



Central Valley Regional Water Quality Control Board

11 April 2017

CERTIFIED MAIL
7015 1520 0002 0442 0663

Karin Rodriguez
City of Modesto
1010 Tenth Street
Modesto, CA 95353

NOTICE OF APPLICABILITY REVISED

WATER QUALITY ORDER 2015-0121-DWQ GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS CITY OF MODESTO CITY OF MODESTO CO-COMPOST FACILITY STANISLAUS COUNTY

On 16 November 2016, the City of Modesto (the Discharger) submitted a Report of Waste Discharge (ROWD) for the City of Modesto Co-Compost Facility (Facility), which included a Technical Report, Notice of Intent (NOI), and a filing fee to obtain coverage under Water Quality Order 2015-0121-DWQ General Waste Discharge Requirements for Composting Operations (hereafter General Order), for composting operations at the above-referenced site. The complete General Order can be accessed at:

http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2015/wqo2015_0121_dwq.pdf

On 23 January 2017, a Notice of Applicability (NOA) was issued to the City of Modesto for the subject facility. On 22 February 2017, the City of Modesto submitted a response letter indicating that their Technical Report did not show catch basin piping interconnections or the main line routing to the tail water pump station, and requested staff to incorporate this information into the NOA, which would eliminate the requirement to line the central drainage ditch. The City of Modesto also requested to extend the date to install groundwater monitoring wells to early 2018.

This NOA was developed after the review of your ROWD and your 22 February 2017 response letter, as described in the attached Staff Memorandum, which is a part of this NOA. Based on staff's review, the Facility meets the conditions of the General Order, and is hereby covered under State Water Resources Control Board General Order **2015-0121-DWQ-R5S003** as a **Tier II** composting operation. The Discharger must comply with all Tier II requirements of the General Order.

The filing fee for the City of Modesto Co-Compost Facility is based on a Threat to Water Quality and Complexity rating of 3B. The submitted \$4,699 filing fee covers the first year permitted by this Notice of Applicability (NOA). The Discharger shall submit the required annual fee (as specified in the annual billing issued by the State Water Resources Control Board) until the Notice of Applicability is officially terminated.

To fully comply with this NOA, please familiarize yourself with the contents of the enclosed Staff Memorandum and all of the requirements of the General Order. The Discharger is responsible for implementing all operations in a manner that complies with the General Order. Any noncompliance with this General Order constitutes a violation of the Water Code and is grounds for enforcement action and/or termination of enrollment under this General Order.

Conditions of this Composting General Order include, but are not limited to:

- The Water and Wastewater Management Plan, as submitted in the Technical Report and approved by Staff in this NOA, must be implemented.
- Groundwater monitoring wells must be installed at the site to monitor the facility by **30 March 2018**.
 - A work plan for installation of the wells must be submitted for approval by **30 September 2017**.
 - A certification report documenting installation of the wells must be submitted within 60 days following well installation activities.

The above workplan and certification report shall be prepared in accordance with the attached *Requirements for Monitoring Well Workplan and Monitoring Well Installation Reports*.

- Technical reports must be submitted 90 days prior to each construction activity, while post-construction reports must be submitted 60 days after the completion of each construction activity.
- The Annual Monitoring and Maintenance Report, technical reports, and all monitoring reports must be uploaded into the State Water Board's GeoTracker database.
- A revised NOI is required at least 90 days prior to:
 - adding a new feedstock, additive, or amendment;
 - changing construction materials or specifications;
 - changing a monitoring program; or
 - changing an operation or activity not described in the approved NOI and technical report.

Attachment B of the General Order includes specific monitoring and reporting requirements that you must comply with, including routine monitoring and reporting to the Central Valley Regional Water Control Board. The first year Annual Monitoring and Maintenance Report as identified in the General Order must be submitted to the Central Valley Regional Water Board no later than **1 April 2018**, and then annually by 1 April each following year.

All monitoring and technical reports and other correspondence must be converted to searchable Portable Document Format (PDF) and submitted electronically to the State Water Board's GeoTracker database (see General Order, Report Submittals). Once you receive an upload confirmation from GeoTracker that your report has been received, please send a courtesy email and confirmation number to centralvalleysacramento@waterboards.ca.gov and to the staff person indicated below.

The following information should be included in the body of the email or any documentation submitted to the mailing address for this office:

Attention:	Paul Sanders, Compliance and Enforcement Unit Paul.Sanders@waterboards.ca.gov (916) 464-4817
Discharger Name:	City of Modesto
Facility Name:	City of Modesto Co-Compost Facility
County:	Stanislaus County
CIWQS Place ID:	826886

Now that the NOA has been issued, the Board's Compliance and Enforcement Section will provide management of this composting site. Paul Sanders is your new point of contact for any questions about the General Order and NOA, and you may contact him at contact email and phone number below. If you find it necessary to make a change to your permitted operations, Paul Sanders will direct you to the appropriate Permitting staff.

Original Signed By Andrew Altevogt for

PAMELA C. CREEDON
Executive Officer

Enclosures:

1. Staff Memorandum
2. Requirements for Monitoring Well Installation Work Plans and Monitoring Well Installation Reports

cc: Nadine Langley, State Water Resources Control Board, Sacramento
Miguel Galvez, Stanislaus County Planning and Community Development, Modesto
Howard Hold, Central Valley Water Board, Rancho Cordova

Central Valley Regional Water Quality Control Board

STAFF MEMORANDUM

TO: Marty Hartzell, PG, CHG
Senior Engineering Geologist

FROM: John Moody
Water Resources Control Engineer

DATE: 10 April 2017

SUBJECT: APPLICABILITY OF COVERAGE UNDER STATE WATER RESOURCES CONTROL BOARD WATER QUALITY ORDER 2015-0121-DWQ – CITY OF MODESTO CO-COMPOST FACILITY, STANISLAUS COUNTY

REPORT OF WASTE DISCHARGE

On 16 November 2016, the City of Modesto (Discharger) submitted a Notice of Intent (NOI) and a Technical Report for the City of Modesto Co-Compost Facility (facility). The Technical Report, NOI, and Filing Fee were submitted to obtain coverage under Water Quality Order 2015-0121-DWQ, General Waste Discharge Requirements for Composting Operations (hereafter General Order) at the above-referenced site.

On 23 January 2017, a Notice of Applicability (NOA) was issued to the City of Modesto for the subject facility. On 22 February 2017, the City of Modesto submitted a response letter indicating that their Technical Report did not show catch basin piping interconnections or the main line routing to the tail water pump station, and requested staff to incorporate this information into the NOA, which would eliminate the requirement to line the central drainage ditch. The City of Modesto also requested to extend the date to install groundwater monitoring wells to early 2018.

SITE DESCRIPTION

The 65-acre composting facility was constructed in August 2013 and is located at 7001 Jennings Road about 8 miles southwest of downtown Modesto. The facility is on City-owned land corresponding to Assessor's Parcel Numbers 022-001-002 and 022-001-004 (site). The facility is located to the east of the San Joaquin River, northwest of the Merced River, and south of the Tuolumne River. Immediately northwest of the site along the Tuolumne River is the City's Secondary and Tertiary Water Quality Control Facility (WQCF), a wastewater treatment plant that operates under an NPDES permit issued by the Central Valley Water Board.¹ Approximately 35 acres of the composting facility is operational surface, while the remainder of the facility primarily consists of buildings, equipment, and buffer land. See Attachment A: Site Map (attached).

¹. Waste Discharge Requirements for the City of Modesto Water Quality Control Facility (Order R5-2012-0031, NPDES No. CA0079103).

The site is relatively flat with slopes up to one percent from east to west and a ground surface elevation of about 52 feet MSL. Surface soils at the site consist of sandy, silty, and/or clayey loam soils to a depth of at least 5 feet below ground surface (bgs). Such soils are estimated to have a minimum in-place hydraulic conductivity of about 1.4×10^{-4} cm/sec.² The site is generally underlain by the Modesto Formation, which consists of weakly consolidated alluvium such as clay, silt, sand, and/or gravel; and the Dos Palos Formation, which is primarily flood basin deposits. A 2009 geotechnical investigation conducted at the adjacent WQCF found medium-to-dense silty sand, "clean" sand, and hard sandy silt in these deposits to a depth of 51 feet bgs, the maximum depth investigated. Sandy soils were predominantly encountered below 19 feet bgs.

Land uses within one mile of the facility include the wastewater treatment plant, agricultural (orchards and farms), and rural residential. The nearest residences are about 1,000 feet to the southeast and 1,500 feet to the north of the facility. The average annual precipitation at the site is about 10.0 inches and the 24-hour, 25-year peak storm event is 2.2 inches.³ The facility is not located within a 100-year flood plain.⁴

A regional hydrogeologic evaluation noted that an unconfined aquifer exists above the Corcoran Clay, a significant geological benchmark found at the base of the Upper Tulare Lake Formation, which overlies the Laguna and Mehrten formations and underlies the Riverbank and Modesto formations, at a depth of about 225 feet bgs. Hydraulic conductivities of this unconfined aquifer are estimated to be on the order of 10^{-2} cm/sec based on grain size and heterogeneity of the Modesto and Riverbank alluvial deposits. Downward vertical flow may also exist due to surface recharge and pumping of the confined aquifer underlying the Corcoran.

Regional groundwater flow is generally to the west, but can be locally influenced by the three major rivers in the area (Merced, Tuolumne, and San Joaquin). No groundwater monitoring wells have been installed at the site, so the depth to groundwater and groundwater flow direction have not been determined. The 2009 geotechnical investigation conducted at the WQCF encountered groundwater at depths ranging from 7 to 15 feet bgs in soil borings. Based on this information and an unimproved ground surface elevation of 52 feet MSL, the average groundwater elevation at the facility is estimated to be about 42 feet MSL and the depth to groundwater about 10 feet bgs. Given the relatively high groundwater table at the site, the Discharger has proposed installation of groundwater monitoring wells to monitor depth to groundwater, flow direction, and groundwater quality in the upper aquifer beneath the facility.

The closest surface water is a slough extending from the WQCF to an outfall to the San Joaquin River about 1.5 miles southwest of the facility. A storm water ditch also flows along West Tyler Road about 1,100 feet north of the facility and an agricultural well used to supply water for the composting facility is approximately 1,200 feet to the north-northeast of the facility. See Attachment A. The storm water surface drains and the agricultural well are all located more than the 100 feet from the perimeter of composting operations, as required under the General Order.

-
2. Native soils at the site primarily consist of Hilmar and Fresno loam soils. See U.S. Department of Agriculture, Natural Resources Conservation Service Soil Survey for the Modesto-Turlock Area.
 3. Based on Rainfall-Depth-Duration-Frequency data from the Department of Water Resources (DWR) Patterson California Irrigation Management System (CIMIS) weather station about 4 miles southwest of the site.
 4. Based on the Federal Emergency Management Agency's (FEMA) National Flood Hazard Layer map, Stanislaus County, Panel No. 06099C0540E, August 2008.

COMPOSTING OPERATIONS

Composting operations at the site currently consist of green waste composting by the open windrow method. Feedstock materials for this process include green materials, residential food waste, food processing industry wastes (pomace, hulls, skins, juice, etc.), manure, and other compostable materials. The facility accepts about 250 tons per day (65,000 tons per year) of mixed yard and green waste materials. The facility is permitted by CalRecycle to receive up to 500 tons per day (130,000 tons per year) of compostable material. Trucks entering the site are first weighed at a scale in the Office/Shop Area in the northeast part of the facility. Incoming loads are then tipped on a 180 foot x 180 foot square concrete pad in the Tipping Pad Area in the northwest part of the facility and visually inspected for incompatible debris (e.g., plastic, glass, metal). After removal of any contaminants, the incoming green material is fed to a horizontal grinder, which reduces the particle size of the material to 1 to 6 inches. The material is then hauled to the Windrow Composting Area (WCA) in the central portion of the site.

At the WCA, the ground compost materials are formed into windrows approximately 15 feet wide by 6 feet tall and 280 feet long. No additives or amendments are used in the composting process. Each windrow is watered as needed to maintain the appropriate moisture content. The water is supplied by the agricultural well in the northeast corner of the site. Active compost is maintained under aerobic conditions at a temperature of at least 131 degrees Fahrenheit for pathogen reduction and killing of weed seeds. During this 1-month period, the windrows are turned a minimum of five times. Once the desired level of decomposition is reached, the material is moved to curing areas on the pad for up to 2 months.

After composting and curing, the compost is transferred to a 10-acre Finished Compost Storage Area west of the WCA for a period of 3 to 9 months pending final screening and stockpiling for sale. The compost is then transferred to the Loading Area where it is processed through a trommel to further remove contamination and separate out oversized materials. The finished product (about 3/8" minus particle size) is then tested and analyzed for regulatory parameters (e.g., nutrients, pH, pathogens) and stockpiled for sale.

Composting Pad

The 35-acre operational surface was constructed with various designs depending on area/use, as described below:

- The Office/Shop Area (northeast portion of operational surface) was constructed with 3 inches of asphalt overlying 7 inches of aggregate base and native soil compacted to 95% of maximum.
- The Tipping Area (northwest portion of operational surface) also included this design, except for the grinding area, where an 8-inch thick, 180 foot square concrete pad was constructed over compacted soil cement.
- The 20-acre WCA pad was constructed with a base of at least 15 inches of impermeable soil cement. An asphalt cover (3 inches thick) was also constructed over the northern third of the WCA pad (6.7 acres) to stand up to heavier use and provide additional protection for future biosolids co-composting operations. No asphalt cover was constructed on the remaining two-thirds of the WCA pad.
- The Loading Area (north of the WCA) was constructed with a 3-inch asphalt cover overlying a soil cement base.
- The pad for the 10-acre Finished Compost Storage Area (west of the WCA) was constructed with at least one foot of native soil compacted to 95% of maximum dry density. Construction

Quality Assurance (CQA) testing of the pad indicated that it had an average hydraulic conductivity of 2.0×10^{-6} cm/sec.

See Attachment A.

All areas of the operational surface were constructed in accordance with the requirements of the General Order, with the possible exception of the southern two-thirds of the WCA pad consisting of soil cement, which is brittle and can crack under tensile stress. Inspection of this portion of the pad for cracks may be difficult due to filling of the cracks with ground compost materials during operations. The Discharger has proposed visual maintenance inspections and the installation of groundwater monitoring wells to address this issue. Covering this area with asphalt is also an option, but would be more expensive.

Drainage Controls & Leachate Handling

The WCA's drainage system includes four, north-south aligned ridges that drain east-west at a 1% slope into concrete-lined gutters between the windrows. The gutters drain to catch basins that are plumbed to subsurface piping. Underground piping runs parallel to the central ditch, flowing west to a collection vault that houses an existing tail water pump (identified as Tail Water Pump A on Attachment A), where leachate and contact storm water is pumped to the WQCF. In the event of an unusual storm event, the WCA may pond briefly while the tail water pump evacuates the water which eventually clears the site. Other areas of the facility are drained to the central ditch and/or protected from run-on by berms. A raised perimeter roadway encircles the 35-acre operating surface to prevent run-on and to prevent runoff from leaving the leachate drainage system.

The leachate/drainage system was designed to handle flows from a 100-year, 24-hour storm event, including flows from the facility, and therefore meets the 25-year, 24-hour peak storm design requirement of the General Order. The central drainage ditch may receive wastewater flow from active and curing compost areas during an extreme rain event.

TIMELINE FOR COMPLIANCE

Full compliance with Order 2015-0121-DWQ must be completed by the dates indicated in the Improvement Plan Schedule presented below. This schedule incorporates on-going operations of the facility, seasonal weather, fluctuations in the market demand of finished product, and company resources. The proposed improvements include installation of a groundwater monitoring network to monitor depth to groundwater, flow direction, and groundwater quality in the upper aquifer beneath the facility. The City of Modesto shall comply with the following schedule.

Improvement Plan Schedule

Task	Completion Dates
Submit a work plan for monitoring well installation	30 September 2017
Groundwater monitoring well installation	30 March 2018
Submit certification report documenting monitoring well installation activities	60 days following well installation activities

The Discharger must submit a technical report with design information (i.e., design report) at least 90 days prior to new construction of any operating, containment, or drainage structures (e.g., working surfaces, detention ponds, berms, ditches), monitoring wells, or any other water quality protection element for approval by the Central Valley Water Board. The design information must include flow and capacity calculations, engineered drawings, materials, specifications, rationale, and all other information relevant to the proposed design. The technical report must ensure testing and quality assurance of liner materials and compacted soils in accordance with commonly accepted engineering practices, American Society for Testing and Materials test methods, and/or other appropriate material standards and must be signed and stamped by a registered professional. The Discharger must submit a post-construction (i.e., as-built) report to the Central Valley Water Board within 60 days of completing all construction or installation activities associated with all applicable containment structures and/or monitoring facilities, as required for compliance with this General Order. The post-construction report must be signed and stamped by a registered professional.

MONITORING AND REPORTING

The City of Modesto will regularly inspect and maintain all containment, control, monitoring structures, and monitoring systems pursuant to the submitted Technical Report and Attachment B of the General Order Monitoring and Reporting requirements. The frequency of inspections will be sufficient to prevent discharges of feedstocks, additives, amendments, compost (active, curing, or final product), or wastewater from creating, threatening to create, or contributing to conditions of contamination, pollution, or nuisance.

The City of Modesto will conduct a monitoring program as prescribed in the Monitoring and Reporting Program (MRP) requirements (Attachment B) of the General Order. Sections that apply are A.1 (Facility Inspections), A.3 (Biosolids Monitoring), A.4 (Groundwater Protection Monitoring), A.5 (General Sampling Requirements), and B (Reporting Requirements).

Site specific sampling points for groundwater monitoring will include all monitoring wells after their installation in accordance with the above compliance schedule. Results of monitoring will be reported annually in the Annual Monitoring and Maintenance Report, which will be submitted by **1 April** of each year as long as the Notice of Applicability is in effect.

SITE CLOSURE

At least 90 days prior to ceasing composting operations, City of Modesto shall submit a Site Closure Plan to the Central Valley Water Board for approval. The site restoration shall include work necessary to protect public health, safety, and the environment.

DISCUSSION

The City of Modesto's Technical Report indicates that the operating surface for composting operations meets the minimum design requirements of the General Order, but that the portion of the pad covered with only soil cement (i.e., the southern two-thirds of the WCA) may be prone to cracking over time due to the brittleness of soil cement. Covering the area with asphalt, conducting inspections to identify and repair any such cracks, and/or installing monitoring wells to allow for the early detection of any groundwater impacts resulting from such cracks, are possible ways to address the cracking issue. Given the cost of asphalt and possibility that cracks in the soil cement may not be visible upon routine inspection due to filling with debris, the Discharger has proposed the third option -- installation of monitoring wells. Monitoring wells are also necessary to determine the depth to groundwater and groundwater flow direction at the site. Upon detection of impacts to groundwater indicative of a compost leachate leak, the Discharger shall follow the notification procedures in MRP Section B.2 (violation) or B.3 (significant event), as applicable per the General Order. All technical

reports submitted to investigate and/or remediate the leak or impacts shall be submitted consistent with the timelines specified above (i.e., work plan within 90 days prior to construction and certification report within 60 days of completion) or as otherwise directed by Water Board staff.

RECOMMENDATION

Based on staff review of the Technical Report and supporting documents, the City of Modesto meets the minimum requirements of the General Order. The Notice of Applicability can be issued and stay in effect as long as the Discharger implements all facility operations and improvements, in a manner that complies with the requirements of the General Order. Improvement measures shall include those specified in this memo (i.e., monitoring well installations) and any measures necessary to protect water quality in response to detection of a leak, groundwater impacts, a groundwater separation issue, or other General Order violation, threatened violation, or significant event.



Drawing Reference:
 City of Modesto
 Co-Compost Facility
 Attachment D – Technical Report
 Figure 1 – Detailed Site Map

SITE MAP
 City of Modesto
 City of Modesto Co-Compost Facility
 Stanislaus County

REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which includes the information contained in Section 2, below. All workplans and reports must be prepared under the direction of, and signed/stamped by, a professional geologist or civil engineer licensed by the State of California.

SECTION 1 - Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
- Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- On-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals (if appropriate) and logging methods

C. Monitoring Well Design (in narrative and/or graphic form):

- Diagram of proposed well construction details
 - Borehole diameter
 - Casing and screen material, diameter, and centralizer spacing (if needed)
 - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
 - Anticipated depth of well, length of well casing, and length and position of perforated interval
 - Thickness, position and composition of surface seal, sanitary seal, and sand pack
 - Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

- Method of development to be used (i.e., surge, bail, pump, etc.)
- Parameters to be monitored during development and record keeping technique
- Method of determining when development is complete

Disposal of development water

E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):

Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey

Datum for survey measurements

List well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)

F. Schedule for Completion of Work

G. **Appendix: Groundwater Sampling and Analysis Plan (SAP)**

The Groundwater SAP shall be included as an appendix to the workplan, and shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities.

Provide a detailed written description of standard operating procedures for the following:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
 - General sampling techniques
 - Record keeping during sampling (include copies of record keeping logs to be used)
 - QA/QC samples
- Chain of Custody
- Sample handling and transport

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

A. General Information:

Purpose of the well installation project

Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells

Number of monitoring wells installed and copies of County Well Construction Permits

Topographic map showing facility location, roads, surface water bodies
Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

On-site supervision of drilling and well installation activities

Drilling contractor and driller's name

Description of drilling equipment and techniques

Equipment decontamination procedures

Soil sampling intervals and logging methods

Well boring log

- Well boring number and date drilled
- Borehole diameter and total depth
- Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
- Depth to first encountered groundwater and stabilized groundwater depth
- Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (in narrative and/or graphic form):

Well construction diagram, including:

- Monitoring well number and date constructed
- Casing and screen material, diameter, and centralizer spacing (if needed)
- Length of well casing, and length and position of perforated interval
- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Type of well caps (bottom cap either screw on or secured with stainless steel screws)

E. Well Development:

Date(s) and method of development

How well development completion was determined

Volume of water purged from well and method of development water disposal

Field notes from well development should be included in report

F. Well Survey (survey the top rim of the well casing with the cap removed):

Identify the coordinate system and datum for survey measurements

Describe the measuring points (i.e. ground surface, top of casing, etc.)

Present the well survey report data in a table

Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix