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Napa County
1195 Third Street, Suite 310
Napa, CA 94559
Attn: Clerk of the Board

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SPACE ABOVE THIS LINE FOR RECORDER'S USE

TEMPORARY MONITORING WELL AND ACCESS EASEMENT AGREEMENT

Napa County Two Dual Completion Monitoring Wells Project ("Project")

This Temporary Monitoring and Access Easement Agreement for the Napa County Two Dual Completion Monitoring Wells Project ("Agreement") is entered into as of the last date of execution, below, by and between Napa County Groundwater Sustainability Agency ("Grantee") and Realty Income Properties 2, LLC, a Delaware limited liability company, the undersigned owner(s) ("Grantor") of that certain real property more commonly known as Napa County Assessor's Parcel Number 022-033-007-000, or 022-010-029-000, and 030-110-027-000 ("Property"). All references to "Grantee" shall include Grantee's officers, agents, employees, volunteers, contractors, and subcontractors performing work for Grantee pursuant to this Agreement.

RECITALS

WHEREAS, Grantee received a grant from the State of California Department of Water Resources to install two (2) nested, dual-completion, long-term (used for a minimum of 10 years) monitoring wells located on a portion of the Property in the Napa Valley Subbasin as shown on the Technical Provisions for Monitoring Wells in Exhibit A ("Technical Provisions for Monitoring Wells"), attached hereto and incorporated herein by reference, for purposes of measuring groundwater conditions and compliance with the Sustainable Groundwater Management Act (SGMA) and all applicable Federal, State and local statutes, rules, regulation and ordinances; and

WHEREAS, Grantee requires access to two (2) wells installed under this Agreement on the Property as shown on the Technical Provisions for Monitoring Wells for purposes of groundwater monitoring and compliance with the Sustainable Groundwater Management Act (SGMA) and all applicable Federal, State and local statutes, rules, regulation and ordinances; and

WHEREAS, two (2) nested, dual-completion, long-term monitoring wells will be drilled to depths of up to approximately 100 feet ("Wells") and a minimum depth of ninety (90) feet. Installation will involve allowing drill rigs and other vehicles to access parcel property for well completion. Once installed, initial frequent visits will be made to install self-contained water level data loggers then subsequent monthly to semiannual visits will be made to retrieve data and maintain operations; and

WHEREAS, the Wells will be installed on the Property) and;

WHEREAS, the Grantee has conducted the necessary review of the Project pursuant to the California Environmental Quality Act ("CEQA"); and

WHEREAS, Grantor has been given an opportunity to review and comment on the Technical Provisions for Monitoring Wells; and

WHEREAS, in order to proceed with construction and monitoring, Grantee wishes to obtain, and Grantor wishes to grant, a non-exclusive temporary construction and access easement over the Property, subject to the terms and conditions of this Agreement.

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, Grantor and Grantee hereby agree as follows:

1. Grant of Easement. Grantor hereby grants to Grantee, without any warranties and subject to all matters of record, and Grantee hereby accepts a non-exclusive temporary easement in gross for the drilling, installation, operation, maintenance, inspection, monitoring, repair and replacement, at Grantee's sole cost and expense and in compliance with all applicable Federal, State and local statutes, rules, regulation and ordinances, of two (2) Wells to monitor the groundwater on the Property. The easement area shall be located, on the portion of the Property depicted as "Proposed MW Locations on TWE Property" on Figures 3 and 4 in the Technical Provisions for Monitoring Wells with the Well being located at the coordinates indicated in the table below and with the Well being the center point of the easement area and the easement area extending ten (10) feet to each side from the final drill location of the Well ("Easement Areas"). Further, Grantor grants to Grantee, without any warranties and subject to all matters of record the non-exclusive temporary right of reasonably necessary ingress and egress over all reasonable roadways located on the remainder of the Property that are leading to the Easement Areas for the sole purposes of accessing the Wells and exercising the rights herein granted (the "Easement"); provided, however, that Grantee shall exercise its rights hereunder so as to not materially interfere with or impair the business operations on the Property by Grantor and its tenants occupants, lessees, agents, officers, directors, employees and other appointees, invitees or designees which business operations shall include but not be limited to pedestrian or vehicular access to and from the Property or the visibility of any signage on the Property. Grantor further agrees that its use of the Easement or the Wells shall not cause damage to, or removal or relocation of or otherwise harm any grape vines growing on the Property. Grantor reserves the right to the full use and enjoyment of the Easement Area subject to the rights herein granted to Grantee. Notwithstanding anything in the Easement to the contrary, (a) Grantee accepts the Property as is, where is, with all faults; (b) Grantor makes no representations or warranties of any kind, either express or implied, with respect to the Property or the condition thereof; and (c) the rights granted by the Easement are subject to all matters of record and applicable laws to which the Property is subject, and to any state of facts which a new survey or physical inspection of the Property might disclose.

2. The Wells will be installed on and the Property at the approximate latitude/longitudinal coordinates as shown in the table below for each respective parcel. The area marked as "Bale Lane #1" on Figure 3 of Exhibit A with the coordinates specified below shall be the preferred location for the installation of one of the Wells. Notwithstanding the foregoing, if Bale Lane #1 is not accessible for drilling and installation of one of the Wells, Grantee may install one of the Wells in the area marked as "Bale Lane # 2" on Figure 3 of Exhibit A, with the coordinates specified below. For the avoidance of doubt, only one (1) of the Wells shall be installed on either of the parcels 022-033-007-000 or 022-010-029-000. The second one of the Wells shall be installed at parcel 030-110-027-000.

Site Name	Latitude	Longitude	APN
Bale Lane #1 (Preferred Location)	38.555595	- 122.51346 3	022-033-007-000
Bale Lane #2 (Backup Location)	38.555497	- 122.51427 9	022-010-029-000
Rutherford Rd	38.463752	- 122.41466 0	030-110-027-000

The exact coordinates of the Wells will depend on driller accessibility and Grantor preferences. In the event of a change as to the location of any of the proposed Wells, Grantee shall provide Grantor and Grantor's tenant updated drawings and coordinates for Grantor and Grantor's tenant's review and approval not to be unreasonably withheld, conditioned or delayed, prior to the installation of the Wells. Notwithstanding anything to the contrary contained herein, the updated coordinates of the Wells shall be in the immediate vicinity of the coordinates referenced above and not in a completely different location on the Property. For the avoidance of doubt, other than the installation of the Wells permitted by this Agreement, no invasive testing shall be permitted on any part of the Property.

3. Term of Easement. The Easement shall continue in effect for an initial period of ten (10) years ("Initial Term"). After the expiration of the Initial Term, Grantor, at Grantor's sole discretion, may extend the term of this Easement upon Grantee written request. If Grantee no longer requires access and monitoring of the Well during the Initial Term, it shall promptly provide written notice to Grantor and, at Grantee's sole cost and expense, thereafter properly abandon and decommission the Well in compliance with all applicable Federal, State and local statutes, rules, regulation and ordinances restore any property damage to the Property resulting from the decommissioning of the Wells and return the Property to as good as a condition existing as of the date of this Agreement.

4. Notice of Entry. Grantee will coordinate its entry and all activities on the Property in compliance with the terms of this Easement with Grantor and Grantor's tenant by noticing Grantor and Grantor's tenant (in writing to the addresses for notices below) at least 48 hours over the course of two (2) business days in advance of entering the Property. Grantee shall comply with all of Grantor's tenant's health and safety procedures during any period for which they are on the Property and must check in with Grantor's tenant's vineyard manager upon entrance on the Property. If a representative of Grantor or Grantor's tenant reasonably believes that Grantee's Work or activity on the Property is creating or could create an interference with its Tenant's ordinary use of the Property, then Grantor or Tenant shall immediately notify Grantee and Grantee shall immediately cease or cause the cessation of such Work/activity until the interference is remediated to Grantor's and Tenant's reasonable satisfaction. Grantee may only enter and exit the Property at the points of entry approved by Grantor or Tenant.

5. Construction, Maintenance and Removal of the Well. Grantee shall exercise its rights under this Easement ("Work") pursuant to terms of this Easement at Grantee's sole cost and expense, and all Work shall be performed: (i) in a good and careful and workmanlike manner; (ii) in accordance with all applicable laws, codes, regulations, and ordinances, and (iii) free of all claims or liens. Grantee shall, at its sole expense, promptly repair and restore any property damage to the Property resulting from the exercise of the rights granted herein. Following installation of the Wells, Grantee shall provide Grantor an as-built survey depicting the Wells and the Easement Area.

6. Grantee's Standard of Care; Waiver and Release; Indemnification. Grantee shall use due care in the exercise of its rights hereunder and shall not materially interfere with or impair Grantor's or its tenant's occupants, lessees, agents, officers, directors, employees and other appointees, invitees or designees operations on the Property when exercising its rights under the terms of this Easement. Grantee shall promptly repair any damage resulting from the Project and the Work and shall restore any alterations constructed by Grantee on the Property which are not consistent with the Well described in Exhibit A. Grantee accepts any and all risks of loss (including, without limitation, the loss of personal property, equipment, supplies and materials), liability, damage, injury or fatality in connection with Grantee's entry, Work or activities on the Property to construct the Wells and will indemnify, defend, protect and hold harmless Grantor and its tenants occupants, lessees, agents, officers, directors, employees and other appointees, invitees or designees against all actions, claims, demands, suits, liabilities, losses, damages, injury, fatality, costs and expenses (including court costs and attorneys' fees), related to or arising out of Grantee's entry, Work or activities on the Property (collectively, "Claims"). Grantee shall further indemnify, defend, protect and hold Grantor and its tenant's occupants, lessees, agents, officers, directors, employees and other appointees, invitees or designees harmless from any Claims resulting from Grantee's exercise of its rights and obligations under this Easement in a manner that is inconsistent with the design of the Project. This indemnification (a) shall survive the expiration or termination of the Easement in relation to acts or omissions occurring prior to such dates during the term of the Easement Agreement; (b) shall not be limited by reason of any insurance carried by Grantee, Grantor, or any tenant of the Property; and (c) shall extend to any tenant or occupant of the Property.

7. Grantor's Cooperation. During the term of the Easement and thereafter for so long as the Project is being maintained, Grantor agrees to refrain from any intentional acts that would directly jeopardize the structural soundness of the Wells provided that Grantor has no obligation whatsoever to take any affirmative acts to repair or maintain the Wells. Furthermore, Grantor agrees to coordinate with the Grantee to allow maintenance by the Grantee as described above to protect the Wells built as part of the Project. If the Wells are jeopardized in any way, once such risk is discovered by Grantor, Grantor also agrees to notify Grantee or its assigns of any discovery of such risks.

8. Compliance with Laws. The parties shall comply with all applicable statutes, ordinances, orders, permits, licenses, approvals, authorizations and other requirements of any kind (collectively, "Laws") relating to use of the Easement or Work.

9. Insurance. Throughout the term of this Agreement, Grantee shall procure and maintain in full force and effect (and cause its contractors and subcontractors to maintain in full force and effect) commercial general public liability and property damage insurance against claims for personal injury (including contractual liability arising under the indemnity contained in Paragraph 5 above), death, or property damage arising out of the Grantee's use of the Easement Area or the entry onto the Grantor's Property, with single limit coverage of not less than an aggregate of Two Million Dollars (\$2,000,000.00) including umbrella coverage, if any, and naming Grantor, Grantor's tenant and Grantor's successors in the event of a change thereof (provided Grantee has been supplied the name of the successor to Grantor in the event of a change in ownership), as additional insureds.

10. Recordation. This Agreement shall be recorded in the Official Records of Napa County. Upon expiration or termination of this Agreement, as applicable, Grantee, at its sole cost and expense, shall execute and record a quitclaim deed (or similar notice) evidencing termination of the Agreement and releasing any and all interest in Grantor's parcel relating thereto.

11. Assignment. This Agreement shall not be assigned by Grantee to any other party except as provided herein without the express written consent of Grantor, which consent shall not be unreasonably withheld.

12. Binding Effect. It is intended that each of the easements, covenants, conditions, restrictions, rights and obligations set forth herein shall run with the land pursuant to applicable law, including, without limitation, California Civil Code Sections 1467, 1468, 1469 and 1470, and create equitable servitudes in favor of the real property benefited thereby, shall bind every person having any fee, leasehold or other interest therein and shall inure to the benefit of the parties hereto and their respective successors, assigns, heirs, executors, administrators and personal representatives.

13. Provision of Material to Grantor. Copies of all reports, memoranda, data, and photographs resulting from the entry and investigation shall promptly be provided to Grantor without cost to Grantor. A representative of Grantor or its Tenant may be present while the Work is being performed, and, if requested by the Grantor or Tenant representative, will be provided with splits of any samples taken by Grantee or those working for it.

14. Condition of the Property. Grantee will return the Property to the same condition in which it was found. Grantee will pay Grantor for any damage to the Property or pay to Tenant any damage to Tenant's improvements that is not so restored by Grantee. This obligation shall survive the expiration or sooner termination of the Easement.

15. Environmental Condition. The granting of this Easement by Grantor is not intended, nor should it be construed, as an admission of liability on the part of the Grantor or the Grantor's successors and assigns for any contamination discovered on the Property.

16. Attorneys' Fees. In the event of any controversy, claim or dispute relating to this Agreement or its breach, the prevailing party shall be entitled to recover from the non-prevailing party, in addition to any other relief that may be granted, its reasonable expenses, attorneys' fees and cost.

17. Notices. Any notification required under this Agreement shall be provided to the parties at the following address and phone number, or at such other addresses as either party may subsequently designate by written notice:

GRANTEE:

Brian Bordona, Acting Director, Planning, Building And
Environmental Services Department
Napa County, 1195 Third Street, Suite 201 Napa,
California 94559
Tel: (707) 253-4805

GRANTOR:

Realty Income Properties 2, LLC
Attn: Legal Department
11995 El Camino Real
San Diego, CA 92130
(858) 284-500
notices@realtyincome.com

TENANT :

Treasury Wine Estates

18. Reserved.

19. Captions. The captions in this Agreement are for convenience only and are not part of this Agreement. The captions do not in any limit or amplify the provisions of this Agreement and shall not affect the construction or interpretation of any of its provisions.

20. Reserved.

21. Partial Invalidity. If any term, covenant or condition of this Agreement or its application to any persons or circumstances shall be held to be invalid or unenforceable, the remainder of this Agreement and the application of such term or provision to other persons or circumstances shall not be affected, and each term hereof shall be valid and enforceable to the fullest extent permitted by law.

22. Counterparts. This Agreement may be executed in any number of original counterparts, all of which evidence only one agreement, binding on all parties.

23. Not a Public Dedication. Nothing contained in this Agreement shall be deemed to be a gift or dedication of any portion of any of the Property to or for the general public. However, the Well shall remain the property of Grantee.

24. Amendments. Any modifications or amendments of this Easement must be in writing. This Agreement may only be amended in writing signed by both parties.

25. Entire Agreement. This Easement, together with any amendments, constitutes the entire agreement between the parties regarding the matters described in this Easement, and this Easement supersedes any previous oral or written agreements between the parties.

26. Subordination of Deeds of Trust. Any mortgage or deed of trust affecting any portion of the Property shall at all times be subject and subordinate to the terms of this Agreement. Upon foreclosure of or sale under a power of sale contained in any such mortgage or deed of trust, the purchaser shall acquire title to such Property subject to the terms of this Agreement. To the extent required, Grantor shall use its best efforts to obtain from the beneficiary of any mortgage or deed of trust presently recorded against and affecting the Property, its written consent to this Agreement and agreement that its mortgage or deed of trust shall at all times be subject and subordinate to the terms of this Agreement. The refusal by the beneficiary of any mortgage or deed of trust to consent and subordinate to this Agreement shall not constitute a breach of this agreement by Grantor.

27. Authority. Each of the individuals executing this Agreement on behalf of a party individually represents and warrants that he or she has been authorized to do so and has the power to bind the party for whom they are signing.

28. Governing Law. This Agreement will be construed and interpreted in accordance with the laws (excluding conflict of laws principles) of the State of California.

Signatures follow.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the last date of execution below.

Date: November 22nd, 2022

REALTY INCOME PROPERTIES 2, LLC,
a Delaware limited liability company

By: Realty Income Corporation,
a Maryland corporation,
its sole and managing member

Approved As To Form
Legal Department

L. Tehrani

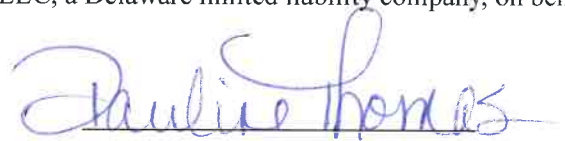
By 
DANIEL HAUG
SVP & Associate General Counsel

"GRANTOR"

STATE OF ARIZONA)
)
COUNTY OF MARICOPA)

On this 22nd day of November, 2022 before me personally appeared Daniel Haug, the SVP & Associate General Counsel of Realty Income Properties 2, LLC, a Delaware limited liability company, on behalf thereof.




Notary Public

My Commission expires: 11/9/26

NAPA COUNTY GROUNDWATER
SUSTAINABILITY AGENCY (NCGSA)

By _____
RYAN GREGORY, Chair
NCGSA Board of Directors

"GRANTEE"

APPROVED AS TO FORM Office of County Counsel By:  Deputy County Counsel Date: 11/24/2022 Doc:	APPROVED BY THE NAPA COUNTY GROUNDWATER SUSTAINABILITY AGENCY BOARD OF DIRECTORS Date: _____ Processed By: _____ _____ Deputy Clerk of the Board	ATTEST: NEHA HOSKINS Clerk of the Board of Supervisors By: _____
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Treasury Wine Estates Americas Company, a Delaware corporation ("Tenant") hereby consents to the terms of this Temporary Monitoring Well and Access Easement Agreement ("Temporary Easement"), and further acknowledges and agrees that its leasehold interest in the subject real property owned by Realty Income Properties 2, LLC, a Delaware limited liability company ("Landlord") shall be deemed to be subordinate, inferior and subject to this Temporary Easement, notwithstanding that this Temporary Easement was created subsequent in time to the Lease Agreement dated June 23rd, 2010, as amended, for which a Memorandum of Lease dated December 28th, 2015, was recorded on December 30th, 2015, under Document No. 2015-0031932. Tenant hereby acknowledges and agrees to perform the obligations of Landlord under this Temporary Easement, for so long as Tenant holds a leasehold interest in the subject real property owned by Landlord.

Treasury Wine Estates Americas Company,
a Delaware corporation



By: _____
Name: Ben Dollard
Title: President

GUARANTOR'S CONSENT

The undersigned, Guarantor under that certain Guaranty of Lease dated as of January 10, 2017 ("Guaranty") entered into in connection with the above-referenced Lease, hereby consents to the terms of this Temporary Easement, as set forth above, and acknowledges that the Guaranty shall continue to apply to the full performance of each and all of the terms, covenants and conditions of the Lease, as so amended, to be kept and performed by Tenant under the Lease, as so amended.

GUARANTOR:

Treasury Wine Estates Limited

By: _____
Name: Tim Ford
Title: Chief Executive Officer

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a Delaware corporation

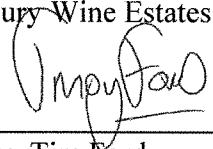
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Treasury Wine Estates Americas Company,
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Name: Ben Dollard
Title: President

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GUARANTOR:

Treasury Wine Estates Limited

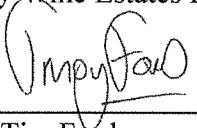
By:  _____
Name: Tim Ford
Title: Chief Executive Officer

EXHIBIT A

TECHNICAL PROVISIONS FOR MONITORING WELLS

Napa County Two Dual-Completion Monitoring Wells Project

1.1 GENERAL REQUIREMENTS

1.1.1 SCOPE OF WORK

A. Purpose - Two dual-completion monitoring wells are to be constructed at four (4) different sites located in the County of Napa, California. The monitoring wells will be used to sample and monitor groundwater quality and groundwater depth.

B. Test Hole Drilling and Monitoring Well Construction

1. The Work to be completed under this Contract will consist of furnishing all materials, labor, equipment, fuel, tools, transportation and services for the drilling and sampling of test holes at the selected sites. The test holes shall be converted to permanent monitoring wells.
2. At each site, one test hole shall be drilled to an approximate depth of 100 feet below ground surface. The actual depth of each test hole will be determined by the Engineer based on the lithology encountered.
3. Continuous cored samples will be collected from within each test hole from ground surface to the total depth of the borehole. Cores and drill cuttings of the formations encountered will be collected and a driller's log will be prepared to define the encountered lithology.
4. Test holes will be drilled utilizing the auger method. The diameter of the bore holes shall be a minimum of 10-inches.
5. Well casing and screens shall be constructed of 2-inch, Schedule 40, F480-88A PVC pipe and 2.5-inch, Schedule 40, F480-88A PVC pipe. Each dual-completion monitoring well shall be constructed with one 2-inch and one 2.5-inch casing string.
6. All cuttings and any drilling waste shall be contained. The Contractor shall take ownership and lawfully dispose of the waste. Napa County will provide a central location for cuttings disposal subject to verification that the cuttings are free of contamination.

C. Preliminary Monitoring Well Design

1. A preliminary monitoring well design is depicted in the Plans.
2. A graded gravel envelope will be placed in the annulus between the

well casing and the borehole wall from the bottom of the borehole to the level specified in the final well design. A 5-foot thick bentonite seal will be placed between the two piezometers at a depth specified in the final well design. A one-foot transition seal of fine sand will be placed on top of the graded gravel envelope. A sanitary/annular seal consisting of neat cement shall be placed on top of the transition sand and extend to the ground surface.

D. Local and State Standards

All drilling and well construction activities shall comply with local and State standards. If a conflict arises between the Technical Provisions and regulatory requirements, the Contractor shall immediately notify the Engineer and not proceed until the Engineer resolves the conflict.

1. It is the Contractor's sole responsibility to procure, pay for, and satisfy all well, encroachment, and construction related permits.

1.1.2 LOCATION AND LOCAL CONDITIONS

1. The project sites are located in the County of Napa, CA. as shown in the Plans.
2. The geology in the project area consists of interbedded clays, silts, sandy clays, sands, gravels, and possible cobbles.

1.2 MATERIALS

1.2.1 CERTIFICATES OF COMPLIANCE

The Contractor shall provide certificates of compliance as specified herein.

A. Items Requiring a Certificate of Compliance

1. The Contractor shall submit to the Engineer for approval, certificates of compliance for the following materials:
 - a) Cement Grout Sealing Material
 - b) Blank Well Casing
 - c) Well Screen
 - d) Gravel Envelope Material
2. No material shall be incorporated into the Work until certificates of compliance have been approved by the Engineer.

B. Content of Certificates of Compliance

1. Certificates of compliance from the Contractor, suppliers, and/or

manufacturers, shall clearly indicate that the material to be delivered to the job site will meet all requirements of the project Technical Provisions. A certificate of compliance shall include, but not be limited to the project title, delivery location, date (or approximate date) of delivery, name of the material with appropriate classification or model numbers, quantity, name of the manufacturers, statement of compliance with all requirements of the Technical Provisions, and the name, title and signature of the certifying agent.

2. A factory or mill certification (laboratory test report) shall be submitted with the certificates of compliance for all components of the casing assembly. The factory or mill certification shall not be a substitute for the certificate of compliance, unless it contains all information required for a certificate of compliance as described above.

3. Insufficient, incomplete, or unclear certificates will be rejected and the Contractor shall be responsible for all delays caused by any need for re-submittal.

C. New Materials - All materials provided by the Contractor shall be new.

1.2.2 MATERIALS SPECIFICATIONS

A. Sealing Material - Sealing material, consisting of neat cement shall be employed for surface/annular sealing of the wells and abandonment purposes if required.

1. The sealing material shall be composed of one 94-pound sack of Portland cement and approximately 5-6 gallons of clean water.

B. Well Casing and Screen Material

1. The PVC well casing and well screen for the monitoring wells will be made of ASTM F480-88A Schedule 40 PVC. The ends of each joint shall be threaded and coupled with O-ring seals. The blank casing will be 2-inch Schedule 40 PVC, ASTM F480-88A, and 2.5-inch Schedule 40 PVC, ASTM F480-88A. The well screen shall be fabricated from the same material as the blank casing. The perforations shall be machine cut horizontal slots, with openings of 0.030-inch.

2. The bottom of each PVC casing assembly shall be furnished with PVC threaded end of the same schedule and size as the casing and the same specifications as described herein.

C. Gravel Envelope - The sand used for the gravel envelope shall be hard, water-worn, and washed clean of silt, fine sand, dirt, and foreign matter (crushed gravel will not be accepted). It shall be well rounded and graded. The gravel envelope material is specified to be #8 SRI sand or approved equal. Alternative

materials are subject to the approval of the Engineer. A description and sieve analysis of gravel packing materials to be delivered to the site must be submitted prior to the use of the material in the Work. The gravel, if stockpiled at the well site, shall be protected and kept free of foreign matter.

D. Transition Sand Seal - The sand used for the transition sand seal will be #30 mesh sand. The transition sand shall be delivered to the site in 50 pound sacks.

1.3 TEST HOLE DRILLING AND MONITORING WELL CONSTRUCTION

1.3.1 MOBILIZATION

A. General

1. Mobilization shall include acquisition of the necessary drilling and well construction permits; transportation of personnel, equipment, and operating supplies to and from the sites, establishment of portable sanitary facilities, preparing a work site sufficient to support equipment and personnel in a safe and workman-like manner, and other preparatory work at the site required by the Contractor for his/her operations.
2. The Contractor shall be responsible for ensuring that all the conditions of the drilling and well construction permits are met and that all required notifications are made in a timely manner as required.
3. The Contractor shall mark each drilling location and arrange for underground utility surveys. Work at a site cannot commence until the site is cleared of underground utilities.
4. The Contractor shall provide the appropriate auger drilling rig to complete the test holes/monitoring wells as specified in the plans and for the particular site conditions. The Contractor shall also provide all tools, accessories, power, fuel, materials, supplies, and lighting necessary to conduct efficient drilling operations. The drilling unit shall be in good condition and of sufficient capacity to perform the specified drilling and well construction.
5. The County of Napa will provide a central location where the drilling rig may be stored overnight provided the Contractor will use the drilling rig on the next working day for well construction for the project.

1.3.2 TEST HOLE DRILLING

A. Scope - The test holes shall be drilled using the hollow stem auger method. The diameter of the borehole shall be a minimum of 10-inches. The final depth of the test hole will depend on location and the lithology encountered while drilling and will be determined by the Engineer. It is anticipated that the test holes will

be drilled to an approximate depth of 100 feet below ground surface.

B. Methods

1. The test hole shall be drilled using the hollow stem auger drilling method of construction.
2. The drilling operations shall be conducted using equipment that is adequate to reach the depth and perform the evaluations specified in the Technical Provisions. If, in the opinion of the Engineer, the Contractor's equipment is not capable of satisfactorily performing the specified work, the Contractor, at his/her own expense, shall substitute equipment satisfactory to the Engineer.
3. The Contractor shall keep records providing the following information:
 - a) A record of construction activities for each shift.
 - b) All measurements for depths shall be referenced to the existing ground surface at the well site.
4. During the drilling of the test hole, the Contractor shall collect continuous core samples using the split barrel sample collection procedure as outlined in ASTM D1586-11L: *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*, or an equal method approved by the Engineer. The Contractor shall deliver samples to the Engineer.

1.3.3 WELL CASING AND SCREEN

A. Scope - This item shall consist of furnishing and installing blank casing and well screen as specified in the Engineer's final design.

B. Methods

1. With the drilling string still in the borehole, the casing assembly shall be installed within the inside of the drill pipe in accordance with the final well design for casing installation furnished by the Engineer. Care shall be taken to ensure that the casing is centered within the drill pipe.
2. The casing assembly shall be installed to the specified depth supported above the ground surface. The casing shall be capped to insure that foreign particles are prevented from entering the casing.
3. If, for any reason, the casing cannot be landed in the correct position or at a depth acceptable to the Engineer, the Contractor shall remove the casing, redrill the borehole and reinstall the casing to the specified depth. If the casing cannot be removed from the borehole the

contractor shall construct another well immediately adjacent to the original location and complete the well in accordance with these Technical Provisions at no additional cost to the Engineer. The abandoned hole shall be sealed in accordance with these Technical Provisions and in accordance with any laws pertaining to proper well abandonment at no additional cost to the Engineer.

4. If any of the casing assemblies collapse prior to well completion, the remaining hole shall be abandoned in accordance with these Technical Provisions at no cost to the Engineer. A replacement borehole and well shall be drilled and constructed at an adjacent location as directed by the Engineer.

1.3.4 GRAVEL ENVELOPE AND TRANSITION SAND SEALS

A. Scope - This item shall consist of providing and installing coarse grained sand opposite the screen intervals and a fine sand transition seal between the coarse sand and the cement annular/sanitary seal, as specified by the Engineer, in the annulus between the casing and screens and the well bore of each well.

B. Methods

1. The gravel will be placed in the annulus between casing assembly and the inside of the drill string and brought up to a level within the annulus so that when a drill flight is removed sand will fill the annulus between the casing and the drill string. Sufficient sand will be placed inside the drill string so that sand will still remain in the drill string when a flight is removed. This procedure will be repeated until the gravel envelope is to the level specified in the final well design for casing installation furnished by the Engineer.

2. The fine sand transition seal will be placed in the annulus between the casing assembly and the inside of the drill string and brought up to a level within the annulus so that when a drill flight is removed sand will still fill the annulus between the casing and the drill string. This procedure will be repeated until the transition seal is to the level specified in the final well design for casing installation furnished by the Engineer.

3. The quantities of gravel placed in the annulus of each well shall not be less than the computed volume of the annulus. A quantity less than the computed value will be judged as an indication of voids, and corrective measures shall be taken by the Contractor.

4. If the volume of gravel installed in the annulus is less than the theoretical volume, the well may be rejected by the Engineer.

5. Gravel packing and transition seal placement shall continue

uninterrupted until the gravel pack reaches the depth of the surface seal.

1.3.5 SANITARY SEAL

A. Scope - This item shall consist of providing and installing a neat cement sanitary seal in the annulus between the casing and the borehole of each well.

B. Methods

1. Before installing any sanitary seal material, any flights remaining in the borehole shall be removed.
2. The sanitary seal sealing material will be poured from the surface into the annulus from the top of the fine sand transition seal to 12-inches from the finish grade if the seal depth is less than 20 feet below ground surface and no water is present in the borehole. If the top of the fine sand transition seal is more than 20 feet below ground surface, or if there is water in the borehole, the sealing material will be placed using the tremie pipe method.
3. Sealing operations shall continue uninterrupted until the seal is installed to the specified depth.

1.3.6 MONITORING WELL DEVELOPMENT

A. Scope - This item shall consist of utilizing airlift pumping and surging, surge block and bailing, or other approved method(s) in order to remove drilling fluids and to develop the gravel envelope and near-wellbore region prior to groundwater sampling.

B. Methods - Development of each monitoring well piezometer shall continue until the discharge water is sand-free and the following turbidity guidelines are achieved after surging:

- for piezometers that produce less than 2 gpm, a turbidity of 10 NTU within two casing volumes of purging
- for piezometers that produce at least 2 gpm, a turbidity of 5 NTU must be achieved within two casing volumes of purging.

1.3.7 SURFACE COMPLETION

A. Scope - This item shall consist of furnishing and installing surface completions as depicted on the plans and in accordance with State and local standards.

B. Methods

1. Above Ground Surface Completions

a. The Contractor shall excavate a square hole extending fourteen inches from the outside of the borehole and six (6) inches below ground surface. A square wood form 6 inches deep shall be placed on the ground surface to form the concrete pedestal above the ground surface as shown in the Plans. A steel reinforcing wire mesh, with a maximum six-inch square opening, will be placed in the form and supported four-inches above the bottom of the excavation.

b. A steel riser (minimum of 5 feet long including cover) having a minimum outside diameter of 8 inches with a minimum wall thickness of 3/16 inches shall be used. A locking steel cover shall be attached to the riser, as shown in the Plans.

c. The riser shall be suspended above the top of the well such that the top of the riser is 3 feet above grade. A concrete slurry shall then be poured and tamped on top of the annular seal such that the riser is set in concrete. The concrete will be poured and tamped until it is approximately 3 inches below grade. The remaining portion of the excavation and the wood form will then be poured with concrete slurry, tamped and finished with a graded surface which shall slope gently away from the riser.

d. The finished concrete pedestal shall be 12 inches in thickness and 6 inches above grade. The riser set in the center of the pedestal will extend 3 feet above grade. The steel riser shall be painted with high visibility, high grade rust resistant paint.

e. The Contractor shall install protective bollards around the concrete pedestal as shown on the Plans. Four bollards will be placed 24-inches from the center of the steel riser, perpendicular to the sides of the pedestal. Each 4-inch diameter bollard will extend 4-feet above ground surface. Bollards will be cemented in a minimum 8-inch diameter hole excavated to a minimum depth of 30-inches. The bollards will be painted with high visibility, high grade rust resistant paint.

2. Flush Mount Surface Completions

a. All below ground (flush mount) well completions will be housed in a traffic rated valve box with a cast iron lid and locking ring. The valve box will be a Morrison Series 519 manhole or approved equal.

b. The Contractor shall excavate a hole large enough to allow for a 4-inch apron of concrete around the manhole at ground surface to a depth of 16-inches to allow for the installation of the specified manhole.

c. The box will be centered over the well casing and set flush with existing grade.

d. A concrete slurry shall then be poured and tamped on top of the annular seal and brought to grade level such that the box is set in concrete.

1.3.8 TEST HOLE ABANDONMENT

A. General - If directed by the Engineer, a test hole shall be destroyed in accordance with State and local standards for the construction and destruction of wells and other deep excavations.

B. Methods - Neat cement shall be injected from the bottom of the borehole by means of pumping equipment and a tremie pipe. The tremie pipe may be raised as the grout is placed but the discharge end must be submerged in grout at all times until the grouting is completed. The test hole shall be filled with cement grout to within 5 feet of the ground surface. The balance of the hole shall be filled with native material to the ground surface.

1.3.9 REJECTED BOREHOLE OR WELL

A. General - No payment will be made for any labor or materials involved in the construction of any borehole or well when such a hole fails to reach the specified or directed final depth and/or diameter for any preventable cause, or when such a test hole fails to meet these Technical Provisions. Such holes will be rejected and shall be replaced as specified herein. Preventable failures include any failure caused by faulty or inadequate drilling equipment, failure caused by negligence or improper drilling operations or techniques, failure caused by the installation of faulty or non-approved materials, or failure caused by improperly protecting drill holes and drilling work from the natural elements, including cave-ins resulting from existing soil conditions.

B. Abandonment of a Rejected Borehole or Well -- Any rejected borehole or well shall be abandoned at no additional cost to the Owner and in accordance with provisions of Section 1.3.7. Any casing remaining in the hole shall be cut off at a depth of five feet and the upper portion thereof removed.

C. Non-Payment for Borehole and Well Abandonment - No payment will be made for the abandonment of a rejected borehole or well. The cost of abandonment shall be borne by the Contractor.

D. Replacement of a Rejected Borehole or Well - Any rejected borehole shall be replaced by another hole adjacent to the first, or at a location as directed by the Engineer.

1.3.10 STANDBY TIME/LABOR

1.3.10.1 STANDBY TIME

Within one (1) hour after the completion of test hole drilling and logging operations, the Engineer will provide the final well design. Such time **will not** be considered standby time.

During the drilling operations, it may be necessary for the Engineer to perform work or analysis that will require the drilling crew and equipment to stand idle. In such an event, the Engineer shall request the Contractor to cease operations and shall state the anticipated extent or duration thereof. The Contractor shall promptly cease operations.

1.3.10.2 LABOR

During the course of the project, the Engineer may direct the Contractor to perform work that is not explicitly defined in these Provisions. In such an event, the Engineer will request in writing to the Contractor the additional work to be performed.

1.3.11 RECORDS

A. Scope - The item consists of preparing final records of the drilling and well construction.

B. Well Completion Records -- Prior to final acceptance of a test hole or well, the Contractor shall prepare and deliver to the Engineer a Well Completion Report in the format required by the State of California. The owner of the well listed on the Well Completion Report shall indicate the County of Napa.

C. Final Prints - The Contractor shall prepare two (2) final prints of the daily tour reports, drilling logs, and as-built construction drawings. As-built construction documentation will include GPS coordinates for each monitoring well.

1.3.12 SITE CLEAN-UP AND RESTORATION

A. Scope - This item shall consist of restoring the work site to its original condition after work is completed.

B. Methods - The Contractor shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work, and at completion of the Work, he/she shall remove all waste materials, rubbish, and debris from and about the well site as well as all tools, construction equipment, fuel tanks, machinery and surplus materials. The Contractor shall leave the site clean and ready for use by the Engineer. The Contractor shall restore to their original condition all temporary work areas. The Contractor is responsible for any damages to properties adjacent to the sites caused by drilling or construction activities associated with the Work described herein.

**Napa County
Monitoring Well Installation
Payment and Bid Sheet**

Item No.	Description	Unit of Measure	Unit Price	Quantity	Extended Price
1	Well Site Mobilization	Lump Sum		1	
2	Site-to-Site Mobilization	Lump Sum		3	
3	Test Hole Drilling	Linear Foot		400	
4	Geophysical Logging	Lump Sum		1	
5	Borehole Reaming	Linear Foot		300	
6	Blank Casing - 2" Sch 40 PVC	Linear Foot		380	
7	Well Screen - 2" Sch. 40 PVC w/0.030" Slot Size	Linear Foot		40	
8	Blank Casing - 2.5" Sch 40 PVC	Linear Foot		220	
9	Well Screen - 2.5" Sch. 40 PVC w/0.030" Slot Size	Linear Foot		40	
10	Gravel Envelope and Intermediate Seals	Linear Foot		320	
11	Annular Seal	Linear Foot		80	
12	Well Development	Each		8	
13	Surface Completion - Above Ground	Each		4	
14	Fluid/Cuttings Containment	Lump Sum		1	
Total Price					

Bidder: _____

Signed: _____

Date: _____



**BLANK CASING
2-INCH DIAMETER
SCH. 40 PVC, F-480-88A
THREADED CASING**

1'

