr. Gary Silva are submitting a Planning Application Form and supporting attachments for renewal of Use Permit (UP) #04-UPB-0427, Silva Ranch Biosolids Land Application. The existing UP #04-UPB-0427 expires on December 31, 2017, and was last renewed in October 2005. At that time, three previously issued UPs (92-UPB-0726, 96-UPB-323, and 96-UPB-576) were consolidated into UP #04-UPB-0427.

No changes in the scope of activities or operation are proposed. We have included as part of the Planning Application Form and supporting attachments, a current detailed Project Description (Attachment 1) and Neighborhood Outreach Plan (Attachment 3), as well as a 2017 update to the Silva Ranch Biosolids Land Application Management Plan, prepared by Synagro (Attachment 2).

In preparing for the UP renewal, representatives from Synagro met on March 9, 2017with you and other staff from Sacramento County in a "Pre-application Meeting". At that time you provided the meeting participants with an agenda/outline covering various areas that we discussed during the meeting. One issue of note which we want to specifically address is the resolution of two Notices of Violation (NOV) for the land application of green materials. These two NOVs were issued to Silva Ranch and Synagro West by the Central Valley Regional Water Quality Control Board for the land application of green materials to certain fields at Silva Ranch that were only approved for biosolids land application.

These two NOVs have been resolved through the actions of Mr. Gary Silva and Synagro. In addition, and to address specifically your request that green materials application areas at Silva Ranch be identified, we have included as Attachment 4 topographic and aerial maps which delineates these areas, as well as the areas which are specifically dedicated to biosolids land application. We want to be clear, there will be no future co-mingling of green materials with biosolids, as areas approved for land application of each of these materials are managed separately, and are separately regulated by the Central Valley Regional Water Quality Control Board via specific and general waste discharge requirements (biosolids) and the Irrigated

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DECEMBER 29, 2017

Ms. Leanne Mueller
Sacramento County, Office of Planning and Environmental Review
827 7th Street, Room 225
Sacramento, CA, 95814

RE: Response to REQUEST FOR ADDITIONAL INFORMATION, Control No.: PLNP2017-00270, Silva Ranch Biosolids Land Application Use Permit Renewal

Dear Ms. Mueller,

Provided below and attached is Synagro's response to the REQUEST FOR ADDITIONAL INFORMATION, Control No.: PLNP2017-00270, Silva Ranch Biosolids Land Application Use Permit Renewal. The requested items are shown in bold type followed by Synagro's response.

1. **APN: 138-0060-062 was included in the original permit, but is not listed in this application. Please indicate if this parcel is intended to be included in the Use Permit application.**

    a. No, this parcel is to be excluded as it has been isolated by Mr. Gary Silva for his continued use with the green material and feed lot agricultural operations. Below is a list of parcels for use in the biosolids land application at Silva Ranch; these are also identified in response to question number 12, please see attachment 1.

Class B Biosolids Application Sites	
Order 95-064, Silva Ranch I	**Order 98-023, Silva Ranch II**
APN 136-0280-023	APN 136-0280-024
APN 138-0060-028	APN 136-0280-039
APN 140-0030-028	APN 136-0280-040
APN 140-0030-029	APN 138-0060-025
APN 140-0050-021	APN 138-0060-030
	APN 138-0060-031
	APN 138-0060-049
	APN 138-0060-053
	APN 138-0060-054

	APN 138-0060-058
	APN 138-0060-059
	APN 138-0060-061
	APN 138-0060-064

Acreage, Zone Use Designations, and APNs: +/- 3,000 Acres in AG-20, AG-20 (F), AG-80, and AG-80 (F)

2. **Some of the parcels involved in the proposed Use Permit Amendment are owned by Sunridge Anatolia, LLC, Tildean Silva Credit Trust, and Tildean L. Silva Marital Trust. Please have these entities sign an application or provide a letter of authorization to process this application.**

    a. Synagro notes that item No. 2 refers to a "proposed Use Permit Amendment." We respectfully point out that Synagro and Mr. Gary Silva are seeking a Use Permit renewal, with no amendments or changes proposed in the existing biosolids land application operation. Additionally, Mr. Silva is currently out of the country so Synagro needs to wait until he returns to address the letter of authorization item related to his deceased wife Mrs. Tildean Silva and the other entity.

3. **Please explain the agricultural processes occurring on the site. Is the property solely used for the growing of forage crops? If so what are the crops and what is the cropping schedule? Do cattle graze on the property? Are there growing/grazing constraints associated with the deposit of the biosolids?**

    a. Please explain the agricultural processes occurring on the site: Durum wheat and sudangrass are grown to support cattle and goats via grazing, and to produce harvested forage for cattle and goat feed. Durum wheat and sudangrass are also grown to produce seed. Irrigation of crops is practiced to supplement rainfall.

    b. Is the property solely used for the growing of forage crops? If so what are the crops and what is the cropping schedule? Yes, the property upon which biosolids are land applied is used for growing durum wheat and sudangrass year-round in a double-crop rotation pattern.

    c. Do cattle graze on the property? Yes.

    d. Are there growing/grazing constraints associated with the deposit of the biosolids? Yes, at least a 30-day waiting period after biosolids application is required before harvest or grazing per US EPA regulations and Central Valley Regional Water Quality Control Board Waste Discharge Requirements.

4. **The spreading of biosolids has been occurring on these properties for more than 20 years. Please explain why this practice is still necessary.**

    a. Silva Ranch is an agricultural business producing forage crops and livestock. Profitable production of forage crops to support livestock in southeast Sacramento County requires ongoing application of soil amendments because of poor clay soils and addition

only organic matter which helps the clay soil hold water, but also supply all the essential nutrients crops grown at Silva Ranch need. This includes macronutrients and micronutrients, which makes the product useful for farming. Biosolids also store carbon in the soil and help plants take more carbon dioxide out of the air, which helps fight climate change. The following are documented benefits from biosolids:

- Increased crop yields and plant growth
- Enhanced soil fertility from macro- and micro-nutrients
- Improved soil organic matter, soil structure and soil tilth
- Increased water-holding capacity in sandy and clay soils
- Improved drainage in heavy soils
- Reduced soil erosion from wind
- Increased diversity and productivity by soil microorganisms

The practice of biosolids land application is still necessary after 20 years because the benefits of land application and recycling of organic matter and nutrients in biosolids outweigh the alternative of using products such as commercial fertilizer or manures. In addition, water contained in biosolids applied at Silva Ranch supplements seasonal crop irrigation water requirement and promotes long-term water conservation by increasing soil organic matter content. Commercial fertilizers or other soil amendments do not create the same benefits as using biosolids, especially soil quality effects of increased carbon content and water holding capacity over the long-term.

Soil sampling performed at Silva Ranch over the past 10 years as part of Central Valley Regional Water Quality Control Board Waste Discharge Requirements Monitoring and Reporting Program suggests important improvements in soil fertility. Soil pH shows a long-term trend upward toward neutral pH (7.0), with most fields applied with biosolids in a 6.0 to 7.5 range. For the first 15 years of Silva Ranch biosolids land application, lime was regularly added to the soil to achieve pH levels above 5.5. This practice is no longer necessary on a ranch-wide basis, due in part to ongoing biosolids applications made at appropriate agronomic rates. Soil cation exchange capacity is also increasing on biosolids applied areas as compared to soil samples taken from areas not applied with biosolids. Effects are most pronounced in the 0 to 1-foot region below ground surface, and decrease with depth.

5. **The current Use Permit limits the transport of biosolids to 70 trucks per day and the amount that may be deposited on the site to 84,000 tons annually, of which 10, 000 may be liquid sludge. Please confirm whether this amount will remain the same or if different amount are proposed.**

    a. The limit is 184,000 tons annually, of which 10,000 gallons may be liquid sludge. Leanne Mueller confirmed the limit in an email to Dr. Mark Grey (Consultant to Synagro) on November 30, 2017. As noted in the September Use Permit application, there are no changes in the scope of activities or operations at Silva Ranch being proposed.

6. **What is the typical depth that biosolids are spread on the fields? What is the typical frequency of application on each field?**

    a. The typical depth of spreading is one to two inches over the ground surface. Within 24 hours of application—typically within the same day as application--biosolids are incorporated directly into the soil using a farm implement known as a disc, which is pulled behind a farm tractor. Typically, each field receives one or two different applications of biosolids over a 12-month period.

7. **Please prove a copy of the CVRWQCB approved Short Term Storage Plan for Silva Ranch identified in the Plan of Operation section of the Silva Ranch Biosolids Management Plan. Under Section (e) Soil Incorporation methods please explain what is meant by the statement "Biosolids meeting vector attraction reduction through incorporation are incorporated within 6 hours after application"**

    a. Please see attached, extracted pages 3-6 of 'Addendum to June 1, 2017 Silva Ranch Report of Waste Discharge Submittal'.

    b. What is meant by the statement "Biosolids meeting vector attraction reduction through incorporation are incorporated within 6 hours after application"? This was a sentence content error in the Silva Ranch Biosolids Management Plan. The sentence should read: "Any biosolids source which has not met Vector Attraction Reduction in accordance with 40 CFR Part 503, Options 1-8, which are performed at the WWTP, will be incorporated into the soil within six hours after they are spread to comply with Option 10 of 40 CFR Part 503."

8. **Provide additional details for the biosolids receiving pit, such as, depth and slope of the sides and specific location. Please see attached, 'Addendum to June 1, 2017 Silva Ranch Report of Waste Discharge Submittal'.**

    a. Biosolids Receiving Pit Information Summary:

    Depth: The biosolids receiving pit slopes from front to back, approximately 8 feet in depth.

    Side Slopes: Compacted clay berms surrounding the receiving pit are up to 10 feet high and constructed at a 2:1 slope.

    Location: See Figure attached in response to Question No. 12. The biosolids receiving pit is located in the eastern portion of Silva Ranch, and is clearly indicated in a "call-out" text box and arrow. In Synagro's September 15, 2017 Use Permit Application, the location of the biosolids receiving pit is clearly noted in Figures on pages 37, 38, and 39. A legend for all figures appears on page 36.

9. **In comparing the project exhibits and aerial photos it appears that greenwaste is being placed on portions of APN:136-0280-024, 140-0030-028 and 029, and 138-0060-062. Please confirm this is the case. Additionally, the mixing of greenwaste and biosolids has been**

identified as previously occurring and is not permitted. Please identify how this will be avoided during this project.

a. Yes. Mixing will be avoided because separate areas have been set aside for only green materials (See Figures/Legend in Attachment 4 in Synagro's September 15, 2017 Use Permit Application to Sacramento County). A minimum of 25 feet will be maintained between biosolids and green materials. In addition, the information about biosolids and green material separation has been shared with Mr. Silva and the field personnel managing the green material application process. There will be no co-mingling of green materials with biosolids, as areas approved for land application of each of these materials are managed separately, and are separately regulated by the Central Valley Regional Water Quality Control Board via specific and general waste discharge requirements (biosolids) and the Irrigated Lands Program (green materials).

10. **Please provide details as to how close the biosolids will be placed to greenwaste. PER will confer with the Environmental Management Department (EMO) and the State for standards.**

    a. A minimum of 25 feet will be maintained between biosolids and green materials. This is consistent with the 25-foot minimum distance to property lines.

11. **Are there typical "haul routes" for transporting the biosolids to the fields for application? If so please identify these.**

    a. Yes, biosolids arrive at Silva Ranch using Twin Cities Road or Clay Station Road. Two other primary "haul routes" are used to deliver biosolids to fields in the eastern and western portions of Silva Ranch, within the Silva Ranch property boundaries. These two general "haul routes" are shown in the attached Figures, which were prepared to address Question No. 12. Other "haul routes" exist within Silva Ranch between and among fields; these "haul routes" are too numerous to identify on a figure.

12. **Please provide exhibit maps detailing the parcels that will be utilized for the biosolids. Please also indicate the APN of each parcel. The submitted maps should show the areas of the subject parcel that will not be utilized for biosolids application, such as, setbacks from creeks and residences. Also, provide the location of the following:**

    Please see the attached maps including the map legend for items b-f below. For the staging areas see the note in item a. below.

    a. **Staging areas:** Biosolids application staging areas can occur anywhere within a field in Silva Ranch as long as buffer zones are met.

    b. **Setback from canals and waterways**

    c. **Identify slopes greater than 15 percent**

    d. **All buildings**

    e. **Wells**

f. **All water retention basins**

13. How close does the spreading of the biosolids occur to waterways on the parcels?

No less than 50 feet.

14. Please specify the typical buffer zone that is utilized between the application areas and property lines, roadways, and residences.

a. Typical buffer zone distances:

i. Biosolids application area and property line = 25 Feet

ii. Biosolids application area and roadways = 50 Feet

iii. Biosolids application area and residences = 500 Feet

15. Please provide an air quality analysis for this proposed project.

a. Background: In a telephone conversation between Dr. Mark Grey (consultant to Synagro) and Ms. Leanne Mueller on November 29, 2017, Ms. Mueller requested an air quality analysis limited to greenhouse gas emissions from the land application of biosolids at Silva Ranch. Since then, an analysis of greenhouse gas (GHG) emissions from biosolids land application at Silva Ranch has been conducted and the results are presented below. Dr. Grey retained Paul Rosenfeld, Ph.D., owner and principal of Soil, Water, Air, and Protection Enterprise (SWAPE) to perform the GHG analysis. Dr. Rosenfeld is an expert in air quality analysis.

b. Regulatory Standard: From a review of applicable regulatory standards, Sacramento Air Quality Management District does not have greenhouse gas or CO2 equivalent threshold of significance for agricultural operations (LandUseTransportation/Documents/CH2ThresholdsTable5-2015.pdf). Regardless, presented below is an analysis of emissions attributable to biosolids land application.

c. Biosolids Characteristics: Biosolids used at Silva Ranch is delivered from up to 20 different wastewater treatment plants from the Sacramento Valley, Bay Area, and other northern California municipalities. Almost all wastewater treatment plants use single or double stage anaerobic digestion (mesophilic and thermophilic)for stabilization followed by dewatering; the treatment plants that do not use anaerobic digestion use aerobic digestion or long-term (years) lagoon treatment, followed by dewatering. These processes reduce the potential for the generation of GHG from biosolids land application, as labile, readily available carbon is decomposed or recovered at the wastewater treatment plant as biogas.

d. Operational Parameters: Depending upon time of year, 5 to 10 loads of biosolids per day are delivered to Silva Ranch from up to 20 different wastewater treatment facilities. Each of the approximately 25-wet ton loads of biosolids arrives in a covered trailer and is generally greater than 20% solids. During winter months, up to 7 days of storage is allowed in a permitted storage pad located within Silva Ranch. Once stored, these

biosolids are removed using a front-end wheel loader and delivered to fields using a biosolids spreader, followed by soil incorporation using a farm tractor and disc. During summer months, biosolids are typically delivered directly to fields, off-loaded, reloaded into a biosolids spreader using a front-end wheel loader, spread onto fields, and incorporated into the soil using a farm tractor and disc. Working assumptions for farm equipment emissions are:

Silva Ranch Equipment	**Operating Range (hours per day)**
Hyundai HL760-7A Front-end Wheel Loader (2004)	2
Kuhn Knight Slinger SLC 150 (2016)	3-6
CASE iH Steiger 470HD (2014)	3-6

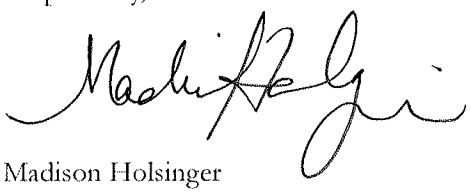
e. Emissions from Biosolids Storage and Land Application: Greenhouse gas emissions may be emitted from biosolids land application due to material storage and the application process. The Biosolids Emissions Assessment Model (BEAM) was used in conjunction with peer-reviewed literature to estimate emissions from stockpiling and land application of biosolids (http://www.ccme.ca/files/Resources/waste/biosolids/beam_final_report_1432.pdf). Biosolids are generally applied to aerobic soils to meet the nitrogen requirements of a crop. Insignificant amounts of methane are assumed to be emitted from the stockpiling of biosolids and land application, as biosolids applied at the Silva Ranch have already undergone aerobic or anaerobic digestion or have remained in a lagoon for extended periods of time.

The CO2 emissions an estimate resulting from the use of biosolids spreading equipment was calculated using the California Air Resources Board's (CARB) Off-Road Diesel Analysis Section (ORDAS) emission estimation tool (https://www.arb.ca.gov/msei/ordiesel.htm). ORDAS is responsible for the emissions inventory and industry characterization for heavy industries in California that use off-road diesel vehicles. These include construction, agriculture, locomotives, ocean-going vessels, portable generators, transport refrigeration units, and others.

Calculations suggest that GHG emissions resulting from operational equipment used for biosolids land application at Silva Ranch are approximately 474 megagrams (Mg) of carbon dioxide (CO2) annually. Additionally, analyses suggest that below zero net CO2 emissions will result from the biosolids applied for agricultural purposes over the course of a year (biosolids agricultural applications have been found to be a net sink for CO2), and would offset any CO2 emissions from biosolids stockpiled during the winter months.

If you have any questions please contact me at 916-862-9305, thank you.

Respectfully,



Madison Holsinger

Technical Services Manager

cc: Gary Silva

Mark Grey

Ken Noble, Layne Baroldi, Jeff Faust, Simranpreet Kaur – Synagro

ATTACHMENT 1

Silva Ranch Map Legend, Aerial, and Topographic maps

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MAP LEGEND

- Buffer Area, Surface Water/Creek
- Field Boundary
- Green Material Application Area
- House/Occupied Residence
- On-Site Structures
- Retention Pond
- Slope >15%
- Well

SYNAGRO

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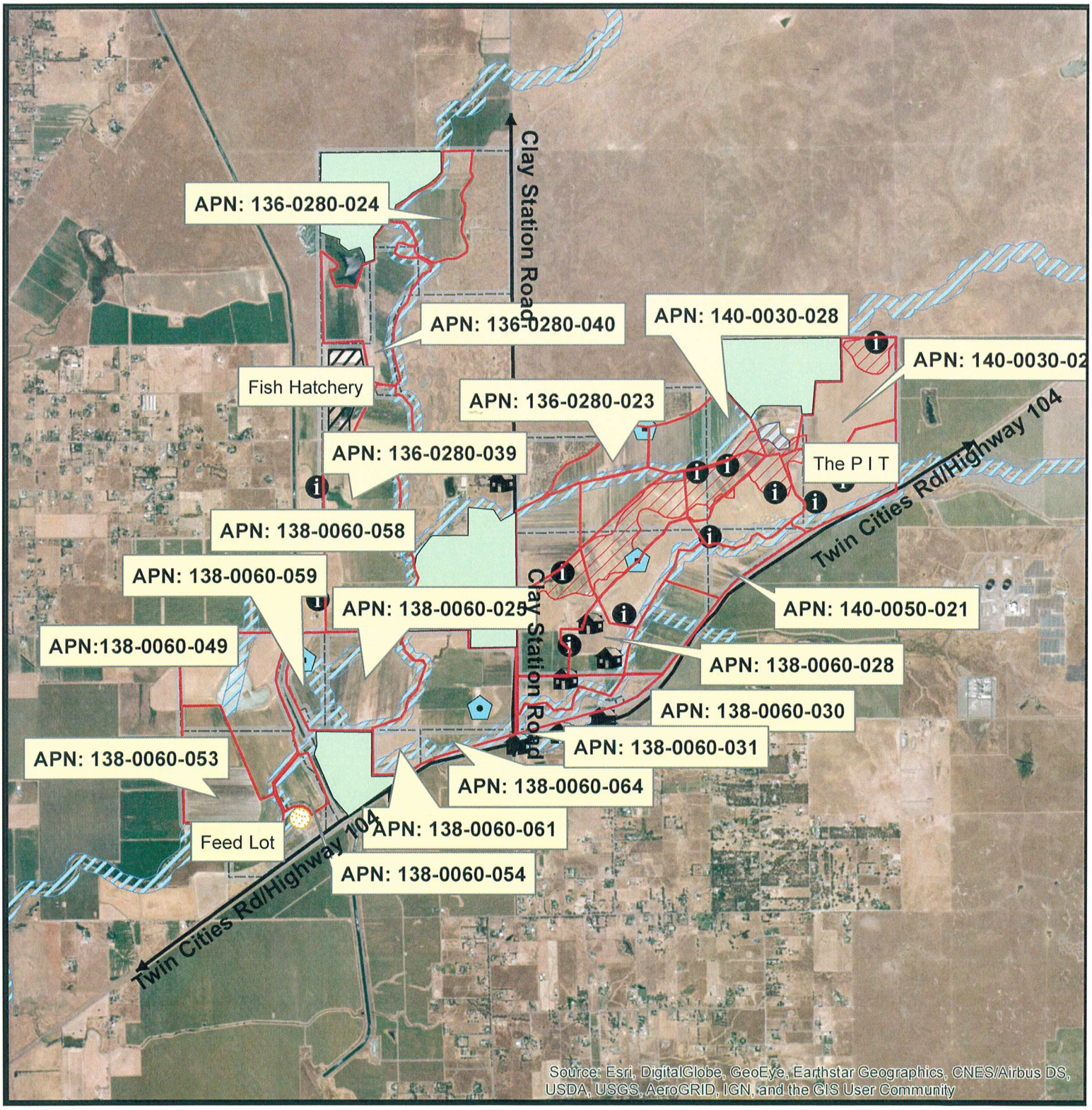

Silva Ranch I & II
Aerial Map

1:45,000

1 in = 3,750 ft

N
W E
S

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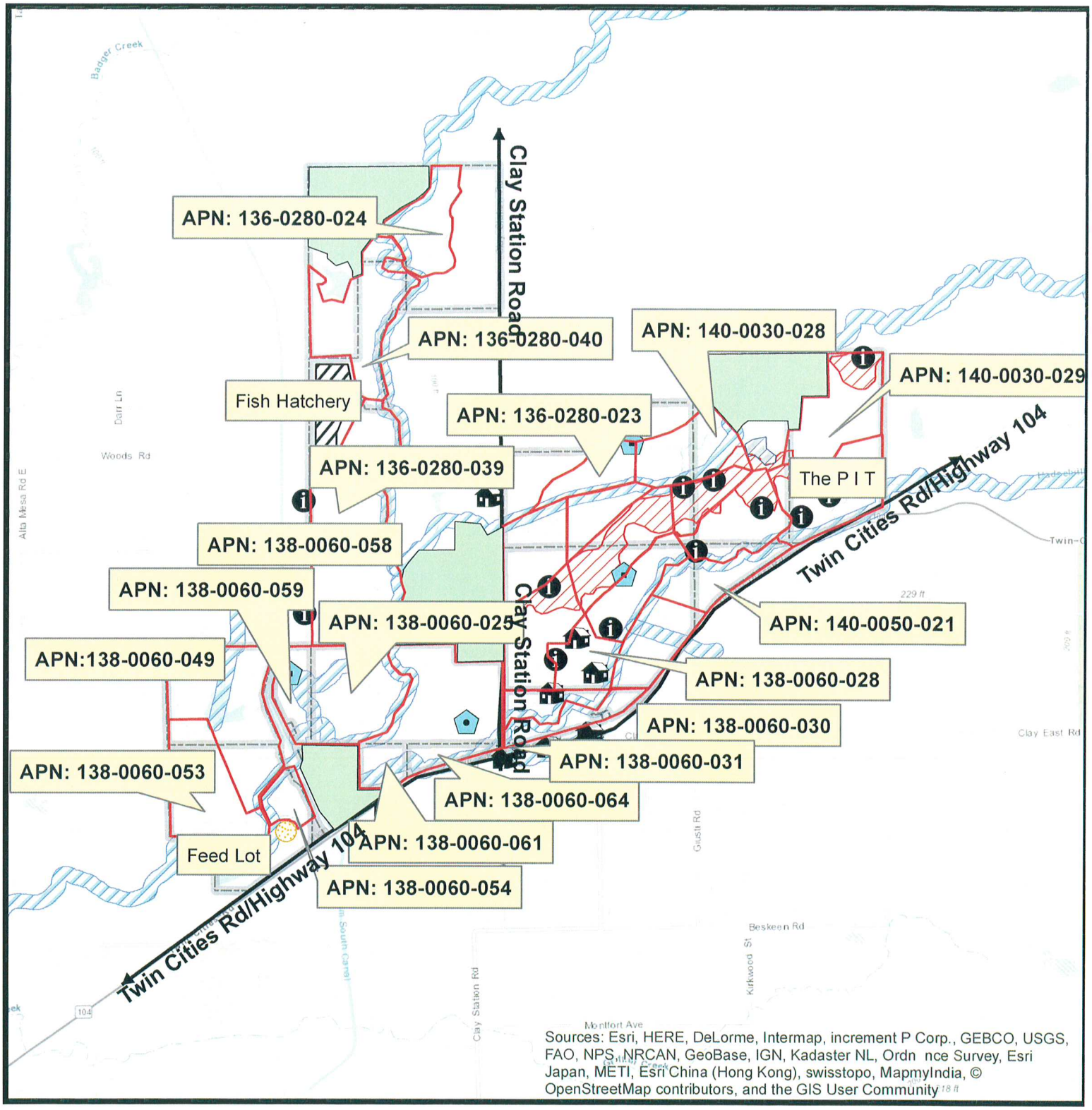
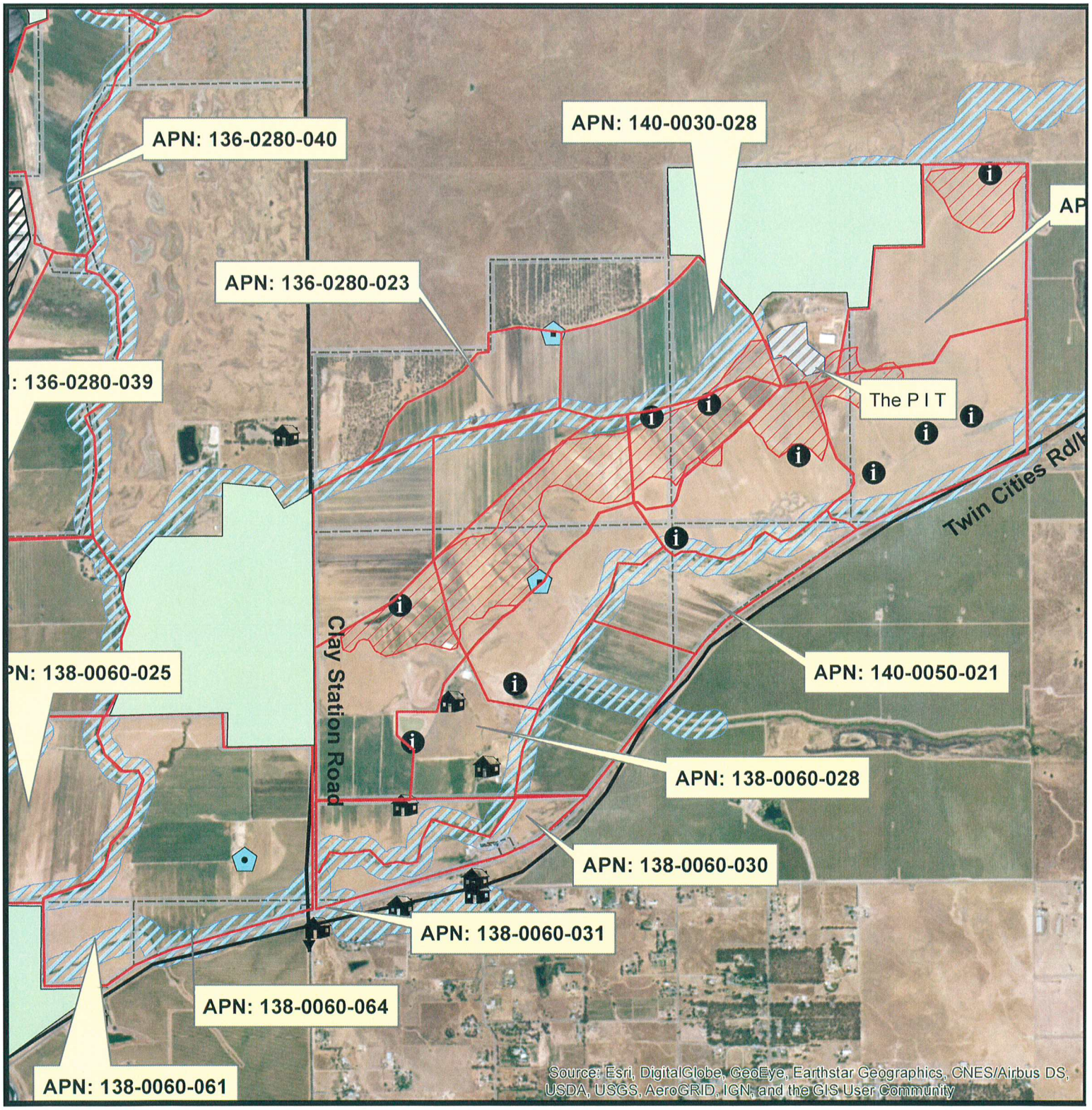
Rancho Cordova, CA 95670
PH: (916) 862-9300



	Silva Ranch I & II Topographic Map	N W E S
	1:45,000 1 in = 3,750 ft	

SYNAGRO

Synagro West, LLC
3110 Gold Canal Drive, Suite E
Rancho Cordova, CA 95670
PH: (916) 862-9300



Silva Ranch I
Aerial Map

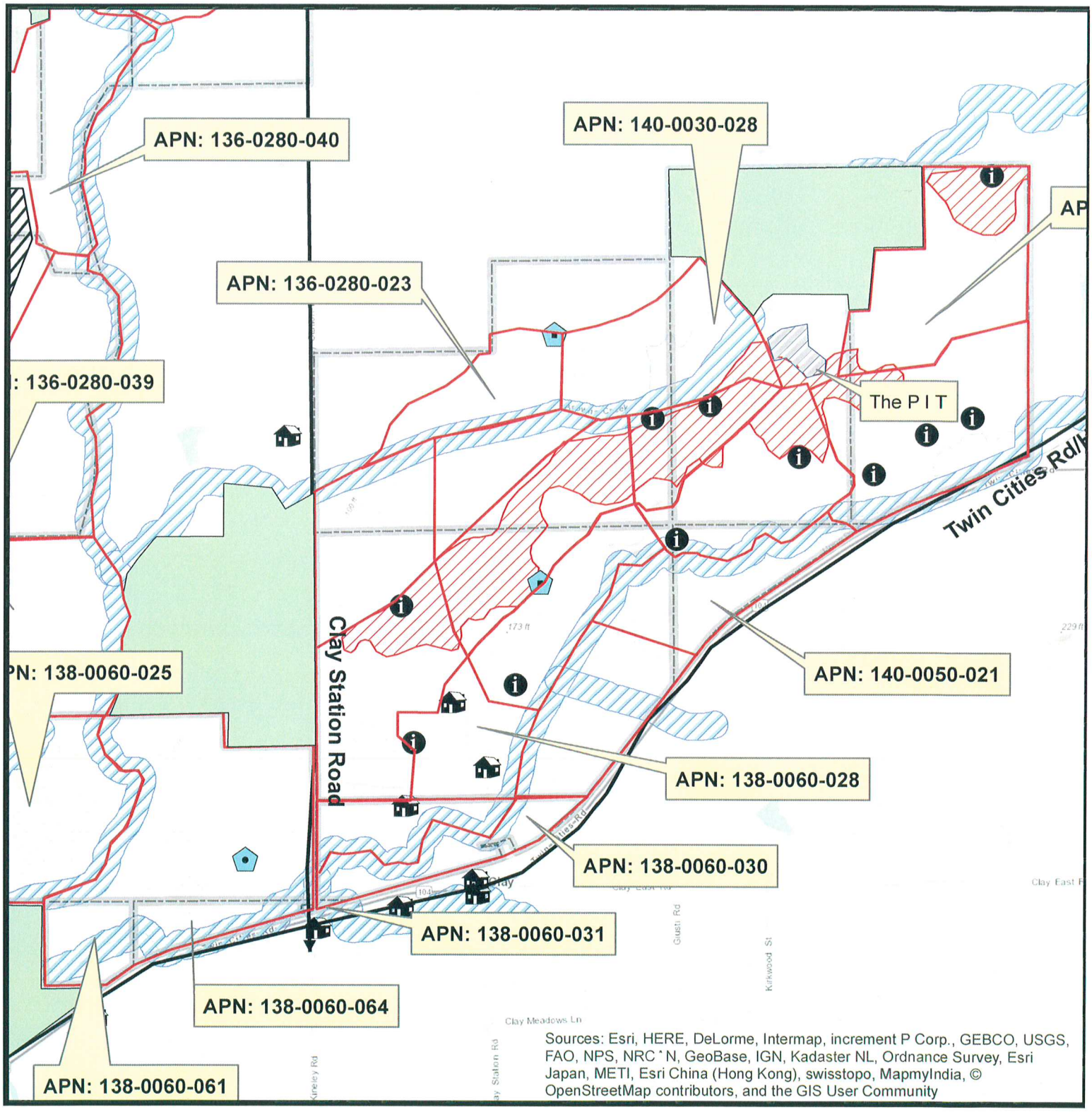
1:24,000

1 in = 2,000 ft

N
W E
S

SYNAGRO

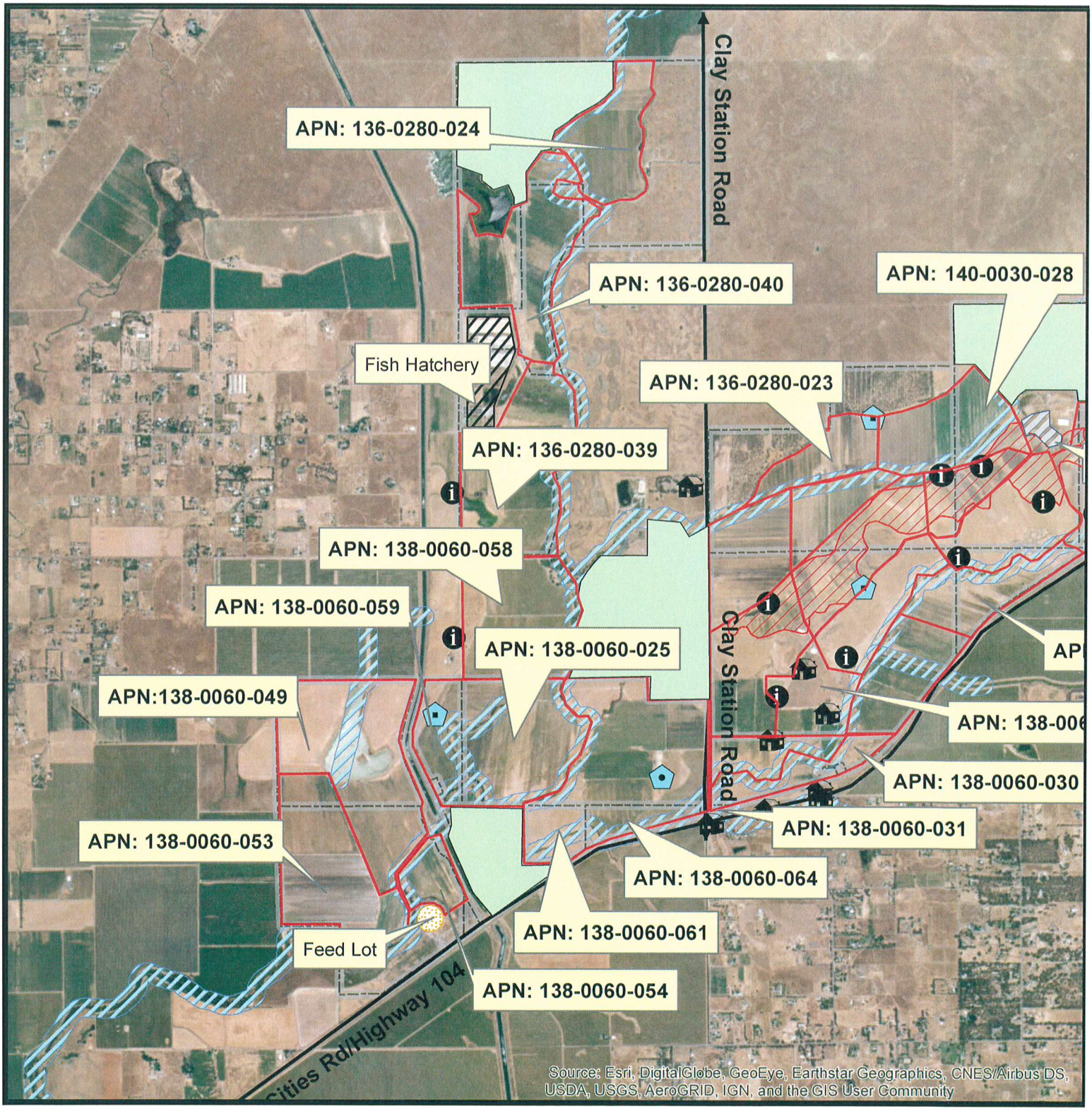
Synagro West, LLC
3110 Gold Canal Drive, Suite E
Rancho Cordova, CA 95670
PH: (916) 862-9300



	Silva Ranch I Topographic Map	N W E S
	1:24,000 1 in = 2,000 ft	

SYNAGRO

Synagro West, LLC
3110 Gold Canal Drive, Suite E
Rancho Cordova, CA 95670
PH: (916) 862-9300



Silva Ranch II
Aerial Map

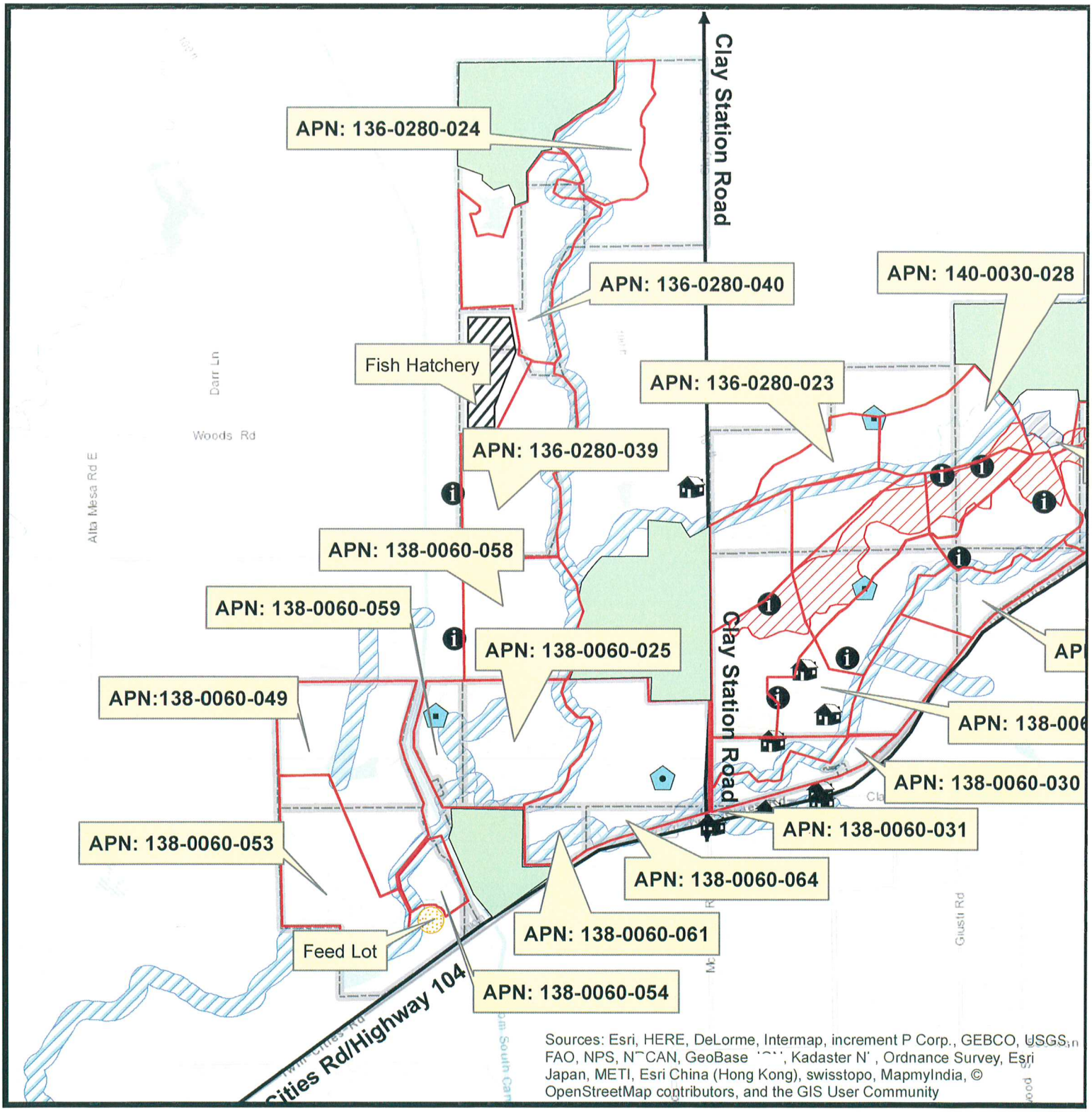
1:35,000

1 in = 2,917 ft

N
W E
S

SYNAGRO

Synagro West, LLC
3110 Gold Canal Drive, Suite E
Rancho Cordova, CA 95670
PH: (916) 862-9300



Silva Ranch II
Topographic Map

1:35,000

1 in = 2,917 ft

N
W E
S

ATTACHMENT 2

Extracted pages of 'Addendum to June 1, 2017 Silva Ranch Report of Waste Discharge Submittal'

gjc

California Water Boards

Edmund G. Brown Jr.
Governor

Matthew Rodriquez
Secretary for
Environmental Protection

Central Valley Regional Water Quality Control Board

13 January 2014

Gary Silva
Silva Ranch
11540 Clay Station Road
Herald, CA 95638

Jacob Collins
Synagro West, Inc.
3845 Bithell Lane
Suisun City, CA 94585

APPROVAL OF SHORT-TERM BIOSOLIDS STORAGE PLAN, SILVA RANCH I, SACRAMENTO COUNTY

The Silva Ranch I biosolids application operation is regulated by Waste Discharge Requirements (WDRs) Order 95-064 and revised Monitoring and Reporting Program (MRP) R5-2007-0807.

Central Valley Water Board staff has reviewed the *Short-Term Biosolids Storage Plan* submitted by Synagro on 4 November 2013. The plan was submitted to comply with the Biosolids Short-Term Storage Specifications Section D.8 of the WDRs, which states: *"If short-term biosolids storage is planned for the site, a plan describing the storage program and means of complying with this Order shall be submitted for the Executive Officer approval no later than 60-days prior to the storage of biosolids. The storage of biosolids shall not commence until after approval of the plan."*

The *Short-Term Biosolids Storage Plan* provides a description of procedures that are to be implemented for the short term (less than seven days) of temporary storage of biosolids at the Silva Ranch I facility. Board staff finds the plan to be acceptable. Therefore, as Executive Officer, I approve the plan.

If you have any questions, please contact Guy Childs at (916) 464-4648 or by e-mail at gchilds@waterboards.ca.gov.

for Pamela C. Creedon
Executive Officer

cc: Lea Gibson, Sacramento County Environmental Management Department, Mather
Jacob Collins, Synagro West, Inc., Suisun City

gjc: 13-Jan-14

SYNAGRO

October 25, 2014

Guy Childs, P.G.
California Regional Water Quality Control Board
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670

RE: WDR Permit # 95-064 - Short-Term Storage Plan

Dear Mr. Childs:

Synagro is submitting the attached Short-Term Storage Plan for Silva Ranch, WDR 95-064 for approval. Section D of the permit allows for field storage requirements under the following conditions:

WDR 95-064 – Section D. Short Term Storage Requirements

Biosolids shall be considered to be in short-term storage if they are placed on the ground or in non-mobile containers (i.e., not in a truck or trailer) at the application site prior to application for periods up to seven days. "Storage" does not include biosolids placed on the ground for brief periods of time solely to facilitate transfer the biosolids between transportation and application vehicles.

1. Biosolids shall not be stored for more than seven consecutive days prior to application.
2. Biosolids containing free liquids shall not be placed on the ground prior to application on an approved site.
3. Biosolids shall not be stored directly on the ground at any one location for more than seven days in any 60 day period.
4. Sites for the storage of Class B biosolids shall be located, designed, and maintained to restrict public access to the biosolids.
5. If short-term biosolids storage is planned for the site, a plan describing the storage program and means of complying with this Order shall be submitted for Executive Officer approval no later than 60-days prior to the storage of biosolids. The storage of biosolids shall not commence until after approval of the plan.
6. The Discharger shall operate the biosolids storage facilities in accordance with the approved biosolids storage plan.

The attached Short-Term Field Storage Plan includes management practices relative to storage site locations (e.g. restricted areas, buffer zones, slope requirements, etc.) and addresses wet weather contingencies.

We respectfully request approval as soon as possible. As always, if you have any questions, please do not hesitate to call me at (707) 580-4654.

Sincerely,

Jacob Collins
Technical Services
Synagro

Cc: Lea Gibson, Sacramento Environmental Management Department

SYNAGRO

Silva Ranch WDR 95-064 Short-Term Biosolids Storage Plan

This Biosolids Storage Plan describes the management practices to be implemented during rain events. Short-term storage is when biosolids are placed on the ground (i.e., not in a truck or trailer) at the application site prior to application for periods of 7 days or less.

General requirements

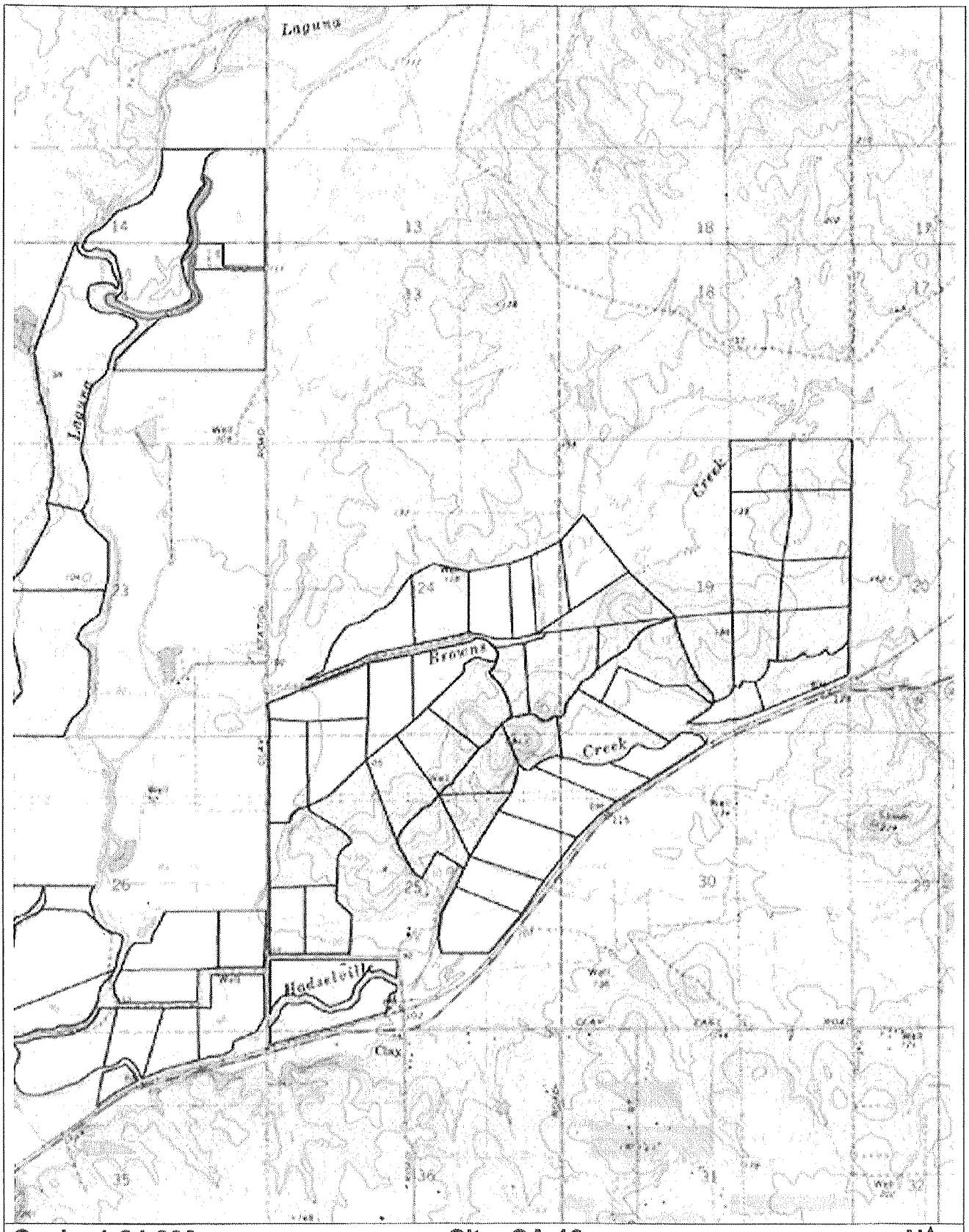
- Biosolids shall not be stored directly on the ground at any one location for more than seven days in any 60 day period
- Biosolids storage locations will be:
  - Outside the 100 year floodplain
  - On slopes <3%
  - Outside of low areas of a field if water will naturally pond around the stockpile
  - At least 25 feet from property lines, 50 feet from public roads, 100 feet from high water line of Hadselville and Browns Creeks, tributaries, ponds, lakes, marshes or vernal pools, and surface inlets to underground tiles.
  - At least 75 feet from natural drainageways (swales, gullies, ravines) and manmade drainageways (road ditches).
  - Away from excessive slopes so water from the adjoining landscape will not run onto the stored biosolids unless such water can be diverted away from/around the stored biosolids through the use of silt fence, straw bales or other methods.

- Best Management Practices (BMPs) to minimize and prevent offsite movement and or discharges:
  - BMP's include:
    - Installation of a berm or dike to contain the runoff and run-on from the storage area.
    - Use of straw/hay bales, straw waddles, tillage or other methods to prevent runoff and run-on.
    - Tarping or covering biosolids.

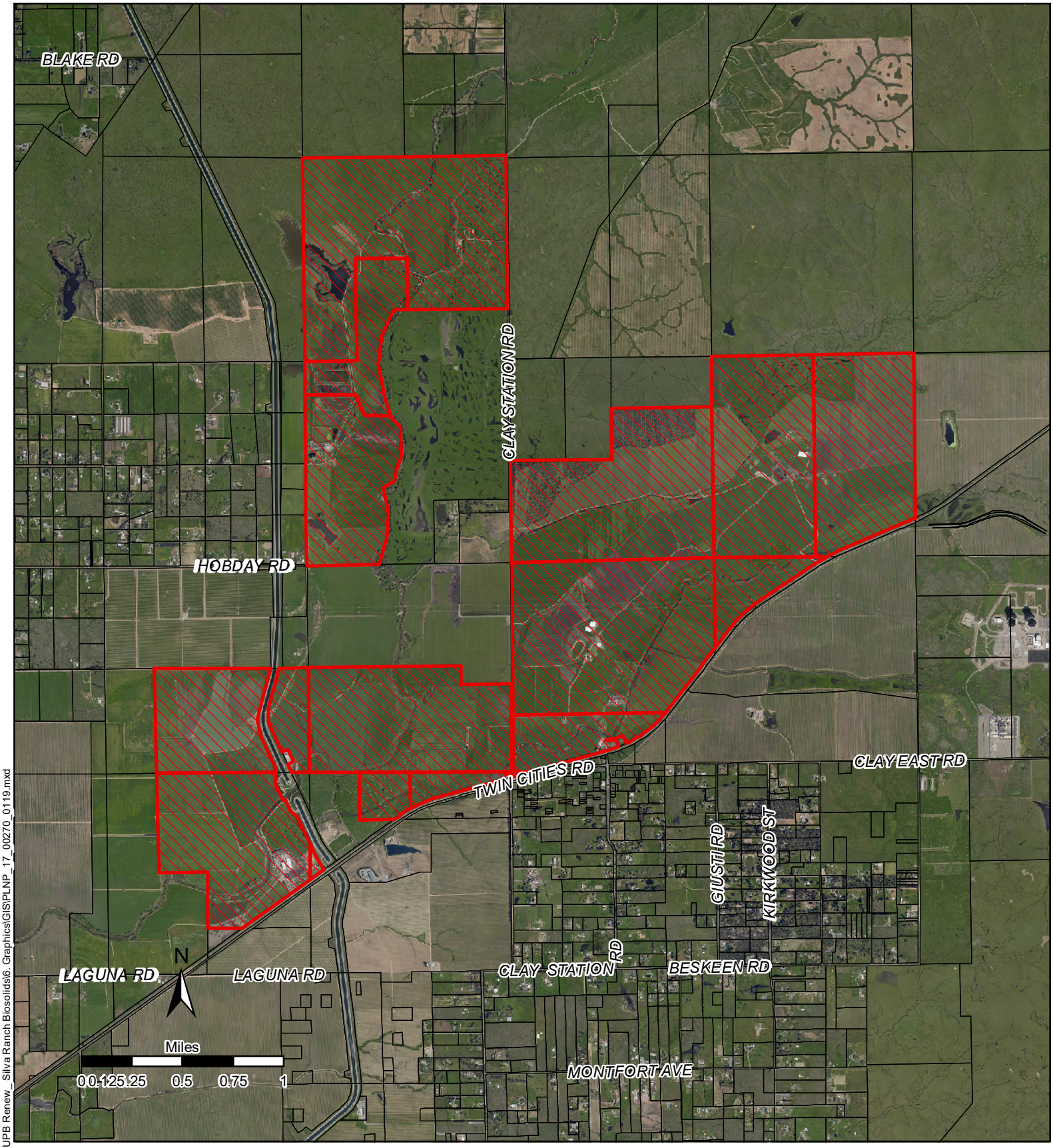
- During rain events the Site Manager will employ the following:

  - Inspection of biosolids storage site(s)
  - Ensure stored biosolids are in appropriate location (outside 100 yr flood plain, 25 ft from property lines, etc.)
  - Ensure BMPs such as straw waddles, straw/hay bales, tarping are employed if needed
  - Note if runoff or run-on conditions exist and if any that corrective actions were implemented

SITE MAP - SILVA RANCH EAST



Scale 1:24,000 Site: SA-18 N

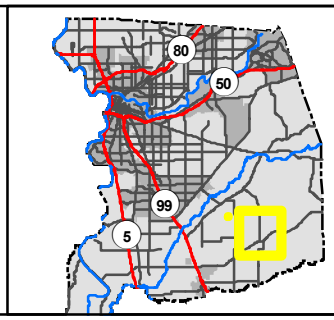


Project Area

Control #: PLNP2017-00270

Location: APN's: 136-0280-023 / 024 / 037 / 039 / 040;
138-0060-025 / 028 / 030 / 031 / 049 / 053 / 054 / 059 / 061 / 064;
140-0030 / 028 / 029 140-0050-021.

Supervisorial District: 5 - Nottoli



1/28/2019P:\2017\PLNP\PLNP2017-00270 UPB Renew_ Silva Ranch Biosolids\6. Graphics\GIS\PLNP_17_00270_0119.mxd

USE PERMIT
County of Sacramento
Board of Supervisors

Control Number
04-UPB-0427

Hearing Date: October 12, 2005

Assessor's Parcel Nos.
136-0280-023, 024, 025, 038, and 039; 138-0060-025, 028, 030, 031, 049, 053, 054, 059, 061, 062, and 064; 140-0030-014, 015; 140-0050-021

OWNER/APPLICANT:	**CO-APPLICANT:**	**OWNER:**
Gary and Tildean Silva 11540 Clay Station Road Herald, CA 95638	Synagro West, Inc. Attention: Mark A. Grey, PhD. 4993 Golden Foothill Pkwy, Suite 2 El Dorado Hills, CA 95762	George Chapcopulos Trust 2101 San Joaquin Hills R Newport Beach, CA 92660

PERMISSION IS GRANTED TO USE THE SUBJECT PREMISES FOR THE FOLLOWING DESCRIBED USE: To allow digested municipal sewage biosolids to be spread upon and disced into the topsoil of grazing land on approximately 3,000± acres in the AG-20, AG-20 (F), AG-80, and AG-80 (F) zones as a use not otherwise provided for in the AG zone (pursuant to Zoning Code Section 110-30.5). Note: The following use permits are being renewed: Use Permit No. 92-UPB-0726, approved March 15, 1995; 96-UPB-XXX-0323, approved October 22, 1997; and 96-UPB-0576, approved June 11, 1997, all of which expire on March 15, 2005.

DESCRIPTION OF PREMISES: The property is located at the northwest and northeast corners of Clay Station Road and Twin Cities Road, and on the west side of Clay Station Road, in the Southeast community.

CONDITIONS OF APPROVAL:

1. The proponent shall comply with U.S. EPA promulgated Standards for the use or Disposal of Sewage Sludge in 40 CFR 503 and with the State Minimum Standards for solid waste disposal and handling as well as Regional Water Quality Control Board (RWQCB) requirements.

2. A daily log shall be maintained. Entries shall include, but are not limited to: daily tonnage received, name of biosolids source(s), accidents, injuries, fires, spills and other miscellaneous events.

3. Comply With the Following Complaint Response Protocol:

   Complaints received regarding nuisance conditions related to off-site odors and/or fly breeding will be investigated by LEA staff. Complaint information will be provided to the property owner and the Operator within 24 hours. Complaint investigation will be initiated within 24 hours.

4. Objectionable odors shall not be perceivable beyond the limits of the property. The Facility operator shall self-monitor odor emission and land fly breeding. Appropriate control measures must be taken to prevent the occurrence of nuisances to the satisfaction of the LEA.

5. All contracts with biosolids transporters shall indicate that the transportation company is responsible, either directly or financially, in full, for the cleanup of any spills of materials while biosolids are in transit. Copies of the terms of each contract shall be kept on file at the project site.

6. The transport of biosolids shall be limited to no more than 70 truck trips per day.

7. The amount of biosolids to be deposited on the site shall not exceed 184,000 tons annually, of which 10,000 tons may be liquid biosolids.

8. The operator of the facility shall maintain records of biosolids storage. The records shall identify the date and quantity of all biosolids entering the storage facility and the date that the biosolids were applied to the land. This information shall be made available to the LEA upon request.

9. Any changes in the Report of Disposal Site Information document shall be reported to the LEA at least 60 days prior to implementation of the proposed change.

10. REPORTS: The following reports shall be submitted to the LEA:

    a. Report of biosolids receipts and dispositions

    b. Site map update showing areas where biosolids have been spread

    c. Biosolids storage report (when applicable)

    As occurring:

    d. Proposed new biosolids source for approval to landspread

    e. Change of ownership/operator

11. The site shall be inspected monthly by the LEA during the season when biosolids are being spread and incorporated into the soil. Access to the site shall be granted to the LEA representative(s) for the purpose of inspection without prior notification. The operator will be billed at the current hourly rate for each inspection including travel and office time spent.

12. In the event of any change in the control of ownership of the land or the site operator described in the Report of Disposal Site Information, the conditional relationship with the LEA is terminated. Upon application and payment of the appropriate fees by the new owner/operator, a review process will be initiated. Operation during this interim period will not be authorized.

13. The facility shall accept only municipal wastewater treatment plant biosolids. Acceptance of any waste material that has been manifested as designated or hazardous is prohibited.

14. The operator shall not engage in spreading or discing the biosolids at the site during heavy rains. Spreading or discing during hours of darkness is prohibited.

15. Application or discing of the biosolids within 500 feet of any occupied building, within 25 feet of property lines, within 50 feet of public roads, and within 50 feet of surface water drainage course is prohibited.

16. No biosolids application or discing shall occur within 500 feet of any on-site potable water wells. Drilled water wells shall be capped to prevent intrusion of water from the surface.

17. No biosolids application or discing shall occur within 500 feet of the Folsom South Canal.

18. Biosolids must be landspread and incorporated into the soil within 24 hours of arrival at the site, except that a maximum of 32,000 cubic yards may be stored up to 90 days in the event of wet weather or soil conditions. Any storage area shall be designed to isolate storm water run-on and ruff-off from the biosolids. Biosolids storage area plans shall be approved by the RWQCB prior to use. Liquid biosolids shall be injected into the soil and shall not be stored at the site under any circumstances.

19. The operator shall not apply biosolids to any slope exceeding 15 percent. Biosolids applied to slopes between 12 and 14 percent shall be incorporated into soil immediately.

20. The operator shall not landspread any biosolids contaminated with oversized inert solids, which have no beneficial agricultural use.

21. Public access shall be controlled for at least 12 months after the last biosolids application.

22. Grazing by milk animals shall be prevented for at least 12 months after the last biosolids application.

23. There shall be no planting of unprocessed food crops for three years after biosolids application.

24. The Biosolids Management Plan, Report of Disposal Site Information, RWQCB Waste Discharge Requirements and other important information on the project shall be combined into a single document. This may be titled the "Biosolids Land Application Program for Silva Ranch". A three ring binder with an index and tabs or other suitable format shall be used to allow information to be quickly located and to be updated during the life of the project. The document shall contain the following:

    a. Site information (general).

    b. Operating information (general).

c. Spill response plan with responsibilities, methods for cleanup of spills, contact persons, and phone numbers.

d. Soil suitability analysis prepared by a soil scientist or other qualified professional who is familiar with land application of biosolids. The analysis shall include classification and evaluation of soils on the site with reference to appropriate management practices including items such as tillage, cropping patterns, biosolids application methods, and use of buffer zones.

e. Irrigation and drainage plan including capacities, layout, and operation of the facilities. Conditions and criteria for containment and release of water from runoff collection basins shall be defined.

f. Biosolids storage plan including capacities, layout, stormwater control, vector control, odor control, maximum storage duration and time of year for storage shall be defined.

g. Agronomic plan with cropping patterns, biosolids application methods, biosolids incorporation practice, methods for measuring and controlling actual biosolids application rates in the field, and methods for determining agronomic application rates. The plan shall be prepared by a certified agronomist who is experienced with land application of biosolids.

h. Monitoring, record keeping, and reporting program with requirements for the RWQCB, EPA and other agencies, plus planned monitoring conducted at the option of Synagro. The program shall integrate the information into one master program with analytical tests to be performed, sample locations and sample frequency. The program shall clearly identify the schedule and recipients of submittals and reports.

i. Appendices including RWQCB waste discharge requirements, permits, CEQA documentation and other regulatory approvals.

25. Wetland avoidance areas that include the delineated buffer areas established in the Pre-Jurisdictional Determination of Waters of the United States, of the Silva Ranch Landspreading Area, prepared by Dr. Laurence Stromberg, shall be established before any biosolids application to land occurs in the vicinity of these resource areas.

The limits of clusters of vernal pools shall be identified in the field by a qualified biologist and the setback shall be applied to the clusters where the pools are closely spaced rather than to individual pools. The setback may be greater on the upslope side of the seasonal wetlands. These setbacks or wetland buffer areas shall be marked to accommodate local topography.

Continuous permanent protective wire fencing (not chain-link) with flagging and signs saying "Keep-out-Protected Natural Area" shall be installed around the perimeter of that area. No construction or biosolids application related activities shall be allowed within the area, and no domestic animal grazing shall be allowed within that area.

26. Landspreading shall not occur in the lower half of watershed "N" (below the 135-foot contour) and the lower third of watersheds "O" and "P", below the 130-foot contour (while there is currently no evidence of their use, these slopes can provide cover and egg-laying habitat for the western pond turtle and some setback has been recommended by the Department of Fish and Game).

27. Biosolids application to land is prohibited on the Hadselville Creek restoration area unless or until authorized by the California Department of Fish and Game. The restoration area includes that portion of the Silva Ranch lying within a line which begins at the intersection of the property line and Twin Cities Road, following the newly constructed drainage ditch in a westerly direction until it meets the unchannelized portion of Hadselville Creek; north to the 125-foot contour; following the 125-foot contour easterly to the west property line, south to the point of beginning.

28. In order to protect that area of the project site indicated to contain potential vernal pools and other wetlands, the applicant/operator shall implement one of the following measures:

    a. Remove the area from the land application loading zones indicated on Plates F and N; or

    b. Prior to the land application of biosolids on that area of the property indicated on Plate N of the Initial Study, the property owner shall submit to the Department of Environmental Review and Assessment a wetlands delineation and special status species report for that portion of the property, prepared by a qualified wetlands consultant and verified by the U.S. Army Corps of Engineers, to determine the extent of any wetlands and/or special status species that my be located on the property. No landspreading of biosolids shall be allowed within 50 feet of the delineated vernal pools and intermittent drainages and/or 100 feet of permanent wetlands and waters of the United States at this location.

29. Should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work shall be suspended and the Department of Environmental Review and Assessment shall be immediately notified at 874-7914. At that time, the Department of Environmental Review and Assessment will coordinate any necessary investigation of the find with appropriate specialists as needed. The project applicant shall be required to implement any mitigation deemed necessary for the protection of such cultural resources. Additionally, pursuant to Section 5097.97 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code, in case of the discovery of human remains, all work is to stop and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.

30. Comply with the Mitigation Monitoring and Reporting Program (MMRP) for this project as follows:

    a. The project proponent shall comply with the MMRP for this project, including the payment of 100% of the Department of Environmental Review and Assessment staff

costs, and the costs of any technical consultant services incurred during implementation of the MMRP. The initial estimate of these costs is $15,000.00. If the initial estimate of these costs exceeds the actual monitoring costs, the balance shall be refunded to the proponent, and if the actual monitoring costs exceed the initial estimate, the proponent shall be responsible for paying the additional amount.

b. Until the MMRP has been recorded and the estimated MMRP fee has been paid, no final parcel map or final subdivision map for the subject property shall be approved; and no encroachment, grading, building, sewer connection, water connection or occupancy permit from Sacramento County shall be approved.

31. Physical damage to adjacent County roadways that is attributable to the project hauling operation shall be repaired by the property owner/business operator to the satisfaction of the Department of Transportation. Ad roadway evaluation, prepared by a qualified engineer, which compares the condition of affected sections of Clay Station and Twin Cities Roads (between the project site and 500 feet distant from the center of all access driveways) shall be submitted before commencement and after completion of all hauling operations, or at the request of the Department of Transportation.

32. PG&E maintains a towerline crossing north to south through the site. This proposal shall not add or take from the land under the towerline by more than 2 feet and shall not cause a diminished access to the tower locations.

33. This Use Permit shall expire on December 31, 2017.

FINDINGS:

1. The request is consistent with the County General Plan Map (General Agriculture and Resource Conservation Combining General Plan Designations) and Text in that no policies conflict with the request.

2. The request is consistent with the Southeast Community Plan Map.

3. Identified environmental effects and suggested mitigation measures have been taken into consideration in the recommended actions and conditions of approval.

4. Staff has identified no effects from the proposal, which would result in a significant detrimental impact on adjoining or neighboring properties if the conditions, as recommended by staff, are adopted.

5. The granting of the use permit will not, under the circumstances of the particular case, be detrimental to the health, safety, peace, morals, comfort, or general welfare of persons residing or working in the neighborhood of such proposed use or be detrimental or injurious to property and improvements in the neighborhood or to the general welfare of the County, in that:

a. The use has been in operation for the past 10 years.

b. No new properties are being added to the landspreading operation.

c. No traffic impacts are anticipated.

6. The high moisture content of the biosolids tends to reduce dust generation at the site.

7. Odors will be minimal due to the requirement of discing the biosolids within 24 hours of unloading the material in the field.

8. Vector problems should be minimal due to the anaerobic digestion process used at the SRWTP which qualifies as an approved vector attraction reduction process by the United States EPA.

9. Natural habitat areas will remain no-load zones and fenced for their protection and preservation.

10. The project is a compatible use under the Williamson Act, as the land will continue to be used for agricultural purposes.

11. The previous Initial Study/Negative Declarations entitled "Future Tech Environmental Services/Silva Ranch Municipal Sewage Sludge Landspreading Use Permit (Control No. 92-UPB-0726), "Silva Ranch Biosolids Landspreading Expansion Use Permit" (Control No. 96-UPB-0323), and "Silva Ranch Use Permit" (Control No. 96-UPB-0576) are still adequate and appropriate for the proposed project.

12. The previously adopted Mitigation Monitoring and Reporting Programs for "Future Tech Environmental Services/Silva Ranch Municipal Sewage Sludge Landspreading Use Permit (Control No. 92-UPB-0726), "Silva Ranch Biosolids Landspreading Expansion Use Permit" (Control No. 96-UPB-0323), and "Silva Ranch Use Permit" (Control No. 96-UPB-0576) can be replaced by the new Mitigation Monitoring and Reporting Program prepared for the current project.

ENVIRONMENTAL DOCUMENT: Prior Negative Declaration

THIS ACTION DOES NOT RELIEVE THE APPLICANT OF THE OBLIGATION TO COMPLY WITH ALL ORDINANCES, STATUTES, REGULATIONS AND PROCEDURES. ALL COSTS INCURRED BY THE COUNTY TO ENFORCE THE CONDITIONS LISTED IN THIS PERMIT SHALL BE THE RESPONSIBILITY OF THE PERMIT HOLDER AND/OR PROPERTY OWNER. THE ABOVE USE WILL NOT BE CONDUCTED TO CONSTITUTE EITHER A PUBLIC OR PRIVATE NUISANCE. VIOLATION OF ANY OF THE FOREGOING CONDITIONS WILL CONSTITUTE GROUNDS FOR REVOCATION OF THIS PERMIT. BUILDING PERMITS ARE REQUIRED IN THE EVENT ANY BUILDING IS PLANNED. A CONDITIONAL USE PERMIT, IF NOT USED FOR THE PURPOSE FOR WHICH IT WAS GRANTED, SHALL LAPSE AND SHALL BECOME VOID THREE YEARS FOLLOWING THE DATE ON WHICH THE PERMIT BECAME EFFECTIVE, UNLESS BY CONDITION OF

THE PERMIT A GREATER TIME IS ALLOWED, OR UPON THE EXPIRATION DATE OF A VALID BUILDING PERMIT OBTAINED AFTER THE GRANT OF THE CONDITIONAL USE PERMIT, WHICHEVER DATE IS LAST TO OCCUR.

SACRAMENTO COUNTY BOARD OF SUPERVISORS

By Cindy H. Turner
Cindy H. Turner, Clerk

Building Inspection
Public Works
Environmental Health
Planning Department
Planning Commission

The Silva Ranch Use Permit Renewal -- Additional Information
Submitted July 16, 2018

Prepared by Synagro West LLC. in consultation with Mr. Gary Silva and Mark Grey, Ph.D.

The following information is organized according to subject matter discussed at the Southeast Sacramento County Planning Advisory Committee meeting on May 24, 2018 and during a follow-up call between Synagro (Dr. Mark Grey) and Sacramento County Planning staff (Joelle Inman and Leanne Mueller), and provides additional information to support staff in preparing and processing the use permit renewal.

I. Biosolids Definition and Quality

The Federal and State of California biosolids definition remains the same since the Silva Ranch Use Permit was last renewed in 2005. At that time, the Board of Supervisors requested additional information on biosolids definition, and we include here the Sacramento County staff response (Attachment 1).

As required by the Central Valley Regional Water Quality Control Board (CVRWQCB), biosolids applied at the Silva Ranch are routinely tested (typically monthly). The test results are entered into the CVRWQCB's reporting spreadsheet which is included in monthly reports to the CVRWQCB. The test results are compared to established limits which are included in the CVRWQCB's reporting spreadsheet.

II. Odor Mitigation

Biosolids land application odor mitigation is a daily operations task at the Silva Ranch. Odor prevention and control measures are part of the overall biosolids management program at the Silva Ranch and are included in the Silva Ranch Biosolids Management Plan (BMP). A BMP update was prepared in September 2017 (Attachment 2). If an odor complaint occurs, Synagro responds consistent with the actions found in the Silva Ranch Complaint Response Protocol (Attachment 3).

Odors from biosolids land application are controlled and mitigated using a combination of best management practices and strategies:

i. Biosolids stabilization meeting all Federal and State standards for land application
ii. Covered transport truck trailers and truck cleaning after unloading and prior to leaving the Silva Ranch
iii. Any odorous load can be rejected and returned to point of origin

iv. Ranch specific set-backs creating buffer zones
v. Prescribed biosolids application fertilization rates
vi. Incorporation of biosolids into the soil within 24 hours after surface application

To place existing biosolids odor mitigation strategies in context with current Sacramento County guidance for some land uses which have the potential to emit odors, other odor mitigation measures as described in Sacramento County Air Quality Management District CEQA Guide, Technology- and Design-Based Odor Reduction Measures, Revised June 2014 were reviewed (Attachment 4). Methods described in these documents for mitigation have limited applicability to the Silva Ranch operation.

III. Air Quality Protection and Mitigation

Airborne Pathogens. The issue of the potential for airborne movement of pathogens from biosolids land applied to receptors within and outside the boundary of biosolids land application has been extensively studied (for more than 20 years), with results published in peer-reviewed journals and used as best management practice guidance across the United States and Canada.

We include here for your review three sources of information, with an emphasis on work done at the University of Arizona: (i) 2003 2-page study summary from the University of Arizona concerning the specific pathogen *S. Aureus* and biosolids land application (Attachment 5); (ii) a 2017 letter concerning availability of literature describing biosolids land application results and citation list from Dr. Ian Pepper, University of Arizona--the citations list includes a large body of work on airborne pathogen research (Attachment 6); and (iii) 2016 Guide to Biosolids Quality from Washington State University, which includes on pages 6 and 7 a succinct summary of pathogen research and findings (Attachment 7). This document also supports the information provided in Item I. Biosolids Definition and Quality.

Worker Health and Safety. County staff expressed concerns regarding the Silva Ranch employee safety during the CPAC meeting, and we enclose here two documents to address worker safety issues: (1) Synagro document "Basic Hygiene When Working with Biosolids" (Attachment 8), and (2) NIOSH Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids; also see https://www.cdc.gov/niosh/docs/2002-149/ (Attachment 9). These documents provide Synagro employees and employees of the Silva Ranch best practices information for worker safety and protection.

Dust and Particulates. We understand County staff is concerned about dust and particulate movement from biosolids land application at the Silva Ranch, and potential

effect on worker safety, and on adjacent properties and residents. As with odor management, dust and particulate control and mitigation is a daily biosolids land application operations priority.

Dust controls are implemented to prevent dust movement off-site due to biosolids land application activities. Dust control is primarily accomplished with:

i. Sensitivity to weather conditions (suspend operations in high wind (>25mph) conditions
ii. Vehicle (on-road and on-farm) access and speed control
iii. Periodic watering down of access roads within the Ranch and biosolids staging areas (frequency based on operations, road conditions, and weather conditions)
iv. Large buffer distances from off-site receptors

Periodically, and as needed, Silva Ranch road intersections with Clay Station Road and Twin Cities Road may be watered down as well for dust control. Posted speed limits are displayed on main haul routes within the Silva Ranch. From a worker protection standpoint, dust masks are provided. Operations equipment is sealed-cab, which limits exposure to dust.

Per our discussions with County staff regarding general and specific agricultural operations best practices for dust control, several additional sources of information to mitigate dust and particulate movement from agricultural operations in Sacramento County, and more generally within the San Joaquin Valley and corresponding air districts were reviewed. We note two Sacramento Metropolitan Air Quality Management District CEQA mitigation guidance documents: (i) Basic Construction Emission Control Practices (Attachment 10), and (ii) Enhanced Fugitive PM Dust Control Practices (Attachment 11).

These two documents describe practices which minimize dust and particulate movement from active construction sites and are similar in some respects to measures already in practice at the Silva Ranch; predominately frequent and targeted use of water to suppress dust. There are also conservation management practices used at the Silva Ranch which work together to reduce the amount of dust and particulates generated from agricultural operations. Some of the practices used at the Silva Ranch are illustrated in the conservation management measures for agriculture operations and cattle feed lots, as documented by the San Joaquin Valley Air Quality Management District (Attachment 12).

IV. Ground Water and Surface Water Protection

During the CPAC meeting, there was some concerns expressed about protection of ground and surface water quality. The CVRWQCB regulates ground and surface water discharges through the issuance of Waste Discharge Requirements (WDR). At the current time the Regional Board has issued a Tentative revised WDR for biosolids land application at Silva Ranch R5-XXXX-XXXX. Findings 19, 20, 30, and 42-45 specifically address ground and surface water conditions and monitoring. We have attached the Tentative WDR, which is scheduled for adoption in 2018 (Attachment 13).

V. Inspection of Biosolids Land Application Operations

Synagro and Mr. Gary Silva support periodic inspections as required by Sacramento County to enforce Use Permit conditions.

VI. Green Material Separation from Biosolids Land Application Program

It is a violation of the WDR to apply green material to areas at the Silva Ranch permitted for biosolids application. Discharge Prohibition A. 15 (Tentative WDR, Page 14) requires a specific process and update to the WDR should any other material (other than biosolids) be proposed for land application as beneficial soil amendment. Separate areas of the Silva Ranch are set aside for green material use to prevent its use on areas permitted for biosolids application.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2019-0002

WASTE DISCHARGE REQUIREMENTS

FOR

SYNAGRO WEST, LLC
AND
GARY SILVA, Sr.
SILVA RANCH BIOSOLIDS LAND APPLICATION
SACRAMENTO COUNTY

The California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) finds that:

1. On 1 June 2017, Synagro West, LLC (Synagro) submitted a Report of Waste Discharge (RWD) describing reuse of stabilized municipal wastewater treatment plant biosolids as a soil amendment on Silva Ranch properties located at 11540 Clay Station Road (Facility), near the unincorporated community of Herald in Sacramento County (Section S25, T6N, R7E, MDB&M). Synagro submitted a RWD Addendum on 2 October 2017.

2. The Facility is situated on 3,000 acres of agriculturally-zoned property, owned by Gary Silva Sr. (Silva). Synagro manages the application of biosolids at the Facility. Synagro and Silva (*collectively*, Dischargers) are each responsible for complying with these Waste Discharge Requirements (WDRs).

3. The Facility is private farmland, fenced-off with gated access points to control public access. The Facility has historically been divided into two sections, "Silva Ranch I" and "Silva Ranch II," made up of 17 separate Assessor's Parcel Numbers (APN), listed below. Locations of these APNs are depicted in Attachments A-B, which are incorporated herein.

Location	**Assessor's Parcel Numbers**
Silva Ranch I	APN 136-0280-023, APN 138-0060-028, APN 140-0030-028, APN 140-0030-029, APN 140-0050-021
Silva Ranch II	APN 136-0280-024, APN 136-0280-040, APN 136-0280-039, APN 138-0060-025 [1], APN 138-0060-030 [1], APN 138-0060-031, APN 138-0060-049 [1], APN 138-0060-053 [1], APN 138-0060-054, APN 138-0060-059 [1], APN 138-0060-061 [1], APN 138-0060-064 [1]

Notes:

[1] These parcels may be subject to the Irrigated Lands Program, which addresses discharges of wastes (e.g., sediments, pesticides, nitrates) from commercial irrigated lands.

4. The Dischargers have been applying biosolids as a soil amendment at Silva Ranch I since 1995, and at Silva Ranch II since 1998.

5. WDRs Order 95-064, adopted by the Central Valley Water Board on 24 March 1995, prescribes requirements for the discharge of biosolids on approximately 1,200 acres of Silva Ranch I.

6. WDRs Order 98-023, adopted by the Central Valley Water Board on 23 January 1998, prescribes requirements for the discharge of biosolids on approximately 1,600 acres of Silva Ranch II.

7. Monitoring and Reporting Program (MRP) Order No. R5-2007-0807, issued on 25 April 2007, prescribes requirements for monitoring biosolids and biosolids land application areas that are regulated under WDRs Order 95-064 and WDRs Order 98-023.

8. In rescinding WDRs Order 95-064, WDRs Order 98-023, and MRP Order No. R5-2007-0807, this Order establishes a unified permit for biosolids application on both Silva Ranch I and Silva Ranch II.

Existing Facility and Discharge

9. The State Water Resources Control Board's (State Water Board) general findings regarding "biosolids," as set forth in Finding Nos. 4-10 of the 22 July 2004 WDRs General Order for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities, Order No. 2004-0012-DWQ (Biosolids General Order), are incorporated as though fully set forth herein.

10. "Class A" biosolids and "Class B" biosolids, as defined in section 503.32 of 40 Code of Federal Regulations part 503 (40 C.F.R. part 503, Standards for the Use or Disposal of Sewage Sludge), are accepted at the property year-round for use as a fertilizer in production of durum wheat, sudan grass and similar crops. Both "Class A" and "Class B" biosolids meet all 40 C.F.R. part 503 vector attraction and pollution concentration limits, and the pathogen reduction standards set forth in section 503.32. Biosolids are designated "Class A" biosolids when treated to essentially remove all pathogens. (See 40 C.F.R. section 503.32(a).) When treatment substantially reduces but does not completely remove all pathogens, biosolids are considered "Class B." (See *id*., section 503.32(b).)

11. The Facility receives biosolids from various municipal wastewater treatment facilities throughout California. These facilities primarily generate "Class B" biosolids. Applied biosolids contain approximately 13 to 90 percent total solids, with little or no free water.

12. Within Silva Ranch I and Silva Ranch II, predominantly "Class B" biosolids are applied to multiple fields, some of which stretch across multiple APNs. These fields, also referred to as designated land application areas (LAAs), are individually numbered, but vary in shape and size. The Discharger has remapped the fields to better facilitate the identification of field boundaries and tracking biosolids application, which include updating field boundaries and matching the boundaries to the cropping patterns. The

number of fields and designation of the LAAs have changed from the original 80 fields. These individual fields/designated LAAs are depicted on Attachments A-B.

13. The Facility allows for delivery 24 hours a day, seven days per week, 365 days per year (weather permitting). Each truckload of biosolids (one truck trip) averages about 25 wet tons. The Dischargers are in the process of renewing their Sacramento County Conditional Use Permit (CUP) for the spreading and disking of biosolids on the property. No changes to their existing biosolids application operations are being proposed for the new CUP. The prior permit, CUP No. 04-UPB-0427, which expired on 31 December 2017, authorizes the following:

    a. Transporting up to 70 truckloads of biosolids to the Facility each day;

    b. Depositing 184,000 tons of biosolids annually (10,000 of which may be liquid biosolids); and

    c. On-site biosolids storage of up to 32,000 cubic yards.

14. Biosolids are delivered to the Facility in dump trailers and off-loaded at a staging area within the field (designated LAA) where the biosolids are to be applied. Within 24 hours of arrival, biosolids are loaded from the ground into surface application equipment (e.g., a manure spreader, side slinger spreader, etc.) and applied by spreading onto the field. Applied biosolids are then incorporated into the topsoil, via disking, within 24 hours. The operation is managed so that fields receive biosolids on a rotational basis.

15. Under unusual emergency circumstances (e.g., equipment breakdowns), when all offloaded biosolids cannot be spread the same operating day, temporary on-site storage areas are created using hay bales and earth embankments, metal or plastic transfer boxes.

16. Biosolids application operations are discontinued when soils in a designated LAA become saturated. Operations are not resumed until soils at the designated LAA have sufficiently dried to allow equipment access without damaging soil.

17. During inclement weather, biosolids are kept at a clay-lined, 2.2-acre storage area surrounded by 5 to 10-foot high concrete and soil berms. Referred to as the “Pit,” this storage area is considered a “short-term” (less than consecutive 7 days) storage facility. The location of the Pit is shown on Attachment A. Once inclement weather has passed and conditions at the designated LAA are suitable for application, stored biosolids are applied at the designated LAA. The Dischargers operate the Pit in accordance with their Short-Term Biosolids Storage Plan dated 25 October 2014 to comply with the Biosolids Storage and Transportation Specifications in section E of this Order.

18. Biosolids are applied to fields at agronomic rates calculated based on the estimated nitrogen uptake of crops planted at each field, recommendations for optimal crop production, and any residual nutrients from prior applications at the same field. Vehicles used for spreading the biosolids are calibrated by measuring the amount handled on a known square footage.

19. Durum wheat and sudan grass are currently grown on the Silva Ranch property.

    a. Durum wheat is planted during the winter months, from 1 September through 31 March, and harvested through pasturing through the late spring. The RWD states that the recommended agronomic rate for durum wheat in Sacramento County ranges from 250 to 370 pounds of nitrogen per acre (lb/ac). The Dischargers have historically used an agronomic rate of 250 lb/ac.

    b. Sudan grass is planted during the summer months from 1 April through 31 August. Harvesting can occur every 21 to 30 days. The recommended agronomic rate for sudan grass in Sacramento County ranges from 350 to 560 lb/ac, depending on how intensely the crop is managed. The Dischargers have historically used an agronomic rate of 350 lb/ac.

    c. Crops are grown and harvested exclusively for livestock grazing and production of livestock feed. When used for livestock feed, crops are harvested roughly 90 days after planting. The Dischargers do not graze milk cows at the property. Prior WDRs restrict grazing of livestock for 30 days.

    d. The Facility does not grow turf or sod sold for offsite uses, or food crops used for human consumption.

20. The Dischargers' supplemented RWD includes a Biosolids Management Plan dated 1 June 2017 and Biosolids Spill Response Plan dated 25 March 2015. Taken together, these plans adequately comply with the Discharge Specifications and Land Application Area Specifications set forth in sections B and D of this Order.

21. Per their supplemented RWD, Dischargers will implement the following operational flood and surface water protection measures:

    a. Bermed fields to prevent off-site discharge to other designated LAAs.

    b. Fourteen storm water runoff retention ponds, designed to collect runoff falling on the drainage area from a 24-hour storm with a return frequency of 25 years.

    c. Portions of designated LAAs falling within a 100-year flood plain will not receive biosolids between15 October and 15 April.

22. Although there are surface waters in the vicinity of designated LAAs receiving biosolids on a year-round basis (Browns Creek flows through in the northern portion of the Silva Ranch I; Hadselville Creek bisects the southern portion of Silva Ranch°I; and Laguna Creek bisects Silva Ranch II), the Dischargers' surface water protection measures are sufficient to obviate the need for surface water monitoring in the adjacent creeks. The Dischargers will also be conducting routine field inspections and storm water pond monitoring to verify that there is no uncontrolled runoff drainage to surface waters.

23. The entire Facility is situated on land with a "low potential for public exposure," as defined per 40 C.F.R. section 503.32(b). Additionally, public access to the Facility is restricted. (For the purposes of this Order, areas with a "high potential for public exposure" include those within a mile of: educational facilities; facilities designed for

recreational activities other than hunting, fishing, or wildlife conservation; places of public assembly; hospitals; and similarly-sensitive receptors.)

24. A few designated LAAs are known to have received, or appear to have received, compostable materials ("green material" as defined in 14 California Code of Regulations (CCR), section 17852(21).). As of 28 October 2016, green material has not been applied to any field designated as LAAs to receive biosolids.

Non-Enrollment under Biosolids General Order

25. The Dischargers' biosolids land application operation at the Facility does not qualify for regulatory coverage under the State Water Board's Biosolids General Order (see Finding No. 9) because the operation:

    a. Exceeds the allowable 2,000 net acreage;

    b. Does not comply with Discharge Specification B.10.b(2)(a) of the Biosolids General Order ("For at least 60 days after application of biosolids in areas with average daily (daytime) air temperatures exceeding 50 degrees Fahrenheit … Domesticated Animals are not grazed."); and

    c. Does not comply with Prohibition A.14 of the Biosolids General Order, which prohibits the application of "Class B" biosolids containing a moisture content of less than 50 percent.

26. Although the Dischargers' operation does not qualify for coverage under the Biosolids General Order, the Central Valley Water Board is not precluded from prescribing individual WDRs per this Order, which establishes Prohibitions and Discharge Specifications similar to those contained in the Biosolids General Order. Moreover, the Biosolids General Order is not intended to be the exclusive means of regulating the water quality impacts from biosolids application. (See State Water Board Order No. 2004-0012-DWQ, p. 1, Finding No. 1.)

Site-Specific Conditions

27. The Facility is located on moderately flat terrain, with an overall site elevation of approximately 86.9 feet, and soil slopes between 0 and 36 percent (20 degrees). Most of the fields receiving biosolids have surface slopes of less than 10 percent (5.7 degrees). The only areas with surface slopes exceeding 10 percent are fields within APN 136-0060-028, APN 136-0280-023, APN 140-0030-028, and APN 140-0030-029.

28. Approximately 1,000 acres of the Facility falls within a 100-year flood plain designated in the Federal Emergency Management Agency's Flood Insurance Map. The affected portion—located at the lowest elevations of Silva Ranch I and Silva Ranch II, south of Hadseville Creek, North of Browns Creek and West of Laguna Creek—is not used for biosolids application in the wet season.

29. The Facility is located in a rural, remote area of southern Sacramento County. Surrounding land uses are agricultural, typically consisting of fields planted with durum

wheat and sudan grass and grazing of cattle. Rancho Seco Nuclear Generating Station and the Rancho Seco Regional Park are located southeast of Facility.

30. Based on data from the nearest weather station in Sloughhouse 6 SE, California (048293), the annual average total precipitation is 20.1 inches and the 100-year precipitation is approximately 33.7 inches. (Under the General Order, this Facility would be classified as being situated in a “non-arid” location.)

31. The Facility is located within reference evapotranspiration (ETo) Zone 14, which has an annual average ETo of approximately 57.0 inches.

Groundwater Conditions

32. Soil types in the area classified by the Natural Resource Conservation Service (formerly Soil Conservation Service) include Capay Clay Loam, Corning Complex, Hadselville-Pentx Complex, Hicksville Loam, Redding Gravelly Loam, and San Joaquin-Xerarents.

33. There is no groundwater monitoring network at the Facility.

34. Based on data from the California Department of Water Resources, Groundwater Information Center Interactive Map Application, depth to groundwater at the Facility is approximately 150 feet below ground surface (bgs).

Basin Plan, Beneficial Uses, and Regulatory Considerations

35. The operative Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. In accordance with Water Code section 13263, subdivision (a), this Order prescribes WDRs implementing the Basin Plan.

36. Local drainage is to Browns Creek and Hadselville Creek, tributary to Laguna Creek and the Cosumnes River. Per the Basin Plan, beneficial uses of the Cosumnes River are: municipal and domestic supply (MUN); agricultural supply (AGR); water contact recreation (REC-1); non-contact water recreation (REC-2); warm freshwater habitat (WARM); cold freshwater habitat (COLD); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development (SPAWN); and wildlife habitat (WILD).

37. Per the Basin Plan, beneficial uses of underlying groundwater are MUN, AGR, industrial service supply (IND) and industrial process supply (PRO).

38. The Basin Plan establishes narrative water quality objectives (WQOs) for chemical constituents, tastes and odors, and toxicity in groundwater; and sets forth a numeric objective for total coliform organisms.

39. The Basin Plan’s numeric WQO for bacteria requires that the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN-designated groundwater.

40. The Basin Plan's narrative WQOs for chemical constituents, at a minimum, require MUN-designated waters to meet the maximum contaminant level (MCLs) specified in California Code of Regulations, title 22 (Title 22). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

41. The narrative toxicity WQO requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses.

42. Quantifying a narrative WQO requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses. The Basin Plan states that when compliance with a narrative WQO is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations to implement the narrative WQO.

43. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot, and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 µmhos/cm. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops and the appropriate salinity values to protect agriculture in the Central Valley are considered on a case-by-case basis. It is possible to achieve full yield potential with waters having EC up to 3,000 µmhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop. The list of crops in the Findings are not intended as a definitive inventory of crops that are or could be grown in the area where groundwater quality is potentially affected by the discharge, but it is representative of current and historical agricultural practices in the area.

44. The Central Valley Water Board adopted Basin Plan amendments incorporating new programs for addressing ongoing salt and nitrate accumulation in the Central Valley at its 31 May 2018 Board Meeting. These programs, once effective, could change how the Central Valley Water Board permits discharges of salt and nitrate. For nitrate, dischargers that are unable to comply with stringent nitrate requirements will be required to take on alternate compliance approaches that involve providing replacement drinking water to persons whose drinking water is affected by nitrates. Dischargers could comply with the new nitrate program either individually or collectively with other dischargers. For salinity, dischargers that are unable to comply with stringent salinity requirements would instead need to meet performance-based requirements and participate in a basin-wide effort to develop a long-term salinity strategy for the Central Valley. This Order may be amended or modified to incorporate any newly-applicable requirements.

45. The stakeholder-led Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative has been coordinating efforts to implement new salt and nitrate management strategies. The Board expects dischargers that may be affected by new salt and nitrate management policies to coordinate with the CV-SALTS initiative.

Antidegradation Analysis

46. The State Water Board's *Policy with Respect to Maintaining High Quality Waters of the State*, Resolution No. 68-16 (Antidegradation Policy) prohibits degradation of groundwater unless it shown that anticipated degradation:

    a. Is consistent with the maximum benefit to the people of the state.

    b. Will not unreasonably affect present and anticipated future beneficial uses.

    c. Does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives, and

    d. Is minimized by practicable treatment or control (BPTC) applied by the discharger.

47. Degradation of groundwater by some of the typical constituents associated with the application of biosolids as a soil amendment, when applied at agronomic rates and using best management practices, is consistent with the maximum benefit to the people of the state. The economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and provides sufficient justification for allowing the limited groundwater degradation that may occur pursuant to this Order.

48. The Dischargers do not monitor groundwater quality at the site. Depth to groundwater is approximately 150 feet. Based on site soils, depth to restrictive soil layers may occur at approximately 78 inches. It is not possible to determine pre-1968 groundwater quality from available data. The Dischargers are not required to provide groundwater monitoring because groundwater at the biosolids application area is at depths greater than 25 feet.

49. Constituents of concern that have the potential to degrade groundwater include pathogens, heavy metals, and nitrogen, which can be present in the biosolids.

    a. Pathogens can cause water quality problems that could result in public health problems. Public access control; crop use and site restrictions; and buffer zones around water supply wells, surface water drainage courses, and public areas are control measures to prevent and reduce the threat to water quality and transmission of pathogens to the public.

    b. Over-application of heavy metals can result in water quality and/or public health problems. Establishing application rates for specific metals will minimize groundwater degradation.

    c. Biosolids are a significant source of nitrogen. Over-application of nitrogen can result in the buildup of nitrogen in the soils. Excess nitrogen can eventually convert to nitrate, which can migrate to groundwater causing degradation. Establishing application rates that meet the agronomic rates of the crops to be grown will minimize groundwater degradation.

50. This Order establishes biosolids quality limitations and groundwater limitations for the application areas that will not unreasonably threaten present and anticipated beneficial uses, or result in groundwater quality exceeding concentration limits that are protective of designated beneficial uses. Based on the depth to shallow groundwater, biosolids character, and application loading rate, the discharge of biosolids does not pose a threat to groundwater quality. The requirements of this Order do not allow any degradation to occur.

51. The Dischargers will provide the following biosolids operation and control measures.

    a. Biosolids will meet the U.S. Environmental Protection Agency's (USEPA) criteria for land-application (see 40 C.F.R. part 503).

    b. The LAAs are on private property, secured by fencing and gates to prevent public access.

    c. Approximately 3,000 acres is available for biosolids application.

    d. Nutrient loading from the biosolids is a calculated rate, specific to the nitrogen uptake for the crop to be planted (determined based on agronomic recommendations for proper crop production and residual nutrients from previous applications).

    e. LAAs within the 100-year flood plain will not receive biosolids between 15 October and 15 April of each year.

    f. The Dischargers maintain setback distances for the staging, storage and biosolids application areas, as defined per the Discharge Specifications in section B of this Order.

    g. Biosolids application area includes berms and 14 storm water runoff retention ponds to collect any runoff from the application fields. Routine storm water monitoring is performed when water is present in the ponds. Storm water runoff released to surface waters and/or used for irrigation is reported in the annual report.

    h. The Dischargers maintain the biosolids storage area (Pit) in accordance with their Short-Term Biosolids Storage Plan. The Pit is clay-lined and surrounded by 5 to 10-foot-high concrete and soil berms to prevent runoff and run-on into the area.

    i. The Dischargers maintain a Biosolids Management Plan**,** which describes the operational procedures regarding biosolids application and storage activities, including procedures for spill prevention and response plans and adverse weather plans.

    j. The Dischargers maintain a Biosolids Spill Response Plan, a copy of which will be maintained in all vehicles transport biosolids.

Other Regulatory Considerations

52. Pursuant to Water Code section 106.3, subdivision (a), it is "the established policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." Although this Order is not necessarily subject to Water Code section 106.3 because it does not revise, adopt or establish a policy, regulation or grant criterion (see section 106.3, subdivision (b)), it nevertheless promotes that policy by requiring discharges to meet MCLs designed to protect human health and ensure that water is safe for domestic use.

53. Based on the threat and complexity of the discharge, the Facility is classified as 2B, as defined below:

    a. Category 2 threat to water quality: "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance."

    b. Category B complexity, defined as: "Any discharger not included [as Category A] that has physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal) or any Class 2 or Class 3 waste management units."

54. California Code of Regulations, title 27 (Title 27), prescribes requirements for the treatment, storage, processing, and disposal of solid waste. However, discharges regulated under this Order are exempt from Title 27 requirements insofar as the discharges involve soil amendments (i.e., "[u]se of nonhazardous decomposable waste as a soil amendment pursuant to applicable best management practices…") and reuse (i.e., "[r]ecycling or other use of materials salvaged from waste, or produced by waste treatment, such as scrap metal, compost, and recycled chemicals…"). (See Title 27, section 20090, subdivisions (f), (h).)

55. The statistical data analysis methods set forth in the EPA's 2009 *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (Unified Guidance) are appropriate for determining whether discharges comply with Groundwater Limitations in section F of this Order. However, other analytical methods may be appropriate as well.

56. Water Code section 13267, subdivision (b)(1) provides as follows:

> [T]he regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

57. The technical reports required under this Order, as well as per the separately-issued Monitoring and Reporting Program (MRP) Order No. R5-2019-0002, are necessary to ensure compliance with the WDRs prescribed herein. The Dischargers own and/or operate the Facility with biosolids discharges that are regulated under this Order.

58. In connection with the prior CUP (2004-UPB-0427), the County of Sacramento performed an Initial Study and adopted a Negative Declaration dated 12 October 2005, under the California Environmental Quality Act (CEQA), Public Resources Code section 21000 et seq. In adopting its Negative Declaration, the County of Sacramento determined that issuing three separate land use permits for the application of biosolids on approximately 3,000 acres (collectively, "Silva Ranch Biosolids Land Application Use Permit") would not have a significant effect on the environment, and that an environmental impact report need not be prepared.

59. The Dischargers' prior CUP (2004-UPB-0427) expired on 31 December 2017. The Dischargers are in the process of renewing their CUP, and to the extent that any subsequent CUP prescribes any nuisance abatement requirements that are more stringent than those set forth in this Order, those more stringent requirements shall be controlling. In other words, this Order shall not be interpreted as authorizing the violation of any conditions in a CUP issued by the County of Sacramento. Conversely, nothing in any subsequently-issued CUP shall be interpreted as authorizing a violation of the WDRs set forth in this Order.

60. To ensure protection of waters of the state, this Order places additional requirements on the continuance of an existing operation involving the discharge of waste. Accordingly, the adoption of this Order is exempt from the provisions of CEQA pursuant to section 15301 of the CEQA Guidelines (Cal. Code Regs., tit. 14, section 15000 et seq.).

61. Federal regulations in 40 C.F.R. part 503 (Standards for the Use or Disposal of Sewage Sludge) establish management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. Although the Central Valley Water Board is using 40 C.F.R. part 503 as guidelines for the purposes of this Order, the Central Valley Water Board is not the implementing agency for these regulations. Accordingly, the Dischargers may have separate and/or additional compliance, reporting and permitting responsibilities with respect to the EPA.

62. Pursuant to Water Code section 13263, subdivision (g), the ability to discharge waste is a privilege, not a right, and the adoption of this Order does not create a vested right to continue any discharges.

Public Notice

63. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

64. The Dischargers and interested agencies and persons have been notified of the Central Valley Water Board's intent to prescribe WDRs for this discharge, and have been provided an opportunity to submit written comments and an opportunity for a public hearing.

65. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that Order Nos. 95-064 and 98-023 and MRP No. R5-2007-0807 are rescinded; and that, pursuant to Water Code sections 13263 and 13267, Synagro West, LLC and Gary Silva Sr. (Dischargers), their agents, successors, and assigns, to meet the provisions contained in Division 7 of the Water Code, and regulations promulgated thereunder, shall comply with the following requirements.

A. Discharge Prohibitions

1. **Effective immediately**, until approval of a 30-Day Grazing Restriction Assessment Report (see section G.2 of this Order), cattle and other animals are prohibited from grazing on any field where biosolids have been applied within the preceding 60 days (if daytime temperatures average 50°F or higher) or 90 days (if daytime temperatures are below 50°F).

2. Discharge of biosolids at a location or in a manner different from that described in the Findings is prohibited.

3. The discharge of biosolids shall not cause or threaten to cause "pollution," as defined per Water Code section 13050, subdivision (*l*)(1).

4. The application of any material resulting in a violation of the Safe Drinking Water and Toxic Enforcement Act is prohibited. (See Health & Safety Code, section 25249.5.)

5. The storage, transport, or application of biosolids shall not cause a "nuisance," as defined per Water Code section 13050, subdivision (m).

6. Biosolids shall not be discharged from the Facility's storage areas or designated LAAs to: adjacent land areas not regulated by this Order; any onsite surface waters; or any surface water drainage course.

7. Storm water and/or irrigation water runoff shall not flow from designated LAAs within 30 days of application of biosolids, unless vegetation surrounding the designated LAA, and along the path of runoff, provides at least 33 feet of untrimmed grass (or similar vegetation) sufficient to prevent the transportation of biosolids with the storm water and/or irrigation water away from the application site.

8. Biosolids shall not be discharged or applied at rates exceeding the nitrogen requirements of the vegetation, or at rates degrading of groundwater quality.

9. The application of "hazardous waste" is prohibited. (See Cal. Code Regs., tit. 22, section 66261.1 et seq.)

10. Biosolids shall not be discharged if constituent concentrations, in milligrams per kilogram (mg/kg) dry weight (See 40 C.F.R. section 503.13 Table 1), exceed the following:

Constituent	Ceiling Concentration, mg/kg dry weight
Arsenic	75
Cadmium	85
Copper	4,300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

11. Biosolids shall not be applied to designated LAAs with frozen or water-saturated ground; or applied during periods of precipitation in a manner that induces runoff from the Facility.

12. Biosolids shall not be applied in portions of designated LAAs that are subject to gully erosion or washout offsite.

13. Until approval of a Conditional Biosolids Application Site Report, per section G of this Order, biosolids shall not be applied to portions within a designated LAA with slopes exceeding 10 percent is prohibited. (See Finding No. 27 [Fields containing slopes in excess of 10 percent].)

14. Compostable material/green material (and other similar materials) shall not be applied to any field designated as an LAA to receive biosolids.

B. Discharge Specifications

1. Biosolids shall be applied exclusively to designated LAAs within Silva Ranch I and Silva Ranch II.

2. Waste constituents, including those associated with biosolids, shall not be released, discharged, or placed in a location or manner resulting in a violation of the Groundwater Limitations set forth in section F of this Order.

3. Prior to application, biosolids shall remain confined within transportation equipment and containers and staging/storage sites.

4. Public contact with biosolids in designated LAAs shall be prevented through such means as fences, signs or other acceptable alternatives.

5. Objectionable odors shall not be perceivable beyond the limits of the Facility's boundaries at intensities creating or threatening to create nuisance conditions.

6. All staging areas, storage sites, and designated LAAs shall be designed, constructed, operated and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

7. All storm water runoff retention ponds shall be designed to collect runoff falling on the drainage area from a 24-hour storm with a 25-year return frequency.

8. All storm water runoff retention ponds shall be emptied, by applying the stored water as irrigation to seeded biosolids application areas:

    a. At least once prior to **15 September of each year**; and

    b. During the **rainy season (15 October to 15 April),** as frequently as conditions allow to maintain maximum containment capabilities.

9. All open containment structures (e.g., storm water retention ponds) shall be managed to prevent breeding of mosquitoes, specifically:

    a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface;

    b. Weeds shall be minimized through control of water depth, harvesting, or herbicides;

    c. Dead algae, vegetation, and debris shall not accumulate on the water surface; and

    d. Dischargers shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.

10. Newly-constructed or rehabilitated berms or levees (excluding internal berms separating ponds or controlling flow of water within a pond) shall be designed and constructed under the supervision of a California Registered Civil Engineer.

11. Wastewater contained in any unlined pond shall not have a pH of less than 6.0, or greater than 9.0.

12. All biosolids for land application shall comply with the applicable pathogen reduction standards set forth in 40 C.F.R. section 503.32. Additionally, all biosolids meeting “Class A” standards shall not have a maximum fecal coliform concentration greater than 1,000 most probable number (MPN) per gram of biosolids; or the density of salmonella, sp.[1] shall not be greater than three MPN per four (4) grams.

13. Dischargers shall implement one of the available vector attraction reduction requirements listed in 40 C.F.R. section 503.33.

[1] As determined by a U.S. EPA approved method other than a method in “Standard Methods for the Examination of Water and Wastewater” 18th Ed., 1992, American Public Health Assn., 1015 15th Street NW Washington, DC 2005; and other than the method found in Kenner, B.A. and H.P. Clark, “Detection and Enumeration of Salmonella and Pseudomonas aeruginosa,” Journal of Water Pollution Control Federation, Vol. 46, No. 9, September 1974, pp. 2163-2171. Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314.

14. Biosolids with less than 75 percent moisture shall not be applied during wind gusts of over 25 miles per hour (as determined by the nearest calibrated regional weather station [e.g., airport, CIMS]).

15. If biosolids are to be incorporated into soil, they shall be incorporated via disking:

    a. Within 24 hours after application in arid areas;

    b. Within 24 hours after application in non-arid areas between 1 May and 31 October, and

    c. Within 48 hours after application in non-arid areas between 1 November and 30 April.

16. Prior to biosolids application to ground surfaces with slopes greater than 10 percent (see Finding No. 27), and subject to the prohibition in section A.14 of this Order, Dischargers shall submit a Conditional Biosolids Application Site Report in accordance with section G of this Order.

17. Structures conveying tail water shall be designed and maintained to minimize any field erosion. Tail water structures shall be boarded and wrapped with plastic prior to any biosolids application but removed after biosolids incorporation into the soil.

18. "Class B" biosolids (see 40 C.F.R. section 503.32) shall comply with the following.

    a. The discharge of tail water or field runoff is prohibited within 30 days after application of biosolids for areas where biosolids have not been incorporated into the soil, and where there is not a minimum of 33 feet[2] of un-mowed grass or similar vegetation bordering the application area and along the path of runoff to prevent movement of biosolids particles from the application site.

    b. For **at least 12 months** after application of biosolids, grazing of milking animals used for producing unpasteurized milk for human consumption is prevented, if the field is used as pasture.

    c. After an application of biosolids in any field, Dischargers shall ensure the following site restrictions (See 40 C.F.R. section 503.32(b)(5)):

        i. For **at least 30 days**, food crops, feed crops, and fiber crops, whose edible parts do not touch the surface of the soil, shall not be harvested.

[2] For sites where the topography slopes are greater than 10 percent, the minimum width of vegetative border shall be proposed in accordance to Discharge Specification B.16 above.

ii. For **at least 30 days**, public access to the site with a low potential for public exposure is restricted.

iii. For **at least 12 months**, public access to the site with a high potential for public exposure is restricted.

iv. For **at least 12 months**, turf shall not be harvested if the harvested turf is placed on land with a high potential for contact by the public, as defined in 40 C.F.R. section 503.11.

v. For **at least 14 months**, food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface shall not be harvested.

vi. For **at least 20 months**, food crops with harvested parts below the land surface when applied biosolids remain exposed on the surface for more than 4 months (prior to incorporation into the soil), shall not be harvested.

vii. For **at least 38 months**, food crops with harvested parts below the land surface when applied biosolids remain exposed on the surface for less than 4 months (prior to incorporation into the soil), shall not be harvested.

19. Until the appropriate technical report is approved pursuant to section G of this order, for **at least 60 days** after application of biosolids, domesticated animals shall not be grazed, if the daytime temperatures average exceeds 50 degrees Fahrenheit (otherwise a **90 day period** shall apply).

20. Subject to any larger setback requirements imposed by a local agency for the protection of the environment and public health, all Facility staging, storage, and biosolids application areas shall maintain the following setbacks distances:

a. **25 feet** from the edge of the Silva Ranch property line;

b. **500 feet** from any domestic water supply wells or occupied dwellings;

c. **50 feet** from any public roads and occupied onsite residences; and

d. **100 feet** from the high water mark of Laguna and Hadselville Creeks and their tributaries, and any ponds, lakes, wetlands, underground aqueducts, or vernal pools.

21. Biosolids shall be staged, stored and applied in accordance with the approved Biosolids Management Plan, and in a manner that controls and minimizes windblown material (e.g., dust) and biosolids movement offsite.

C. Mass Loading Limitations

1. Biosolids shall not be applied at rates exceeding the agronomic rate for nitrogen for the crop being grown.

2. Biosolids shall not be applied in amounts exceeding the risk-based cumulative loading rates (adjusted to account for background metals concentrations) as defined below:

$$BC = CP - 1.8(BS)$$

***Where*:** **BC** = Background Adjusted Cumulative Loading Rate (lb/ac)

CP = Cumulative Pollutant (CP) Loading Rate (lb/ac) (See 40 C.F.R. section 503.13 Table 2)

BS = Actual Background Site Soil Concentration (mg/kg)

And where the values for CP for each metal are specified below:

Pollutant	Cumulative Pollutant (CP) Loading Rate (lbs/ac)
Arsenic	36
Cadmium	34
Copper	1,336
Lead	267
Mercury	15
Molybdenum	16
Nickel	374
Selenium	89
Zinc	2,494

For each field receiving biosolids, compliance is determined by comparing the cumulative loading rates for each pollutant BC.

D. Land Application Area Specifications

1. Dischargers shall apply biosolids in accordance with their operative Biosolids Management Plan.

2. All fields within LAAs designated for receiving biosolids shall be planted with durum wheat, sudan grass, or similar crops.

3. Biosolids may be applied to LAAs with slopes exceeding 10 percent only if each of the following conditions are met:

   a. The Conditional Biosolids Application Site Report is approved (see section G.3 of this Order);

   b. The soil depth is sufficient to support the crops to be planted at the LAA;

c. The slope will allow safe operation of spreading and tilling equipment;

d. The slope can be tilled, planted, and grazed without causing or exacerbating soil erosion; and

e. The Dischargers are implementing the erosion control plan submitted as part of an approved Conditional Biosolids Application Site Report.

4. Public access to the LAAs shall be restricted for **at least 30 days** after biosolids application, based on the low potential for public exposure.

5. Biosolids application to the LAAs shall not be performed during rainfall or ground saturation.

6. Biosolids shall not be applied to any LAAs within a designated 100-year flood plain between **15 October and 15 April**.

7. Discharge of storm water runoff from LAAs to other areas within Silva Ranch or surface water drainage courses (offsite or onsite) is prohibited, except as allowed by Discharge Prohibition A.7.

8. Storm water runoff from LAAs shall be captured and recycled for irrigation, or allowed to percolate within designated LAAs.

9. Public contact with biosolids LAAs shall be controlled using fences, signs, and other appropriate means.

E. Biosolids Storage & Transportation Specifications

For the purposes of this Order, biosolids are considered “staged” if briefly placed on the ground solely to facilitate transfer of the biosolids between transportation and application equipment. Biosolids are “stored” if they are: (a) either placed on the ground, or kept in an offloaded non-mobile container; (b) at the application site or an intermediate location away from the generator/processing site; and (c) for more than 48 hours. Storage sites holding biosolids between two and seven consecutive days are considered “short-term,” whereas storage sites holding biosolids for more seven consecutive days are considered “long-term.”

1. Under no circumstances shall biosolids with less than 15 percent solids be kept at any storage facility prior to application.

2. Biosolids with “free liquids” shall not be placed on the ground prior to application at the designated LAA (excluding equipment cleaning operations).

3. Biosolids shall not be stored for more than seven (7) consecutive days prior to application.

4. Biosolids storage sites shall be located, designed, maintained and operated to:

a. Restrict public access to “Class B” biosolids;

b. If storing biosolids between 15 October and 15 April, prevent washout or inundation from a storm or flood with a return frequency of 100 years;

c. Contain all storm water falling on the biosolids storage area during a 100-year rainfall year; and

d. Minimize leachate generation and erosion.

5. Biosolids storage sites shall be operated in accordance with the approved Short-Term Biosolids Storage Plan and Biosolids Management Plan.

6. All biosolids materials shall be transported:

a. In covered vehicles capable of containing transported biosolids;

b. If capable of generating “free liquids,” inside sealed (leak-proof) containers and/or vehicles;

c. By properly-trained drivers and personnel who are alerted as to the nature of their biosolids cargo, and provided with a copy of the approved Biosolids Spill Response Plan;

d. Along routes avoiding residential areas to the extent possible, and if residential routes are unavoidable, during daylight hours only;

7. Dischargers shall immediately remove and relocate any biosolids stored or applied on site in violation of this Order.

F. Groundwater Limitations

Release of waste constituents from any portion of the application site shall not cause groundwater to:

1. Exceed a total coliform organism level of 2.2 MPN/100 mL over any seven-day period.

2. For constituents identified in Title 22, contain constituents in concentrations that exceed either the Primary or Secondary MCLs established therein.

3. Contain taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that causing nuisances or adversely affecting beneficial uses.

G. Provisions

The following reports shall be submitted pursuant to Water Code 13267, and shall be prepared as described in section G.6:

1. **Discharge Specification Compliance Work Plan**

Within **30 days of this Order**, Dischargers shall submit for Central Valley Water Board staff review a work plan describing the methods by which they will demarcate and distinguish between designated LAAs to comply with the Discharge Specifications set forth in section B of this Order.

2. **30-Day Grazing Restriction Assessment Report**

a. If Dischargers intend to permit cattle and other animals to graze on a field that has received biosolids for application within the preceding 60 days (if average daytime temps. 50°F or higher) or within the preceding 90 days (otherwise), Dischargers shall submit a 30-Day Grazing Restriction Assessment Report to the Executive Officer. This report shall provide a technical justification for the U.S. EPA's minimum 30-day restriction, set forth in 40 C.F.R. part 503, as being adequately protective of land productivity and animal health (without any additional waiting periods for biodegradation).

b. Regarding to land productivity, the report shall include the following:

i. A certified soil scientist or agronomist's evaluation of the potential effects of grazing on land productivity (e.g., potential nutrient imbalances, metal phytotoxicity, excessive salinity, etc.), with consideration of:

(a) The nature of LAA soils at the Facility;

(b) Biosolids characterization data;

(c) Current biosolids application rates at the Facility;

(d) Current soil management and grazing practices at the Facility;

(e) The need to preserve short-term and long-term land productivity; and

(f) The information in the following Table.

Limitation to Land Application			
Parameter	**Slight**	**Moderate**	**Severe**
Cation exchange capacity [a] (avg. meq/100g, 0-20" depth)	> 15	10 - 15	< 10
pH [b] (avg. 0-20" depth)	> 6.5	5.0 – 6.5	< 5.0
Erosion hazard rating [c]	None to Slight [d]	Moderate	High to Severe [e]

a. Cation exchange capacity limits based on professional judgement. b. pH limits based on U.S. Department of Agriculture (1993). c. Erosion hazard limits based on professional judgment. d Slopes of 3% or less are deemed to have only a "slight" erosion hazard rating. e Under no circumstances shall grazing be permitted in an area associated with a "severe" erosion hazard rating.

ii. A satisfactory demonstration, by the certified soil scientist or agronomist, that the 30-day period set forth in 40 C.F.R. part 503 is adequately protective of land-productivity.

iii. Either an available Erosion Hazard Reports (derived from USDA soil survey reports) or, if no such reports are available, a Soils Survey Report prepared by a qualified soil scientist, using NCRS Guidelines to determine the erosion hazard of LAA slopes over 3 percent.[3]

c. Regarding animal health, the report shall include an evaluation from a qualified animal health professional (i.e., a veterinarian or similarly-qualified person) with experience in epidemiology, toxicology and the medical ecology of infectious diseases potentially transferred between livestock, wildlife and humans. This evaluation shall demonstrate that:

i. The 30-day waiting period under 40 C.F.R. part 503 is sufficient to prevent animal toxicity and other potential health risk exposures to pathogens and synthetic organic compounds (SOCs), which would not persist significantly longer than 30 days after biosolids application; and

ii. There is a low potential for increased incidence of disease resulting from ingestion of pathogenic organisms in crops grown on Facility LAAs or from animals fed with crops grown on Facility LAAs.

3. **Conditional Biosolids Application Site Report**

a. **By 1 April 2019**, if biosolids are applied to ground surfaces having a slope greater than 10 percent, the Discharger shall submit for review and verification of the requirements specified below.

b. The report shall include an Erosion Control Plan that:

[3] At sites having a "moderate" limitation, biosolids may be applied only where the crop is not known to be particularly sensitive to metals and nutrient imbalances or is not known to be bioaccumulative of heavy metals. Sites having a "severe" limitation are prohibited. Sites with a slope of greater than 20 percent shall not accept biosolids unless those sites will be immediately covered by sod or a sufficient mulch cover to control erosion.

i. Describes site conditions (within an appropriate-sized range of slopes, e.g., 12 to 15 percent) that will support the application and full containment of biosolids without soil erosion; and

ii. Specifies the application practices and management practices to be implemented, which will ensure full containment of biosolids at the site of application, and prevent soil erosion.

c. The report shall be prepared by one of the following professionals:

i. Certified Soil Scientist;

ii. Certified Agronomist;

iii. Registered Agricultural Engineer; or

iv. Registered Civil Engineer, or a Certified Professional Erosion and Sediment Control Specialist.

4. **Revised Biosolids Management Plan**

By 1 May 2019, Dischargers shall submit a Revised Biosolids Management Plan. The Biosolids Management Plan dated 1 June 2017 shall be updated to include the following:

a. Description of the measures and controls implemented to prevent or minimize windblown material (i.e. dust) and biosolids movement offsite during the transportation, application, and storage of biosolids, specifically the handling of biosolids with a moisture content less than 50 percent.

b. Animal grazing management plan that describes measures and controls implemented to prevent transfer of biosolids to adjacent creeks via the grazing animals' hooves and skin,

5. **Construction of "Long-Term" Storage Site**

a. If a "long-term" storage facility is to be constructed (see definition in section E above), Dischargers shall submit a new RWD that includes the design of the biosolids storage facility in accordance with Class II surface impoundment or waste pile standards contained in Chapter 15, a construction management plan and schedule, and a Long-Term Biosolids Storage Plan.

b. The storage facility shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years. The storage facility shall be designed and maintained to contain all storm water falling on the biosolids storage area during a 100-year rainfall year.

6. **General Requirements for Technical Reports**

   a. In accordance with Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain work plans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.

   b. Dischargers shall submit the technical reports and work plans required by this Order for consideration by the Executive Officer and incorporate any Executive Officer comments in a timely manner, as appropriate under the circumstances.

   c. Unless expressly stated otherwise in this Order, the Discharger shall proceed with all work required by the foregoing provisions by the due dates specified.

7. Dischargers shall comply with the separately-issued Monitoring and Reporting Program No. R5-2019-0002 (incorporated herein), and any subsequent revisions thereto by the Executive Officer. The submittal dates of Discharger self-monitoring reports shall be no later than the submittal date specified in the MRP.

8. Except as otherwise directed herein, Dischargers shall comply with the Central Valley Water Board's Standard Provisions and Reporting Requirements for WDRs dated 1 March 1991, which is attached hereto and incorporated herein. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

9. Dischargers shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, Dischargers shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then Dischargers shall state the reasons for such noncompliance and provide an estimated date of compliance. Dischargers shall notify the Central Valley Water Board in writing when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

10. Dischargers shall continually properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory

controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Dischargers when the operation is necessary to achieve compliance with the conditions of this Order.

11. Dischargers shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.

12. As described in the Standard Provisions, Dischargers shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.

13. If Dischargers report toxic chemical release data to the State Emergency Response Commission (SERC) pursuant to section 313 of the Emergency Planning and Community Right to Know Act (42 U.S.C. section 11023), Dischargers shall also report the same information to the Central Valley Water Board within 15 days of the report to the SERC.

14. **At least 90 days** prior to termination or expiration of any lease, contract, or agreement involving disposal or recycling areas or off-site reuse of effluent, used to justify the capacity authorized herein and assure compliance with this Order, Dischargers shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

15. In the event of any change in control or ownership of the biosolids application areas, Dischargers shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

16. To assume operation as “Discharger” under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

17. A copy of this Order (including the Information Sheet and all attachments), the separately-issued MRP R5-2019-0002 (with subsequent amendments thereto), and the Standard Provisions shall be kept at the discharge facility for reference by operating personnel, who shall be familiar with their contents.

18. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

If, in the opinion of the Executive Officer, either Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

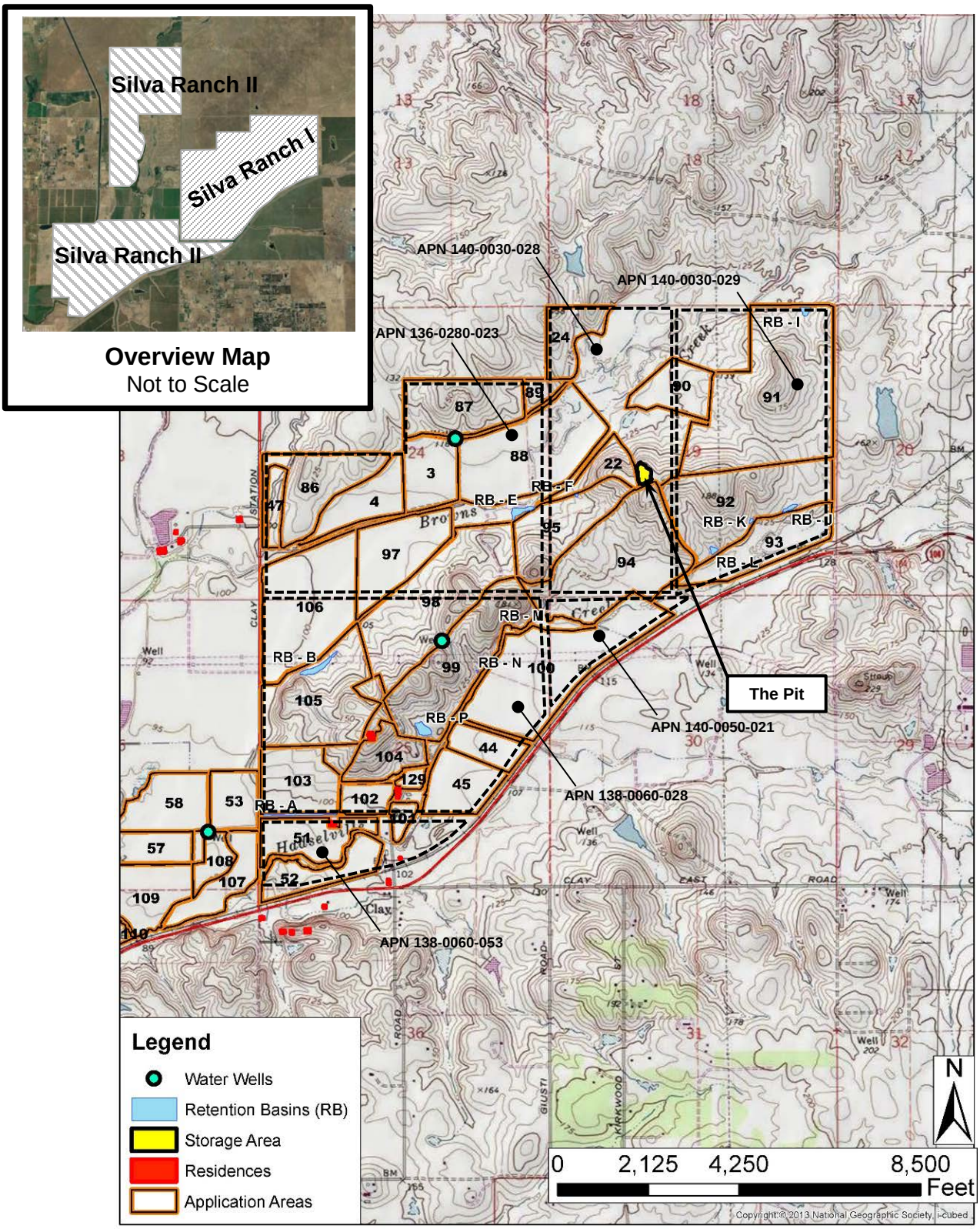
Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board for administrative review in accordance with Water Code section 13320, and California Code of Regulations, title 23, section 2050 et seq. To be timely, the State Water Board must receive the petition by 5pm on the 30th day after the date of this Order, except that if the 30th day falls on a Saturday, Sunday or State Holiday, the petition must be received by the State Water Board by 5pm on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet (at the address set forth below), or will be provided upon request.

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

I, PATRICK PULUPA, Executive Officer, do hereby certify that the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 7 February 2019.

- original signed by -

PATRICK PULUPA, Executive Officer



LEGEND

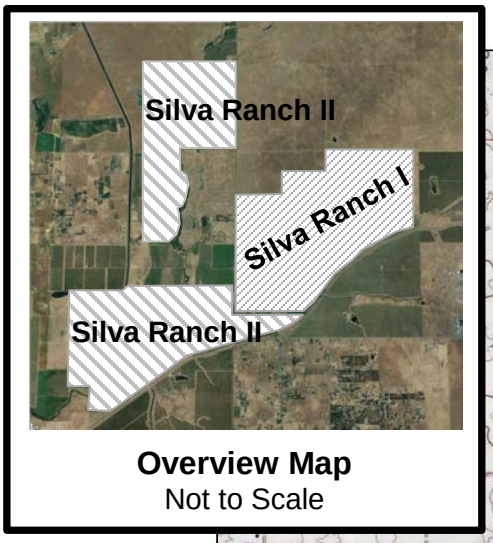
LAA Land Application Areas

APN Boundary

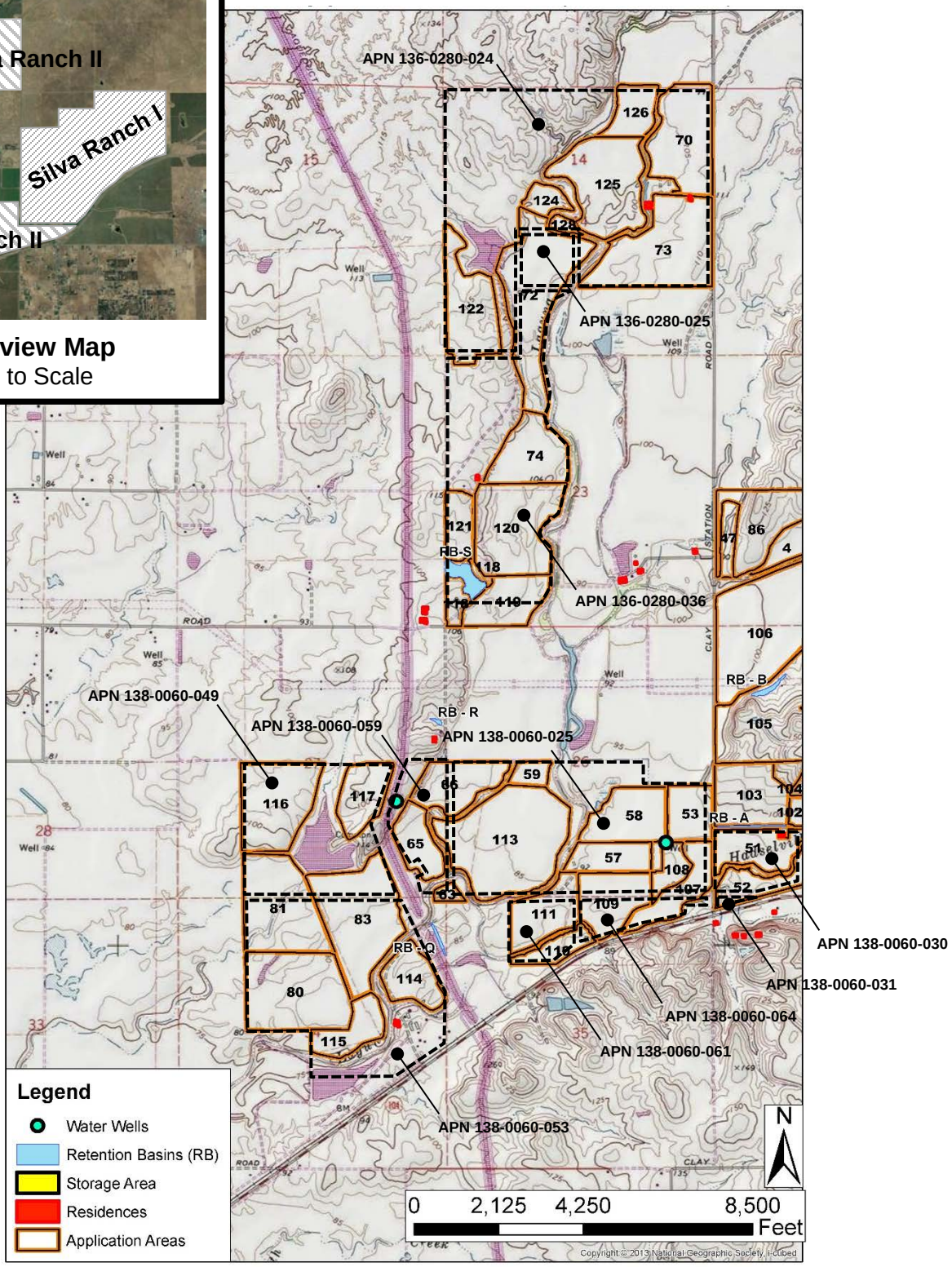
LOCATION MAP

SYNAGRO/SILVA RANCH I
BIOSOLIDS APPLICATION SITES
SACRAMENTO COUNTY

approx. scale
1" = 2,000'



Overview Map
Not to Scale



LEGEND

LAA Land Application Areas

APN Boundary

LOCATION MAP
SYNAGRO/SILVA RANCH II
BIOSOLIDS APPLICATION SITES
SACRAMENTO COUNTY

approx. scale
1" = 2,000'

BIOSOLIDS MONITORING RESULTS

Generator Information

Owner Name _____

Facility Name _____

RWQCB Region _____

County _____

NPDES Permit No. _____

WDRs Order No. _____

Project Information

Project Type _____ Pond cleanout _____ Continuous wasting/drying
_____ Drying bed cleanout _____ Stockpile Disposal

Estimated Project Duration _____ to _____

Estimated Total Mass [4] _____ dry tons this calendar year

Required EPA Certification Frequency _____

Stabilization Method _____

Pathogen Reduction Method [8] _____

Vector Attraction Reduction Option [9] _____

Sampling Information

[1] Lab Sample ID						
[2] Sampler's Sample ID						
[3] Sampler						
Sample Date						
Analysis Date						

Analytical Result	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**
Fecal coliform, MPN/g												
Total solids, percent												
Total nitrogen, mg/Kg												
Ammonia nitrogen, mg/Kg												
Nitrate nitrogen, mg/Kg												
Total phosphorus, mg/Kg												
Total potassium, mg/Kg												

Nitrogen Loading Rate

[5] Mineralization rate, percent												
[6] Volatilization factor, percent												
[7] Units conversion factor												
[10] PAN, lbs/ton												

Footnotes

[1] Sample ID assigned by the analytical laboratory.

[2] Sample ID from chain of custody form.

[3] Specify whether sampling was performed by Synagro or generator/generator's contractor.

[4] Estimated mass to be land applied at this site.

[5] Equals 20% for anerobically digested; 30% for aerobically digested; 25% for aerobically/anaerobically digested; 40% for lime-stabilized; 10% for composted.

[6] Equals 50% for surface application; 100% for subsurface injection.

[7] Equals 0.002 lbs/ton per mg/Kg.

[8] Specify in detail. For example: "Class B - anaerobic digestion for ___ to ___ days at ___ to ___ degrees F (range for past month)".

[9] Specify in detail. For example: "Option 1 - volatile solids reduction greater than 38%; VS in = ___, VS out = ___".

[10] Equals (mineralization rate * Org N concentration) + (volatilization rate * Ammonia concentration) + (nitrate concentration) * (0.0023 unit conversion)

Sampling Information

[1] Lab Sample ID			
[2] Sampler's Sample ID			
[3] Sampler			
Sample Date			
Analysis Date			

Metals Analyses

	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Regulatory Limits				
							40 CFR 503 (dry wt. basis)		22 CCR (wet wt. basis)		
							mg/Kg	mg/Kg	mg/L	mg/L	mg/Kg
							Table 1	Table 3	STLC	10 x STLC	TTLC
Arsenic, mg/Kg							75	41	5	50	500
Cadmium, mg/Kg							85	39	1	10	100
Copper, mg/Kg							4,300	1,500	25	250	2,500
Lead, mg/Kg							840	300	5	50	1,000
Mercury, mg/Kg							57	17	0.2	2.0	20
Molybdenum, mg/Kg							75		350	3,500	3,500
Nickel, mg/Kg							420	420	20	200	2,000
Selenium, mg/Kg							100	36	1	10	100
Zinc, mg/Kg							7,500	2,800	250	2,500	5,000
Semi-volatile organic compounds, detections only (mg/Kg)											
PCBs/aldrin/dieldrin, detections only (mg/Kg)											

OWNER NAME _____
FACILITY NAME _____

MONTHLY FIELD MONITORING RESULTS

Month _____ **Year** _____

Field Information

Field ID No.				
Gross Acreage				
Net Acreage				
Crop				
Anticipated Planting Date				
Anticipated Harvest Date				
Anticipated Irrigation Date(s)				
Next Allowable Runoff Date				

Source Information

Source ID Code	Owner Name	Facility Name

Biosolids Application Information (tonnage per field)

Day of Month	Source ID	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
Total Application (tons)									
Application Rate (tn/ac)									
PAN Application (lb)									
PAN Rate (lb/ac)									
Phosphorus Rate (lb)									
Phosphorus Rate (lb/ac)									
Potassium Rate (lb)									
Potassium Rate (lb/ac)									

ANNUAL FIELD ACTIVITIES SUMMARY

Year ________ **Field ID Number** ________________

Gross Acreage ____________
Net Acreage ____________
Crop ____________
Actual Planting Date ____________
Actual Harvest Date ____________

Month	Date	Biosolids Applied		PAN Applied tn/ac	P Applied tn/ac	K Applied tn/ac	Irrigation		Precipitation inches	Runoff Control Status
		wet tn	dry tn				gallons	inches		
Totals										

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2019-0002

FOR
SYNAGRO WEST, LLC AND GARY SILVA, SR
SILVA RANCH BIOSOLIDS LAND APPLICATION SITES
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code section 13267. Dischargers shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. Except as specified otherwise in this MRP, grab samples will be considered representative of water, wastewater, soil, solids/sludges, and groundwater.

The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements dated 1 March 1991 (Standard Provisions). Field test instruments (such as those used to measure pH, electrical conductivity, dissolved oxygen, wind speed, and precipitation) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;

2. The instruments are field calibrated at the frequency recommended by the manufacturer;

3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and

4. Field calibration reports are submitted as described in the “Reporting” section of the MRP.

Laboratory analytical procedures shall comply with the methods and holding times specified in the following (as applicable to the medium to be analyzed):

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA);

- *Test Methods for Evaluating Solid Waste* (EPA);

- *Methods for Chemical Analysis of Water and Wastes* (EPA);

- *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA);

- *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and

- *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125).

Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program (ELAP). The Dischargers may propose alternative methods for approval by the Executive Officer. Where technically feasible, laboratory reporting limits shall be lower than concentrations that implement applicable water quality objectives/limits for the constituents to be analyzed.

A glossary of terms used in this MRP is included on the last page.

BIOSOLIDS MONITORING

Biosolids from each generator shall be sampled and analyzed as follows. Generator information shall include at a minimum, facility, mailing address, facility contact person, level of pathogen treatment ("Class A" or "Class B"), and description of vector attraction reduction achievement. Small generators are those that generate and/or land apply less than 350 dry tons per year (either during a cleanout project or by continuous wasting and disposal). Large generators are all others. Results for all chemical constituents shall be reported in mg/Kg on a dry weight basis. Composite samples may be used in lieu of grab samples if all required sample holding times are met.

For Generators Using Continuous Sludge Wasting and Disposal and for Pond Cleaning Projects:

Constituents	Sample Type	Units	Sampling Schedule		Reporting Frequency
			Small Generator	Large Generator	
Metals (total) [1]	Grab	mg/Kg	1 per 6 months	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
PCB aroclors, aldrin, dieldrin [2]	Grab	mg/Kg	1 per 6 months	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Semi-volatile Organic [3]	Grab	mg/Kg	1 per 6 months	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Percent Moisture [5]	Calculated	%	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly[4]
Ammonia Nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Nitrate Nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

Constituents	Sample Type	Units	Sampling Schedule		Reporting Frequency
			Small Generator	Large Generator	
Total Phosphorus	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Potassium	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Solids	Grab	%	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Fecal Coliform [6]	Grab	MPN/gram	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

Notes:

1 Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
2 Using SW 846 Method 8080.
3 Using EPA Method 8270.
4 Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.
5 The result of subtracting the percent total solids from 100.
6 Sampling and analysis for Class A biosolids only.

If, for a particular biosolids generator, it can be demonstrated that the biosolids material exhibits consistent chemical character over a period of at least two years, the applicable sampling schedule may be reduced upon written approval of a Biosolids Monitoring Data Summary Report. The report shall contain tabulated analytical data summaries for all biosolids monitoring data for the previous three years.

For Generators with Stockpile Disposal Projects:

Constituents	Sample Type	Unit	Number of Samples	Reporting Frequency
Metals (total) [1]	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
PCB aroclors, aldrin, dieldrin [2]	Composite	mg/Kg	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Semi-volatile Organic [3]	Composite	mg/Kg	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Percent Moisture [5]	Calculated	%	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Nitrogen	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Ammonia Nitrogen	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Nitrate Nitrogen	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]

Constituents	Sample Type	Unit	Number of Samples	Reporting Frequency
Total Phosphorus	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]
Total Potassium	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]
Total Solids	Composite	%	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Fecal Coliform [6]	Composite	MPN/gram	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

Notes:

[1] Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
[2] Using SW 846 Method 8080.
[3] Using EPA Method 8270.
[4] Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.
[5] The result of subtracting the percent total solids from 100.
[6] Sampling and analysis for Class A biosolids only.

The analytical data shall be presented in the monthly monitoring report(s) for the month(s) in which application of the biosolids occurs. For months in which no application takes place, the Monthly Monitoring Report shall so state.

ROUTINE FIELD MONITORING

The Dischargers shall establish and implement an inspection and application oversight program to monitor and control biosolids application rates, and to ensure compliance with the WDRs.

Each discrete application field (land application area) shall be managed and monitored as follows:

1. **Pre-Application Oversight**

    a. Identify generator(s) whose biosolids are to be applied.

    b. Define crop to be planted.

    c. Calculate allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data for the generator(s)' biosolids.

    d. Document communication of allowable loading rates to spreader operator.

2. **Pre-Application Inspection**

    a. Verify that setbacks are clearly delineated.

    b. Verify that runoff controls are in place and functional.

    c. Verify that culverts are blocked (where applicable).

3. **Application Oversight**

   a. Verify compliance with setbacks and allowable loading rate.

   b. Verify compliance with soil incorporation requirements.

4. **Post-Application Oversight**

   a. Confirm with irrigation manager requirements to control runoff for the specified period after application.

   b. Calculate actual biosolids and PAN loading rates.

   c. Note anticipated dates of planting, irrigation, and harvest.

SOIL MONITORING

The Dischargers shall establish an annual soil sampling program as follows: two background sampling locations outside of the land application areas (e.g., within application setback areas) and at least six sampling locations within each discrete land application area identified in the WDRs that has received biosolids in the last 12 calendar months. Sampling locations shall be distributed to be representative of each subarea and predominant soil type. Soil samples shall be collected from each sampling location at the following depth intervals: 0 to 1 foot, 2 to 3 feet, and 5 to 6 feet below the ground surface. Each 12-inch sample shall be thoroughly mixed to create a composite sample representative of the depth interval, and shall be analyzed as follows:

Constituents	**Units**	**Sampling Frequency** [3]	**Reporting Frequency**
Soil Classification (USCS and USDA)	---	Annually	Annually
pH	Std Units	Annually	Annually
Total Solids [1]	% total weight	Annually	Annually
Total Alkalinity [1]	mg/Kg as CaCO3	Annually	Annually
Cation Exchange Capacity [1]	meq/100 grams	Annually	Annually
Electrical Conductivity	µmhos/cm	Annually	Annually
Chloride [2]	mg/L	Annually	Annually
Iron [2]	mg/L	Annually	Annually
Manganese [2]	mg/L	Annually	Annually

Notes:

1 To be reported on a dry weight basis; show calculations.

2 Analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.

3 Samples shall be collected in the fall (fourth quarter). Sampling must occur at the same time each year.

STORM WATER RETENTION POND MONITORING

Storm water samples shall be obtained from each of the storm water retention ponds, as defined in the Waste Discharge Requirements (WDRs), when water is present. Grab samples will be considered representative. Storm water monitoring shall include, at a minimum, the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
pH	Std.	Grab	Monthly	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
Nitrate Nitrogen	mg/L	Grab	Monthly	Monthly
Ammonia Nitrogen	mg/L	Grab	Monthly	Monthly
Standard Minerals [1]	mg/L	Grab	Monthly	Monthly
Metals [2]	mg/L	Grab	Monthly	Monthly

Notes:
[1] Standard Minerals shall include, at a minimum, the following: chloride, iron, manganese, and sodium.
[2] Metals shall include cadmium, copper, lead, nickel, and zinc.

Analytical data and a map identifying sample locations shall be presented in the Annual Report.

REPORTING

All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents less than 50MB should be emailed to:

centralvalleysacramento@waterboards.ca.gov

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board
ECM Mailroom
11020 Sun Center Drive, Suite 200
Rancho Cordova, California 95670

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any correspondence used to transmit documents to this office:

Silva Ranch Biosolids Land Application, Sacramento County		
Program: Non-15 Compliance	Order: R5-2019-0002	CIWQS Place ID: 257072

In reporting monitoring data, the Dischargers shall arrange the data in tabular form using the format provided in the example tables, which are part of this MRP, or in another approved

format so that the date, sample type (e.g., biosolids, soil, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed and stamped by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board on the **1st day of the second month following the end of the monitoring period** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. A scaled site map depicting each discrete field, property boundaries, roads, on-site structures, surface water bodies, drainage features, and runoff controls (as applicable);

2. The results of biosolids monitoring for each biosolids generator whose waste were applied to land during the month. Specifically, tabulated data for each generator and verification of compliance with the biosolids monitoring requirements shall be provided using the attached Biosolids Monitoring Results form (or approved revision thereof). Laboratory analytical reports need not be included, but must be provided upon request;

3. The results of routine field monitoring. Specifically, tabulated information for each discrete application field used during the month shall be provided using the attached Field Monitoring Results form (or approved revision thereof) and metals loading rate for the month;

4. For each biosolids generator and discrete application field, a comparison of monitoring data to Prohibition A.10 and Mass Loading Limit C.2 and an explanation of any violation of those requirements;

5. If no biosolids were applied during the month, a letter report certifying that fact; and

6. The results of storm water retention pond monitoring.

B. Annual Report

An Annual Report shall be prepared and submitted to the Regional Board by **1 February** each year. The Annual Report shall include the following:

1. The monthly monitoring report for the last month of the calendar year.

2. In tabular format, the total mass (dry tons) of biosolids received from each biosolids generator for each month in the calendar year.

3. For each discrete application field, the total biosolids applied, irrigation, precipitation, and runoff control operations for each month in the calendar year. Specifically, tabulated information for each discrete application field shall be provided using the attached Field Activities Summary form (or approved revision thereof).

4. In tabular format, for each discrete application field:

    a. Total cumulative metals loading rates (lbs/acre) as of the end of the previous calendar year;

    b. Calculated total metals and plant available nitrogen (PAN) loading rates (lbs/acre) for the calendar year and provide calculations to obtain PAN loading results;

    c. The cumulative metals loading rates (lbs/acre) since biosolids land application began, which is the sum of metals from newly applied and from previously applied biosolids; and

    d. The cumulative metals loading rates to date as a percentage of the cumulative metals loading limits.

5. A report of soil monitoring, including:

    a. Sampling and analysis activities, including a scaled map of sampling locations;

    b. Tabulation of all soil analytical results;

    c. Historical time vs. concentration plots for each constituent at each sampling interval;

    d. A discussion of any observed spatial or temporal variation; and

    e. Whether pH adjustment is needed and, if so, how and when the adjustment will be made.

6. A storm water retention pond monitoring summary report including:

    a. The contents of the regular storm water monitoring report for the last sampling event of the calendar year;

    b. Tabular summaries of all data collected during the calendar year; and

    c. Dates when storm water runoff was released to surface waters and/or used for irrigation, and the volume discharged on each day.

7. An evaluation of the potential effects including potential nutrient imbalances, metals phytotoxicity, and excessive salinity on land productivity based on site soils and biosolids characterization. If any detrimental impact to soil productivity or animal health is identified, include a discussion of corrective actions taken, planned, or proposed.

8. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.

9. A discussion of any data gaps and potential deficiencies or redundancies in the monitoring system or reporting program.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall clearly indicate the submitting Discharger's name, facility or site name, county, monitoring period, and type of report (i.e., monthly, quarterly, or annual). The letter shall include a discussion of any requirement violations during the reporting period and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to the Standard Provisions and Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or its authorized agent, under penalty of perjury, that to the best of the signer's knowledge, the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program as of the date of this Order.

I, PATRICK PULUPA, Executive Officer, do hereby certify that the foregoing is a full and correct copy of a Monitoring and Reporting Program issued by the California Regional Water Quality Control Board, Central Valley Region on 7 February 2019.

- original signed by -

PATRICK PULUPA, Executive Officer

ATTACHMENTS: Biosolids Monitoring Results Form
Monthly Field Monitoring Results Form
Annual Field Activities Summary Form

GLOSSARY

BOD_5	Five-day biochemical oxygen demand
CaCO3	Calcium carbonate
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-hr Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots over a 24-hour period.
Daily	Every day except weekends or holidays.
Twice Weekly	Twice per week on non-consecutive days.
Weekly	Once per week.
Twice Monthly	Twice per month during non-consecutive weeks.
Monthly	Once per calendar month.
Bimonthly	Once every two calendar months (i.e., six times per year) during non-consecutive months.
Quarterly	Once per calendar quarter.
Semiannually	Once every six calendar months (i.e., two times per year) during non-consecutive quarters.
Annually	Once per year.
mg/L	Milligrams per liter
mL/L	Milliliters [of solids] per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
gpd	Gallons per day
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
MTF	Multiple tube fermentation

ORDER R5-2019-0002
SYNAGRO WEST, LLC AND GARY SILVA, SR
SILVA RANCH BIOSOLIDS LAND APPLICATION
SACRAMENTO COUNTY

INFORMATION SHEET

Gary Silva, Sr. (Silva) owns the Silva Ranch property that receives biosolids. The biosolids application site is approximately 3,000 acres of agriculturally zoned land located on property designated as "Silva Ranch I" and "Silva Ranch II," which consists of multiple parcels divided into numerous individual fields. Synagro West, LLC (Synagro) manages the application of biosolids on the Silva Ranch property and, like Silva, is also responsible for compliance with these Waste Discharge Requirements (WDRs).

Silva Ranch I and Silva Ranch II have been receiving biosolids as a soil amendment since 1995 and 1998, respectively. "Class A" and "Class B" biosolids are accepted year-round as a fertilizer for the production of durum wheat and sudan grass crops. Crops are grown and harvested for the production of livestock feed or used for grazing of livestock.

WDRs Order 95-064, adopted by the Central Valley Water Board on 24 March 1995, prescribes requirements for the discharge of biosolids on approximately 1,200 acres of Silva Ranch I. WDRs Order 98-023, adopted on 23 January 1998, prescribes requirements for the discharge of biosolids on approximately 1,600 acres of Silva Ranch II.

Monitoring and Reporting Program (MRP) R5-2007-0807, issued on 25 April 2007, prescribes requirements for monitoring biosolids and biosolids land application areas that are regulated under WDRs Order 95-064 and WDRs Order 98-023.

Silva Ranch receives biosolids from municipal wastewater treatment facilities from 16 California counties. Silva Ranch allows for 24-hour deliveries, seven days per week, 365 days per year weather permitting. Within 24 hours of arrival at the site, the biosolids are loaded from the ground into surface application equipment and spread onto the designated field. Disking is performed to incorporate the biosolids into the topsoil within 24 hours of application. During inclement weather, biosolids is stored at the "Pit," a "short-term" biosolids storage facility, until the weather has cleared and field conditions are suitable for application.

Land Application Areas designated to receive biosolids is summarized below.

LAA Field Designation	APN	Available Acres	Location
Field 3	136-0280-023	29.5	Silva Ranch I
Field 4	136-0280-023	28.4	Silva Ranch I
Field 22	140-0030-029	13.6	Silva Ranch I
Field 24	140-0030-029	17.5	Silva Ranch I
Field 44	138-0060-028	29.5	Silva Ranch I
Field 45	138-0060-028	9.8	Silva Ranch I
Field 47	136-0280-023	30.2	Silva Ranch I
Field 51	138-0060-030	26.2	Silva Ranch I
Field 52	138-0060-030	22.0	Silva Ranch I
Field 53	138-0060-025	21.4	Silva Ranch II

LAA Field Designation	APN	Available Acres	Location
Field 57	138-0060-025	34.9	Silva Ranch II
Field 58	138-0060-025	7.6	Silva Ranch II
Field 59	138-0060-025	3.6	Silva Ranch II
Field 65	138-0060-059	21.8	Silva Ranch II
Field 66	138-0060-059 138-0060-025	31.3	Silva Ranch II
Field 70	136-0280-024	53.4	Silva Ranch II
Field 72	136-0280-025	76.4	Silva Ranch II
Field 73	136-0280-024	73.5	Silva Ranch II
Field 74	136-0280-036	37.4	Silva Ranch II
Field 80	138-0060-053	68.7	Silva Ranch II
Field 81	138-0060-053 138-0060-049	60.9	Silva Ranch II
Field 83	138-0060-053 138-0060-049	69.9	Silva Ranch II
Field 86	136-0280-023	46.5	Silva Ranch I
Field 87	136-0280-023	48.0	Silva Ranch I
Field 88	136-0280-023	81.5	Silva Ranch I
Field 89	136-0280-023	7.2	Silva Ranch I
Field 90	140-0030-028 140-0030-029	29.0	Silva Ranch I
Field 91	140-0030-029	132.9	Silva Ranch I
Field 92	140-0030-029	78.6	Silva Ranch I
Field 93	140-0030-029	41.4	Silva Ranch I
Field 94	140-0030-028	80.7	Silva Ranch I
Field 95	140-0030-028 136-0280-023	35.2	Silva Ranch I
Field 97	136-0280-023 138-0060-028	46.0	Silva Ranch I
Field 98	136-0280-023 138-0060-028	66.0	Silva Ranch I
Field 99	136-0280-023 138-0060-028	76.7	Silva Ranch I
Field 100	138-0060-028 140-0050-021	93.3	Silva Ranch I
Field 101	138-0060-028	5.7	Silva Ranch I
Field 102	138-0060-028	12.3	Silva Ranch I

LAA Field Designation	APN	Available Acres	Location
Field 103	138-0060-028	38.1	Silva Ranch I
Field 104	138-0060-028	23.1	Silva Ranch I
Field 105	138-0060-028	71.0	Silva Ranch I
Field 106	138-0060-028	81.2	Silva Ranch I
Field 107	138-0060-025 138-0060-064	25.5	Silva Ranch II
Field 108	138-0060-025 138-0060-064	11.9	Silva Ranch II
Field 109	138-0060-025 138-0060-064	32.8	Silva Ranch II
Field 110	138-0060-061	13.3	Silva Ranch II
Field 111	138-0060-061 138-0060-025	30.7	Silva Ranch II
Field 113	138-0060-025	94.0	Silva Ranch II
Field 114	138-0060-053	23.7	Silva Ranch II
Field 115	138-0060-053	22.2	Silva Ranch II
Field 116	138-0060-049	52.9	Silva Ranch II
Field 117	138-0060-049	25.6	Silva Ranch II
Field 118	136-0280-036	10.2	Silva Ranch II
Field 119	136-0280-036	29.6	Silva Ranch II
Field 120	136-0280-036	62.7	Silva Ranch II
Field 121	136-0280-036	16.5	Silva Ranch II
Field 122	136-0280-024	44.0	Silva Ranch II
Field 124	136-0280-024	9.6	Silva Ranch II
Field 125	136-0280-024	60.8	Silva Ranch II
Field 126	136-0280-024	19.2	Silva Ranch II
Field 128	136-0280-024	3.3	Silva Ranch II
Filed 129	138-0060-028	4.0	Silva Ranch I

Storm Water Retention Basins that have the potential to collect runoff from the fields that receive biosolids is summarized below.

Basin	APN	Location
RB-A	138-0060-028	Silva Ranch I
RB-B	138-0060-028	Silva Ranch I
RB-E	136-0280-023	Silva Ranch I
RB-F	136-0280-023	Silva Ranch I
RB-I	140-0030-029	Silva Ranch I

Basin	APN	Location
RB-J	140-0030-029	Silva Ranch I
RB-K	140-0030-029	Silva Ranch I
RB-L	140-0030-029	Silva Ranch I
RB-M	138-0060-028	Silva Ranch I
RB-N	138-0060-028	Silva Ranch I
RB-P	138-0060-028	Silva Ranch I
RB-Q	138-0060-053	Silva Ranch II
RB-R	138-0060-059 [1]	Silva Ranch II
RB-S	136-0280-036	Silva Ranch II

[1] Just north of APN 138-0060-059.

Compliance Issues

In 2017, the Central Valley Water Board issued a Notice of Violation (NOV) to Silva and Synagro (Dischargers) regarding the overlapping application of compostable/green material within areas of Silva Ranch I. The overlapping application of compostable/green material is a concern to the Central Valley Water Board, as it may result in the overloading of nitrogen and other constituents. As of 28 October 2016, compostable/green material has not been applied to fields designated as LAAs to receive biosolids, but is applied on other fields within the Silva Ranch property. The Central Valley Water Board intends to address the disposal of compostable/green material through a separately-issued monitoring and reporting program and/or WDRs orders.

Compliance with State Water Board Biosolids General Order

The State Water Resources Control Board adopted Water Quality Order No. 2004-0012-DWQ, *General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities* (Biosolids General Order), on 22 July 2004. The Dischargers' biosolids land application operation at the Silva Ranch property does not qualify for regulatory coverage under the Biosolids General Order because it:

1. Exceeds the allowable 2,000 net acreage.

2. Does not comply with Discharge Specification B.10.b(2)(a) of the Biosolids General Order ("For at least 60 days after application of biosolids in areas with average daily … air temperatures exceeding 50 degrees Fahrenheit…Domesticated Animals are not grazed.").

    a. The Dischargers' current biosolids operation prevents grazing by animals whose products are consumed by humans for one month after biosolids application, which meets the minimum standards per 40 C.F.R. section 503.32.

    b. The General Order prescribes more stringent site restrictions due to potentially significant impacts related to land productivity and animal

health. Potential land productivity impacts include changes in soil fertility and salinity, changes in trace elements and heavy metal plant toxicity in soils, changes in grazing-land productivity, and soil degradation. Potential animal health impacts include the transmittal of pathogenic organisms in crops grown on biosolids application sites where animals are allowed to graze.

3. Does not comply with Prohibition A.14 of the General Order ("The application of "Class B" biosolids containing a moisture content of less than 50 percent is prohibited."), which prescribes a minimum moisture content to reduce the potential for biosolids movement offsite, specifically pertaining to visible particulate matter or windblown material.

The Biosolids General Order was developed to streamline the regulatory process for land application of biosolids as a soil amendment, but may not be appropriate for all sites using biosolids due to site-specific conditions or location. Therefore, such sites are not precluded from being issued individual WDRs. Many of the requirements of the Biosolids General Order are appropriate for this site. The Prohibitions and Discharge Specification of this Order are similar to those contained in the Biosolids General Order. Site-specific requirements that do not comply with the Biosolids General Order will be allowed based on the following:

1. This Order requires submittal of a report providing technical justification that the federally-mandated 30-day waiting period prior to allowing cattle grazing on land receiving biosolids has a low potential to affect land productivity and animal toxicity.

2. This Order requires submittal of a revised Biosolids Management Plan to address measures and controls to prevent or minimize windblown material and biosolids movement offsite during the transportation, application, and storage of biosolids, specifically the handling of biosolids with a moisture content less than 50 percent.

3. Because application sites are sometimes difficult to demarcate and distinguish, this Order requires the Dischargers to submit a workplan whereby they will propose a method for demarcating and distinguishing between application sites, and for tracking and reporting where biosolids and other materials are applied.

Site-Specific Conditions

Silva Ranch is located on moderately flat terrain, with a site elevation of 86.9 feet, and soil slopes of 0 to 20 degrees. A portion of the Ranch property falls within a 100-year flood plain. This portion is approximately 1,000 acres located at the lowest elevations of Silva Ranch I and Silva Ranch II; south of Hadseville Creek, North of Browns Creek, and West of Laguna Creek.

Silva Ranch is located in rural, remote areas of southern Sacramento County. The surrounding land uses are agricultural, typically consisting of fields planted with durum wheat and sudan grass and grazing of cattle. Rancho Seco Nuclear Generating Station and the Rancho Seco Regional Park are located southeast of the Silva Ranch property.

Soil types in the area classified by the Natural Resource Conservation Service (formerly known as the Soil Conservation Service) include Capay Clay Loam, Corning Complex, Hadselville-Pentx Complex, Hicksville Loam, Redding Gravelly Loam, and San Joaquin-Xerarents.

Groundwater Conditions

There is no groundwater monitoring network at the Silva Ranch property. Based on data from the California Department of Water Resources, depth to groundwater is approximately 150 feet.

Other Regulatory Considerations

The U.S. Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in Code of Federal Regulations, title 40, part 503 (40 C.F.R. part 503, Standard for the Use or Disposal of Sewage Sludge), which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria.

The Central Valley Water Board is using 40 C.F.R. part 503 as guidelines in establishing this Order, though it is not the implementing agency for such regulations. The Dischargers may have separate and/or additional compliance, reporting, and permitting responsibilities to the EPA.

Legal Effect of Rescission of Prior WDRs or Orders on Existing Violations

The Central Valley Water Board's rescission of prior waste discharge requirements and/or monitoring and reporting orders does not extinguish any violations that may have occurred during the time those waste discharge requirements or orders were in effect. The Central Valley Water Board reserves the right to take enforcement actions to address violations of prior prohibitions, limitations, specifications, requirements, or provisions of rescinded waste discharge requirements or orders as allowed by law.

Monitoring and Reporting Program

The Monitoring and Reporting Program is designed to verify compliance with the prohibitions, mass loading limitations, and operational requirements of the WDRs.

ATTACHMENT B

COUNTY OF SACRAMENTO
CALIFORNIA

For the Agenda of:
October 12, 2005

To: Board of Supervisors

From: Department of Environmental Review and Assessment

Subject: **Report Back on Silva Ranch Biosolids Land Application Use Permit (Control No.: 2004-UPB-0427)**

Contact: Joyce Horizumi or Robert Caikoski (874-7914)

Overview
The project consists of the renewal of three Use Permits, consolidated as one use permit, to allow digested municipal sewage biosolids to be spread upon and disked into the topsoil of grazing land on approximately 3,000 acres at the northwest and northeast corners of Clay Station Road and Twin Cities Road in the Southeast community. Your Board heard the item on September 21, 2005 and continued the item to October 12, 2005 to allow staff to address issues that were raised during the September hearing.

Recommendation
It is recommended that the Board of Supervisors consider the attached supplemental information from DERA as an addendum and find the Prior Negative Declarations as adequate and complete, and also adopt the new Mitigation Monitoring and Reporting Program.

BACKGROUND:

During the Board hearing on September 21, 2005, questions were raised by your Board regarding:

- The definitions of sludge and biosolids;
- The regulation of biosolid land application;
- LEA protocol pertaining to odor and vector control;
- The effectiveness of a recommended condition pertaining to roadway damage caused by hauling trucks;
- The contradiction between Conditions 6 and 12.

This memo will address the definitions and regulation of biosolids. The Planning Department will address the remaining issues. In addition to the Board's questions, concerns were raised by a neighbor, Mr. Upton. The attached US Environmental

Protection Agency "Frequently Asked Questions" about biosolids addresses many of the issues raised by Mr. Upton.

DISCUSSION:

Land application of biosolids is currently regulated by EPA under Standards for the Use or Disposal of Sewerage Sludge (Title 40 Code of Federal Regulations [CFR] Part 503, know as the Part 503 regulations, adopted in 1993. The Part 503 regulations were developed using a risk-based approach to determine appropriate treatment, storage, and application procedures for biosolids that would protect human health and the environment from potentially dangerous or toxic constituents that may be present in biosolids. The Part 503 regulations control the final use of biosolids according to various constituents of concern, including the level of pathogen reduction, the degree of vector attraction reduction, and the concentration of pollutants in the biosolids. The regulations were developed through extensive scientific peer review, and public notification and comment were sought before they were adopted.

Biosolids are defined as:

> *The soil-like residue of materials removed from sewage during the treatment process. During treatment, bacteria and other tiny organisms break sewage down into simpler, harmless organic matter. The organic matter combined with bacterial cell masses, settles out to form biosolids. Biosolids in their liquid form look like muddy water and contain 1-10% solids. Biosolids may be dewatered in a second step of the treatment process, which turns it into a "cake" with the texture of a wet sponge. In this stage it contains 11-40% solids.*

Biosolids are graded into two classes:

> *Class A: Material that has met the Class A pathogen reduction requirements or equivalent treatment by a Process to Further Reduce Pathogens (PFRP) in accordance with 40 CFR 503. Processes include composting, heat drying, heat treatment, thermophilic (high temperature) aerobic digestion, beta or gamma ray irradiation and pasteurization.*
>
> *Class B: Material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with 40 CFR 503. Processes include aerobic digestion, composing, anaerobic digestion, lime stabilization and air drying.*

Note: Sylva Ranch biosolid land application accepts both Class A and Class B biosolids.

Sludge is defined as follows:

> *A solid, semi-solid or liquid residue generated during the treatment of domestic sewage in a treatment works.*

The difference between biosolids and sludge:

Biosolids are treated sewage sludge. Biosolids are carefully treated and monitored and must be used in accordance with regulatory requirements.

No single state agency regulates biosolids management in California. Biosolids recycling projects involve oversight by the nine Regional Wastwater Control Boards (RWQCB), the California Integrated Waste Management Board (IWMB), the California Air Resources Board, and the California Department of Food and Agriculture (DFA). In 1983, the California Department of Health Services (DHS) published the "Manual of Good Practice for Land-spreading Sewage Sludge" to promote recycling efforts. Land application of biosolids in California is currently permitted through individual Waste Discharge Requirements (WDR) issued by the RWQCB in accordance with Title 23, Chapter 9, Division 3 of the California Code of Regulations.

In June 2004 the California State Water Resources Control Board certified a Programmatic Environmental Impact Report covering General Order for General Waste Discharge Requirements for biosolids land application as adequate and complete. Potentially significant impacts discussed in the Programmatic EIR were: land productivity, public health, land use and aesthetics, biological resources, noise, cultural resources, and cumulative nitrate contamination of groundwater. The EIR found that all potential impacts associated with these issues could be reduced to a less than significant level with the implementation of mitigation measures that each RWQCB will attached to the individual project WDR. In addition the State Water Resources Control Board adopted a Mitigation Monitoring Program to be implemented by each RWQCB. The Programmatic EIR considered the effects of applying biosolids to land at any location in the state that outside of wetlands, waterways, urbanized area or areas that are excluded from the General Order (GO). The General Order was developed to provide a single regulatory framework for the land application of biosolids and to streamline the permitting process that each RWQCB uses for biosolids application projects. The GO was based on Part 503 regulations, but to ensure further protection of the health, safety, and welfare of Californians, the GO contains a number of specific limitations, prohibitions, and discharge specifications that exceed federal standards. The GO is intended to:

- Comply with Section 13274 of the California Water Code
- Provide a regulatory framework for biosolids application to land that can be used by each RWQCB to act on Notices of Intent (NOI) filed by potential dischargers in a manner that avoids or mitigates potential adverse environmental effects
- Provide a flexible regulatory framework that allows implementation of a biosolids beneficial use program for land application operations at the regional level and contains requirements tat are based on sound science and best professional judgment.

For the subject project, the analyses contained in the Prior Negative Declarations prepared by DERA are site-specific and the recommended mitigation measures are intended to protect site-specific resources—wetlands and cultural resources—that will

work on concert with the more global requirements of state and federal regulators . General operational safeguards will be imposed by new WDR issued by the RWQCB to ensure that other potential impacts will be less than significant level.

CONCLUSION

The spreading of biosolids on the subject properties has been adequately analyzed on both the state and local levels. The State RWQCB WDR will contain general mitigation measures to reduce impacts associated with land productivity, public health, land use, aesthetics, biological resources, noise, cultural resources, and cumulative nitrate contamination of groundwater that will be enforced by the RWQCB staff. The project will be required to conform to Part 503 of the EPA regulations. Upon approval of the project and adoption of the mitigation monitoring and reporting program, the project will be required to comply with the County's site-specific mitigation measures for protection of wetlands and cultural resources.

Respectfully Submitted,

Joyce Horizumi, Director
Department of Environmental
Review and Assessment

P:\2004\04-0427 Silva Ranch Biosolids Renewal\Env Docs\Correspondence\Board Report Back 10-12-05.doc

ATTACHMENT A

SILVA RANCH

COMPLAINT RESPONSE PROTOCOL AND CONTACT SHEET

Prepared by:

Bruce MacLeod, Technical Services Director

Simranpreet Kaur, Technical Services Manager

Complaint Response Protocol

If a call has been made to complain about biosolids land application activities, Synagro requests that the Sacramento County Environmental Management Department notify Synagro Monday through Friday between the hours of 8:00 am to 5:00pm. PST.

Synagro West, LLC: Simranpreet Kaur (916) 862-9300

If the call is related to a complaint, please ask for the Technical Services Manager during normal business hours. If you do not reach an employee, please leave your name and phone number on the Synagro voicemail system. During off hours, contact the following individuals on their cell phones 24-hours a day:

Simranpreet Kaur	Technical Services Manager	(916) 772-6043
Bruce MacLeod	Technical Services Director	(937) 361-0972
Mark Kaebnick	Area Director	(916) 202-8259

When reporting a complaint to Synagro, providing the following information will assist Synagro and the facility in conducting a complete investigation:

- name, address and phone number of caller
- nature of event (odor, noise...)
- location of event
- time/duration of event
- description/characteristics

Synagro will investigate all complaints reported and notify Sacramento County of the results of the investigation.

These procedures are to be executed within 24 hours of receipt of a phone call or email from Sacramento County.

The Area Director, Technical Services Director and the Technical Services Manager oversee the community response and ensure that the company is proactive in identifying the cause and providing a follow up to any complaints received at Silva Ranch.

TECHNOLOGY- AND DESIGN-BASED ODOR REDUCTION MEASURES

The District encourages lead agencies to evaluate the specific needs and circumstances of a project to assure the proper application of odor reduction technology. This list provides a range of applicable odor reduction technologies or practices that can be implemented for different types of odor sources. It also provides sources of additional information about controlling odors from specific source types. The District recognizes that there is a vast range of odor-reducing technologies and does not consider this list to be comprehensive. The District also encourages lead agencies to develop other feasible engineering and design measures as needed.

WASTEWATER TREATMENT PLANTS

The following list provides current, in-practice mitigation measures to reduce odor emissions from wastewater treatment plants.

- Install activated carbon filters/carbon adsorption in primary clarifiers, headworks building, aeration basin influent channel, and/or all waste gas exhaust systems;
- Install biofiltration/bio trickling filters for all waste gas exhaust systems;
- Install fine bubble aerators to wastewater treatment tanks or ponds to increase treatment efficiency and dissolved oxygen to prevent odor-generating anaerobic activity;
- Install hooded enclosures on grit dumpsters and belt filter presses, primary clarifier weir covers, and/or channel seals;
- Install wet and dry scrubbers on waste gas exhaust systems from treatment tanks;
- Install caustic and hypochlorite chemical scrubbers on waste gas exhaust systems from treatment tanks;
- Install ammonia scrubber on waste gas exhaust from treatment tanks;
- Install energy-efficient blower system to increase treatment efficiency and dissolved oxygen levels;
- Install thermal oxidizer to oxidize all waste gas exhaust;
- Cap or cover storage basins and anaerobic ponds to avoid release of odorous compounds;
- Install mixed flow exhaust system to dilute waste gas exhaust; and

- Install SolarBee or similar technologies on storage basins and lagoons and anaerobic ponds to avoid fugitive release of odorous compounds.

Sources

Bleth, J. 2009 (January). Odor Barrier Goes the Distance. *Water & Wastes Digest* 49(1).

Bleth, J., and Knud-Hansen, C. F. 2007 (April 3). The Potential of Solar-Powered Water Circulators to Help Solve Serious Water and Energy Problems in the U.S.

Gans, C. 2004 (March). Exhausting Odors. *Water & Wastewater News.*

Harshman, V. 2006 (July). Nowhere to Hide. *Water & Wastewater News.*

Hoover, M. 2008 (January). Scrubbing Out Odor. *Water & Wastes Digest* (48)1.

IDS-Environment: The Information Resource for Environment Industry. Air Pollution Control Equipment Solutions: Thermal Oxidizers and Catalytic Oxidizers.

Integra Engineering. Odor Control. (NOTE: Dewberry acquired Integra Engineering November 2010, eliminating this reference link.)

Tetley, P. A. 2001 (September). Managing Wastewater Treatment Odors: Mitigating Odors through Exhaust Dilution. *Chemical Processing.*

U.S. Environmental Protection Agency. 1999 (September). *Wastewater Technology Fact Sheet: Fine Bubble Aeration*. Washington, D.C.

Water Environment Research Foundation. 2003. *Identifying and Controlling Municipal Wastewater Odor: Phase I, Literature Search and Review*. Water Environment Federation. IWA Publishing, London, UK.

Zabrocki, J., and Larson, P. L. Green Wastewater Treatment Plant combats excessive blower energy usage. Green Water Systems.

LANDFILL/RECYCLING/COMPOSTING FACILITIES

The following list provides current, in-practice mitigation measures and management practices for landfills, recycling facilities, and composting facilities.

- Install a passive gas collection system within the facility;
- Install an active gas collection system within the facility;
- Install a flare for treatment of methane gas prior to release;
- Install vegetation growth on landfill to cover intermediate and final portions of a landfill;

- Install a cover/cap on the landfill/recycling/compost facility that can be used to cover landfill/recycling/compost piles daily after operations cease;
- Apply an odor neutralizing spray to landfill or compost pile each day after operations cease;
- Install a negative and/or positive aeration system for compost facilities to control moisture and temperature and provide oxygen for microbial decomposition; and
- Determine the appropriate frequency of turning and mixing of compost piles, which may be a function of ambient temperature.

Sources

Agency for Toxic Substances and Disease Registry. 2001. *Landfill Gas Primer – An Overview for Environmental Health Professionals.* Chapter 5, Landfill Gas Control Measures. Atlanta, GA.

California Integrated Waste Management Board. 2008. Climate Change and Solid Waste Management: Landfill Methane Capture Strategy.

PETROLEUM REFINERIES

The following list provides current, in-practice mitigation measures for petroleum refinery facilities.

- Install water injection system to hydrocracking process;
- Install a vapor recovery system in loading and unloading areas and for influent treatment areas;
- Inject masking odorants into process streams;
- Install flare meters and controls for process gas exhaust; and
- Install SolarBee for aerated ponds.

Sources

Industrial WaterWorld. 2005 (November). *Wastewater Circulators Solve Noxious Odors at Shell Oil Martinez Refinery.*

CHEMICAL PLANTS

The following list provides current, in-practice mitigation measures for chemical plants.

- Install wet scrubbers to treat process gas exhaust;
- Install catalytic oxidation to treat process gas exhaust;

- Install thermal oxidation to treat process gas exhaust; and
- Install carbon adsorption to treat process gas exhaust.

Sources

National Academy of Sciences. 1979. Odors from Stationary and Mobile Sources. Assembly of Sciences National Research Council. Washington, D.C.

Food Service Facilities

Typical odor emissions associated with food service providers include char broilers, deep-fryers, and ovens. However, food waste associated with food service providers can putrefy if not managed properly. Lead Agencies should evaluate the specific needs and circumstances of a project to assure the proper level and type of odor mitigation measures are implemented.

- Install integral grease filtration system or grease removal system in kitchen exhaust system;
- Install baffle grease filters in kitchen exhaust system to remove grease particles;
- Install electrostatic precipitator to kitchen exhaust system to remove odorous particulates from kitchen gas exhaust;
- To treat exhaust stack effluent from the building install disposable pleated or bag filters, activated carbon filters, oxidizing pellet beds, an incineration system to treat exhaust stack effluent; a catalytic conversion system to treat exhaust stack effluent; and
- Maintain proper packaging and frequency of food waste disposal to avoid generation of odiferous compounds.

Sources

D'Antonio, P. C. 2008. Grease Removal and Kitchen Exhaust Systems. Heating/Piping/Air Conditioning Engineering. HPAC Engineering.

Agriculture and Livestock Operations

The following list provides current, in-practice mitigation measures and management practices for agricultural land uses and livestock operations.

- Use geomembrane covers for manure storage;
- Use biocovers for manure storage;
- Install mechanical or gravity solid separation for lagoons;
- Install fine bubble aerator for lagoons;

- Install biofilters for ventilation of manure management buildings;
- Develop a diet manipulation program to minimize generation of odorous compounds from livestock manure;
- Install activated sludge treatment in lagoons and manure storage;
- Install wet scrubbers on livestock building exhaust; and
- Install air dilution system on livestock building exhaust.

Sources

Peterson, T., and J. Lorimor. 1998. Try a Biocover to Reduce Odor. *Odor and Nutrient Management.*

Nebraska Department of Environmental Quality. 2005. Best Management Practices for Odor Control.

RENDERING PLANTS

Odiferous compounds generated by rendering plants tend to be highly offensive to the public. The main sources of odors from rendering plants include exhaust gas from within the facility and process wastewater. The following list provides current, in-practice mitigation measures to reduce the release of odors from rendering plants.

- Install a multi-stage wet scrubber on facility process exhaust;
- Install biofilters on facility process exhaust;
- Install venturi scrubbers or similar technology to remove particulate matter from facility process exhaust prior to treatment by scrubbers and biofilters;
- Install boiler incinerators to treat facility process exhaust;
- Install direct flame incineration or catalytic incineration to treat facility process exhaust;
- Maintain negative pressure within the rendering facility to minimize the release of fugitive odor emissions.
- Use chemical coagulation and dissolved air flotation (DAF) to remove proteins, fats, and oils from facility wastewater.
- Use activated sludge treatment to remove dissolved fraction of waterborne pollutants.

Sources

Hesler, J.C. 1972. Smoke, Grease Aerosol and Odor Control in Meat Processing Plants.

Hydro Solutions, Inc. 2009. Rendering Division.

U.S. Environmental Protection Agency. 1995 (September). AP 42 Fifth Edition Compilation of Emission Factors, Volume 1: Stationary Point and Area Sources, Chapter 9.5.3 Meat Rendering Plants.

Woodard & Curran. 2006. Industrial Waste Treatment Handbook Second Edition.

Biosolids Safe for Land Application

Study shows absence of pathogens

By Susan McGinley

Benjamin Tanner

Air samplers at work in a field near Leesburg, Virginia.

THE WATER QUALITY CENTER

The University of Arizona, National Science Foundation Water Quality Center investigates physical, chemical and microbial processes that affect the quality of surface and subsurface waters including potable supplies.

Housed in the UA College of Agriculture and Life Sciences Environmental Research Laboratory in Tucson, the Center includes an interdisciplinary group of biologists, chemists, physicists, hydrologists, and engineers who work together to resolve water quality problems. Undergraduate and graduate students also participate in conducting research and publishing and presenting papers.

Funding for the Center is supplied by companies and agencies interested in specific water quality issues, and by the National Science Foundation.

Research focal areas include water security; the fate and remediation of commercial and industrial contamination; agrochemical products and practices that influence water quality; municipal waste treatment and reuse; mining; and potable water quality.

For more information see **wqc.arizona.edu.**

For at least two decades, wastewater treatment plants have produced Class A and B biosolids, the organic residues that result from specific treatment of sewage.

Biosolids are frequently used for land application on cropland, pastures or timberland, where they decompose while furnishing nitrogen, phosphorus and potash to growing plants. This method offers a more ecologically sound and practical alternative to domestic waste disposal than landfills or incineration, where water or air pollution may result.

Over the past two years questions have arisen over whether *Staphylococcus aureus*, a human disease pathogen present in raw sewage, remains in treated biosolids and potentially causes illness following its application to soil. A medically important pathogen, *S. aureus* causes a wide variety of human skin and wound infections, food poisoning, septicemia, toxic shock syndrome, pneumonia, meningitis, and other infections.

In a recent study, scientists at the University of Arizona have produced evidence that *S. aureus* is not present in biosolids. Their report appears in the journal *Environmental Science and Technology*.

Chemically and biologically different from raw sewage, biosolids must meet Part 503 of the federal EPA standards regarding pathogen and heavy metal content, handling and application precautions, and other regulations.

"Sixty percent of all biosolids are land-applied in the United States, but this amount covers less than 0.1 percent of agricultural land," says Ian Pepper, a professor in the UA Department of Soil and Water Science and director of the UA National Science Foundation Water Quality Center (WQC) (*see sidebar*).

This center has gained national recognition, and WQC studies on land application of biosolids are being utilized by EPA as a response to a 2002 National Academy Science Report on land application.

In July 2002, after an 18-month study, the National Academy of Sciences (NAS) issued a report stating there is "no documented, scientific evidence that the part 503 rule has failed to protect public health regarding land application of biosolids." At the same time, the Academy noted that "additional scientific work is needed to reduce persistent uncertainty about the potential for adverse health effects from exposure to biosolids."

Since no scientific data were available to document whether biosolids specifically contain *S. aureus*, Pepper and colleagues Patricia Rusin, Sheri Maxwell, John Brooks and Charles Gerba conducted biosolid and bioaerosol studies on samples from 15 different sites across the United States.

"As the saying goes, 'Absence of evidence isn't evidence of absence,'" Pepper says. "Our study focused on finding the scientific evidence regarding the presence or absence of *S. aureus* in biosolids and bioaerosols."

Benjamin Tanner

An applicator called a "Slinger" catapults biosolids into the air as part of study in Mojave, Arizona.

The sampling sites ranged from the East coast to the Southwest, and all were full-scale treatment plants; no pilot plants were included in the study. The researchers took samples of raw sewage and untreated primary sewage sludge in sterile bottles and transported them on ice to their laboratory. Biosolid samples were collected in sterile containers at the production site and likewise transported overnight to the laboratory on ice. Each sample was assayed for *S. aureus* the day it was received.

Pepper and the team collected the bioaerosol samples from four different sites in the Southwestern United States using commercial land applicators.

"We evaluated the potential for bioaerosols from biosolids with a higher solids content using applicators called 'slingers,' which literally sling biosolids 80 to 100 feet through the air," Pepper says.

"For liquid biosolids (lower solids content) the material was sprayed from a tanker. In either case we had aerosol samplers hooked up to pumps so that known volumes of air were sucked into a collection fluid, which is later analyzed using cultural assays."

The scientists analyzed all bioaerosol samples for *S. aureus* within 24 hours of collection.

In all, the team analyzed three raw untreated sewage samples and two undigested primary sewage sludge samples, 23 different biosolid samples, and 27 aerosols obtained during biosolid land application (biosolid aerosols).

"We detected *S. aureus* in samples of raw sewage and undigested primary sewage sludge," the scientists state in their report. "However, we did not detect *S. aureus* in Class A or Class B biosolids after aerobic or anaerobic digestion, lime stabilization, heat-dry pelleting, and / or composting." These are conventional methods that treatment plants use to remove disease-causing organisms from raw sewage.

"You can find *S. aureus* in sewage and you should be able to because one in three people have it in their systems," Pepper says. "Yet it should be noted that none of the biosolid or biosolid aerosol samples in our study were positive for *S. aureus.* The most likely explanation is that wastewater treatment kills *S. aureus* along with other pathogenic microbes."

Pepper notes that allegations regarding the safety of biosolids are often not based on good science.

"Overall we need more scientific studies to resolve potential issues of concern," Pepper says. "Our study was science-based and indicates that biosolids are an unlikely source of *S. aureus.*"

"Our study focused on finding the scientific evidence regarding the presence or absence of *S. aureus* in biosolids and bioaerosols."

Karen Josephson

Spray tanker spreads biosolids on farm field in Marana, Arizona.

CONTACT

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February 27, 2017

To Whom It May Concern:

Contrary to the claim that there is no valid science supporting land application of biosolids, there are literally hundreds of peer reviewed publications in support of land application. People who are unaware of these publications should perhaps learn the value of searching the literature. For example, a comprehensive list of references on all aspects of land application is concisely documented in the last National Academy of Science's National Research Council publication: "Biosolids Applied to Land: Advancing Standards and Practices." As a member of that Committee I can assert to the value of this publication. In addition, listed below are some of the publications resulting from research conducted just at the University of Arizona since the NRC publication. Copies of research publications are available upon request.

Ian L. Pepper
Director, Water & Environmental Technology (WET) Center
Co-director, Water & Energy Sustainable Technology (WEST) Center
The University of Arizona

UNIVERSITY OF ARIZONA STUDIES ASSOCIATED WITH LAND-APPLICATION OF CLASS A AND B BIOSOLIDS IN THE UNITED STATES

Rusin, P., S. Maxwell, J. Brooks, C. Gerba, and I. Pepper. 2003. Evidence for the Absence of *Staphylococcus aureus* in Land Applied Biosolids. *Environ. Sci. & Technol*. 37:4027–4030.

Brooks, J.P., C.P. Gerba, and I.L. Pepper. 2004. Aerosol Emission, Fate, and Transport from Municipal and Animal Wastes. *J. Residuals Sci. Technol.* 1:13–25.

Brooks, J.P., B.D. Tanner, C.P. Gerba, C.N. Haas, and I.L. Pepper. 2005a. Estimation of Bioaerosol Risk of Infection to Residents Adjacent to a Land Applied Biosolids Site Using an Empirically Derived Transport Model. *J. Appl. Microbiol*. 98:397–405.

Brooks, J.P., B.D. Tanner, K.L. Josephson, C.N. Haas, C.P. Gerba, and I.L. Pepper. 2005b. A National Study on the Residential Impact of Biological Aerosols from the Land Application of Biosolids. *J. Appl. Microbiol.* 99:310–322.

Tanner, B.D., J.P. Brooks, C.N. Haas, C.P. Gerba, and I.L. Pepper. 2005. Bioaerosol Emission Rate and Plume Characteristics During Land Application of Liquid Class B Biosolids. *Environ. Sci. & Technol.* 39:1584–1590.

Zaleski, K.J., K.L. Josephson, C.P. Gerba, and I.L. Pepper. 2005a. Potential Regrowth and Recolonization of *Salmonella* and Indicators in Biosolids and Biosolid Amended Soil. *Appl. Environ. Microbiol.* 71:3701–3708.

Brooks, J.P., B.D. Tanner, C.P. Gerba, and I.L. Pepper. 2006. The Measurement of Aerosolized Endotoxin from Land Application of Class B Biosolids in Southeast Arizona. *Can. J. Microbiol*. 52:150–156.

Chetochine, A., M.L. Brusseau, C.P. Gerba, and I.L. Pepper. 2006. Leaching of Phage from Class B Biosolids and Potential Transport Through Soil. *Appl. Environ. Microbiol*. 72:665–671.

Brooks, J.P., C.P. Gerba, and I.L. Pepper. 2007. Diversity of aerosolized bacteria during land application of biosolids. *J. Appl. Microbiol*. 103:1779–1790.

Cheng, L., A.S. Chetochine, I.L. Pepper, and M.L. Brusseau. 2007. Influence of DOC on MS-2 bacteriophage transport in a sandy soil. *Water Air Soil Pollution* 178:315–322.

Brooks, J.P., S.L. Maxwell, C. Rensing, C.P. Gerba, and I.L. Pepper. 2007. Occurrence of antibiotic-resistant bacteria and endotoxin associated with the land application of biosolids. *Can. J. Microbiol.* 53:616–622.

Castro-del Campo, N., I.L. Pepper, and C.P. Gerba. 2007. Assessment of *Salmonella* typhimurium Growth in Class A Biosolids and Soil/Biosolid Mixtures. *J. Res. Sci. & Technol*. 4:83–88.

Pepper, I.L., H. Zerzghi, J.P. Brooks, C.P. Gerba. 2008. Sustainability of Land Application of Class B Biosolids. *J. Environ. Qual.* 37:58–67.

Gerba, C.P., N. Castro-del Campo, J.P. Brooks, and I.L. Pepper. 2008. Exposure and Risk Assessment of *Salmonella* in Recycled Residuals. *Wat. Sci. Technol.* 57:1061-1065.

Tanner, B.D., J.P. Brooks, C.P. Gerba, C.N. Haas, K.L. Josephson, and I.L. Pepper. 2008. Estimated Occupational Risk from Bioaerosols Generated During Land Application of Class B Biosolids. *J. Environ. Qual.* 37:2311-2321.

Zerzghi, H., C.P. Gerba, and I.L. Pepper. 2010. Long-term Effects of Land Application of Class B Biosolids on Soil Chemical Properties. *J. Res. Sci. Technol.* 7:51-61.

Zerzghi, H., C.P. Gerba, J.P. Brooks, and I.L. Pepper. 2010. Long-term Effects of Land Application of Class B Biosolids on the Soil Microbial Populations, Pathogens and Activity. *J. Environ. Qual.* 39:402-408.

Zerzghi, H., J.P. Brooks, C.P. Gerba, and I.L. Pepper. 2010. Influence of Long-term Land Application of Class B Biosolids on Soil Bacterial Diversity. *J. Appl. Microbiol*. 109:698-706.

Pepper, I.L., J.P. Brooks, R.G. Sinclair, P.L. Gurian, and C.P. Gerba. 2010. Pathogens and Indicators in United States Class B Biosolids: National and Historic Distributions. *J. Environ. Qual.* 39:2185-2190.

Pepper, I.L., Zerzghi, H.G., Bengson, S.A., Iker, B.C., Banerjee, M.J., and Brooks, J.P. 2012. Bacterial Populations within Copper Mine Tailings: Long Term Effects of Amendment with Class A Biosolids. *J. Appl. Microbiol.* 113:569-577.

Brooks, J.P., McLaughlin, M.R., Gerba, C.P., and Pepper, I.L. 2012. Land Application of Manure and Class B Biosolids: An Occupational and Public Quantitative Microbial Risk Assessment. *J. Environ. Qual.* 41:2009-2023.

Pepper, I.L., Zerzghi, H.G., Bengson, S.A., and Glenn, E.P. 2013. Revegetation of Copper Mine Tailings Through Land Application of Biosolids: Long-Term Monitoring. *Arid Land Res. & Mgmt.* 27:245-256.

WASHINGTON STATE UNIVERSITY EXTENSION

GUIDE TO BIOSOLIDS QUALITY

WSU PEER REVIEWED

FS192E

GUIDE TO BIOSOLIDS QUALITY

By
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Abstract

Biosolids are the material produced from digestion of sewage at city wastewater treatment plants. Biosolids may be spread over land for plant fertilization and soil conditioning.

This publication summarizes the benefits of land-applied biosolids, describes and discusses major categories of contaminants, and explains what is currently known about emerging contaminants in biosolids. While this publication does not include a comprehensive list of individual contaminants, it does discuss the more relevant classes of contaminants.

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Guide to Biosolids Quality

Introduction

Biosolids are the **biomass** material produced following **aerobic and anaerobic digestion** at **municipal wastewater** treatment facilities. **Sewage sludge**, food particles, feces, and other organic solids are converted biologically, within engineered systems, to produce a completely transformed biosolids product. Biosolids are comprised of living and dead wastewater treatment **microorganisms**, small **inorganic** particles, and **insoluble** compounds. In Washington State, biosolids are most often land applied for plant fertilization and soil conditioning as part of a **sustainable practice** to manage municipal **wastewater residuals** (Figure 1).

Like animal manures, biosolids are a source of plant nutrients and stable **carbon compounds.** When biosolids are land applied for crop production, plant nutrients and **organic matter** improve crop production, allowing for recycling of nutrients, and reducing the amount of **synthetic** fertilizers needed. For example, approximately 5,000 tons of nitrogen (N) and 2,000 tons of phosphorus (P) were recycled in Washington State in 2012 by land-applying biosolids (WA Dept. of Ecology 2014a; Sullivan et al. 2015).

Land-applying biosolids keeps valuable organic carbon and plant nutrients from being disposed of in landfills or incinerated. In Washington State, approximately 81% of biosolids are land applied, 18.5% are incinerated, and 0.5% is disposed of in landfills (Figure 2). Of the portion that is approved for land application, 70% is used in agriculture, 25% is used in residential or commercial settings, and 5% is used in forestry (Figure 2).

Class A biosolids can be used as a fertilizer in residential or commercial areas. The Washington State University (WSU) publication *Using Biosolids in Gardens and Landscapes* (Cogger 2014) provides information on Class A biosolids use. **Class B biosolids** are used as a fertilizer in Washington State for wheat, alfalfa, and timber production (WA Dept. of Ecology 2014a). The WSU publication *Fertilizing with Biosolids* (Sullivan et al. 2015) provides information on Class B biosolids use in agriculture.

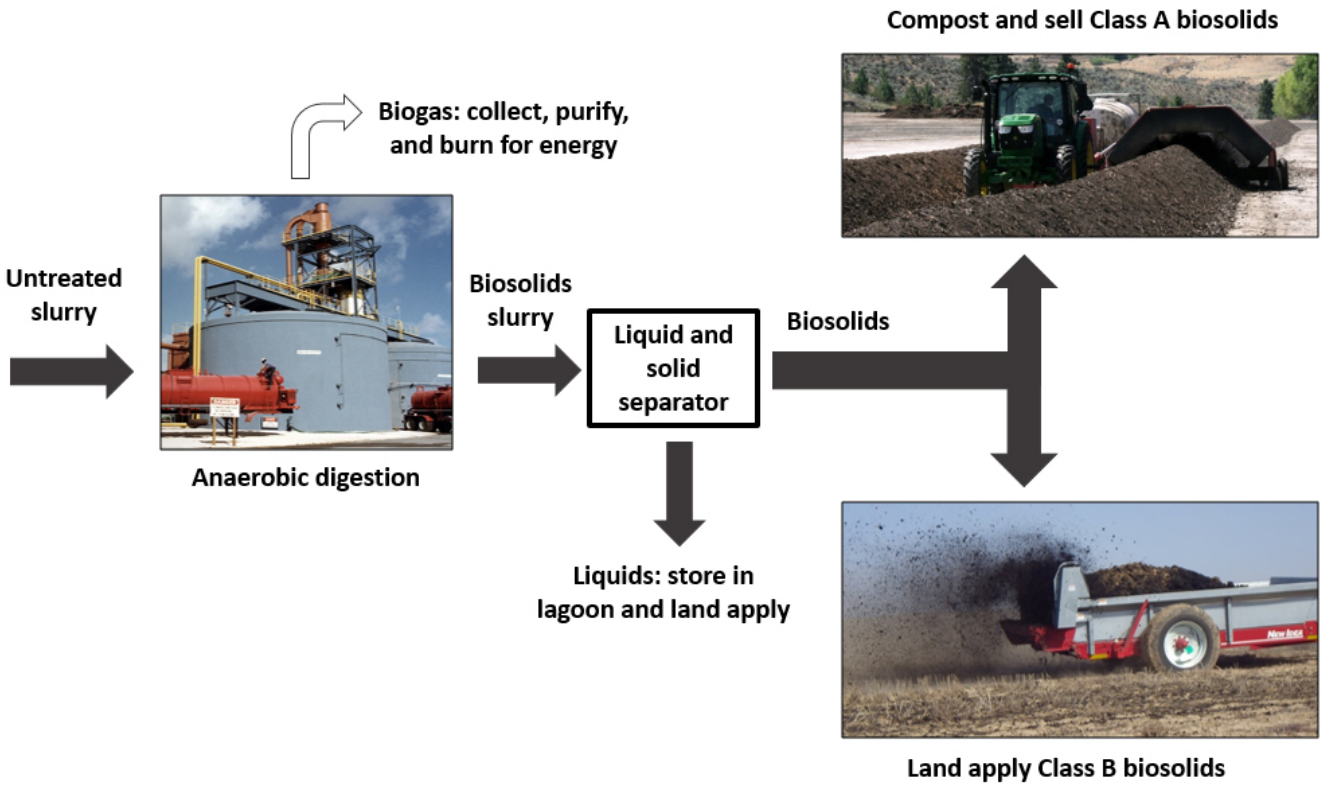

Figure 1. Treatment of sewage slurry using anaerobic digestion. Adapted from: Slurry, Options for slurry treatment by anaerobic digestion. Department of Environment, Food and Rural Affairs (Defra) 2011. (Land application photo by Andy Bary, WSU; anaerobic digestion photo from Energy.gov Flickr page and compost photo from Food and Drug Administration Flickr page per USA.gov U.S. Government Works.)

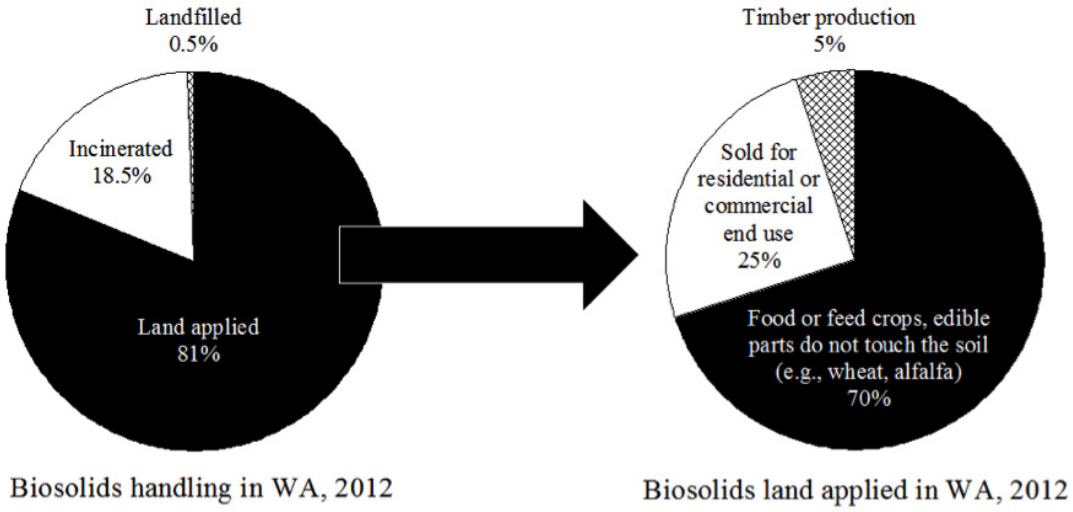

Figure 2. Biosolids use data for 2012, by percentage, for Washington State. Approximately 110,000 dry tons of biosolids were handled in Washington in 2012 (WA Dept. of Ecology 2014a). (Illustration by Shannon M. Mitchell, USA)

Class A biosolids are used as a soil amendment and plant fertilizer in gardens and landscapes. They meet EPA standards for regulated ***contaminants****, and they have been treated to reduce* ***biological contaminants*** *to very low levels.*

Class B biosolids are used as a soil amendment and plant fertilizer for agricultural land, timberland, rangeland, and land reclamation sites. They meet the criteria for regulated contaminants, and the level of biological contaminants has been substantially reduced. Plants whose edible parts do not make contact with the soil when harvested, such as wheat, barley, and alfalfa, can be harvested 30 days after the last biosolids application.

Recycling biosolids means that they are used for a useful purpose, instead of being disposed of in landfills or incinerated. Recycling biosolids through land application as a soil amendment and fertilizer is highly regulated. Only biosolids that meet the criteria for maximum allowable concentrations of potentially toxic **trace elements** and **pathogens** are land applied. There are also required setback distances from water sources to limit the potential for contamination of surface water and **groundwater** (WA Dept. of Ecology 2014a).

Scientific research shows that there are many **agronomic** benefits and minimal environmental or human health risks from biosolids when land application follows federal regulations (Cogger et al. 2013; EPA 2014a; Sullivan et al. 2015). Nevertheless, the public has many questions regarding biosolids recycling, and some are apprehensive about supporting biosolids land application because some contaminants can be found in biosolids.

This Washington State University (WSU) publication summarizes the benefits of land-applied biosolids, describes and discusses major categories of contaminants, and explains what is currently known about **emerging contaminants** in biosolids. This publication does not include a comprehensive list of individual contaminants, but rather, discusses the more relevant classes of contaminants. The WSU publication *Fertilizing with Biosolids* (Sullivan et al. 2015) provides more information on plant nutrients in biosolids, application guidelines, and soil quality benefits.

Biosolids Quality: Crop Production Benefits

The major benefit of using biosolids as a fertilizer and **soil conditioner** for crop production is that it can be an inexpensive method for providing nitrogen and improving soil quality. Class B biosolids are less expensive for farmers to use than synthetic fertilizers, and agricultural operations using biosolids have the same or increased crop yield and crop quality as crops grown with synthetic fertilizers (Epstein 2003; Cogger et al. 2013). The desirable aspects of biosolids for crop producers are summarized below.

Figure 3. Biosolids being spread on agricultural fields (left), and biosolids covering agricultural soil prior to incorporation (right). (Photos by Andy Bary, WSU)

Organic Carbon

The organic carbon (organic C) content in biosolids ranges from 5% to 54%, with a mean value of 24% (Girovich 1996; Gilmour et al. 2003). Adding organic C to soils low in organic matter improves soil quality. Physical improvements include higher **soil porosity**, **soil aggregation**, **water-holding capacity,** and lower **bulk density** (Epstein 2003). Plants grown in biosolids-amended soils exhibit improved root to shoot ratios as a result of decreased resistance to root penetration. Organic C is also a source of food for soil microorganisms and **macrofauna**.

Macronutrients

Organic nitrogen (organic N) is the primary nutrient in biosolids. Biosolids are a slow-release N fertilizer compared to synthetic fertilizers (e.g., anhydrous ammonia). Other plant **macronutrients** that are abundant in biosolids include phosphorus (P), magnesium (Mg), and calcium (Ca). However, there are only low levels of potassium (K), so supplements may be needed if soil analysis shows that concentrations of this element are below optimal levels (Epstein 2003).

In Washington State, the amount of biosolids land applied to a given site is calculated as part of the Washington Department of Ecology biosolids land-application program (WA Dept. of Ecology 2014b), so maximum crop yield can be targeted, while reducing the risk of **nitrate leaching**. Typically from 2 to 10 dry tons per acre (5–20 metric ton/hectare) of biosolids are applied to agricultural fields every 1 to 5 years (Girovich 1996). They can be applied in liquid slurry or solid form. The solid form is typically applied to fields with a spreader and then incorporated into the soil by tilling or disking (Figure 3).

Cogger et al. (2013) compared biosolids and anhydrous ammonia fertilizers in a dryland wheat–fallow rotation. Biosolids were applied at 2, 3, and 4 dry tons per acre (5, 7, and 9 metric ton/hectare). Biosolids treatments were applied once every 4 years for 16 years. Standard anhydrous ammonia application was done once every 2 years for 16 years for the synthetic fertilizer treatment. On average, over the eight harvests from the wheat–fallow rotation, the biosolids-amended fields produced equal or greater wheat yields compared to the fields fertilized with anhydrous ammonia. Wheat harvesting and sample collection in fields where biosolids were applied is shown in Figure 4.

Figure 4. Wheat harvesting and sample collection from fields where Class B biosolids were land applied. (Photo by Andy Bary, WSU)

Micronutrients

Plant **micronutrients** in biosolids include boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (M), molybdenum (Mo), zinc (Zn), and nickel (Ni). Other chemical elements in biosolids, such as cobalt (Co), sodium (Na), selenium (Se), and silicon (Si), can also be beneficial to plants at low concentrations (Girovich 1996; Epstein 2003; Goodman 2004). If farmers are supplementing micronutrients, biosolids can reduce or eliminate the need for these supplements. Some farmers might not find it cost effective to apply micronutrients (e.g., not enough yield benefits to justify the cost); however, soils will receive these nutrients as an added benefit when biosolids are applied.

Biosolids Quality: Contaminants

Municipal wastewater treatment facilities treat wastewater from industrial and household sources that may contain various contaminants. Those contaminants that bind to organic or inorganic particles and are not degraded normally remain in the wastewater solids, which are eventually converted into biosolids (Girovich 1996; Epstein 2003). Contaminants can include metals, pathogens, **antibiotics**, some industrial and household chemicals, **odorants**, and **aerosols**.

A representative biosolids sample is tested for regulated contaminants and plant nutrients as part of the biosolids land-application program. In addition, many researchers and the **Environmental Protection Agency (EPA)** have surveyed numerous biosolids throughout the United States for a multitude of regulated and non-regulated contaminants, so the approximate contaminant concentration range is known. The types of contaminants that can be found in biosolids are summarized below and are discussed further in Appendix A.

Metals

Trace elements, including **heavy metals**, can be found in biosolids. Trace elements exist naturally in the environment and in agricultural soils and many are beneficial to living organisms. However, trace element concentrations in excess of beneficial levels can be toxic. Plants can uptake soluble or available trace elements into their roots and leaves. They are taken up to a lesser extent in fruits, seeds, and flowers (Epstein 2003).

Potentially toxic trace elements in biosolids are regulated and monitored in biosolids land-application programs. Concentrations of metals in biosolids have fallen sharply over the last 40 years since the passage of the **Clean Water Act** of 1972. Metals are no longer present in biosolids at concentrations that could cause human, animal, or environmental health issues (Cogger et al. 2000).

Metals bind to soils and have limited solubility in soils with a neutral pH, which lowers the risk of exposure to these metals.

There are several reasons why metal concentrations in biosolids should not be a concern when biosolids are applied to agricultural soils, but two major reasons are metal **sorption** characteristics and soil **pH**. Some metals bind to **hydrous oxide** surfaces and organic matter in soils, significantly lowering the amount that is plant-available (Epstein 2003). Metals are soluble at acidic pH levels, but most metals have drastically reduced **solubility** in the typical crop soil pH range of 5.5 to 7.5. When metal solubility decreases, it limits their transport and **bioavailability** (Epstein 2003). For example, aluminum is insoluble in soils above pH 5.5, so only a small fraction of the total aluminum is available for plant uptake in agricultural soils with a pH greater than 5.5.

Pathogens

Pathogens are disease-causing agents, and some pathogens are present in Class B biosolids. Pathogens are a universal problem in waste-derived soil amendments and even in yard debris with residual pet or animal waste (Table 1; WA Dept. of Ecology 2009; Gerba et al. 2011). Levels of **pathogenic bacteria** are lower in biosolids than in manure, but the number of **viruses** is higher in biosolids (Table 1). Free-range animals, such as deer and birds, living on agricultural lands also contribute to pathogen levels in soils.

The fate of pathogens in soils and crops is dependent on several factors, including climate and soil characteristics. Pathogen levels decrease in soil-crop systems over time due to pathogen sensitivity to heat, sunlight, drying, and competing **microbes**. Pathogens can live in soils and on plants, but plants do not uptake pathogens. Some **bacterial pathogens** and viruses survive for as long as several months (Gerba and Smith 2005). Pathogens do not leach through soil, but they can be transported by **surface runoff**.

There is the potential for pathogens to regrow in biosolids if climate and soil conditions are not harsh enough to kill them off, such as under moist and cool conditions. However, biosolids-amended soil is not a **reservoir for pathogens** following the end of the pathogen life-cycle (Epstein 2003). A review of pathogen **risk assessment** research confirms that current biosolids land-application guidelines are appropriate for protecting public health (Oun et al. 2014).

Table 1. Approximate concentrations of selected pathogenic bacteria and viruses in Class B biosolids, manure, and pet feces.

Pathogenic organism	Concentration (organism/g, dry weight)		
	Biosolids[a]	Manure[a]	Pet feces[b]
Bacteria			
Campylobacter jejuni	2	1400	
E. coli O157:H7	< 1	110	
Listeria monocytogenes	20	210	
Salmonella	50	180	1,000,000
Viruses			
Adenoviruses	20	Not detected	
Enteroviruses	< 1 to 30	Not detected	501,000

[a]Bacteria reported in **colony-forming units** per gram and viruses reported in **plaque-forming units** per gram (King et al. 2011).
[b]Values reported in organisms per gram (Gerba et al. 2011).

Hot, dry soils exposed to sunlight create conditions that kill pathogenic bacteria and viruses. After pathogens die, they can no longer cause illness. The risk of pathogen or viral infection to the general public are low because plants do not uptake pathogens, and fresh crops whose harvested parts come into contact with the soil are not grown using Class B biosolids.

Table 2. Maximum concentrations of selected antibiotics in biosolids and cattle manure.

Antibiotic class	Maximum concentration (mg/kg, dry weight)	
	Biosolids	Cattle manure
Macrolide	6.5[a]	8.1[b]
Sulfonamide	0.65[a]	0.36[c]
Tetracycline	8.7[a]	6.6[b]

[a]EPA (2009)
[b]Massé et al. (2014)
[c]Zhao et al. (2010)

Antibiotics and Antibiotic-Resistant Bacteria

Antibiotics can be found in biosolids or manure because many of them are not completely metabolized before being excreted in urine and feces. Maximum levels of some antibiotics in biosolids and cattle manure are similar (Table 2). Antibiotic concentrations in swine manure are higher, ranging from 4 to 59 mg/kg and from 7 to 760 mg/L (Heuer et al. 2011; Massé et al. 2014).

In addition to relatively low antibiotic concentrations in biosolids, those antibiotics that are found in biosolids tend to bind tightly to soil particles, which reduce their **biological activity**. Research on antibiotics in biosolids continues; however, to date, antibiotics have not been found to accumulate in soils or have adverse effects on microorganisms at concentrations found in land-applied biosolids. To date, the scientific literature shows that bioavailable antibiotic concentrations in biosolids are not high enough to influence **antibiotic resistance**.

Antibiotic-resistant bacteria are found in biosolids, manure, and even pristine soils (Minur et al. 2011; Brooks et al. 2015). The main concern with levels of resistant bacteria and antibiotics in biosolids or manure is that they may increase the risk of pathogenic bacteria acquiring antibiotic-resistance traits. Research shows that land-applied manure containing antibiotics and resistance genes can significantly influence resistant bacterial populations in soils (Heuer and Smalla 2007; Heuer et al. 2011).

In contrast, levels of resistant bacteria in soils amended with biosolids were not significantly different from unamended soils or soils fertilized with a synthetic fertilizer (Zerzghi et al. 2010). Research in the area of bacterial resistance continues, but currently the public health risk from resistant bacteria in biosolids is considered to be low. Risks are minimized by restrictions on public access to biosolids and by rules that limit the types of crops that can be grown using Class B biosolids (NRC 2002; Brooks et al. 2007; King et al. 2011).

Industrial and Household Chemicals

There can be numerous types of **persistent chemicals** in biosolids because biosolids are derived from industrial and household wastewater. Chemicals in biosolids can include **surfactants, plasticizers, pharmaceuticals, flame retardants,** and chemicals from **personal care products**—for example, **triclosan**, which is found in some hand soaps (Figure 5). These substances are not regulated by the EPA because risk assessments have so far shown that organic chemicals pose minimal risk to human health and the environment at the concentrations commonly found in land-applied biosolids.

Supplementing EPA risk assessments, Smith (2009) performed risk assessments for surfactants, **dioxins**, pharmaceuticals, **estrogenic compounds**, and other **organic contaminants** found in biosolids, concluding that they pose minimal risk to human health if the biosolids are land-applied on agricultural soils at normal agronomic rates. Additionally, Rocarro et al. (2014) performed risk assessments for pharmaceuticals and personal care products and found low risk for human health problems from land-applied biosolids.

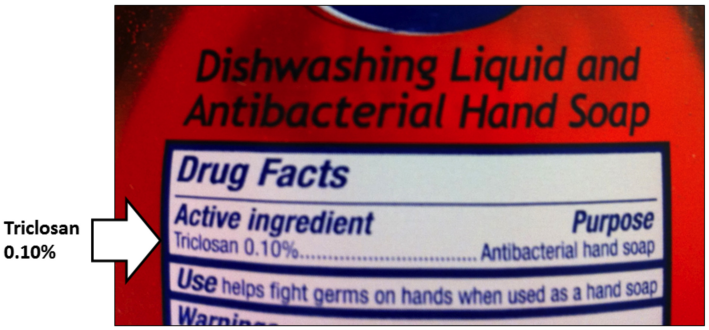

Figure 5. The antibacterial compound triclosan is found in some hand soaps. (Photo by Shannon M. Mitchell, USA)

Three primary factors govern the assessment that industrial and household chemicals in biosolids are not likely to endanger human health or the environment when land-applied. First, **degradation** and sorption effectively lower bioavailable contaminant levels. Second, plants do not uptake significant levels of organic contaminants. Third, the required setback distances for land-applied biosolids limit contaminant transport to water sources (Sullivan et al. 2015).

Many contaminants found in biosolids are also found in household dust, personal hygiene products, and manufactured foods. For example, median concentrations of a flame retardant, plasticizer, and perfluorinated chemical are at similar levels for biosolids and household dust (Table 3). Although these levels are similar, the general population is exposed to a substantially greater amount of household dust than biosolids.

Another example is the **antibacterial** ingredient triclosan, which is found in some hand soaps. This contaminant concentration was greater in biosolids than in household dust; however, the general population can be exposed to high concentrations of triclosan (1,000 mg/kg) when using some hand soaps (Figure 5).

Concentrations of the plasticizer **di(2-ethylhexyl) phthalate (DEHP)** in both biosolids and household dust are relatively high in comparison to the other chemicals listed in Table 3. DEHP is found in some **polyvinyl chloride (PVC) resin** (Figure 6), and small amounts of DEHP can leach from these plastic resins. For example, up to 24 mg/kg of DEHP was found in olive oil stored in plastic containers (EHHI 2008). Consequently, it appears that the public is exposed to DEHP in many products they use daily.

Table 3. Median concentrations of selected contaminants in biosolids and household dust.

		Median concentration (mg/kg, dry weight)	
Category	Compound	Biosolids	Household dust
Flame retardant	PBDE 99	0.58[a]	0.30[c]
Plasticizer	BPA	1.00[a]	1.46[d]
Perfluorinated chemical	PFOS	1.02[a]	0.48[e]
Antibacterial	Triclosan	3.86[a]	0.22[d]
Plasticizer	DEHP	310.00[b]	340.00[c]

[a]Higgins et al. (2010)
[b]Maximum reported value from EPA (2009)
[c]Rudel et al. (2003)
[d]Greens et al. (2009)
[e]Kato et al. (2009)

Symbol	Type of plastic	Example
1 PETE	Polyethylene Terephthalate **PETE**	Beverage bottles
2 HDPE	High Density Polyethylene **HDPE**	Milk jugs
3 PVC	Polyvinyl Chloride **PVC** with **DEHP**	Cooking oil bottles
4 LDPE	Low Density Polyethylene **LDPE**	Zip-lock bags
5 PP	Polypropylene **PP**	Yogurt containers
6 PS	Polystyrene **PS**	Styrofoam containers
7 OTHER	Other e.g., Polycarbonate with **BPA**	Canned foods

Figure 6. Plastic resin materials in plastic products. DEHP is found in some PVC resin (symbol #3), and bisphenol A (BPA), shown in the category of Other, can be found in the lacquer lining of canned foods (symbol #7). Adapted from: Plastics that may be harmful to children and reproductive health. Environment & Human Health, Inc. Report (2008).

Certain chemicals, such as triclosan, dioxins, persistent pharmaceuticals, and some surfactants might be more of an environmental concern than others. For example, triclosan has been found to **bioaccumulate** in earthworms; some pharmaceuticals are persistent and can leach through the soil and into groundwater; some surfactants are toxic to aquatic species.

Recently, the EPA identified safer and more environmentally friendly surfactant alternatives for industrial use, replacing common surfactants like **nonylphenol ethoxylates (NPE)**. The EPA now evaluates manufacturing processes that use surfactants to assess potential environmental and human health risks (EPA 2012; 2014b). Because emerging contaminants have been studied for a shorter period of time relative to metals, less information is available. Thus, continued research is needed to supply the information necessary for new or improved risk assessments.

Odorants

Odors from biosolids come from a complex mixture of odorants. Unpleasant odors are the main public complaint about land-applied biosolids (NRC 2002). Although odorants are a nuisance, they are not a public health threat (Girovich 1996). Biosolids produced at different facilities have different odors because the wastewater treatment processes used are not always the same.

Aerosols

Aerosols are comprised of very small airborne particles that may contain contaminants, such as pathogens or chemicals. They travel through the air, but they do not travel very far (usually less than 541 ft), and they do not remain airborne for very long (usually less than one hour) (Low et al. 2007; King et al. 2011).

*The fate of industrial and household chemicals in soils results in low **effective concentrations**. Most chemicals in biosolids tend to bind to soils, and they also degrade in biosolids-amended soils. Risks to the general public are minimal because plants do not uptake significant amounts of organic chemicals into their edible parts.*

To minimize human contact with significant concentrations of aerosols, there are public access restrictions for biosolids-application sites. Authorized individuals who come in contact with biosolids should follow basic hygiene precautions and wear appropriate personal protective equipment (CDC 2002).

Summary

Biosolids are land applied as a sustainable way to manage municipal wastewater residuals. There are many benefits to land-applying Class B biosolids on agricultural fields because biosolids are rich in organic carbon, nitrogen, phosphorus, and other plant nutrients. Equal or greater crop yields are obtained using biosolids compared to synthetic fertilizer. Incorporating biosolids into the soil improves soil porosity and water-holding capacity, among other soil characteristics, and biosolids can help improve soil quality for more effective crop production.

Land-applying biosolids is highly regulated by state environmental protection departments and the EPA because, along with the organic carbon and plant nutrients in biosolids, there are low levels of contaminants derived from industrial and household wastewater. To date, research indicates that contaminants in Class B biosolids pose minimal risk to human, animal, or environmental health. Ongoing research on biosolids continues to investigate contaminants and measure potential impacts. New research findings are reviewed periodically and risk assessments conducted to reevaluate the effectiveness of existing biosolids land-application regulations.

For More Information

For more information on biosolids, visit the Washington State University Biosolids Management website.

Acknowledgments

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Guide to Biosolids Quality—Appendix A

This appendix describes and discusses the major categories of contaminants that may be found in biosolids. Part I of this section covers the categories of organic contaminants, and Part II covers the categories of biological contaminants. When interpreting the information provided here, it is important to understand that exposure to contaminants through biosolids may be minimal compared to exposure through other pathways, such as household dust, personal hygiene products, uncontrolled burning, and animal manures.

Many contaminants degrade in the soil or are neutralized when they bind tightly to soil particles, so potential negative effects in the terrestrial environment may be short-lived. However, some contaminants persist in the environment and can be potentially harmful. If risk assessments show that significant risk exists from an organic contaminant, use of the chemical may be restricted or banned. Risk assessments are periodically updated as new information becomes available in order to accurately evaluate potential environmental and human health risks from land-applied biosolids.

Part I: Organic Contaminants

Personal care products

Some personal care products, like lotions, soaps, fragrances, and cosmetics, contain chemicals that may be of environmental concern. Antibacterials such as triclosan and fragrances such as synthetic **musks** are of particular concern. Triclosan may negatively impact soil or aquatic microorganisms because of its antibacterial properties, which allow it to kill bacteria. However, overall, the effects of triclosan in the soil may be short-lived because it binds to soil particles and its **half-life** ranges from 17 to 35 days (Smith 2009).

Pharmaceuticals

Allowing pharmaceuticals into the environment is a concern because of their unknown effects on the aquatic or terrestrial ecosystems and their potential for groundwater contamination. There are hundreds of pharmaceuticals released into municipal wastewater treatment facilities every day because many medicines are not completely metabolized. Some pharmaceuticals, such as **carbamazepine**, are persistent and can leach through soils.

Not all pharmaceuticals are potentially harmful to the environment, but antibiotics are a unique group because they kill or inhibit certain bacteria when they are at effective concentrations. With antibiotics, there is the potential for soil microbial effects, including antibiotic-resistance selection, if relatively high antibiotic concentrations reach soils. However, most antibiotics found in biosolids are not bioavailable because they tend to bind tightly to soil particles, which neutralize them.

Surfactants

Surfactants are used in many industrial applications and consumer products and can end up in biosolids from industrial and municipal wastes. Some surfactants, including nonylphenol ethoxylates (NPEs) and **nonylphenol (NP)**, can cause environmental and human health problems. The use of these chemicals is being more closely monitored, regulated, restricted, or banned (EPCEU 2006; EPA 2014) because NPEs are toxic to some aquatic species and NP has endocrine-disrupting properties (Smith 2009), which can cause **endocrine disruption** in fish by mimicking estrogen compounds, thereby disrupting the natural balance of hormones. It can also bioaccumulate in fish and birds; however, currently there is inconsistent evidence that it bioaccumulates in humans.

Fish consumption may lead to higher levels of NP in breast milk, which may in turn negatively affect newborns (e.g., abnormal neurological development, growth, and memory function). However, drinking water with low levels of NP is not a significant source of exposure. In **terrestrial systems**, the effects of NPE and NP contamination may be short-lived because they tend to bind to soil particles and the half-life for each is less than 20 days (Smith 2009; González et al. 2010).

Plasticizers

Plasticizers (such as **bisphenol A [BPA]** and **phthalates**) are used to make soft plastics. One commonly used plasticizer is DEHP. DEHP has relatively low toxicity for aquatic species (Defra 1991), although it can bioaccumulate in aquatic organisms. Some evidence links DEHP to changing levels of male sex steroid hormones, potentially affecting fertility (Mendiola et al. 2012). The European Union has restricted the use of DEHP and other phthalates in order to lower the public's exposure to these plastic materials and to limit children's potential exposure to phthalates contained in children's toys (EPCEU 2006).

DEHP that ends up in biosolids comes from plastic pipes, industrial waste, and products stored in plastic materials (e.g., foods and soaps). DEHP exposure from biosolids is less concerning than DEHP inhalation and ingestion. In terrestrial systems, the effects of DEHP may be short-lived because it binds strongly to soils, and its half-life is less than 50 days (Smith 2009).

Perfluorinated chemicals

Perfluorinated chemicals (PFCs) are used to make non-stick, waterproof, stain-resistant, or fire-resistant surfaces. They are persistent and can leach through soil. Toxicity studies are limited at this time; however, these chemicals do not bioaccumulate. There is uncertainty about the effects of long term low levels of perfluorinated chemicals in the environment, such as **perfluorooctanoic acid (PFOA)**, and how they may affect human and animal health (NIH 2012).

Since 2000, the EPA has been working with manufacturers to phase out some perfluorinated chemicals. A review of emerging organic contaminants in biosolids by Clarke and Smith (2011) determined that the potential effects of perfluorinated chemicals in biosolids should be researched further since they are present at higher concentrations compared to other chemicals.

Flame retardants

Flame retardants are used in many materials and products to make them fire resistant. **Polybrominated diphenyl ethers (PBDEs)** are commonly used in building materials, electronics, furnishings, motor vehicles, plastics, polyurethane foams, and textiles (EPA 2009). PBDEs can end up in biosolids depending on how much is released into the sewer system. Toxicity is not well understood, but PBDEs may be endocrine disruptors or **neurotoxins**. The EPA states that PBDEs may be toxic to the liver and thyroid in humans.

The use of PBDEs was restricted in Washington State in 2008, and the Washington Department of Ecology released a report in January 2015 recommending restrictions on products and furniture that contain PBDEs as well as requirements for having manufacturers report PBDE use in their consumer products (WA Dept. of Ecology 2014a). Other states have or are in the process of phasing out or banning their use. PBDEs bind tightly to soil particles; they are very persistent, and they can bioaccumulate (EPA 2015c).

Polychlorinated biphenyls

Polychlorinated biphenyls (PCBs), also called **Aroclors**, were widely used in numerous materials and products (similar to PBDEs) prior to 1979. They were banned in 1979 because they were found to be **carcinogenic**. They can still be found in items that pre-date the ban, including electrical equipment, oil, thermal insulation, cable insulation, adhesives, paint, caulking, plastics, and floor finishes. PCBs can end up in biosolids depending on how much is released into the sewer system from these old materials. PCBs bind tightly to soil particles; they are very persistent, and they can bioaccumulate (EPA 2013a).

Dioxins and furans

Dioxins and **furans** are byproducts of certain industrial processes, incineration, and uncontrolled burning. Dioxins and furans are mainly released into the atmosphere and are eventually deposited on the Earth's surface. They can also be released into sewer systems from industrial and household wastewater, and because they are very persistent, they can end up in wastewater effluent and biosolids. Some dioxins cause adverse health effects at high enough levels, including cancer (EPA 2015b); 2,3,7,8-**tetrachlorodibenzo-*p*-dioxin (TCDD)** is the most toxic dioxin (EPA 2015b).

TCDD is a priority pollutant, and 16 other dioxins and furans may have endocrine-disrupting properties (WHO 2014). They are regulated as **nonconventional pollutants** in many **National Pollutant Discharge Elimination System (NPDES) permits**. Dioxins and furans are regulated in wastewater **effluents** to limit the amount discharged to the environment. They are not regulated in biosolids because an extensive risk assessment by the EPA concluded that these compounds are present in biosolids at levels that are too low to warrant regulation (EPA 2003). In the terrestrial system, dioxins and furans are persistent and tend to bind to soils since they are insoluble in water. They can also bioaccumulate because they concentrate in the fatty tissue of **biota** (Fiedler 2003).

Part II: Biological Contaminants

The primary pathogens of concern in sewage sludge and biosolids are listed in Table A-1. They fall under the following four categories: **enteric viruses**, bacterial pathogens, **protozoan parasites**, and **helminth parasites**. Many of these pathogens may not be detected in biosolids frequently, or they may be present at low concentrations; however, it is important to continue to monitor biosolids for pathogens so the public health risks from land-applied biosolids remain low.

Table A-1. Pathogens of concern in biosolids.

Enteric viruses	Bacterial pathogens	Protozoan parasites	Helminth parasites
Adenoviruses	*Aeromonas*	*Balantidium coli*	*Ascaris lumbricoides*
Astroviruses	*Burkholderia*	*Cryptosporidium* spp.	*Ascaris sum*
Caliciviruses	*Campylobacter jejuni*	*Cyclospora*	*Hymenolepis nana*
Coxsackieviruses	Enteropathogenic *E. coli*	*Entamoeba histolytica*	*Necator americanus*
Echoviruses	*E. coli* O157:H7	*Giardia lamblia*	*Taenia* spp.
Enteroviruses	*Helicobacter pylori*	*Microsporidia*	*Toxocara canis*
Hepatitis virus A/E	*Legionella* spp.	*Toxoplasma gondii*	*Trichuris trichirua*
Norovirus	*Leptospira*		
Norwalk virus	*Listeria monocytogenes*		
Polioviruses	*Salmonella* spp.		
Reoviruses	*Vibrio cholera*		
Rotaviruses	*Yersinia* spp.		

Adapted from: NRC (2002) and EPA (2011)

Table A-2. Pathogen/indicator maximum allowable levels in Class B and Class A biosolids.[a]

Pathogen or indicator	Class B	Class A
Fecal coliform	< 2×10^6 CFU[b] or MPN[c] per gram	< 1×10^3 MPN per gram
Salmonella spp.	Reduced by a factor of 10	< 3 MPN per 4 grams
Enteric viruses	Reduced by a factor of 10	< 1 PFU[d] per 4 grams
Viable helminth ova	Not applicable	< 1 viable ova per 4 grams

Adapted from: EPA 2015a
[a]Total solids on dry weight basis
[b]CFU = colony-forming units
[c]MPN = **most probable number**
[d]PFU = plaque-forming units

Regulated pathogens or indicators

Currently, four types of pathogens or **indicator**s are measured in biosolids to determine Class B and Class A equivalency. These four types are **fecal coliform**, ***Salmonella* spp.**, enteric viruses, and viable helminth **ova** (Table A-2). Testing for some pathogens or indicators is less expensive than testing for all pathogens that can be found in biosolids. However, some researchers believe that this traditional method of testing pathogen contamination in biosolids may be inadequate for estimating emerging pathogen concentrations. New molecular genetic methods for quantifying pathogen levels are advancing, and they may prove to be more accurate and reliable methods of testing in the future (EPA 2011).

Protozoan Parasites

The two most common protozoan parasites associated with biosolids are **C*ryptosporidium*** and **G*iardia***. Although these protozoa die within days of Class B biosolids treatment, more research concerning *Cryptosporidium* **oocyst** viability is needed for improved risk assessment evaluations (EPA 2011). In soils, *Giardia* can persist for less than a day or up to 28 days, and *Cryptosporidium* can persist from 28 days to over a year.

Helminth Parasites

Biosolids-borne helminthes and ova (i.e., eggs) are rare in the U.S. because the public has access to clean water and has a high level of personal hygiene (EPA 2015b). Very few helminths entering the sewer system means very few can end up in biosolids. However, helminth ova can persist for several years in soil (Gerba and Smith 2005), so it is important to continue limiting helminth parasites in biosolids. This is especially true for Class A biosolids since the primary route of helminth infection is through consumption of contaminated foods.

Aerosolized Endotoxins

Endotoxins are poisonous substances that are released when the cell walls of **gram-negative bacteria** break down. Concentrations of endotoxins are similar for biosolids, animal manures, and compost (EPA 2011). Aerosolized endotoxins can form following mixing, tilling, or disking biosolids, animal manures, and compost. The effects of inhaling aerosolized endotoxins can include fever, coughing, breathlessness, flu-like symptoms, and inflammation (EPA 2011).

Authorized individuals who come in contact with biosolids during mixing, disking, or tilling should wear appropriate personal protective equipment (CDC 2002). Aerosols are not airborne for very long and they do not travel very far, only around 541 ft (Low et al. 2007; King et al. 2011), so they are unlikely to become a public health concern.

Glossary

adenoviruses. Viruses affecting adenoid tissue (tonsils), most of which cause respiratory diseases, and spread by respiratory secretions and fecal contamination. See also **viruses**.

aerosols. Small particles or liquid droplets in air.

agronomic. Relating to agronomy, the science and technology of producing and using plants for food, fuel, fiber, and land reclamation.

anaerobic digestion. A series of biological processes in which microorganisms break down biodegradable material (often wastes such as liquid manure or food-processing wastes) in the absence of oxygen, which generates biogas containing methane, a source of renewable energy.

antibacterial. Chemical or agent that interferes with the growth and reproduction of bacteria. Used specifically for disinfecting surfaces and eliminating potentially harmful bacteria. Unlike antibiotics, antibacterial agents are not used as medicines for humans or animals, but can be found in soaps, detergents, health and skincare products, and household cleaners.

antibiotic. A substance used in medicines for humans and animals that is capable of destroying or weakening certain microorganisms, especially bacteria or fungi that cause infections or infectious diseases.

antibiotic resistance. The ability of a microorganism to withstand the effects of an antibiotic.

Aroclors. Also called PCBs. Synthetic (man-made) organic chemicals banned in 1979 after they were found to cause cancer in animals.

bacterial pathogens. Also called pathogenic bacteria. Bacteria that can cause disease, in contrast to the majority of bacteria, which are harmless or beneficial. See also **pathogens**.

bioaccumulate. To accumulate substances within a biological organism in concentrations greater than the concentrations found in the environment.

bioavailability. Degree and rate at which a substance is absorbed into a living system or is made available at the site of physiological activity.

biological activity. Describes the effects, either beneficial or adverse, of a chemical or drug on living matter.

biological contaminants. Biological substances, such as parasites, bacteria, and viruses that may pose a threat to human and animal health. See also **contaminants**.

biomass. Organic matter derived from living or recently living organisms.

biosolids. Treated sewage sludge, particularly that which is intended for agricultural use as a soil conditioner.

biota. The animal and plant life of a particular region, habitat, or geological period.

bisphenol A (BPA). Synthetic organic chemical used since 1957 to manufacture certain plastics and epoxy resins, commonly used as coatings on the inside of food and beverage cans, that is currently being investigated for potentially harmful effects on both human and environmental health because it is an endocrine (hormone system) disruptor.

bulk density. The dry weight (often of soil) in a given volume.

***Campylobacter*.** Gram-negative bacteria, most of which are pathogenic and can infect humans and animals and are one of the main causes of bacterial foodborne disease in many developed countries.

carbamazepine. Brand name Tegretol. A medication used to treat epilepsy and neuropathic pain as well as schizophrenia and bipolar disorder.

carbon compounds. Compounds consisting largely of carbon atoms, which are the basis of all organic, living matter.

carcinogenic. Having the potential to cause cancer.

Class A biosolids. Sewage sludge that has been treated to reduce biological contaminants to very low levels. Meets EPA standards for regulated contaminants. Can be used as a soil amendment and plant fertilizer in home gardens and landscapes.

Class B biosolids. Sewage sludge that has been treated to substantially reduce the level of biological contaminants. Meets the EPA criteria for regulated contaminants. Can be used as a soil amendment and plant fertilizer for agricultural land, timberland, rangeland, and land-reclamation sites.

Clean Water Act. The primary federal law in the United States governing water pollution.

colony-forming unit. A unit of measure used to estimate the number of viable bacterial cells in a sample.

compost. Organic matter that has been composted; that is, decomposed through a series of biological processes in which microorganisms break down biodegradable material in the presence of oxygen; it can then be recycled as a fertilizer and soil amendment.

contaminants. Undesirable biological or chemical elements or agents, foreign matter, or other substances that if present may be potentially harmful to humans and the environment. Unlike pollutants, contaminants are not always hazardous. See also **pollutants**.

***Cryptosporidium*.** Type of protozoan parasite that causes diarrheal gastrointestinal illness in humans. These parasites are able to form oocysts (i.e., a dormant and more resilient form of the organism) until favorable environmental conditions arise.

degradation. Breakdown of substances by chemical or biological reactions.

di(2-ethylhexyl) phthalate (DEHP). Synthetic organic chemical in the phthalate group, widely used as a plasticizer in the manufacture of some polyvinyl chloride (PVC) plastic materials.

dioxins. Highly toxic compounds produced as a by-product in some manufacturing processes, notably herbicide production and paper bleaching. They are a serious and persistent environmental contaminant.

effective concentrations. The amount of a substance needed to induce a response.

effluents. Outflowing liquid that is frequently wastewater or treated wastewater.

emerging contaminants. New, previously undetected, or poorly understood contaminants.

endocrine disruption. Interference with the human endocrine (hormonal) system. Any system in the body controlled by hormones can be derailed by a hormone disruptor, which can cause cancerous tumors, birth defects, and other developmental disorders.

endotoxins. Substances bound to the outer membrane of gram-negative bacteria that can be released when a bacterium ruptures or disintegrates, potentially eliciting a strong immune response in humans.

enteric viruses. Group of viruses that primarily infect the intestinal tract of humans through ingestion of food or water contaminated with viruses of fecal origin. This group includes adenoviruses and enteroviruses. See also **viruses**.

enteroviruses. Viruses found in feces and respiratory secretions that are spread through the fecal-oral route, potentially causing illnesses ranging from mild respiratory problems to meningitis. See also **viruses**.

Environmental Protection Agency (EPA). An agency of the U.S. federal government that was created for the purpose of protecting human health and the environment.

***Escherichia coli* O157:H7.** Distinct variation of the bacteria *E. coli* that is pathogenic and is typically passed to humans through consumption of contaminated food. It is infectious, causing diarrheal illness that if severe enough can lead to kidney failure.

estrogenic compounds. Substances having an action similar to that of estrogen, the primary female sex hormone that is responsible for development and regulation of the female reproductive system and secondary sex characteristics.

fecal coliform. Bacteria that live in the digestive tracts of warm-blooded animals, including humans, and are excreted in their feces. Most are not harmful, but some are pathogenic to humans and can cause disease.

flame retardants. Compounds added to a variety of manufactured materials to make them more fire resistant.

furans. Colorless, flammable, highly volatile liquids found in heat-treated commercial foods, such as roasted coffee and processed baby foods that are toxic and may be carcinogenic in humans.

Gram-negative bacteria. Bacteria that have an inner cell membrane and do not form spores (i.e., a more resilient form of the organism that allows for asexual reproduction), and are more resistant.

***Giardia*.** Type of protozoan parasite transmitted by the fecal-oral route that can cause diarrhea, gas, cramps, and nausea. These parasites are able to form oocysts (i.e., a dormant and more resilient form of the organism) until favorable environmental conditions arise.

groundwater. Water present in soil pore spaces beneath the soil surface or in rock crevices and pores.

half-life. The time required for any specified substance to decrease by half (e.g., the length of time in days it takes for half of a contaminant concentration to be degraded).

heavy metals. Any relatively dense metal, such as alkali and alkaline earth metals, transition and post-transition metals, lanthanides, and actinides. Sometimes arsenic and antimony are also considered heavy metals.

helminth parasites. Large, worm-like parasites that can cause a wide variety of infectious diseases by infecting the gastrointestinal tract of humans. Infection can occur when, for example, helminth eggs are swallowed after touching contaminated soil.

hydrous oxide. A class of minerals that is highly porous with large surface areas that show an affinity for organic and inorganic contaminants.

indicator organism. A group of organisms used as a proxy or substitute for pathogen contamination testing. See also **pathogens**.

inorganic. Of, relating to, or denoting non-living compounds (not containing more than one carbon atom).

insoluble. Substance incapable of being dissolved. Refers to solubility in water unless otherwise indicated.

leaching. Draining away substances from soil or similar materials by the action of liquids, especially rainwater.

macrofauna. Organisms greater than 2 mm in length that live part of their life in the soil. Some examples are earthworms, insects and their larvae, slugs, and snails.

macronutrients. Nutrients needed in relatively large amounts. For plants, the primary macronutrients are nitrogen, phosphorus, and potassium. Calcium, sulfur, and magnesium are secondary macronutrients.

microbes. Shorter term for microorganisms.

micronutrients. Nutrients only needed in very small amounts.

microorganisms. Diverse, microscopic living organisms that include fungi, viruses, all bacteria, and almost all protozoa.

most probable number. In microbiology, microbial cultures grown in the laboratory are assessed visually to determine growth or no growth, bypassing the difficult process of colony counting.

municipal wastewater. Wastewater derived from local households and sometimes industrial facilities.

musks. Perfume ingredient essential in modern perfumery.

National Pollutant Discharge Elimination System (NPDES) permits. The permitting system used to regulate point source pollution (i.e., identifiable effluent discharge locations), such as municipal wastewater treatment facilities, industrial facilities, and some animal feedlots.

neurotoxins. Substances that are poisonous or destructive to nerve tissue.

nitrate. Chemical (NO_3^-) produced for use as a fertilizer in agriculture because of its high solubility and biodegradability characteristics.

nonconventional pollutants. Pollutants other than the conventional pollutants. Conventional pollutants are biochemical oxygen demand (BOD), fecal coliform bacteria, oil and grease, pH, and total suspended solids. Wastewater treatment facilities are designed to remove these conventional pollutants, but not nonconventional pollutants.

nonylphenol (NP). Synthetic organic compounds that are used in manufacturing antioxidants, lubricating oil, detergents, emulsifiers, and solubilizers (surfactants) that have been found to be an endocrine disruptor.

nonylphenol ethoxylates (NPE). Also called nonoxynols. Synthetic organic compounds used in detergents, emulsifiers, wetting agents, and defoaming agents (surfactants) that break down to nonylphenol in some cases and have mild to medium estrogenic function.

odorants. A chemical compound that has a smell or odor.

oocyst. A hardy, thick-walled spore that develops at a certain stage in the life cycle of coccidian parasites like *Cryptosporidium* and then is shed in the feces of infected individuals.

ova. For helminths, ova are the eggs produced by helminth worms for reproduction.

organic. Of, relating to, or derived from living matter.

organic contaminants. A class of chemical contaminants that has more than one carbon atom in its chemical makeup.

organic matter. Matter composed of organic (carbon-containing) compounds that have come from the remains of organisms such as plants and animals and their waste products.

organic solids. Solids made up of compounds with more than one carbon atom in their chemical makeup as opposed to inorganic solids which are made up of inorganic (non-carbon) compounds.

parasites. Organisms that live in or on a host in a non-mutual symbiotic relationship where they derive nourishment from the host while doing damage to it.

pathogenic bacteria. Single-celled microorganisms that cause disease.

pathogens. Agents that cause disease, especially living microorganisms such as bacteria, viruses, or fungi.

perfluorinated chemicals (PFCs). A group of fluorine-containing chemicals that have been used extensively in commercial applications to make products oil, stain, and water resistant such as stain-resistant carpeting and food packaging like microwavable popcorn bags.

perfluorooctanoic acid (PFOA). A type of PFC that is used in the process of making Teflon® and similar chemicals, although it is burned off during the process and is not present in significant amounts in the final Teflon products. It is a toxicant and carcinogen in animals.

persistent chemicals. Chemicals that are difficult to remove from the environment.

personal care products. Products used by individuals for personal hygiene and personal appearance, such as soaps, cosmetics, fragrances, and hair-styling products.

plasticizers. Additives that increase the plasticity or fluidity of plastic materials used to make soft plastics like some polyvinyl chlorides (PVCs). See **phthalates**.

plaque-forming unit. A unit of measure used to estimate the number of particles capable of forming plaques (e.g., virus particles) in a sample.

pH. A numeric scale used to specify the acidity or basicity of an aqueous (water-containing) solution.

pharmaceuticals. Compounds manufactured for use as medicinal drugs.

phthalates. A group of man-made chemicals used in a wide range of common products, and are often used as a plasticizer in plastics, especially in PVC resins.

pollutants. Undesirable biological or chemical elements or agents, foreign matter, or other substances or contaminants that are in high enough concentrations that they become hazardous to human or environmental health.

polybrominated diphenyl ethers (PBDEs). Organic chemicals, structurally similar to polychlorinated biphenyls (PCBs), used as a flame retardant, although they are being phased out in many products because they are persistent chemicals and they bioaccumulate.

polychlorinated biphenyls (PCBs). Organic chemicals, structurally similar to polybrominated diphenyl ethers (PBDEs), that were used as a flame retardant until they were banned in 1979 because they were found to be carcinogens.

polyvinyl chloride (PVC). A widely produced synthetic thermoplastic resin used chiefly for thin coatings, insulation, and piping. See resin.

protozoa. Single-celled organisms larger than bacteria, but smaller than helminth worms, that exhibit animal-like behaviors.

protozoan parasites. Microscopic, single-celled parasitic organisms transmitted to humans by such means as contaminated water, waste, blood, poorly handled food, and insects, potentially causing serious illness.

reservoir for pathogens. A long-term host for pathogens of an infectious disease.

resin. A solid or highly viscous substance that is malleable until it sets into a hard finish.

risk assessment. A process used to evaluate the nature and magnitude of a possible negative outcome in a defined situation, such as evaluating the level of risk or threat certain chemical contaminants pose to human and environmental health.

***Salmonella* spp.** Bacteria, usually motile (capable of motion), that are pathogenic to humans and other warm-blooded animals and cause food poisoning, gastrointestinal inflammation, typhoid fever, and septicemia.

sewage sludge. Residual, semi-solid material that is produced as a by-product during municipal and industrial sewage and wastewater treatment.

***Shigella*.** Gram-negative bacterium related to *Salmonella* that causes disease in primates and humans and is one of the leading causes of bacterial diarrhea worldwide.

soil aggregation. The arrangement of soil particles into stable units or aggregates.

soil conditioner. A substance that is added to a soil to improve its physical qualities, such as texture, structure, and porosity, in order to increase its ability to provide plant nutrition.

soil porosity. A measure of the amount of air space between soil particles.

solubility. The ability of a solid, liquid, or gaseous chemical to dissolve into a bulk amount of material (solid, liquid, or gas), depending on its physical and chemical properties as well as temperature and pH.

sorption. A physical and chemical process by which one substance becomes attached to another.

surface runoff. Excess stormwater, meltwater, or water from other sources that flows over the Earth's surface.

surfactants. Substances that tend to reduce the surface tension of a liquid in which they are dissolved.

sustainable practices. Practices that can be maintained over time without adverse consequences.

synthetic. Of, relating to, or produced by chemical or biochemical synthesis, especially to imitate a natural product.

terrestrial system. Land-based communities that include living and non-living things.

tetrachlorodibenzo-*p*-dioxin (TCDD). The most potent of the toxic dioxin compounds, it is a persistent and carcinogenic chemical that is also known as Agent Orange.

trace element. An element (in the periodic table of elements) present in very small amounts.

triclosan. Antibacterial and antifungal agent found in consumer products, such as soaps, detergents, surgical cleaning treatments, and children's toys.

viruses. Submicroscopic infective agents that replicate inside living cells and often cause disease.

wastewater residuals. Materials comprised of suspended solids and sludge from the primary and secondary wastewater processing steps used by wastewater treatment plants, which after being treated and stabilized become biosolids.

water-holding capacity. Amount of water that can be stored in the soil.

Yersinia enterocolitica. Gram-negative bacteria that can infect both humans and animals, causing diarrhea in humans; animals that recover become carriers, and dogs, sheep, wild rodents, and environmental water may be reservoirs for pathogenic strains.

Definitions adapted from Merriam-Webster.com, wikipedia.org, U.S. Environmental Protection Agency (EPA), and Centers for Disease Control and Prevention (CDC).

References

Brooks, J.P., S.L. Maxwell, C. Rensing, and I.L. Pepper. 2007. Occurrence of Antibiotic-Resistant Bacteria and Endotoxin Associated with the Land Application of Biosolids. *Canadian Journal of Environmental Microbiology* 53: 616–622.

Brooks, J.P., C.P. Gerba, and I.L. Pepper. 2015. Antibiotic Resistant Bacteria. Animal Manure Management. *eXtension*.

Centers for Disease Control and Prevention (CDC). 2002. Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids. Cincinnati, OH: The National Institute for Occupational Safety and Health (NIOSH).

Centers for Disease Control and Prevention. 2015. Adenoviruses: Symptoms. Atlanta, GA.

Clarke, B.O., and S.R. Smith. 2011. Review of 'Emerging' Organic Contaminants in Biosolids and Assessment of International Research Priorities for the Agricultural Use of Biosolids. *Environment International* 37: 226–247.

Cogger, C.G., D.M. Sullivan, C.L. Henry, and K.P. Dorsey. 2000. Biosolids Management Guidelines for Washington State. Publication #93-80. Olympia: Department of Ecology Publication Distribution Center.

Cogger, C.G., A.I. Bary, A.C. Kennedy, and A-M. Fortuna. 2013. Long-Term Crop and Soil Response to Biosolids Applications in Dryland Wheat. *Journal of Environmental Quality* 42: 187–1888.

Cogger, C.G. 2014. Using Biosolids in Gardens and Landscapes. *Washington State University Extension Publication* FS156E.

Defra (Department for Environment, Food and Rural Affairs), Toxic Substances Division. 1991. Environmental Hazard Assessment: Di-(2-ethylhexyl) Phthalate. Directorate for Air, Climate and Toxic Substances. Department of the Environment.

Defra (Department for Environment, Food and Rural Affairs). 2011. Archive: Codes of Good Agricultural Practice–Definitions. Slurry, Options for Treatment by Anaerobic Digestion. University of Hertfordshire: Agricultural Document Library.

Environment & Human Health, Inc. 2008. Plastics That May Be Harmful to Children and Reproductive Health. North Have, CT: Environment & Human Health, Inc.

Epstein, E. 2003. Land Application of Sewage Sludge and Biosolids. Boca Raton, FL: CRC Press.

European Parliament and the Council of the European Union (EPCEU). 2006. Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18 December 2006. Annex XVII. Restrictions on the Manufacture, Placing on the Market and Use of Certain Dangerous Substances, Mixtures and Articles.

Fiedler, H. 2003. Dioxins and Furans. In *The Handbook of Environmental Chemistry Vol. 3, Part O. Persistent Organic Pollutant,* edited by H. Fiedler,125–201. Springer-Verlag: Berlin-Heidelberg.

Gerba, C.P., and J.R. Smith. 2005. Sources of Pathogenic Microorganisms and Their Fate during Land Application of Wastes. *Journal of Environmental Quality* 34: 42–48.

Gerba, C.P., A.H. Tamimi, C. Pettigrew, A.V. Weisbrod, and V. Rajagopalan. 2011. Sources of Microbial Pathogens in Municipal Solid Waste Landfills in the United States of America. *Waste Management & Research* 29: 781–790.

Gilmour, J.T., C.G. Cogger, L.W. Jacobs, G.K. Evanylo, and D.M. Sullivan. 2003. Decomposition and Plant-Available Nitrogen in Biosolids: Laboratory Studies, Field Studies, and Computer Simulation. *Journal of Environmental Quality* 32: 1498–1507.

Girovich, M.J. 1996. Biosolids Treatment and Management: Processes for Beneficial Use. Boca Raton, FL: CRC Press.

González, M.M., J. Martín, D. Camacho-Muñoz, J.L. Santos, I. Aparicio, and E. Alonso. 2010. Degradation and Environmental Risk of Surfactants after the Application of Compost Sludge to the Soil. *Waste Management* 32: 1324–1331.

Goodman, R.M. 2004. Encyclopedia of Plant and Crop Science. New York, NY: M. Dekker.

Greens, T., L. Roosens, H. Neels, and A. Covaci. 2009. Assessment of Human Exposure to Bisphenol-A, Triclosan and Tetrabromobisphenol-A through Indoor Dust Intake in Belgium. *Chemosphere* 76: 755–760.

Heuer, H., and K. Smalla. 2007. Manure and Sulfadiazine Synergistically Increased Bacterial Antibiotic Resistance in Soil over At Least Two Months. *Environmental Microbiology* 9: 657–666.

Heuer, H., H. Schmitt, and K. Smalla. 2011. Antibiotic Resistance Gene Spread Due to Manure Application on Agricultural Fields. *Current Opinion in Microbiology* 14: 236–243.

Higgins, C.P., J.O. Sharp, J.G. Sepulvado, B.J. Litrrell, G. O'Connor, E. Snyder, and D. McAvoy. 2010. Trace Organic Chemicals in Biosolids-Amended Soil: State-of-the-Science Review. Final Report SRK5T09. Water Environment Research Foundation. Alexandria, VA.

Kato, K., A.M. Calafat, and L.L. Needham. 2009. Polyfluoroalkyl Chemicals in House Dust. *Environmental Research* 109: 518–523.

King, G.M., J.P. Brooks, S. Brown, C. Gerba, G.A. O'Connor, and I.L. Pepper. 2011. Land Application of Organic Residuals: Public Health Threat or Environmental Benefit? Washington, DC: American Society for Microbiology.

Low, S.Y., T. Paez-Rubio, C. Baertsch, M. Kucharski, and J. Peccia. 2007. Off-Site Exposure to Respirable Aerosols Produced during the Disk-Incorporation of Class B Biosolids. *Journal of Environmental Engineering* 133: 987–994.

Massé, D.I., N.M.C. Saady, and Y. Gilbert. 2014. Potential of Biological Processes to Eliminate Antibiotics in Livestock Manure: An Overview. *Animals* 4: 146–163.

Mendiola, J., J.D. Meeker, N. Jørgensen, A.-M. Andersson, F. Liu, A.M. Calafat, J.B. Redmon, E.Z. Drobnis, A.E. Sparks, C. Wang, R. Hauser, and S.H. Swan. 2012. Urinary Concentrations of Di(2-ethylhexyl) Phthalate Metabolites and Serum Reproductive Hormones: Pooled Analysis of Fertile and Infertile Men. *Journal of Andrology* 33: 488–498.

Minur, M., K. Wong, and I. Xagoraraki. 2011. Release of Antibiotic Resistant Bacteria and Genes in the Effluent and Biosolids of Five Wastewater Utilities in Michigan. *Water Research* 45: 681–693.

National Institutes of Health. 2012. Perfluorinated Chemicals (PFCs). Research Triangle Park, NC: *National Institute of Environmental Health Sciences.*

National Research Council. 2002. Biosolids Applied to Land: Advancing Standards and Practices. Committee of Toxicants and Pathogens in Biosolids Applied to Land. National Research Council. Washington, DC: National Academy Press.

Oun, A., A. Kumar, T. Harrigan, A. Angelakis, and I. Xagoraraki. 2014. Effects of Biosolids and Manure Application on Microbial Water Quality in Rural Areas in the US. *Water* 6: 3701–3723.

Pepper, I.L., J.P. Brooks, R.G. Sinclair, P.L. Gurian, and C.P. Gerba. 2010. Pathogens and Indicators in United States Class B Biosolids: National and Historic Distributions. *Journal of Environmental Quality* 39: 2185–2190.

Roccaro, P., and F.G.A. Vagliasindi. 2014. Risk Assessment of the Use of Biosolids Containing Emerging Organic Contaminants in Agriculture. *Chemical Engineering Transactions* 37: 817–822.

Rudel, R.A., D.E. Camann, J.D. Spengler, L.R. Korn, and J.G. Brody. 2003. Phthalates, Alkylphenols, Pesticides, Polybrominated Diphenyl Ethers, and Other Endocrine-Disrupting Compounds in Indoor Air and Dust. *Environmental Science & Technology* 37: 4543–4553.

Smith, S.R. 2009. Organic Contaminants in Sewage Sludge (Biosolids) and Their Significance for Agricultural Recycling. *Philosophical Transactions of The Royal Society A* 367 (1904): 4005–4041.

Sullivan, D.M., C.G. Cogger, and A.I. Bary. 2015. Fertilizing with Biosolids. *Pacific Northwest Extension Publication* PNW 508-E. Oregon State University.

U.S. Environmental Protection Agency. 2000. Biosolids and Residuals Management Fact Sheet: Odor Control in Biosolids Management. EPA 832-F-00-067. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2003. Final Action Not to Regulate Dioxins in Land-Applied Sewage Sludge. EPA-822-F-03-007. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2009. Targeted National Sewage Sludge Survey. EPA-822-R-08-018. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2011. Problem Formulation for Human Health Risk Assessments of Pathogens in Land-Applied Biosolids. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2012. Dfe Alternatives Assessment for Nonylphenol Ethoxylates. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2013a. Learn about Polychlorinated Biphenyls (PCBs). Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2013b. Literature Review of Contaminants in Livestock and Poultry Manure and Implications for Water Quality. EPA 820-R-13-002. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2014a. Water: Sewage Sludge (Biosolids) – Introduction. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2014b. Significant New Use Rules: Certain Nonylphenols and Nonylphenol Ethoxylates. 40 CFR Parts 721. EPA-HQ-OPPT-2007-0490-0211. Washington, DC: U.S. Environmental Protection Agency.

Washington Department of Ecology. 2009. Pet Waste FAQs. Olympia: Washington State Department of Ecology.

Washington Department of Ecology. 2014a. Biosolids. Olympia: Washington State Department of Ecology.

Washington Department of Ecology. 2014b. Biosolids: 2015 General Permit for Biosolids Management Process. Olympia: Washington State Department of Ecology.

U.S. Environmental Protection Agency. 2015a. Basic Information: Pathogen Equivalency Committee. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2015b. Learn About Dioxin. Washington, DC: U.S. Environmental Protection Agency.

U.S. Environmental Protection Agency. 2015c. Polybrominated Diphenyl Ethers (PBDEs) Action Plan Summary. Washington, DC: U.S. Environmental Protection Agency.

Washington Department of Ecology. 2014. What are Flame Retardants? Olympia: Washington State Department of Ecology.

World Health Organization. 2015. Dioxins and Their Effects on Human Health. *WHO Media Centre* Fact Sheet N°225.

Zerzghi, H., C.P. Gerba, J.P. Brooks, and I.L. Pepper. 2010. Long-Term Effects of Land Application of Class B Biosolids on the Soil Microbial Populations, Pathogens, and Activity. *Journal of Environmental Quality* 39: 42–408.

Zhao, L., Y.H. Dong, and H. Wang. 2010. Residues of Veterinary Antibiotics in Manures from Feedlot Livestock in Eight Provinces of China. *Science of the Total Environment* 408: 1069–1075.

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BASIC HYGIENE WHEN WORKING WITH BIOSOLIDS

1. Wash hands thoroughly with soap and water after contact with biosolids.
2. Avoid touching face, mouth, eyes, nose, genitalia, or open sores and cuts while working with biosolids.
3. Wash your hands before you eat, drink, or smoke and before and after using the bathroom.
4. Eat in designated areas away from biosolids-handling activities.
5. Do not smoke or chew tobacco or gum while working with biosolids.
6. Use barriers such as gloves between skin and surfaces exposed.
7. Remove excess biosolids from footwear prior to entering a vehicle or building.
8. Keep wounds and cuts covered with clean, dry bandages.
9. Thoroughly but gently flush eyes with water if biosolids contact eyes.
10. Change into clean work clothing on a daily basis and reserve footwear for use at worksite.
11. Practice universal precautions when handling biosolids by using disposable latex or nitrile type gloves when the potential for handling biosolids is present.
12. Keep PPE and other materials that have come in contact with biosolids off of break room tables and other food preparation areas.

Guidance for Controlling Potential Risks to Workers Exposed to Class B Biosolids

This guidance is intended only for controlling health risks to workers from Class B biosolids during handling and land application. This guidance is not intended to address nonoccupational exposure.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

July 2002

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Introduction

Biosolids are the organic residues resulting from the treatment of commercial, industrial, and municipal wastewater (sewage). One purpose of the treatment is to significantly reduce the concentration of disease-causing organisms (also known as pathogens). Treatment also reduces the attractiveness of the residues to insects, birds, and rodents. The product is a material that can be recycled for uses such as adding organic material to the soil.

The U.S. Environmental Protection Agency (EPA) has established two categories of biosolids:

- Class A biosolids have undergone treatment to the point where the concentration of pathogens is reduced to levels low enough that no additional restrictions or special handling precautions are required by Federal regulations [40 CFR* Part 503]. If the Class A biosolids meet *exceptional quality* requirements for metals content, they may be sold in bags and applied in the same way as other soil conditioners such as peat moss.
- Class B biosolids have undergone treatment that has reduced but not eliminated pathogens. By definition, Class B biosolids may contain pathogens. As a result, Federal regulations for use of Class B biosolids require additional measures to restrict public access and to limit livestock grazing for specified time periods after land application [40 CFR Part 503]. This allows time for the natural die-off of pathogens in the soil.

Whereas EPA rules [40 CFR Part 503] restrict public access to lands treated with Class B biosolids in order to protect public health, these rules do not apply to workers involved with Class B biosolids handling and land application.

Workers may come in contact with Class B biosolids during the course of their work. Workers and employers may be well aware of the need for precautions when contacting untreated sewage but less aware of the need for basic precautions when using Class B biosolids. This document provides information, guidance, and recommendations to employers and employees working with Class B biosolids to minimize occupational risks from pathogens. It does not address other potential safety and health issues such as injuries or exposures to chemicals.

How are biosolids used?

Biosolids are typically treated to Class B or Class A standards at the wastewater (sewage) treatment plant, where a liquid or semi-solid material is produced. In a liquid state, biosolids can be transported by truck to a land application site where they are applied directly to the land using tractors, tank wagons, irrigation systems, or special application vehicles. Alternatively, biosolids may undergo mechanical dewatering that may include the use of polymers. Dewatered and liquid biosolids are often temporarily stored at the treatment plant or application site. Dewatered biosolids are transported and applied to land using front-end loaders, trucks, tractors, or biosolids-spreading equipment. Most biosolids are applied with spreaders in semisolid form and then incorporated into the soil using a disc plow. Workers may come into either direct or indirect contact with biosolids during any phase of the treatment, transport, or application process, or after they are land applied. Currently, more than 50% of the biosolids generated in the United States is recycled as soil conditioners to improve and maintain productive soils and stimulate plant growth rather than being sent to landfills or incinerated. Biosolids are applied on agricultural land, forestlands, and surface mine reclamation sites. Class A biosolids are also used in horticultural applications. EPA estimates that 7.1 million tons of biosolids were generated for use or disposal in 2000.

*Code of Federal Regulations.

What is in biosolids that requires control of worker exposures?

There are four major types of human disease-causing organisms (pathogens) that can be found in sewage: (1) bacteria, (2) viruses, (3) protozoa, and (4) helminths (parasitic worms). Class B biosolids may contain the same types of pathogens as the source sewage, but at reduced concentrations. Both Class A and Class B biosolids may also contain chemicals (including metals) and allergens.

To protect public health, the EPA's 40 CFR Part 503 rule prescribes a *restricted period* of up to 1 year to limit public access to lands where Class B biosolids have been applied. These EPA restrictions do not apply to occupational access. EPA does recognize that occupational exposure can occur and states that workers exposed to Class B biosolids might benefit from several additional precautions such as use of dust masks when spreading dry materials, the use of gloves when touching biosolids, and routine hand washing before eating, drinking, smoking, or using the bathroom.

The risk of worker exposure to infectious agents in Class B biosolids is likely greatest prior to, during, and immediately after land application of the biosolids. Because the concentration of pathogens declines through natural processes, the potential for pathogen exposure decreases over time.

Do we know these pathogens can cause disease?

Yes, the association between poor hygiene, raw sewage, and infectious disease is well established. Most of the pathogenic bacteria, viruses, and parasites in biosolids are enteric, which means they are present in the intestinal tracts of humans and animals. Enteric organisms that may be found in biosolids include, but are not limited to, *Escherichia coli*, *Salmonella, Shigella, Campylobacter, Cryptosporidium, Giardia*, Norwalk virus, and enteroviruses. Exposure may potentially result in disease (e.g., gastroenteritis) or in a carrier state in which an infection does not clinically manifest itself in the individual but can be spread to others. These enteric organisms are usually associated with self-limited gastrointestinal illness but can develop into more serious diseases in sensitive populations such as immune-compromised individuals, infants, young children, and especially the elderly.

The disease risk is a function of the number and types of pathogens in the Class B biosolids relative to the exposure levels and infective dose. Because data are sparse on what constitutes an infective dose, it is prudent public health practice to minimize workers' contact with Class B biosolids and soil or dusts containing Class B biosolids during production and application, and at land application sites during the period when public access is restricted. Class A biosolids may also present some health risk to workers, since some chemicals and biologic constituents in Class A biosolids are not regulated by the EPA.

Can workers be exposed to pathogens from biosolids?

Workers could be exposed to pathogens and irritants when working with Class B biosolids during the period when public access is restricted. During a NIOSH field investigation at one biosolids land application and storage site that did not comply with EPA requirements, the following was observed:

- NIOSH interviewed employees who worked in all phases of the biosolids operation. Some

employees reported repeated episodes of gastrointestinal illness after working with the biosolids, either at the treatment plant or during land application.

- NIOSH observed among workers an inconsistent awareness, provision, and use of protective equipment and hygiene practices appropriate for handling Class B biosolids (or biosolids that do not comply with EPA standards).
- NIOSH collected bulk samples from different locations within the biosolids storage site and found measurable concentrations of fecal coliforms. Fecal coliforms are used as an indicator for the presence of other enteric microorganisms. Enteric bacteria were detected in air samples collected at the land application site.
- The local department of environmental services recently informed NIOSH that biosolids applied at this site intermittently exceeded (by up to 4.5 times) the EPA fecal coliform upper limit for Class B biosolids prior to the NIOSH survey.
- The substandard biosolids were applied at the agricultural site before the monitoring results were received from the laboratory.

EPA reports that high-pressure spray applications may result in some aerosolization of pathogens and that application or incorporation of dewatered biosolids may cause very localized fine particulate/dusty conditions. Also, farm workers may be exposed to biosolids after application and during the restricted period. Ancillary workers (for example, laborers hired to clean trucks that were used to haul biosolids) can be exposed to biosolids. Exposures to substandard biosolids can occur when these materials are loaded and hauled to approved landfills or incinerators for disposal.

Additional study of worker exposures to pathogens and other toxics possibly present in Class B biosolids is needed. This will reduce scientific uncertainty about these issues and allow further refinement of worker precautions.

What should employers do to prevent work-related illness?

To protect workers who have direct contact with Class B biosolids and thus are likely to have an exposure to pathogens, employers should provide a basic level of protection, including appropriate measures from those listed below. While the measures are worded to refer to Class B biosolids, most also apply to tasks involving contact with sewage, untreated or partially treated sludge, or substandard biosolids.

Provide basic hygiene recommendations for workers.

Basic hygiene precautions are important for workers handling biosolids. The following list, originally developed by EPA, provides a good set of hygiene recommendations.

1. Wash hands thoroughly with soap and water after contact with biosolids.
2. Avoid touching face, mouth, eyes, nose, genitalia, or open sores and cuts while working with biosolids.
3. Wash your hands *before* you eat, drink, or smoke and before and after using the bathroom.
4. Eat in designated areas away from biosolids-handling activities.
5. Do not smoke or chew tobacco or gum while working with biosolids.

6. Use barriers between skin and surfaces exposed to biosolids.

7. Remove excess biosolids from footgear prior to entering a vehicle or a building.

8. Keep wounds covered with clean, dry bandages.

9. Thoroughly but gently flush eyes with water if biosolids contact eyes.

10. Change into clean work clothing on a daily basis and reserve footgear for use at worksite or during biosolids transport.

11. Do not wear work clothes home or outside the work environment.

12. Use gloves to prevent skin abrasion.

In addition, NIOSH recommends the following steps to provide a more comprehensive set of precautions for use by employers and employees:

Provide appropriate protective equipment, hygiene stations, and training.

Personal Protective Equipment (PPE).—Appropriate PPE should be provided for all workers likely to have exposure to biosolids. The choices of PPE include goggles, splash-proof face shields, respirators, liquid-repellent coveralls, and gloves. Face shields should be made available for all jobs in which there is a potential for exposure to spray or high-pressure leaks, or aerosolized biosolids during land application. Management and employee representatives should work together to determine which job duties are likely to result in this type of exposure, to conduct appropriate on-site monitoring, and to determine which type of PPE is needed in conjunction with a qualified safety and health professional. If respirators are needed, a comprehensive program would include respirator fit-testing and training or retraining.

Hygiene and Sanitation.—Hand-washing stations with clean water and mild soap should be readily available whenever contact with biosolids occurs. In the case of workers in the field, portable sanitation equipment, including clean water and soap, should be provided. Cabs should be wiped down and cleaned of residual mud (or settled dust) frequently to reduce potential for exposure to biosolids.

Training.—Periodic training on standard hygiene practices for biosolids workers should be conducted by qualified safety and health professionals to cover issues such as the following:

- Frequent and routine hand washing (the most valuable safeguard in preventing infection by agents present in biosolids), especially before eating or smoking
- The proper use of appropriate PPE, such as coveralls, boots, gloves, goggles, respirators, and face shields
- The removal of contaminated PPE and the use of available on-site showers, lockers, and laundry services
- Proper storage, cleaning, or disposal of contaminated PPE
- Instructions that work clothes and boots should not be worn home or outside the immediate work environment
- Prohibition of eating, drinking, or smoking while working in or around biosolids
- Procedures for controlling exposures to chemical agents that may be in biosolids

Reporting.—Workers should be trained to report potentially work-related illnesses or symptoms to the appropriate supervisory or health care staff. This may aid in the early detection of work-relat ed health effects.

Immunizations.—Ensure that all employees are up-to-date on tetanus-diphtheria immunizations, since employees are at risk of soil-contaminated injuries. Current CDC recommendations do not support hepatitis A vaccination for sewage workers.

Extend good environmental practices to prevent and minimize occupational exposures.

- Where feasible, substituting Class A biosolids could reduce the pathogen exposure risks during land application compared to applying Class B biosolids. Feasibility may be affected by local customer preferences, since the two types of biosolids vary in the nutrient value they provide to end-users.

- Monitor the source material coming from the wastewater treatment facility. Check monitoring results to assure they meet specified Class B or Class A standards prior to land application operations.

- Monitor stored biosolids prior to application to assure that the biosolids are properly stabilized and that unacceptable regrowth or cross-contamination from substandard material has not occurred.

- Where local conditions permit, inject biosolids below the soil or incorporate (thoroughly mix) into tilled soil. This will minimize post-application worker contact with applied biosolids and prevent resuspension into the air during periods of dryness.

- On windy days, avoid spreading or disturbing dry biosolids (e.g., compost) that would create dust.

- On windy days, avoid spreading biosolids by high-pressure spray.

- Avoid unnecessary mechanical disturbance and contact with land-applied Class B biosolids during the period when public access is restricted.

- Equip heavy equipment used at storage and application facilities with sealed, positive-pressure, air-conditioned cabs that contain filtered air-recirculation units.

- Monitor worker exposures when adjusting precautions to address site-specific issues.

For More Information

Additional information about biosolids and preventive measures can be obtained from the following government Web sites:

- Environmental Protection Agency (EPA). *Biosolids*.
  www.epa.gov/owm/bio.htm
  (This site includes links to professional associations that address biosolids.)

- National Center for Infectious Diseases (NCID). *Viral Hepatitis Resource Center*.
  www.cdc.gov/ncidod/diseases/hepatitis

- National Institute for Occupational Safety and Health (NIOSH).
  www.cdc.gov/niosh

Bibliography

Brugha R, Heptonstall J, Farrington P, Andren S, Perry K, Parry J [1998]. Risk of hepatitis A infection in sewage workers. Occup Environ Med *55*(8):567–569.

CDC (Centers for Disease Control and Prevention) [1999]. Prevention of hepatitis A through active or passive immunization. MMWR *48*(RR–12).

CFR. Code of Federal regulations. Washington, DC: U.S. Government Printing Office, Office of the Federal Register.

Clark CS [1987]. Health effects associated with wastewater treatment, disposal, and reuse. J Water Pollut Control Fed *59*(6):436–440.

DeSerres G, Laliberté D [1997]. Hepatitis A among workers from a waste water treatment plant during a small community outbreak. Occup Environ Med *54*(1):60–62.

Dorn RC, Reddy CS, Lamphere DN, Gaeuman JV, Lanese R [1985]. Municipal sludge application on Ohio farms: health effects. Environ Res *38*:332–359.

EPA [2002]. Office of Inspector General status report: land application of biosolids. Washington, DC: Environmental Protection Agency, 2002–S–000004.

EPA [2000]. Guide to field storage of biosolids. Washington, DC: Environmental Protection Agency, Office of Wastewater Management, EPA/832–B–00–007.

EPA [1999]. Biosolids generation, use, and disposal in the United States. Washington, DC: Environmental Protection Agency, Office of Solid Waste, EPA530–R–99–009.

EPA [1999]. Environmental regulations and technology—control of pathogens and vector attraction in sewage sludge. Washington, DC: Environmental Protection Agency, Office of Research and Development, EPA/625/R–92/013.

EPA [1995]. Pathogen risk assessment methodology for municipal sewage sludge landfilling and surface disposal. Washington, DC: Environmental Protection Agency, Office of Research and Development, EPA/600/R–95/016.

Khuder SA, Arthur TA, Bisesi MS, Schaub EA [1998]. Prevalence of infectious disease and associated symptoms in wastewater treatment workers. Am J Ind Med *33*:571–577.

Kowal NE, Pahren HR [1981]. Health effects associated with wastewater treatment and disposal. J Water Pollut Control Fed *53*(6):776–786.

Laitinen S, Kangas J, Kotimaa M, Liesivouri J, Martikainen PJ, Nevalainen A, Sarantila R, Husman K [1994]. Workers' exposure to airborne bacteria and endotoxins at industrial wastewater treatment plants. Am Ind Hyg Assoc J *55*(11):1055–1060.

Lodor ML [2001]. Viewpoint: NIOSH report omits significant details in LeSourdsville case. Biosolids Technical Bulletin, Water Environ Fed *7*(4):11–13.

Lundholm M, Rylander R [1983]. Work-related symptoms among sewage workers. Br J Ind Med *40*:325–329.

National Research Council [1996]. Use of reclaimed water and sludge in food crop production. Washington, DC: National Academy Press.

NIOSH [1999]. Hazard evaluation and technical assistance report: Bio-Solids Land Application Process, LeSourdsville, OH. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National

Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 98–0118–2748.

Pillai SD, Widmer KW, Dowd SE, Ricke SC [1996]. Occurrence of airborne bacteria and pathogen indicators during land application of sewage sludge. Appl Environ Microbiol *62*:296–299.

Scarlett- Kranz JM, Babish JG, Strickland D, Lisk DJ [1987]. Health among municipal sewage and water treatment plant workers. Toxicol Ind Health *3*(3):311–319.

Straub TM, Pepper IL, Gerba CP [1993]. Hazards from pathogenic microorganisms in land-disposed sewage sludge. Rev Environ Contamin Toxicol *132*:55–91.

Trout D, Mueller MS, Venczel L, Krake A [2000]. Evaluation of occupational transmission of Hepatitis A virus among wastewater workers. J Occup Environ Med *42*(1):83–87.

WEF [1994]. Safety and health in wastewater systems: manual of practice No. 1. Alexandria, VA:Water Environment Federation (WEF).

BASIC CONSTRUCTION EMISSION CONTROL PRACTICES (BEST MANAGEMENT PRACTICES)

The following Basic Construction Emissions Control Practices are considered feasible for controlling fugitive dust from a construction site. The practices also serve as best management practices (BMPs), allowing the use of the non-zero particulate matter significance thresholds.

Control of fugitive dust is required by District Rule 403 and enforced by District staff.

- Water all exposed surfaces two times daily. Exposed surfaces include, but are not limited to soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Cover or maintain at least two feet of free board space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour (mph).
- All roadways, driveways, sidewalks, parking lots to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

The following practices describe exhaust emission control from diesel powered fleets working at a construction site. California regulations limit idling from both on-road and off-road diesel powered equipment. The California Air Resources Board enforces the idling limitations.

- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [required by California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Provide clear signage that posts this requirement for workers at the entrances to the site.

Although not required by local or state regulation, many construction companies have equipment inspection and maintenance programs to ensure work and fuel efficiencies.

- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determine to be running in proper condition before it is operated.

Lead agencies may add these emission control practices as Conditions of Approval (COA) or include in a Mitigation Monitoring and Reporting Program (MMRP).

ENHANCED FUGITIVE PM DUST CONTROL PRACTICES

SOIL DISTURBANCE AREAS

- Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.
- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 mph.
- Install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.
- Plant vegetative ground cover (fast-germinating native grass seed) in disturbed areas as soon as possible. Water appropriately until vegetation is established.

UNPAVED ROADS (ENTRAINED ROAD DUST)

- Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
- Treat site accesses to a distance of 100 feet from the paved road with a 6 to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The phone number of the District shall also be visible to ensure compliance.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT