APPENDIX H

HYDROLOGY AND WATER QUALITY REPORTS

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July 10, 2012
4953-10-1031 (OD12162610)

Mr. Jack Kurchian
President
System, LLC
9034 West Sunset Boulevard
West Hollywood, California 90069

Re: **Impacts from Temporary Dewatering**
Proposed Melrose Triangle Mixed-Use Project
Between Santa Monica Boulevard, Melrose Avenue and Almont Drive
West Hollywood, California

Dear Mr. Kurchian:

This letter addresses potential impacts for temporary dewatering during construction for the proposed Melrose Triangle Mixed-Use Project to be constructed between Santa Monica Boulevard, Melrose Avenue and Almont Drive in West Hollywood, California. Under our predecessor firm of MACTEC Engineering and Consulting, Inc., we prepared a geotechnical consultation for the project in report dated August 27, 2010 (MACTEC Project No. 4953-10-1031). We also provided supplemental geotechnical consultation that provided an update of our August 27, 2010 report based on modifications to the project and recent changes in the California Building Code; the results were presented in a letter dated April 16, 2012.

You have provided us with updated drawings for the project dated January 10, 2012. The recent plans show minor shift in building layout. The project plan remains essential similar with the previous plan showing several buildings constructed over a single subterranean structure. The above-grade portion of the buildings shows three to five levels in height of retail, commercial and residential space. The buildings are underlain by three to four levels of subterranean set approximately at Elevation 179.5 feet (or up to 46 feet below the existing ground surface).

In our opinion, the updated building configuration and information do not have any significant impact on the project as discussed in the April 16, 2012 letter.

The permanent structure will be designed for hydrostatic pressures and a subdrain system will therefore not be used; as such, there will be no withdrawal of groundwater associated with the operation of the building after construction. However, temporary dewatering will be needed during construction. As water is drawn from the soils during temporary dewatering of the site, the soils surrounding the site will experience additional loading, which will cause some settlement of the soils beyond the footprint of the proposed building. We stated our opinion in the August 27, 2010 report that the maximum settlement due to dewatering will be about one inch along the perimeter of the building and we also stated our opinion that the maximum estimated differential settlements will be on the order of ¼-inch over 25 feet in areas directly adjacent to the site. This corresponds to a slope of about 1/1200, which is less than what is normally considered to be acceptable for buildings and utilities. Thus it is our opinion that there will be neglible impact on existing structures and infrastructure as a result of construction of the proposed Melrose Triangle Mixed-Use development.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this letter.

It has been a pleasure to be of professional service to you. Please call if you have any questions or if we can be of further assistance.

Sincerely,

AMEC Environment & Infrastructure, Inc.

Reviewed By:

Rosalind Munro
Principal Engineering Geologist

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(6 copies submitted)

July 2, 2012

Jack Kurchian
System LLC
9034 West Sunset Boulevard
West Hollywood, CA 90069

Subject: **DRAFT Addendum to the Hydrogeological Evaluation Report—Proposed Melrose Triangle Mixed-Use Project**
Between Santa Monica Boulevard, Melrose Avenue, and Almont Drive
AMEC Project No. OD12162610.08

Dear Mr. Kurchian:

AMEC Environment & Infrastructure, Inc. (AMEC; formerly MACTEC), is pleased to present this Addendum to the Hydrogeological Evaluation Report on behalf of System LLC. The Hydrogeological Evaluation Report (HER), dated January 26, 2009, was commissioned by System LLC to provide site-specific hydrogeological information and to estimate construction dewatering rates for the proposed Melrose Triangle multistory, mixed-use development located in West Hollywood, California. This Addendum presents the results of additional groundwater modeling to evaluate potential dewatering requirements for the proposed development with respect to anticipated hydrogeological conditions in the water bearing units beneath the Melrose Triangle site (the Site), as well as potential impacts to local groundwater flow following completion of the development.

Description of Proposed Development

In 2008, System LLC submitted development plans to the City of West Hollywood for construction of a mixed-use residential/commercial development on the approximately 134,400-square-foot (three-acre) site, located in an area bounded by Santa Monica Boulevard, Melrose Avenue, and Almont Drive, and known locally as the Melrose Triangle. The development that was proposed in 2008 consisted of a five-story complex (above grade) and six levels of subterranean parking and storage space. The floor of the lowest subterranean parking level of the building was established at Elevation 156.50 feet with respect to the project datum. This would require an excavation of 70 to 80 feet below the existing grades in order to accommodate the building foundations. Depth-to-water measurements at the site's four groundwater wells indicated that groundwater is first encountered beneath the site at depths of approximately 7 to 20 feet below ground surface (bgs).

Given these circumstances, construction dewatering and post-development water management constitute a major project consideration. Aquifer test analysis presented in the HER showed evidence of a leaky aquifer system, in which vertical flow from the interbedded units, in addition to

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horizontal flow through the aquifers, contributed to discharge from the pumping test well. The degree of leakance was thought to have particular significance to the dewatering system design; additional groundwater flux into the target dewatering zone from the productive lower aquifers presents the possibility of higher-than-anticipated dewatering requirements, even with the updated shallower planned excavation, and especially at early times of the dewatering phase. The potential impact of the completed subsurface structures on regional groundwater flow was also a concern that is addressed in this Addendum. An Addendum to the HER dated April 5, 2012 described the anticipated dewatering requirements based on the updated subterranean development plan. The findings of the HER, as well as the updated dewatering requirements were used as the basis for constructing a groundwater flow model of the site, the results of this updated modeling effort are presented in this Addendum.

Site Groundwater Conditions

The depth to groundwater at former extraction well EW-1, and monitoring wells OB-1, OB-2, and OB-3 (see Figure 1) were measured on June 27, 2012 in order to assess changes in groundwater flow conditions since 2008. These most recent measurements are very similar to those recorded in 2008, so there is no evidence of a significant shift in groundwater gradient or flow direction since work done for the HER. The table below shows data from this and previous monitoring periods.

Well Identification	Date Measured	Top of Well Casing Elevation [feet MSL]	Depth to Water [feet below top of casing]	Groundwater Elevation [feet MSL]
EW-1	10/28/2008 12/1/2008 6/27/2012	219.84	15.36 15.19 16.27	204.48 204.65 203.57
OB-1	10/28/2008 12/1/2008 6/27/2012	224.21	19.51 19.38 19.58	204.70 204.83 204.63
OB-2	10/28/2008 12/1/2008 6/27/2012	211.72	7.22 7.04 7.30	204.50 204.68 204.42
OB-3	10/28/2008 12/1/2008 6/27/2012	221.83	16.97 16.82 16.98	204.86 205.01 204.85

Additional water level measurements were taken on June 27, 2012 at two unnamed shallow monitoring wells located in the parking lot at the northern corner of the Site in the vicinity of boring location B-4 (see Figure 1). These two monitoring wells had total measured depths of 48.5 and 88.5 feet bgs, and groundwater was measured at a depth of 30.0 and 25.60 feet, respectively. Although the screened intervals of these shallow wells are not known, it is unlikely that these wells penetrate the confined Exposition aquifer unit beneath the Site (see description of Site geology in the HER). Water levels at these locations are approximately 10 to 15 feet deeper than at OB-3, the nearest monitoring well screened in the Exposition. This relative difference in water elevation provides further evidence that confining conditions increase with depth beneath the site, and that the Exposition unit represents a large potential source of water for future dewatering activities compared to the shallower water-bearing units.

Three-Dimensional Flow Modeling

AMEC constructed a three layer groundwater flow model of the proposed Melrose Triangle development based on known hydrogeologic conditions and the anticipated subsurface construction at the Site. This model was developed using MODFLOW-2000 (MODFLOW), a widely-used modular software package for simulating groundwater flow (Harbaugh et. al., 2000). Use of MODFLOW allows for explicit discretization of structures and hydrogeologic units at the Site in three dimensions as well as the simulation of transient flow conditions, allowing for the simulation of additional dewatering scenarios that were not a part of the WINFLOW models presented in either the HER or the April 5, 2012 Addendum.

The MODFLOW model domain is a 7000-foot x 7000-foot rectangular grid with the Site in the center of this quadrangle. The predominant direction of undisturbed groundwater flow as described in the HER is simulated by applying constant head boundary conditions to the northwest and southeast grid boundaries to approximate the observed natural gradient of approximately 0.025 feet per foot in the southeasterly direction. The aerial size of the model domain is considered large enough such that disturbance from simulated pumping at the Site will not overcome the imposed natural groundwater gradient at the boundaries. Initial undisturbed hydraulic head in the model domain was set at 205 feet above mean sea level (MSL), reflecting conditions presented in the HER. Figure 2 shows conceptually the configuration of the model layers in cross-section. As shown on Figure 2, the model was constructed with three layers:

- Layer 1 represents an Upper Aquifer unit within which the proposed dewatering wells will be screened. Conceptually, this layer is associated with the Older Alluvium described in the HER;
- Layer 2 represents a confining Aquitard that separates layer 1 from layer 3; and
- Layer 3 represents a Lower Aquifer unit which is believed to be regionally extensive and highly transmissive. Conceptually, this layer is associated with the Exposition unit described in the HER

The table below shows the range of groundwater hydraulic parameters used in the MODFLOW model scenarios.

Model Layer	Simulated Hydrogeologic Unit	Horizontal Hydraulic Conductivity [feet/day] (cm/second)	Storage Coefficient [-]	Layer Thickness [feet]
1: Upper Aquifer	Older Alluvium	[2 to 8] (7.06×10^{-4} to 2.82×10^{-3})	1×10^{-5}	40
2: Aquitard	Unnamed confining unit between Older Alluvium and Exposition	[0.8 to 0.0008] (2.82×10^{-4} to 2.82×10^{-7})	1×10^{-5}	10
3: Lower Aquifer	Exposition	[8] (2.82×10^{-3})	1×10^{-5}	100

The table above shows that the model layers 1 and 3 incorporate the highest anticipated horizontal hydraulic conductivity (Kh) for these units based on aquifer testing done in association with development of the HER. The Kh of the aquitard unit was varied according to the evaluated dewatering scenarios described in the section below. Vertical hydraulic conductivity (Kv) was set to 10% of the Kh for all model layers. The storage coefficient, was also calculated from test results obtained for the HER, and was assigned equally to all model layers. Thicknesses for model layers 1 and 2 were estimated from investigative work presented in geologic cross-sections in the HER. The simulated Lower Aquifer thickness was set to 100 feet, as the exact thickness of the Exposition extends beyond the depth of exploration at the Site, and model results are considered relatively insensitive over a plausible range of thicknesses for this unit.

Dewatering wells DW-1 through DW-16 were simulated in the MODFLOW model in positions consistent with their locations as shown in the HER and April 5, 2012 Addendum. The wells in the MODFLOW model were simulated as constant-head model grid cells, such that the groundwater elevation in these simulated cells was always at a target dewatering drawdown elevation of 160 feet MSL (a depth of approximately 70 feet below the project datum) for the simulated dewatering periods. In this way, flux through the simulated well grid cells will vary in time from the start of dewatering, reflecting the necessary pumping rate to maintain the target drawdown level in the well. Dewatering wells in this model can be considered fully-screened through the 40 foot thick Upper Aquifer.

Dewatering Scenarios – Evaluation of Vertical Underflow

The MODFLOW model was used to simulate several dewatering scenarios in order to evaluate the effects of flow from the Lower Aquifer into the Upper Aquifer during the dewatering phase of construction. As aquifer testing presented in the HER shows that the Lower Aquifer is a relatively productive confined unit compared to the shallower water-bearing zones, it was thought that flow from this lower unit may increase the necessary dewatering capacity of the site, even though the lower aquifer will not be penetrated by the updated construction plan. The MODFLOW model simulations were performed to address concerns that vertical flow across the aquitard may affect dewatering system performance, as evaluation of the aquifer pump test data indicated aquifer system beneath the Site is "leaky", that is vertical flow occurs between water bearing units.

Previous WINFLOW models evaluated the site as a single aquifer unit with an impervious base, as such, the WINFLOW models did not account for the layered geology beneath the Site or the potential for upward vertical flow caused by the confined nature of the Lower Aquifer. It has been noted in dewatering projects where a transmissive aquifer exists at depth beneath the dewatered unit, that the deeper aquifer can act as a recharge boundary of essentially constant hydraulic head, providing a large water source for the dewatering system (Powers et al., 2007). The major factor controlling vertical underflow into Upper Aquifer units at the Melrose Triangle site is the ability of the Aquitard unit to act as a flow barrier to the Lower Aquifer water source. Therefore, scenarios 1-3 shown in the table below simulate hydraulic conductivities for the Aquitard unit over a range of values considered reasonable for this type of geologic unit. A Kh of 0.0008 feet/day (2.82×10^{-7} cm/second) can be considered a largely impervious aquitard, with 0.8 feet/day (2.82×10^{-4} cm/second) being the greatest conductivity considered for this unit. The hydraulic parameters modeled in the MODFLOW model scenarios 1-3 had the following properties:

Model Scenario	**Simulated Kh for Layer 1 [feet/day] (cm/second)**	**Simulated Kh for Layer 2 [feet/day] (cm/second)**	**Simulated Kh for Layer 3 [feet/day] (cm/second)**
1	[8.0000] (2.82×10^{-3})	[0.0008] (2.82×10^{-7})	[8.0000] (2.82×10^{-3})
2	[8.0000] (2.82×10^{-3})	[0.08] (2.82×10^{-5})	[8.0000] (2.82×10^{-3})
3	[8.0000] (2.82×10^{-3})	[0.8] (2.82×10^{-4})	[8.0000] (2.82×10^{-3})

Figure 3 shows the total simulated pumping rate out of the 16 dewatering wells over time during the dewatering phase. It is evident from this figure that for each scenario presented, total flow out of the dewatering system will stabilize by about 10-15 days after the start of pumping. As such, this figure only shows results from the first 50 days of dewatering, not the entire anticipated two-year dewatering period during construction. Although flow rates stabilize (i.e., achieve steady-state conditions) relatively quickly, it is clear that greater sustained cumulative pumping rates will be necessary to dewater the site when the simulated Kv of the Aquitard unit is greater, as the vertical flow is related to the Kv of the Aquitard unit, which is set to 10% of Kh for all model simulations. Sustained flow rates for scenarios 1-3 vary between approximately 150 and 330 gpm, which is within the range estimated by previous simulations for a single aquifer unit with a Kh of 2.82×10^{-3} cm/second (approximately 260 gpm, as shown in the April 5, 2012 Addendum). Initial flow rates on the first day of dewatering range from approximately 300 to 500 gpm and stabilize to steady-state flow conditions ranging between 150 and 330 gpm after approximately 15 days.

The table below shows simulated total discharge for the 16-well dewatering system after a two-year period of pumping. Consistent with the results for scenarios 1-3 on Figure 3, the total dewatering volume for model scenarios is greater when vertical flow between the Lower and Upper Aquifer units is greater.

Model Scenario	Simulated Discharge for 730-day Dewatering Period [millions of gallons]
1	157
2	265
3	350

Figures 4 and 5 show anticipated drawdown and recovery curves for each model scenario over time for the dewatering and recovery phases of construction, respectively. The groundwater elevation at a single reference point in the center of the Site within the Upper Aquifer is plotted in both of these figures. Again, only the early-time data for these simulations is plotted, as the sustained groundwater elevations are reached relatively quickly for both drawdown and recovery. Maximum sustained drawdown is achieved between five and ten days after the start of dewatering (Figure 4), and recovery to the initial groundwater elevation of 205 feet MSL is achieved between 4 and 8 days (Figure 5) for all model scenarios. This reflects the relatively responsive conditions within these confined aquifer units as shown in aquifer tested associated with the HER. The sustained drawdown elevations for scenarios 1-3 vary between approximately 162 and 166 feet MSL due to the varied level of vertical communication between the Lower and Upper aquifers at the reference point at the center of the site, but this range is well below the target excavation elevation of approximately 178 feet MSL.

Dewatering Scenarios - Evaluation of Shallow Aquifer Transmissivity

Aquifer tests performed for the HER were from wells screened within the Older Alluvium and Exposition geologic units, so hydraulic conductivity estimates were considered to be a bulk property of all encountered water-bearing units. However, this does not take into consideration the relative transmissivities of the shallower and deeper aquifers. It is possible that the relatively greater proportions of fine-grained material in the Upper Alluvium compared to the Exposition may result in proportionally smaller Kh values in the shallower unit. If this is the case, the total capacity of the dewatering system may be less than previously anticipated. To explore this situation, two additional scenarios (scenario 4 and 5 – see table below) were evaluated for cases where the Upper Aquifer unit is relatively less transmissive than the Lower Aquifer. The Kh values selected for the Upper Aquifer reflect the range of conductivities evaluated by the WINFLOW modeling presented in the April 5, 2012 Addendum. The Aquitard Kh is set to 0.08 feet/day (2.82×10^{-5} cm/second) (which is considered a reasonable value for this fine grained geologic material), and these additional scenarios are compared against scenario 2 (as described in the section above). These model scenarios improve upon previously constructed models in that they allow vertical underflow.

Model Scenario	Simulated Kh for Layer 1 [feet/day] (cm/second)	Simulated Kh for Layer 2 [feet/day] (cm/second)	Simulated Kh for Layer 3 [feet/day] (cm/second)
2	[8.0] (2.82×10^{-3})	[0.08] (2.82×10^{-5})	[8.0] (2.82×10^{-3})
4	[2.0] 7.06×10^{-4}	[0.08] (2.82×10^{-5})	[8.0] (2.82×10^{-3})
5	[0.80] 2.82×10^{-4}	[0.08] (2.82×10^{-5})	[8.0] (2.82×10^{-3})

Figure 6 shows the total simulated pumping rate out of the 16 dewatering wells over time during the dewatering phase for scenarios 2, 4 and 5. Similarly to scenarios 1-3, flow rates presented in this figure stabilize by about 10-15 days after the start of pumping. Scenarios 4 and 5 shows that the simulated flow rate out of the dewatering wells decreases significantly by lowering the Kh of the Upper Aquifer within a one order of magnitude range. The stable flow rate when the Upper Aquifer unit has a Kh of 0.8 feet/day (2.82×10^{-4} cm/second) is around 60 gpm, about one-third the sustained flow rate of scenario 2, where both the Upper and Lower Aquifers are assigned a Kh of 8 feet/day (2.82×10^{-3} cm/second). The model results indicate that the dewatering system may be more sensitive to variations in the shallow aquifer transmissivity than to vertical underflow from the deeper units.

The table below presents the total discharge estimated for the 16-well dewatering system after a two-year period of pumping for scenarios 2, 4, and 5. Scenarios 4 and 5 show that the total simulated volume is significantly lower when Kh in the Upper Aquifer is proportionally less than in the Lower Aquifer. The MODFLOW results are consistent with WINFLOW models that demonstrated the same trend of lower system flow rates associated with lower transmissivity of the upper aquifer unit targeted for dewatering.

Model Scenario	Simulated Discharge for 730-day Dewatering Period [millions of gallons]
2	265
4	112
5	38

Figures 7 and 8 show anticipated drawdown and recovery curves for model scenarios 2, 4, and 5 over time for the dewatering and recovery phases of construction. Again, simulated groundwater elevation is from a single reference point in the center of the Site within the Upper Aquifer. . Similar to results presented in Figure 4, the maximum sustained drawdown is achieved between five and ten days after the start of dewatering (Figure 7), and recovery to the initial groundwater elevation of 205 feet MSL is achieved between 4 and 8 days after pumping has ended (Figure 8) for all model scenarios. The sustained drawdown elevations for scenarios 4-5 vary between approximately 166 and 171 feet MSL, but are still well below the target excavation elevation of approximately 178 feet MSL. These results indicate that Upper Aquifer transmissivity over the simulated range of Kh values will not greatly impact drawdown or recovery times at the Site.

Groundwater Flow Pathway Evaluation

Given the impervious nature of the planned subsurface structures, the effects on the local groundwater ons due to the disturbed subsurface was also evaluated with this MODFLOW model. An impervious lateral flow boundary condition was applied to the boundaries of the Site within the Upper Aquifer unit of the three-layer flow model described above. This boundary condition was applied to the steady-state flow field with a southeasterly-directed flow gradient of 0.025 feet per foot as described in the HER. The resulting groundwater flow pathways are presented on Figure 9. This figure shows that groundwater in the Upper Aquifer will flow around the Site following subsurface construction.

Figure 10 shows simulated groundwater elevation contours in the vicinity of the Site after construction in the Upper Aquifer. These correspond to the model simulation used to generate flow pathways in Figure 9. It is evident from Figure 10 that while there is a steep gradient between groundwater elevation within the site (approximately 160 feet MSL) and outside (approximately 200 feet MSL), the model shows no significant groundwater mounding above the observed natural groundwater gradient along the Santa Monica Blvd edge of the construction boundary.

Figure 11 shows the simulated groundwater elevation contours in the Upper Aquifer at steady-state conditions during the dewatering phase of construction. The groundwater contours in this figure reflect conditions in the Upper Aquifer for model scenario 5. This can be considered conservative in that lower Kh values for the dewatered aquifer unit will result in a more laterally-extensive radius-of-influence due to pumping. The view of Figure 11 has been expanded to show that drawdown and the radius-of-influence for the dewatering operation is not anticipated to impact groundwater levels or flow directions on a regional scale in the vicinity of the Site, even if the shallow aquifer units at the Site have a relatively small Kh compared to the deeper aquifers. In particular, Site dewatering activities are not likely to interfere with the ability of the City of Beverly Hills municipal supply wells to extract groundwater.

Conclusions

Flow simulations for a range of possible Aquitard conductivities indicate that sustained pumping rate for 16 dewatering wells should fall within the range of approximately 150 to 330 gpm in order to draw down groundwater elevations to the necessary depth for excavation, with initial flow rates between 300 and 500 for the first few days of dewatering. Dewatering system capacity should be planned accordingly to reflect this simulated range of conditions. Although these sustained flow rates are similar to previously simulations, they reflect the range of possible confining conditions of the productive Lower Aquifer unit.

Dewatering system capacities based on scenarios 1-3 should be considered conservative, in that they reflect a geologic setting with a relatively large bulk transmissivity. Model scenarios 4 and 5 indicate that lower relative hydraulic conductivity values in the shallower aquifer units may significantly decrease the total flow rate necessary to dewater to the anticipated depth of excavation. However, aquifer property estimates as of this time are based on pumping tests performed across both shallow and deeper aquifer units, as well as visual inspection of geologic material, as such, the transmissivities of each water-bearing unit have not been individually differentiated. Therefore, it may be desirable to perform additional investigations in the Older Alluvium in order to establish reliable estimates of specific hydraulic properties.

Target drawdown should be achieved relatively quickly following the initiation of dewatering, and recovery of groundwater to undisturbed levels should occur in less than ten days following the cessation of pumping. Following the completion of subsurface construction, the model simulations show that groundwater in the Upper Aquifer unit should flow around the impervious subsurface structures without appreciable mounding in the vicinity of the buildings. However, all water bearing units are currently considered as confined aquifers in the model scenarios presented here. If future investigations find that groundwater is unconfined or "perched" in the shallower units, this may affect predictions related to dewatering system capacities and drawdown/recovery times. Recent measurements taken from shallow monitoring wells in the northern corner of the site show that depths to groundwater are deeper in these shallower units than in wells screened within the Exposition. These data further demonstrate that the Exposition aquifer unit is the more transmissive (productive) and confined water-bearing unit beneath the Site. However, since the shallow wells cover only a small portion of the Site and their screen intervals are not well defined, it is difficult to draw conclusions specific to the hydraulic regime of the Older Alluvium that are relevant to future dewatering activities.

If you have any comments or questions about this Addendum Letter and the conclusions or recommendations, please feel free to contact Warren Chamberlain at (510) 663-3984.

Sincerely,

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

Sean Culkin, PG
Project Hydrogeologist

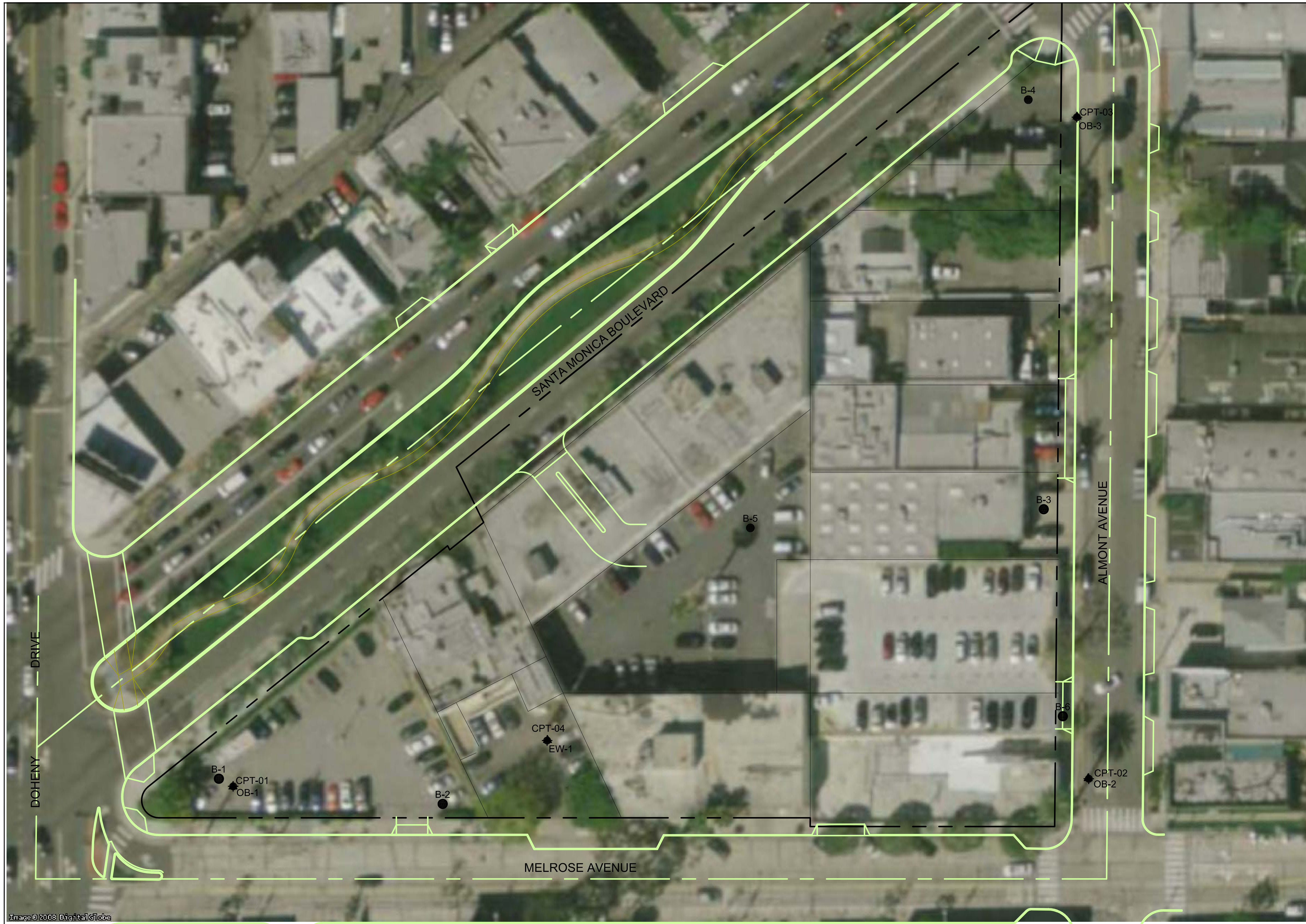
Warren B. Chamberlain, PG, CHG, PE
Senior Principal Engineer

Attachments:
Figure 1 – Well, Borehole, and CPT Locations
Figure 2 – Model Domain Cross-Section
Figure 3 – Simulated Dewatering System Flow rates, Aquitard Scenarios
Figure 4 – Simulated Time-Drawdown Plot, Aquitard Scenarios
Figure 5 – Simulated Time-Recovery Plot, Aquitard Scenarios
Figure 6 – Simulated Dewatering System Flow rates, Upper Aquifer Scenarios
Figure 7 – Simulated Time-Drawdown Plot, Upper Aquifer Scenarios
Figure 8 – Simulated Time-Recovery Plot, Upper Aquifer Scenarios
Figure 9 – Groundwater Flow Pathlines for the Upper Aquifer Following Construction
Figure 10 – Simulated Groundwater Elevation Contours for the Upper Aquifer Following Construction
Figure 11 – Simulated Regional Groundwater Elevation Contours During Dewatering Phase

References:

Harbaugh, A.W., E.R. Banta, M.C. Hill, and M.G. McDonald, 2000. MODFLOW-2000 User Guide, U.S. Geological Survey Open-File Report 00-92.

Powers, J.P., A.B. Corwin, P.C. Schmall, W.E. Kaeck, 2007. *Construction Dewatering and Groundwater Control*, John Wiley & Sons, Hoboken, NJ.



LEGEND

EW-1 Aquifer Test Well

Property Line

B-4 Boring Location

CPT-01 CPT Location

Outline of Existing Buildings/Lots (Approximate only, estimated from Aerial View)

N

0 60
SCALE: feet

AutoCAD basemap provided by Studioeleven Architects, dated 8-31-2006

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Hydrogeological Site Characterization Investigation
Well, Borehole and CPT Locations
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 1

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PCB	OD12162610		4/2012		

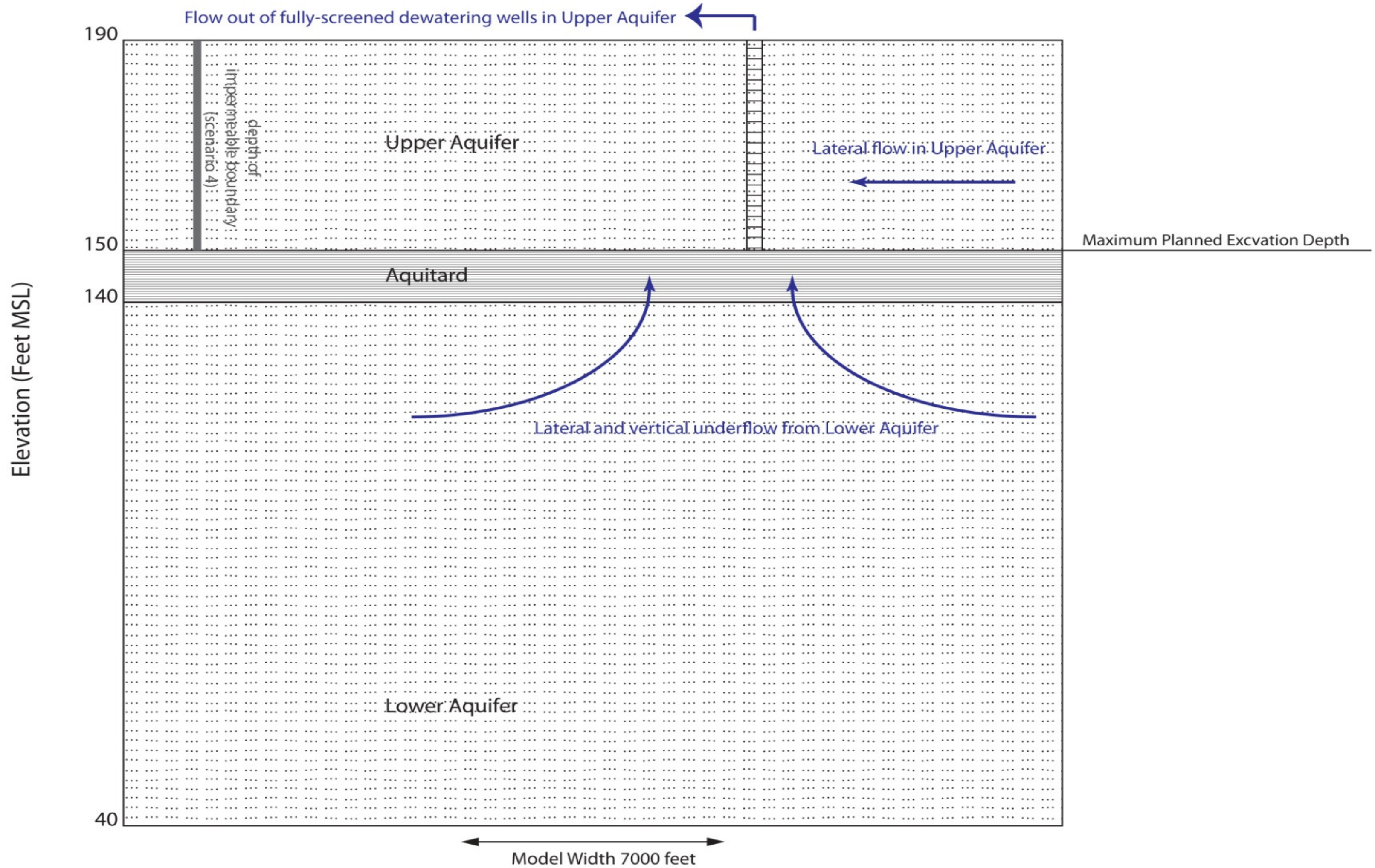
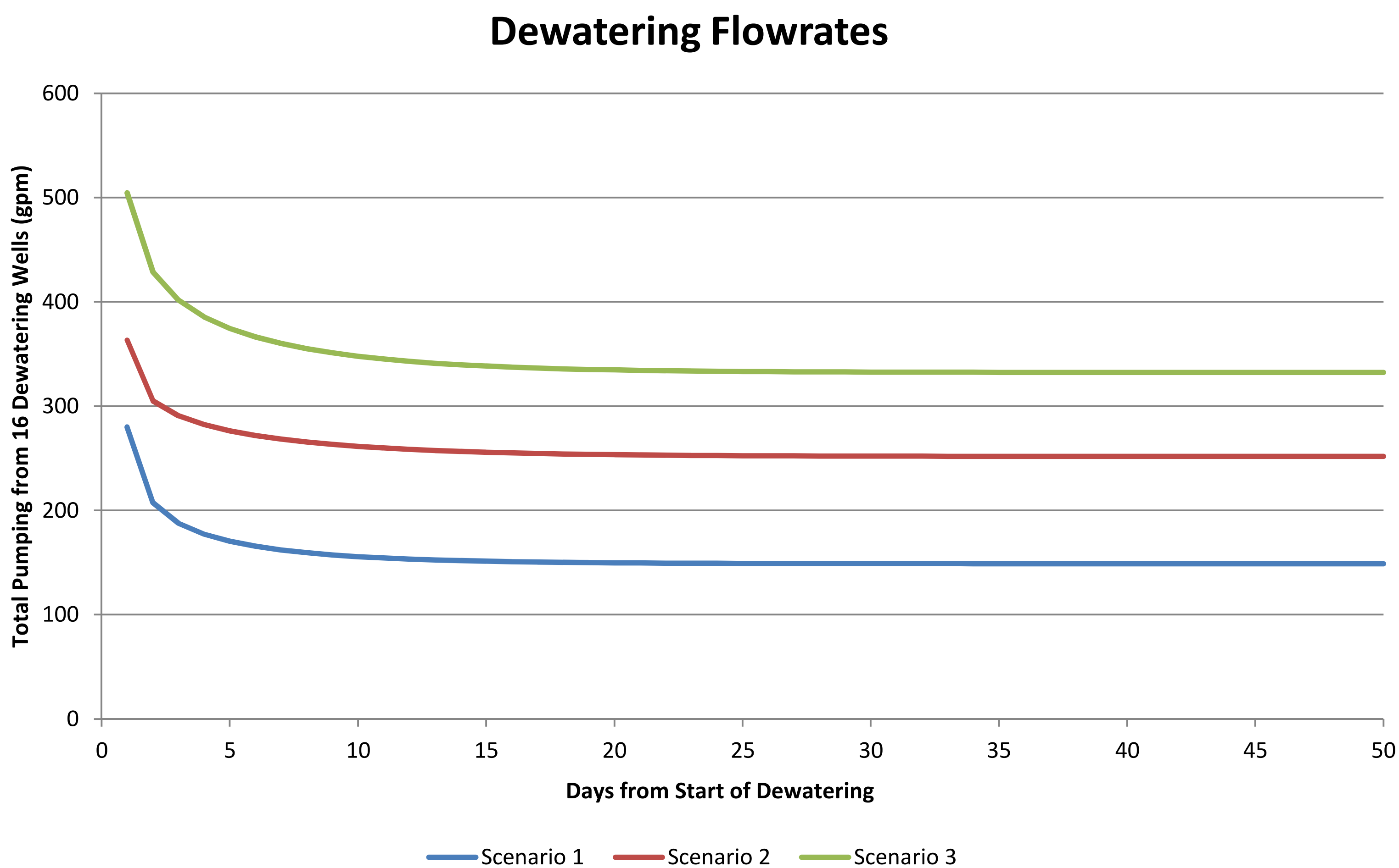


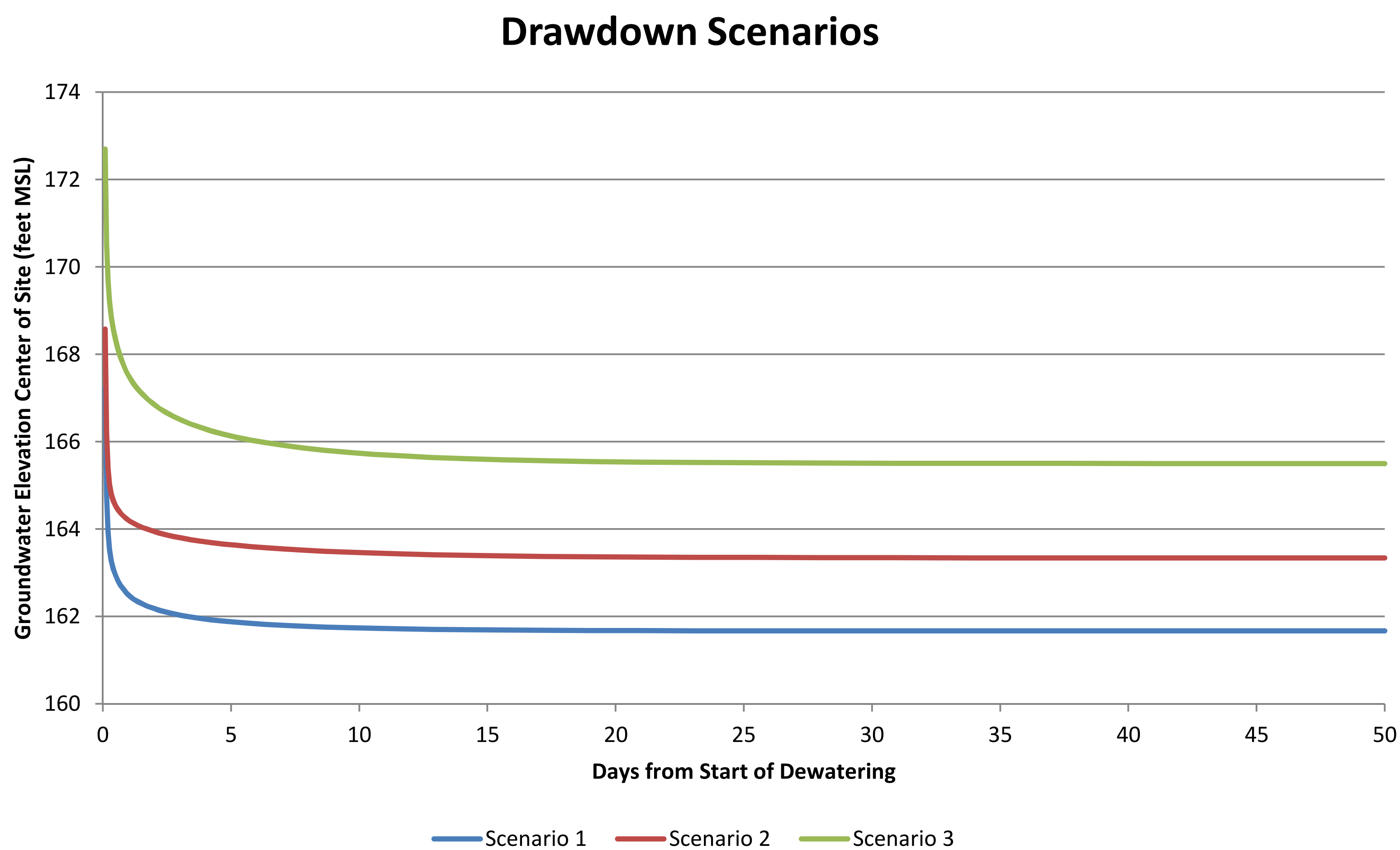
		Figure:
amec	Model Domain Cross-Secion Addendum to the Hydrogeological Evaluation Report Proposed Melrose Triangle Development Corners of Santa Monica, Melrose & Almont West Hollywood, California	2

DRAWN	JOB NUMBER	CHECKED	DATE
SLC	OD12162610	WBC	Jun-12



amec	Simulated Dewatering System Flow Rates, Aquitard Scenarios Addendum to the Hydrogeological Evaluation Report Proposed Melrose Triangle Development Corners of Santa Monica, Melrose & Almont West Hollywood, California	Figure: 3

DRAWN	JOB NUMBER	CHECKED	DATE
SLC	OD12162610	WBC	Jun-12

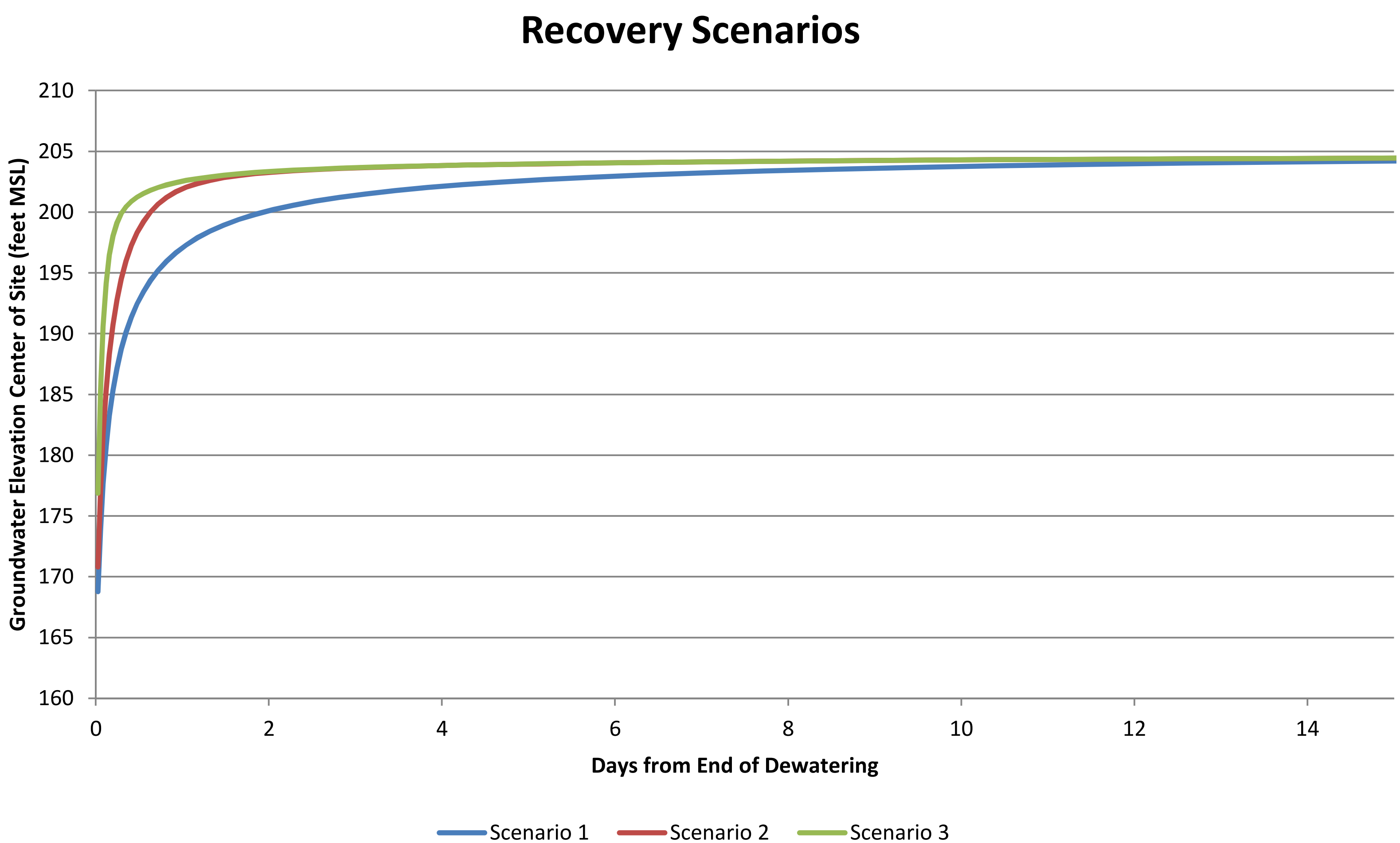


amec

Simulated Time-Drawdown Plot, Aquitard Scenarios
Addendum to the Hydrogeological Evaluation Report
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

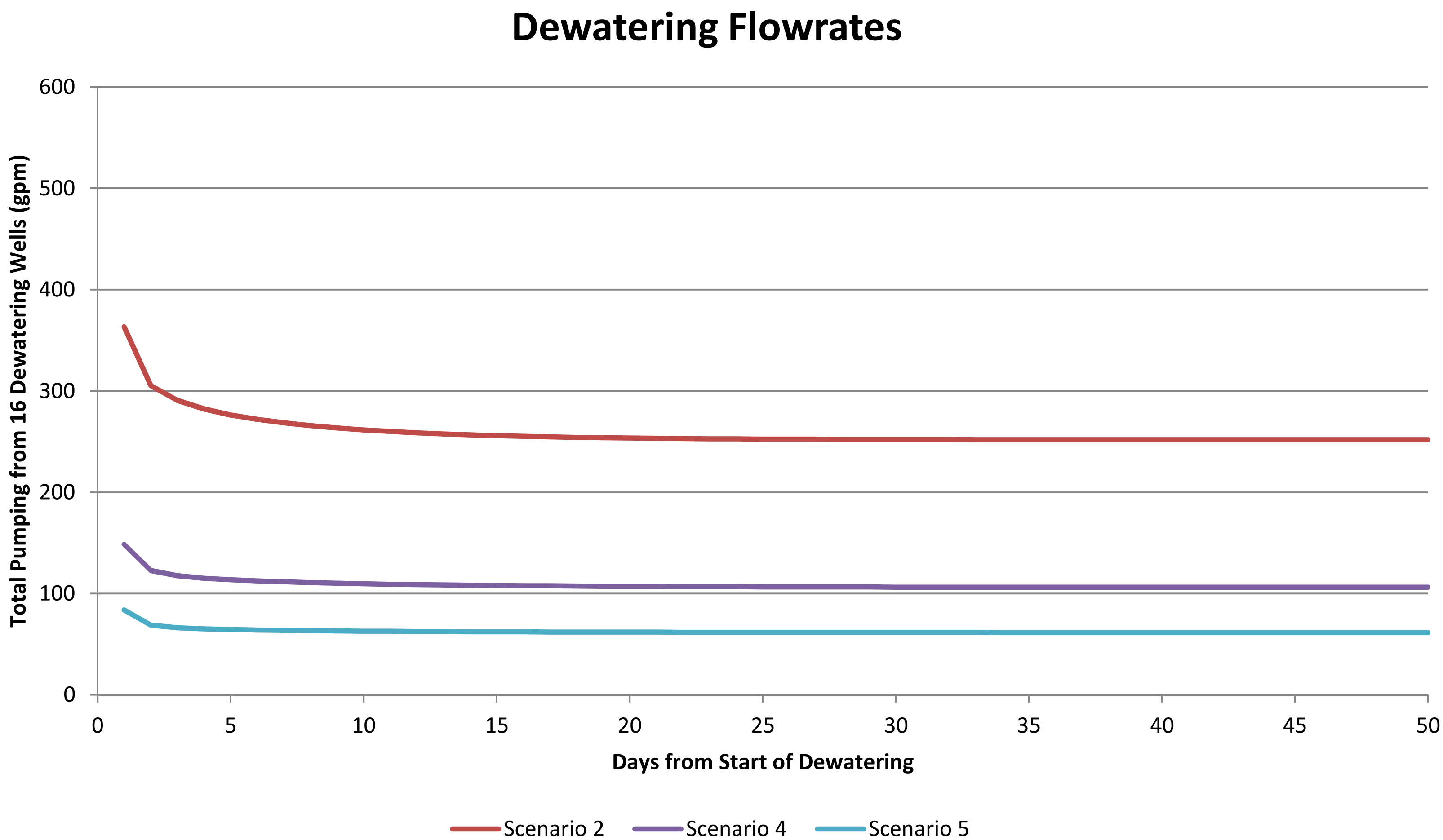
Figure: 4

DRAWN	JOB NUMBER	CHECKED	DATE
SLC	OD12162610	WBC	Jun-12

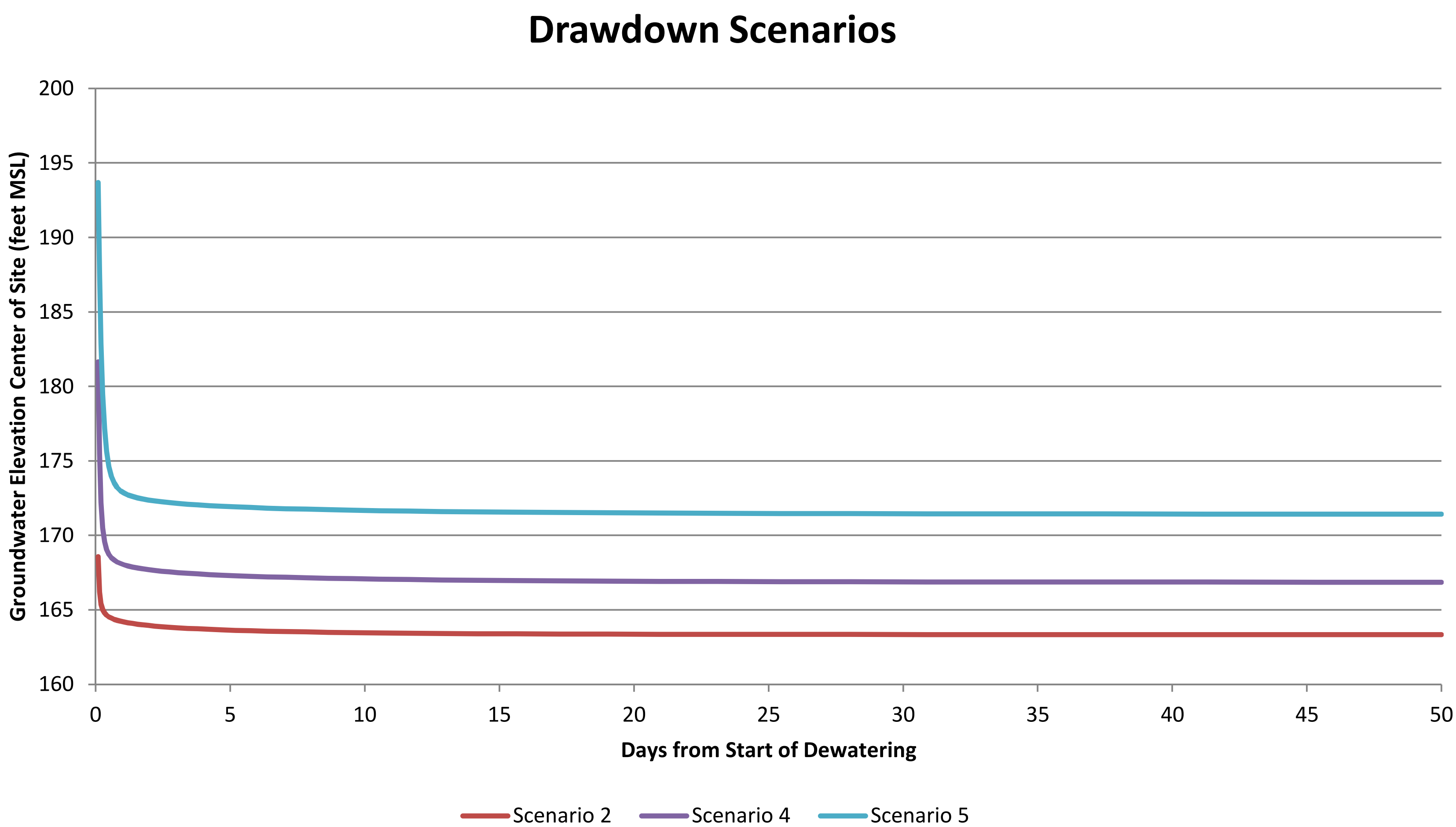


amec	Simulated Time-Recovery Plot, Aquitard Scenarios Addendum to the Hydrogeological Evaluation Report Proposed Melrose Triangle Development Corners of Santa Monica, Melrose & Almont West Hollywood, California	Figure: **5**

DRAWN	JOB NUMBER	CHECKED	DATE
SLC	OD12162610	WBC	Jun-12



amec	Simulated Dewatering System Flow Rates, Upper Aquifer Scenarios Addendum to the Hydrogeological Evaluation Report Proposed Melrose Triangle Development Corners of Santa Monica, Melrose & Almont West Hollywood, California		Figure: 6
DRAWN SLC	JOB NUMBER OD12162610	CHECKED WBC	DATE Jun-12



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Simulated Time-Drawdown Plot, Upper Aquifer Scenarios
Addendum to the Hydrogeological Evaluation Report
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

Figure: 7

DRAWN	JOB NUMBER	CHECKED	DATE
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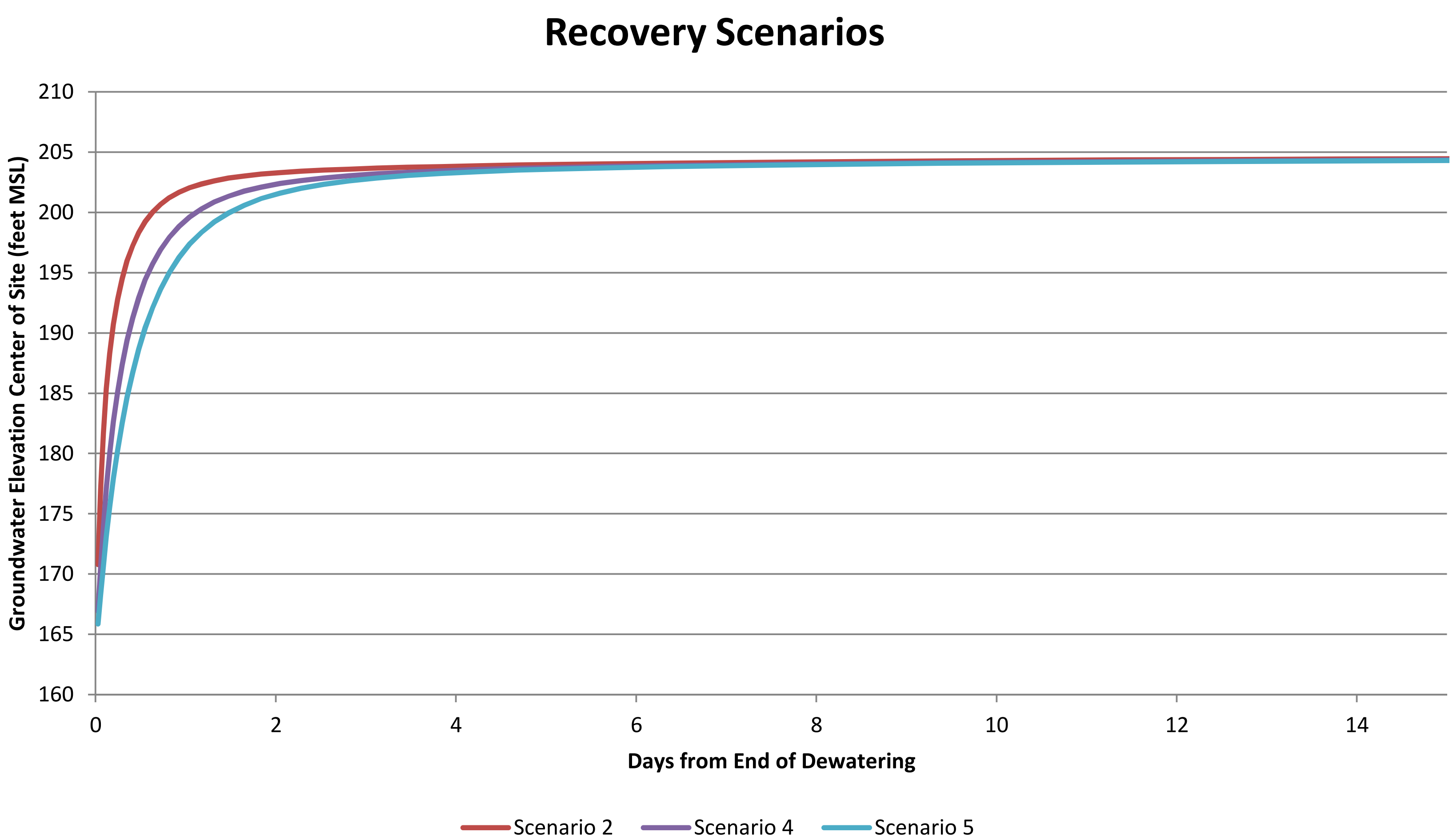

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Simulated Time-Recovery Plot, Upper Aquifer Scenarios
Addendum to the Hydrogeological Evaluation Report
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

Figure: **8**

DRAWN	JOB NUMBER	CHECKED	DATE
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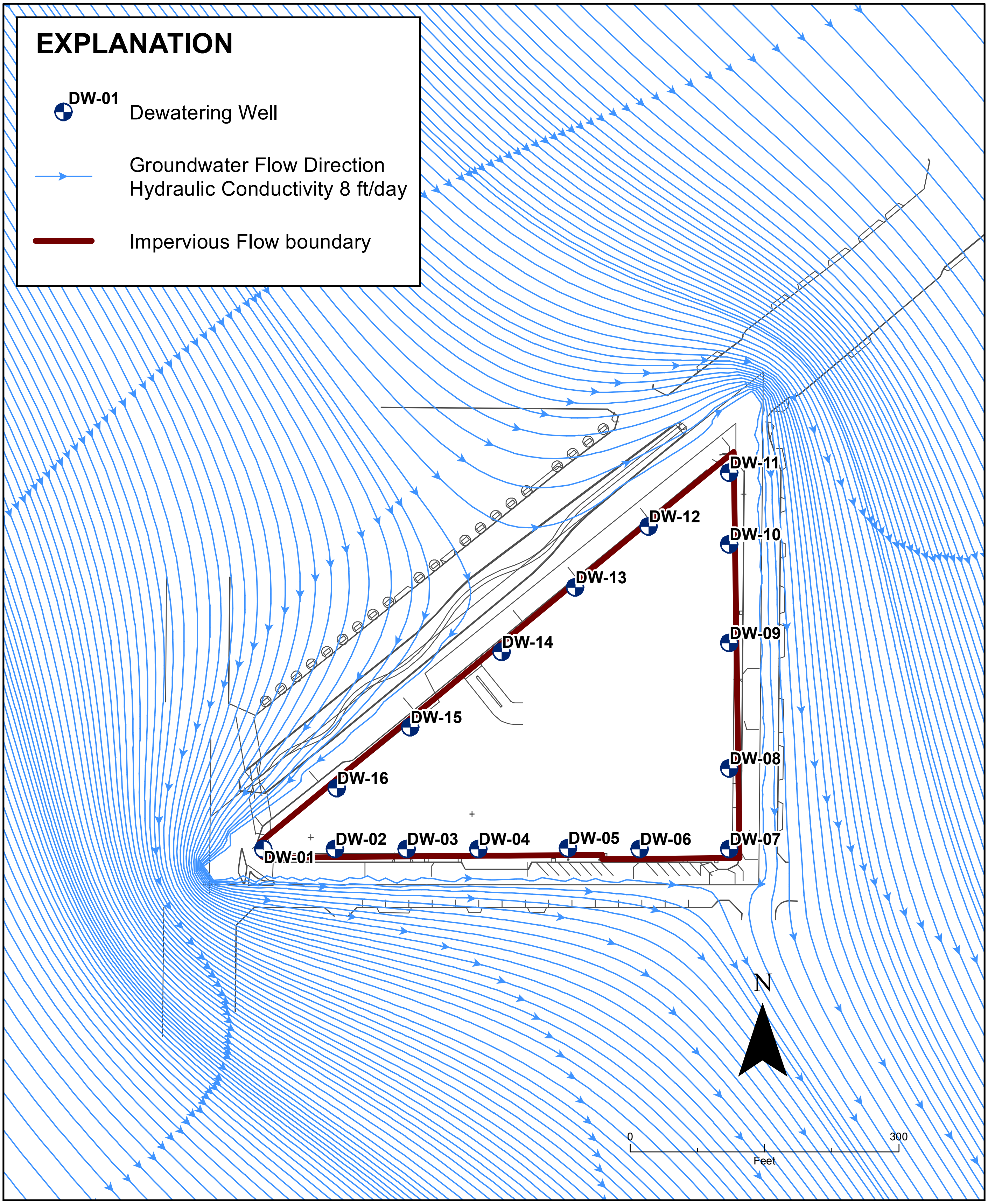

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Simulated Groundwater Flowlines
Upper Aquifer, Completed Site
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose, & Almont
West Hollywood, California

FIGURE
9

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
RJP	OD12162610	SLC	6/2012	WBC	6/2012

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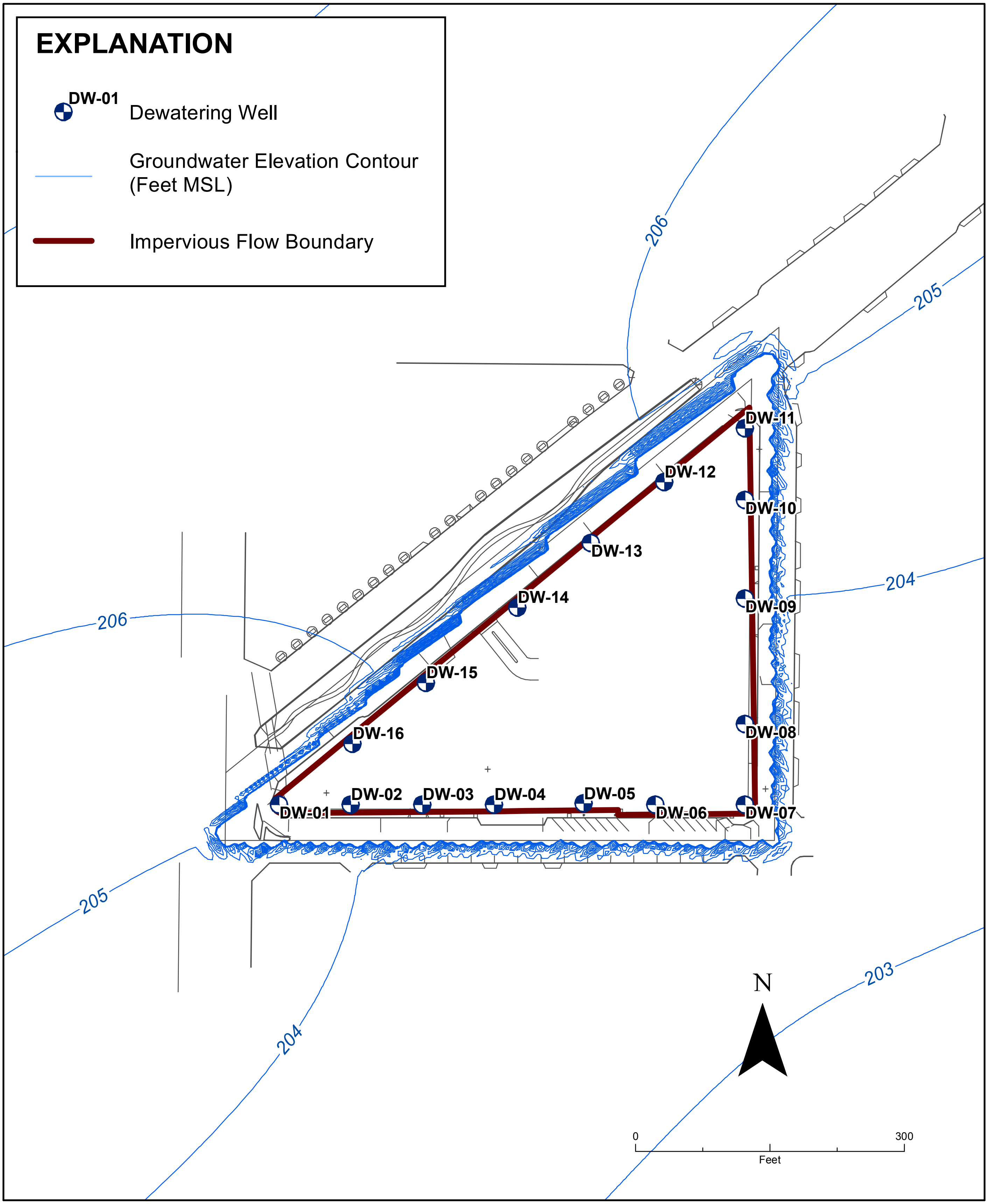

amec

Simulated Groundwater Elevation
Upper Aquifer, Completed Site
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose, & Almont
West Hollywood, California

FIGURE **10**

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
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Thursday, June 28, 2012 4:51:45 PM
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amec

Simulated Regional Groundwater Elevation Contours During Dewatering Phase - Model Scenario 5
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose, & Almont
West Hollywood, California

FIGURE
11

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
TJH	OD12162610	SLC	6/2012	WBC	6/2012

April 5, 2012

Jack Kurchian
System LLC
9034 West Sunset Boulevard
West Hollywood, CA 90069

Subject: **Addendum to the Hydrogeological Evaluation Report—Proposed Melrose Triangle Mixed-Use Project**
Between Santa Monica Boulevard, Melrose Avenue, and Almont Drive
AMEC Project No. OD1216261D.08

Dear Mr. Kurchian:

AMEC Environment & Infrastructure, Inc. (AMEC; formerly MACTEC), is pleased to present this Addendum to the Hydrogeological Evaluation Report on behalf of System LLC. The Hydrogeological Evaluation Report (HER), dated January 26, 2009, was commissioned by System LLC to provide site-specific hydrogeological information and to estimate construction dewatering rates for the proposed Melrose Triangle multistory, mixed-use development located in West Hollywood, California (see Figure 1). This Addendum evaluates potential dewatering requirements for the proposed development in light of the modified design criteria, one of which is the reduction of subterranean parking levels from six (in the previous design) to four.

Description of Proposed Development

In 2008, System LLC submitted development plans to the City of West Hollywood (the City) for construction of a mixed-use residential/commercial development on the approximately 134,400-square-foot (three-acre) site, located in an area bounded by Santa Monica Boulevard, Melrose Avenue, and Almont Drive, and known locally as the Melrose Triangle. The development that was proposed in 2008 consisted of a five-story complex (above grade) and six levels of subterranean parking and storage space (Figure 2). The floor of the lowest subterranean parking level of the building was established at Elevation 156.50 feet with respect to the project datum. This would require an excavation of 70 to 80 feet below the existing grades in order to accommodate the building foundations. Depth-to-water measurements at the site's four groundwater wells indicated that groundwater is first encountered beneath the site at depths of approximately 7 to 20 feet below ground surface (bgs). Given these circumstances, construction dewatering and post-development water management constitute a major project consideration.

In 2012, System LLC revised their development plans. The most significant modification to the development plans with respect to the site's hydrogeological considerations is that the number of subterranean parking levels was reduced from six to four.

The basement floor elevation for the development is now set approximately at Elevation 179.5 feet (or 46 feet below the project datum of Elevation 225.5 feet), as presented on Figure 3. The hydrogeological section presented in the HER has been revised to illustrate the proposed new floor elevation as presented in Figures 4, 5, and 6; this is discussed in more detail below. Dewatering requirements will change in accordance with the new project specifications.

Site-Specific Hydrogeological Study

The 2009 HER presented a detailed description of site-specific geology and groundwater conditions. Specific testing and analyses performed for the HER involved installing four groundwater wells to assess the local groundwater gradient and flow direction, performing aquifer pumping tests to assess the hydraulic conductivity and storativity of water-bearing zones, testing water quality, and developing a groundwater model to estimate construction dewatering requirements.

The HER was reviewed by KFM GeoScience of Diamond Bar, California, on behalf of the City. The City provided comments in a Geotechnical, Geology, and Seismic Review Sheet dated February 18, 2009. MACTEC addressed these comments in a letter dated August 12, 2009. The reader is referred to the HER for specific details and findings presented in the report.

The relevant findings of the HER are summarized as follows:

- Three water-bearing zones were encountered beneath the site.
  - The Younger Alluvium (from ground surface to depths of about 40 feet bgs).
  - The Older Alluvium (from about 40 to 70 feet bgs).
  - The Exposition Aquifer (from about 70 to >125 feet bgs).
- Sediment density/consolidation appears to increase within the Older Alluvium and Exposition Aquifer.
- Depths to groundwater varied from 7 to 20 feet bgs; the variation in depth to groundwater is related to changes in topographic surface elevation across the site.
- Groundwater flow beneath the site is directed toward the southeast at a gradient of about 0.025 feet per foot (ft/ft).
- The combined hydraulic conductivity of the water bearing zones was determined to vary from 8 to 10 feet per day (ft/day).

The HER investigation was performed with the understanding that six levels of subterranean parking and storage space would be included in the development; that investigation required exploration to a greater depth than required for the 2012 revised design. As illustrated on Figures 4 through 6, the new design does not require penetration into the Exposition Aquifer, which is the major water-producing zone, as well as the zone under the greatest hydrostatic pressure.

Dewatering Requirements

In the 2012 design, dewatering wells will not encounter the higher-conductivity Exposition Aquifer. This will decrease the overall transmissivity of the water bearing units requiring dewatering. As illustrated on Figures 4 through 6, the basement of the development will only encounter the upper portion of the Older Alluvium water-bearing zone. To allow for construction, groundwater levels will need to be drawn down to 6 feet below the lowest floor elevation (FFE 4 at 179.5 feet). A target construction dewatering groundwater level of 160 feet Elevation, was used to allow for a minimum 10-foot cone of depression around dewatering wells, and provide an appropriate factor of safety.

The combined hydraulic conductivity of the Younger and Older Alluvium water-bearing zones is likely less than the combined hydraulic conductivity determined from pumping tests that included the Exposition Aquifer. Based on this premise, dewatering scenarios were performed using the same number of dewatering wells as presented in the HER, but with hydraulic conductivities of 8, 2, and 0.8 ft/day.

The simulated groundwater levels under steady state conditions of the models are presented on Figures 7 (K = 8 ft/day), 8 (K = 2 ft/day), and 9 (K = 0.8 ft/day). Well extraction rates (in gallons per minute [gpm]) for each scenario are summarized in the following table.

Extraction Well	**K = 8 ft/day**	**K = 2 ft/day**	**K = 0.8 ft/day**
DW-01	20	4	2
DW-02	20	4	2
DW-03	10	4	1
DW-04	10	4	1
DW-05	10	4	1
DW-06	20	4	1
DW-7	10	8	2
DW-8	10	4	2
DW-9	20	4	2
DW-10	20	4	2
DW-11	20	4	2
DW-12	20	4	2
DW-13	20	4	2
DW-14	20	4	2
DW-15	20	4	2
DW-16	20	4	2
Total Well Field (gpm)	**260**	**68**	**28**

The extraction well construction details used in the models consisted of 6-inch diameter wells set in 12-inch boreholes, with wells screened from 210 to 160 feet Elevation. Because the Winflow® models assume steady-state groundwater flow conditions, no transient effects were considered (e.g., time required to reach target dewatering levels, or periods of aquifer recharge or withdrawal).

Based on the modeled dewatering scenarios, groundwater extraction rates vary from a total well field yield of about 260 gpm for the highest hydraulic conductivity value (K = 8 ft/day) to a total well field yield of about 28 gpm for the lowest hydraulic conductivity value (K = 0.8 ft/day). This range of potential extraction rates is provided based on premise that the new shallower development will encounter less transmissive water bearing zones. Therefore, the 2012 designsignificantly decreases the dewatering requirements for the project.

Conclusions and Recommendations

The 2012 redesigned Melrose Triangle development with a basement elevation of 179.5 feet Elevation represents subterranean intrusion of between 38 and 46 feet below current surface topography. Groundwater is encountered between 7 and 20 feet bgs. A 16-well extraction system is recommended for the project in a layout similar to that illustrated on Figures 7 through 9. Site-specific hydrological testing of aquifers with greater thickness than represented by the project indicated a combined hydraulic conductivity of 8 ft/day; this value was used in the current evaluation. Therefore, 260 gpm is the maximum estimated dewatering extraction rate under steady-state conditions. Typically, groundwater extraction at the initiation of dewatering can be performed at higher pumping rates than can be achieved under steady-state conditions. If rapid initial drawdown is required at the initiation of dewatering, then equipment should be sized accordingly.

If you have any comments or questions about this Addendum Letter and the conclusions or recommendations, please feel free to contact Warren Chamberlain at (510) 663-3984.

Sincerely,

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

Sean Culkin, PG
Project Hydrogeologist

Warren B. Chamberlain, PG, CHG, PE
Senior Principal Engineer

Attachments: Figure 1 – Hydrogeological Site Characterization Investigation Well, Borehole, and CPT Locations
Figure 2 – Historical Six-Sublevel Building Design
Figure 3 – Current Four-Sublevel Building Design
Figure 4 – Geological Cross Section A-A′
Figure 5 – Geological Cross Section B-B′
Figure 6 – Geological Cross Section C-C′
Figure 7 – Dewatering Simulation Level B-4, K = 8 ft/day
Figure 8 – Dewatering Simulation Level B-4, K = 2 ft/day
Figure 9 – Dewatering Simulation Level B-4, K = 0.8 ft/day

AutoCAD basemap provided by Studioeleven Architects, dated 8-31-2006

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Hydrogeological Site Characterization Investigation
Well, Borehole and CPT Locations
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 1

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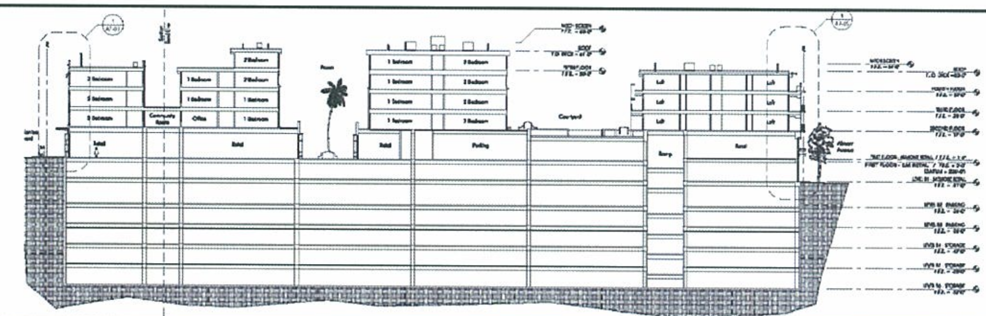

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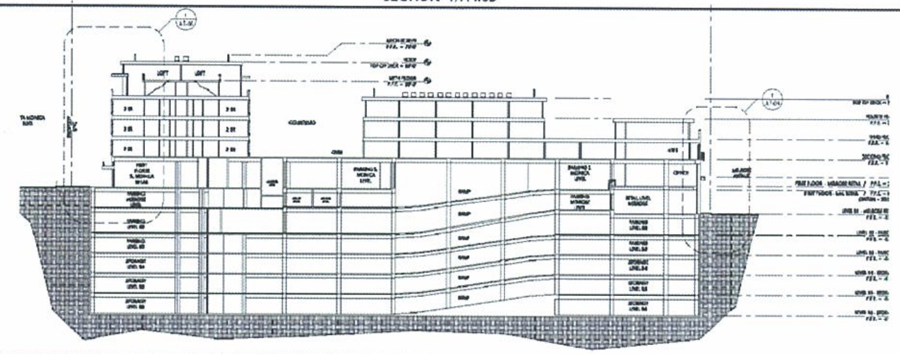
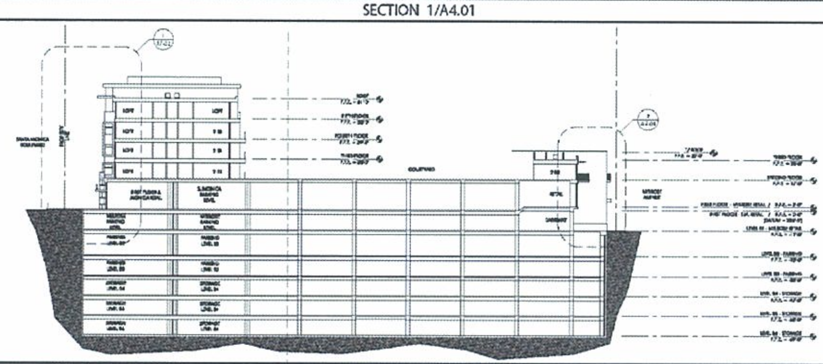
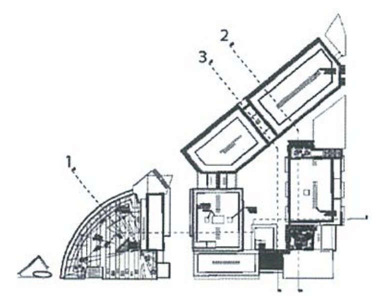


SECTION 1/A4.01 | 2



SECTION 2/A4.01 | 3



SECTION LOCATION

Historical Six Sub-Level Building Design

Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 2

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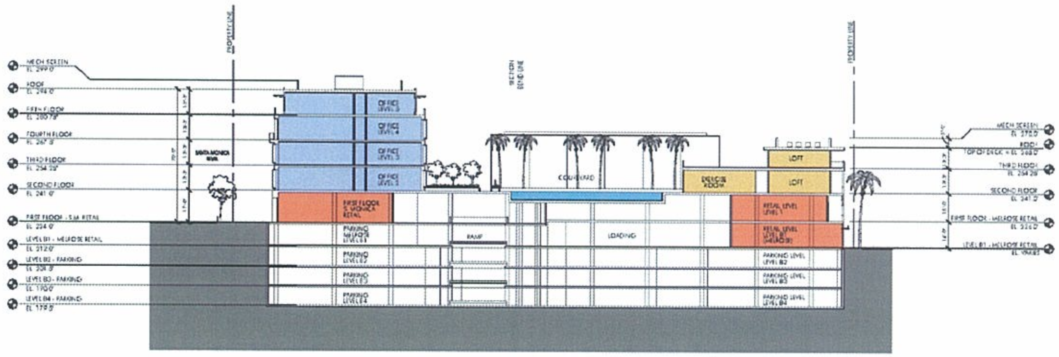
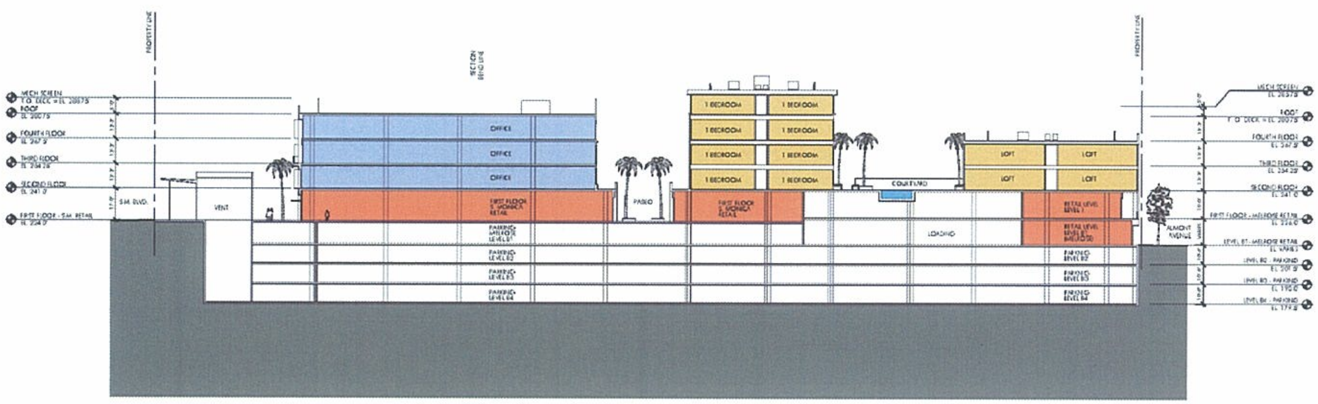


BUILDING SECTION 1 (NORTH/SOUTH)



BUILDING SECTION 2 (EAST/WEST)

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Current Four Sub-Level Building Design

Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 3

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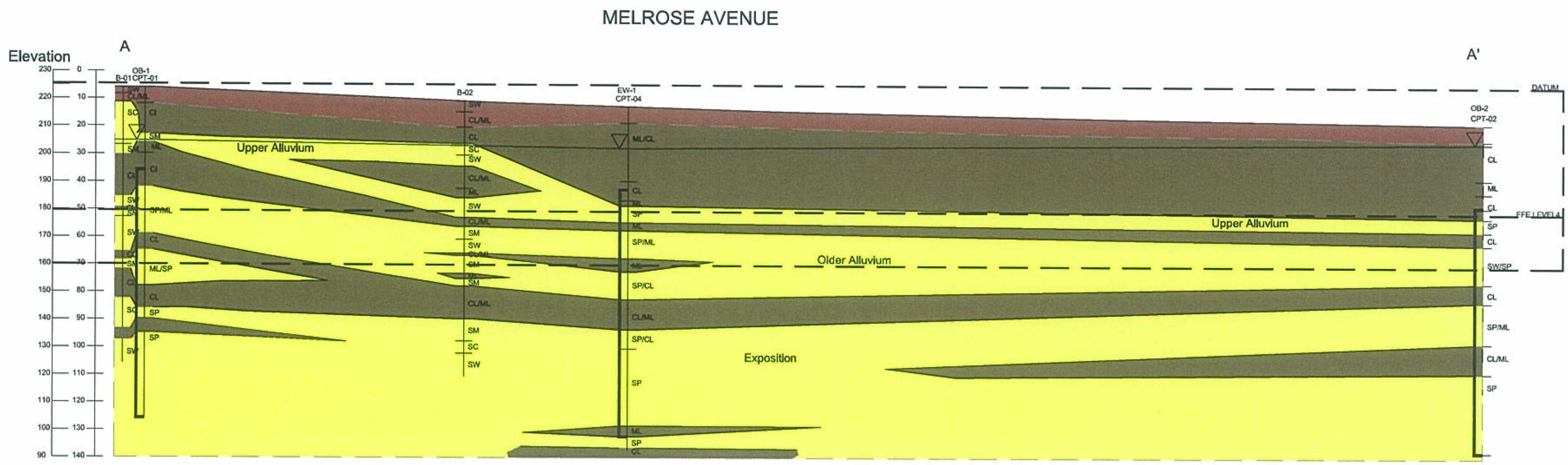

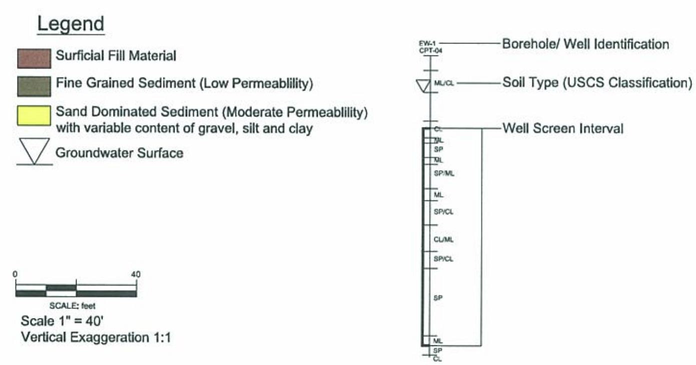

Geologic Cross-Section
Section A-A'
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 4

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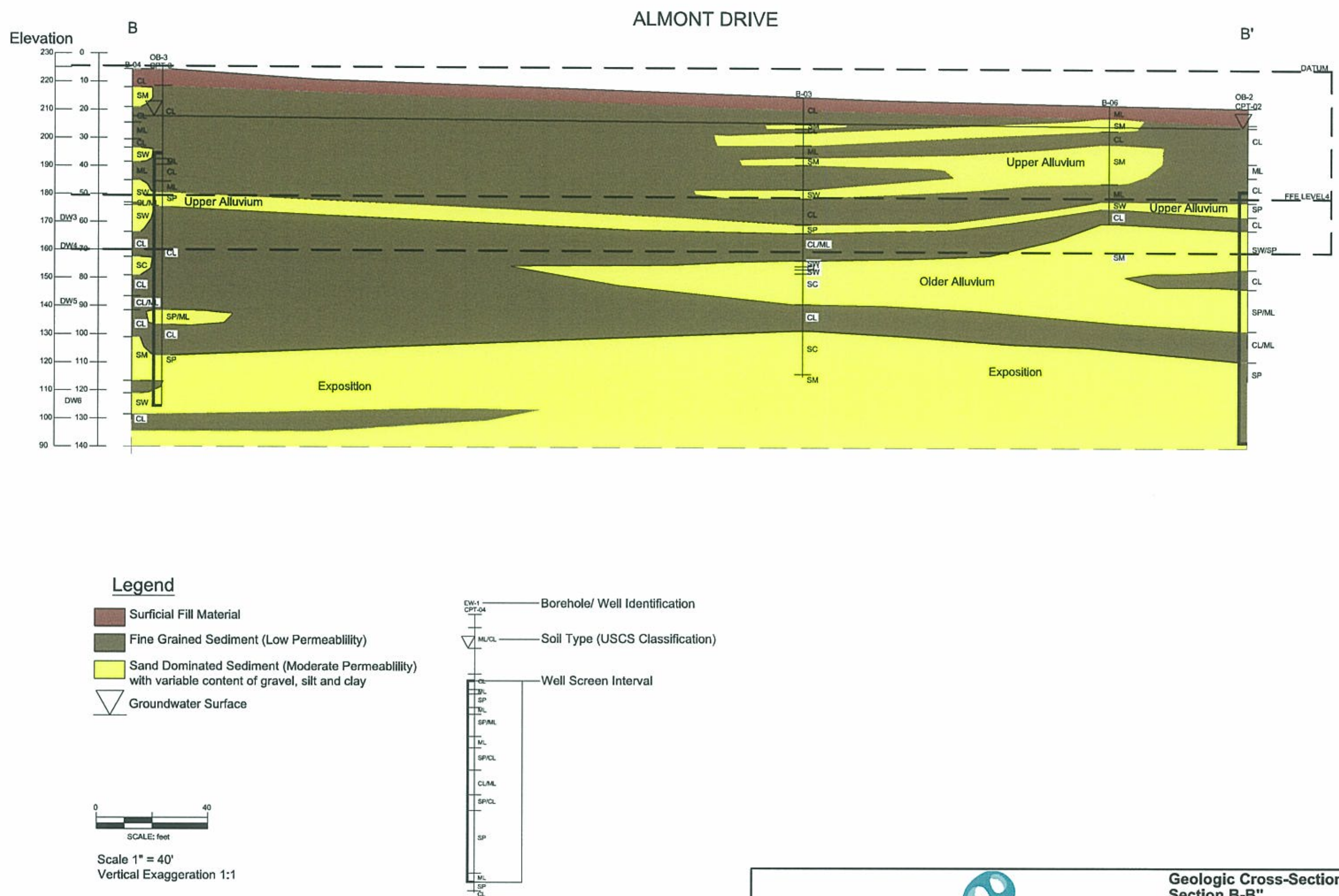

Geologic Cross-Section
Section B-B''
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 5

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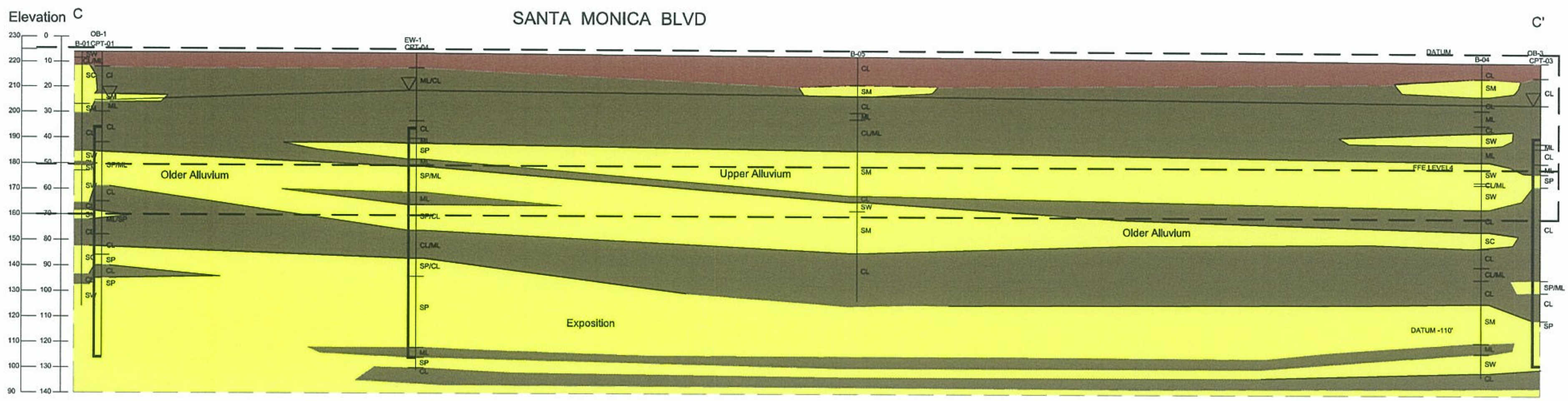

Legend

- Surficial Fill Material
- Fine Grained Sediment (Low Permeability)
- Sand Dominated Sediment (Moderate Permeability) with variable content of gravel, silt and clay
- Groundwater Surface

Borehole/ Well Identification
Soil Type (USCS Classification)
Well Screen Interval

SCALE: feet

Scale 1" = 40'
Vertical Exaggeration 1:1

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Geologic Cross-Section
Section C-C'
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE 6

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
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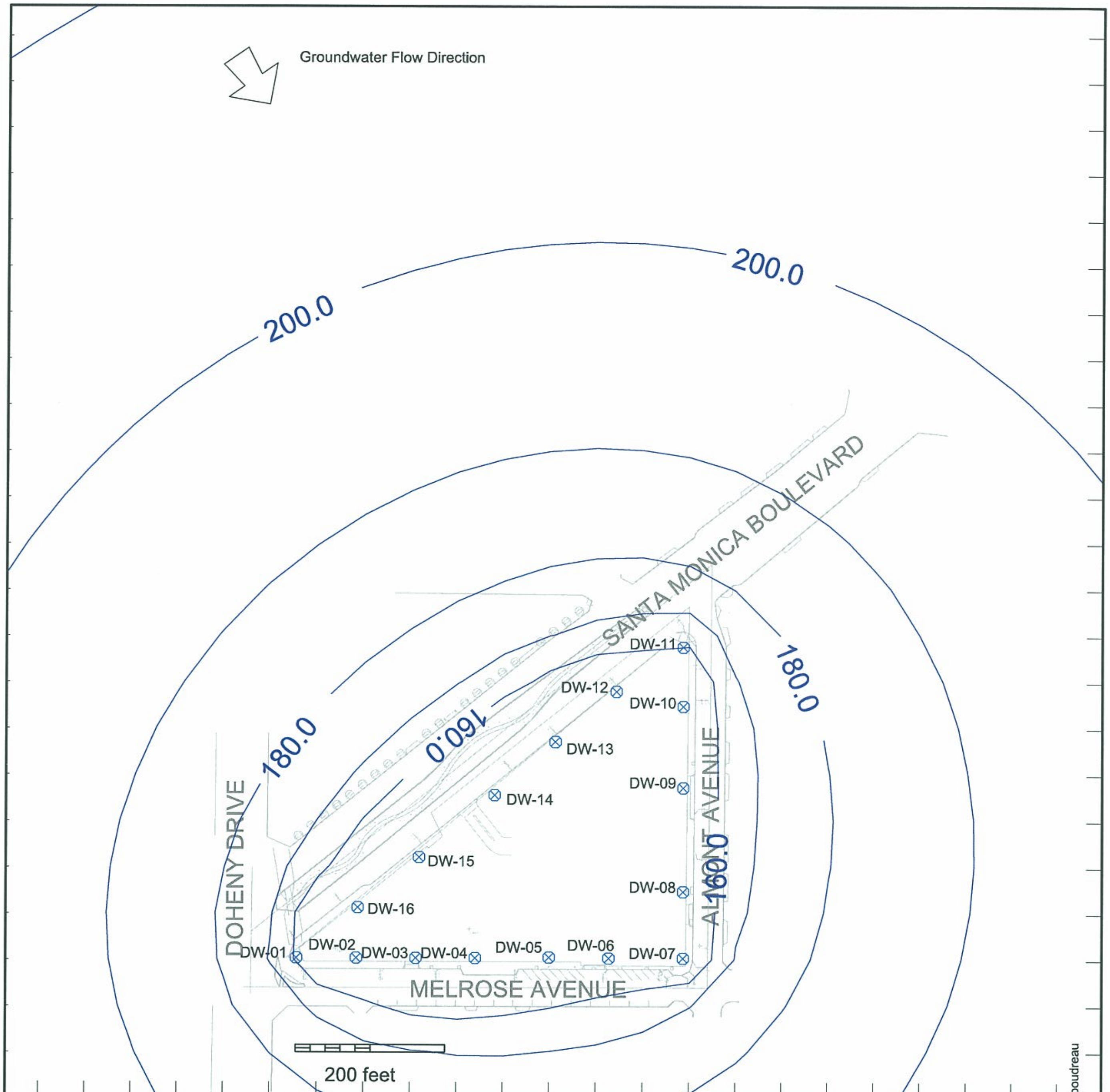

Legend

Site Name	Melrose Triangle
Hydraulic Conductivity	8 ft/day
Storage Coefficient	$1e^{-005}$
Leakage Factor	0.1 ft.
Pumping Rate	20 gal/min
Dewatering Well	⊗DW-15
Groundwater Elevation (ft. MSL)	

Plotted: 03-30-2012 11:04 AM By: phillip.boudreau
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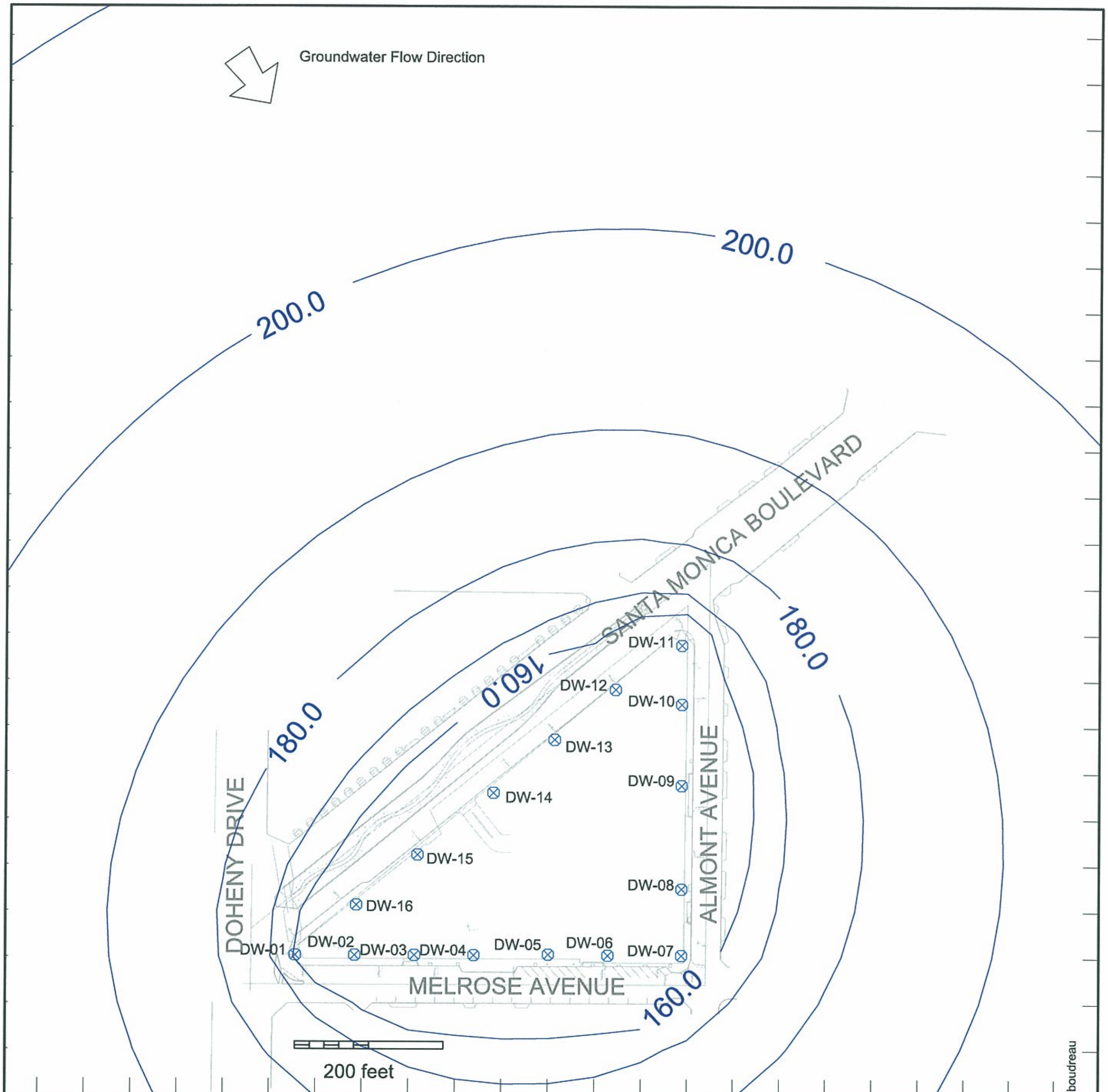
amec

Dewatering Simulation Level B-4
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE
7

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
PCB		SLC			



Legend

Site Name	Melrose Triangle
Hydraulic Conductivity	2 ft/day
Storage Coefficient	$1e^{-005}$
Leakage Factor	0.1 ft.
Pumping Rate	4 gal/min
Dewatering Well	⊗DW-15
Groundwater Elevation (ft. MSL)	~

Plotted: 03-30-2012 11:04 AM By: phillip.boudreau
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Dewatering Simulation Level B-4
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE **8**

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
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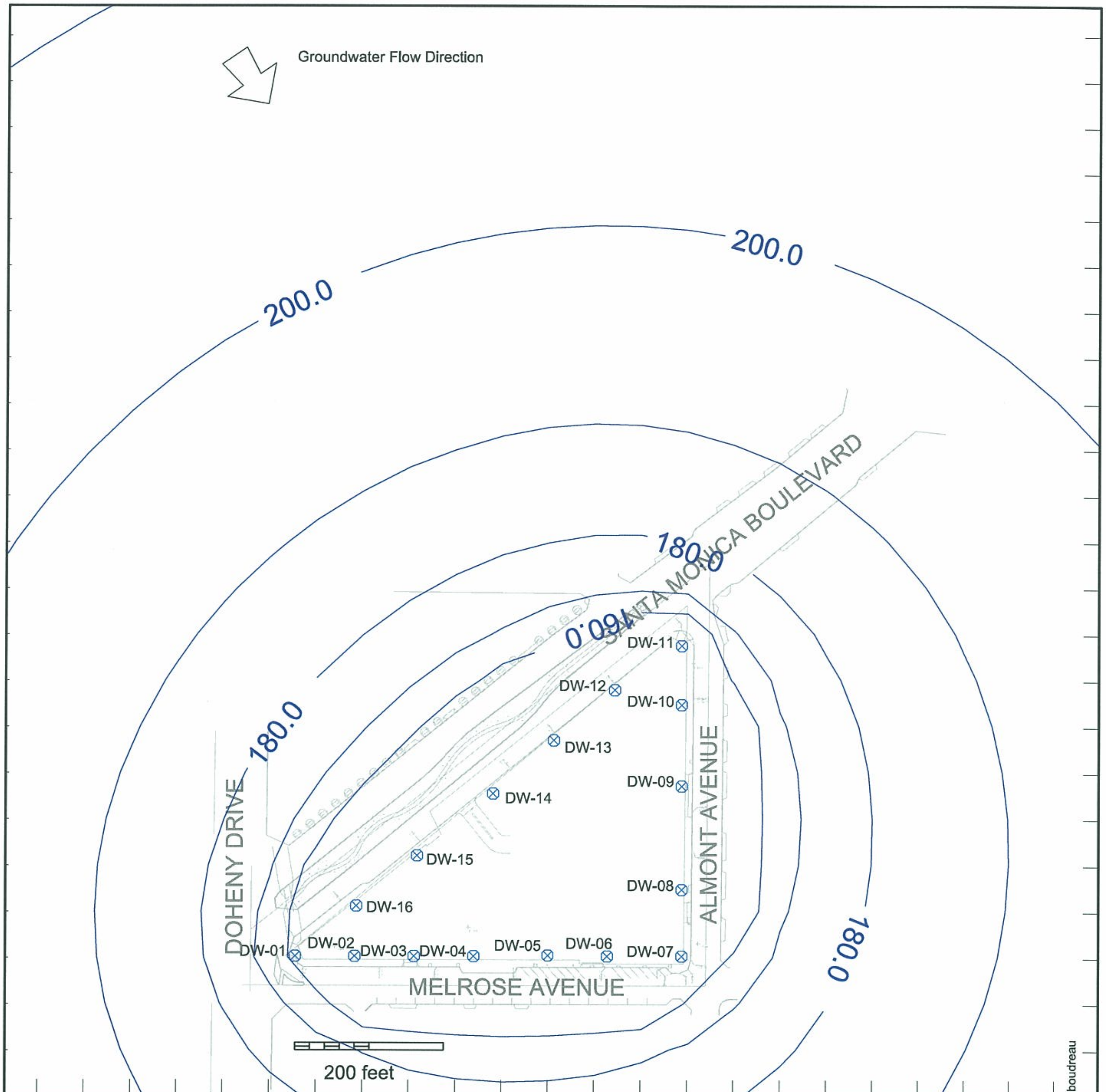

Legend

Site Name	Melrose Triangle
Hydraulic Conductivity	0.8 ft/day
Storage Coefficient	$1e^{-005}$
Leakage Factor	0.1 ft.
Pumping Rate	2 gal/min
Dewatering Well	⊗DW-15
Groundwater Elevation (ft. MSL)	

Plotted: 03-30-2012 11:02 AM By: phillip.boudreau
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Dewatering Simulation Level B-4
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, California

FIGURE **9**

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
PCB		SLC	4/2012		

Hydrogeological Evaluation Report
For the Proposed Melrose Triangle Development
Corners of Santa Monica Boulevard,
Melrose Avenue and Almont Drive
West Hollywood, California

Prepared For

System, LLC
1888 Century Park East, Suite 450
Los Angeles, California 90067

MACTEC Project No.: 4088087537.05

Sean Culkin
Staff II Hydrogeologist

For Xiuyang Xu
with permission

Xiuyang Xu Ph.D.
Senior Hydrogeologist

Warren Chamberlain, PG, CHG
Senior Principal Engineer

CERTIFIED HYDROGEOLOGIST
WARREN B. CHAMBERLAIN
NO.
2/28/10
STATE OF CALIFORNIA

January 26, 2009

MACTEC Engineering and Consulting, Inc.
600 Grand Avenue, Suite 300
Oakland, CA 94610 - (510) 451-1001

Hydrogeological Evaluation Report
For the Proposed Melrose Triangle Development
Corners of Santa Monica Boulevard, Melrose Avenue and Almont Drive
West Hollywood, California

MACTEC Project No. 4088087537.05

This document was prepared by MACTEC Engineering and Consulting, Inc. at the direction of System LLC for the sole use of System LLC the only intended beneficiaries of this work. No other party should rely on the information contained herein without the prior written consent of System LLC. This report and the interpretations, conclusions, and recommendations contained within are based in part on information presented in other documents that are cited in the text. Therefore, this report is subject to the limitations and qualifications presented in the cited documents.

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS

b	aquifer thickness
bgs	below ground surface
cm/s	centimeters per second
DTW	Depth to Water
EIR	Environmental Impact Report
gpm	gallons per minutes
K	hydraulic conductivity
msl	Mean Sea Level
ft	foot (feet)
ft/d	feet per day
ft/ft	feet per foot
MACTEC	MACTEC Engineering and Consulting, Inc.
mm	millimeters
r/B	leakance factor
Site	Melrose Triangle, Corners of Santa Monica Boulevard, Melrose Avenue and Almont Drive in West Hollywood, California
S	Storativity
T	Transmissivity
WHWRA	West Hollywood West Residence Association
[--]	dimensionless units

1.0 INTRODUCTION

MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to submit this Melrose Triangle Site Hydrogeological Evaluation Report for the property located within the bounds of Melrose Avenue, Santa Monica Boulevard and North Almont Drive (the Site) in West Hollywood, California (Figure 1-1). The Site-specific hydrogeological evaluation was performed at the request of the City of West Hollywood's (the City) Planning Department in a letter dated February 28, 2008 and to address concerns posed by the West Hollywood West Residence Association (WHWRA) to address their comments to the Draft Environmental Impact Report (EIR), and also to assist in the design of a construction dewatering system. Site development is being proposed by System LLC (System), who commissioned MACTEC to perform the Site-specific hydrogeological evaluation.

The work was performed in general accordance with the MACTEC prepared *Workplan to Install Aquifer Test Wells and Perform Aquifer Characterization Testing* submitted to the City of West Hollywood dated July 23, 2008 and addendum memo, dated July 31, 2008. The City of West Hollywood approved the Workplan through their consultant KFM GeoSciences in an email dated August 8, 2008.

The report provides a brief description of the planned Melrose Triangle development and details of the Site hydrogeological investigation, including cross-sections of Site geology, procedures and results from the performance of aquifer pump testing, results of water quality testing, a discussion of Site-specific hydraulic and hydrological features, and conclusion and recommendations, as warranted.

2.0 BACKGROUND

System has submitted development plans to the City for the purposes of constructing a mixed-use residential /commercial development on the approximately 134,400 square-foot (3-acre) site. The developed structure will consist of a five-story complex (above grade) and six levels of subterranean parking and storage space. The floor of the lower subterranean parking level of the building will be established at about Elevation 140 feet and the excavation to the bottom of the lowest subterranean floor will extend about 70 to 80 feet below the existing grades. Prior to this current investigation groundwater was estimated to occur at about 20 to 30 feet below ground surface (bgs). As such, to complete the building foundation and basement construction, Site excavation will require shoring and dewatering.

Initial development plans (including a draft EIR, and a white paper on the local hydrology) submitted to the City of West Hollywood Planning Department, received several comments related to the project. Many concerns were raised by interested parties regarding the impact of construction dewatering on the local hydrogeologic system and settlement issues. To address those issues related to the Site's Hydrogeology, System commissioned the performance of a hydrogeological study in accordance with the outline provided by the City in their letter dated February 29, 2008.

MACTEC prepared a Workplan to Install Aquifer Test Wells and Perform Aquifer Characterization Testing, dated July 23 (and memorandum dated July 31) detailing proposed investigation methods. The City via their review consultant KFM GeoSciences approved the Workplan in an e-mail dated August 18, 2008.

2.1 Regional Hydrogeological Setting

The Site is located within the Hollywood Subbasin underlying the northeastern portion of the Coastal Plain of Los Angeles Groundwater Basin (*DWR, 2004*) as shown in the regional geomorphic map below.

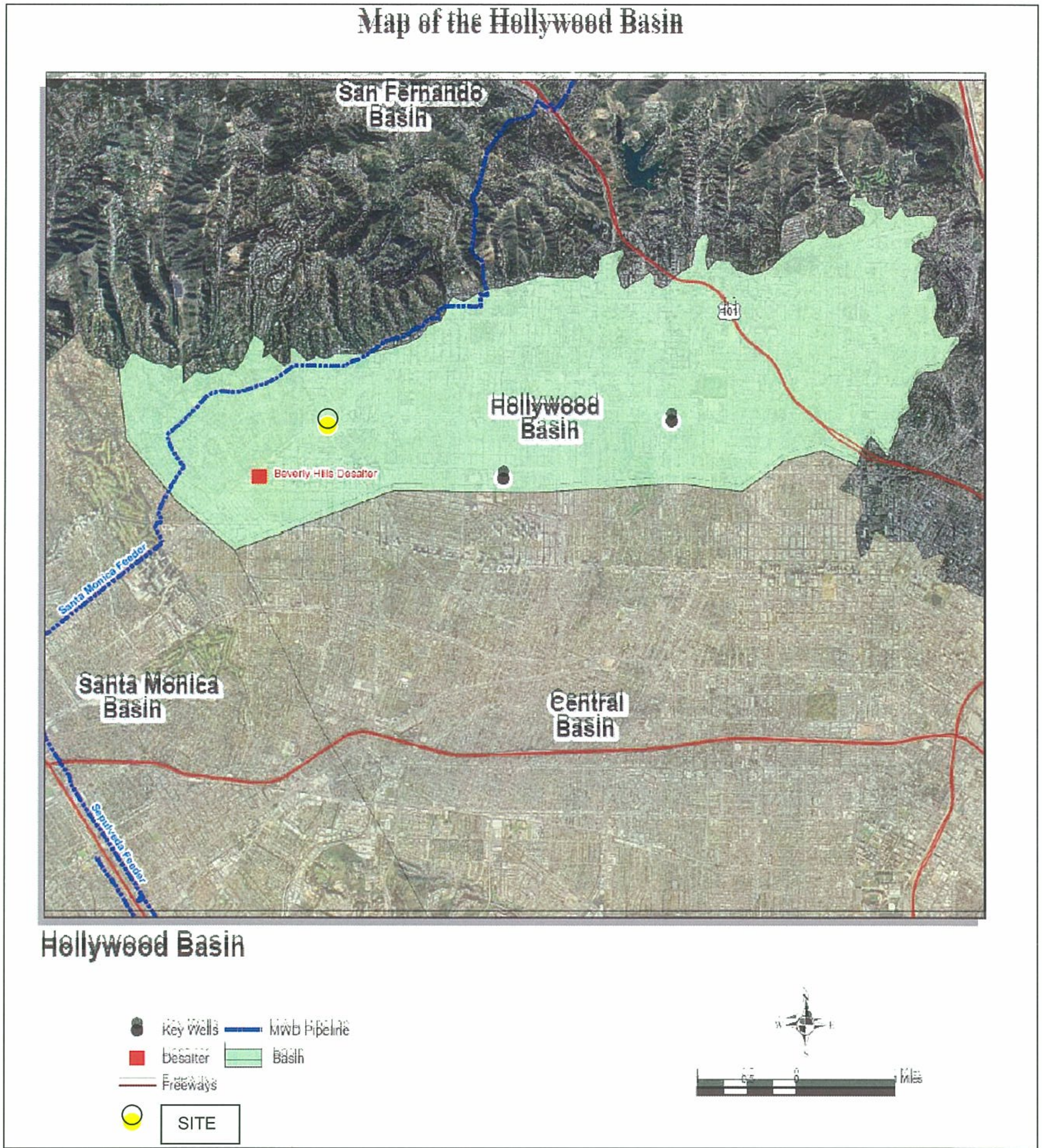


Figure 2-1 Regional Geomorphic Map

From Groundwater Assessment Study (*MWD, 2007*); Site location approximate.

The regional groundwater condition of the Hollywood subbasin has recently been documented in the Groundwater Assessment Study published by the Metropolitan Water District of Southern California (*MWD, 2007*).

The Hollywood Subbasin underlies the northeastern portion of the Los Angeles Coastal Plain. The basin is bound on the north by the Santa Monica Mountains and the Hollywood fault, on the east by the Elysian Hills, the west by the Newport-Inglewood Uplift and the south by the La Brea high, an area of shallow bedrock. A summary of the major hydrogeologic formations with the Hollywood Basin are listed below:

Feature	Description
Aquifers(s)	Alluvium Lakewood Formation (Exposition and Gage Aquifers) San Pedro Formation (Jefferson, Lynwood, Silverado and Sunnyside aquifers)
Depth of Groundwater basin	Up to 660 feet
Thickness of water bearing units	Alluvium (up to 60 feet) Lakewood (up to 175 feet) San Pedro Formation (up to 100 feet)

The DWR 1961 reports that the Alluvium covers much of the Hollywood Basin and aquifer thicknesses range from 5 to 60 feet. Groundwater within the Alluvium exists under semi-perched unconfined conditions, and limited groundwater is produced from this zone. The majority of potable groundwater is produced from the deep aquifers of the San Pedro Formation and shallower aquifers of the Lakewood Formation. The Gage aquifer of the Lakewood Formation is the major water-bearing member of the Hollywood Basin (*DWR, 1961*).

2.2 Regional Aquifer Demand and Water Quality

The only documented groundwater production within the Hollywood Subbasin is from four City of Beverley Hills municipal supply wells. Water is extracted, treated, and supplied for municipal use. The City of Beverley Hills has recently (2002 to 2005) produced about 1,200 acre-feet of water per year. The total storage for the Hollywood Subbasin is estimated at 400,000 acre-feet, with the safe yield estimated at 3,000 acre-feet per year (*MWD, 2007*).

Groundwater in the Hollywood Subbasin is replenished by percolation of precipitation and stream flow from the Santa Monica Mountains to the north. Historical precipitation at the nearby Santa Monica Pier is summarized below:

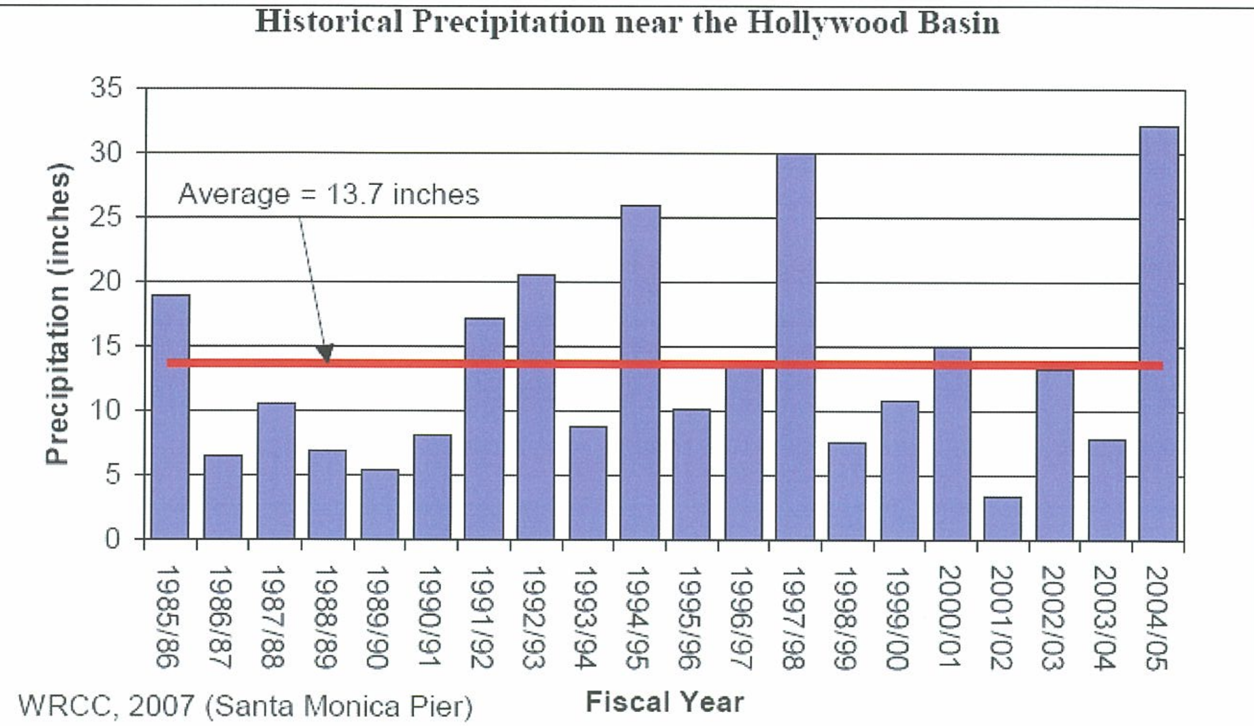


Figure 2-1 Historical Precipitation

From Groundwater Assessment Study (*MWD, 2007*); average rainfall 13.7 inches per year.

Regional demand for groundwater in the West Hollywood area is limited as indicated by the changes in water level from two Los Angeles County Department of Public Works wells located in the vicinity of the project site. The two hydrographs indicate that seasonal fluctuation in local groundwater elevation varies by less than 10 feet through the yearly cycle. Also, conditions of extended drought (Figure 2-1, years 1986 to 1991) do not appear to have adversely impacted regional water levels as indicated by the two Los Angeles County Department of Public Works wells (Figure 2-2).

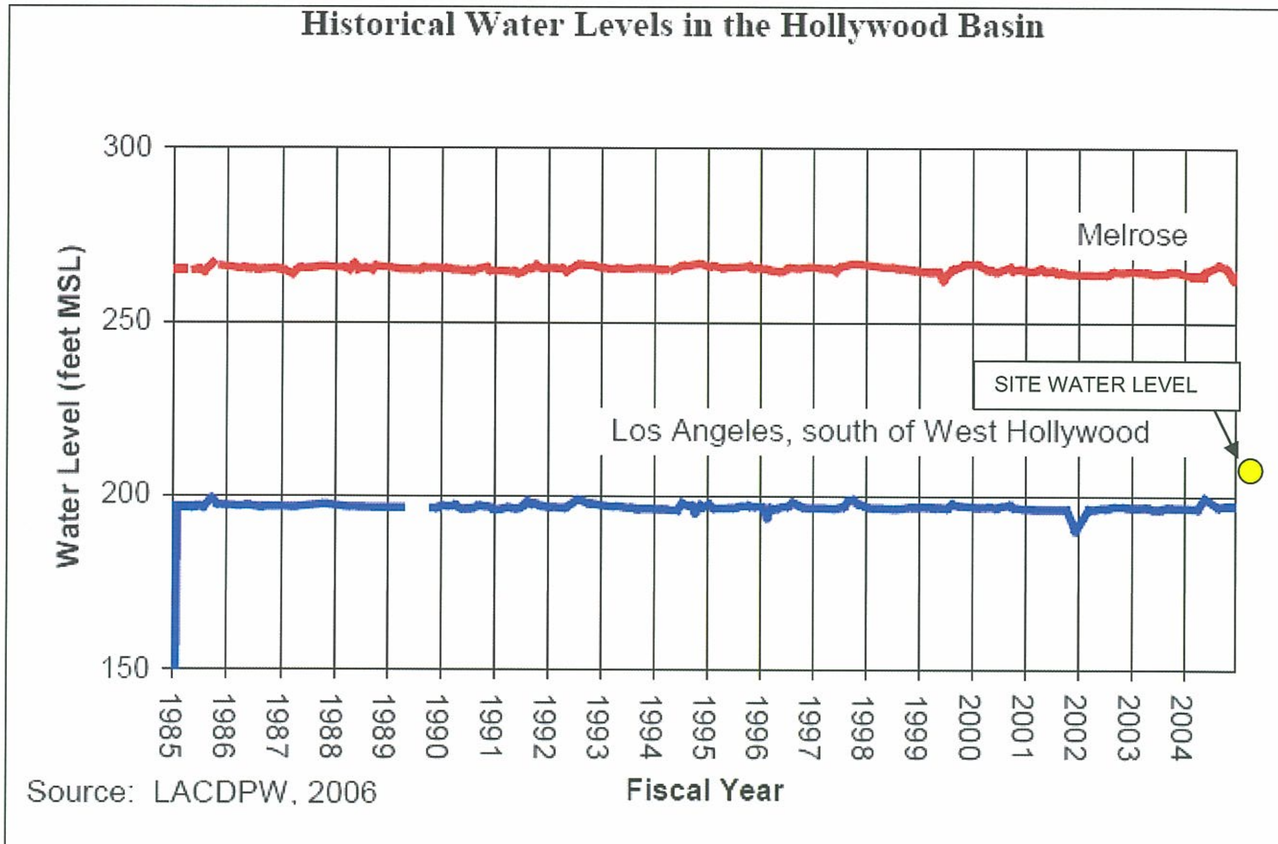


Figure 2-2 Historical Water Levels

From Groundwater Assessment Study (*MWD, 2007*)

3.0 SITE INVESTIGATION FINDINGS

To assist with the Site hydrogeological evaluation, MACTEC installed one groundwater extraction well and three groundwater observation wells. The purpose built wells were used to collect groundwater elevation data, collect water quality samples and perform aquifer pump tests. The wells were screened across the entire depth interval planned for construction dewatering. The following sections provide details for the Site-specific geology, hydraulic properties and water quality. Collectively these data provide the most up to date information related to the hydrogeologic condition at the Site.

3.1 Investigation Field Activities

Three geotechnical and one hydrogeological field investigations have been performed at the Site by MACTEC (or its predecessor Law-Crandall) from 1985 to present. From these investigations, eight geotechnical soil borings, four cone penetrometer (CPT) test borings and four groundwater wells (one extraction and three observation wells) have been installed and logged to obtain subsurface lithological information. The maximum depth explored was 125 feet bgs in borings B-4 and CPT-04. The location of the recently installed CPT borings, past geotechnical borings, and wells are presented on the Site Map in Figure 3-1.

To perform the recently completed hydrogeological field investigation a series of regulatory permits were required, and included:

- City of West Hollywood Encroachment permit,
- County of Los Angeles Well Construction permits, and
- Los Angeles Regional Water Quality Control Board NPDES permit.

Copies of the permits required to perform the field activities are included in Appendix A.

The following provides a brief summary of field activities performed to collect Site-specific hydrogeological data.

Preliminary Site characterization was performed using the CPT borings to define subsurface lithologies prior to installing wells. The CPT borings were installed on August 18 and 19, 2008, and CPT logs along with boring logs from previous investigations are presented in Appendix B. The CPT method was used to pre-screen subsurface lithologies at proposed well locations because previous Site characterization efforts had reported difficultly in retrieving core samples from the target depths required for the hydrogeological characterization. The CPT logs were reviewed for lithological information and aquifer and aquitard units were identified.

MACTEC installed one extraction well (EW-1) and three groundwater observation wells (OB-1, OB-2 and OB-3), between September 18 and 25, 2008. The groundwater extraction and observation wells were installed using the hollow stem auger drilling method. To avoid potential drilling difficulties, a wooden plug was set inside the drill bit of the hollow-stem auger drill string and the boreholes were continuously drilled to the planned well depths; as such, no soil sampling was performed while drilling. Well development activities were performed on September 29 and October 1, 2008.

The locations of monitoring wells OB-1, OB-2, and OB-3 are generally congruent with the locations of previous CPT locations CPT-01, CPT-02, and CPT-03, respectively. Due to subsurface utilities, OB-2 was installed in Almont Drive, rather than within the sidewalk as proposed. The location of extraction well EW-01 is congruent with the location of CPT-04, in the parking area near the western corner of the Site. All wells were constructed with Schedule 40 PVC casings to a depth of 120 feet bgs; extraction well EW-01 with 0.030-inch slotted screen and medium sand filter pack material, while observations wells were constructed with 0.020-inch slotted screen and # 3 sand filter pack material. All wells were screened from 30 to 120 feet bgs and the annular filter pack to 3 feet above the top of the well screen and a 2-foot seal of bentonite chips. The observation wells were constructed using 2-inch diameter piping and set in 8-inch diameter boreholes, while extraction well EW-01 was constructed using 6-inch diameter piping and set in a 12-inch diameter borehole. Well construction details are provided in the table below:

Table 3-1: Well Construction Details

Well Location	Top of Casing Elevation (feet, msl)	Well Total Depth (feet bgs)	Screened Interval (feet bgs)	Casing Diameter (inches)	Boring Diameter (inches)
EW-01	219.84	120	30-120	6	12
OB-01	224.21	120	30-120	2	8
OB-02	211.72	120	30-120	2	8
OB-03	221.83	120	30-120	2	8

Following well installation, all wells were developed to remove fine-grained material from the sand filter pack that surrounds the PVC well casing.

Prior to performing the aquifer pump tests, MACTEC obtained groundwater samples from extraction well EW-1. Groundwater samples were analyzed for the supplemental requirements of the National Pollutant Discharge Elimination System (NPDES) permit, administered by the Los Angeles Regional Water Quality Control Board (LARWQCB). The LARWQCB issued a NPDES permit CAG994004, CI-9468.

The aquifer pump tests were performed by placing a 4-inch diameter, stainless steel Grundfos SP4 pump into extraction well EW-1; the pump intake was set at about 100 feet bgs. The well discharge line consisted of 2-inch diameter PVC pipe that was connected to a 5-micron bag filter to ensure that no sediment was discharged into the City's storm drainage system. The discharge was piped to an onsite catch-basin. An inline flow meter and totalizer and were also plumbed into the discharge line to monitor the extraction well discharge rate and volume.

Changes in well water levels in all four wells were recorded using In-Situ Level-logger 500 pressure transducers that were installed prior to pumping. The transducers electronically store changes in pressure (due to changes in water level) that are later downloaded to a computer and converted to groundwater elevation data. The transducer data is calibrated against manual depth to water measurements, which were made prior to and during the pump test. The aquifer pump test activities were performed from December 1 to 5, 2008.

3.2 Site Geology

Three geological cross-sections were constructed to develop a Site Conceptual Model (SCM) of the hydrogeological condition at the Site. The alignment of cross-sections is presented on Figure 3-1; section A-A' parallels Melrose Avenue and runs west to east; section B-B' parallels Almont Drive and runs north to south; and, section C-C' parallels Santa Monica Boulevard and runs southwest to northeast. Cross-sections A-A', B-B' and C-C' are presented in Figures 3-2, 3-3, and 3-4, respectively. Note that the construction datum is 225 feet Elevation and the final floor elevation for the basement floor (level 6 storage) is -69 feet below datum (that is, 156 feet Elevation). The construction elevation datum and final floor elevation data are transposed onto cross-sections and based on the Site Sections Plan A6.01; a copy of Site Sections Plan A6.01 is provided in Appendix C.

Sediment types encountered in boreholes are consistent with alluvial deposits of gravel, sand, silt and clay. The upper alluvial deposits to depths of approximately 35 to 40 feet bgs consist predominantly of fine-grained sediments interlaced with sand stringers. Groundwater appears to be perched within these discontinuous sand deposits. Lateral continuity of sediments appears to be more continuous at depths below 40 feet bgs, where deposits may represent "Older Alluvium" of the Lakewood Formation. A probable geological boundary occurs near the 40-foot bgs level and is co-incident with an increase in sediment compaction as indicated by the increased blow counts observed on the standard penetrometer test records on boring logs and also reflected by the N60 count on CPT logs.

The Older Alluvium/Exposition Aquifer of the Lakewood Formation appears to extend to the maximum depths of exploration at 125 feet bgs. As indicated on the cross-sections, the upper sand unit within the Lakewood Formation extends from about 40 to 70 feet bgs, and will be excavated during the construction. A continuous layer of fine-grained aquitard material exists below the Older Alluvium that extends from about 70 to 80 feet bgs.

Below the aquitard material, thicker sequences of sand appear to exist that may represent the upper Exposition Aquifer proper. As illustrated in Figures 3-2 to 3-4, the Exposition aquifer will be penetrated by dewatering wells and likely produce the majority of water during construction activities. At depths of about 110 feet bgs and deeper sand aquifer and clay aquitard units appear to be intertwined and interbedded.

3.3 Site Groundwater Elevations and Hydraulic Gradient

To determine the hydraulic gradient across the Site, the newly installed wells were surveyed with respect to geographic location and vertical top of casing elevation. From the surveyed top of casing elevation, the depth to groundwater was measured in each well to determine the groundwater elevation. All wells were surveyed by Psomas Engineering, a State of California licensed surveyor. The well survey information is provided in Appendix B.

A set of groundwater depth to water measurements were collected from Site wells on October 28, and December 1, 2008, with the results presented in the table below.

Table 3-2: Surveyed Top of Well Casing Elevations and Depth to Water Measurements.

Well Identification	Date Measured	Top of Well Casing Elevation (ft, msl)	Depth to Water (feet)	Groundwater Elevation (ft, msl)	ΔH (feet)
EW-1	10/28/08	219.84	15.36	204.48	--
	12/01/08		15.19	204.65	0.17
OB-1	10/28/08	224.21	19.51	204.70	--
	12/01/08		19.38	204.83	0.13
OB-2	10/28/08	211.72	7.22	204.50	--
	12/01/08		7.04	204.68	0.18
OB-3	10/28/08	221.83	16.97	204.86	--
	12/01/08		16.82	205.01	0.15

The groundwater elevation at each well location was calculated by subtracting the depth to water measured in each well from its respective top of casing elevation. From the groundwater elevation data the Site-specific groundwater gradient was determined by application of the three-point rule. The results of the calculations to determine the Site-specific groundwater elevation and gradients are presented in the table below, and Figure 3-5 (note data from well EW-1 was not included in contouring).

Table 3-3: Groundwater Elevations at Well Locations and Local Gradient Data

Date Measured	Groundwater Elevations measured in Monitoring Wells (feet msl)				Gradient (feet/foot)	Bearing	Flow Direction
	EW-1	OB-1	OB-2	OB-3			
10/28/08	204.48	204.70	204.50	204.86	0.0023	142°	S 38 E
12/01/08	204.65	204.83	204.66	205.01	0.0026	145°	S 35 E

The Site-specific groundwater gradient determined from the above measurements is between 0.0023 to 0.0026 feet per foot (ft/ft) towards the southeast. The results presented above represent a set of measurements over a relatively short time period and do not account for seasonal trends in groundwater fluctuation. However, as presented in Figure 2-2, data from the Los Angeles County's regional monitoring wells do not appear to vary significantly seasonally. It is likely, then, that groundwater flow in the region is relatively stable if unimpeded by pumping or discontinuities in the aquifer material.

3.4 Site Aquifer Testing Procedures and Results

To determine the Site-specific aquifer hydraulic properties a series of aquifer pump tests were performed. A step drawdown test was performed on December 2, 2008 at extraction well EW-1 to determine well capacity and to determine an appropriate pumping rate for the subsequent constant rate aquifer pump test. The constant rate pump test was performed between December 3 and 4, 2008 at extraction well EW-1, with associated observations collected at wells OB-1, OB-2 and OB-3.

3.4.1 Pump Test Details

The step drawdown test consisted of four sequential steps where the pumping rate from well EW-1 was increased incrementally each successive step. Prior to the step drawdown test, the pump at well EW-1 was run at various revolutions per minute (RPM) settings to establish a baseline minimum and maximum flowrate. It was determined that the minimum flowrate out of EW-1 was approximately 30 gpm, and the maximum flowrate was approximately 100 gpm. Initial water levels were also obtained at well EW-1 and each observation well to determine the ambient groundwater conditions prior to pumping, and to calibrate electronically-obtained results with manual depth-to-water measurements. Water level data was collected every 5 minutes throughout the duration of the step drawdown and constant rate pump test utilizing pressure transducers placed in each well. During the first step of the test, water was extracted from well EW-1 at 31 gpm for 59 minutes. When water levels were observed to have stabilized within plus or minus 0.1 feet, the next step was initialized. During Step 2, water was pumped for 62 minutes at a rate of 42 gpm. Step 3 pumped water at 55 gpm for 87 minutes, and during Step 4, water was pumped at 65 gpm for 73 minutes. The step drawdown test is summarized in the table below.

Table 3-4: A Summary of the Step Drawdown Pump Test Flow Rates and Duration

Step	Flow Rate from EW-1 (gpm)	Duration (minutes)
1	31	59
2	42	62
3	55	87
4	65	73

During steps 1 through 3, groundwater elevations were observed to have stabilized in well EW-1 after an initial drop after each increase of the pumping rate. Steps 1 through 3 drew the water level in well EW-1 down to approximately 5, 7.5, and 10 feet below the static water elevation, respectively. However, water levels fluctuated during the late-time period of Step 4. Water level fluctuation resulted from sand and silt being drawn into the pump from the surrounding formation, and clogging the bag-filters. The clogged filters caused a backpressure on the pump, resulting in fluctuating flow rates. The presence of silt and sand in the extracted water indicated pumping stress was being applied to the aquifer surrounding the screen of well EW-1, as such, it was determined that the maximum sustainable well yield had been reached and the pump was shut-off and the test ended.

The time-drawdown plot for the step drawdown test at well EW-1 is presented in Appendix E. Note the water level fluctuations towards the end of Step 4 are readily apparent. Following the completion of the step drawdown test, the aquifer was allowed to recover for 15 hours so that groundwater levels could to return to static pre-pumping conditions. The results from the step drawdown test showed that a sustainable pumping rate of 55 gpm was achievable. While the pumping at 65 gpm did not cause excessive drawdown (only 12 feet within the well), the induced flow likely caused turbulent flow in the vicinity of the well screen resulting in sediment being drawn into the well. In order to be conservative, 52 gpm was chosen as the flowrate for the constant rate pump test.

The constant rate pump test involved extracting groundwater from well EX-1 at a rate of 52 gpm, while observing the effects of the applied stress to the surrounding aquifer system. Pressure transducers were placed in extraction well EW-1, and observation wells OB-1, OB-2, and OB-3 to record drawdown over both the pumping and recovery phase of the pump test. The pumping phase was conducted for 1,928 minutes between December 3 and 4, 2008. Time–drawdown data was collected at 5-minute intervals, and a recovery period of 16 hours was allowed to collect groundwater elevation date during the recovery period. Manual depth-to-water readings were also taken to calibrate the digital transducer data. Groundwater elevations fell approximately 10 feet below their initial state level in well EW-1, and between 2 and 3 feet in observation wells OB-1, OB-2, and OB-3. Groundwater levels recovered to their initial levels fairly quickly in all four wells after pumping ceased. Time drawdown plots for the constant rate pump test are presented in Appendix D, as Figure D-2 through D-9. For each well the data is presented on linear-linear and linear-log (semi-log) scales. Note that for the constant rate pump test time-drawdown plots the late time trend appears to flatten on the semi-log plot; this pattern is typical of delayed yield and indicative of a "leaky confined aquifer" (*Spane, 1993*).

3.4.2 Pump Test Analysis

This section presents the detailed analysis of the aquifer pump test data. The major objective of the pumping test data analysis is to quantify the Site hydrogeologic parameters such as transmissivity (T), hydraulic conductivity (K), and aquifer storativity (S). To estimate the hydraulic properties of subsurface materials, the observed field data (time-drawdown plots or curves) are matched to theoretical curves derived from mathematical equations which represent specific groundwater extraction conditions within "ideal" aquifers. Time-drawdown plots were obtained from each of the four wells used in the constant rate aquifer pump test. In accordance with ASTM guidelines (ASTM Standard D6034 – 96, 2004), data reduction and analysis was achieved using the commercial AQTESOLV® software program and professional judgment.

To determine the hydraulic properties of the aquifer material, field recorded time-drawdown data are fitted to theoretical equations (curves) that represent an ideal aquifer. The ideal aquifer is assumed to have the following properties:

- It is homogeneous and extends horizontally in all directions beyond the area of interest without encountering recharge or barrier boundaries.
- The aquifer thickness is uniform throughout.
- It is isotropic (i.e., hydraulic conductivity in the horizontal and vertical direction is equal to each other).
- Water is instantaneously released from aquifer storage when the head is reduced.
- The pumping well is frictionless and fully penetrates the aquifer.

However, natural aquifers rarely exhibit "idealized" conditions, and as such, hydraulic parameters derived from curve fitting of theoretical equations to field data incorporate the limitations inherent in the theoretical assumptions due to aquifer variability. Therefore, where a good fit between theoretical and field data may exist, actual hydraulic properties of the aquifer likely vary through time and space.

Groundwater elevation data recorded during the 32-hour pumping phase and 16-hour recovery phase were analyzed using the Hantush leaky aquifer solution (*Hantush, 1960*) and the Theis solution (1930) for confined aquifers. The theoretical curves for the Hantush leaky aquifer solution provide a better match to observed data than the Theis solution; which would be expected given the interbedded nature of the observed geology, and that wells screened multiple aquifer zones. The curve matches for the step drawdown test and the constant rate pump test are presented in Appendix E and summarized below.

Table 3-5: A Summary of the Aquifer Hydraulic Properties Determined from the Aquifer Pump tests.

Well	Step EW-1	Constant Rate Pump Test EW-1	OB-1	OB-2	OB-3
T (ft^2/day)	640	653	652	609	653
K (ft/day)	9.14	9.33	9.31	8.70	9.33
S [--]	3.40E-04	6.10E-04	7.30E-07	7.69E-07	1.25E-07

Note that T is transmissivity, where T = Kb (hydraulic conductivity x aquifer thickness). A cumulative aquifer thickness of 70 feet was used throughout.

The hydraulic conductivity for the aquifer zones tested returned a relatively narrow range of hydraulic conductivity values between 8.7 to 9.33 feet per day (ft/day) and the storativity values at the observation wells in the range of 10^{-6} to 10^{-7}.

3.5 Groundwater Quality Testing

To perform the aquifer pump testing described above, groundwater chemistry data was collected in order to obtain a NPDES permit to discharge extracted groundwater to the Los Angeles County Storm Drain Network. Groundwater samples were collected from well EW-1 following completion of well development and analyzed for pollutant compounds and water quality constituents listed on the NPDES Application Supplemental Requirements. Groundwater samples were collected on September 29 and October 1, 2008 and analyzed by American Scientific Laboratories, LLC of Los Angeles, California and Accutest of Milpitas, California.

Groundwater samples were submitted for the following analytical method:

- EPA method 8260 for Volatile Organic Compounds (VOCs)
- EPA method 8260 for Total Petroleum Hydrocarbons (Gasoline Range Organics)
- EPA method 8270 for Semi-Volatile Organic Compounds (SVOCs)
- EPA method 8270A for 1,4-Dioxane
- EPA Method 1664 for Oil and Grease
- EPA Method 180.1 for Turbidity
- EPA method 218.6 for Hexavalent Chromium
- EPA Method 300 for Anions
- EPA Method 314.0 for Perchlorate
- EPA Methods 6010b/6020/7470A for Metals
- EPA Method 8015B for Total Petroleum Hydrocarbons, (Diesel and Oil Range Organics)
- EPA Method 8081A for Organochlorine Pesticides

- EPA Method 8082 for Polychlorinated Biphenyls (PCBs)
- Standard Method (SM) 2340-C for Hardness
- SM 2540-C for Total Dissolved Solids (TDS)
- SM 2540-D for Total Suspended Solids (TSS)
- SM 2540-F for Settleable Solids (SS)
- SM 4500-CN-E for Cyanide, Total
- SM 4500-H-B- for pH
- SM 4500-S-2-D for Sulfide
- SM 5210B for Biological Oxygen Demand (BOD)

In addition, groundwater samples were also collected from wells OB-1, OB-2, and OB-3 and analyzed for common pollutants such as hydrocarbon compounds, VOCs and dissolved metals, to test for potential on or offsite contamination. No VOCs, hydrocarbon compounds or dissolved metals were detected in groundwater samples collected from wells OB-1, OB-2, and OB-3. The certified analytical data sheets and chain-of-custody documentation for the current sampling event are presented in Appendix F.

3.6 Groundwater Quality Analytical Results

Water quality at EW-1 was found to be generally good, and contained no pollutant compounds in excess of the NPDES requirements. No VOCs, SVOCs, hydrocarbon fuels or compounds, pesticides, PCBs, were reported in the sample collected from at EW-1 above laboratory reporting limits. All dissolved metals were ND at EW-1 except boron (179 micrograms per liter [μg/L]), and copper (0.54 μg/L). The EPA has no regulatory standard for boron, and the dissolved copper concentration at EW-1 is well below the EPA Maximum Contaminant Level (MCL) Goal of 1,300 μg/L.

A table of common water quality parameters and the results at EW-1 is shown below in Table 3-6. Total Dissolved Solids (TDS) at 880 mg/L exceeded the US Environmental Protection Agency (EPA) secondary standard for drinking water; however, is a reasonable value for untreated groundwater. Hardness was measured at 530 mg/L; hardness in groundwater is caused primarily by dissolved calcium and magnesium, which are nontoxic (*Driscoll, 1986*). Hardness at 530 mg/L, is classified as "very hard" by the EPA, but, again, is a reasonable value for untreated groundwater. All other water quality parameters were either non-detect (ND), or at low concentrations within posted EPA limits for drinking water. The anions (chloride, nitrate as N, nitrite as N, and sulfate) were all detected at low levels, within the acceptable range for untreated groundwater.

Table 3-6: Water quality parameters from Well EW-1.

Water Quality Parameter	Result from sample at EW-1	EPA limit
Total Dissolved Solids	880 mg/L	500 mg/L*
Total Suspended Solids	ND	NA
Settleable Solids	ND	NA
Hardness as $CaCO_3$	530	NA
Cyanide	ND	0.2 mg/L**
Chloride	128	NA
Nitrate as N	0.28	15
Nitrite as N	0.09	1
pH	7.36	6.5-8.5*
Sulfide	ND	NA
Sulfate	181	250*
Biological Oxygen Demand***	ND	NA

* Secondary drinking water standards. EPA recommends limit, but does not enforce.

** Highest level of contaminant allowed in drinking water. *** This is a measure of the oxygen used by the metabolic processes of organisms in the water.

3.7 Summary of Site Specific Hydrogeological Conditions

The performance of the hydrogeological investigation has provided valuable Site-specific information to the nature of both the geology and groundwater flow. Between the ground surface and 125 feet bgs (the maximum well depth explored) two main aquifer zones are encountered. The upper aquifer occupies the zone from approximately 40 to 70 feet bgs at EW-1 and consists of well-graded fine-to-medium sands interbedded with some silty clay. This zone is confined by an upper layer of sandy clay, above which the well is not screened. This upper aquifer varies in thickness across the Site, and not all sandy units are continuous between observation wells. Cumulative thickness of sandy units in the upper aquifer zone at OB-1, OB-2, and OB-3 are approximately 15, 20, and less than 10 feet, respectively. The lower aquifer units, occurs from about 80 feet bgs to the maximum depth explored, however, discontinuous layers of silt and clay occur. This lower aquifer unit appears to have a higher content of gravel material and is likely a higher water producing zone than the upper unit.

Results of the pumping tests indicate a relatively productive aquifer zone(s) beneath the Site. The aquifer system was able to handle relatively high pumping rates, in excess of 50 gpm, without drawing down water levels in the well more than 12 feet. The step-drawdown test was ended not because of dewatering the well, but because of excess stress being put on the aquifer causing sand and silt to be taken up by the pump. Additionally, water levels were observed to rebound quickly when pumping was interrupted or ceased.

Although the entire the upper and lower aquifer units are considered to be one single confined aquifer for the purposes of the pump test analyses, the lower aquifer is probably the more productive of the two zones. This lower unit consists of silty sands and contains gravel. Boring logs indicate areas of abundant gravel within this zone, as well as coarse sands, which may yield higher K-values than the finer, well-sorted sands encountered in the upper aquifer zone. Additionally, the lower aquifer zone is more laterally continuous than the upper aquifer zone. In the lower unit, sand and gravel intervals represent about 40-feet of thickness at EW-1, and between 40- and 20-feet of thickness at the three observation wells.

Hydraulic conductivity (K) values developed by the Hantush leaky aquifer solution curve fitting analysis also indicate a relatively productive aquifer zone. K-values are fairly consistent across the Site; ranging between approximately 8.7 to 9.33 ft/day. For the three observation wells, K was highest at OB-1, where the lower aquifer was thickest, and lowest at OB-3, where it was thinnest.

4.0 GROUNDWATER MODELING FOR DEWATERING

Groundwater modeling for the Site was performed to estimate the volume and rate of groundwater extraction required to lower the groundwater piezometric surface to allow for safe and dry excavation during construction. The computer software Winflow®, which is based on the analytic elements method (*Strack, 1989*), was used to evaluate dewatering options. The Winflow® software program is an interactive, analytical modeling tool that simulates two-dimensional steady-state and transient groundwater flow. For the purposes of the modeling exercise, the Site hydrogeological setting was considered to consist of one confined aquifer system. Input parameters for the computer modeling are the Site-specific hydraulic parameters discussed in Section 3.

The Winflow® simulations were conducted in three stages, as listed below:

1) Simulation of the regional static groundwater conditions and compare to actual Site data.
2) Simulation of drawdown associated with the constant rate aquifer pump test.
3) Simulation of the Site dewatering demand to lower the groundwater surface to Elevation 140 feet, which is approximately 16 feet below the planned basement level 6 final floor elevation of Elevation 156 feet.

The Winflow® groundwater model simulations were run in the steady-state mode, and the potentiometric surface map (groundwater elevation map) for each simulation is presented in Appendix G. The physical boundaries of the aquifer model included the depth to the top of the aquifer at 30 feet bgs (i.e., top of aquifer at an elevation of 190 feet), bottom of the aquifer set at 80 feet elevation, and the length of well screen at 90 feet.

The regional groundwater flow field for modeling was determined by defining a reference head of 207.6 feet approximately 1,000 feet upgradient of the Site. The groundwater gradient was set with a magnitude 0.0026 ft/ft and flow direction of bearing 145° to match observed Site conditions, the simulation of the regional groundwater flow is presented as Figure G-1, with the green arrow representing the model reference head location.

To verify the results obtained from the constant rate pump test, a model was simulated that included pump test parameters; that is, a pump rate of 52 gpm from well EW-1 and the final drawdown values (after 24-

hours of extraction) recorded in the extraction well EW-1 (at 10.09 feet) and observation wells, OB-1 (at 2.40 feet), OB-2 (at 2.65 feet) and OB-3 (at 2.23 feet). The modeling indicated a good fit to observed drawdown at locations EW-1 and OB-2 when a hydraulic conductivity of 8 ft/day was used and at OB-1 and OB-3 when a hydraulic conductivity of 12 ft/day was used. Figure G-2 presents the potentiometric surface from a steady state simulation of the constant rate pump test with a hydraulic conductivity of 10 ft/day for the aquifer unit. Based on the good fit between observed field data to model simulation results for the two simulations described above, the model's aquifer geometry, regional groundwater flow and hydraulic conductivity value of 10 ft/day were considered to provide a fair representation of the Site's hydrogeological condition and suitable for estimating the Site's dewatering demand.

The simulation to dewater the Site to Elevation 140 feet was constructed using 16 wells (of similar construction to well EW-1) located around the perimeter of the Site. The model simulation that achieves the required dewatering goal is presented in Figure G-3, and the model simulation output is included in Appendix G, and the extraction rates for well identified in the model are list in the table below.

Table 4-1: Dewatering Rates for Model Simulation

Well Identification	Extraction Rate (gpm)	Well Identification	Extraction Rate (gpm)
DW-1	100	DW-9	100
DW-2	100	DW-10	100
DW-3	50	DW-11	100
DW-4	50	DW-12	100
DW-5	50	DW-13	100
DW-6	50	DW-14	100
DW-7	100	DW-15	100
DW-8	100	DW-16	100

Due to the regional groundwater flow intersecting the Site almost perpendicular to Santa Monica Boulevard, the wells located along this transect act as a cut off barrier to flow. All wells along this transect (DW-1, and DW-11 through DW-16) pump groundwater at a rate of 100 gpm. Along Melrose Avenue DW-1 through DW-7, the end wells DW-1, DW-2 and DW-7 are pumped at 100 gpm, while interior wells DW-3 through DW-6 are pumped at 50 gpm. Along Almont Drive, wells DW-7, DW-8, DW-10 and DW-11 are pumped at 100 gpm and well DW-9 is pumped at 50 gpm. Collectively the total extraction rate from the 16 well dewatering system is 1,350 gpm. Note, alternative dewatering system designs could have been presented that either increased the extraction rates from individual wells and reduced the spacing between wells or decreased extraction rates and increased well density; however, given results of the aquifer pump tests, design flow rates between 50 to 100 gpm per well were considered optimal for Site conditions.

The dewatering model presented (in Figure G-3) should achieve project goals, and in practice a network of monitoring wells should be installed and monitored to verify groundwater drawdown. Also, as predicated by Site geological cross-sections and from the aquifer pump test results, Site conditions are variable (i.e., aquifer thicknesses, hydraulic conductivities, regional flow) and sufficient flexibility should be designed into the dewatering system to account for these variabilites.

5.0 RESPONSE TO COMMENTS BY WEST HOLLYWOOD WEST RESIDENTS ASSOCIATION

The West Hollywood West Residents Association (WHWRA) in a comment letter dated January 31, 2008 presented a series of questions regarding the Draft Environmental Impact Report (EIR) related to the Site development. A copy of the comment letter is presented in Appendix H, specifically, pages 3 to 6 of the comment letter presented concerns related to "Geology and Hydrology"; to the extent possible, the following addresses those relevant concerns of the WHWRA directly related to this investigation and study.

Groundwater Flow Direction: Based on this study and the limited two sets of measurements, groundwater flow beneath the Site has a magnitude of approximately 0.0023 to 0.0026 ft/ft and flows in a southeast direction.

Underlying Aquifer System: The Site geology to the total depth explored of 125 feet bgs are presented in three cross-sections of the report. As interpreted from Site geology a shallow aquifer system exist between depths of approximately 40 to 70 feet bgs, and a deeper aquifer system exists below about 80 feet bgs to the total depth explored. The sediment beneath the Site were deposited in a fluvial setting and as is typical of the fluvial depositional environment, channel sand and floodplain silts and clays are interbedded in an irregular manner. The Site itself, rest upon a rather small portion of a much larger alluvial plain, that essentially ranges from the surrounding mountains to the coast, i.e., the Los Angeles Coastal Plain. As is typical in the geomorphic setting of the Los Angeles Coastal Plain, groundwater aquifer recharge typically occurs along the mountain range front and flow to areas of lower topographic elevation.

Depth to Groundwater: The depth to groundwater across the Site varies due to Site topography, and from the recent set of measurement the variation observed ranges from approximately 7 to 20 feet bgs. However, it should be noted that the groundwater potentiometric surface is relatively flat beneath the Site and showed variation of less than 1-foot across the Site.

Surface Run-off: While not strictly the concern of this investigation or report, the WHWRA imply that surface run-off will be increase due to the proposed project. The Site as it presently exists is almost 100 percent covered by either building roofs or impermeable pavement. The proposed landscape features for the new Melrose Triangle development should act to decrease the current run-off from the property and alleviated some of the current conditions.

<u>Impacts to Local Construction</u>: It is beyond the scope of this investigation to comment on the construction deficiency of other projects; however, construction and building dewatering is a commonly applied practice within the building industry of the United States of America, and techniques developed within the United States of America have been proven to be highly successful.

<u>Hydrogeological Testing</u>: A comprehensive series of aquifer pump tests were performed and presented within this current report. The hydraulic properties of sediment beneath the Site are now well understood to the depths explored. Groundwater modeling was performed to estimate groundwater extraction rates to facilitate Site dewatering and construction.

<u>Groundwater Discharge</u>: Groundwater extracted during construction activities will be discharged to the storm drain under the restriction of a NPDES permit, as it was during the current investigation.

<u>Post-construction Dewatering Needs</u>: It is beyond the scope of this current investigation to develop a set of scenarios for the post construction dewatering demand for the proposed development.

<u>Groundwater Quality</u>: Groundwater quality testing was performed as part of this current investigation and in strict accordance with regulatory guidelines. No contamination was detected in the groundwater extracted from well EW-1. Further additional groundwater samples were collected observation wells OB-1, OB-2 and OB-3 and tested for VOCs (the most commonly detected pollutants in urban settings); no VOCs were detected in these samples. In general, groundwater quality would appear to be of good condition, although the hardness of the groundwater is relatively high for drinking water.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The current hydrogeological investigation at the Site has collected valuable information to address the requirements of the City of West Hollywood letter dated February 29, 2008, questions posed by WHWRA related to the Draft EIR and also assist in the development of Site dewatering needs. The Site geology to the maximum depth explored of 125 feet bgs is consistent with fluvial deposits of gravel, sand silt and clay. The coarser grained predominately sand deposits comprise the main water-bearing aquifer units. The finer grained silt and clay deposits comprise the relatively impermeable aquitard units. Two relatively continuous water bearing zones to exist beneath the Site; including an upper water-bearing unit from about 40 to 70 feet bgs and a thicker lower water-bearing unit from about 80 feet to the maximum depth explored. However, as presented on geologic cross-sections, lateral aquifer boundaries are irregular and units vary in thickness.

Four groundwater wells were installed to determine sediment hydraulic properties and Site groundwater flow conditions. Groundwater beneath the Site was encountered from approximately 7 to 20 feet bgs, with the depth to groundwater being a function of Site topography and not variation of the groundwater potentiometric surface which was determined to be relatively flat. The groundwater gradient at the Site is about 0.0025 ft/ft with flow towards the southeast.

The performance of an aquifer pump test revealed that hydraulic communication between the pumping well and the three observation wells was readily achievable. The analysis of the pump test data indicated that the water bearing unit(s) behaves as a leaky confined aquifer. The hydraulic conductivities estimated from time drawdown curves were within a narrow range of about 8 to 10 ft/day. Water was readily produced at a rate of 52 gpm from the extraction well EW-1 during the performance of the 32-hour pump test with a maximum drawdown of 10.33 feet.

Based on the results of the investigation, the Site's hydrogeology was modeled using the analytic elements method program of the Winflow® software. Modeling revealed that the planned construction excavation to Elevation 140 feet (16 feet below planned basement level 6) could be dewatered using 16 wells of similar construction to well EW-1 and pumped at rates between 50 to 100 gpm for a total extraction rate of about 1,350 gpm under steady-state conditions. The dewatering system should be designed to have flexibility to compensate for variability of natural conditions.

7.0 REFERENCES

Metropolitan Water District (MWD), 2007. *Groundwater Assessment Study.*

California Department of Water Resources (DWR), 1961. Bulletin 104 - *Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County.*

California Department of Water Resources (DWR), 2004. Bulletin 118 - *Coastal Plain of Los Angeles Groundwater Basin, Hollywood Subbasin.*

Driscoll, F.G., 1986. *Groundwater and Wells.* St. Paul, Minnesota: Johnson Screens.

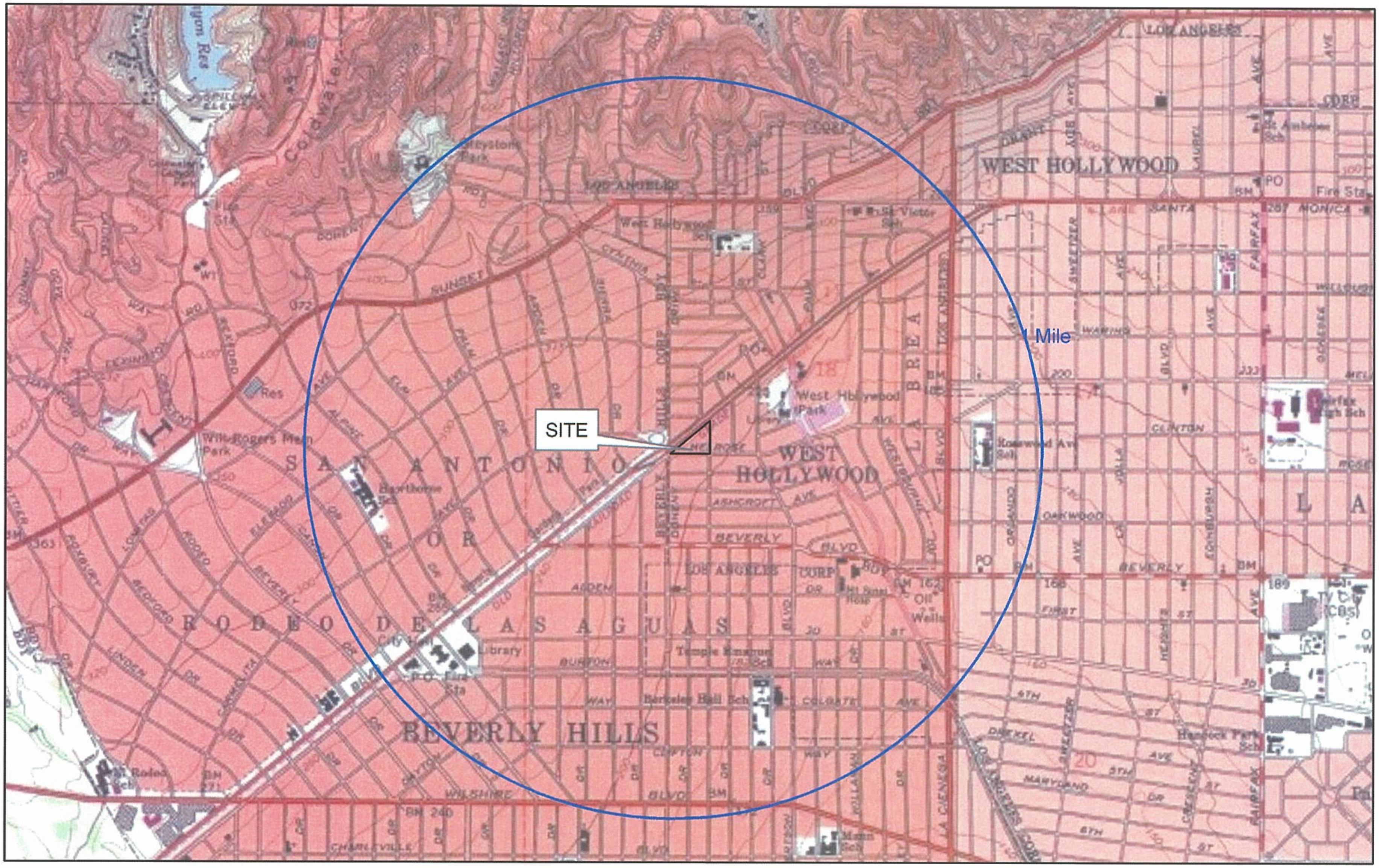
Hantush, M.S., 1960. *Modification of the theory of leaky aquifer.* Journal of Geophysical research V.65, No.11, pp. 3713-3725.

Spane, F.R. 1993: *Selected Hydraulic Test Analysis Techniques for Constant-Rate Discharge Tests.* Battelle, Pacific Northwest Laboratory, Richland, Washington.

Strack, O.DRL. 1989: *Groundwater Mechanics.* Prentice Hall, Englewood Cliffs, New Jersey.

Theis, C.V., 1935. *The relationship between the lowering of the piezometric surface and the rate and duration of discharge of a well using groundwater storage.* Trans. Am. Geophys. Union , Ann. Meet., 16th. pp. 519-524.

FIGURES



MACTEC

Topographic Site Vicinity Map
Melrose Triangle Development
9021 Melrose Avenue
West Hollywood, California 90069

0 2,000
Feet

N

Reference: USGS Topographic Map provided by TOPO!

FIGURE
1-1

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
RJP	4088087537 01		10/2008		

Wednesday, January 7, 2009 12:08:54 PM
P:\4088\087537_Melrose_Triangle\GIS\Project\Figure1_SiteVicinityUSGS.mxd

AutoCAD basemap provided by Studioneleven Architects, dated 8-31-2006

Hydrogeological Evaluation Report
Site Map showing
Well, Borehole and CPT Locations

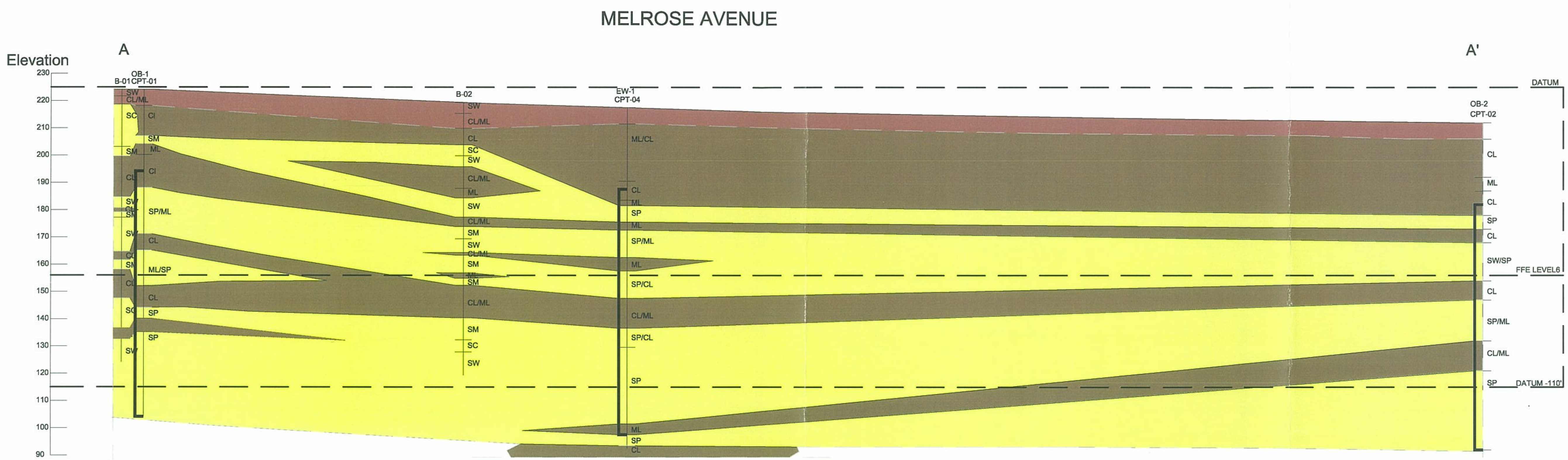
Proposed Melrose Triangle Development
Corners of Santa Monica Blvd, Melrose Avenue & Almont Drive
West Hollywood, California

MACTEC Project No.: 4088-08-7537.01

Figure
3-1

1/6/09
MT_SitePlan_Inv.dwg

MACTEC



Legend

- Surficial Fill Material
- Fine Grained Sediment (Low Permeability)
- Sand Dominated Sediment (Moderate Permeability) with variable content of gravel, silt and clay

0 40
SCALE: feet

Scale 1" = 40'
Vertical Exaggeration 1:1

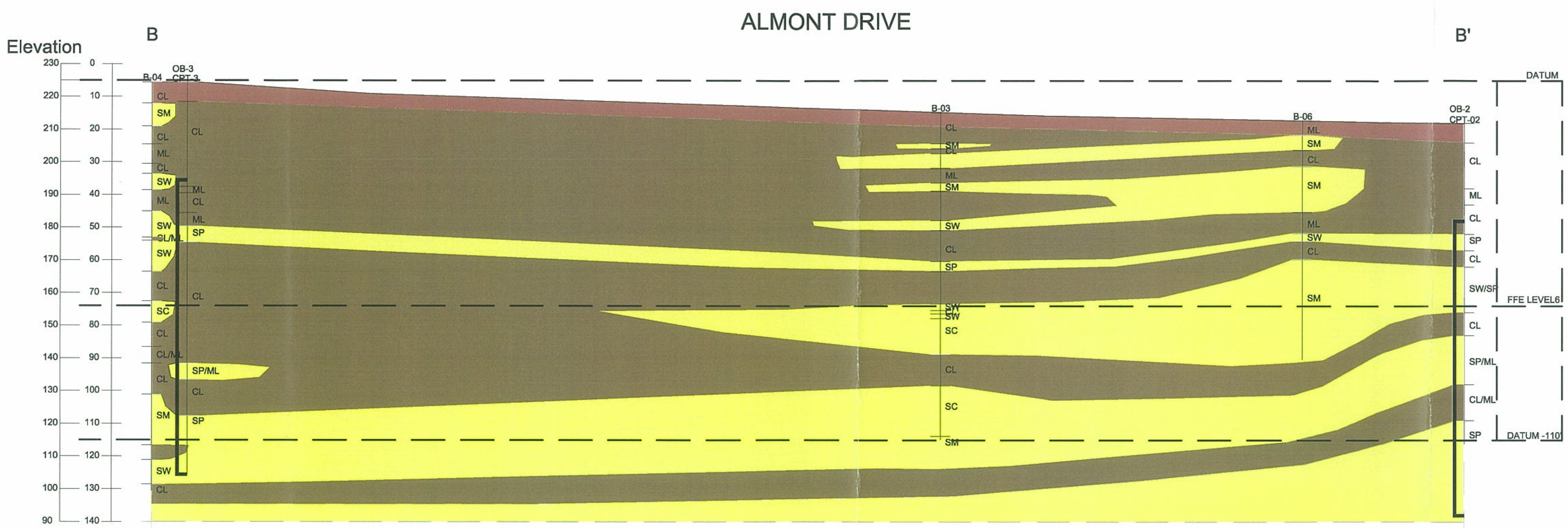
4088053112003.DWG 1.0
20050615.1552

MACTEC

Geologic Cross-Section
Section A-A'
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, CA

FIGURE
3-2

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
PCB	4088087537				



Legend

Surficial Fill Material

Fine Grained Sediment (Low Permeablility)

Sand Dominated Sediment (Moderate Permeablility) with variable content of gravel, silt and clay

0 40

SCALE: feet

Scale 1" = 40'
Vertical Exaggeration 1:1

MACTEC

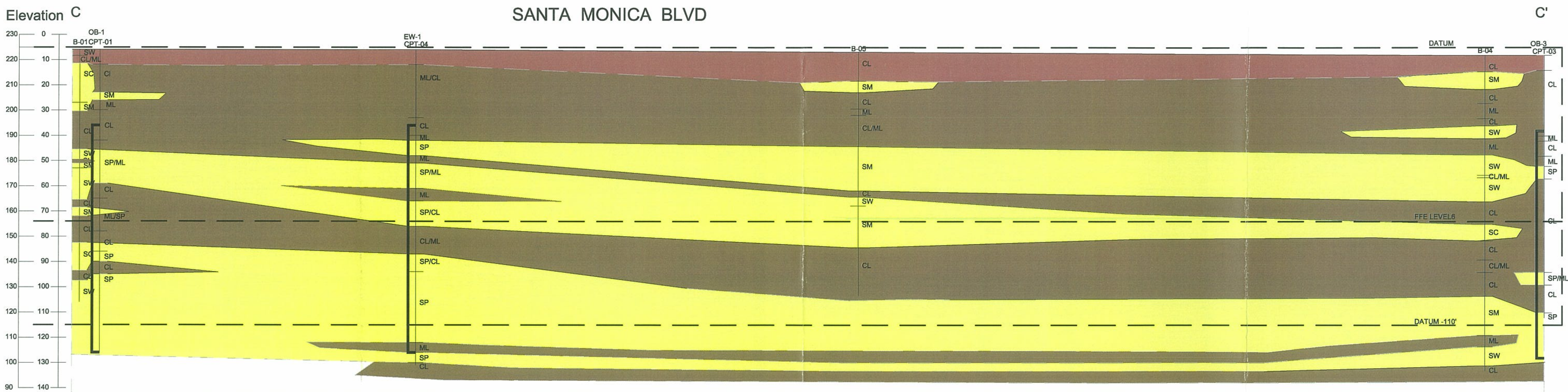
Geologic Cross-Section
Section B-B'
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, CA

FIGURE

3-3

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
PCB	4088087537				

408805311 2003.DWG 1.0
20050615.1552



Legend

- Surficial Fill Material
- Fine Grained Sediment (Low Permeability)
- Sand Dominated Sediment (Moderate Permeability) with variable content of gravel, silt and clay

0 40
SCALE: feet

Scale 1" = 40'
Vertical Exaggeration 1:1

MACTEC

Geologic Cross-Section
Section C-C'
Proposed Melrose Triangle Development
Corners of Santa Monica, Melrose & Almont
West Hollywood, CA

FIGURE
3-4

DRAWN	JOB NUMBER	CHECKED	CHECKED DATE	APPROVED	APPROVED DATE
WBC	4088087537				

4088053112003.DWG 1.0
20050615.1552

AutoCAD basemap provided by Studioeleven Architects, dated 8-31-2006

LEGEND

OB-1 / 204.83 — Aquifer Test Well; Groundwater Elevation in Well (feet, msl)

B-4 — Boring Location

——204.80 Groundwater Elevation Contour (feet, msl)

Hydrogeological Evaluation Report
Potentiometric Surface (December 1, 2008)

Proposed Melrose Triangle Development
Corners of Santa Monica Blvd, Melrose Avenue & Almont Drive
West Hollywood, California

MACTEC Project No.: 4088-08-7537.01

Figure
3-5

1/6/09
MT_SitePlan_GWelev.dwg

MACTEC

APPENDIX A

PERMITS FOR FIELD ACTIVITIES

CITY OF WEST HOLLYWOOD
APPLICATION FOR ENCROACHMENT PERMIT

DATE: 8-7-08

	YES	NO
EXCAVATION?	☐	☐
ENCROACHMENT?	☒	☐
NEW DEVELOPMENT?	☐	☐
ANNUAL RENEWAL?	☐	☐

PERMIT No. 200800135[illegible]
CITY BUSINESS LIC No. ________
STATE CONT. LICENSE No. ________

WORKMEN'S COMPENSATION NO.: ________

APPLICANT INFORMATION: (Responsible Party)
Name: Gary M Cito w/ Mactec Engr
Address: 5650 E. Slauson Ave
City/State/Zip: Los Angeles CA 90040
Phone No.: 323-889-5300
Emergency No.: 626-862-3761

JOBSITE INFORMATION:
Description of Work: Well Installation for groundwater monitoring/observation to assist aquifer characterization and testing
Location/Limits: Melrose Ave and Almont Drive
(1) CPT (2) WELL INSTALL
Start Date: (1) 8-18-08 (2) 9-01-08
End Date: 8-19-08 9-03-08
Max. Depth/Width/Length of Excavation: D______ W______ L______

APPLICANT'S DECLARATION

I hereby make application for permit to excavate/encroach in the public right of way at the described location(s) subject to the provisions required by the Municipal Code and the attachments hereon specified, and the provisions on the reverse side of this form. It is agreed by the Applicant that the City of West Hollywood and any of its officers or employees thereof shall be saved harmless by the Applicant from any liability or responsibility for any accident, loss or damage to persons or property, happening or occurring as the proximate result of any of the work undertaken under the terms of this application and that all of said liability is hereby assumed by the Applicant.

Signature: [signature] Date: 8-07-08

Working Hours/Noise Restrictions: ________

CALL 24 HOURS IN ADVANCE FOR INSPECTIONS: ( ) ___-____
THIS PERMIT EXPIRES: ___/___/___
READ STANDARD REQUIREMENTS ON REVERSE

WHITE - CONSTRUCTION OBSERVER CANARY - PERMITTEE

	Yes	No
Excavation on arterial streets require a one (1) sack	☐	☐
slurry backfill and existing pavement restoration	☐	☐
Excavation 5' or more in Depth?		
D.I.S. Permit No. ________		
Approved Shoring Plan?	☐	☐
Sewer Line Work?	☐	☐
Building and Safety Permit No. ________		
Traffic Plan Required? (Attach) Submit to Pub Wks Insp 1 week prior to work	☐	☐
Approval Date ________		
Name City as Additional Insured? Liability	☐	☐
(Attach Policy)		
Street Sweeping Exemption?	☐	☐
Street Sweeping Schedule ________		
Street markings required?	☐	☐
Pavement Repair	☐	☐
Excavation Area Only?	☐	☐
Full Street Width?	☐	☐
Has Street Improvement Plan been approved?	☐	☐
(Developments and renovations)		
Minimum Best Management Practices for Storm Water Prevention?	☐	☐
Storm Water Pollution Prevention Plan on File?	☐	☐
Approval Date? ________		
Permitted Waste Hauler?	☐	☐
Name of Hauler ________		
Recycling Plan on File?	☐	☐
Approval Date ________		

Additional Requirements: NEED Traffic Control Plan

FEES:	
Issuance Fee	$ 350.00
Parking Meter Fee ___ x $___ x Days	$
No Parking Signs ___ x $___	$
Plan Check Fee	$
Inspection Fee	$
Other Fee(s)	$
Trench Rehab Fee	$
TOTAL FEES	$
Special Deposit	$
TOTAL AMOUNT	$ 350.00

PERMIT APPROVAL AND ACCEPTANCE OR WORK

In compliance with the above application and subject to all the terms, conditions, and restrictions written or printed on the face or the back of this form and attached hereto, as well as any additional documents required herein, permission is granted to encroach or perform work within public rights-of-way.

Approved by: [signature] Date: 8-8-08

The work described herein was inspected and accepted by the City.

Inspected by: ________ Date: ________

PINK - CASHIER GOLDENROD - TEMPORARY FILE

WATER QUALITY PROGRAM - ENVIRONMENTAL HEALTH DIVISION DATE

5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706 TELE (626) 430-5420 FAX (626) 813-3016

☐ NEW WELL CONSTRUCTION ☐ RECONSTRUCTION OR RENOVATION ☐ DECOMMISSIONING ☐ OTHER:
☒ MONITORING OB-1 ☐ CATHODIC ☐ INJECTION EXTRACTION ☐ HEAT EXCHANGE
☐ HYDROPUNCH ☐ C.P.T. (For Ground Water Sampling) ☐ OTHER:

WELL LOCATION

Site Address: 9021 MELROSE AVE | City: WEST HOLLYWOOD | Zip Code: 90069
Nearest Intersection: DOHENY | Thomas Guide Map Book Page/Grid: 592/H7 | Number of Wells in Each Parcel: 1

WELL STRUCTURE

Total Depth of Well: 120' | Depth of Well Casing: 120' | Sanitary / Annular Sealing Material: CEMENT GROUT & 5% BENTONITE
Depth of Sanitary / Annular Seal: 30' | Conductor Casing Seal: N/A

OWNER INFORMATION

Owner's Name: SYSTEM LLC (c/o JACK KURCHIAN) | Telephone Number: (310) 432-5472.
Address: 1888 CENTURY PARK EAST SUITE 450 | City: LOS ANGELES | Zip Code: 90067

DRILLER INFORMATION

Driller's Name: BC² ENVIRONMENTAL CORP | Telephone Number: (714) 449-2990 | C-57 License Number: 686255
Address: 1212 EAST ASH AVE | City: FULLERTON | Zip Code: 92831

WELL DECOMMISSIONING INFORMATION

Well Depth ☐ log/records | Method of Well Assessment | Depth and Number of Perforations
Type and Amount of Sealant | Type of Perforator | Size of Perforations | Method of Upper Seal Pressure Application

CONSULTANT INFORMATION

Company: MACTEC E&C INC.
Address: 600 GRAND AVE SUITE 300 | City: OAKLAND | State: CA | Zip Code: 94610
Project Manager: WARREN CHAMBERLAIN | Telephone Number: (510) 628-3228 | Fax Number: (510) 451-3165

ATTENTION: WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THIS DEPARTMENT.

I hereby agree to comply in every respect with all the regulations of the County Environmental Health Division and with all ordinances and laws of the County of Los Angeles and the State of California pertaining to well construction, reconstruction, and decommissioning data deemed necessary by the County Environmental Health Division Of Los Angeles County.

Signature of Applicant: [signature] Printed Name: Gary M.Cito 8/08/08

THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED OFF BY THE DEPUTY HEALTH OFFICER. WELL CONSTRUCTION OR DECOMMISSIONING CANNOT BE INITIATED WITHOUT A WORK PLAN APPROVAL FROM THIS DEPARTMENT.

(DEPARTMENT USE ONLY)

WORK PLAN APPROVAL

This Approval is Valid for 180 Days

REHS: MICHELLE TSIEBOS | DATE: 8/19/08

Conditions:
On 8/08/08 $201.00 out of $804.00 was paid for permit #4048 to install 1 monitoring well (OB-1). Maintain all setbacks (10 ft away from underground sewer lines, storm water lines or utility lines). Please notify me at least 48 hours prior start of fieldwork for onsite inspection. (310) 419-8446

FINAL INSPECTION

The placement of the annular seal must be witnessed by a Deputy Health Officer for [illegible] Contact this Department to arrange for an appointment.

REHS | DATE

NOTICE

This well permit approval is limited to compliance with the California Well Standards and the Los Angeles County Code and does not grant any rights to construct, reconstruct, or decommission any well. The applicant is responsible for securing all other necessary permits.

8/19/08

WATER QUALITY PROGRAM - ENVIRONMENTAL HEALTH DIVISION

5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706 TELE (626) 430-5420 FAX (626) 813-3016

DATE ____________

- ☐ NEW WELL CONSTRUCTION ☐ RECONSTRUCTION OR RENOVATION ☐ DECOMMISSIONING ☐ OTHER: ________
- ☑ MONITORING OB-2 ☐ CATHODIC ☐ INJECTION ☐ EXTRACTION ☐ HEAT EXCHANGE
- ☐ HYDROPUNCH ☐ C.P.T. (For Ground Water Sampling) ☐ OTHER: ________

WELL LOCATION

Site Address	City	Zip Code
CORNER MELROSE AVE & ALMONT DRIVE	WEST HOLLYWOOD	90069

Nearest Intersection	Thomas Guide Map Book Page/Grid	Number of Wells in Each Parcel
	592 / H7	1

WELL STRUCTURE

Total Depth of Well	Depth of Well Casing	Sanitary / Annular Sealing Material
120'	120'	CEMENT GROUT & 5% BENTONITE

Depth of Sanitary / Annular Seal	Conductor Casing Seal
30'	N/A

OWNER INFORMATION

Owner's Name	Telephone Number	
SYSTEM LLC (c/o JACK KURCHIAN)	(310) 432-5472	
Address	**City**	**Zip Code**
1888 CENTURY PARK EAST, SUITE 450	LOS ANGELES	90067

DRILLER INFORMATION

Driller's Name	Telephone Number	C-57 License Number
BC² ENVIRONMENTAL CORP	(714) 449-2990	686255
Address	**City**	**Zip Code**
1212 EAST ASH AVENUE	FULLERTON	92831

WELL DECOMMISSIONING INFORMATION

Well Depth ☐ log/records	Method of Well Assessment		Depth and Number of Perforations
Type and Amount of Sealant	**Type of Perforator**	**Size of Perforations**	**Method of Upper Seal Pressure Application**

CONSULTANT INFORMATION

Company			
MACTEC E&C INC.			
Address	**City**	**State**	**Zip Code**
600 GRAND AVE, SUITE 300	OAKLAND	CA	94610
Project Manager	**Telephone Number**		**Fax Number**
WARREN CHAMBERLAIN	(510) 628-3228		(510) 451-3165

ATTENTION: WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THIS DEPARTMENT.

I hereby agree to comply in every respect with all the regulations of the County Environmental Health Division and with all ordinances and laws of the County of Los Angeles and the State of California pertaining to well construction, reconstruction, and decommissioning data deemed necessary by the County Environmental Health Division Of Los Angeles County.

Signature of Applicant: [signature] Printed Name: Gary M. Cato 8/08/08

THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED OFF BY THE DEPUTY HEALTH OFFICER. WELL CONSTRUCTION OR DECOMMISSIONING CANNOT BE INITIATED WITHOUT A WORK PLAN APPROVAL FROM THIS DEPARTMENT.

(DEPARTMENT USE ONLY)

WORK PLAN APPROVAL

This Approval is Valid for 180 Days

REHS: MICHELLE TSIEBOS DATE: 8/19/08

Conditions: On 8/08/08 $201.00 out of $804.00 was paid for permit # 4048 to install 1 monitoring well (OB-2) Maintain all setbacks (10 ft away from underground sewer lines, storm water lines or utility lines) Please notify me at least 48 hours prior start of fieldwork for onsite inspection. (310) 419-8446

FINAL INSPECTION

The placement of the annular seal must be witnessed by a Deputy Health Officer for the permit to be valid. Contact this Department to arrange for an appointment.

REHS: DATE:

NOTICE

This well permit approval is limited to compliance with the California Well Standards and the Los Angeles County Code and does not grant any rights to construct, reconstruct, or decommission any well. The applicant is responsible for securing all other necessary permits.

8/19/08

WATER QUALITY PROGRAM - ENVIRONMENTAL HEALTH DIVISION
5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706 TELE (626) 430-5420 FAX (626) 813-3016

DATE

☐ NEW WELL CONSTRUCTION ☐ RECONSTRUCTION OR RENOVATION ☐ DECOMMISSIONING ☐ OTHER:
☒ MONITORING OB-3 ☐ CATHODIC ☐ INJECTION ☐ EXTRACTION ☐ HEAT EXCHANGE
☐ HYDROPUNCH ☐ C.P.T. (For Ground Water Sampling) ☐ OTHER:

WELL LOCATION

Site Address	City	Zip Code
Corner Santa Monica Blvd & Almont Drive	West Hollywood	90069
Nearest Intersection	Thomas Guide Map Book Page/Grid: 592 / H7	Number of Wells in Each Parcel: 1

WELL STRUCTURE

Total Depth of Well	Depth of Well Casing	Sanitary / Annular Sealing Material
120'	120'	Cement Grout c̄ 5% Bentonite
Depth of Sanitary / Annular Seal: 30'		Conductor Casing Seal: N/A

OWNER INFORMATION

Owner's Name	Telephone Number	
System LLC (c/o Jack Korchian)	(310) 432-6472	
Address	City	Zip Code
1888 Century Park East, Suite 450	Los Angeles	90067

DRILLER INFORMATION

Driller's Name	Telephone Number	C-57 License Number
RC² Environmental Corp	(714) 449-2990	686255
Address	City	Zip Code
1212 East Ash Avenue	Fullerton	92831

WELL DECOMMISSIONING INFORMATION

Well Depth ☐ log/records	Method of Well Assessment		Depth and Number of Perforations
Type and Amount of Sealant	Type of Perforator	Size of Perforations	Method of Upper Seal Pressure Application

CONSULTANT INFORMATION

Company			
Mactec E&C Inc.			
Address	City	State	Zip Code
600 Grand Ave, Suite 300	Oakland	CA	94610
Project Manager	Telephone Number	Fax Number	
Warren Chamberlain	(510) 628-3220	(510) 457-3165	

ATTENTION: WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THIS DEPARTMENT.

I hereby agree to comply in every respect with all the regulations of the County Environmental Health Division and with all ordinances and laws of the County of Los Angeles and the State of California pertaining to well construction, reconstruction, and decommissioning data deemed necessary by the County Environmental Health Division Of Los Angeles County.

Signature of Applicant: Gary m Cito Printed Name: Gary M. Cito 8/08/08

THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED OFF BY THE DEPUTY HEALTH OFFICER. WELL CONSTRUCTION OR DECOMMISSIONING CANNOT BE INITIATED WITHOUT A WORK PLAN APPROVAL FROM THIS DEPARTMENT.

(DEPARTMENT USE ONLY)

WORK PLAN APPROVAL
This Approval is Valid for 180 Days

REHS: Michelle Tsiebos DATE: 8/19/08

Conditions:
On 8/08/08 $201.00 out of $804.00 was paid for permit # 4048 to install 1 monitoring well (OB-3) Maintain all setbacks (10 ft away from underground sewer lines, storm water lines or utility lines) Please notify me at least 48 hours prior start of fieldwork for onsite inspection. (310) 419-8446

FINAL INSPECTION
The placement of the annular seal must be witnessed by a Deputy Health Officer for this permit to be valid. Contact the Department to arrange for an appointment.

REHS DATE

COUNTY OF LOS ANGELES · CALIFORNIA

NOTICE
This well permit approval is limited to compliance with the California Well Standards and the Los Angeles County Code and does not grant any rights to construct, reconstruct, or decommission any well. The applicant is responsible for securing all other necessary permits.

8/19/08

WATER QUALITY PROGRAM - ENVIRONMENTAL HEALTH DIVISION

5050 COMMERCE DRIVE, BALDWIN PARK, CA 91706 TELE (626) 430-5420 FAX (626) 813-3016

DATE ____

☐ NEW WELL CONSTRUCTION ☐ RECONSTRUCTION OR RENOVATION ☐ DECOMMISSIONING ☐ OTHER: ____

☒ MONITORING EX-1 ☐ CATHODIC ☐ INJECTION ☐ EXTRACTION ☐ HEAT EXCHANGE

☐ HYDROPUNCH ☐ C.P.T. (For Ground Water Sampling) ☐ OTHER: ____

WELL LOCATION

Site Address	City	Zip Code
Corner Santa Monica Blvd & Melrose Ave	WEST HOLLYWOOD	90069

Nearest Intersection	Thomas Guide Map Book Page/Grid	Number of Wells in Each Parcel
& Doheny Drive	592/H7	1

WELL STRUCTURE

Total Depth of Well	Depth of Well Casing	Sanitary / Annular Sealing Material
120'	120'	Cement Grout 15% Bentonite

Depth of Sanitary / Annular Seal	Conductor Casing Seal
30'	N/A

OWNER INFORMATION

Owner's Name	Telephone Number	
SYSTEM LLC (c/o Jack Kirchian)	(310) 432-5472	
Address	**City**	**Zip Code**
1888 CENTURY PARK EAST, SUITE 450	LOS ANGELES	90067

DRILLER INFORMATION

Driller's Name	Telephone Number	C-57 License Number
BC² Environmental Corp	(714) 449-2990	686255
Address	**City**	**Zip Code**
1212 EAST ASH AVENUE	FULLERTON	92831

WELL DECOMMISSIONING INFORMATION

Well Depth ☐ log/records	Method of Well Assessment	Depth and Number of Perforations	
Type and Amount of Sealant	**Type of Perforator**	**Size of Perforations**	**Method of Upper Seal Pressure Application**

CONSULTANT INFORMATION

Company: MACTEC E&C INC.

Address	City	State	Zip Code
600 GRAND AVE, SUITE 300	OAKLAND	CA	94610

Project Manager	Telephone Number	Fax Number
WARREN CHAMBERLAIN	(510) 628-3228	(510) 451-3165

ATTENTION: WORK PLAN MODIFICATIONS MAY BE REQUIRED IF WELL AND GEOLOGIC CONDITIONS ENCOUNTERED AT THE SITE INSPECTION ARE FOUND TO DIFFER FROM THE SCOPE OF WORK PRESENTED TO THIS DEPARTMENT.

I hereby agree to comply in every respect with all the regulations of the County Environmental Health Division and with all ordinances and laws of the County of Los Angeles and the State of California pertaining to well construction, reconstruction, and decommissioning data deemed necessary by the County Environmental Health Division Of Los Angeles County.

Signature of Applicant: X [signature] Printed Name: X 8-08-08 Gary M. Cito

THIS PERMIT IS NOT COMPLETE UNTIL ALL OF THE FOLLOWING REQUIREMENTS ARE SIGNED OFF BY THE DEPUTY HEALTH OFFICER. WELL CONSTRUCTION OR DECOMMISSIONING CANNOT BE INITIATED WITHOUT A WORK PLAN APPROVAL FROM THIS DEPARTMENT.

**************************************(DEPARTMENT USE ONLY)**************************************

WORK PLAN APPROVAL — This Approval is Valid for 180 Days

REHS	DATE
Michelle TSIEBOS	8/19/08

Conditions: On 8/8/08 $201.00 out of $804.00 was paid for permit # 4048 to install 1 extraction well (EX-1). Maintain all setbacks (10 ft away from underground sewer lines, storm water lines or utility lines). Please notify me at least 48 hours prior start of fieldwork for onsite inspection. (310) 419-8446

FINAL INSPECTION

Placement of the annular seal must be witnessed by a Deputy Health Officer for the permit to be valid. Contact this Department to arrange for an appointment.

REHS	DATE

COUNTY OF LOS ANGELES CALIFORNIA

NOTICE

This well permit approval is limited to compliance with the California Well Standards and the Los Angeles County Code and does not grant any rights to construct, reconstruct, or decommission any well. The applicant is responsible for securing all other necessary permits.

8/19/08

California Regional Water Quality Control Board
Los Angeles Region
Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Linda S. Adams
Agency Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Arnold Schwarzenegger
Governor

November 19, 2008

Mr. Jack Kurchian
System, LLC
1888 Century Park East, Suite 450
Los Angeles, CA 90067

Certified Mail
Return Receipt Requested
Claim No. 7006 3450 0002 3041 1817

COVERAGE UNDER GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND WASTE DISCHARGE REQUIREMENTS—SYSTEM, LLC, MELROSE TRIANGLE PROJECT, 9021 MELROSE AVENUE, WEST HOLLYWOOD, CALIFORNIA (NPDES NO. CAG994004, CI—9468)

Dear Mr. Kurchian:

We have completed our review of your application for a permit to discharge groundwater to surface waters under a National Pollutant Discharge Elimination System (NPDES).

Based on the attached Fact Sheet and other information provided, we have determined that the proposed discharge at the above-referenced site meets the conditions to be regulated under Order No. R4-2008-0032, *General National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements for Groundwater Discharges from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties*, adopted by this Board on June 5, 2008.

Enclosed are your Waste Discharge Requirements, which also serve as your NPDES permit, consisting of Order No. R4-2008-0032 and Monitoring and Reporting Program No. CI-9468. The discharge limitations in Part V.1.Table 1 of Order No. R4-2008-0032 for the specific constituents listed on the Table with the enclosed Fact Sheet are applicable to your discharge. The groundwater discharge flows into the Benedict Canyon Channel, thence into the Ballona Creek. Therefore, the discharge limitations in Attachment B of Order No. R4-2008-0032 are not applicable to your discharge. Prior to starting discharge, a representative sample of the effluent shall be obtained and analyzed to determine compliance with the discharge limitations.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of coverage under this permit. All monitoring reports should be sent to the Regional Board, ATTN: Information Technology Unit. When submitting monitoring or technical reports to the Regional Board per these requirements, please include a reference to "Compliance File No. CI-9468 and NPDES No. CAG994004", which will assure that the reports are directed to the appropriate file and staff. Also, please do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

Mr. Kurchian
System, LLC
(Melrose Triangle Project)
CI-9468

November 19, 2008

To avoid paying future annual fees, please submit written request for termination of your enrollment under the general permit in a separate letter, when your project has been completed and the permit is no longer needed. Be aware that the annual fee covers the fiscal year billing period beginning July 1 and ending June 30, the following year. You will pay full annual fee if your request for termination is made after the beginning of new fiscal year beginning July 1.

We are sending a copy of Order No. R4-2008-0032 only to the applicant. For those on the mailing list, please refer to the Board Order sent to you previously. A copy of the Order will be furnished to anyone who requests it, or it can be obtained at our website address at http:/www.waterboards.ca.gov/losangeles/board decisions/adopted orders/

If you have any questions, please contact Vilma Correa at (213) 576-6794.

Sincerely,

Tracy J. Egoscue
Executive Officer

Enclosures:

General NPDES No. CAG994004, Order No. R4-2008-0032
Fact Sheet
Monitoring and Reporting Program No. CI-9468

cc: Environmental Protection Agency, Region 9, Permit Section (WTR-5)
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Services, Division of Ecological Services
NOAA, National Marine Fisheries Service
Philip Isorena, State Water Resources Control Board, NPDES Unit
Stephanie Trotter, State Water Resources Control Board, NPDES Unit
California Department of Fish and Game, Marine Resources, Region 5
California Department of Public Health, Environmental Branch
Los Angeles County, DPW, Environmental Programs Division
Los Angeles County, DPW, Flood Control Division
Los Angeles County, Department of Health Services
Los Angeles County Sanitation District
City of Los Angeles, Department of Public Works
City of Los Angeles, Bureau of Sanitation
Jae Kim, Tetratech
Anthony Evan, Melrose Triangle

/vbc

State of California-
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
320 West 4th Street, Suite 200, Los Angeles

FACT SHEET
WASTE DISCHARGE REQUIREMENTS FOR SYSTEM, LLC (MELROSE TRIANGLE PROJECT)

(ORDER NO. R4-2008-0032 SERIES NO. 014)
NPDES NO. CAG994004

CI-9468

FACILITY LOCATION
9021 Melrose Avenue
West Hollywood, CA

FACILITY MAILING ADDRESS
1888 Century Park East, Suite 450
Los Angeles, CA 90067

PROJECT DESCRIPTION

System, LLC proposes to discharge groundwater generated from aquifer pumping tests and from future construction dewatering project for the commercial building located at 9021 Melrose Avenue, West Hollywood. The groundwater will be discharged into the storm drain between Melrose Avenue and Almont Drive. The project will be completed within six months. A desilting tank will be installed to allow sediment to settle out before discharging.

VOLUME AND DESCRIPTION OF DISCHARGE

Up to 72,000 gallons per day (gpd) of groundwater will be discharged to the storm drain located between Melrose Avenue and Almont Drive (Latitude: 34° 04' 51", Longitude: 118° 23' 21"). The discharge from the storm drain flows into Ballona Creek, a water of the United States. The site location map is shown in Figure 1.

APPLICABLE EFFLUENT LIMITATIONS

Based on the information provided in NPDES Application Supplemental Requirements, the following constituents listed in the Table below have been determined to show reasonable potential to exist in your discharge. Therefore, the discharge limitations for these constituents in Part V.1. Table 1 of Order No. R4-2008-0032 are applicable to your discharge. The discharge flows into the Ballona Creek. The discharge limitations in Attachment B of the Order No. R4-2008-0032 is not applicable to your discharge.

November 19, 2008

This Table lists the specific constituents and effluent limitations applicable to the discharge.

Constituents	Units	Discharge Limitations	
		Daily Maximum	Monthly Average
Total Suspended Solids	mg/L	150	50
Turbidity	NTU	150	50
Oil and Grease	mg/L	15	10
BOD_5 20°C	mg/L	30	20
Settleable Solids	ml/L	0.3	0.1
Sulfides	mg/L	1.0	—
Phenols	mg/L	1.0	
Residual Chlorine	mg/L	0.1	—
Methylene Blue Active Substances (MBAS)	mg/L	0.5	—

FREQUENCY OF DISCHARGE

The discharge of groundwater will be intermittent and will last approximately six months or for the duration of future construction project.

REUSE OF WATER

Water reuse alternatives and its applicability were evaluated. A small volume of the groundwater will be used for dust control and soil compaction within the project area. The majority of the groundwater will be discharged into the Ballona Creek in compliance with the requirements of the attached order.

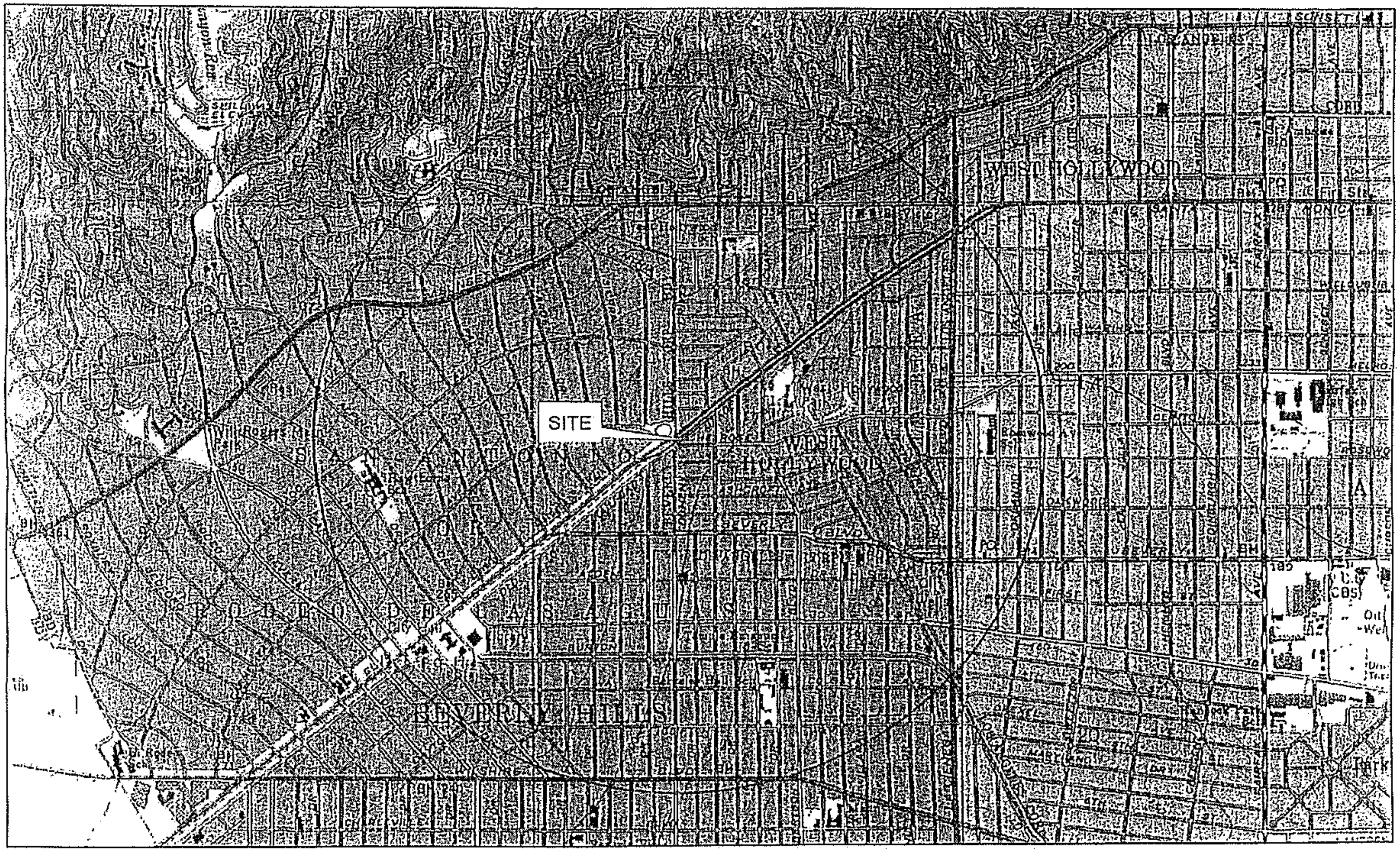


FIGURE 1

SYSTEM, LLC
(MELROSE TRIANGLE)

(9468)

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-9468
FOR
DISCHARGES OF GROUNDWATER FROM CONSTRUCTION AND PROJECT DEWATERING TO SURFACE WATERS
IN
COASTAL WATERSHEDS OF LOS ANGELES AND VENTURA COUNTIES

(GENERAL NPDES PERMIT NO. CAG994004, SERIES NO. 014)

This Order was adopted by the Regional Water Board on:	June 5, 2008
This Order shall become effective on:	November 19, 2008
This Order shall expire on:	June 5, 2013
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Board have classified this discharge as a minor discharge.	

Ordered By: ______________________
Tracy J. Egoscue
Executive Officer

Date: November 19, 2008

TABLE OF CONTENTS

ATTACHMENT E - Monitoring and Reporting Program (MRP)

LIST OF TABLES

Attachment E – Monitoring and Reporting Program (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. An effluent sampling station shall be established for Discharge Point M-001 and shall be located where representative samples of that effluent can be obtained. Provisions shall be made to enable visual inspections before discharge. In the event of presence of oil sheen, debris, and/or other objectionable materials or odors, discharge shall not commence until compliance with the requirements is demonstrated. All visual observations shall be included in the monitoring report.

B. This Regional Water Board shall be notified in writing of any change in the sampling stations once established or in the methods for determining the quantities of pollutants in the individual waste streams.

C. Effluent samples shall be taken downstream of any addition to treatment works and prior to mixing with the receiving waters.

D. This Regional Water Board shall be notified in writing of any change in the sampling stations once established or in the methods for determining the quantities of pollutants in the individual waste streams.

E. Pollutants shall be analyzed using the analytical methods described in 40 CFR §§136.3, 136.4, and 136.5 (revised May 14, 1999); or, where no methods are specified for a given pollutant, by methods approved by this Regional Water Board or the State Water Board.

F. Laboratories analyzing effluent samples and receiving water samples shall be certified by the California Department of Public Health, Environmental Laboratory Accreditation Program (ELAP) or approved by the Executive Officer and must include QA/QC data in their reports. A copy of the laboratory certification shall be provided each time a new certification and/or renewal of the certification is obtained from ELAP.

G. For any analyses performed for which no procedure is specified in the USEPA guidelines or in the MRP, the constituent or parameter analyzed and the method or procedure used must be specified in the monitoring report.

H. Each monitoring report must affirm in writing that "all analyses were conducted at a laboratory certified for such analyses by the Department of Public Health or approved by the Executive Officer and in accordance with current USEPA guideline procedures or as specified in this Monitoring and Reporting Program".

I. The monitoring reports shall specify the analytical method used, the MDL, and the ML for each pollutant. For the purpose of reporting compliance with numerical limitations, performance goals, and receiving water limitations, analytical data shall be reported by one of the following methods, as appropriate:

1. An actual numerical value for sample results greater than or equal to the ML; or

2. "DNQ" if results are greater than or equal to the laboratory's MDL but less than the ML; or,

3. "ND" for sample results less than the laboratory's MDL with the MDL indicated for the analytical method used.

   Analytical data reported as "less than" for the purpose of reporting compliance with permit limitations shall be the same or lower than the permit limit(s) established for the given parameter.

   Current MLs (Attachment G) are those published by the State Water Resources Control Board in the *Policy for the Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, March 2, 2000.

J. Where possible, the MLs employed for effluent analyses shall be lower than the permit limitations established for a given parameter. If the ML value is not below the effluent limitation, then the lowest ML value and its associated analytical method shall be selected for compliance purposes. At least once a year, the Discharger shall submit a list of the analytical methods employed for each test and associated laboratory QA/QC procedures.

The Regional Water Board, in consultation with the State Water Board Quality Assurance Program, shall establish a ML that is not contained in Attachment G to be included in the Discharger's permit in any of the following situations:

1. When the pollutant under consideration is not included in Attachment G;

2. When the Discharger and Regional Water Board agree to include in the permit a test method that is more sensitive than that specified in 40 CFR Part 136 (revised May 14, 1999);

3. When the Discharger agrees to use an ML that is lower than that listed in Attachment G;

4. When the Discharger demonstrates that the calibration standard matrix is sufficiently different from that used to establish the ML in Attachment G, and proposes an appropriate ML for their matrix; or,

5. When the Discharger uses a method whose quantification practices are not consistent with the definition of an ML. Examples of such methods are the USEPA-approved method 1613 for dioxins and furans, method 1624 for volatile organic substances, and method 1625 for semi-volatile organic substances. In such cases, the Discharger, the Regional Water Board, and the State Water Board shall agree on a lowest quantifiable limit and that limit will substitute for the ML for reporting and compliance determination purposes.

K. Water/wastewater samples must be analyzed within allowable holding time limits as specified in 40 CFR §136.3. All QA/QC items must be run on the same dates the samples were actually analyzed, and the results shall be reported in the Regional Water Board format, when it becomes available, and submitted with the laboratory reports. Proper chain of custody procedures must be followed, and a copy of the chain of custody shall be submitted with the report.

L. All analyses shall be accompanied by the chain of custody, including but not limited to data and time of sampling, sample identification, and name of person who performed sampling, date of analysis, name of person who performed analysis, QA/QC data, method detection limits, analytical methods, copy of laboratory certification, and a perjury statement executed by the person responsible for the laboratory.

M. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and to insure accuracy of measurements, or shall insure that both equipment activities will be conducted.

N. The analytical laboratory shall have an acceptable written quality assurance (QA) plan for laboratory analyses. The annual monitoring report shall also summarize the QA activities for the previous year. Duplicate chemical analyses must be conducted on a minimum of ten percent (10%) of the samples, or at least one sample per sampling period, whichever is greater. A similar frequency shall be maintained for analyzing spiked samples.

O. When requested by the Regional Water Board or USEPA, the Discharger will participate in the NPDES discharge monitoring report QA performance study. The Discharger must have a success rate equal to or greater than 80%.

P. For parameters that both monthly average and daily maximum limitations are specified and the monitoring frequency is less than four times a month, the following shall apply. If an analytical result is greater than the monthly average limitation, the Discharger shall collect four additional samples at approximately equal intervals during the month, until compliance with the monthly average limitation has been demonstrated. All five analytical results shall be reported in the monitoring report for that month, or 45 days after results for the additional samples were received, whichever is later. In the event of noncompliance with a monthly average effluent limitation, the sampling frequency for that constituent shall be increased to weekly and shall continue at this level until compliance with the monthly average effluent limitation has been demonstrated. The Discharger shall provide for the approval of the Executive Officer a program to ensure future compliance with the monthly average limitation.

Q. In the event wastes are transported to a different disposal site during the report period, the following shall be reported in the monitoring report:

1. Types of wastes and quantity of each type;

2. Name and address for each hauler of wastes (or method of transport if other than by hauling); and

3. Location of the final point(s) of disposal for each type of waste.

If no wastes are transported off-site during the reporting period, a statement to that effect shall be submitted.

R. Each monitoring report shall state whether or not there was any change in the discharge as described in the Order during the reporting period.

S. All monitoring reports shall include the discharge limitations in the Order, tabulated analytical data, the chain of custody form, and the laboratory report (including but not limited to date and time of sampling, date of analyses, method of analysis and detection limits).

T. Sample collection requirements (as appropriate)

1. Daily samples shall be collected each day.
2. Weekly samples shall be collected on a representative day of each week.
3. Monthly samples shall be collected on a representative day of each month
4. Quarterly samples shall be collected in February, May, August, and November.
5. Semi-annual samples shall be collected in May and November.
6. Annual samples shall be collected in November.

U. Before commencing a new discharge, a representative sample of the effluent shall be collected and analyzed for all the constituents listed in Fact Sheet, and the test results must meet all applicable limitations of Order No. R4-2008-0032.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table 1. Monitoring Location

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
Discharge Point 1	M-001	Treated effluent, after treatment and before contact with the receiving water and/or dilution by any other water or waste.
Discharge Point 2	M-002	If more than one discharge point is authorized under the General Permit, compliance monitoring locations shall be named M-002, M-003, etc. and shall be located so as to allow collection of treated effluent after treatment and before contact with receiving water and/or dilution by any other water or waste.

III. EFFLUENT MONITORING REQUIREMENTS

A. The Discharger shall monitor the effluent at Discharge Point M-001 as follows:

Constituent	Unit	Type of Sample	Minimum Frequency of Analysis
Conventional Pollutants			
Total Waste Flow	gal/day	totalizer	continuously[1]
pH	pH unit	grab	monthly
Temperature	°F	grab	monthly
Total Suspended Solids	mg/L	grab	monthly
Turbidity	NTU	grab	monthly
BOD_5 20°C	mg/L	grab	monthly
Oil and Grease	mg/L	grab	monthly
Settleable Solids	ml/L	grab	monthly
Sulfides	mg/L	grab	monthly
Phenols	mg/L	grab	monthly
Residual Chlorine	mg/L	grab	monthly
Methylene Blue Active Substances (MBAS)	mg/L	grab	monthly
Acute Toxicity	µg/L	grab	annually

1 Record the monthly total flow and report the calculated daily average flow and monthly flow in the quarterly and annual reports, as appropriate.

IV. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Definition of Toxicity

Acute Toxicity

The MRP requires an annual test for acute toxicity which measures primarily lethal effects that occur over a 96-hour period. Acute toxicity shall be measured in percent survival measured in undiluted (100%) effluent.

B. Acute Toxicity Effluent Monitoring Program

1. The Discharger shall conduct acute toxicity tests on effluent grab samples by methods specified in 40 CFR Part 136 which cites USEPA's *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, October 2002, USEPA, Office of Water, Washington D.C. (EPA/821-R-02-012) or a more recent edition to ensure compliance in 100 % effluent.

2. The fathead minnow, *Pimephales promelas*, shall be used as the test species for fresh water discharges and the topsmelt, *Atherinops affinis*, shall be used as the test species for brackish effluent. The method for topsmelt is found in USEPA's *Short-term Method for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*, First Edition, August 1995 (EPA/600/R-95/136), or a more recent edition.

3. In lieu of conducting the standard acute toxicity testing with the fathead minnow, the Discharger may elect to report the results or endpoint from the first 48 hours of the chronic toxicity test as the results of the acute toxicity test.

4. Accelerated Toxicity Monitoring: If the results of the toxicity test yields a survival of less than 90%, then the frequency of analyses shall increase to monthly until at least three test results have been obtained and full compliance with effluent limitations has been demonstrated, after which the frequency of analyses shall revert to annually. Results of toxicity tests shall be included in the first monitoring report following sampling.

5. Effluent samples shall be collected after all treatment processes and before discharge to the receiving water.

C. Reporting

1. The Discharger shall submit a full report of the toxicity test results, including any accelerated testing conducted during the month as required by this permit. Test results shall be reported as % survival for acute

toxicity test results with the self monitoring reports (SMR) for the month in which the test is conducted.

2. If an initial investigation indicates the source of toxicity and accelerated testing is unnecessary, then those results also shall be submitted with the SMR for the period in which the investigation occurred.

   a. The full report shall be submitted on or before the end of the month in which the SMR is submitted.

   b. The full report shall consist of (1) the results; (2) the dates of sample collection and initiation of each toxicity test; (3) the acute toxicity average limit.

3. Test results for toxicity tests also shall be reported according to the appropriate manual chapter on Report Preparation and shall be attached to the SMR. Routine reporting shall include, at a minimum, as applicable, for each test:

   a. Sample date(s);
   b. Test initiation date;
   c. Test species;
   d. End point values for each dilution (e.g., number of young, growth rate, percent survival);
   e. Any applicable charts; and
   f. Available water quality measurements for each test (e.g., pH, D.O., temperature, conductivity, hardness, salinity, ammonia).

4. The Discharger shall provide a compliance summary, which includes a summary table of toxicity data from all samples collected during that year.

   The Discharger shall notify by telephone or electronically, this Regional Water Board of any toxicity exceedance of the limit or trigger within 24 hours of receipt of the results followed by a written report within 14 calendar days of receipt of the results. The verbal or electronic notification shall include the exceedance and the plan the Discharger has taken or will take to investigate and correct the cause(s) of toxicity. It may also include a status report on any actions required by the permit, with a schedule for actions not yet completed. If no actions have been taken, the reasons shall be given.

V. LAND DISCHARGE MONITORING REQUIREMENTS

Not Applicable.

VI. RECLAMATION MONITORING REQUIREMENTS

Not Applicable.

VII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

Not Applicable.

VIII. OTHER MONITORING REQUIREMENTS

Not Applicable.

IX. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. If there is no discharge during any reporting period, the report shall so state.

3. Each monitoring report shall contain a separate section titled "Summary of Non-Compliance" which discusses the compliance record and corrective actions taken or planned that may be needed to bring the discharge into full compliance with waste discharge requirements. This section shall clearly list all non-compliance with waste discharge requirements, as well as all excursions of effluent limitations.

4. The Discharger shall inform the Regional Water Board well in advance of any proposed construction activity that could potentially affect compliance with applicable requirements.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP. The Discharger shall submit SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this

monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table 2. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On	Monitoring Period	SMR Due Date
Continuous	November 19, 2008	All	Submit with quarterly SMR
Weekly	Sunday following permit effective date or on permit effective date if on a Sunday	Sunday through Saturday	Submit with quarterly SMR
Monthly	First day of calendar month following permit effective date or on permit effective date if that date is first day of the month	1st day of calendar month through last day of calendar month	Submit with quarterly SMR
Quarterly	Closest of January 1, April 1, July 1, or October 1	January 1 through March 31. April 1 through June 30. July 1 through September 30. October 1 through December 31	45 days from the end of the monitoring period
Annually	January 1	January 1 through December 31	45 days from the end of the monitoring period

4. Reporting Protocols. The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

a. Sample results greater than or equal to the RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy ($\pm$ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.