Via Email Only

September 26, 2014
Job No. 3269.000

BERLOGAR
STEVENS &
ASSOCIATES

Napa Redevelopment Partners
1025 Kaiser Road
Napa, California 94558

Subject: Post Napa Earthquake Site Reconnaissance and
Applicable Geotechnical Recommendations
Former Napa Pipe Facility
1025 Kaiser Road
Napa, California

Gentlemen:

We have been requested to perform a post Napa Earthquake reconnaissance of the Napa Pipe Facility and to provide an overview of the relevance of previous geotechnical studies performed for the project. A 6.0 magnitude earthquake on the West Napa Fault occurred on August 24, 2014, and several small aftershocks have occurred since then. We performed a site reconnaissance on September 19, 2014 to determine if the earthquake and aftershocks have impacted the site. During the site reconnaissance, we discussed the effects of the earthquake with the onsite maintenance supervisor. The following is a summary of our observations and the impacts of the earthquake on the Napa Pipe site.

1. The only reported damage that resulted from the Napa Earthquake was two breaks in very old water lines. One of the water line breaks occurred on an 8-inch line near a well, southeast of the dry docks. A 2-inch water line broke near the entrance to the site near the guard shack.

2. Incidental damage consisting of minor widening of a few of the existing cracks in the asphalt concrete (AC) pavement were observed and reported. Our observations indicated that several existing cracks in the AC pavement widened less than ⅛-inch in most circumstances and not more than ¼-inch.

3. Three erosion scarps along the Napa River at the south end of the site were present before the earthquake. It did not appear that the earthquake caused further instability of these erosion scarps.

4. Unreinforced concrete masonry blocks that were strewn about the ground around a wall, a small building, and cladding around steel columns in the large manufacturing building north of the dry docks, were reported to have been caused by demolition activities before the earthquake. It was reported that some abandoned light fixtures mounted on the ceiling in this building fell during the Napa Earthquake.

We provided geotechnical recommendations in our Supplemental Geotechnical Investigation report dated September 28, 2010, in which we discussed seismic hazards. Special geotechnical mitigation measures for seismic hazards were not deemed necessary. No indications of ground settlement or lateral spreading from seismically induced liquefaction were observed during our site reconnaissance. However, we did recommend a ground improvement program to mitigate for potential static ground settlement caused by consolidation of underlying soft Bay Mud from new loads, such as additional fill and buildings. Our recommendations included.

1. Scarifying the upper foot of the existing ground surface after demolition and compacting the soil.
2. Surcharge fill placement with and without wick drains to preconsolidate the Bay Mud prior to development.

These measures are still deemed to be appropriate at this time. The effects of the Napa Earthquake had negligible impacts to the project site.

We trust this provides the necessary information. If you have any questions, please contact the undersigned at (925) 484-0220.

Respectfully submitted,

BERLOGAR STEVENS & ASSOCIATES

William R. Stevens
Principal Engineer
GE 2339

Frank Berlogar

WRS/FB:jmo

Copies: Addressee
Mr. Jeremy Sill, RSA

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SUPPLEMENTAL GEOTECHNICAL INVESTIGATION
NAPA PIPE
1025 KAISER ROAD
NAPA, CALIFORNIA

FOR
ROGAL+WALSH+MOL
September 28, 2010

Job No. 3269.600

BERLOGAR GEOTECHNICAL CONSULTANTS

Via E-Mail and Mail

September 28, 2010
Job No. 3269.600

BGC
BERLOGAR
GEOTECHNICAL
CONSULTANTS

Mr. Richard Walsh
Rogal + Walsh + Mol
5 Third Street
San Francisco, California 94195

Subject: Supplemental Geotechnical Investigation
Napa Pipe
1025 Kaiser Road
Napa, California

Dear Mr. Walsh:

This report presents the results of our supplemental geotechnical investigation for the proposed phased, mixed-use residential development at the Napa Pipe facility site (see Plate 1, Vicinity Map). The approximately 154-acre site will be developed with a high density residential neighborhood containing low-rise and mid-rise housing, public open space, retail and restaurants, condominium hotel, water and waste water treatment plant, train and bus stations, business parks with research and development, light industrial and warehouse centers, and office space. The buildings will be limited to 48 feet in height along the waterfront, which is the height limit of the waterfront zoning district. It is our understanding that buildings up to 7 stories tall are proposed.

The site building pads would be raised to about 13 to 14 feet MSL elevation. Park areas along the existing railroad tracks will contain mounded landscape areas up to 16 feet MSL, with depressed storm water basins at elevation 8 feet MSL. A bridge over the wetlands on the south end is proposed. The southern 19-acre portion of the site will be set aside for unspecified future uses, with 5 of the 19 acres retained as wetlands. Flood control berms will be constructed around some of the wetlands. A park area in the southwest corner of the site next to the Napa River will be raised to about 30 feet MSL. Existing seawalls along the Napa River in the northern half of the site will remain as part of the development.

It is our understanding that over 1 million cubic yards of import soil will be required to raise the site to the proposed grades. Further, a site with nearly half million cubic yards of export soil may soon be available for use at the site. Since the proposed project will be phased over several years, we expect the remainder of the import fill will be obtained as material becomes available.

Treadwell and Rollo, Inc. (T&R) previously performed investigations at the site and presented the results in the following reports. The data from these previous investigations have been reviewed and incorporated in this report.

1. Geotechnical Feasibility Study, Napa Pipe Facility Site, 1025 Kaiser Road, Napa, California, January 23, 2007.
2. Additional Geotechnical Investigation, Napa Pipe Facility Site, 1025 Kaiser Road, Napa, California, May 21, 2007.

PURPOSE AND SCOPE OF SERVICES

The purpose of this supplemental geotechnical investigation is to address geotechnical and geologic issues that would have impacts on the proposed development. Preliminary geotechnical recommendations for surcharge fill construction and building foundation options are presented in this report. Our scope of services included a review of the available data pertinent to the site, field reconnaissance, field exploration, laboratory testing, preliminary engineering analyses and preparation of this report.

FIELD EXPLORATION AND LABORATORY TESTING

Eight CPT's were advanced at the site on 7-19-10 and seven borings were drilled on 7-22-10 at the approximate locations shown on the Site Plan, Plate 2. The borings were drilled up to 26 feet deep with hollow stem augers. Soil samples were obtained with a 2.5-inch I.D. split tube sampler and a 2.8-inch I.D. Shelby tube sampler. The samples were logged as drilling progressed and the boring logs are contained in Appendix A.

The CPTs were performed by Middle Earth up to a depth of approximately 40 feet. Upon completion of the CPTs, the holes were backfilled with neat cement grout as required by the Napa County Department of Environmental Management. Measurement of tip resistance, sleeve friction, and pore pressures were recorded to a data file as the cone was advanced. The CPT logs are presented in Appendix B.

The data from the previous investigations by T&R were reviewed. The approximate locations of the previous borings by T&R are shown on the Site Plan and the boring logs are presented in Appendix C.

Laboratory testing consisting of in-situ moisture, density, sieve analyses and consolidation tests were performed. The moisture density data is contained in the boring logs in Appendix A. The sieve analyses and consolidation test results are presented in Appendix D.

SITE CONDITIONS

SURFACE CONDITIONS

The site is a former industrial site and is bounded by the Napa River on the west, industrial uses to the north, and Napa Valley Corporate Park to the east and south. Bedford Slough and associated wetlands are located both on and adjacent to the site on the south. The site is relatively flat and currently ranges approximately 6 to 9 feet in elevation above MSL. The ground surface is mostly paved or covered with gravel. Most of the facility is vacant, with isolated operating industrial activities. A railroad track corridor runs north-south, bisecting the site near the center. On the west end along the Napa River, the ground slopes down to the river on southern portion of the site. Existing seawalls located along the river are present on the northern portion of the site.

SUBSURFACE CONDITIONS

The site is underlain by fill, Bay Mud, and alluvium, with bedrock at depth (several hundred feet deep). Artificial fill was found to be generally 4 to 8 feet thick, with thinner fill overlying the native soils near the margins of the site in T&R borings B-1 and B-2. The fill material was typically a stiff sandy clay to medium dense to dense clayey sand with variable gravel and some concrete rubble.

Young Bay Mud was encountered in the central portion of the site as shown on the Site Plan, Plate 2. The Bay Mud appears to have been deposited in a topographic depression with an east-west orientation. The maximum thickness of Bay Mud approaches 20 feet on the west margin of the site adjacent to the Napa River, thinning out to less than 10 feet thick on the east boundary of the site. The Bay Mud was observed to contain up to (by visual estimate) 15% peat. The Bay Mud is normally consolidated, which means it will consolidate with loading, such as new fill or buildings. The underlying alluvium was found to be medium dense to very dense sand and gravel with clay and stiff to hard clay and silt layers.

GROUNDWATER

Groundwater was found to be about 6 to 8 feet deep. The groundwater level at the site is anticipated to vary, depending on factors such as tidal fluctuations, seasonal rainfall, time of the year and local irrigation practices.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

GENERAL

From a geotechnical engineering standpoint, we believe the proposed multi-use development is generally feasible, provided that a design-level geotechnical investigation is performed and the recommendations thereof are incorporated into the project design and construction. The main geotechnical issues that would impact the project are:

- Ground settlement from consolidation of Bay Mud,
- Surcharge fill impact on existing site operations,
- Existing seawall stability,
- Seismic hazards, including seismic shaking and liquefaction,
- Shallow groundwater,
- Expansive soil.

It should be noted that the preliminary conclusions and recommendations presented herein are intended to assist in evaluating and planning the project. These preliminary conclusions and recommendations are insufficient for the design of the proposed development at this site, and a design-level geotechnical investigation, including additional field exploration and laboratory testing, will be required. The preliminary conclusions and recommendations contained in this

report are subject to refinement and/or modification, depending on the findings from the design-level geotechnical investigation.

BAY MUD SETTLEMENT

The Bay Mud will undergo long-term settlement when subjected to imposed loads from fill and foundations. As material is imported to the portion of the site east of the railroad tracks, it should be placed on the area underlain by Bay Mud. Recommended guidelines for placement of this temporarily stockpiled material are:

1. Place the import to a uniform thickness over the entire Bay Mud area. This will entail placing the stockpile in vertical increments as each import sequence takes place.
2. There are live utility lines in place that need to remain serviceable during the stockpile period. Each of these lines should be evaluated for settlement tolerances so that the stockpile height can be limited as needed to maintain serviceability of each utility line.
3. The perimeter slope of the stockpiled material should be no steeper than 3 horizontal to 1 vertical.
4. The edge (toe of slope) of the stockpile should be set back a minimum of 20 feet from the main sewer trunkline on the east side of the railroad tracks. A greater setback may be prudent if the stockpile exceeds 10 feet in height.
5. The settlement of the stockpile should be monitored through the installation and periodic survey of settlement plates. On a preliminary basis, we anticipate a minimum of 10 settlement plates.

SURCHARGES

The temporary stockpile on the Bay Mud area east of the railroad tracks will likely produce much of the benefit of a formal surcharge program. The degree of benefit will be a function of the time in place, the height of the stockpile and the thickness of the Bay Mud. Depending on these variables, the area of thicker Bay Mud may require additional design considerations such as surcharging or more stringent foundations.

The portion of the site west of the railroad tracks is not intended to receive temporary import stockpiles. The area underlain by Bay Mud will experience significant settlements when loaded by design fills and foundations. It may be that a surcharge with drainage wicks will be needed to reduce design settlements of gravity utilities, roads and buildings.

The following is a preliminary surcharge fill and wick drain design for the portion of the site west of the railroad tracks.

1. Surcharge fill should be placed in a uniform thickness over the Bay Mud area. Surcharge fill placement for individual building pads is not recommended since this may produce problematic differential settlement around the margin of the surcharge fills.
2. The existing ground surface will need to be prepared by scarifying at least 12 inches and compacting to at least 90 percent relative compaction, in accordance with the Modified Proctor, ASTM D1557, in areas proposed for surcharge fills.

3. Wick drains spaced about 3 feet apart should produce the desired consolidation in a relatively short time period (about 4 months). Wick drains spaced at 5-feet spacing may produce similar consolidation results in about 12 months.
4. A 1-foot thick drainage blanket will be required between the existing ground surface and the surcharge fill to permit drainage of the water emanating out of the top of the wick drains. The drainage blanket can consist of ¾-inch to 1½ inch clean rock, crushed rock, or recycled concrete. The drainage blanket should be underlain and overlain by nonwoven filter fabric, such as Mirafi 180N or equivalent.
5. The drainage blanket should be provided with positive drainage relief to maximize the effectiveness of the drainage wicks and minimize the surcharge duration.
6. Surcharge fill thickness should be not less than 6 feet plus the anticipated settlements.
7. Surcharge fill should be placed to a relatively uniform density.
8. For preliminary planning purposes, assumes an average settlement of 6 to 8 inches over the surcharge area for earthwork quantity calculations.
9. Appropriate setbacks should be maintained for features that are sensitive to settlement (i.e. gravity utility lines) or loading (i.e. seawall).
10. Settlement monitoring plates should be installed prior to surcharge fill placement. These settlement plates should be monitored monthly after the wick drains and surcharge fill has been placed. Redundant monitoring plates should be installed to account for potential damage during surcharge fill construction.

EXISTING SEAWALL STABILITY

The proposed development will utilize the existing seawalls in the northern portion of the site. In addition to the impacts of settlement, the stability of these walls should be evaluated in the design level geotechnical investigation. The structural engineer should evaluate the structural integrity of the walls based on static conditions, with additional surcharge and traffic loads, and during seismic events. Setbacks for structures may be required depending on the geotechnical and structural assessment.

SEISMIC HAZARDS

SURFACE FAULT RUPTURE

The site is located outside the designated State of California Earthquake Fault Zone for active faults. According to published mapping by the California Geological Survey (CGS), no known fault traces cross the site, and no visible evidence of surface ground rupture was noted during our site reconnaissance. It is our opinion that the likelihood of surface fault rupture at the site is very low.

GROUND SHAKING

The site is located in a region of high seismicity. As for all sites in the San Francisco Bay Area, the site should be expected to experience at least one moderate to large earthquake during the

lifespan of the development. According to the California Geological Survey, Probabilistic Seismic Hazards Mapping, Ground Motion Page, the site peak ground acceleration for a CBC Site Class D with a 10 percent probability of exceedance in 50 years (475-year return period) is 0.46g.

LIQUEFACTION POTENTIAL

Liquefaction is the temporary transformation of saturated, cohesionless soils into a viscous liquid during strong ground shaking from a major earthquake. Lateral spreading is the lateral movement of ground riding on a liquefied soil layer(s) during an earthquake towards an open face (in this case, the bank of the Napa River). According to the May 21, 2007 T&R report, lateral spreading and liquefaction should not be detrimental to the development. Liquefaction was estimated to produce approximately ½-inch of ground settlement on the inland portion of the site (areas of B-1, B-3, and B-5). The soils below 7.5 feet deep in borings B-7 and B-8 were determined by T&R not to be susceptible to liquefaction, and hence, not prone to lateral spreading. Additional liquefaction analyses will be required for the design level geotechnical investigation.

CALIFORNIA BUILDING CODE (CBC) SEISMIC DESIGN PARAMETERS

The Napa Pipe site is underlain by two different Site Classes. Most of the site is located in Site Class D, but the portion of the site underlain by over 10 feet of Bay Mud is located in Site Class E (see Site Plan, Plate 2). The structural engineer should determine which Site Class is appropriate based on the predominant period of the structures. According to the United States Geological Survey, Earthquake Ground Motion Parameters program, version 5.0.9a dated 10-21-09, the following 2007 CBC seismic design parameters should be incorporated in the structural design of the proposed buildings (for a site located at 37.6647 degrees latitude and -121.8712 degrees longitude).

Areas Underlain by LESS than 10 feet of Bay Mud	**Site Class D**
Mapped Spectral Acceleration for Short Periods, Ss, for Site Class B with 5% damping	1.805 g
Mapped Spectral Acceleration for 1-second Period, S1, for Site Class B with 5% damping	0.601 g
SMs for Site Class D	1.805 g
SM1 for Site Class D	0.901 g
SDs for Site Class D	1.203 g
SD1 for Site Class D	0.601 g

Areas Underlain by MORE than 10 feet of Bay Mud	**Site Class E**
Mapped Spectral Acceleration for Short Periods, Ss, for Site Class B with 5% damping	1.805 g
Mapped Spectral Acceleration for 1-second Period, S1, for Site Class B with 5% damping	0.601 g
SMs for Site Class D	1.624 g
SM1 for Site Class D	1.442 g
SDs for Site Class D	1.083 g
SD1 for Site Class D	0.961 g

EXPANSIVE SOILS

The results of Atterberg Limits tests indicate that the surficial soils have a Plasticity Index of 17 and 28, which is indicative of moderately to highly expansive soil. However, the expansion potential of the existing surface soils is likely moot once the import fill is placed to raise the site. Additional laboratory tests should be performed to further evaluate the expansion potential of imported soils. It would be desirable to limit import fills to a Plasticity Index of not more than 20.

SHALLOW GROUNDWATER

Groundwater was encountered about 6 to 8 feet deep, which is a couple of feet from MSL. The groundwater at the site is influenced by tidal fluctuations. Deep utility trenches will encounter groundwater, requiring dewatering or special construction methods. Water stops may be needed to prevent tidal groundwater seepage through the bedding and shading material around the utility pipes. The impacts of groundwater should be considered in the detention basin design, utility trench construction and site grading in the design level geotechnical investigation.

BUILDING FOUNDATIONS

It is our opinion from a geotechnical engineering standpoint that, after the surcharge fill program has been satisfactorily completed, proposed buildings up to 4 stories high can be supported on stiffened shallow foundations. Isolated column footings will be need to be structurally tied together. Buildings up to 7 stories tall may be able to be supported on reinforced concrete mat foundations or pile foundations. Total settlement of buildings on shallow foundations is estimated to be about 2 inches with potential differential settlement of about 1½ inches across the building pad may be anticipated. Settlement of buildings supported on pile foundations will about half that amount.

We expect shallow foundations constructed on engineered fill will have an allowable bearing capacity of about 2,500 to 3,500 psf, depending on the type building and the quality of fill imported to the site. Reinforced mat foundations should have an allowable bearing capacity of about 1,500 psf. Pile foundation recommendations will depend on the location of the building relative to the thickness of the Bay Mud. Shallow and deep pile foundation recommendations will need to be provided in the design level geotechnical investigation.

STORMWATER DETENTION BASIN

Stormwater detention basins should have sideslopes at a gradient not steeper than 3 horizontal to 1 vertical (3H:1V). Slopes should be planted with deep-rooting, fast-growing grasses before the first winter to reduce erosion. Some irrigation of slopes may be needed to establish the vegetation. Percolation testing may be needed to determine the infiltration rate of soils at the bottom of proposed stormwater detention basin.

RECYCLED CONCRETE AND ASPALT

The existing asphalt concrete and on-site concrete, and existing concrete foundations, building walls, and floor slabs can be recycled. A portable crushing operation should be set up to crush

and blend this material to provide material for aggregate base, utility bedding and shading, wick drain drainage blanket, and engineered fill. Recommendations for gradation and quality of the recycled material should be provided in the design level geotechnical investigation.

LIMITATIONS

The preliminary conclusions and recommendations of this report are based upon the information provided to us regarding the proposed development, subsurface conditions encountered at the CPT and boring locations, and professional judgement. This study has been conducted in accordance with currently accepted standards of geotechnical engineering practice; no other warranty is expressed or implied.

The CPT and boring locations were determined by pacing from the existing surface features and should be considered approximate only. Site conditions described in the text are those existing at the time of our field exploration in July 2010, and are not necessarily representative of such conditions at other locations and times.

The CPT and boring logs show subsurface conditions at the locations and on the date indicated. It is not warranted that they are representative of such conditions elsewhere or at other times. In the event that changes in the nature, design or location of the proposed residential development are planned or if subsurface conditions differ from those described in this report, then the conclusions and recommendations in this report shall be considered invalid, unless the changes are reviewed and the conclusions and recommendations modified or approved in writing.

Respectfully submitted,

BERLOGAR GEOTECHNICAL CONSULTANTS

William R. Stevens
Principal Engineer
GE 2339, Exp. 3/31/12

Frank Berlogar

WRS/FB:jmb

Attachments:
- Plate 1 – Vicinity Map
- Plate 2 – Site Plan
- Appendix A – Logs of Borings, this study
- Appendix B – CPT Logs
- Appendix C – Logs of Borings (Treadwell and Rollo, 2007)
- Appendix D – Laboratory Test Results

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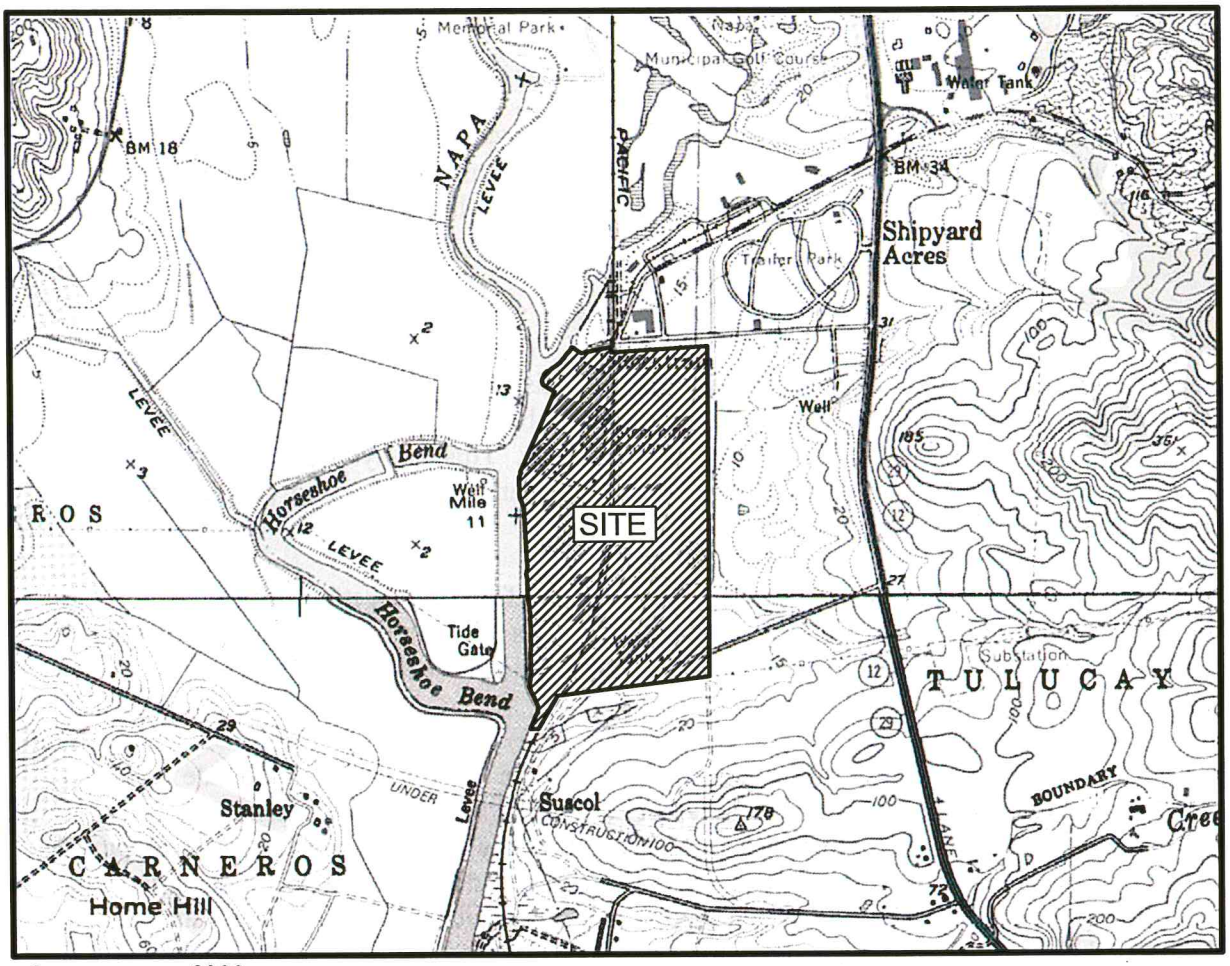

VICINITY MAP

NAPA PIPE

1025 KAISER ROAD

NAPA, CALIFORNIA

FOR

NAPA REDEVELOPMENT PARTNERS

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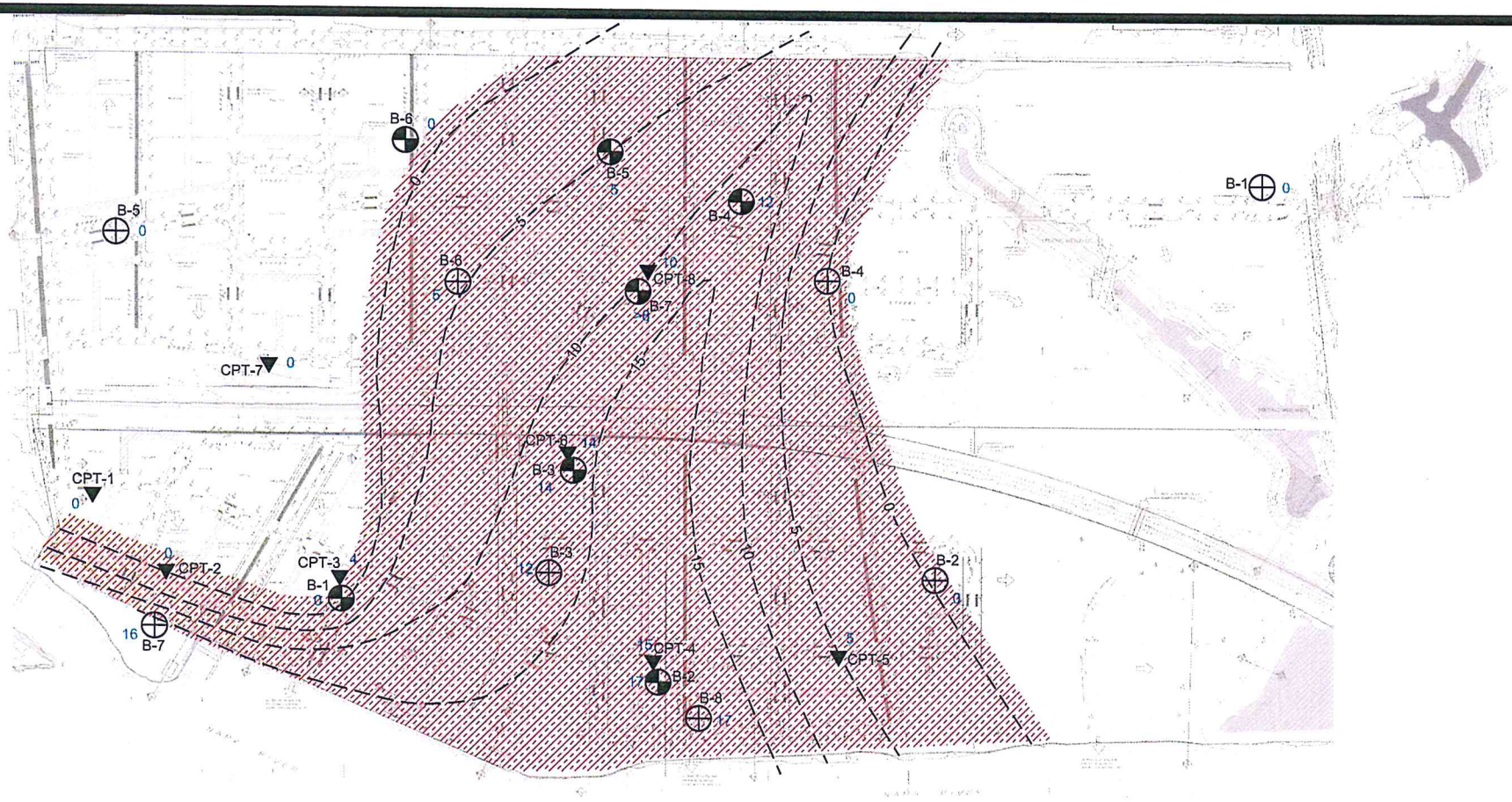
BASE: PORTION OF U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLE, NAPA, CALIFORNIA, PHOTOREVISED 1980, AT A SCALE OF 1:24,000.

PLATE 1



EXPLANATION

- — — 15 — — THICKNESS OF BAY MUD ISOPACHS
- B-7 BORING LOCATION (BGC, THIS STUDY)
- CPT-8 CPT LOCATION (BGC, THIS STUDY)
- B-8 BORING LOCATION (TREADWELL & ROLLO, 2007)
- 17 THICKNESS OF BAY MUD IN FEET
- PRELIMINARY SURCHARGE AREA

N

0 300

1"=300'

SITE PLAN

NAPA PIPE

1025 KAISER ROAD
NAPA, CALIFORNIA
FOR
NAPA REDEVELOPMENT PARTNERS

Berlogar Geotechnical Consultants
SOIL ENGINEERS * ENGINEERING GEOLOGISTS

PLATE 2

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